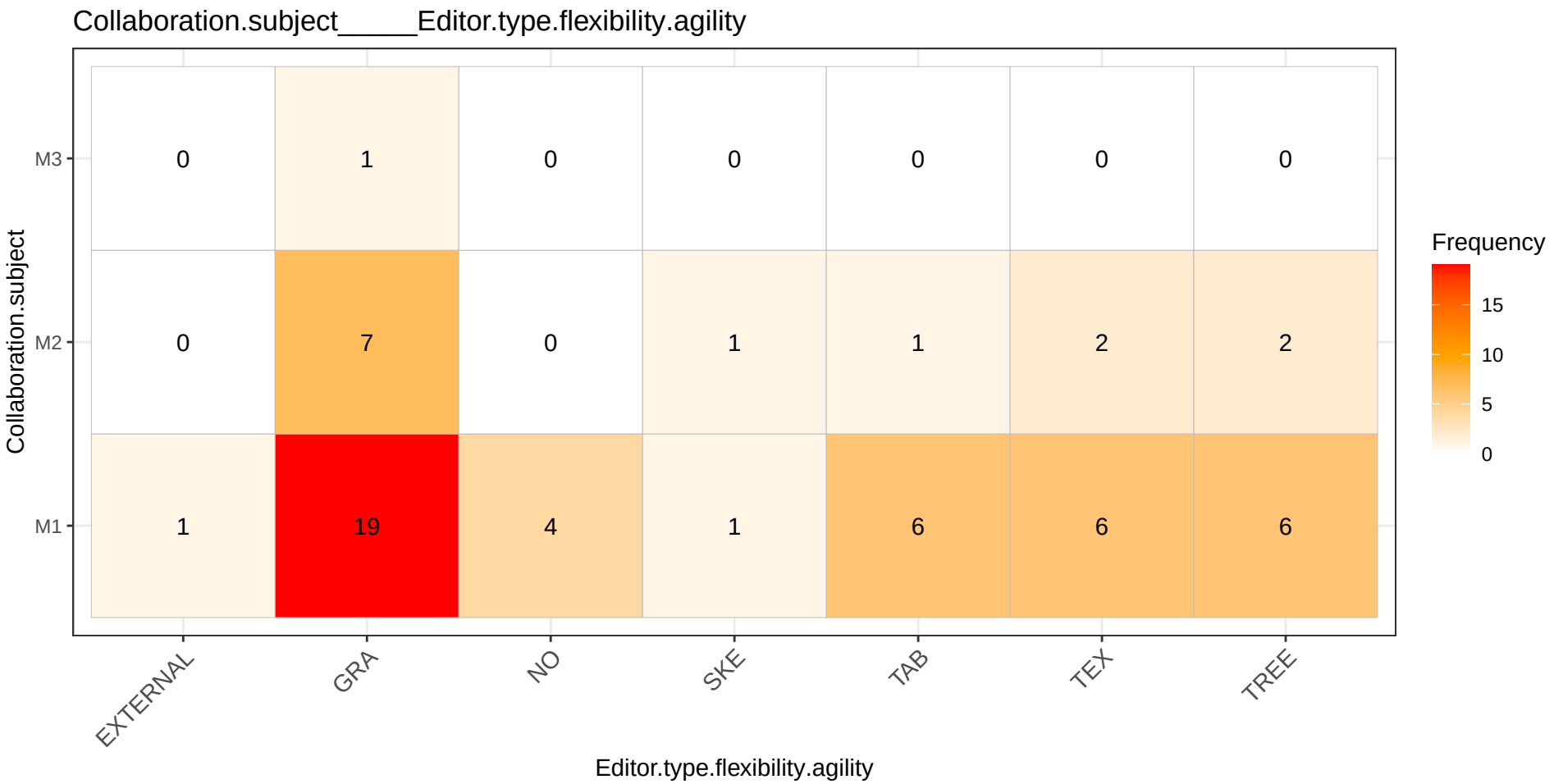
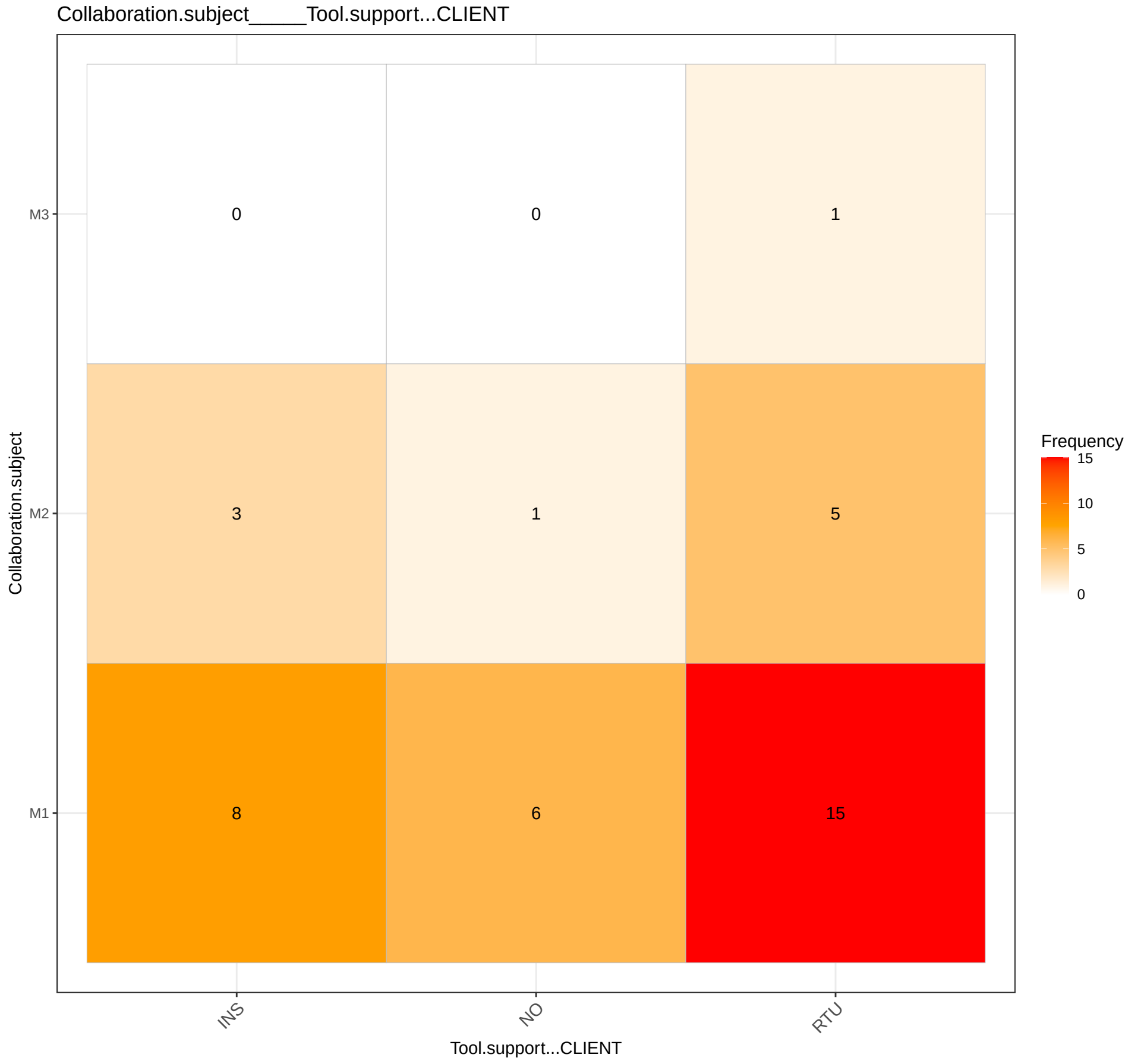
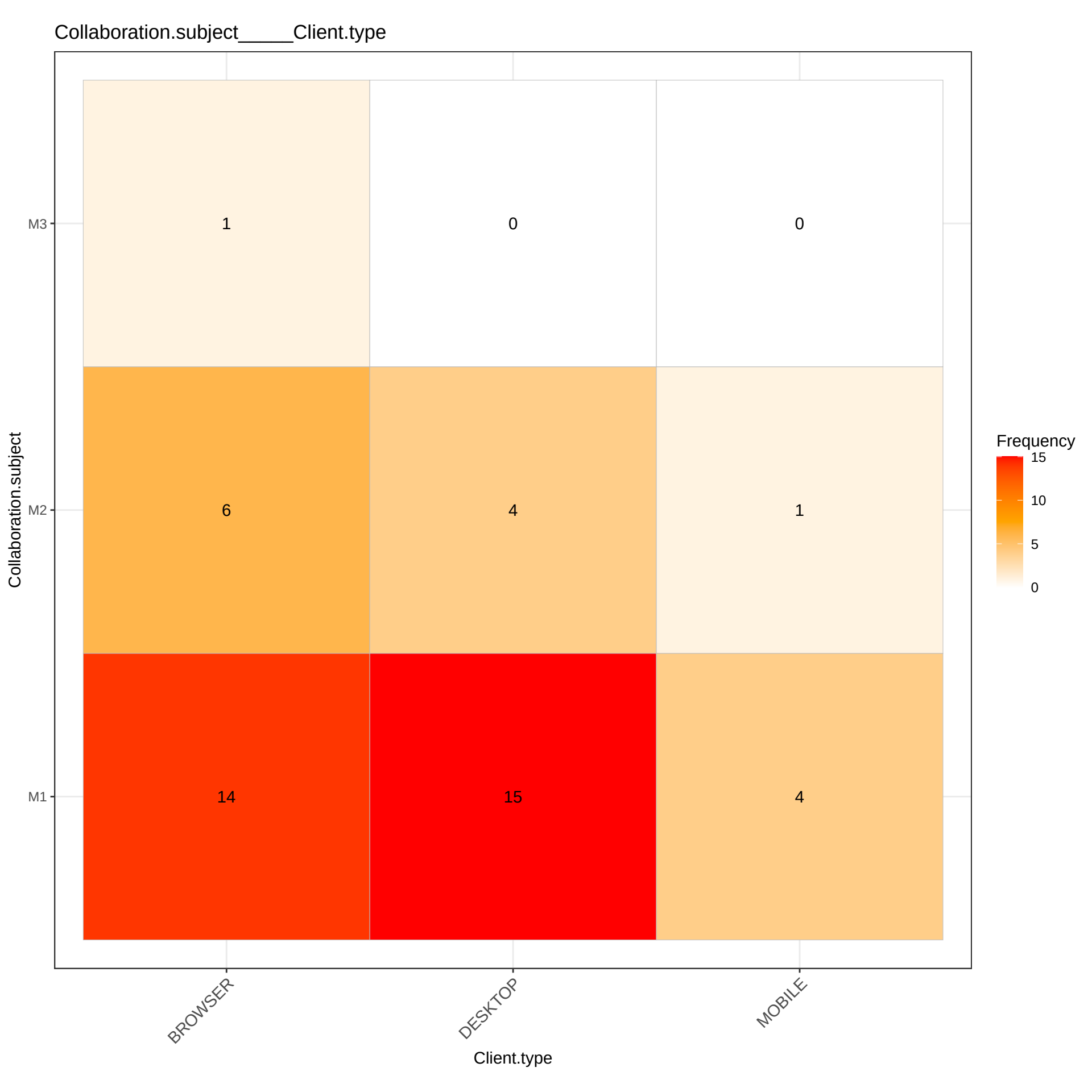
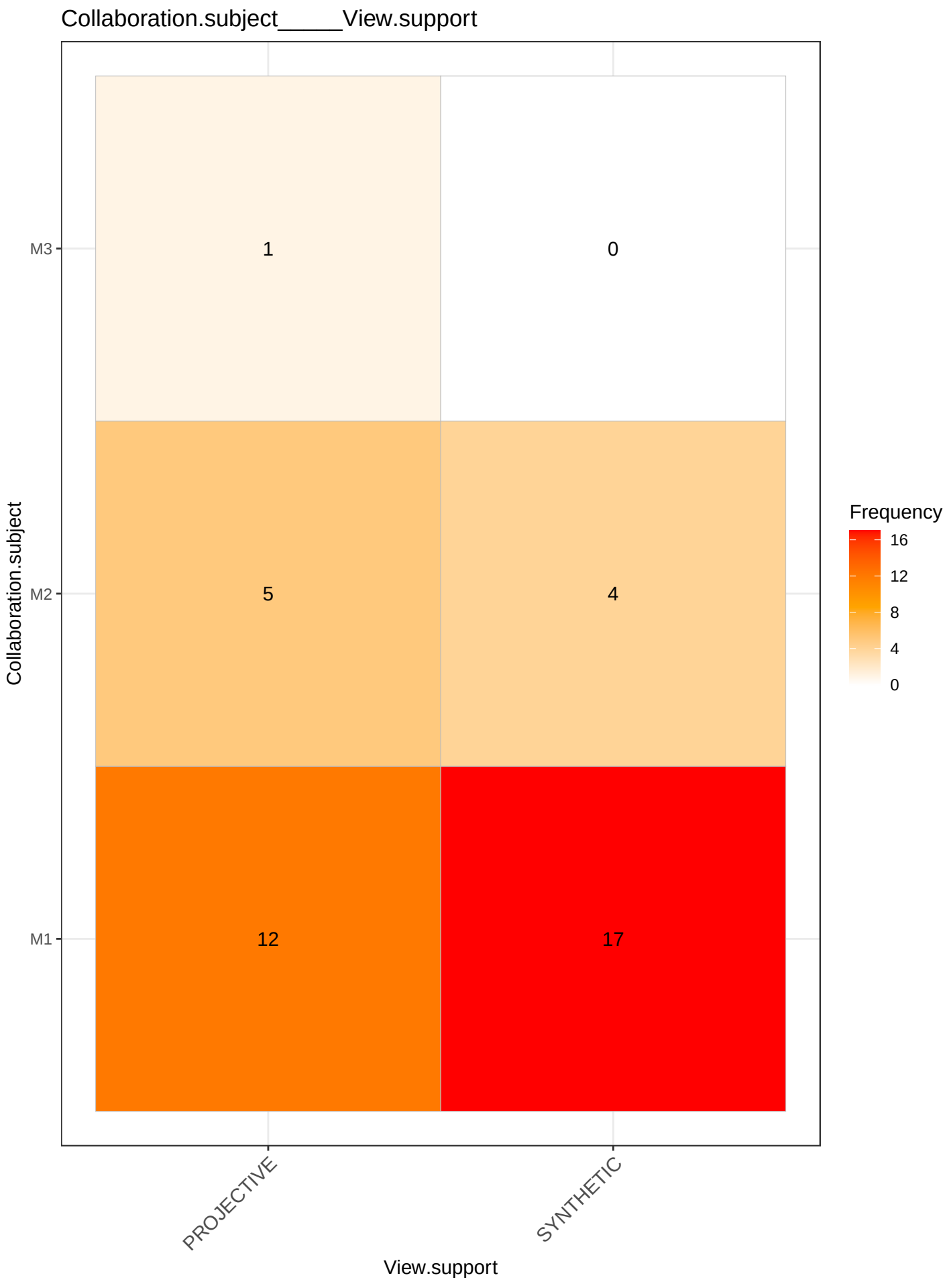
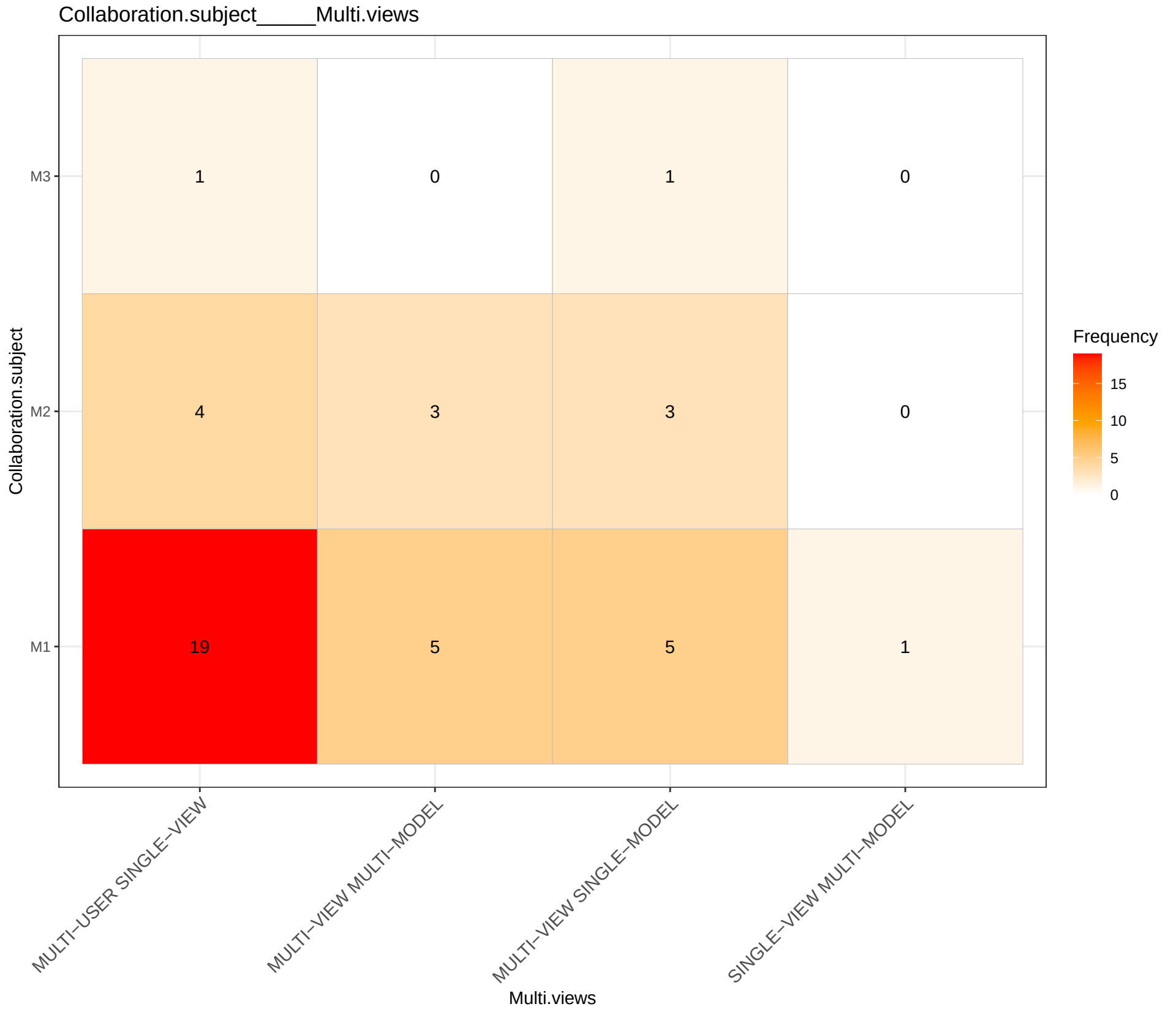
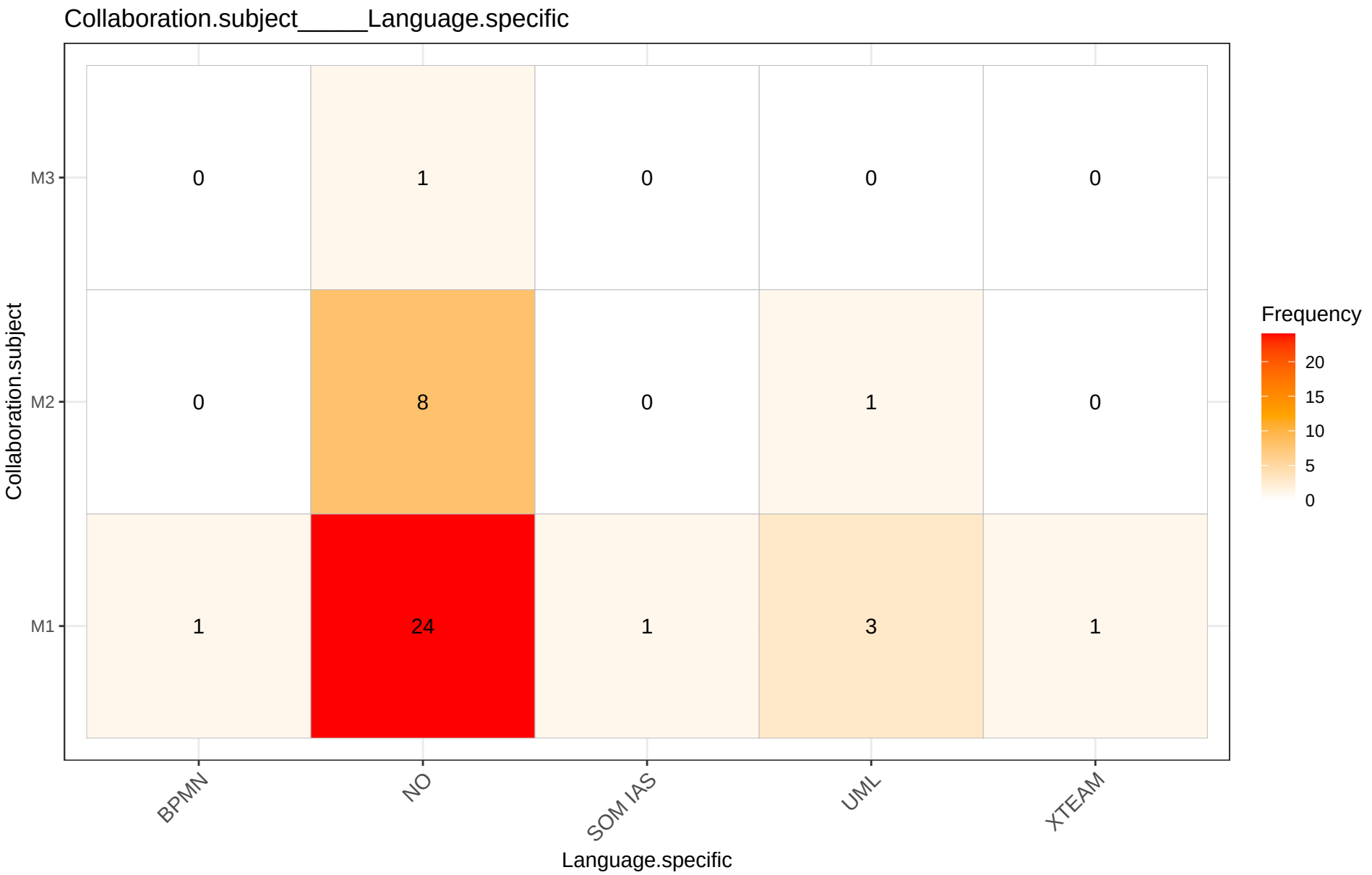

Collaboration.subject_____Editor.type.flexibility.agility
Collaboration.subject
M3
M2
M1
0
1
0
0
0
0
0
0
7
0
1
1
2
2
1
19
4
1
6
6
6
EXTERNAL
GRA
NO
SKE
TAB
TEX
TREE
Editor.type.flexibility.agility
Frequency
15
10
5
0

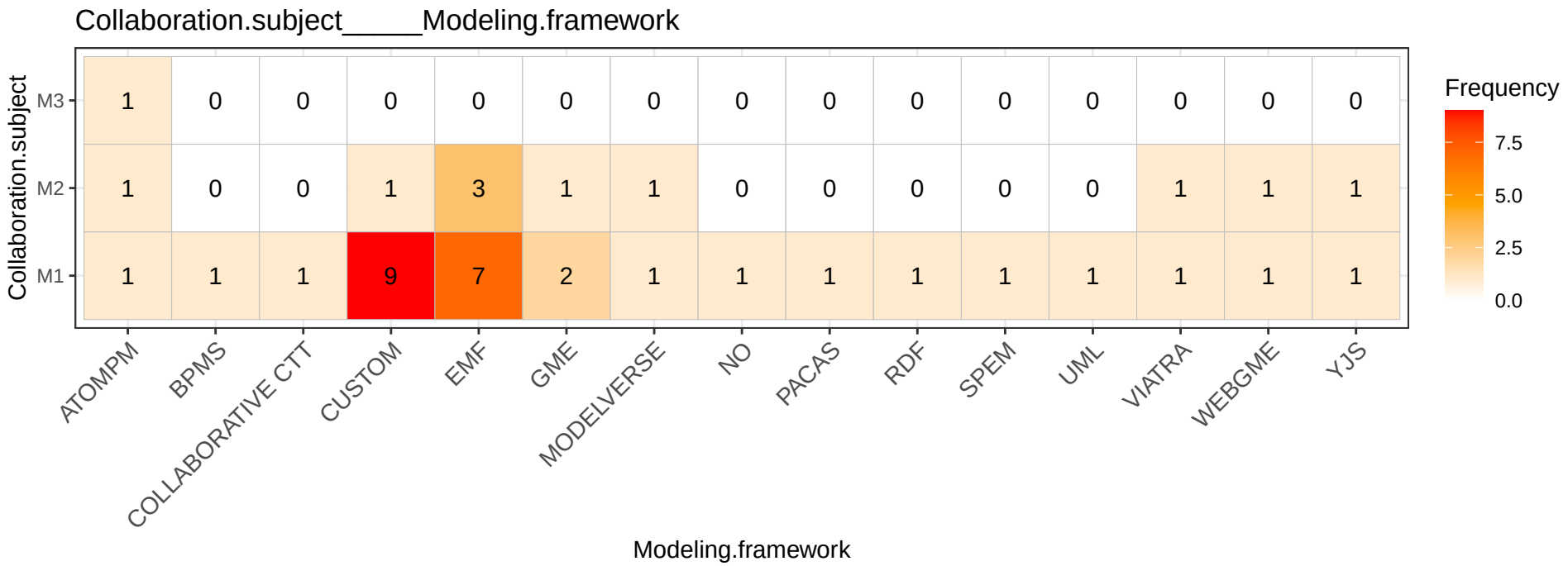

Collaboration.subject_____Tool.support...CLIENT
M3
M2
M1
0
0
1
3
1
5
8
6
15
INS
NO
RTU
Tool.support...CLIENT
Collaboration.subject
Frequency
15
10
5
0

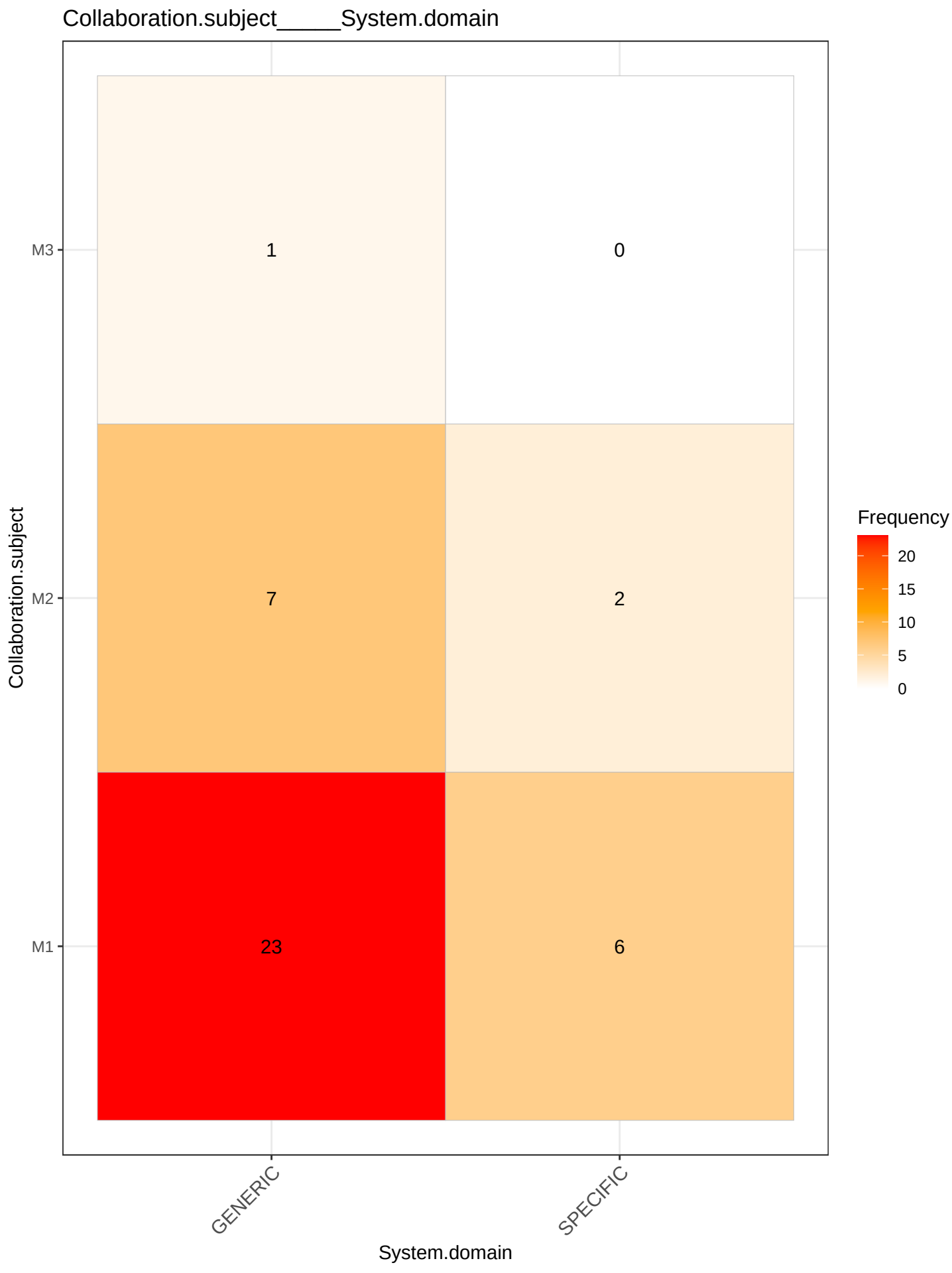

Collaboration.subject_____Client.type
M3
M2
M1
1
0
0
6
4
1
14
15
4
BROWSER
DESKTOP
MOBILE
Client.type
Collaboration.subject
Frequency
15
10
5
0

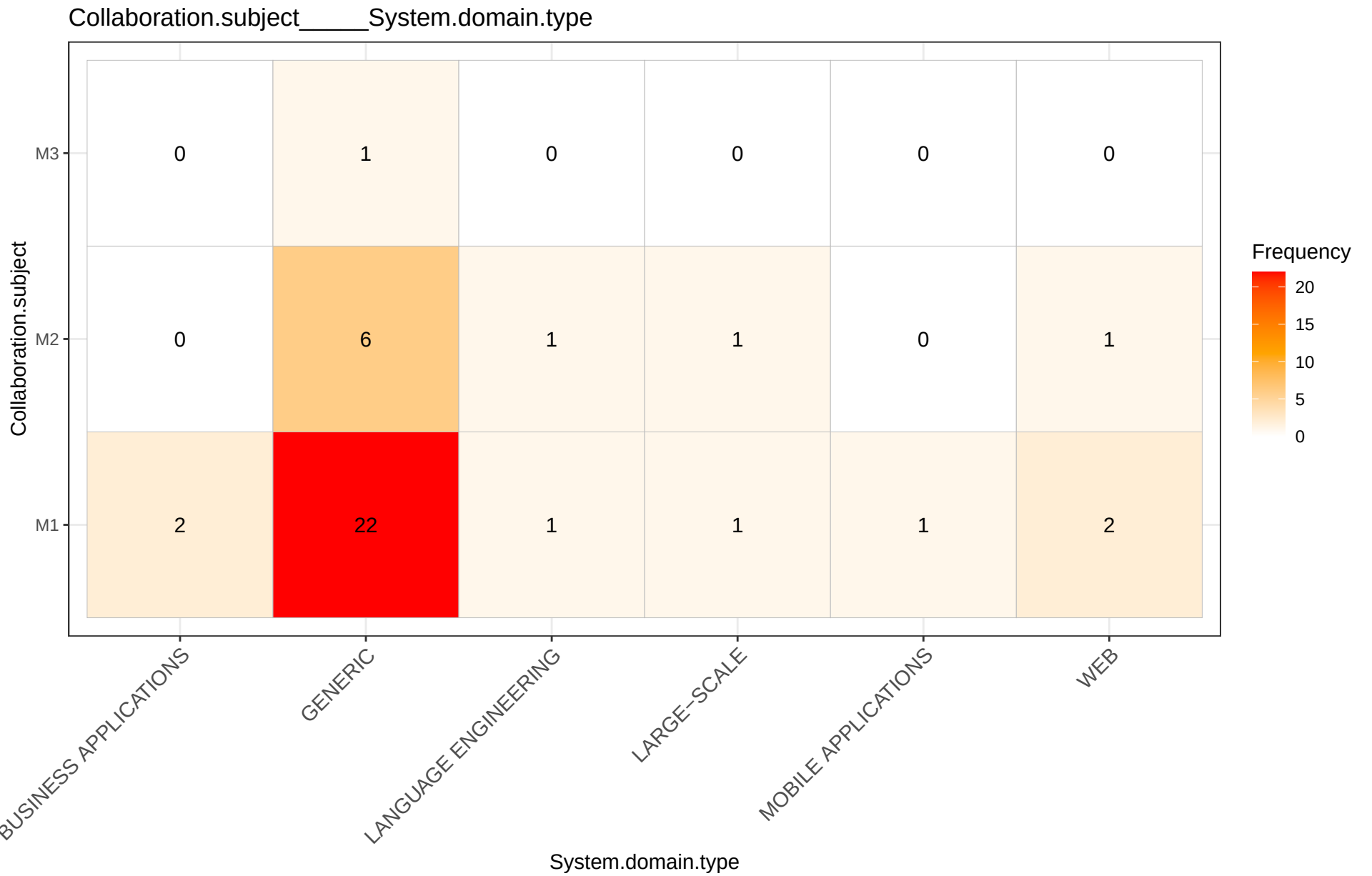

Collaboration.subject_____View.support
M3
M2
M1
1
0
5
4
12
17
Collaboration.subject
PROJECTIVE
SYNTHETIC
View.support
Frequency
16
12
8
4
0

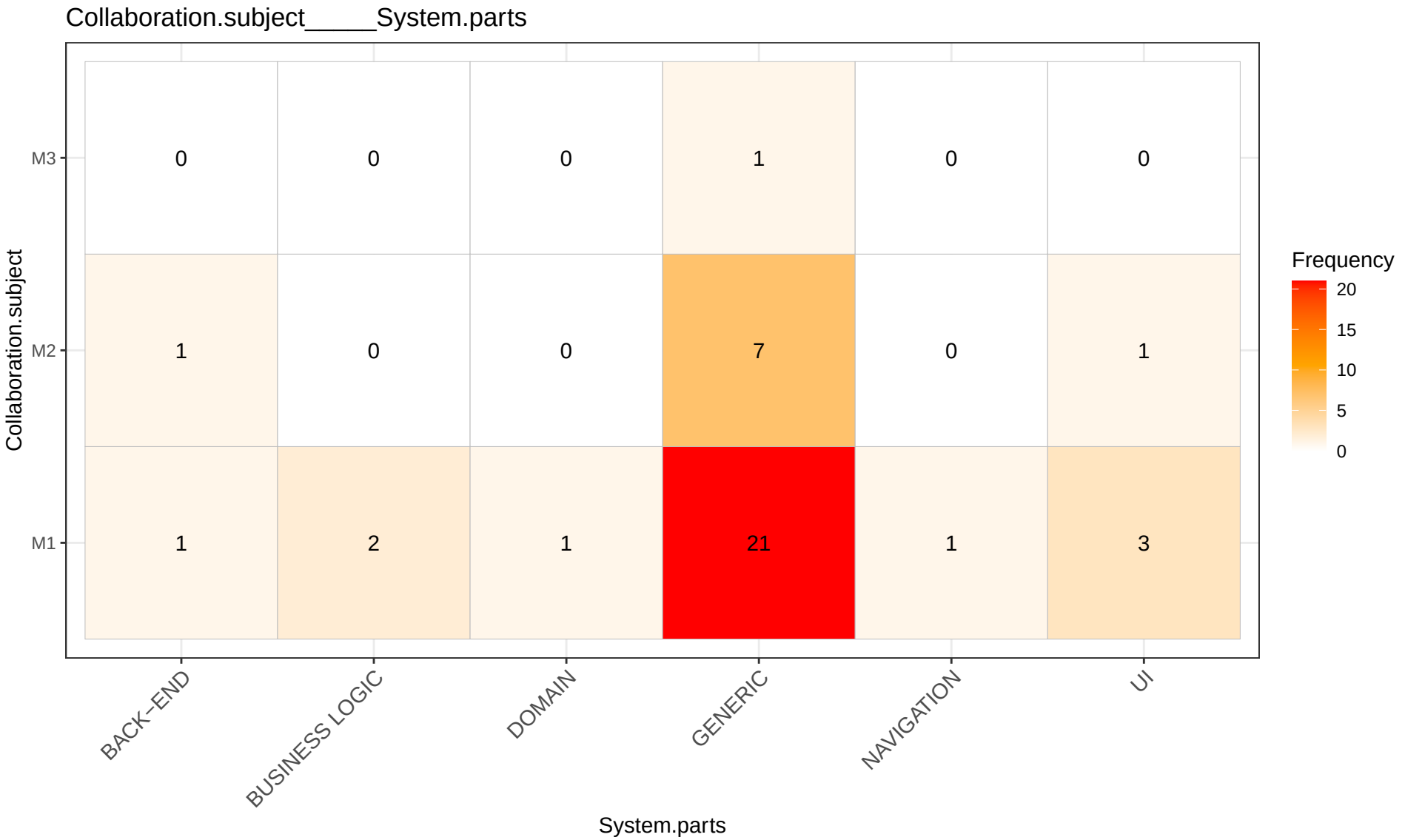

Collaboration.subject_____Multi.views
M3
M2
M1
1
0
1
0
4
3
3
0
19
5
5
1
Collaboration.subject
MULTI−USER SINGLE−VIEW
MULTI−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
SINGLE−VIEW MULTI−MODEL
Multi.views
Frequency
15
10
5
0

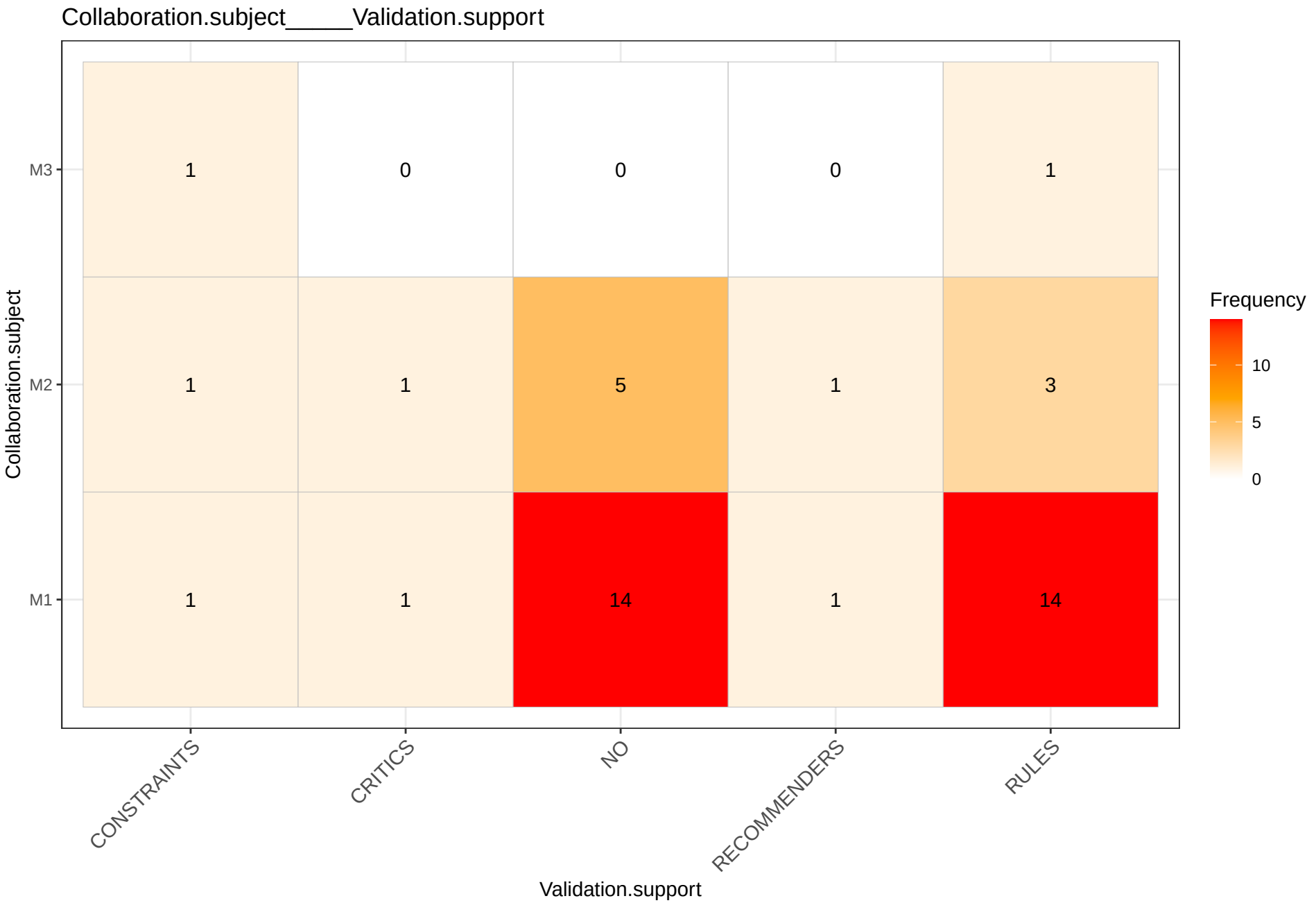

Collaboration.subject_____Language.specific
M3
M2
M1
0
1
0
0
0
0
8
0
1
0
1
24
1
3
1
Collaboration.subject
BPMN
NO
SOM IAS
UML
XTEAM
Language.specific
Frequency
20
15
10
5
0

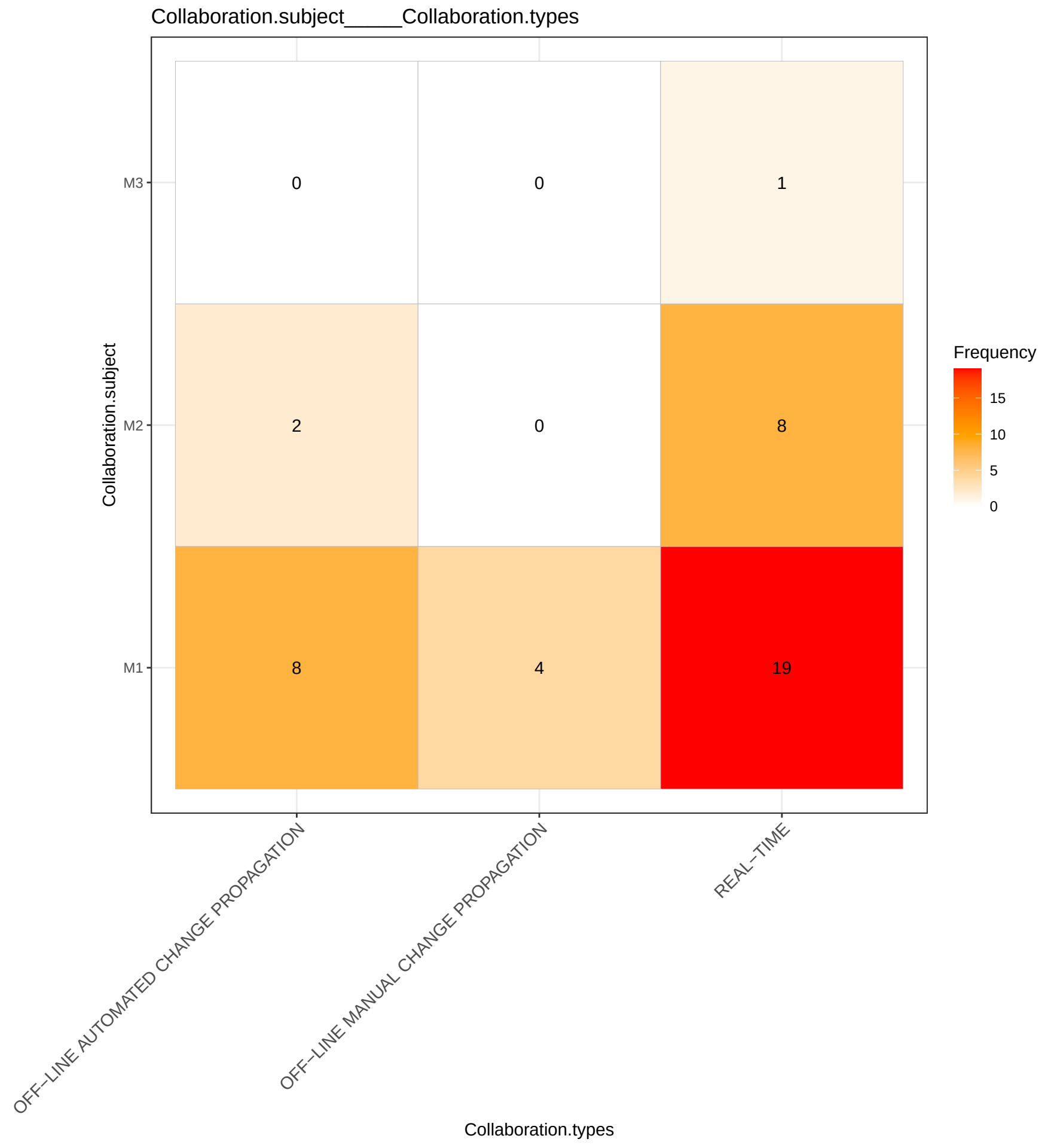

Collaboration.subject_____Modeling.framework
Collaboration.subject
M3
M2
M1
1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 0 0 1 3 1 1 0 0 0 0 0 1 1 1
1 1 1 9 7 2 1 1 1 1 1 1 1 1 1
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
NO
PACAS
RDF
SPEM
UML
VIATRA
WEBGME
YJS
Modeling.framework
Frequency
7.5
5.0
2.5
0.0

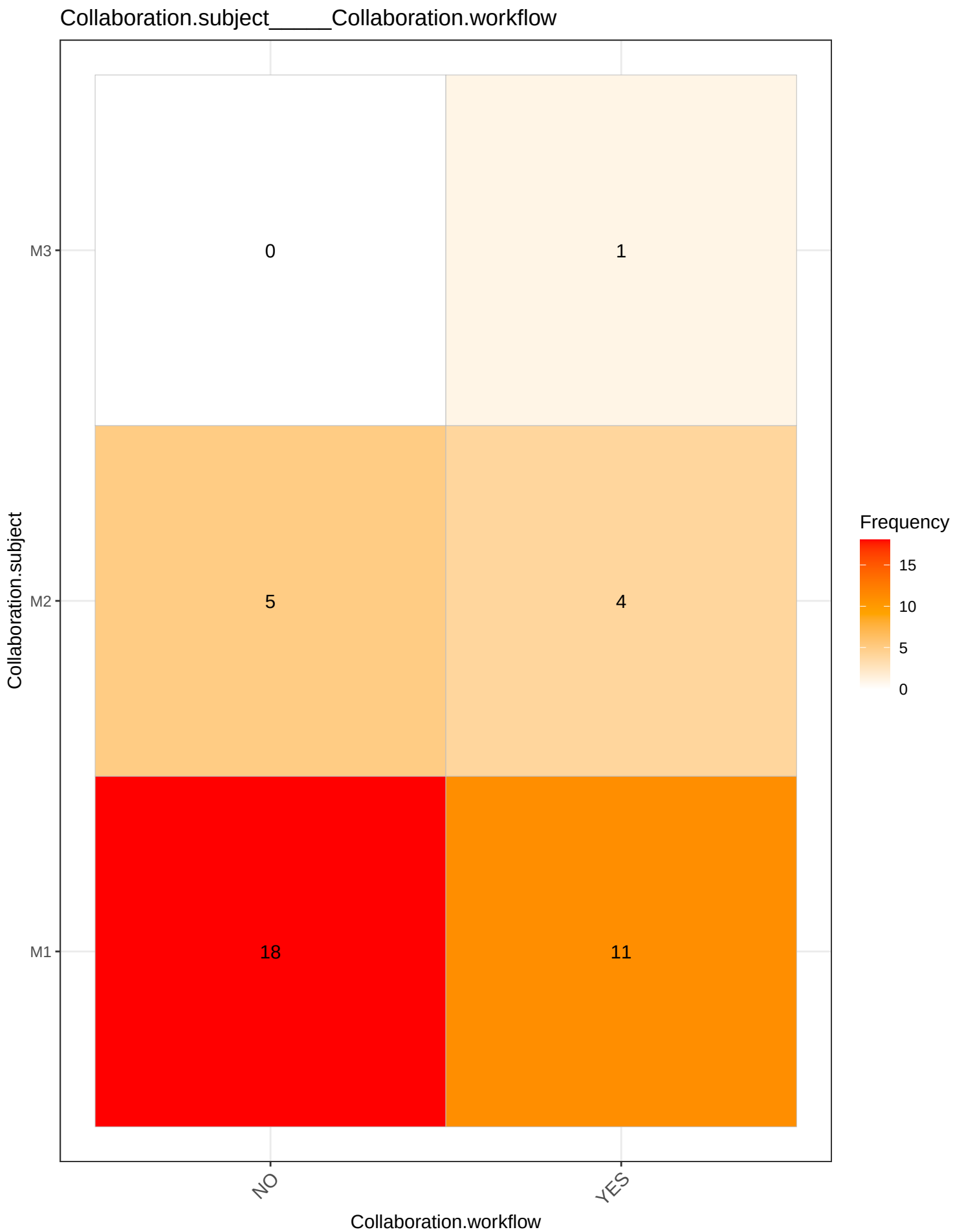

Collaboration.subject_____System.domain
M3
M2
M1
1
0
7
2
23
6
Collaboration.subject
Frequency
20
15
10
5
0
GENERIC
SPECIFIC
System.domain

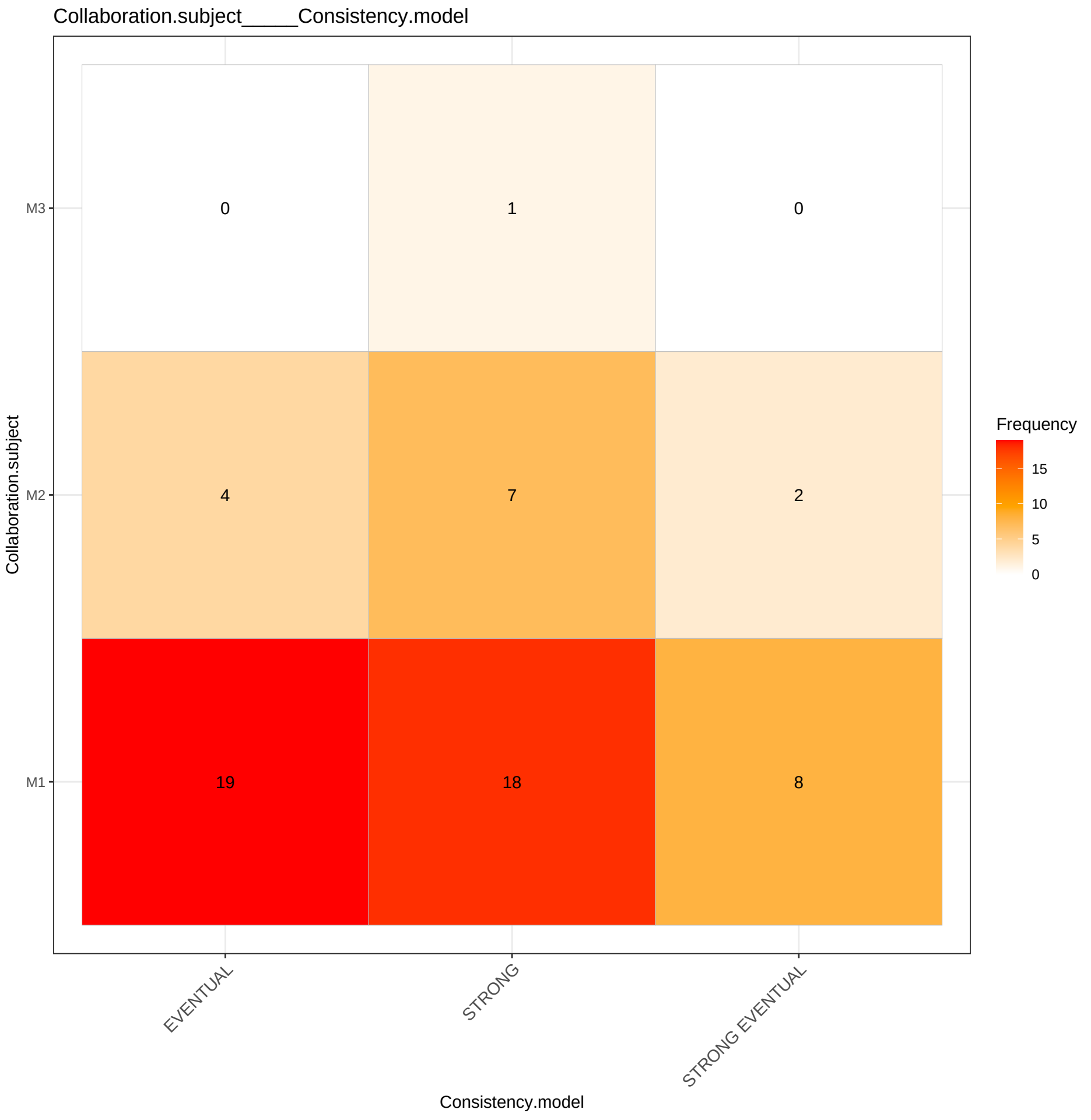

Collaboration.subject_____System.domain.type
Collaboration.subject
M3
M2
M1
0
1
0
0
0
0
0
6
1
1
0
1
2
22
1
1
1
2
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
20
15
10
5
0

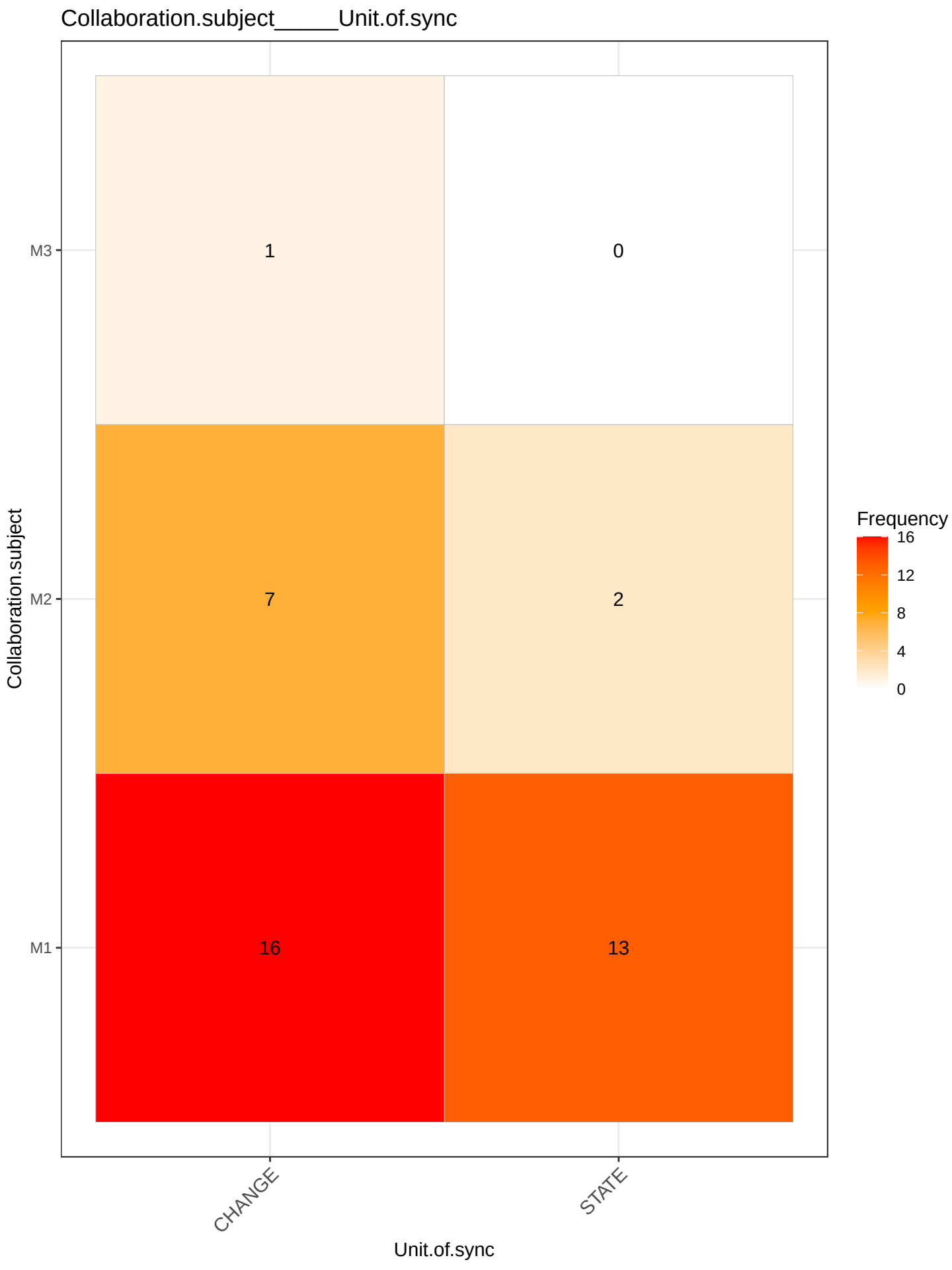

Collaboration.subject_____System.parts
M3
M2
M1
Collaboration.subject
0
0
0
1
0
0
1
0
0
7
0
1
1
2
1
21
1
3
BACK−END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
20
15
10
5
0

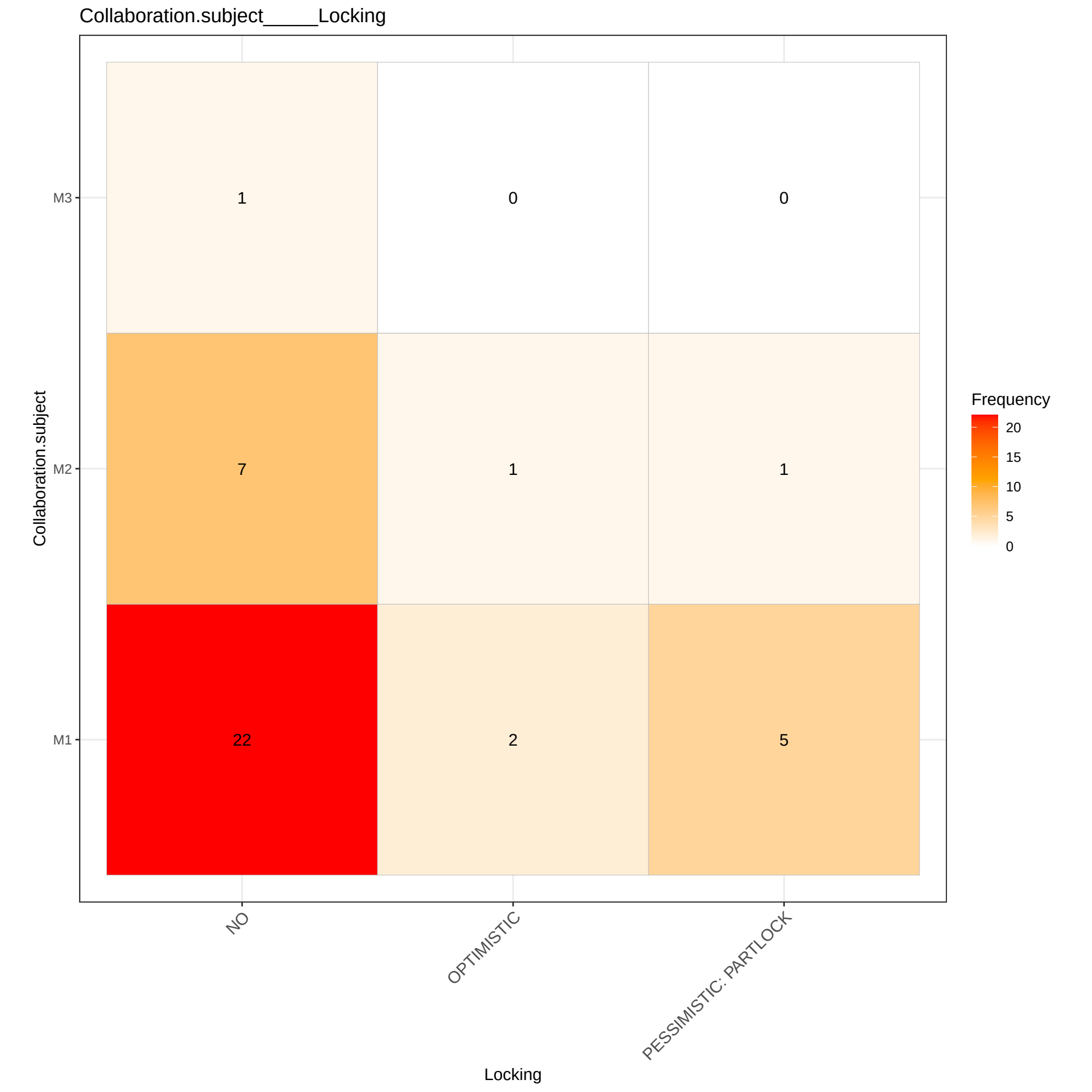

Collaboration.subject_____Validation.support
M3
M2
M1
Collaboration.subject
1
0
0
0
1
1
1
5
1
3
1
1
14
1
14
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
10
5
0

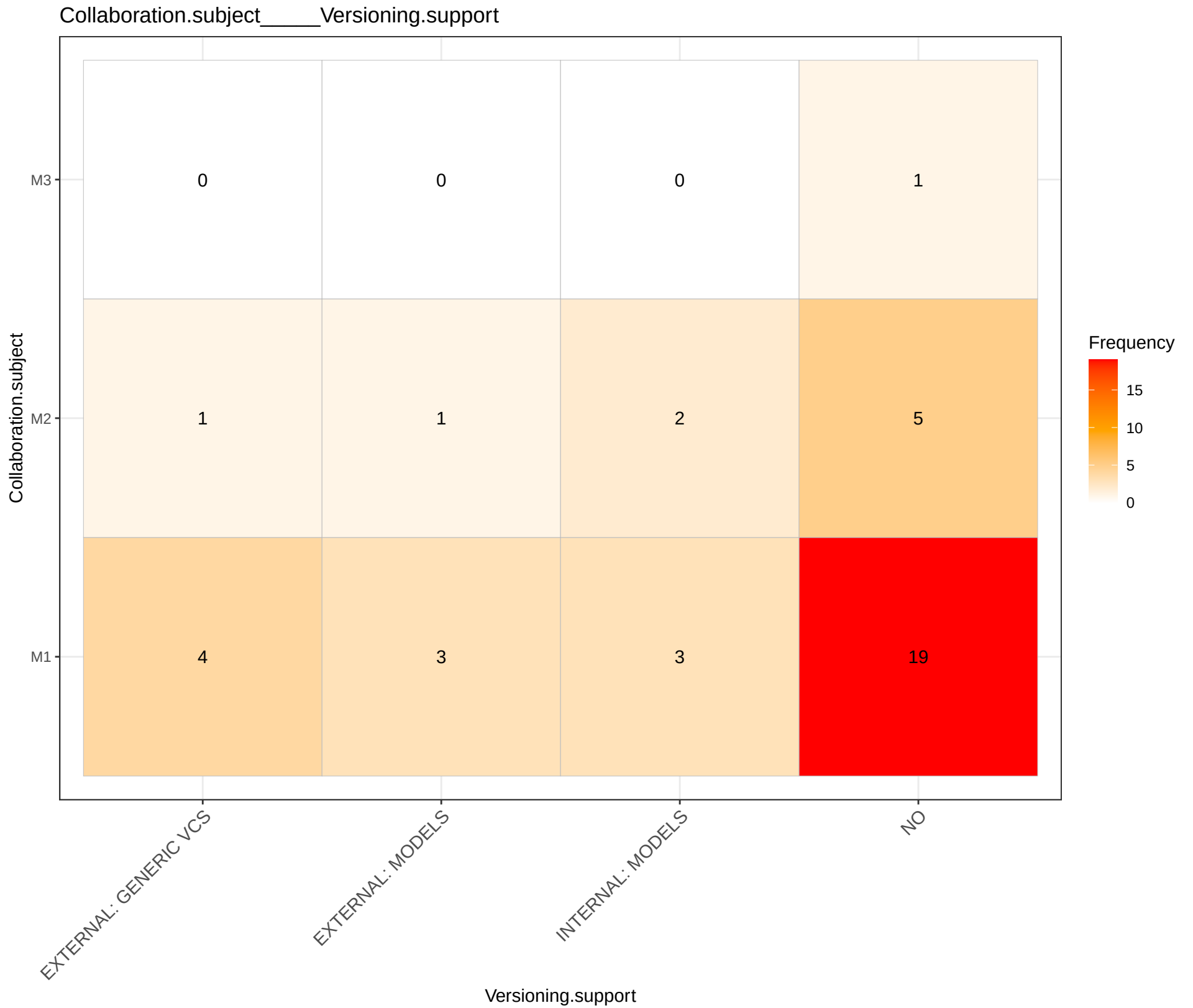

Collaboration.subject_____Collaboration.types
M3
M2
M1
0
0
1
2
0
8
8
4
19
Collaboration.subject
Frequency
15
10
5
0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types

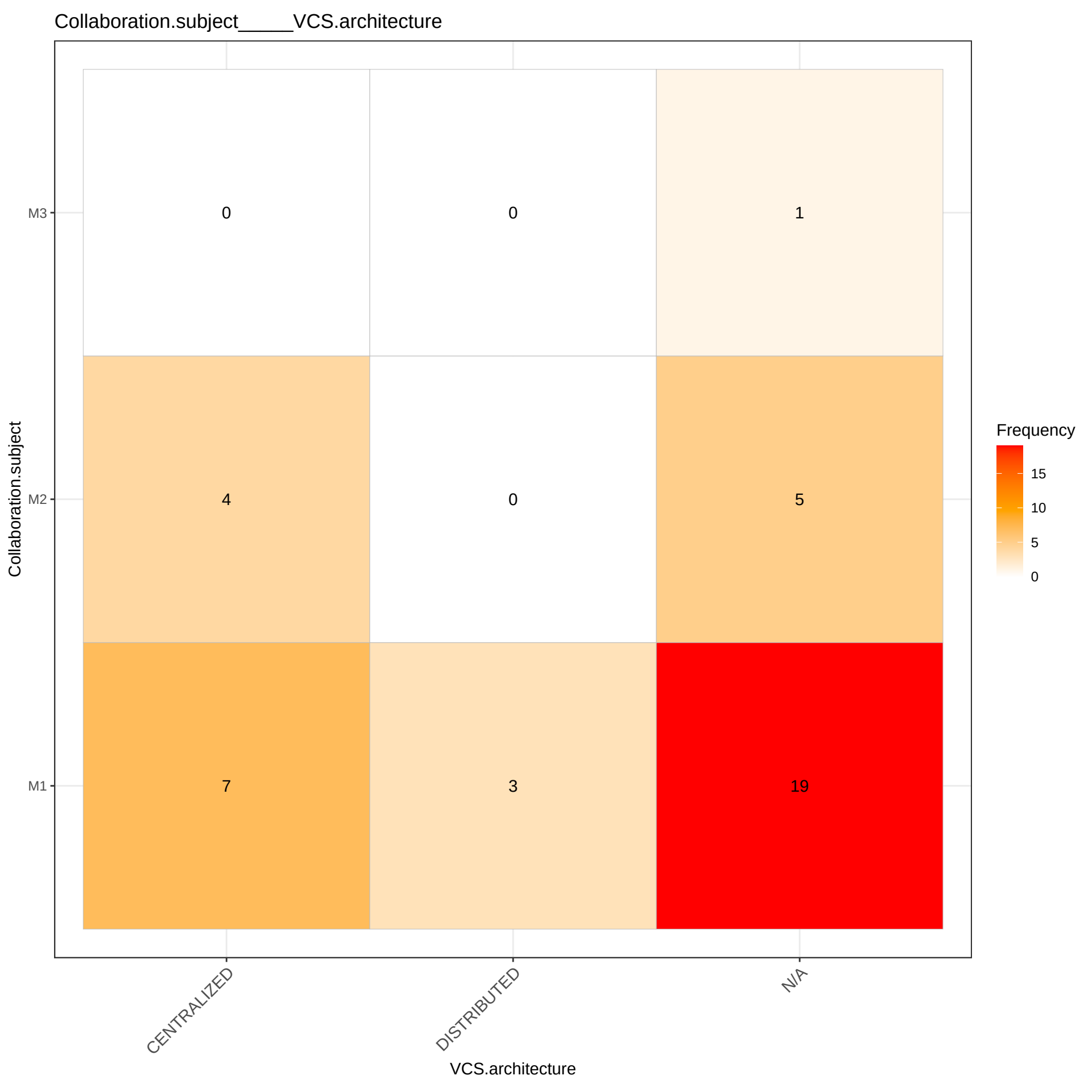

Collaboration.subject_____Collaboration.workflow
M3
M2
M1
0
1
5
4
18
11
Collaboration.subject
NO
YES
Collaboration.workflow
Frequency
15
10
5
0

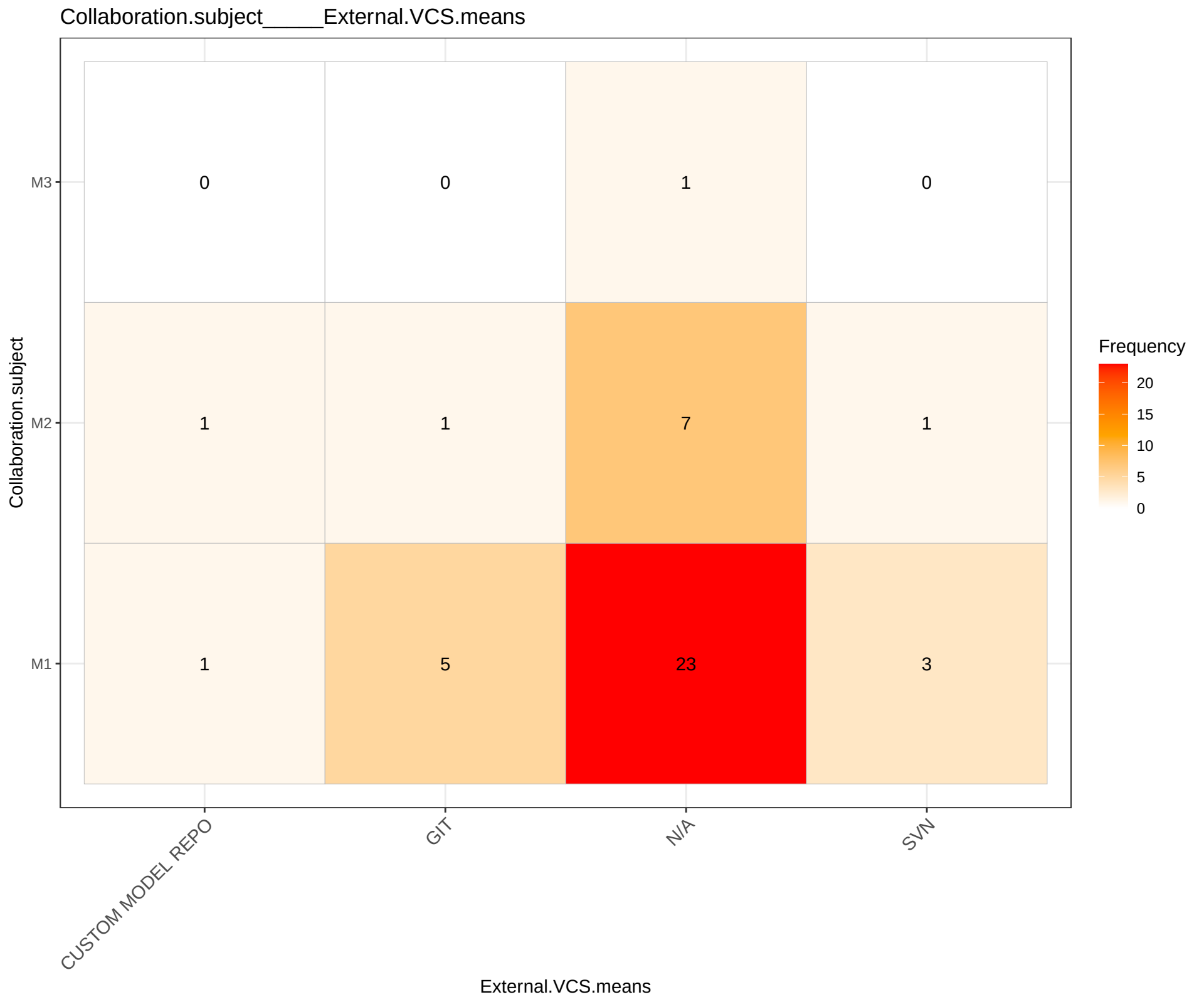

Collaboration.subject_____Consistency.model
M3
M2
M1
0
1
0
4
7
2
19
18
8
Collaboration.subject
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
15
10
5
0

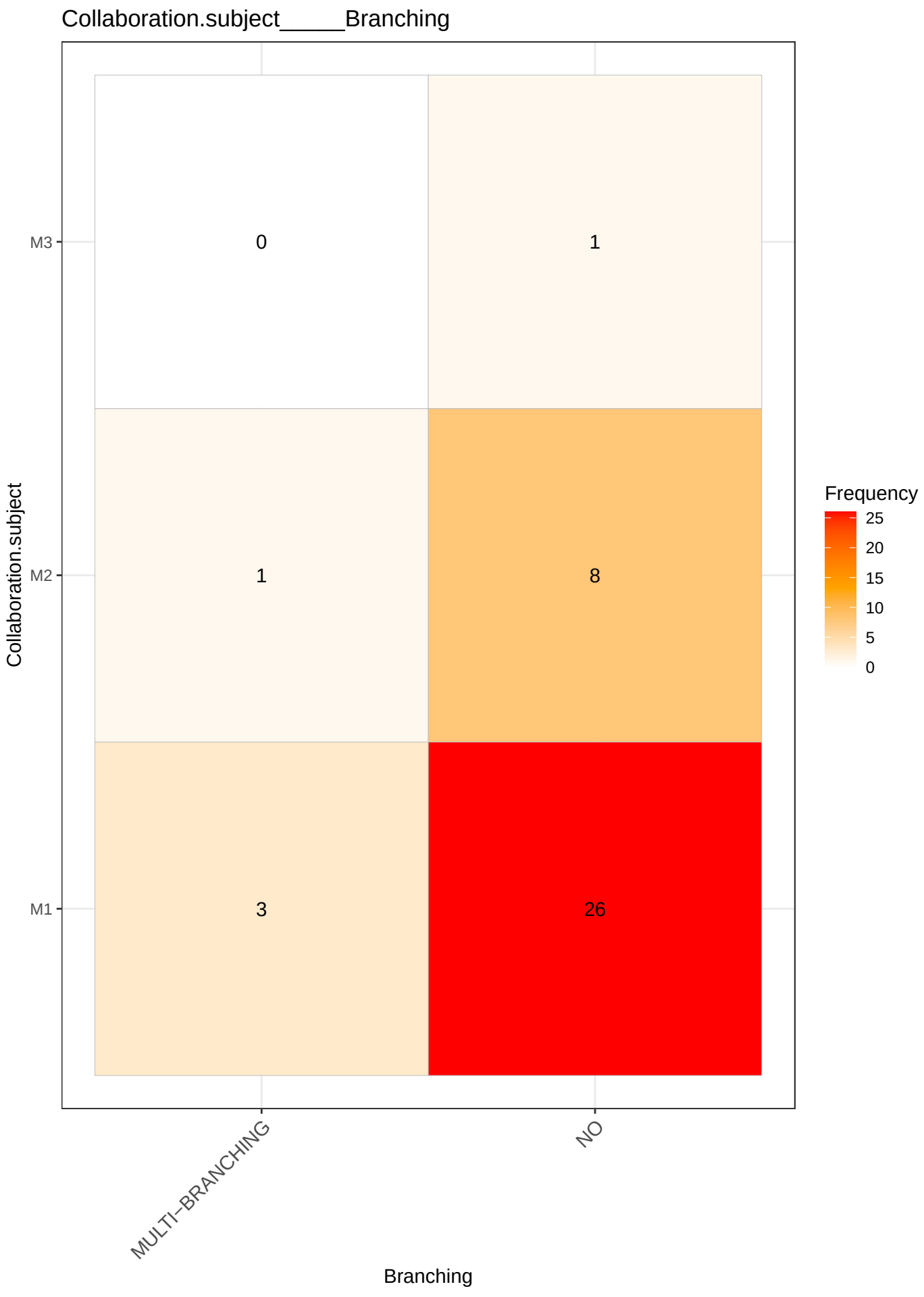

Collaboration.subject_____Unit.of.sync
M3
M2
M1
1
0
7
2
16
13
Collaboration.subject
CHANGE
STATE
Unit.of.sync
Frequency
16
12
8
4
0

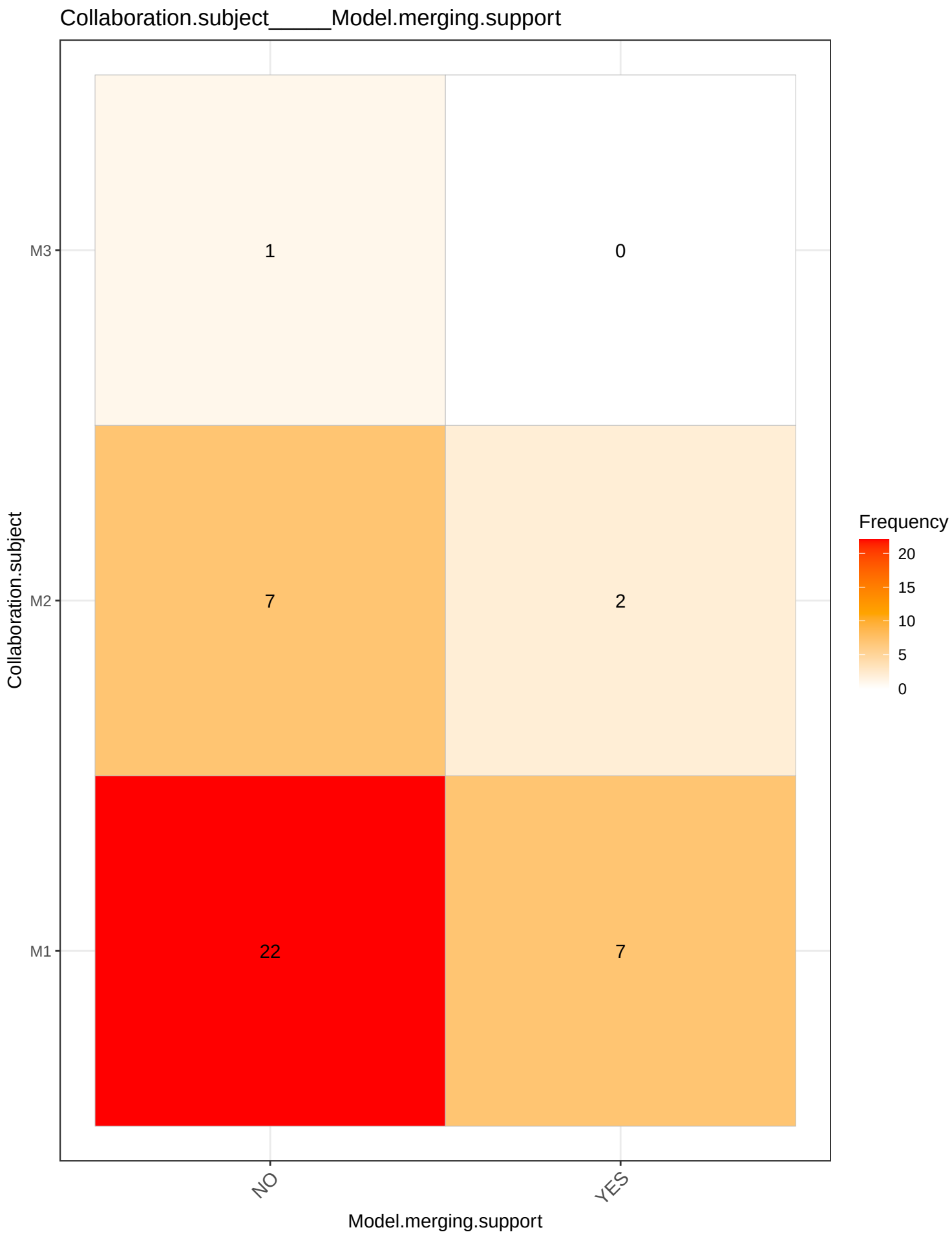

Collaboration.subject_____Locking
M3
M2
M1
Collaboration.subject
1
0
0
7
1
1
22
2
5
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
20
15
10
5
0

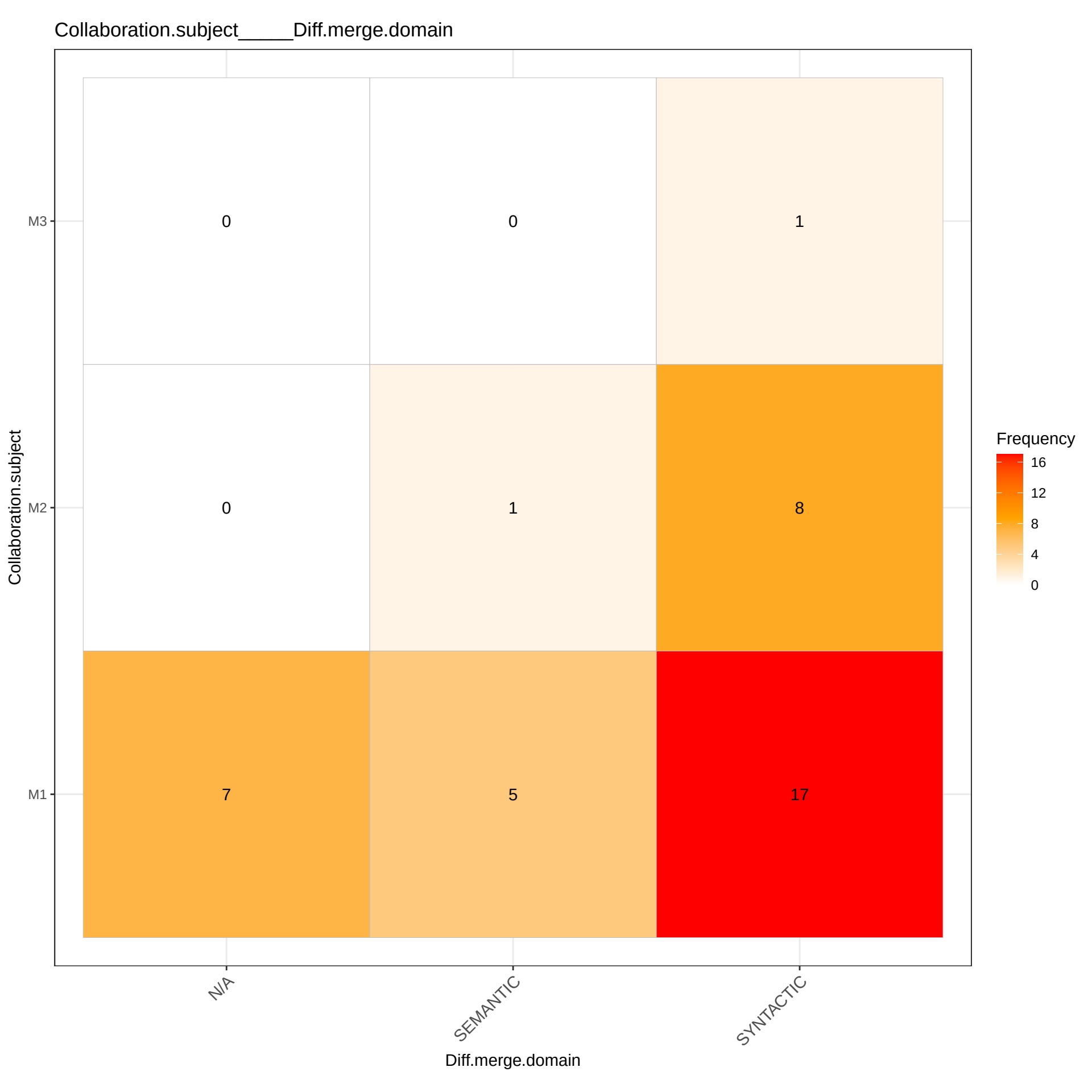

Collaboration.subject_____Versioning.support
M3
M2
M1
0
0
0
1
1
1
2
5
4
3
3
19
Collaboration.subject
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
15
10
5
0

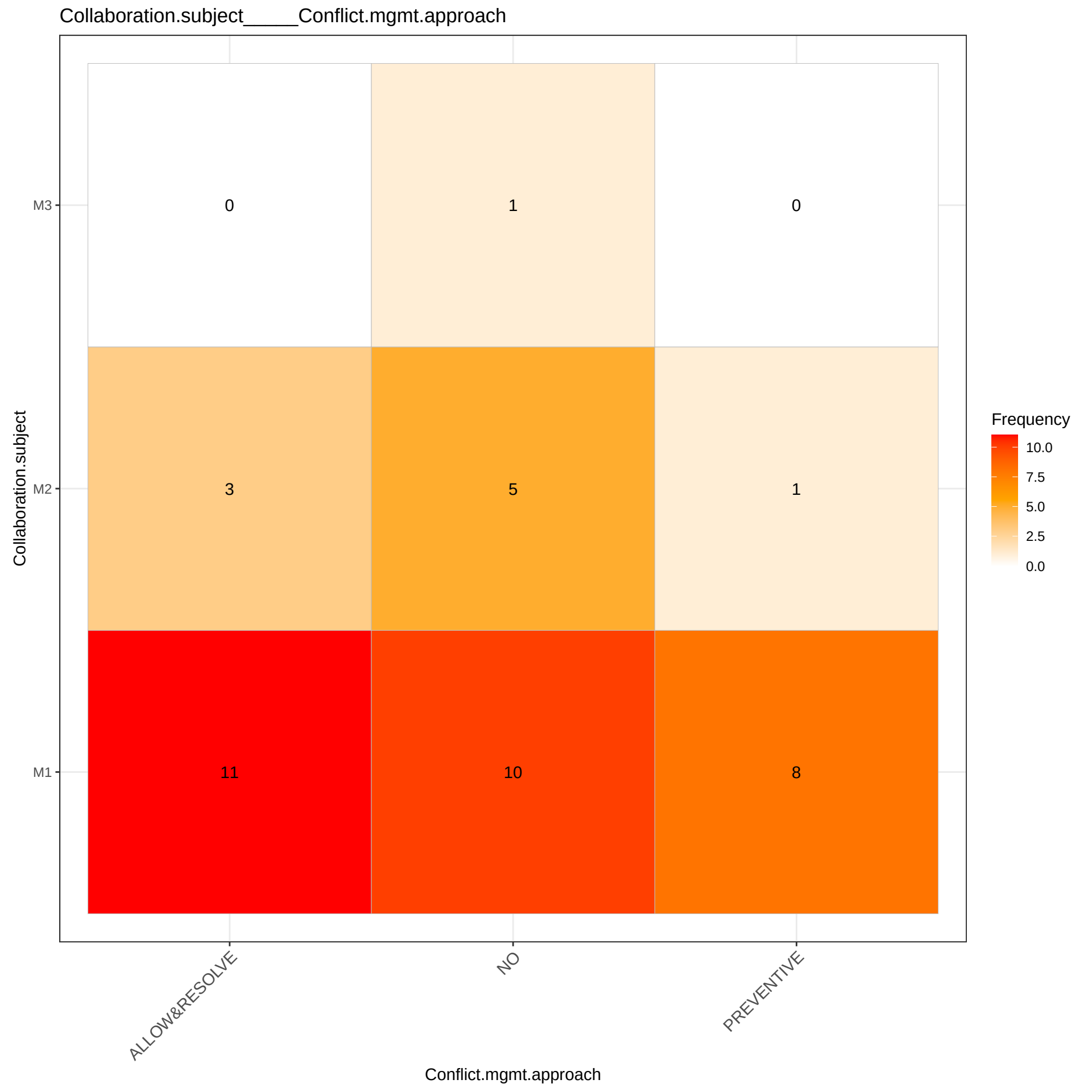

Collaboration.subject_____VCS.architecture
M3
M2
M1
0
0
1
4
0
5
7
3
19
Collaboration.subject
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
15
10
5
0

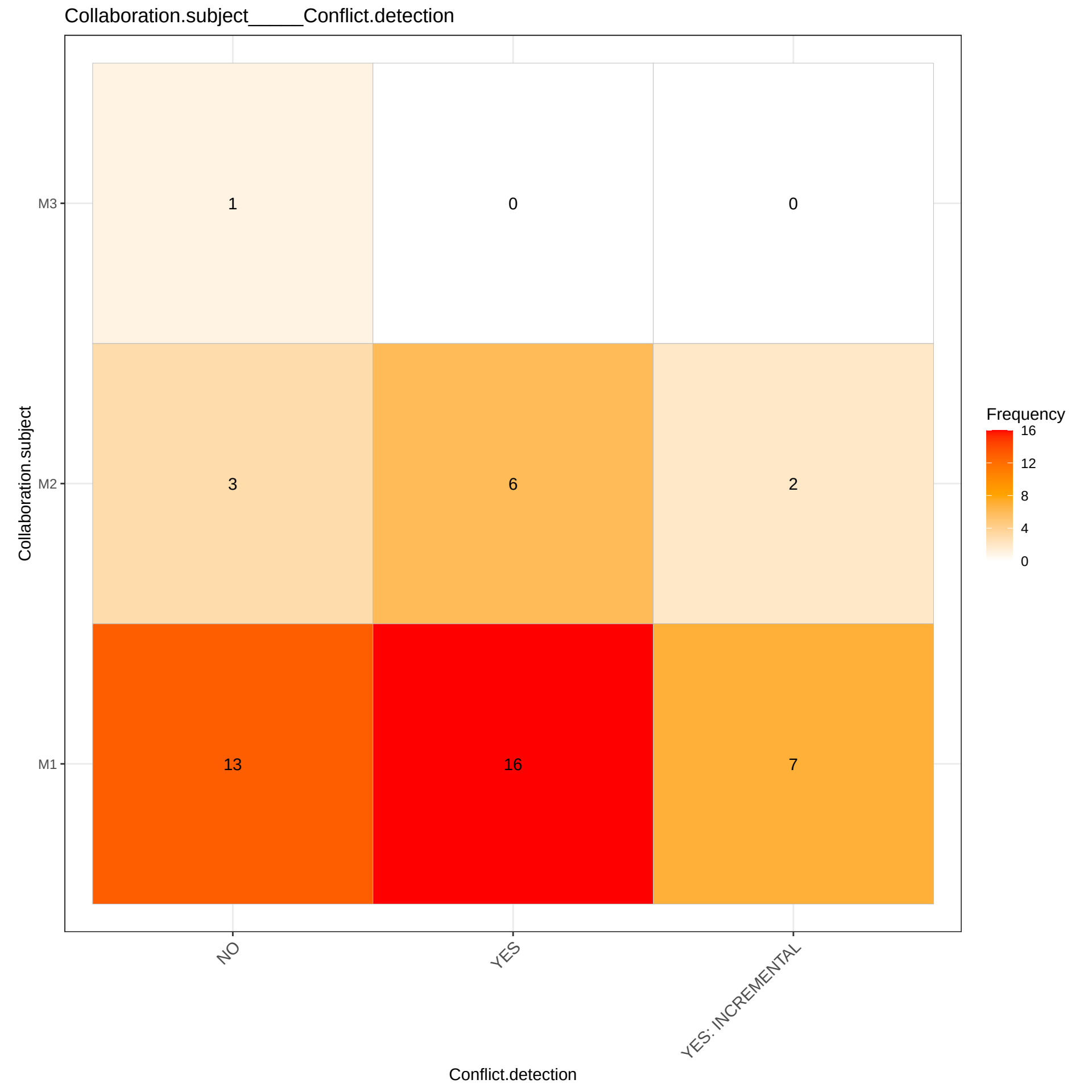

Collaboration.subject_____External.VCS.means
M3
M2
M1
0
0
1
0
1
1
7
1
1
5
23
3
Collaboration.subject
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
20
15
10
5
0

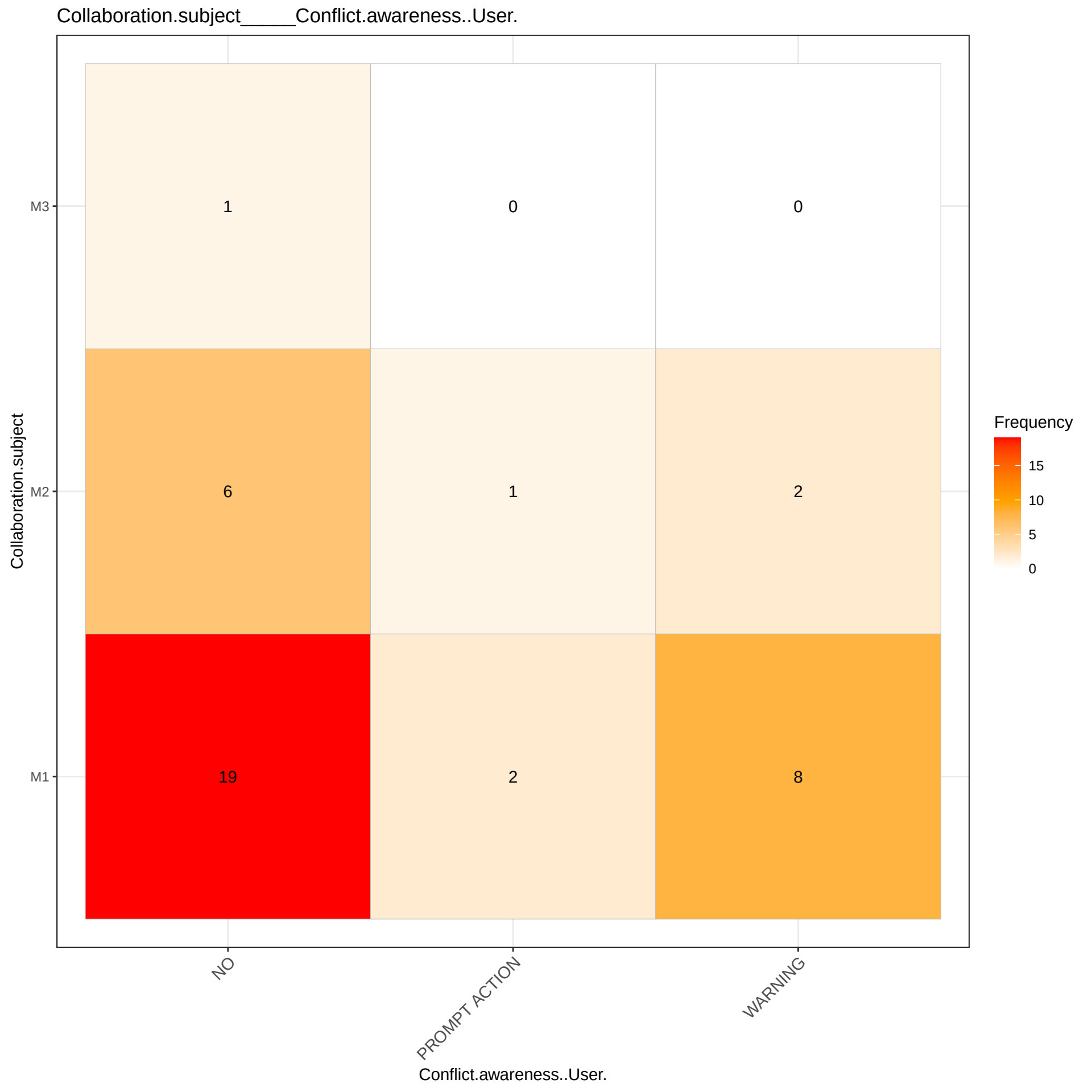

Collaboration.subject_____Branching
M3
M2
M1
0
1
1
8
3
26
Collaboration.subject
Frequency
25
20
15
10
5
0
MULTI−BRANCHING
NO
Branching

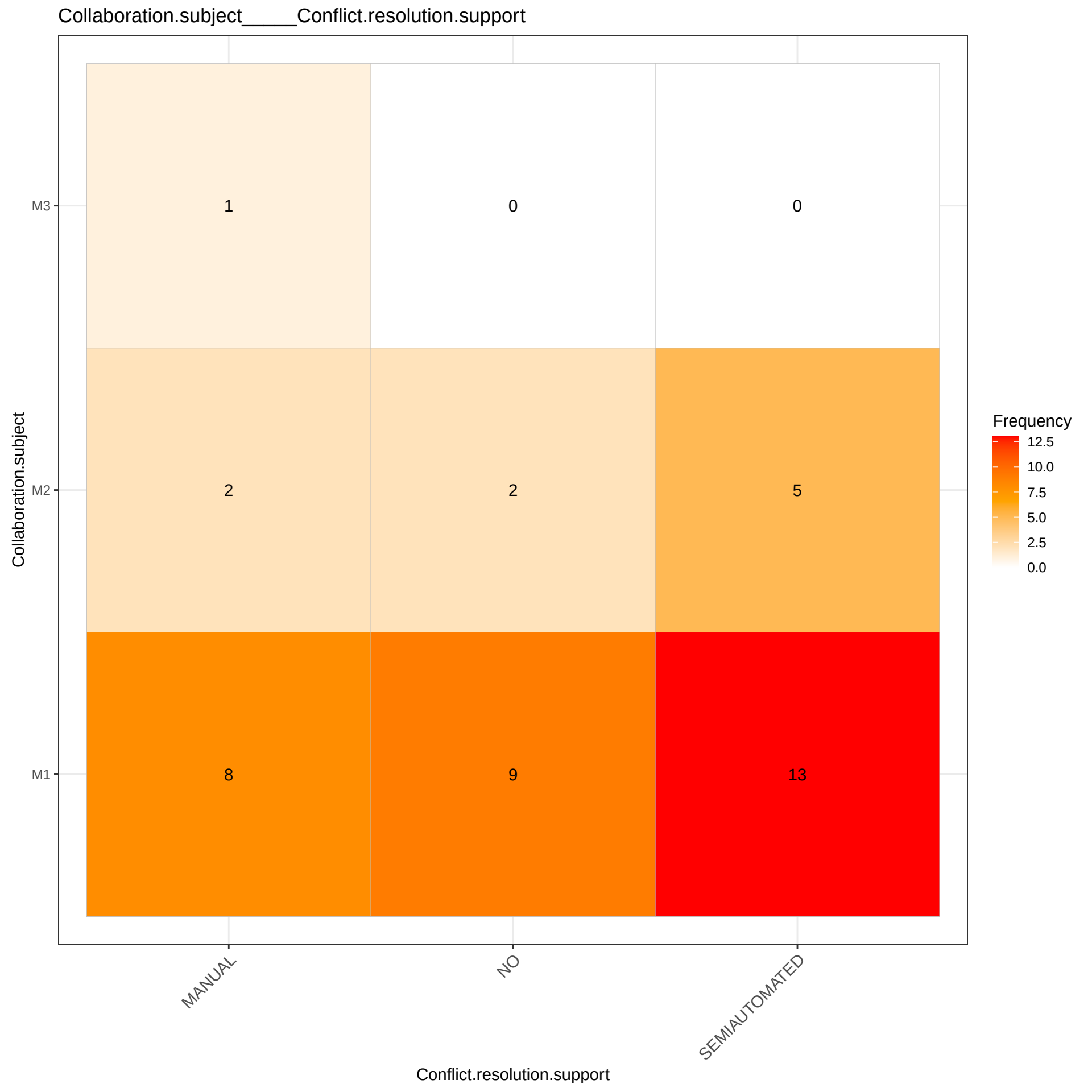

Collaboration.subject_____Model.merging.support
M3
M2
M1
1
0
7
2
22
7
Collaboration.subject
NO
YES
Model.merging.support
Frequency
20
15
10
5
0

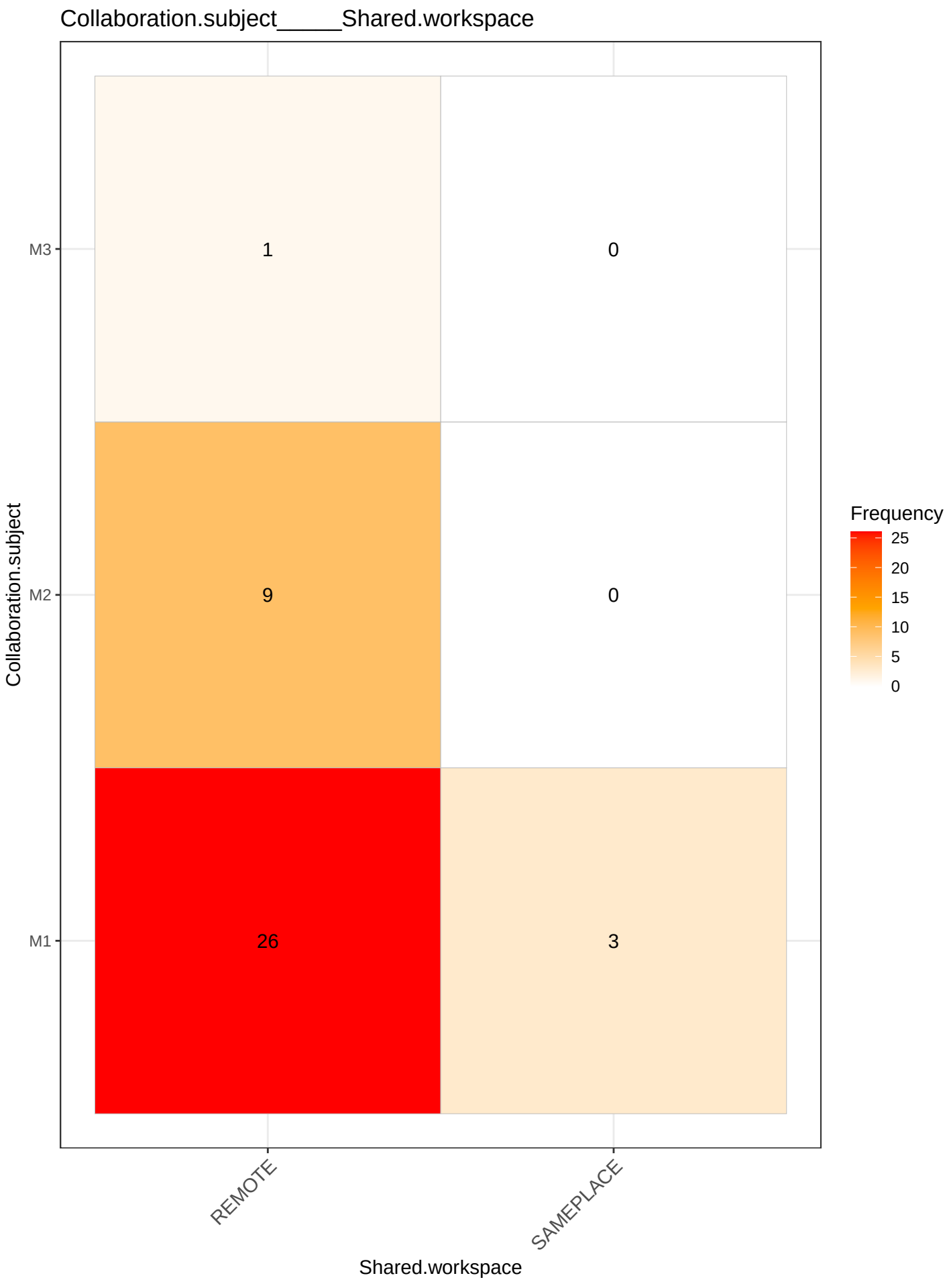

Collaboration.subject_____Diff.merge.domain
M3
M2
M1
0
0
1
0
1
8
7
5
17
Collaboration.subject
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
16
12
8
4
0

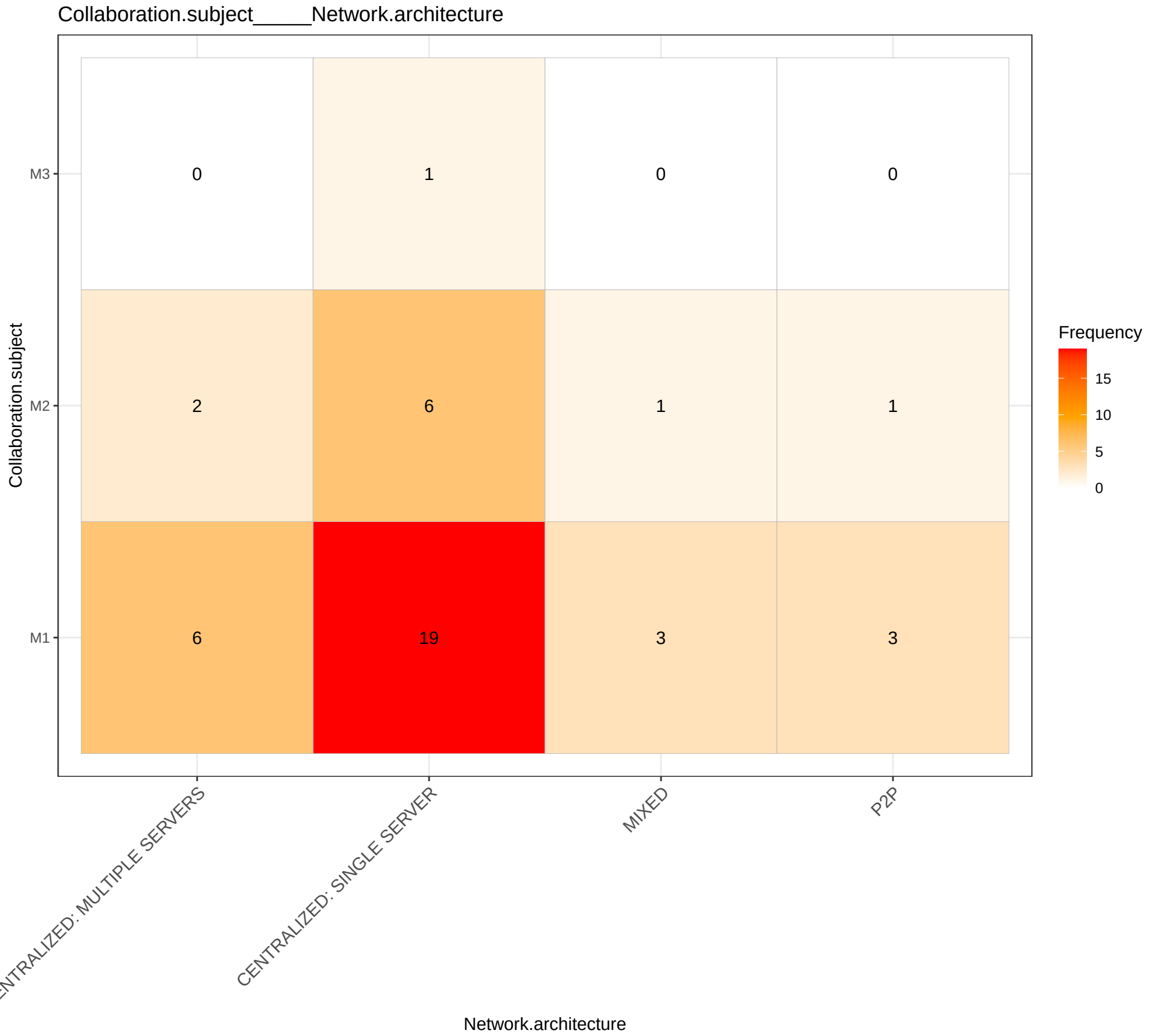

Collaboration.subject_____Conflict.mgmt.approach
M3
M2
M1
0
1
0
3
5
1
11
10
8
Collaboration.subject
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
10.0
7.5
5.0
2.5
0.0

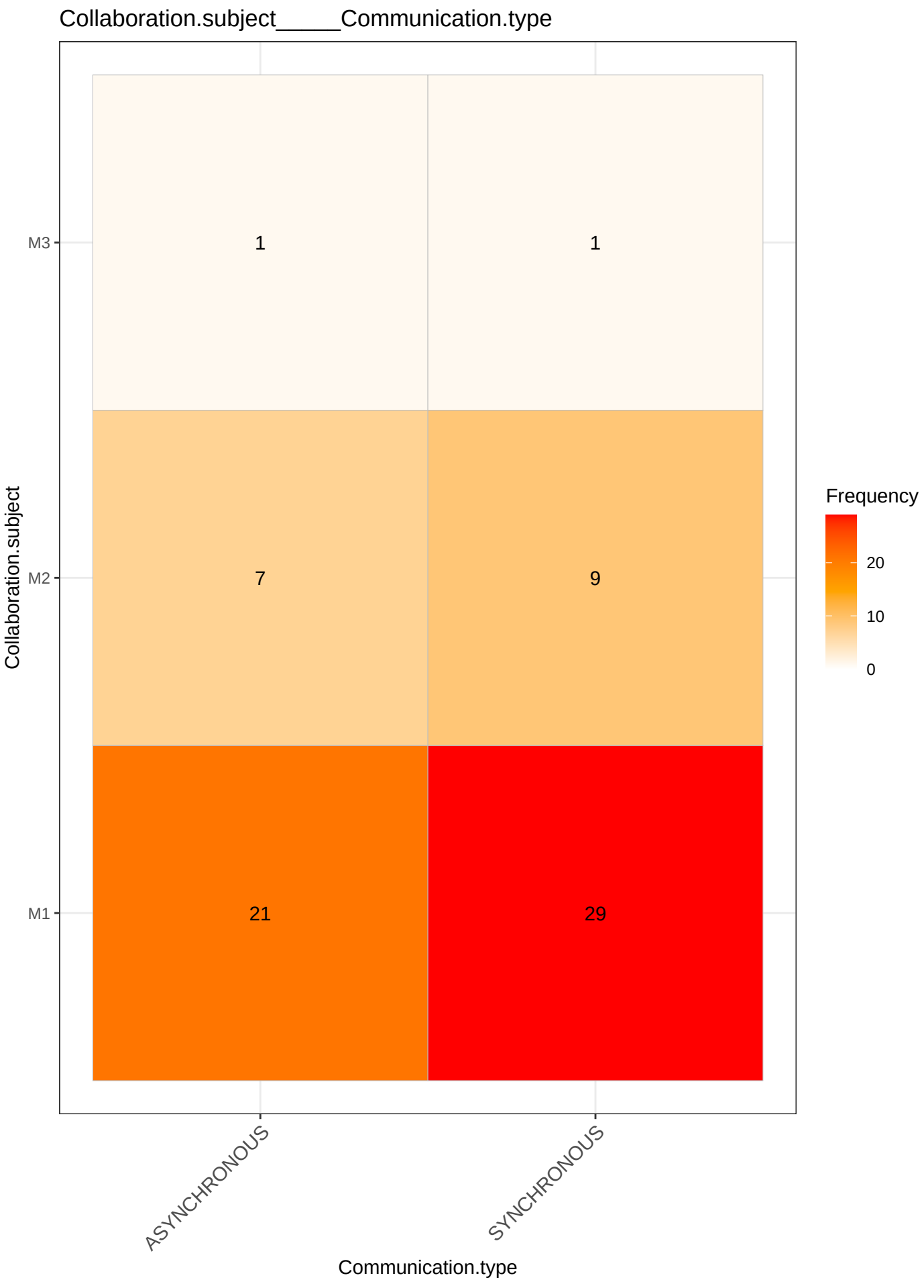

Collaboration.subject_____Conflict.detection
M3
M2
M1
1
0
0
3
6
2
13
16
7
Collaboration.subject
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
16
12
8
4
0

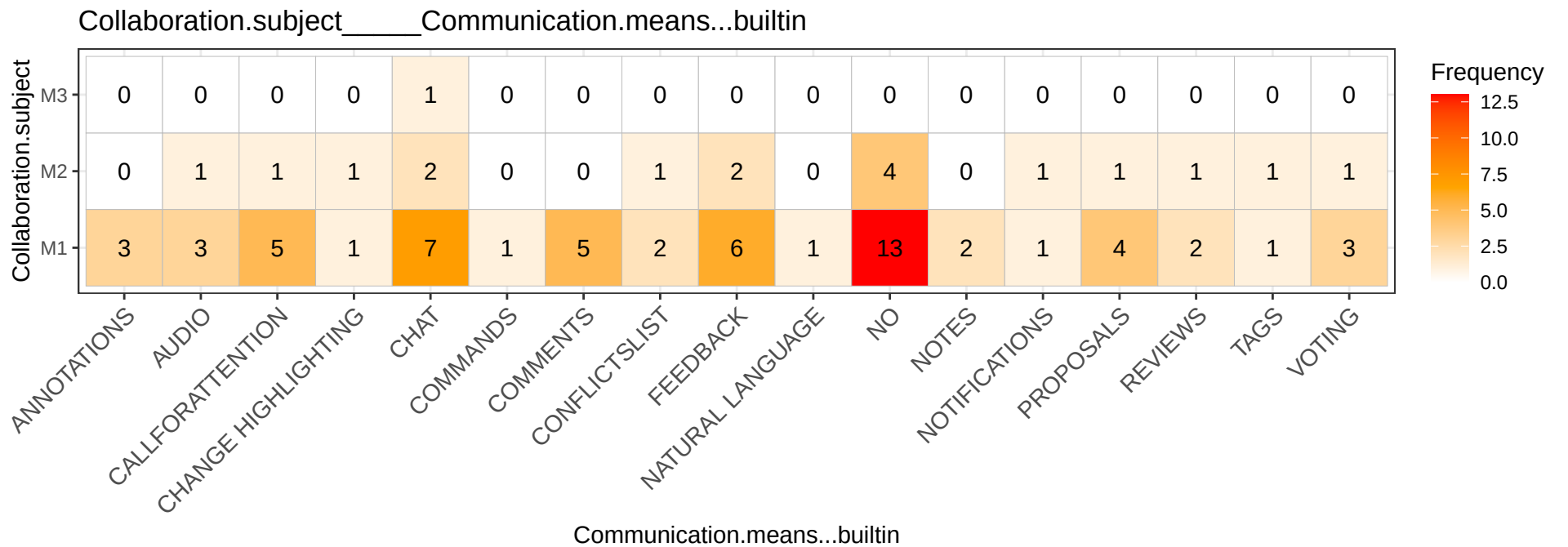

Collaboration.subject_____Conflict.awareness..User.
M3
M2
M1
1
0
0
6
1
2
19
2
8
Collaboration.subject
Frequency
15
10
5
0
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.

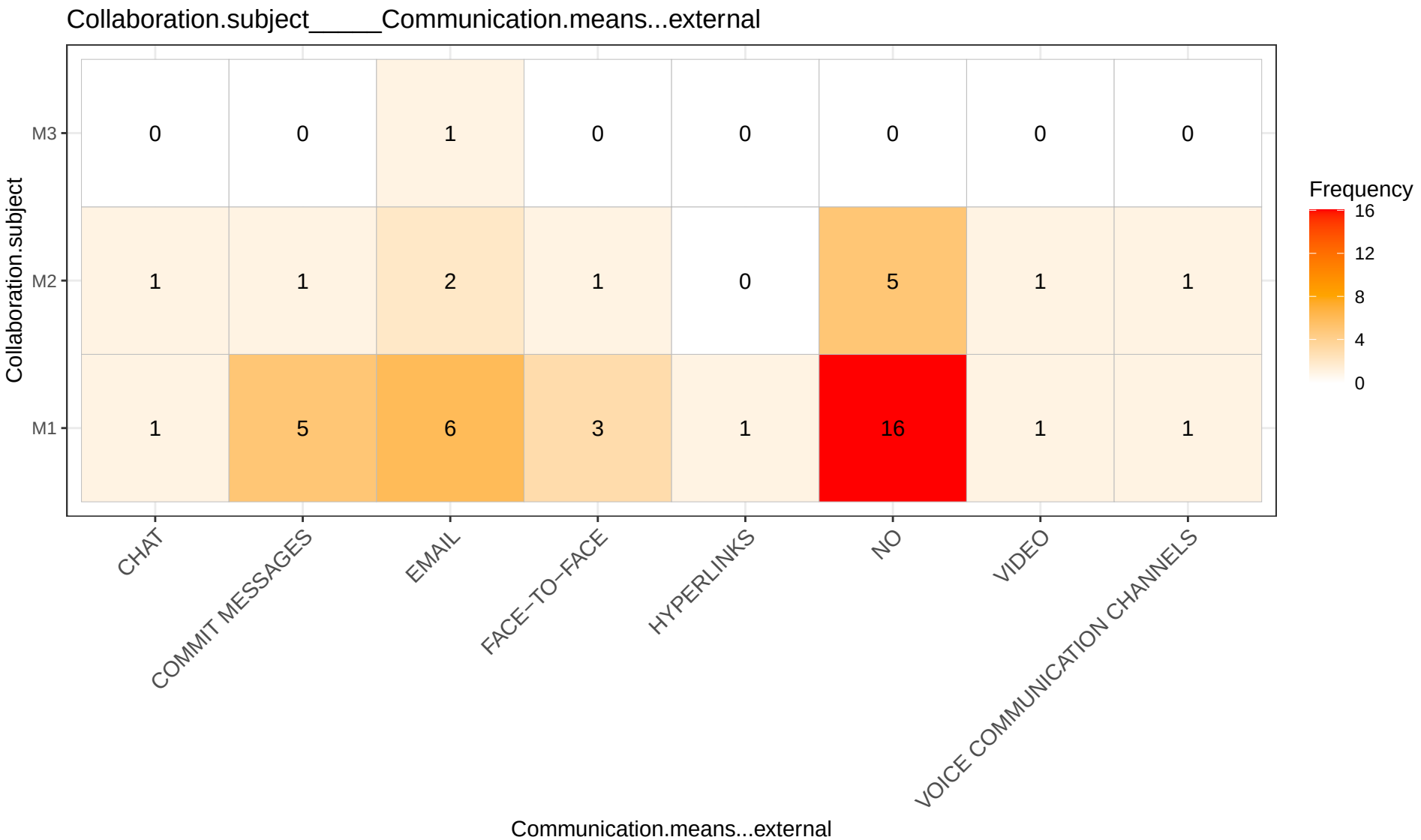

Collaboration.subject_____Conflict.resolution.support
M3
M2
M1
1
0
0
2
2
5
8
9
13
Collaboration.subject
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

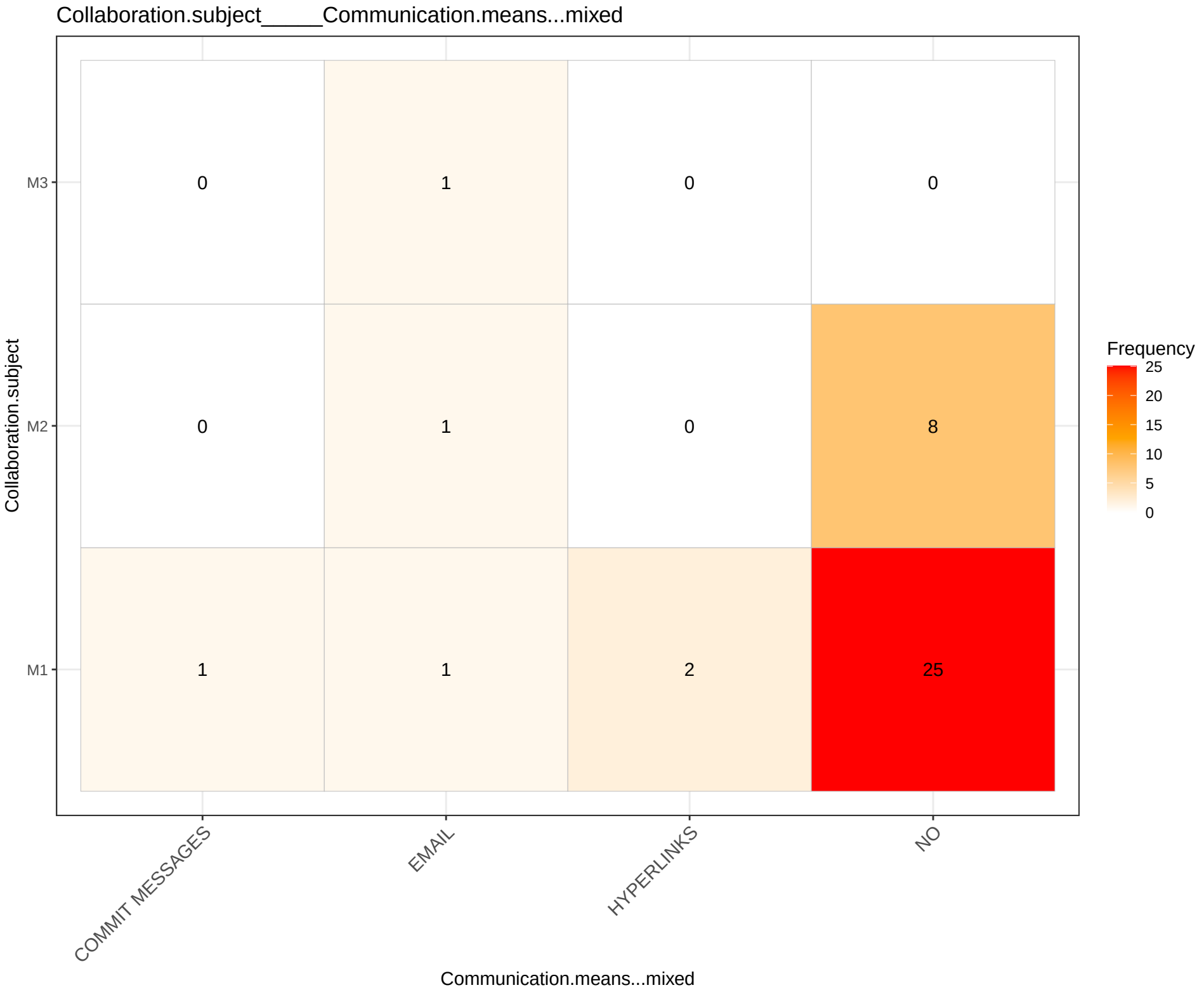

Collaboration.subject_____Shared.workspace
M3
M2
M1
1
0
9
0
26
3
Collaboration.subject
REMOTE
SAMEPLACE
Shared.workspace
Frequency
25
20
15
10
5
0

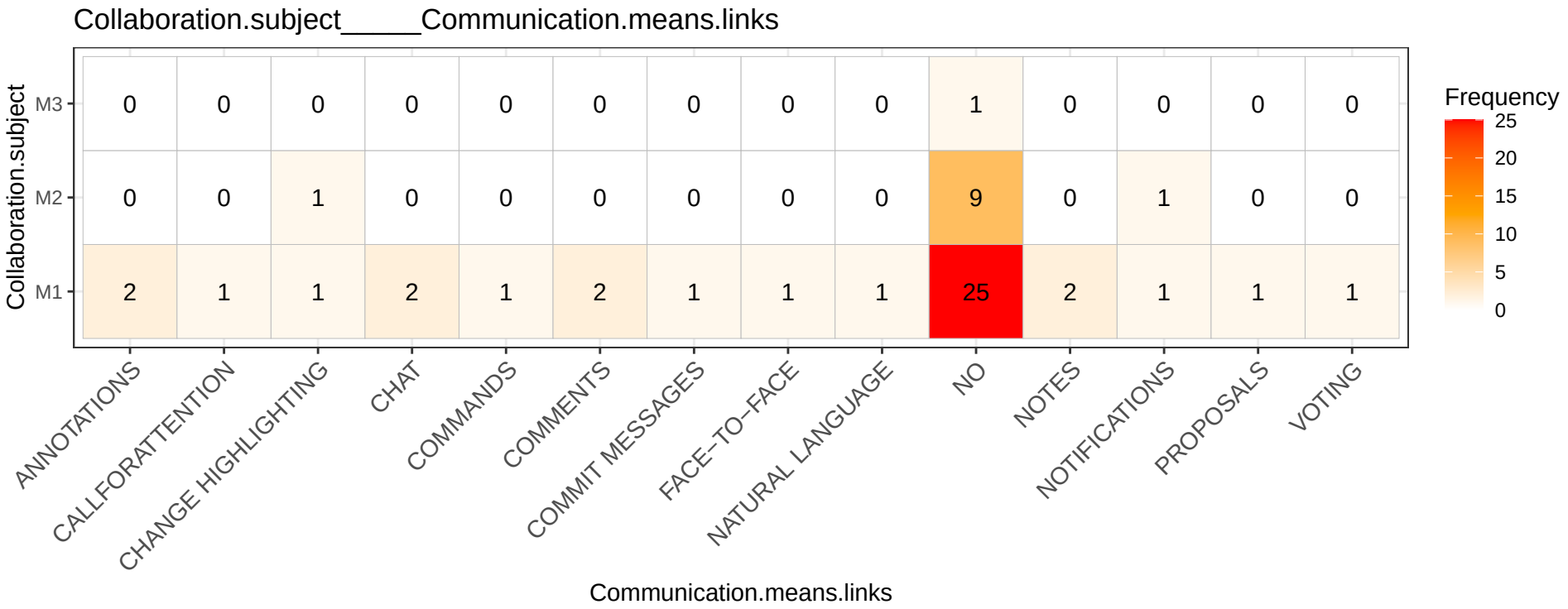

Collaboration.subject_____Network.architecture
M3
M2
M1
Collaboration.subject
0
1
0
0
2
6
1
1
6
19
3
3
Frequency
15
10
5
0
ENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture


Collaboration.subject_____Communication.type
M3
M2
M1
1
1
7
9
21
29
Collaboration.subject
Frequency
20
10
0
ASYNCHRONOUS
SYNCHRONOUS
Communication.type


Collaboration.subject_____Communication.means...builtin
Collaboration.subject
M3
M2
M1
0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 1 1 1 2 0 0 1 2 0 4 0 1 1 1 1 1
3 3 5 1 7 1 5 2 6 1 13 2 1 4 2 1 3
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Collaboration.subject_____Communication.means...external
Collaboration.subject
M3
M2
M1
0 0 1 0 0 0 0 0
1 1 2 1 0 5 1 1
1 5 6 3 1 16 1 1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
16
12
8
4
0


Collaboration.subject_____Communication.means...mixed
M3
M2
M1
0
1
0
0
0
1
0
8
1
1
2
25
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Collaboration.subject
Communication.means...mixed
Frequency
25
20
15
10
5
0


Collaboration.subject_____Communication.means.links
Collaboration.subject
M3
M2
M1
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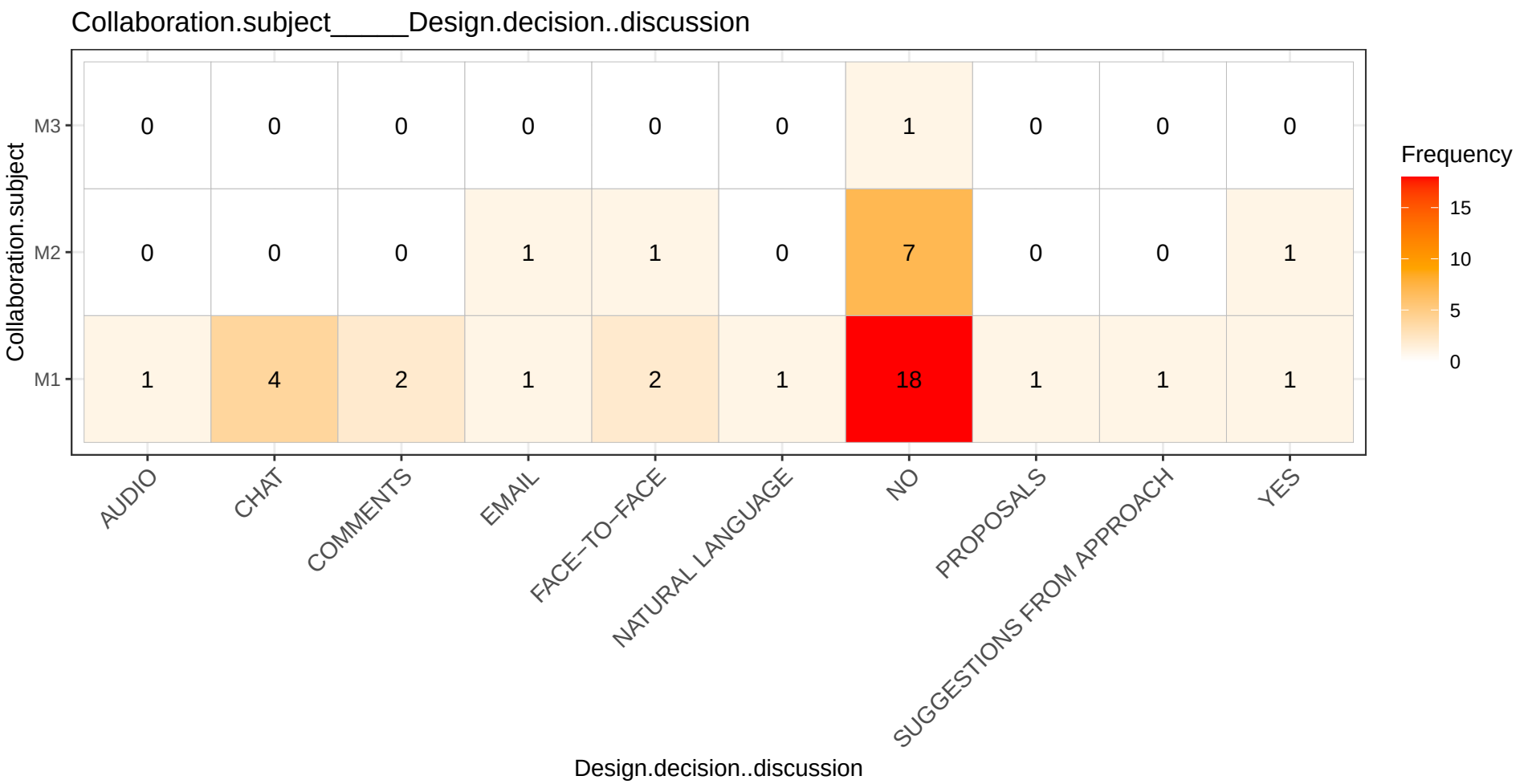
0 0 1 0 0 0 0 0 0 9 0 1 0 0
2 1 1 2 1 2 1 1 1 25 2 1 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE-TO-FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
25
20
15
10
5
0


Collaboration.subject_____Design.decision..discussion
Collaboration.subject
M3
M2
M1
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0 0 0 1 1 0 7 0 0 1
1 4 2 1 2 1 18 1 1 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
15
10
5
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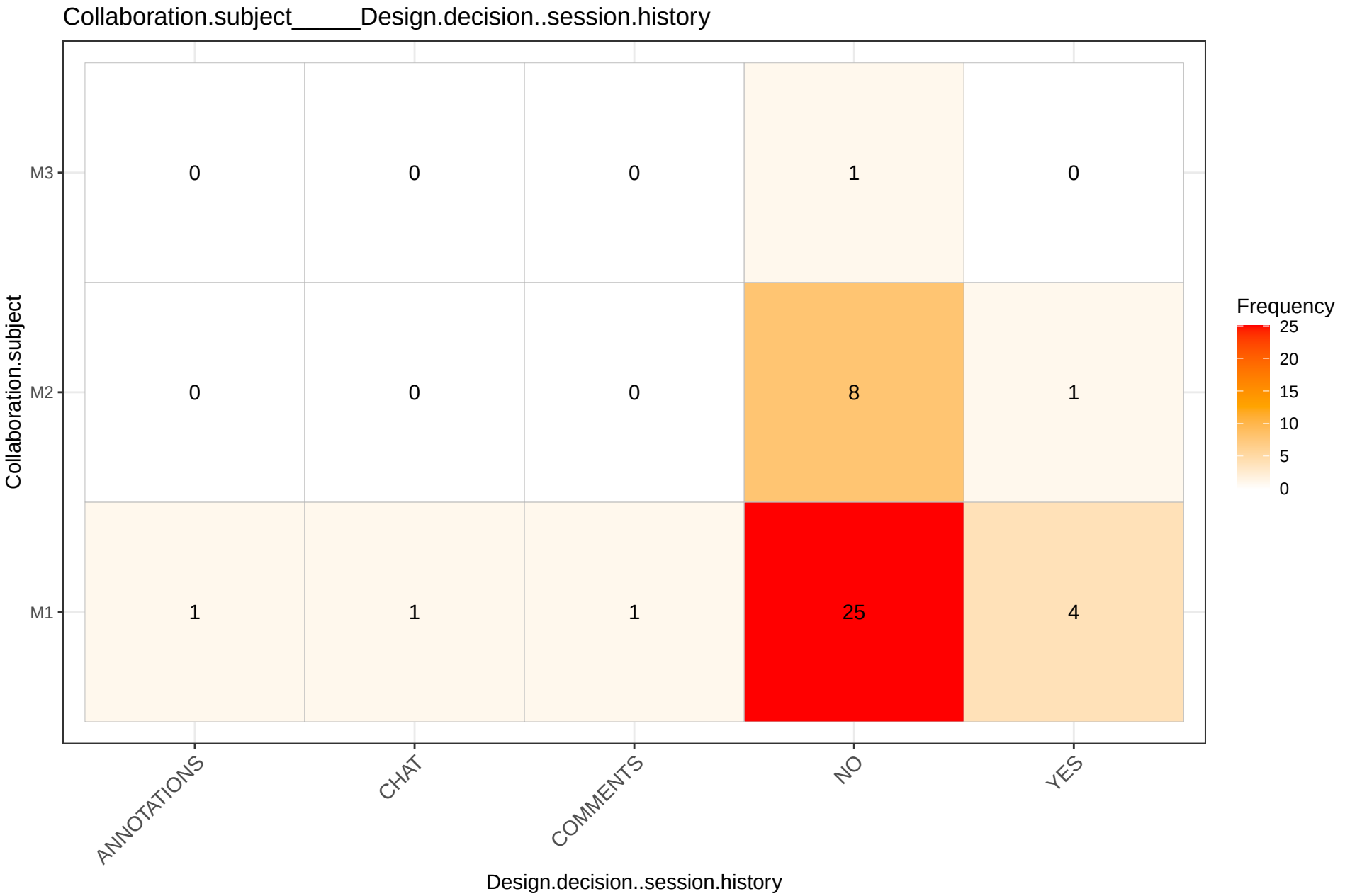
Collaboration.subject_____Design.decision..session.history
Collaboration.subject
M3
M2
M1
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0
0
1
0
0
0
0
8
1
1
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1
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ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
25
20
15
10
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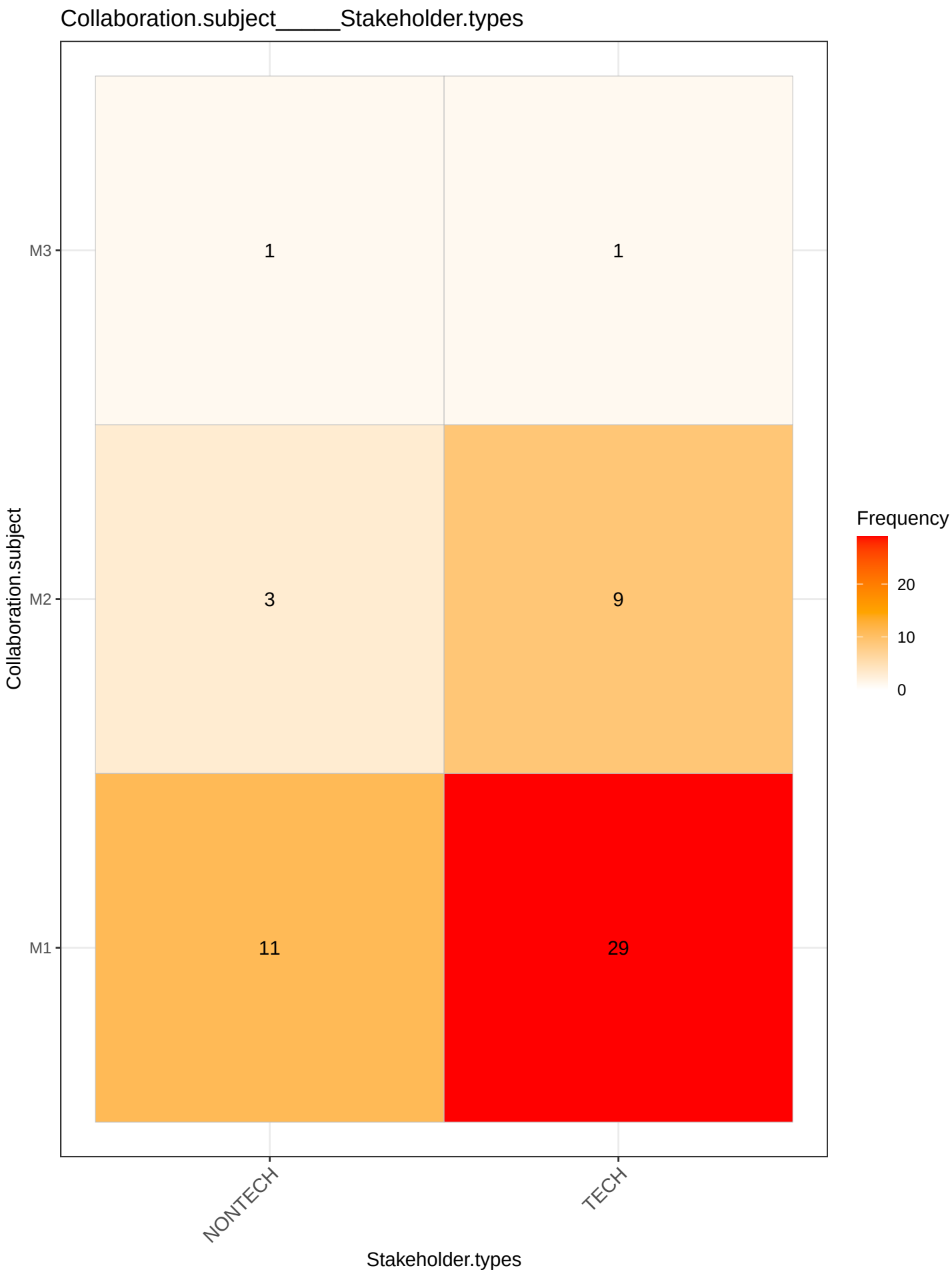
Collaboration.subject_____Stakeholder.types
M3
M2
M1
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1
3
9
11
29
Collaboration.subject
Frequency
20
10
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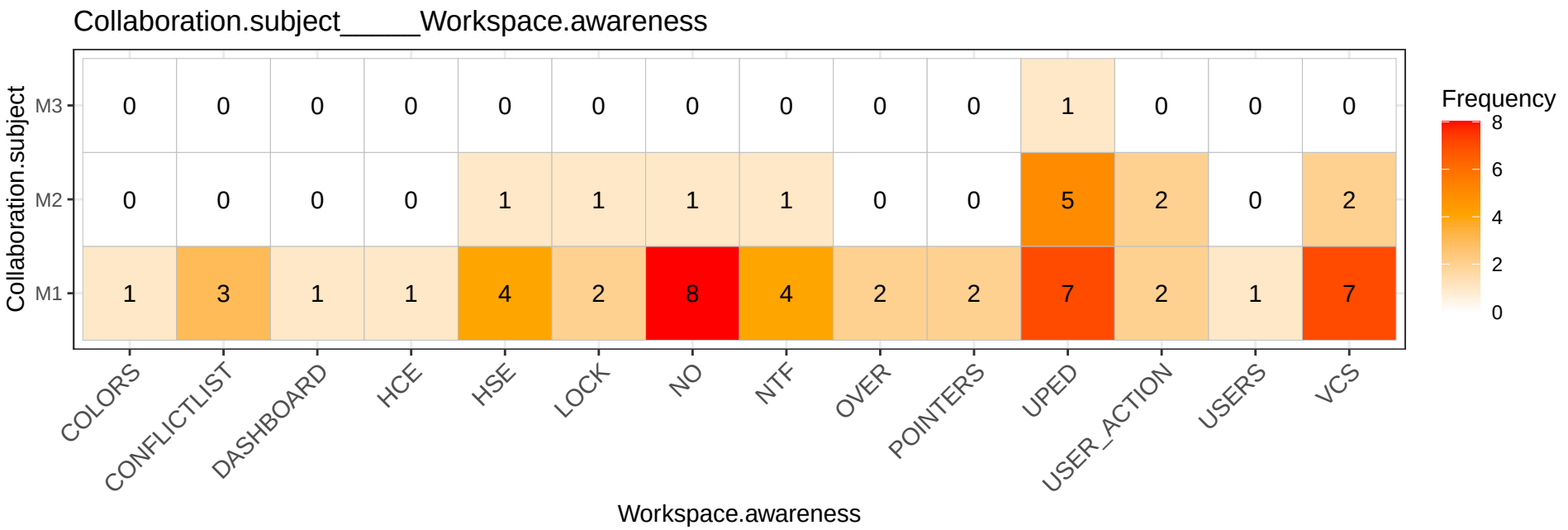
NONTECH
TECH
Stakeholder.types


Collaboration.subject_____Workspace.awareness
Collaboration.subject
M3
M2
M1
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1 3 1 1 4 2 8 4 2 2 7 2 1 7
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
8
6
4
2
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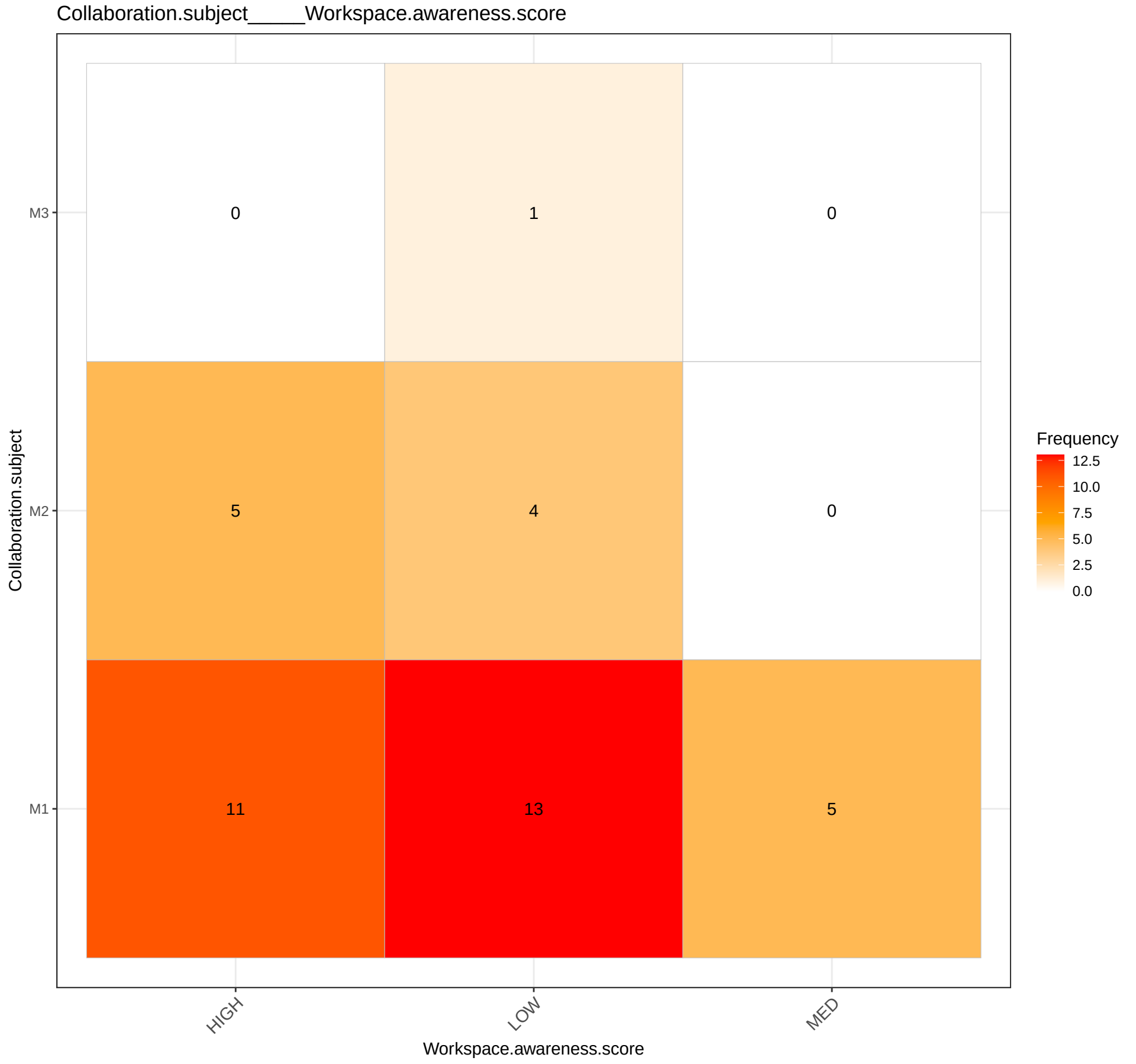
Collaboration.subject_____Workspace.awareness.score
M3
M2
M1
0
1
0
5
4
0
11
13
5
HIGH
LOW
MED
Collaboration.subject
Workspace.awareness.score
Frequency
12.5
10.0
7.5
5.0
2.5
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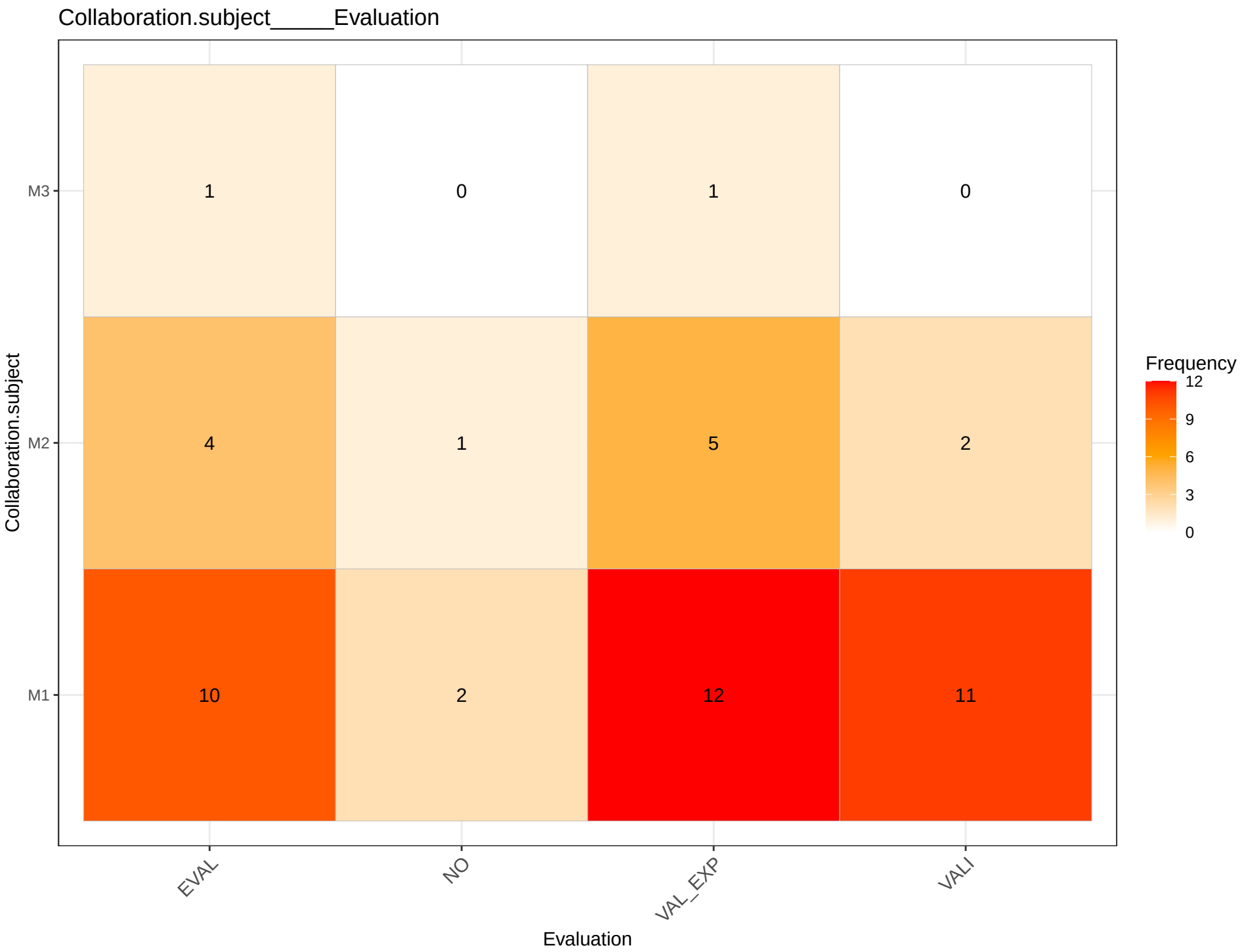
Collaboration.subject_____Evaluation
M3
M2
M1
1
0
1
0
4
1
5
2
10
2
12
11
EVAL
NO
VAL_EXP
VALI
Evaluation
Collaboration.subject
Frequency
12
9
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3
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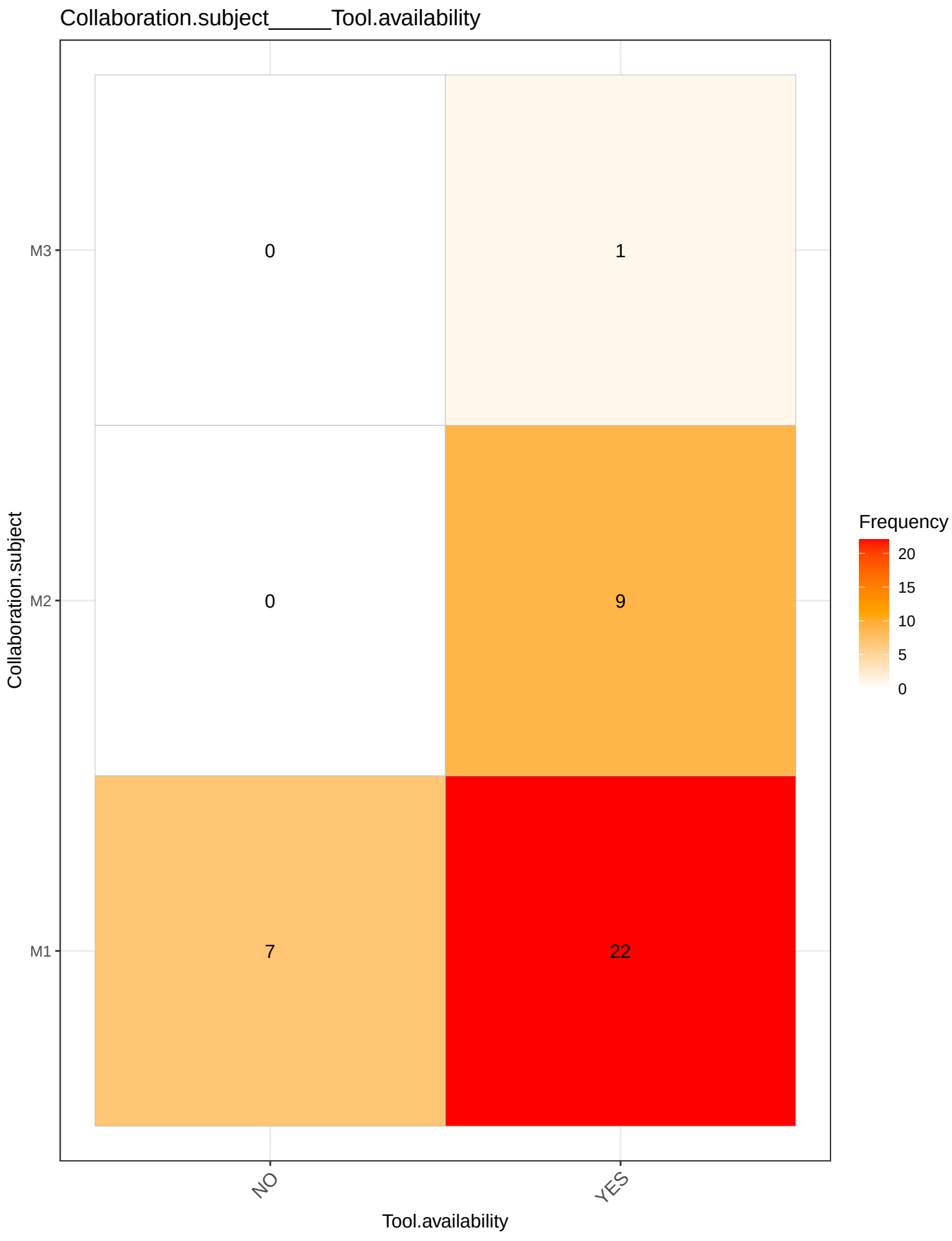
Collaboration.subject_____Tool.availability
M3
M2
M1
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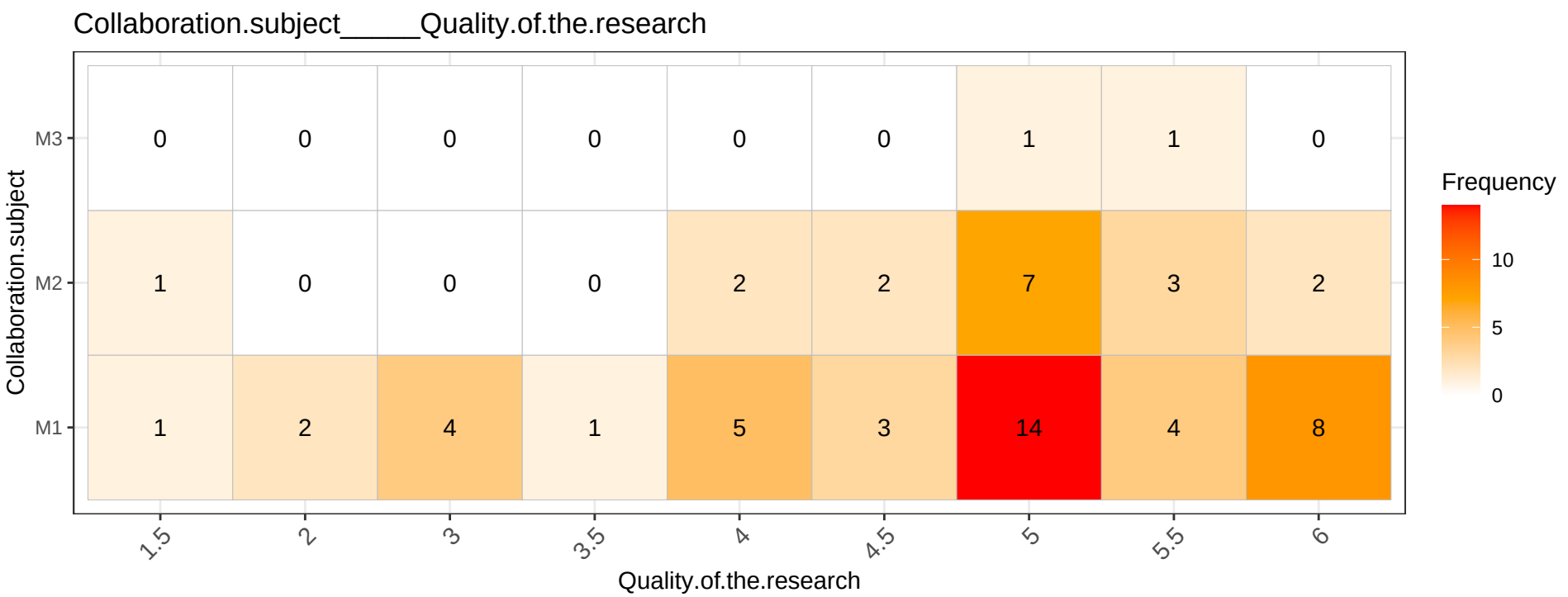
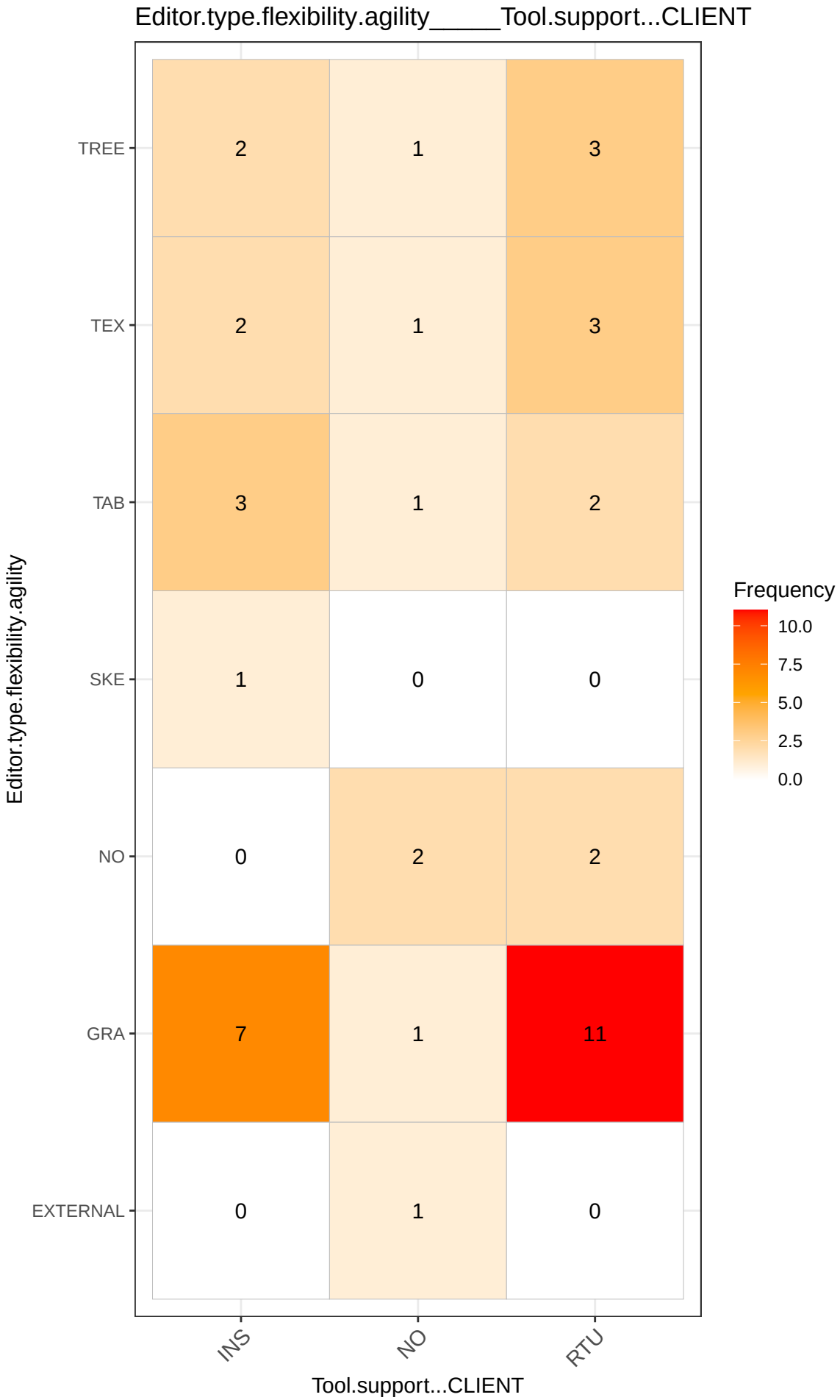
0
9
7
22
Collaboration.subject
NO
YES
Tool.availability
Frequency
20
15
10
5
0


Collaboration.subject_____Quality.of.the.research
Collaboration.subject
M3
M2
M1
0 0 0 0 0 0 1 1 0
1 0 0 0 2 2 7 3 2
1 2 4 1 5 3 14 4 8
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10
5
0


Editor.type.flexibility.agility_____Tool.support...CLIENT
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
2
1
3
2
1
3
3
1
2
1
0
0
0
2
2
7
1
11
0
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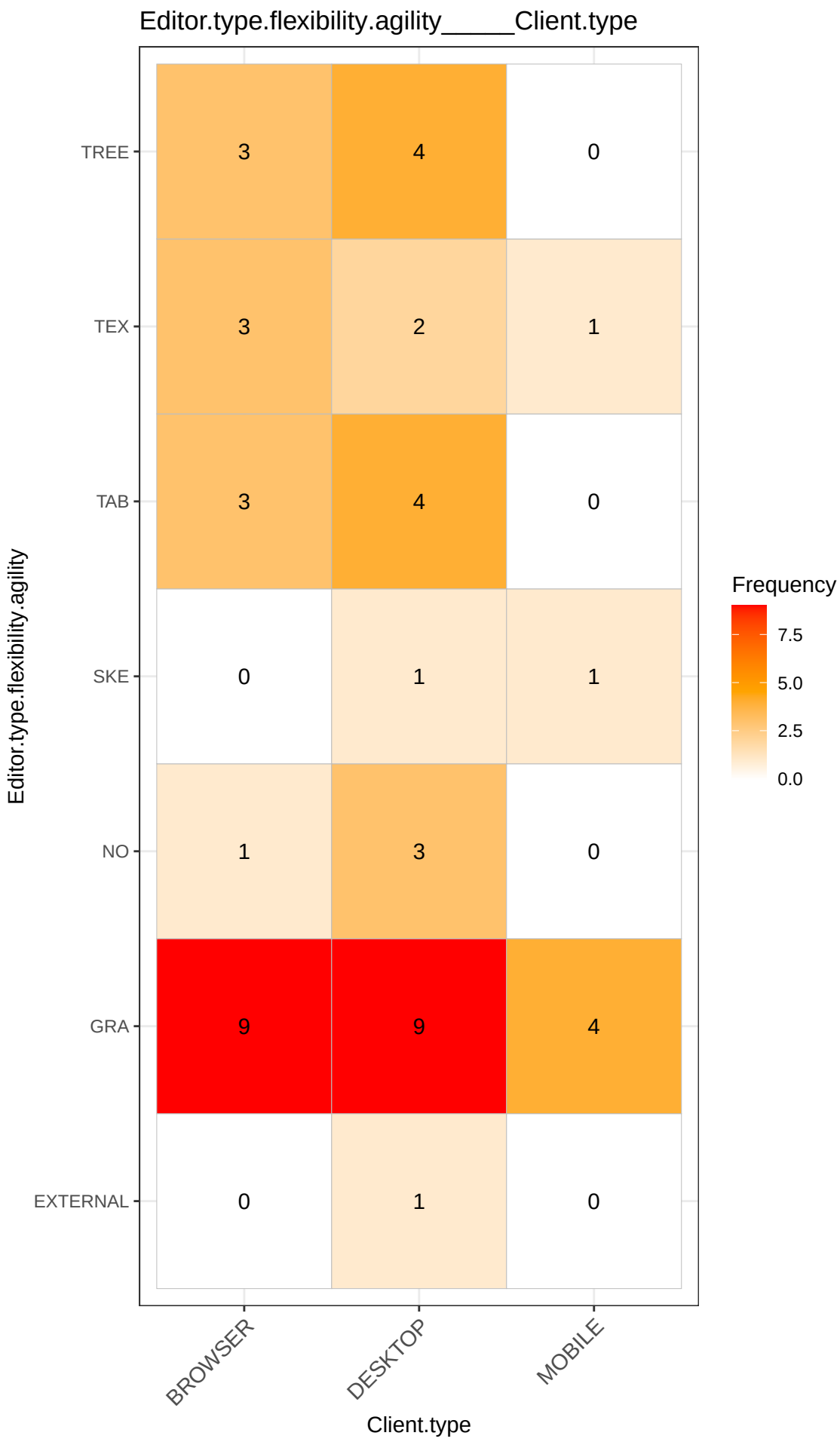
0
INS
NO
RTU
Tool.support...CLIENT
Frequency
10.0
7.5
5.0
2.5
0.0


Editor.type.flexibility.agility_____Client.type
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TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
3
4
0
3
2
1
3
4
0
0
1
1
1
3
0
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0
BROWSER
DESKTOP
MOBILE
Client.type
Frequency
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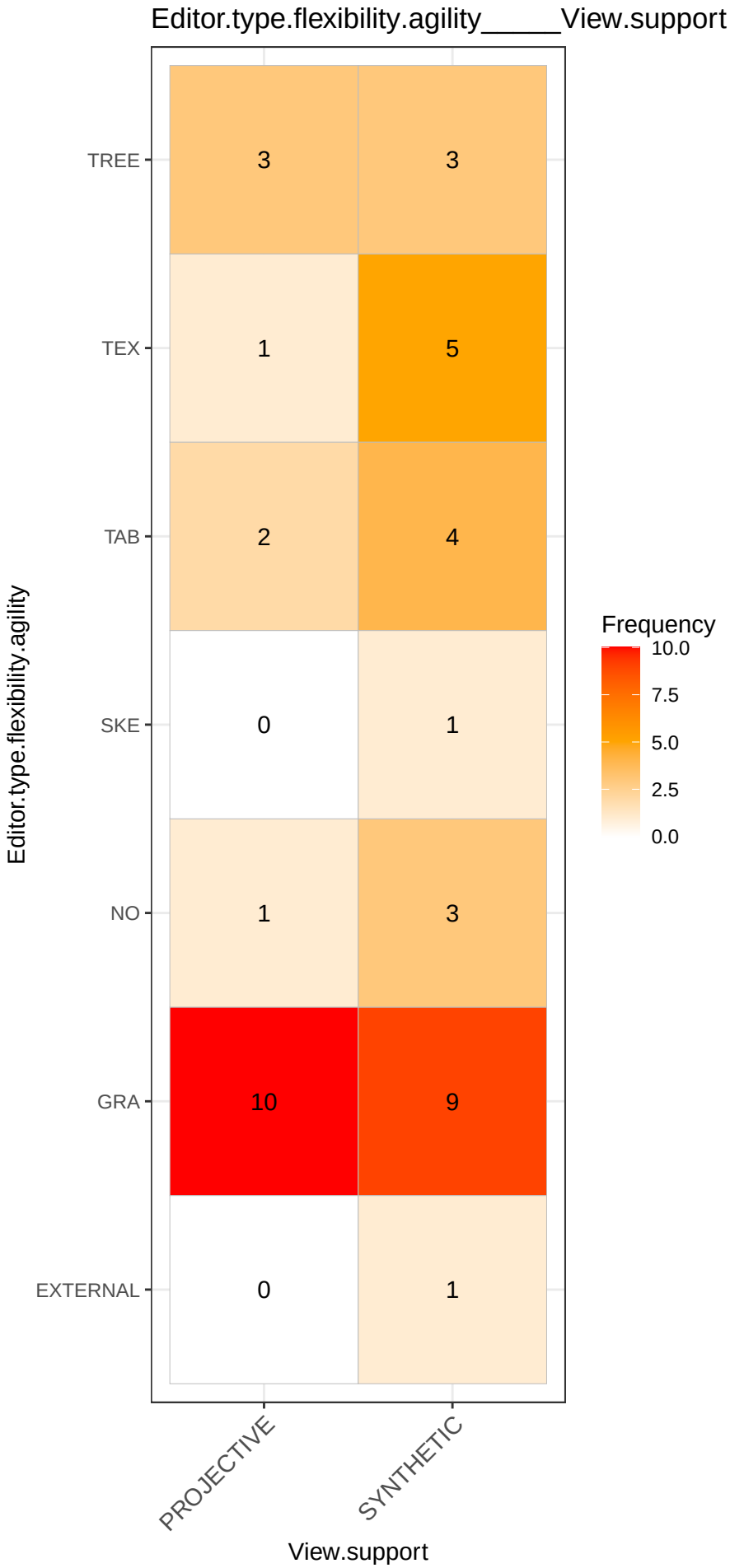
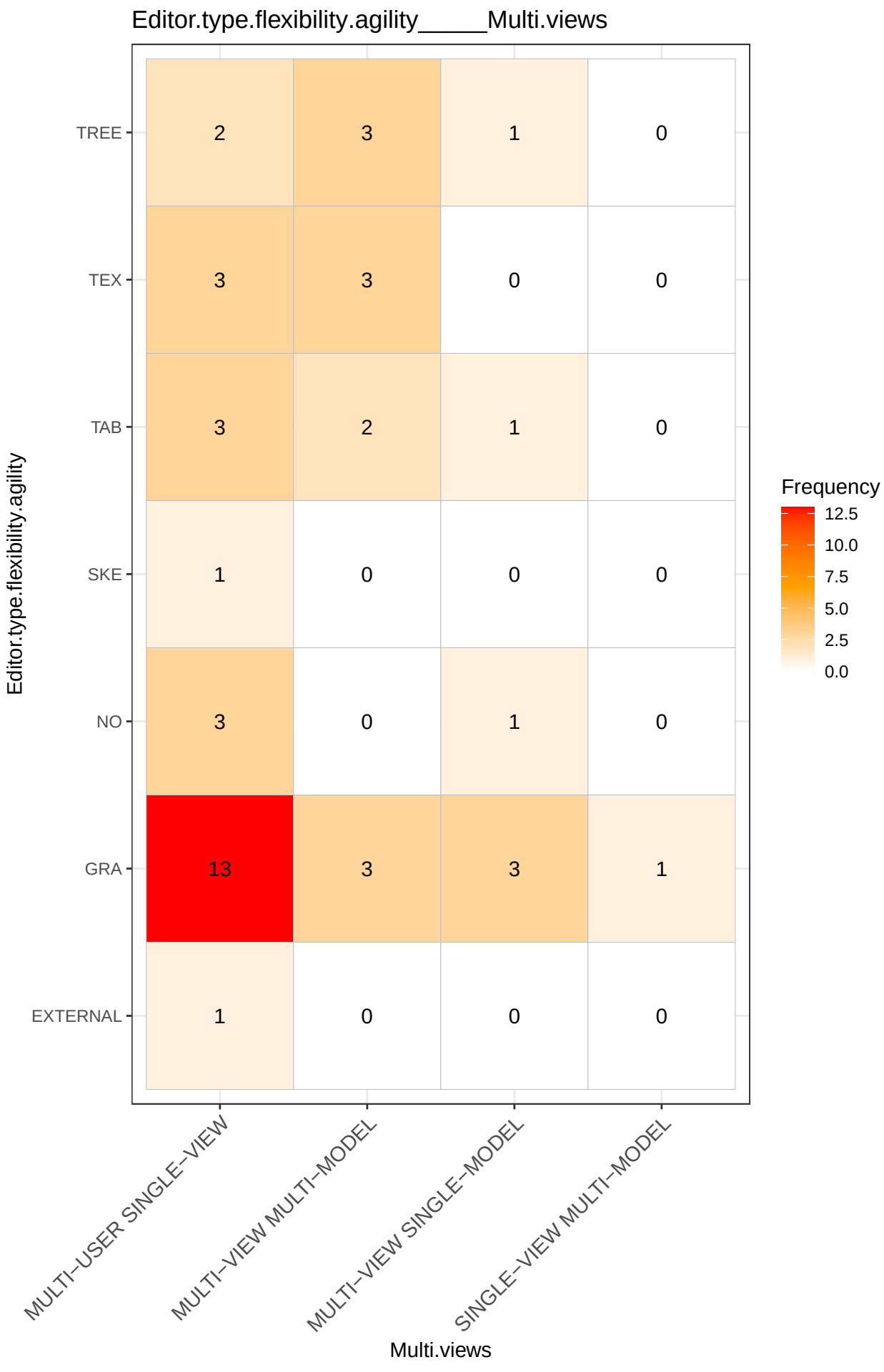
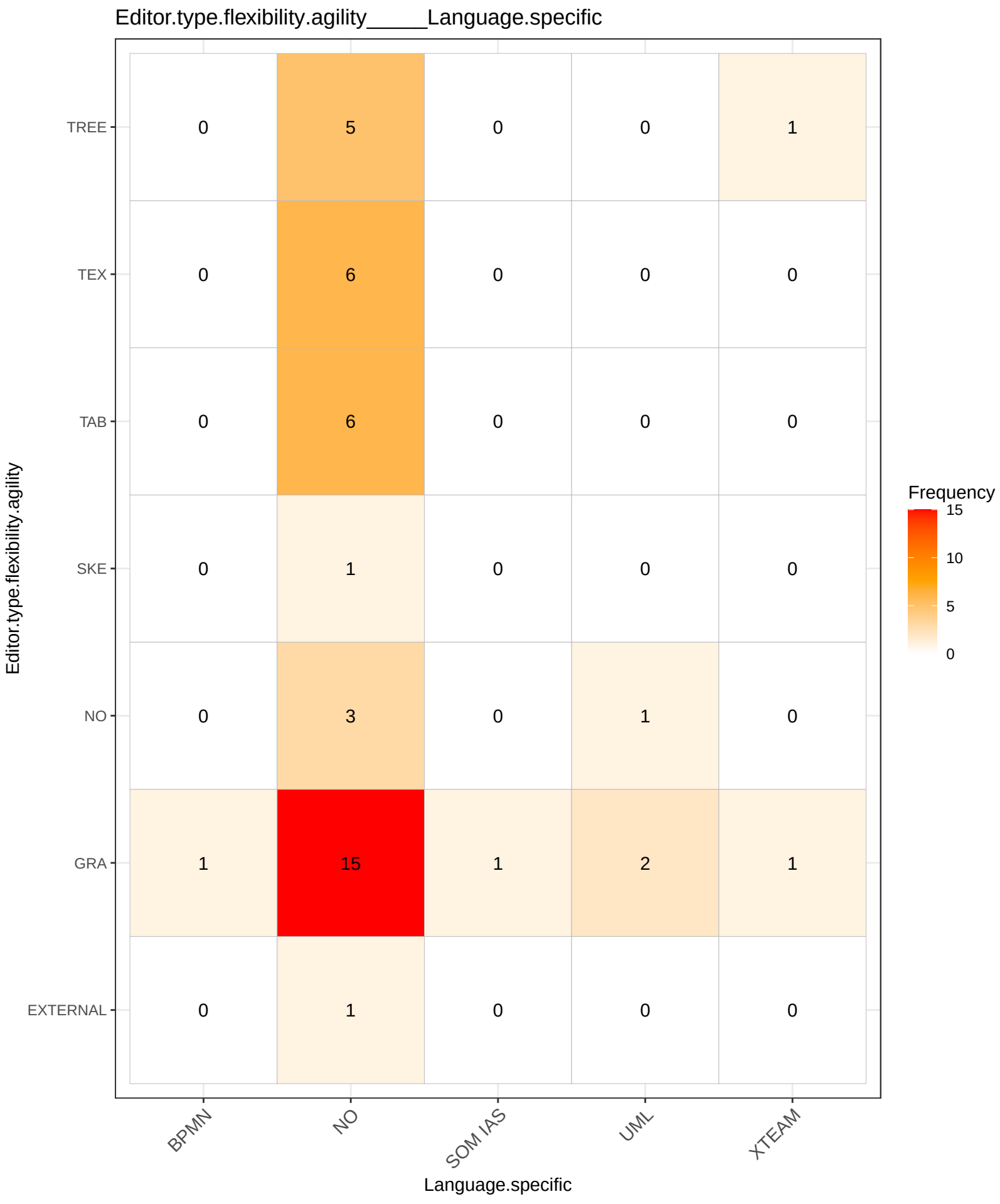
5.0
2.5
0.0


Editor.type.flexibility.agility_____View.support
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
3
3
1
5
2
4
0
1
1
3
10
9
0
1
Editor.type.flexibility.agility
PROJECTIVE
SYNTHETIC
View.support
Frequency
10.0
7.5
5.0
2.5
0.0


Editor.type.flexibility.agility_____Multi.views
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
2
3
1
0
3
3
0
0
3
2
1
0
1
0
0
0
3
0
1
0
13
3
3
1
1
0
0
0
MULTI−USER SINGLE−VIEW
MULTI−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
SINGLE−VIEW MULTI−MODEL
Multi.views
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Editor.type.flexibility.agility_____Language.specific
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TEX
TAB
SKE
NO
GRA
EXTERNAL
0 5 0 0 1
0 6 0 0 0
0 6 0 0 0
0 1 0 0 0
0 3 0 1 0
1 15 1 2 1
0 1 0 0 0
BPMN
NO
SOM IAS
UML
XTEAM
Editor.type.flexibility.agility
Language.specific
Frequency
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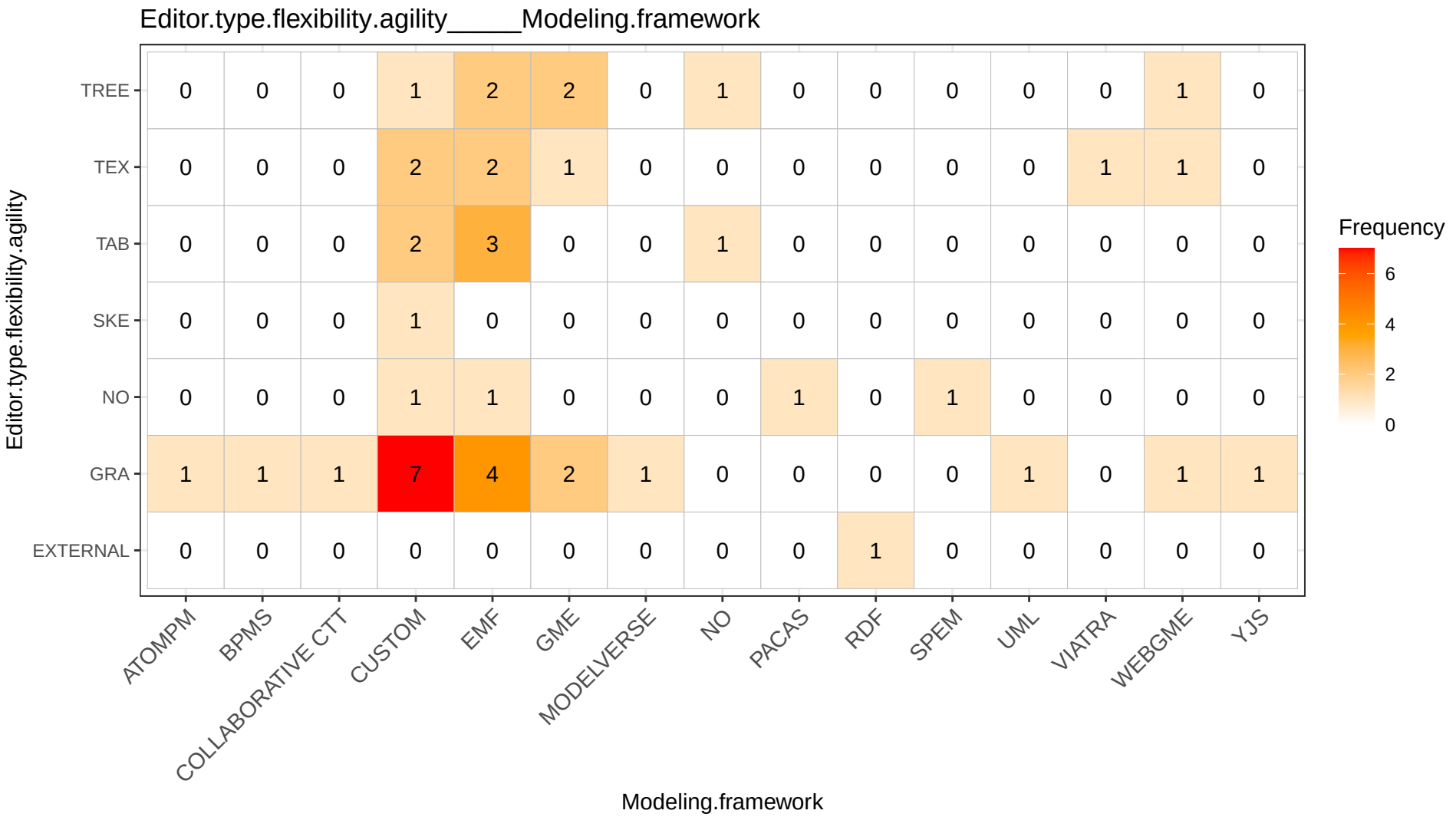
Editor.type.flexibility.agility_____Modeling.framework
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0 0 0 1 2 2 0 1 0 0 0 0 0 1 0
0 0 0 2 2 1 0 0 0 0 0 0 1 1 0
0 0 0 2 3 0 0 1 0 0 0 0 0 0 0
0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 1 1 0 0 0 1 0 1 0 0 0 0
1 1 1 7 4 2 1 0 0 0 0 1 0 1 1
0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
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RDF
SPEM
UML
VIATRA
WEBGME
YJS
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Frequency
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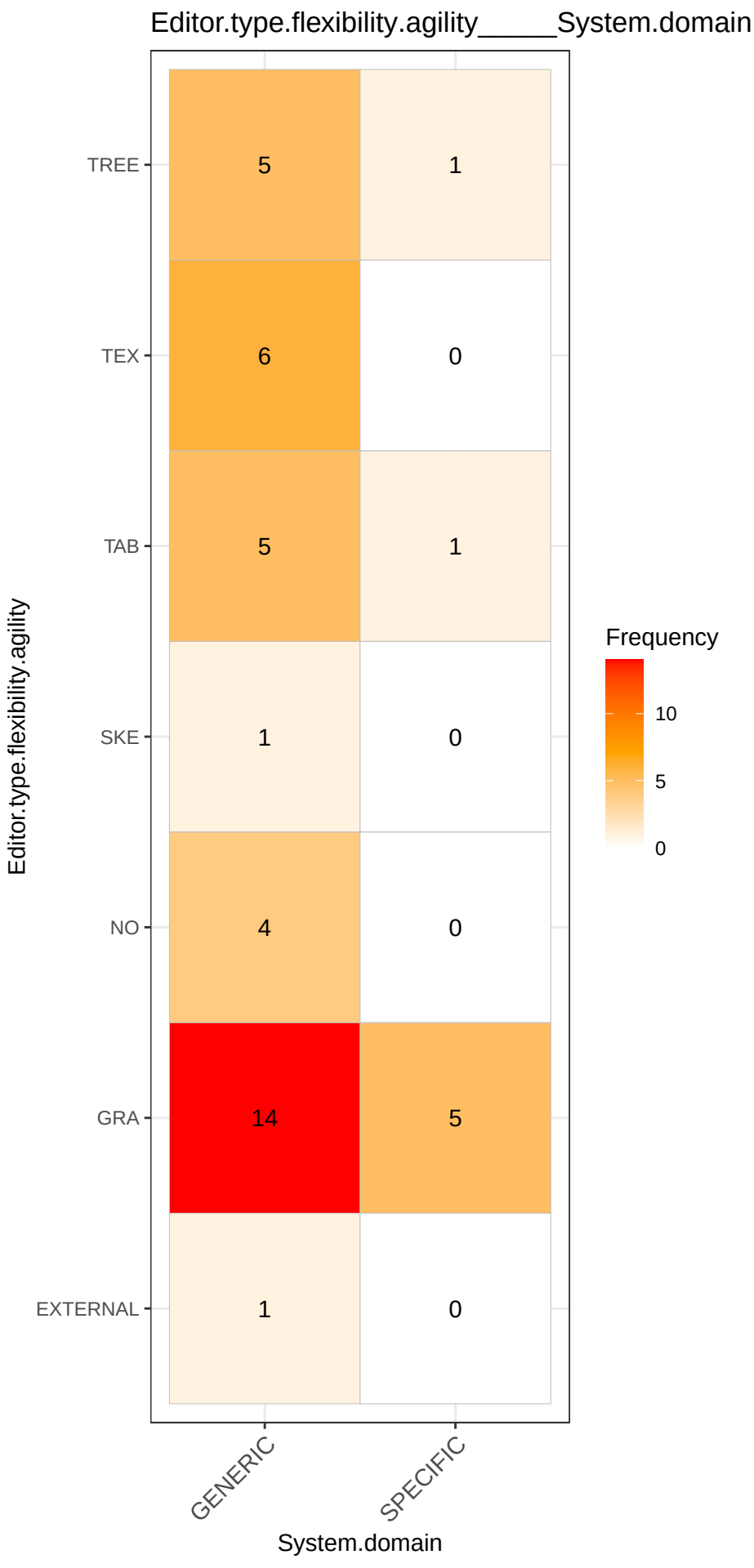
Editor.type.flexibility.agility_____System.domain
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
5
1
6
0
5
1
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GENERIC
SPECIFIC
System.domain
Editor.type.flexibility.agility
Frequency
10
5
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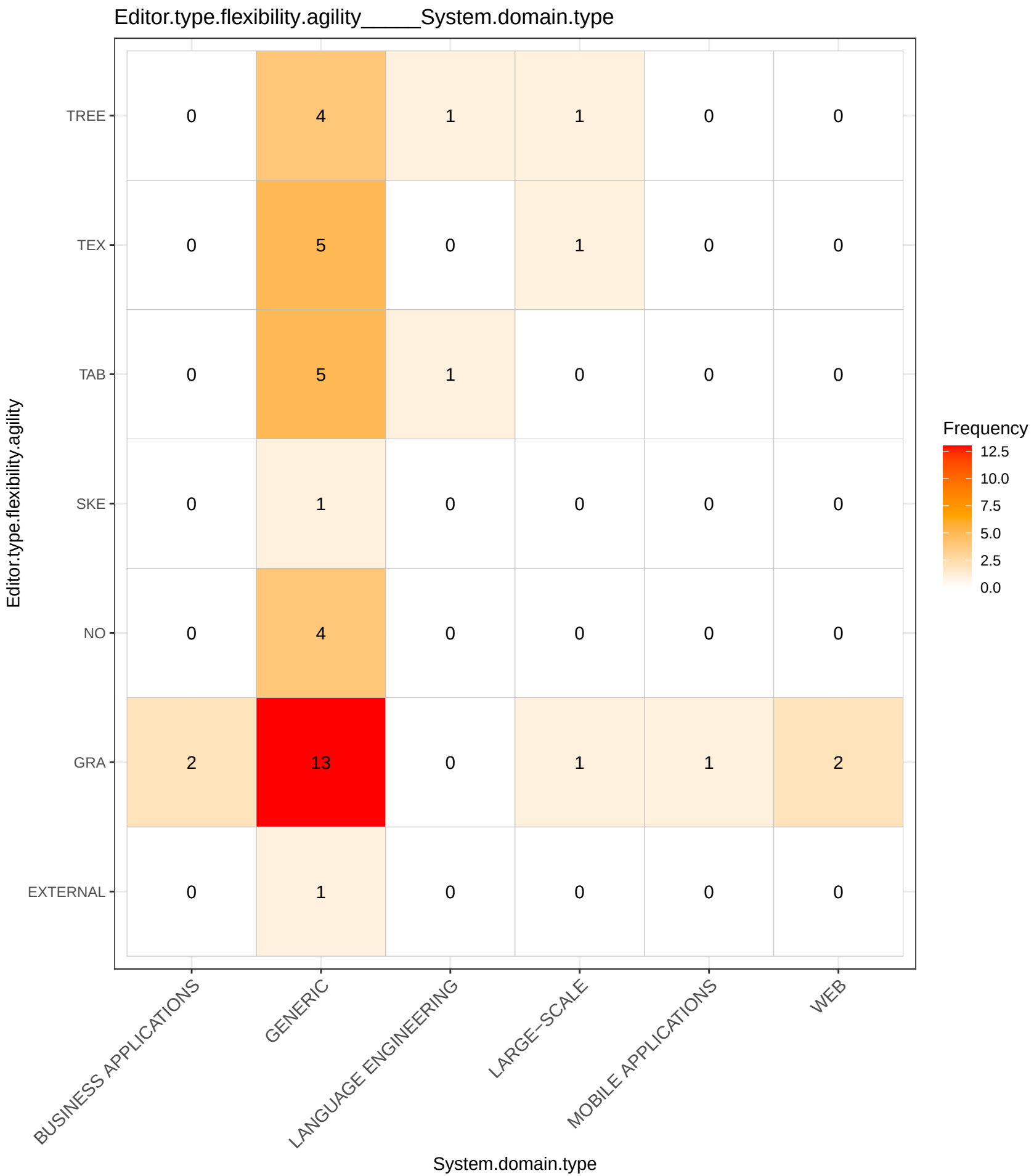
Editor.type.flexibility.agility_____System.domain.type
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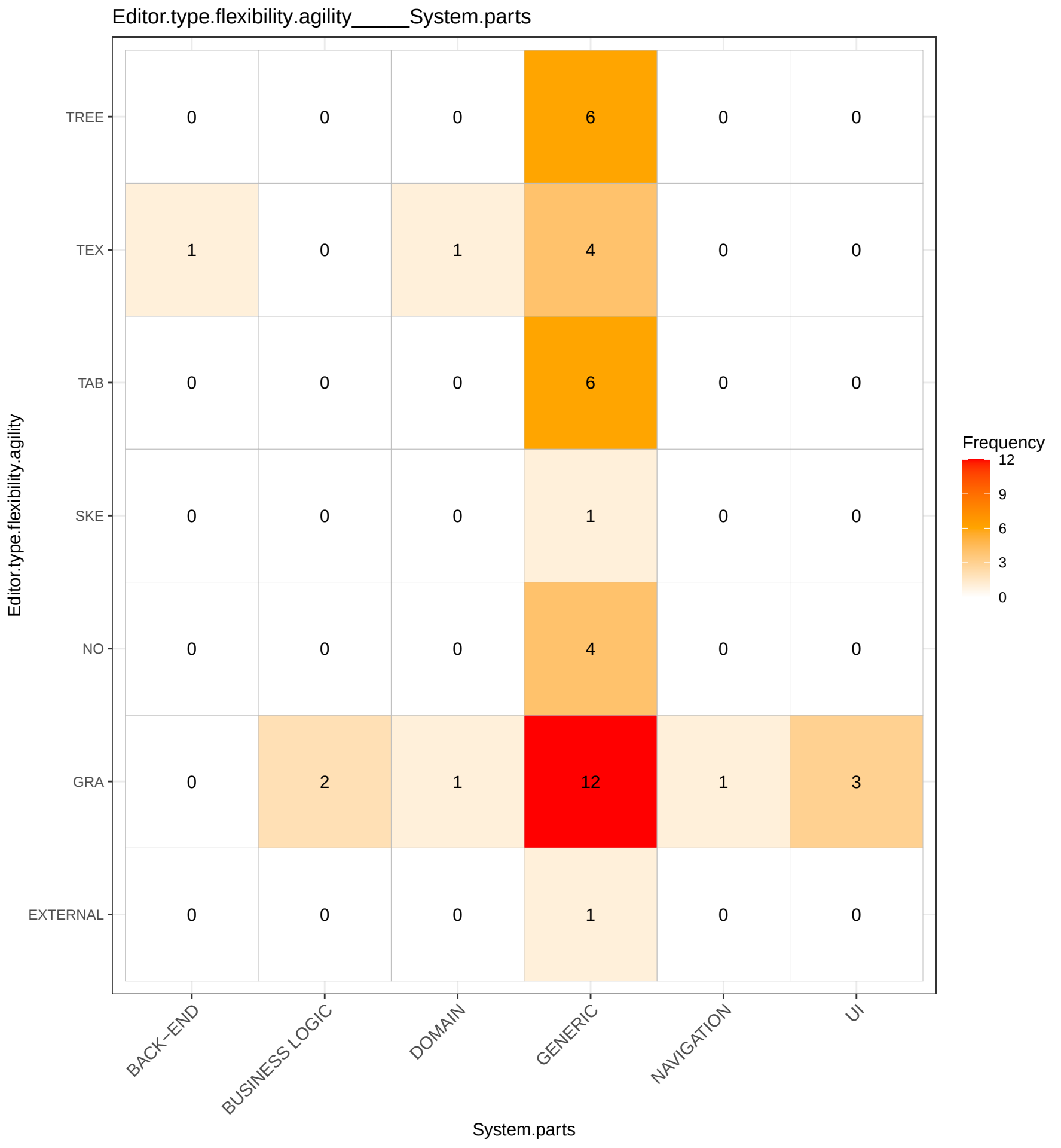
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
0 4 1 1 0 0
0 5 0 1 0 0
0 5 1 0 0 0
0 1 0 0 0 0
0 4 0 0 0 0
2 13 0 1 1 2
0 1 0 0 0 0
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Editor.type.flexibility.agility_____System.parts
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
0 0 0 6 0 0
1 0 1 4 0 0
0 0 0 6 0 0
0 0 0 1 0 0
0 0 0 4 0 0
0 2 1 12 1 3
0 0 0 1 0 0
BACK-END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
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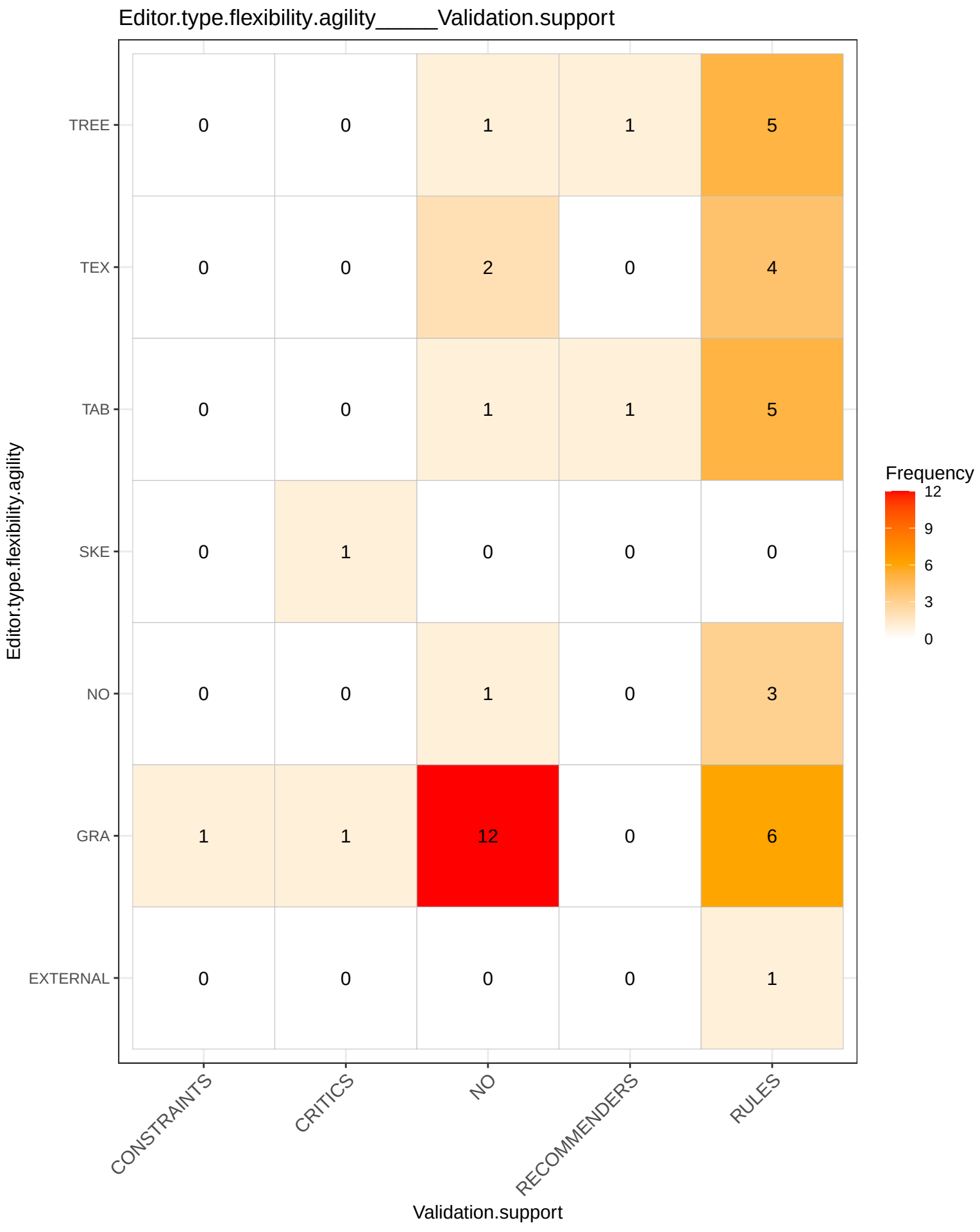
Editor.type.flexibility.agility_____Validation.support
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TEX
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SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
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0 0 2 0 4
0 0 1 1 5
0 1 0 0 0
0 0 1 0 3
1 1 12 0 6
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CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
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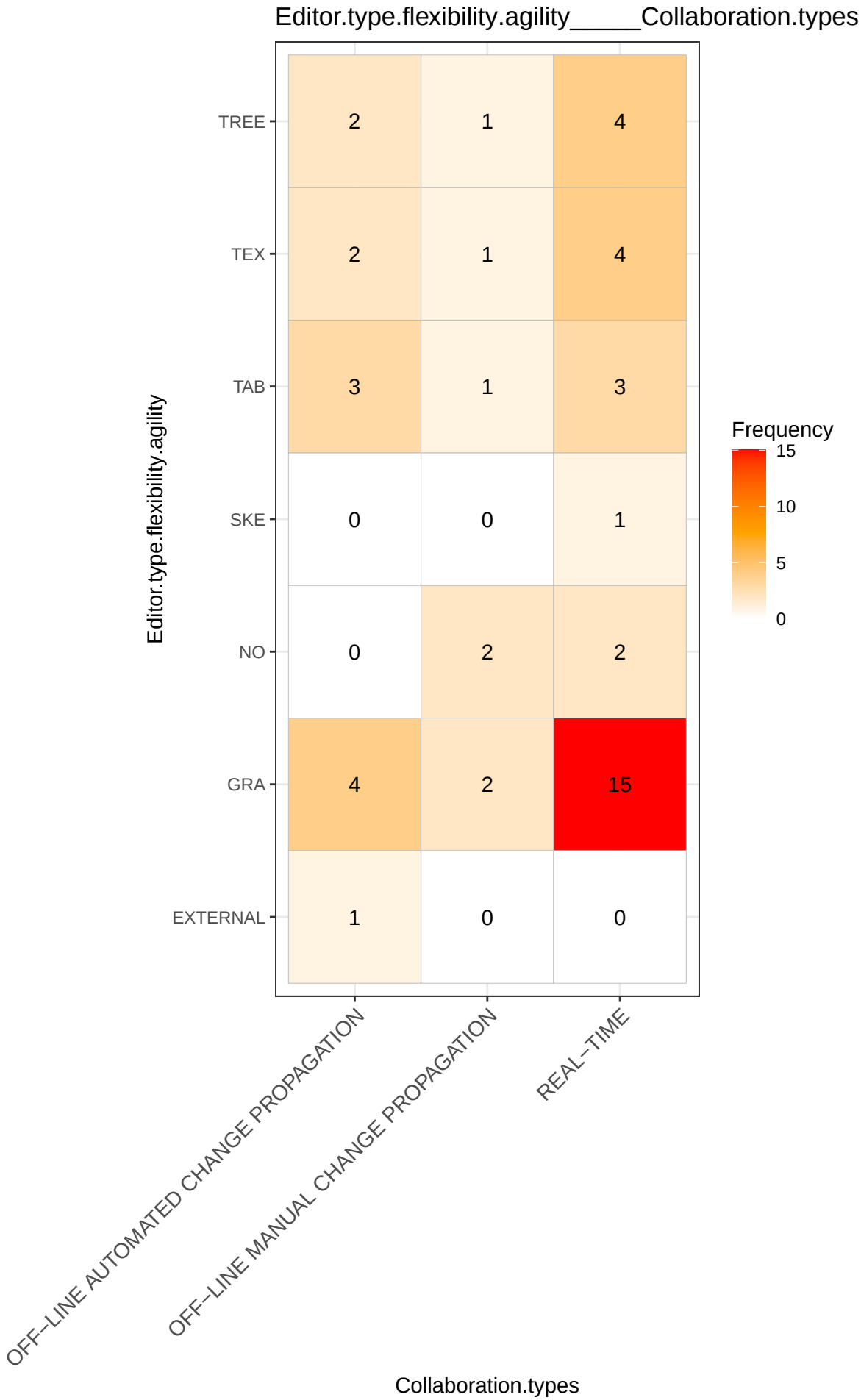
Editor.type.flexibility.agility_____Collaboration.types
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
2
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4
2
1
4
3
1
3
0
0
1
0
2
2
4
2
15
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Frequency
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10
5
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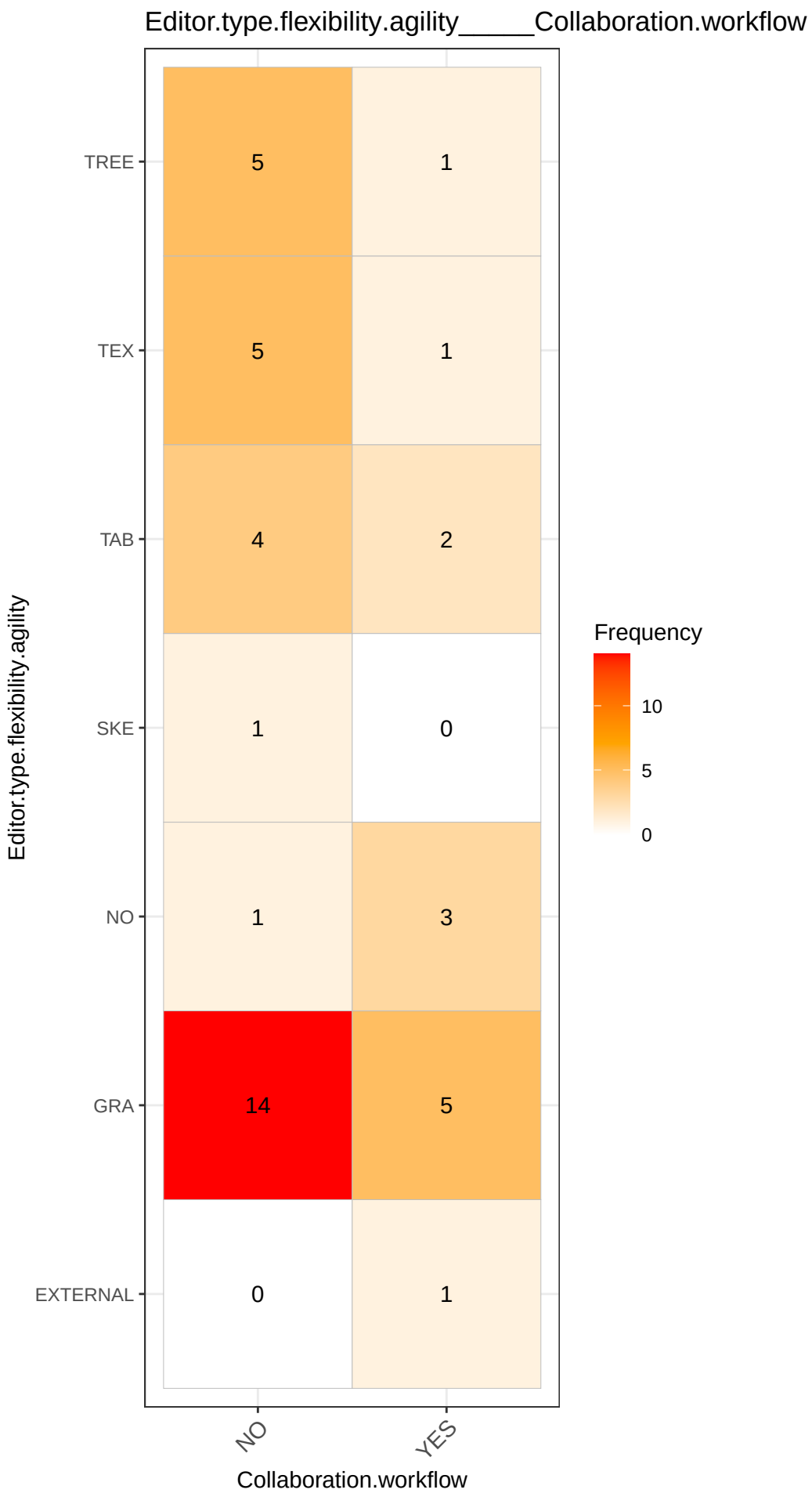
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types


Editor.type.flexibility.agility_____Collaboration.workflow
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
5
1
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3
14
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NO
YES
Collaboration.workflow
Frequency
10
5
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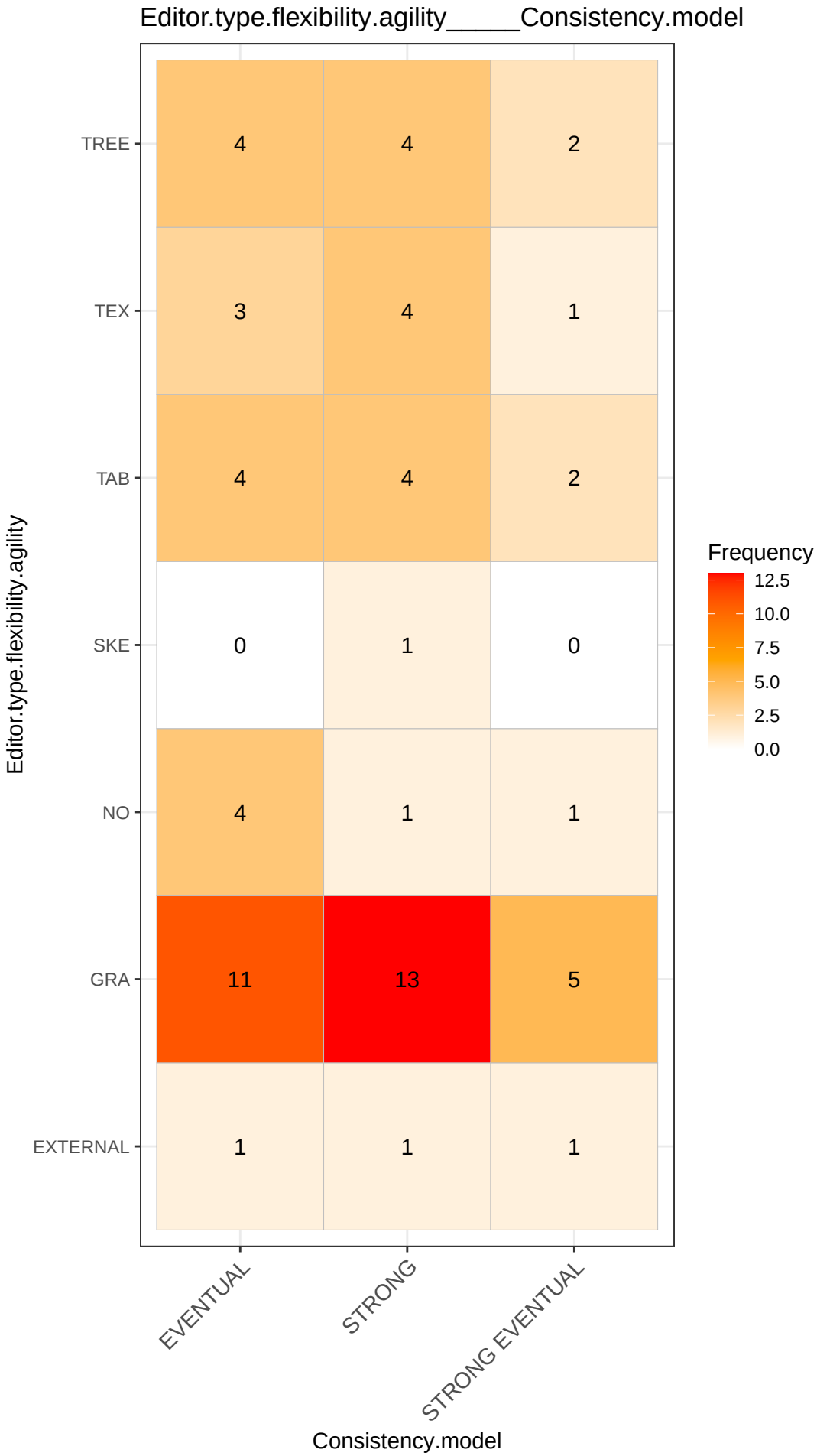
Editor.type.flexibility.agility_____Consistency.model
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
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4
2
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4
1
4
4
2
0
1
0
4
1
1
11
13
5
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1
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EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
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10.0
7.5
5.0
2.5
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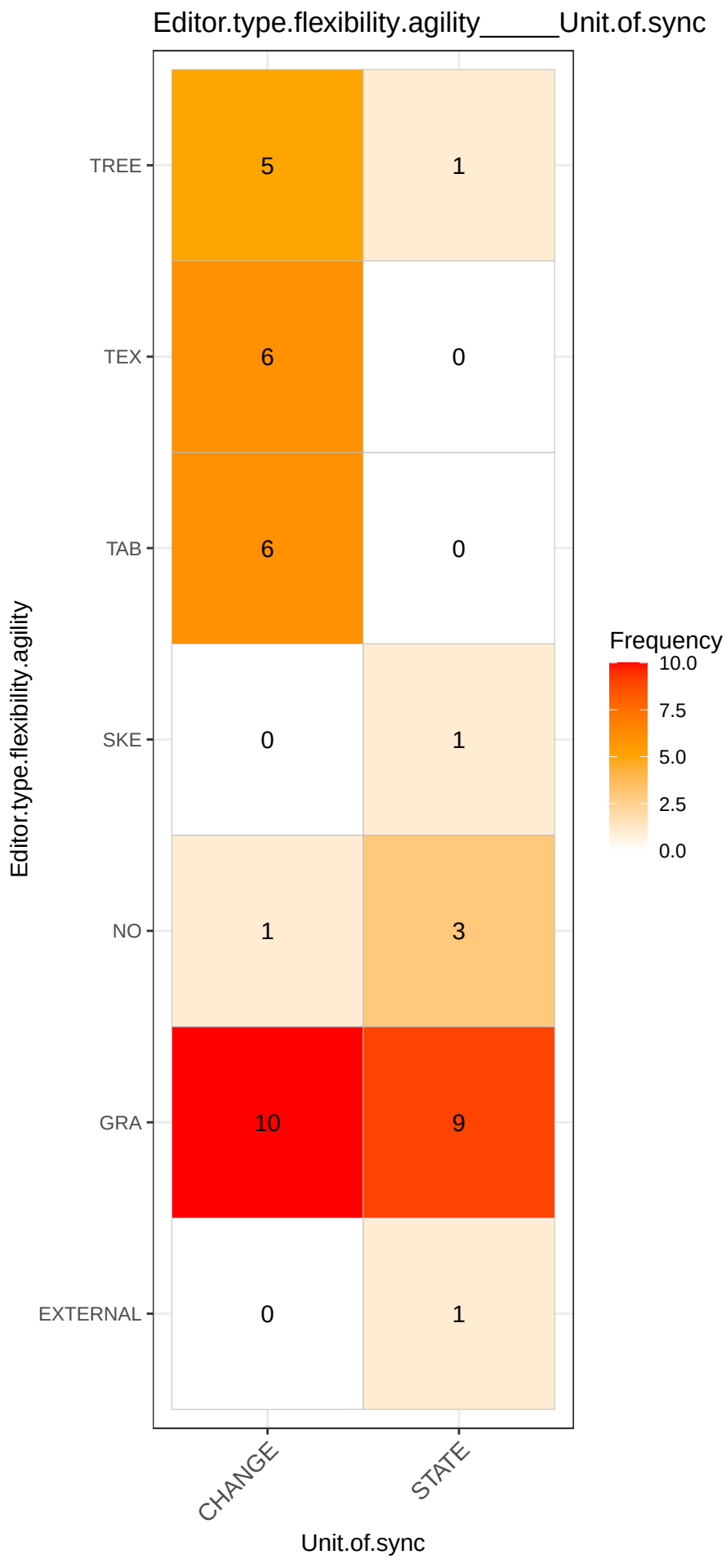
Editor.type.flexibility.agility_____Unit.of.sync
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
5
1
6
0
6
0
0
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CHANGE
STATE
Unit.of.sync
Frequency
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5.0
2.5
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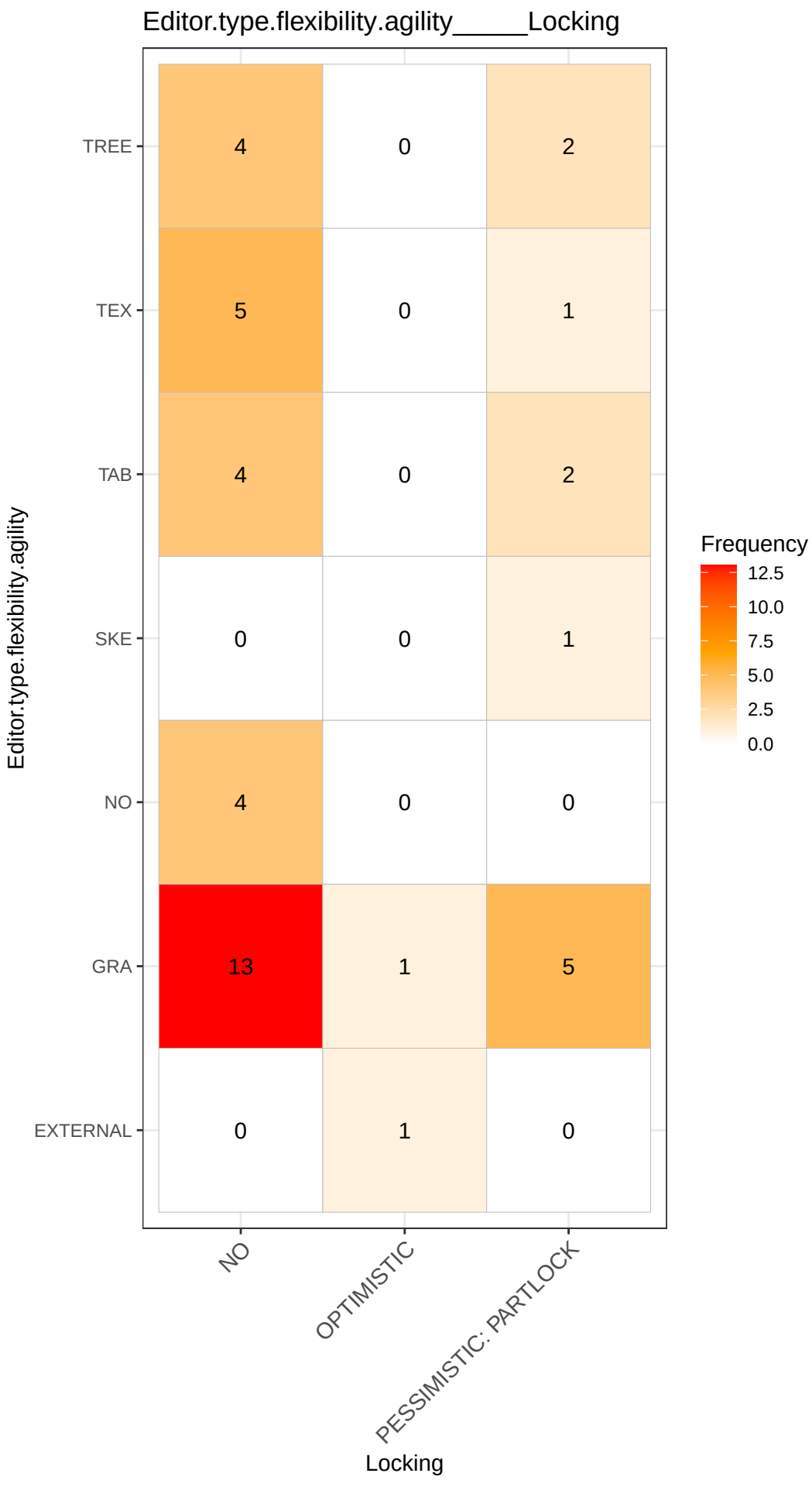
Editor.type.flexibility.agility_____Locking
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
4
0
2
5
0
1
4
0
2
0
0
1
4
0
0
13
1
5
0
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OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
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10.0
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5.0
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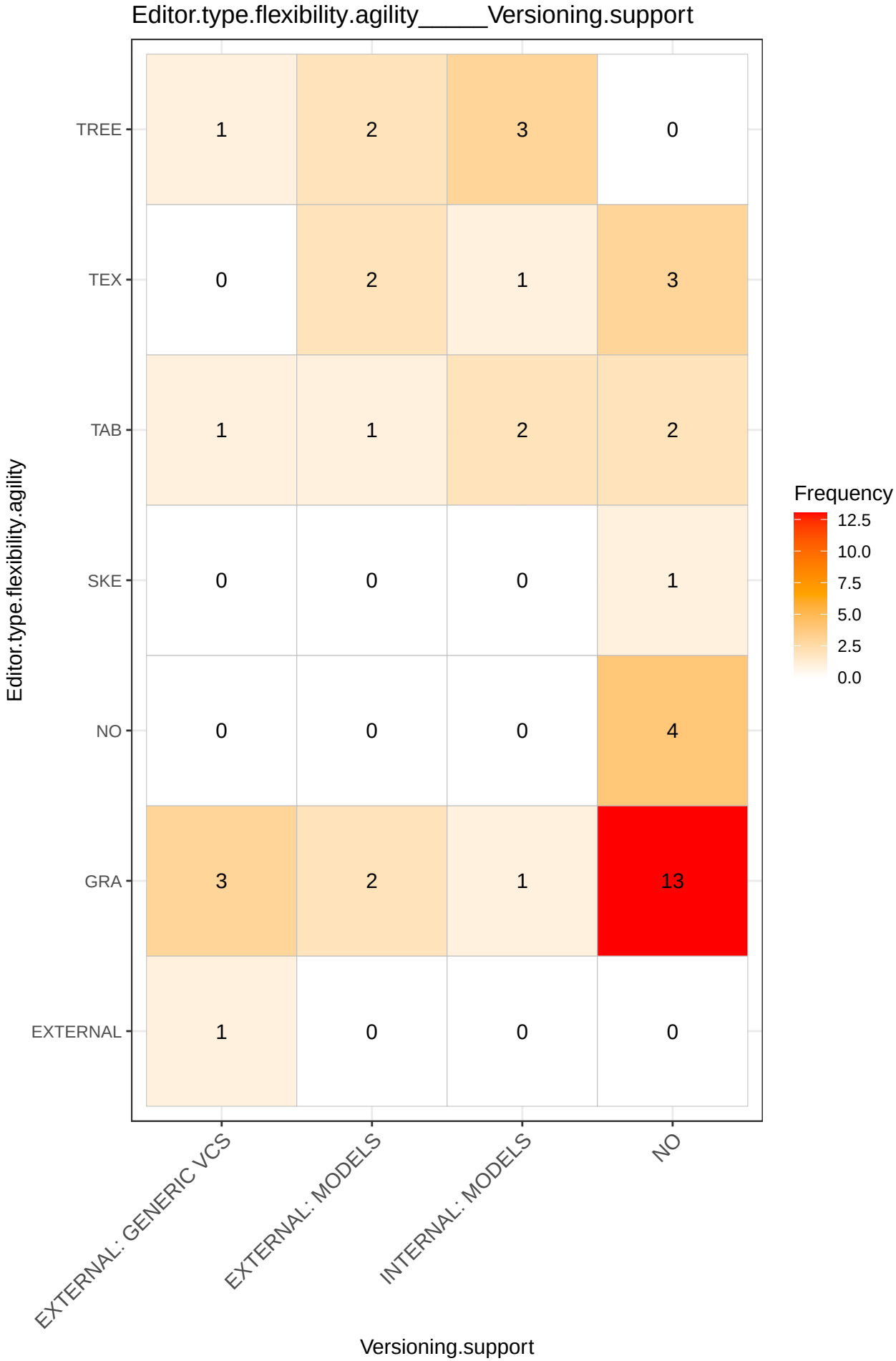
Editor.type.flexibility.agility_____Versioning.support
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TEX
TAB
SKE
NO
GRA
EXTERNAL
1
2
3
0
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2
1
3
1
1
2
2
0
0
0
1
0
0
0
4
3
2
1
13
1
0
0
0
Editor.type.flexibility.agility
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
12.5
10.0
7.5
5.0
2.5
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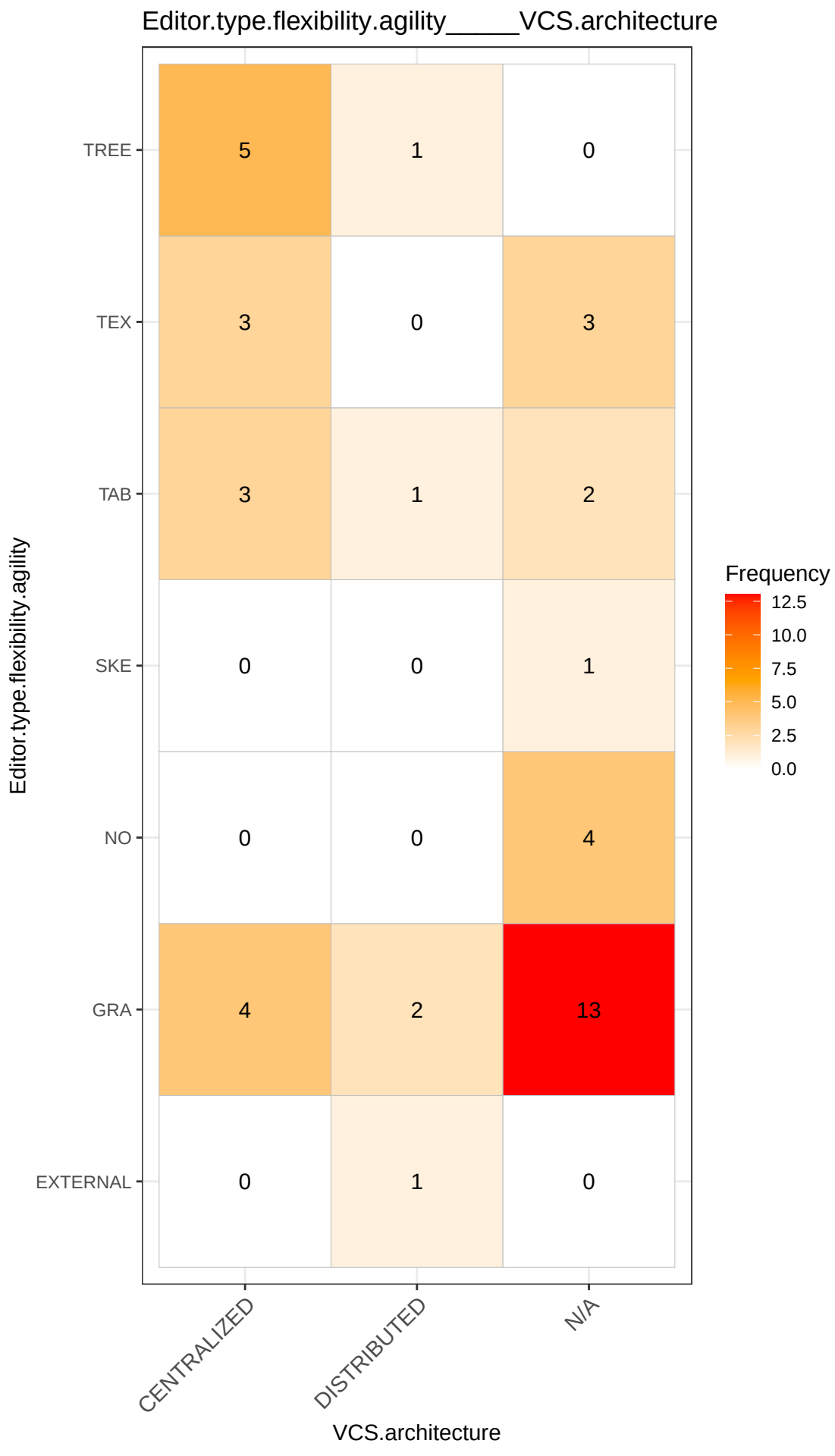
Editor.type.flexibility.agility_____VCS.architecture
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
5
1
0
3
0
3
3
1
2
0
0
1
0
0
4
4
2
13
0
1
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DISTRIBUTED
N/A
VCS.architecture
Frequency
12.5
10.0
7.5
5.0
2.5
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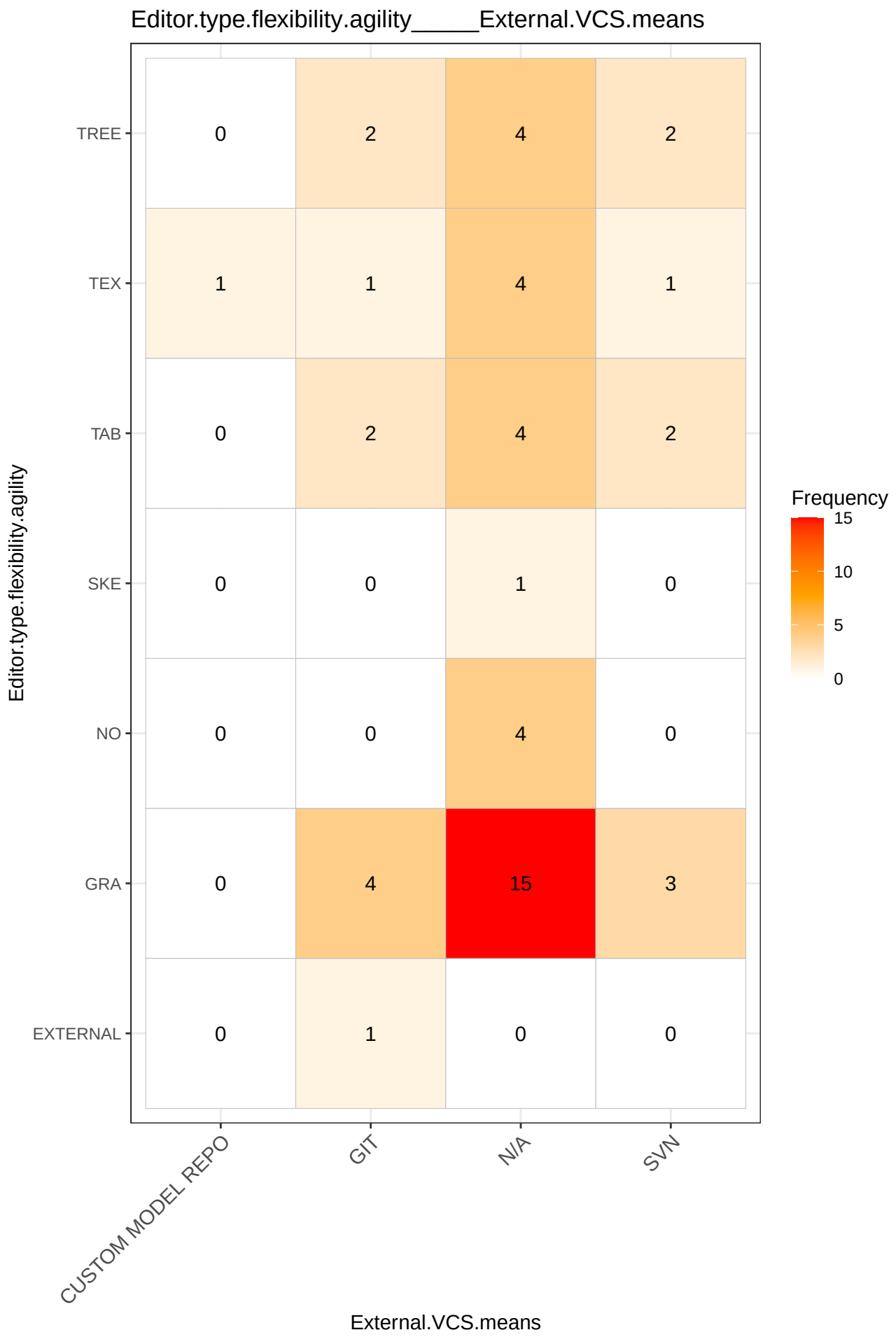
Editor.type.flexibility.agility_____External.VCS.means
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0 2 4 2
1 1 4 1
0 2 4 2
0 0 1 0
0 0 4 0
0 4 15 3
0 1 0 0
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GIT
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SVN
External.VCS.means
Frequency
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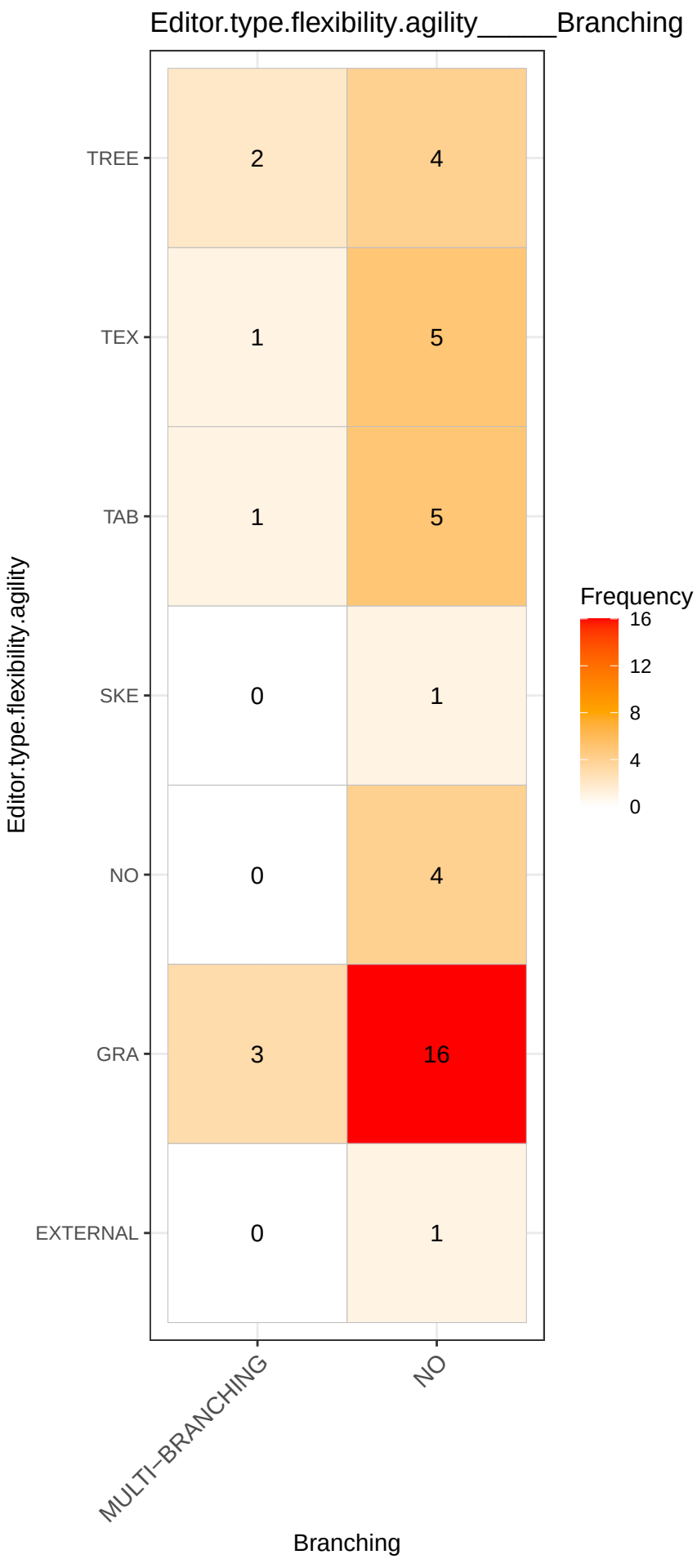
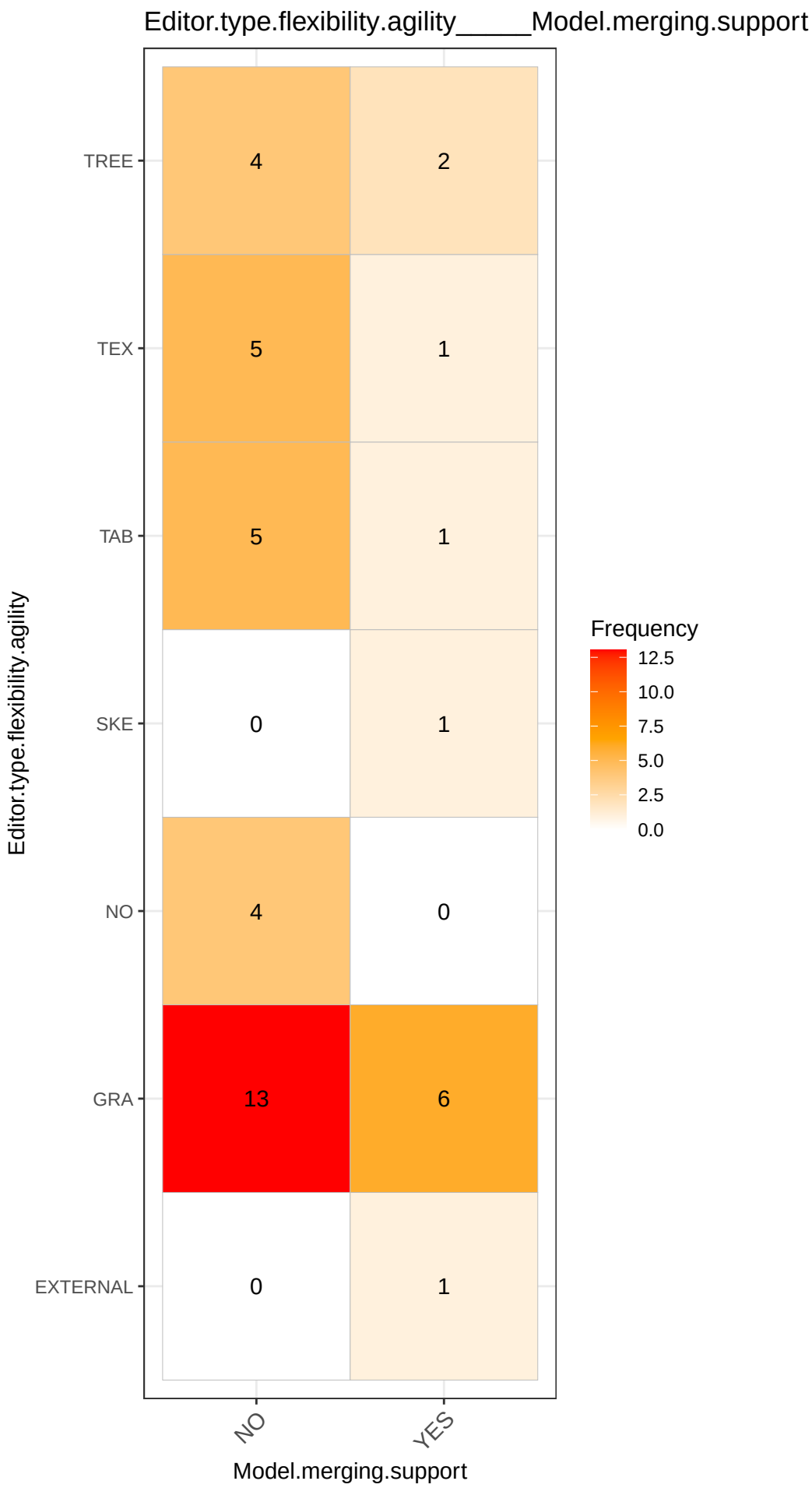
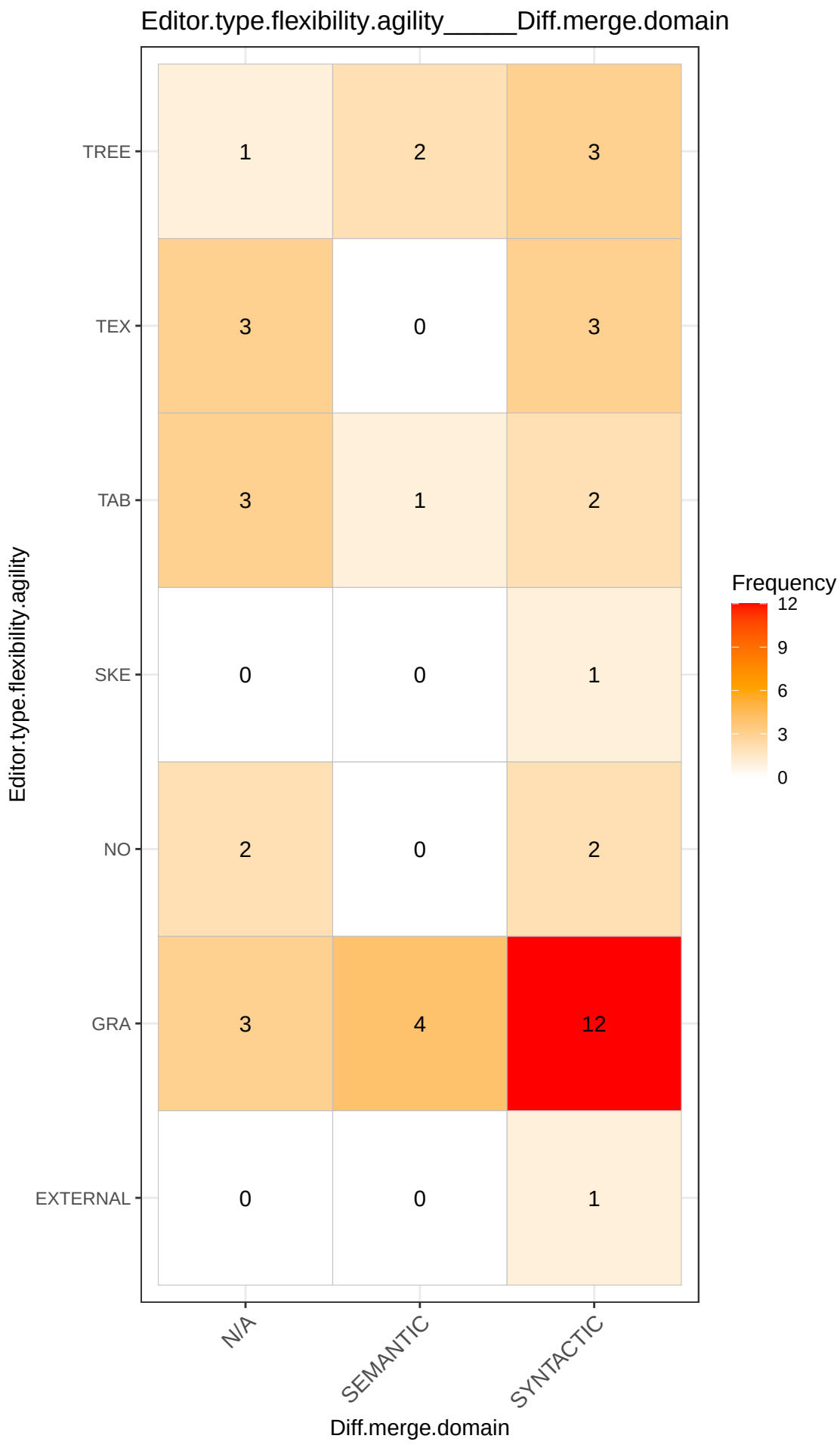
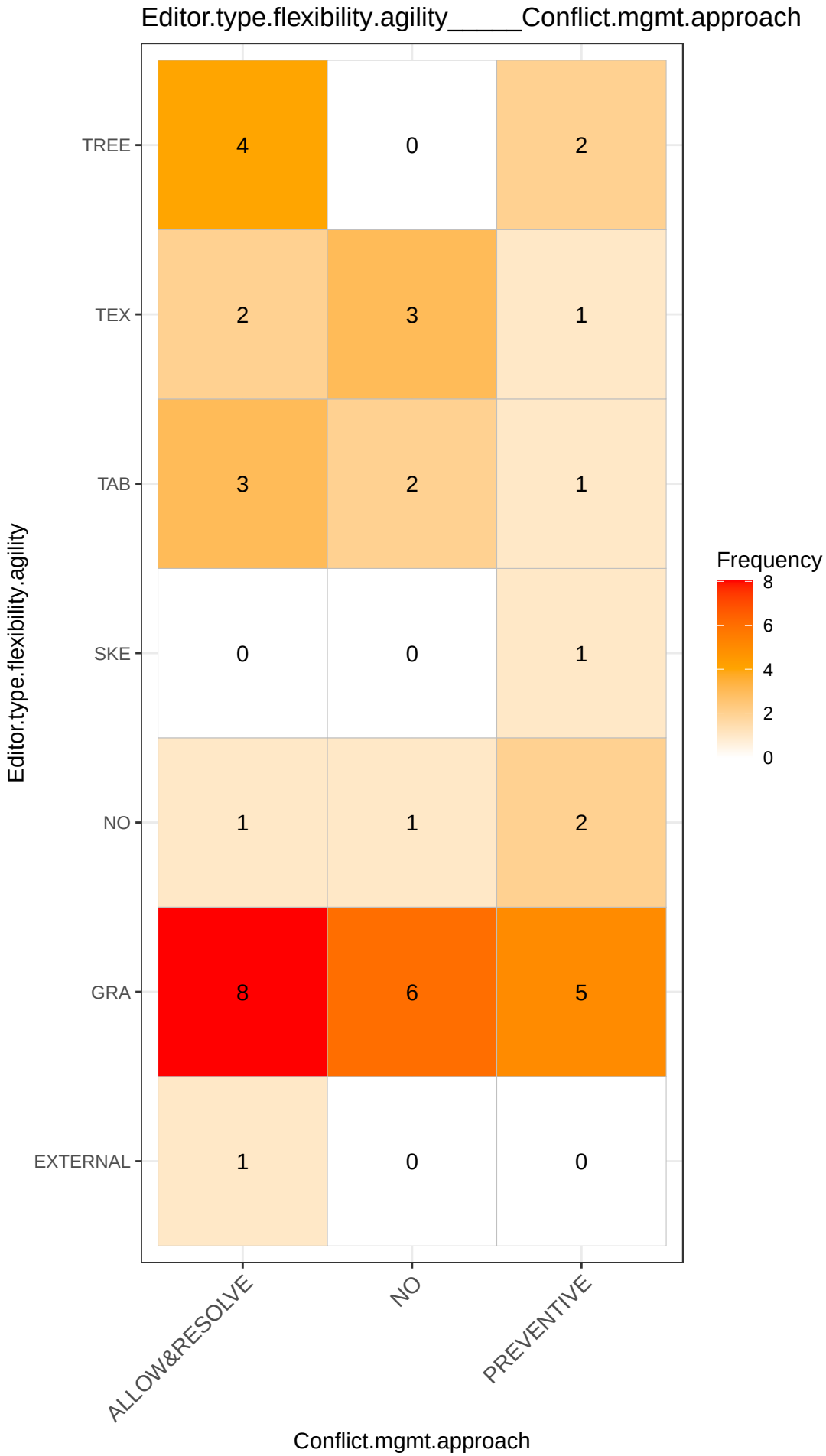
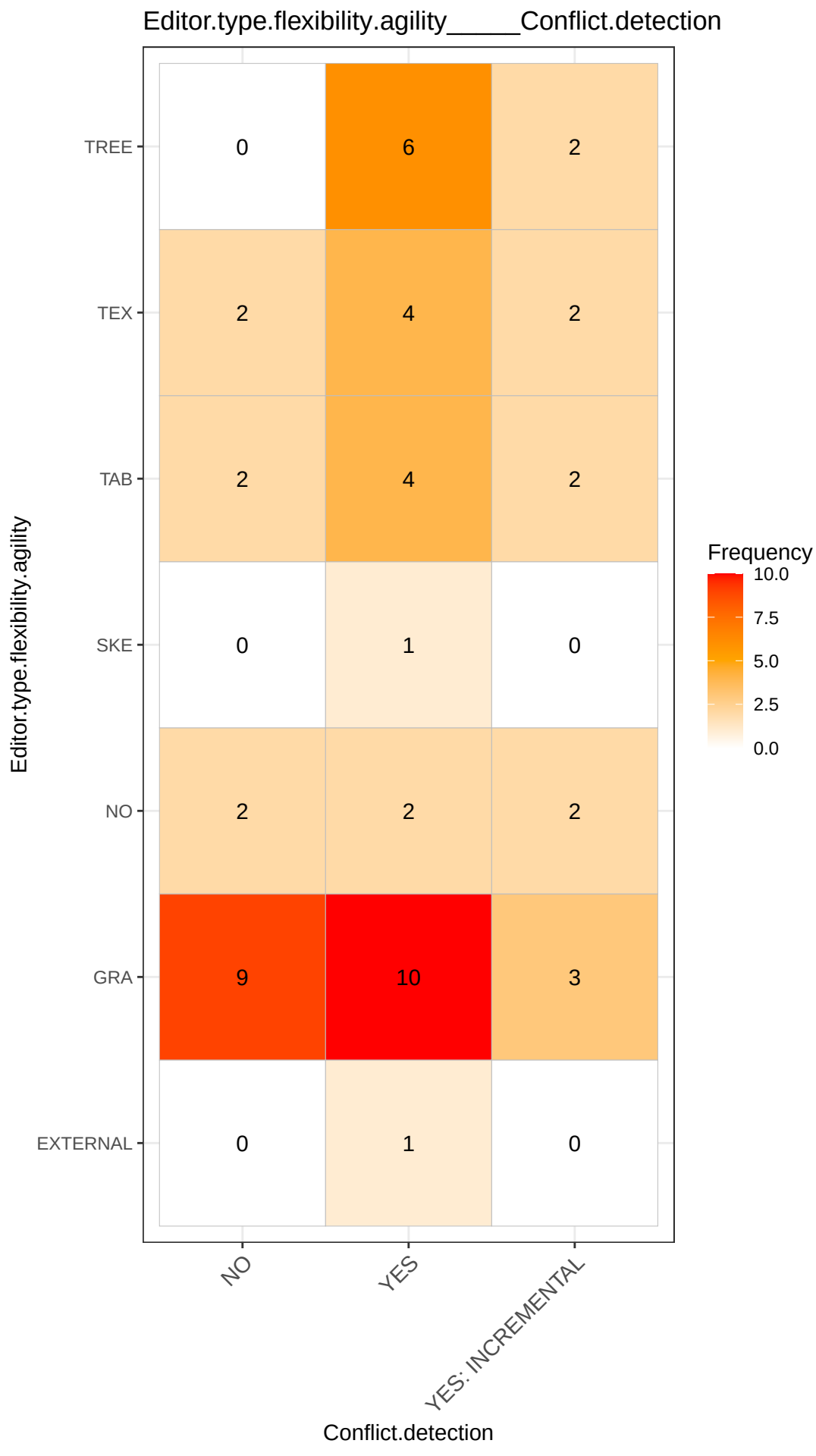
10
5
0

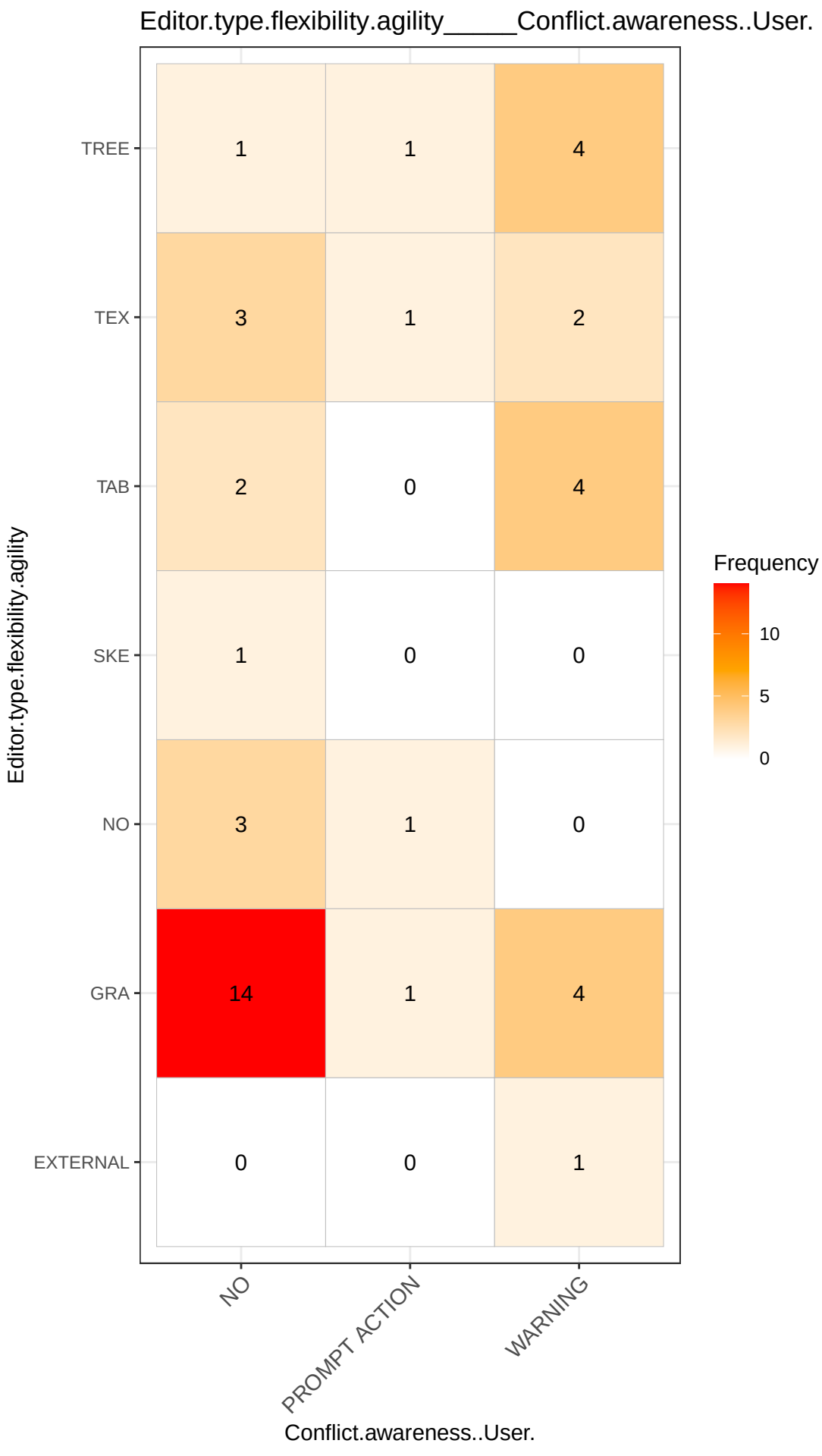

Editor.type.flexibility.agility_____Branching
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
2
4
1
5
1
5
0
1
0
4
3
16
0
1
Frequency
16
12
8
4
0
MULTI−BRANCHING
NO
Branching

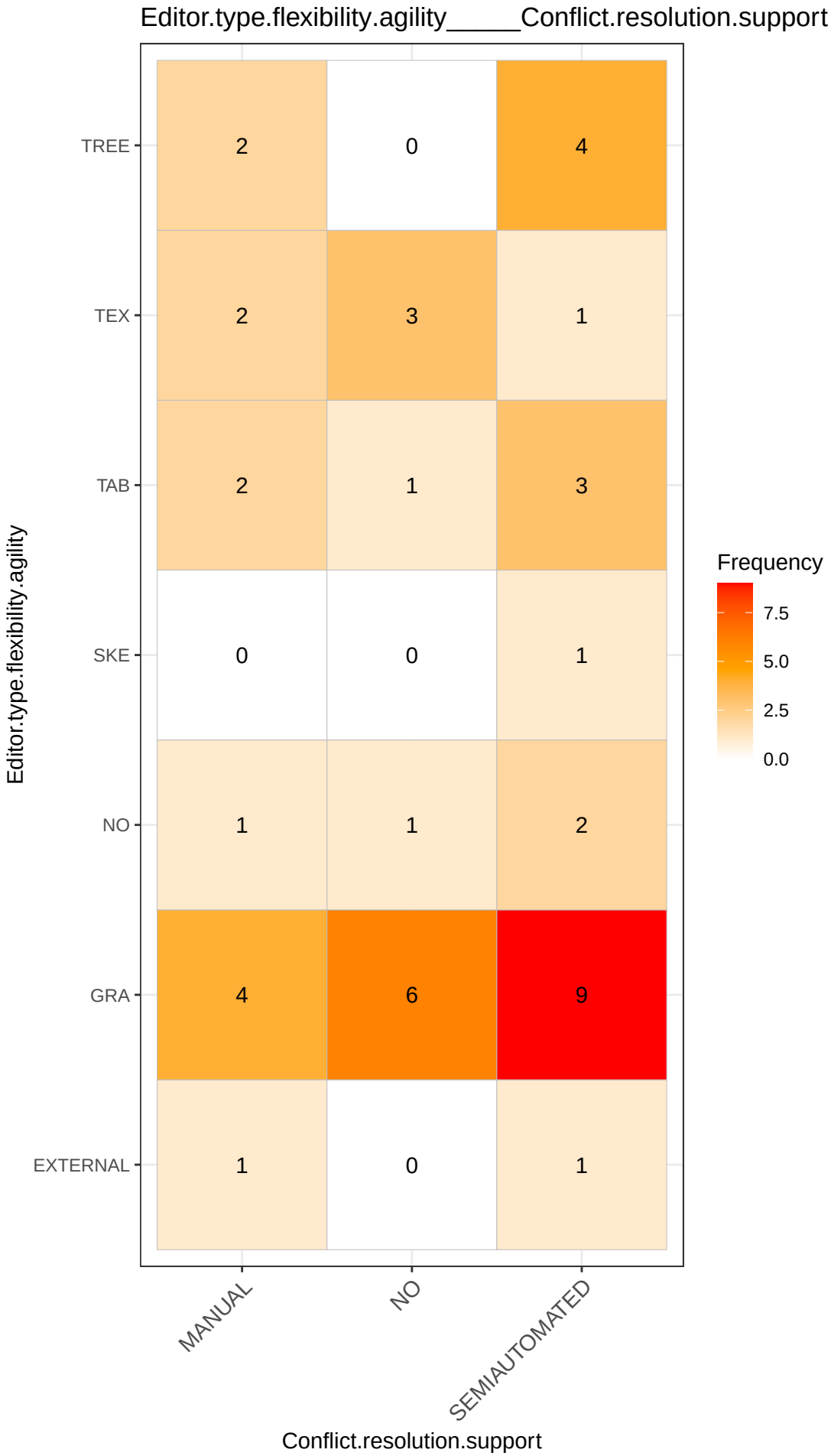

Editor.type.flexibility.agility_____Model.merging.support
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
4
2
5
1
5
1
0
1
4
0
13
6
0
1
NO
YES
Model.merging.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

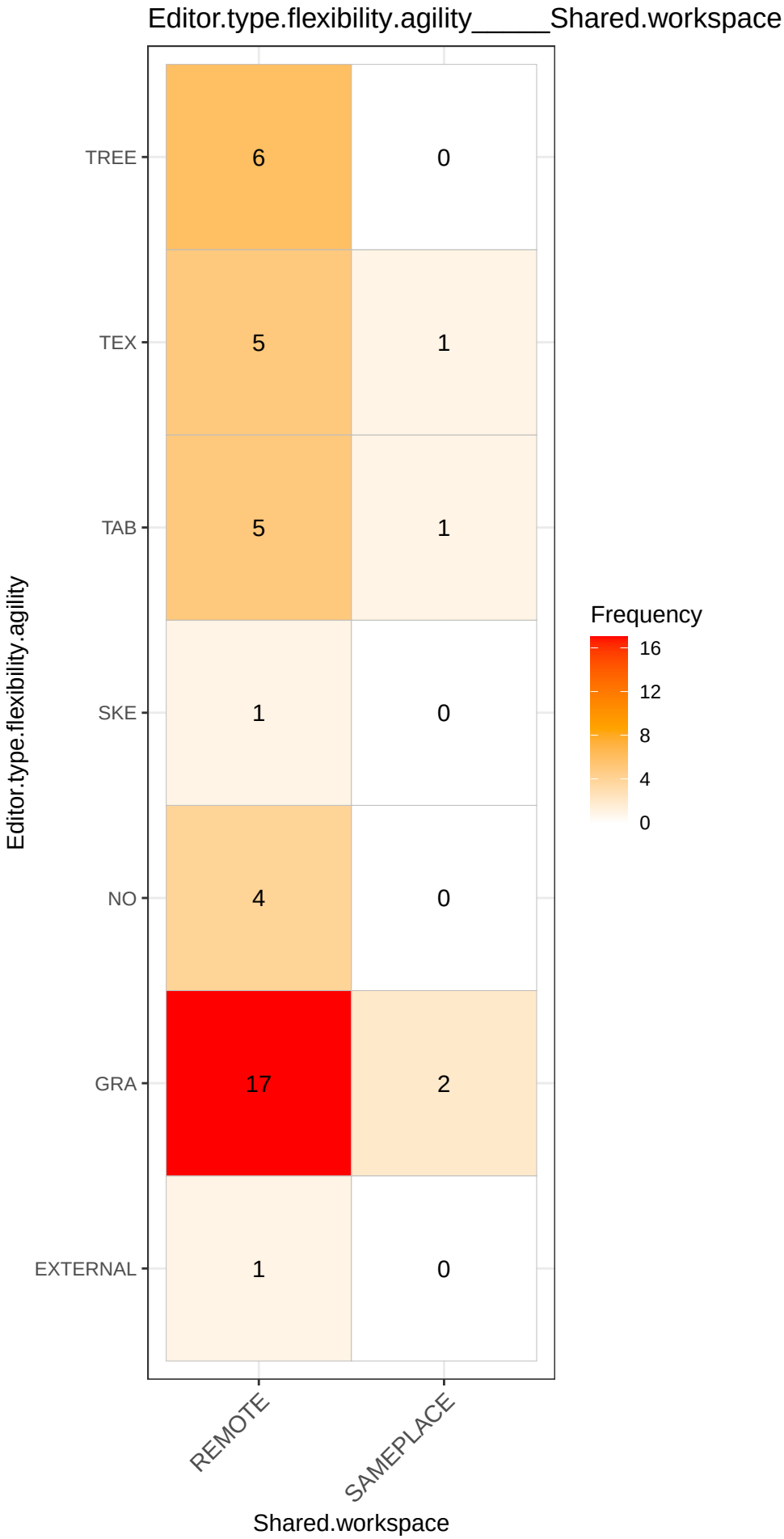

Editor.type.flexibility.agility_____Diff.merge.domain
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
1
2
3
3
0
3
3
1
2
0
0
1
2
0
2
3
4
12
0
0
1
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0

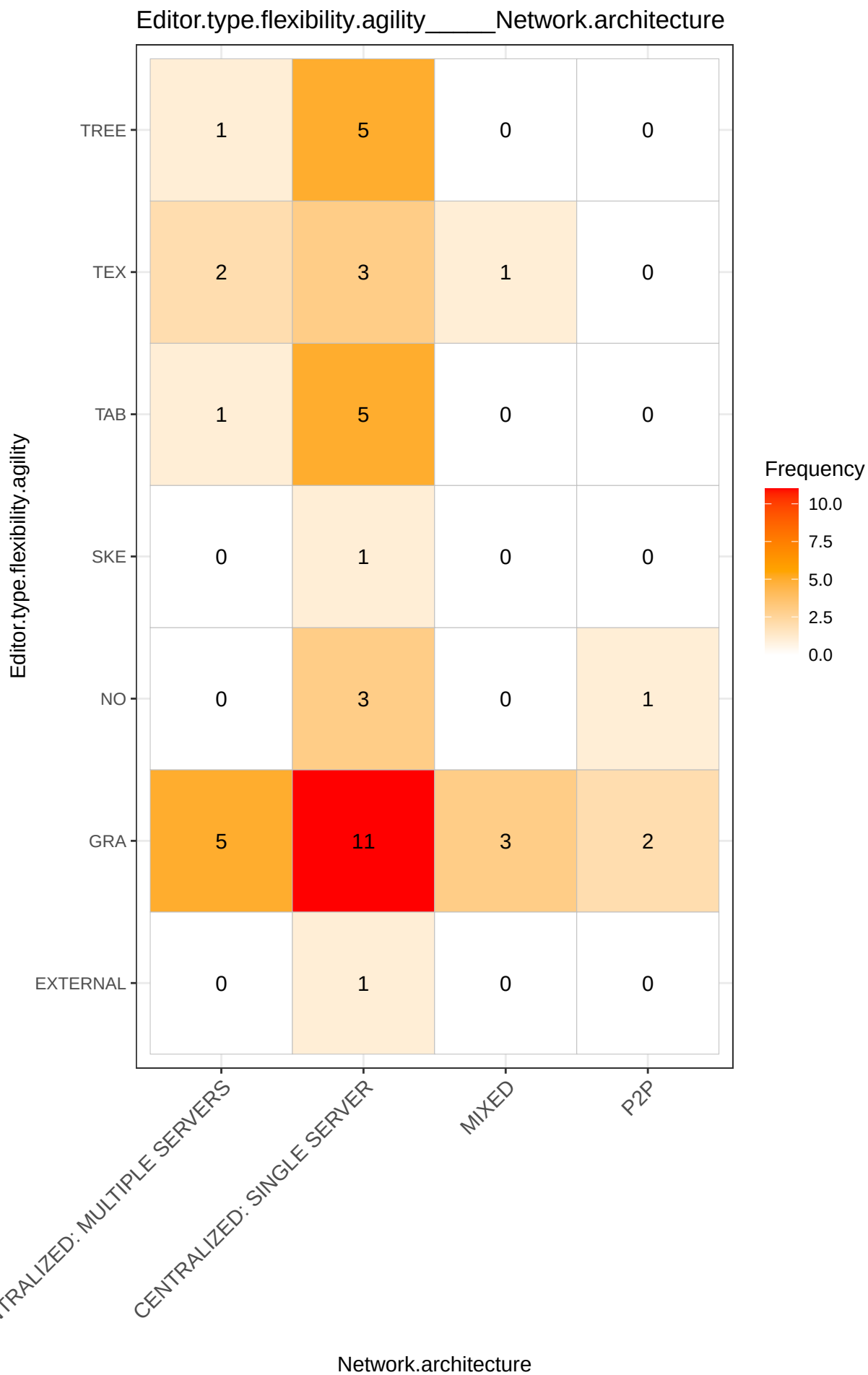

Editor.type.flexibility.agility_____Conflict.mgmt.approach
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
4
0
2
2
3
1
3
2
1
0
0
1
1
1
2
8
6
5
1
0
0
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

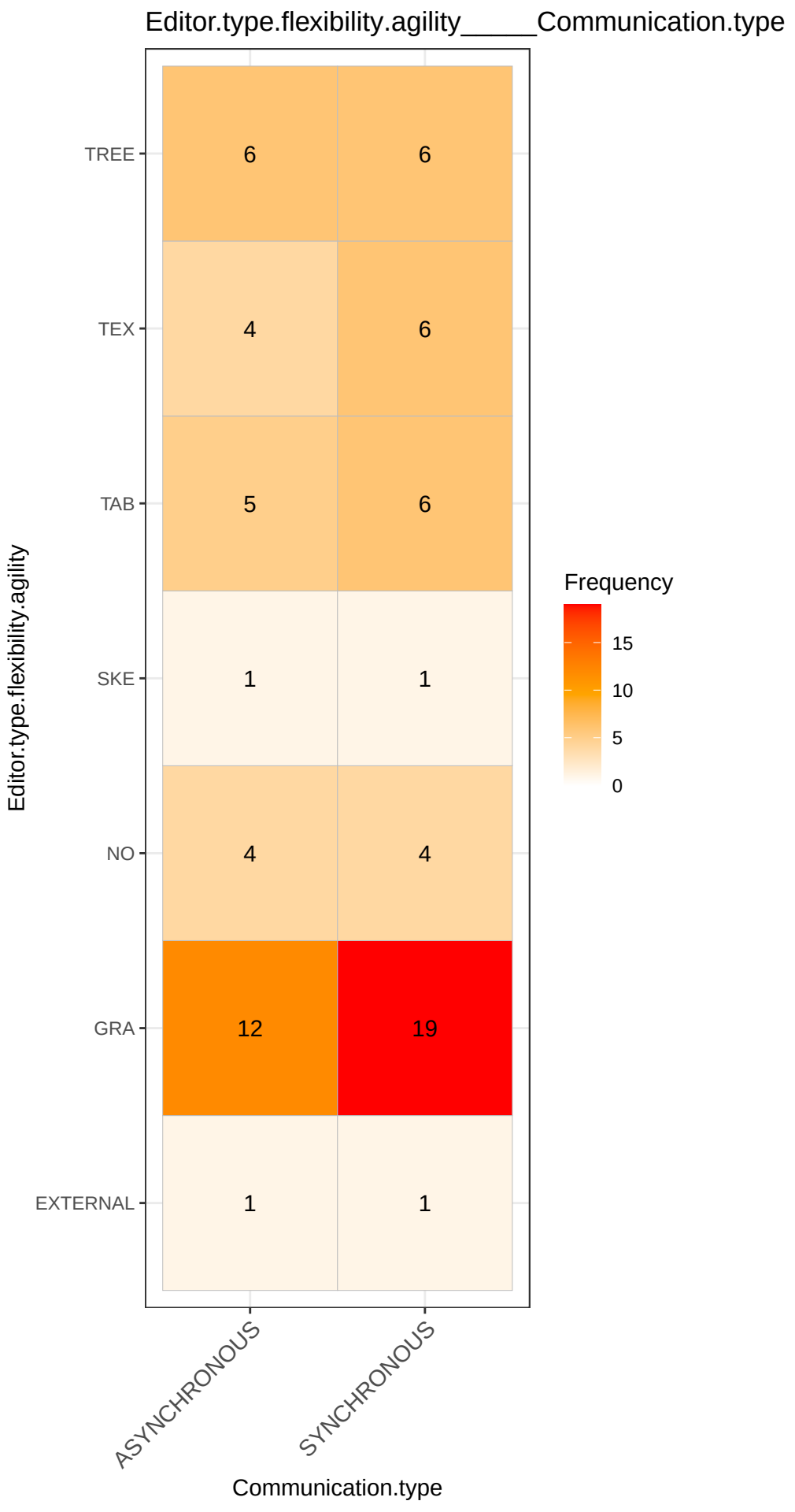

Editor.type.flexibility.agility_____Conflict.detection
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0
6
2
2
4
2
2
4
2
0
1
0
2
2
2
9
10
3
0
1
0
NO
YES
YES: INCREMENTAL
Editor.type.flexibility.agility
Conflict.detection
Frequency
10.0
7.5
5.0
2.5
0.0

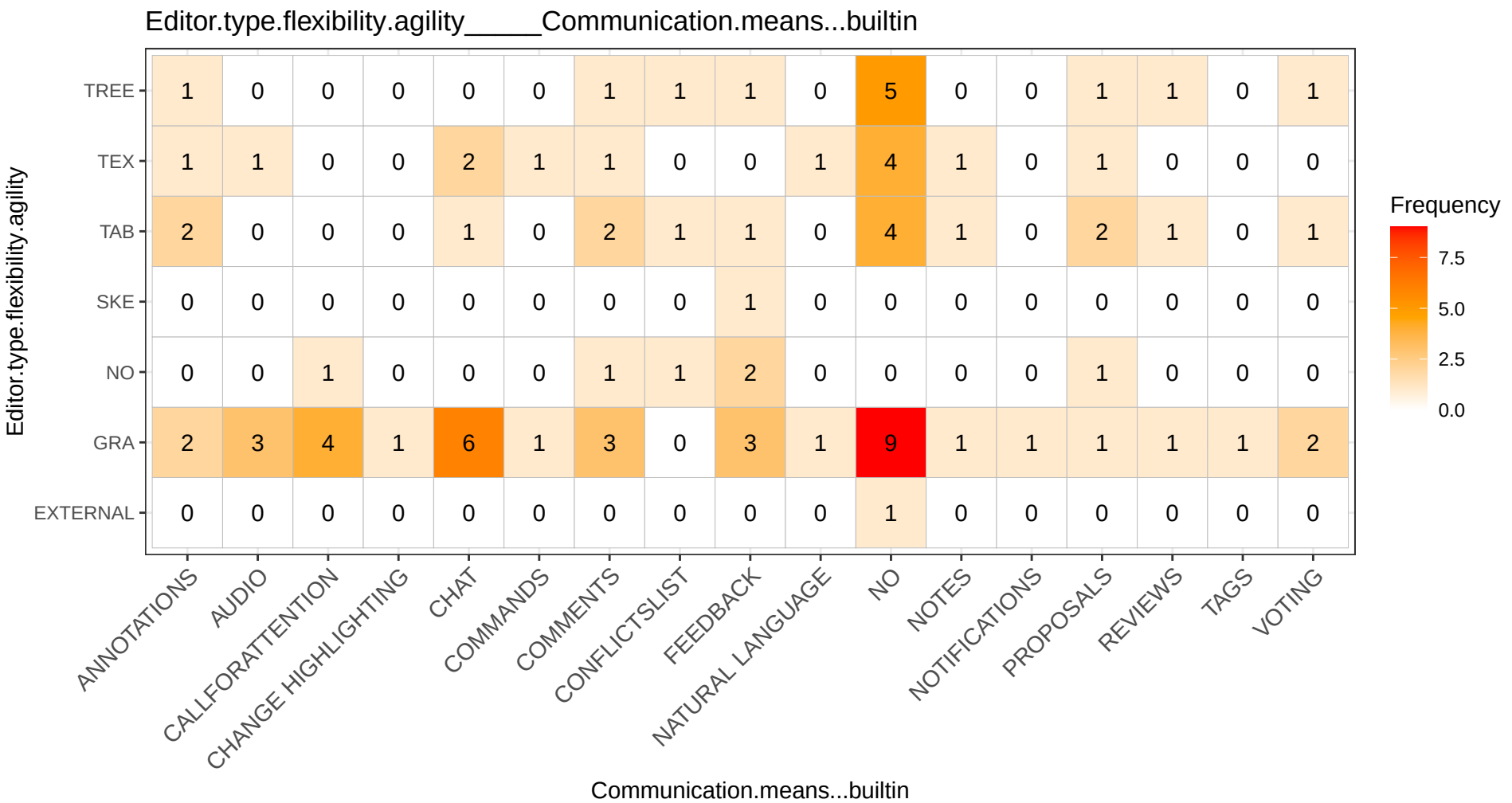

Editor.type.flexibility.agility_____Conflict.awareness..User.
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
1
1
4
3
1
2
2
0
4
1
0
0
3
1
0
14
1
4
0
0
1
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10
5
0

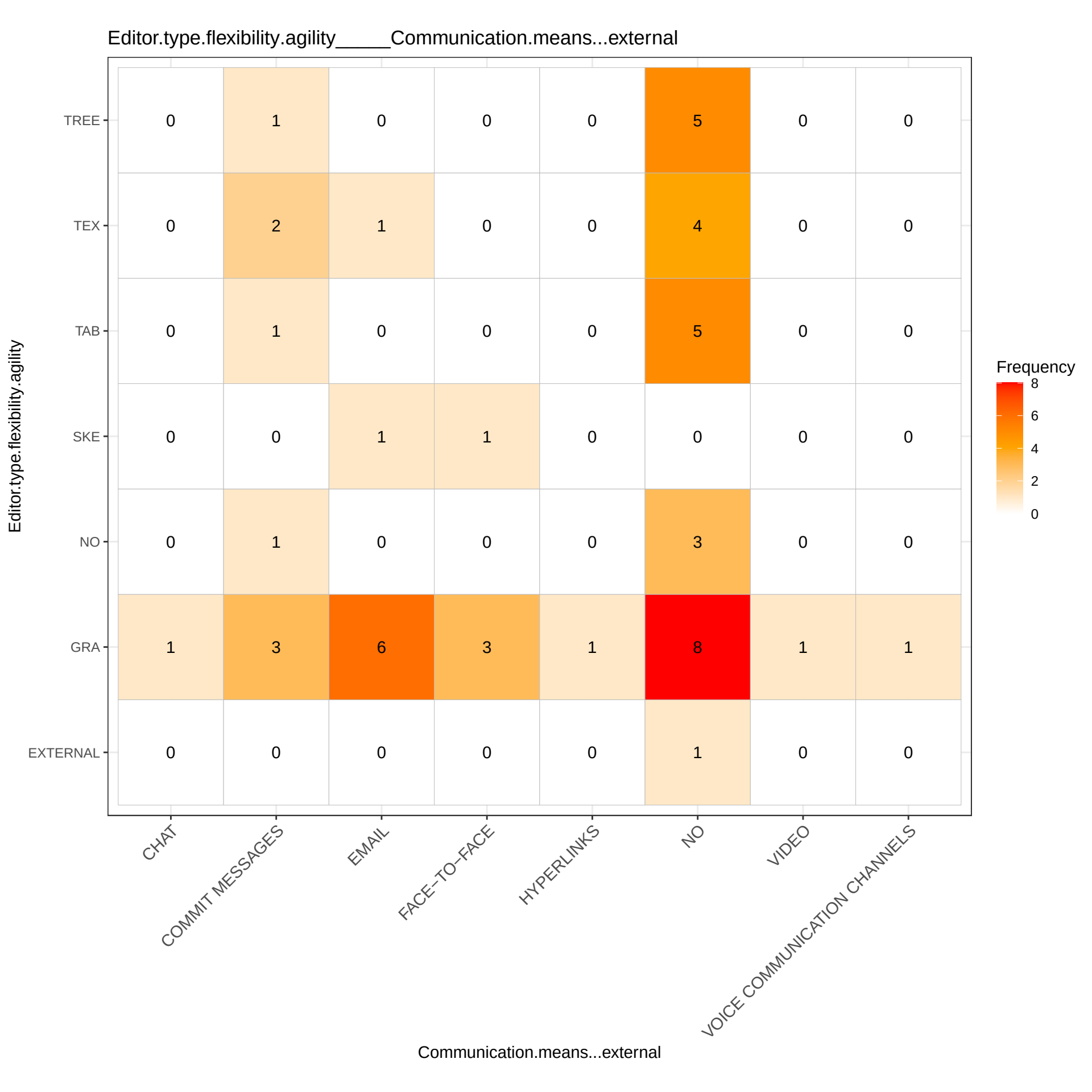

Editor.type.flexibility.agility_____Conflict.resolution.support
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
2
0
4
2
3
1
2
1
3
0
0
1
1
1
2
4
6
9
1
0
1
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

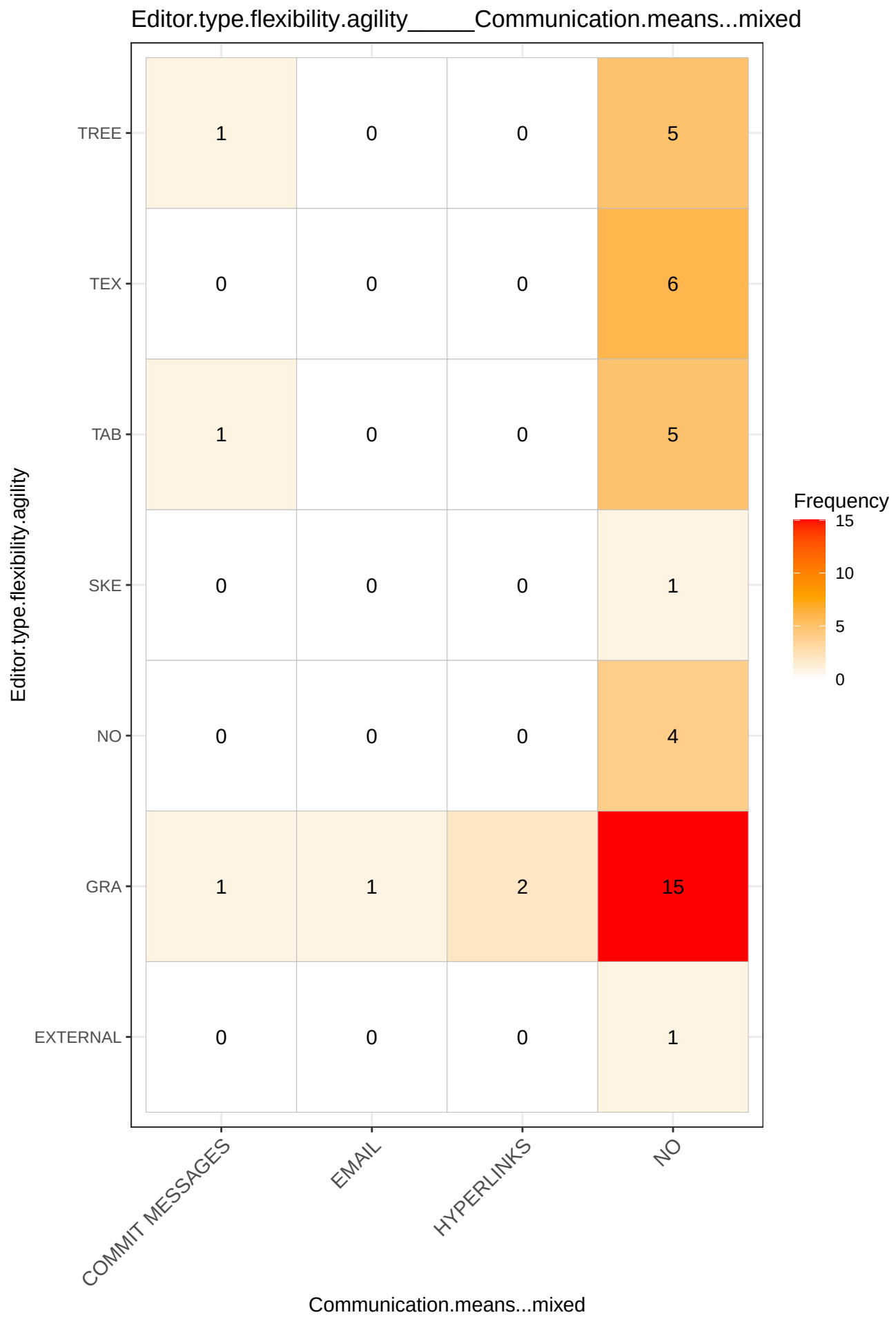

Editor.type.flexibility.agility_____Shared.workspace
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
6
0
5
1
5
1
1
0
4
0
17
2
1
0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

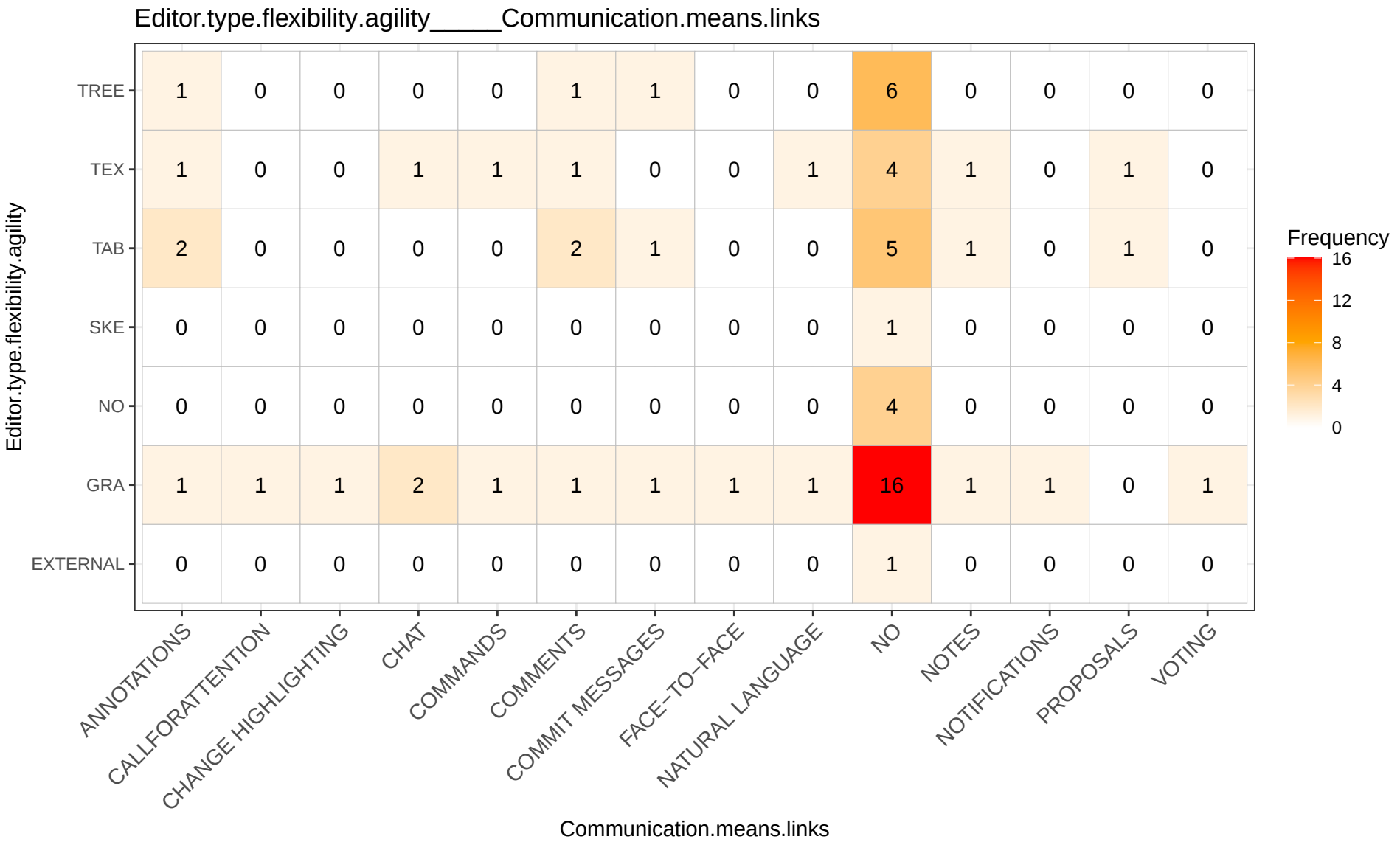

Editor.type.flexibility.agility_____Network.architecture
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
1 5 0 0
2 3 1 0
1 5 0 0
0 1 0 0
0 3 0 1
5 11 3 2
0 1 0 0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

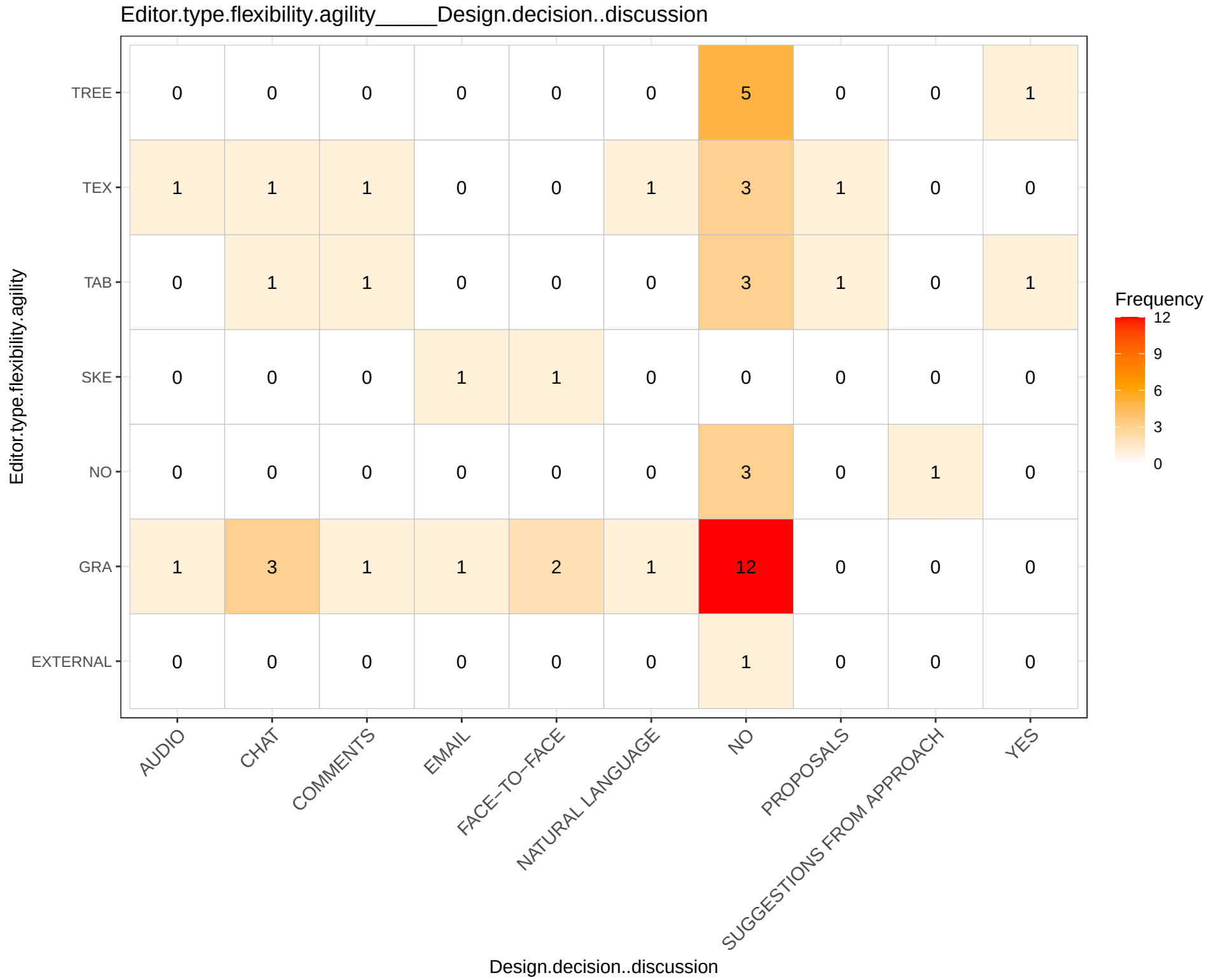

Editor.type.flexibility.agility_____Communication.type
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
6
6
4
6
5
6
1
1
4
4
12
19
1
1
Frequency
15
10
5
0
ASYNCHRONOUS
SYNCHRONOUS
Communication.type

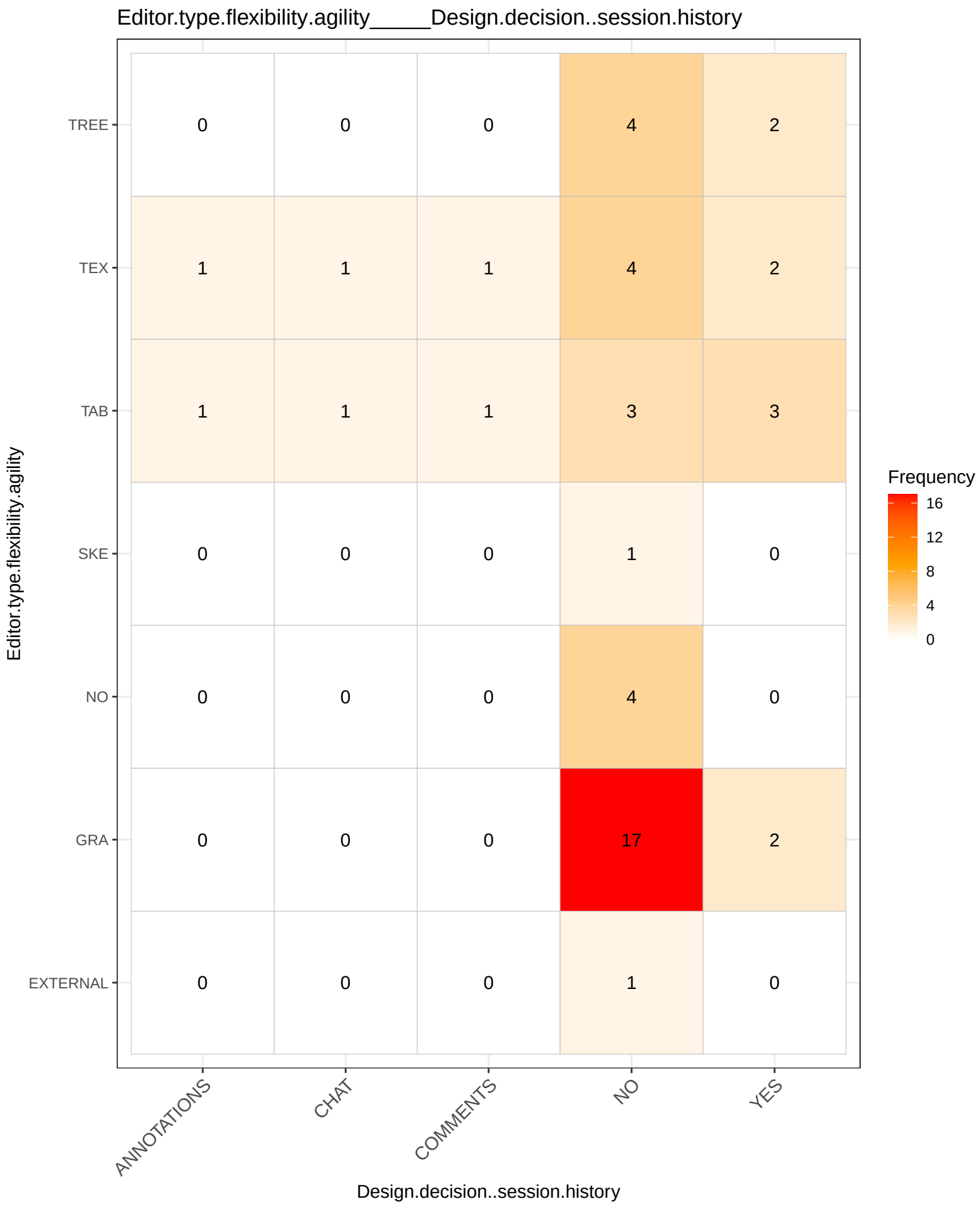

Editor.type.flexibility.agility_____Communication.means...builtin
Editor.type.flexibility.agility
TREE 1 0 0 0 0 0 1 1 1 0 5 0 0 1 1 0 1
TEX 1 1 0 0 2 1 1 0 0 1 4 1 0 1 0 0 0
TAB 2 0 0 0 1 0 2 1 1 0 4 1 0 2 1 0 1
SKE 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
NO 0 0 1 0 0 0 1 1 2 0 0 0 0 1 0 0 0
GRA 2 3 4 1 6 1 3 0 3 1 9 1 1 1 1 1 2
EXTERNAL 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

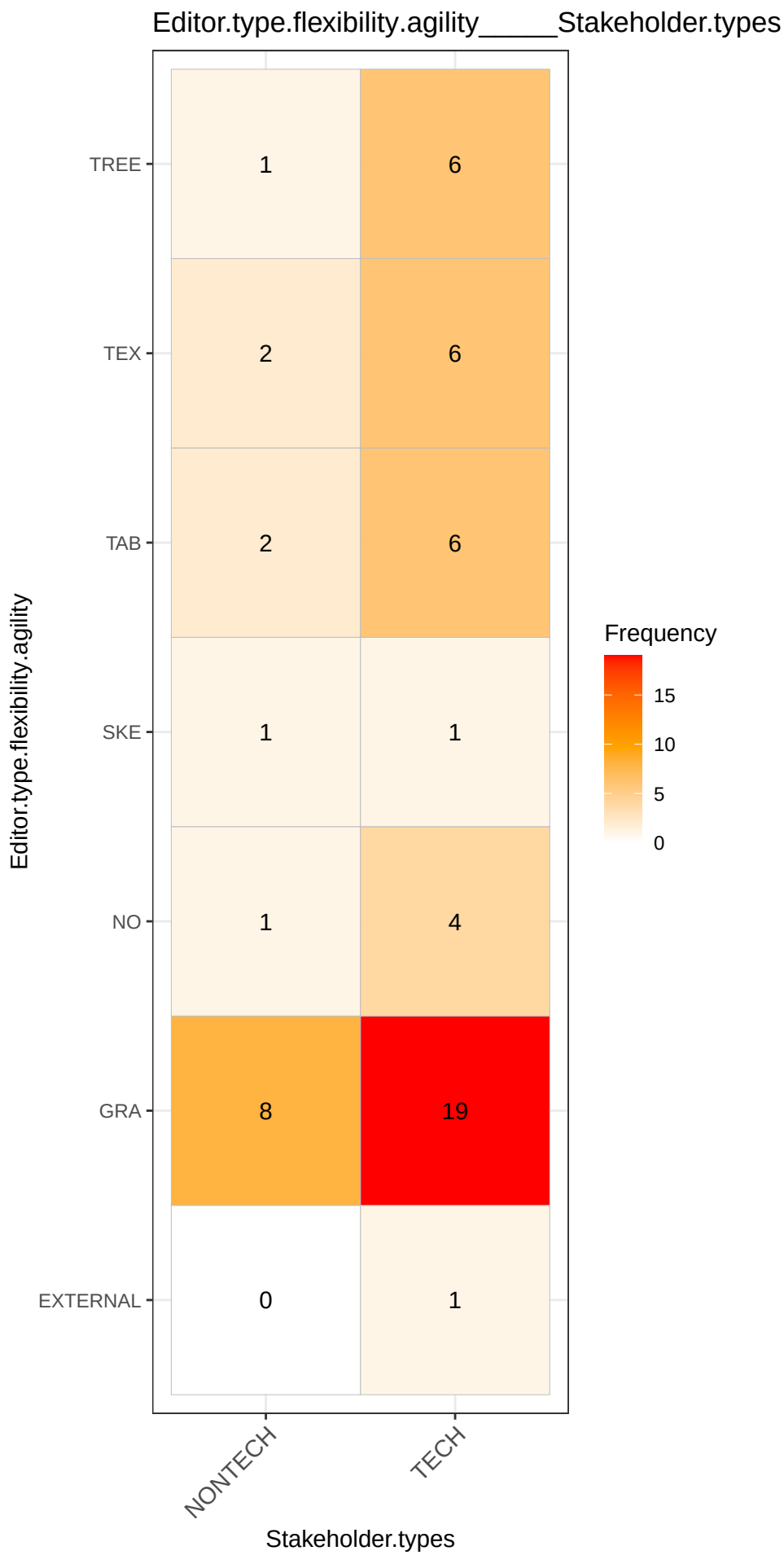

Editor.type.flexibility.agility_____Communication.means...external
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0 1 0 0 0 5 0 0
0 2 1 0 0 4 0 0
0 1 0 0 0 5 0 0
0 0 1 1 0 0 0 0
0 1 0 0 0 3 0 0
1 3 6 3 1 8 1 1
0 0 0 0 0 1 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Editor.type.flexibility.agility
Communication.means...external
Frequency
8
6
4
2
0

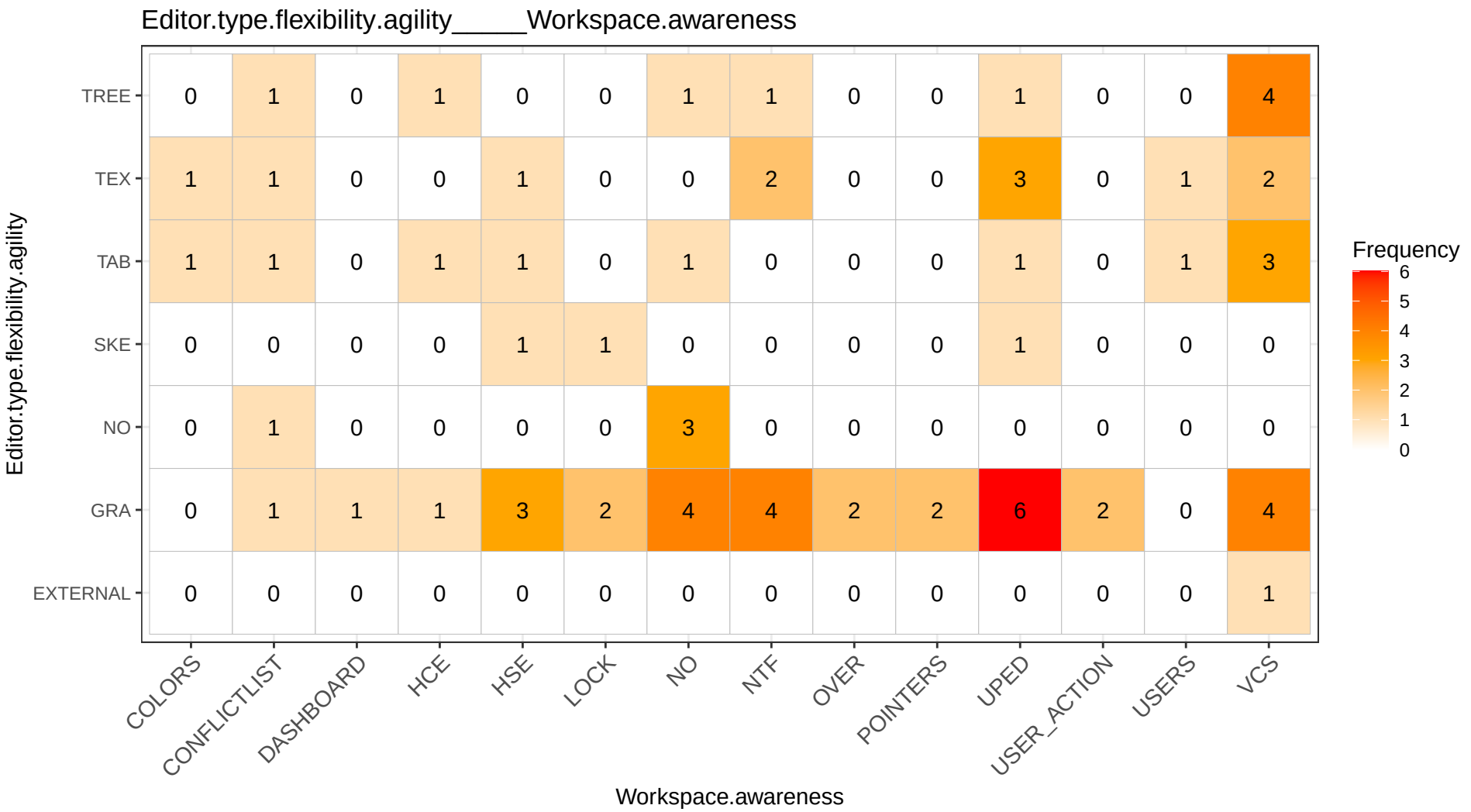

Editor.type.flexibility.agility_____Communication.means...mixed
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
1 0 0 5
0 0 0 6
1 0 0 5
0 0 0 1
0 0 0 4
1 1 2 15
0 0 0 1
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
15
10
5
0

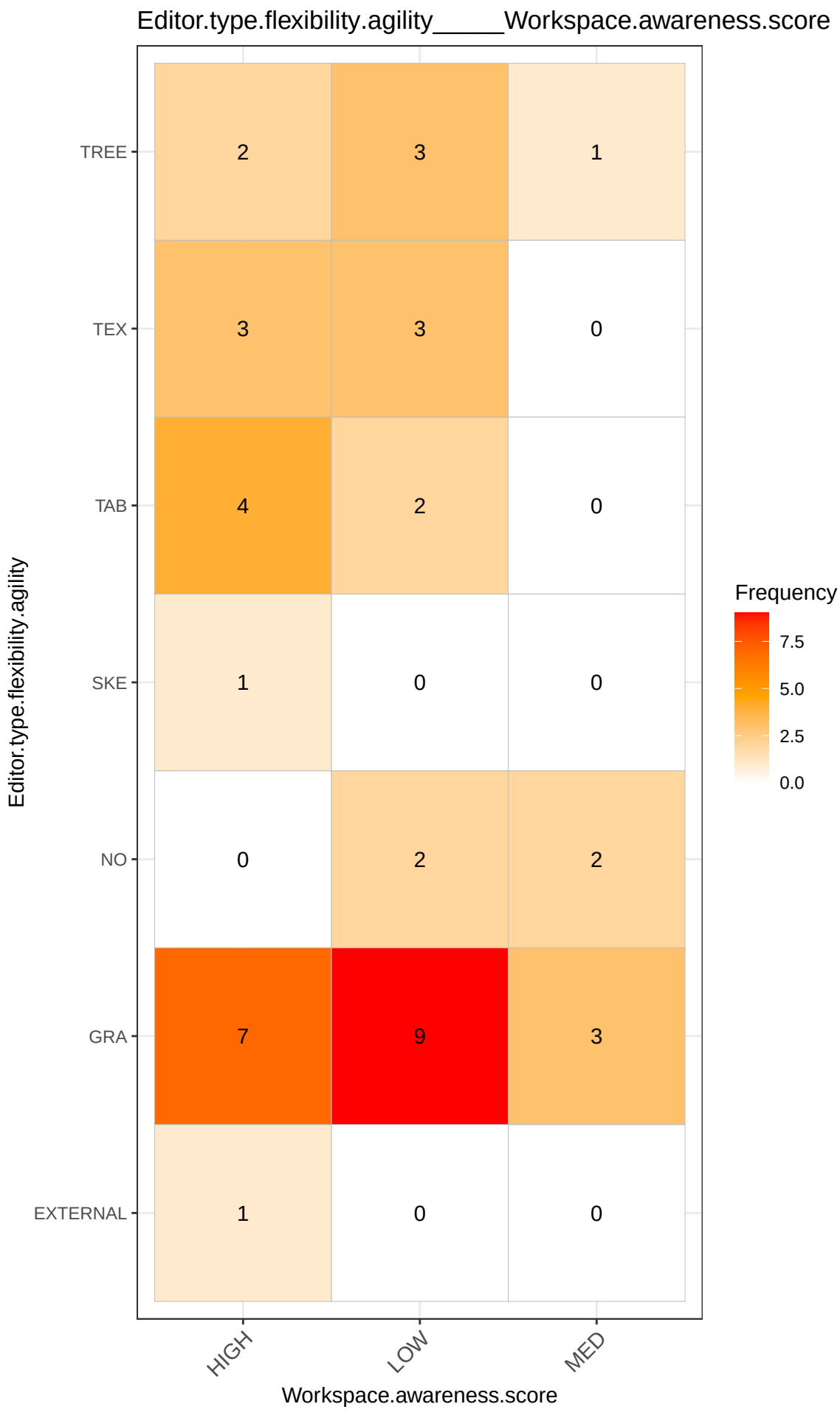

Editor.type.flexibility.agility_____Communication.means.links
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
1 0 0 0 0 1 1 0 0 6 0 0 0 0
1 0 0 1 1 1 0 0 1 4 1 0 1 0
2 0 0 0 0 2 1 0 0 5 1 0 1 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0 0 4 0 0 0 0
1 1 1 2 1 1 1 1 1 16 1 1 0 1
0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0

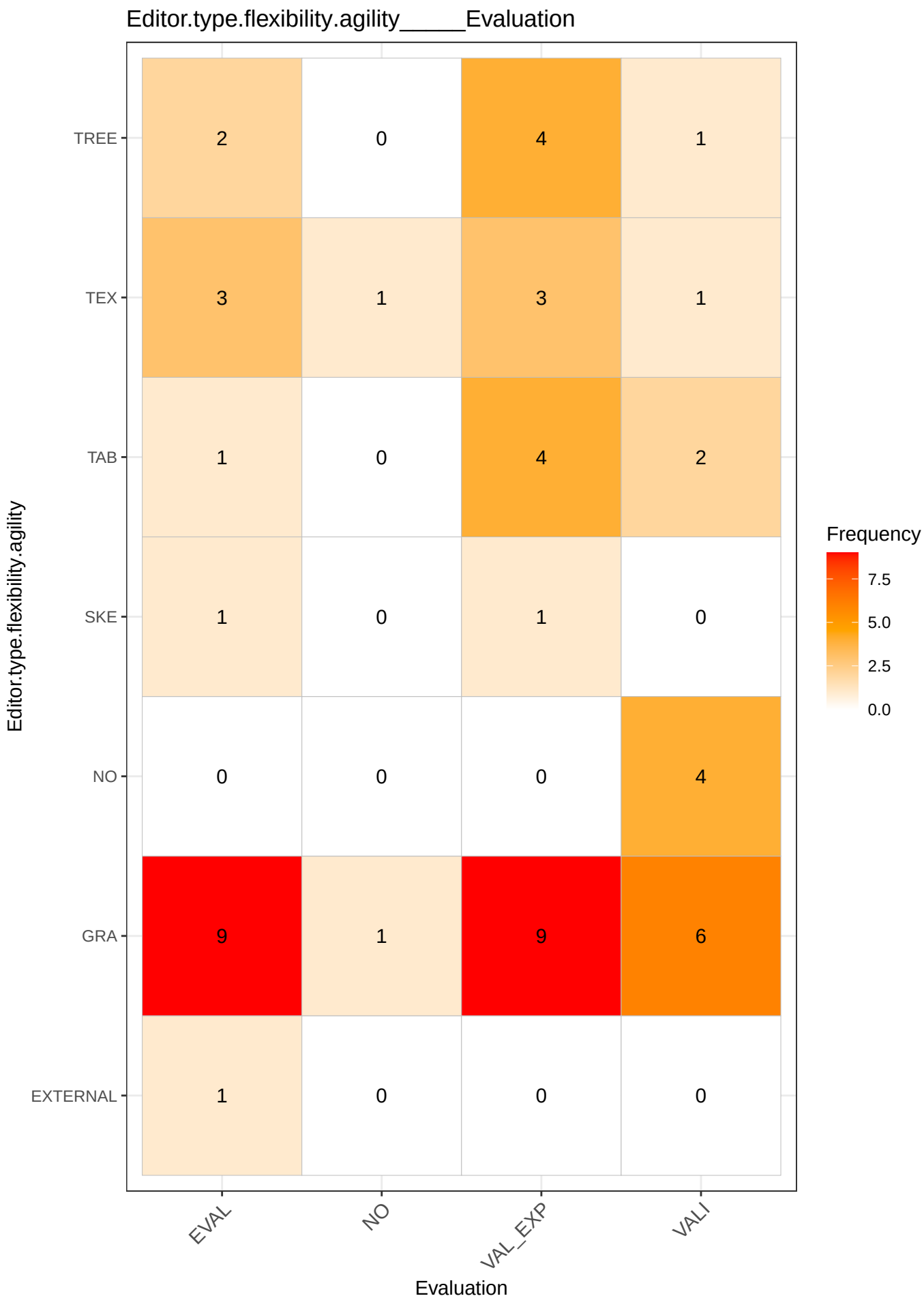

Editor.type.flexibility.agility_____Design.decision..discussion
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0 0 0 0 0 0 5 0 0 1
1 1 1 0 0 1 3 1 0 0
0 1 1 0 0 0 3 1 0 1
0 0 0 1 1 0 0 0 0 0
0 0 0 0 0 0 3 0 1 0
1 3 1 1 2 1 12 0 0 0
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12
9
6
3
0

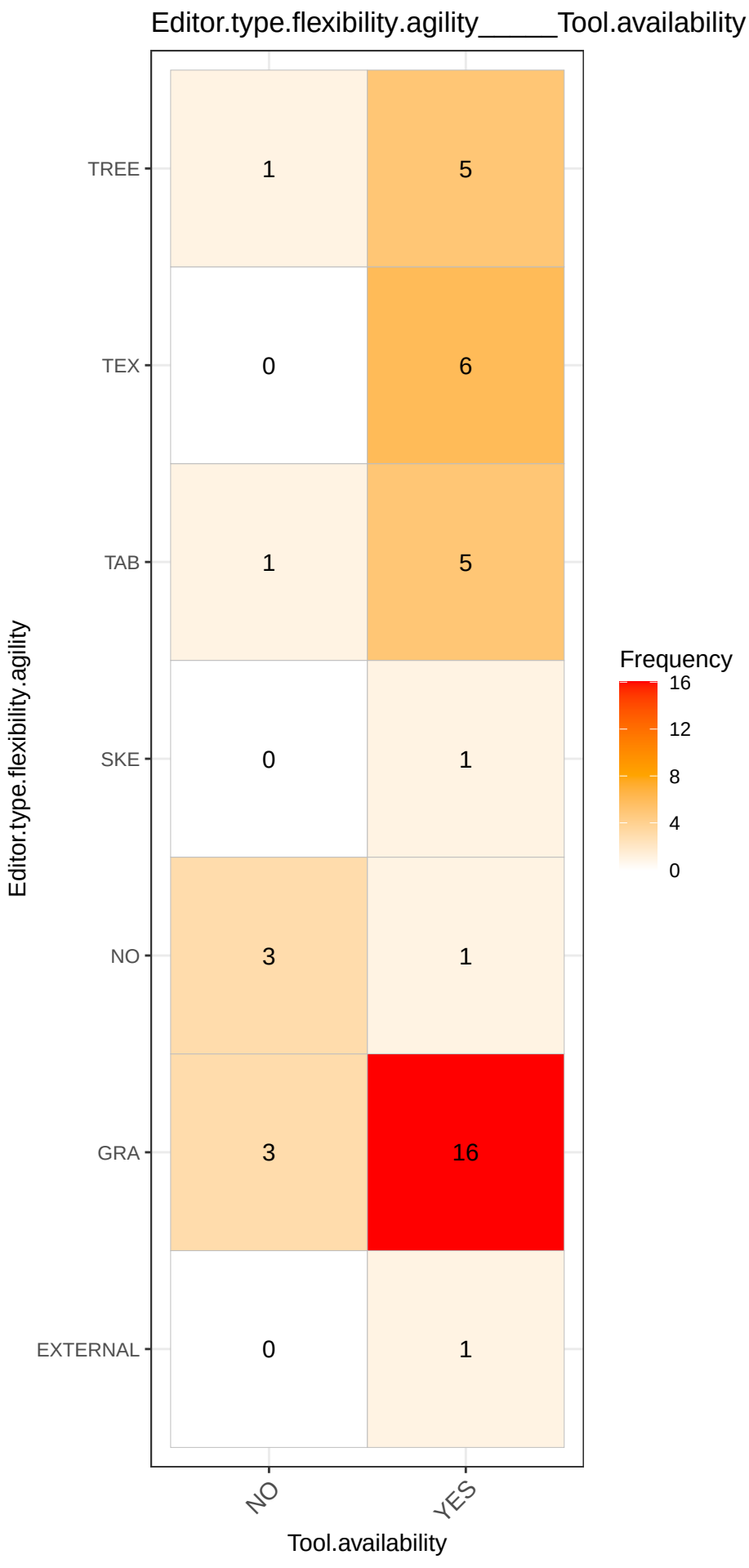

Editor.type.flexibility.agility_____Design.decision..session.history
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
0 0 0 4 2
1 1 1 4 2
1 1 1 3 3
0 0 0 1 0
0 0 0 4 0
0 0 0 17 2
0 0 0 1 0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

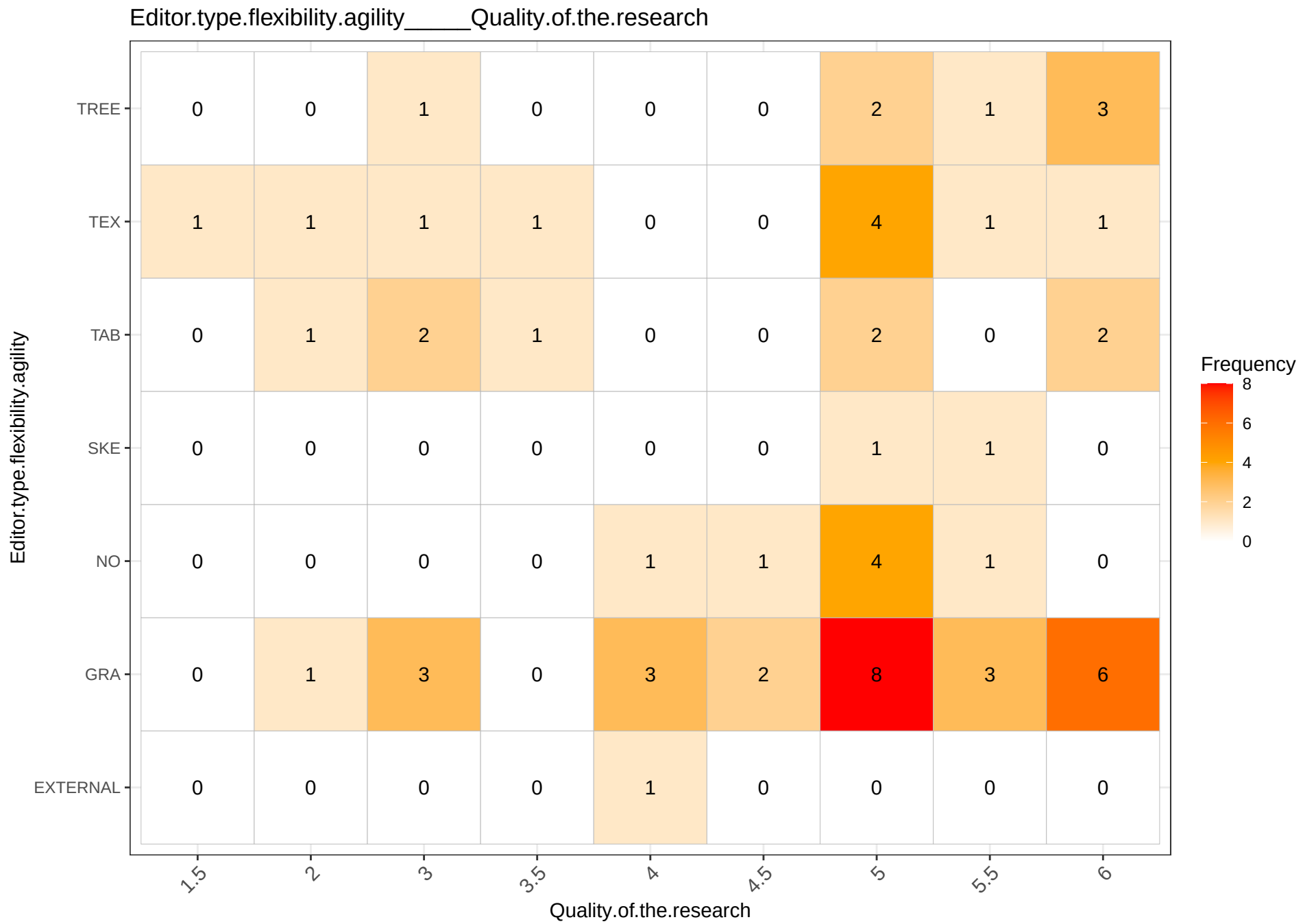

Editor.type.flexibility.agility_____Stakeholder.types
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
1
6
2
6
2
6
1
1
1
4
8
19
0
1
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

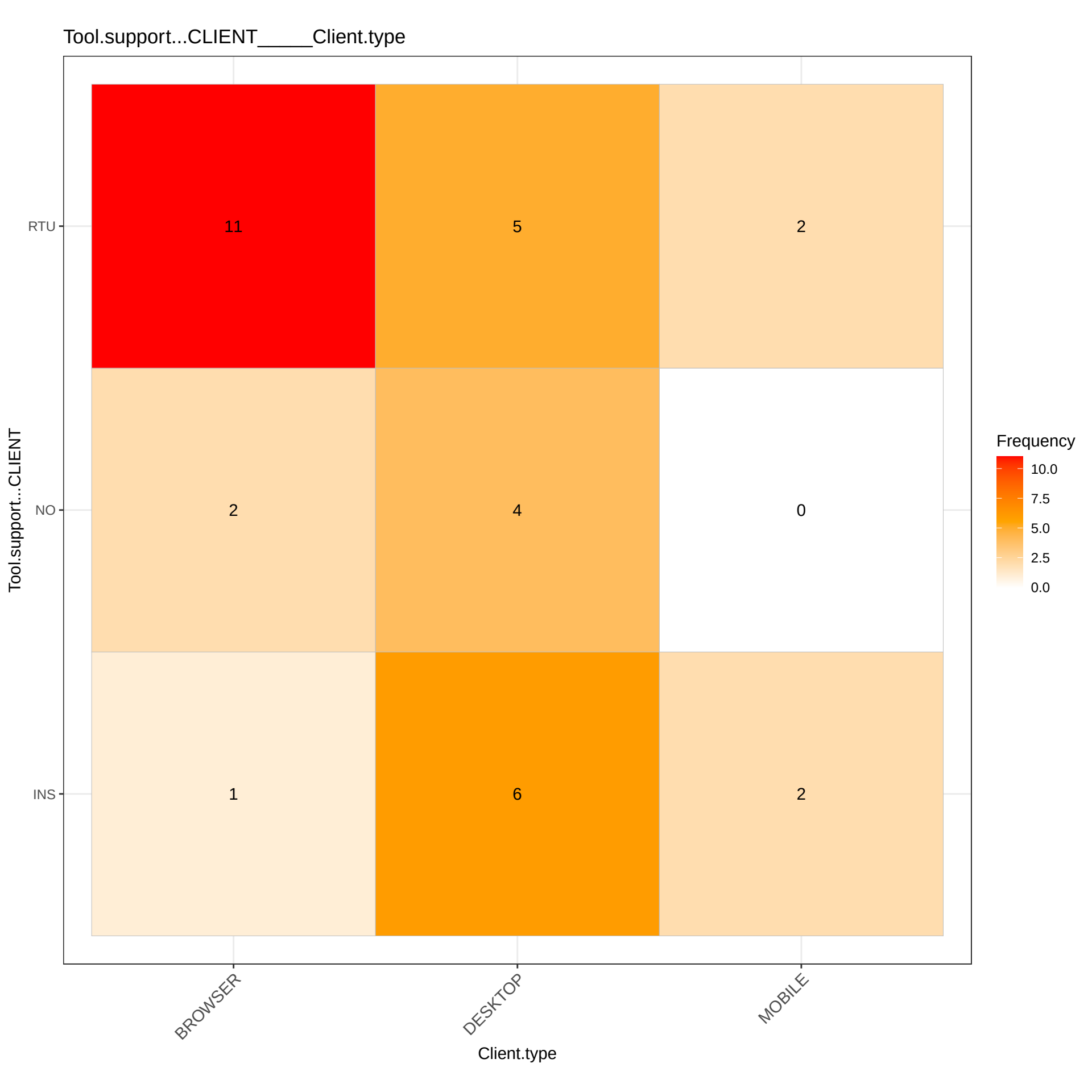

Editor.type.flexibility.agility_____Workspace.awareness
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0 1 0 1 0 0 1 1 0 0 1 0 0 4
1 1 0 0 1 0 0 2 0 0 3 0 1 2
1 1 0 1 1 0 1 0 0 0 1 0 1 3
0 0 0 0 1 1 0 0 0 0 1 0 0 0
0 1 0 0 0 0 3 0 0 0 0 0 0 0
0 1 1 1 3 2 4 4 2 2 6 2 0 4
0 0 0 0 0 0 0 0 0 0 0 0 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

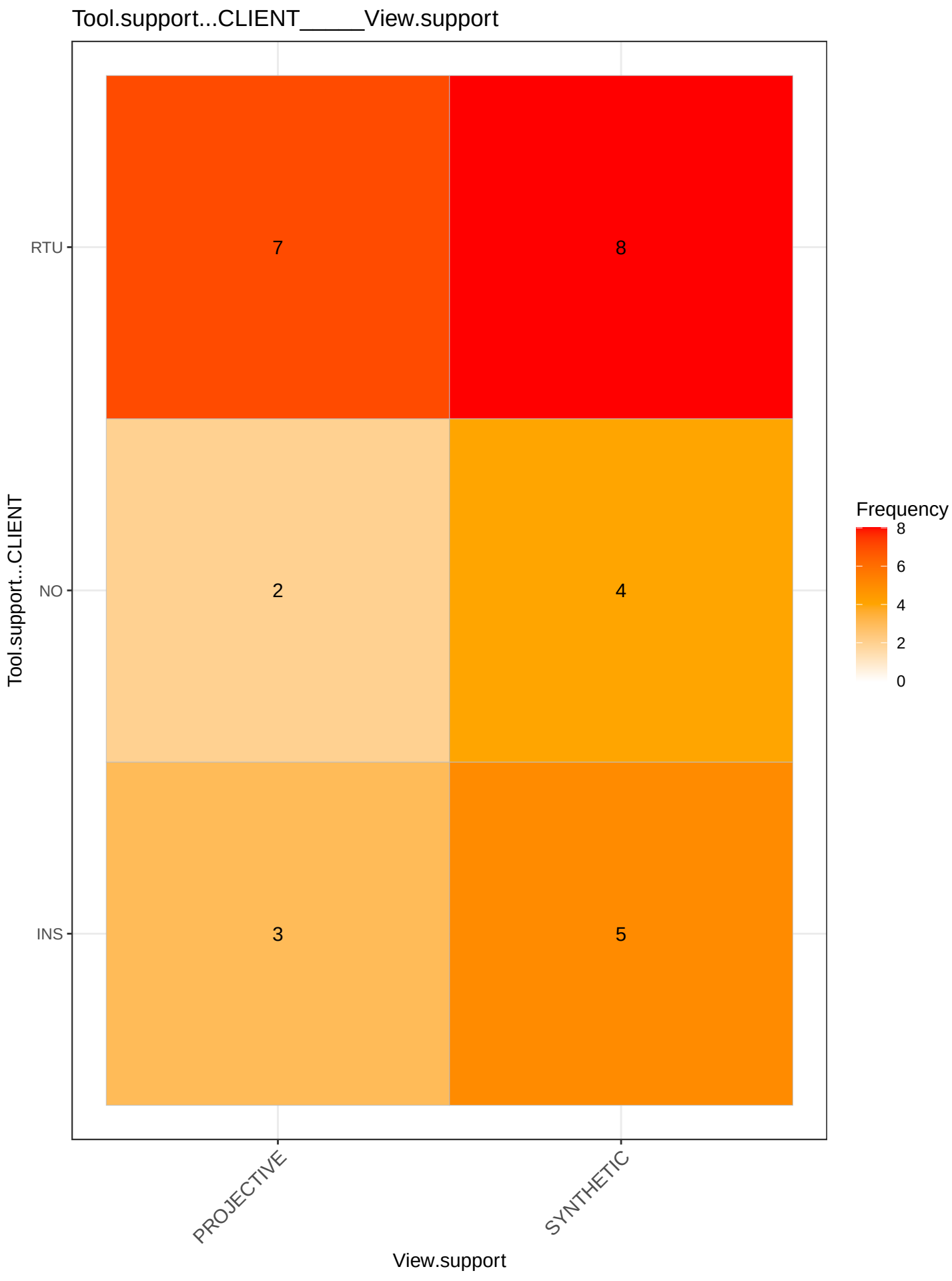

Editor.type.flexibility.agility_____Workspace.awareness.score
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
2
3
1
3
3
0
4
2
0
1
0
0
0
2
2
7
9
3
1
0
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
7.5
5.0
2.5
0.0

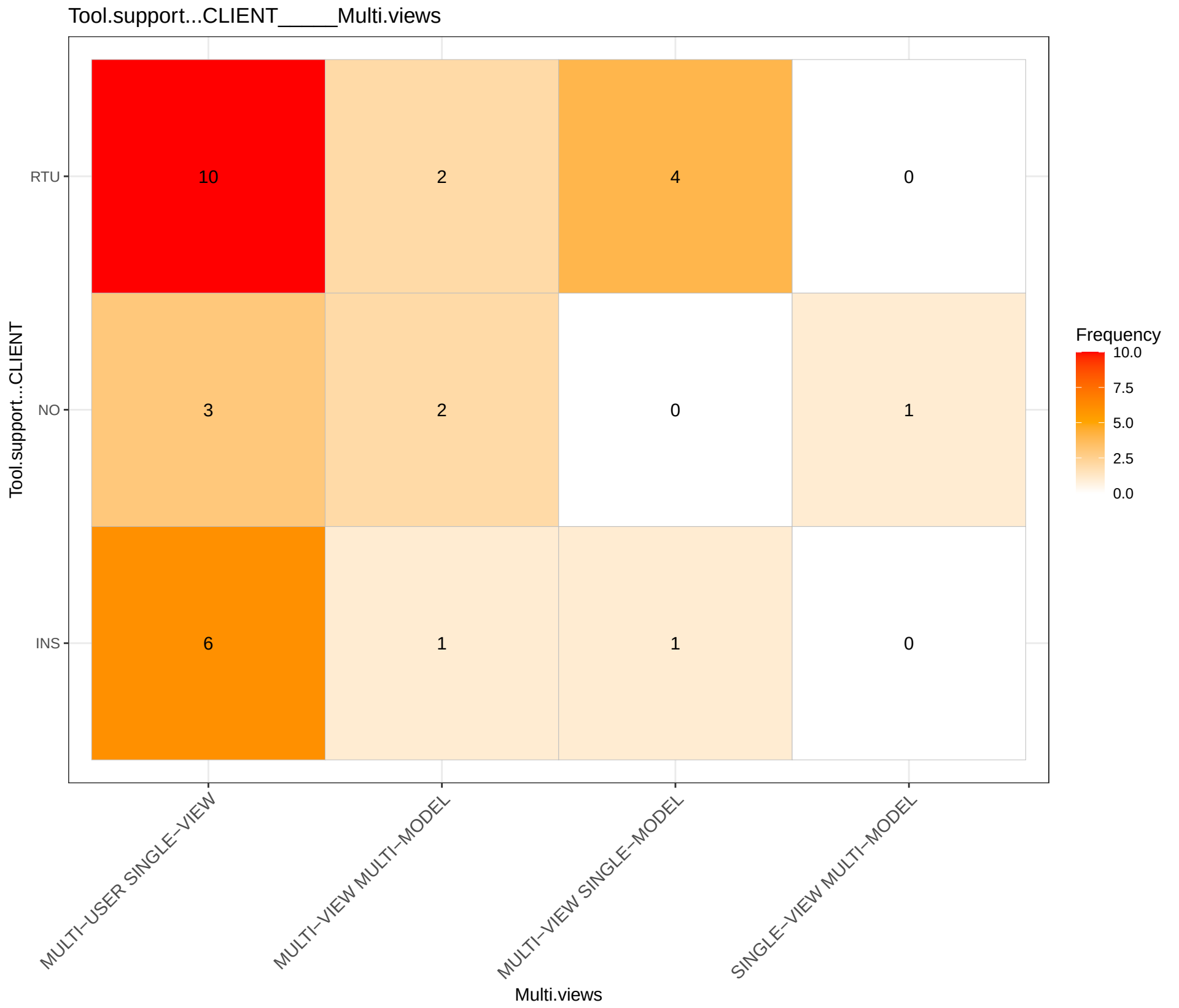

Editor.type.flexibility.agility_____Evaluation
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
Editor.type.flexibility.agility
2
0
4
1
3
1
3
1
1
0
4
2
1
0
1
0
0
0
0
4
9
1
9
6
1
0
0
0
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
7.5
5.0
2.5
0.0

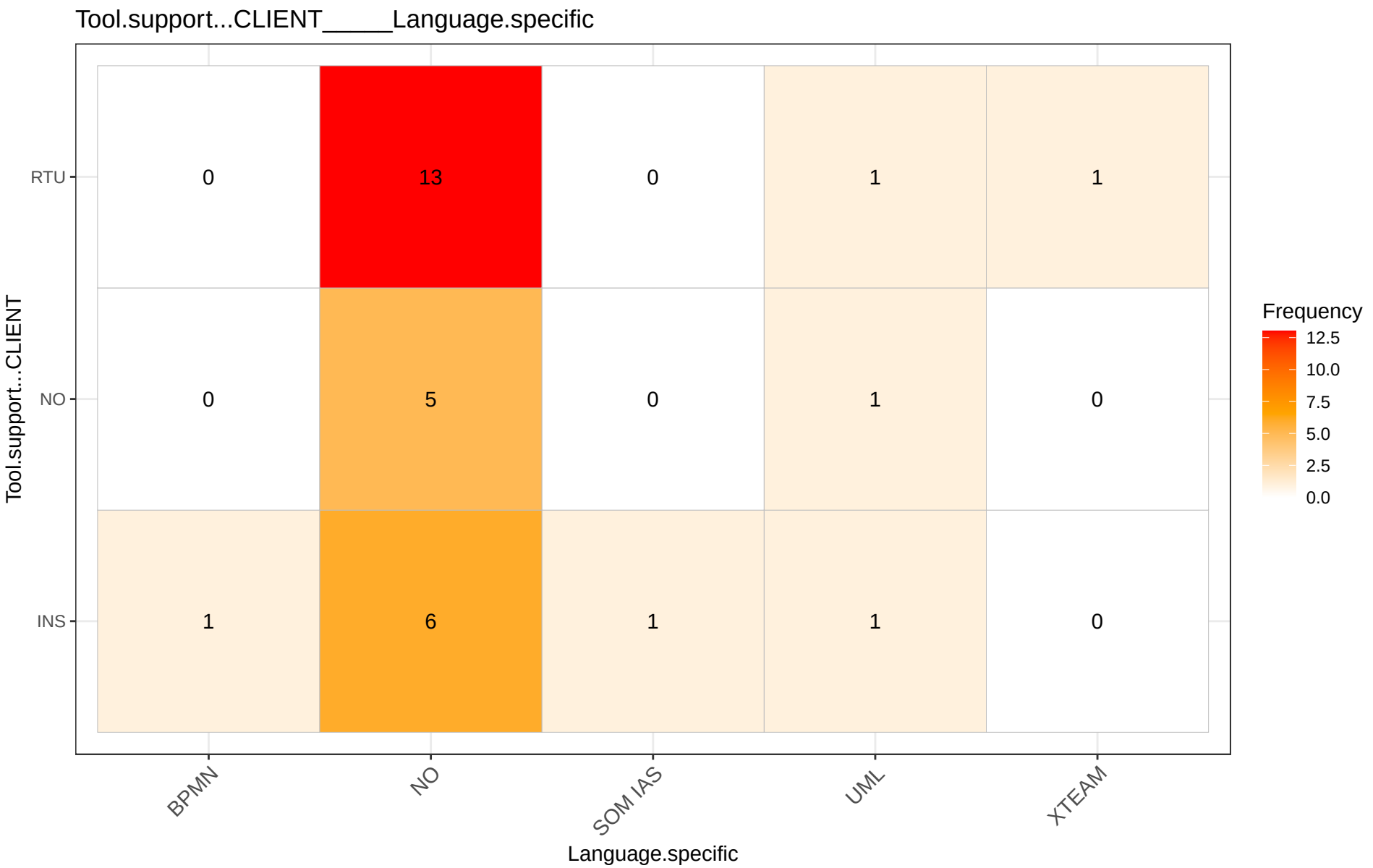

Editor.type.flexibility.agility_____Tool.availability
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
1
5
0
6
1
5
0
1
3
1
3
16
0
1
NO
YES
Tool.availability
Editor.type.flexibility.agility
Frequency
16
12
8
4
0

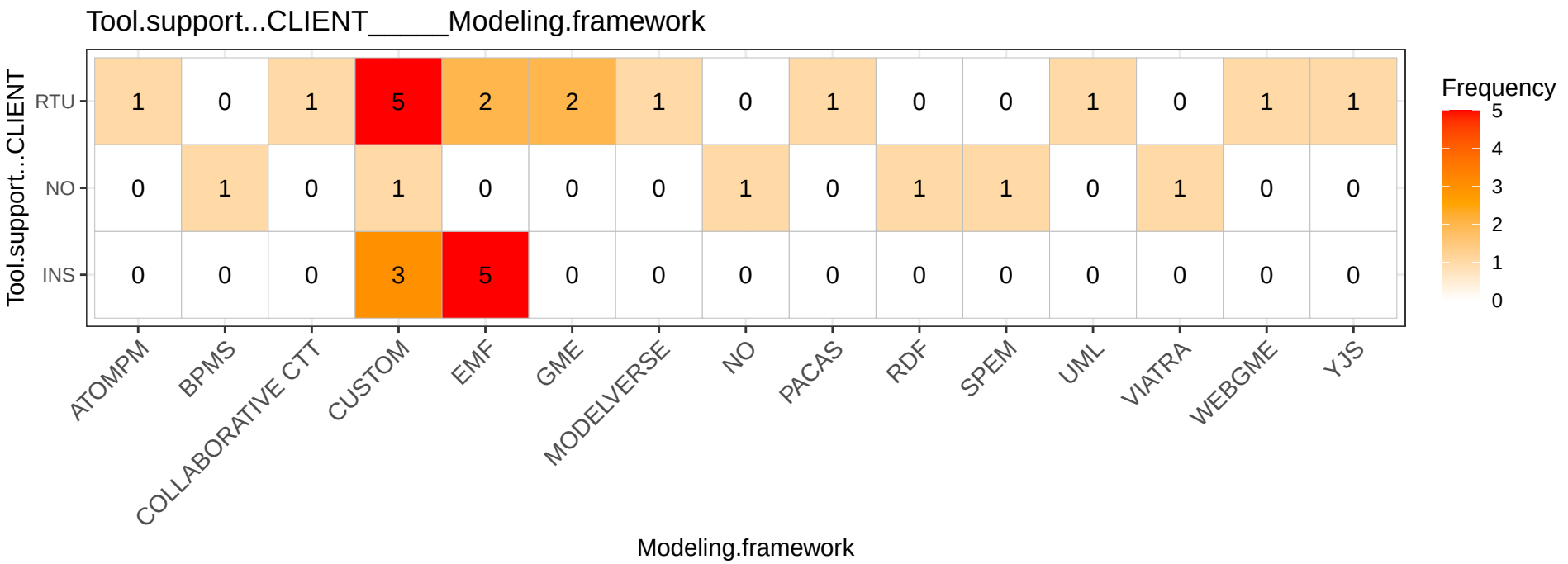

Editor.type.flexibility.agility_____Quality.of.the.research
Editor.type.flexibility.agility
TREE
TEX
TAB
SKE
NO
GRA
EXTERNAL
0 0 1 0 0 0 2 1 3
1 1 1 1 0 0 4 1 1
0 1 2 1 0 0 2 0 2
0 0 0 0 0 0 1 1 0
0 0 0 0 1 1 4 1 0
0 1 3 0 3 2 8 3 6
0 0 0 0 1 0 0 0 0
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
8
6
4
2
0

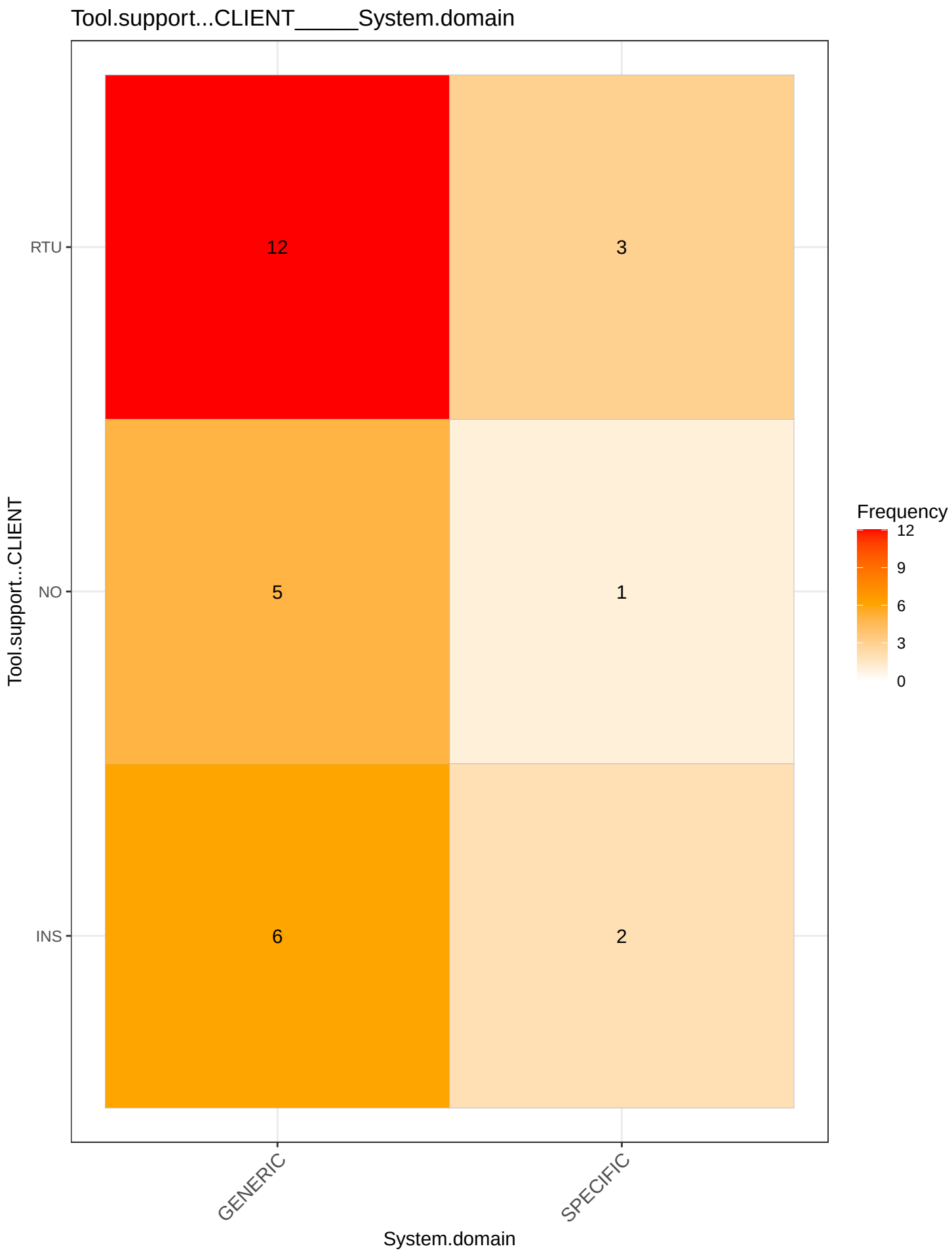

Tool.support...CLIENT_____Client.type
RTU
NO
INS
11
5
2
2
4
0
1
6
2
BROWSER
DESKTOP
MOBILE
Client.type
Tool.support...CLIENT
Frequency
10.0
7.5
5.0
2.5
0.0

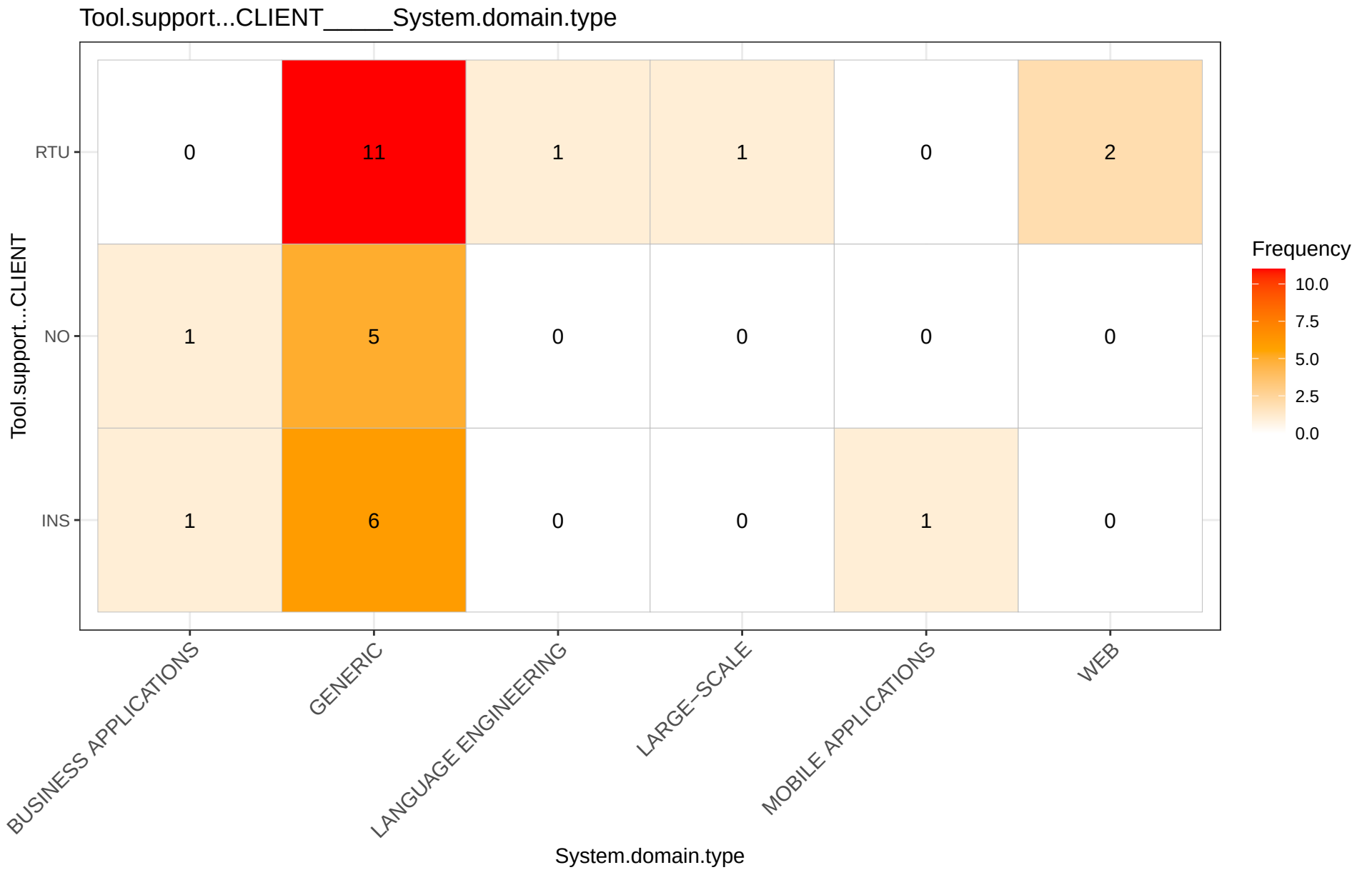

Tool.support...CLIENT_____View.support
RTU
NO
INS
7
8
2
4
3
5
Tool.support...CLIENT
PROJECTIVE
SYNTHETIC
View.support
Frequency
8
6
4
2
0

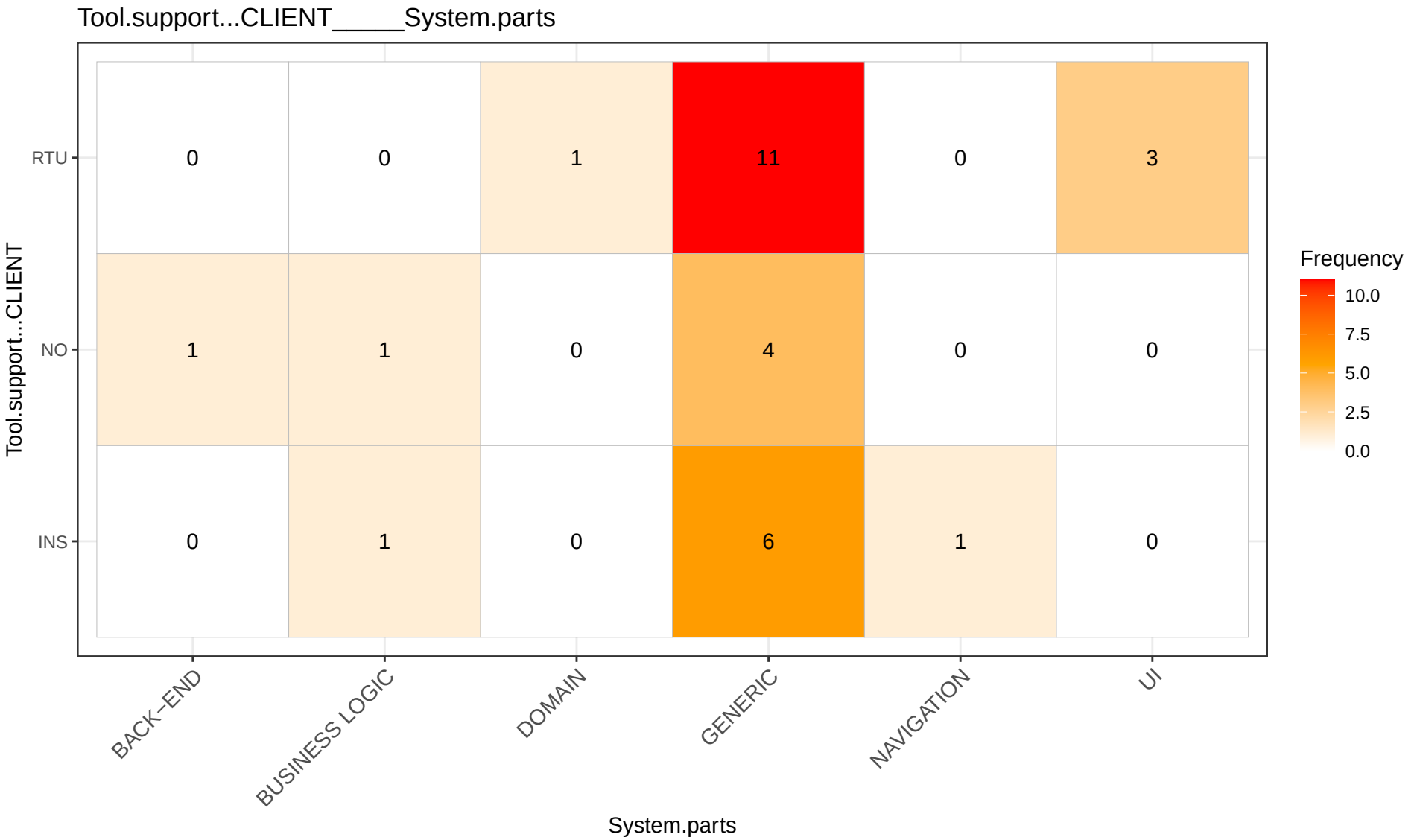

Tool.support...CLIENT_____Multi.views
RTU
NO
INS
10
2
4
0
3
2
0
1
6
1
1
0
Tool.support...CLIENT
MULTI−USER SINGLE−VIEW
MULTI−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
SINGLE−VIEW MULTI−MODEL
Multi.views
Frequency
10.0
7.5
5.0
2.5
0.0

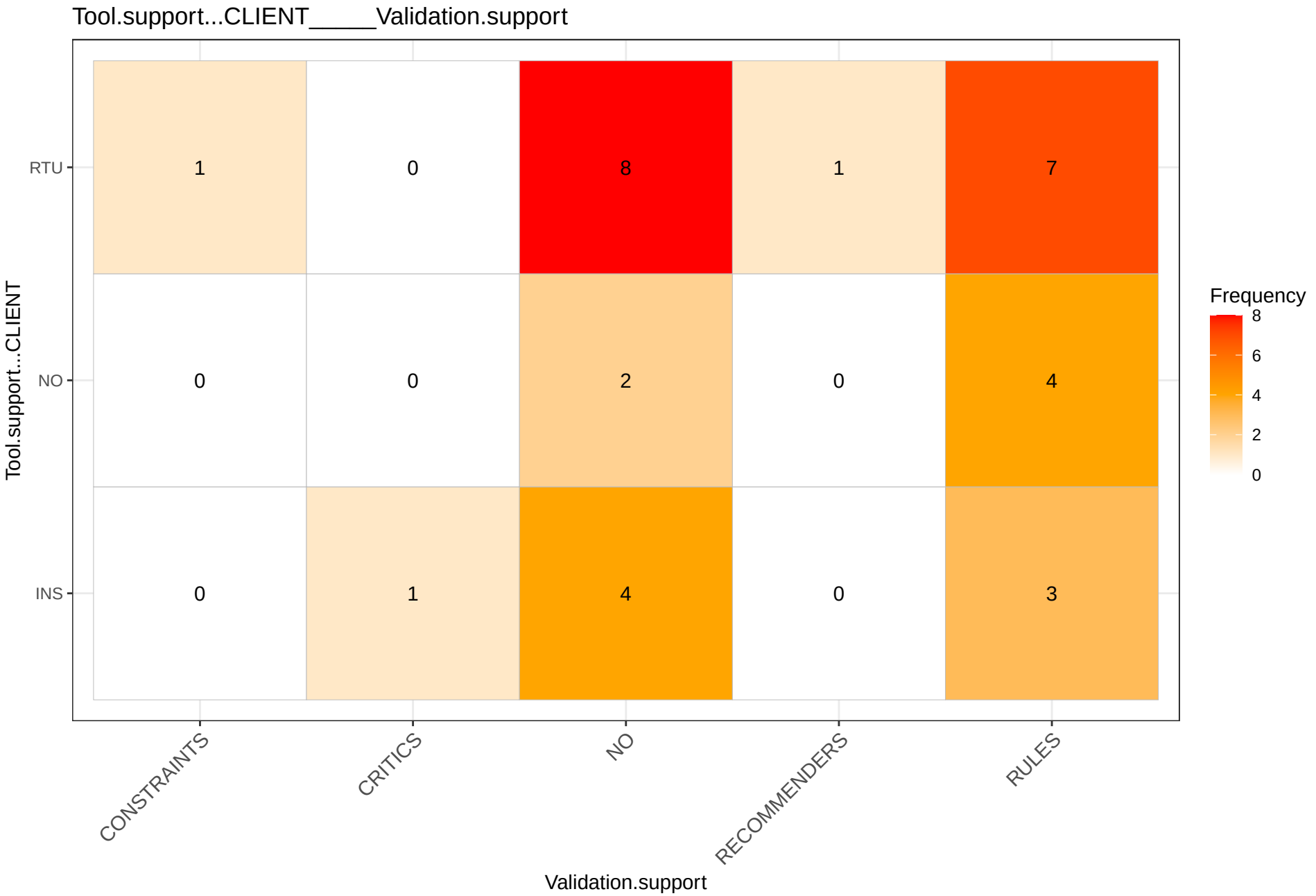

Tool.support...CLIENT_____Language.specific
Tool.support...CLIENT
RTU
NO
INS
0
13
0
1
1
0
5
0
1
0
1
6
1
1
0
BPMN
NO
SOM IAS
UML
XTEAM
Language.specific
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

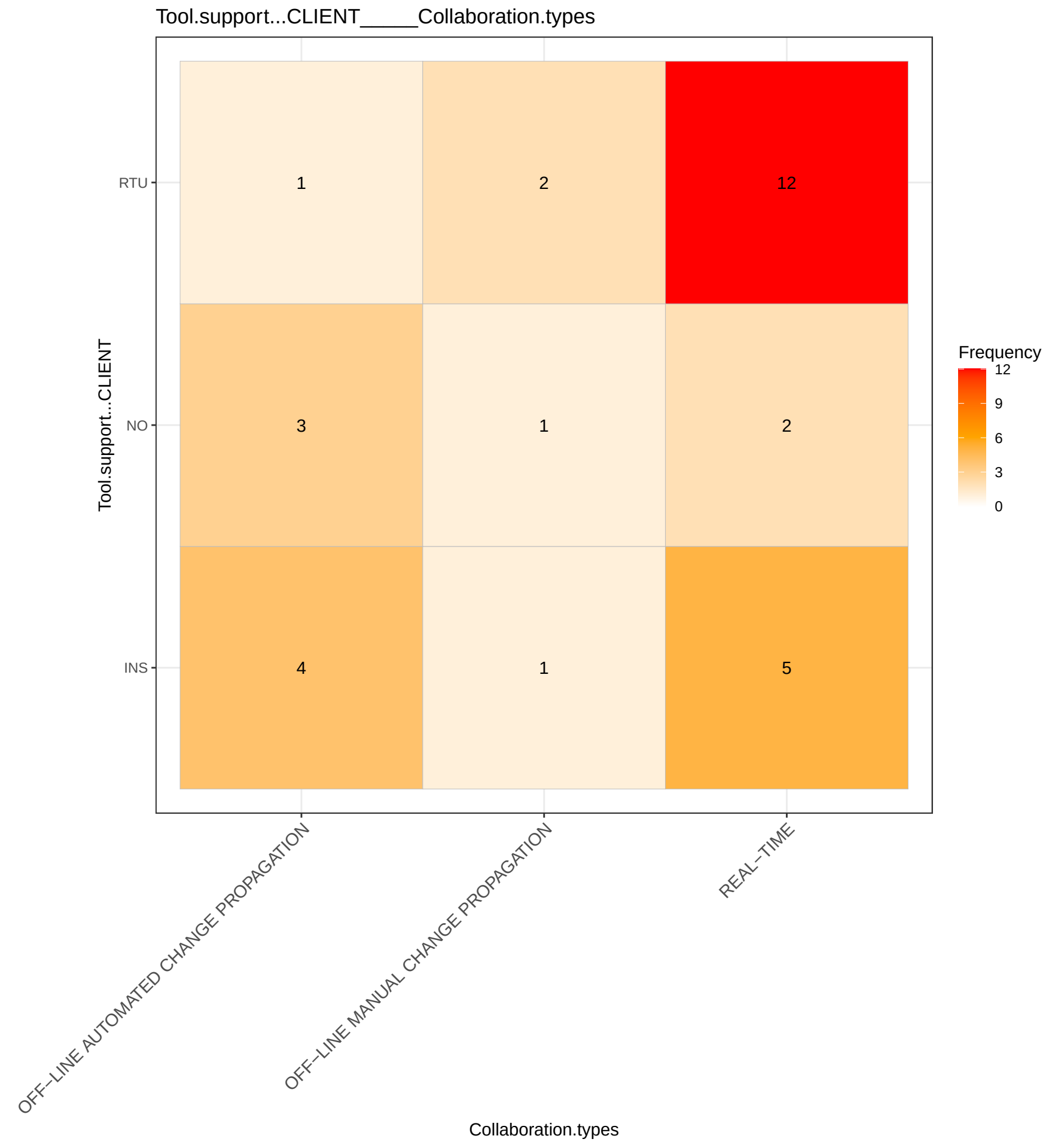

Tool.support...CLIENT_____Modeling.framework
Tool.support...CLIENT
RTU
NO
INS
1 0 1 5 2 2 1 0 1 0 0 1 0 1 1
0 1 0 1 0 0 0 1 0 1 1 0 1 0 0
0 0 0 3 5 0 0 0 0 0 0 0 0 0 0
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
NO
PACAS
RDF
SPEM
UML
VIATRA
WEBGME
YJS
Modeling.framework
Frequency
5
4
3
2
1
0

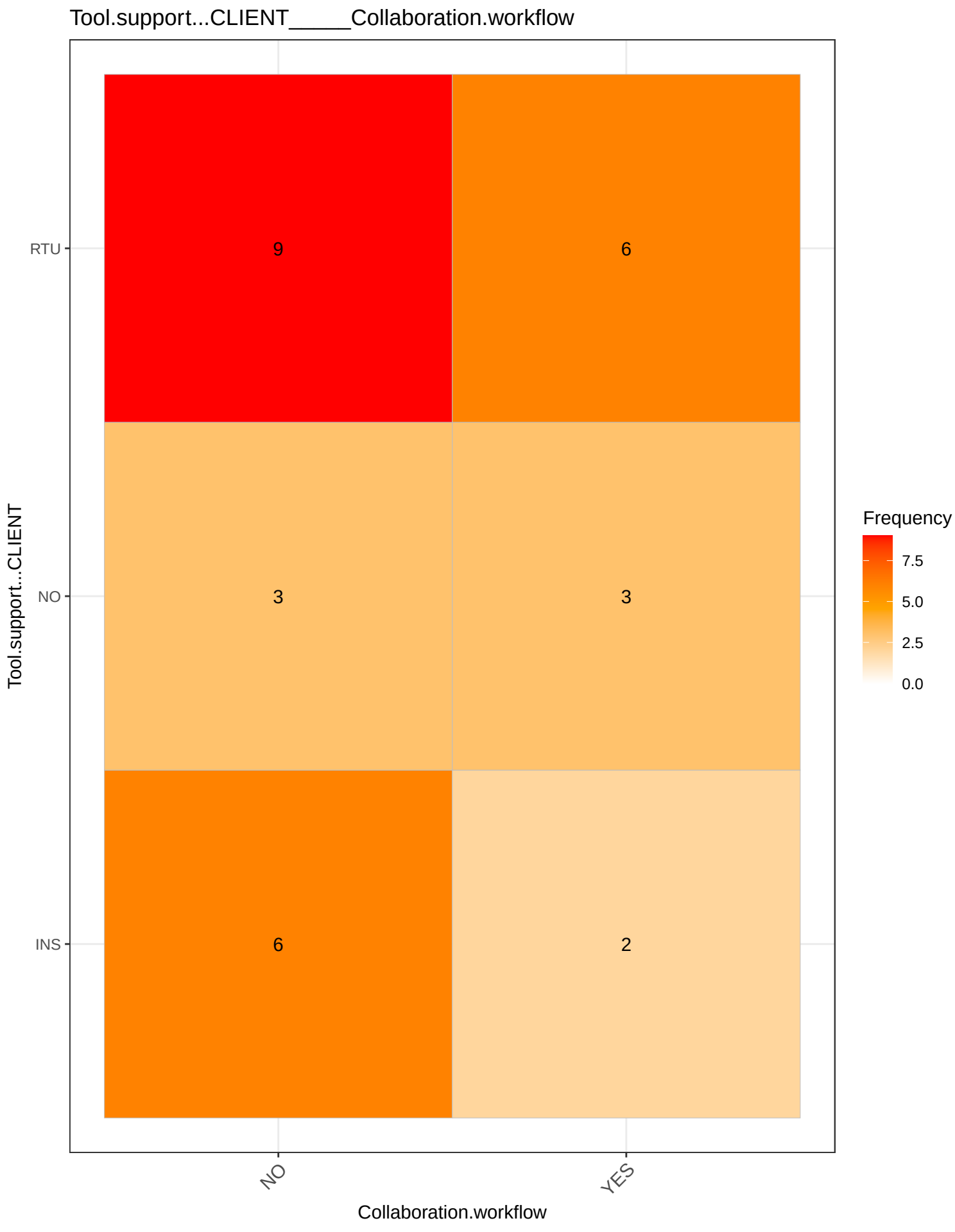

Tool.support...CLIENT_____System.domain
RTU
NO
INS
12
3
5
1
6
2
Tool.support...CLIENT
GENERIC
SPECIFIC
System.domain
Frequency
12
9
6
3
0

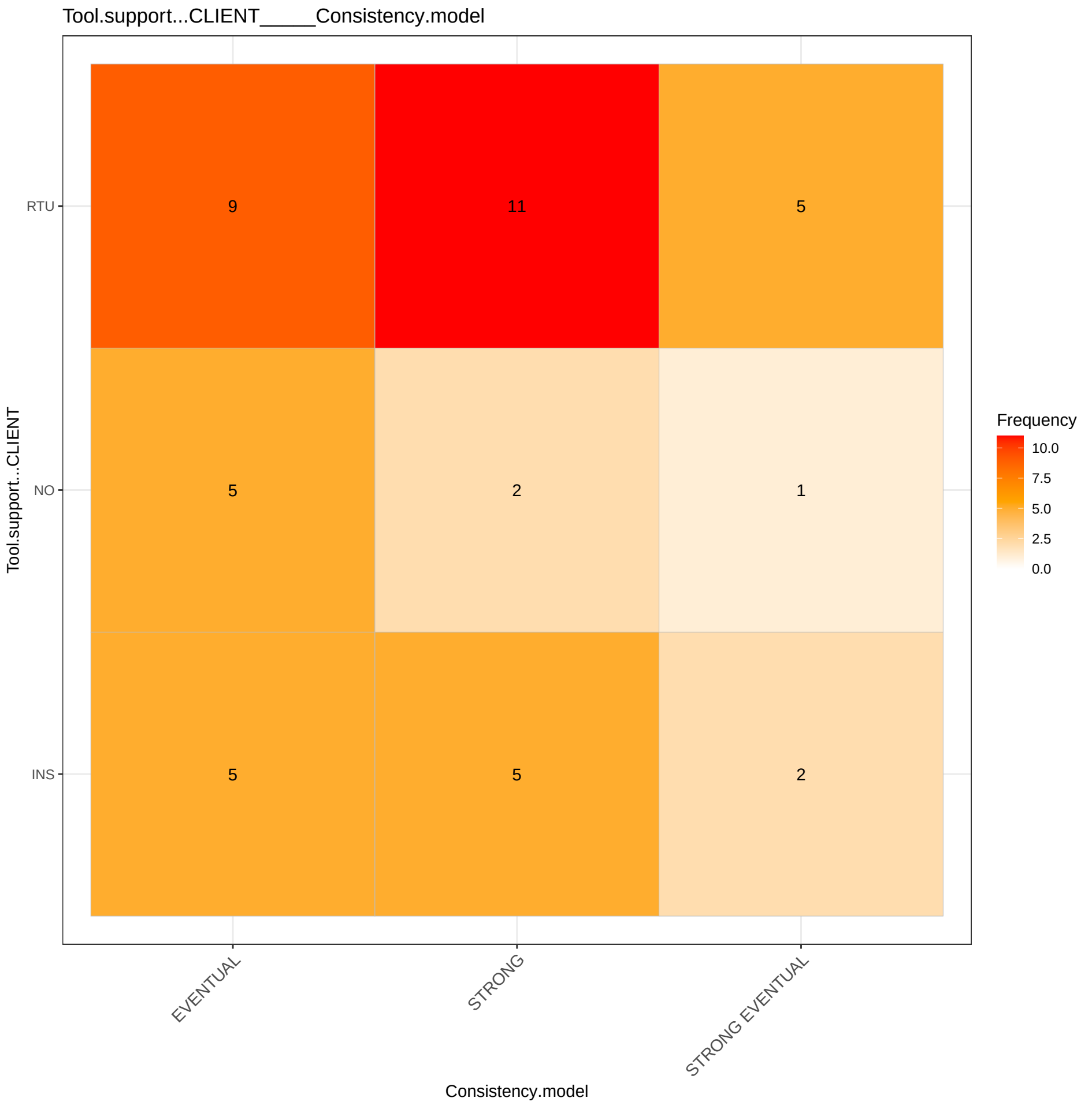

Tool.support...CLIENT_____System.domain.type
RTU
NO
INS
0
11
1
1
0
2
1
5
0
0
0
0
1
6
0
0
1
0
Tool.support...CLIENT
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
10.0
7.5
5.0
2.5
0.0

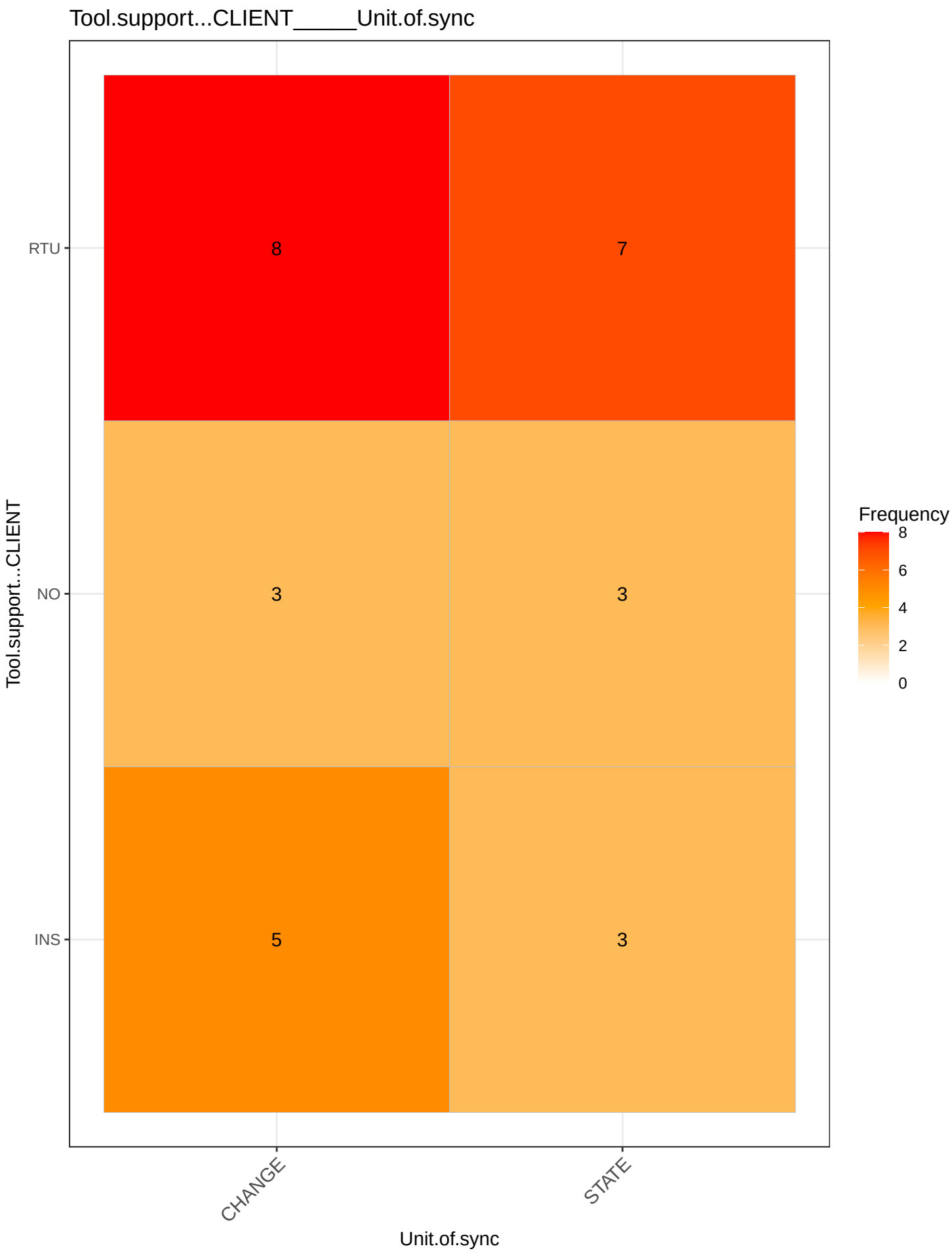

Tool.support...CLIENT_____System.parts
RTU
NO
INS
0
0
1
11
0
3
1
1
0
4
0
0
0
1
0
6
1
0
BACK−END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
Tool.support...CLIENT
System.parts
Frequency
10.0
7.5
5.0
2.5
0.0

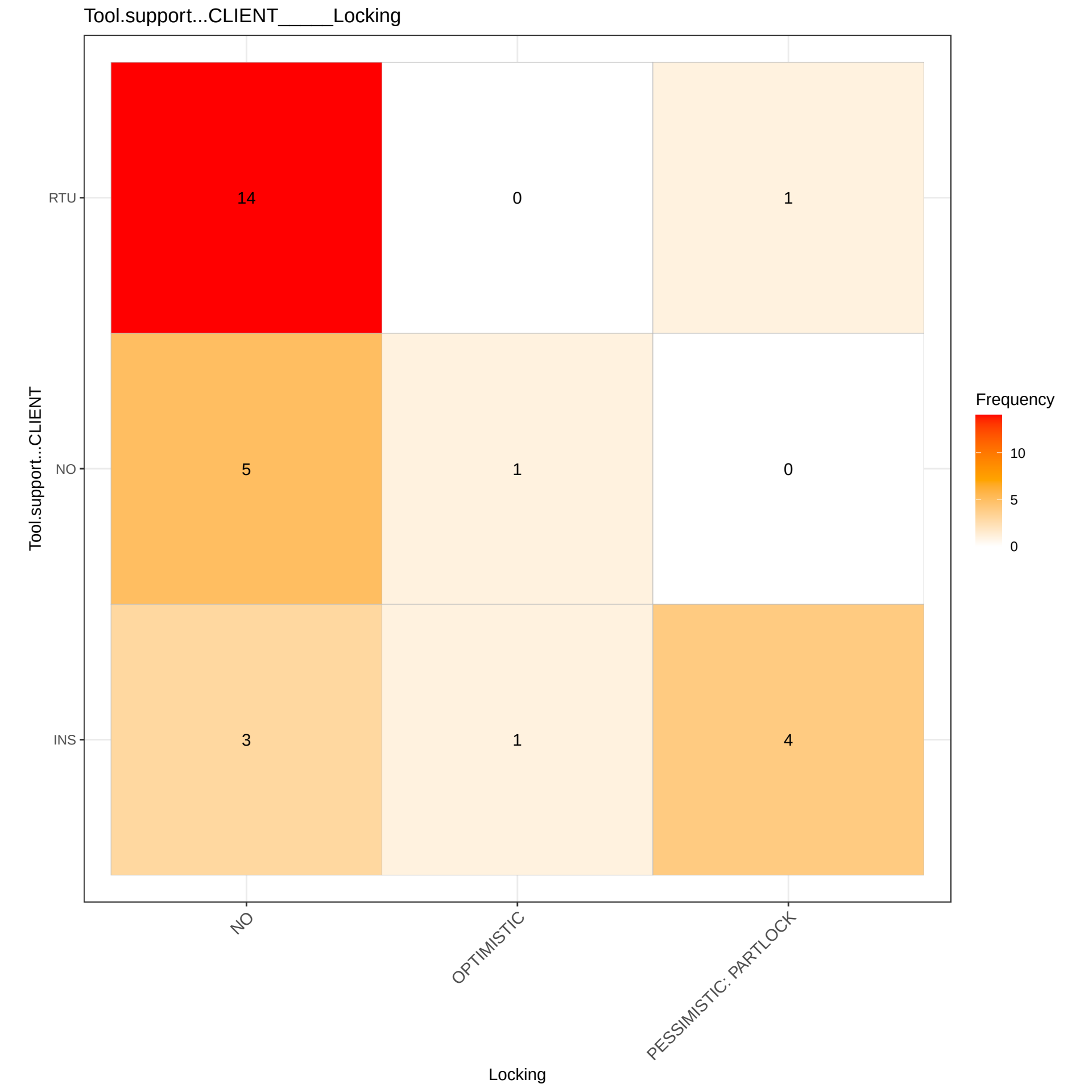

Tool.support...CLIENT_____Validation.support
RTU
NO
INS
Tool.support...CLIENT
1
0
8
1
7
0
0
2
0
4
0
1
4
0
3
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
8
6
4
2
0

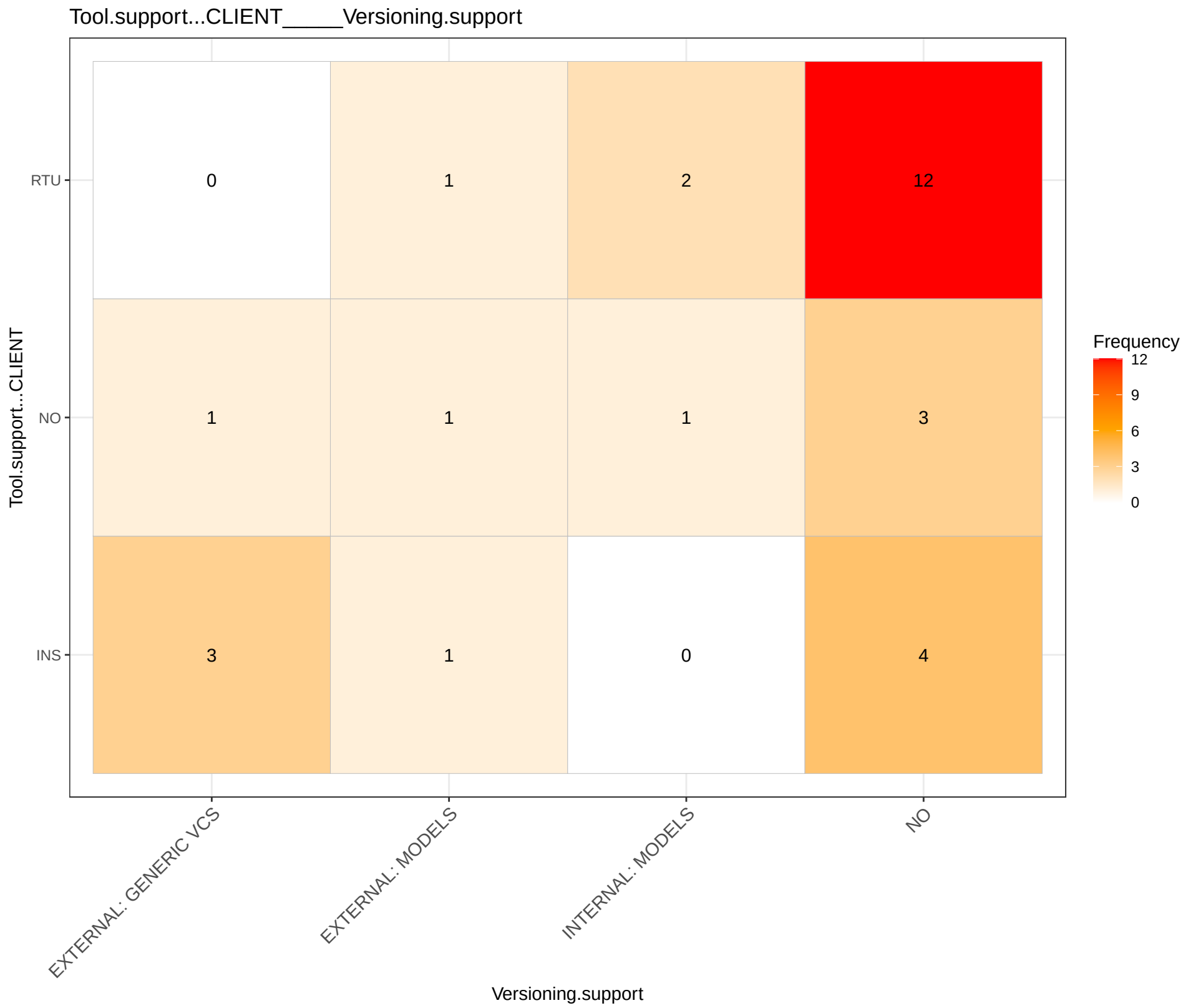

Tool.support...CLIENT_____Collaboration.types
RTU
NO
INS
1
2
12
3
1
2
4
1
5
Tool.support...CLIENT
Frequency
12
9
6
3
0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types

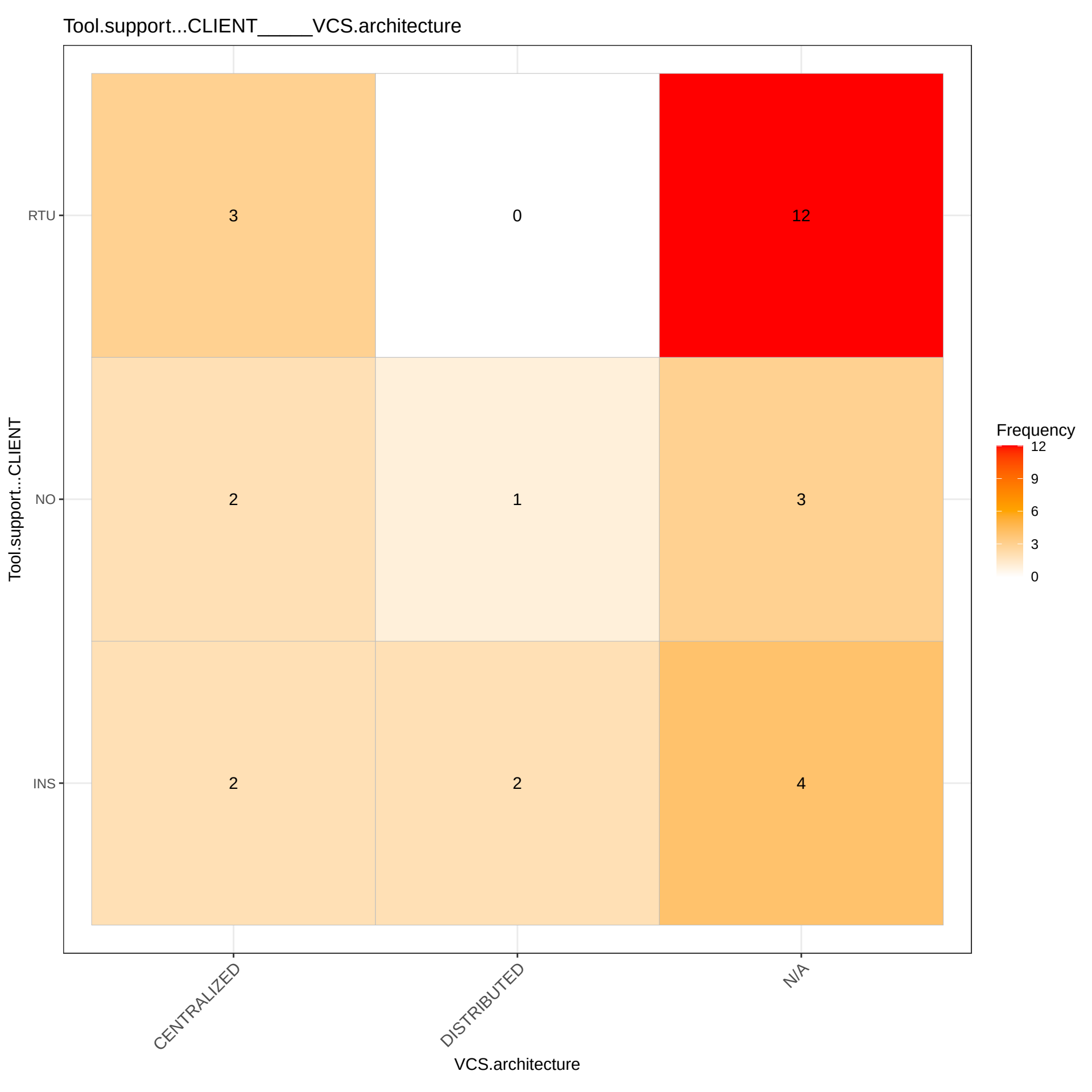

Tool.support...CLIENT_____Collaboration.workflow
RTU
NO
INS
9
6
3
3
6
2
Tool.support...CLIENT
NO
YES
Collaboration.workflow
Frequency
7.5
5.0
2.5
0.0

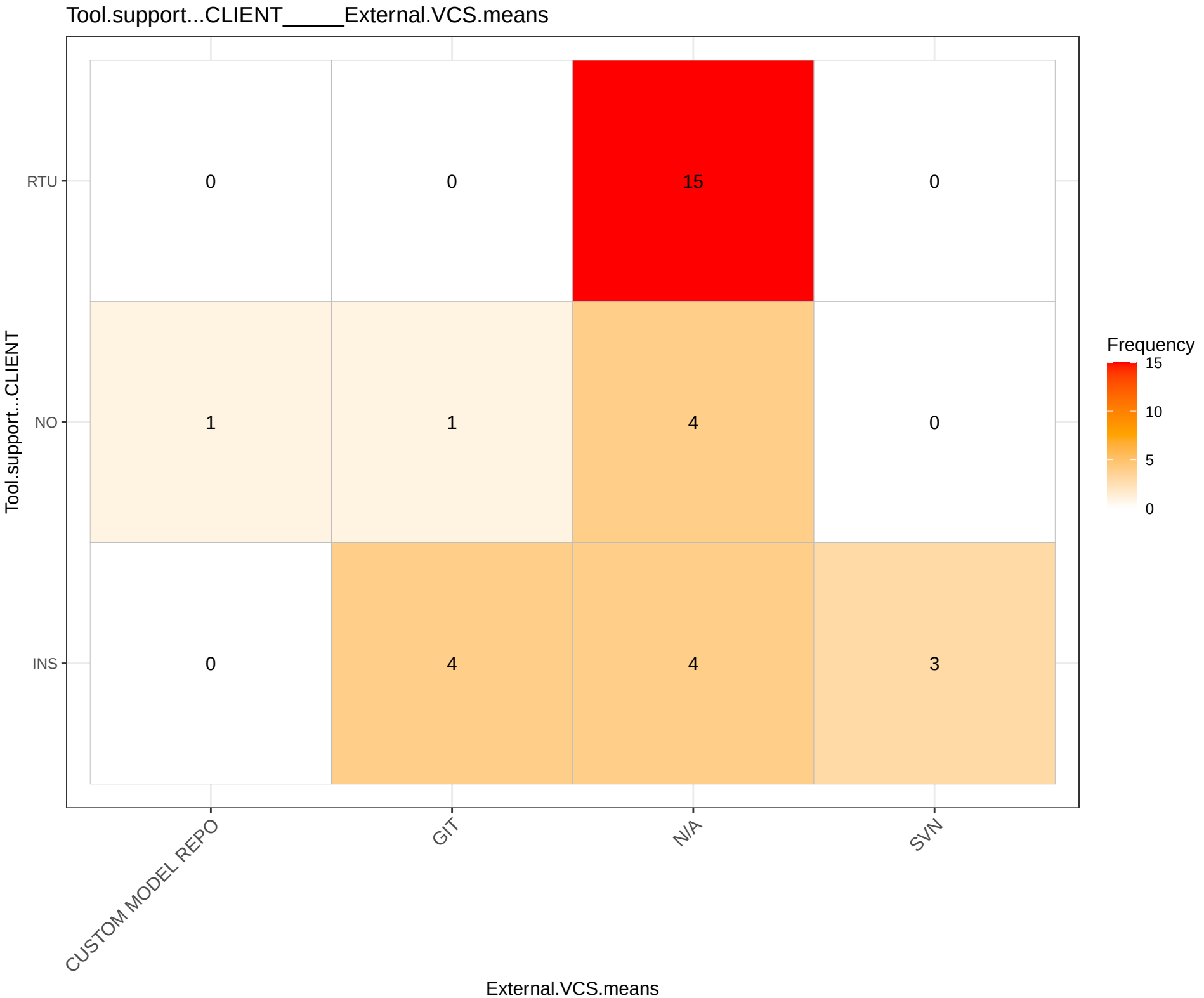

Tool.support...CLIENT_____Consistency.model
RTU
NO
INS
9
11
5
5
2
1
5
5
2
EVENTUAL
STRONG
STRONG EVENTUAL
Tool.support...CLIENT
Consistency.model
Frequency
10.0
7.5
5.0
2.5
0.0

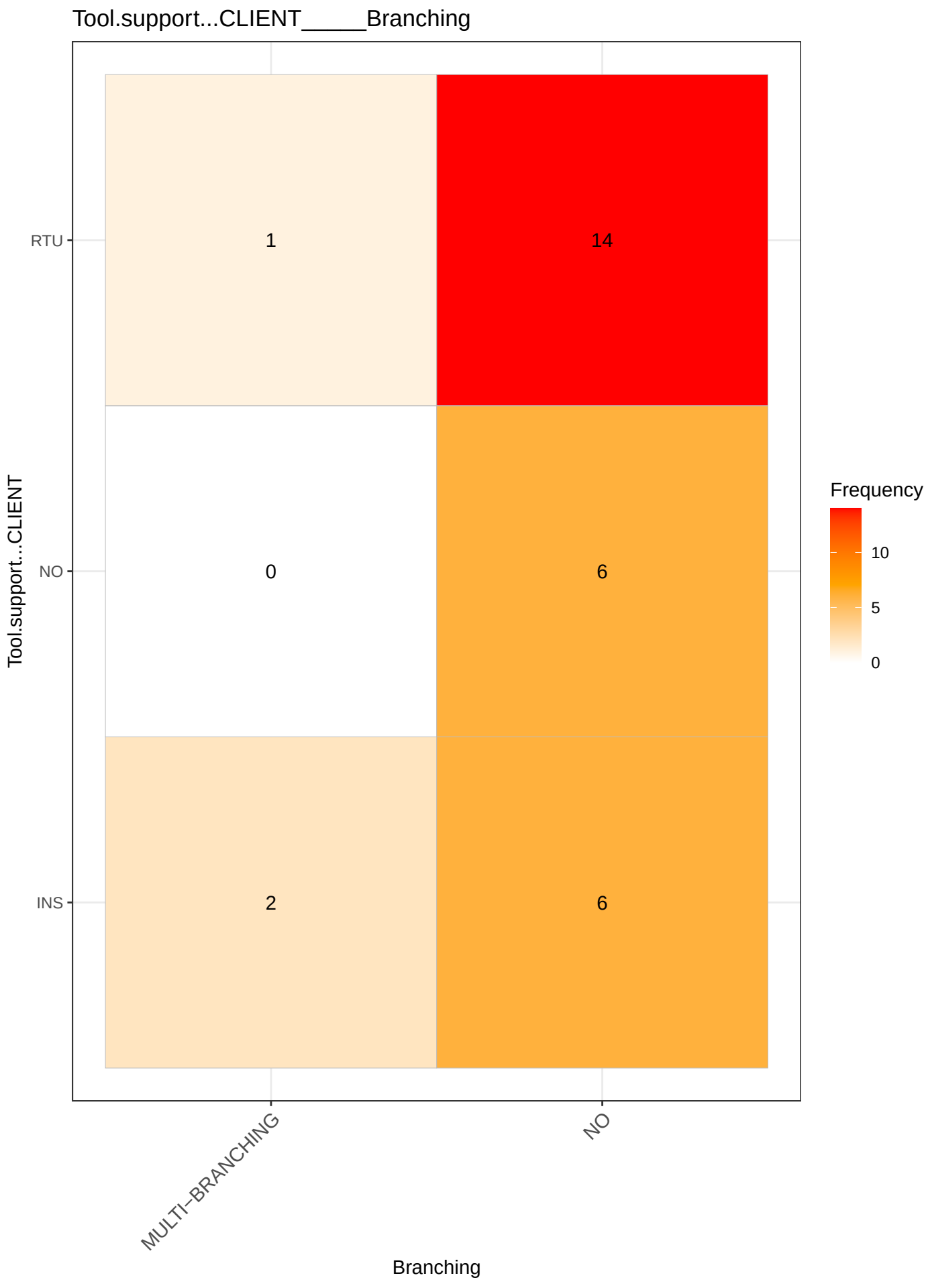

Tool.support...CLIENT_____Unit.of.sync
RTU
NO
INS
8
7
3
3
5
3
Tool.support...CLIENT
CHANGE
STATE
Unit.of.sync
Frequency
8
6
4
2
0

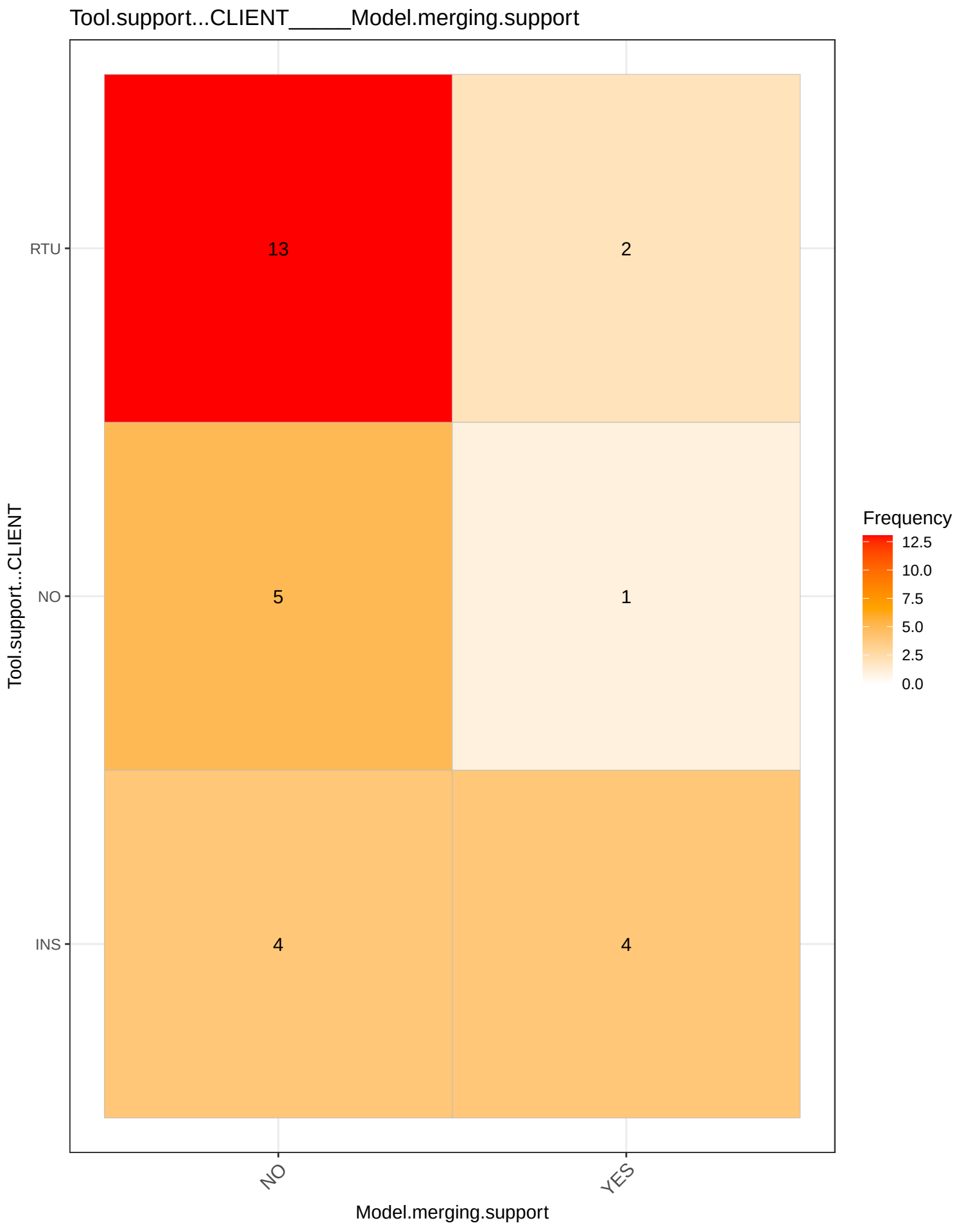

Tool.support...CLIENT_____Locking
RTU
NO
INS
14
0
1
5
1
0
3
1
4
Tool.support...CLIENT
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
10
5
0

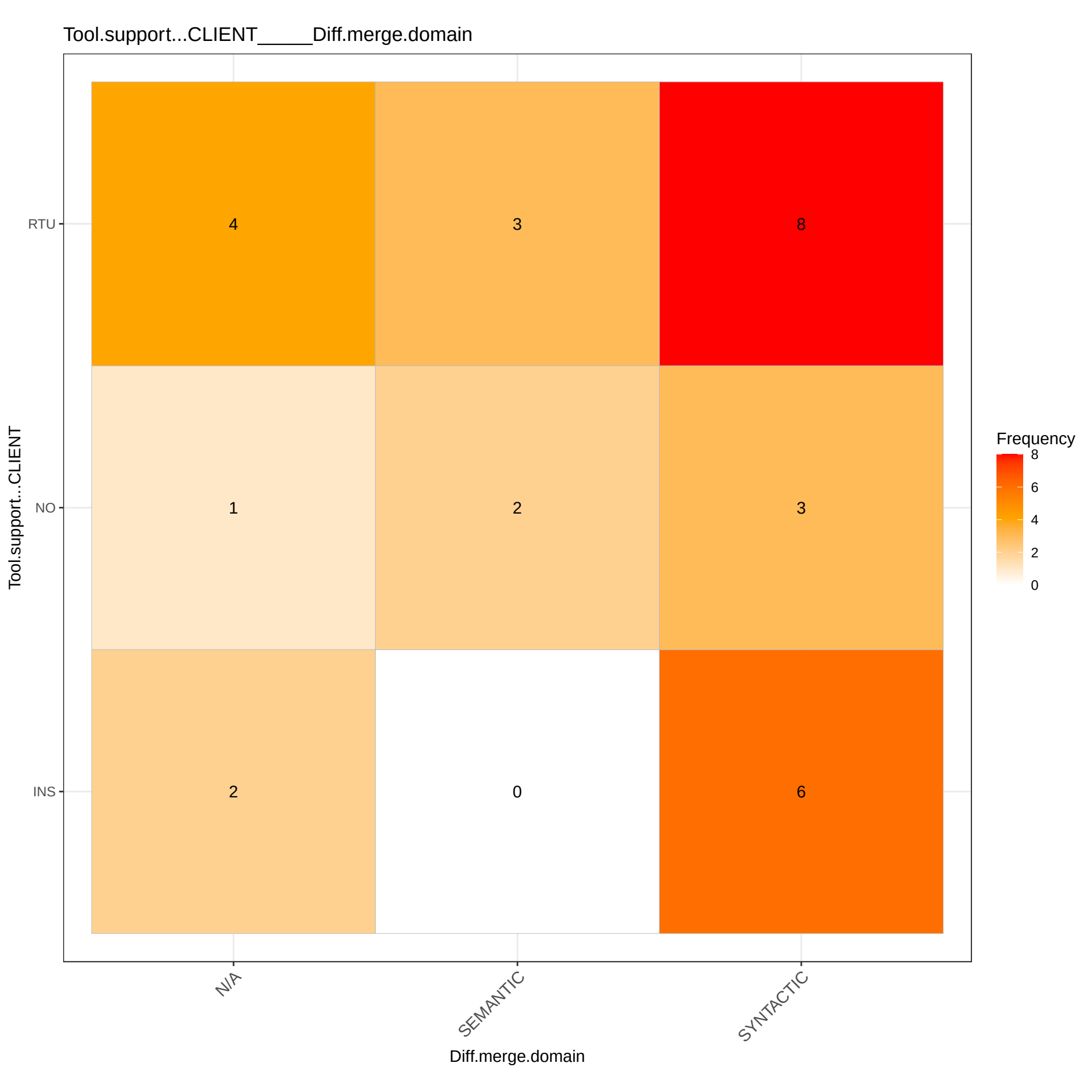

Tool.support...CLIENT_____Versioning.support
RTU
NO
INS
0
1
2
12
1
1
1
3
3
1
0
4
Tool.support...CLIENT
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
12
9
6
3
0

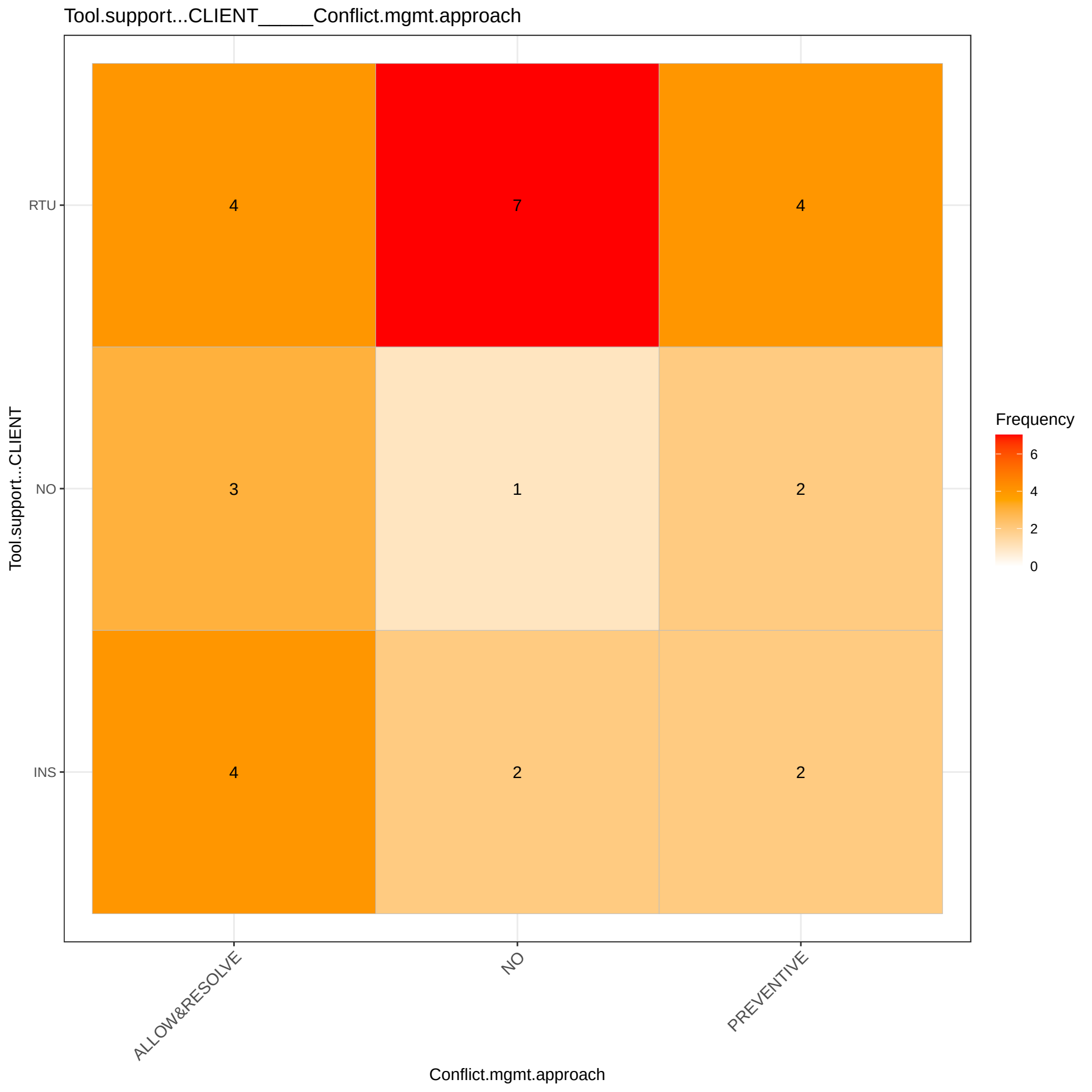

Tool.support...CLIENT_____VCS.architecture
RTU
NO
INS
3
0
12
2
1
3
2
2
4
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Tool.support...CLIENT
Frequency
12
9
6
3
0

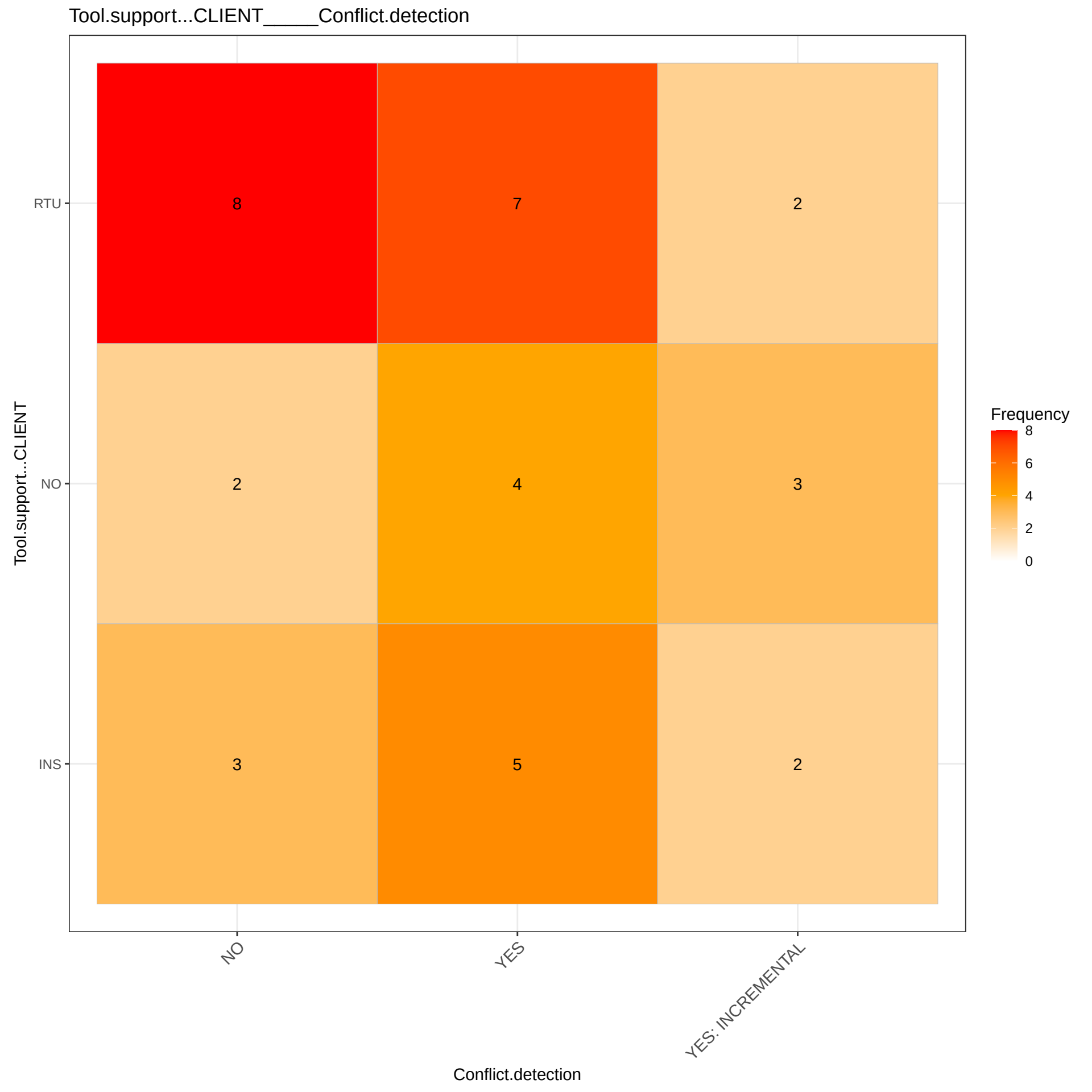

Tool.support...CLIENT_____External.VCS.means
RTU
NO
INS
0
0
15
0
1
1
4
0
0
4
4
3
Tool.support...CLIENT
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
15
10
5
0

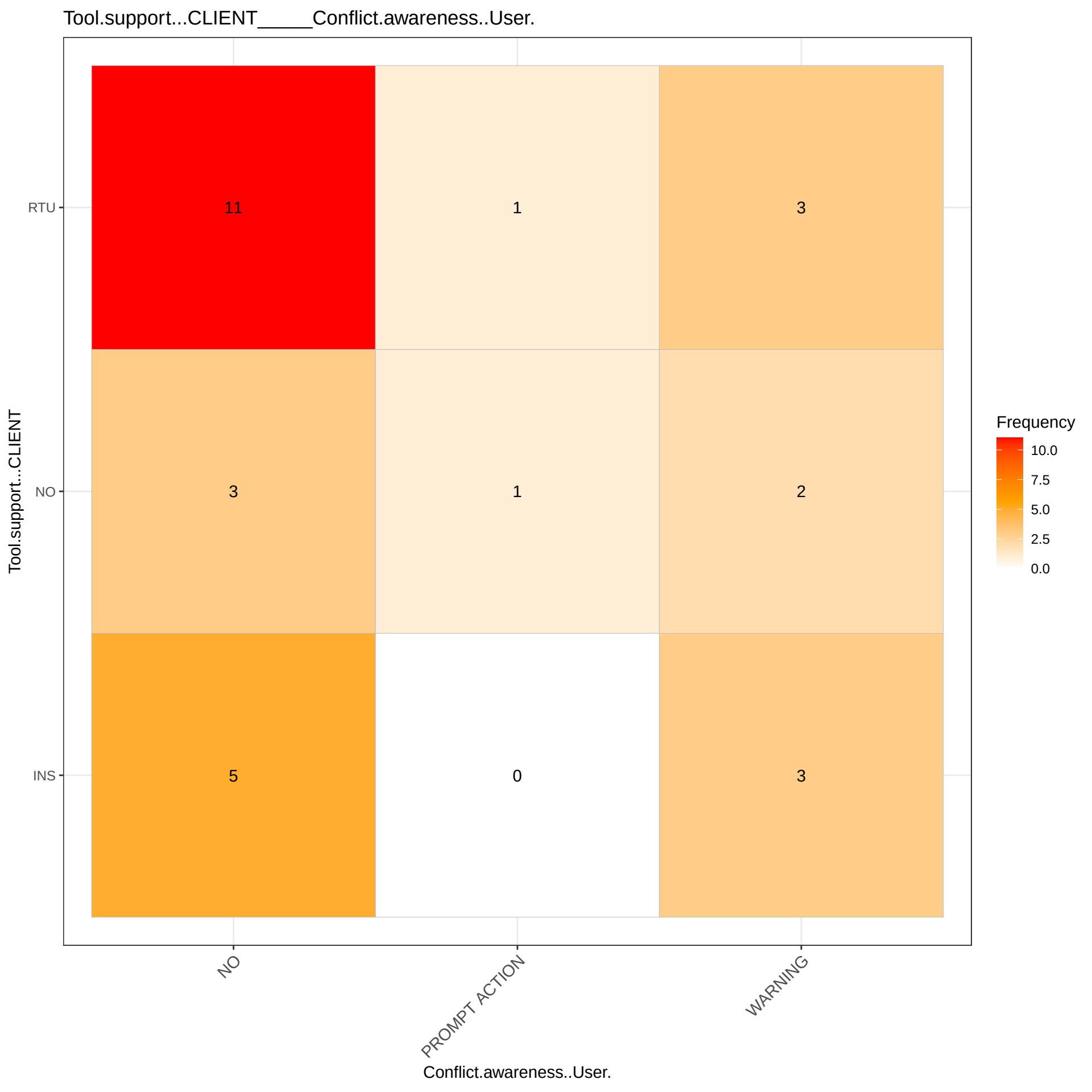

Tool.support...CLIENT_____Branching
RTU
NO
INS
1
14
0
6
2
6
Tool.support...CLIENT
MULTI−BRANCHING
NO
Branching
Frequency
10
5
0

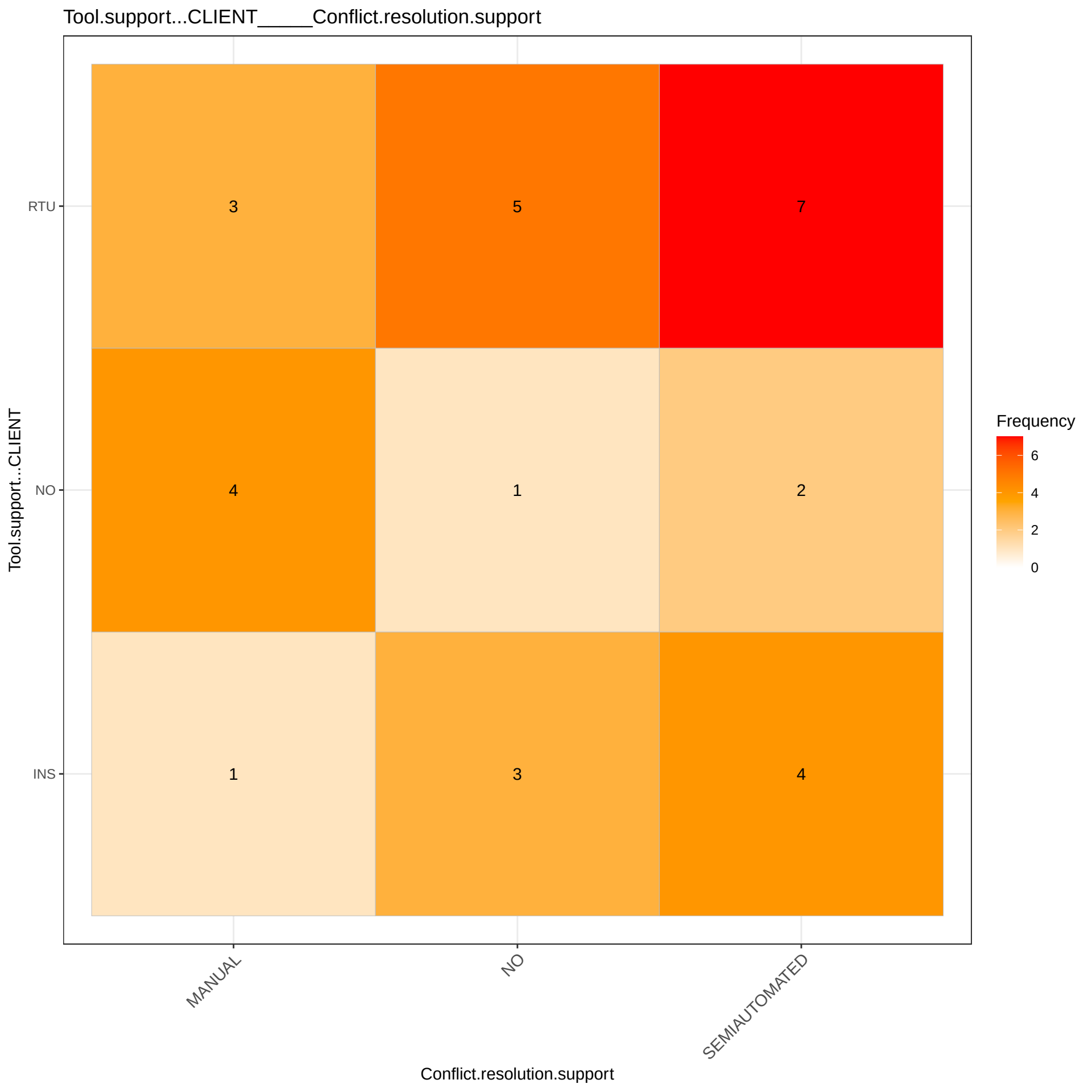

Tool.support...CLIENT_____Model.merging.support
RTU
NO
INS
13
2
5
1
4
4
Tool.support...CLIENT
NO
YES
Model.merging.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

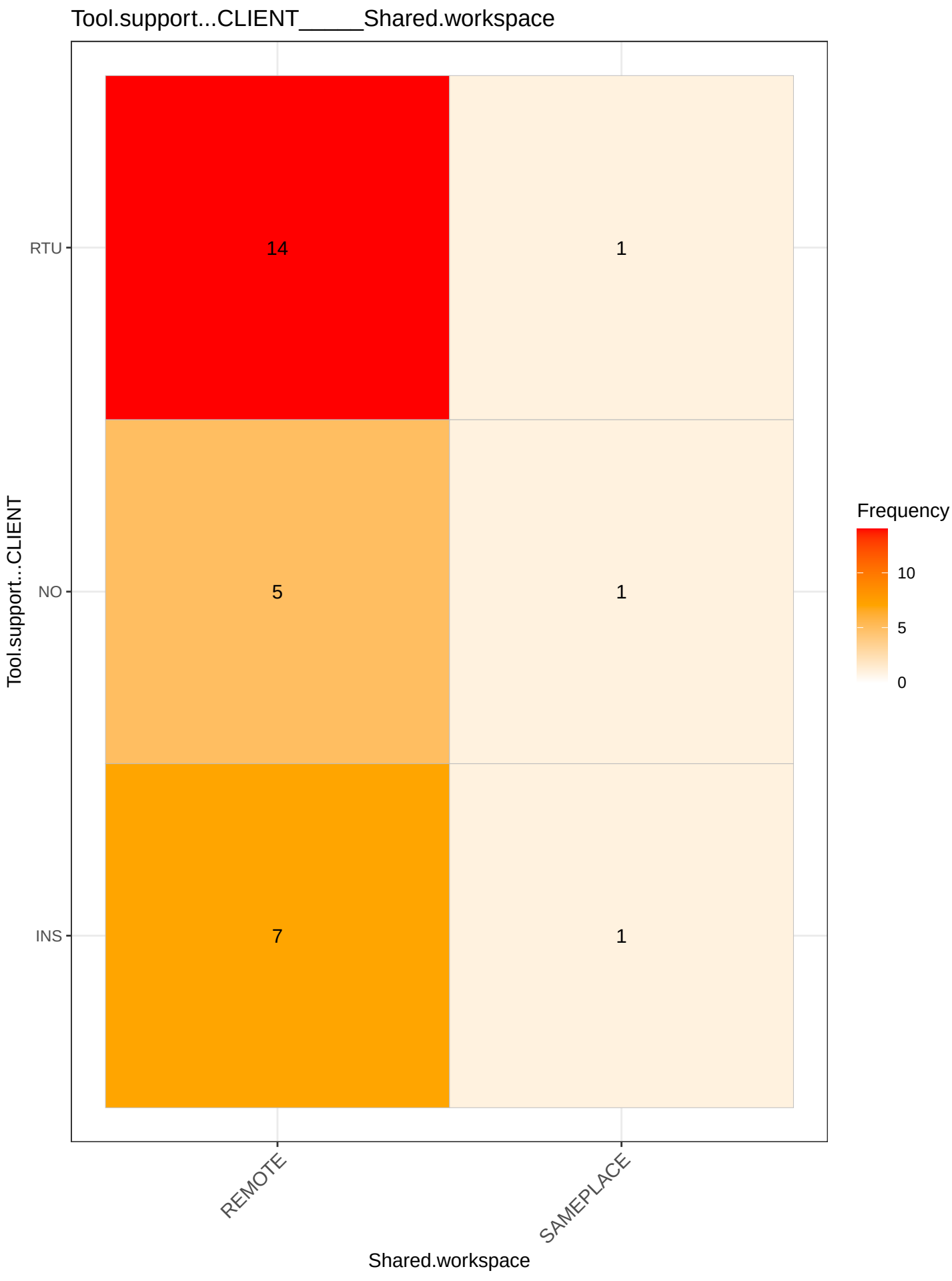

Tool.support...CLIENT_____Diff.merge.domain
RTU
NO
INS
4
3
8
1
2
3
2
0
6
Tool.support...CLIENT
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
8
6
4
2
0

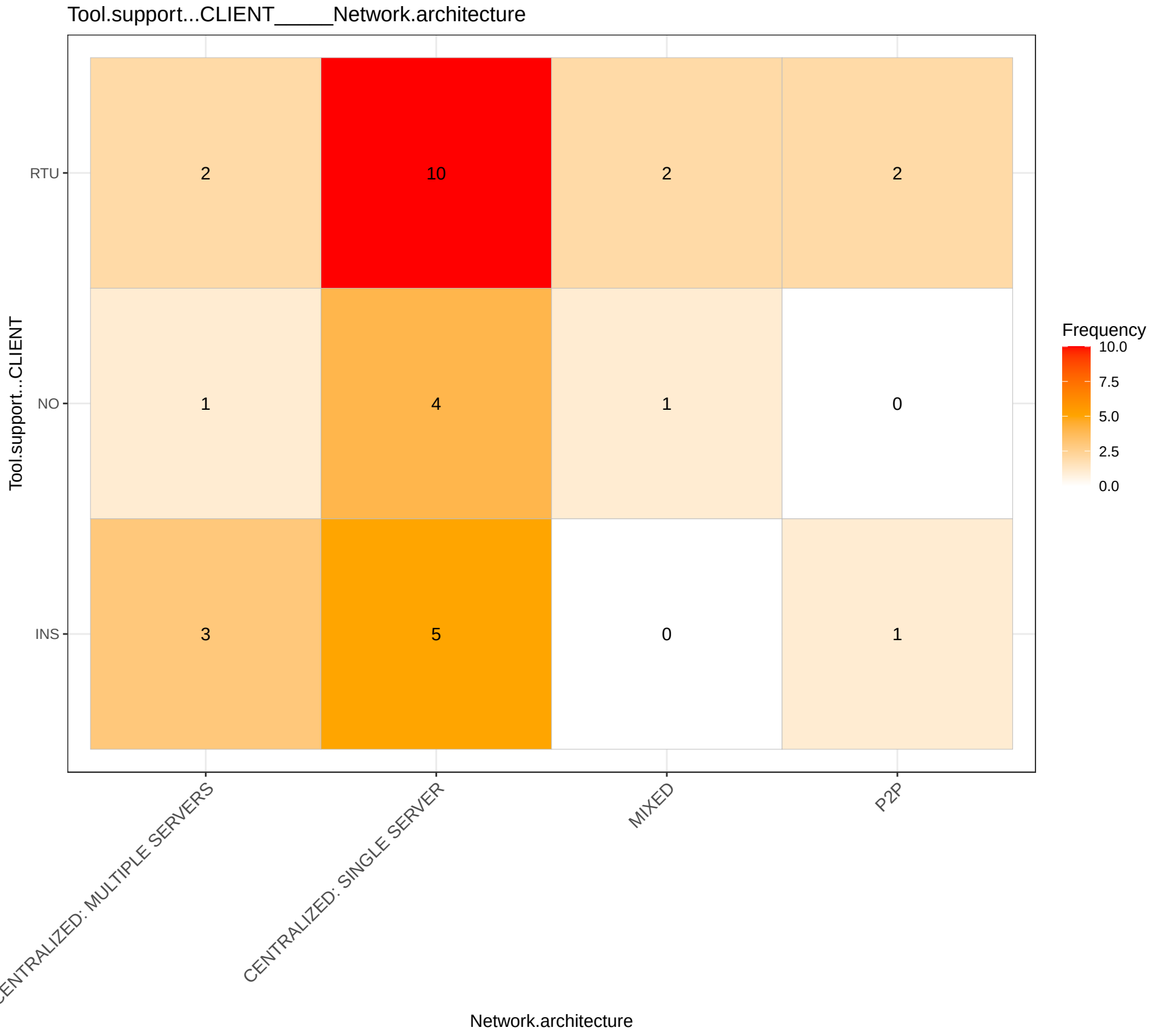

Tool.support...CLIENT_____Conflict.mgmt.approach
RTU
NO
INS
4
7
4
3
1
2
4
2
2
Tool.support...CLIENT
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
4
2
0

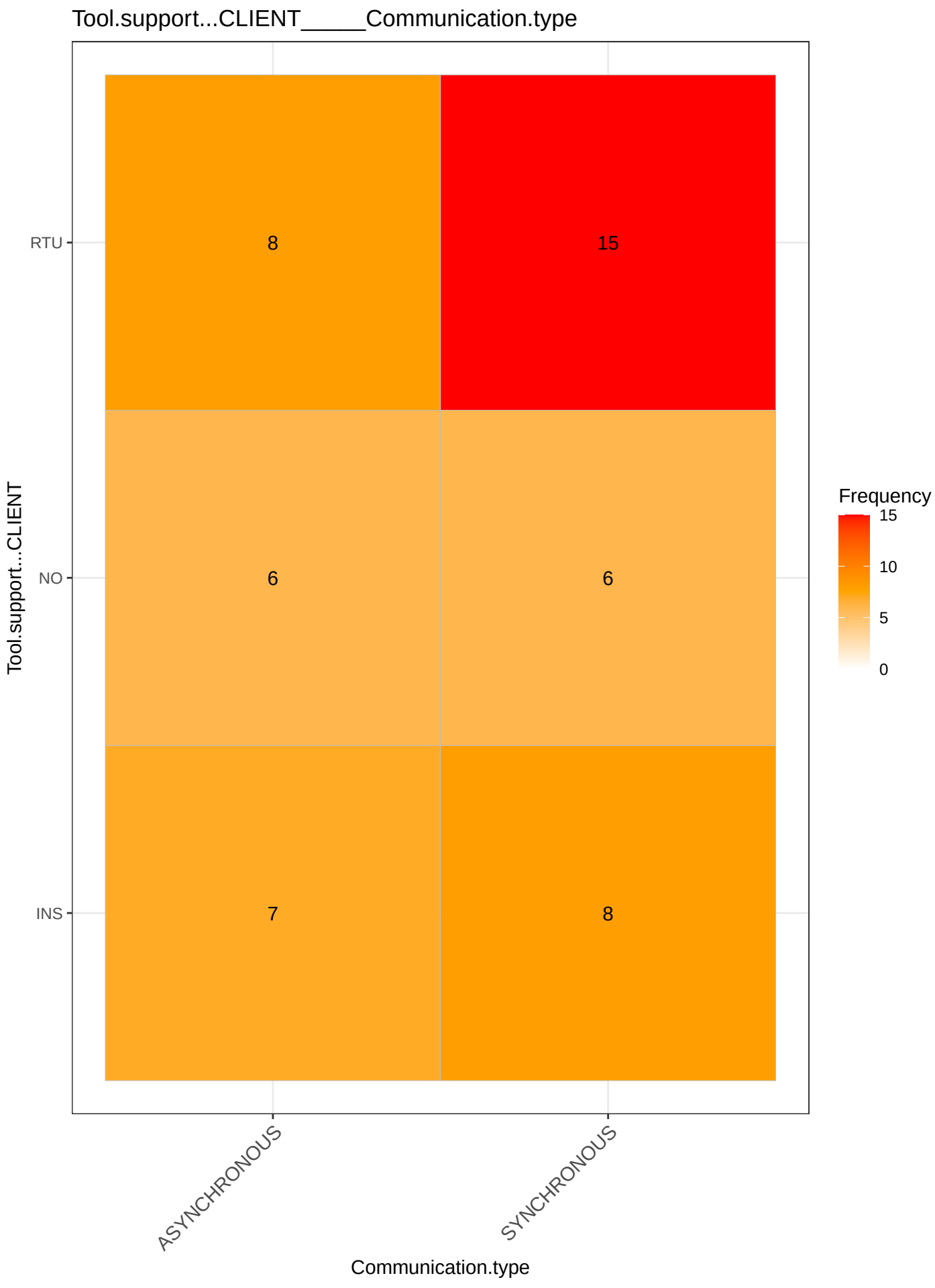

Tool.support...CLIENT_____Conflict.detection
RTU
NO
INS
8
7
2
2
4
3
3
5
2
Tool.support...CLIENT
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
8
6
4
2
0

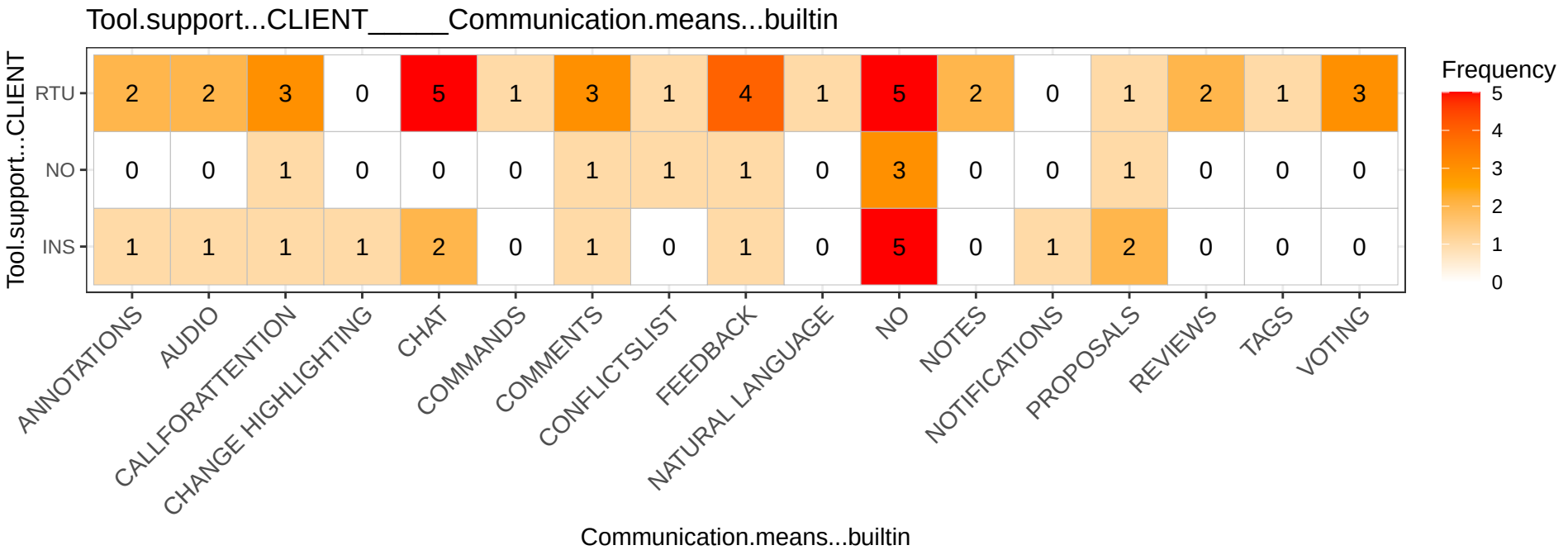

Tool.support...CLIENT_____Conflict.awareness..User.
RTU
NO
INS
11
1
3
3
1
2
5
0
3
Tool.support...CLIENT
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0

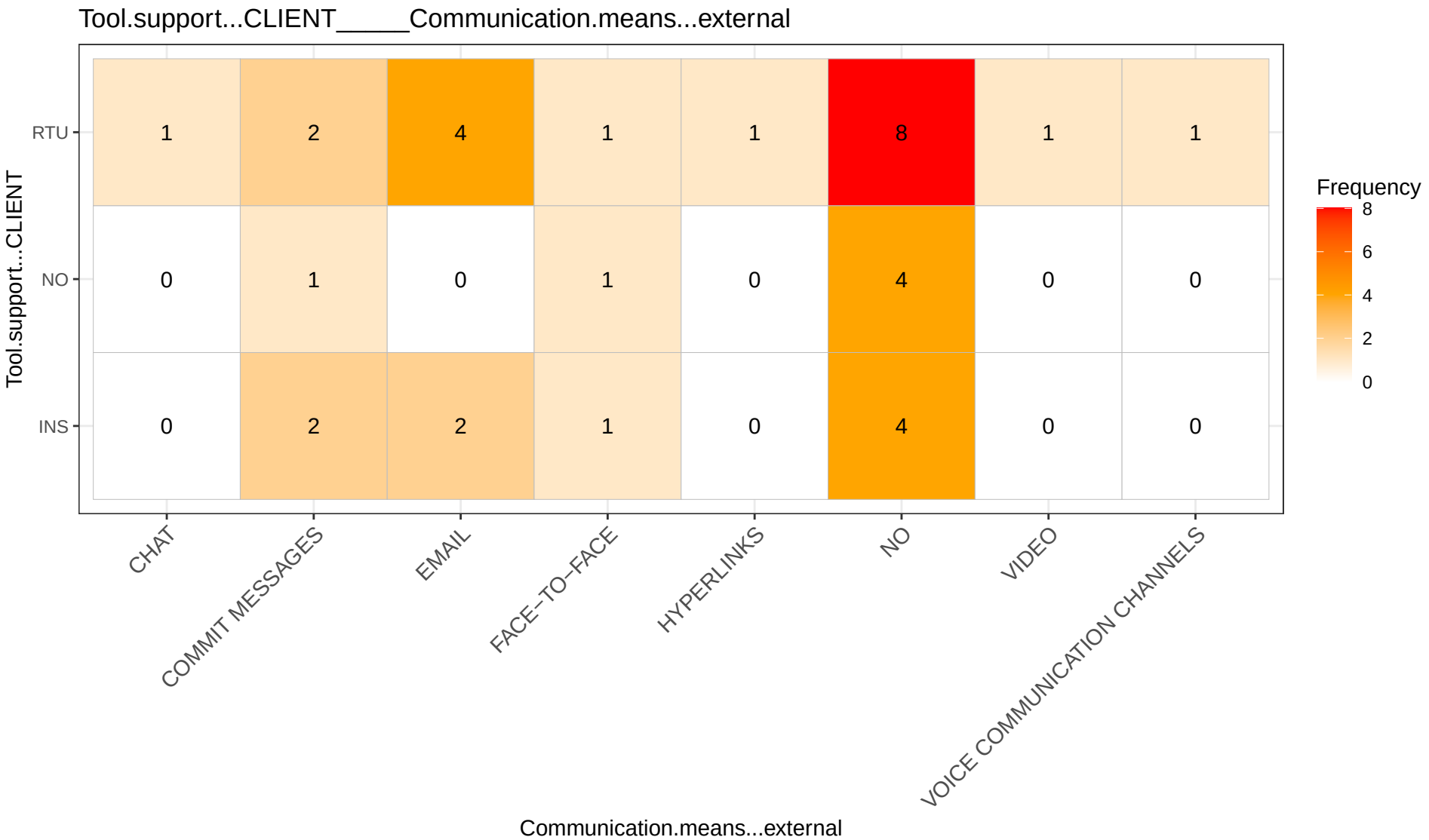

Tool.support...CLIENT_____Conflict.resolution.support
RTU
NO
INS
3
5
7
4
1
2
1
3
4
Tool.support...CLIENT
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
6
4
2
0

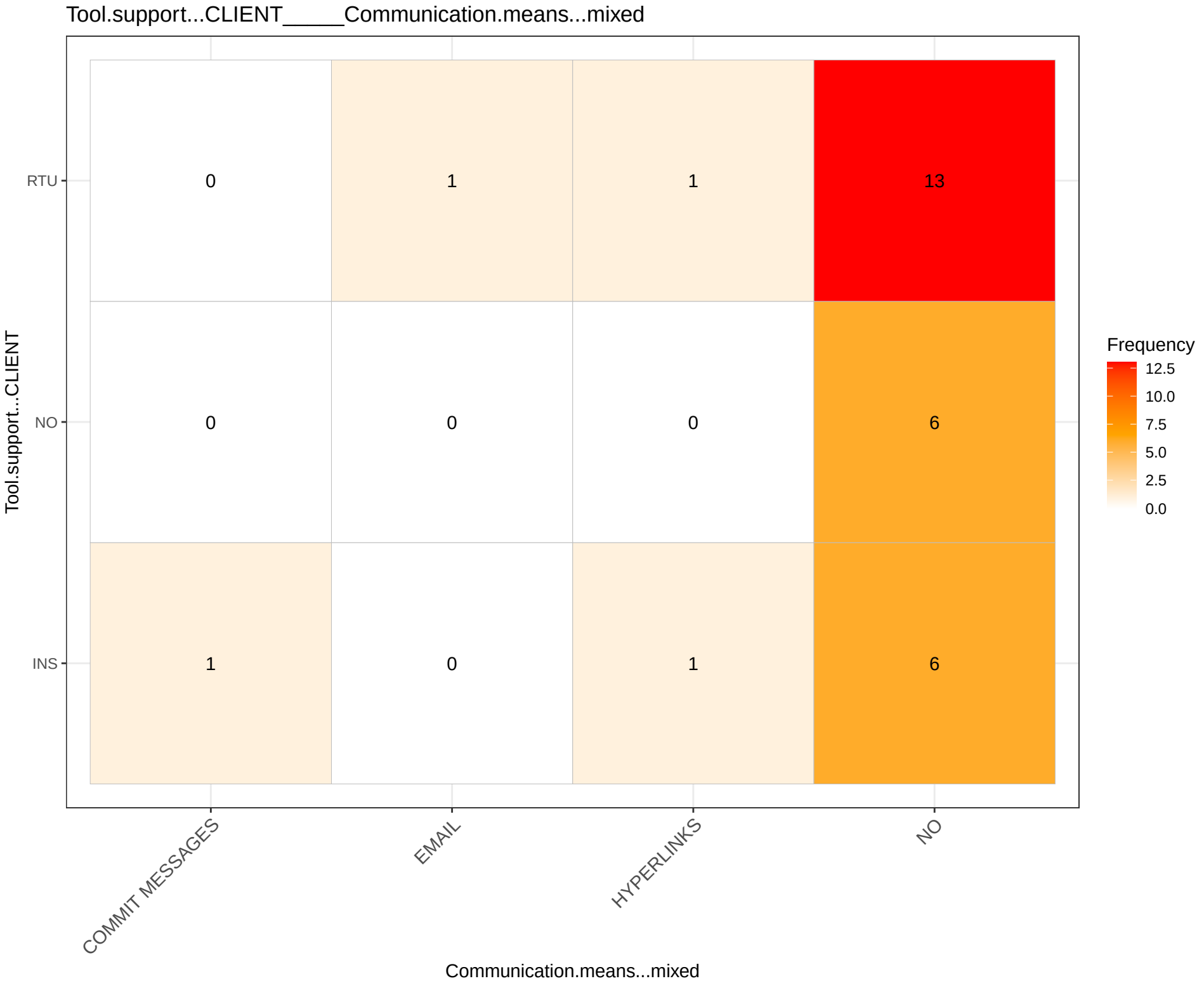

Tool.support...CLIENT_____Shared.workspace
RTU
NO
INS
14
1
5
1
7
1
Tool.support...CLIENT
REMOTE
SAMEPLACE
Shared.workspace
Frequency
10
5
0

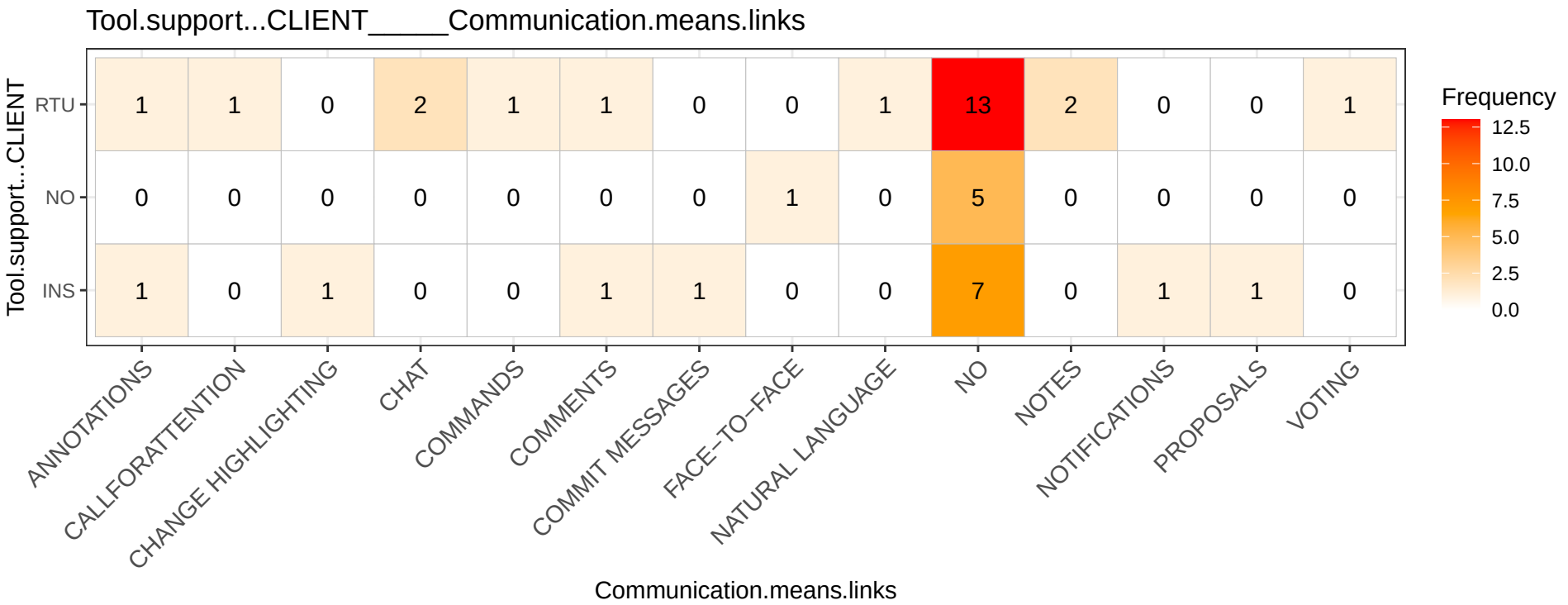

Tool.support...CLIENT_____Network.architecture
RTU
NO
INS
2
10
2
2
1
4
1
0
3
5
0
1
Tool.support...CLIENT
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

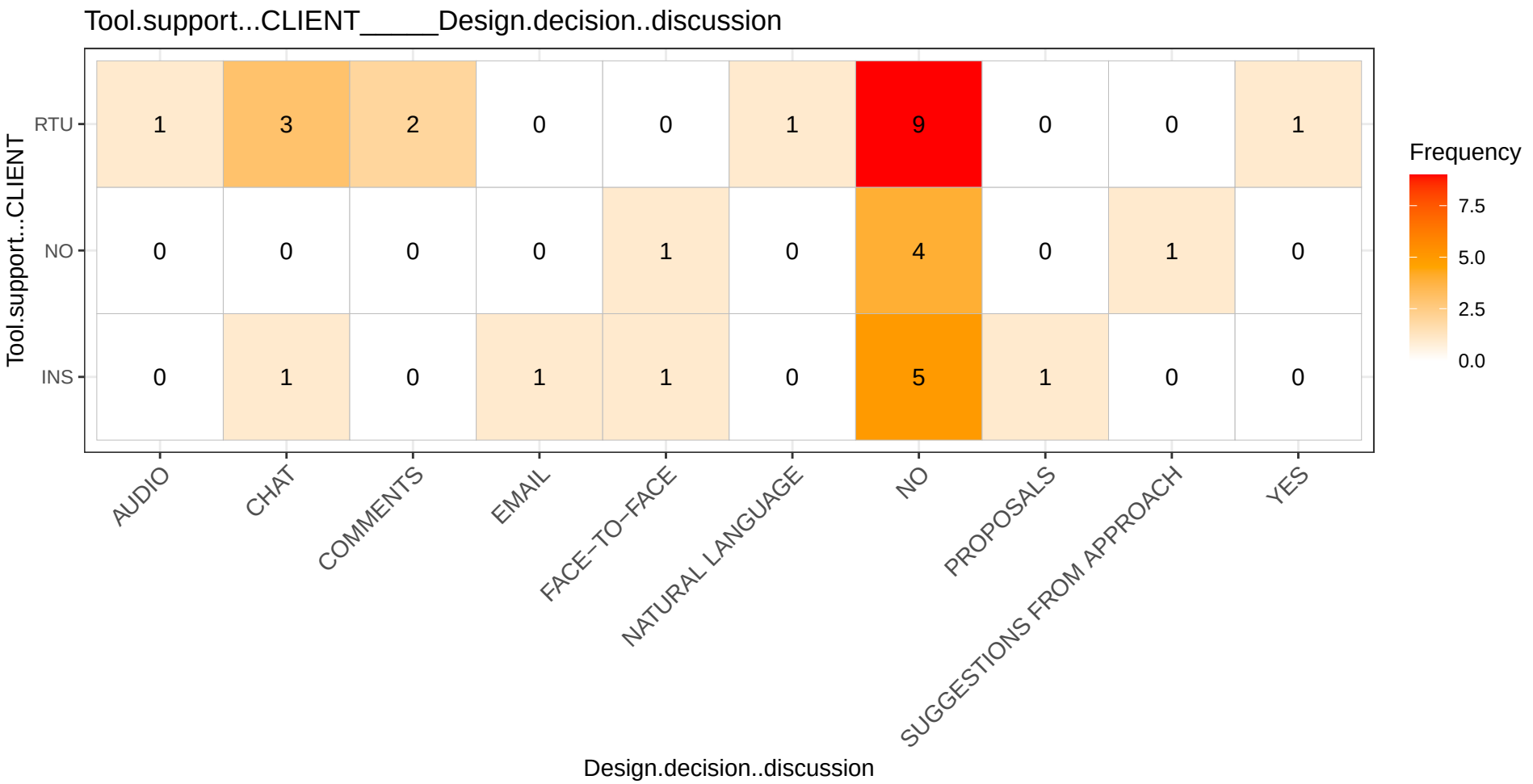

Tool.support...CLIENT_____Communication.type
RTU
NO
INS
8
15
6
6
7
8
Tool.support...CLIENT
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

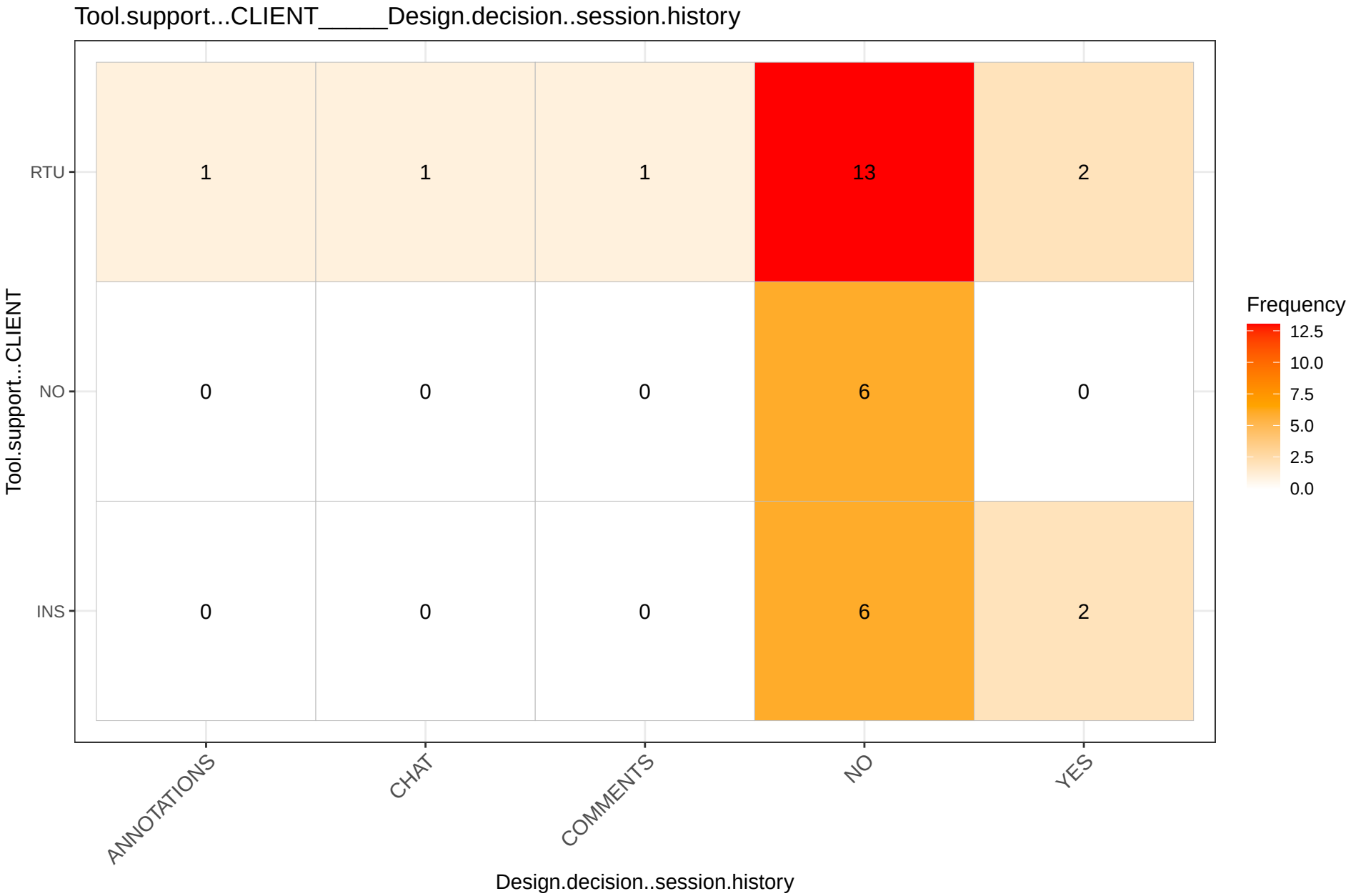

Tool.support...CLIENT_____Communication.means...builtin
Tool.support...CLIENT
RTU
NO
INS
2 2 3 0 5 1 3 1 4 1 5 2 0 1 2 1 3
0 0 1 0 0 0 1 1 1 0 3 0 0 1 0 0 0
1 1 1 1 2 0 1 0 1 0 5 0 1 2 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
5
4
3
2
1
0

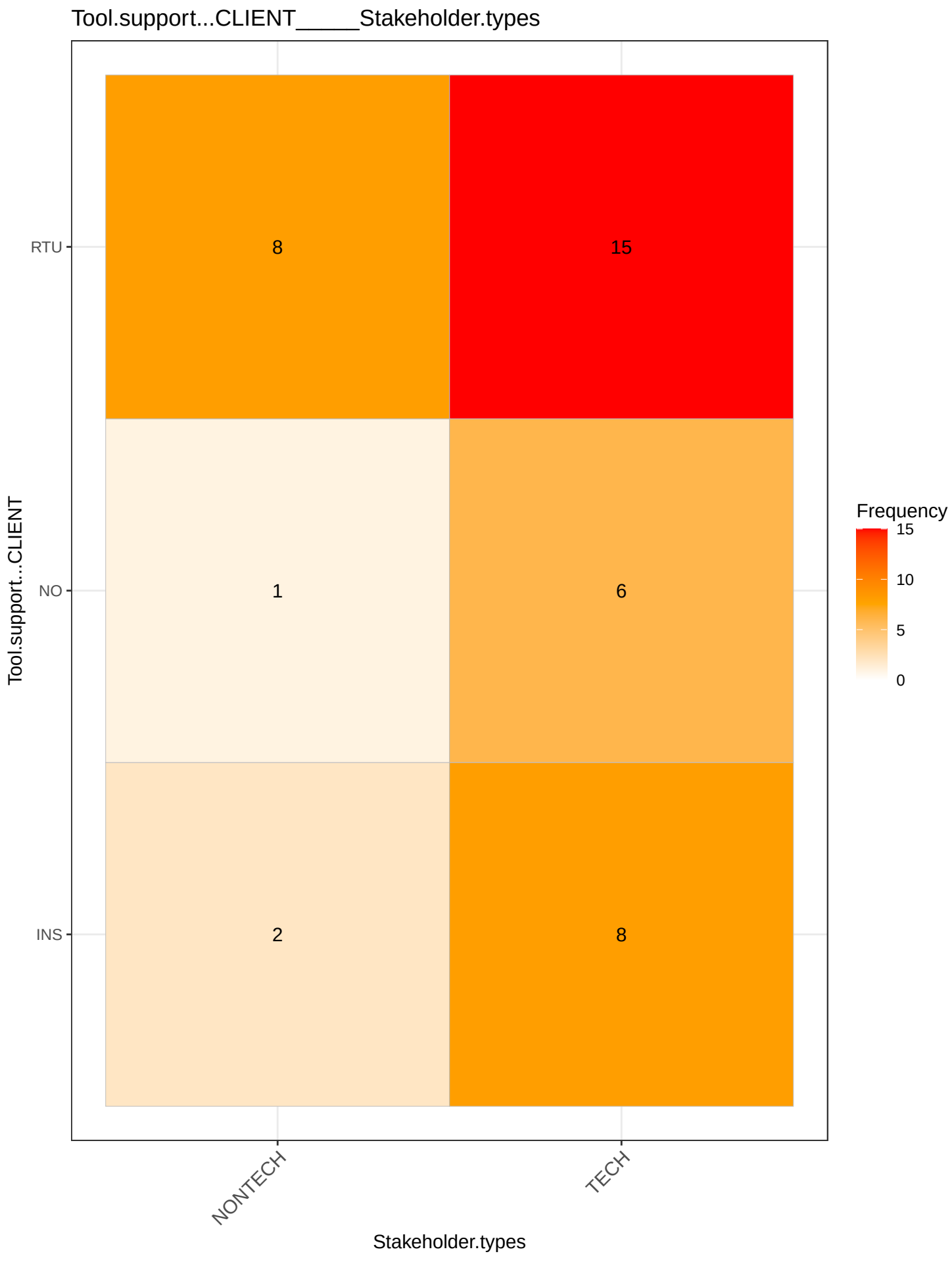

Tool.support...CLIENT_____Communication.means...external
Tool.support...CLIENT
RTU
NO
INS
1
2
4
1
1
8
1
1
0
1
0
1
0
4
0
0
0
2
2
1
0
4
0
0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
8
6
4
2
0

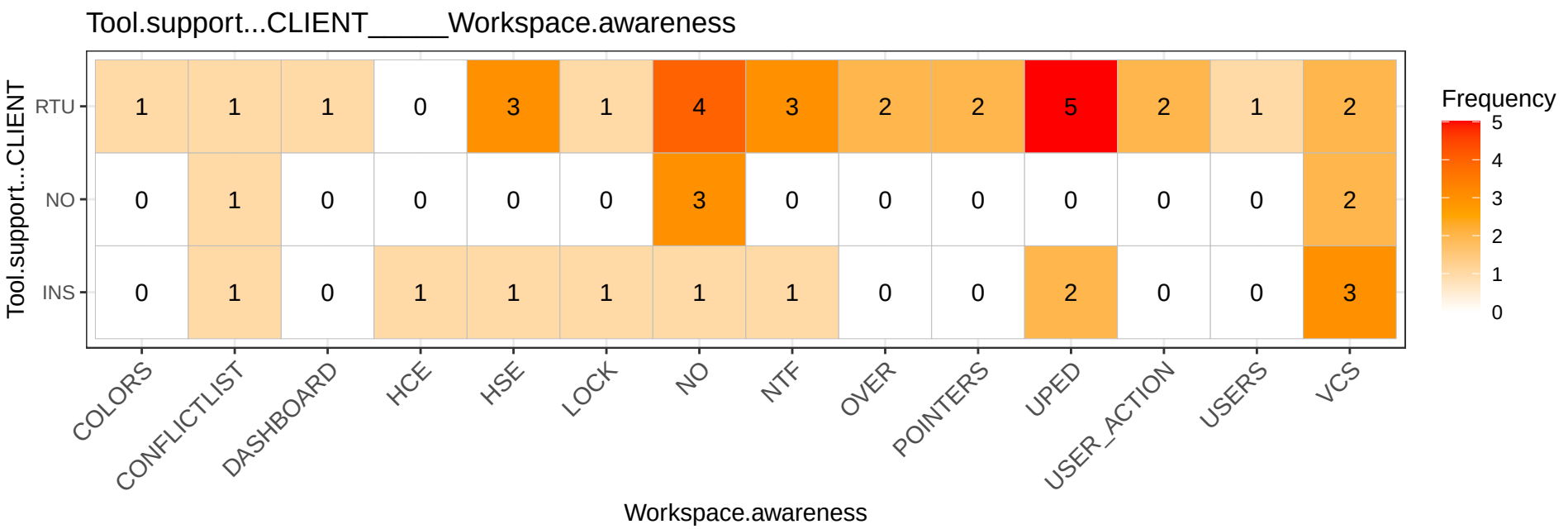

Tool.support...CLIENT_____Communication.means...mixed
RTU
NO
INS
0
1
1
13
0
0
0
6
1
0
1
6
Tool.support...CLIENT
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

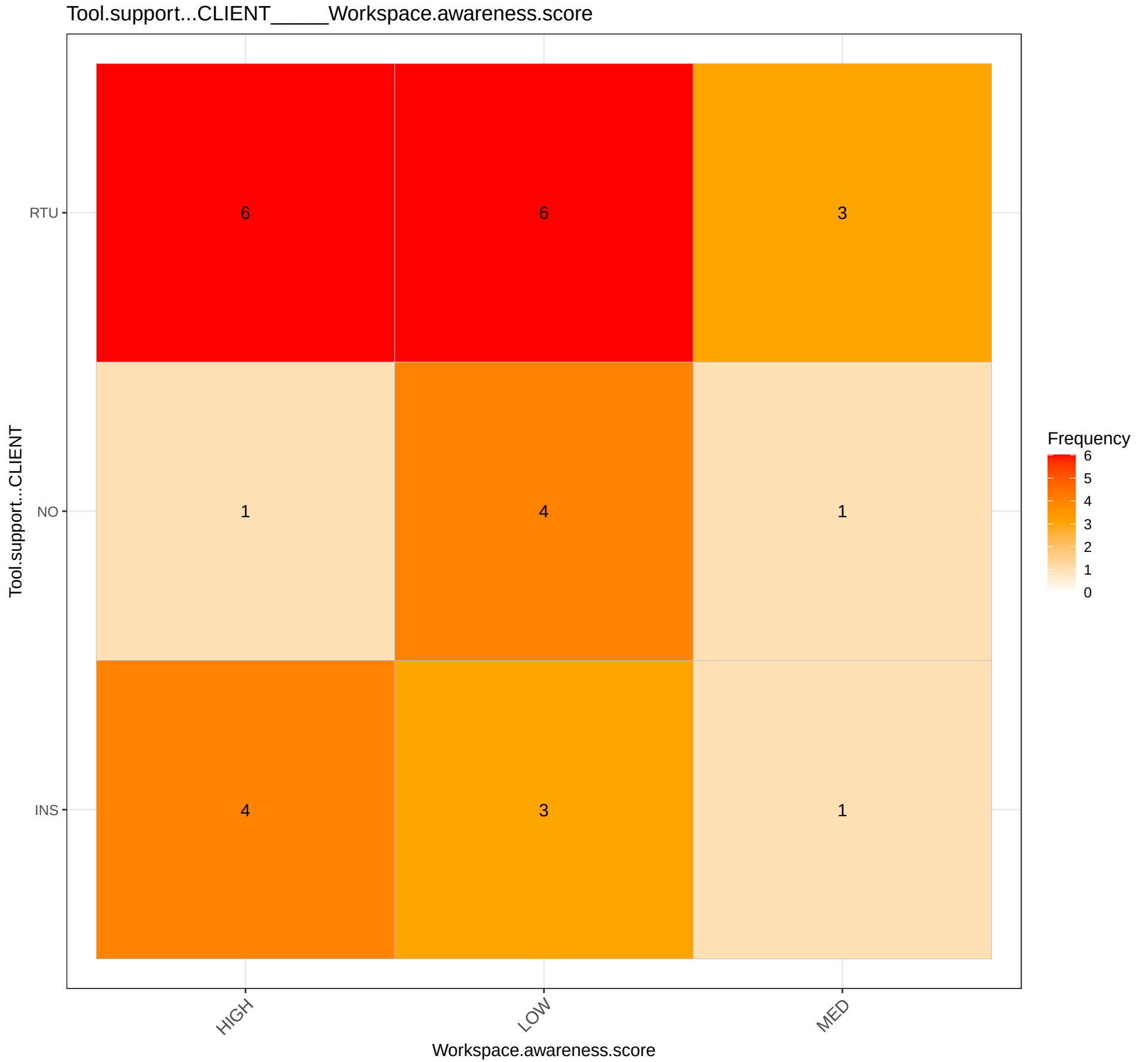

Tool.support...CLIENT_____Communication.means.links
Tool.support...CLIENT
RTU
NO
INS
1 1 0 2 1 1 0 0 1 13 2 0 0 1
0 0 0 0 0 0 0 1 0 5 0 0 0 0
1 0 1 0 0 1 1 0 0 7 0 1 1 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

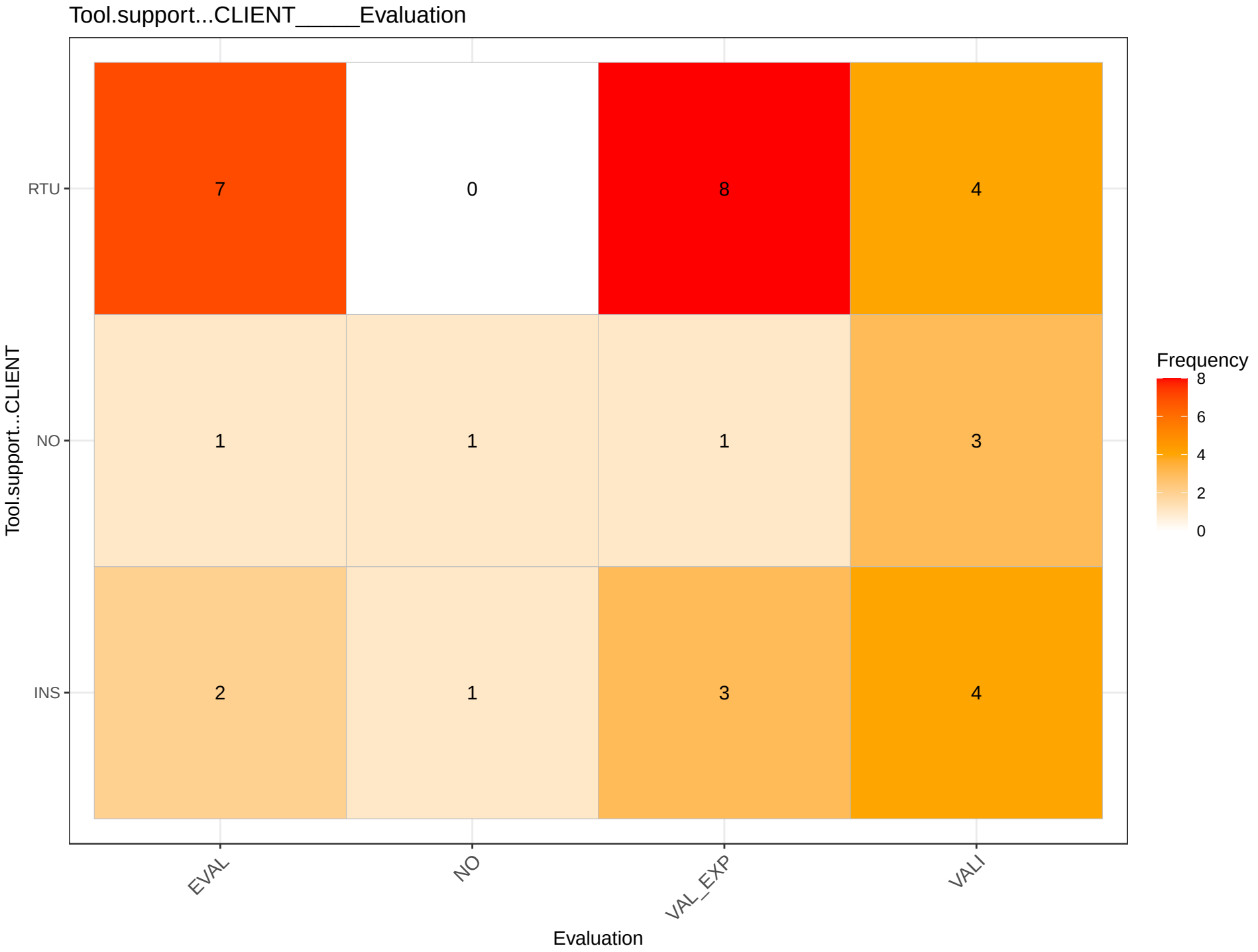

Tool.support...CLIENT_____Design.decision..discussion
Tool.support...CLIENT
RTU
NO
INS
1
3
2
0
0
1
9
0
0
1
0
0
0
0
1
0
4
0
1
0
0
1
0
1
1
0
5
1
0
0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
7.5
5.0
2.5
0.0


Tool.support...CLIENT_____Design.decision..session.history
RTU
NO
INS
1
1
1
13
2
0
0
0
6
0
0
0
0
6
2
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Tool.support...CLIENT
Design.decision..session.history
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Tool.support...CLIENT_____Stakeholder.types
RTU
NO
INS
8
15
1
6
2
8
Tool.support...CLIENT
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0


Tool.support...CLIENT_____Workspace.awareness
Tool.support...CLIENT
RTU
NO
INS
1 1 1 0 3 1 4 3 2 2 5 2 1 2
0 1 0 0 0 0 3 0 0 0 0 0 0 2
0 1 0 1 1 1 1 1 0 0 2 0 0 3
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
5
4
3
2
1
0


Tool.support...CLIENT_____Workspace.awareness.score
RTU
NO
INS
6
6
3
1
4
1
4
3
1
HIGH
LOW
MED
Tool.support...CLIENT
Workspace.awareness.score
Frequency
6
5
4
3
2
1
0


Tool.support...CLIENT_____Evaluation
RTU
NO
INS
7
0
8
4
1
1
1
3
2
1
3
4
EVAL
NO
VAL_EXP
VALI
Evaluation
Tool.support...CLIENT
Frequency
8
6
4
2
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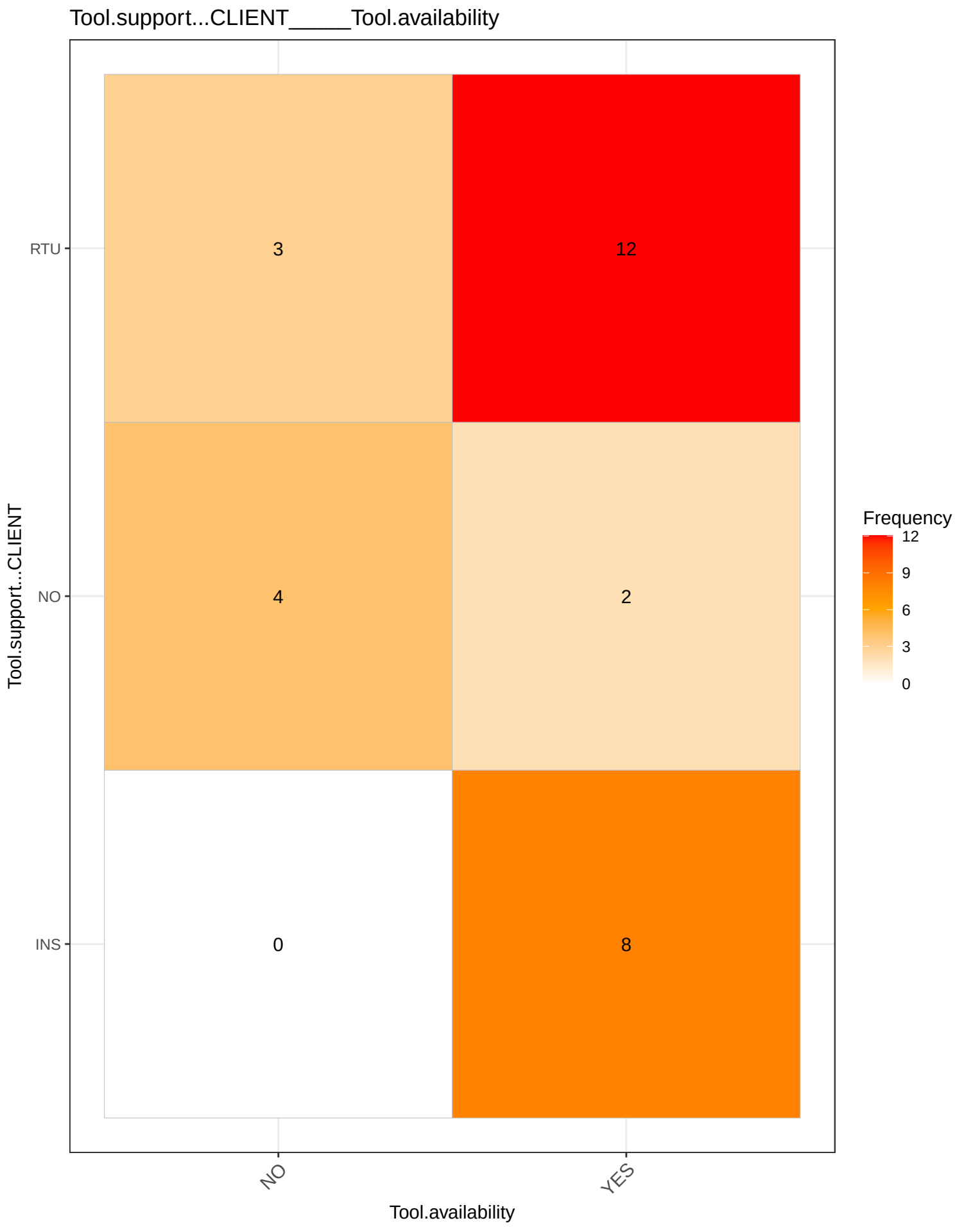
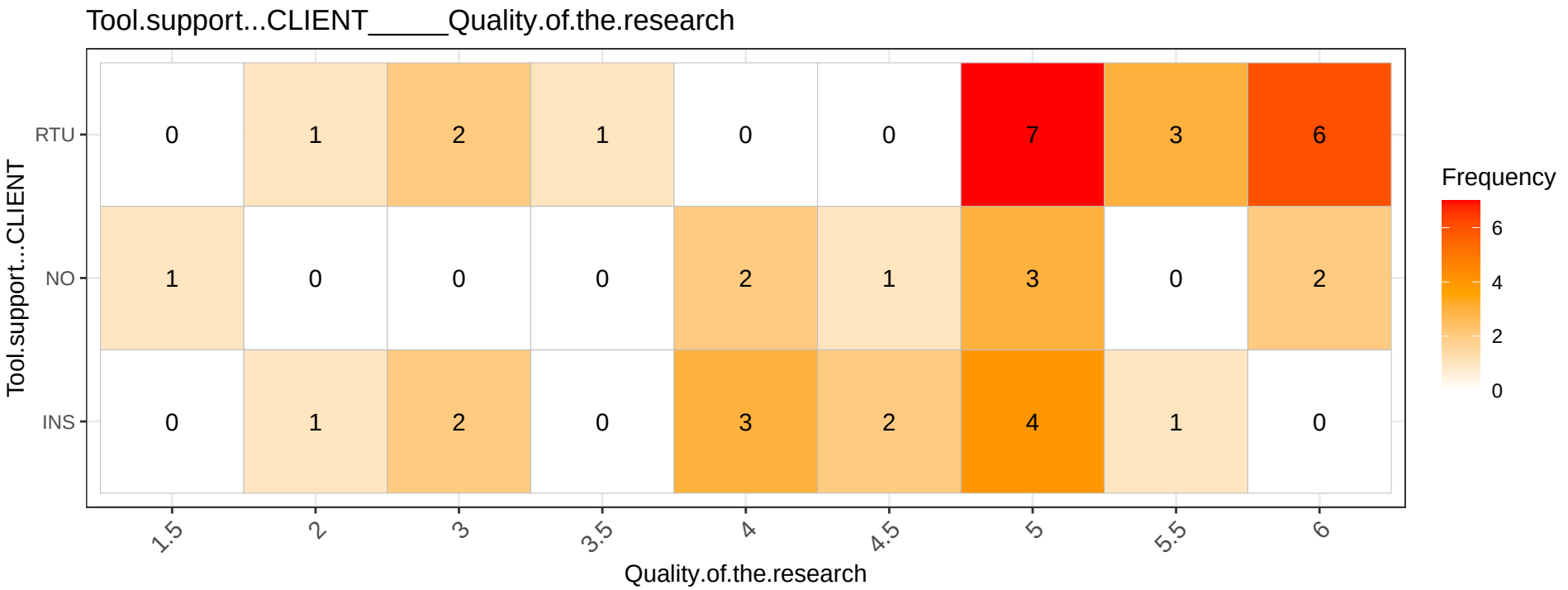
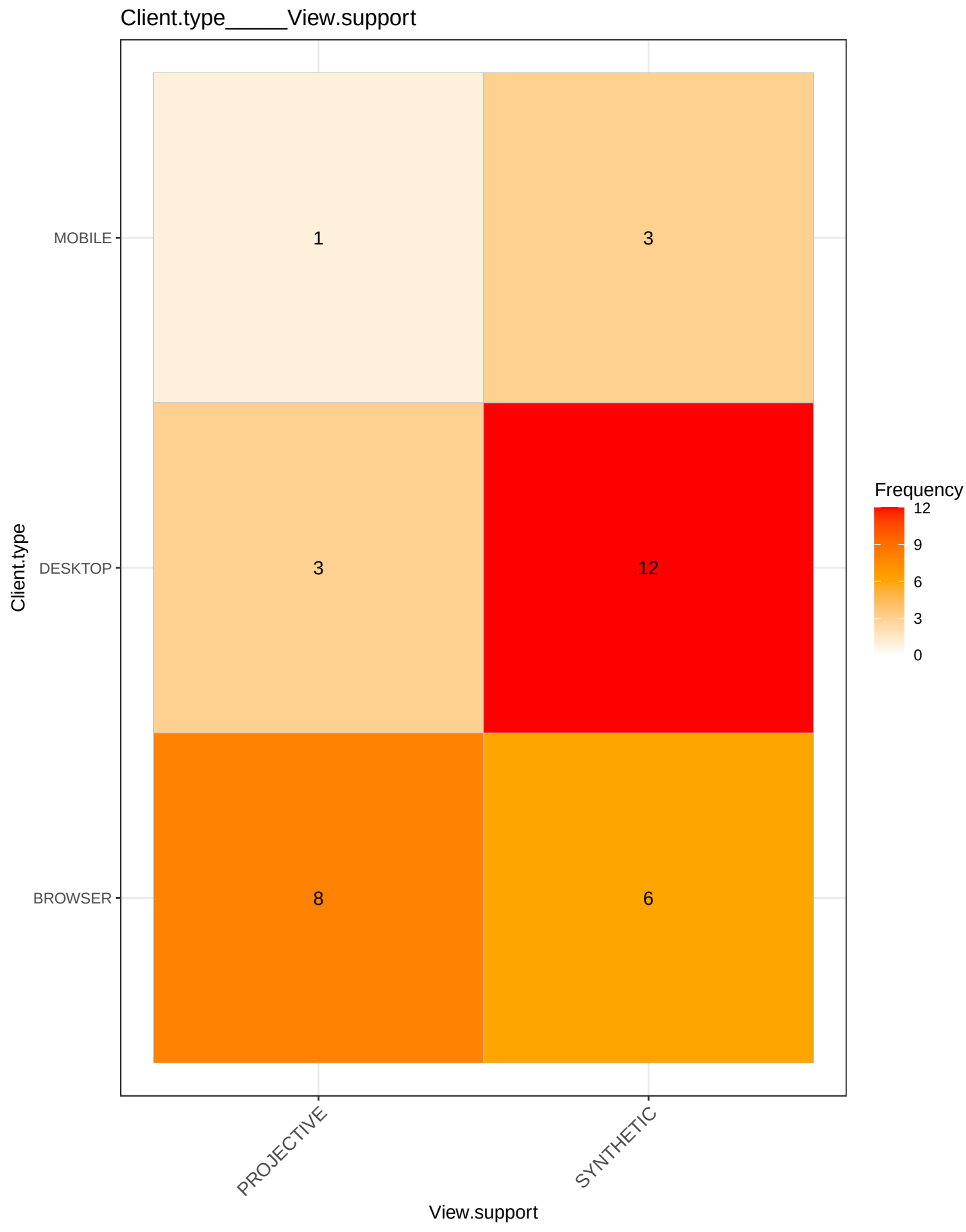
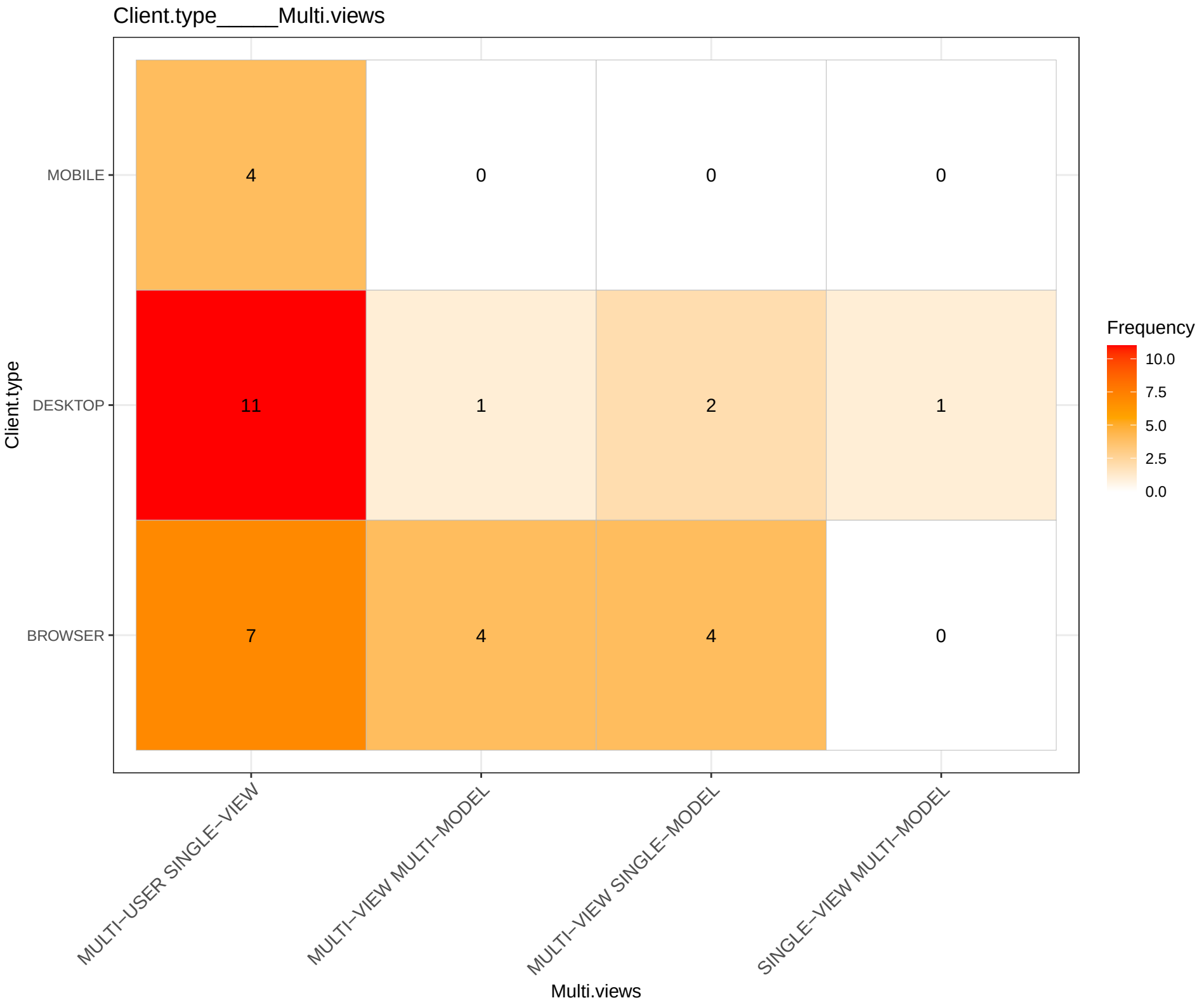
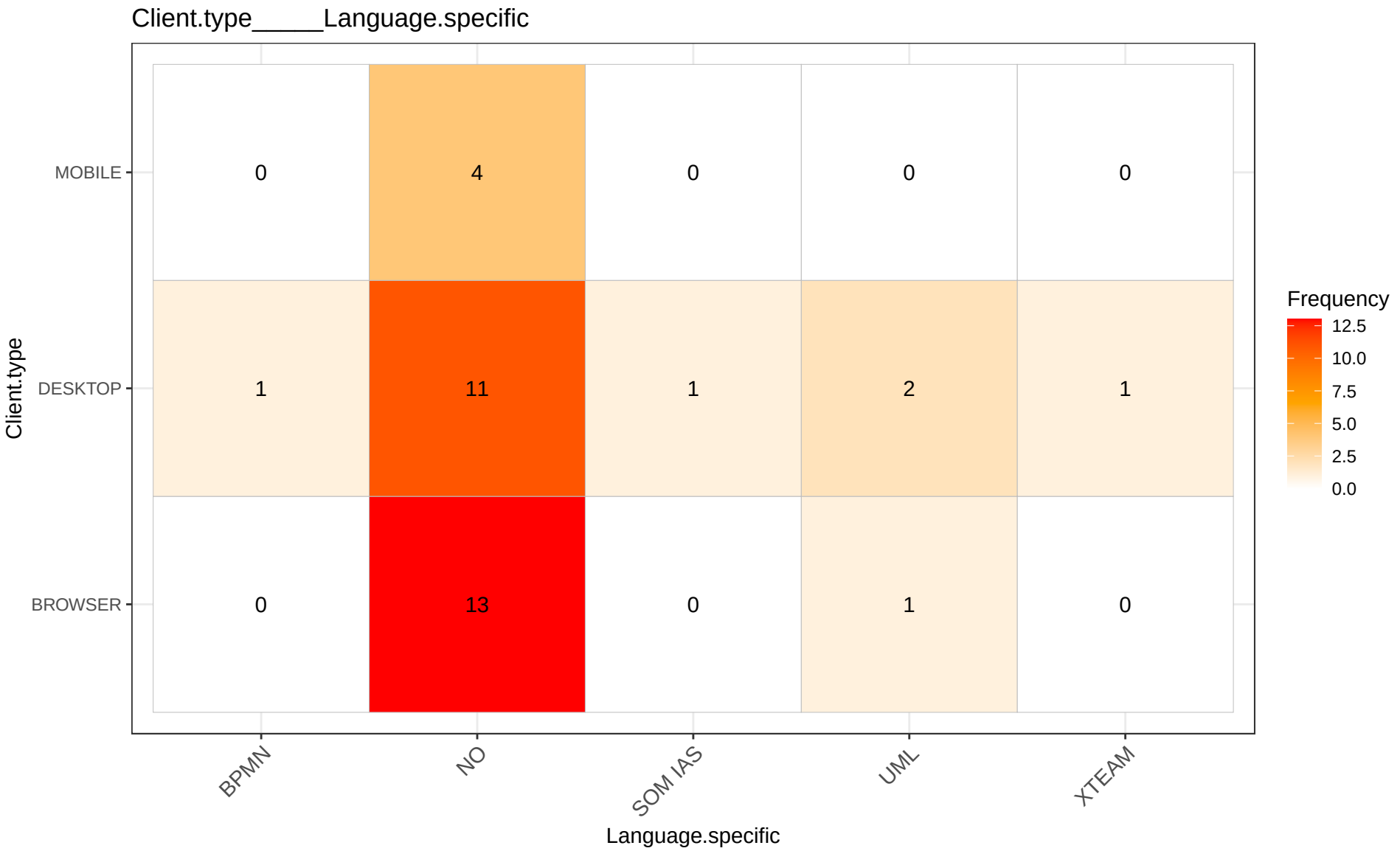
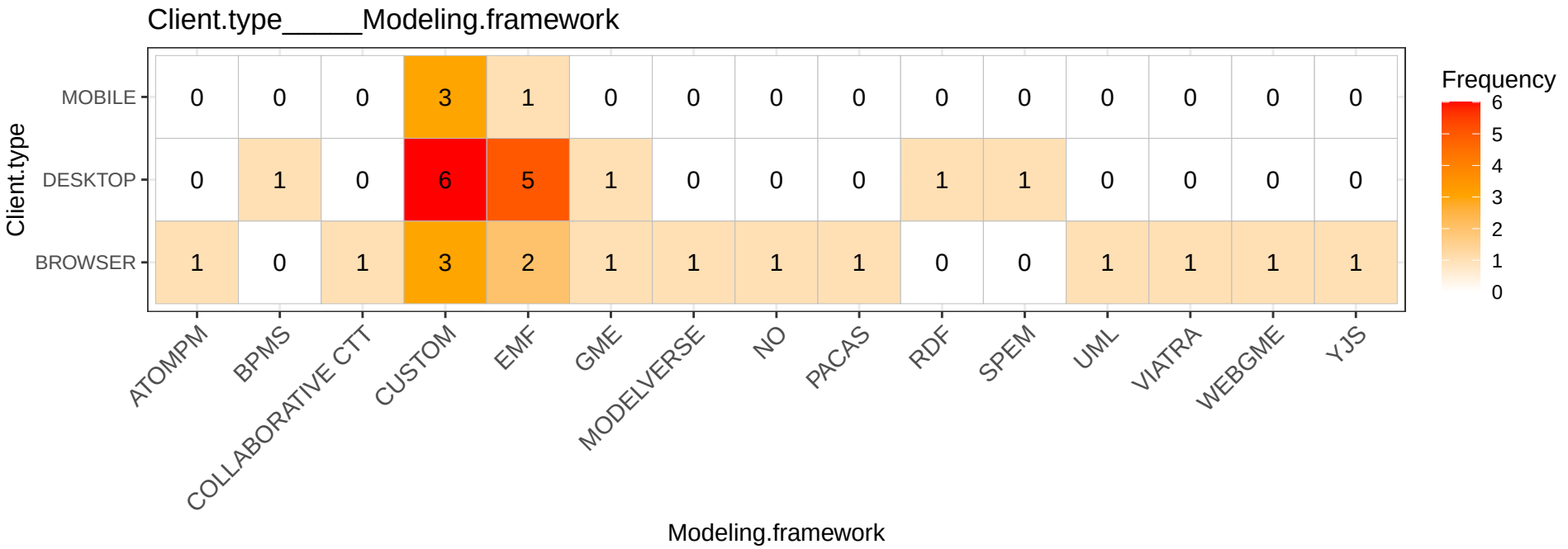

Tool.support...CLIENT_____Tool.availability
RTU
NO
INS
3
12
4
2
0
8
Tool.support...CLIENT
NO
YES
Tool.availability
Frequency
12
9
6
3
0

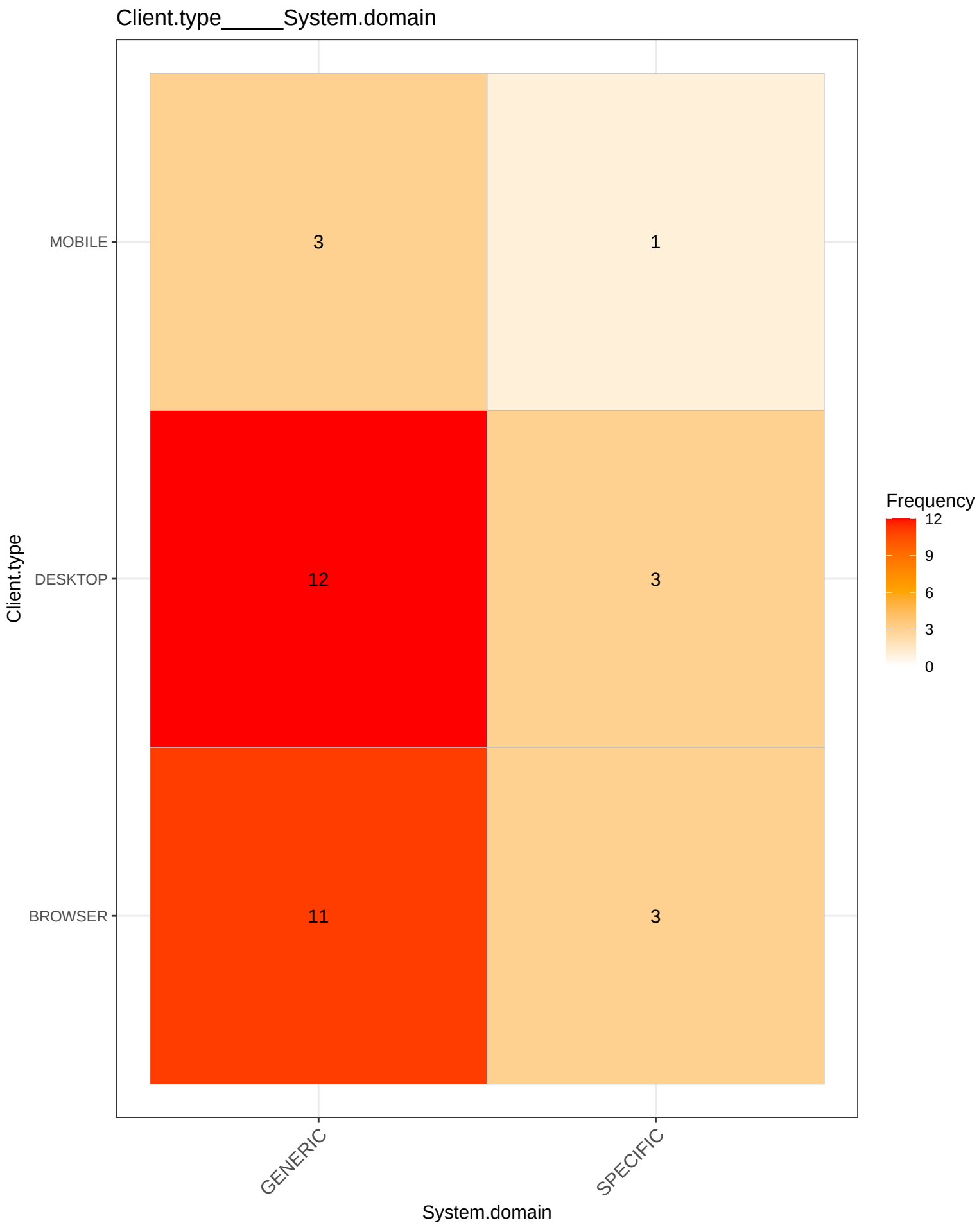

Tool.support...CLIENT_____Quality.of.the.research
Tool.support...CLIENT
RTU
NO
INS
0 1 2 1 0 0 7 3 6
1 0 0 0 2 1 3 0 2
0 1 2 0 3 2 4 1 0
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
6
4
2
0

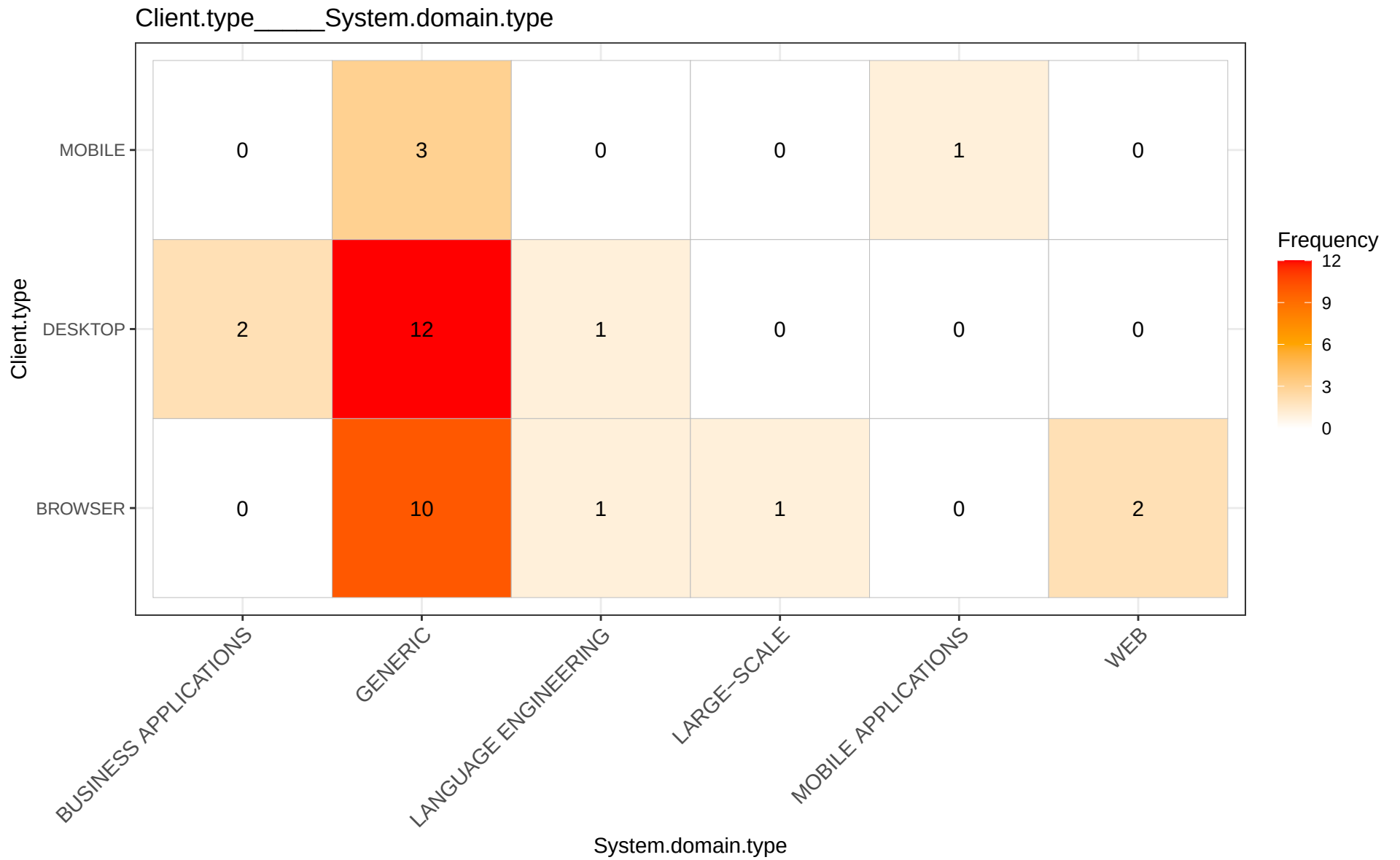

Client.type_____View.support
MOBILE
DESKTOP
BROWSER
1
3
3
12
8
6
Client.type
PROJECTIVE
SYNTHETIC
View.support
Frequency
12
9
6
3
0

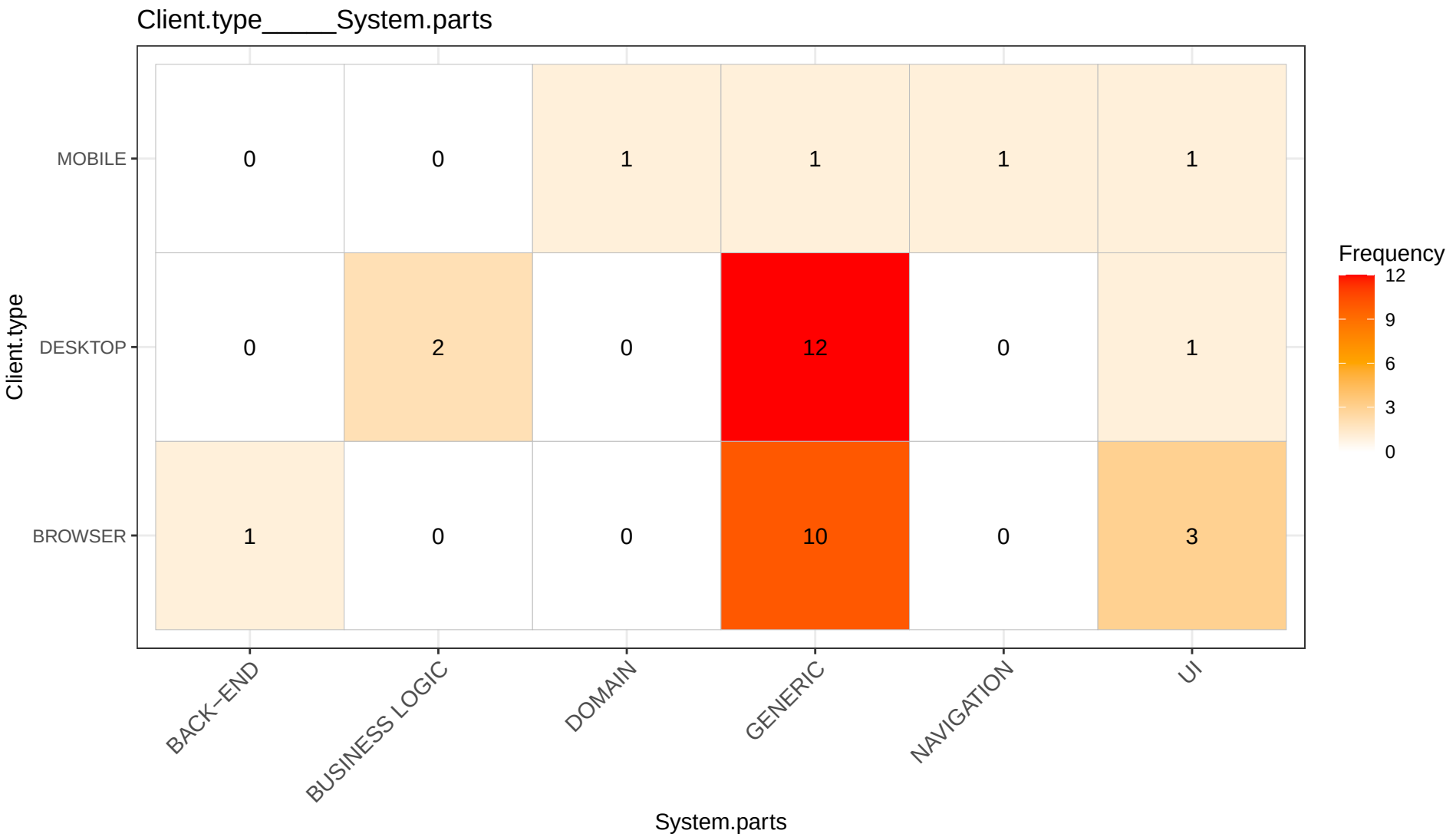

Client.type_____Multi.views
MOBILE
DESKTOP
BROWSER
4
0
0
0
11
1
2
1
7
4
4
0
Client.type
MULTI−USER SINGLE−VIEW
MULTI−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
SINGLE−VIEW MULTI−MODEL
Multi.views
Frequency
10.0
7.5
5.0
2.5
0.0

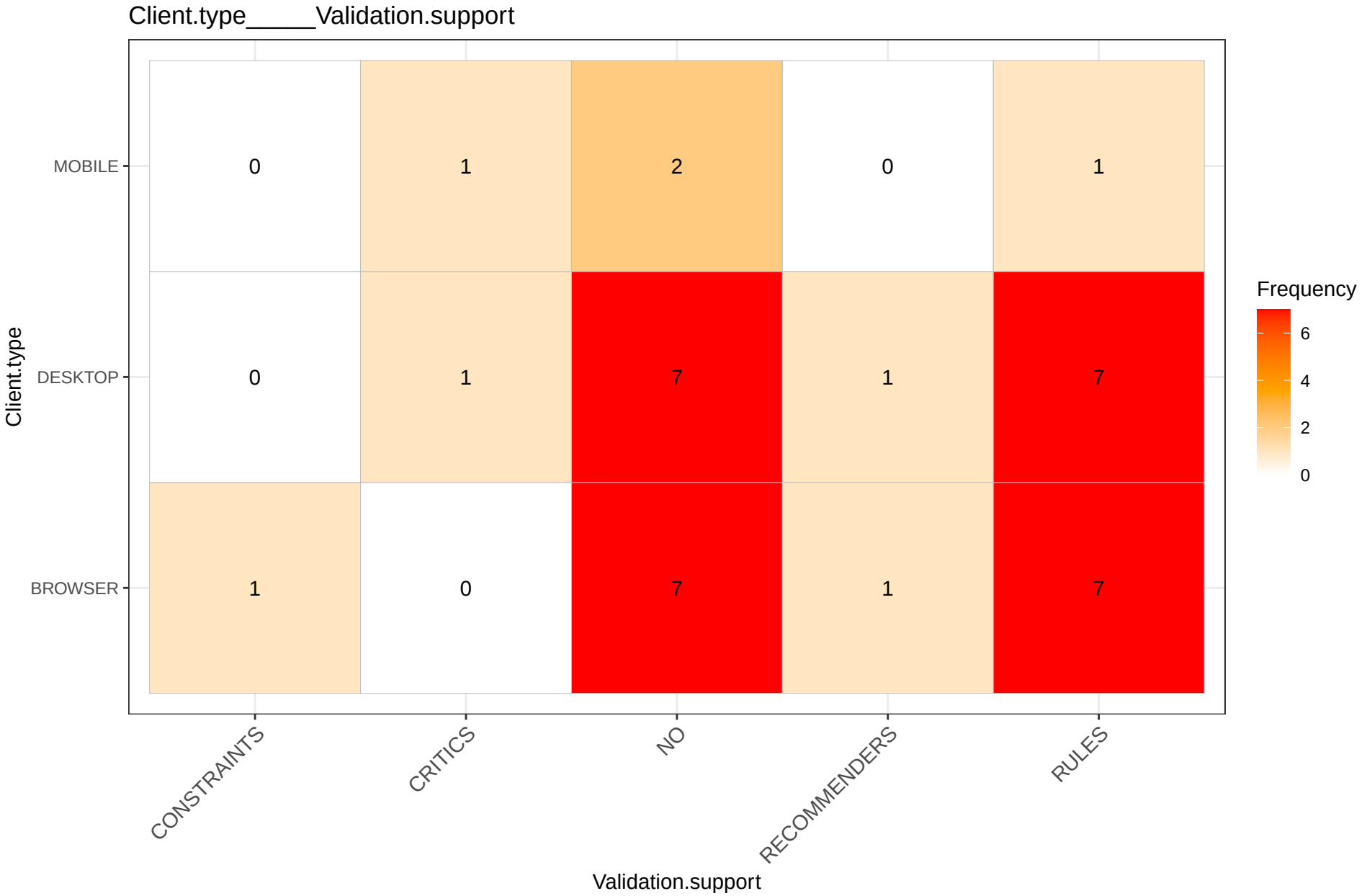

Client.type_____Language.specific
MOBILE
DESKTOP
BROWSER
Client.type
0
4
0
0
0
1
11
1
2
1
0
13
0
1
0
BPMN
NO
SOM IAS
UML
XTEAM
Language.specific
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

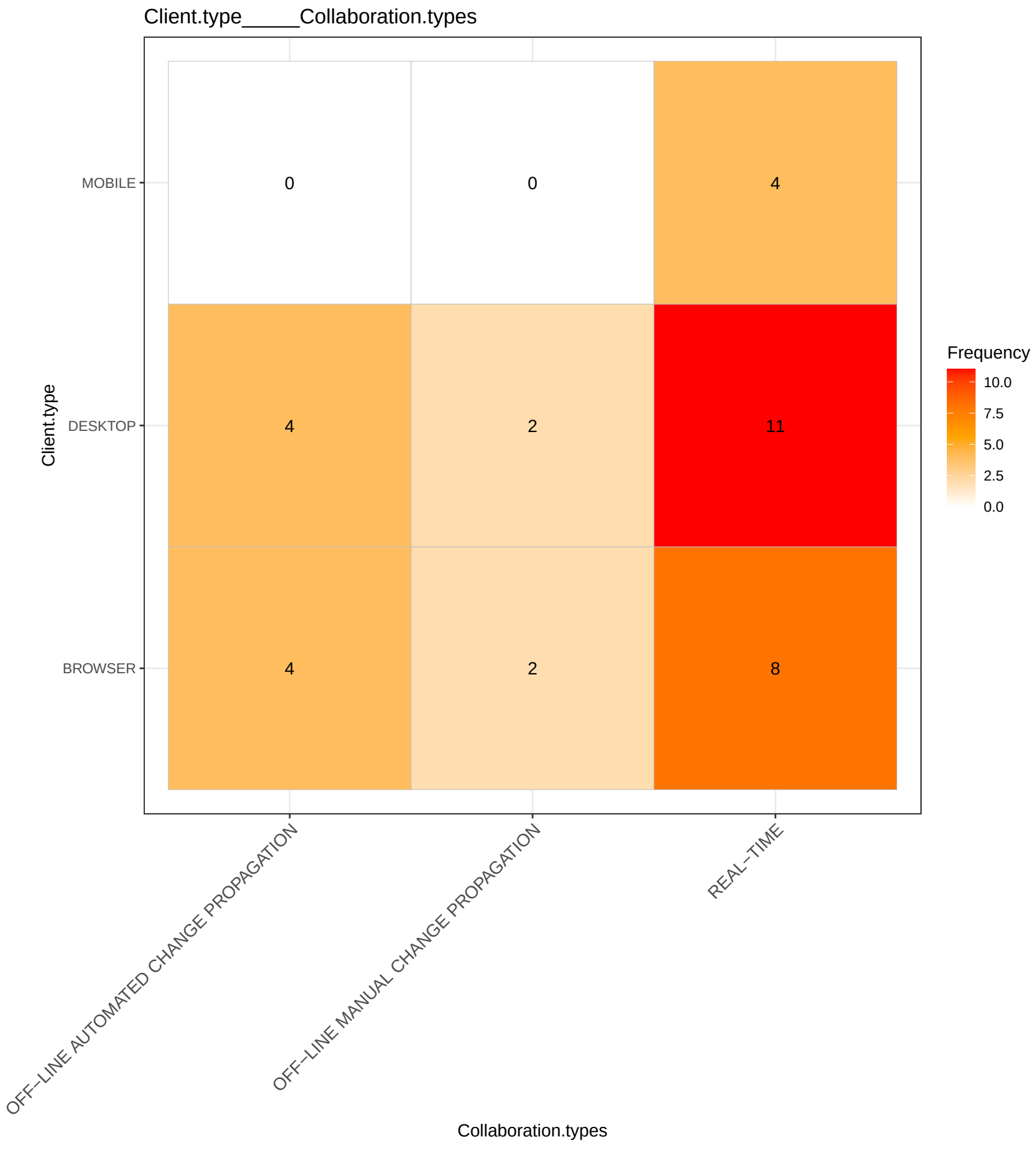

Client.type_____Modeling.framework
Client.type
MOBILE
DESKTOP
BROWSER
0 0 0 3 1 0 0 0 0 0 0 0 0 0 0
0 1 0 6 5 1 0 0 0 1 1 0 0 0 0
1 0 1 3 2 1 1 1 1 0 0 1 1 1 1
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
NO
PACAS
RDF
SPEM
UML
VIATRA
WEBGME
YJS
Modeling.framework
Frequency
6
5
4
3
2
1
0

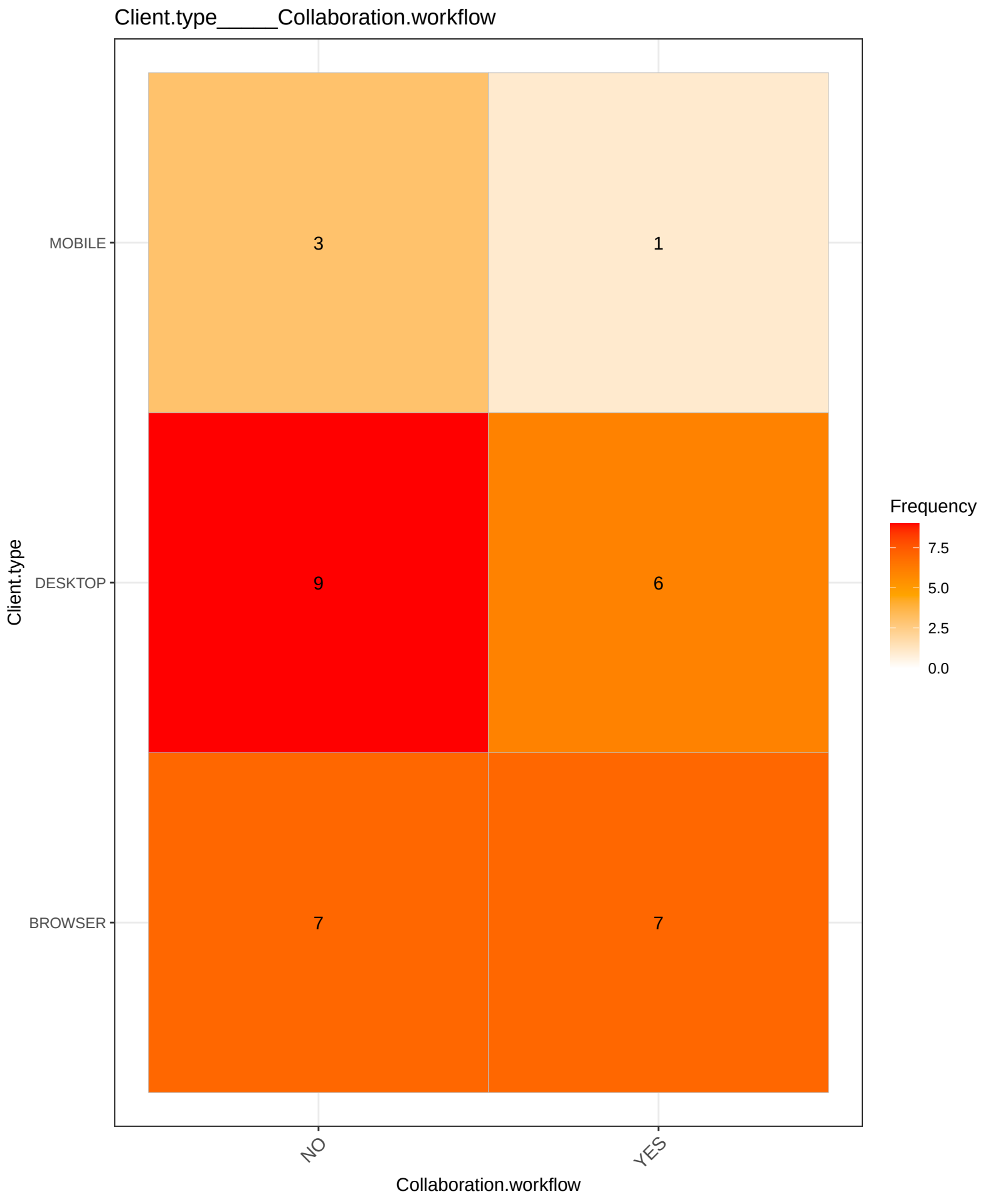

Client.type_____System.domain
MOBILE
DESKTOP
BROWSER
3
1
12
3
11
3
Client.type
GENERIC
SPECIFIC
System.domain
Frequency
12
9
6
3
0

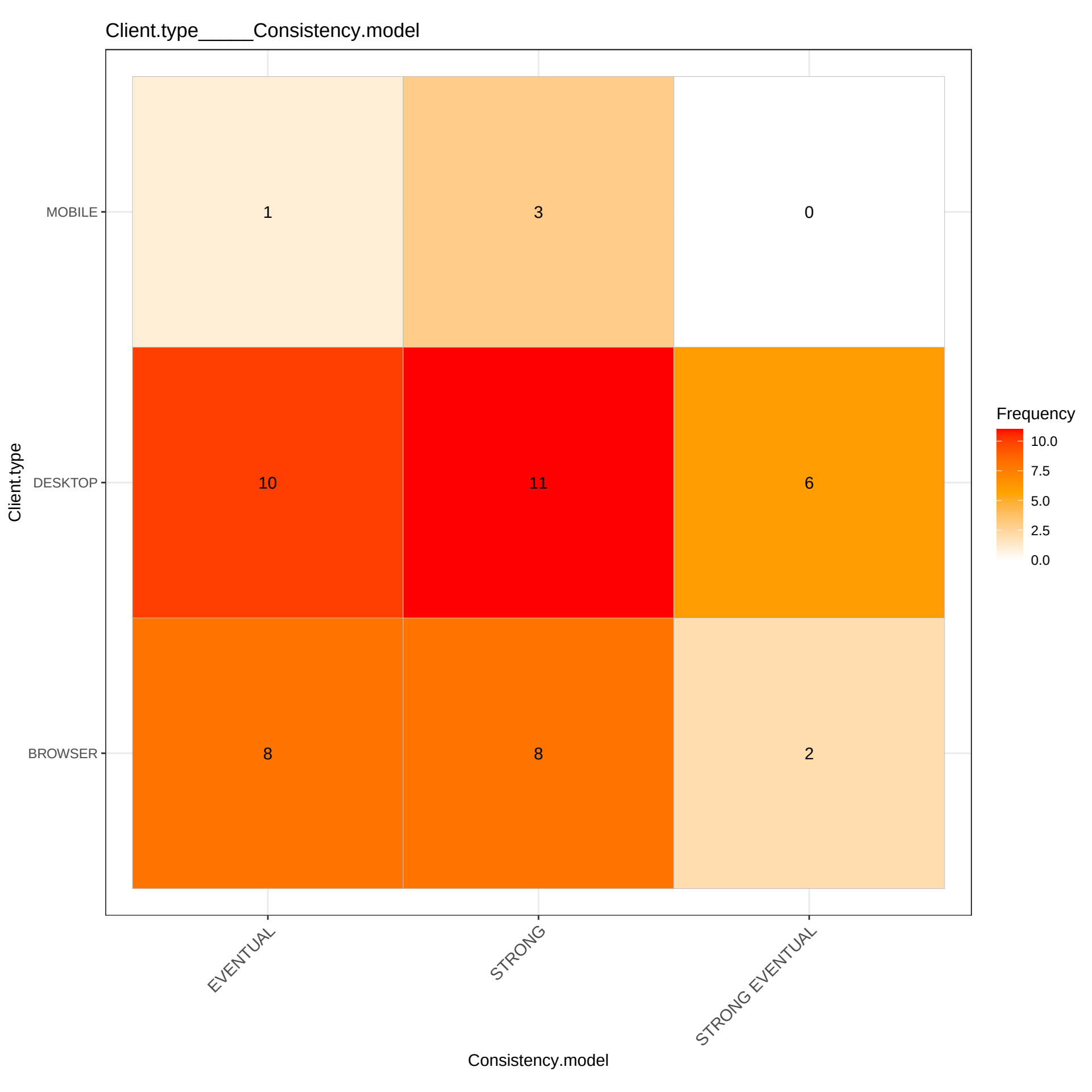

Client.type_____System.domain.type
MOBILE
DESKTOP
BROWSER
Client.type
0
3
0
0
1
0
2
12
1
0
0
0
0
10
1
1
0
2
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
12
9
6
3
0

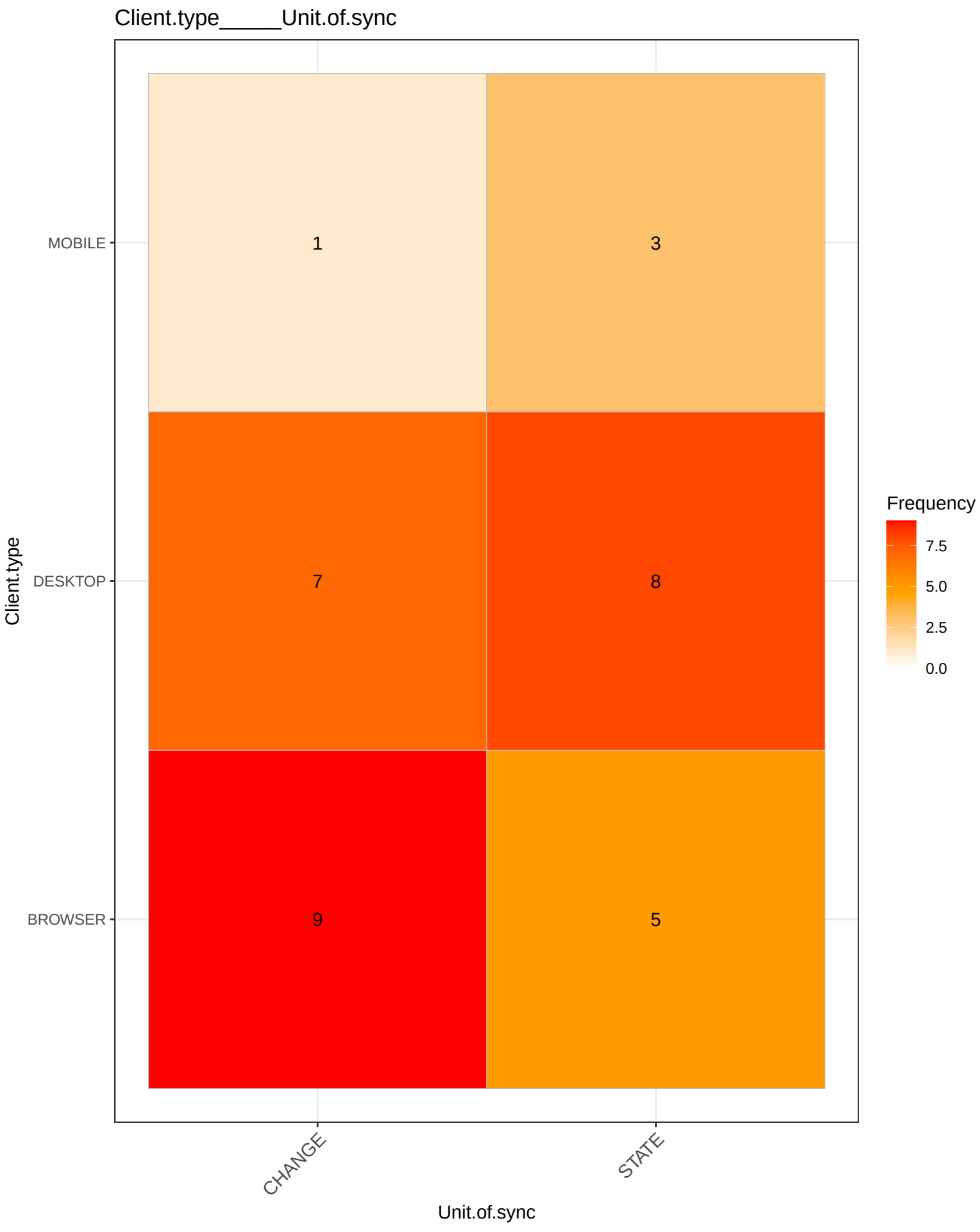

Client.type_____System.parts
MOBILE
DESKTOP
BROWSER
Client.type
0
0
1
1
1
1
0
2
0
12
0
1
1
0
0
10
0
3
BACK-END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
12
9
6
3
0

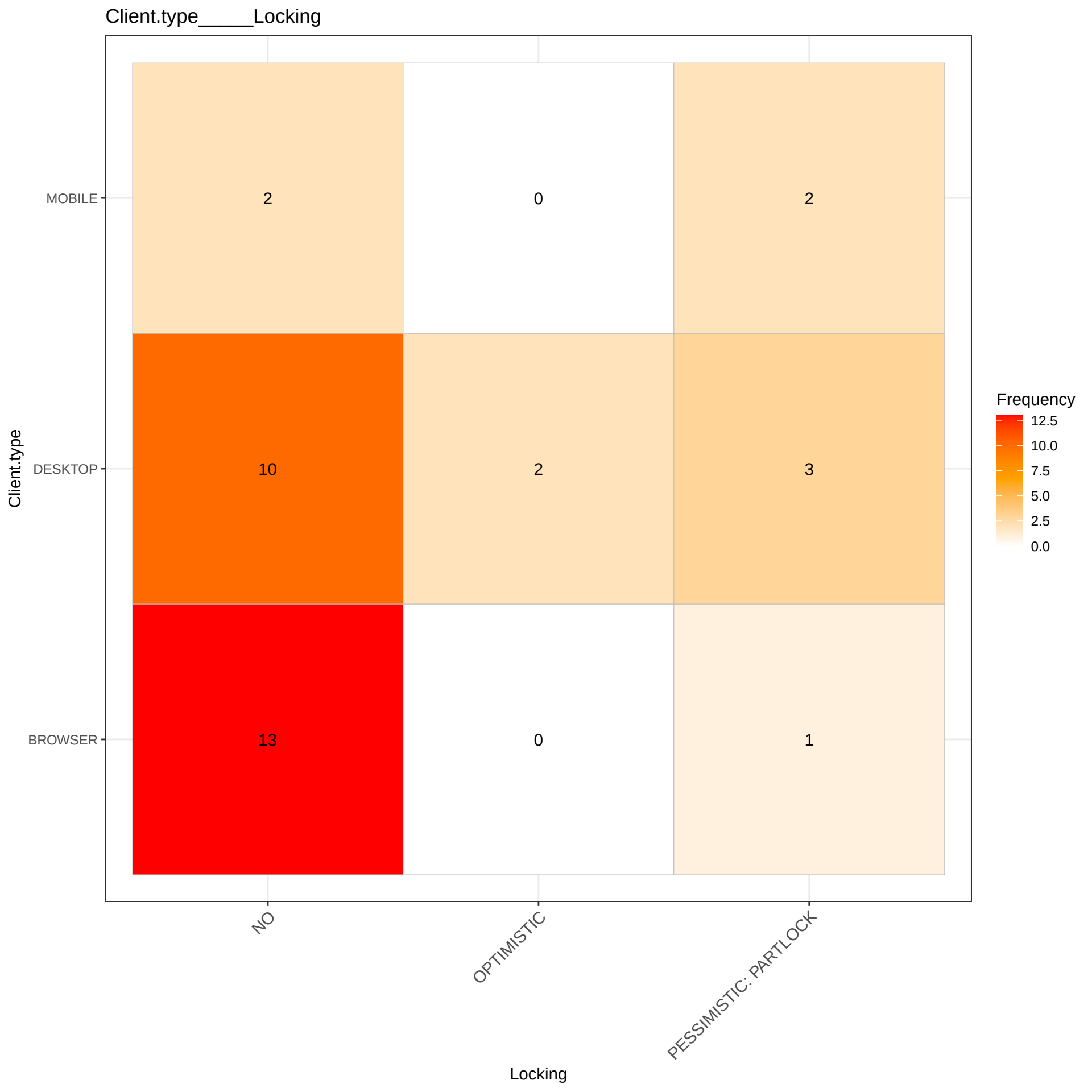

Client.type_____Validation.support
MOBILE
DESKTOP
BROWSER
Client.type
0
1
2
0
1
0
1
7
1
7
1
0
7
1
7
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
6
4
2
0

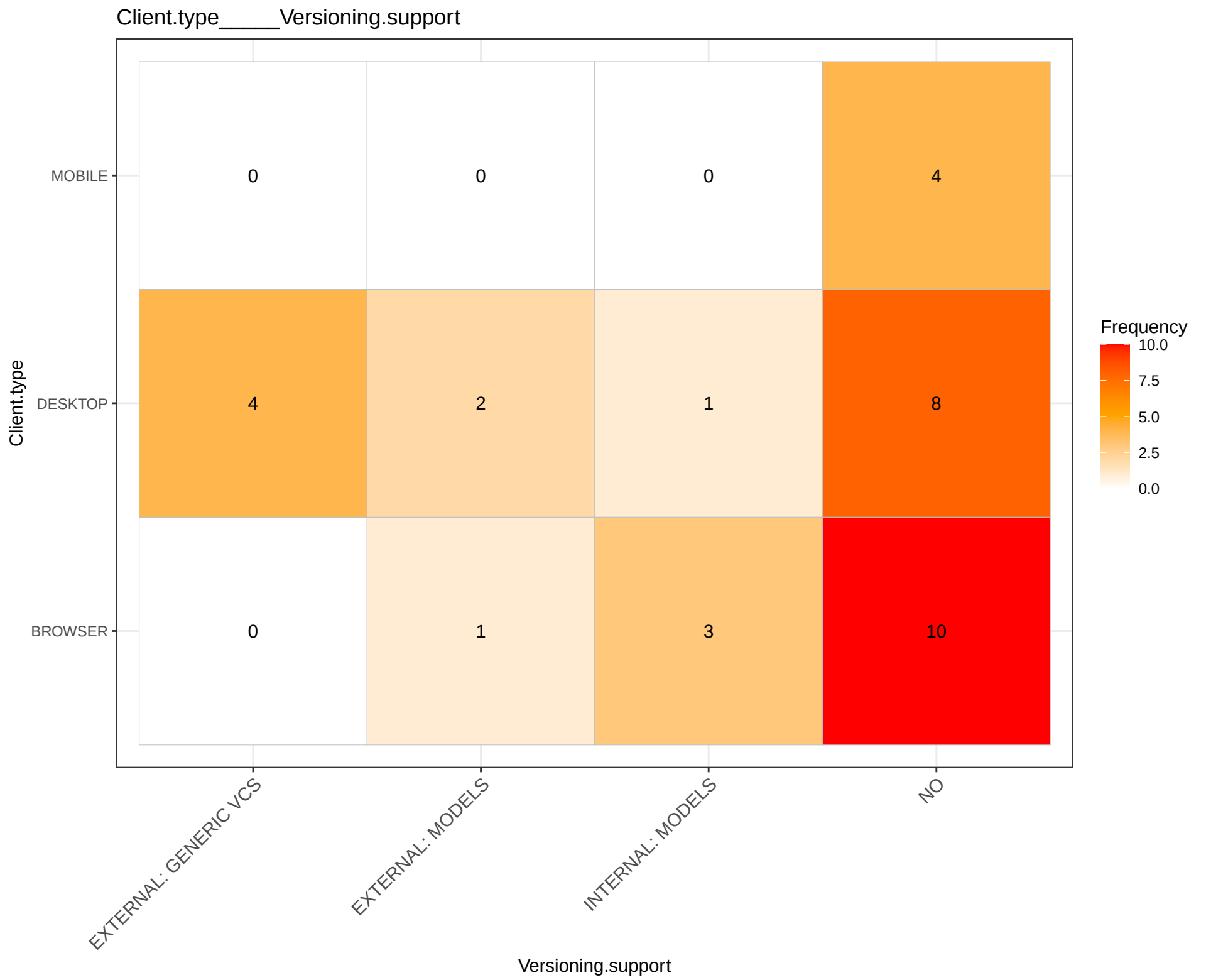

Client.type_____Collaboration.types
MOBILE
DESKTOP
BROWSER
Client.type
0
0
4
4
2
11
4
2
8
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types
Frequency
10.0
7.5
5.0
2.5
0.0

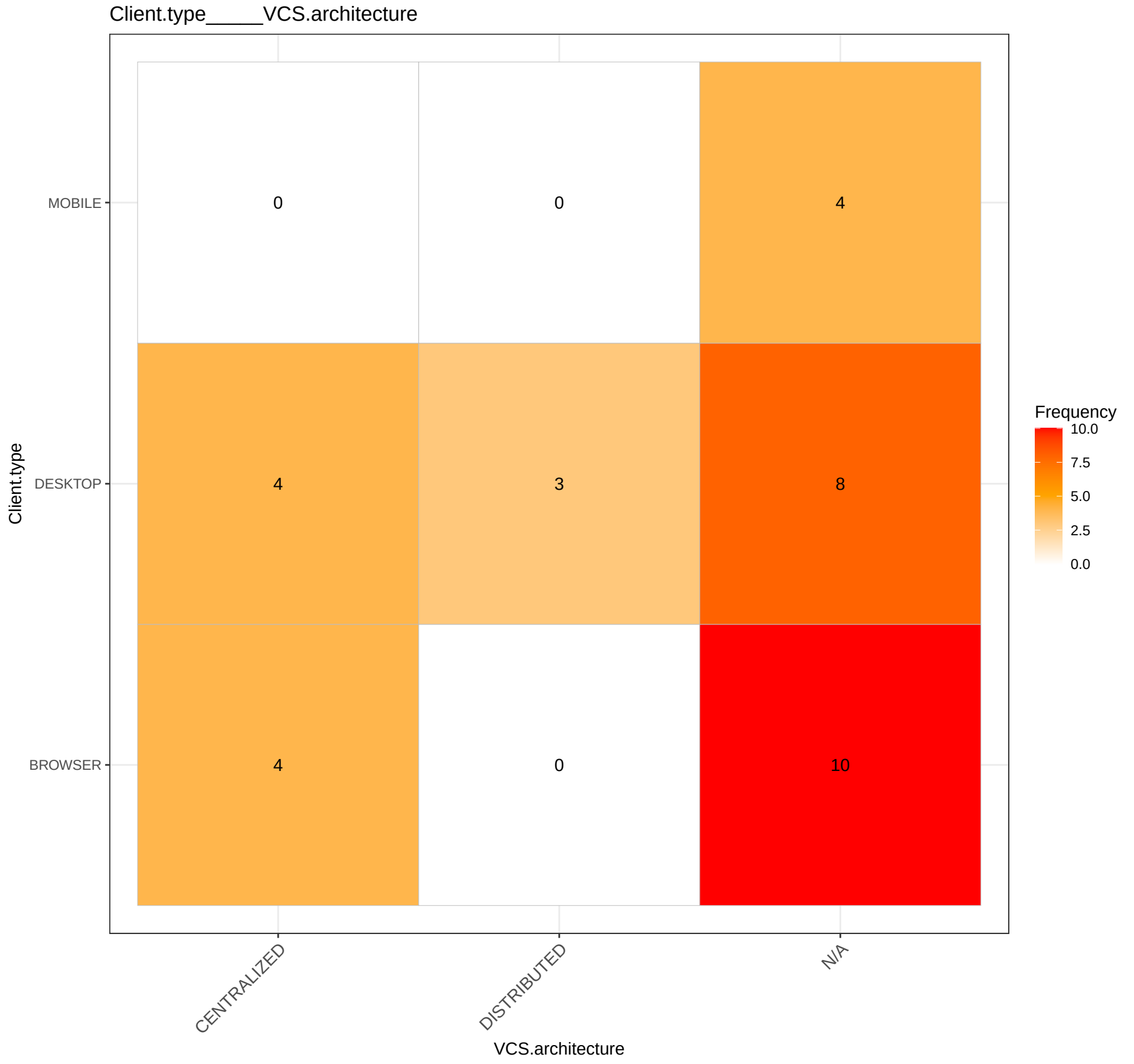

Client.type_____Collaboration.workflow
MOBILE
DESKTOP
BROWSER
Client.type
3
1
9
6
7
7
NO
YES
Collaboration.workflow
Frequency
7.5
5.0
2.5
0.0

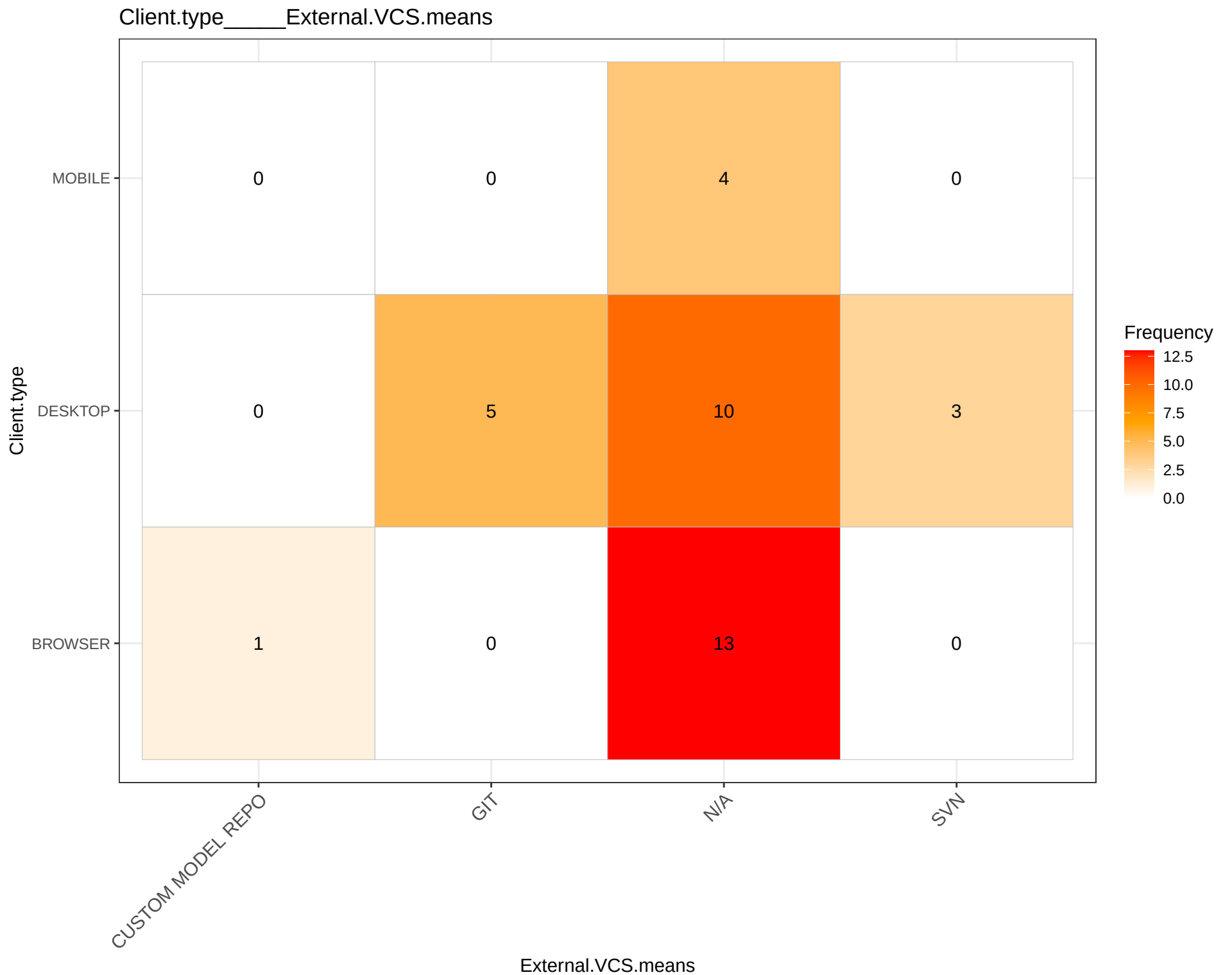

Client.type_____Consistency.model
MOBILE
DESKTOP
BROWSER
1
3
0
10
11
6
8
8
2
Client.type
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
10.0
7.5
5.0
2.5
0.0


Client.type_____Unit.of.sync
MOBILE
DESKTOP
BROWSER
1
3
7
8
9
5
Client.type
CHANGE
STATE
Unit.of.sync
Frequency
7.5
5.0
2.5
0.0


Client.type_____Locking
MOBILE
DESKTOP
BROWSER
Client.type
2
0
2
10
2
3
13
0
1
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Client.type_____Versioning.support
MOBILE
DESKTOP
BROWSER
Client.type
0
0
0
4
4
2
1
8
0
1
3
10
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
10.0
7.5
5.0
2.5
0.0


Client.type_____VCS.architecture
MOBILE
DESKTOP
BROWSER
Client.type
0
0
4
4
3
8
4
0
10
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
10.0
7.5
5.0
2.5
0.0


Client.type_____External.VCS.means
MOBILE
DESKTOP
BROWSER
Client.type
0
0
4
0
0
5
10
3
1
0
13
0
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
12.5
10.0
7.5
5.0
2.5
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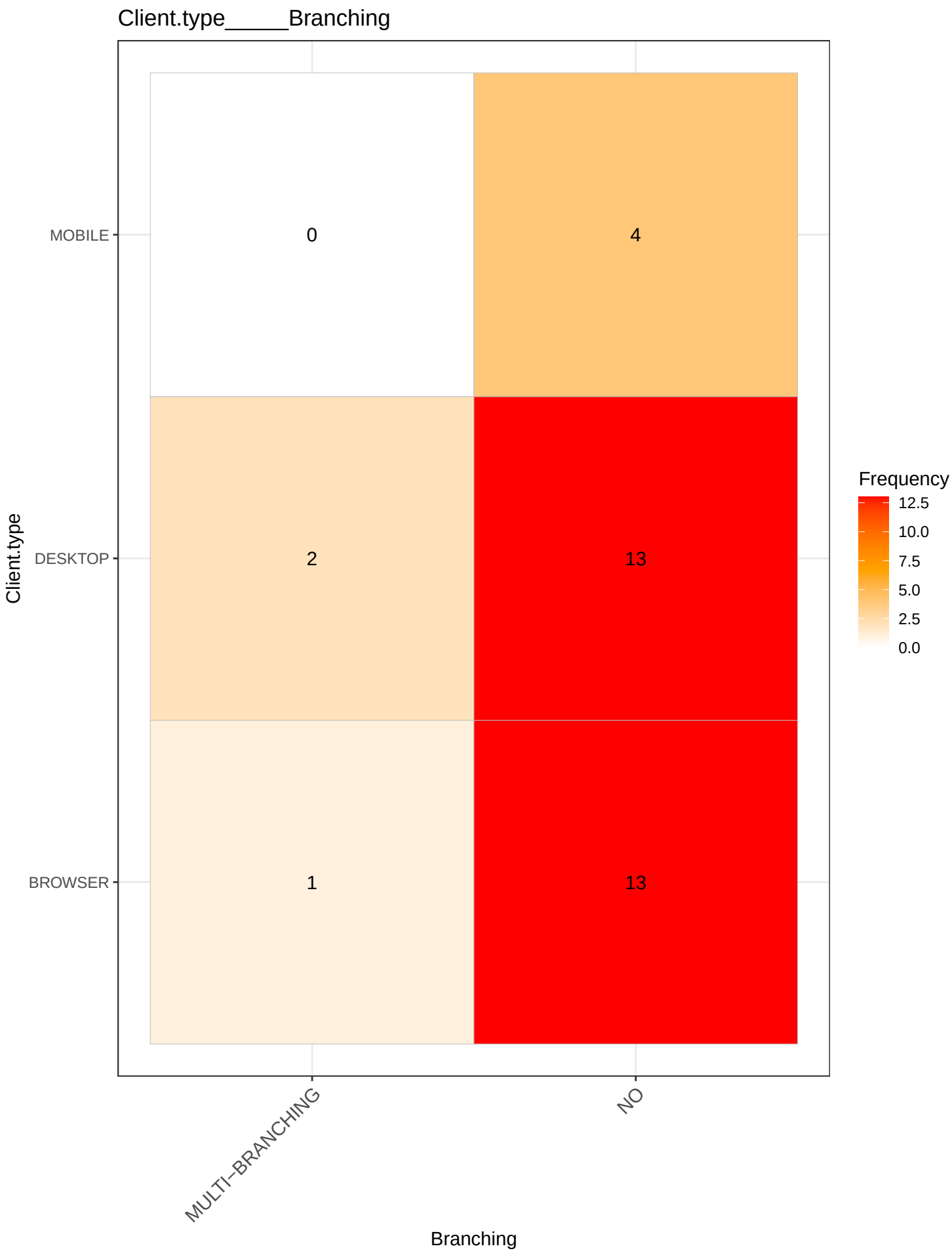
Client.type_____Branching
MOBILE
DESKTOP
BROWSER
Client.type
0
4
2
13
1
13
MULTI−BRANCHING
NO
Branching
Frequency
12.5
10.0
7.5
5.0
2.5
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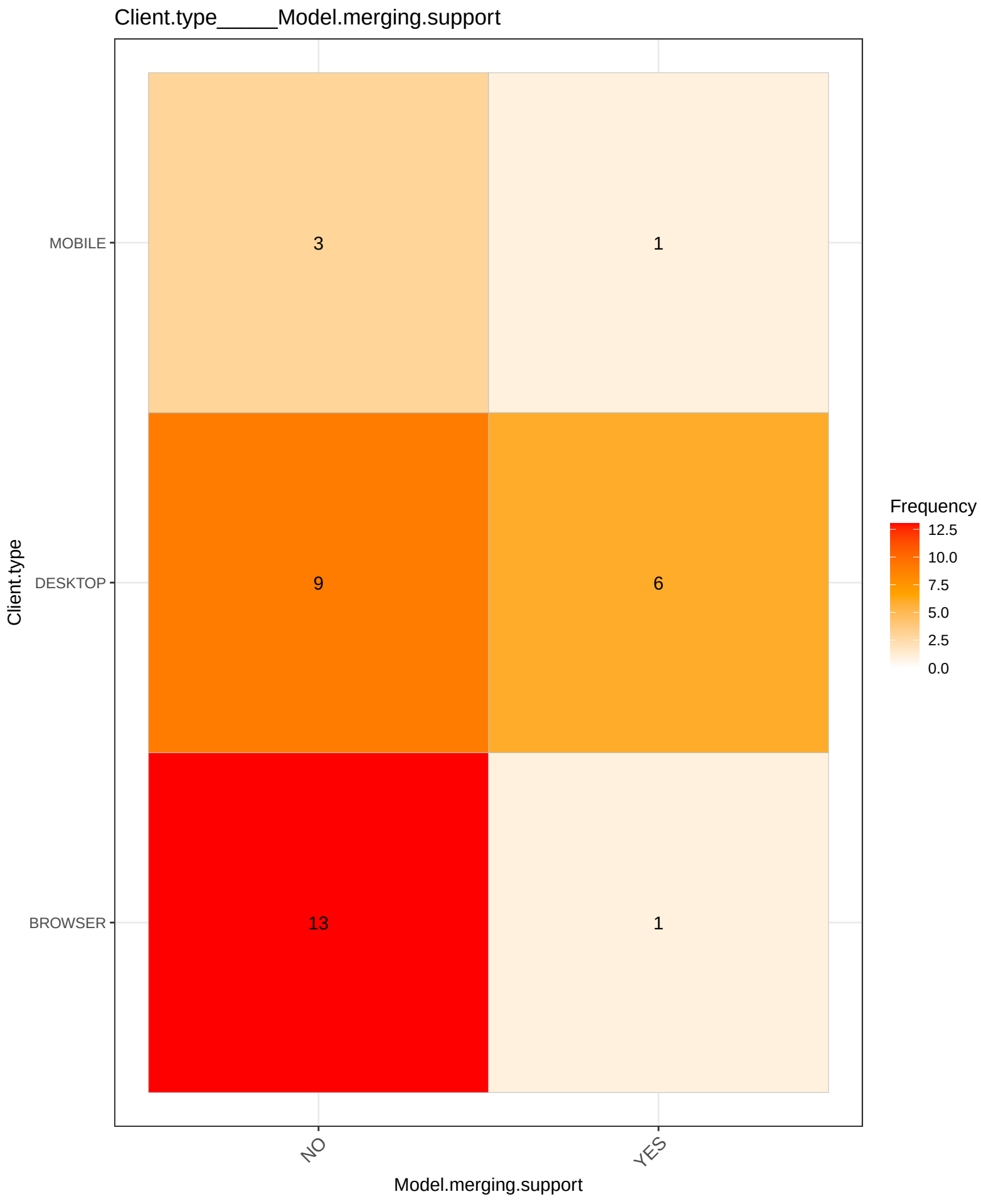
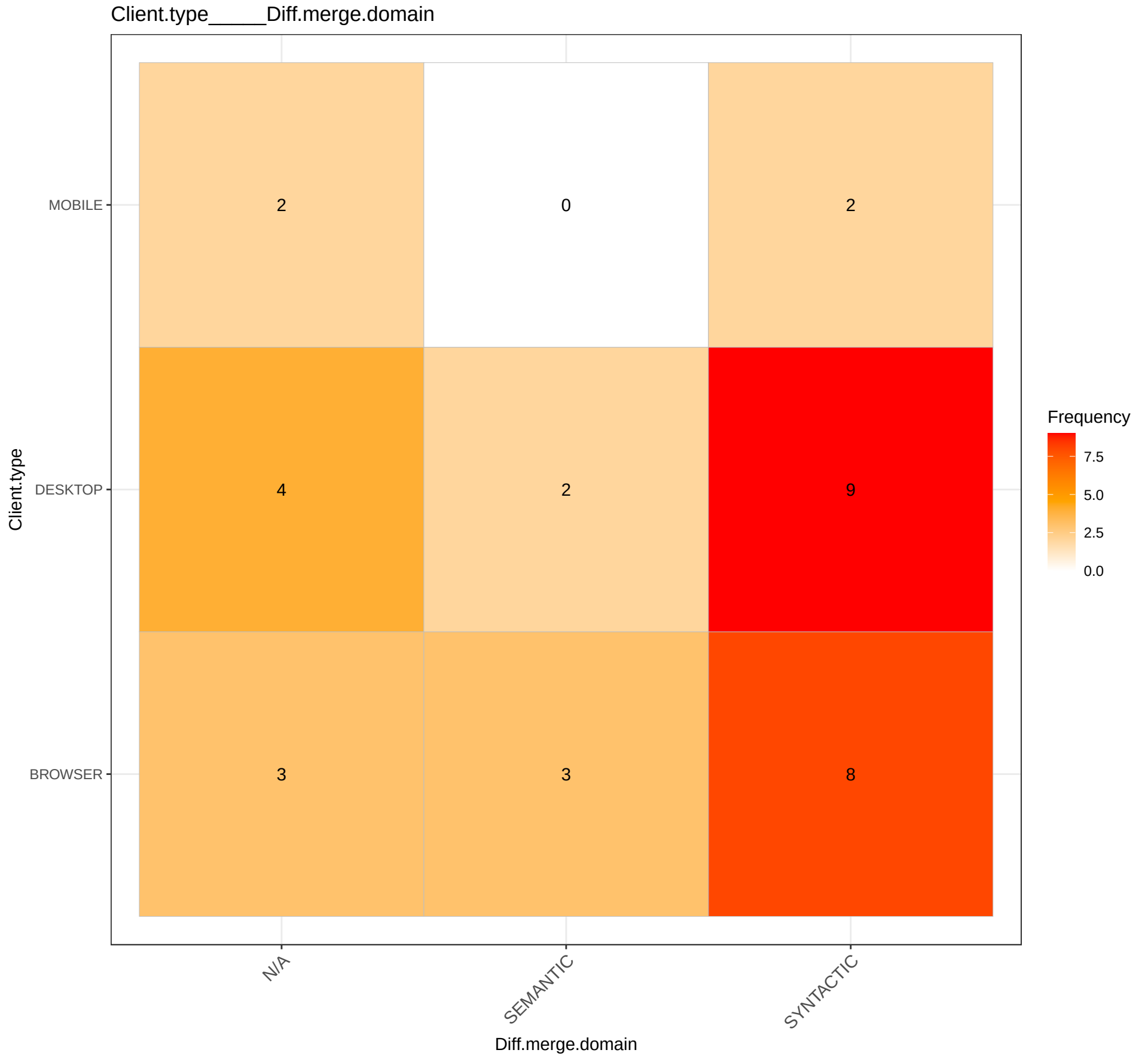
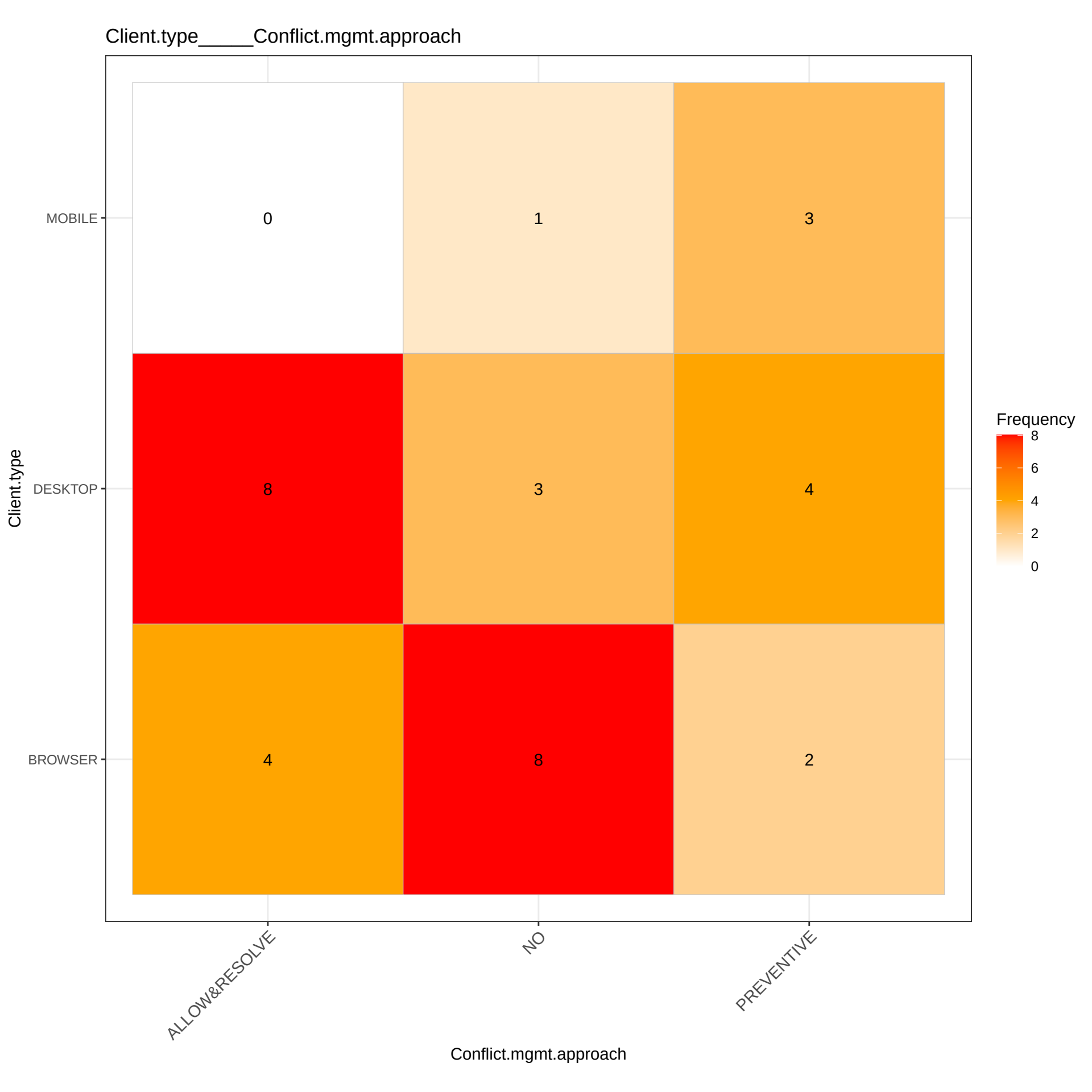
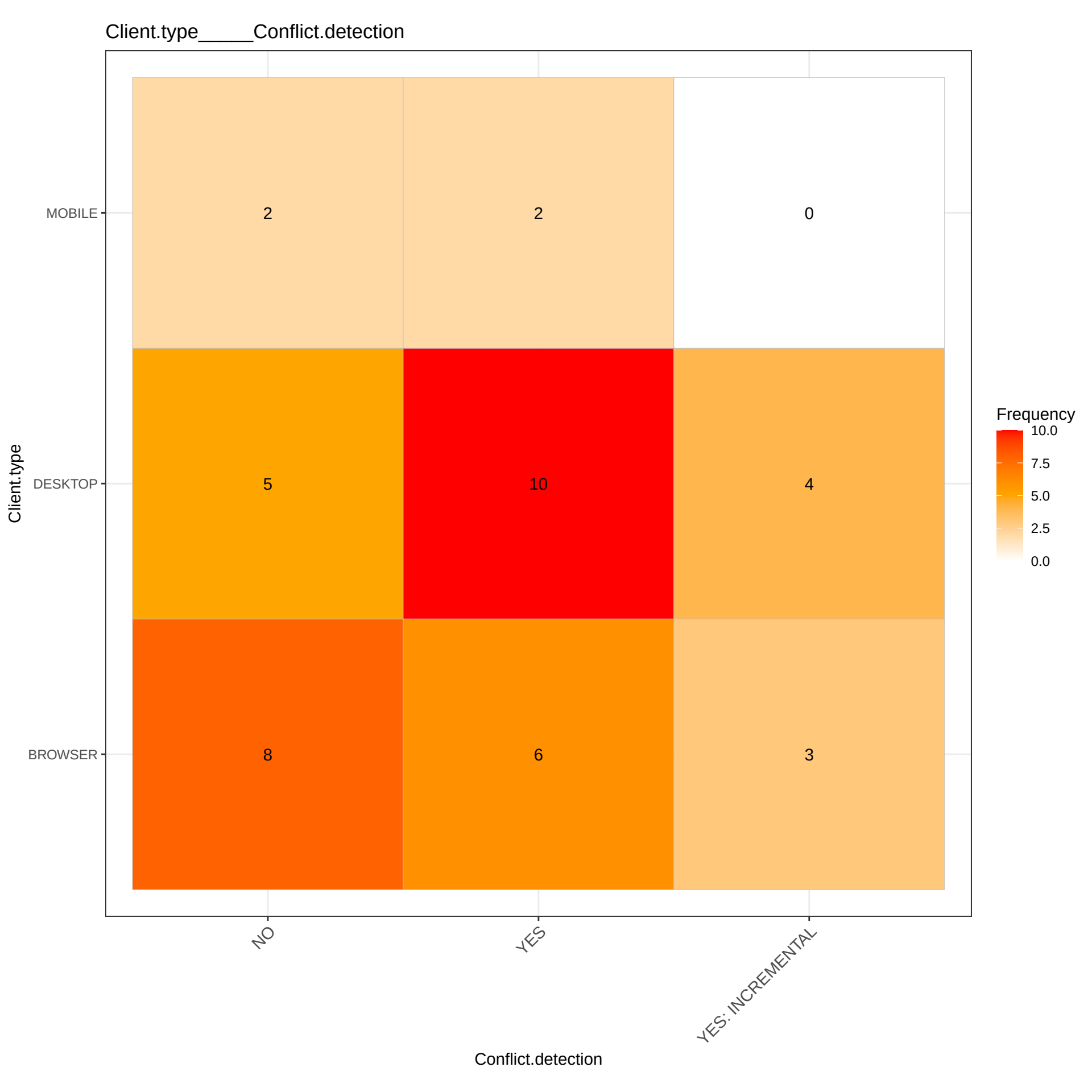
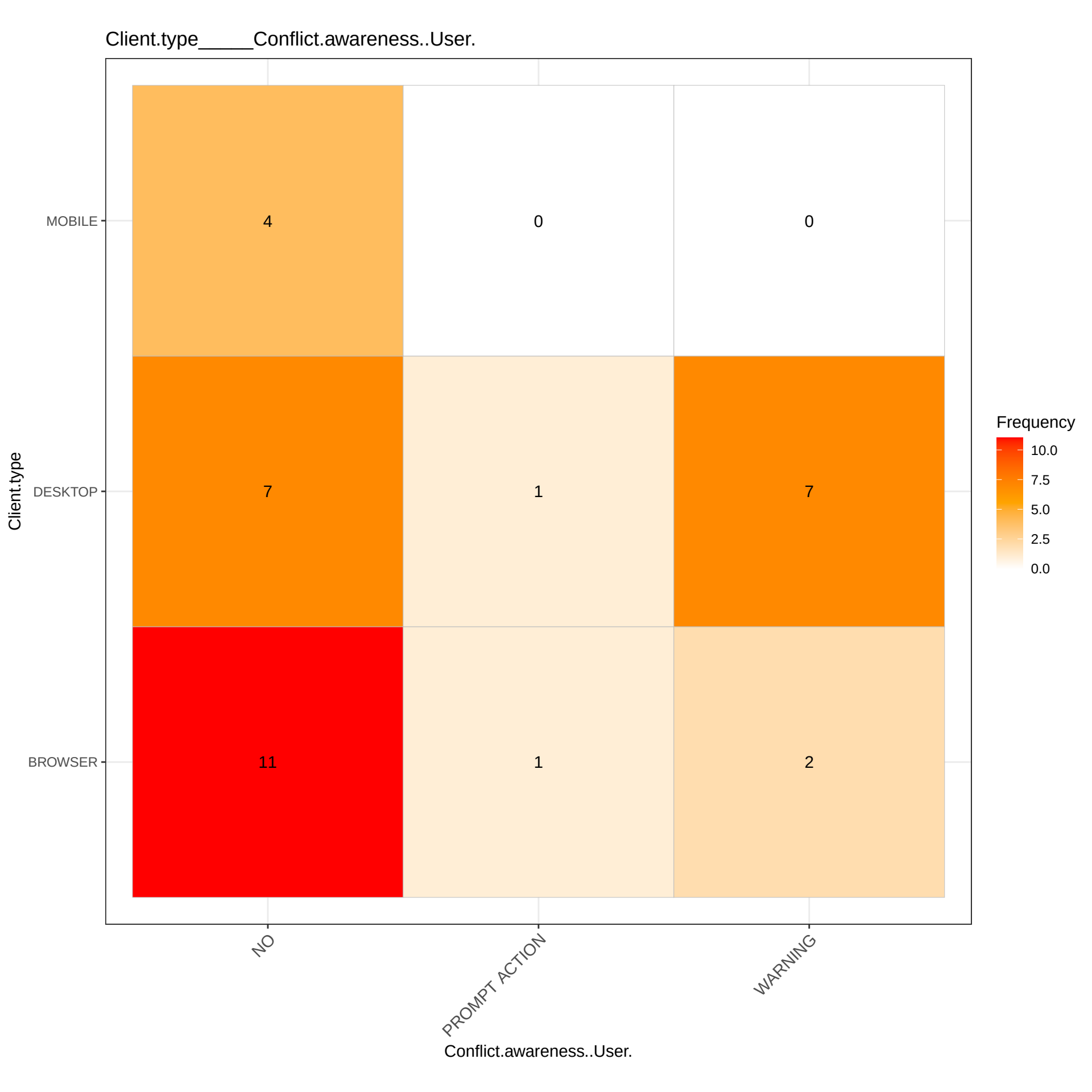
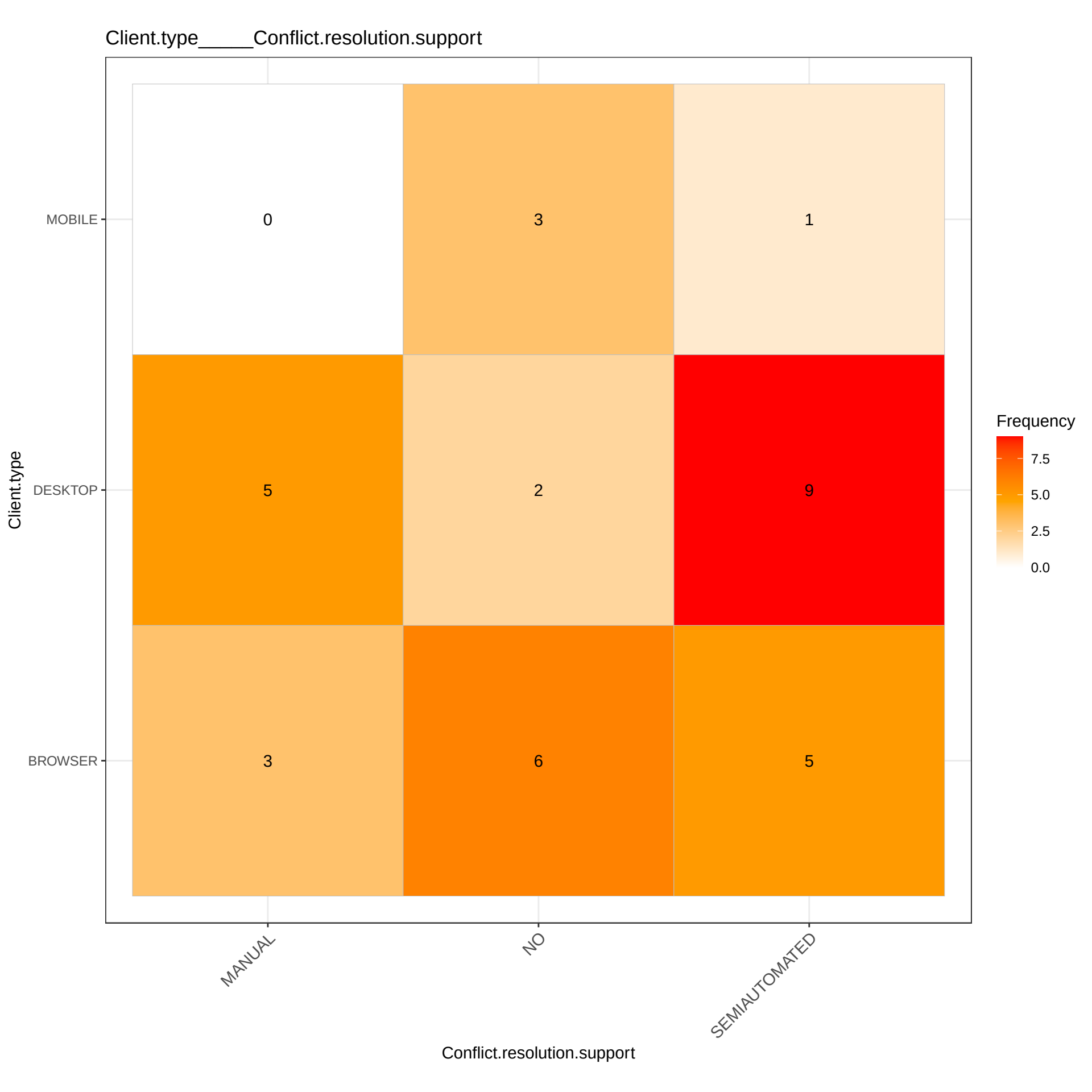

Client.type_____Model.merging.support
MOBILE
DESKTOP
BROWSER
Client.type
3
1
9
6
13
1
NO
YES
Model.merging.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

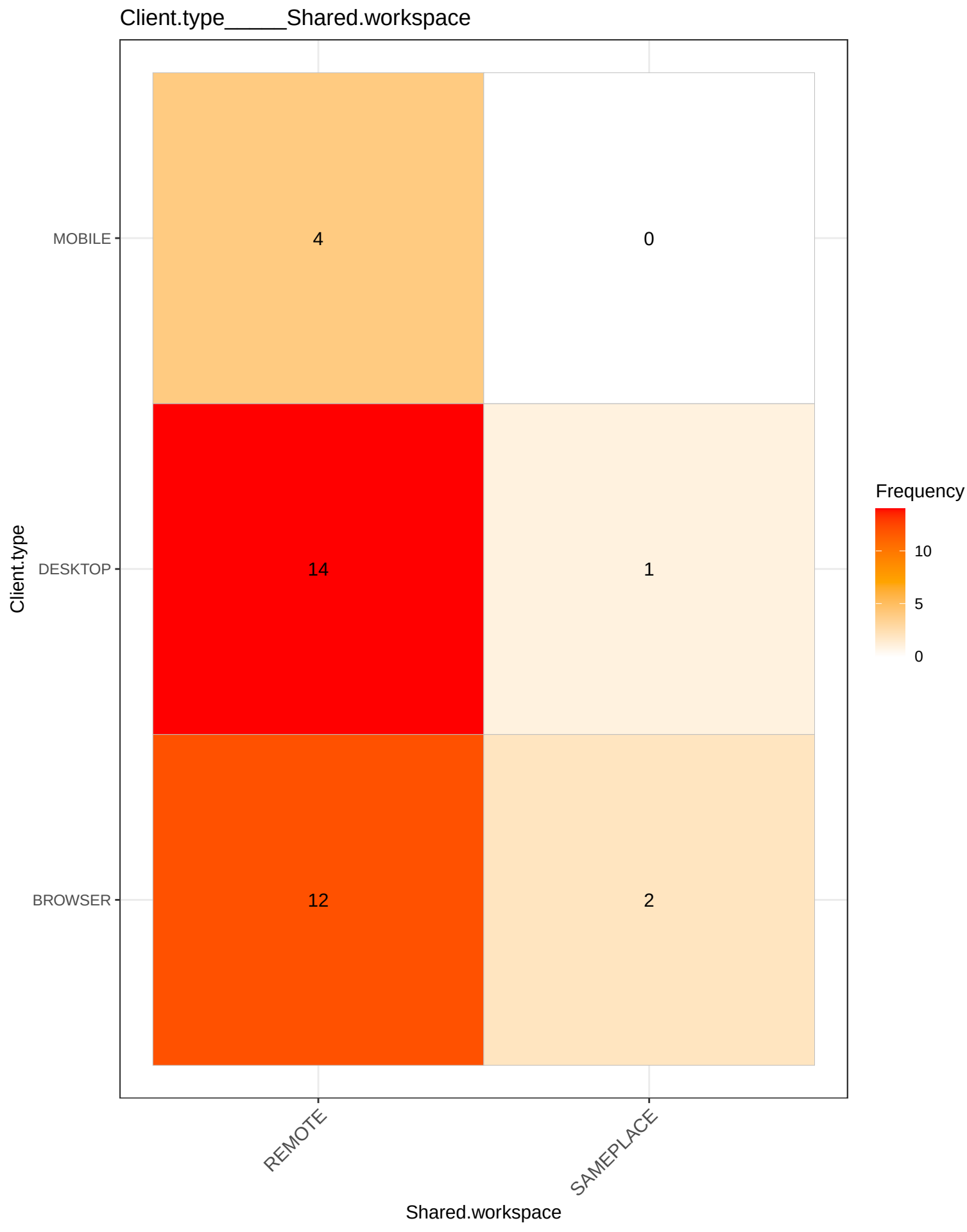

Client.type_____Diff.merge.domain
MOBILE
DESKTOP
BROWSER
Client.type
2
0
2
4
2
9
3
3
8
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
7.5
5.0
2.5
0.0

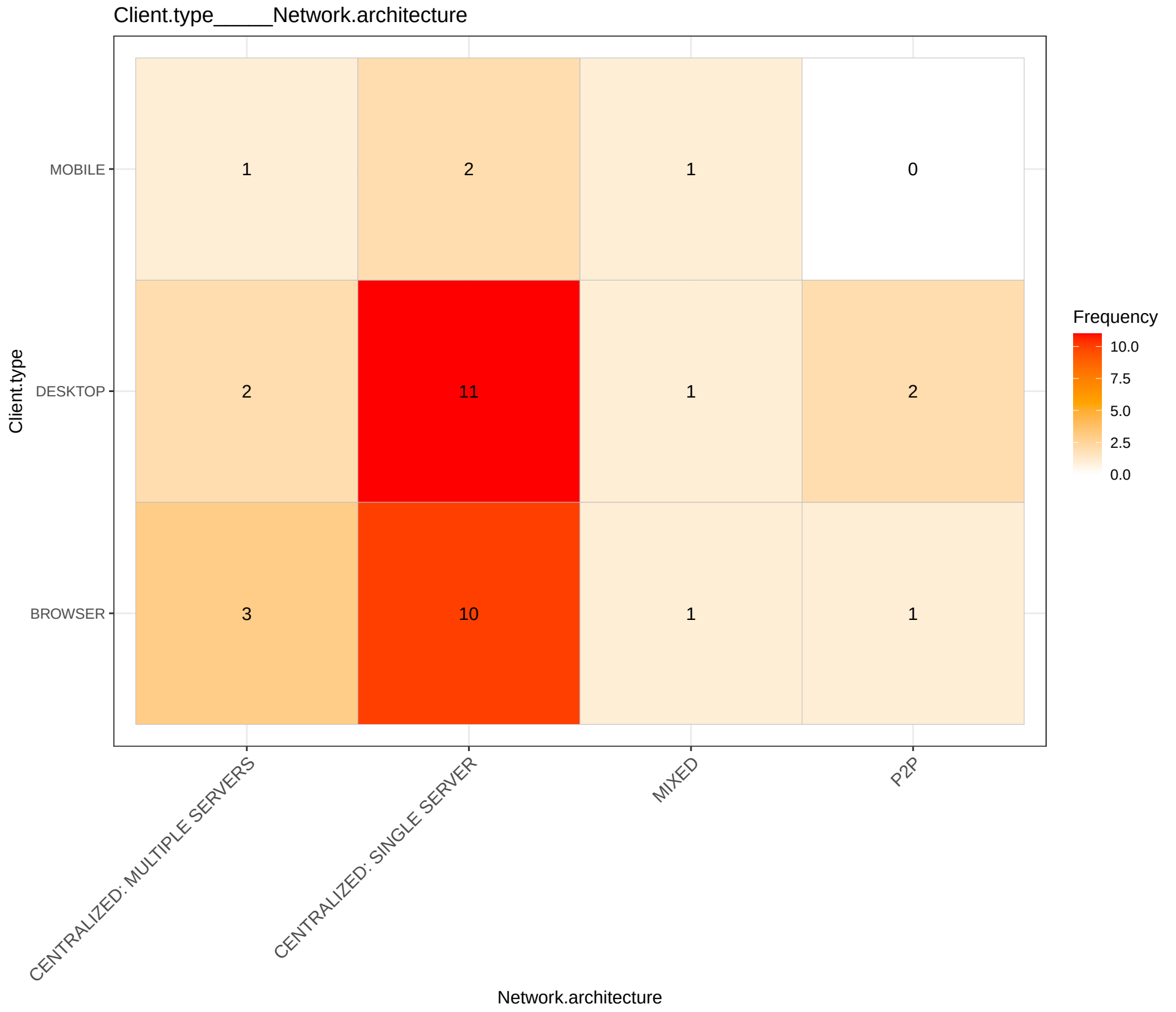

Client.type_____Conflict.mgmt.approach
MOBILE
DESKTOP
BROWSER
Client.type
0
1
3
8
3
4
4
8
2
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

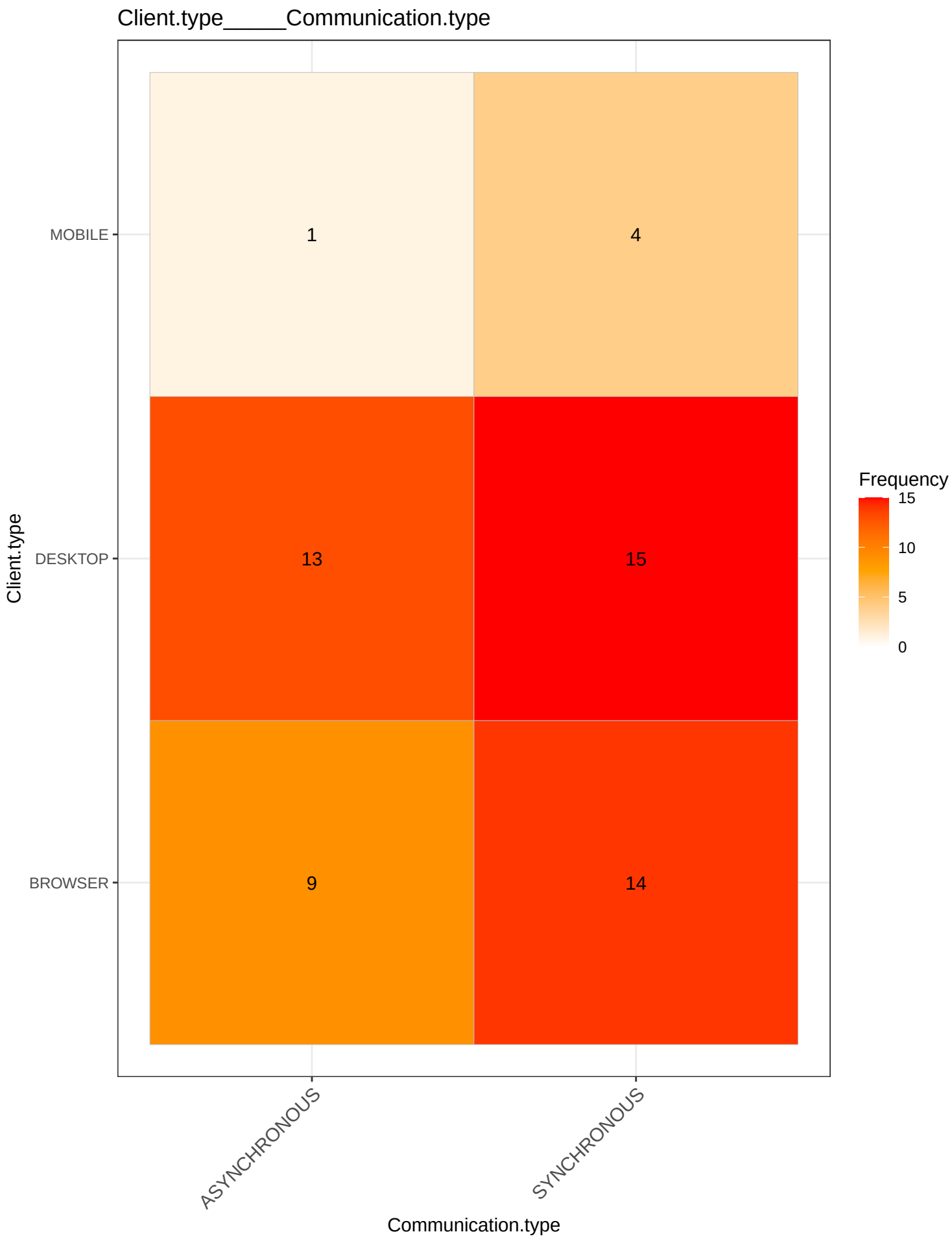

Client.type_____Conflict.detection
MOBILE
DESKTOP
BROWSER
2
2
0
5
10
4
8
6
3
Client.type
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10.0
7.5
5.0
2.5
0.0

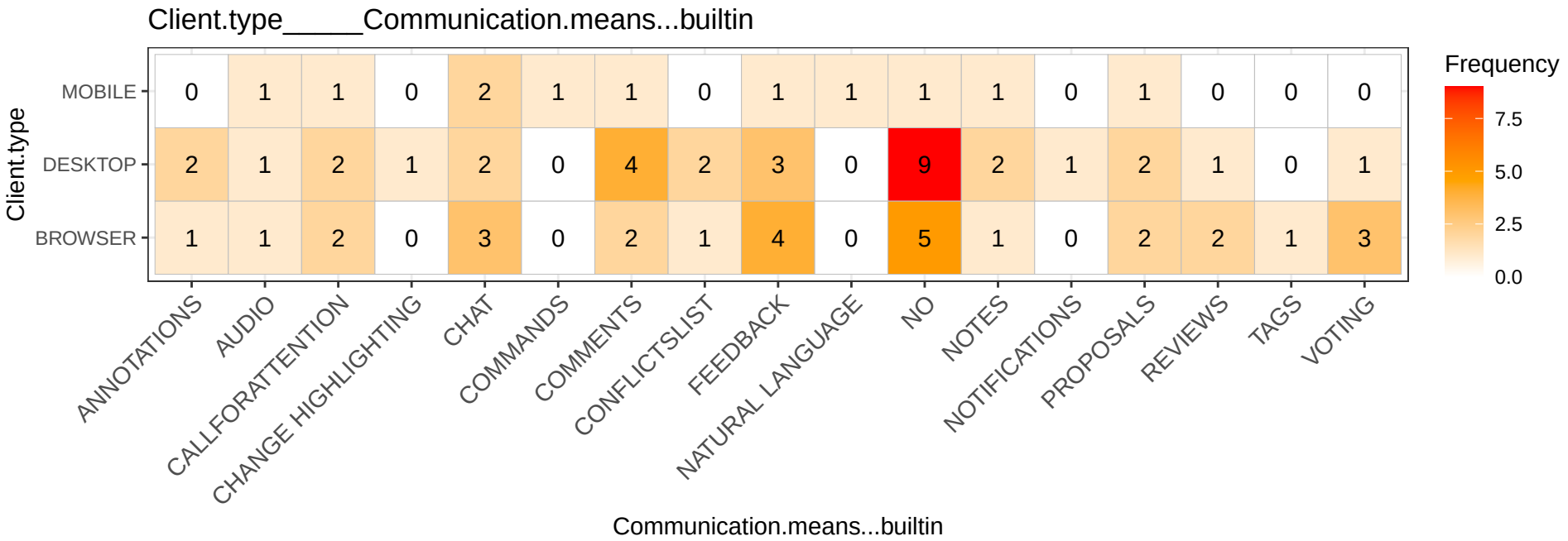

Client.type_____Conflict.awareness..User.
MOBILE
DESKTOP
BROWSER
4
0
0
7
1
7
11
1
2
NO
PROMPT ACTION
WARNING
Client.type
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0

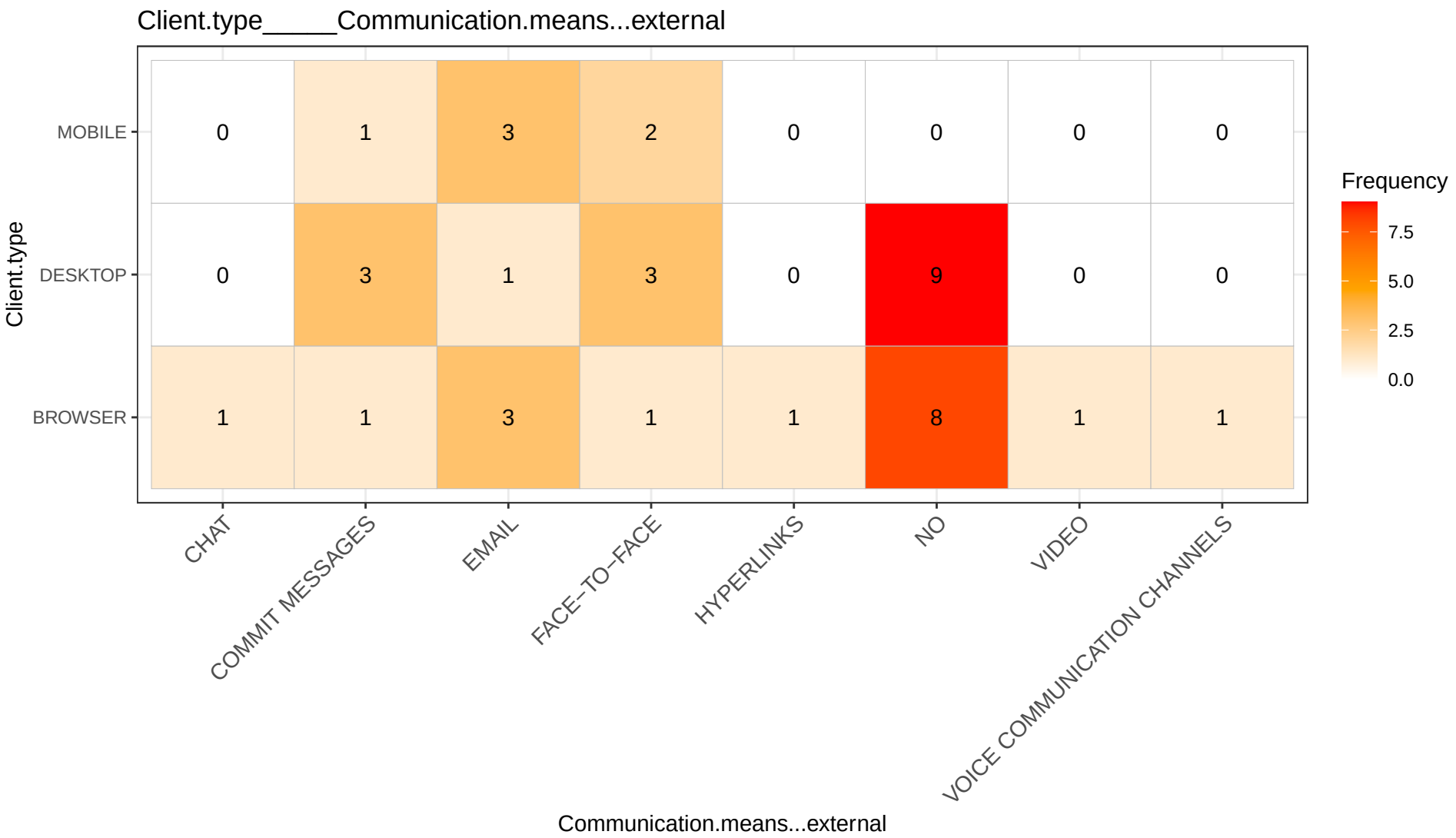

Client.type_____Conflict.resolution.support
MOBILE
DESKTOP
BROWSER
0
3
1
5
2
9
3
6
5
Client.type
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

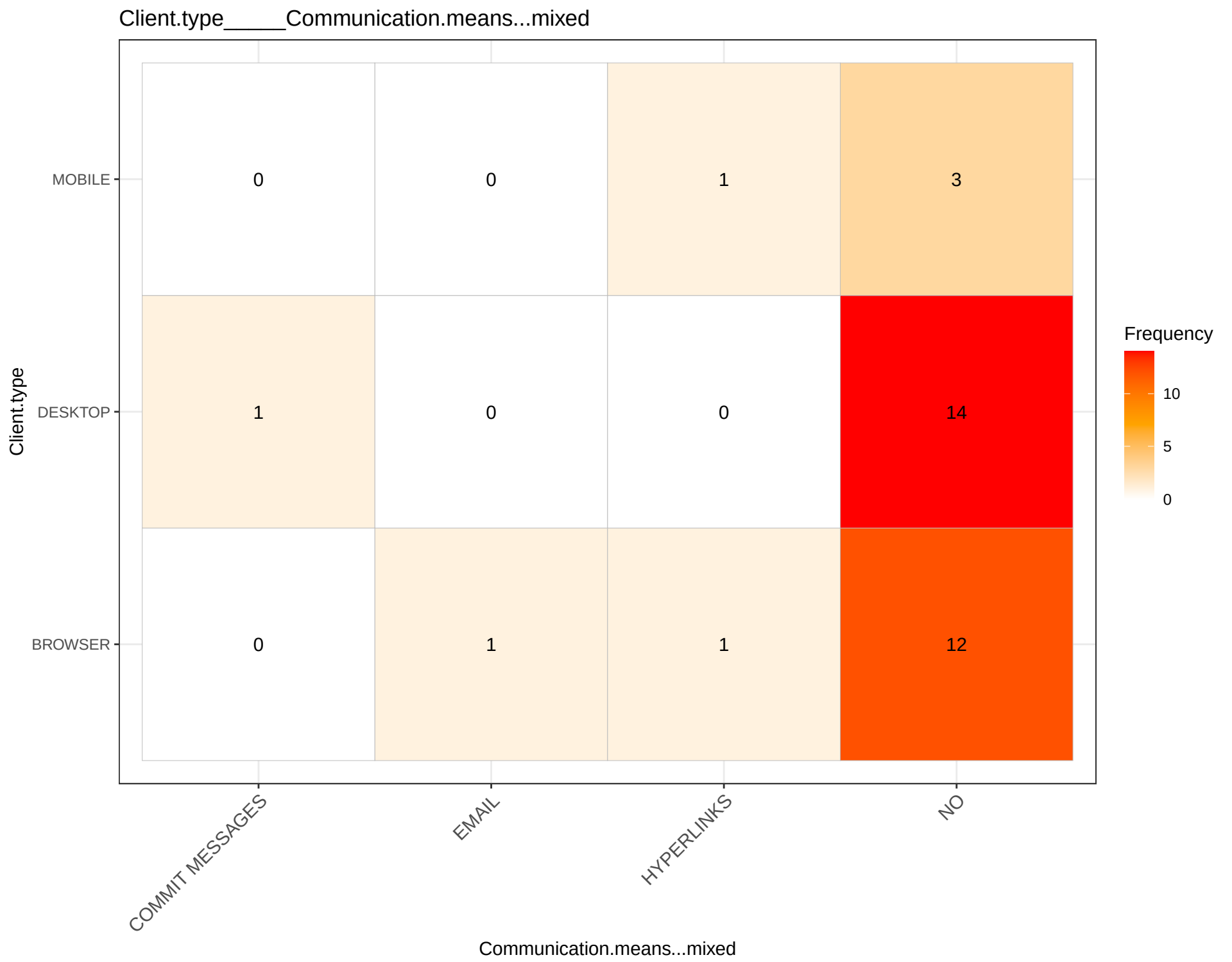

Client.type_____Shared.workspace
MOBILE
DESKTOP
BROWSER
4
0
14
1
12
2
Client.type
REMOTE
SAMEPLACE
Shared.workspace
Frequency
10
5
0

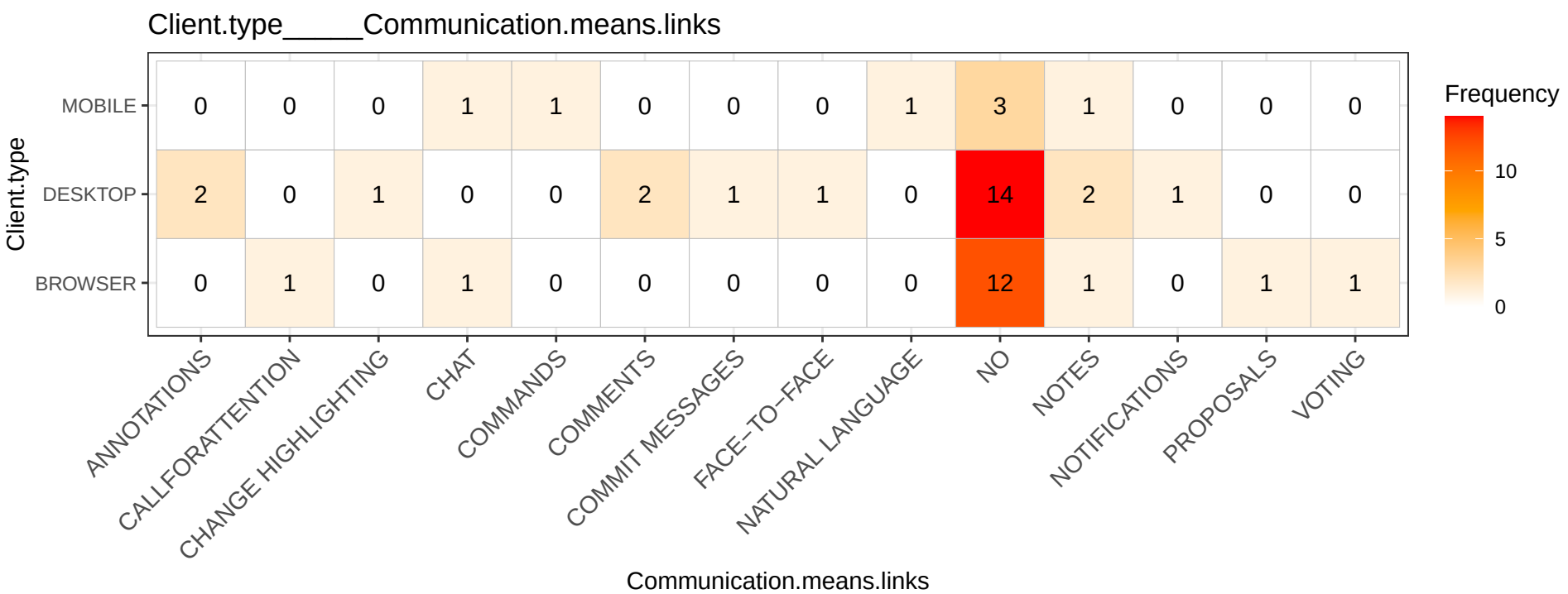

Client.type_____Network.architecture
MOBILE
DESKTOP
BROWSER
Client.type
1
2
1
0
2
11
1
2
3
10
1
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

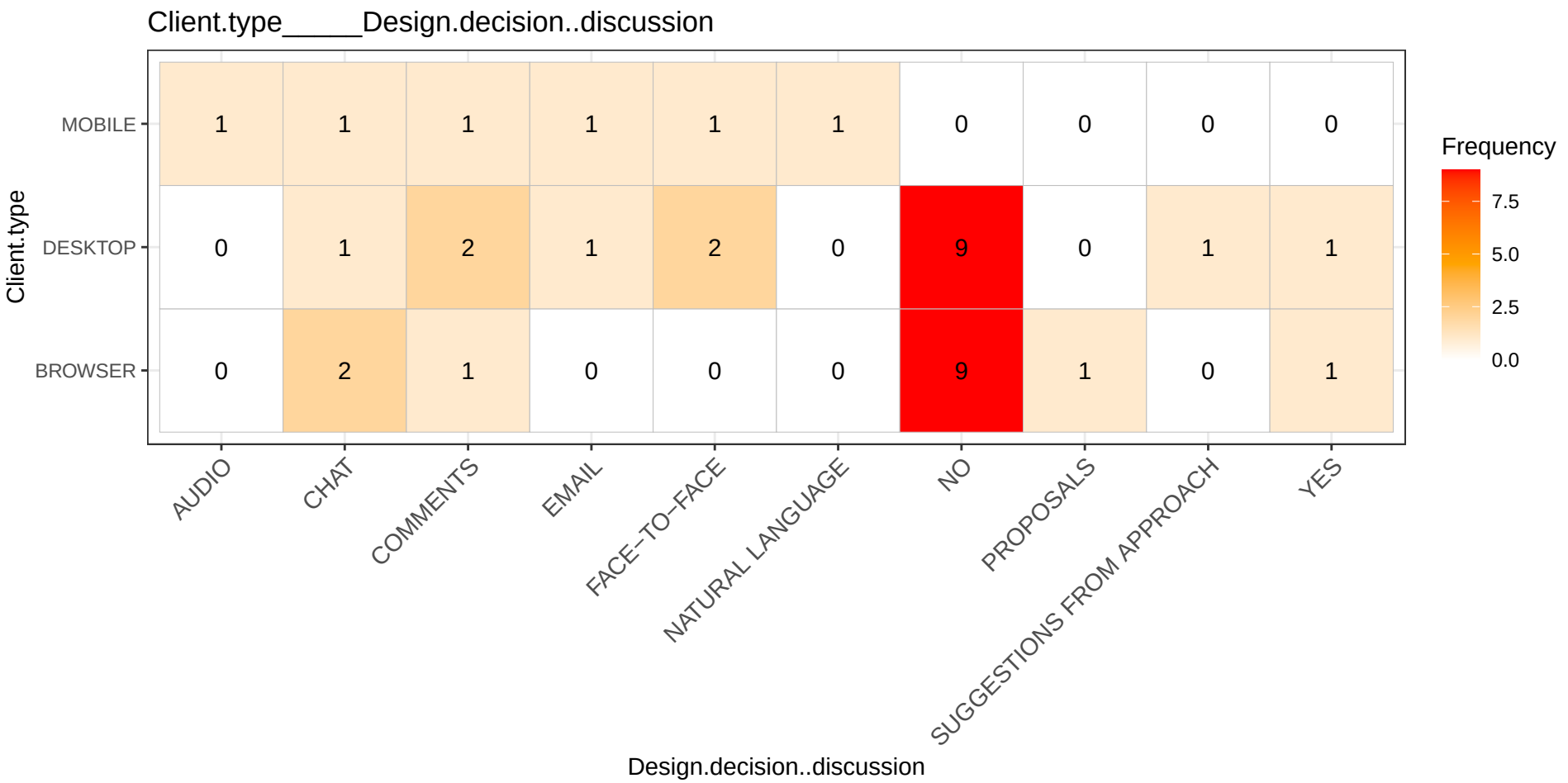

Client.type_____Communication.type
MOBILE
DESKTOP
BROWSER
1
4
13
15
9
14
Client.type
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

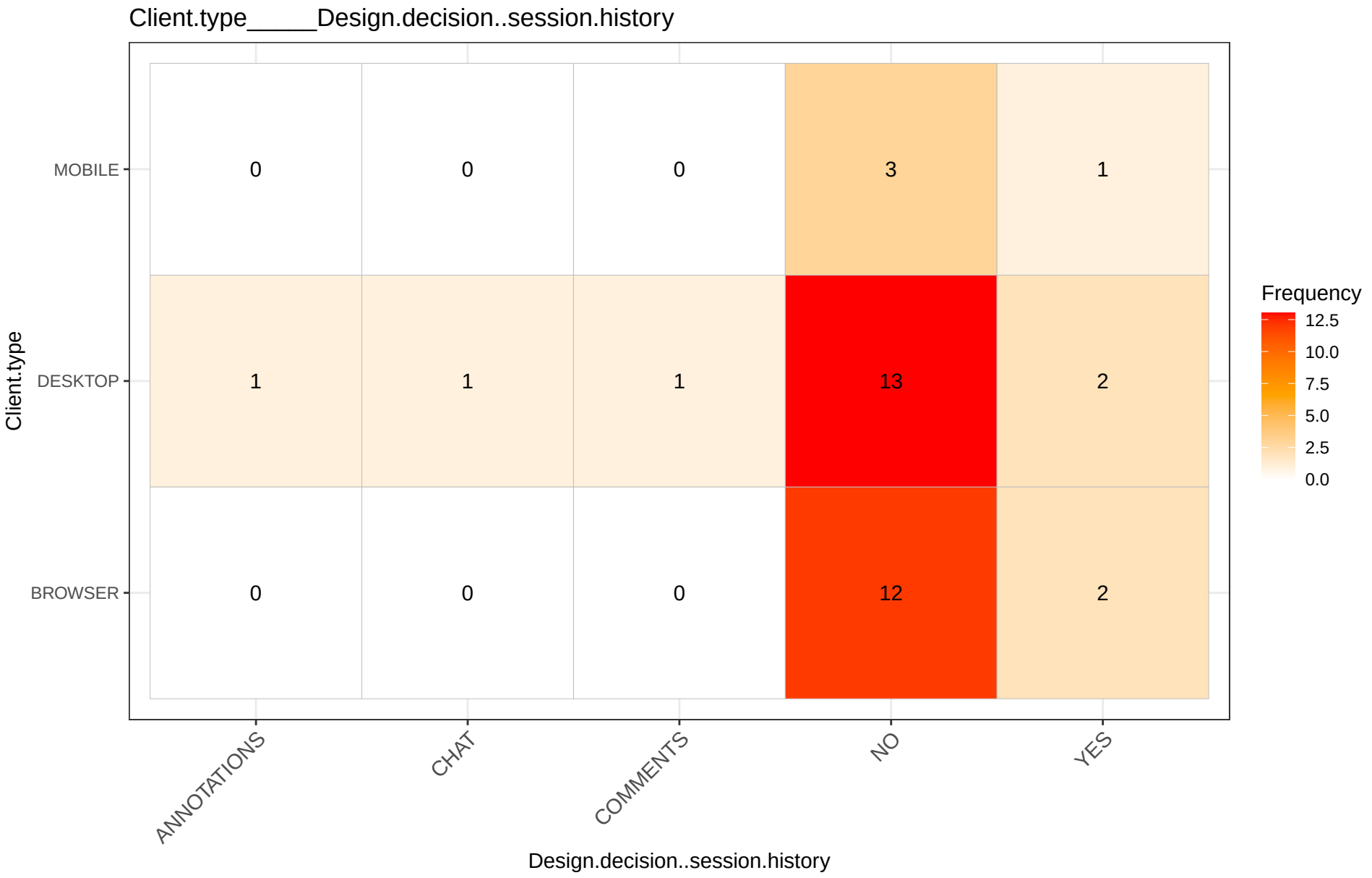

Client.type_____Communication.means...builtin
Client.type
MOBILE
DESKTOP
BROWSER
0 1 1 0 2 1 1 0 1 1 1 1 0 1 0 0 0
2 1 2 1 2 0 4 2 3 0 9 2 1 2 1 0 1
1 1 2 0 3 0 2 1 4 0 5 1 0 2 2 1 3
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

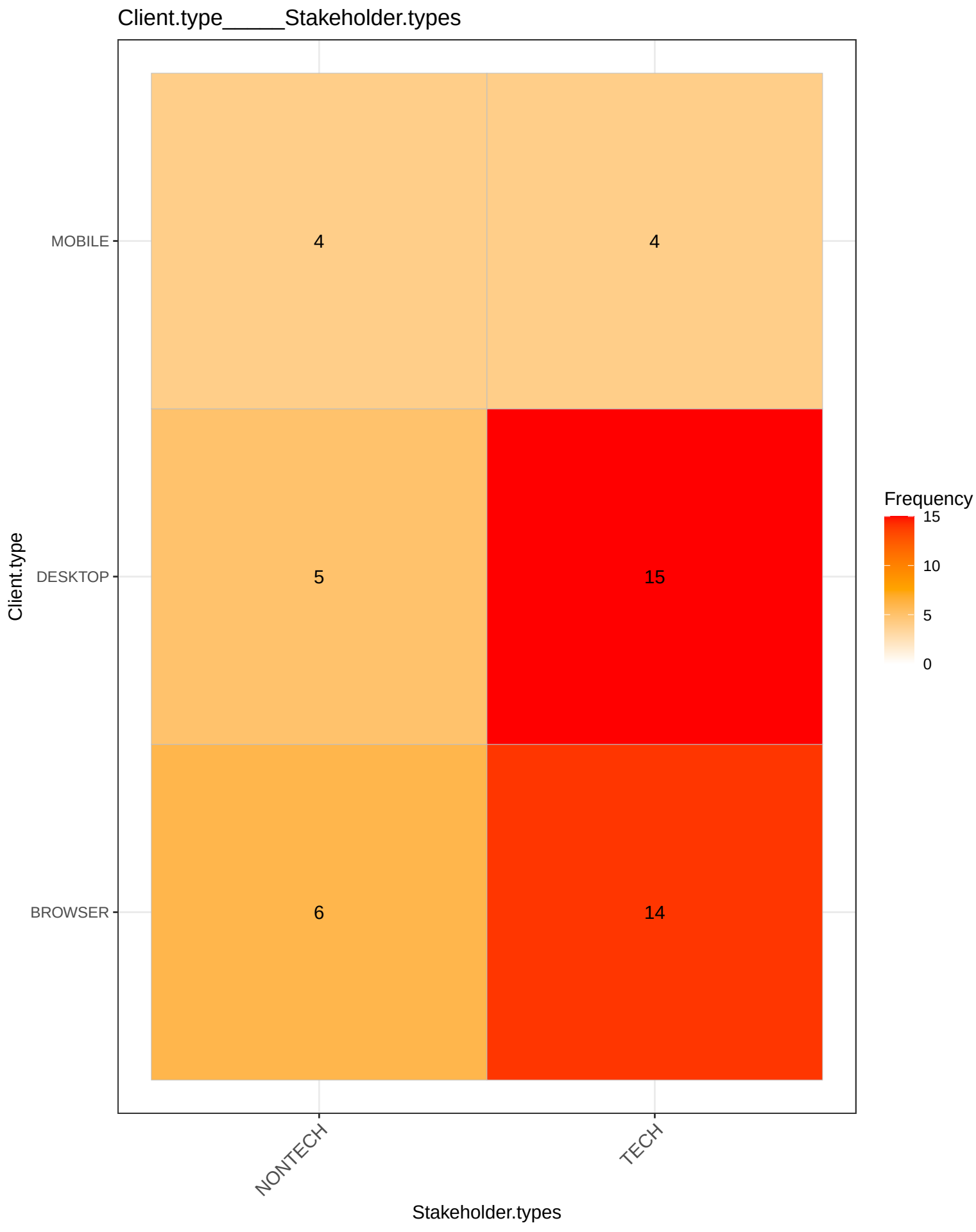

Client.type_____Communication.means...external
Client.type
MOBILE
DESKTOP
BROWSER
0 1 3 2 0 0 0 0
0 3 1 3 0 9 0 0
1 1 3 1 1 8 1 1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
7.5
5.0
2.5
0.0

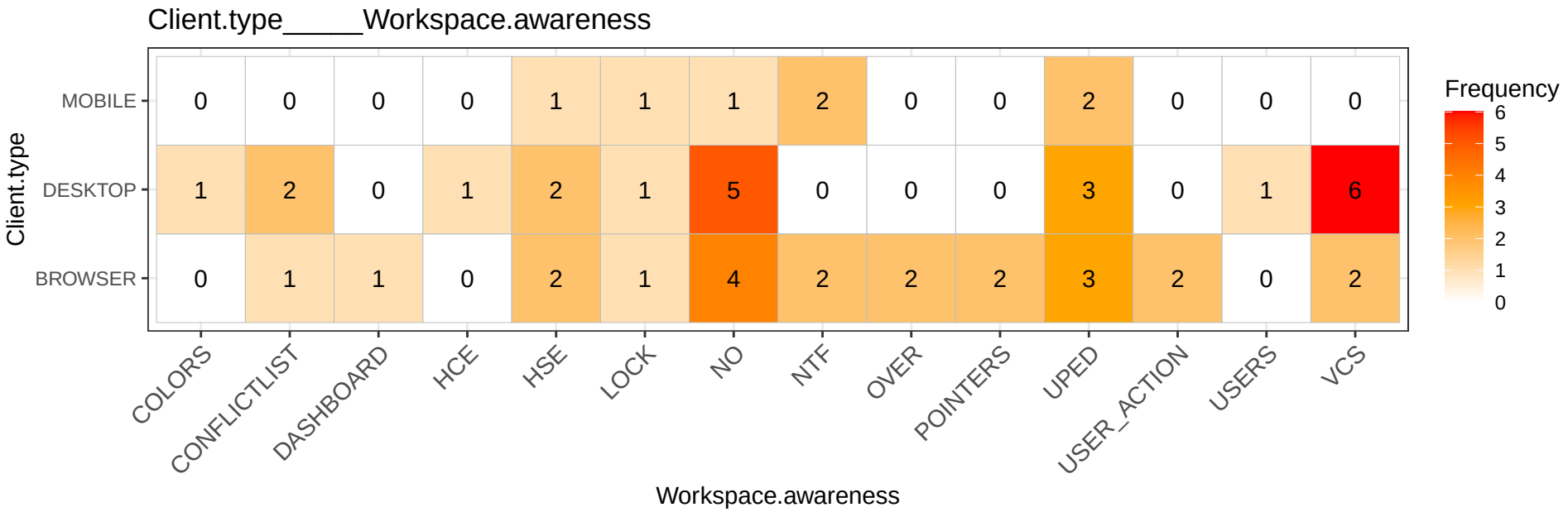

Client.type_____Communication.means...mixed
MOBILE
DESKTOP
BROWSER
Client.type
0
0
1
3
1
0
0
14
0
1
1
12
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
10
5
0

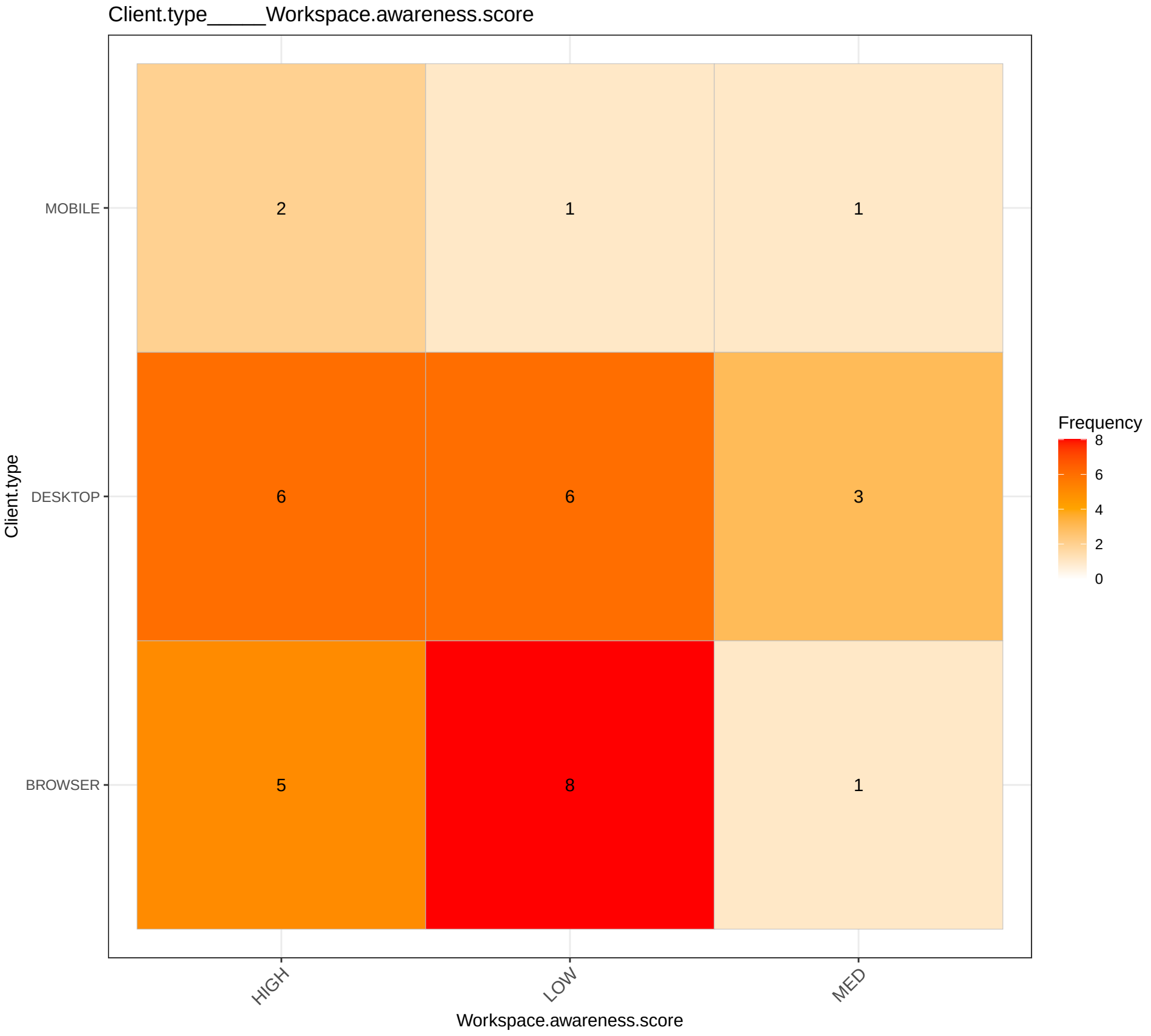

Client.type_____Communication.means.links
Client.type
MOBILE
DESKTOP
BROWSER
0 0 0 1 1 0 0 0 1 3 1 0 0 0
2 0 1 0 0 2 1 1 0 14 2 1 0 0
0 1 0 1 0 0 0 0 0 12 1 0 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE-TO-FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
10
5
0

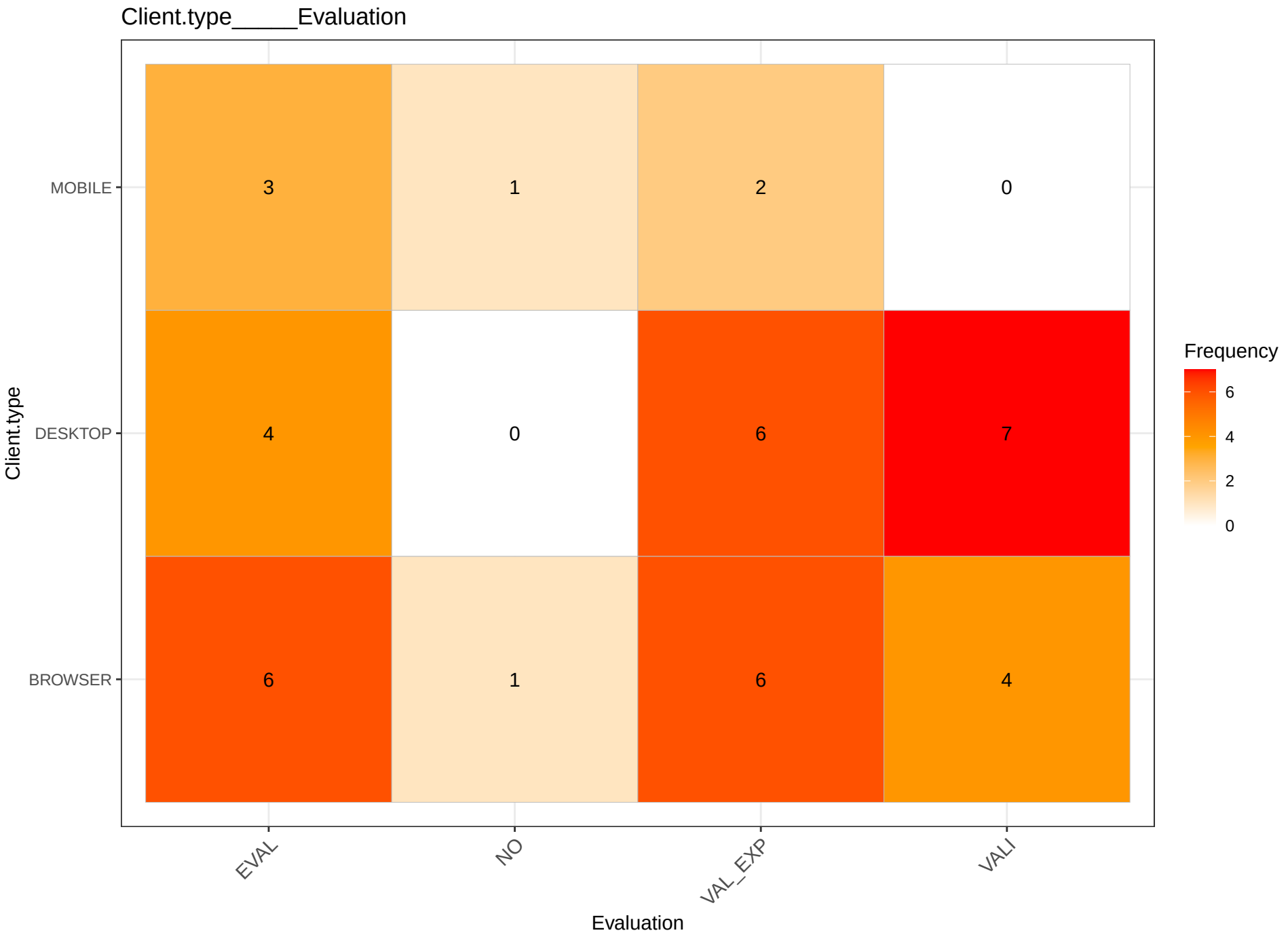

Client.type_____Design.decision..discussion
Client.type
MOBILE
DESKTOP
BROWSER
1 1 1 1 1 1 0 0 0 0
0 1 2 1 2 0 9 0 1 1
0 2 1 0 0 0 9 1 0 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
7.5
5.0
2.5
0.0

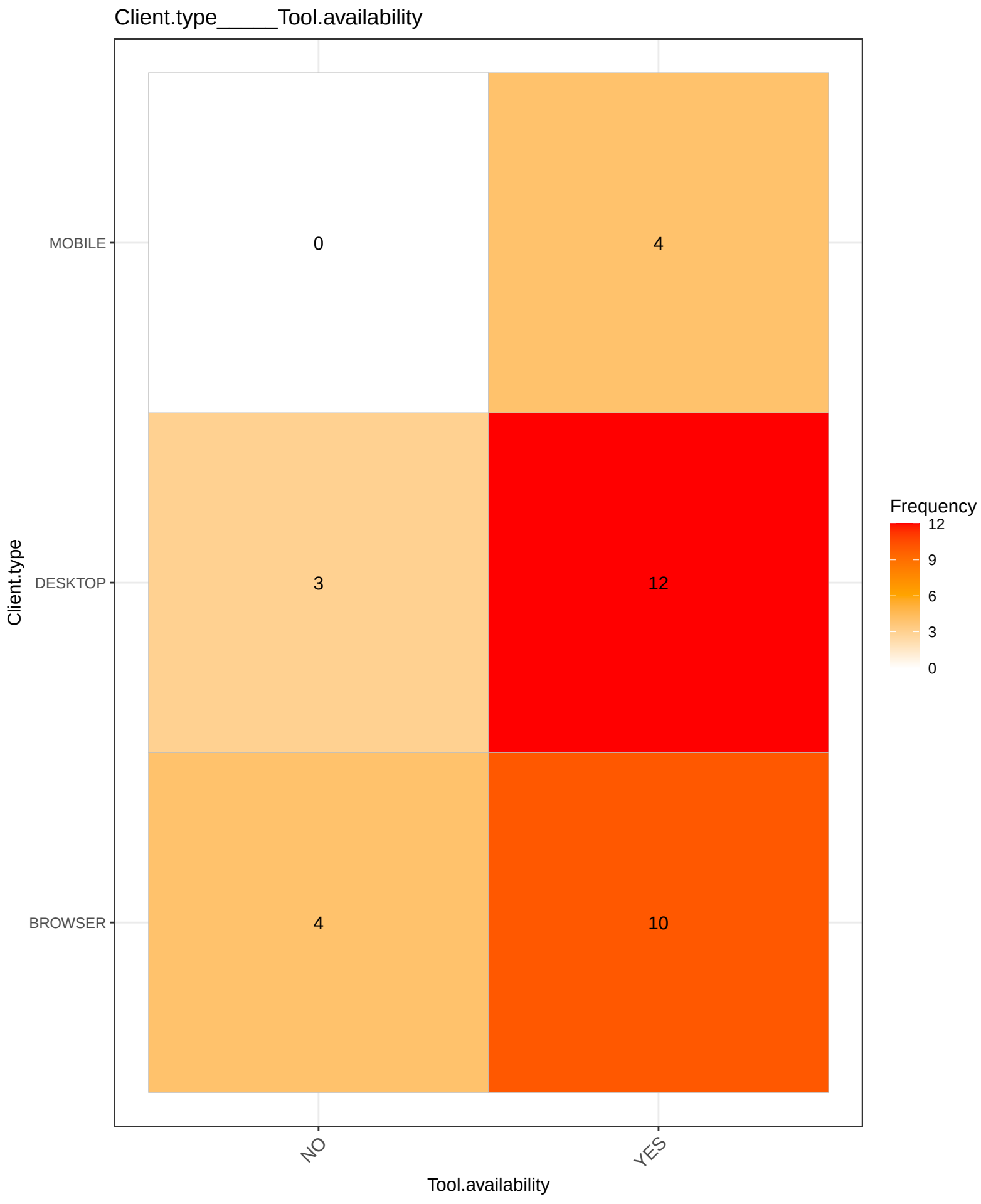

Client.type_____Design.decision..session.history
MOBILE
DESKTOP
BROWSER
Client.type
0
0
0
3
1
1
1
1
13
2
0
0
0
12
2
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

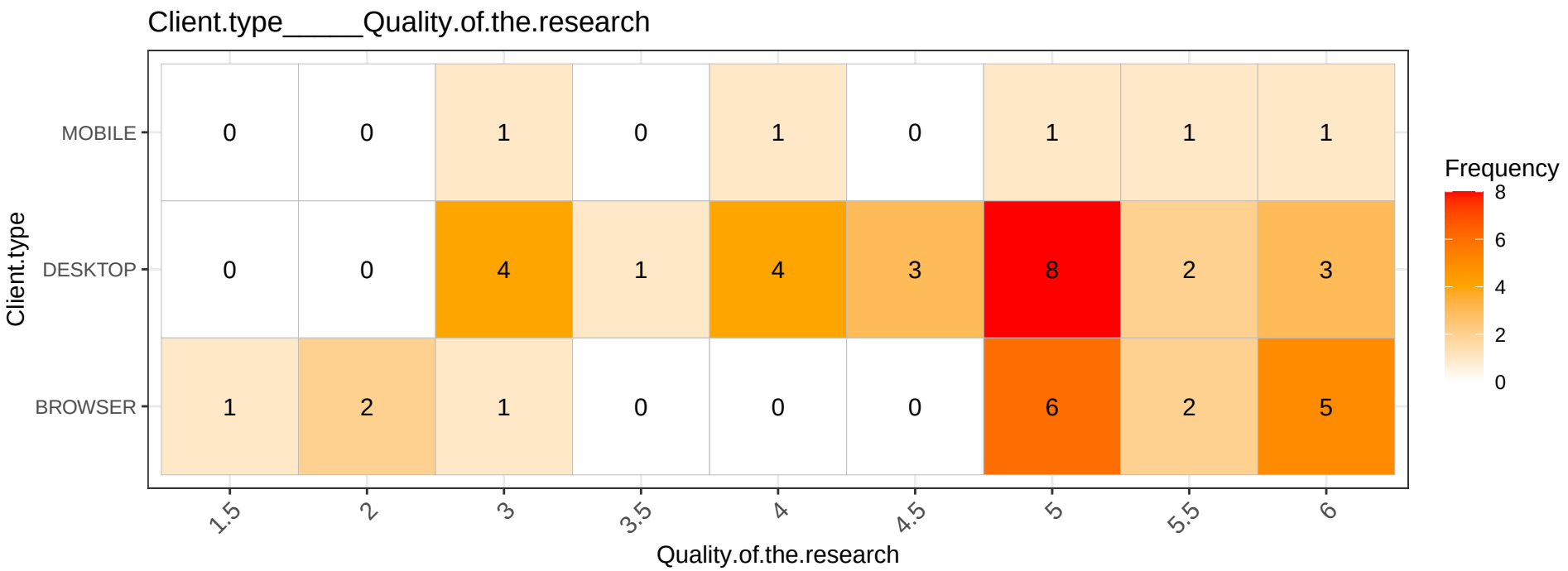

Client.type_____Stakeholder.types
MOBILE
DESKTOP
BROWSER
4
4
5
15
6
14
Client.type
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

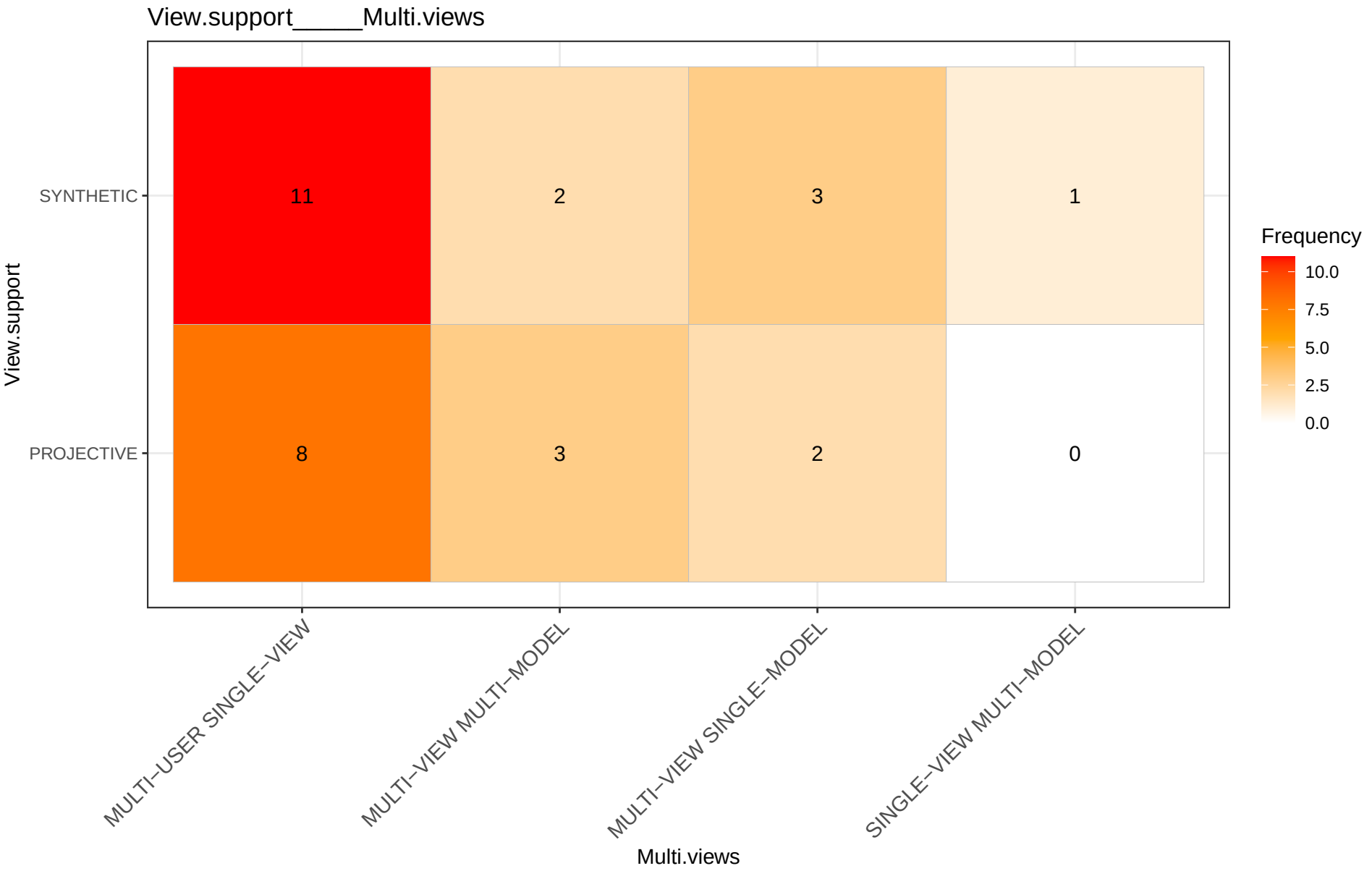

Client.type_____Workspace.awareness
Client.type
MOBILE
DESKTOP
BROWSER
0 0 0 0 1 1 1 2 0 0 2 0 0 0
1 2 0 1 2 1 5 0 0 0 3 0 1 6
0 1 1 0 2 1 4 2 2 2 3 2 0 2
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

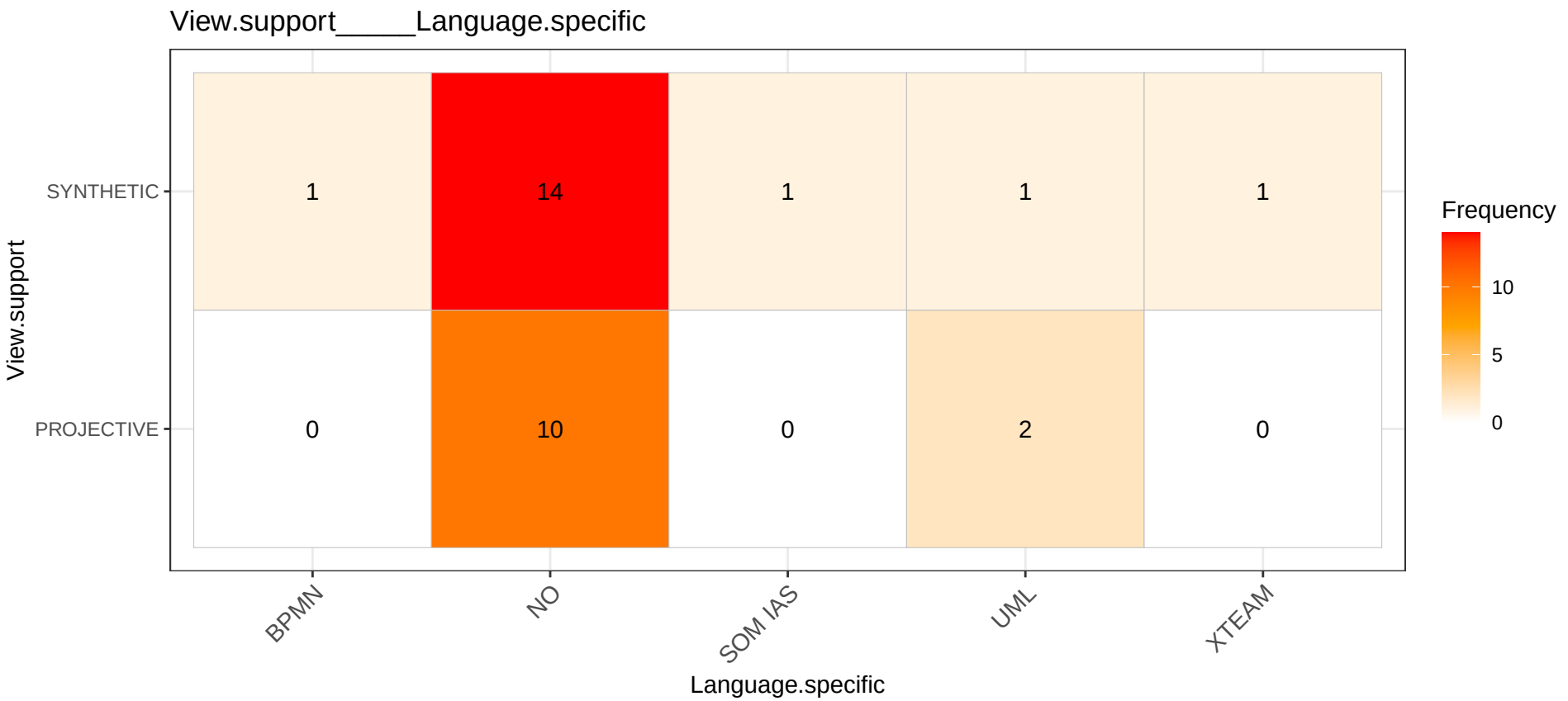

Client.type_____Workspace.awareness.score
MOBILE
DESKTOP
BROWSER
2
1
1
6
6
3
5
8
1
HIGH
LOW
MED
Client.type
Workspace.awareness.score
Frequency
8
6
4
2
0

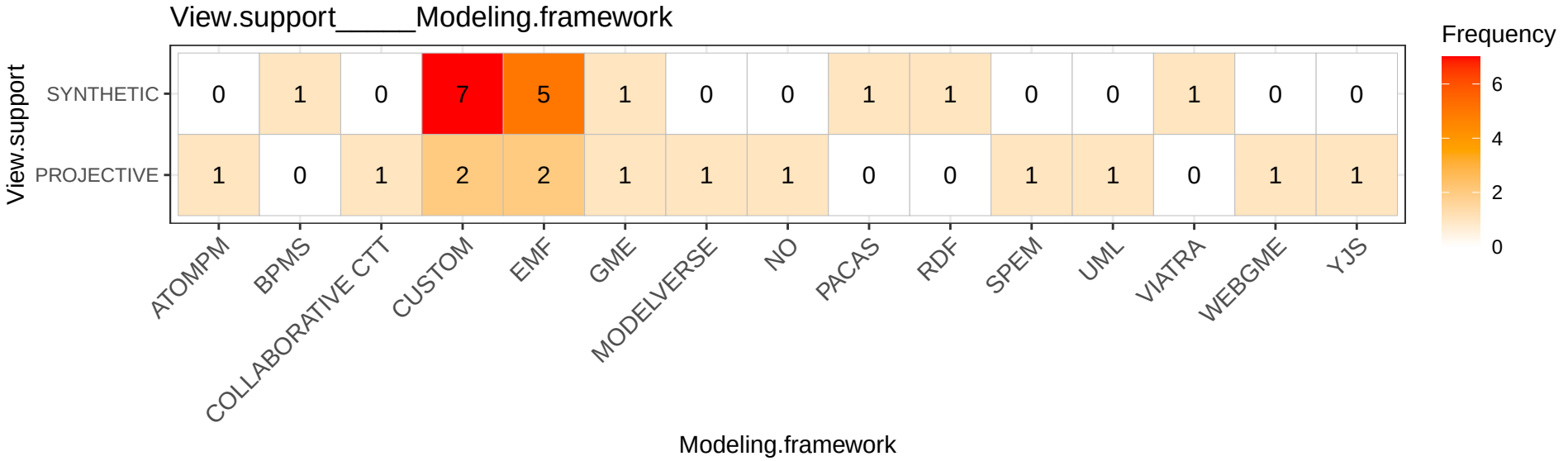

Client.type_____Evaluation
MOBILE
DESKTOP
BROWSER
Client.type
3
1
2
0
4
0
6
7
6
1
6
4
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
6
4
2
0

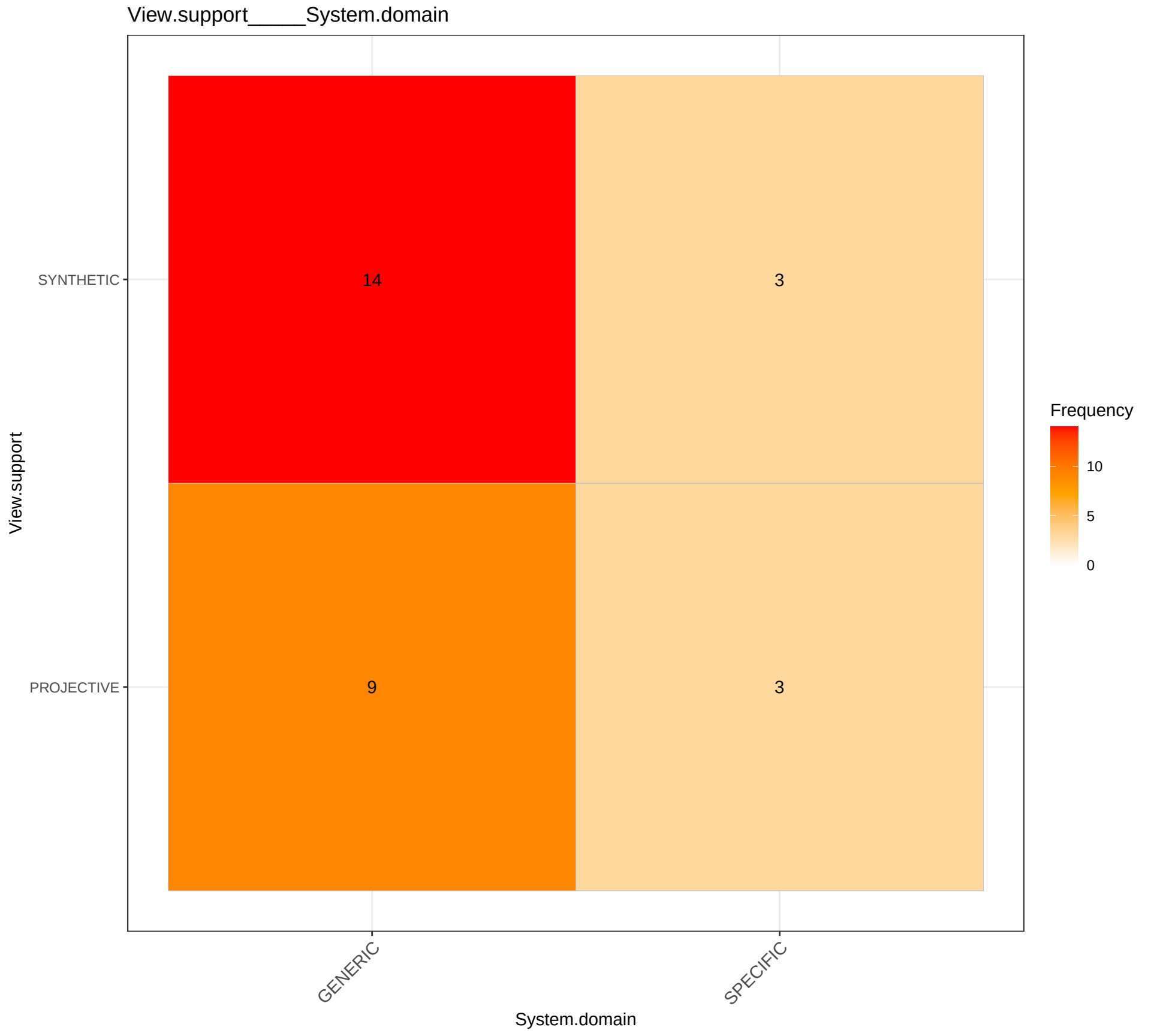

Client.type_____Tool.availability
MOBILE
DESKTOP
BROWSER
Client.type
0
4
3
12
4
10
NO
YES
Tool.availability
Frequency
12
9
6
3
0

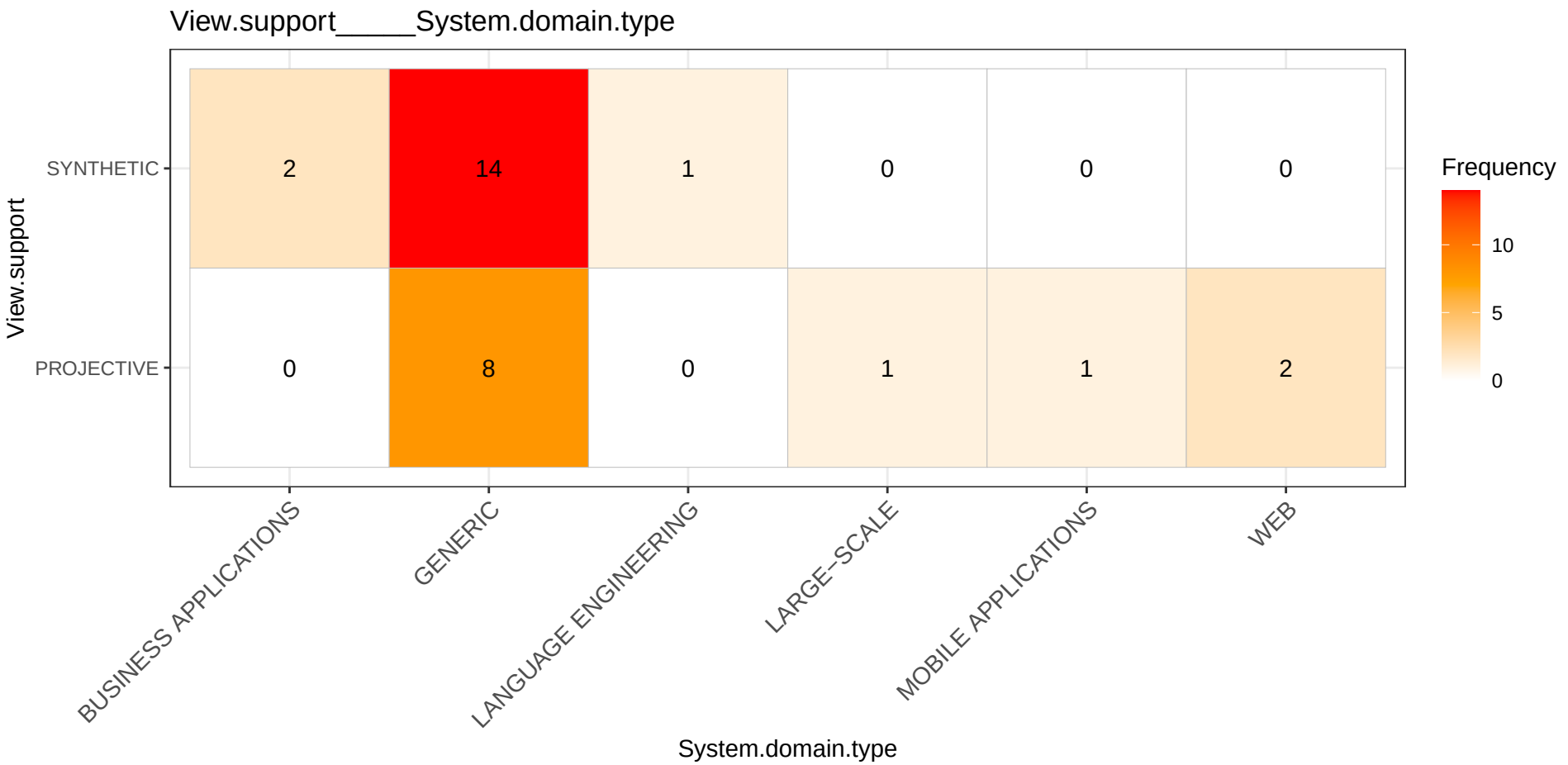

Client.type_____Quality.of.the.research
MOBILE
DESKTOP
BROWSER
Client.type
0 0 1 0 1 0 1 1 1
0 0 4 1 4 3 8 2 3
1 2 1 0 0 0 6 2 5
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
8
6
4
2
0

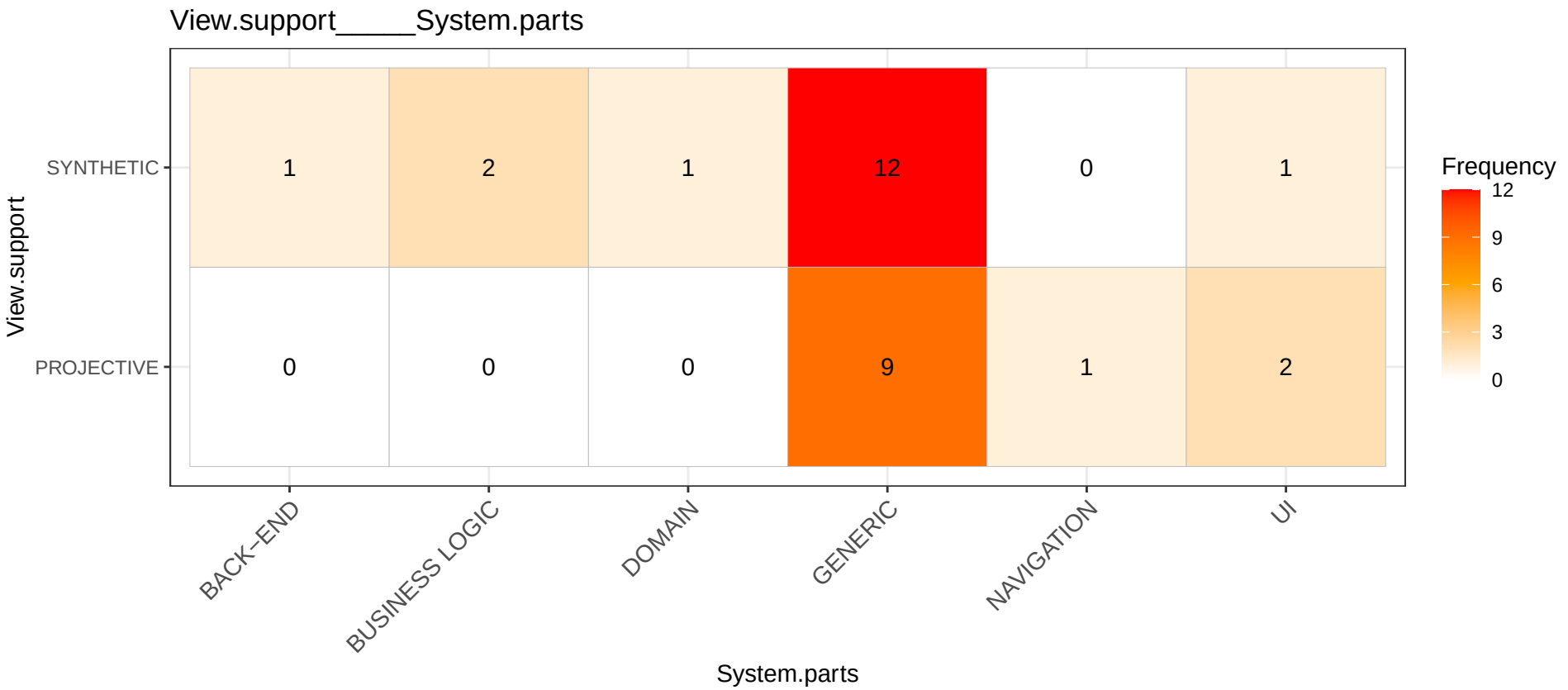

View.support_____Multi.views
SYNTHETIC
PROJECTIVE
View.support
11
2
3
1
8
3
2
0
MULTI−USER SINGLE−VIEW
MULTI−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
SINGLE−VIEW MULTI−MODEL
Multi.views
Frequency
10.0
7.5
5.0
2.5
0.0


View.support_____Language.specific
View.support
SYNTHETIC
PROJECTIVE
1
14
1
1
1
0
10
0
2
0
BPMN
NO
SOM IAS
UML
XTEAM
Language.specific
Frequency
10
5
0

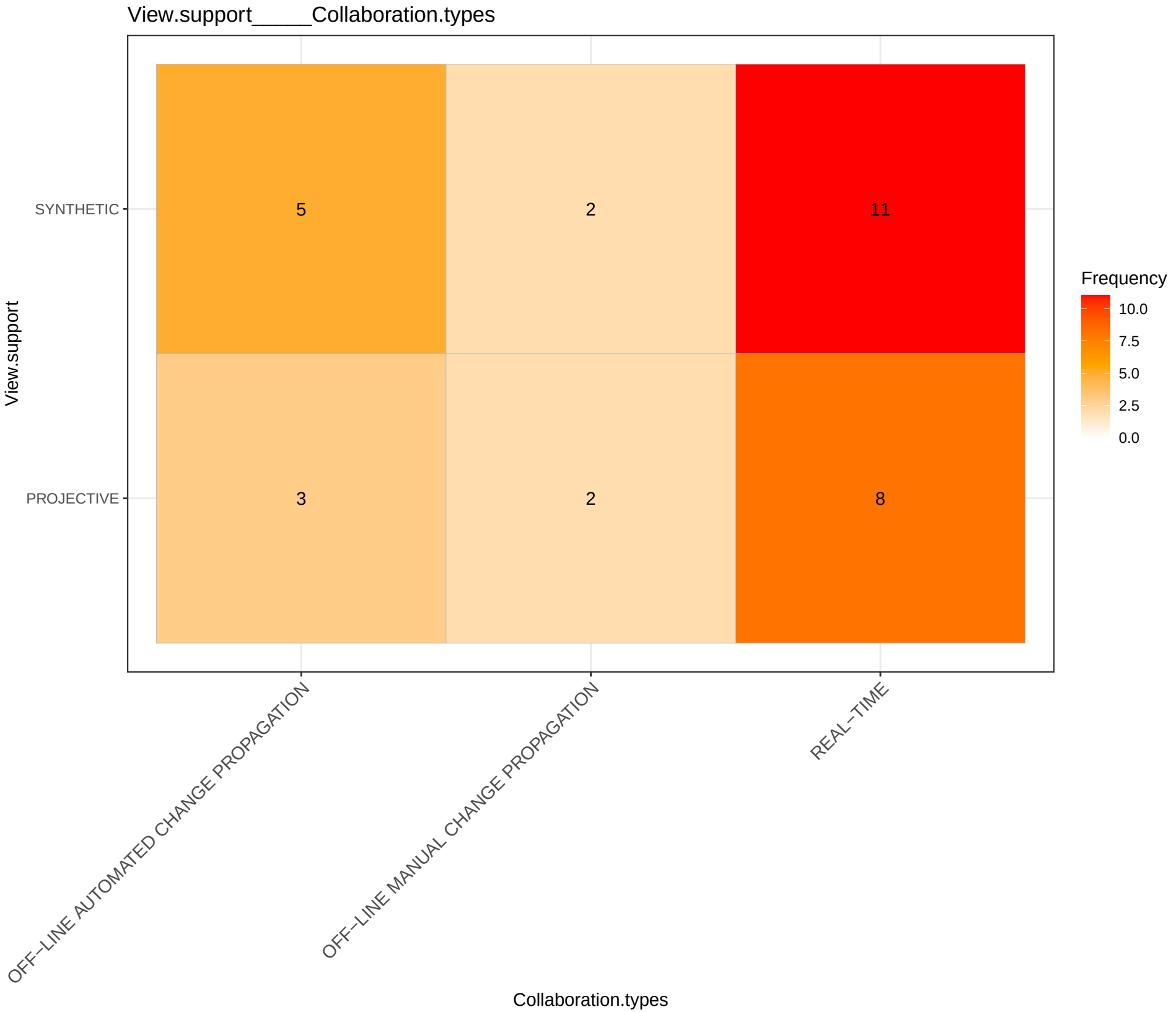

View.support_____Modeling.framework
View.support
SYNTHETIC
PROJECTIVE
0 1 0 7 5 1 0 0 1 1 0 0 1 0 0
1 0 1 2 2 1 1 1 0 0 1 1 0 1 1
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
NO
PACAS
RDF
SPEM
UML
VIATRA
WEBGME
YJS
Modeling.framework
Frequency
6
4
2
0

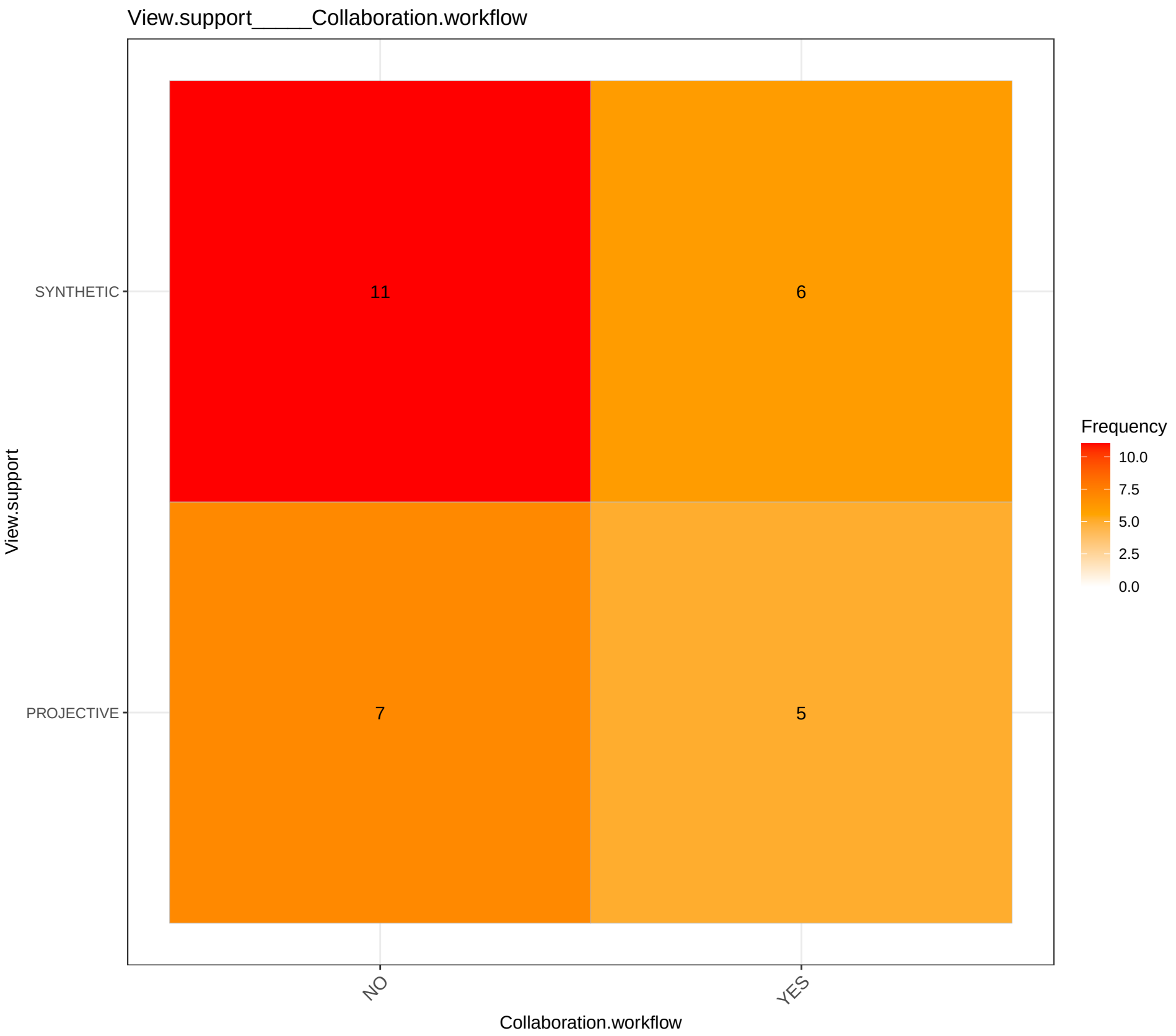

View.support_____System.domain
SYNTHETIC
PROJECTIVE
14
3
9
3
View.support
GENERIC
SPECIFIC
System.domain
Frequency
10
5
0

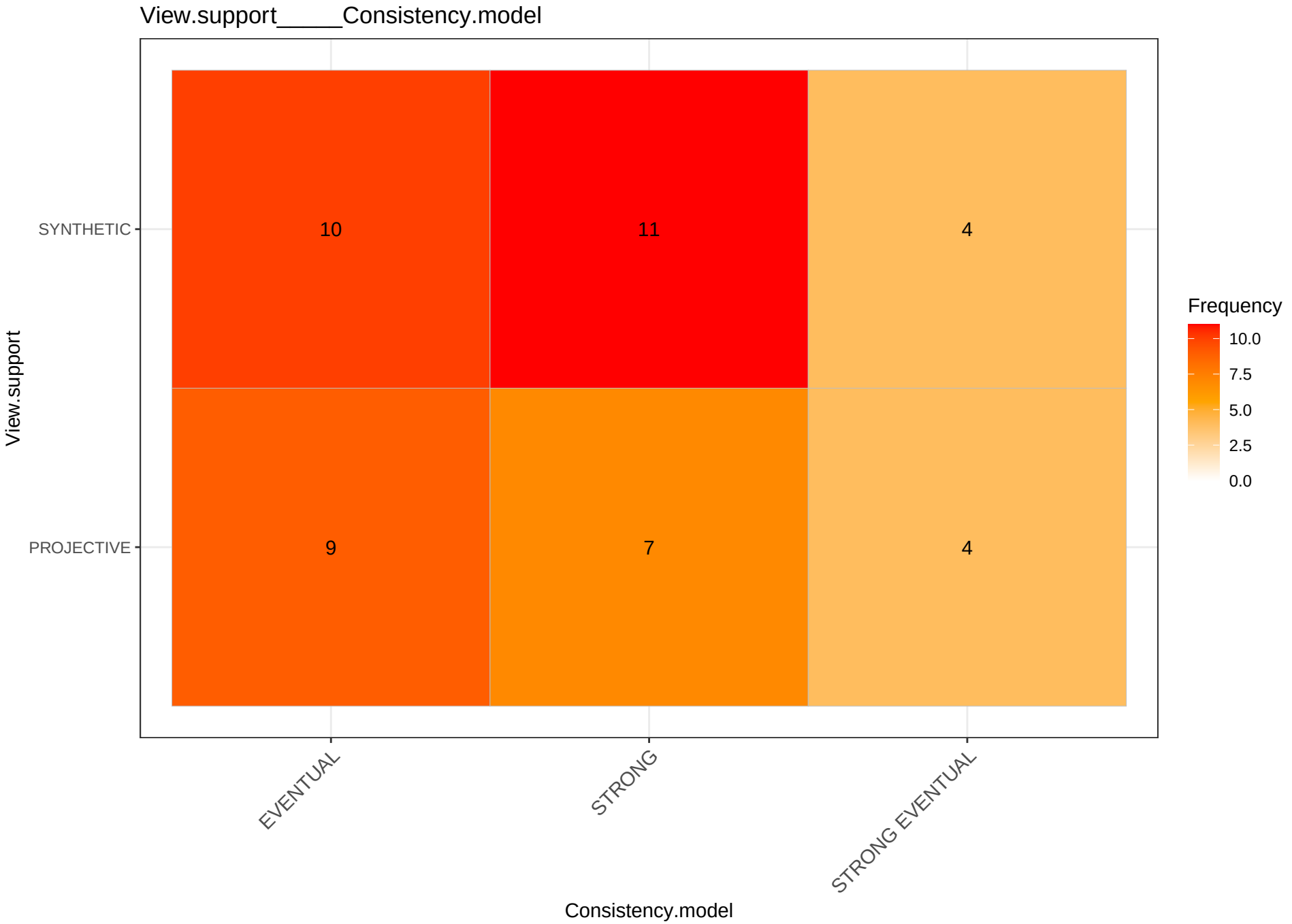

View.support_____System.domain.type
SYNTHETIC
PROJECTIVE
View.support
2
14
1
0
0
0
0
8
0
1
1
2
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
10
5
0

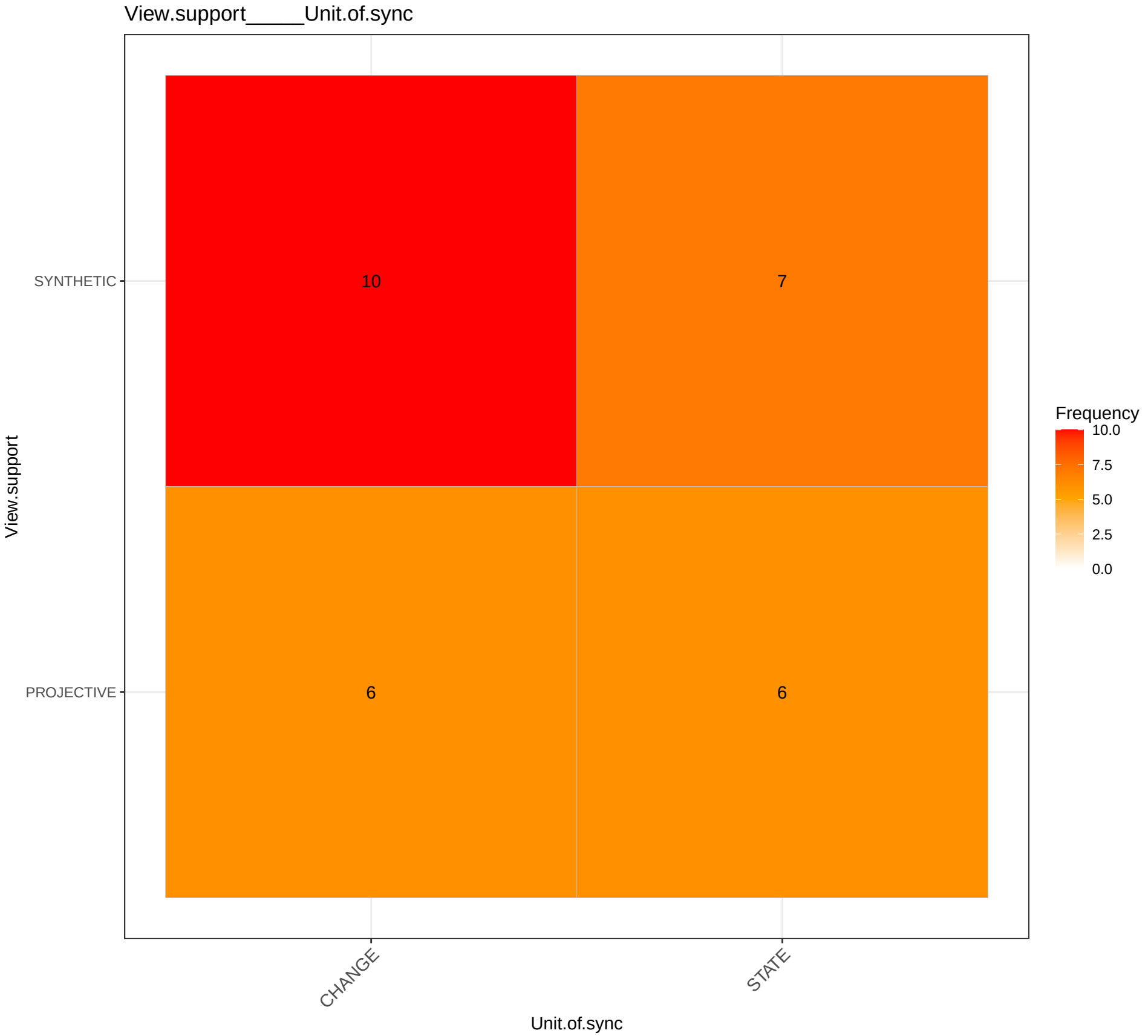

View.support_____System.parts
SYNTHETIC
PROJECTIVE
View.support
1
2
1
12
0
1
0
0
0
9
1
2
BACK−END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
12
9
6
3
0

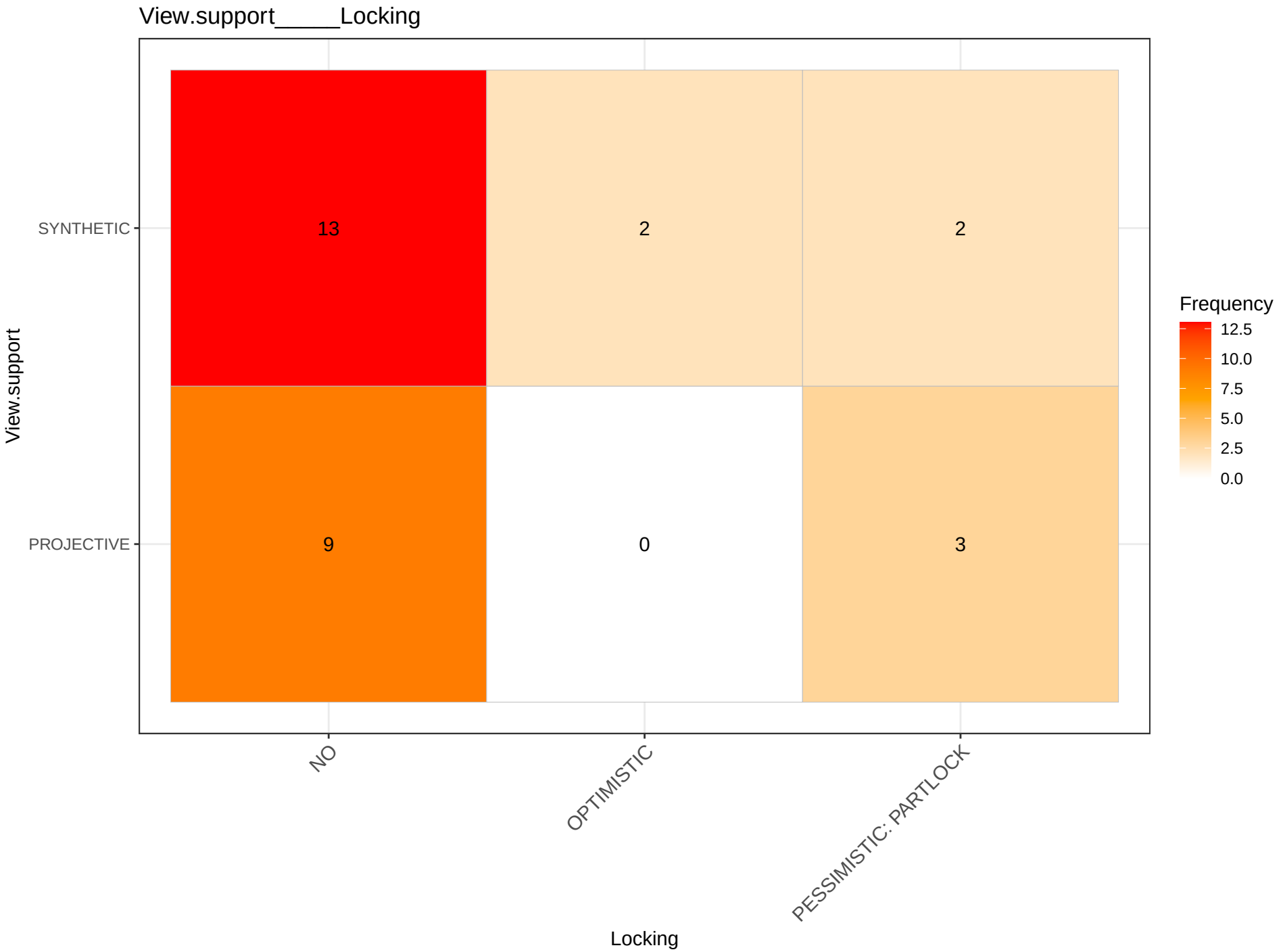
View.support_____Validation.support
SYNTHETIC
PROJECTIVE
View.support
0
1
5
1
11
1
0
9
0
3
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
10.0
7.5
5.0
2.5
0.0

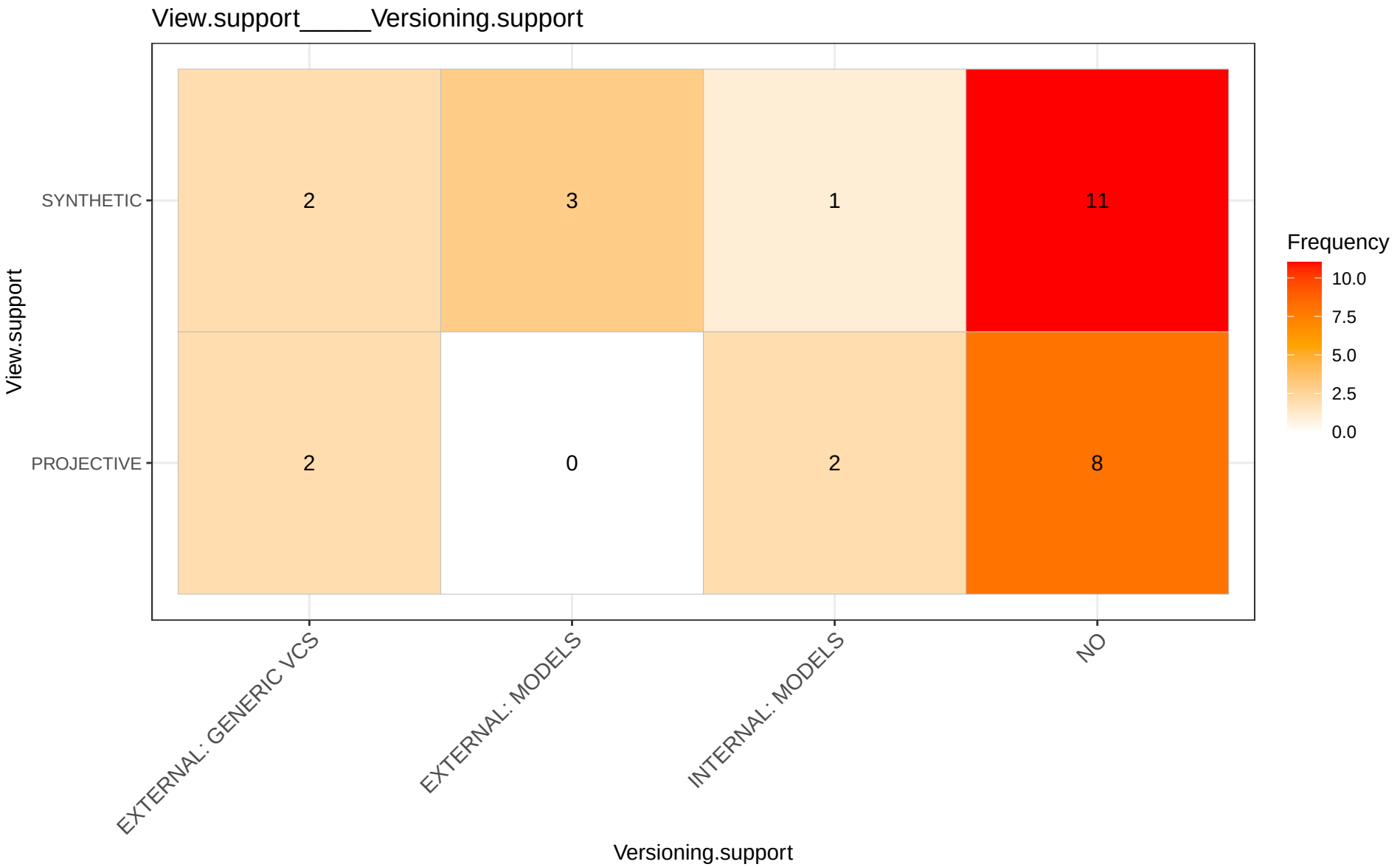

View.support_____Collaboration.types
SYNTHETIC
PROJECTIVE
5
2
11
3
2
8
View.support
Frequency
10.0
7.5
5.0
2.5
0.0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types

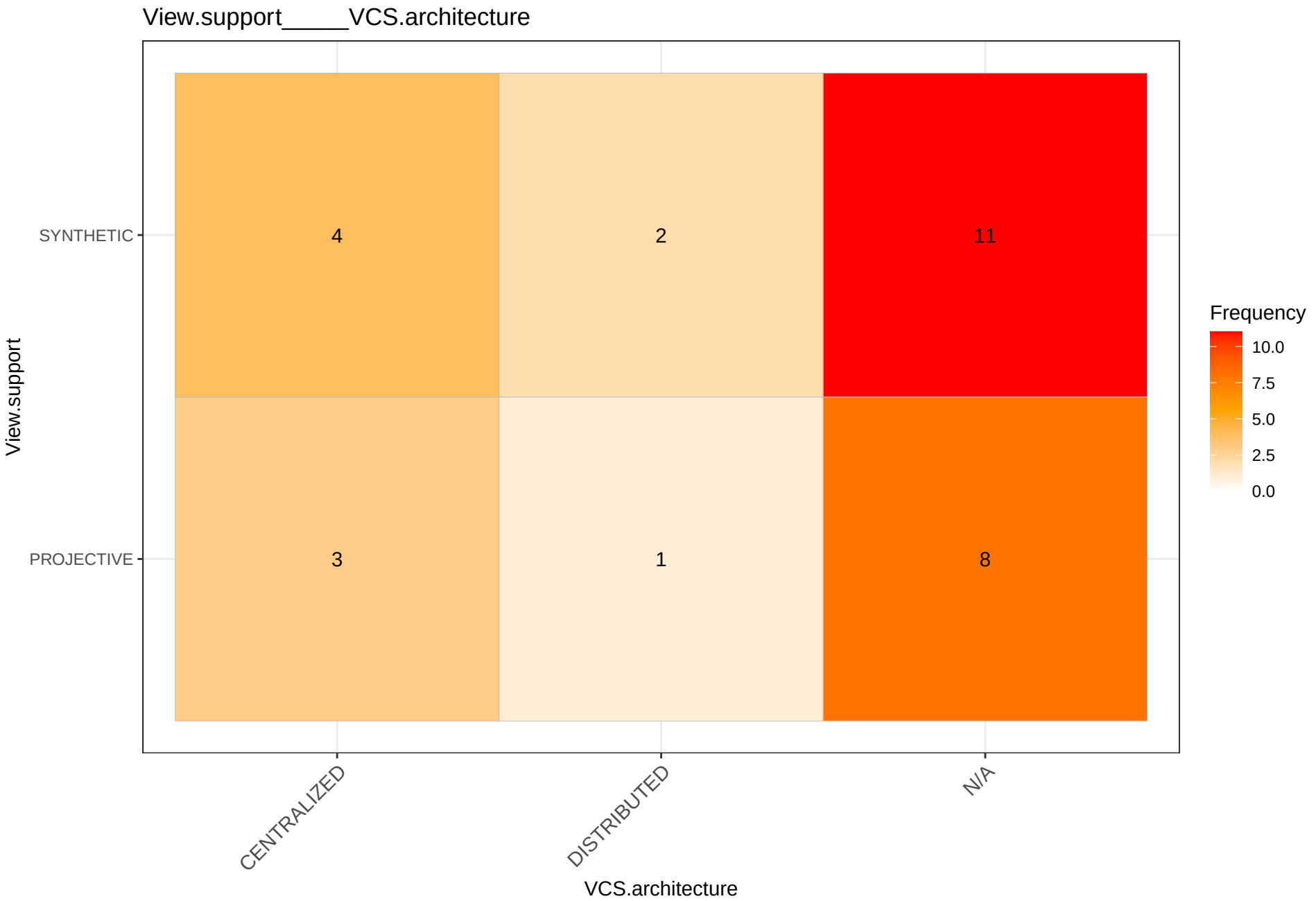

View.support_____Collaboration.workflow
SYNTHETIC
PROJECTIVE
View.support
11
6
7
5
NO
YES
Collaboration.workflow
Frequency
10.0
7.5
5.0
2.5
0.0

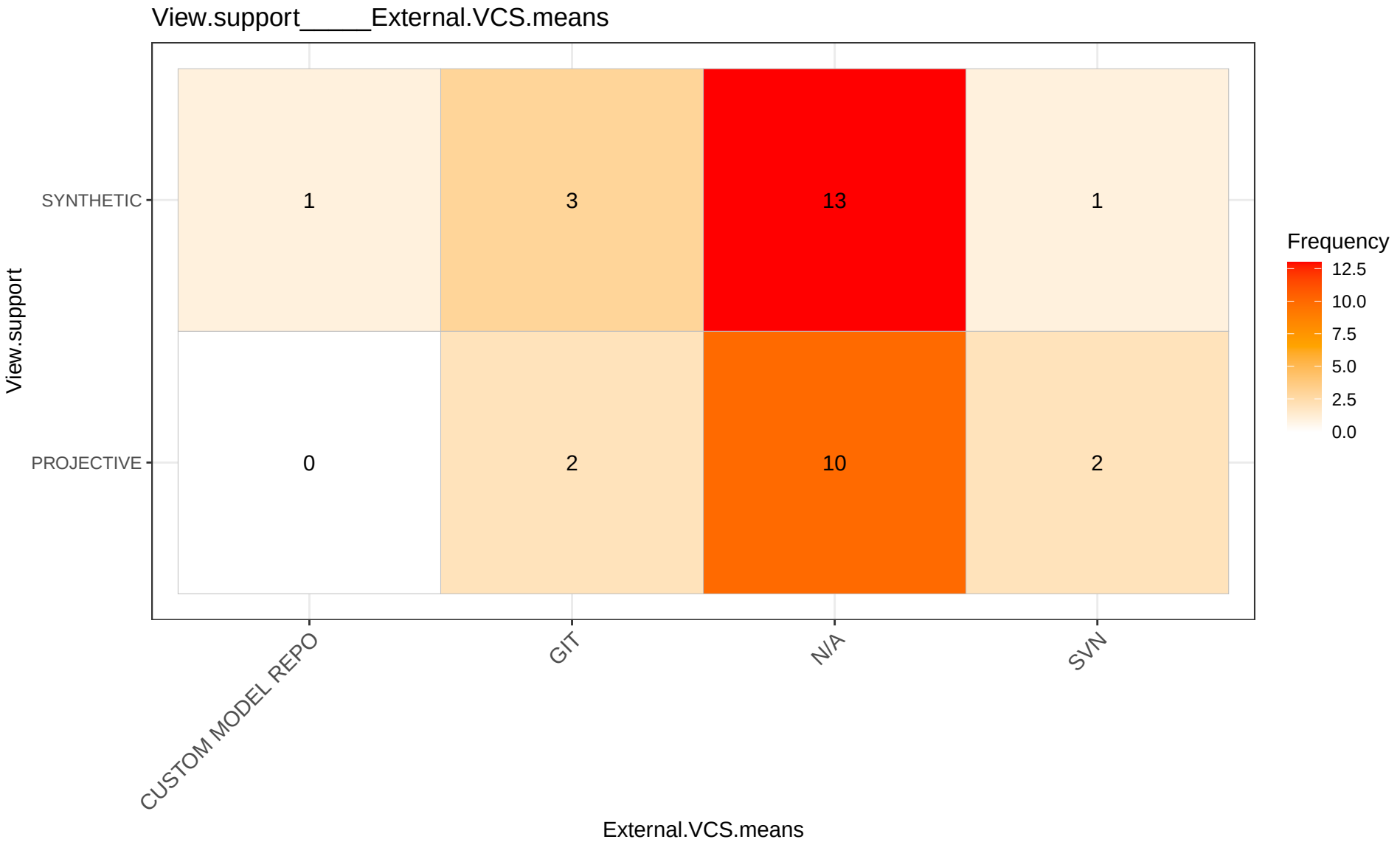

View.support_____Consistency.model
SYNTHETIC
PROJECTIVE
View.support
10
11
4
9
7
4
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
10.0
7.5
5.0
2.5
0.0

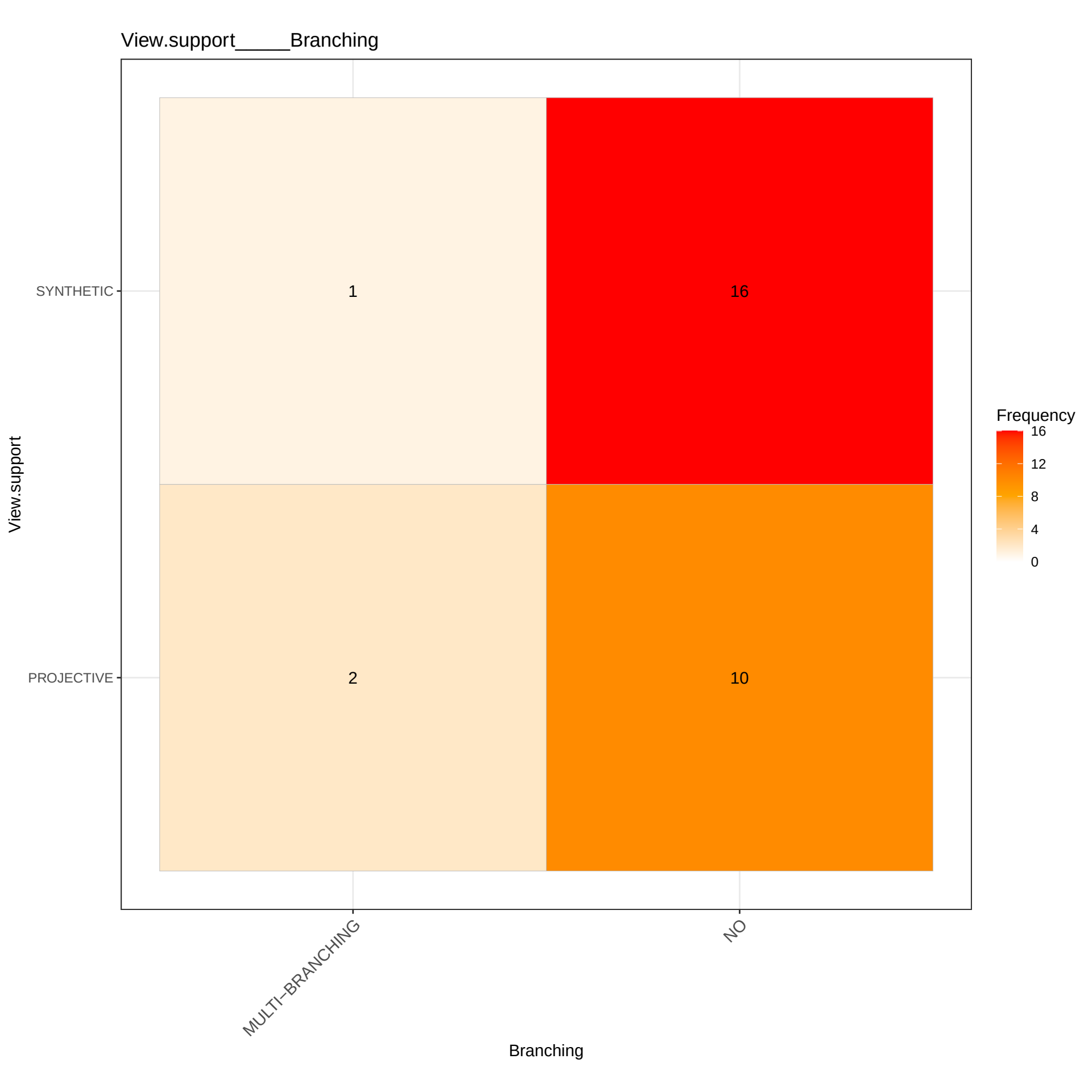

View.support_____Unit.of.sync
SYNTHETIC
PROJECTIVE
View.support
10
7
6
6
CHANGE
STATE
Unit.of.sync
Frequency
10.0
7.5
5.0
2.5
0.0

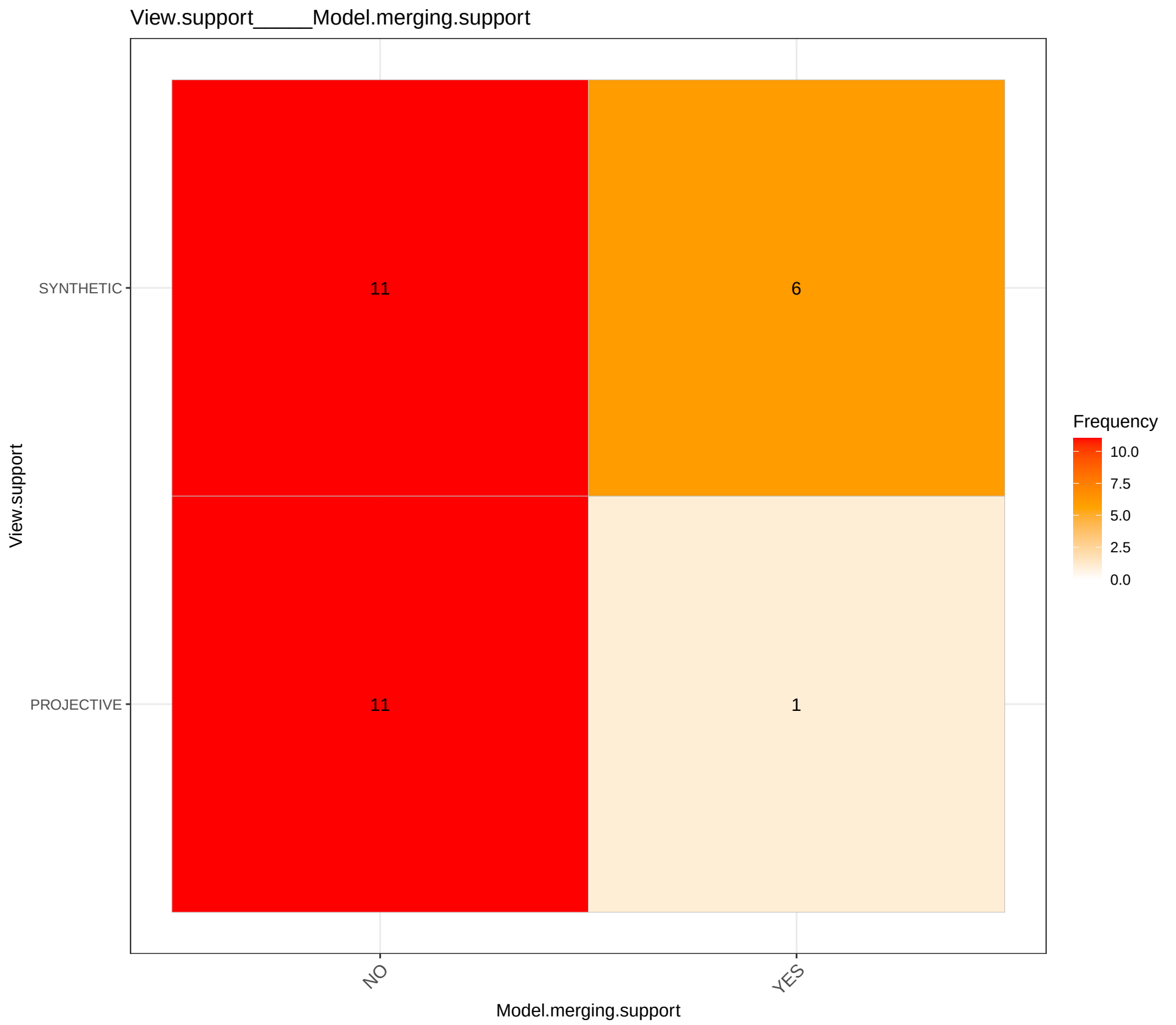

View.support_____Locking
SYNTHETIC
PROJECTIVE
View.support
13
2
2
9
0
3
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

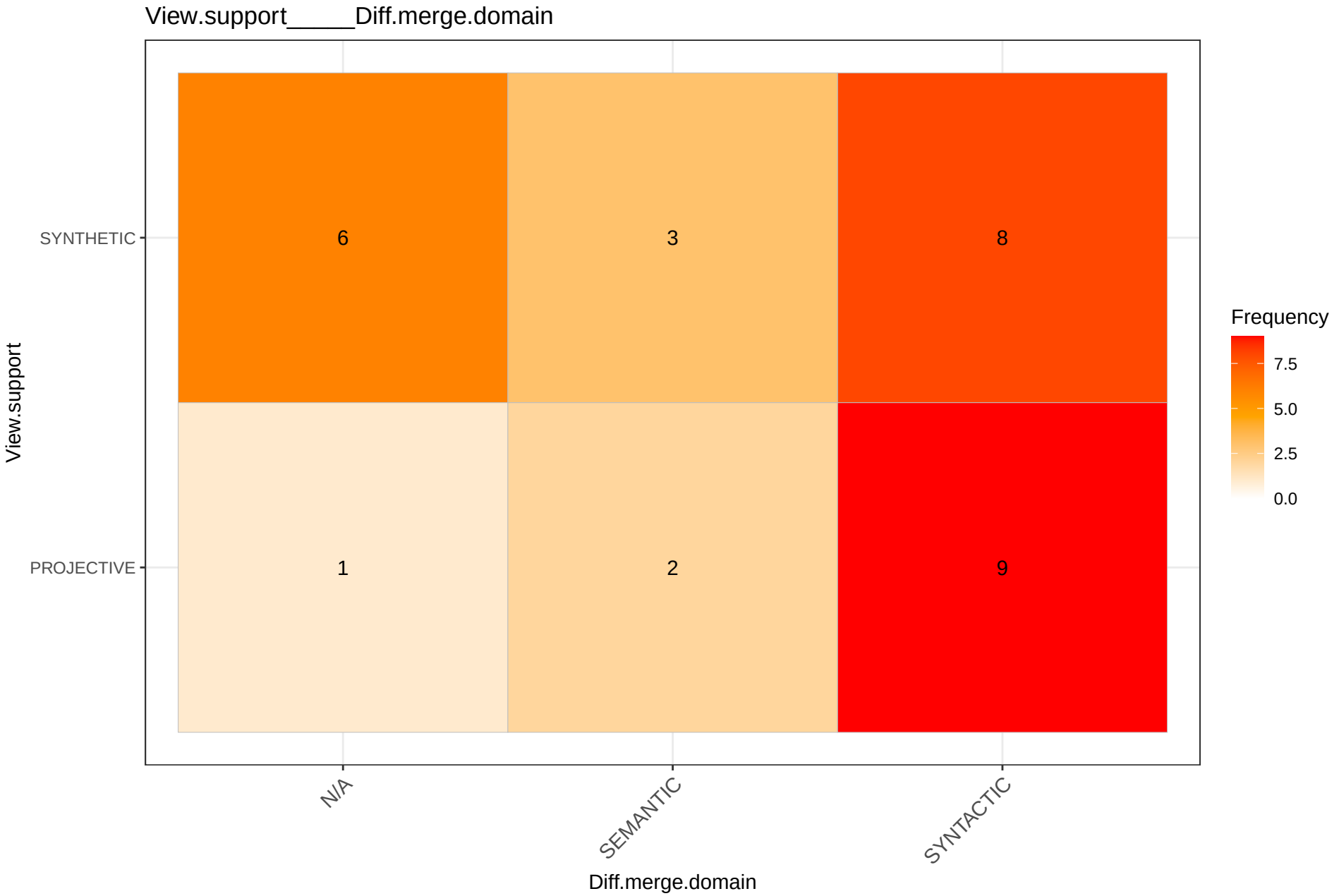

View.support_____Versioning.support
SYNTHETIC
PROJECTIVE
View.support
2
3
1
11
2
0
2
8
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
10.0
7.5
5.0
2.5
0.0

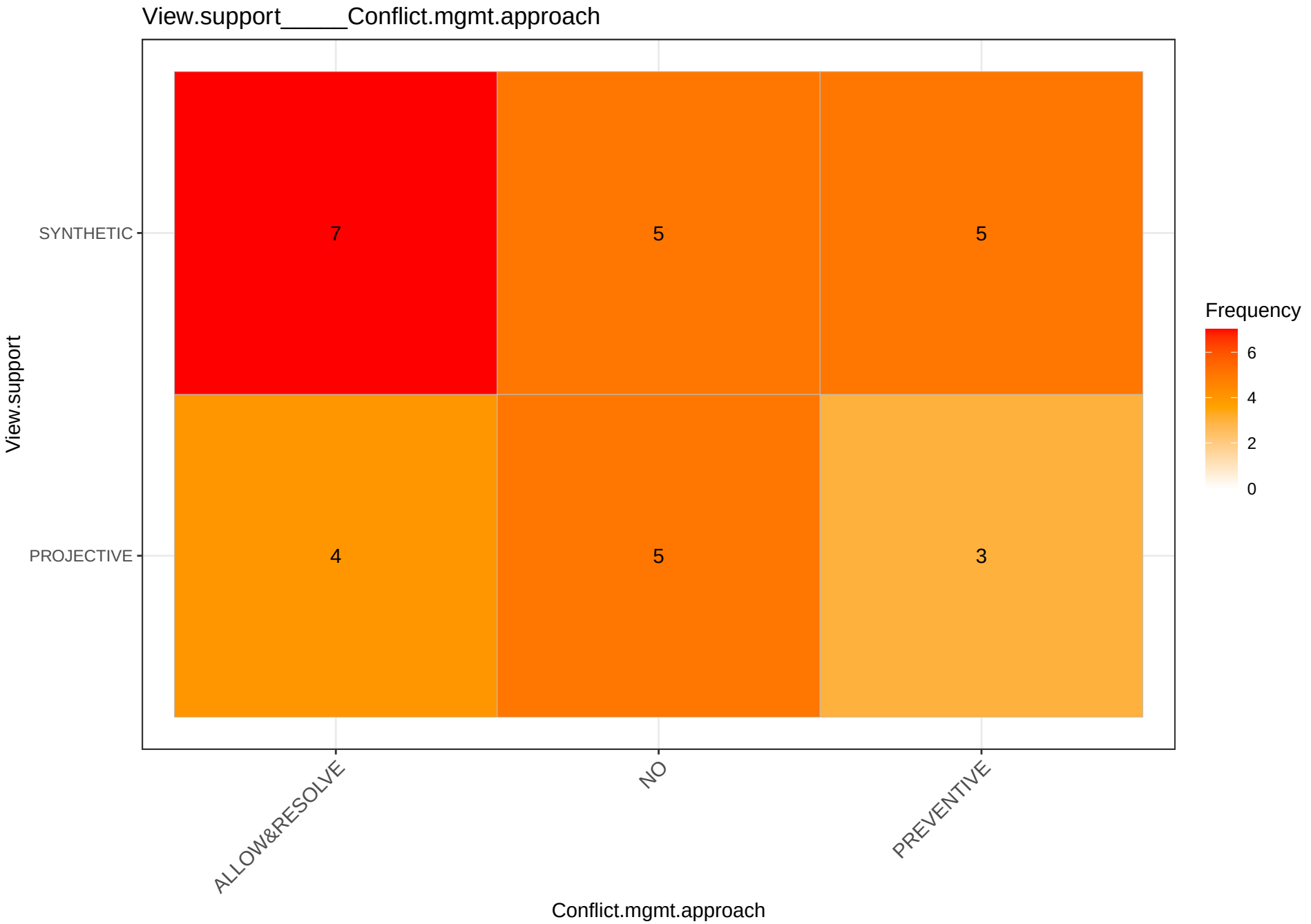

View.support_____VCS.architecture
SYNTHETIC
PROJECTIVE
View.support
4
2
11
3
1
8
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

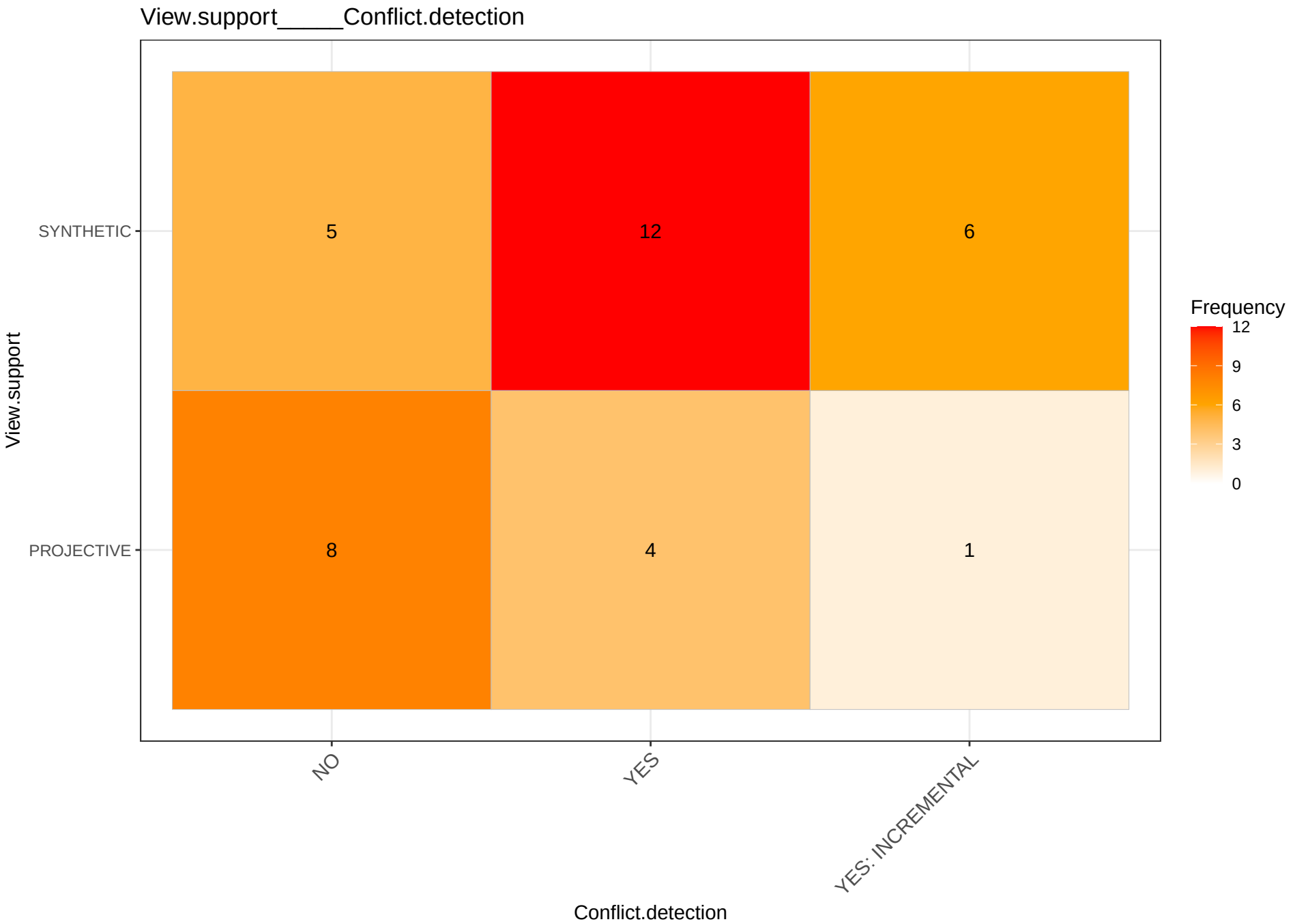

View.support_____External.VCS.means
SYNTHETIC
PROJECTIVE
View.support
1
3
13
1
0
2
10
2
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

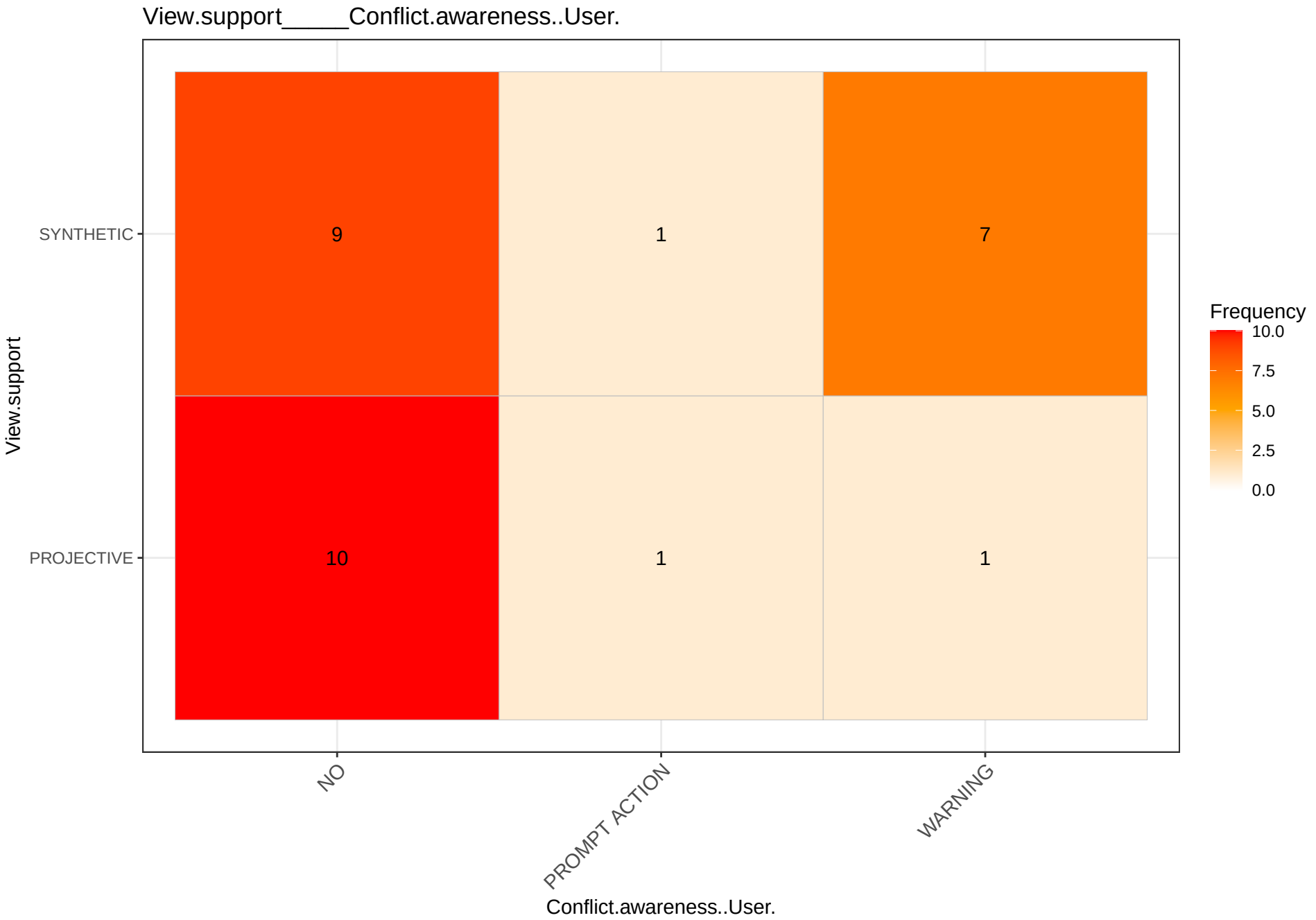

View.support_____Branching
SYNTHETIC
PROJECTIVE
1
16
2
10
View.support
MULTI−BRANCHING
NO
Branching
Frequency
16
12
8
4
0

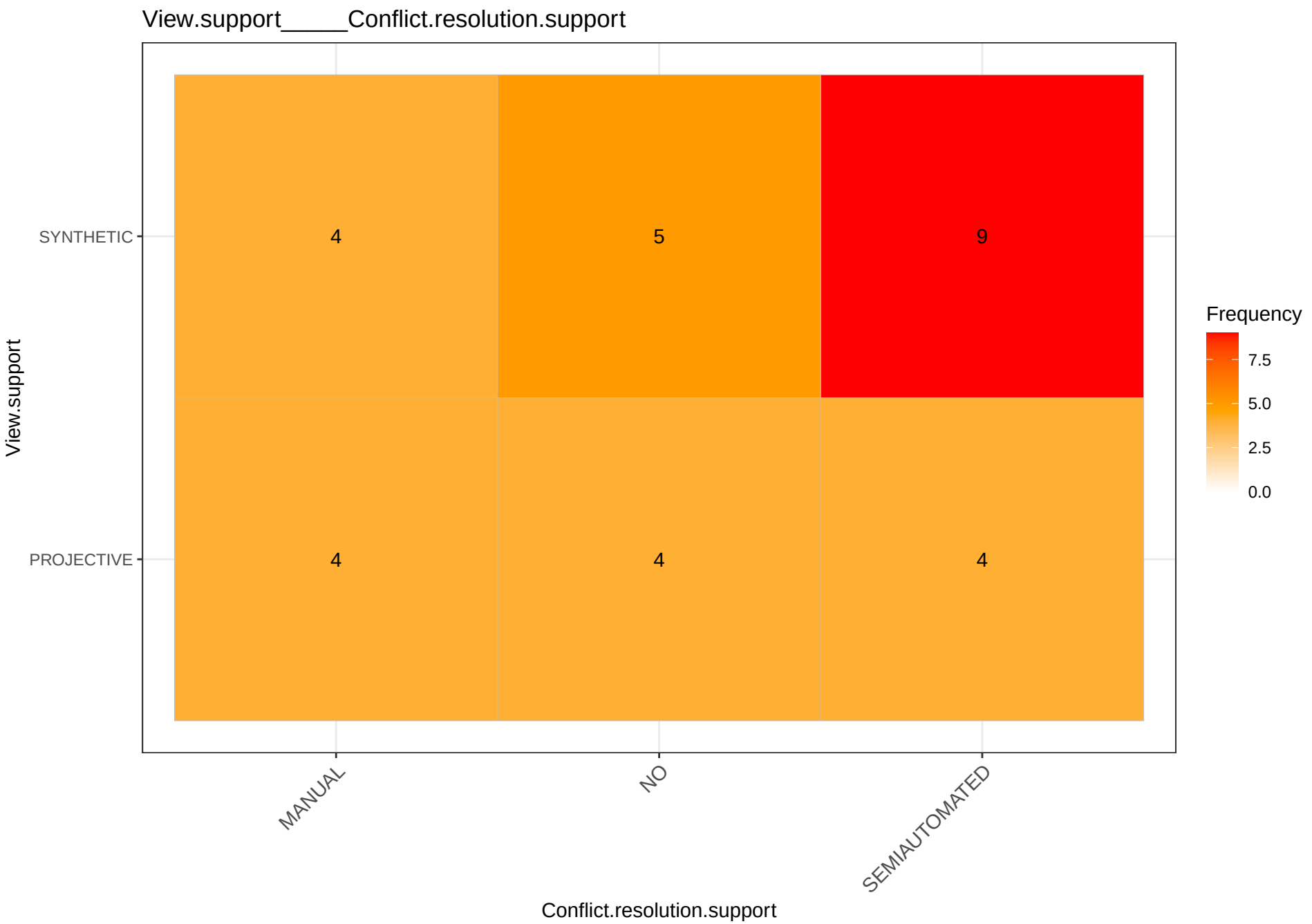

View.support_____Model.merging.support
SYNTHETIC
PROJECTIVE
11
6
11
1
View.support
NO
YES
Model.merging.support
Frequency
10.0
7.5
5.0
2.5
0.0

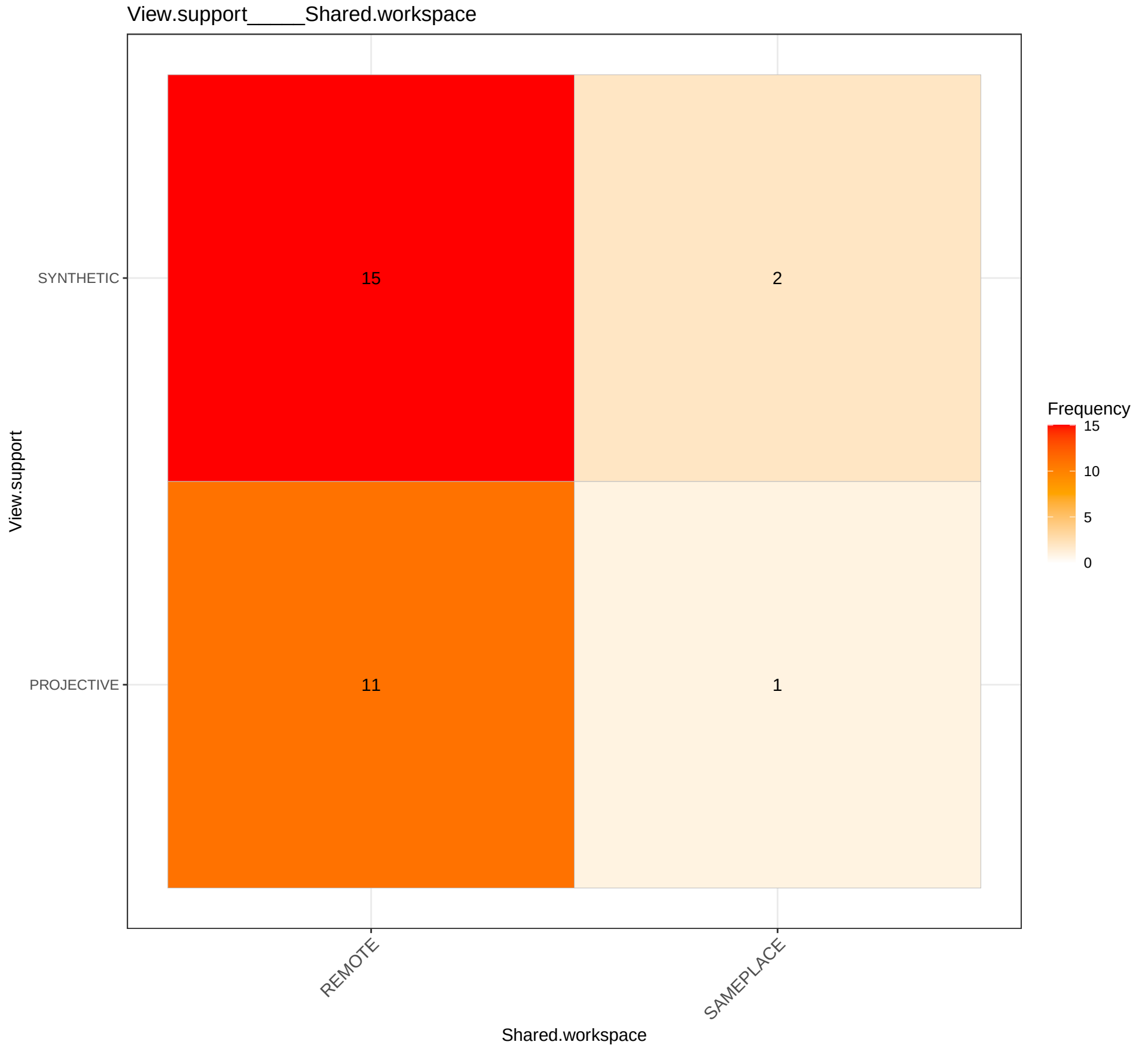

View.support_____Diff.merge.domain
SYNTHETIC
PROJECTIVE
View.support
6
3
8
1
2
9
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
7.5
5.0
2.5
0.0

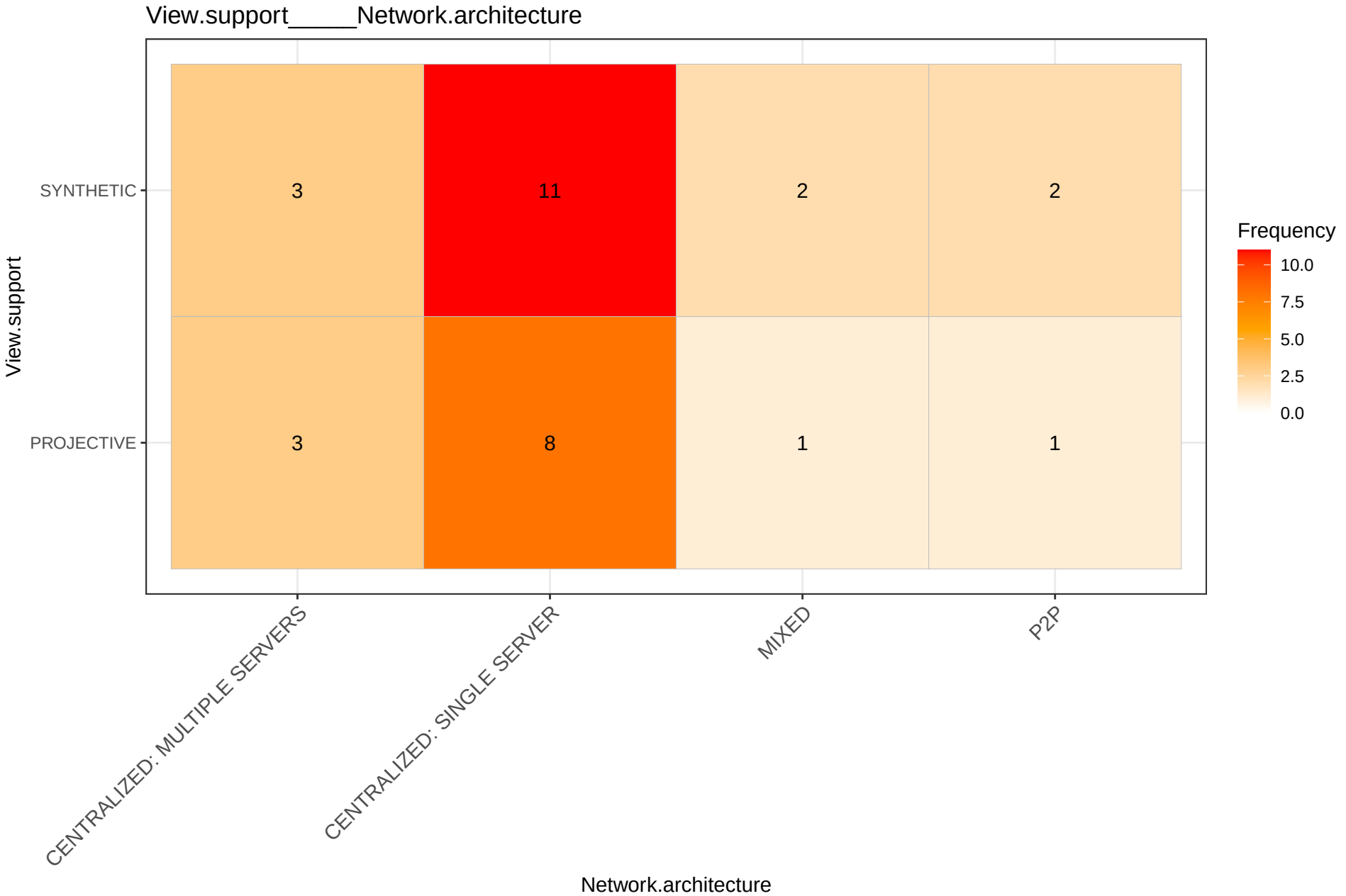

View.support_____Conflict.mgmt.approach
SYNTHETIC
PROJECTIVE
View.support
7
5
5
4
5
3
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
4
2
0

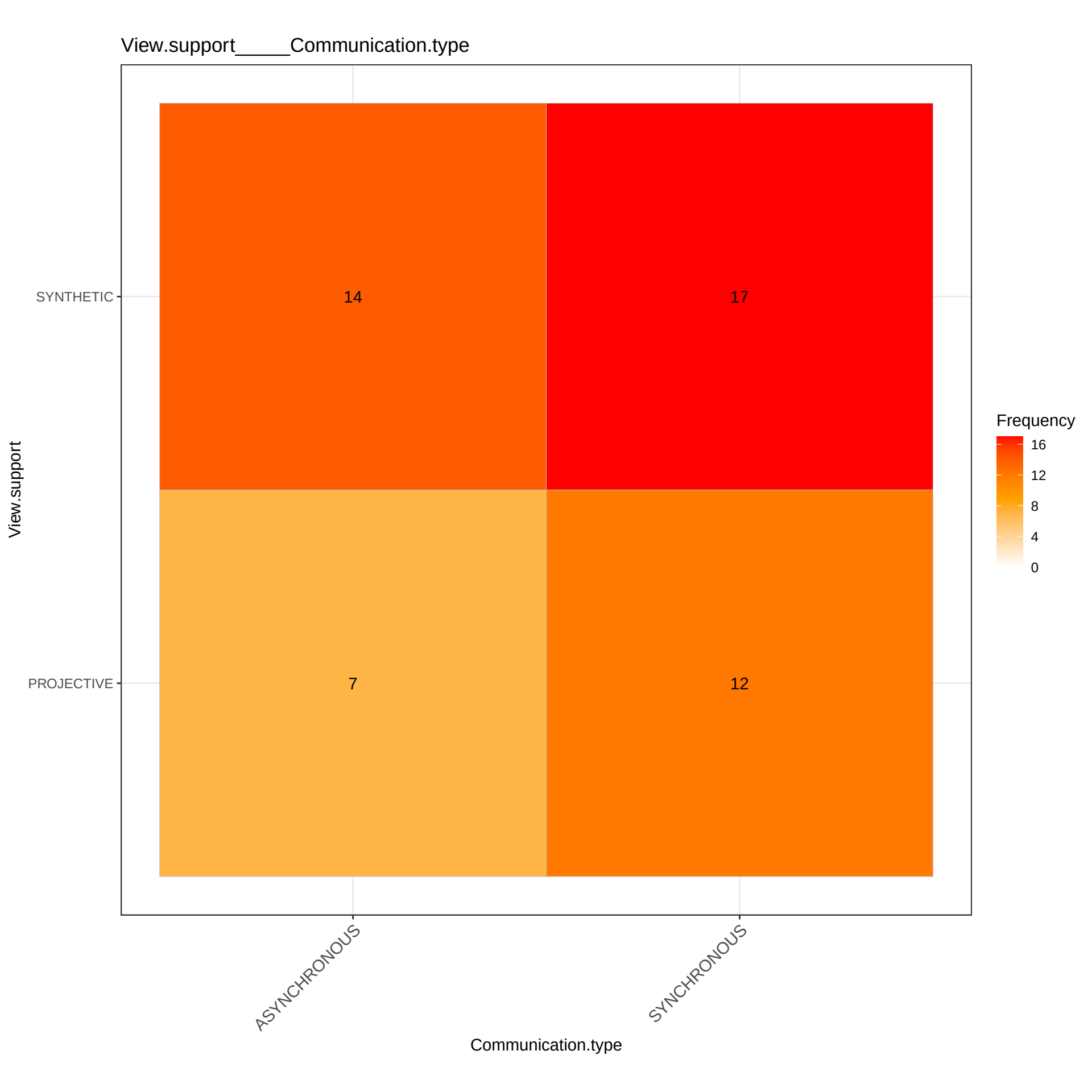

View.support_____Conflict.detection
SYNTHETIC
PROJECTIVE
View.support
5
12
6
8
4
1
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

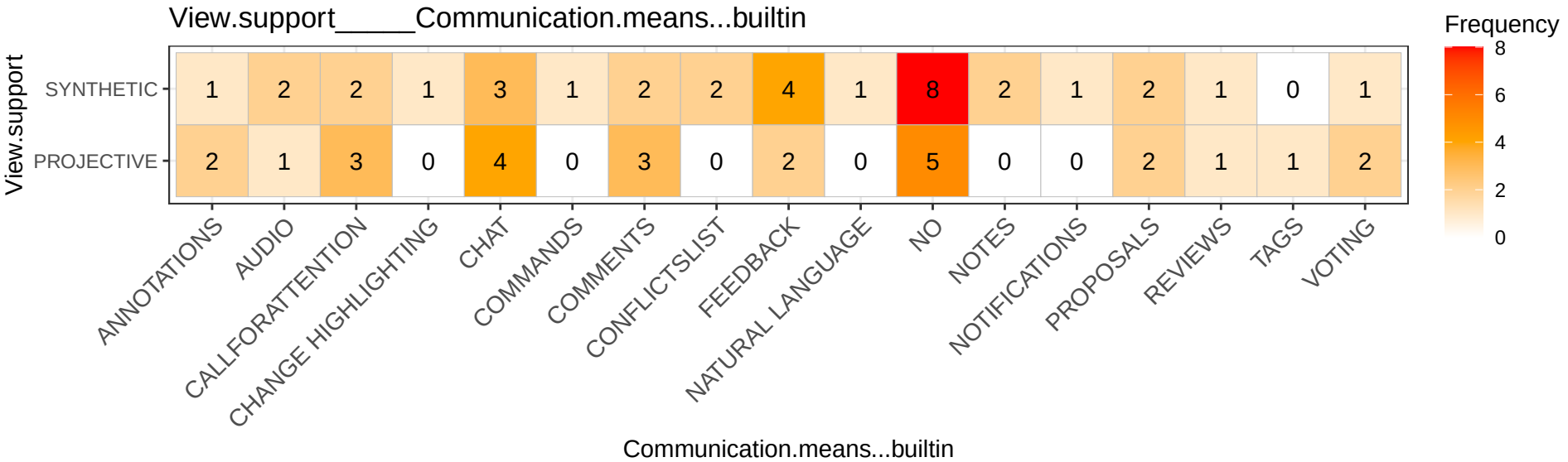

View.support_____Conflict.awareness..User.
SYNTHETIC
PROJECTIVE
View.support
9
1
7
10
1
1
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0

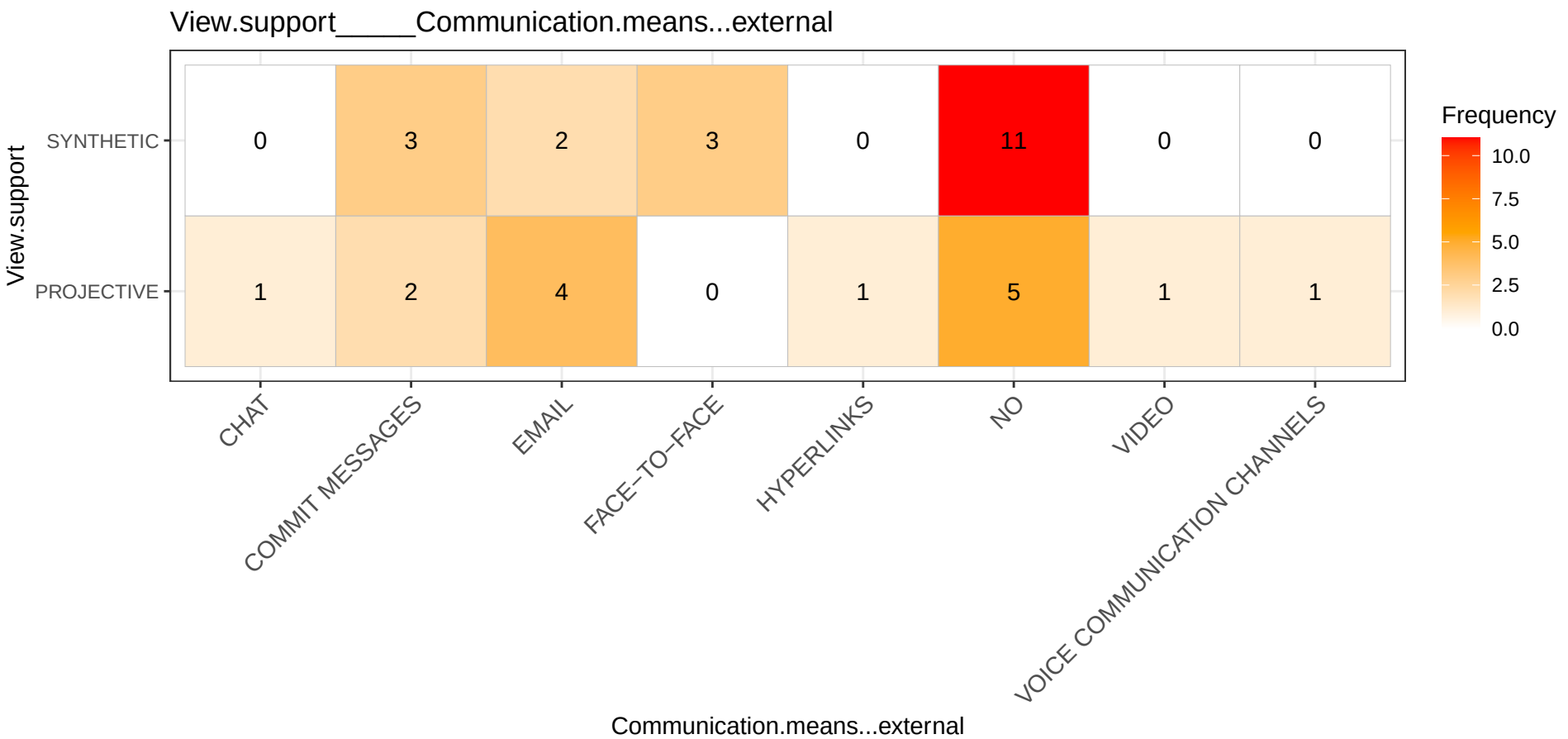

View.support_____Conflict.resolution.support
SYNTHETIC
PROJECTIVE
View.support
4
5
9
4
4
4
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

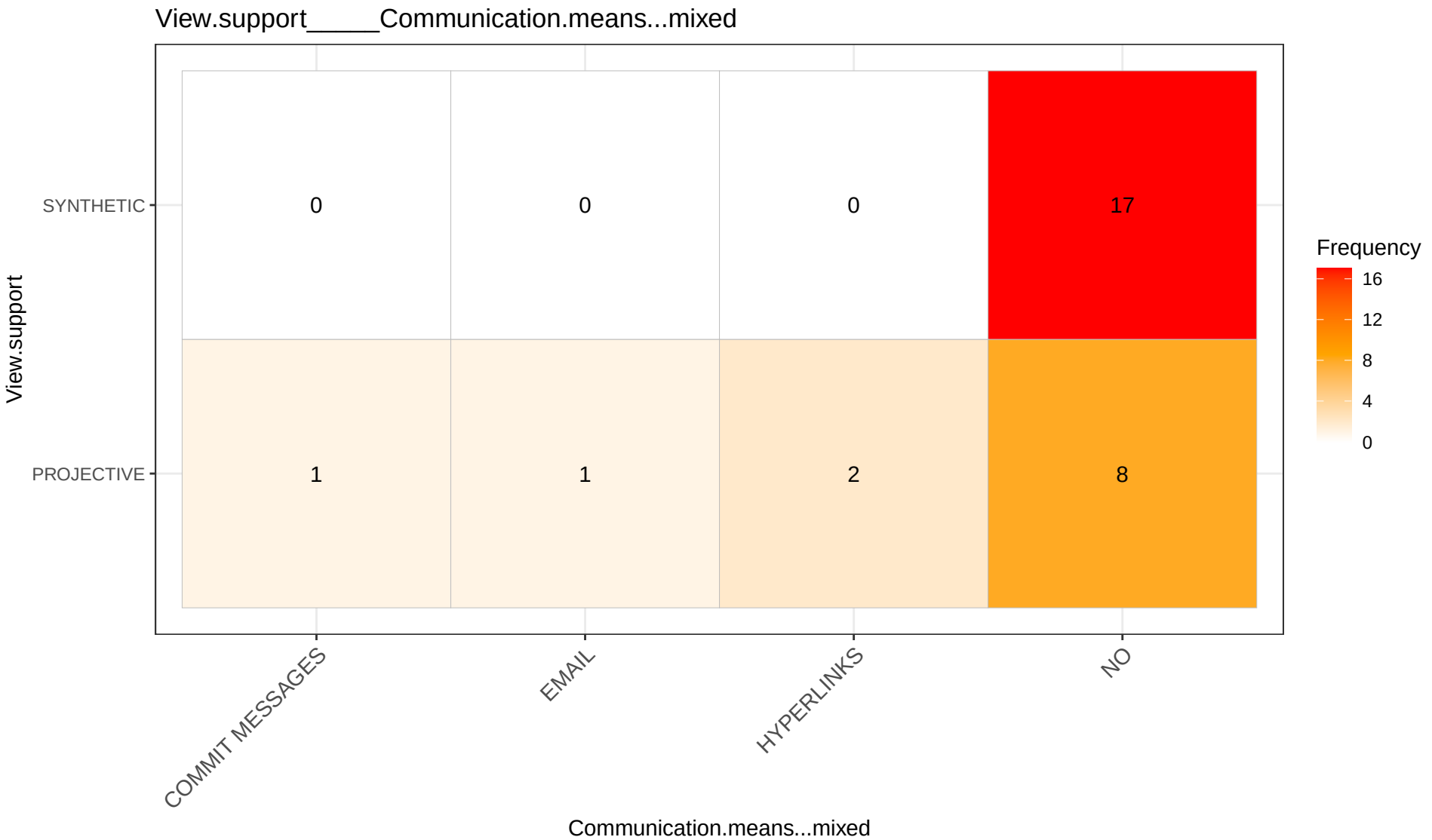

View.support_____Shared.workspace
SYNTHETIC
PROJECTIVE
15
2
11
1
View.support
REMOTE
SAMEPLACE
Shared.workspace
Frequency
15
10
5
0

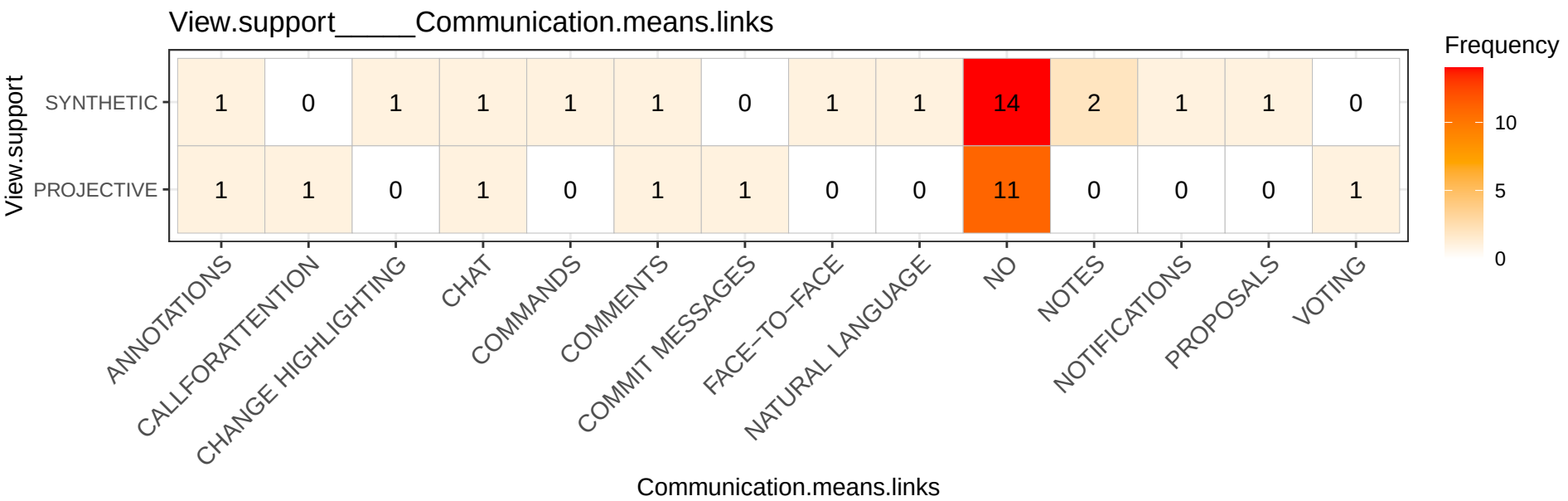

View.support_____Network.architecture
SYNTHETIC
PROJECTIVE
View.support
3
11
2
2
3
8
1
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

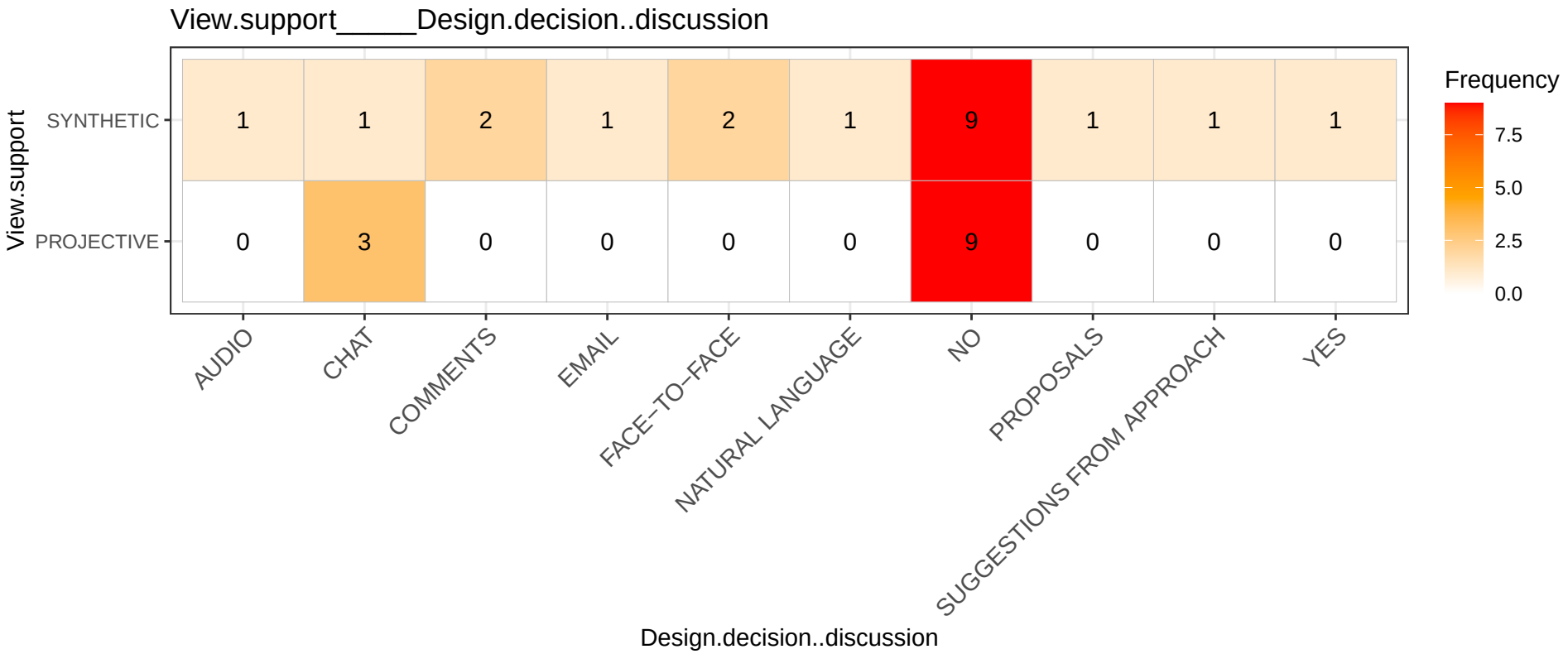

View.support_____Communication.type
SYNTHETIC
PROJECTIVE
View.support
14
17
7
12
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
16
12
8
4
0

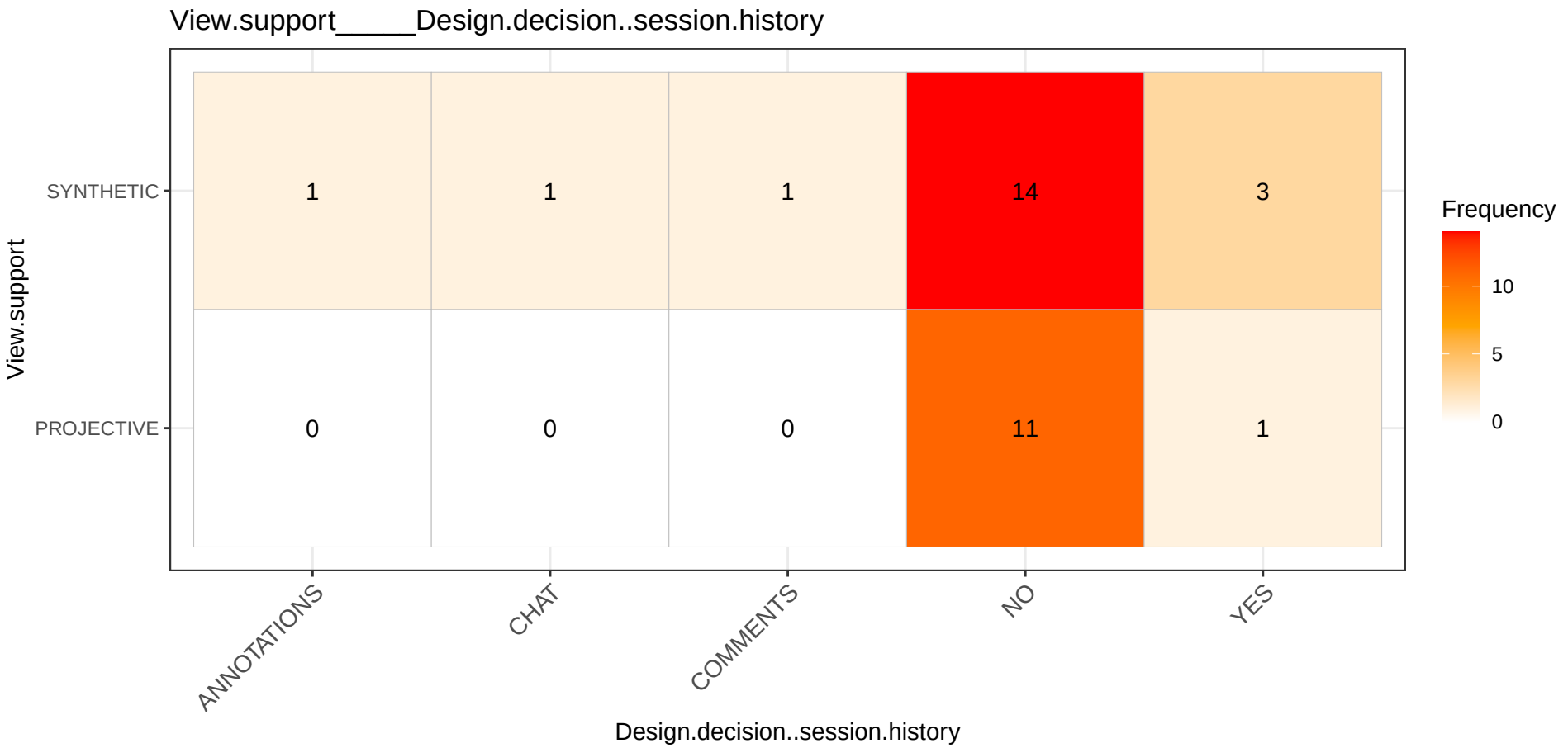

View.support_____Communication.means...builtin
View.support
SYNTHETIC
PROJECTIVE
1 2 2 1 3 1 2 2 4 1 8 2 1 2 1 0 1
2 1 3 0 4 0 3 0 2 0 5 0 0 2 1 1 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
8
6
4
2
0

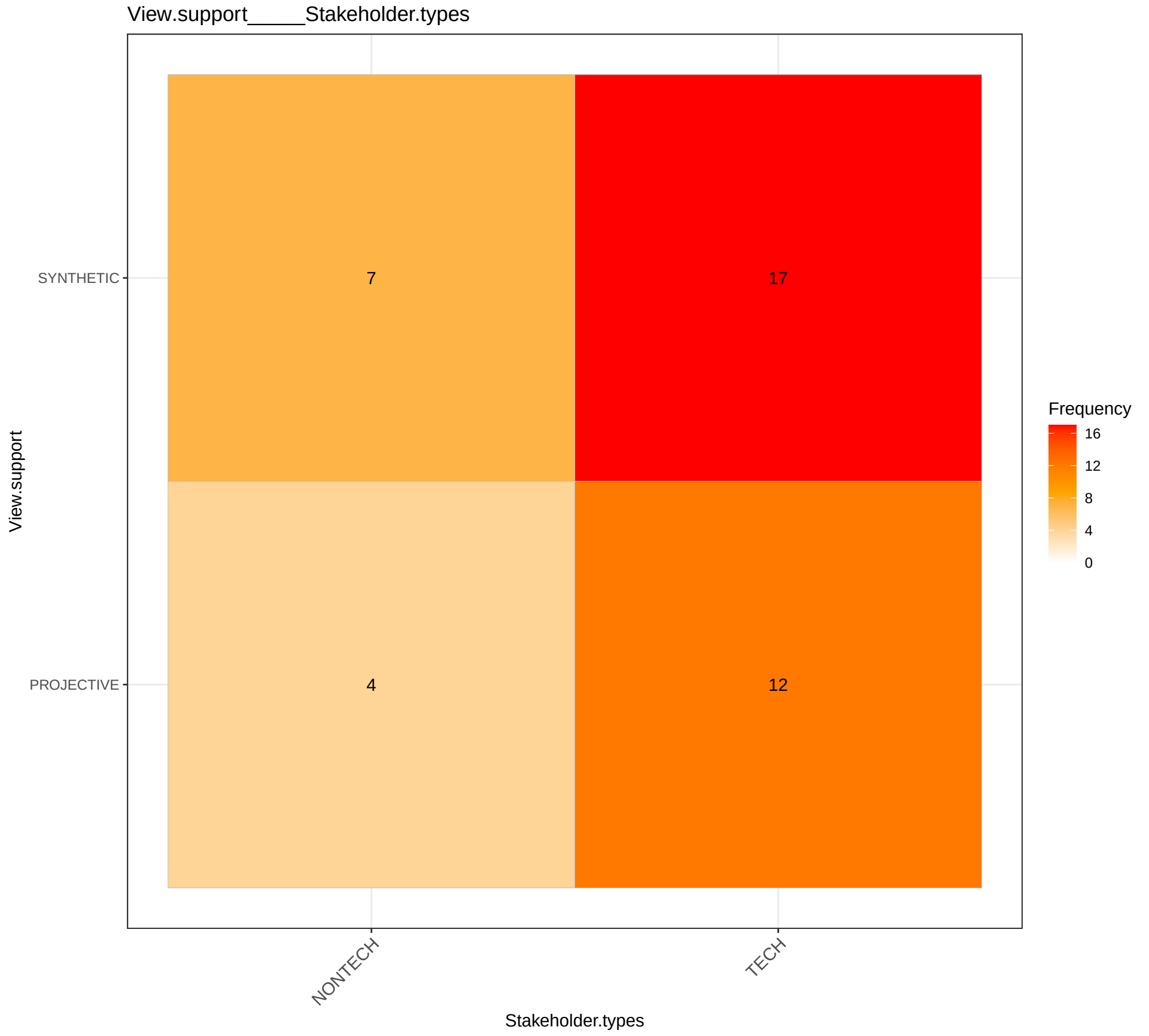

View.support_____Communication.means...external
View.support
SYNTHETIC
PROJECTIVE
0
3
2
3
0
11
0
0
1
2
4
0
1
5
1
1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10.0
7.5
5.0
2.5
0.0

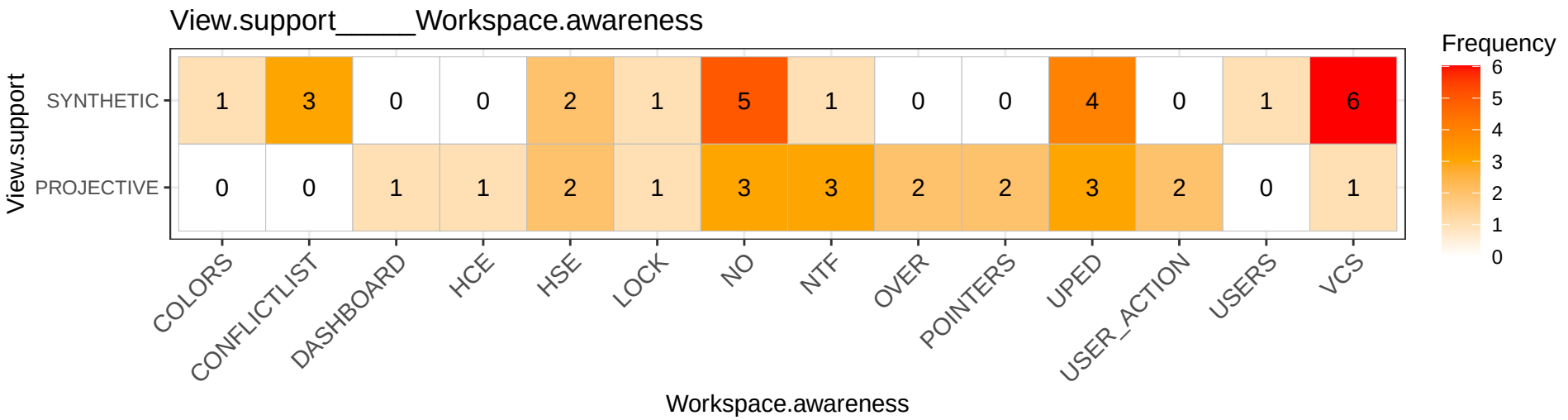

View.support_____Communication.means...mixed
SYNTHETIC
PROJECTIVE
View.support
0
0
0
17
1
1
2
8
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
16
12
8
4
0

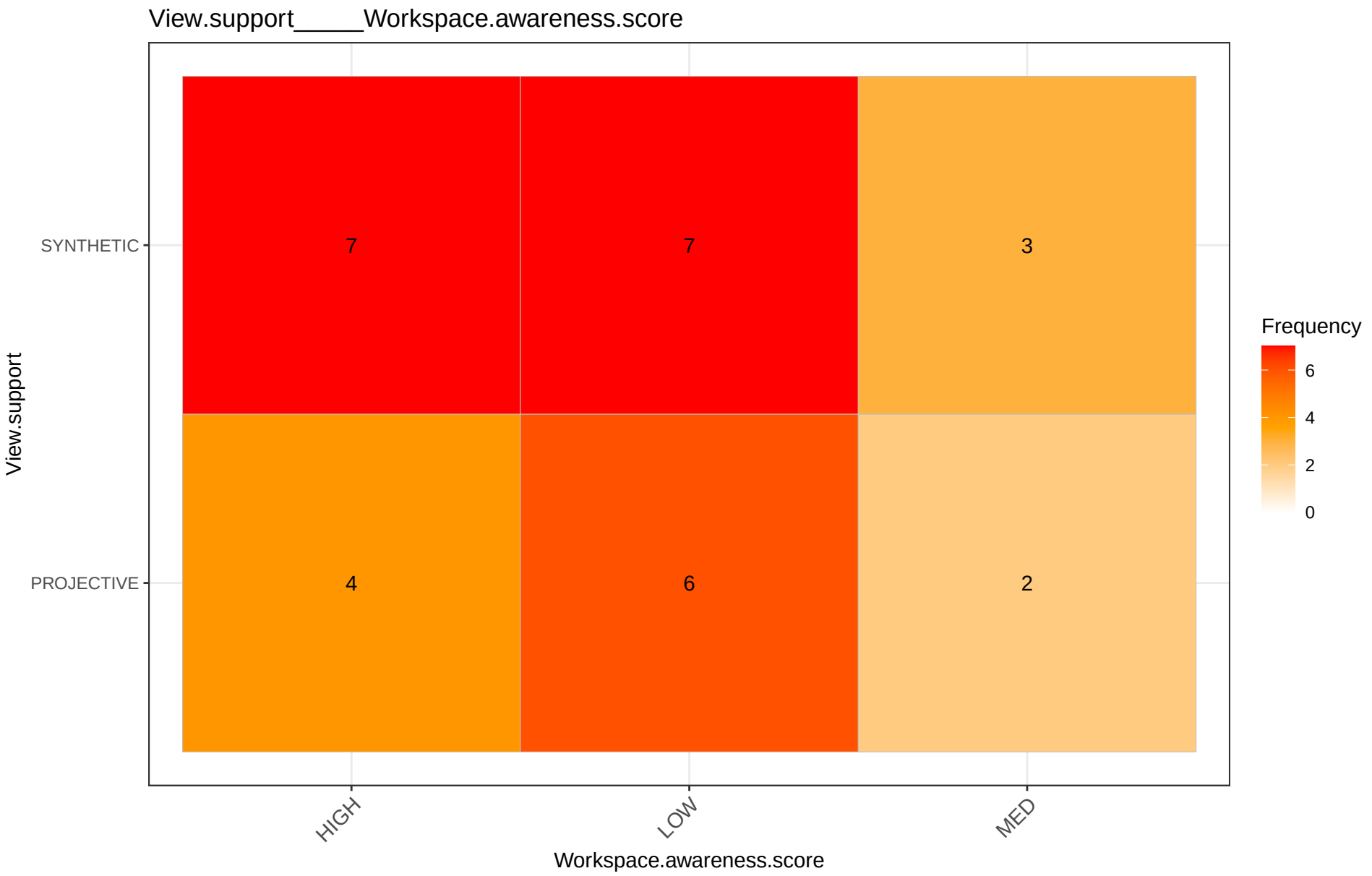

View.support_____Communication.means.links
View.support
SYNTHETIC
PROJECTIVE
1 0 1 1 1 1 0 1 1 14 2 1 1 0
1 1 0 1 0 1 1 0 0 11 0 0 0 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
10
5
0

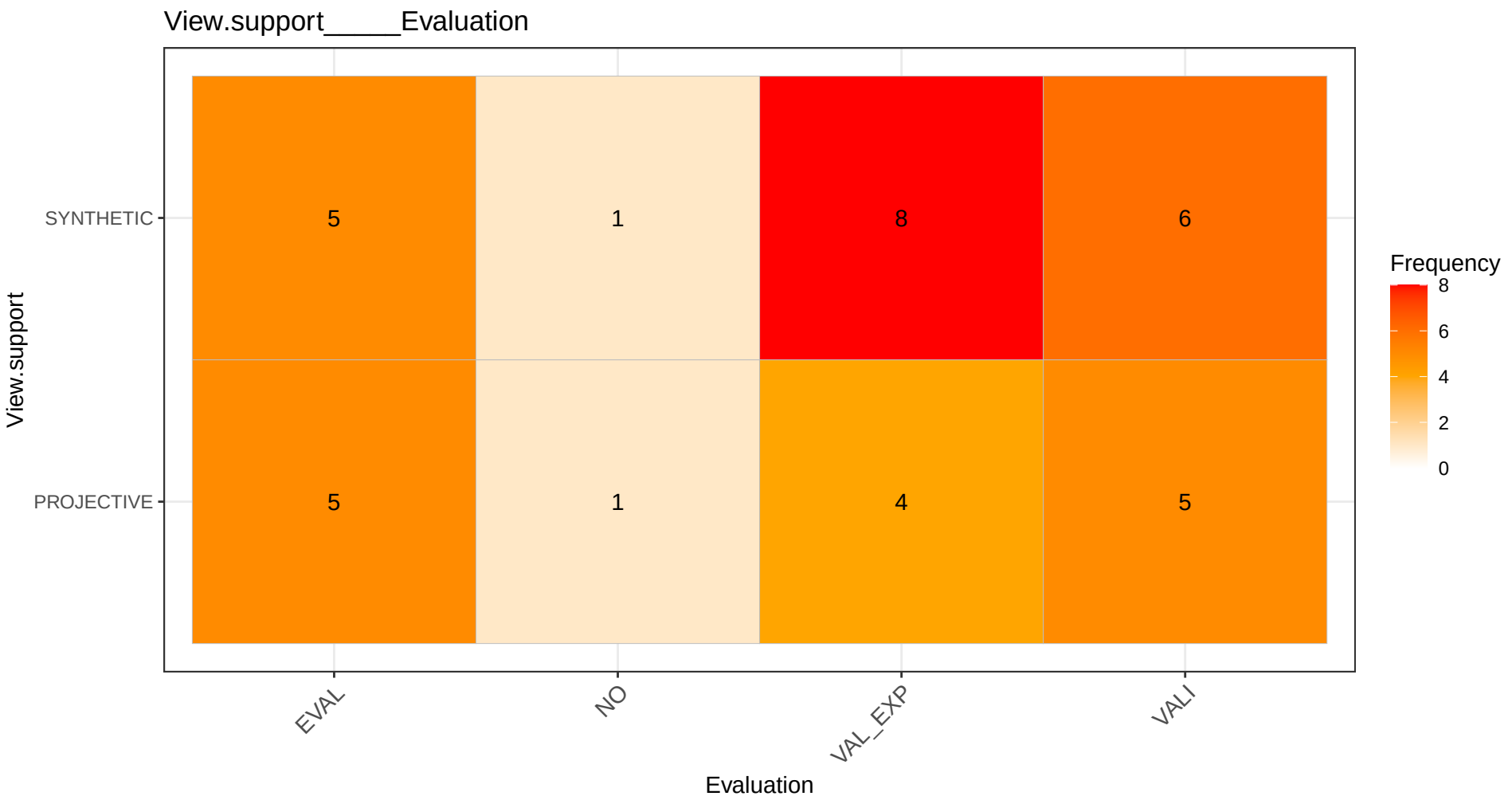

View.support_____Design.decision..discussion
View.support
SYNTHETIC
PROJECTIVE
1
1
2
1
2
1
9
1
1
1
0
3
0
0
0
0
9
0
0
0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
7.5
5.0
2.5
0.0

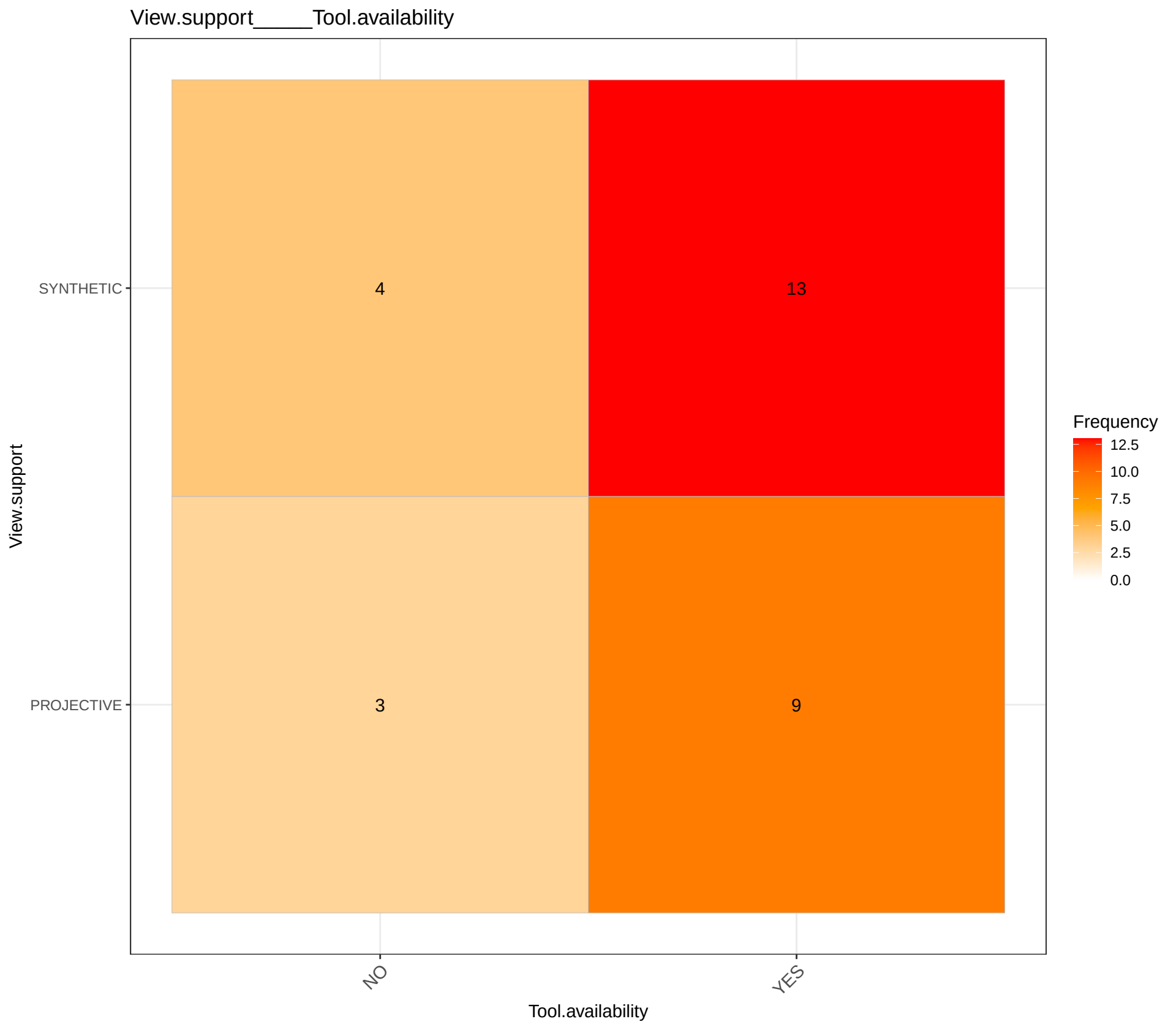

View.support_____Design.decision..session.history
View.support
SYNTHETIC
PROJECTIVE
1
1
1
14
3
0
0
0
11
1
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
10
5
0

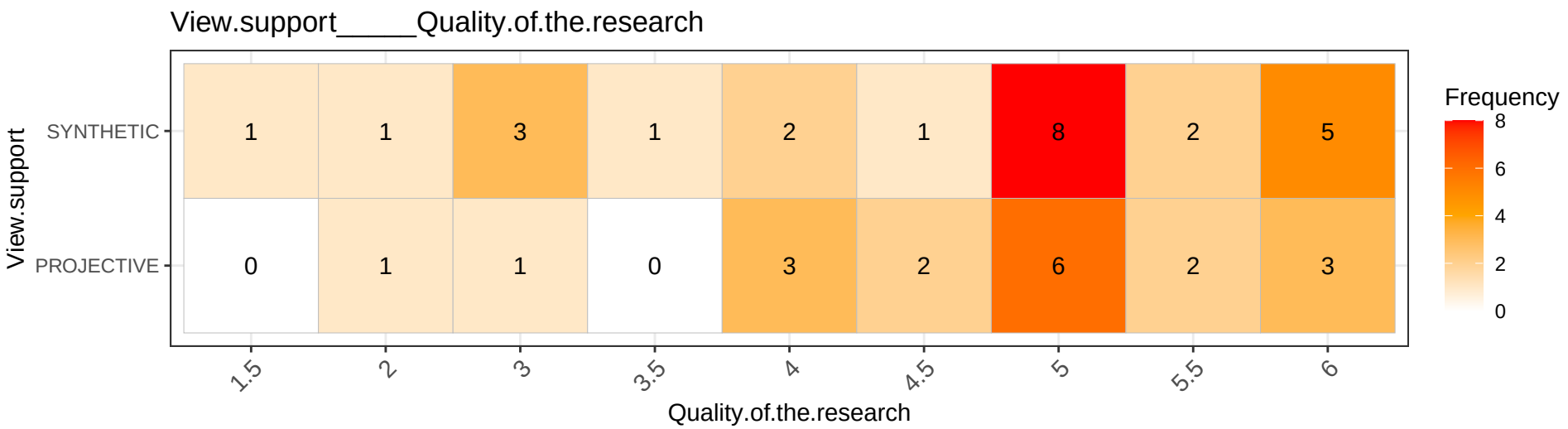

View.support_____Stakeholder.types
SYNTHETIC
PROJECTIVE
7
17
4
12
View.support
NONTECH
TECH
Stakeholder.types
Frequency
16
12
8
4
0

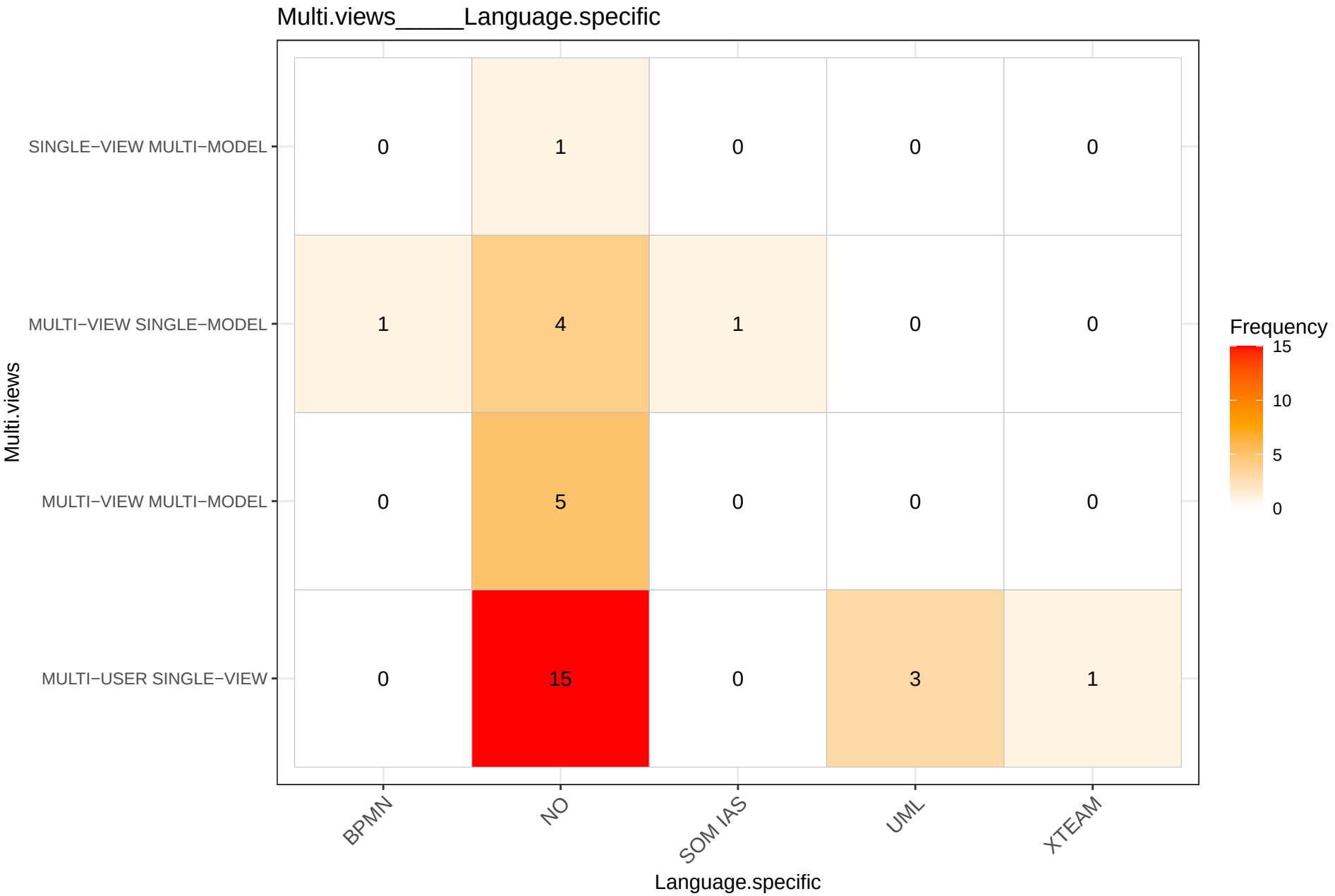

View.support_____Workspace.awareness
View.support
SYNTHETIC
PROJECTIVE
1 3 0 0 2 1 5 1 0 0 4 0 1 6
0 0 1 1 2 1 3 3 2 2 3 2 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0


View.support_____Workspace.awareness.score
SYNTHETIC
PROJECTIVE
View.support
7
7
3
4
6
2
HIGH
LOW
MED
Workspace.awareness.score
Frequency
6
4
2
0


View.support_____Evaluation
SYNTHETIC
PROJECTIVE
View.support
5
1
8
6
5
1
4
5
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
8
6
4
2
0

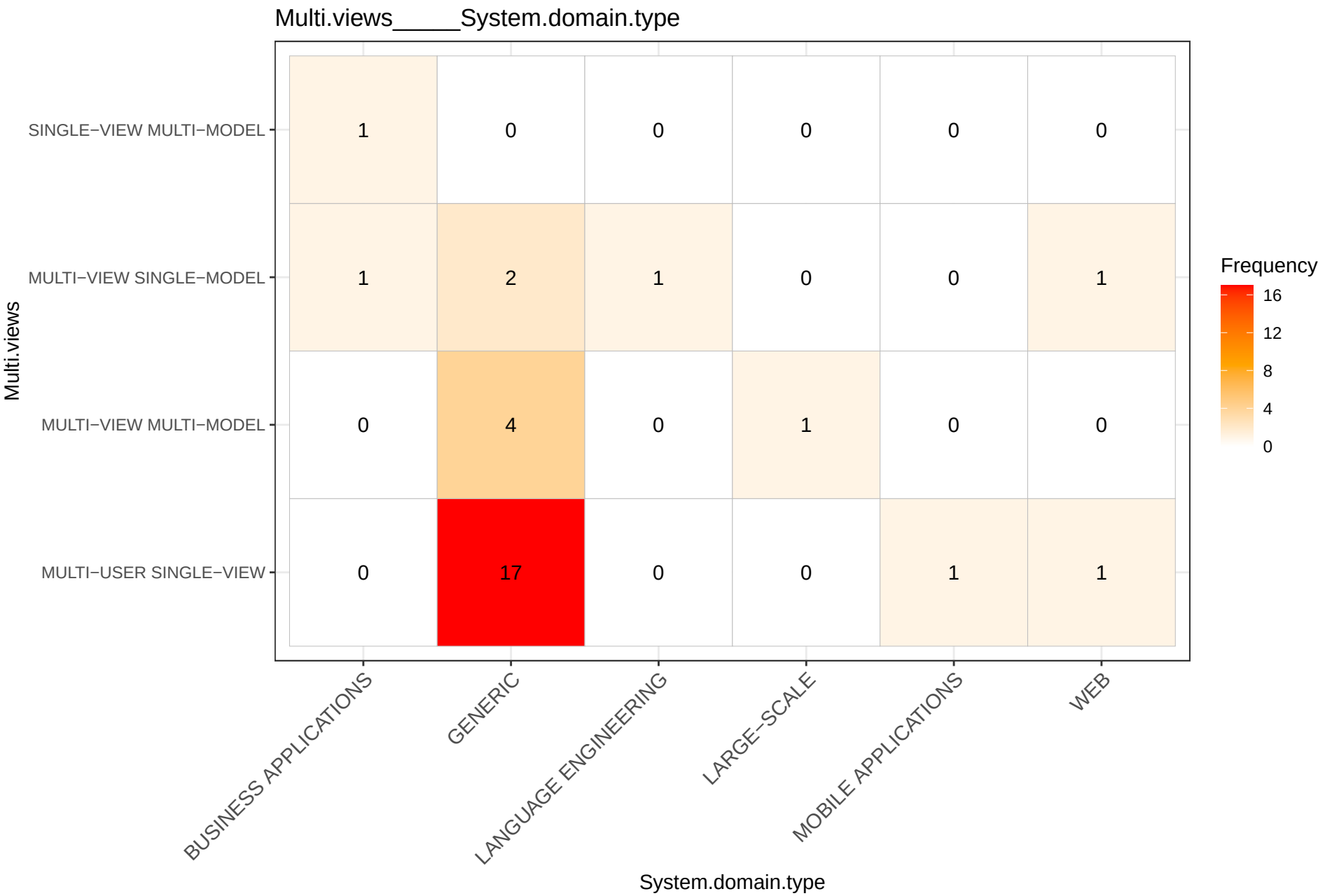

View.support_____Tool.availability
SYNTHETIC
PROJECTIVE
View.support
4
13
3
9
NO
YES
Tool.availability
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

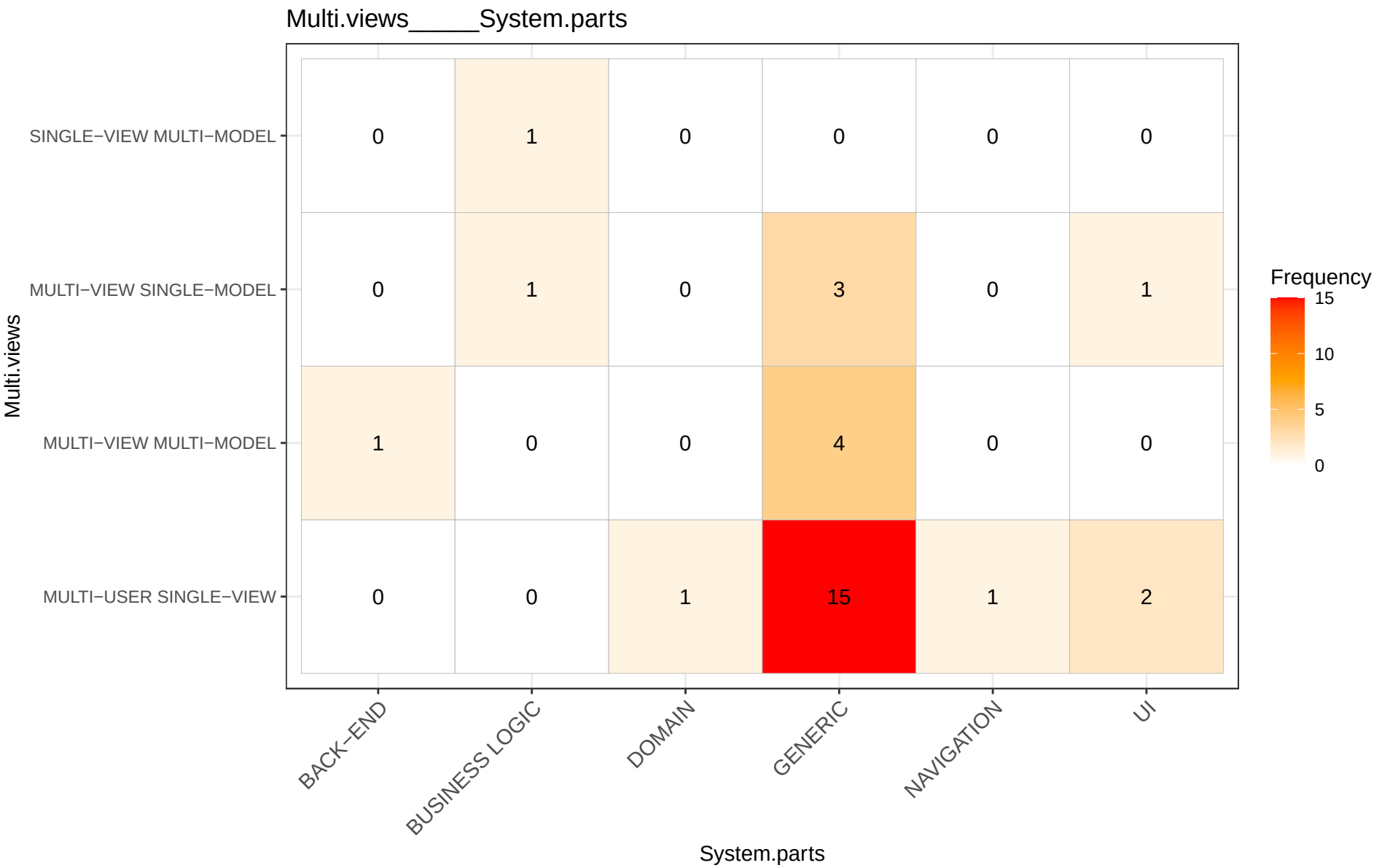

View.support_____Quality.of.the.research
View.support
SYNTHETIC
PROJECTIVE
1
1
3
1
2
1
8
2
5
0
1
1
0
3
2
6
2
3
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
8
6
4
2
0

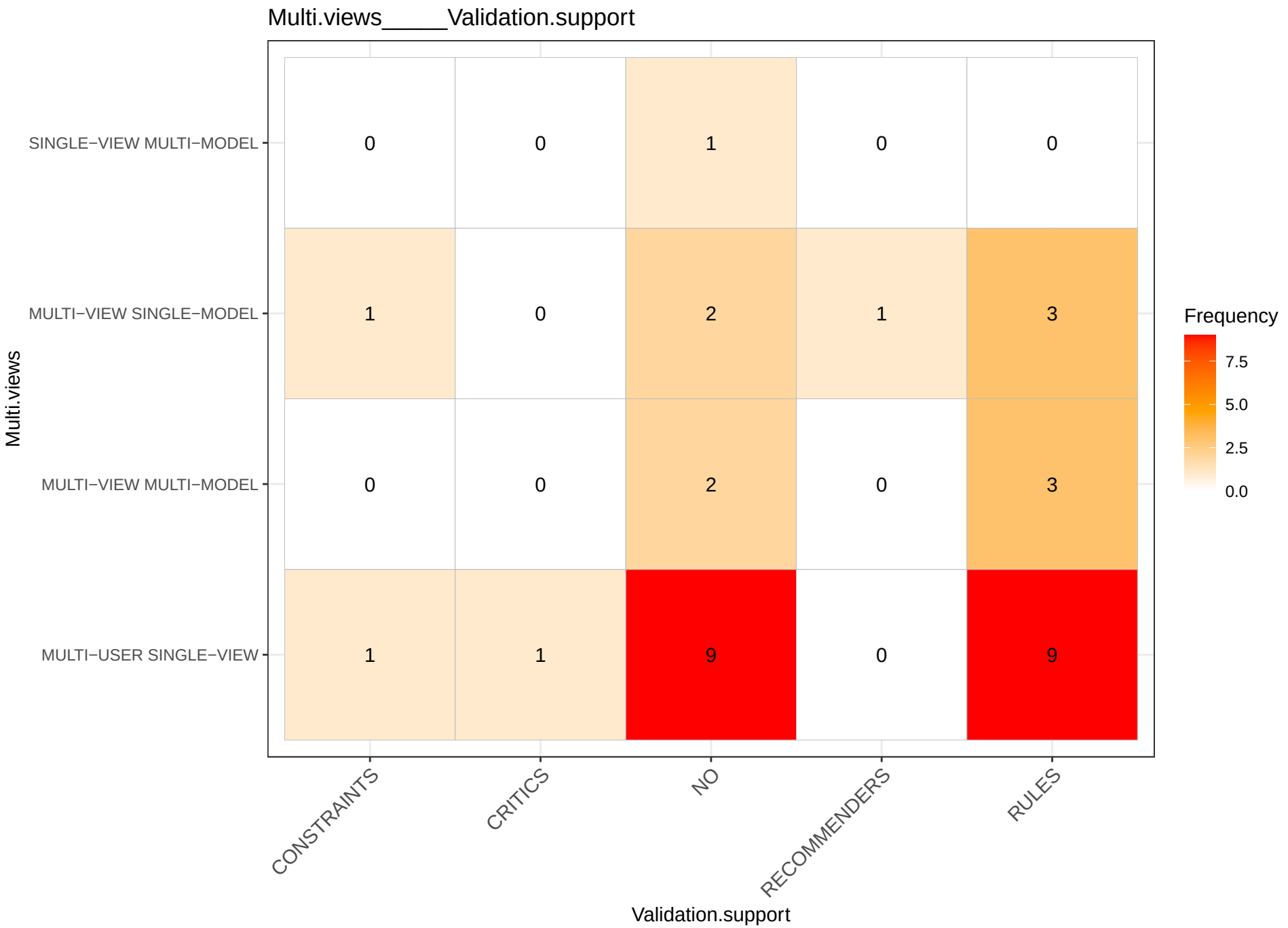

Multi.views_____Language.specific
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
0
0
0
1
4
1
0
0
0
5
0
0
0
0
15
0
3
1
BPMN
NO
SOM IAS
UML
XTEAM
Language.specific
Frequency
15
10
5
0

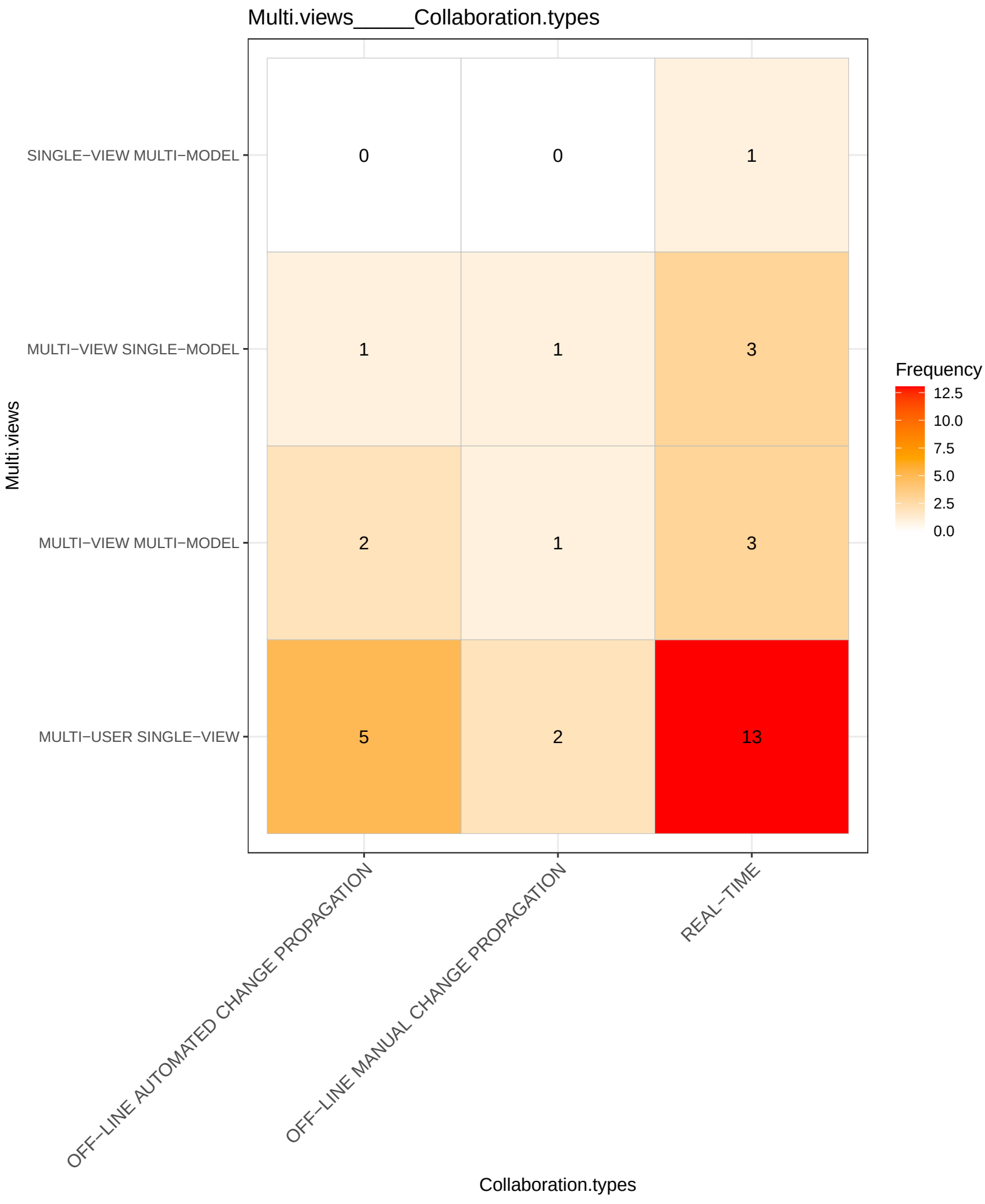
Multi.views_____Modeling.framework
Multi.views
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
1 0 0 1 1 0 0 0 1 0 0 0 0 0 1
0 0 0 0 1 1 1 1 0 0 0 0 1 1 0
1 0 1 8 5 1 0 0 0 1 1 1 0 0 0
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
NO
PACAS
RDF
SPEM
UML
VIATRA
WEBGME
YJS
Modeling.framework
Frequency
8
6
4
2
0

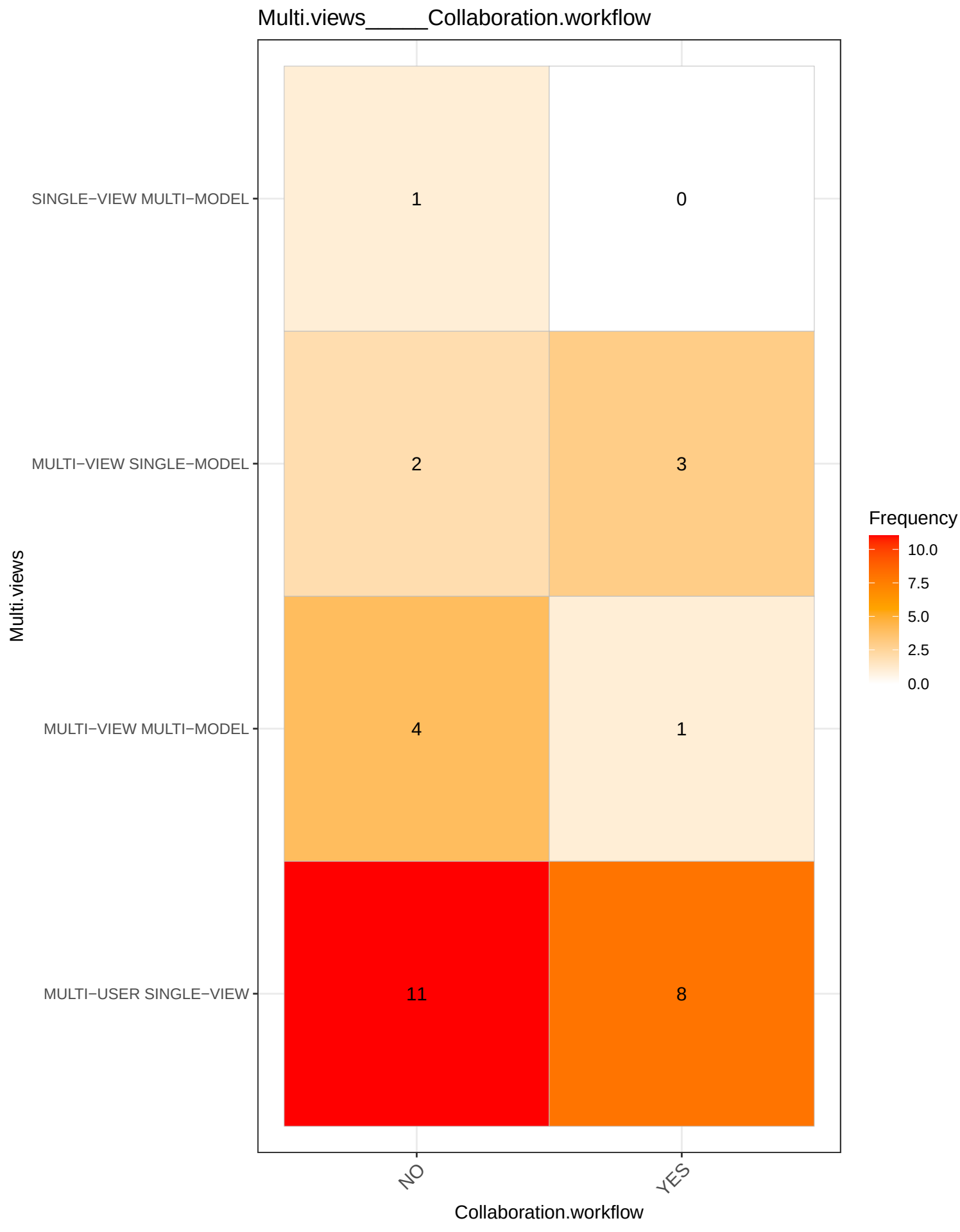
Multi.views_____System.domain
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
2
3
5
0
17
2
GENERIC
SPECIFIC
System.domain
Frequency
16
12
8
4
0

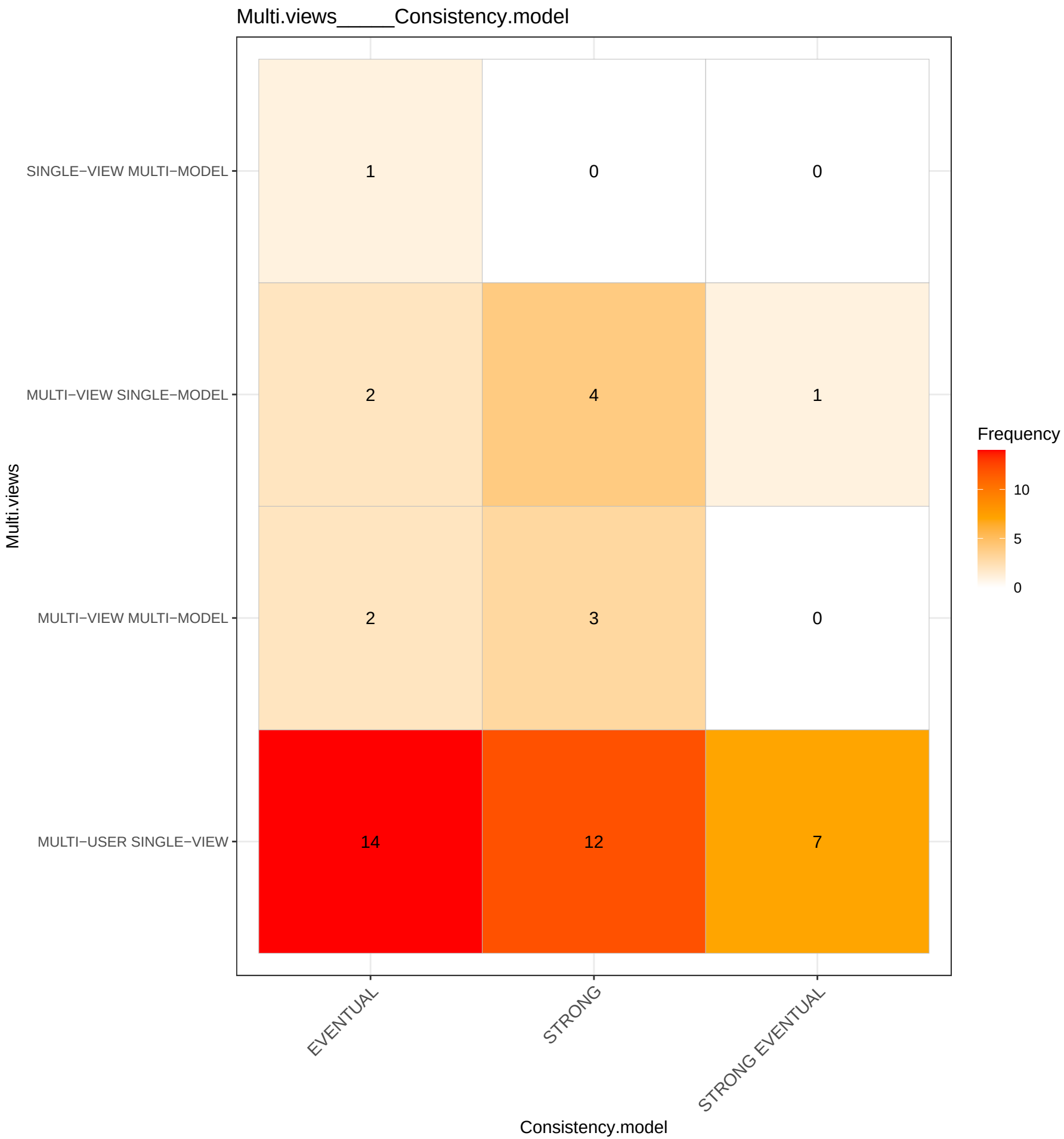

Multi.views_____System.domain.type
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1 0 0 0 0 0
1 2 1 0 0 1
0 4 0 1 0 0
0 17 0 0 1 1
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
16
12
8
4
0

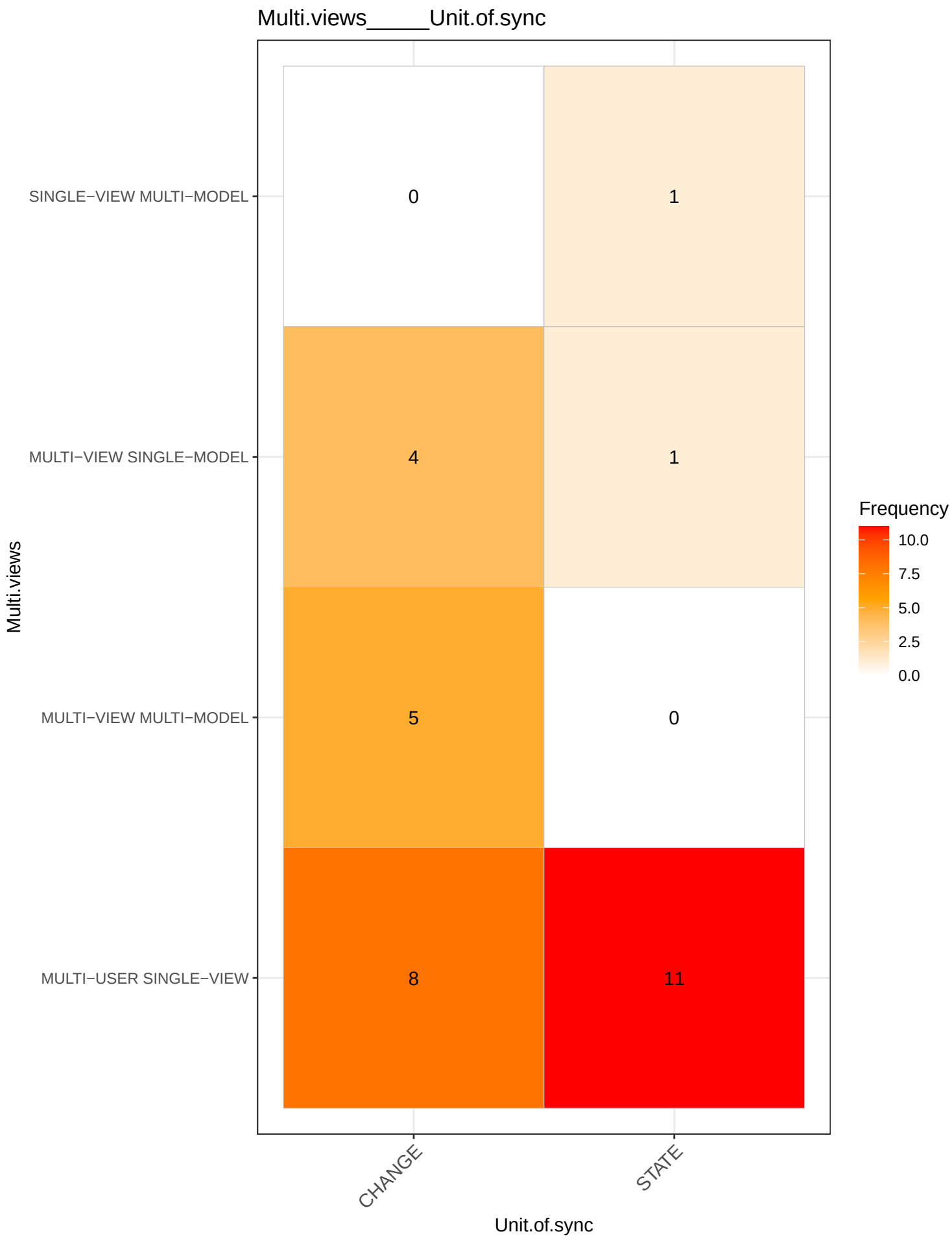

Multi.views_____System.parts
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0 1 0 0 0 0
0 1 0 3 0 1
1 0 0 4 0 0
0 0 1 15 1 2
BACK−END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
15
10
5
0

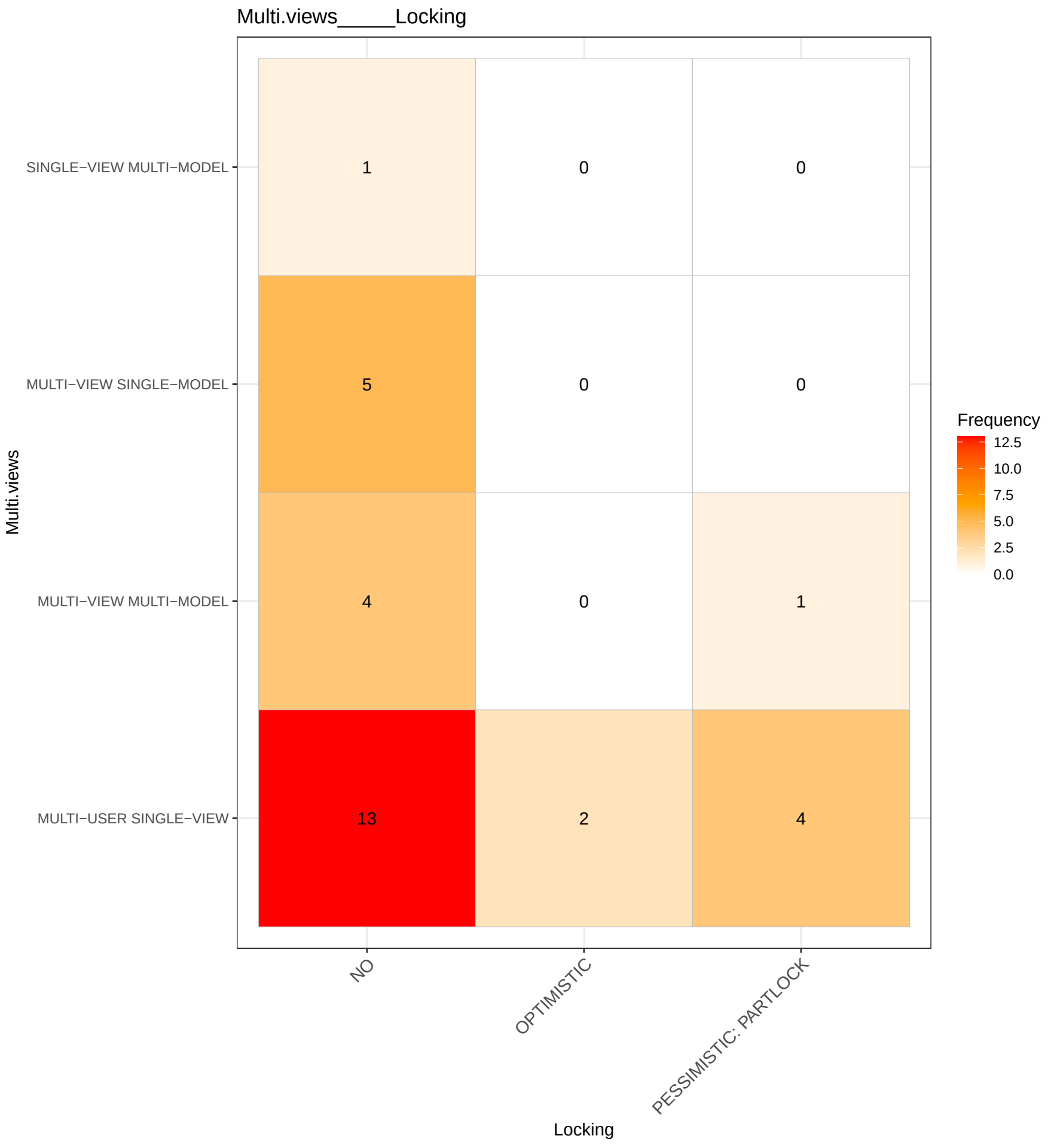

Multi.views_____Validation.support
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0 0 1 0 0
1 0 2 1 3
0 0 2 0 3
1 1 9 0 9
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
7.5
5.0
2.5
0.0

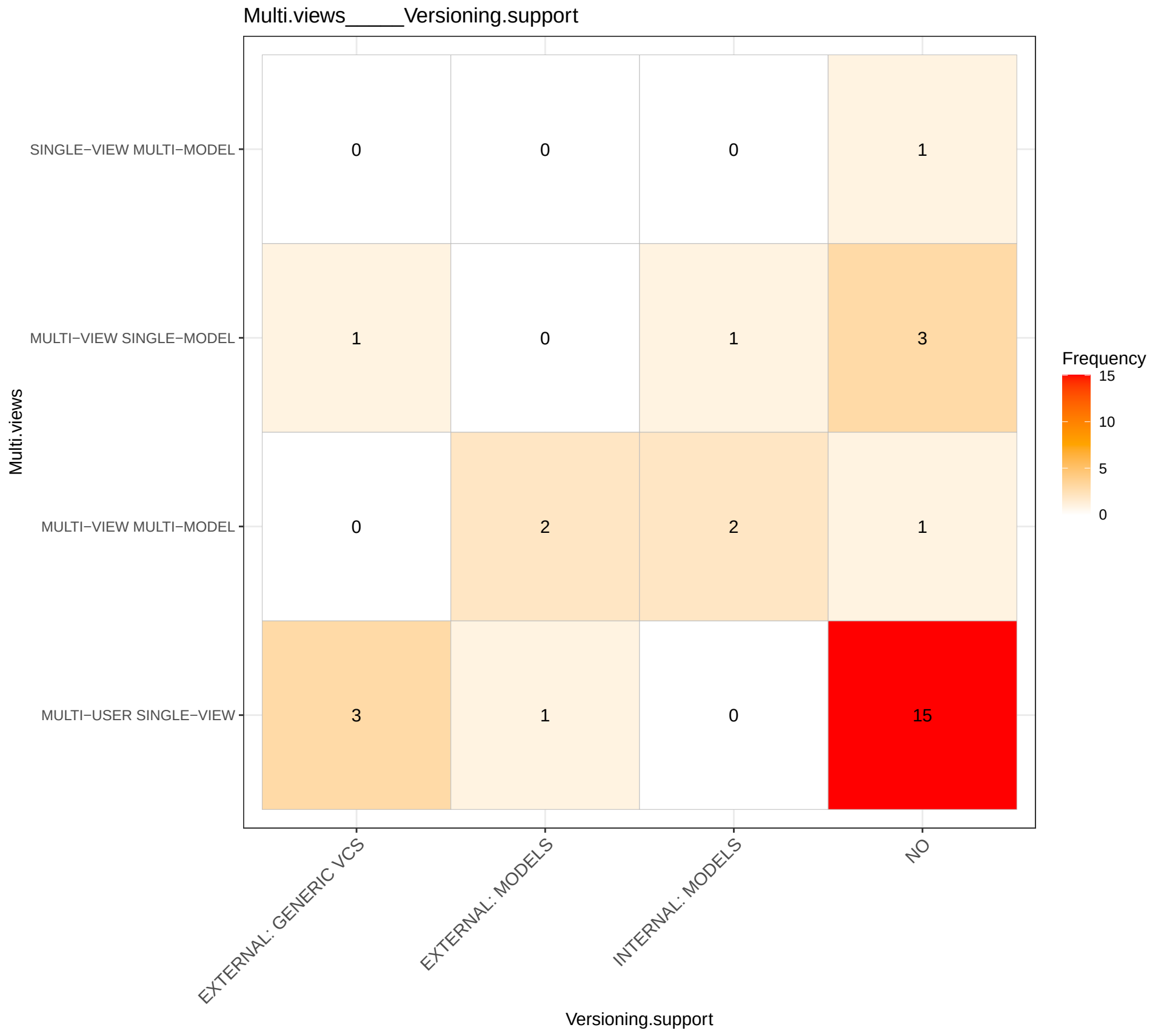

Multi.views_____Collaboration.types
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
0
1
1
1
3
2
1
3
5
2
13
Frequency
12.5
10.0
7.5
5.0
2.5
0.0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types

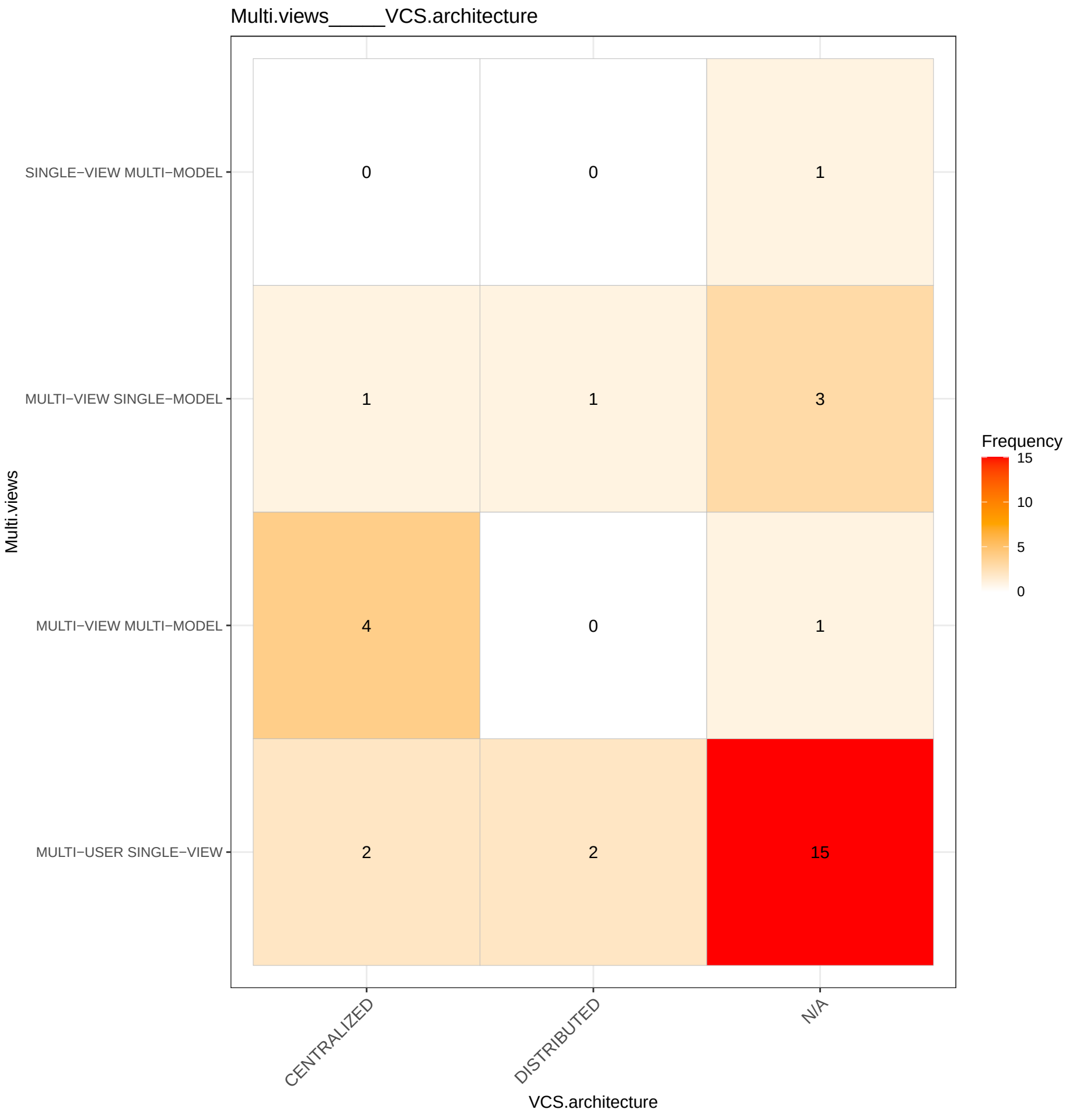

Multi.views_____Collaboration.workflow
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
1
0
2
3
4
1
11
8
Multi.views
NO
YES
Collaboration.workflow
Frequency
10.0
7.5
5.0
2.5
0.0

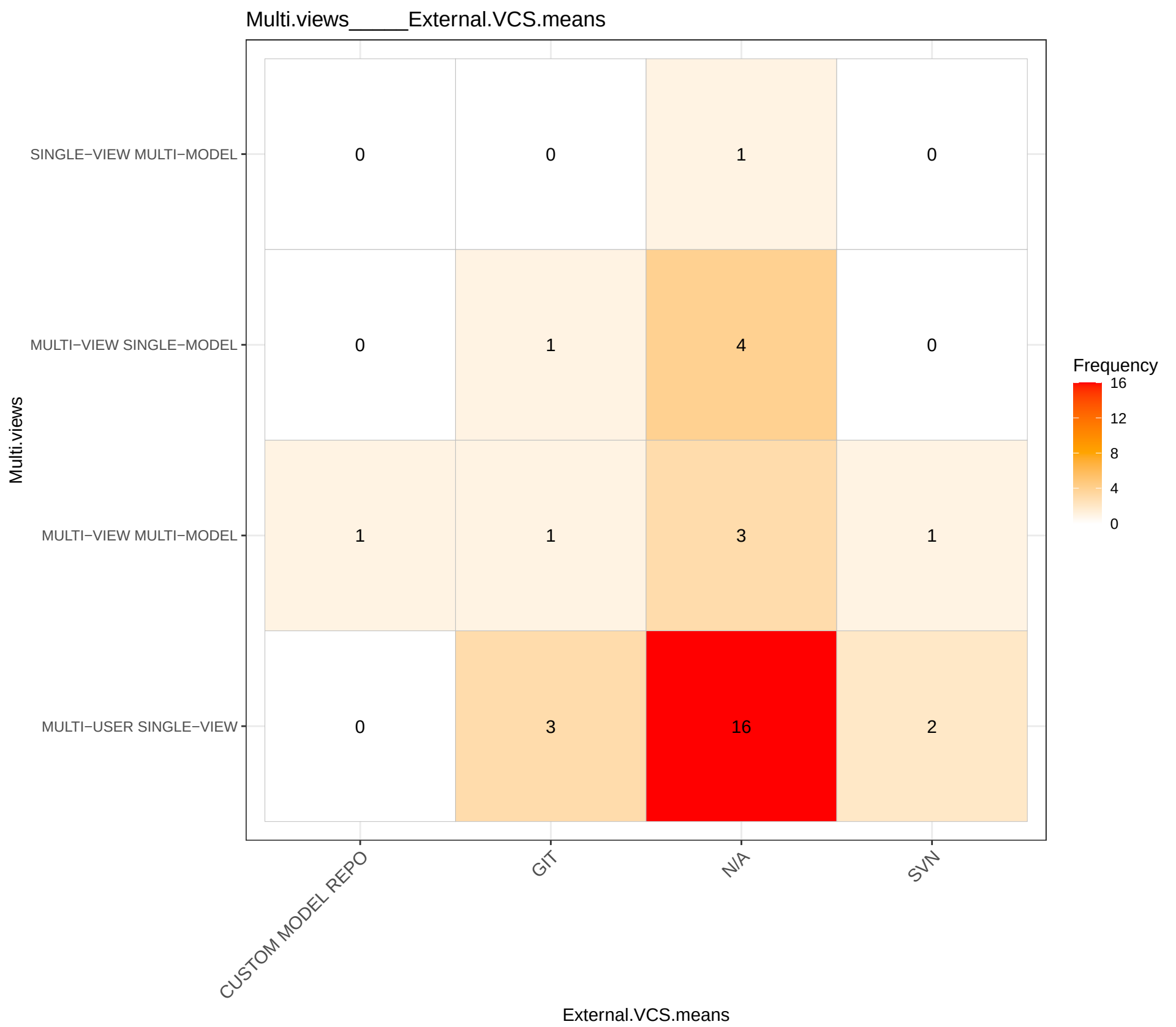

Multi.views_____Consistency.model
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
0
0
2
4
1
2
3
0
14
12
7
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
10
5
0

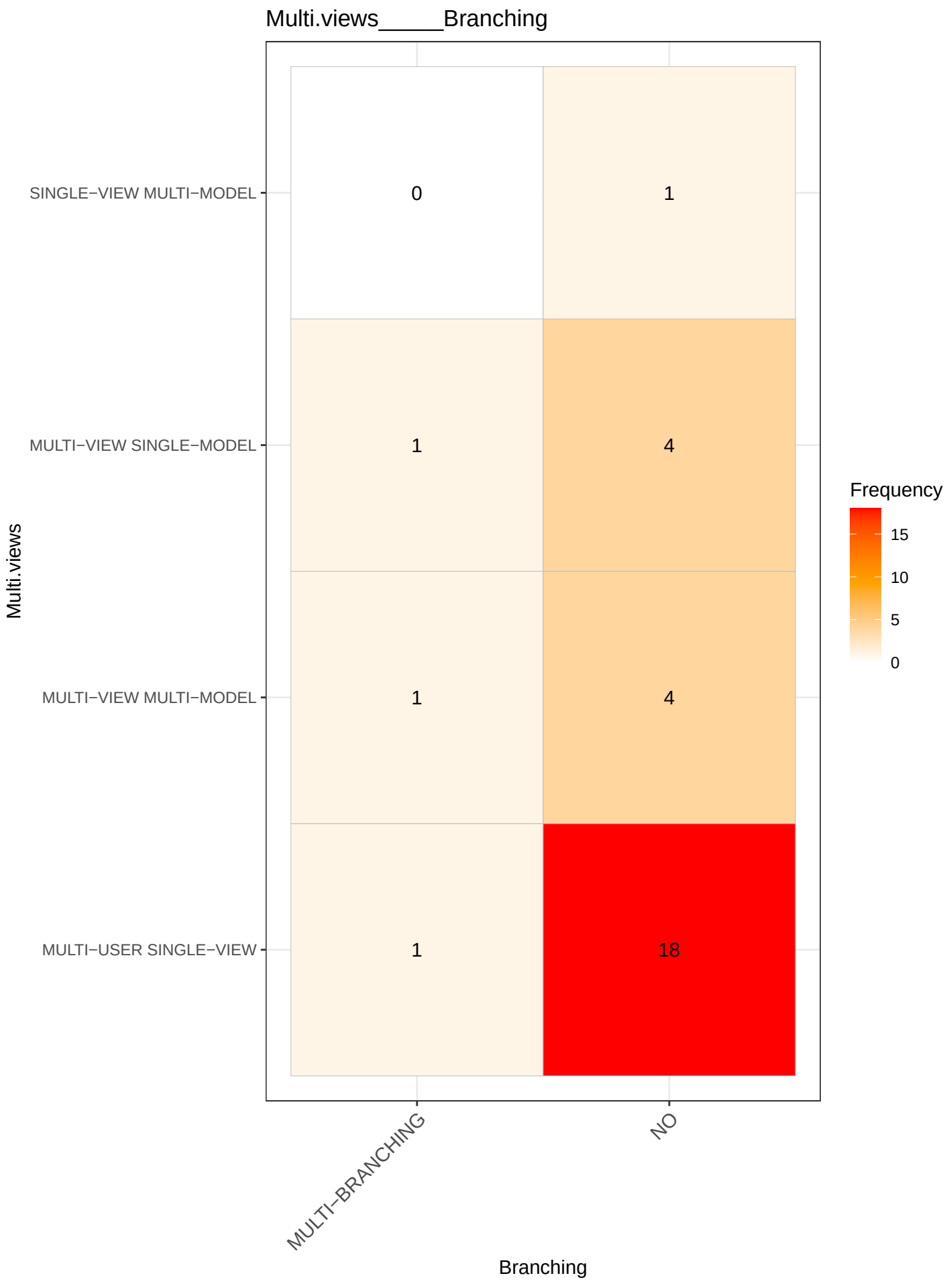

Multi.views_____Unit.of.sync
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
4
1
5
0
8
11
CHANGE
STATE
Unit.of.sync
Frequency
10.0
7.5
5.0
2.5
0.0

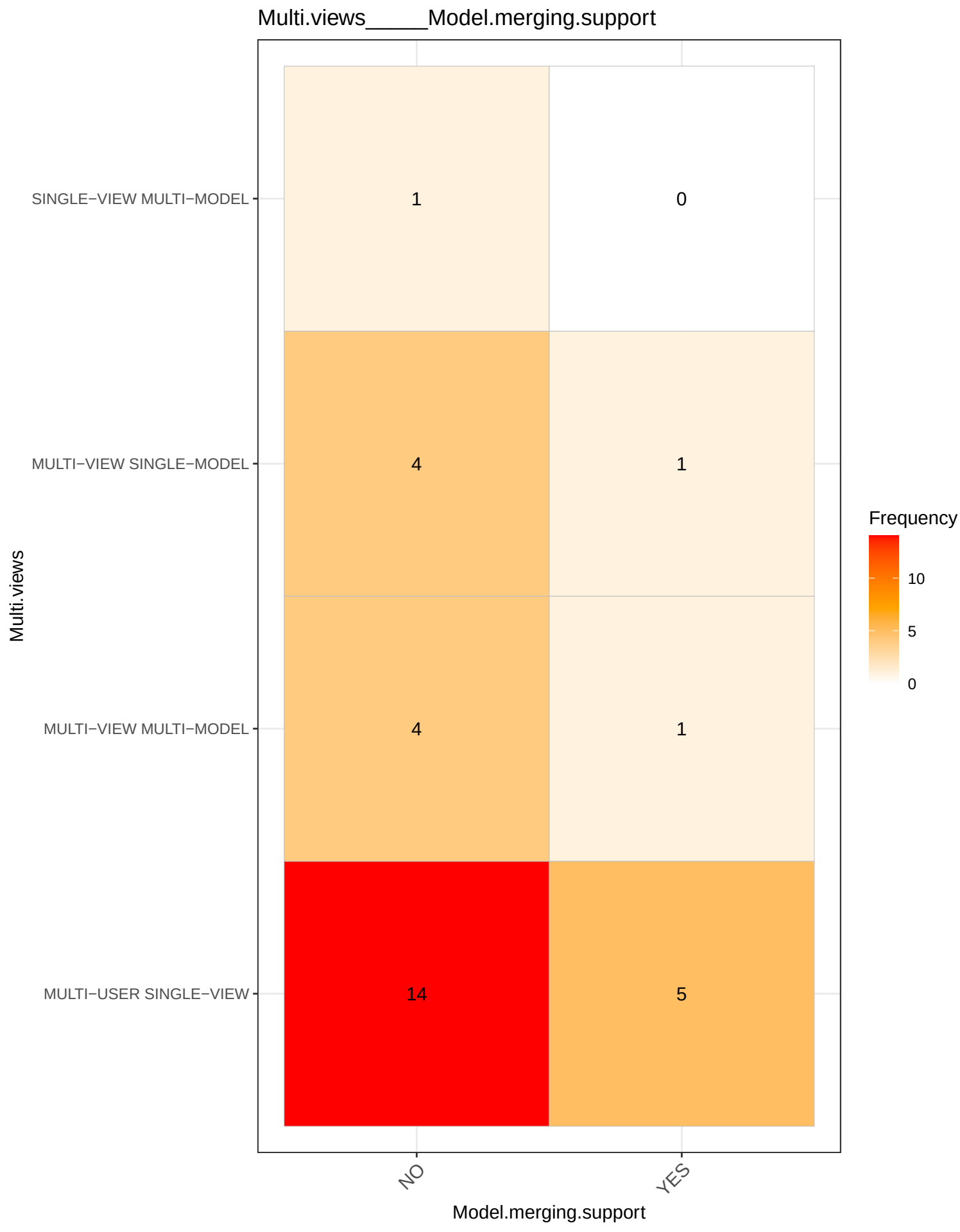

Multi.views_____Locking
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
0
0
5
0
0
4
0
1
13
2
4
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

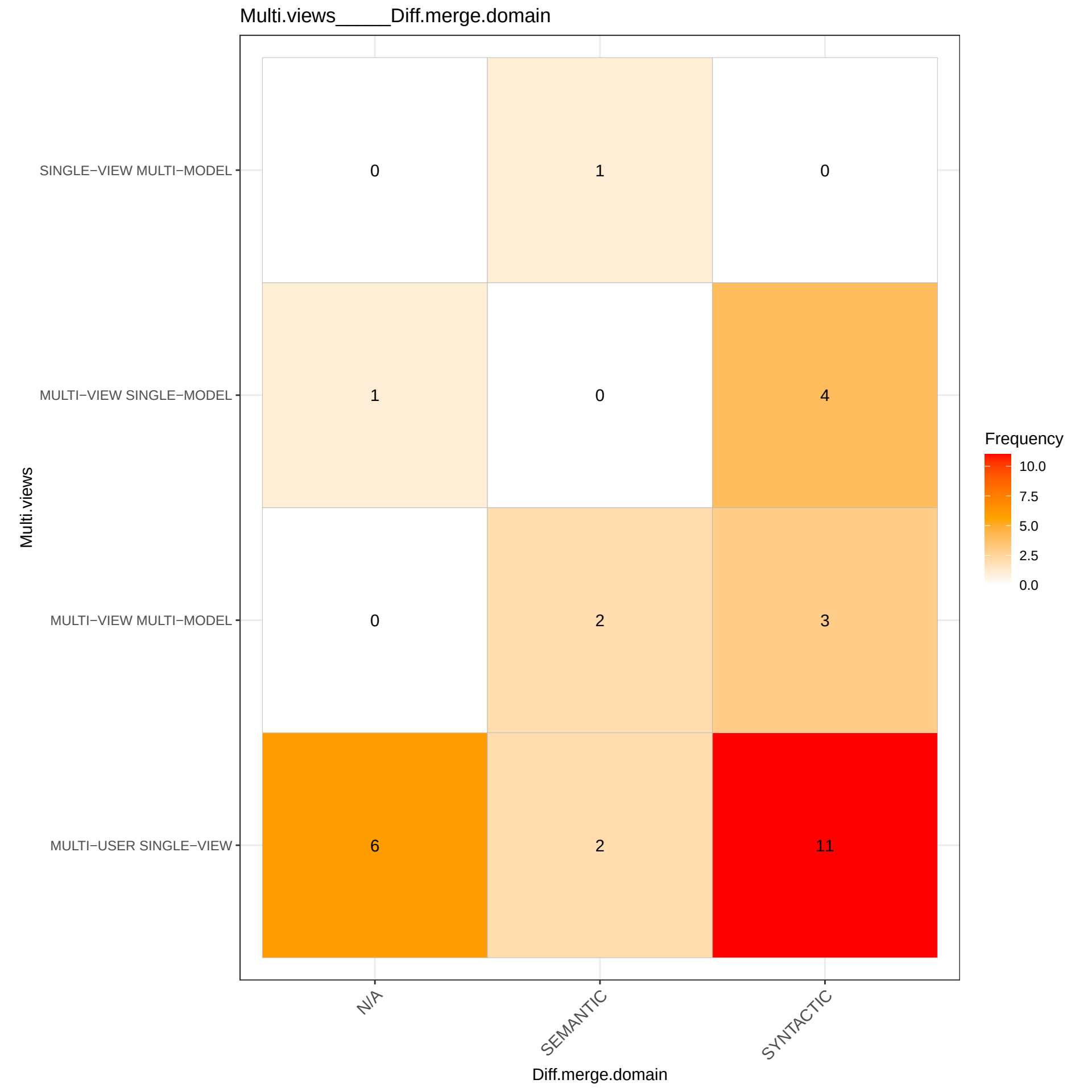

Multi.views_____Versioning.support
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
0
0
1
1
0
1
3
0
2
2
1
3
1
0
15
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
15
10
5
0

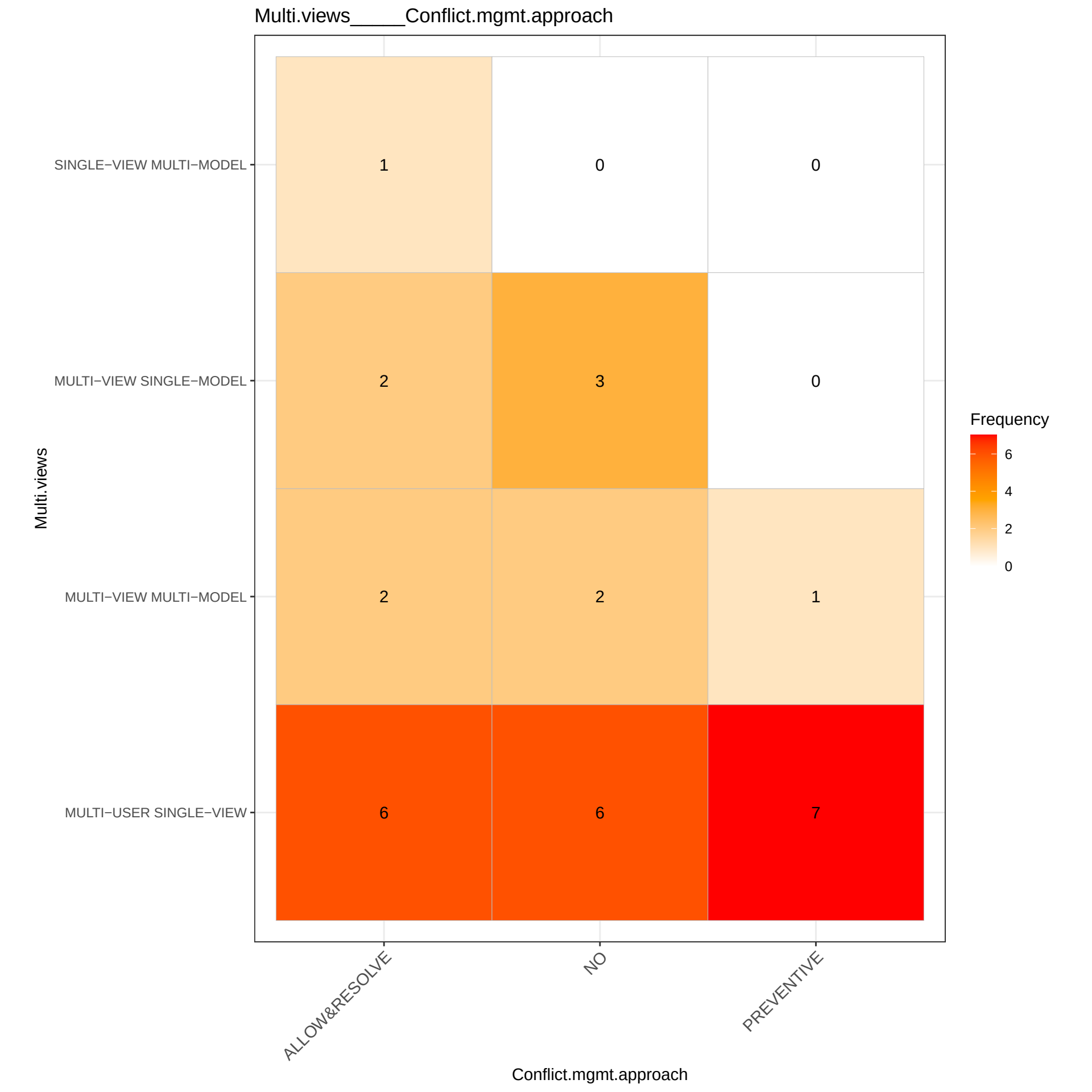

Multi.views_____VCS.architecture
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
0
1
1
1
3
4
0
1
2
2
15
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
15
10
5
0

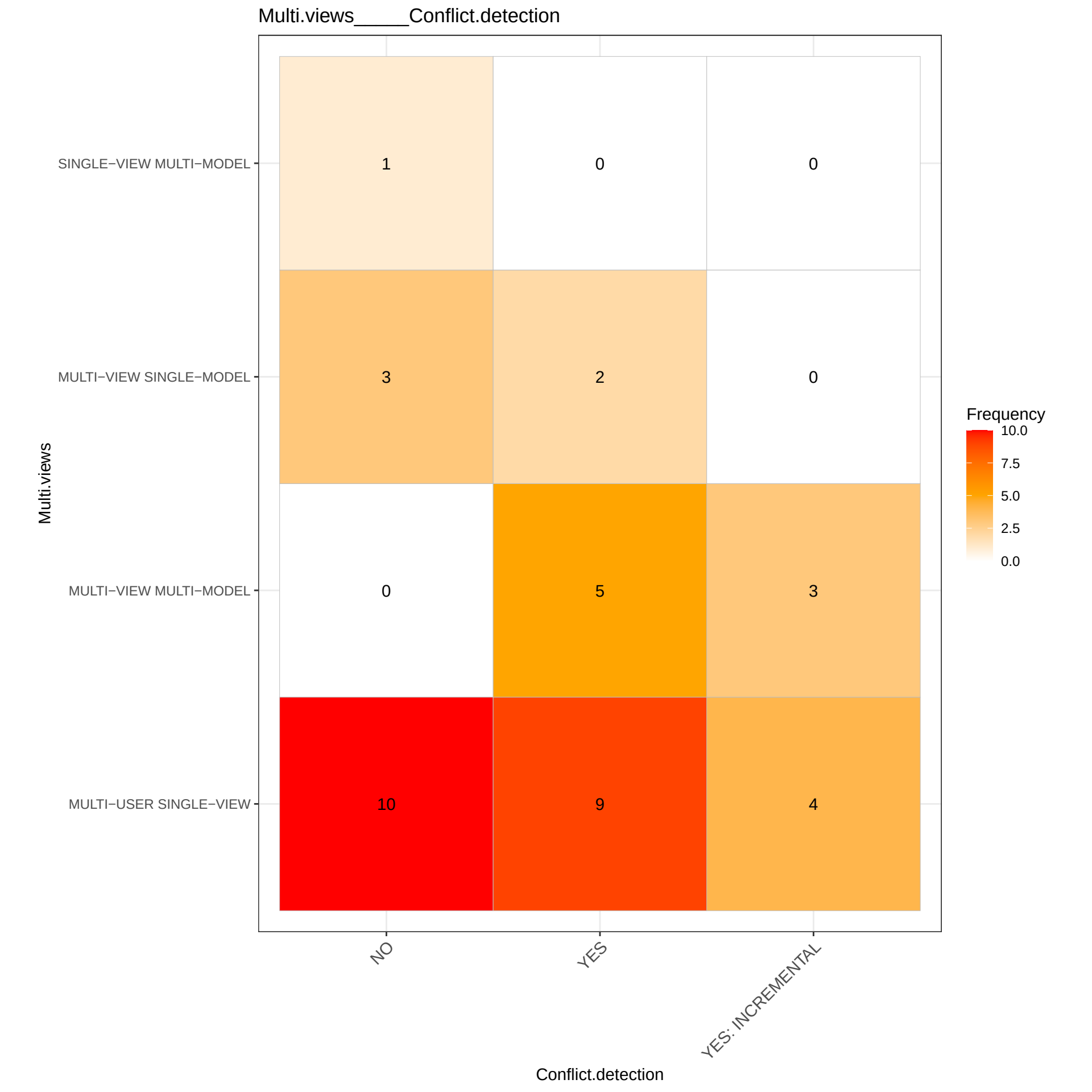

Multi.views_____External.VCS.means
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
0
1
0
0
1
4
0
1
1
3
1
0
3
16
2
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
16
12
8
4
0

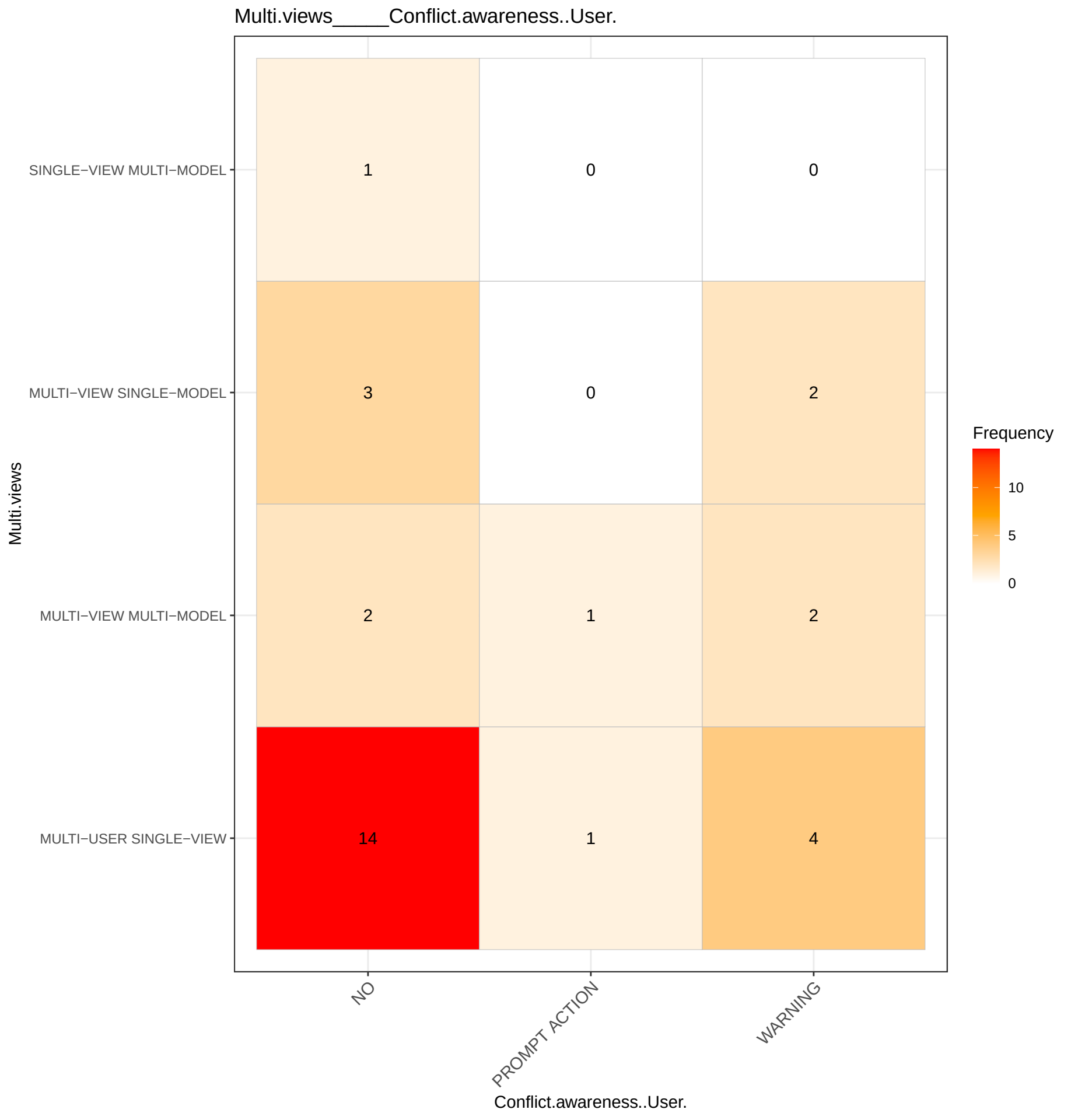

Multi.views_____Branching
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
1
4
1
4
1
18
MULTI−BRANCHING
NO
Branching
Frequency
15
10
5
0

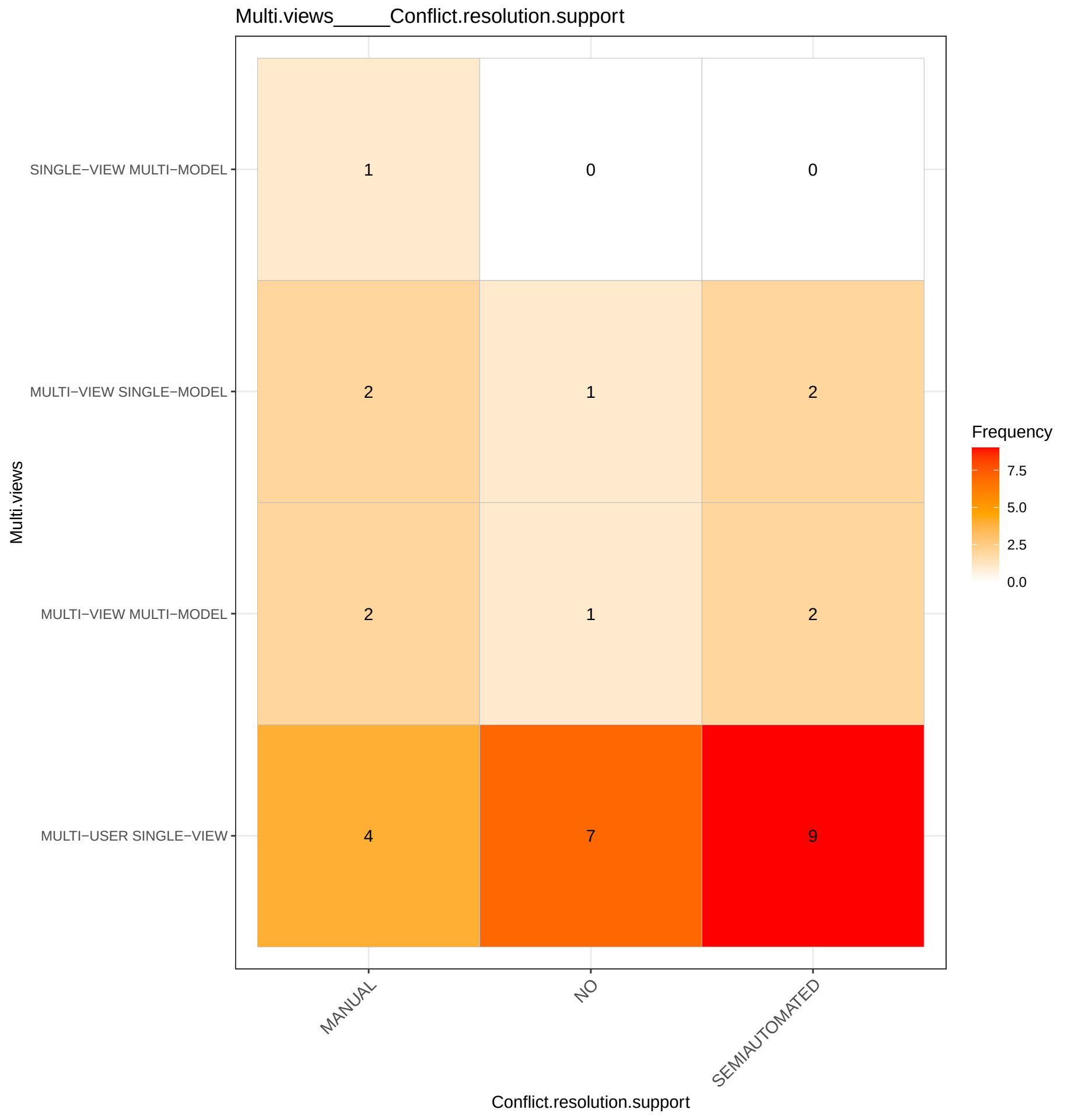

Multi.views_____Model.merging.support
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
1
0
4
1
4
1
14
5
Multi.views
NO
YES
Model.merging.support
Frequency
10
5
0


Multi.views_____Diff.merge.domain
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
0
1
0
4
0
2
3
6
2
11
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10.0
7.5
5.0
2.5
0.0

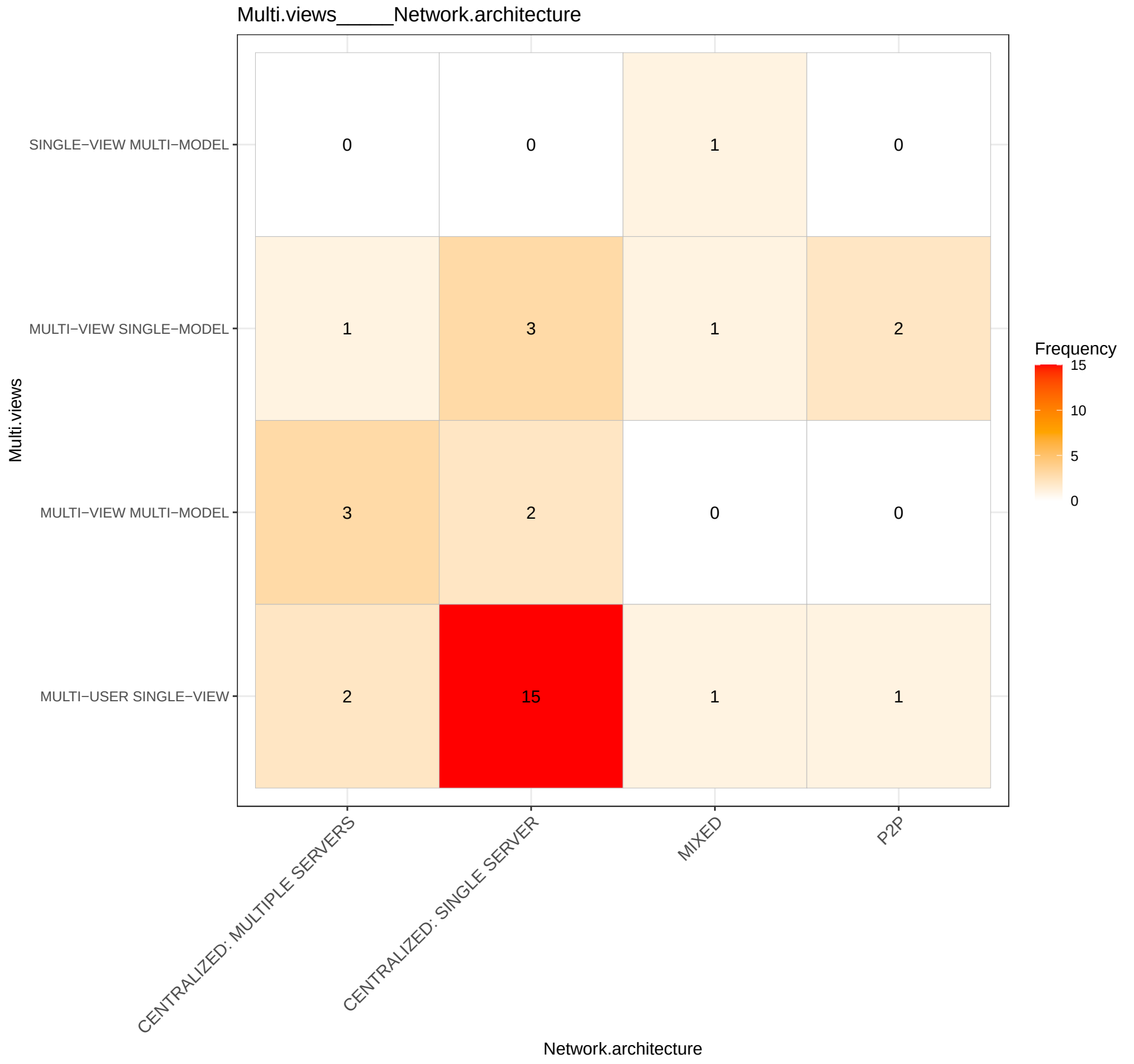

Multi.views_____Conflict.mgmt.approach
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
0
0
2
3
0
2
2
1
6
6
7
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
4
2
0

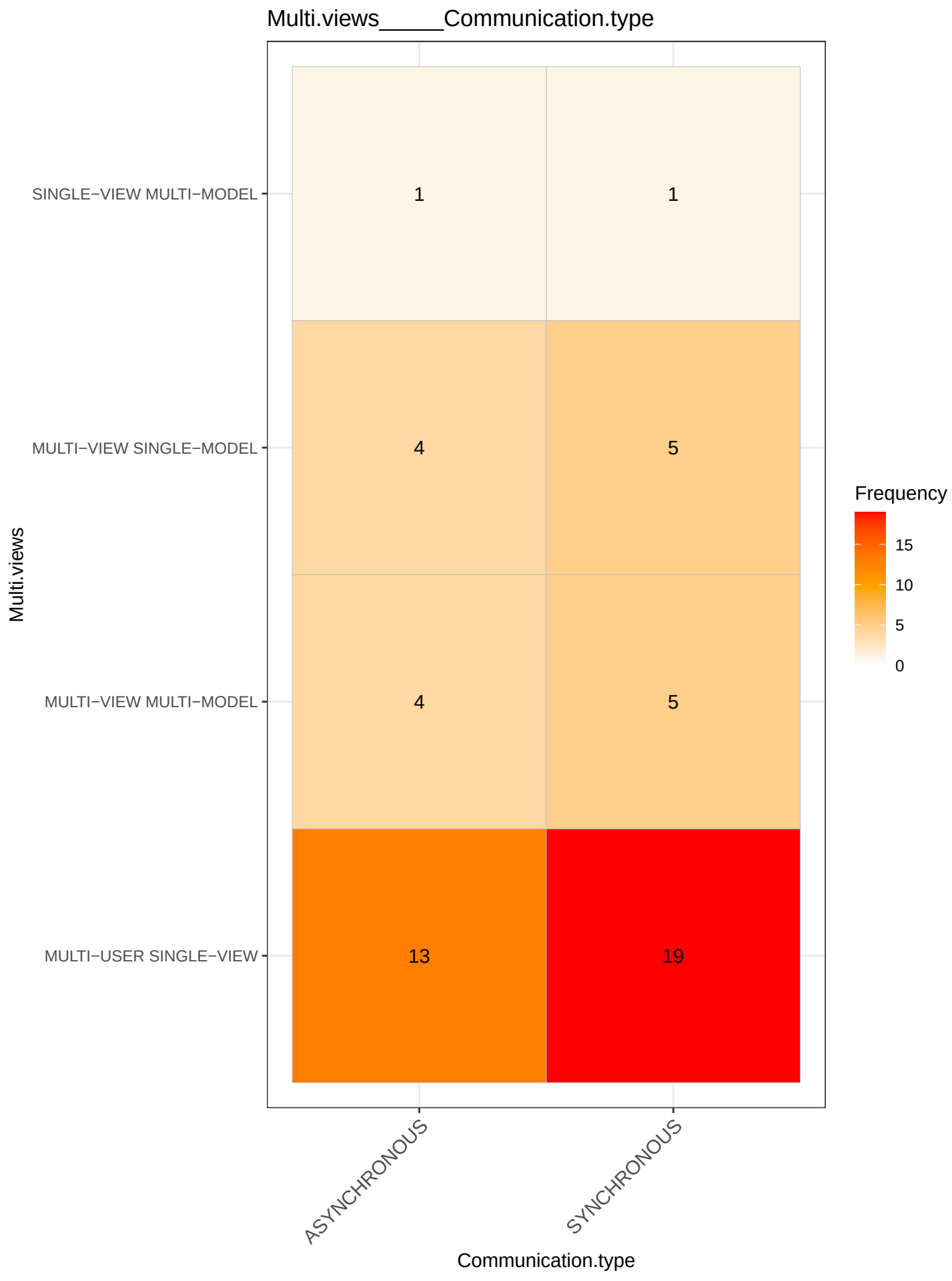

Multi.views_____Conflict.detection
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
0
0
3
2
0
0
5
3
10
9
4
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10.0
7.5
5.0
2.5
0.0

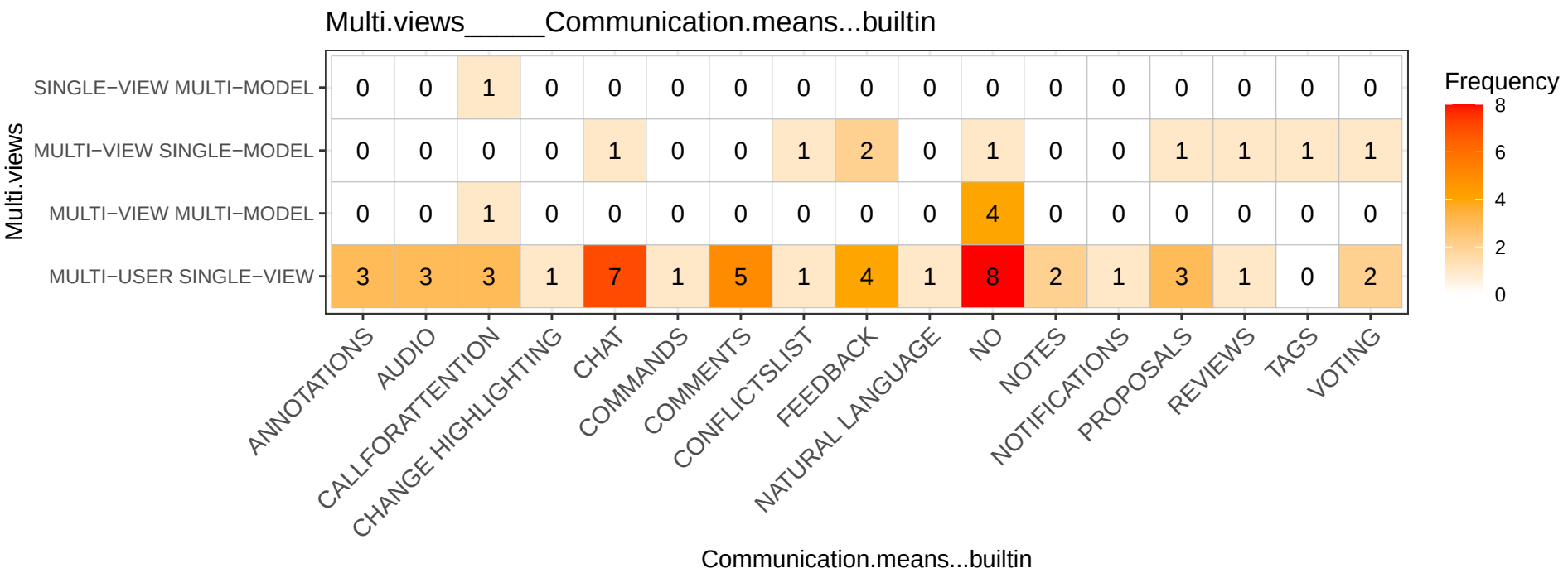

Multi.views_____Conflict.awareness..User.
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
0
0
3
0
2
2
1
2
14
1
4
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10
5
0

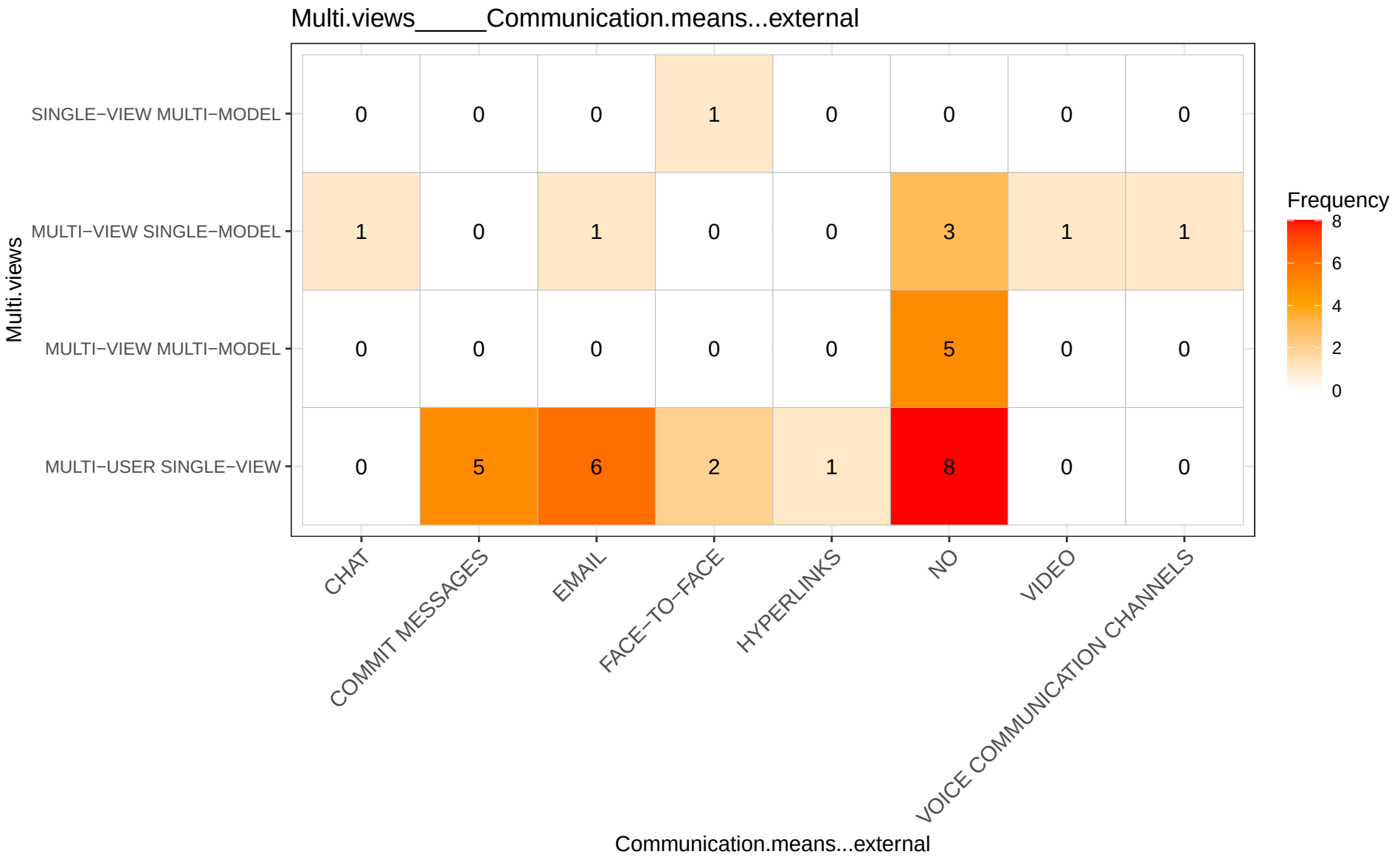

Multi.views_____Conflict.resolution.support
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
0
0
2
1
2
2
1
2
4
7
9
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

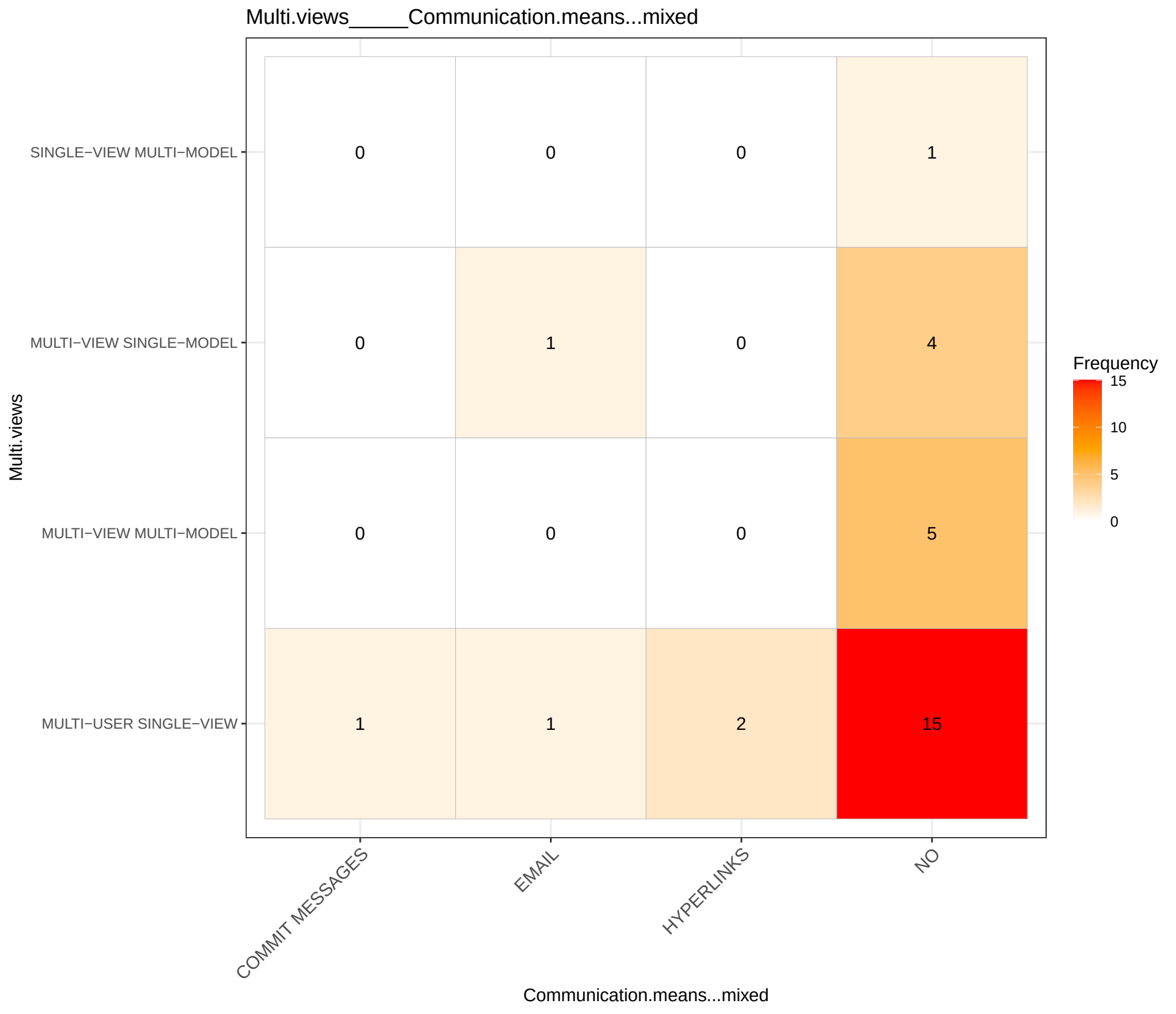
Multi.views_____Shared.workspace
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
5
0
5
0
17
2
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

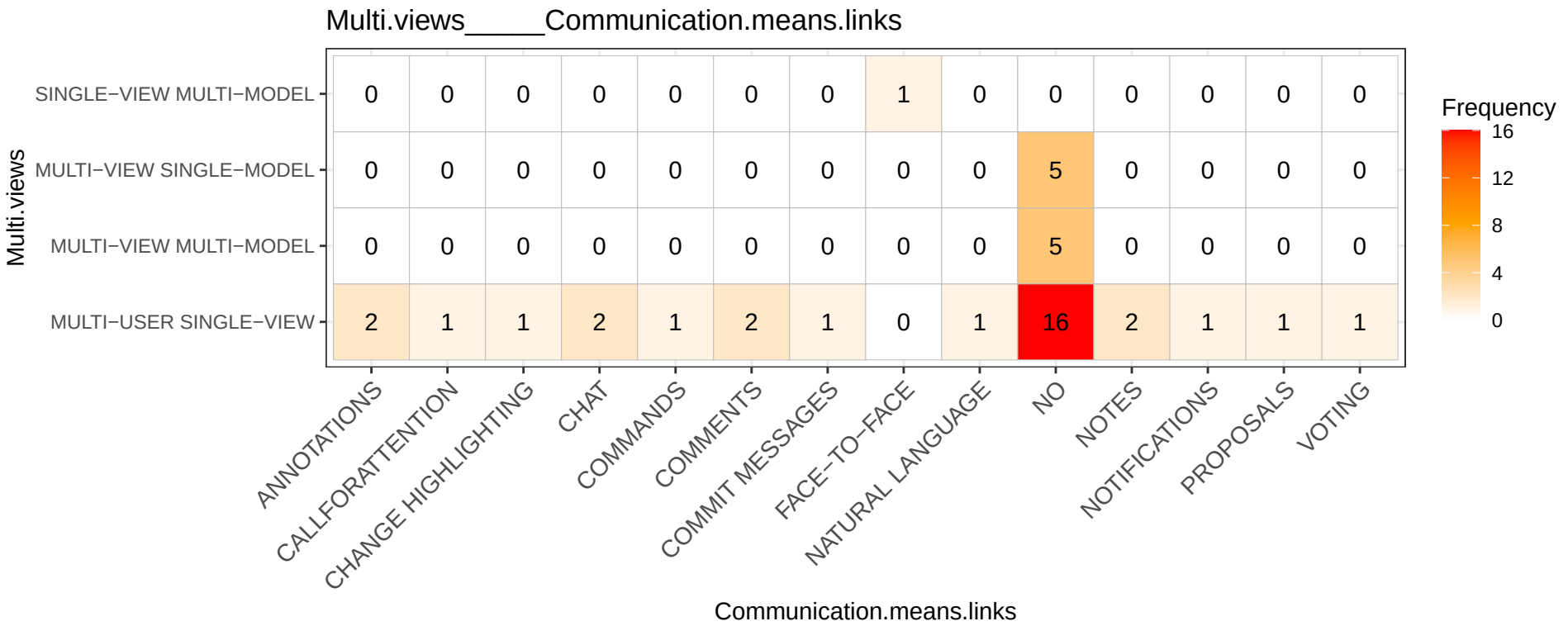

Multi.views_____Network.architecture
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
0
1
0
1
3
1
2
3
2
0
0
2
15
1
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
15
10
5
0

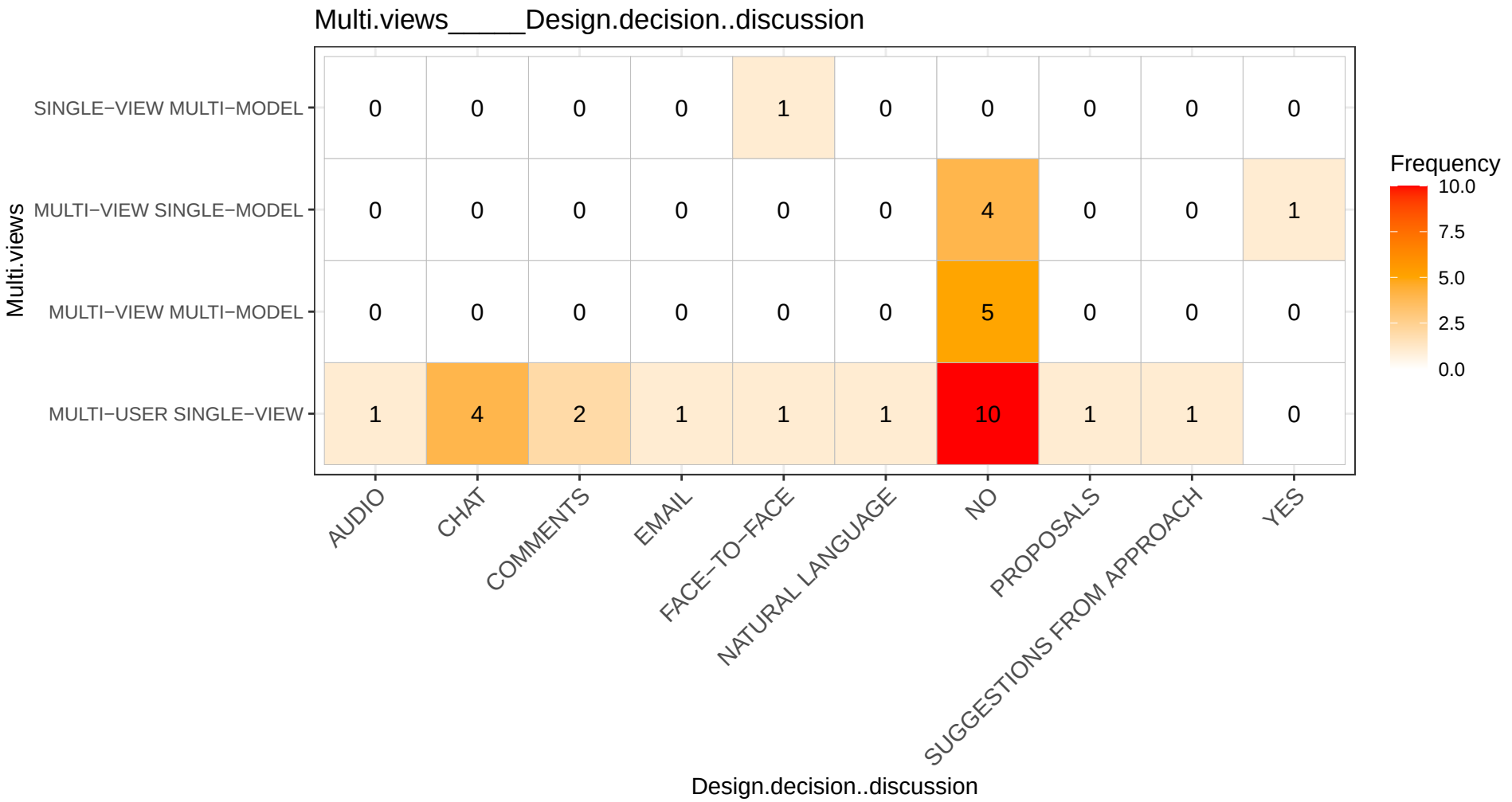

Multi.views_____Communication.type
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
1
1
4
5
4
5
13
19
Multi.views
Frequency
15
10
5
0
ASYNCHRONOUS
SYNCHRONOUS
Communication.type

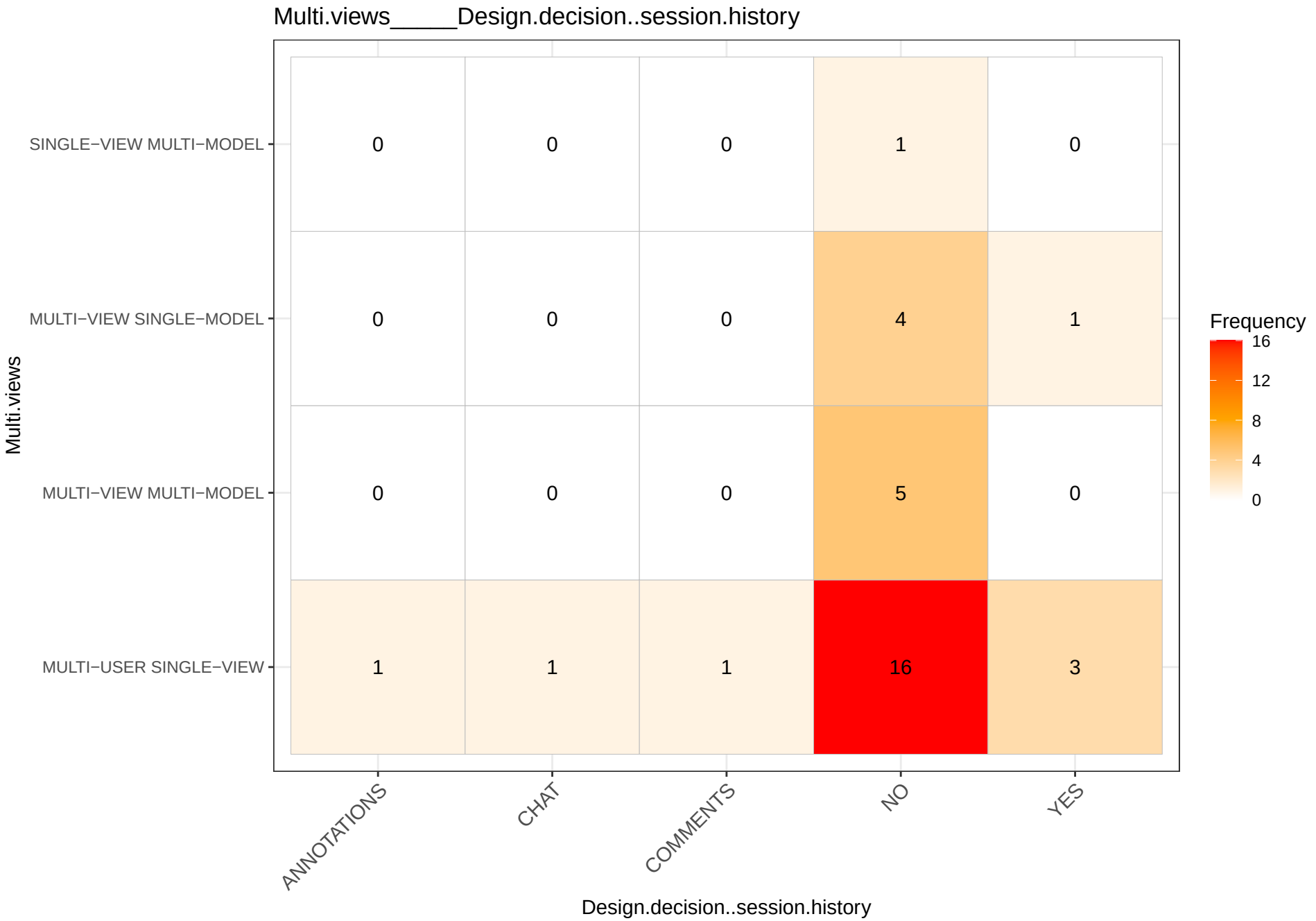

Multi.views_____Communication.means...builtin
Multi.views
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 1 2 0 1 0 0 1 1 1 1
0 0 1 0 0 0 0 0 0 0 4 0 0 0 0 0 0
3 3 3 1 7 1 5 1 4 1 8 2 1 3 1 0 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
8
6
4
2
0

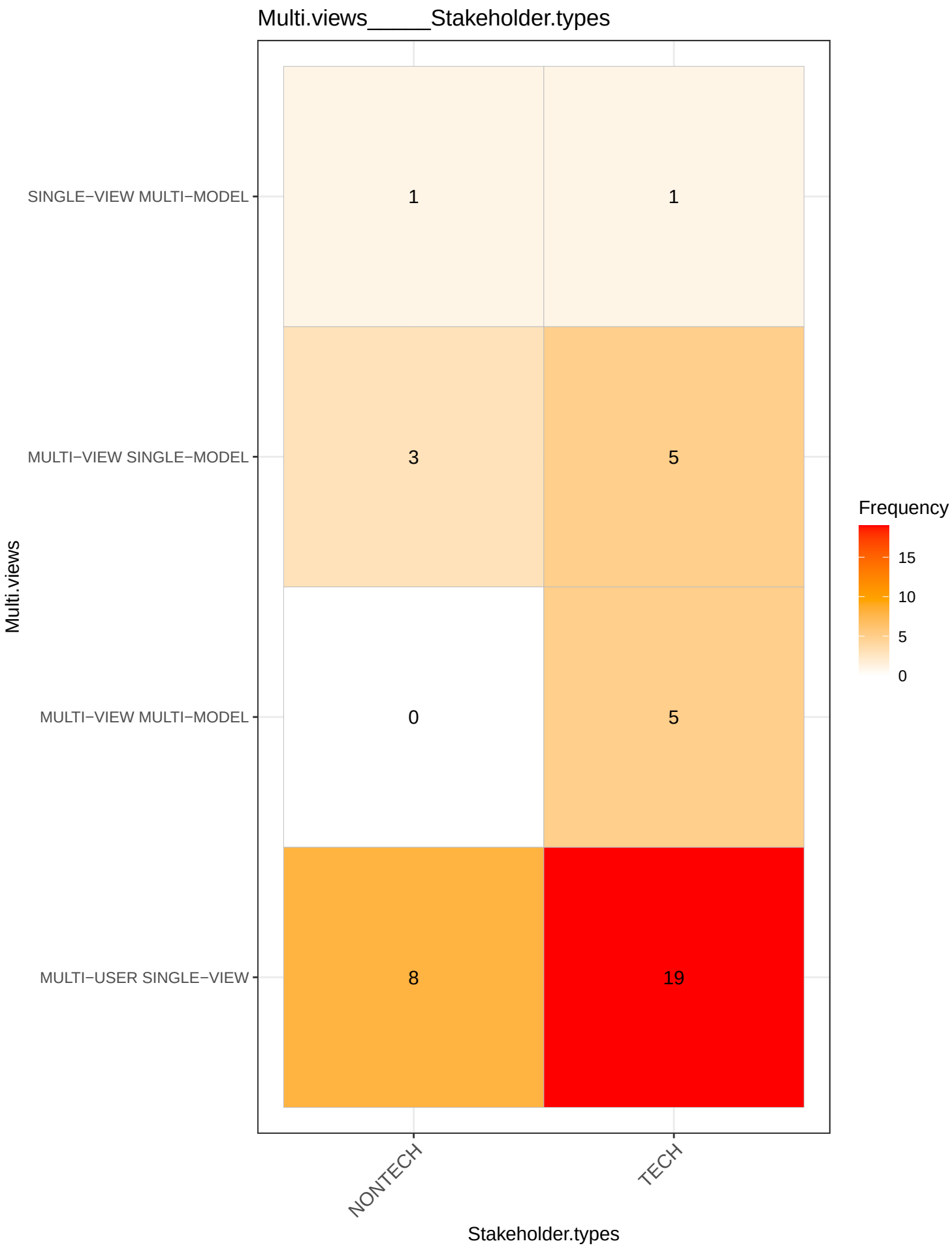

Multi.views_____Communication.means...external
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0 0 0 1 0 0 0 0
1 0 1 0 0 3 1 1
0 0 0 0 0 5 0 0
0 5 6 2 1 8 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
8
6
4
2
0

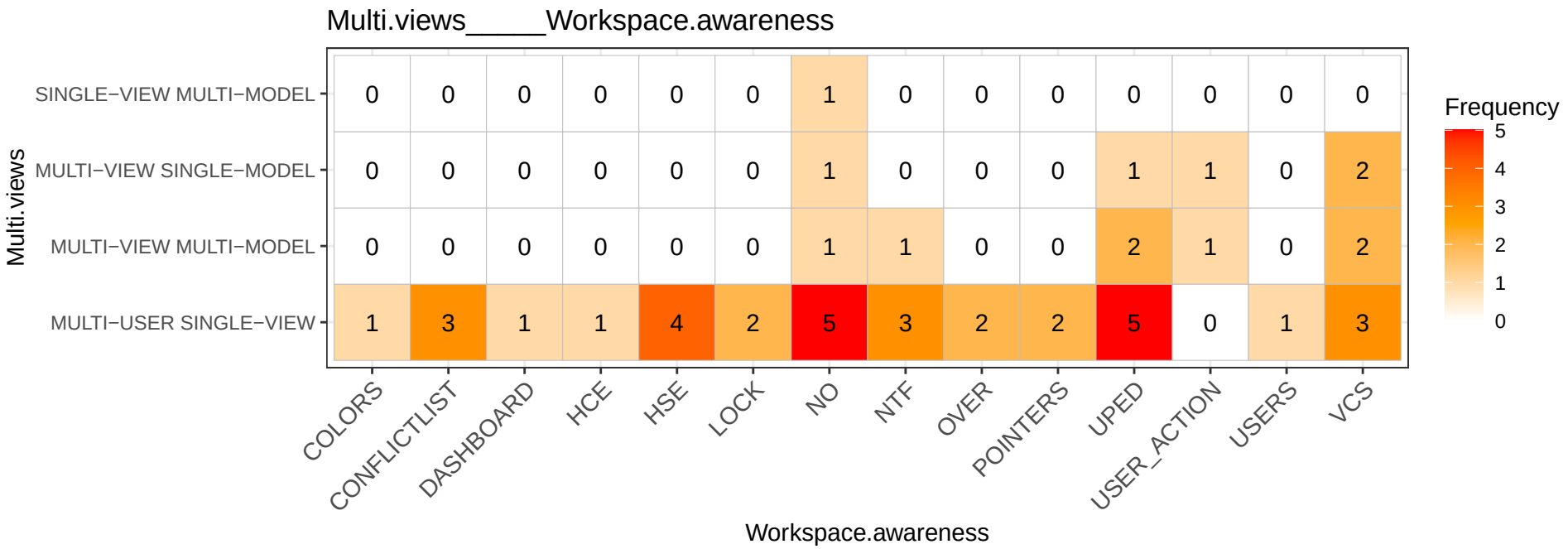

Multi.views_____Communication.means...mixed
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
0
0
1
0
1
0
4
0
0
0
5
1
1
2
15
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
15
10
5
0

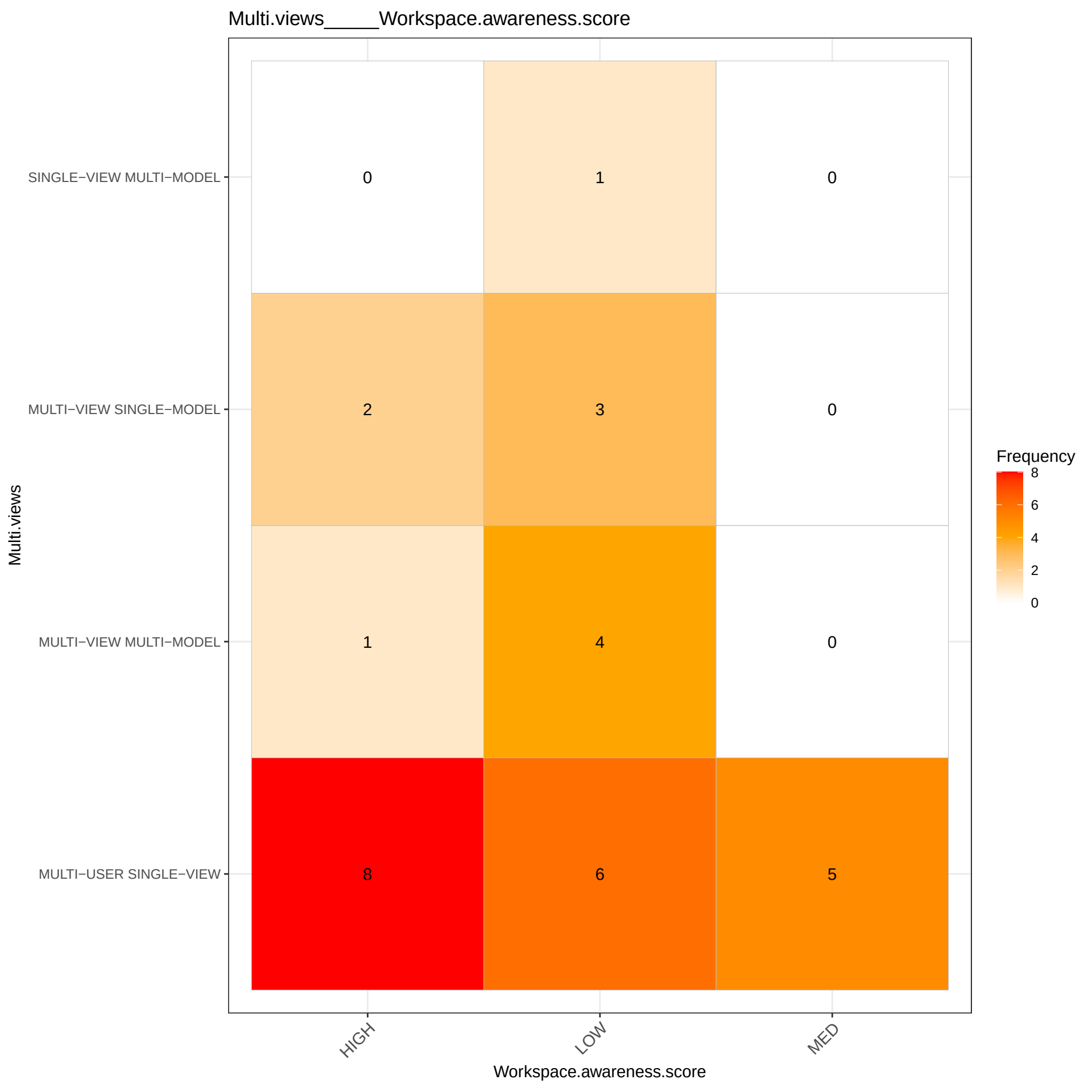

Multi.views_____Communication.means.links
Multi.views
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
0 0 0 0 0 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 5 0 0 0 0
0 0 0 0 0 0 0 0 0 5 0 0 0 0
2 1 1 2 1 2 1 0 1 16 2 1 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0


Multi.views_____Design.decision..discussion
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0 0 0 0 1 0 0 0 0 0
0 0 0 0 0 0 4 0 0 1
0 0 0 0 0 0 5 0 0 0
1 4 2 1 1 1 10 1 1 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0


Multi.views_____Design.decision..session.history
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0 0 0 1 0
0 0 0 4 1
0 0 0 5 0
1 1 1 16 3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0


Multi.views_____Stakeholder.types
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
1
1
3
5
0
5
8
19
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0


Multi.views_____Workspace.awareness
Multi.views
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
0 0 0 0 0 0 1 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0 0 0 1 1 0 2
0 0 0 0 0 0 1 1 0 0 2 1 0 2
1 3 1 1 4 2 5 3 2 2 5 0 1 3
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
5
4
3
2
1
0


Multi.views_____Workspace.awareness.score
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0
1
0
2
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1
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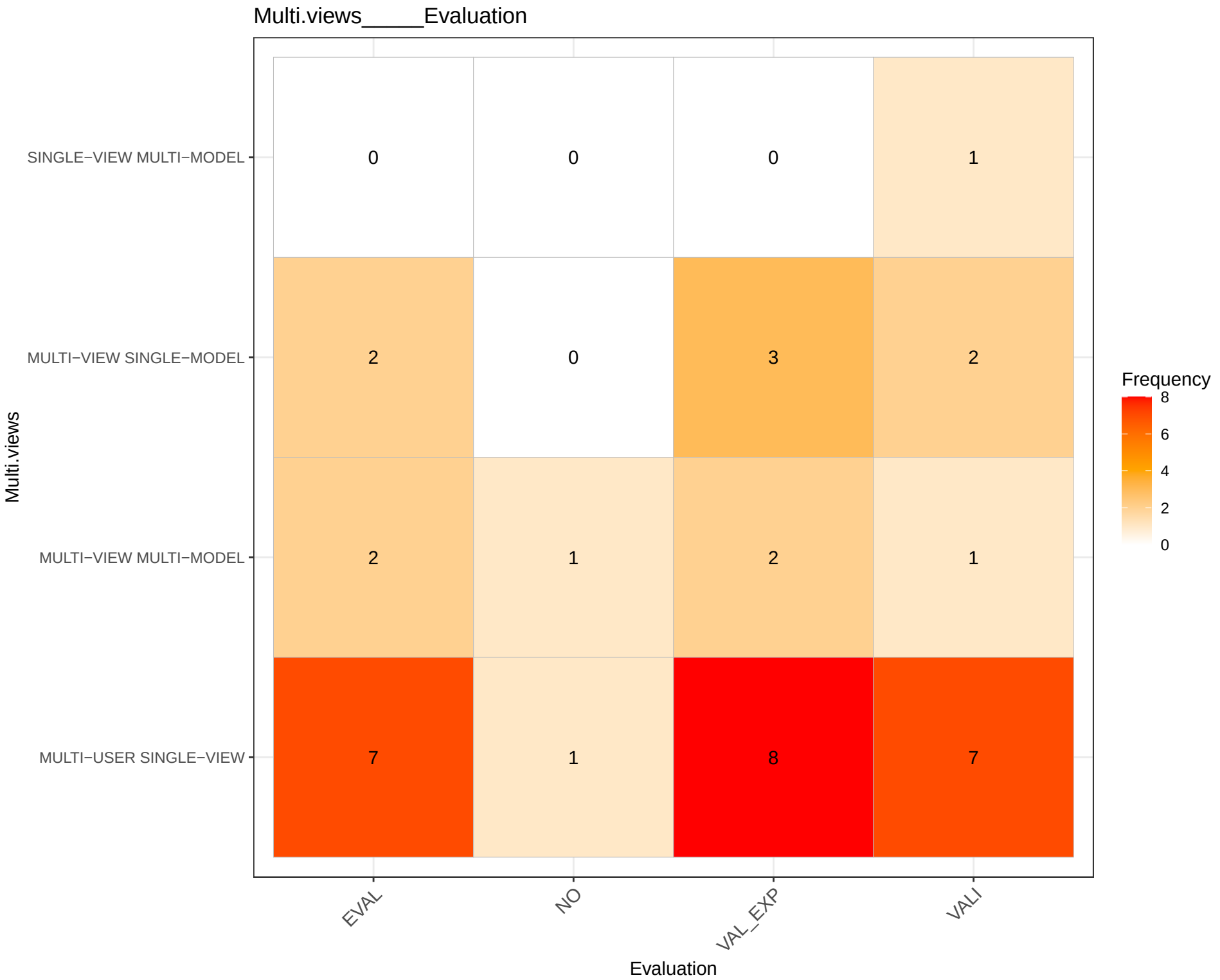
8
6
5
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0


Multi.views_____Evaluation
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MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
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0
0
1
2
0
3
2
2
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1
8
7
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
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6
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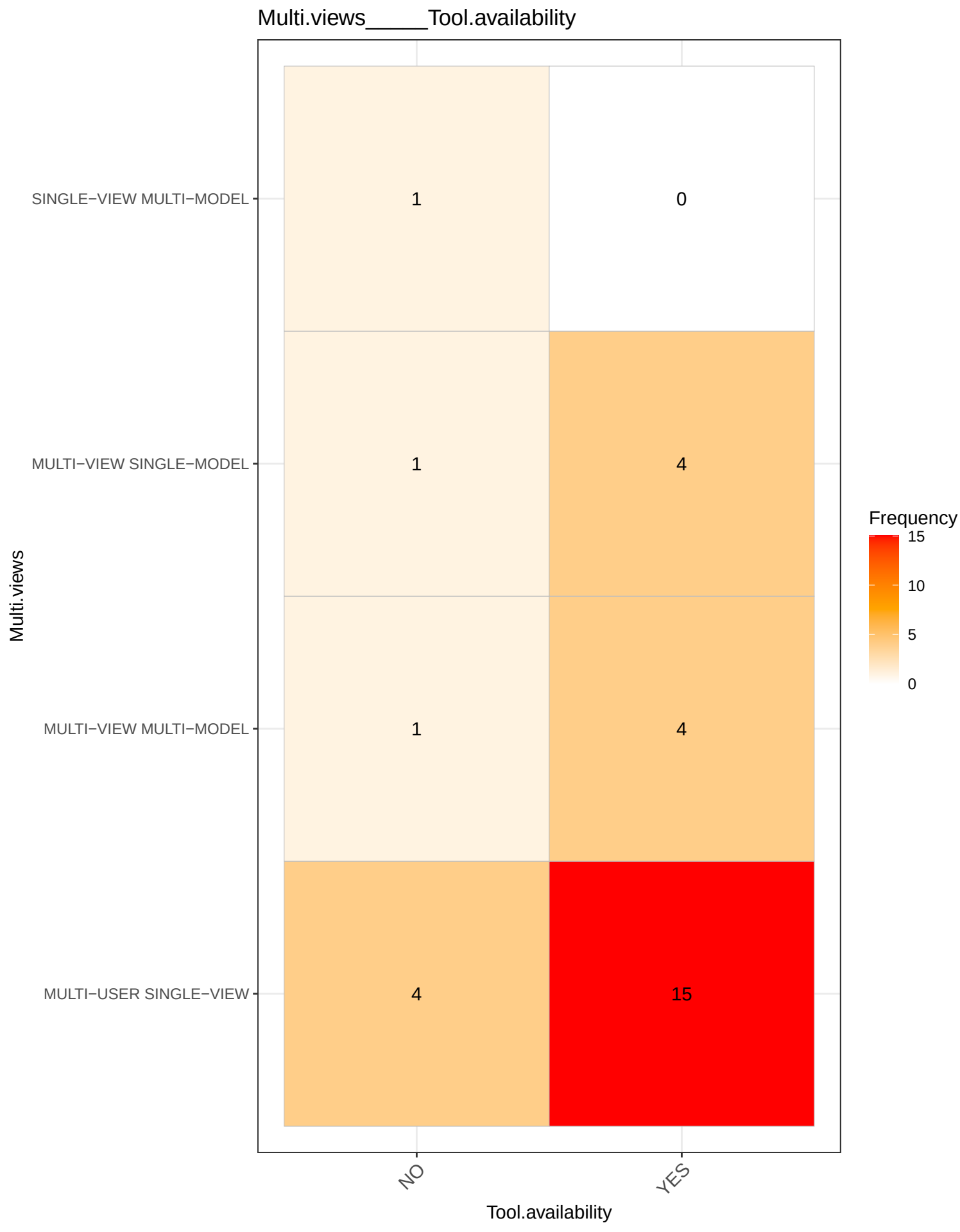
Multi.views_____Tool.availability
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
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1
4
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15
NO
YES
Tool.availability
Frequency
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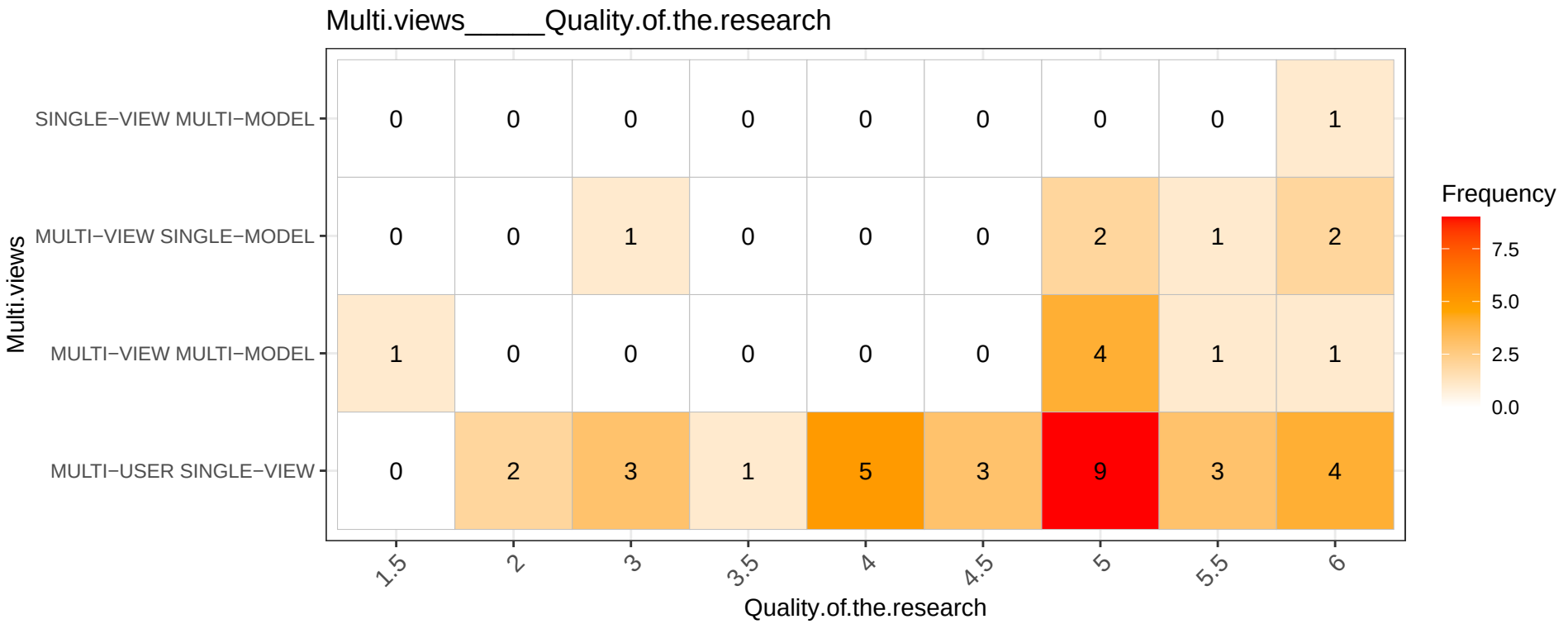
Multi.views_____Quality.of.the.research
SINGLE−VIEW MULTI−MODEL
MULTI−VIEW SINGLE−MODEL
MULTI−VIEW MULTI−MODEL
MULTI−USER SINGLE−VIEW
Multi.views
0 0 0 0 0 0 0 0 1
0 0 1 0 0 0 2 1 2
1 0 0 0 0 0 4 1 1
0 2 3 1 5 3 9 3 4
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
7.5
5.0
2.5
0.0

Language.specific_____Modeling.framework
Language.specific
XTEAM
UML
SOM IAS
NO
BPMN
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0 0 0 1 1 0 0 0 0 0 0 1 0 0 0
0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
1 1 1 7 6 1 1 1 1 1 1 0 1 1 1
0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
ATOMPM
BPMS
COLLABORATIVE CTT
CUSTOM
EMF
GME
MODELVERSE
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PACAS
RDF
SPEM
UML
VIATRA
WEBGME
YJS
Modeling.framework
Frequency
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2
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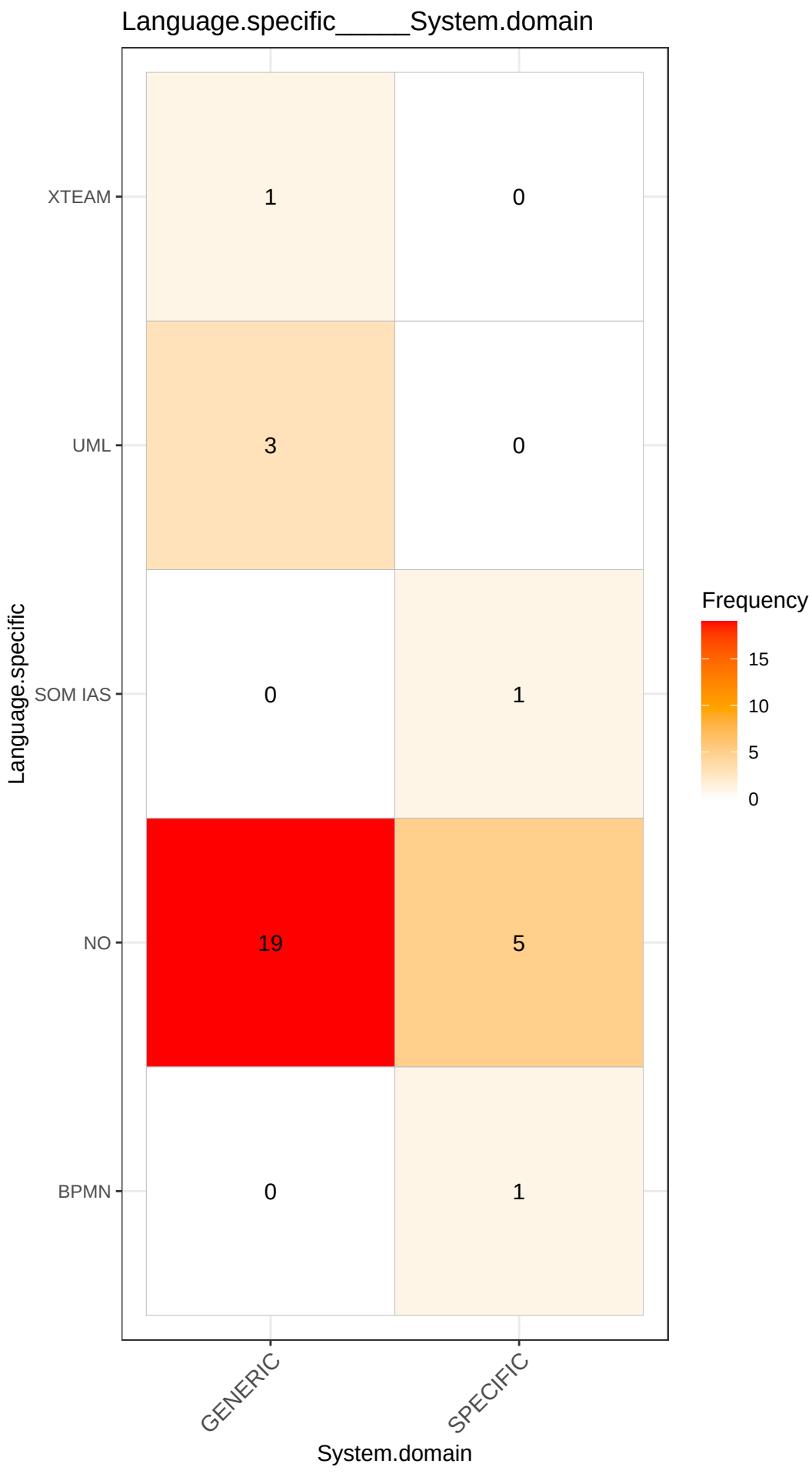
Language.specific_____System.domain
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UML
SOM IAS
NO
BPMN
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SPECIFIC
System.domain
Frequency
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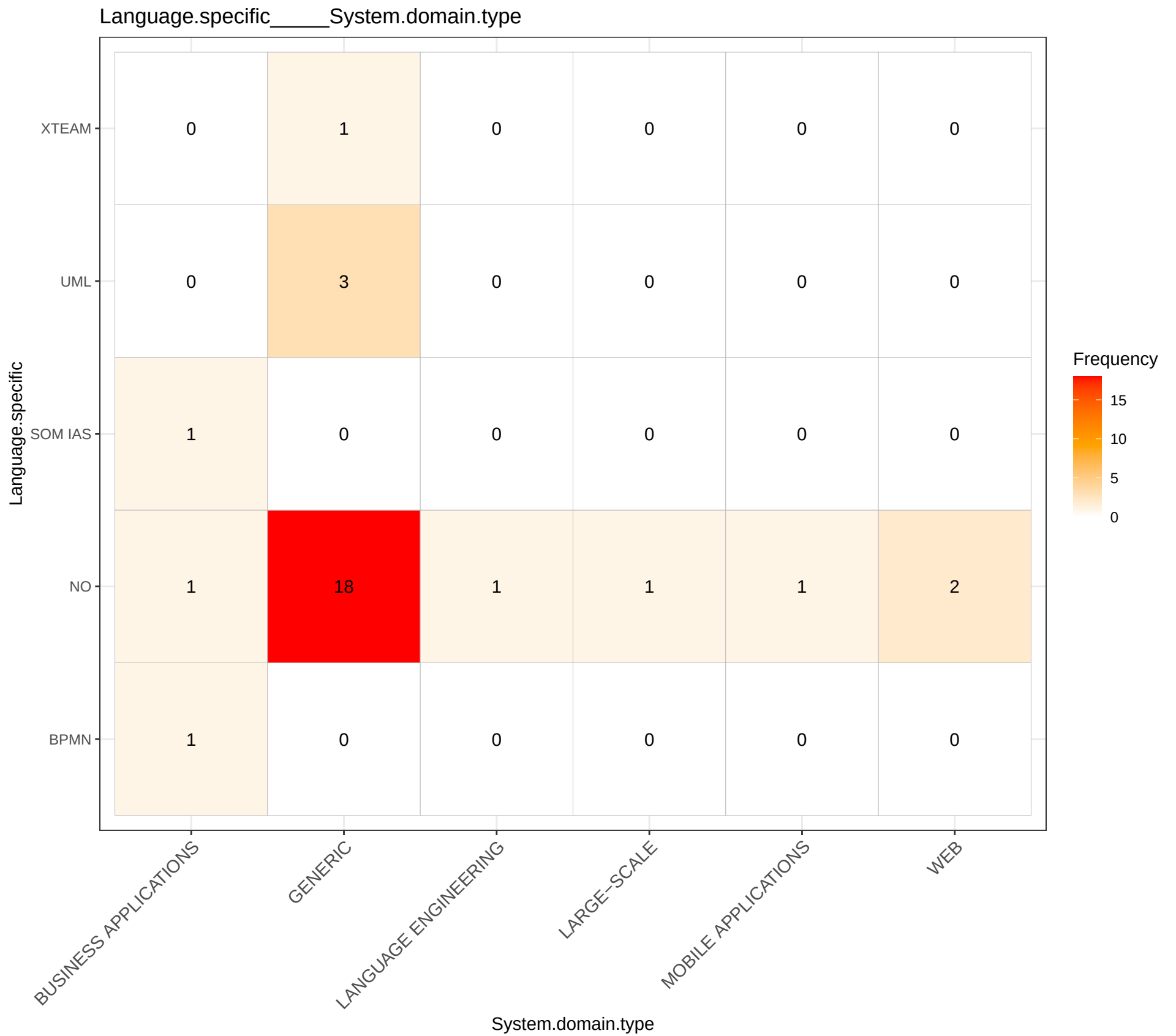
Language.specific_____System.domain.type
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
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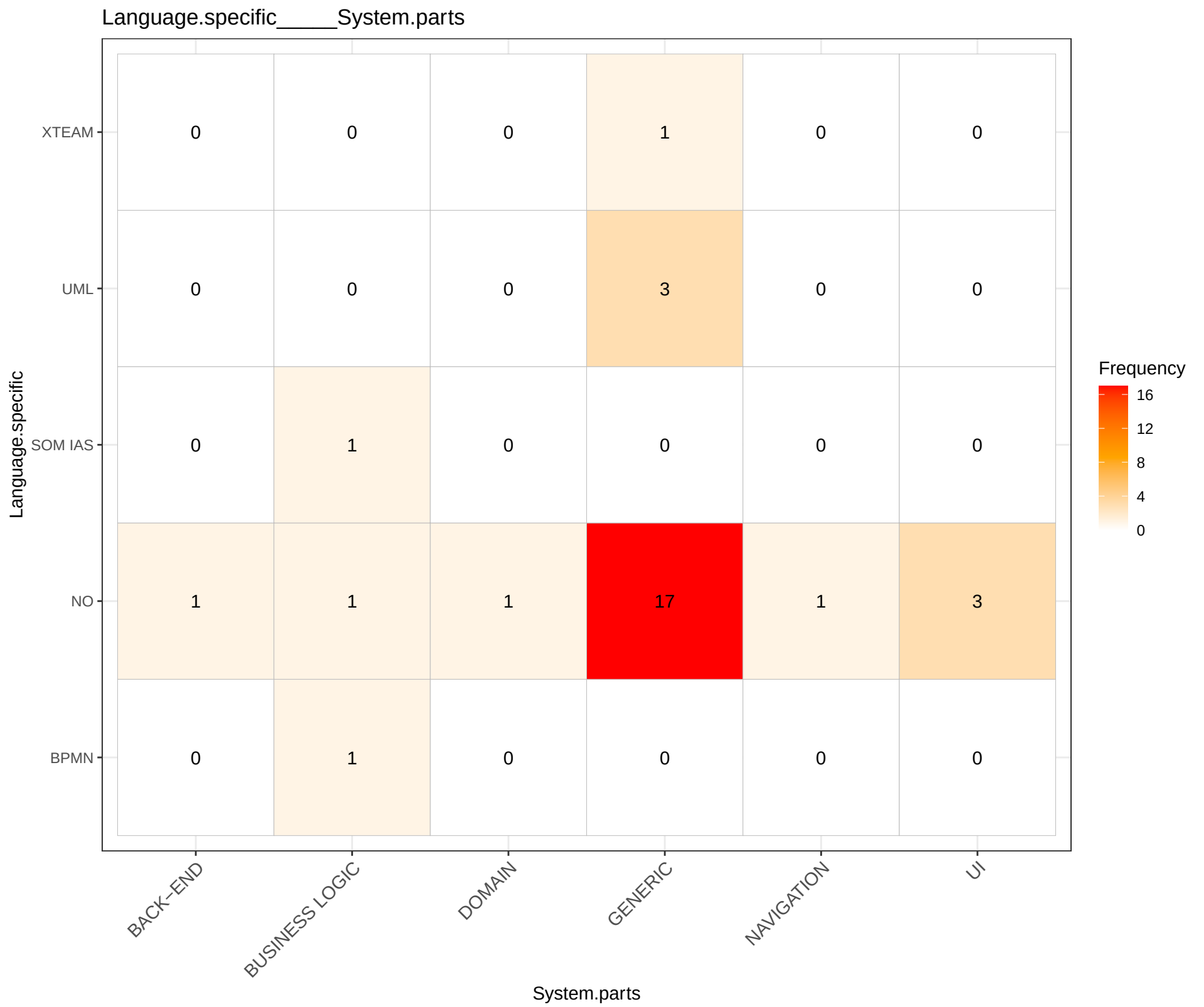
Language.specific_____System.parts
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UML
SOM IAS
NO
BPMN
Language.specific
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0 0 0 3 0 0
0 1 0 0 0 0
1 1 1 17 1 3
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BACK-END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
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12
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4
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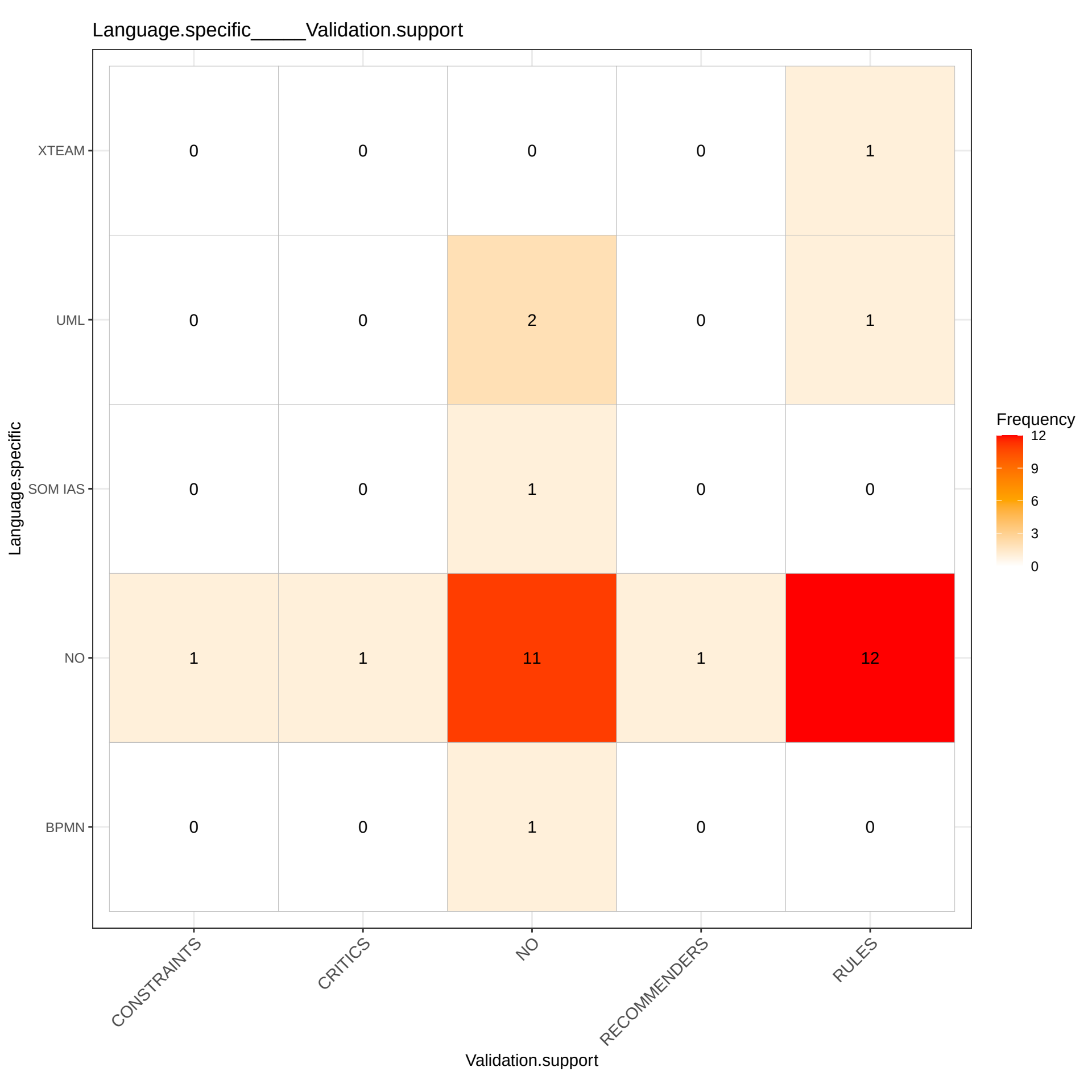
Language.specific_____Validation.support
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
0 0 0 0 1
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0 0 1 0 0
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CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
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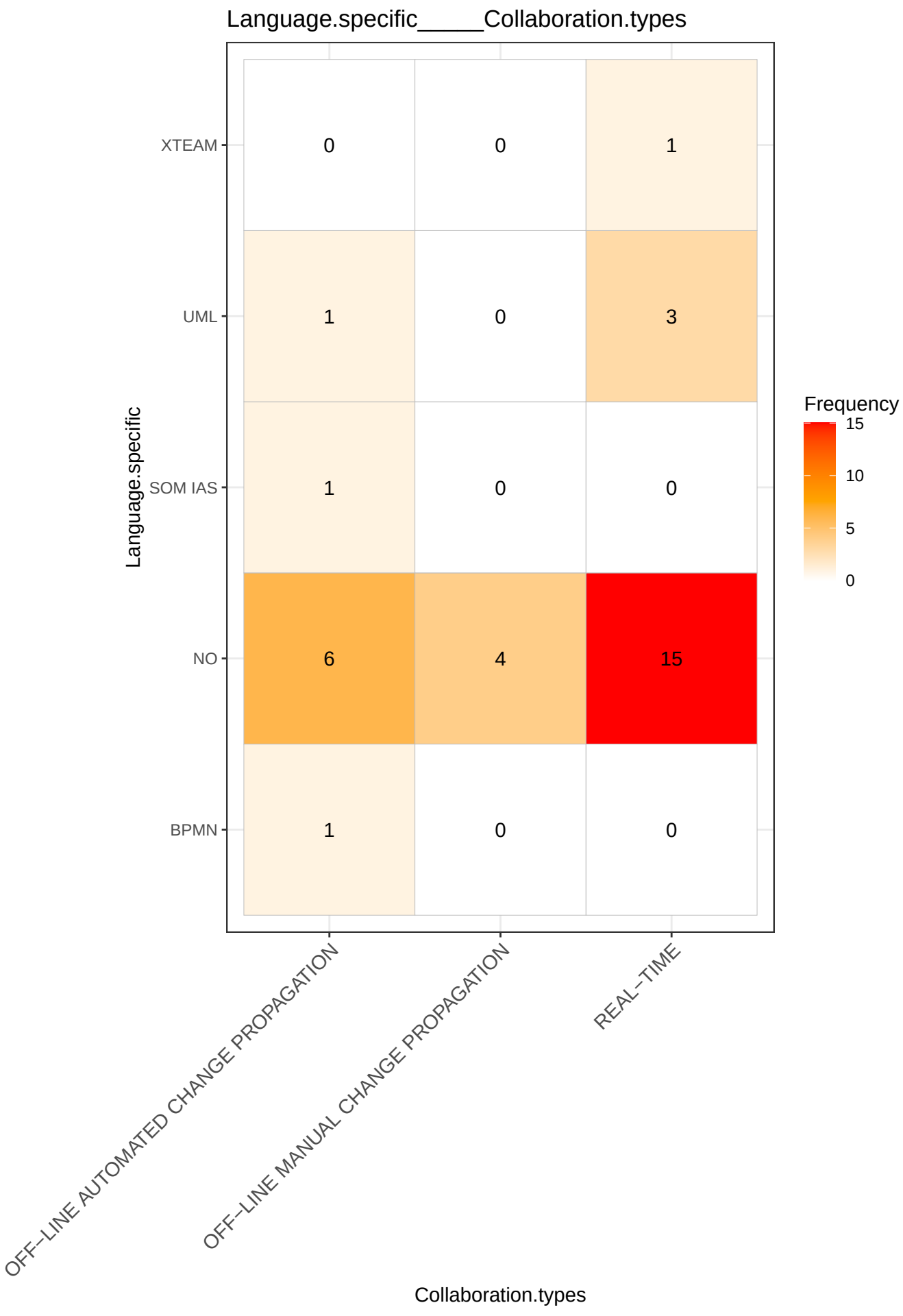
Language.specific_____Collaboration.types
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UML
SOM IAS
NO
BPMN
Language.specific
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1
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1
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0
6
4
15
1
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Frequency
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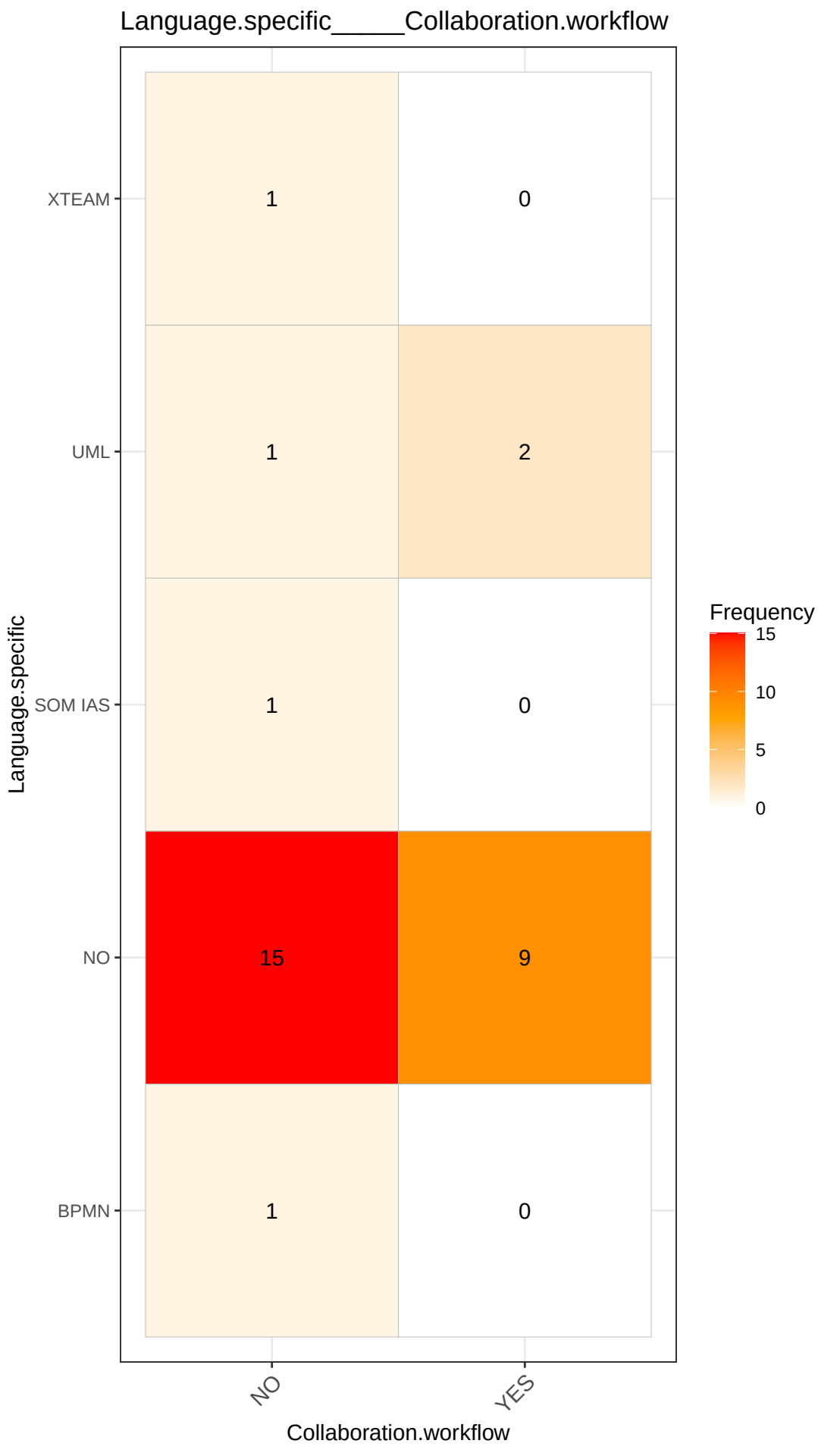
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types


Language.specific_____Collaboration.workflow
XTEAM
UML
SOM IAS
NO
BPMN
1
0
1
2
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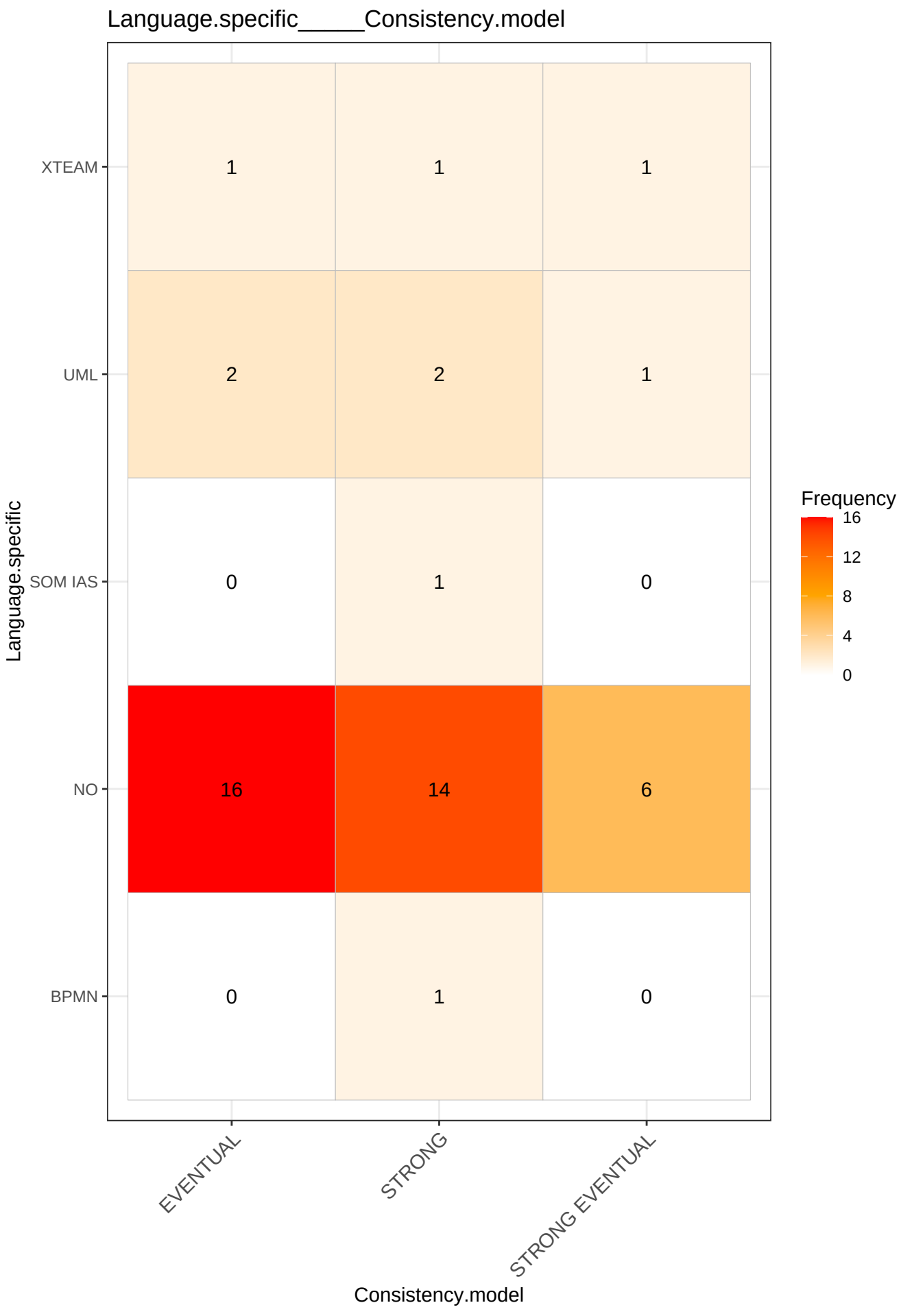
15
9
1
0
Language.specific
NO
YES
Collaboration.workflow
Frequency
15
10
5
0


Language.specific_____Consistency.model
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
1
1
1
2
2
1
0
1
0
16
14
6
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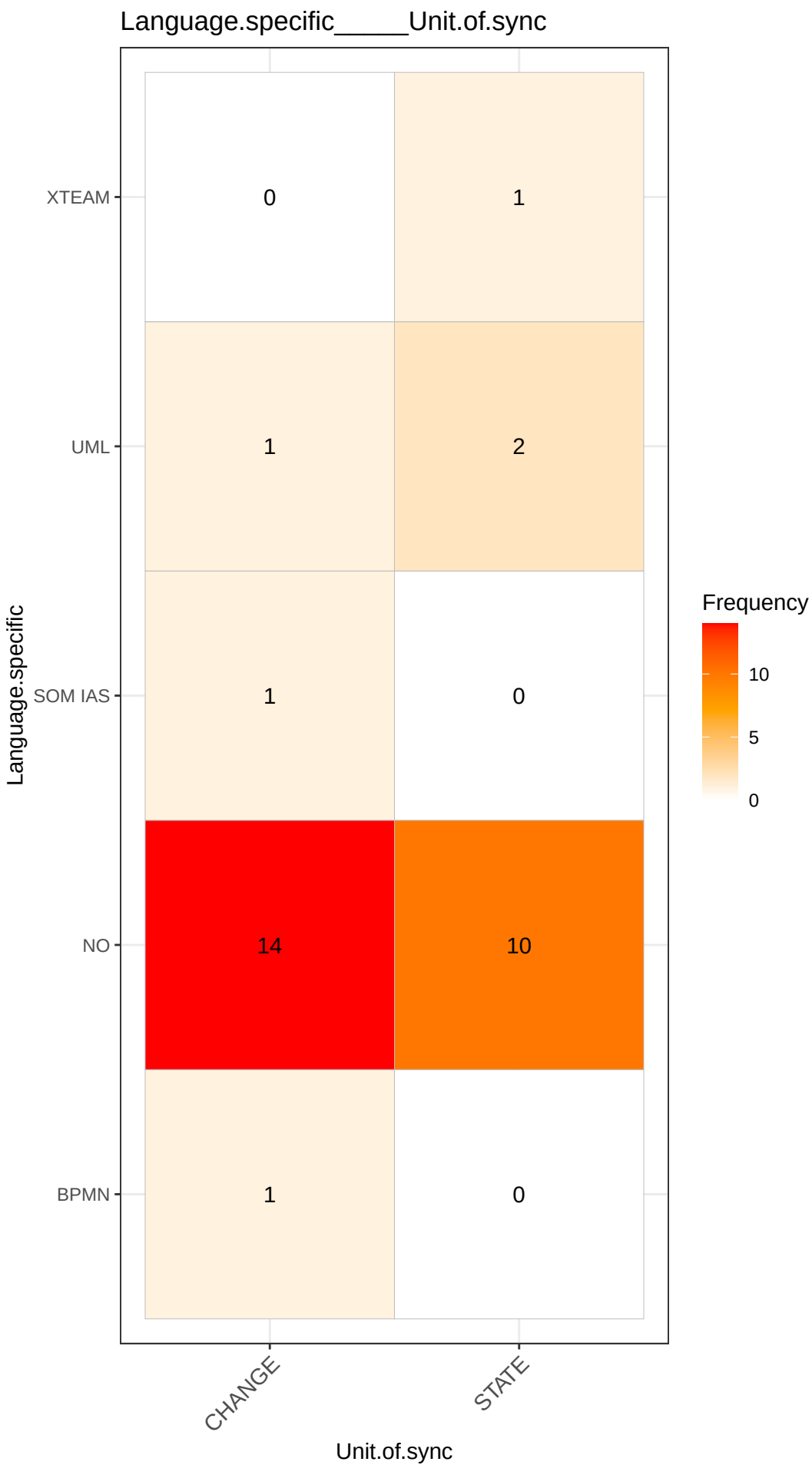
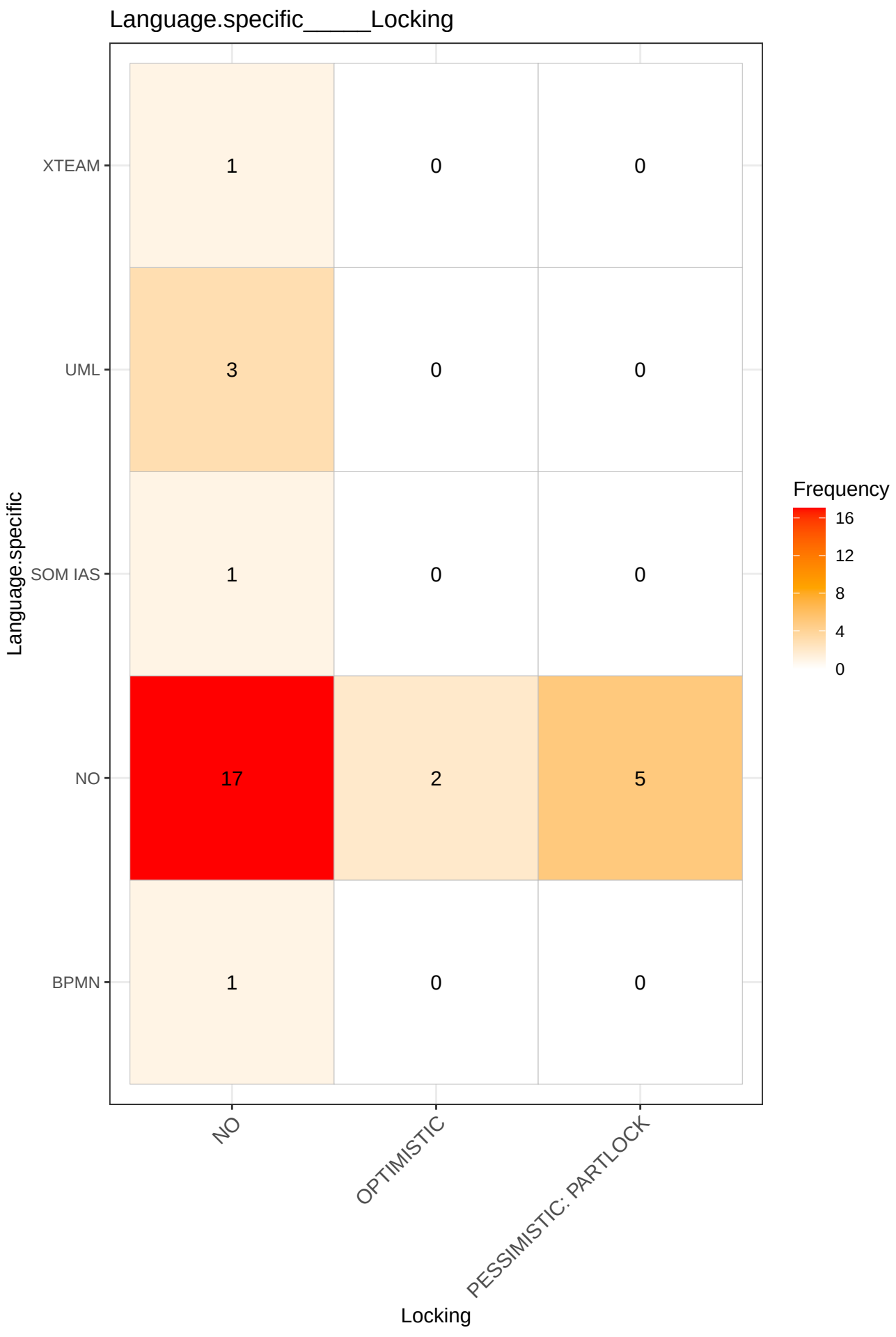
1
0
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
16
12
8
4
0


Language.specific_____Unit.of.sync
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
0
1
1
2
1
0
14
10
1
0
CHANGE
STATE
Unit.of.sync
Frequency
10
5
0


Language.specific_____Locking
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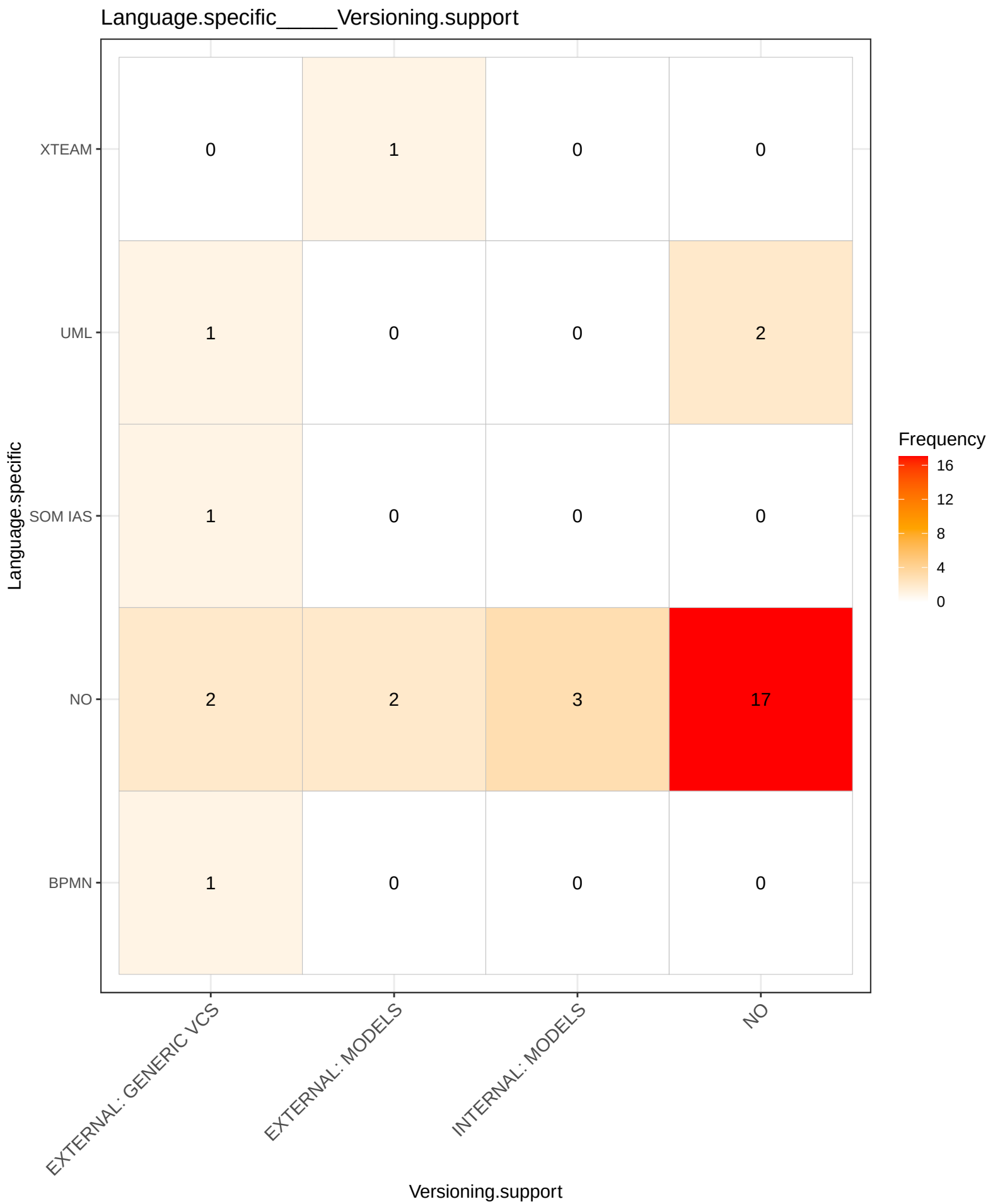
UML
SOM IAS
NO
BPMN
Language.specific
1
0
0
3
0
0
1
0
0
17
2
5
1
0
0
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
16
12
8
4
0


Language.specific_____Versioning.support
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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1
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0
2
1
0
0
0
2
2
3
17
1
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EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
16
12
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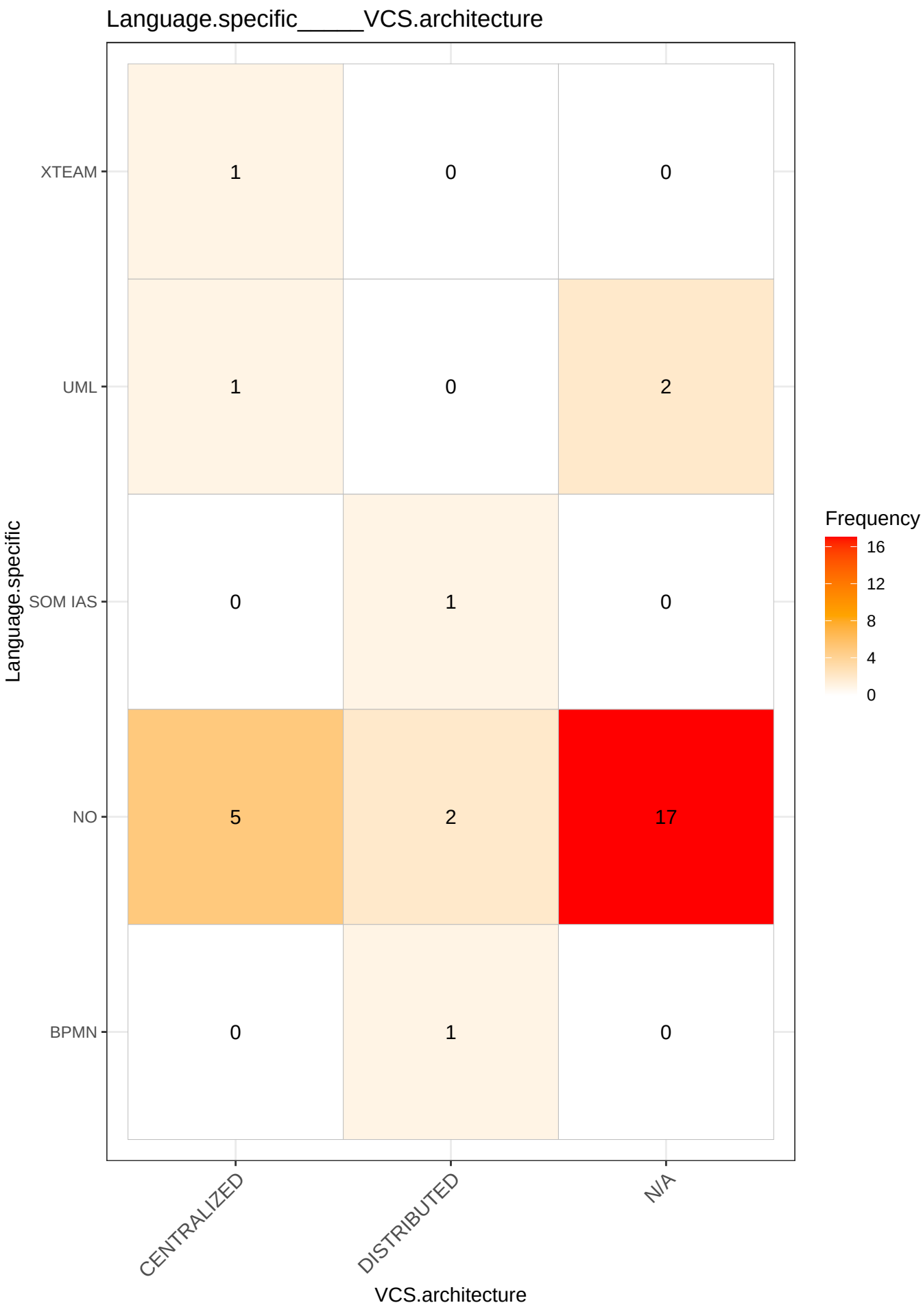
Language.specific_____VCS.architecture
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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1
0
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0
1
0
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CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
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12
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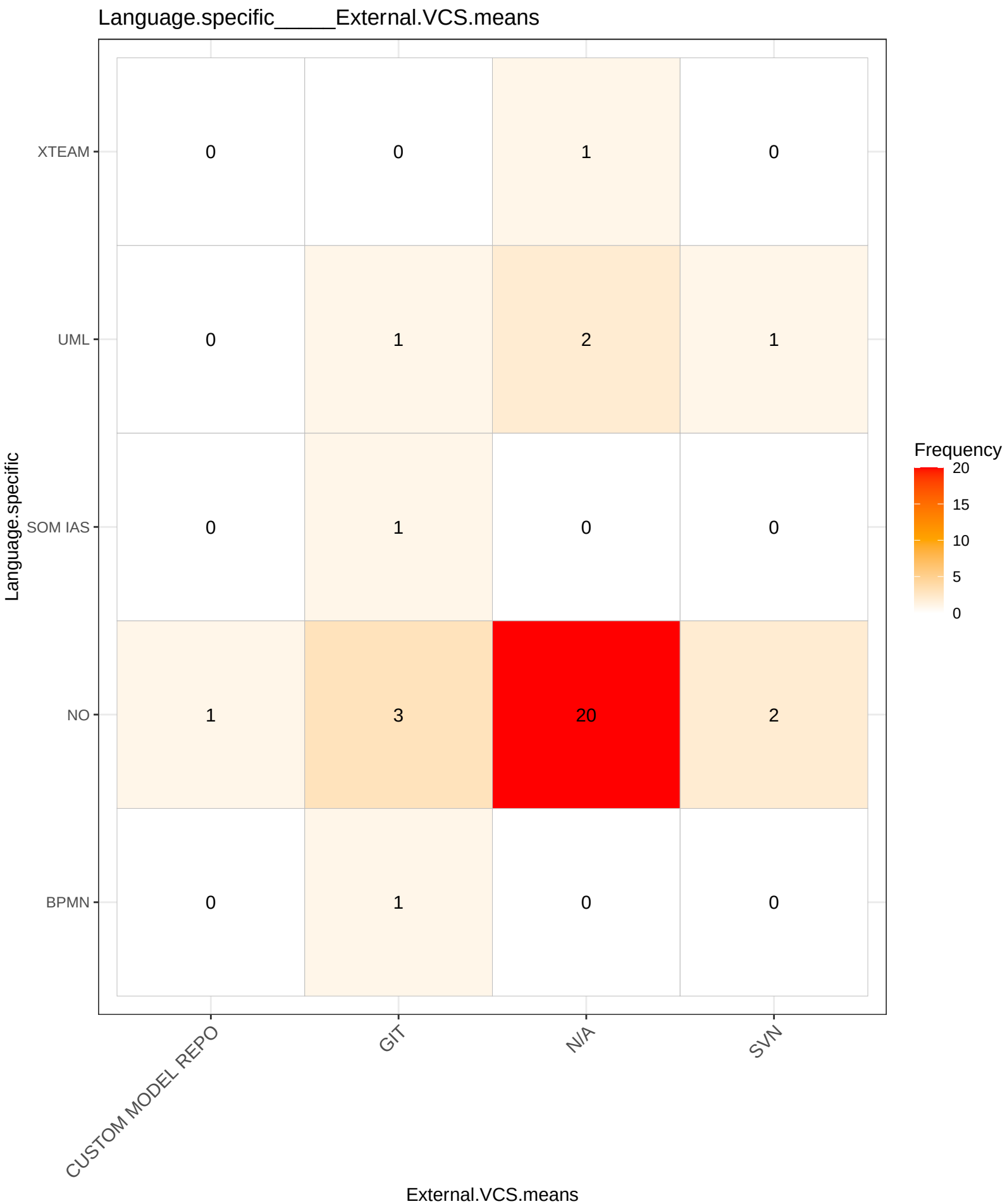
Language.specific_____External.VCS.means
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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1
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1
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1
3
20
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CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
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15
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5
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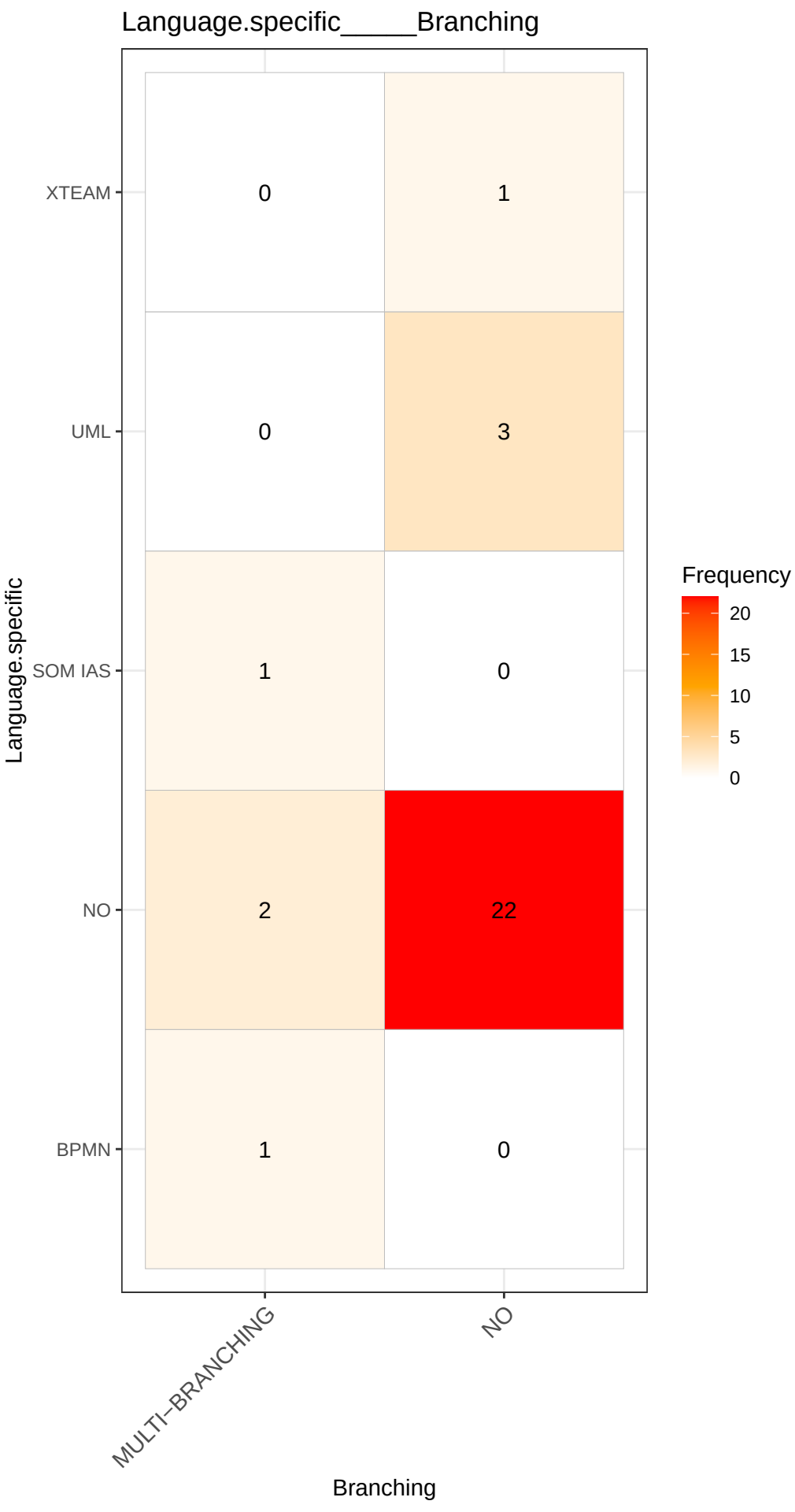
Language.specific_____Branching
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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MULTI−BRANCHING
NO
Branching
Frequency
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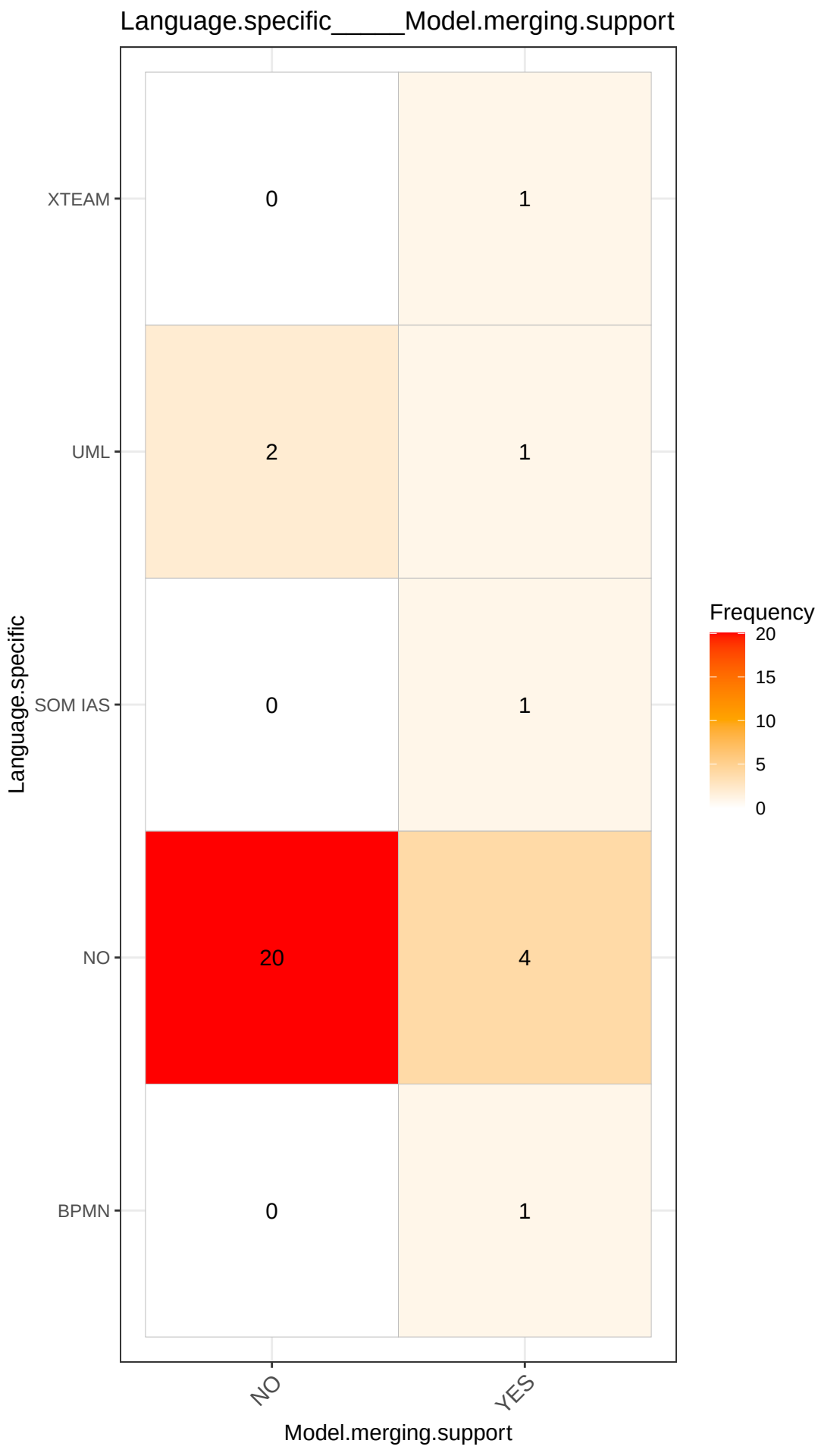
Language.specific_____Model.merging.support
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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1
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4
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1
NO
YES
Model.merging.support
Frequency
20
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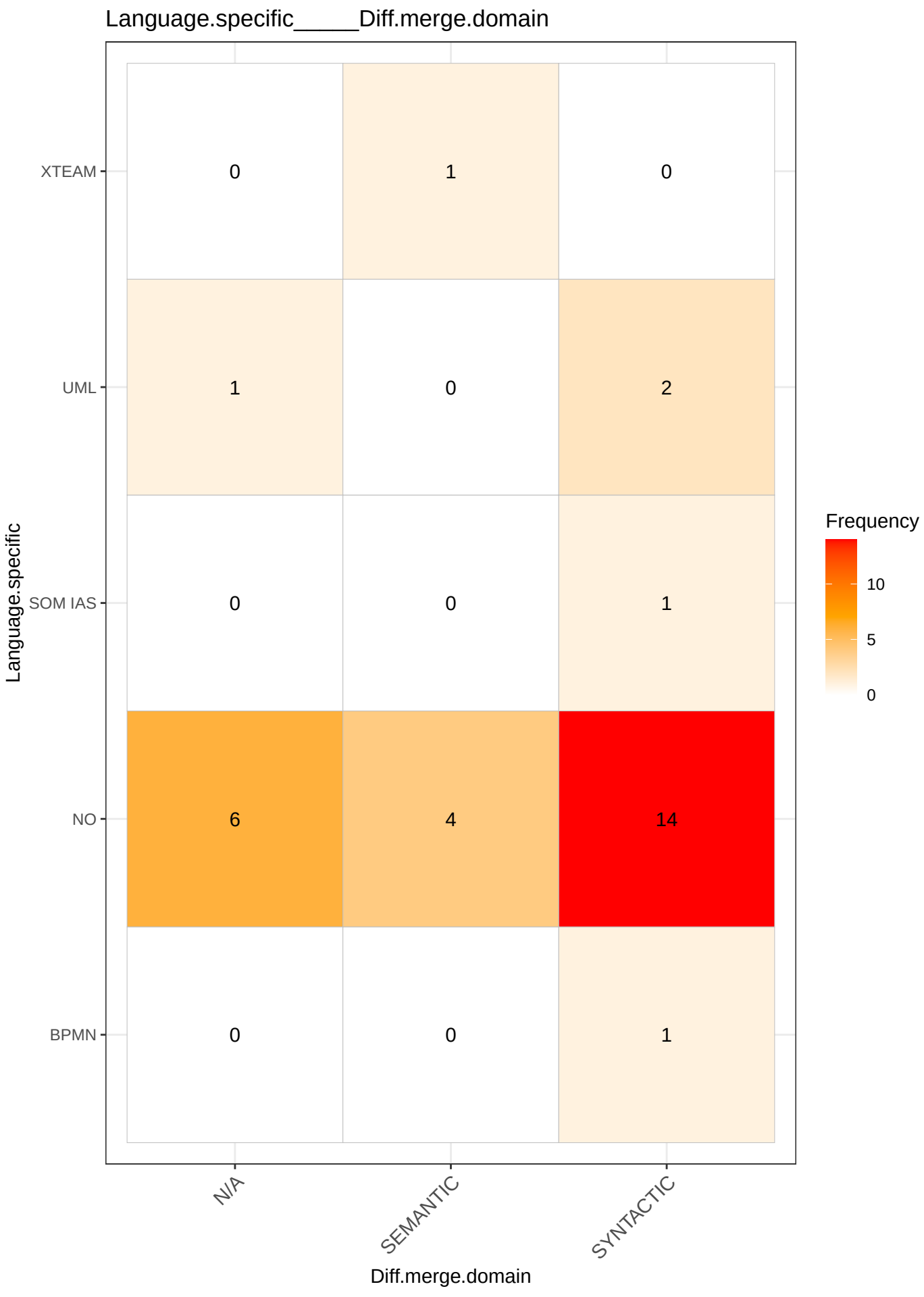
Language.specific_____Diff.merge.domain
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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0
1
0
2
0
0
1
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14
0
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N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10
5
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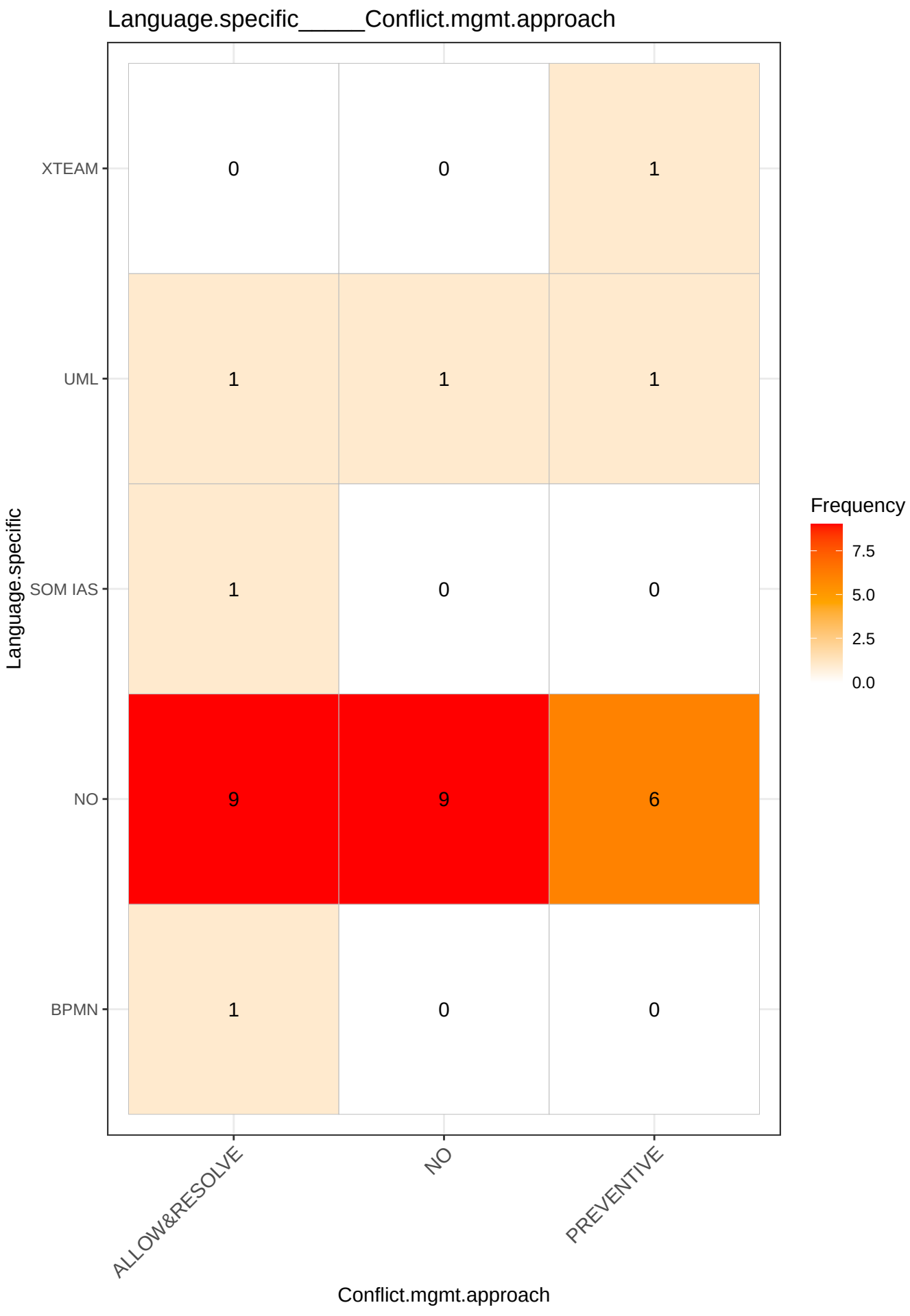
Language.specific_____Conflict.mgmt.approach
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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1
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1
1
1
0
0
9
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1
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ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
7.5
5.0
2.5
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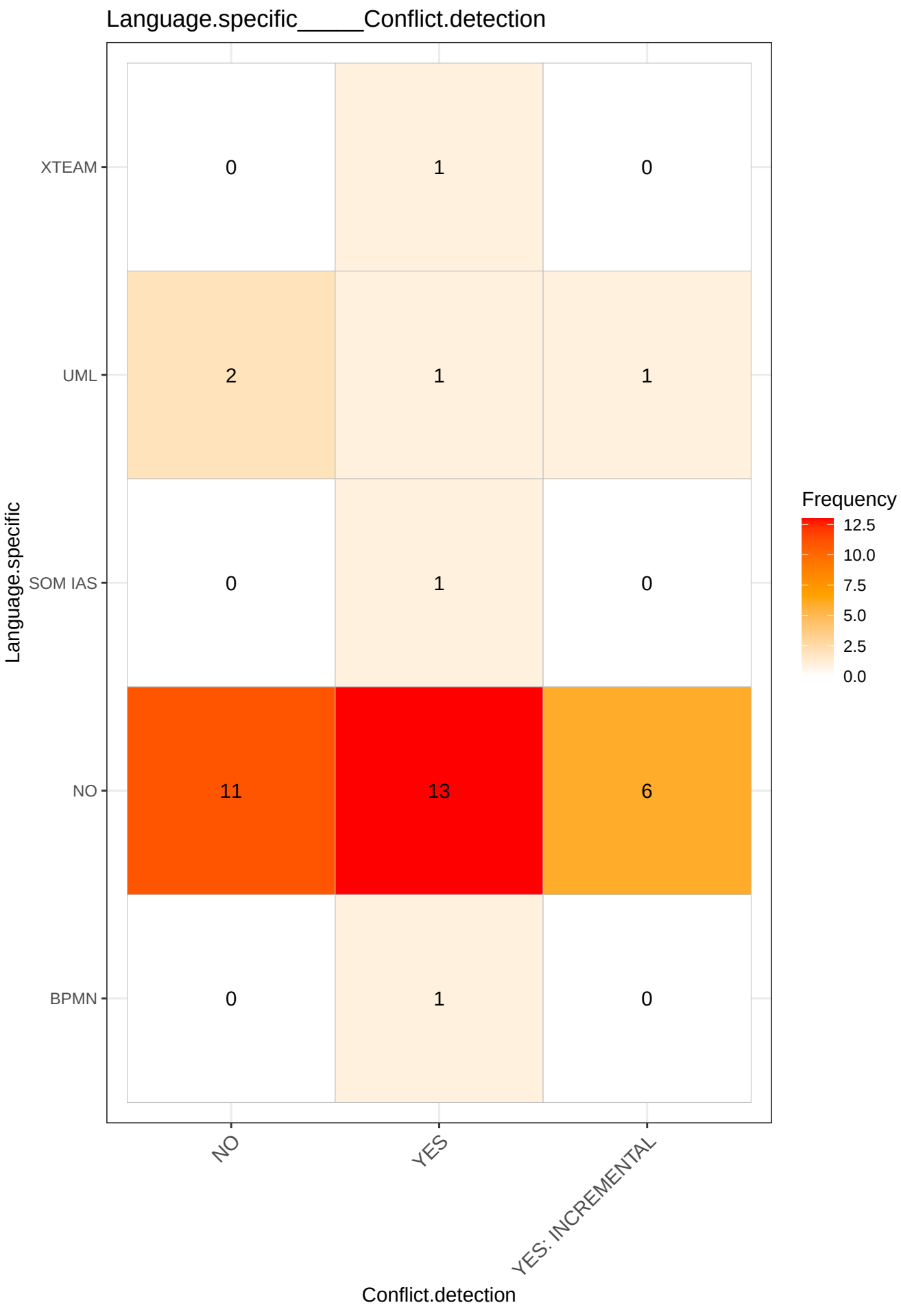
Language.specific_____Conflict.detection
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
0
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0
2
1
1
0
1
0
11
13
6
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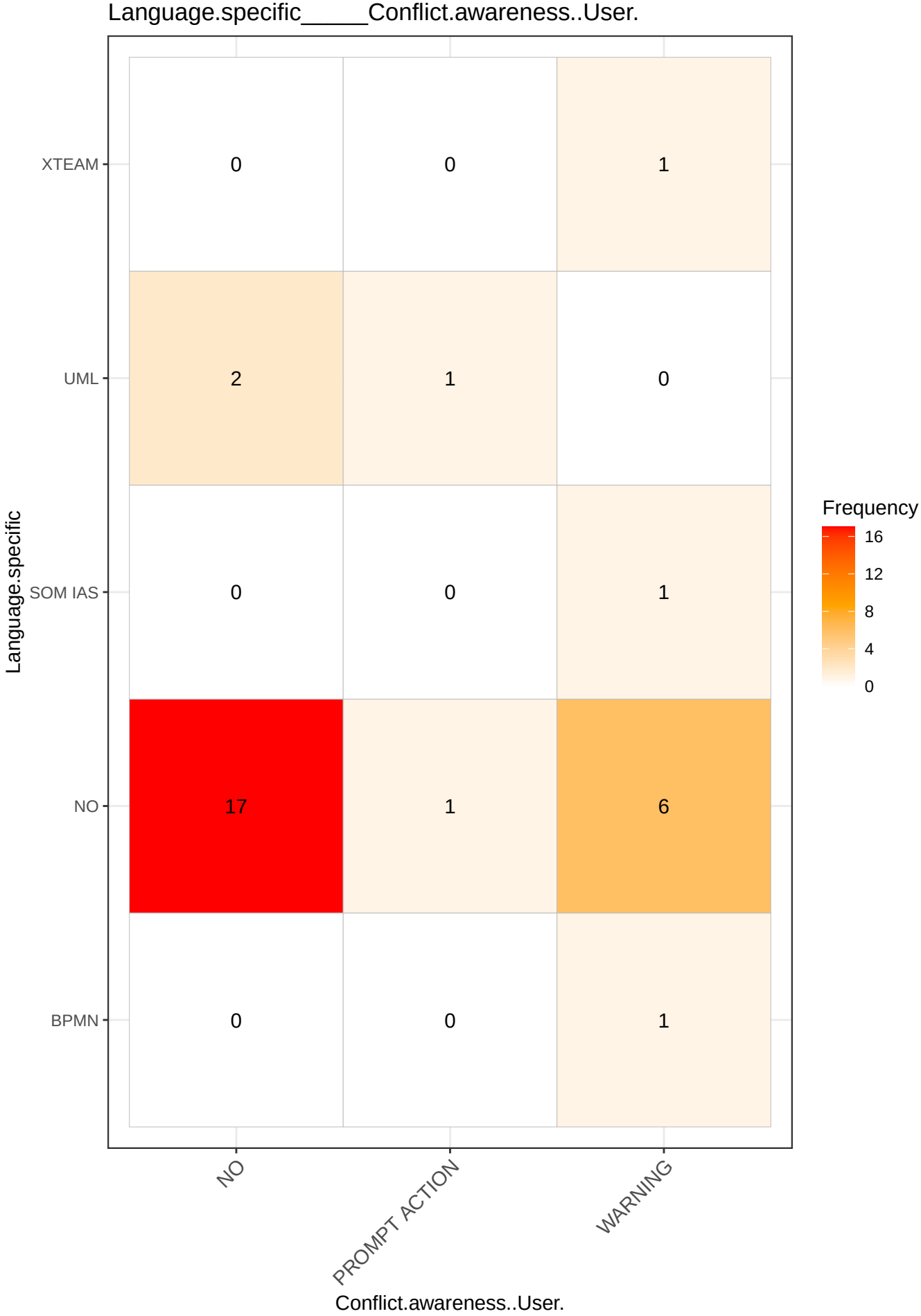
0
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Language.specific_____Conflict.awareness..User.
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
0
0
1
2
1
0
0
0
1
17
1
6
0
0
1
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
16
12
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4
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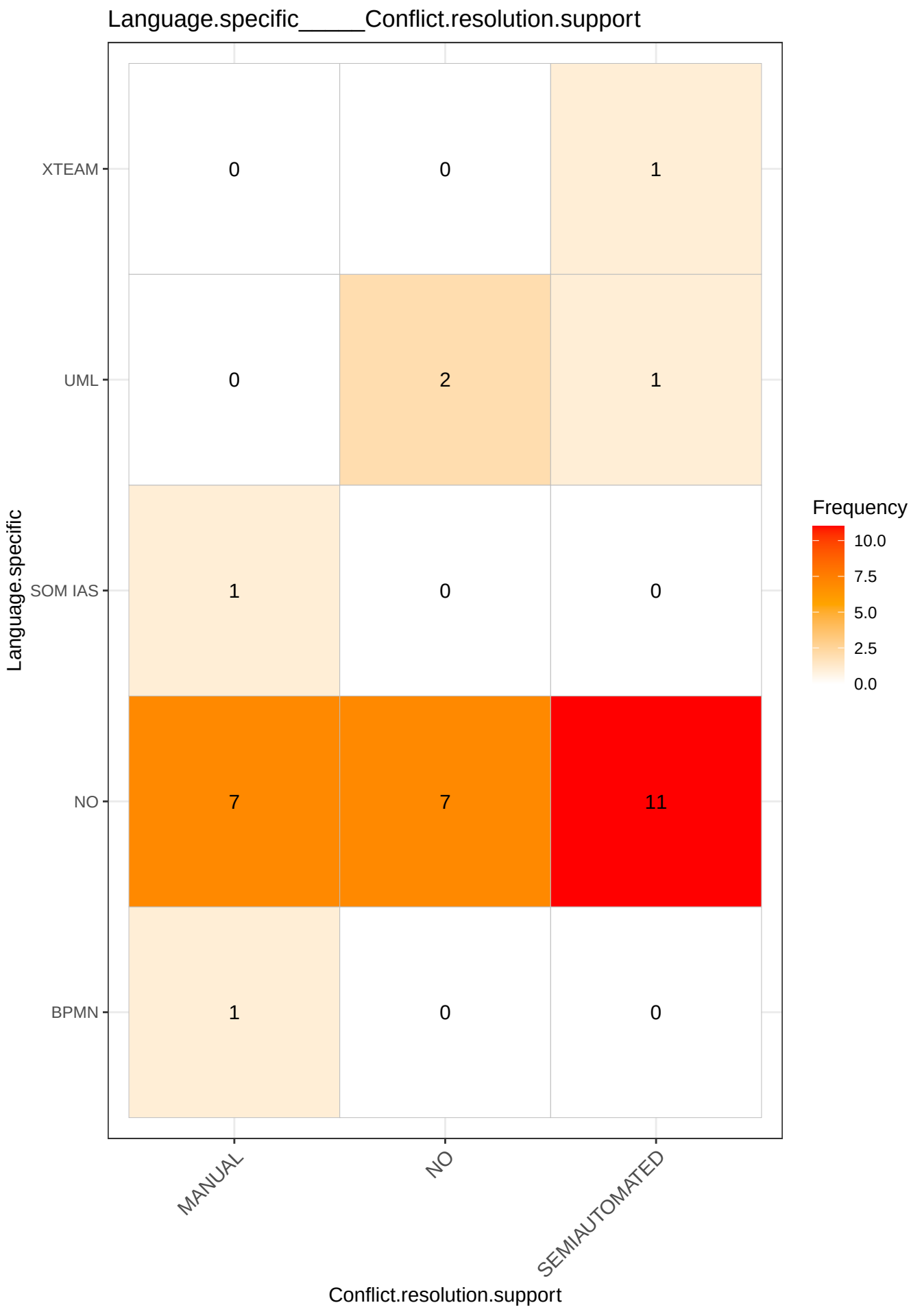
Language.specific_____Conflict.resolution.support
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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0
2
1
1
0
0
7
7
11
1
0
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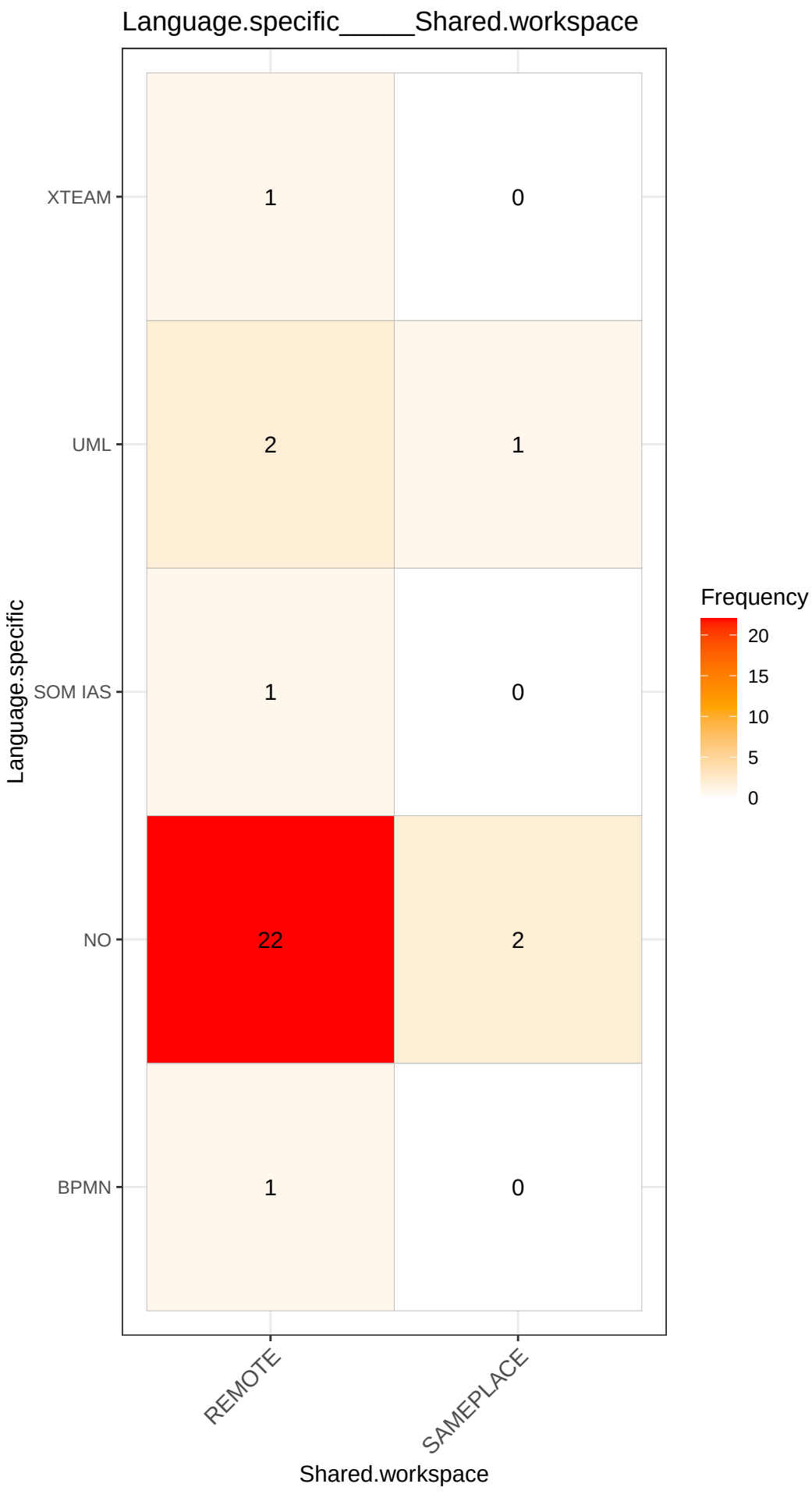
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
10.0
7.5
5.0
2.5
0.0


Language.specific_____Shared.workspace
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
1
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22
2
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REMOTE
SAMEPLACE
Shared.workspace
Frequency
20
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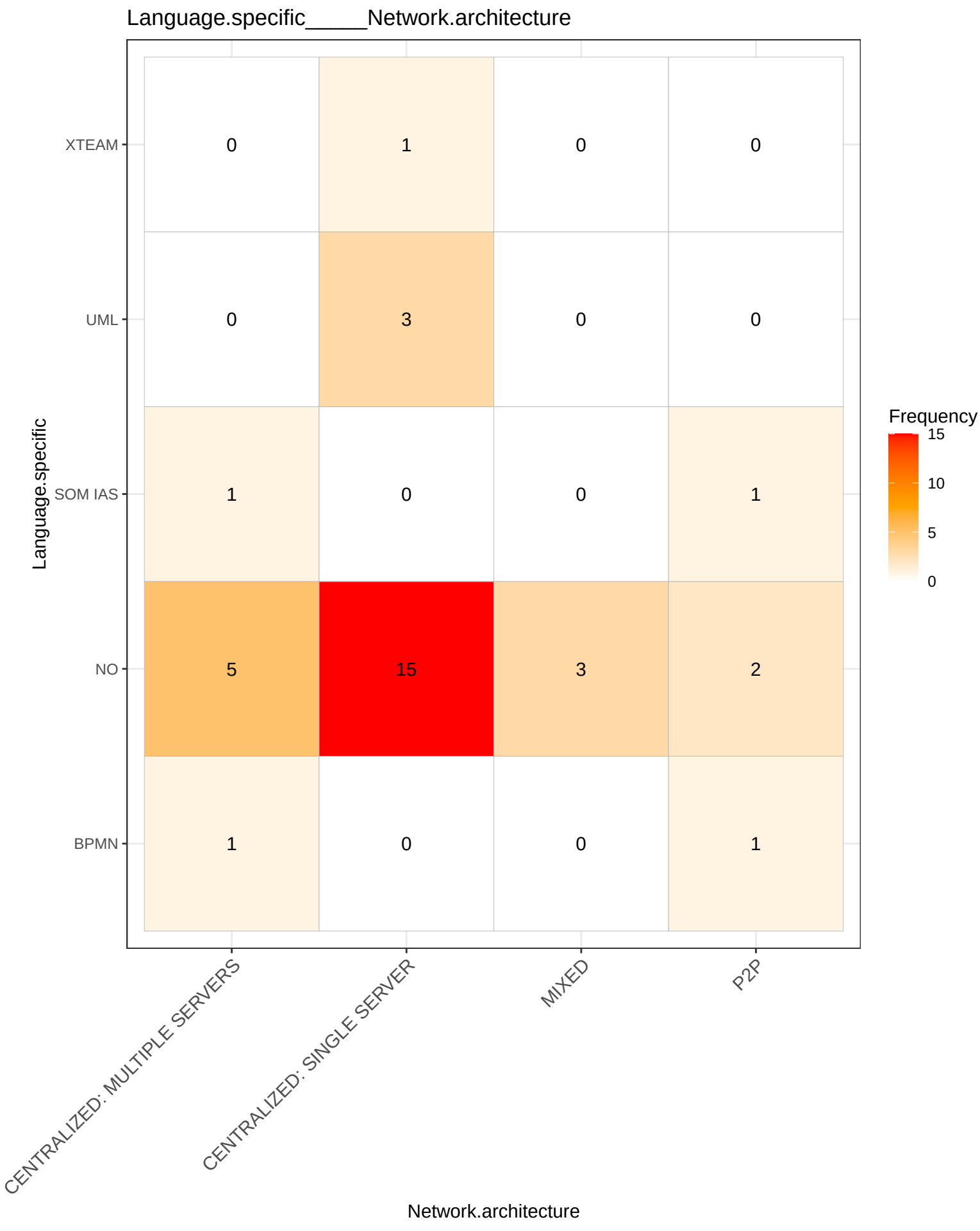
10
5
0


Language.specific_____Network.architecture
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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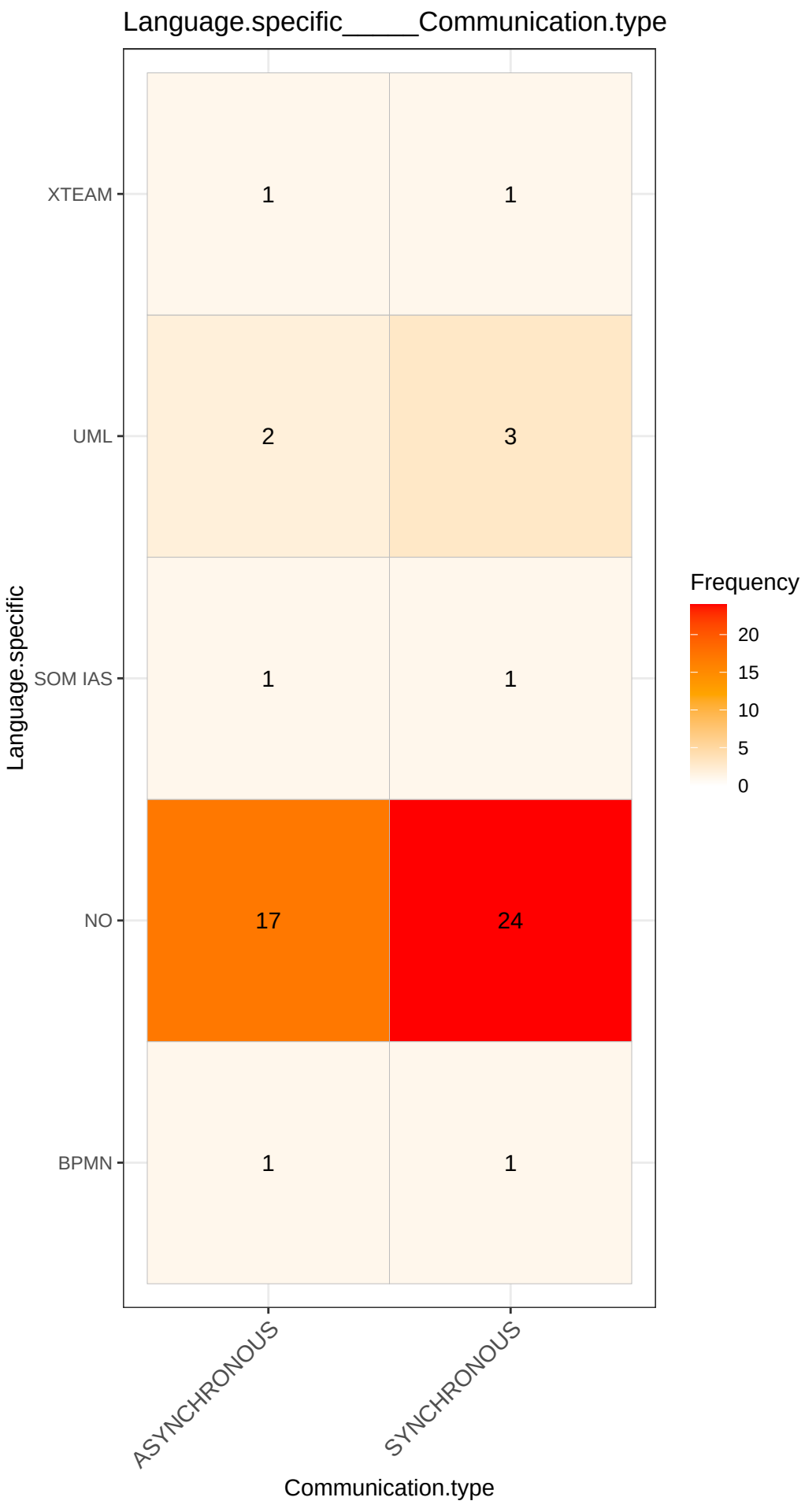
1
0
0
0
3
0
0
1
0
0
1
5
15
3
2
1
0
0
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
15
10
5
0


Language.specific_____Communication.type
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
1
1
2
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1
1
17
24
1
1
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
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10
5
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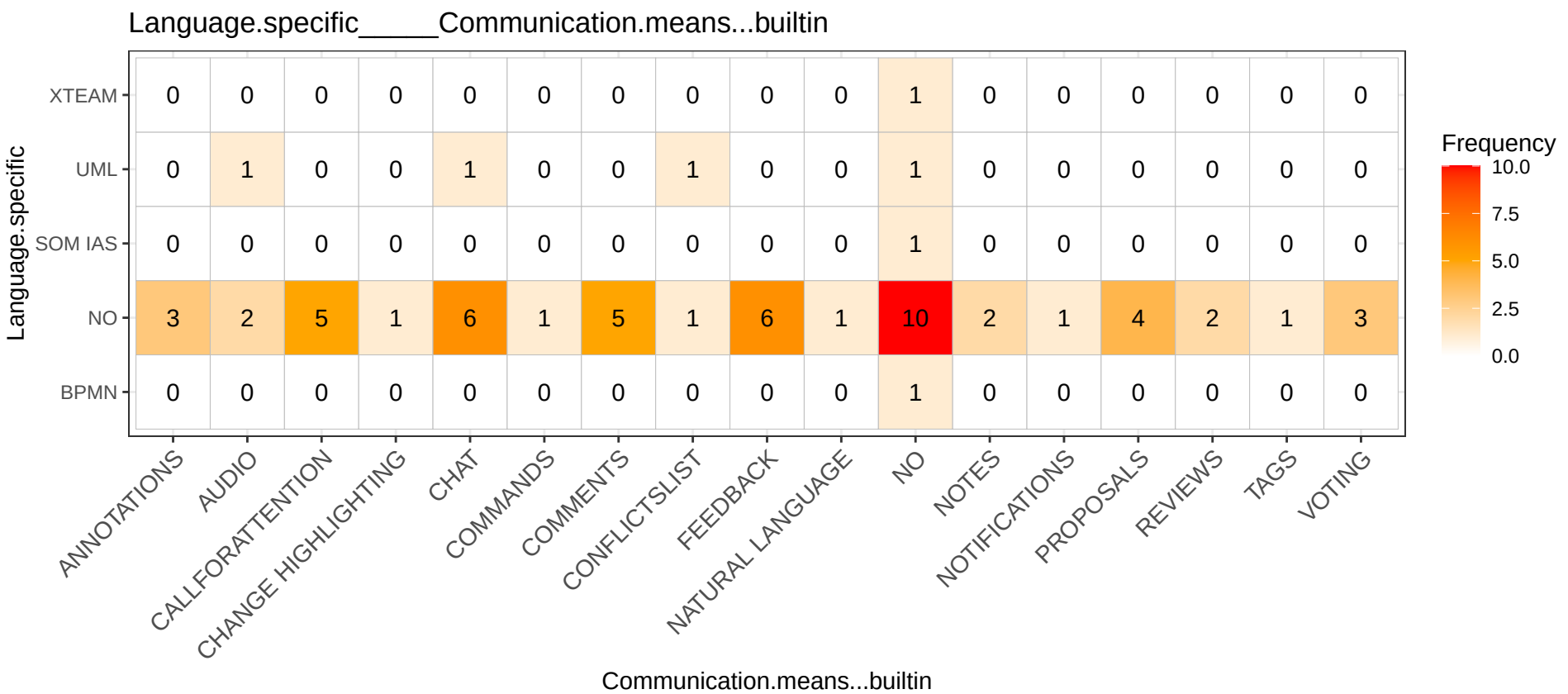
Language.specific_____Communication.means...builtin
Language.specific
XTEAM
UML
SOM IAS
NO
BPMN
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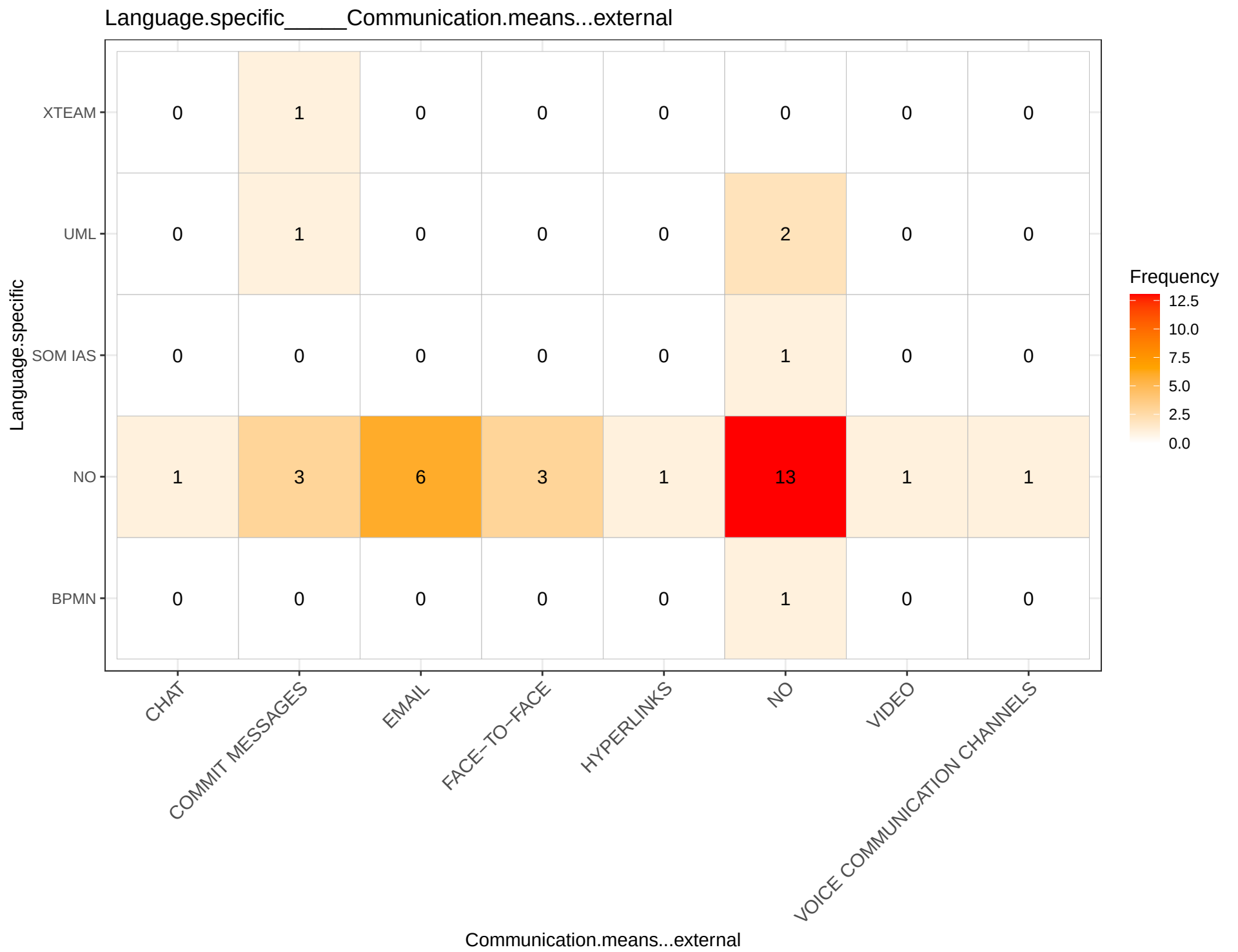
0 1 0 0 1 0 0 1 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
3 2 5 1 6 1 5 1 6 1 10 2 1 4 2 1 3
0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
10.0
7.5
5.0
2.5
0.0


Language.specific_____Communication.means...external
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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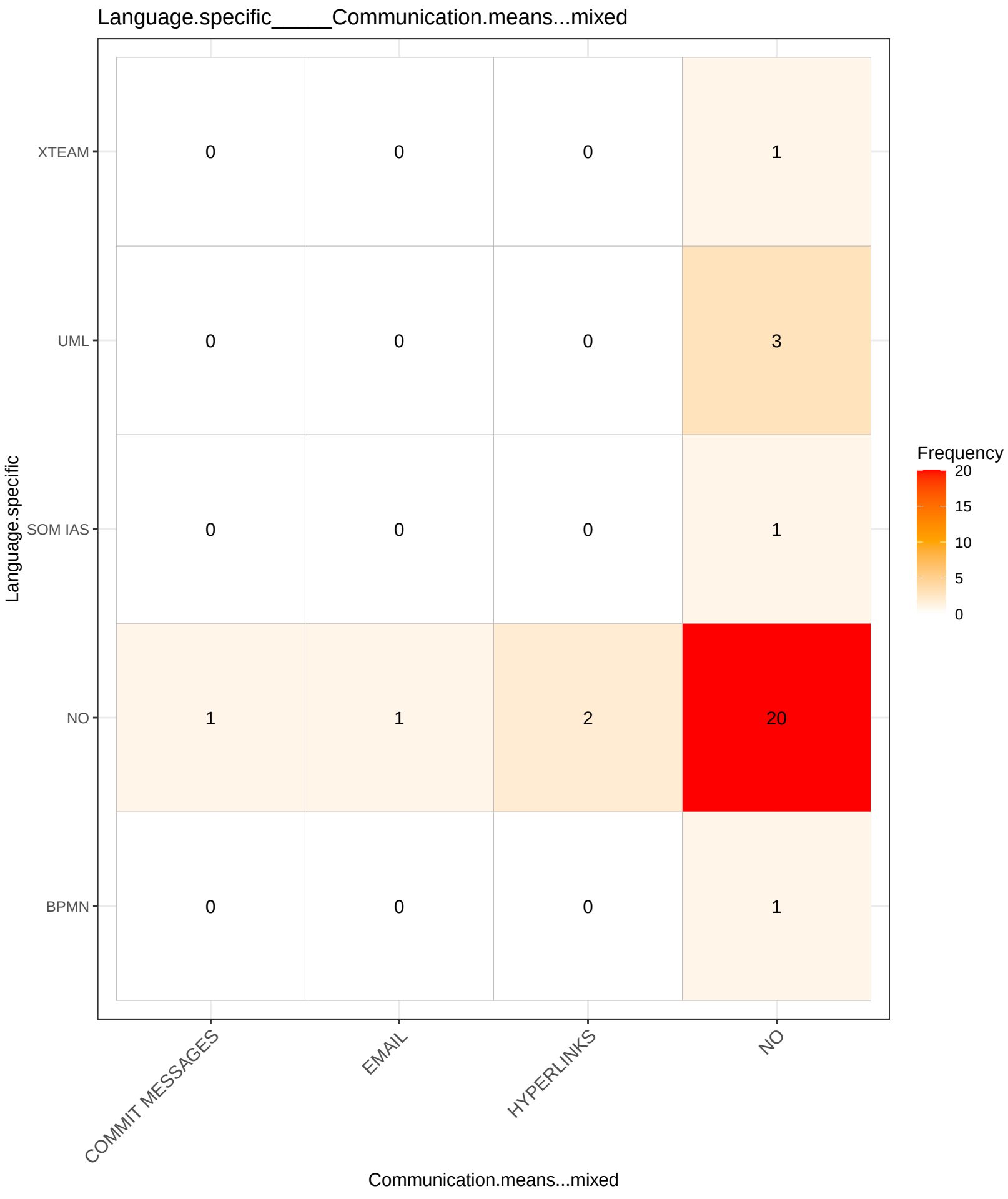
0 1 0 0 0 2 0 0
0 0 0 0 0 1 0 0
1 3 6 3 1 13 1 1
0 0 0 0 0 1 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Language.specific_____Communication.means...mixed
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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0 0 0 3
0 0 0 1
1 1 2 20
0 0 0 1
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
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15
10
5
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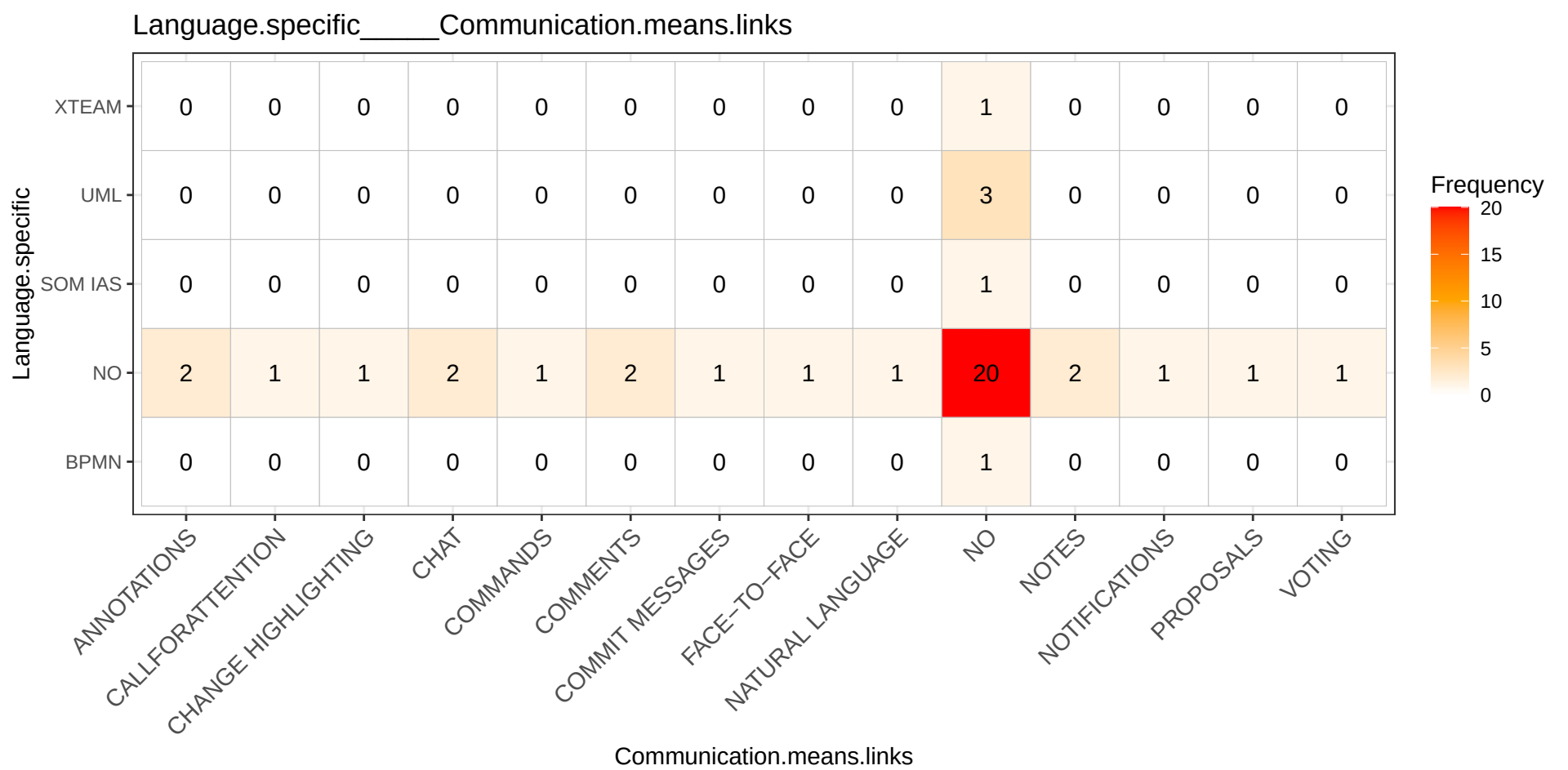
Language.specific_____Communication.means.links
Language.specific
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UML
SOM IAS
NO
BPMN
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2 1 1 2 1 2 1 1 1 20 2 1 1 1
0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
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5
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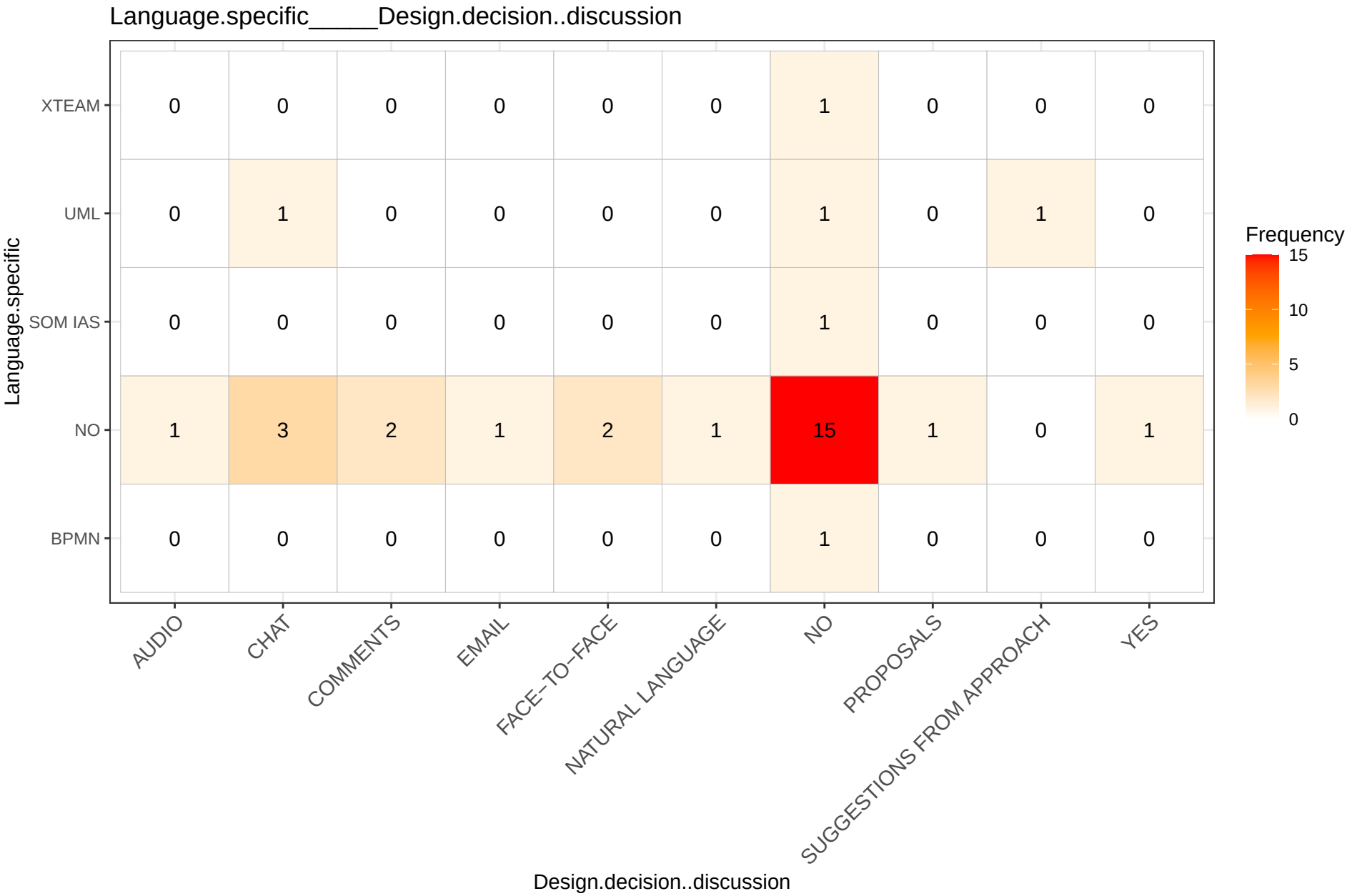
Language.specific_____Design.decision..discussion
Language.specific
XTEAM
UML
SOM IAS
NO
BPMN
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0 0 0 0 0 0 1 0 0 0
1 3 2 1 2 1 15 1 0 1
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
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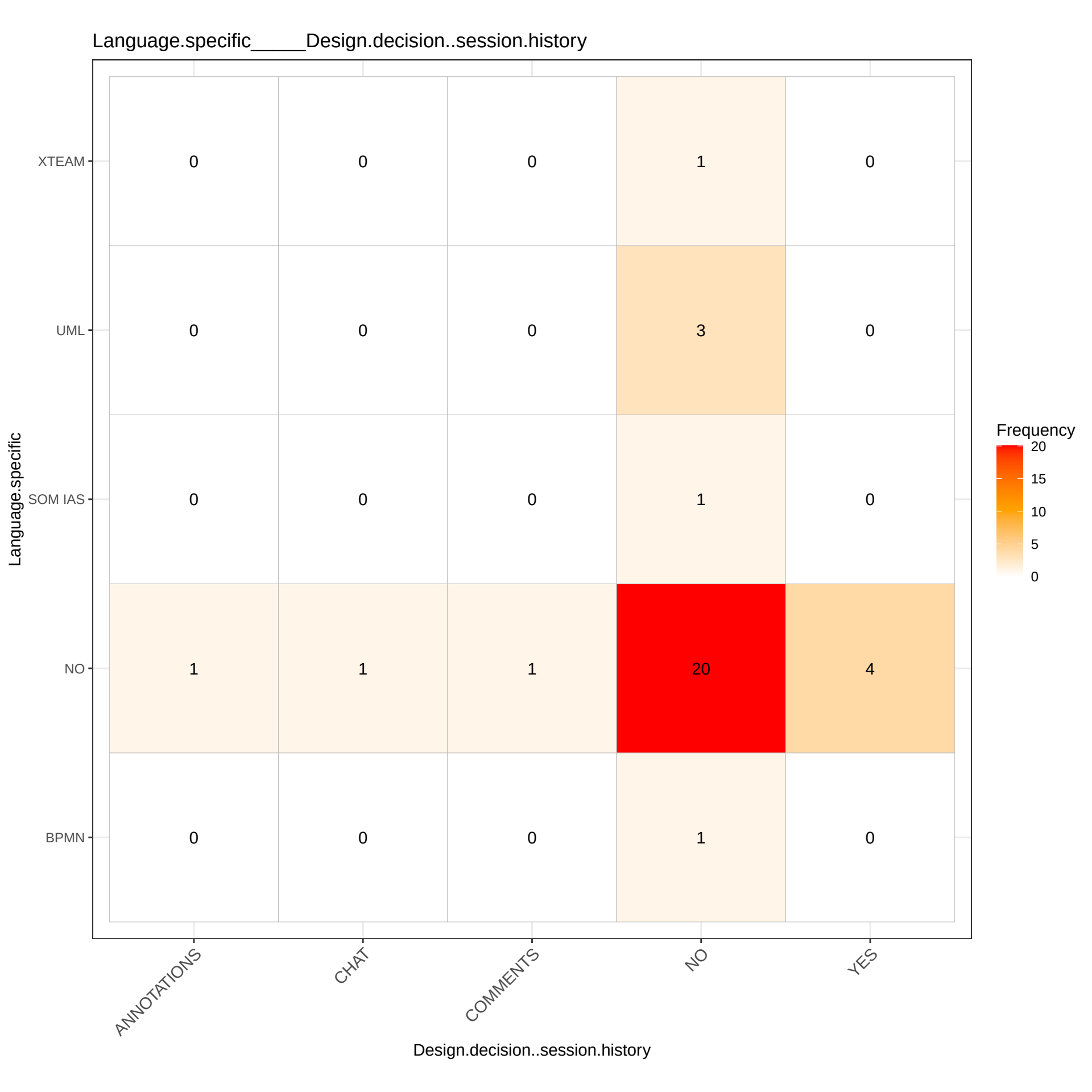
Language.specific_____Design.decision..session.history
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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0 0 0 1 0
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ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
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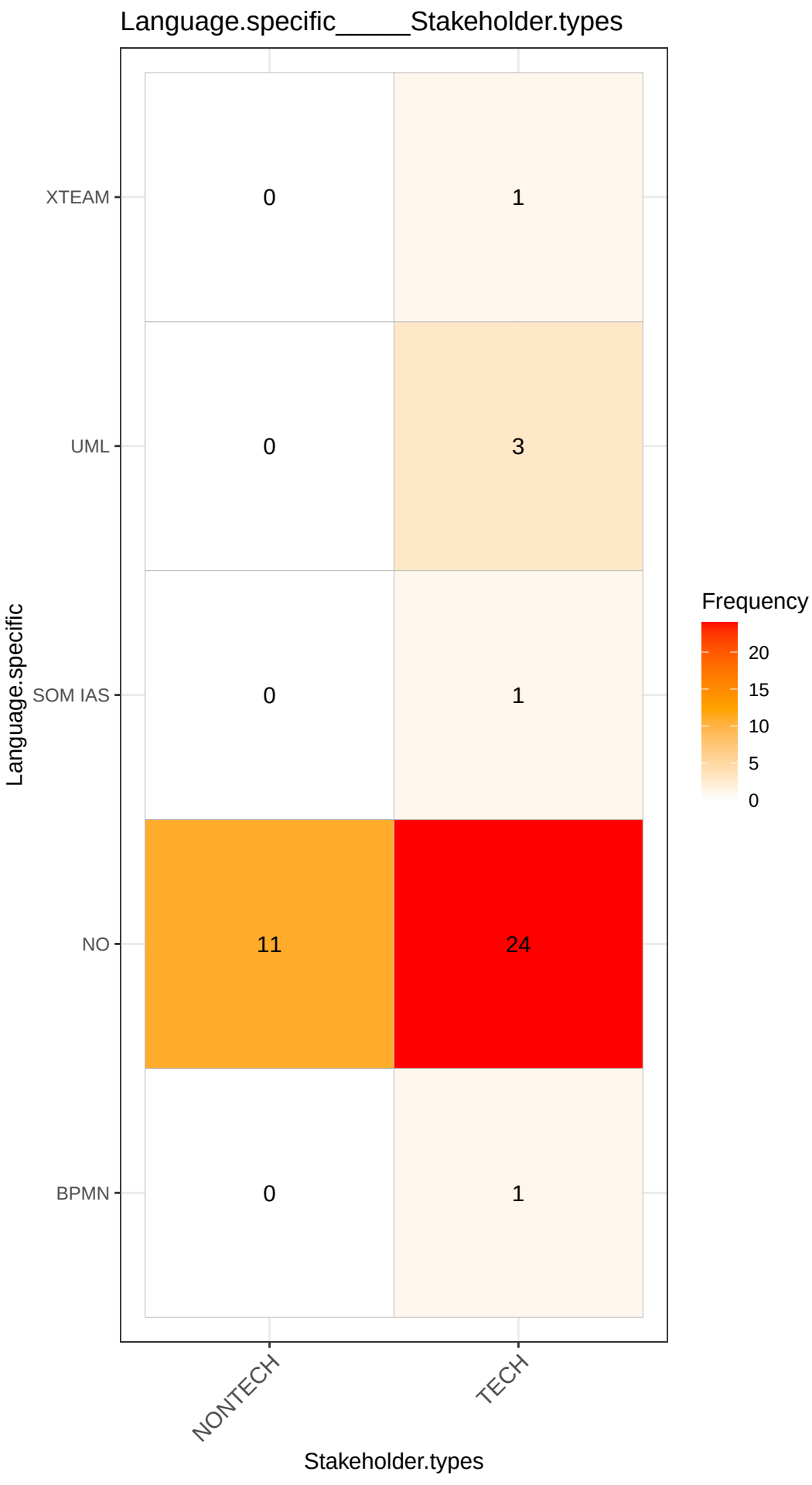
Language.specific_____Stakeholder.types
XTEAM
UML
SOM IAS
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BPMN
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24
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1
Language.specific
NONTECH
TECH
Stakeholder.types
Frequency
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5
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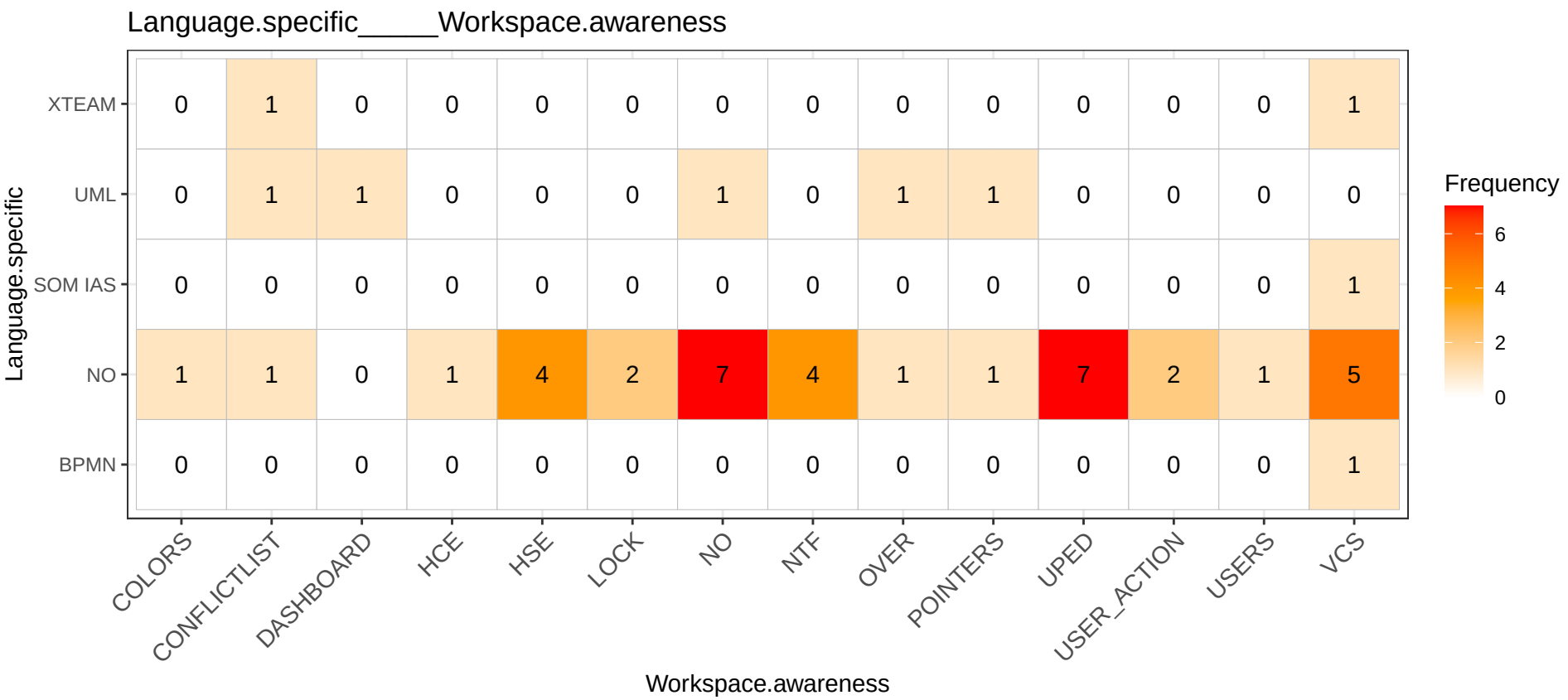
Language.specific_____Workspace.awareness
Language.specific
XTEAM
UML
SOM IAS
NO
BPMN
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0 0 0 0 0 0 0 0 0 0 0 0 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
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NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
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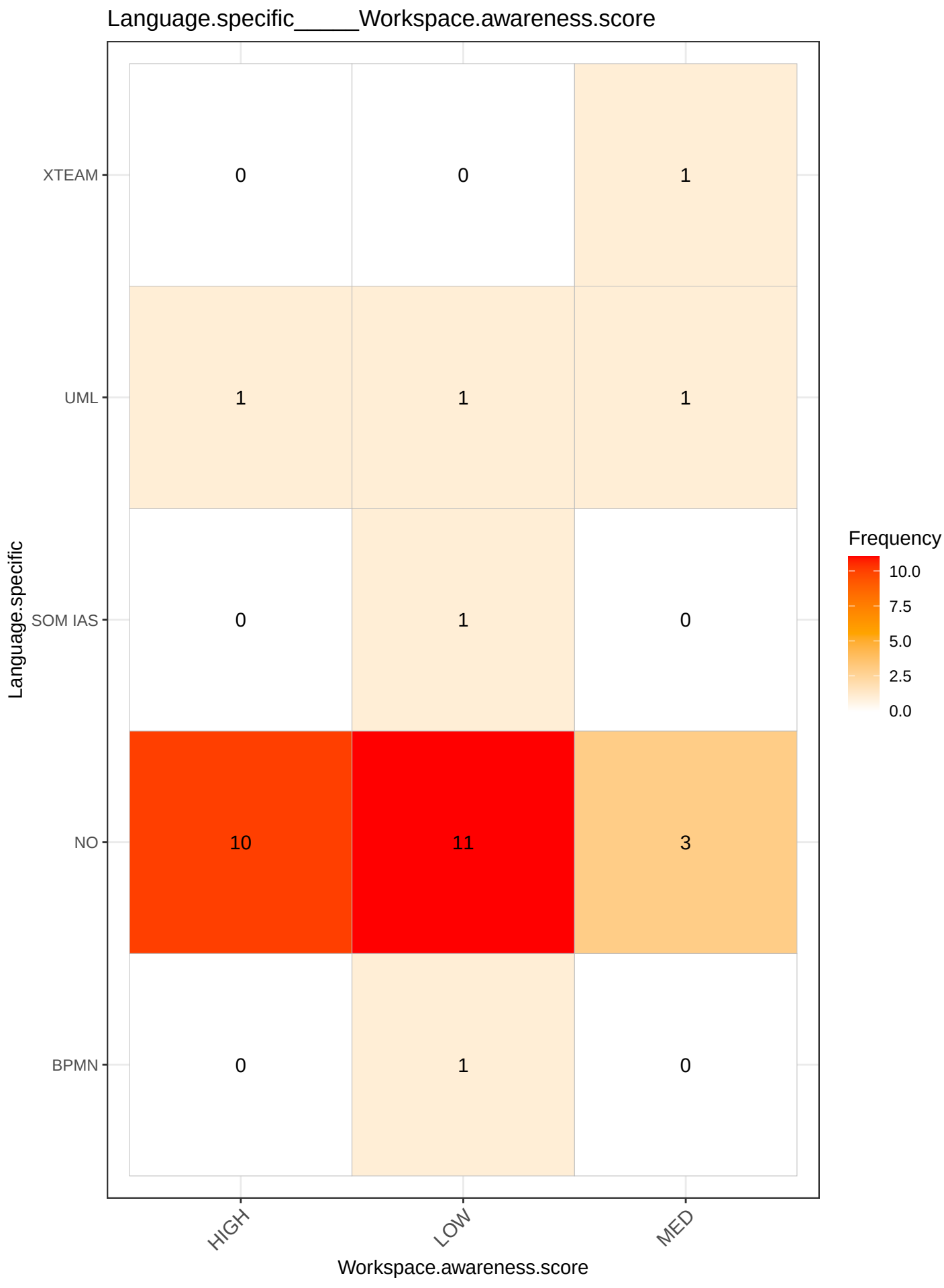
Language.specific_____Workspace.awareness.score
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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1
1
0
1
0
10
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HIGH
LOW
MED
Workspace.awareness.score
Frequency
10.0
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5.0
2.5
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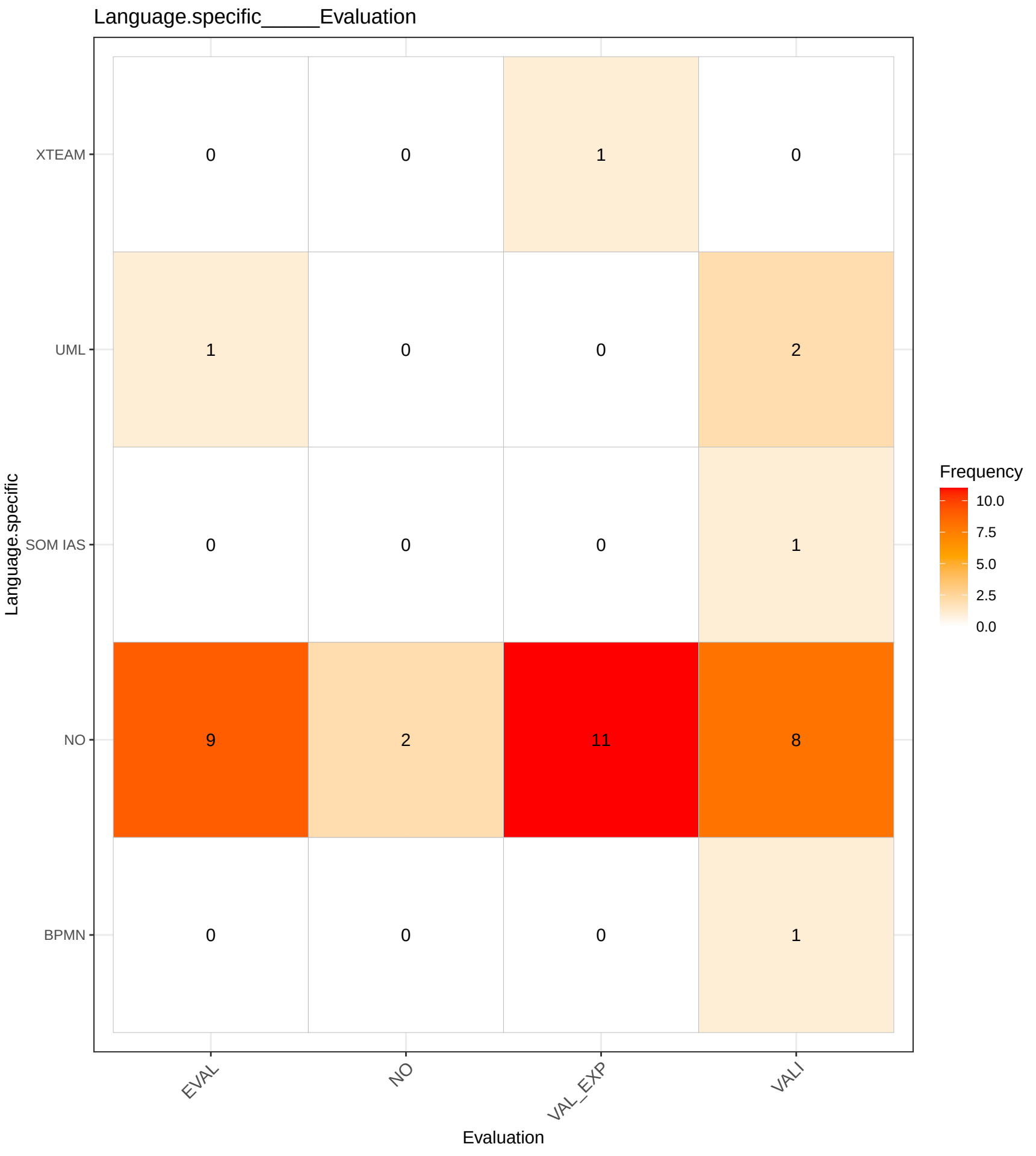
Language.specific_____Evaluation
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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0
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1
9
2
11
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EVAL
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VAL_EXP
VALI
Evaluation
Frequency
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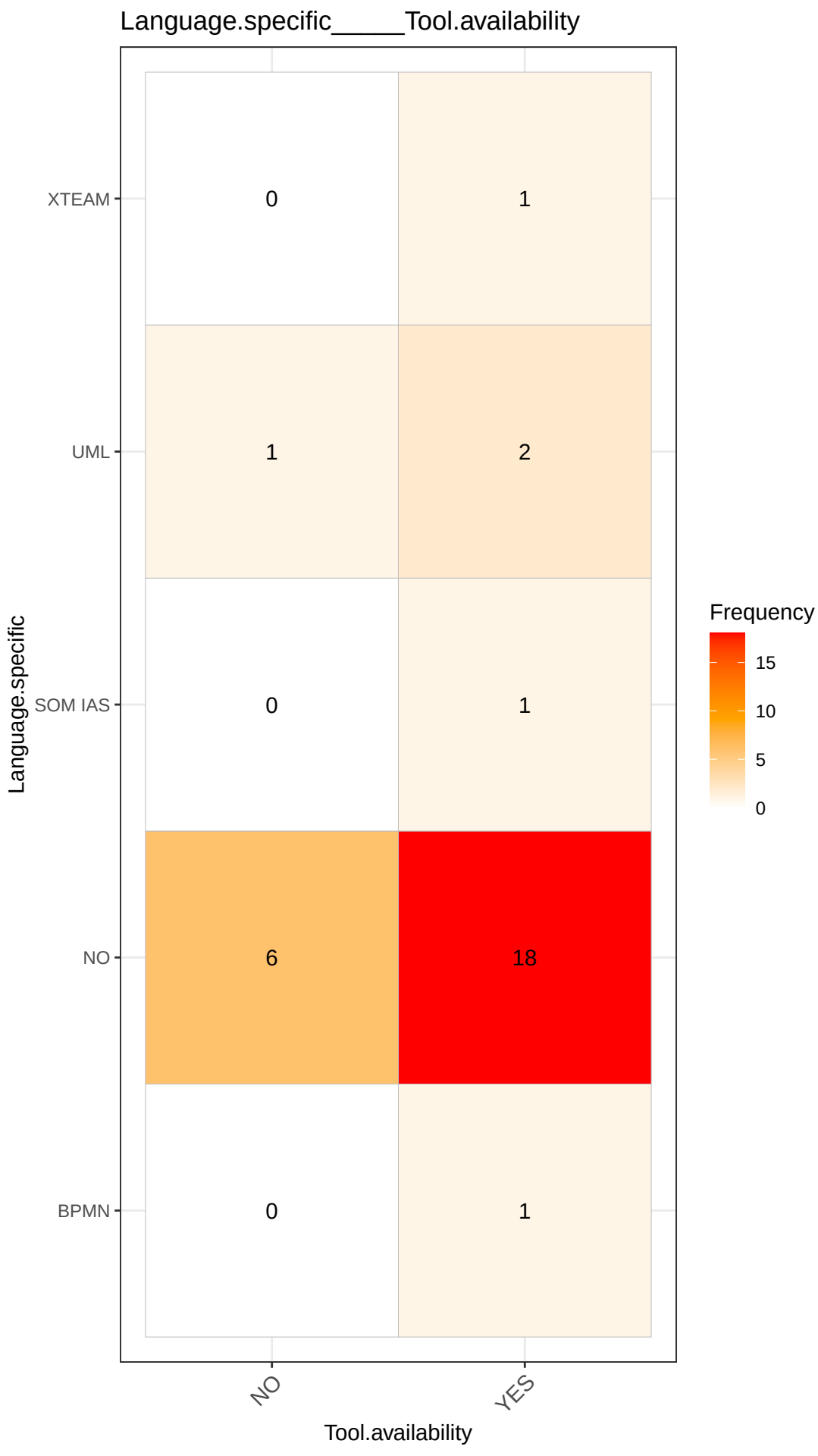
5.0
2.5
0.0


Language.specific_____Tool.availability
XTEAM
UML
SOM IAS
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BPMN
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18
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YES
Tool.availability
Frequency
15
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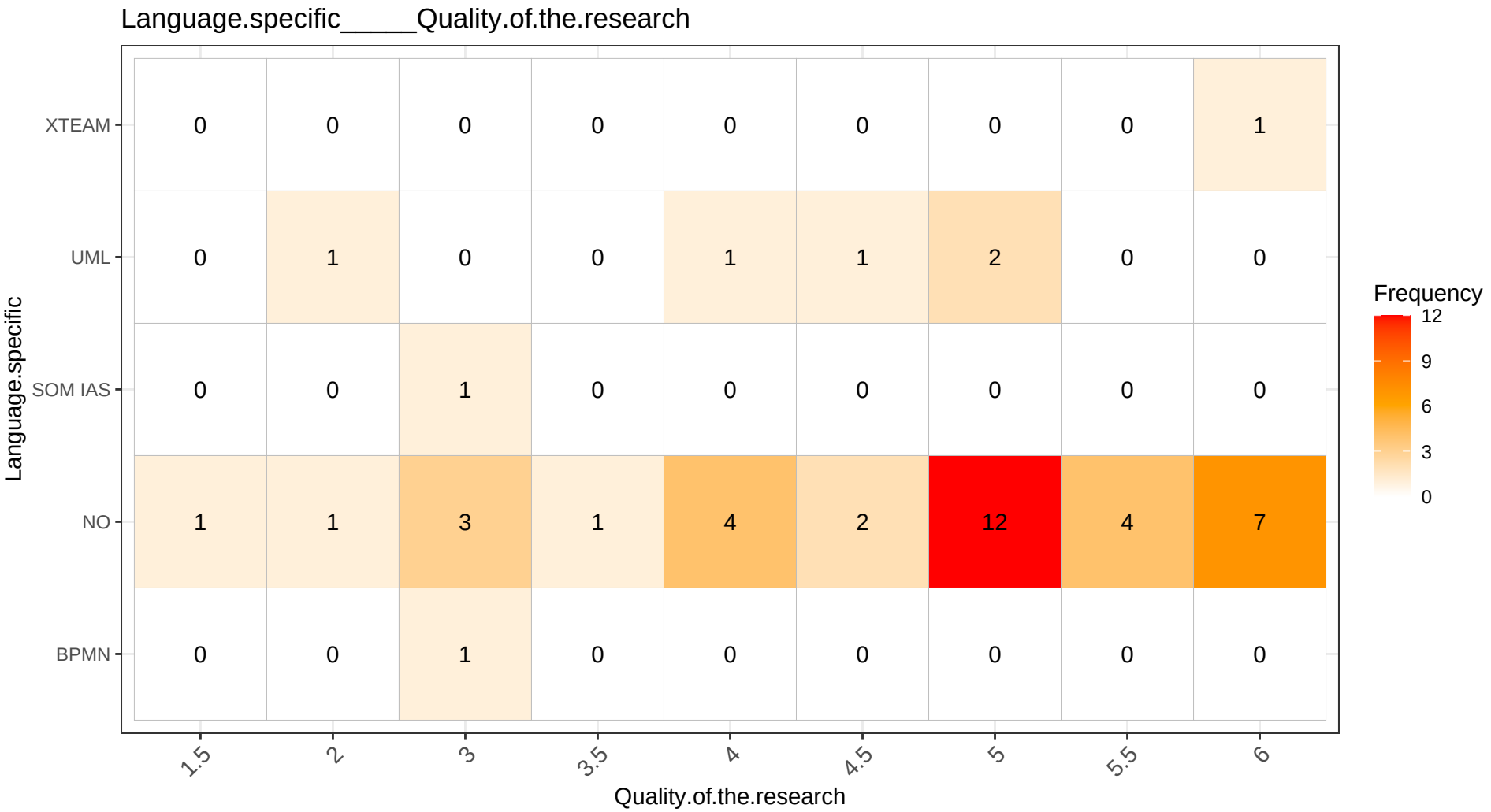
Language.specific_____Quality.of.the.research
XTEAM
UML
SOM IAS
NO
BPMN
Language.specific
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3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
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9
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3
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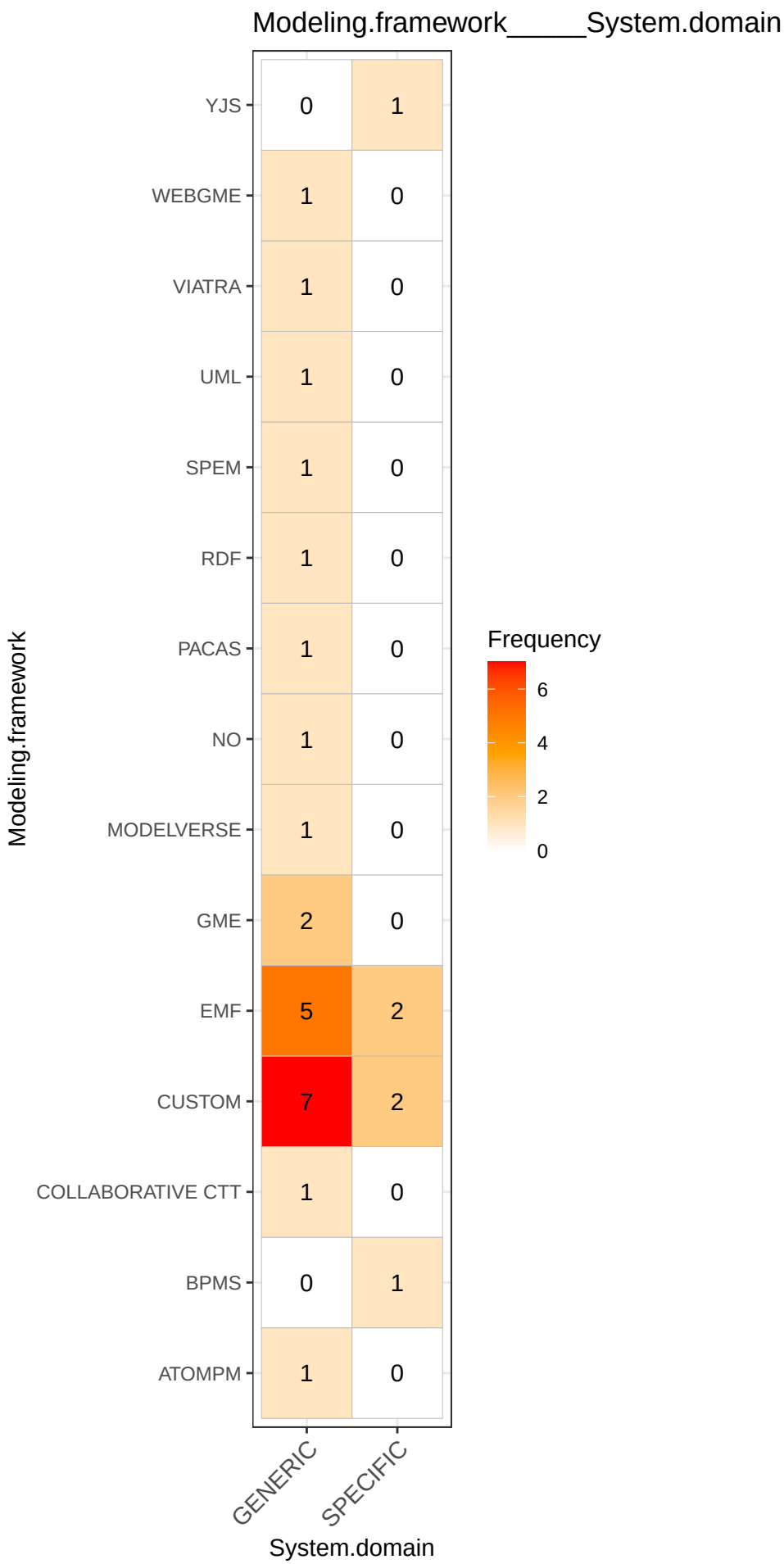
Modeling.framework_____System.domain
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 1
1 0
1 0
1 0
1 0
1 0
1 0
1 0
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1 0
0 1
1 0
GENERIC
SPECIFIC
System.domain
Modeling.framework
Frequency
6
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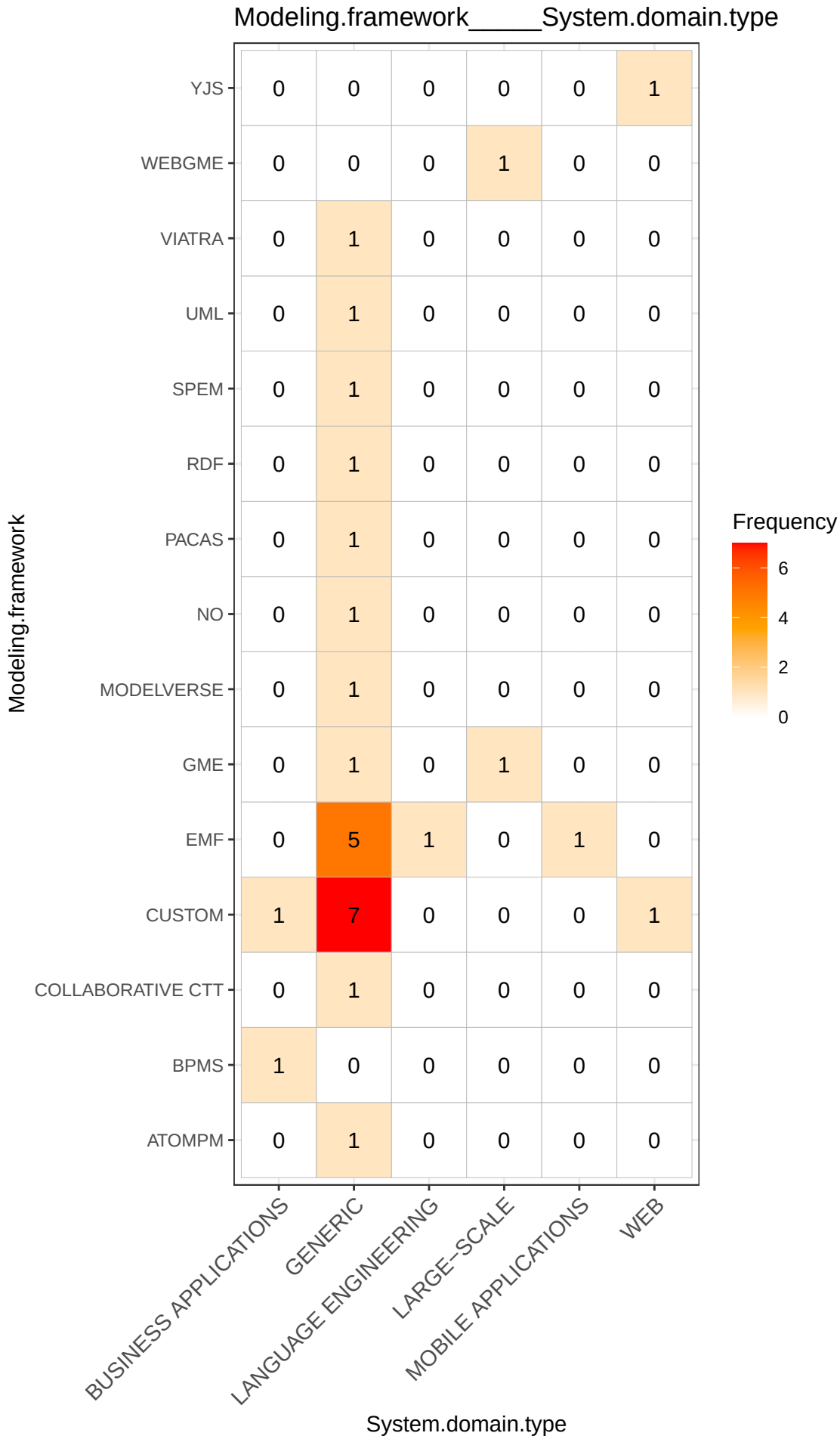
Modeling.framework_____System.domain.type
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 0 0 0 1
0 0 0 1 0 0
0 1 0 0 0 0
0 1 0 0 0 0
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0 1 0 0 0 0
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0 5 1 0 1 0
1 7 0 0 0 1
0 1 0 0 0 0
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0 1 0 0 0 0
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE-SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
6
4
2
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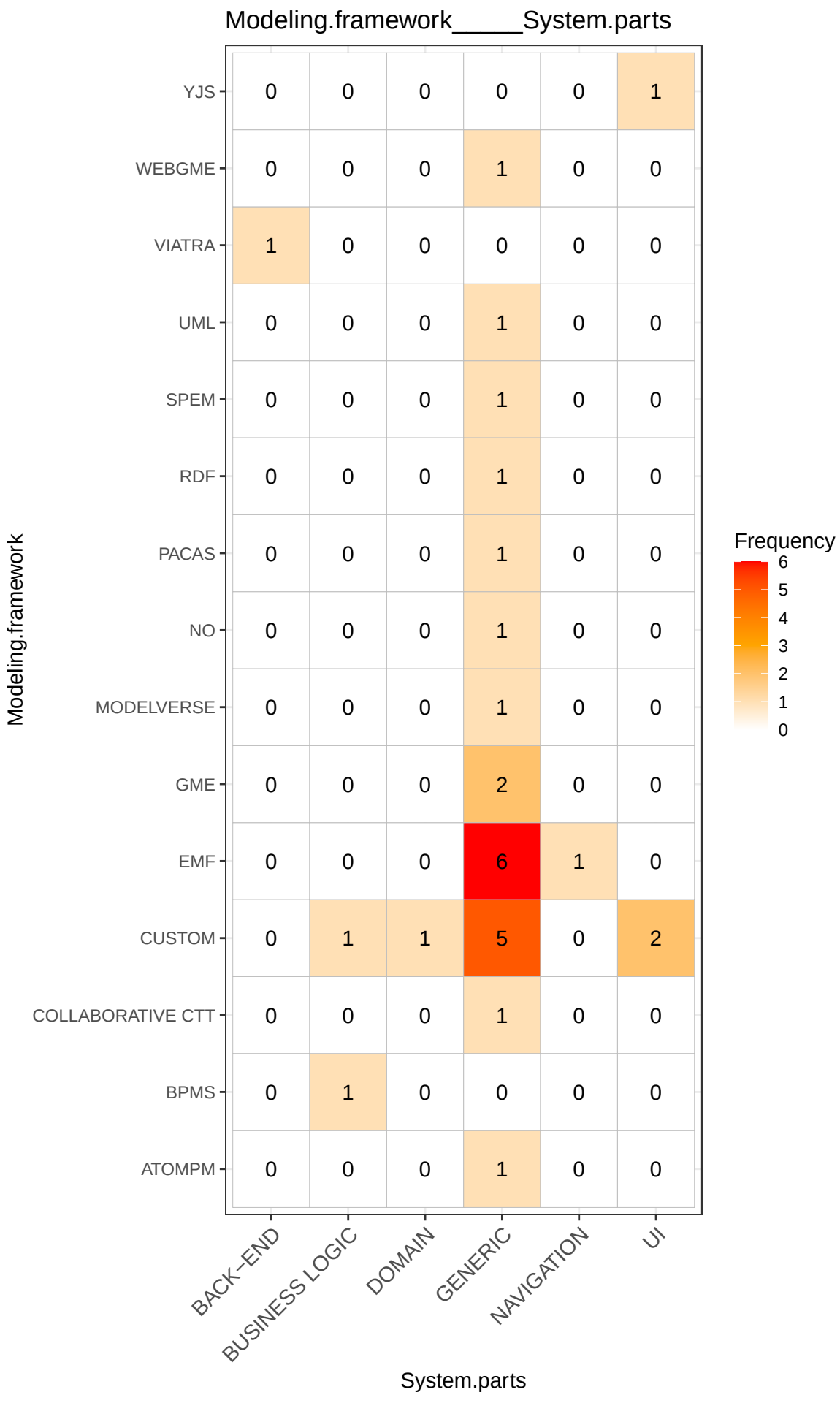
Modeling.framework_____System.parts
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
BACK-END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
6
5
4
3
2
1
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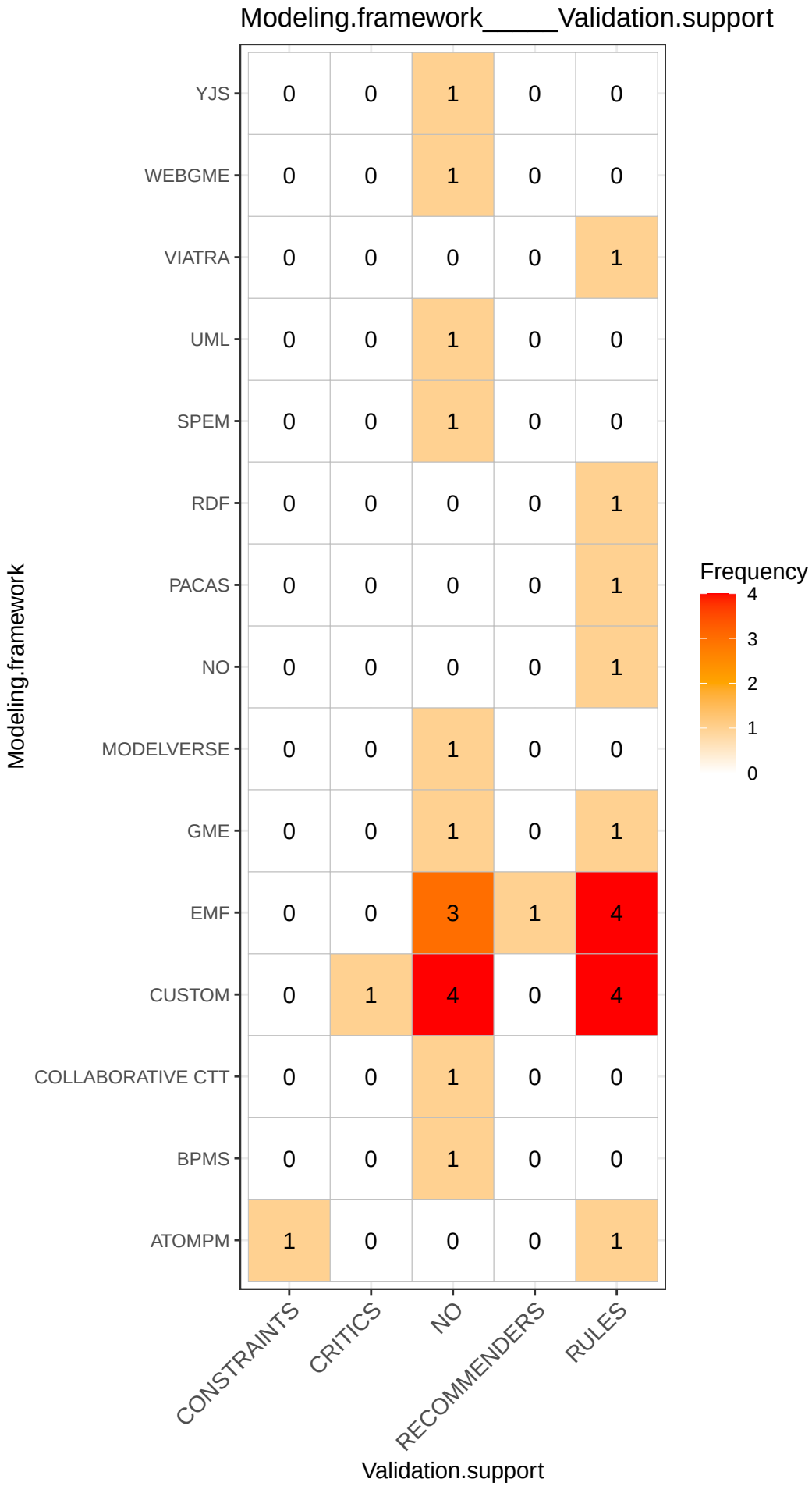
Modeling.framework_____Validation.support
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
0 0 1 0 0
0 0 1 0 0
0 0 0 0 1
0 0 1 0 0
0 0 1 0 0
0 0 0 0 1
0 0 0 0 1
0 0 0 0 1
0 0 1 0 0
0 0 1 0 1
0 0 3 1 4
0 1 4 0 4
0 0 1 0 0
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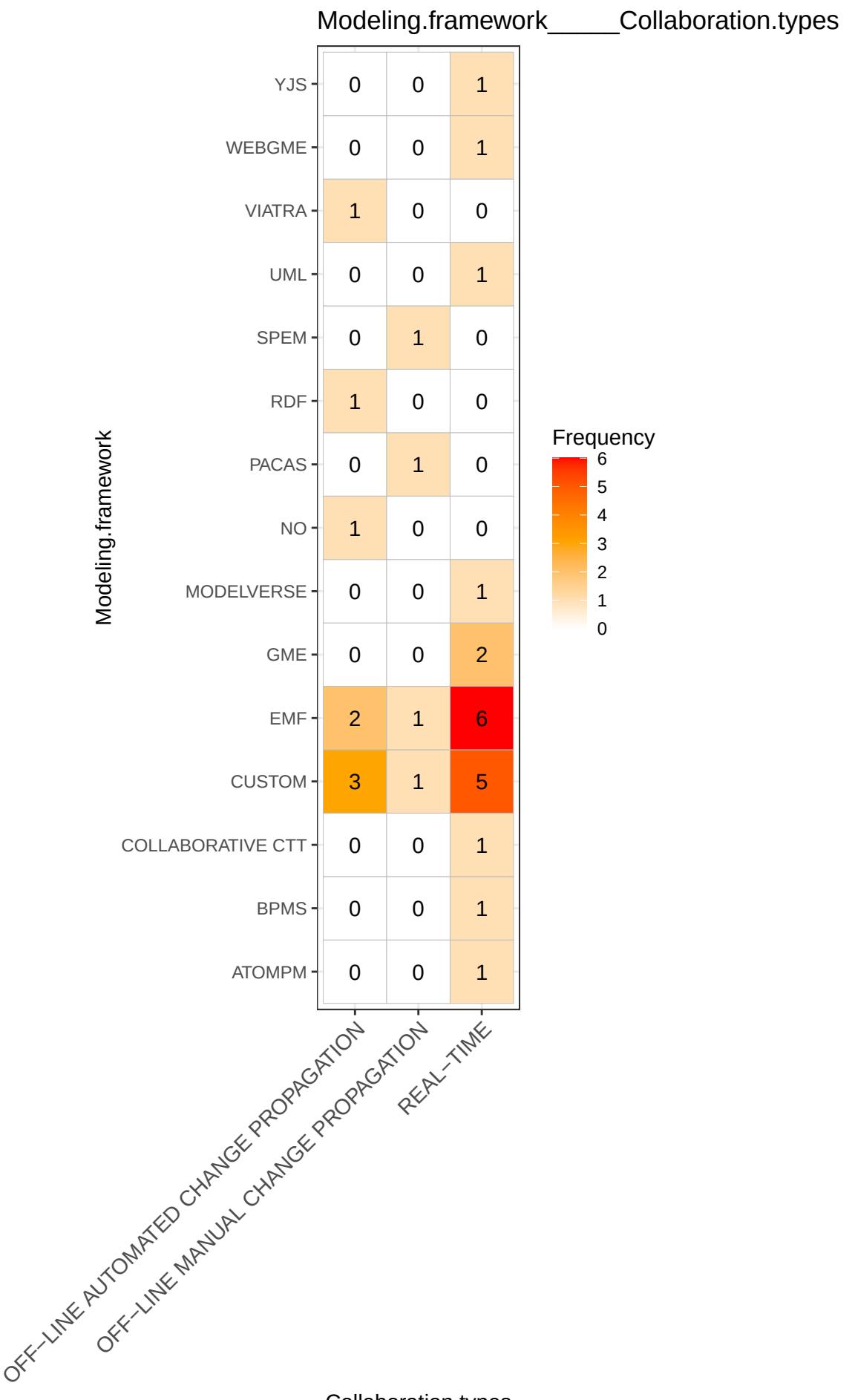
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
4
3
2
1
0


Modeling.framework_____Collaboration.types
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 1
0 0 1
1 0 0
0 0 1
0 1 0
1 0 0
0 1 0
1 0 0
0 0 1
0 0 2
2 1 6
3 1 5
0 0 1
0 0 1
0 0 1
Frequency
6
5
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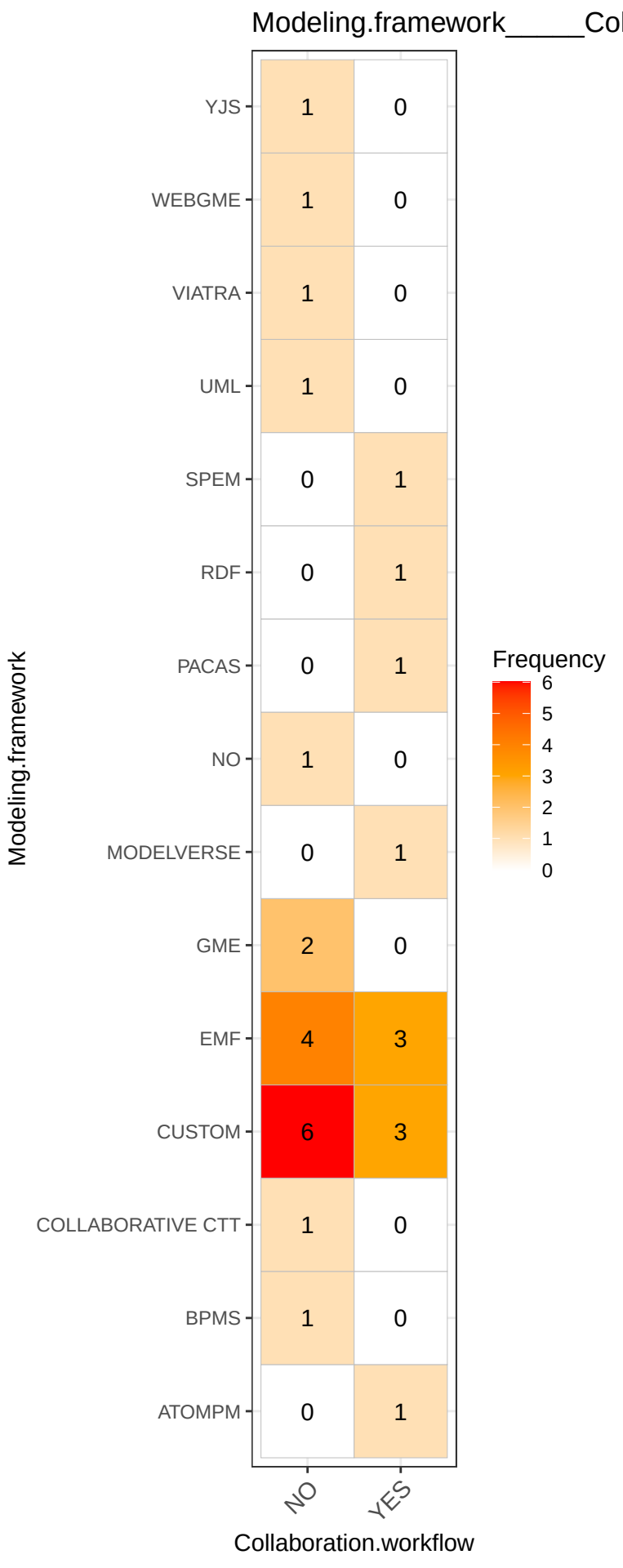
2
1
0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types


Modeling.framework_____Collaboration.workflow
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0
1 0
1 0
1 0
0 1
0 1
0 1
1 0
0 1
2 0
4 3
6 3
1 0
1 0
0 1
Modeling.framework
Frequency
6
5
4
3
2
1
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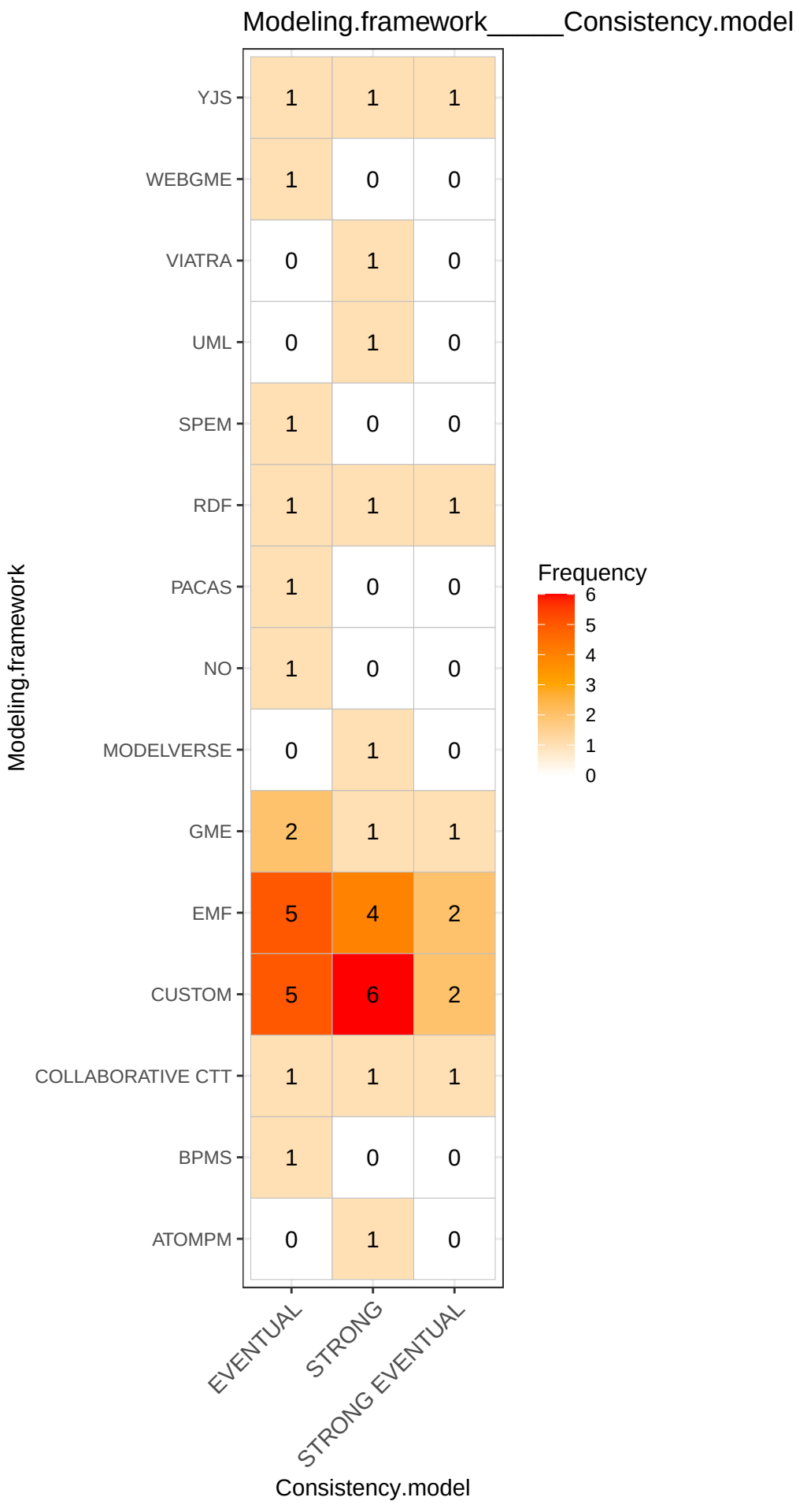
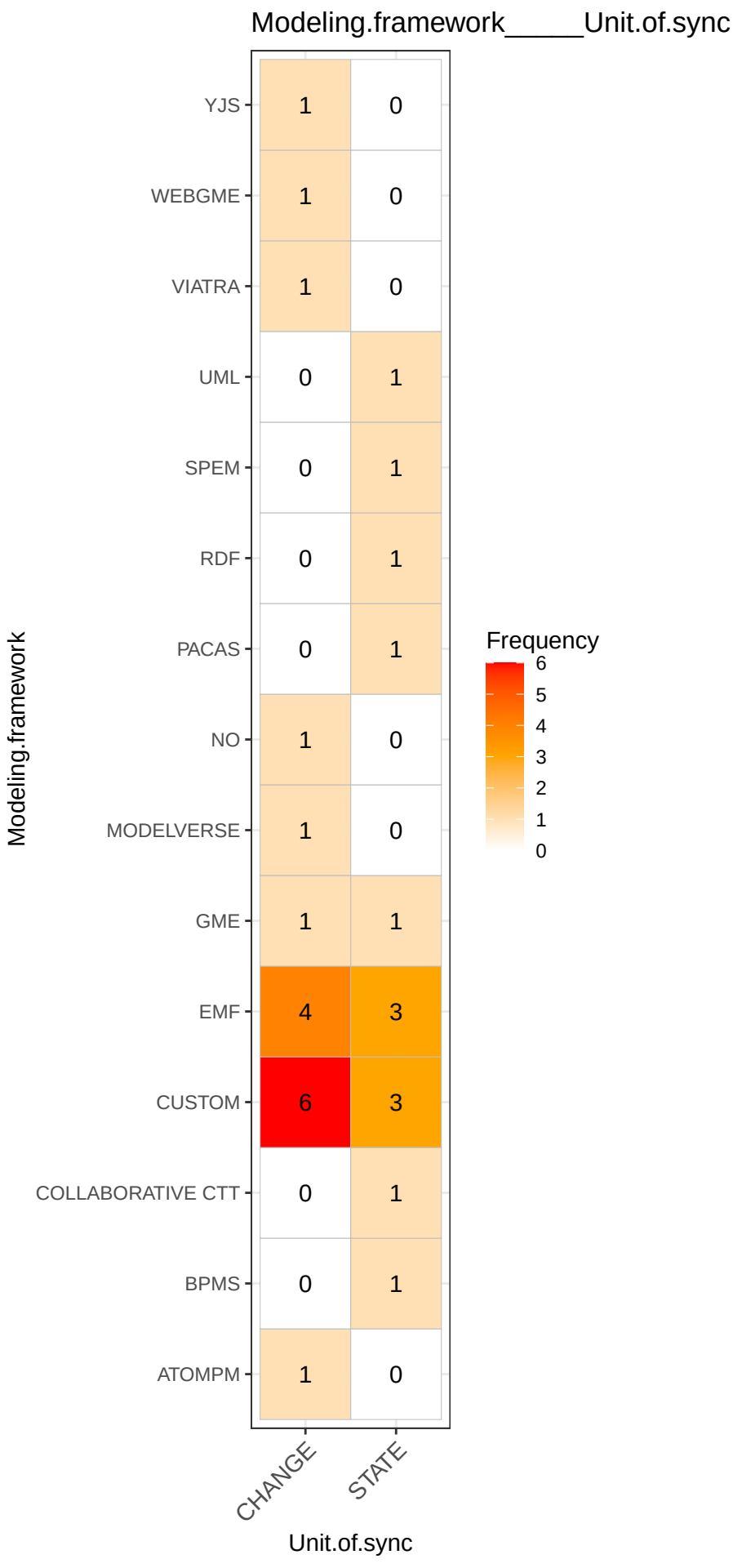
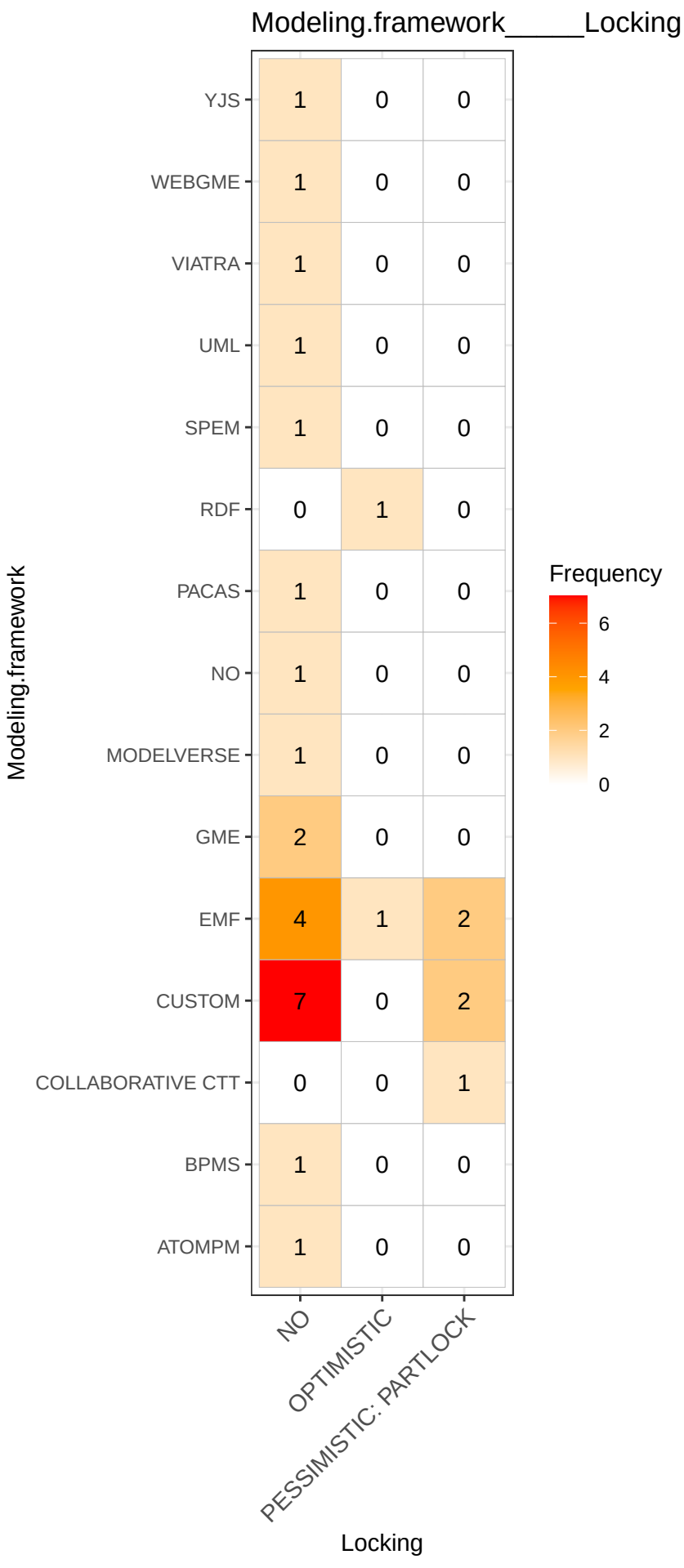
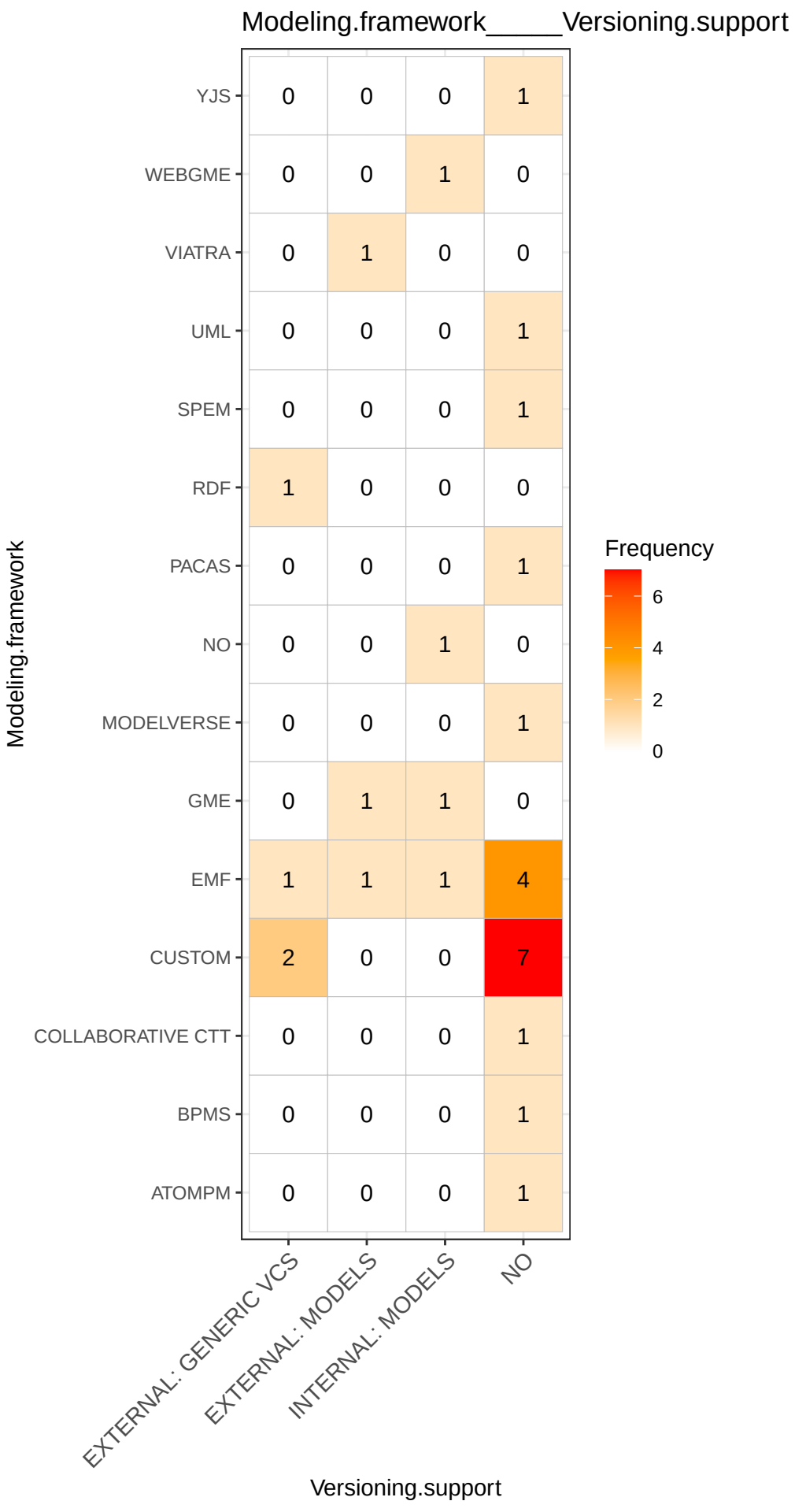
NO
YES
Collaboration.workflow


Modeling.framework_____Consistency.model
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 1 1
1 0 0
0 1 0
0 1 0
1 0 0
1 1 1
1 0 0
1 0 0
0 1 0
2 1 1
5 4 2
5 6 2
1 1 1
1 0 0
0 1 0
Modeling.framework
Frequency
6
5
4
3
2
1
0
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model


Modeling.framework_____Unit.of.sync
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0
1 0
1 0
0 1
0 1
0 1
0 1
1 0
1 0
1 1
4 3
6 3
0 1
0 1
1 0
Modeling.framework
CHANGE
STATE
Unit.of.sync
Frequency
6
5
4
3
2
1
0


Modeling.framework_____Locking
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0 0
1 0 0
1 0 0
1 0 0
1 0 0
0 1 0
1 0 0
1 0 0
1 0 0
2 0 0
4 1 2
7 0 2
0 0 1
1 0 0
1 0 0
Modeling.framework
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
6
4
2
0


Modeling.framework_____Versioning.support
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
0 0 0 1
0 0 1 0
0 1 0 0
0 0 0 1
0 0 0 1
1 0 0 0
0 0 0 1
0 0 1 0
0 0 0 1
0 1 1 0
1 1 1 4
2 0 0 7
0 0 0 1
0 0 0 1
0 0 0 1
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
6
4
2
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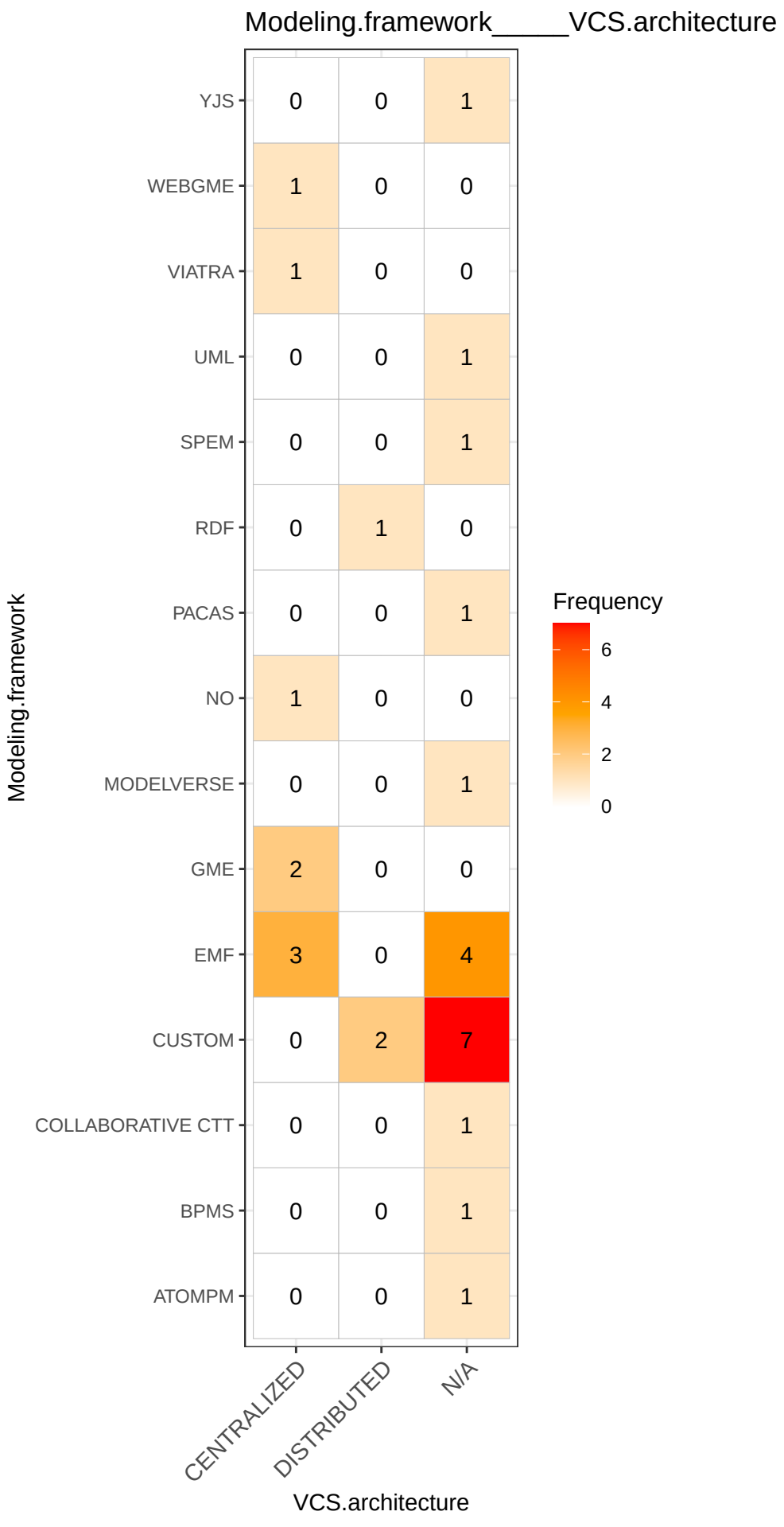
Modeling.framework_____VCS.architecture
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 1
1 0 0
1 0 0
0 0 1
0 0 1
0 1 0
0 0 1
1 0 0
0 0 1
2 0 0
3 0 4
0 2 7
0 0 1
0 0 1
0 0 1
Modeling.framework
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
6
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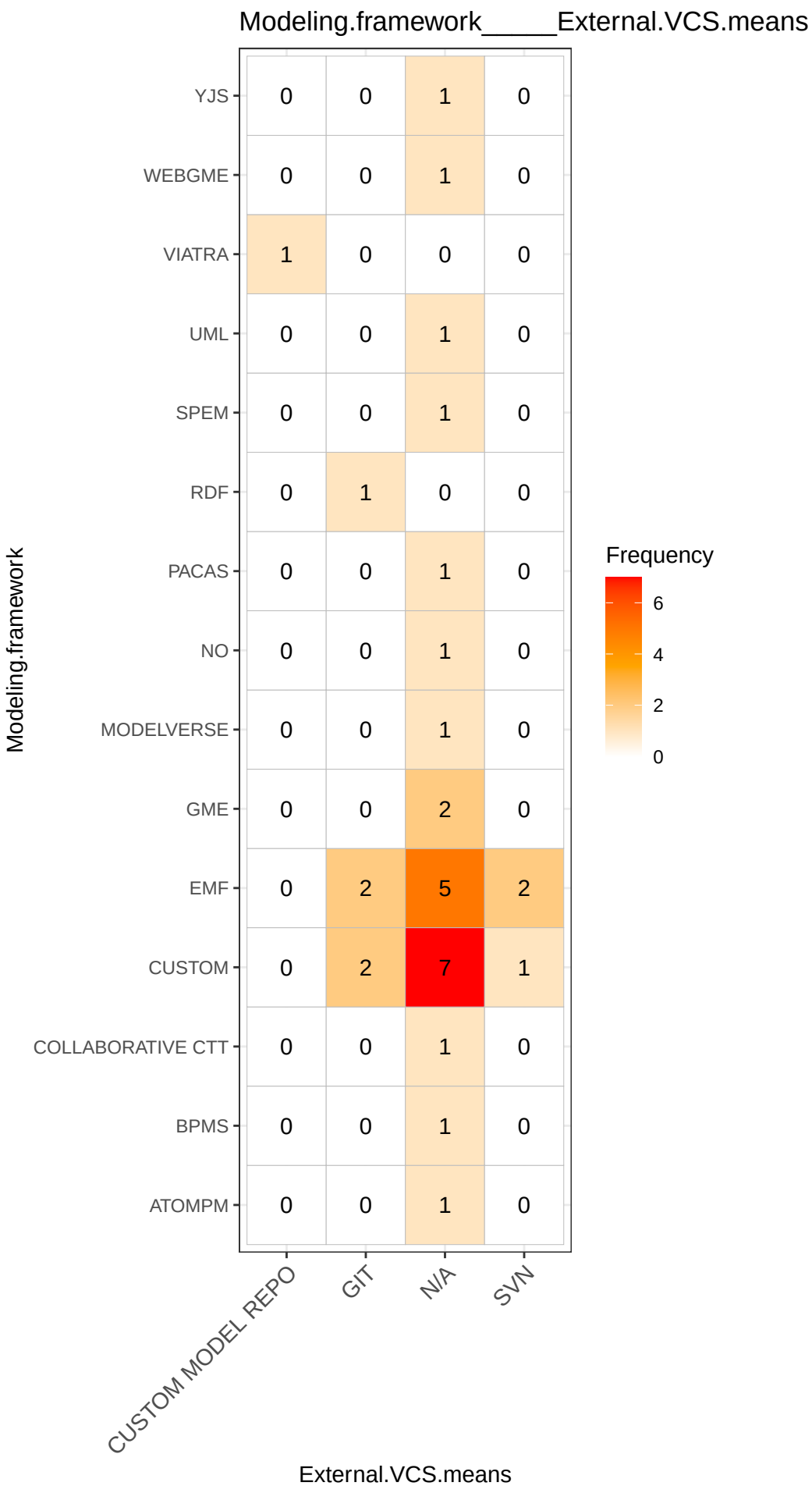
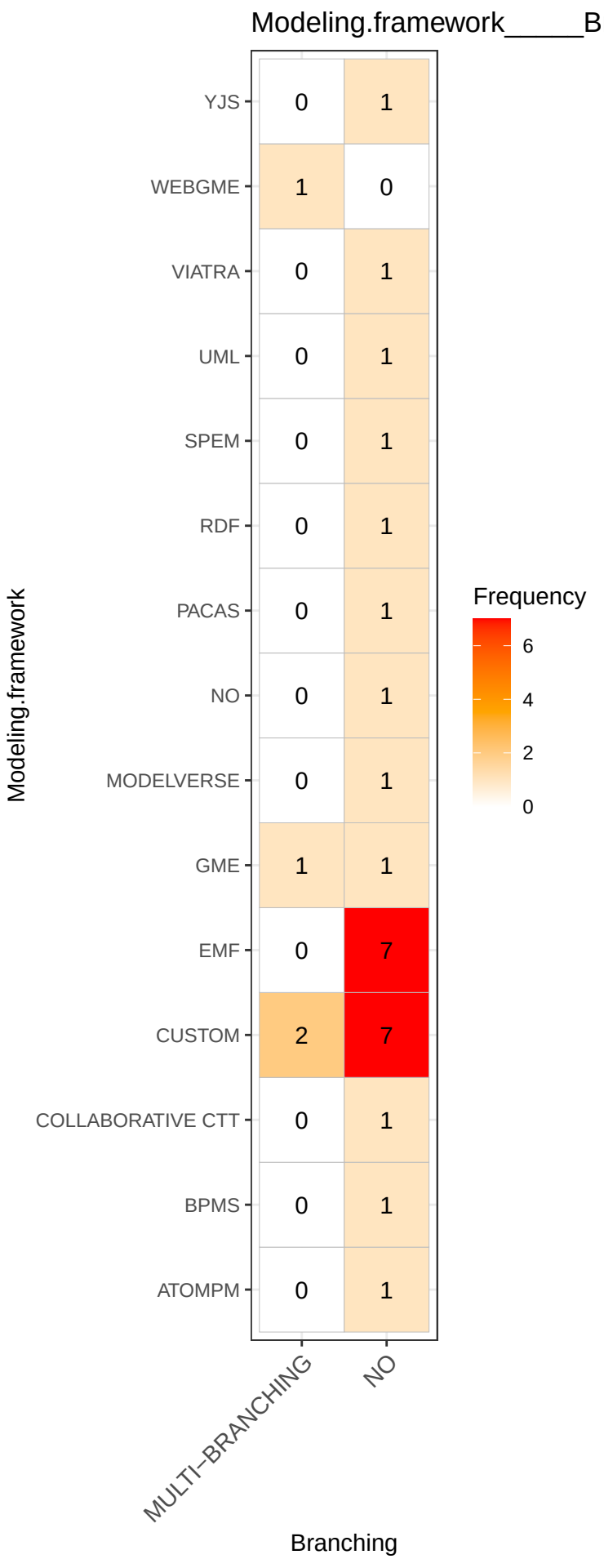
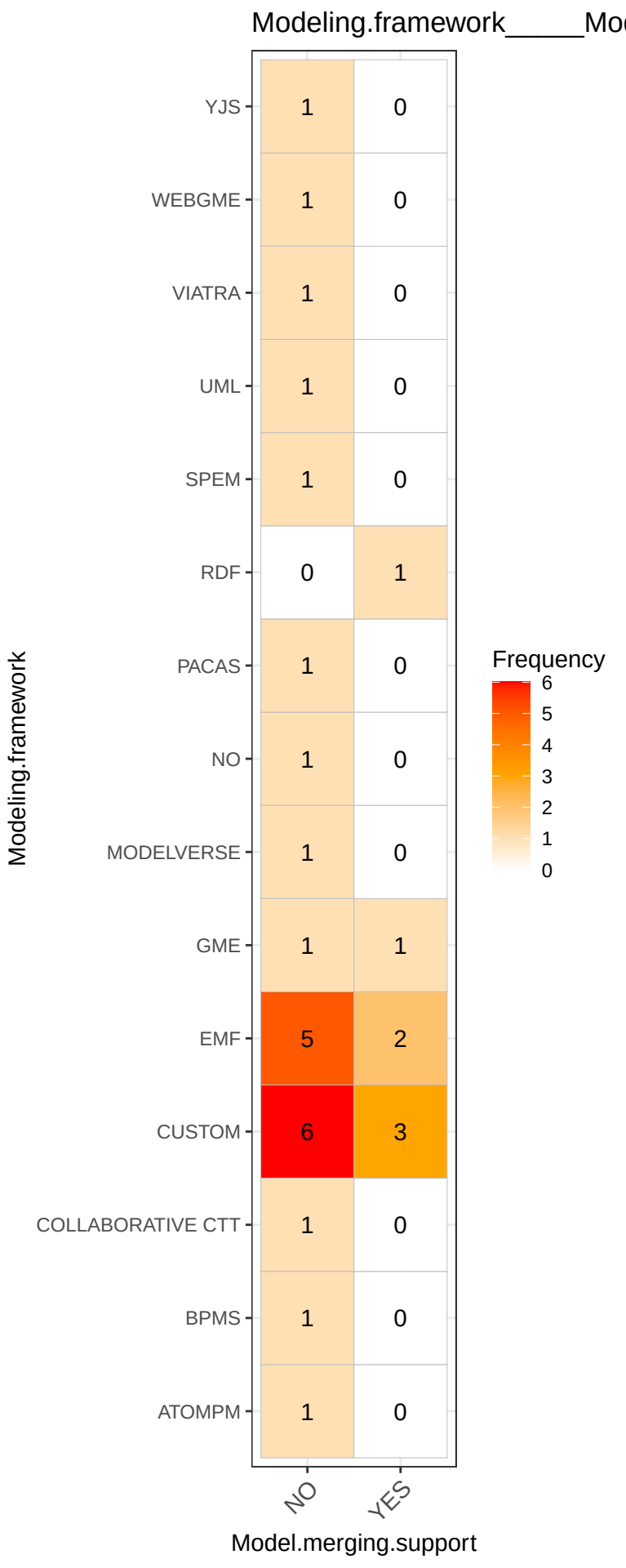
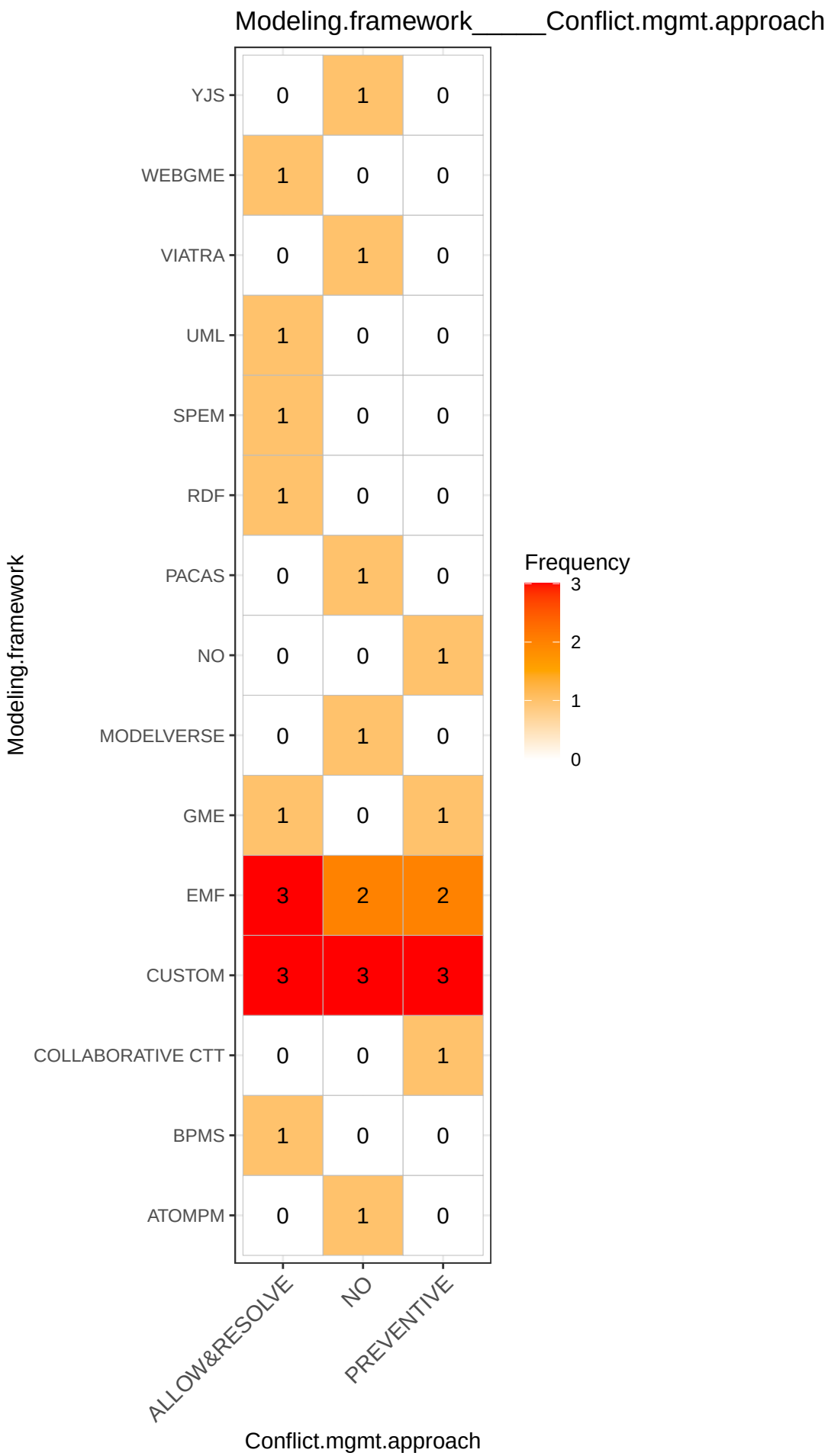
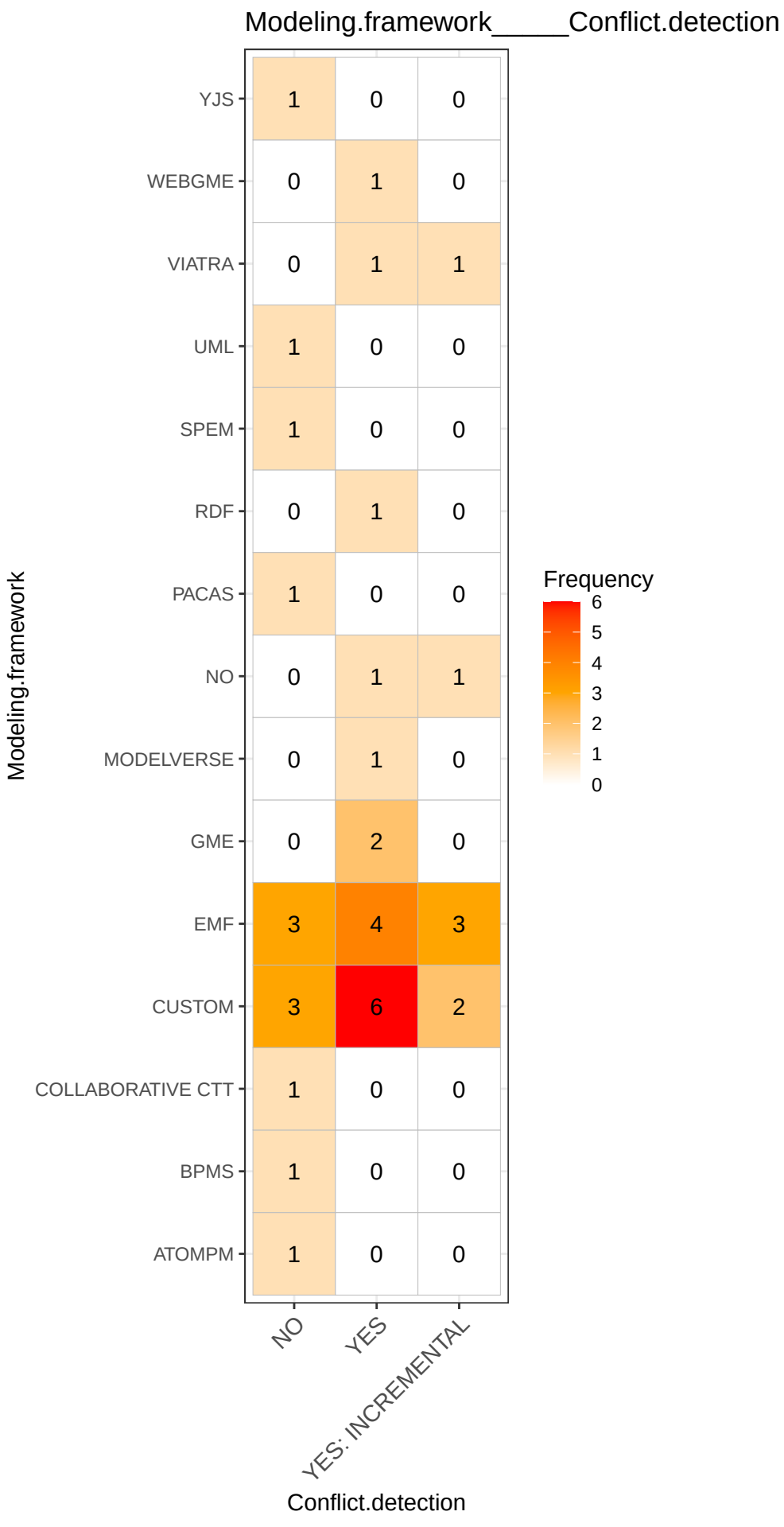

Modeling.framework_____External.VCS.means
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 1 0
0 0 1 0
1 0 0 0
0 0 1 0
0 0 1 0
0 1 0 0
0 0 1 0
0 0 1 0
0 0 1 0
0 0 2 0
0 2 5 2
0 2 7 1
0 0 1 0
0 0 1 0
0 0 1 0
Modeling.framework
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
6
4
2
0


Modeling.framework_____Branching
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 1
1 0
0 1
0 1
0 1
0 1
0 1
0 1
1 1
0 7
2 7
0 1
0 1
0 1
Modeling.framework
Frequency
6
4
2
0
MULTI−BRANCHING
NO
Branching


Modeling.framework_____Model.merging.support
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0
1 0
1 0
1 0
1 0
0 1
1 0
1 0
1 0
1 1
5 2
6 3
1 0
1 0
1 0
Modeling.framework
Frequency
6
5
4
3
2
1
0
NO
YES
Model.merging.support

Modeling.framework_____Diff.merge.domain
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
6
5
4
3
2
1
0


Modeling.framework_____Conflict.mgmt.approach
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 1 0
1 0 0
0 1 0
1 0 0
1 0 0
1 0 0
0 1 0
0 0 1
0 1 0
1 0 1
3 2 2
3 3 3
0 0 1
1 0 0
0 1 0
ALLOW&RESOLVE
NO
PREVENTIVE
Modeling.framework
Conflict.mgmt.approach
Frequency
3
2
1
0


Modeling.framework_____Conflict.detection
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0 0
0 1 0
0 1 1
1 0 0
1 0 0
0 1 0
1 0 0
0 1 1
0 1 0
0 2 0
3 4 3
3 6 2
1 0 0
1 0 0
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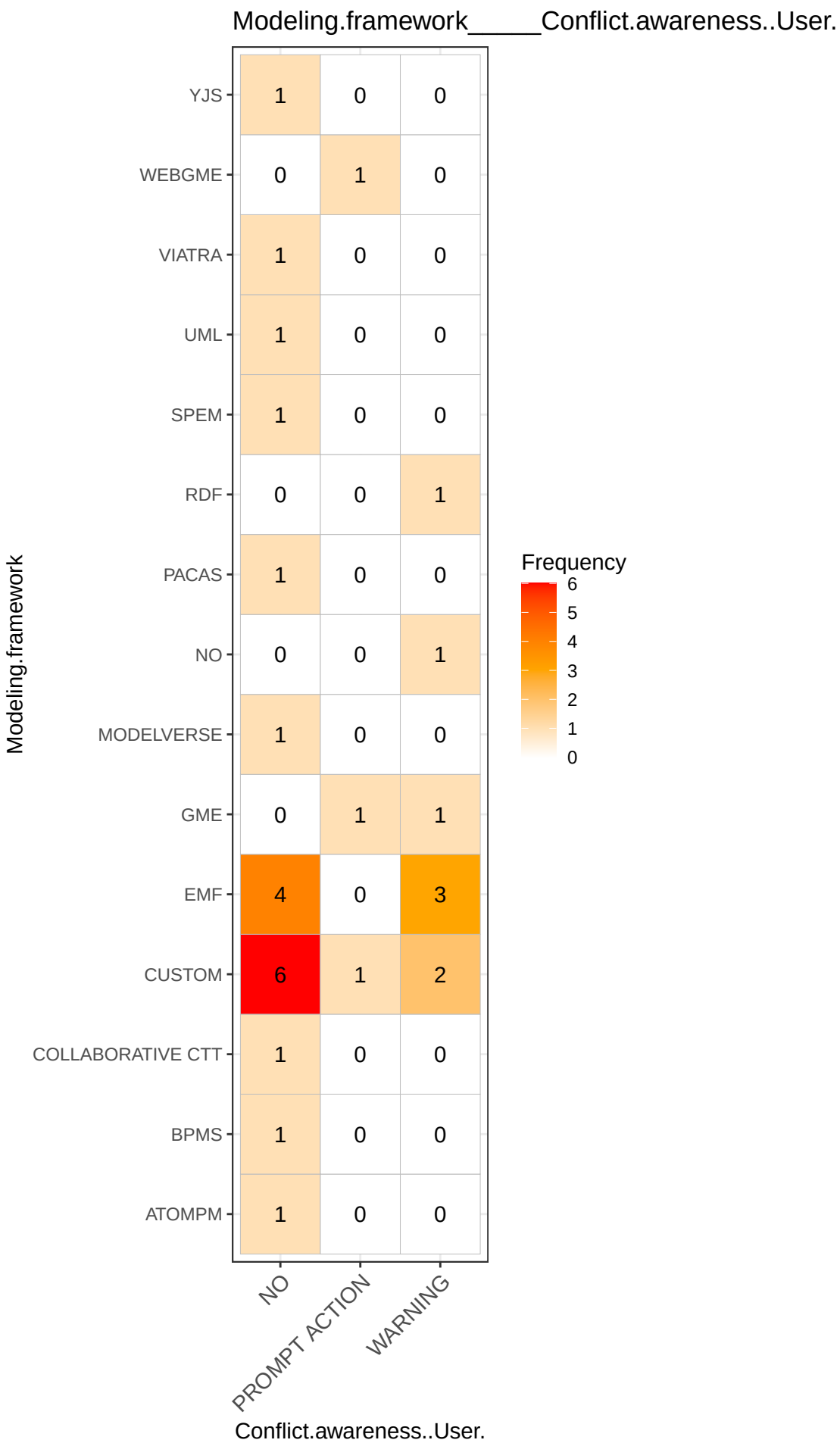
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
6
5
4
3
2
1
0


Modeling.framework_____Conflict.awareness..User.
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0 0
0 1 0
1 0 0
1 0 0
1 0 0
0 0 1
1 0 0
0 0 1
1 0 0
0 1 1
4 0 3
6 1 2
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1 0 0
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
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4
3
2
1
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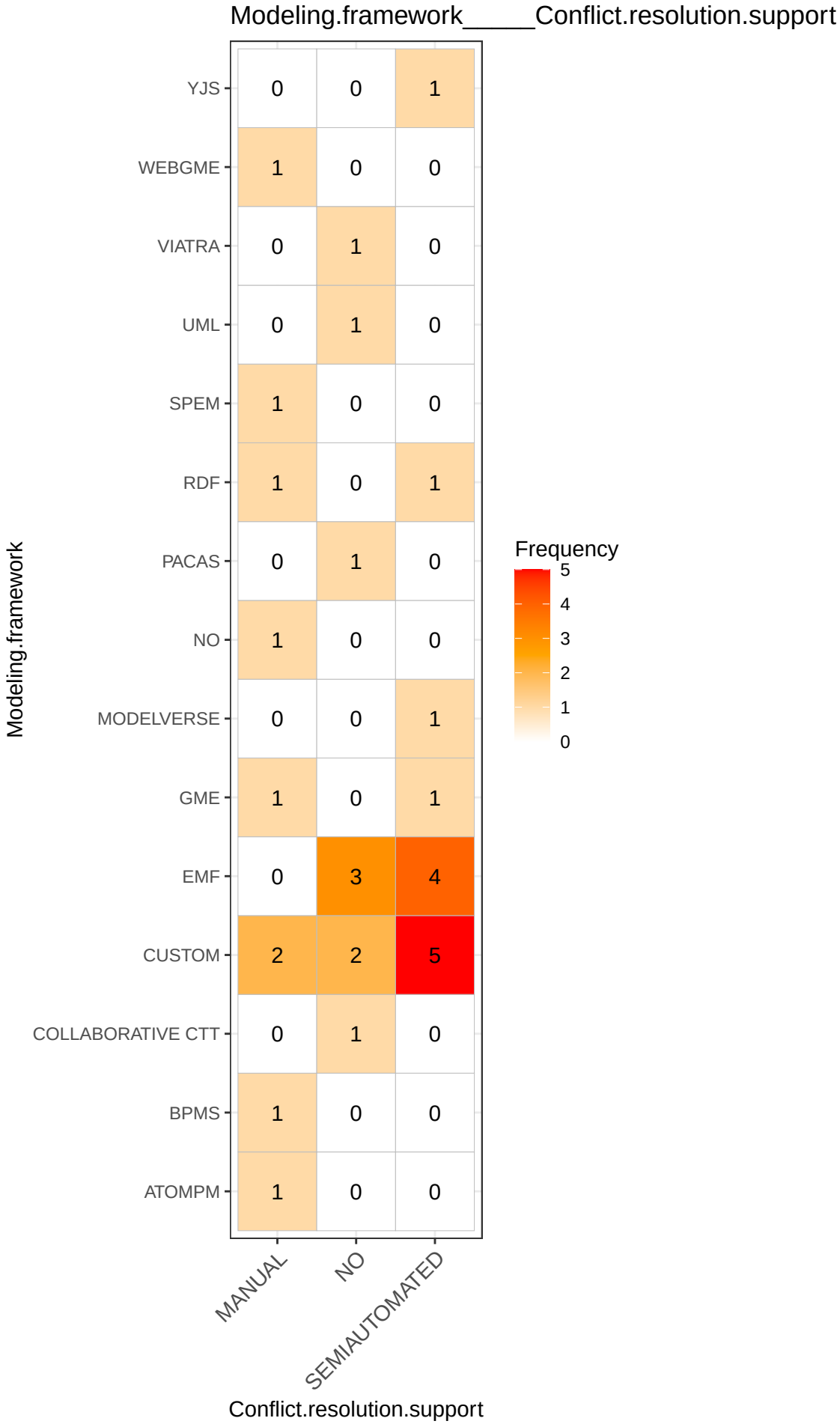
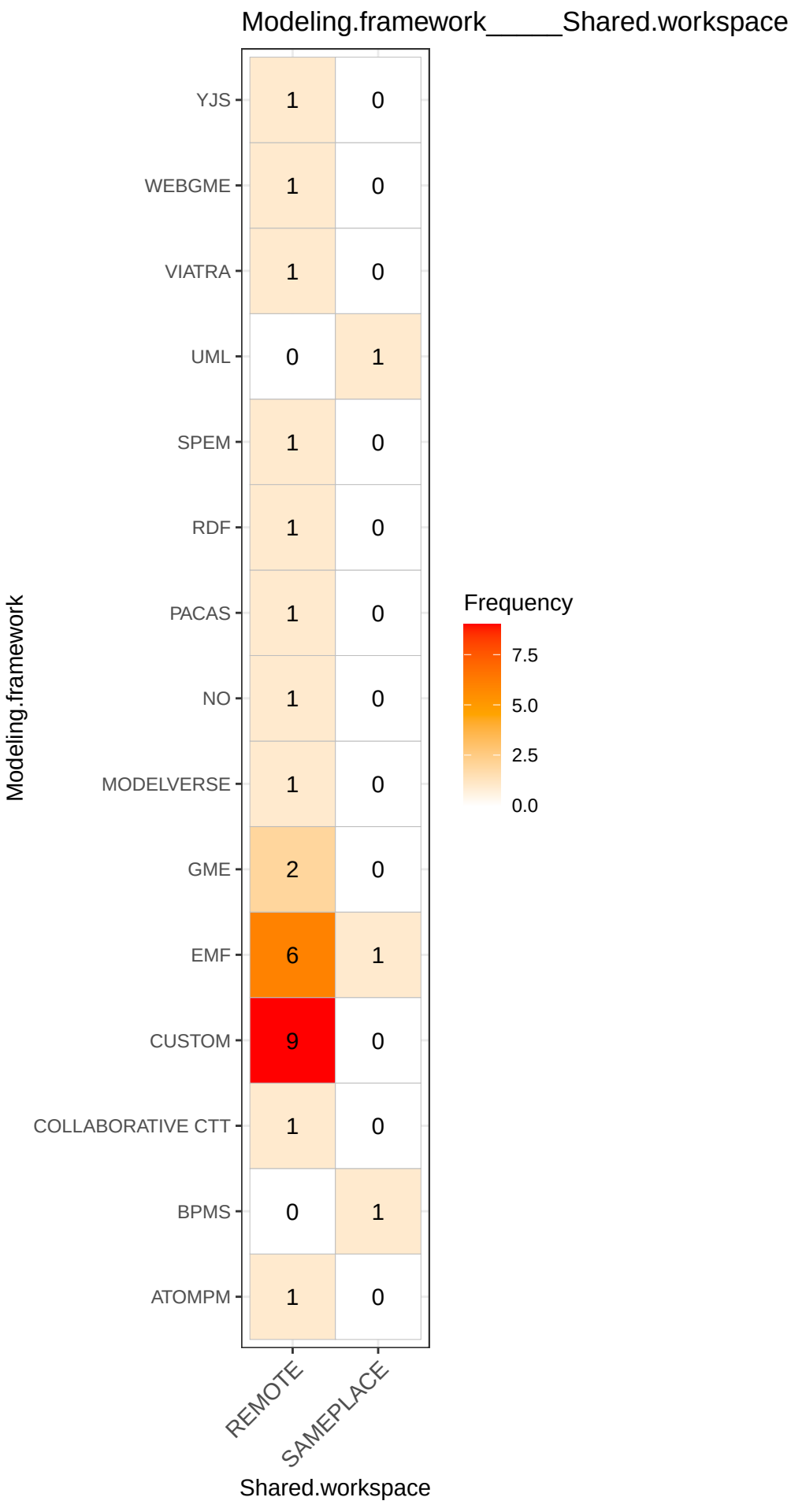
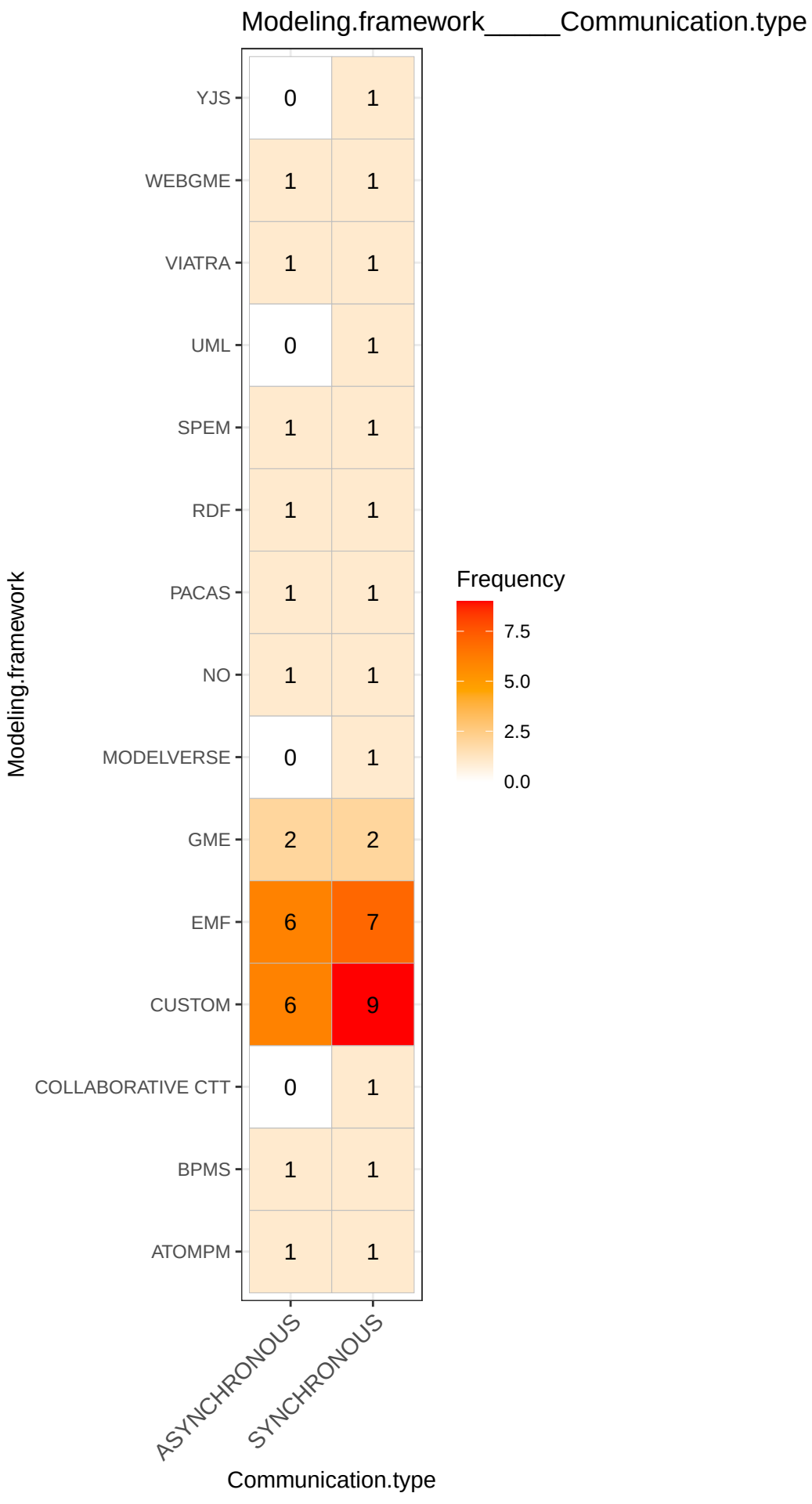
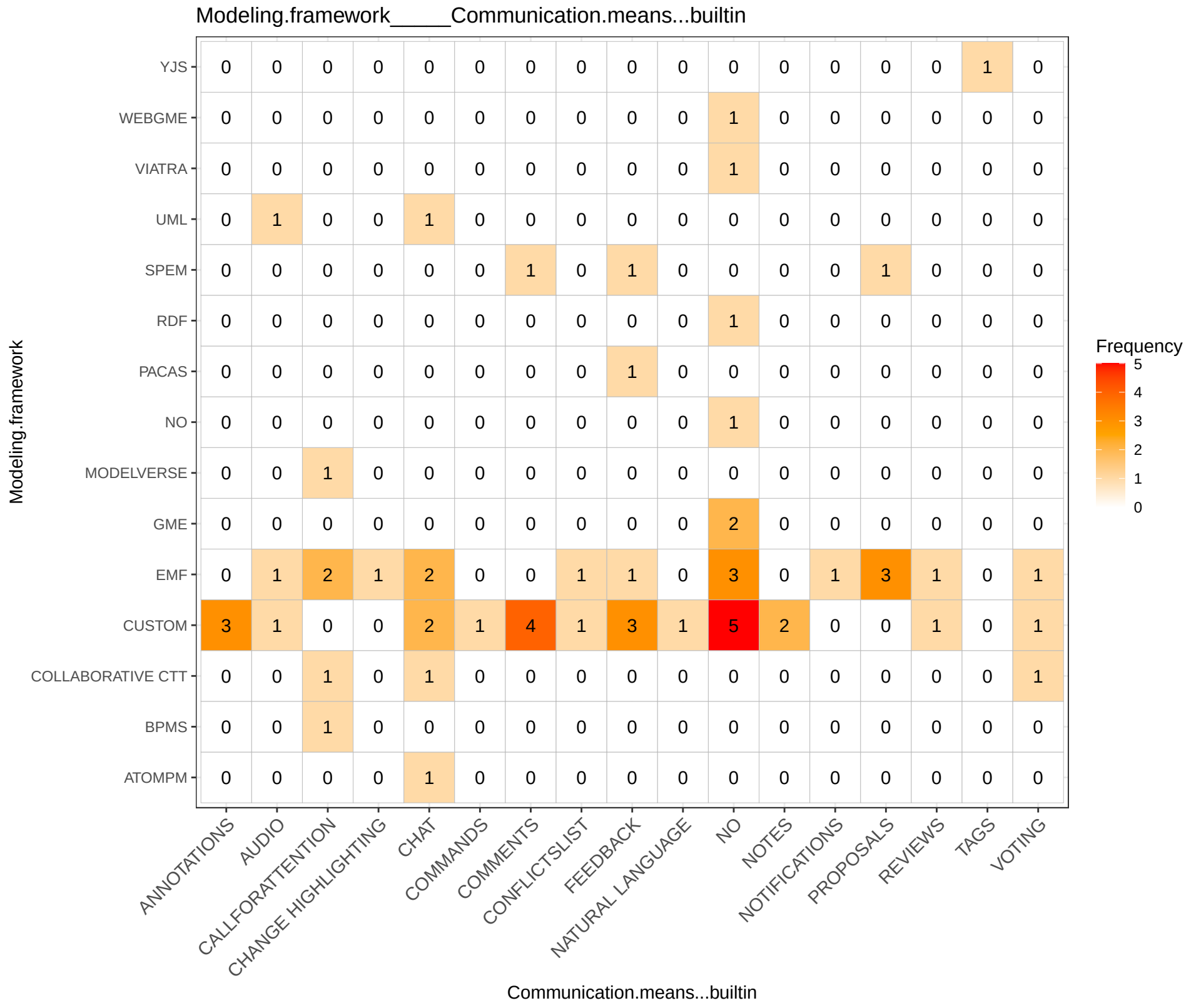
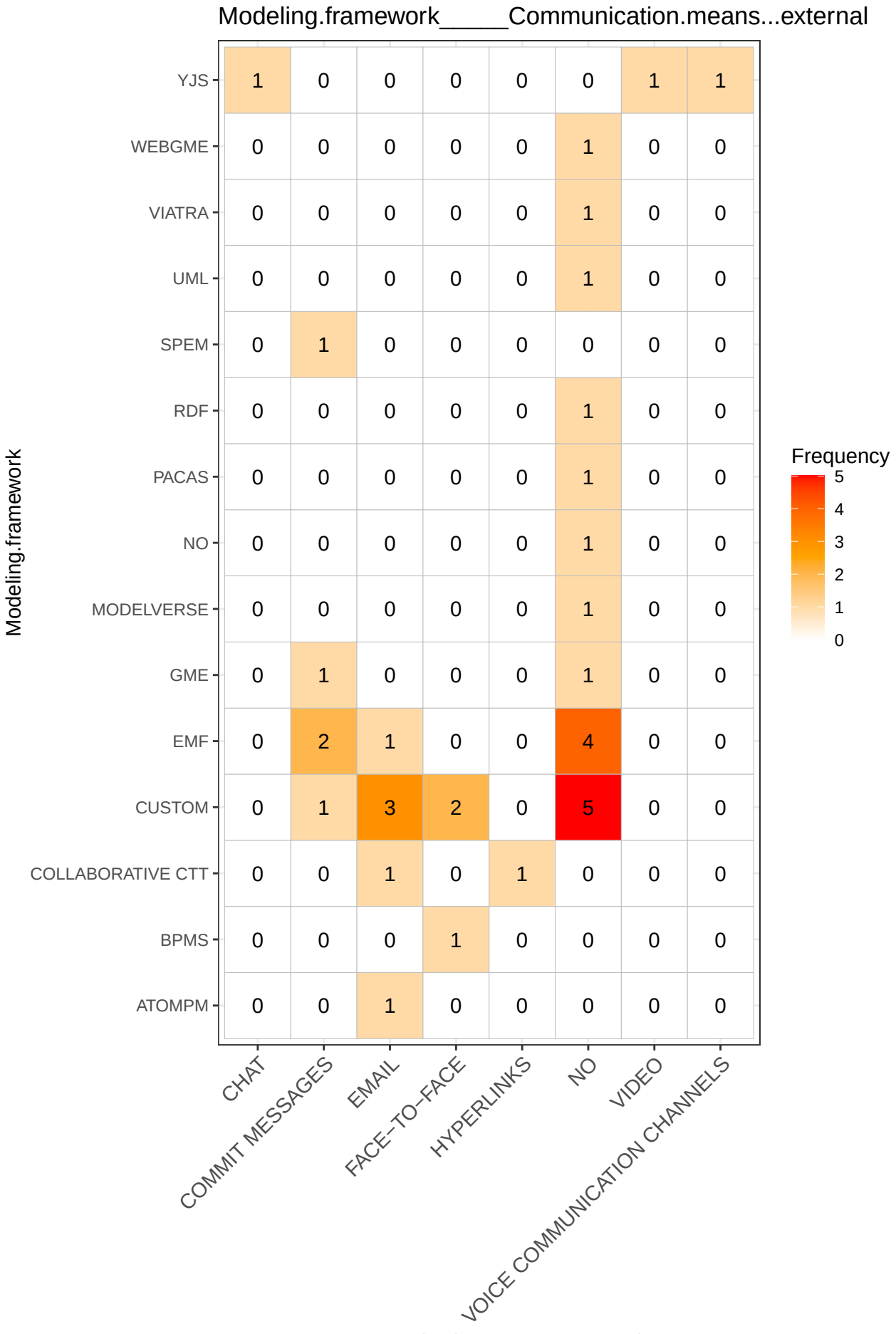

Modeling.framework_____Conflict.resolution.support
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 1
1 0 0
0 1 0
0 1 0
1 0 0
1 0 1
0 1 0
1 0 0
0 0 1
1 0 1
0 3 4
2 2 5
0 1 0
1 0 0
1 0 0
MANUAL
NO
SEMIAUTOMATED
Modeling.framework
Conflict.resolution.support
Frequency
5
4
3
2
1
0


Modeling.framework_____Shared.workspace
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
1 0
1 0
1 0
0 1
1 0
1 0
1 0
1 0
1 0
2 0
6 1
9 0
1 0
0 1
1 0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
7.5
5.0
2.5
0.0

Modeling.framework_____Network.architecture
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 1 1
0 1 0 0
1 0 0 0
0 1 0 0
0 1 0 0
0 1 0 0
0 1 0 0
0 1 0 0
1 0 0 0
0 2 0 0
2 4 0 1
2 6 1 1
0 1 0 0
0 0 1 0
0 1 0 0
Modeling.framework
Frequency
6
5
4
3
2
1
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture


Modeling.framework_____Communication.type
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 1
1 1
1 1
0 1
1 1
1 1
1 1
1 1
0 1
2 2
6 7
6 9
0 1
1 1
1 1
Modeling.framework
Frequency
7.5
5.0
2.5
0.0
ASYNCHRONOUS
SYNCHRONOUS
Communication.type


Modeling.framework_____Communication.means...builtin
Modeling.framework
YJS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0
WEBGME 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
VIATRA 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
UML 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
SPEM 0 0 0 0 0 0 1 0 1 0 0 0 0 1 0 0 0
RDF 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
PACAS 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
NO 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
MODELVERSE 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
GME 0 0 0 0 0 0 0 0 0 0 2 0 0 0 0 0 0
EMF 0 1 2 1 2 0 0 1 1 0 3 0 1 3 1 0 1
CUSTOM 3 1 0 0 2 1 4 1 3 1 5 2 0 0 1 0 1
COLLABORATIVE CTT 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 1
BPMS 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
ATOMPM 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
5
4
3
2
1
0


Modeling.framework_____Communication.means...external
Modeling.framework
YJS 1 0 0 0 0 0 1 1
WEBGME 0 0 0 0 0 1 0 0
VIATRA 0 0 0 0 0 1 0 0
UML 0 0 0 0 0 1 0 0
SPEM 0 1 0 0 0 0 0 0
RDF 0 0 0 0 0 1 0 0
PACAS 0 0 0 0 0 1 0 0
NO 0 0 0 0 0 1 0 0
MODELVERSE 0 0 0 0 0 1 0 0
GME 0 1 0 0 0 1 0 0
EMF 0 2 1 0 0 4 0 0
CUSTOM 0 1 3 2 0 5 0 0
COLLABORATIVE CTT 0 0 1 0 1 0 0 0
BPMS 0 0 0 1 0 0 0 0
ATOMPM 0 0 1 0 0 0 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
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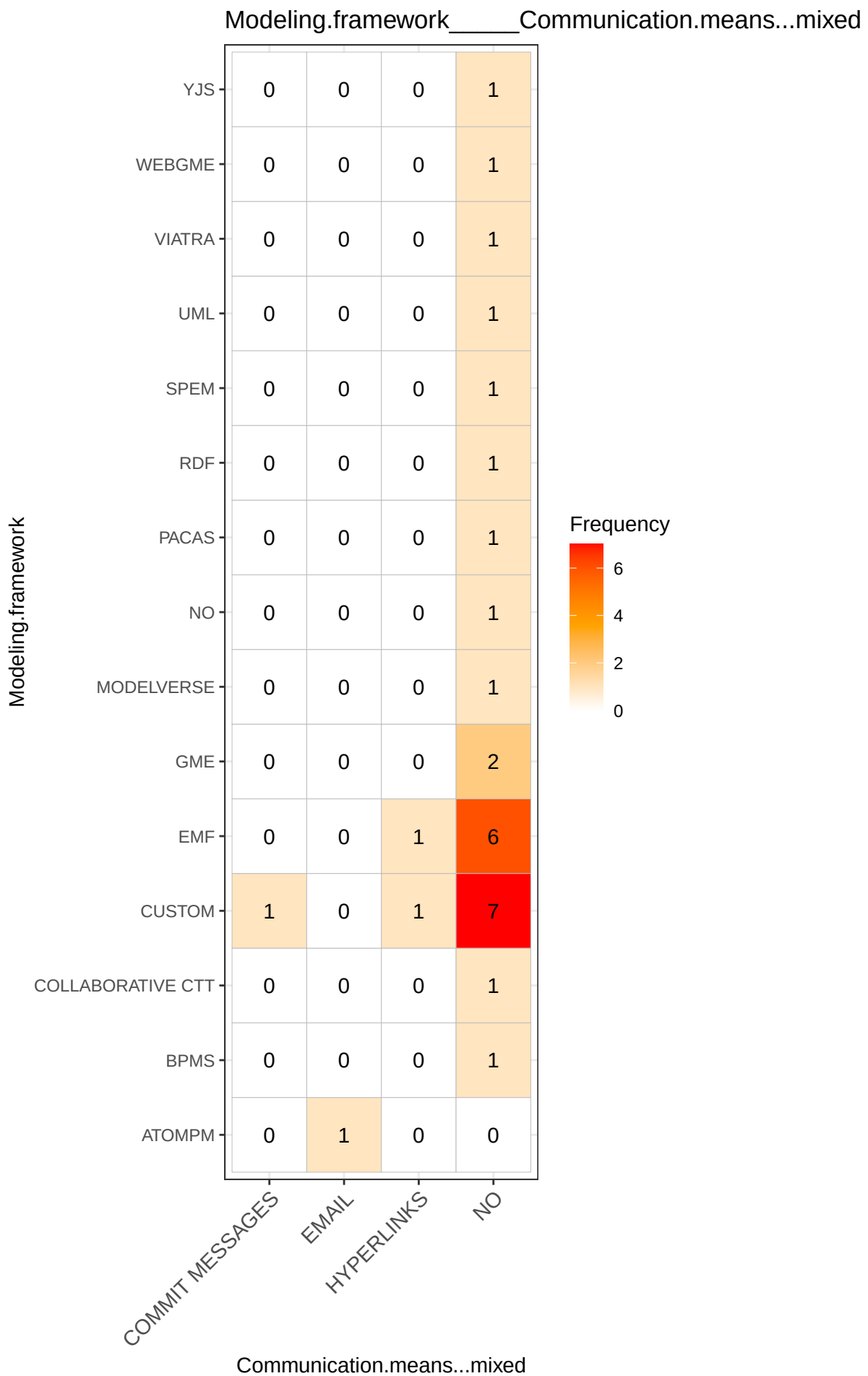
4
3
2
1
0


Modeling.framework_____Communication.means...mixed
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 1
0 0 0 2
0 0 1 6
1 0 1 7
0 0 0 1
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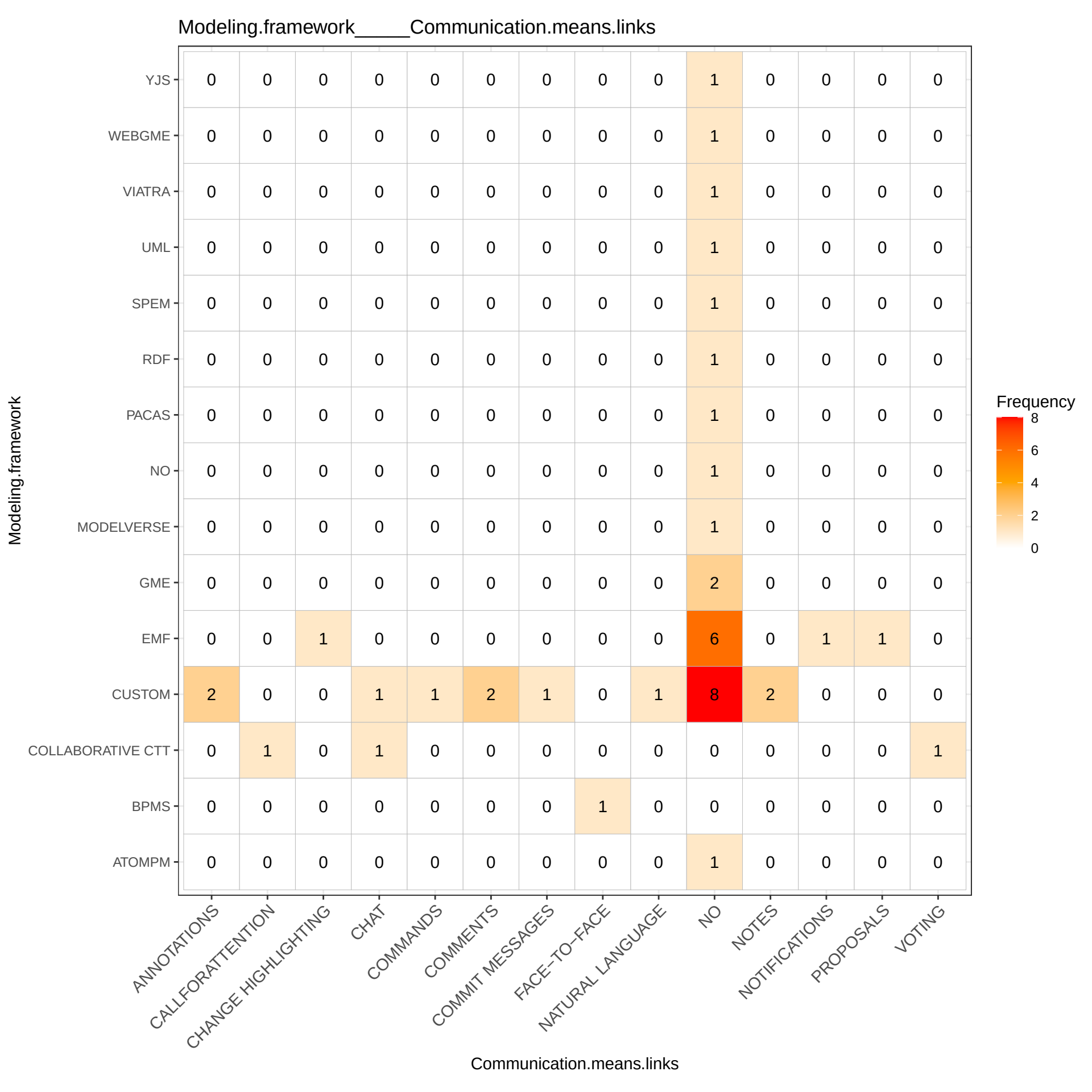
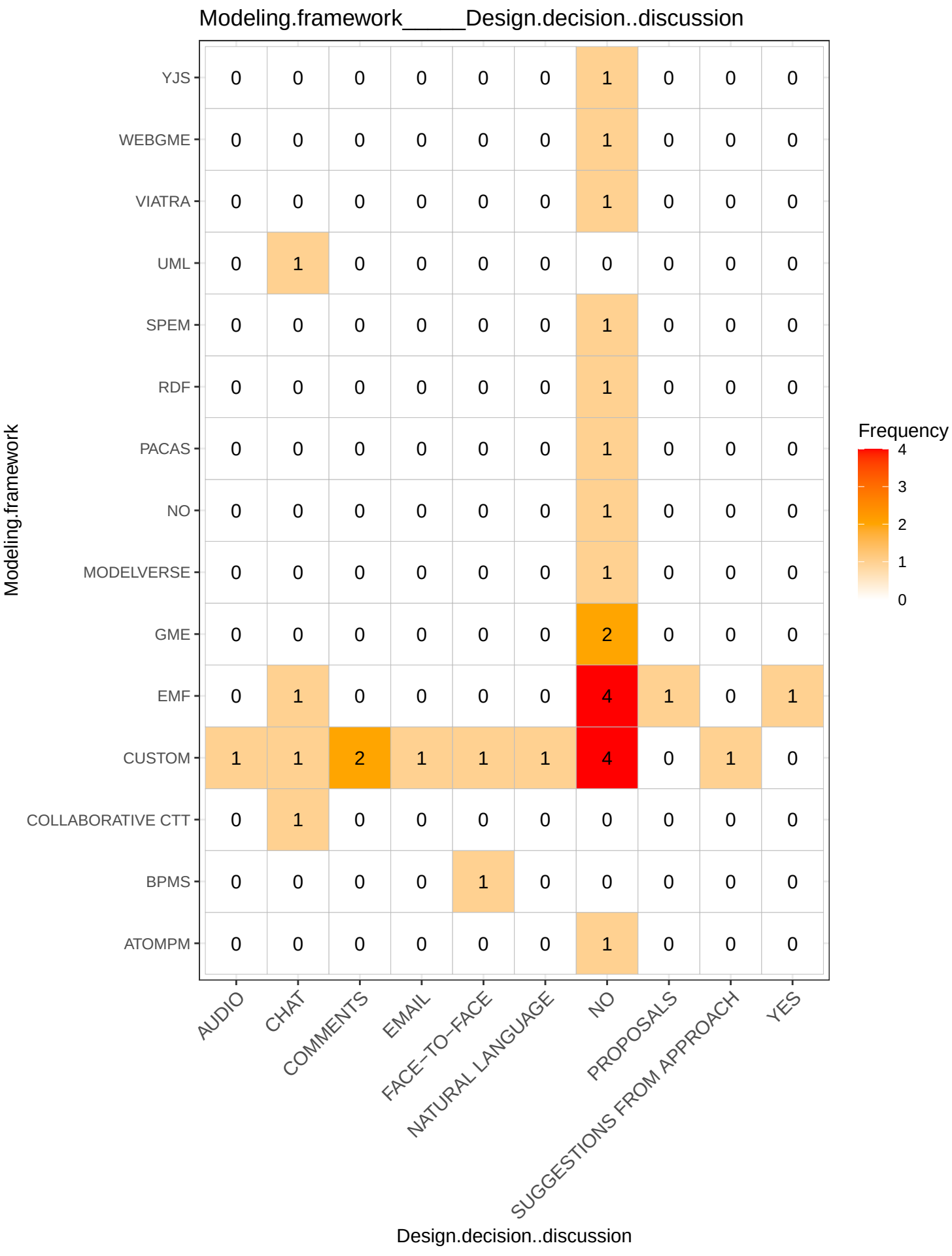
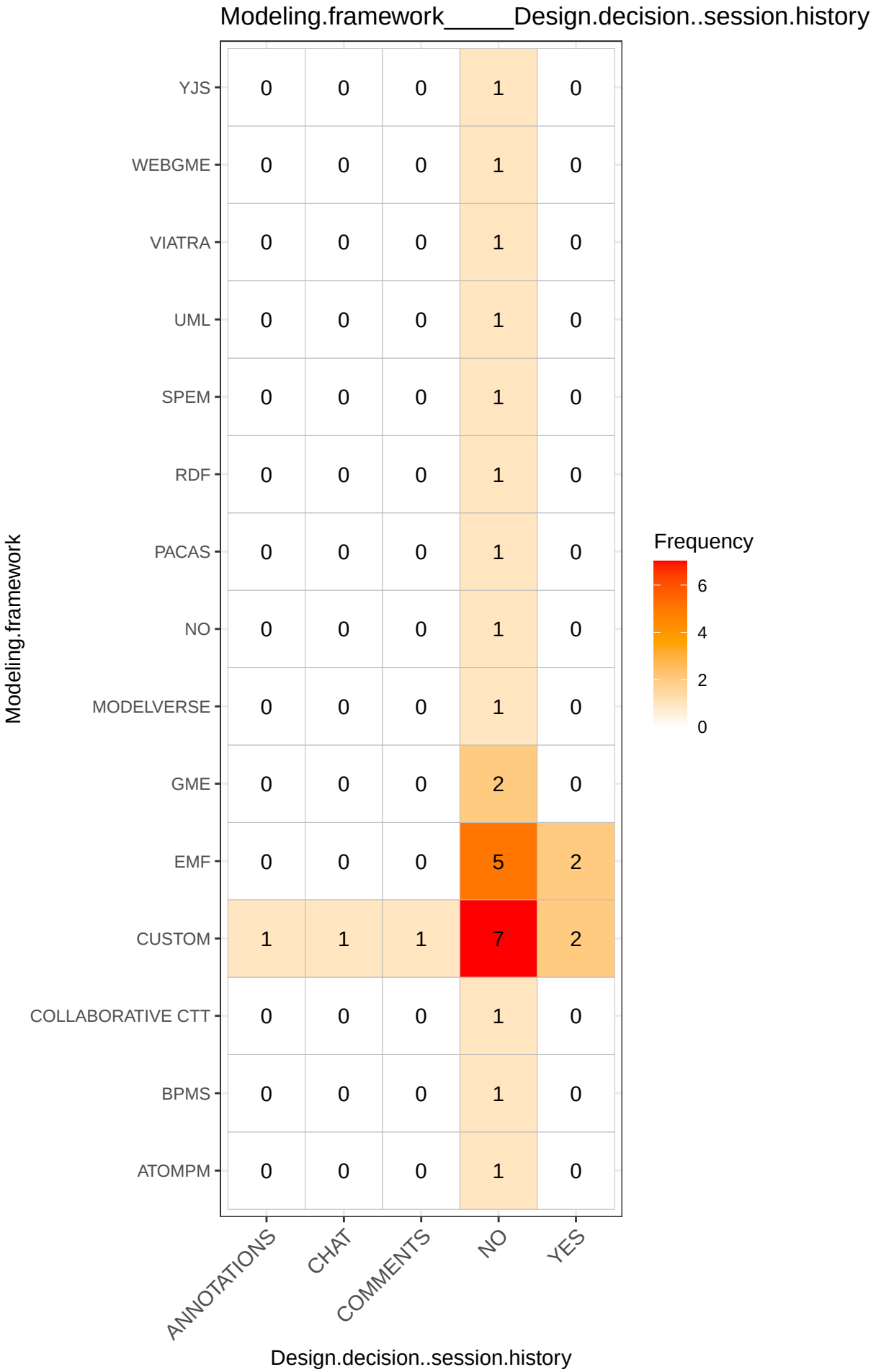
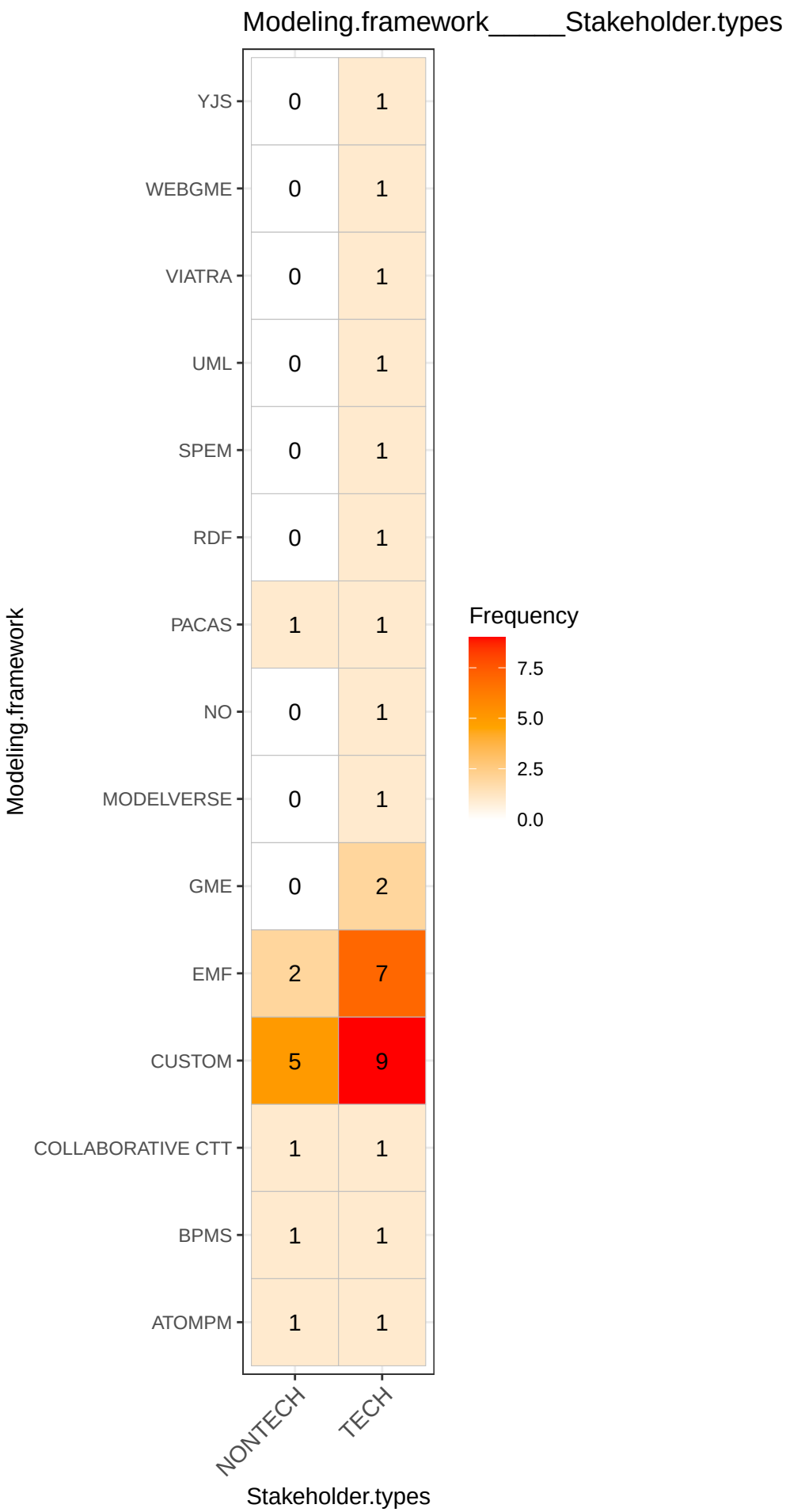
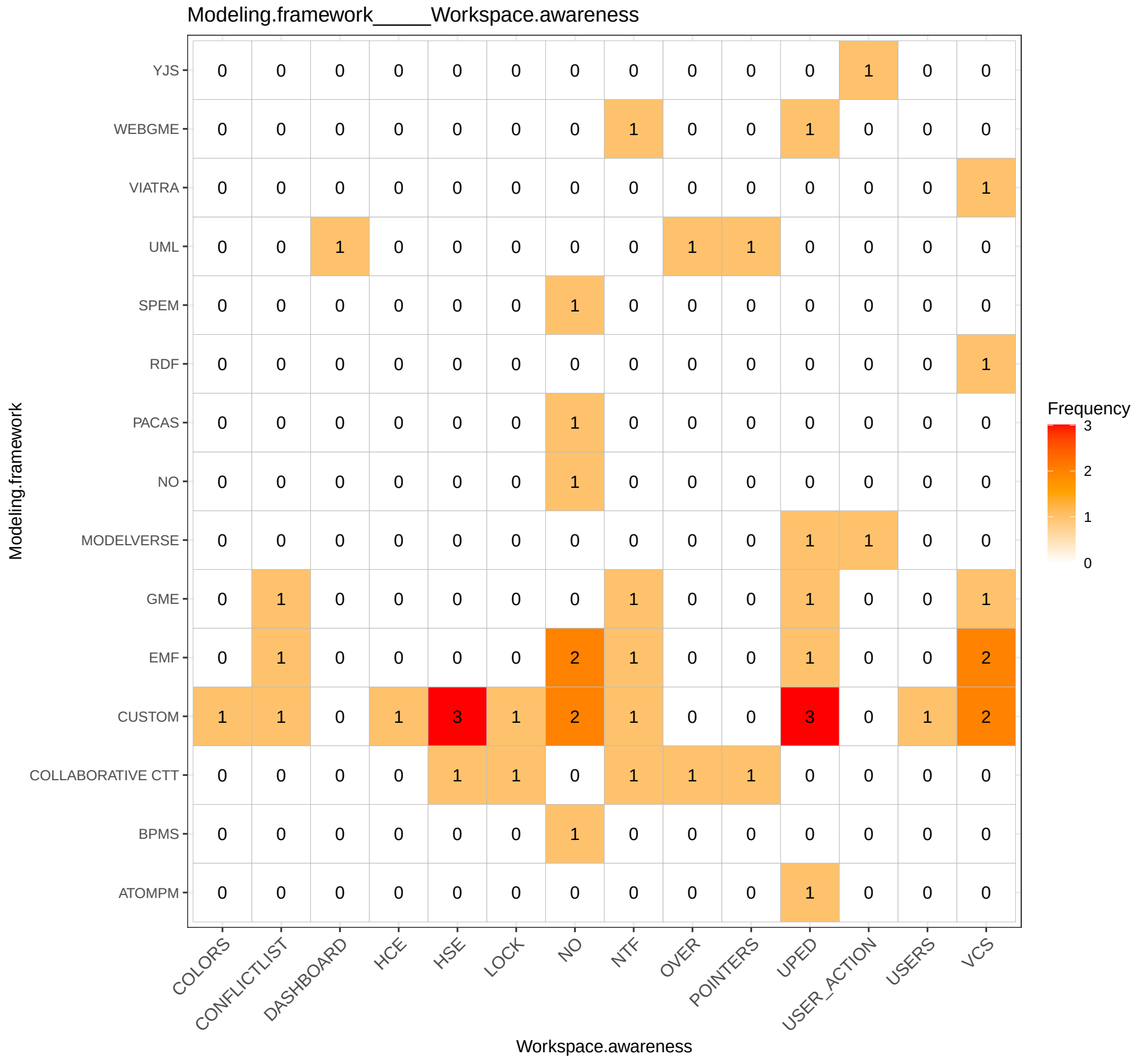
0 1 0 0
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Modeling.framework
Communication.means...mixed
Frequency
6
4
2
0

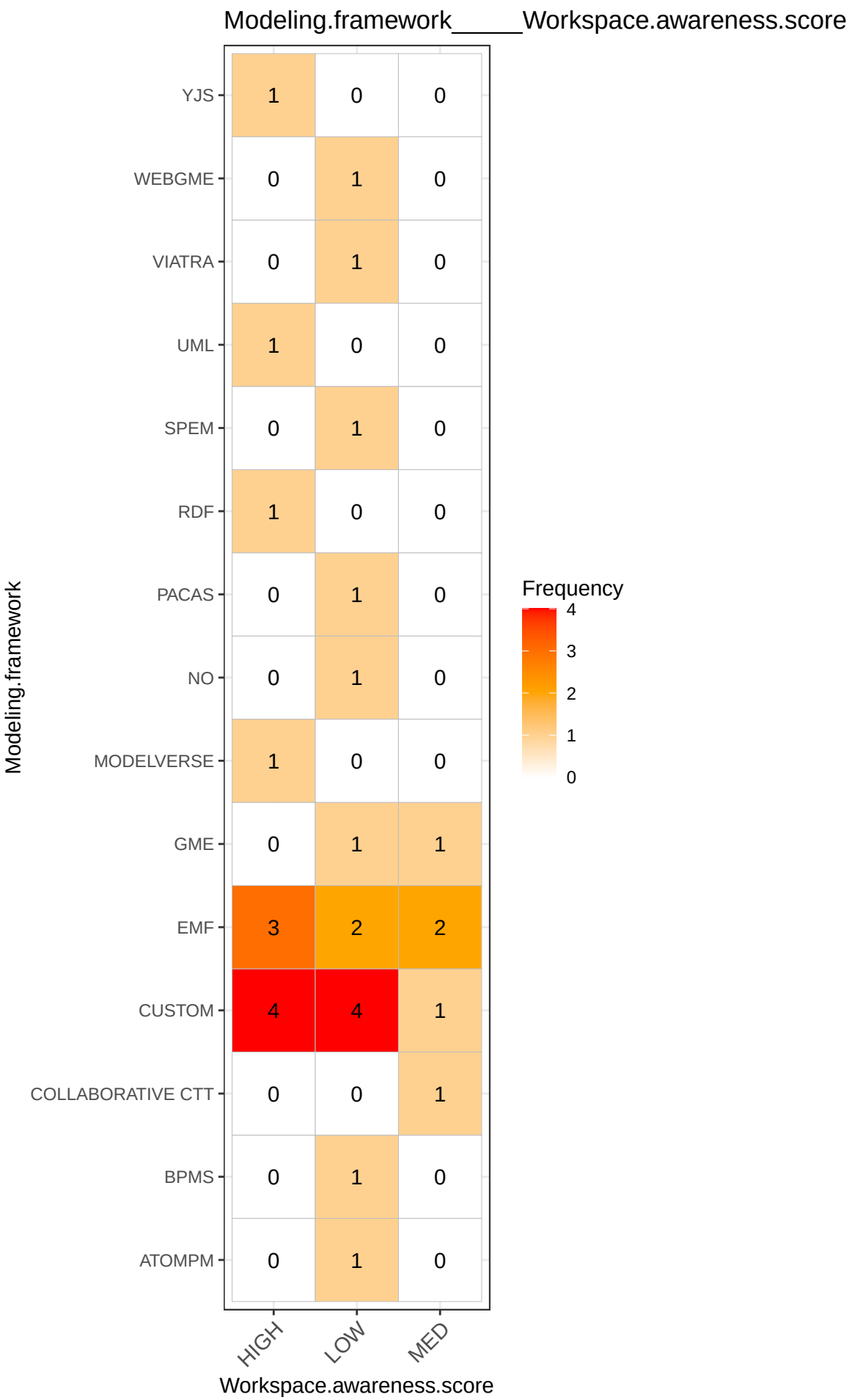

Modeling.framework_____Communication.means.links
Modeling.framework
YJS 0 0 0 0 0 0 0 0 0 1 0 0 0 0
WEBGME 0 0 0 0 0 0 0 0 0 1 0 0 0 0
VIATRA 0 0 0 0 0 0 0 0 0 1 0 0 0 0
UML 0 0 0 0 0 0 0 0 0 1 0 0 0 0
SPEM 0 0 0 0 0 0 0 0 0 1 0 0 0 0
RDF 0 0 0 0 0 0 0 0 0 1 0 0 0 0
PACAS 0 0 0 0 0 0 0 0 0 1 0 0 0 0
NO 0 0 0 0 0 0 0 0 0 1 0 0 0 0
MODELVERSE 0 0 0 0 0 0 0 0 0 1 0 0 0 0
GME 0 0 0 0 0 0 0 0 0 2 0 0 0 0
EMF 0 0 1 0 0 0 0 0 0 6 0 1 1 0
CUSTOM 2 0 0 1 1 2 1 0 1 8 2 0 0 0
COLLABORATIVE CTT 0 1 0 1 0 0 0 0 0 0 0 0 0 1
BPMS 0 0 0 0 0 0 0 1 0 0 0 0 0 0
ATOMPM 0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
8
6
4
2
0


Modeling.framework_____Design.decision..discussion
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
4
3
2
1
0

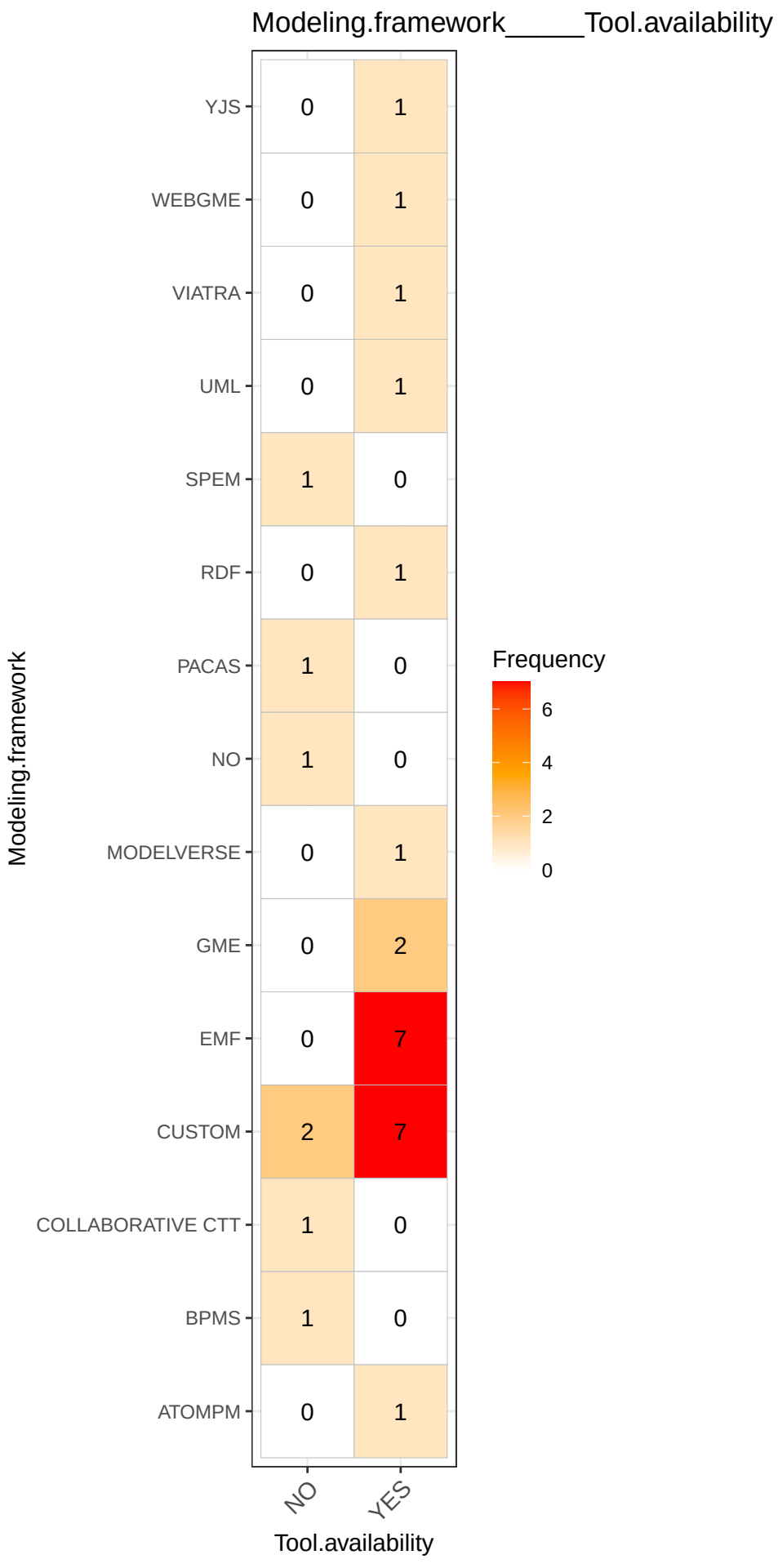

Modeling.framework_____Design.decision..session.history
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
6
4
2
0

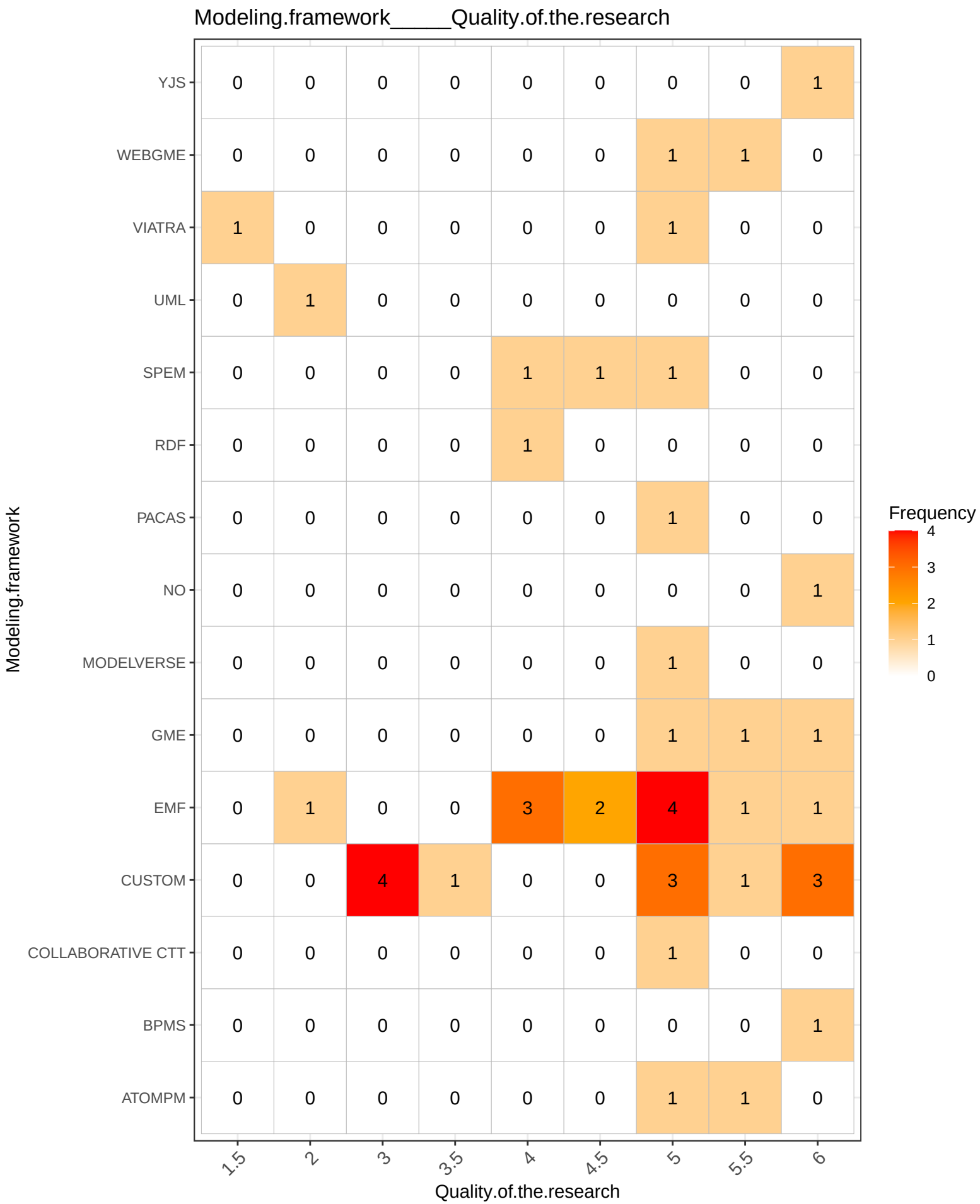

Modeling.framework_____Stakeholder.types
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 1
0 1
0 1
0 1
0 1
0 1
1 1
0 1
0 1
0 2
2 7
5 9
1 1
1 1
1 1
NONTECH
TECH
Modeling.framework
Stakeholder.types
Frequency
7.5
5.0
2.5
0.0

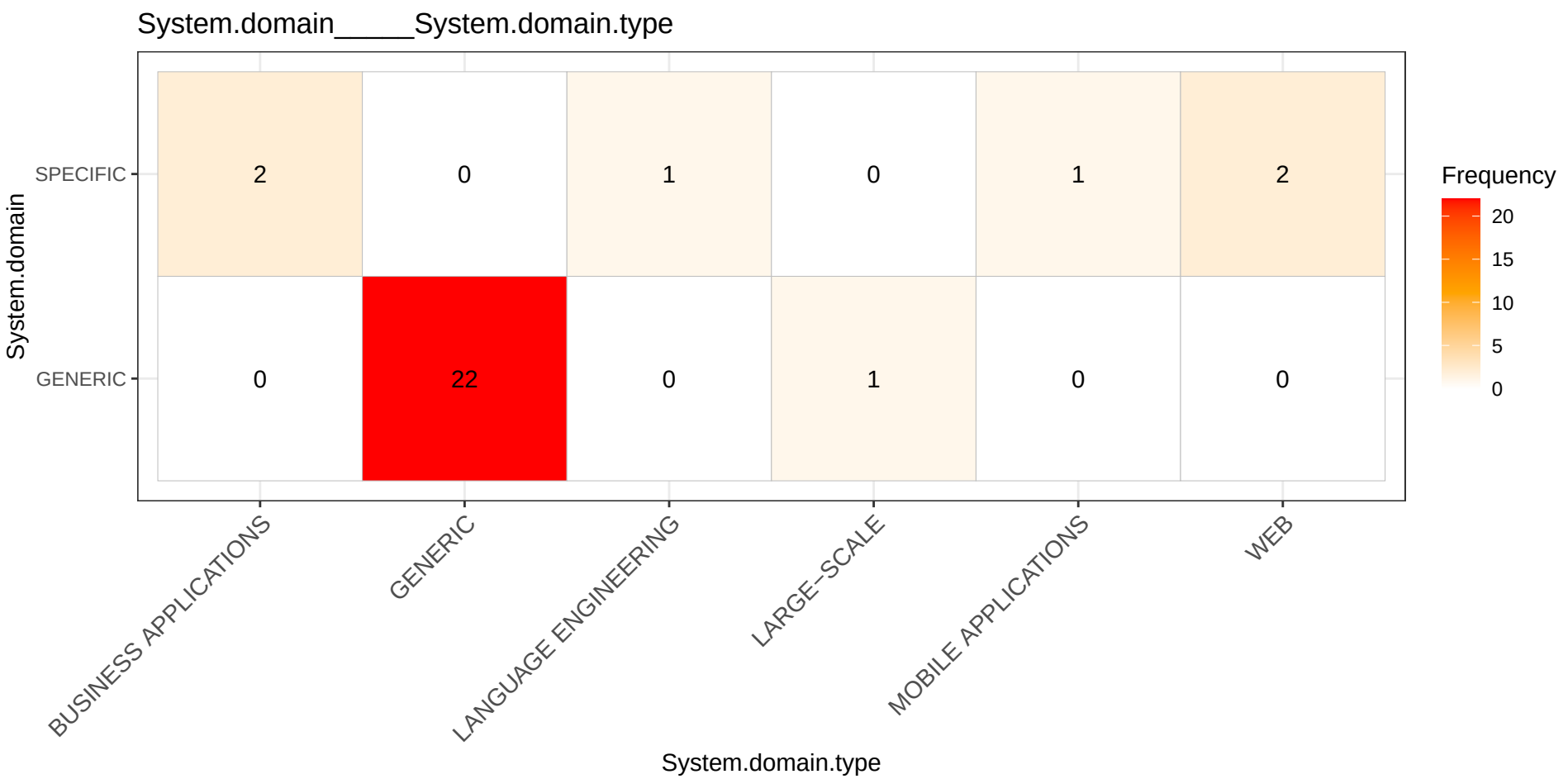

Modeling.framework_____Workspace.awareness
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
3
2
1
0

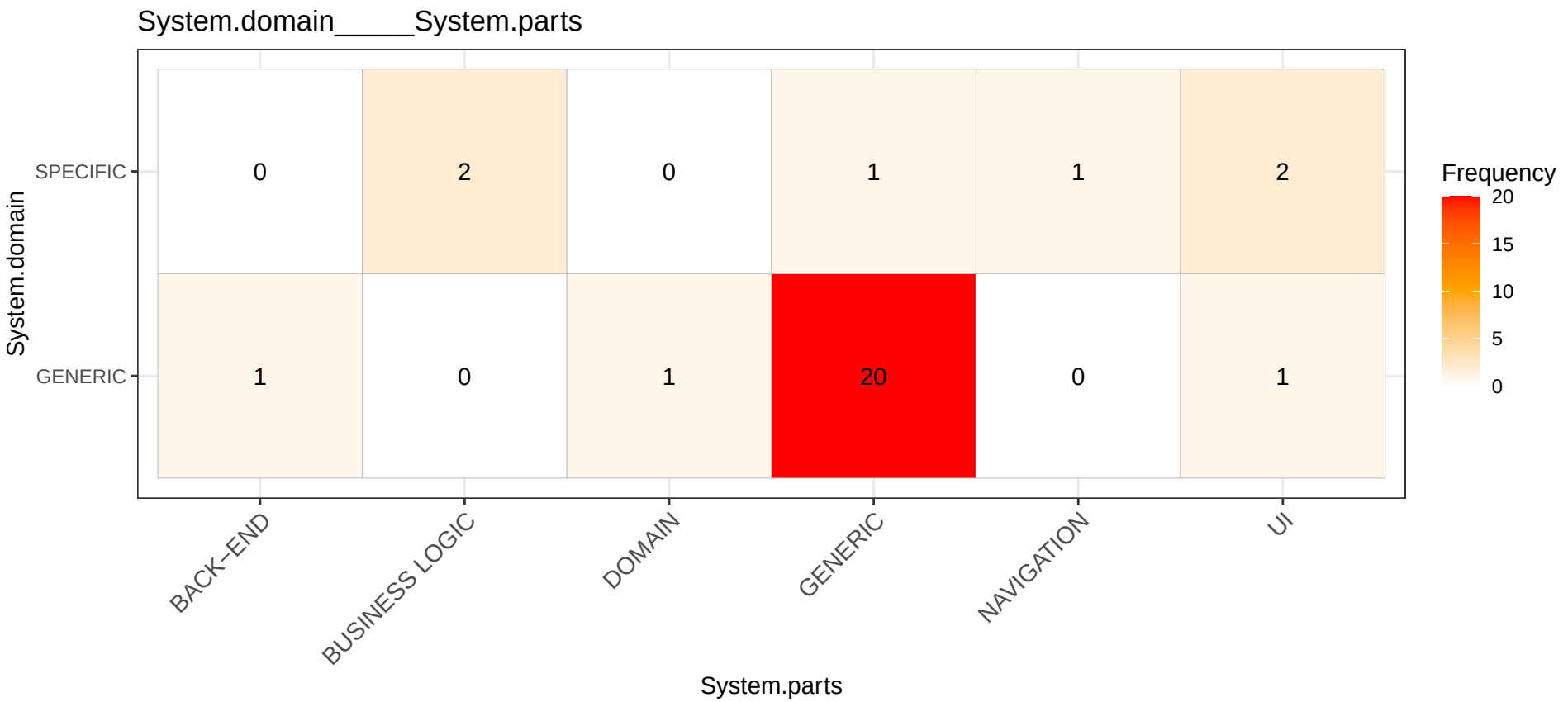

Modeling.framework_____Workspace.awareness.score
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
1 0 0
0 1 0
0 1 0
1 0 0
0 1 0
1 0 0
0 1 0
0 1 0
1 0 0
0 1 1
3 2 2
4 4 1
0 0 1
0 1 0
0 1 0
HIGH
LOW
MED
Workspace.awareness.score
Modeling.framework
Frequency
4
3
2
1
0

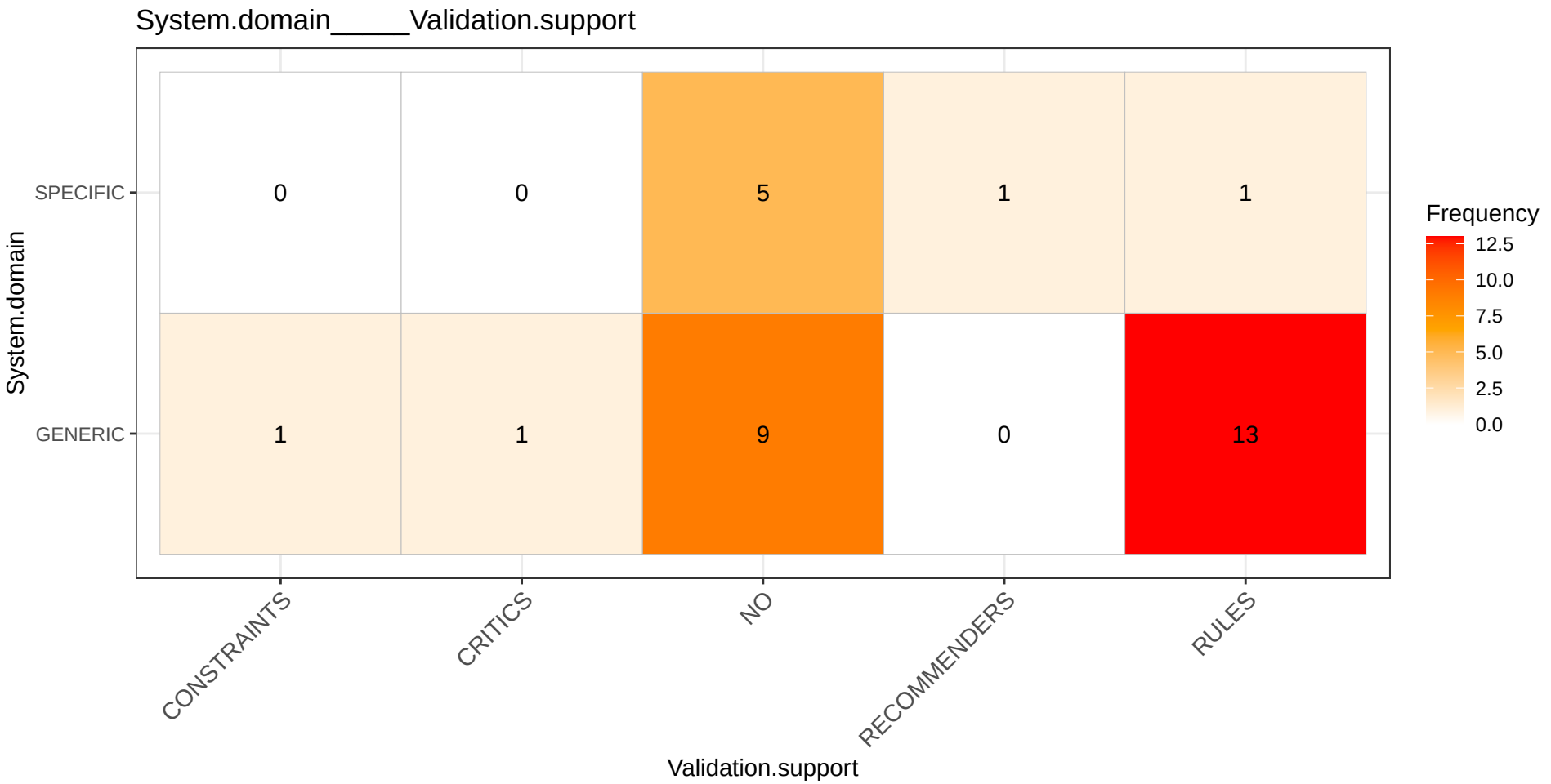
Modeling.framework_____Evaluation
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
Modeling.framework
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
4
3
2
1
0

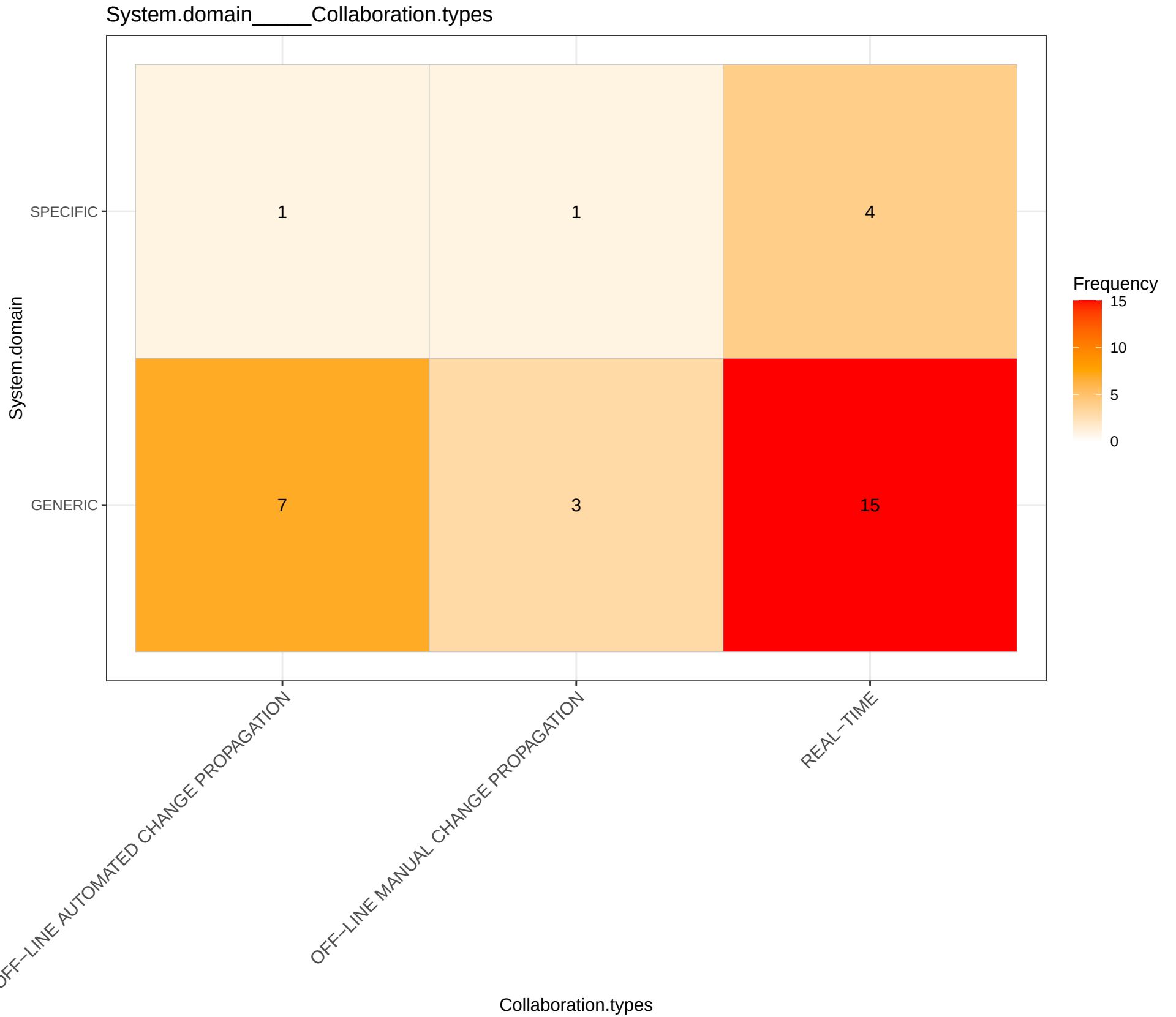

Modeling.framework_____Tool.availability
Modeling.framework
YJS
WEBGME
VIATRA
UML
SPEM
RDF
PACAS
NO
MODELVERSE
GME
EMF
CUSTOM
COLLABORATIVE CTT
BPMS
ATOMPM
0 1
0 1
0 1
0 1
1 0
0 1
1 0
1 0
0 1
0 2
0 7
2 7
1 0
1 0
0 1
NO
YES
Tool.availability
Frequency
6
4
2
0

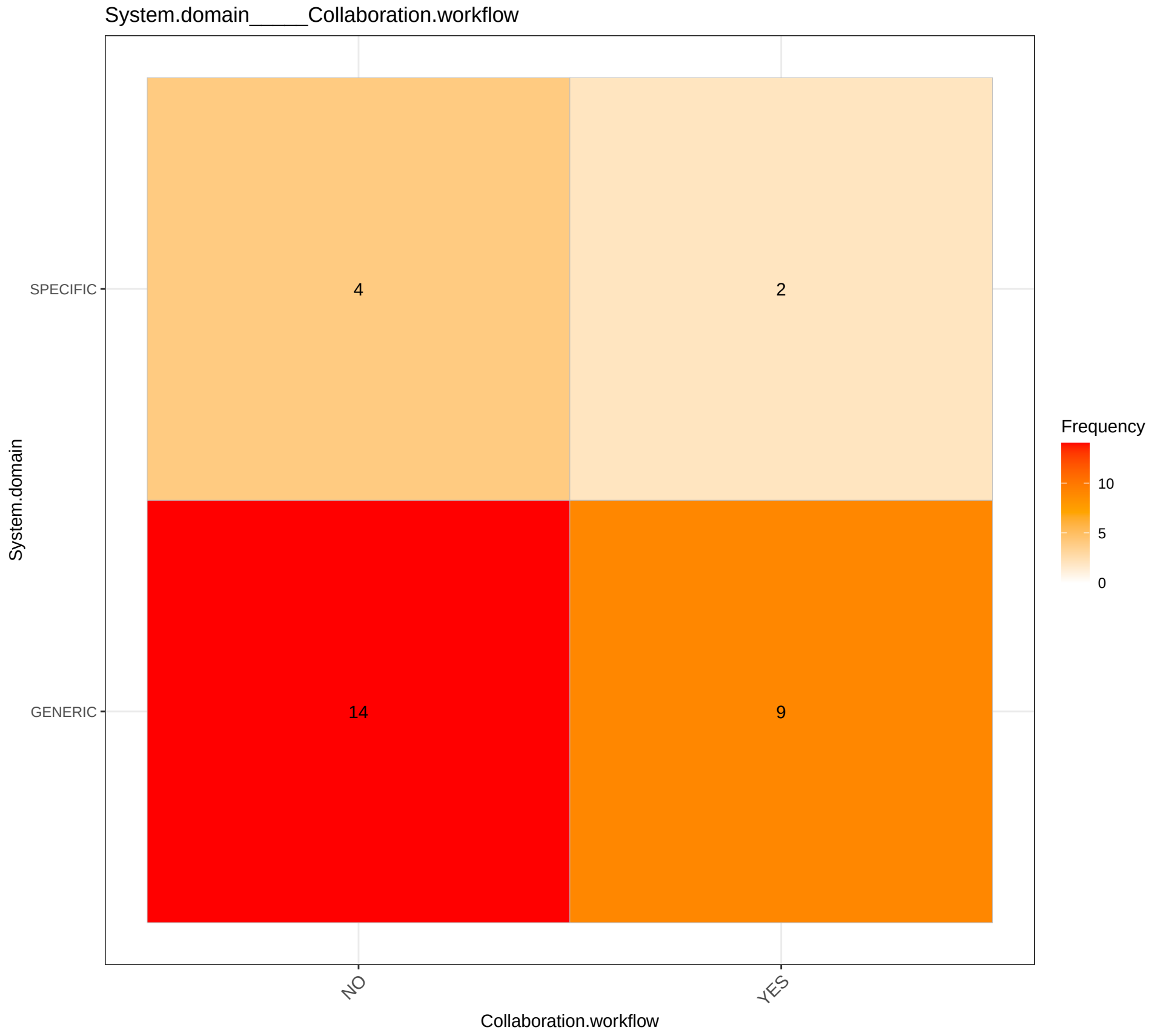

Modeling.framework_____Quality.of.the.research
YJS 0 0 0 0 0 0 0 0 1
WEBGME 0 0 0 0 0 0 1 1 0
VIATRA 1 0 0 0 0 0 1 0 0
UML 0 1 0 0 0 0 0 0 0
SPEM 0 0 0 0 1 1 1 0 0
RDF 0 0 0 0 1 0 0 0 0
PACAS 0 0 0 0 0 0 1 0 0
NO 0 0 0 0 0 0 0 0 1
MODELVERSE 0 0 0 0 0 0 1 0 0
GME 0 0 0 0 0 0 1 1 1
EMF 0 1 0 0 3 2 4 1 1
CUSTOM 0 0 4 1 0 0 3 1 3
COLLABORATIVE CTT 0 0 0 0 0 0 1 0 0
BPMS 0 0 0 0 0 0 0 0 1
ATOMPM 0 0 0 0 0 0 1 1 0
Modeling.framework
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
4
3
2
1
0

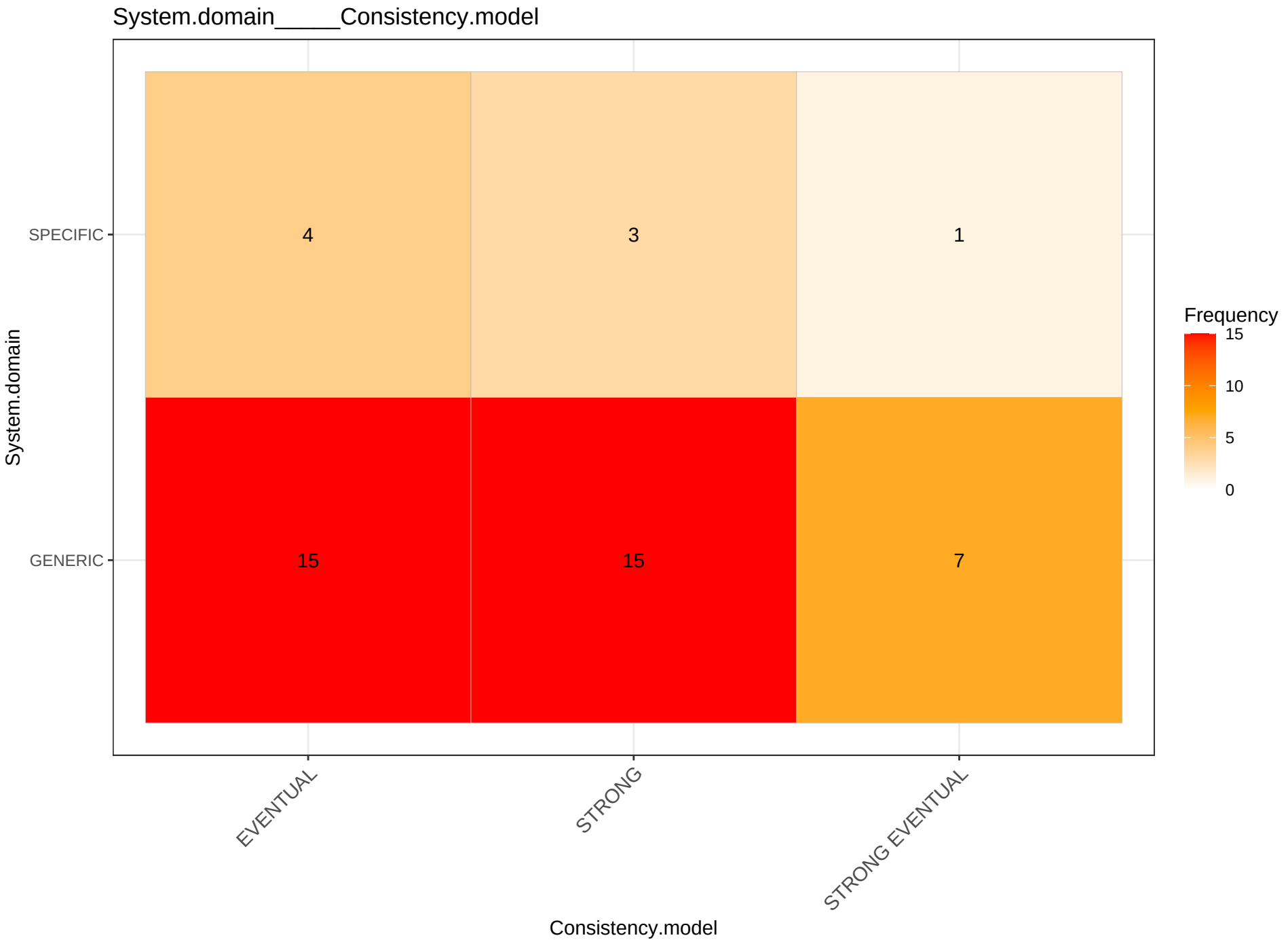

System.domain_____System.domain.type
SPECIFIC
GENERIC
System.domain
2
0
1
0
1
2
0
22
0
1
0
0
BUSINESS APPLICATIONS
GENERIC
LANGUAGE ENGINEERING
LARGE−SCALE
MOBILE APPLICATIONS
WEB
System.domain.type
Frequency
20
15
10
5
0

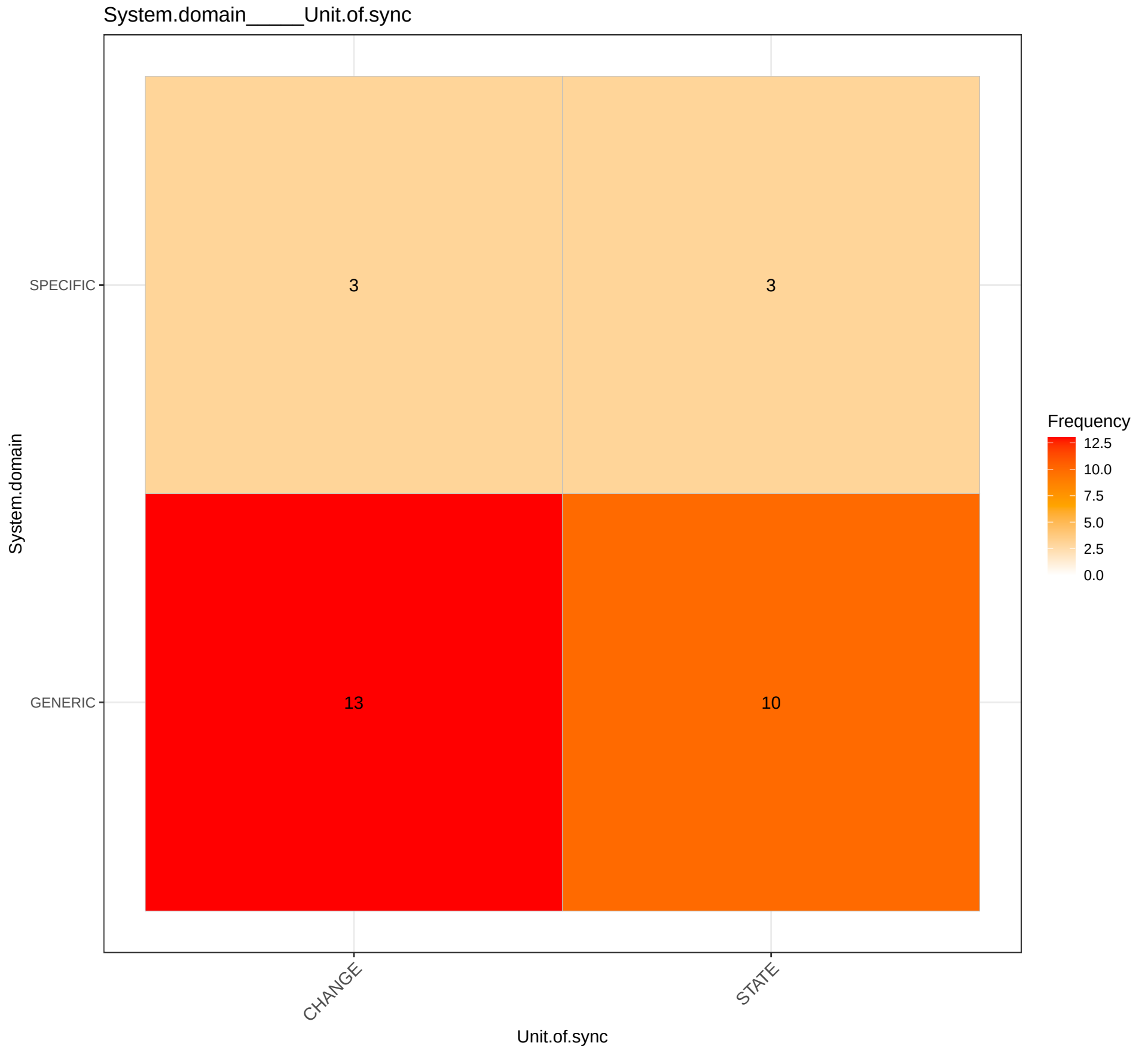

System.domain_____System.parts
System.domain
SPECIFIC
GENERIC
0
2
0
1
1
2
1
0
1
20
0
1
BACK-END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
20
15
10
5
0

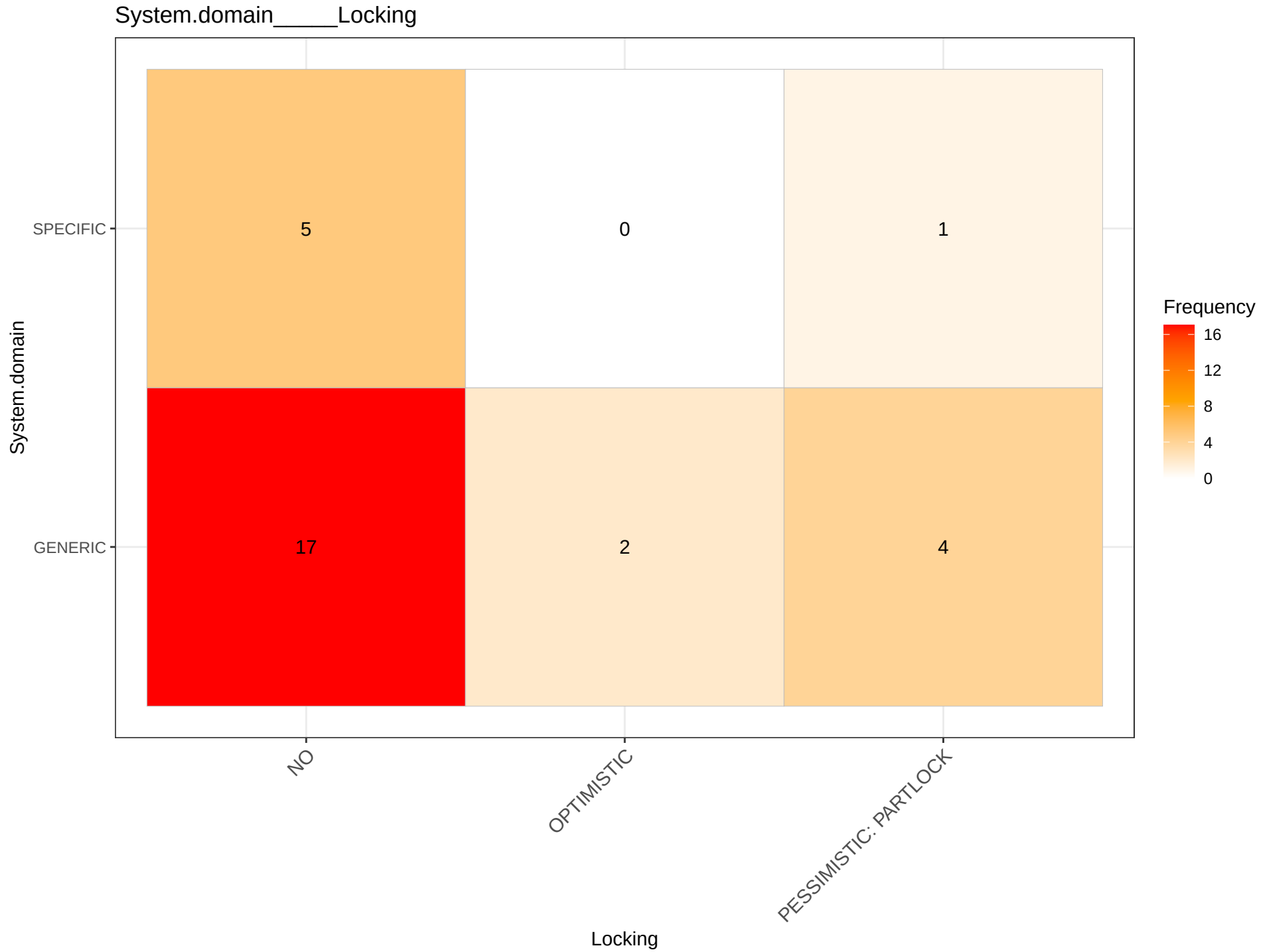

System.domain_____Validation.support
SPECIFIC
GENERIC
System.domain
0
0
5
1
1
1
1
9
0
13
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

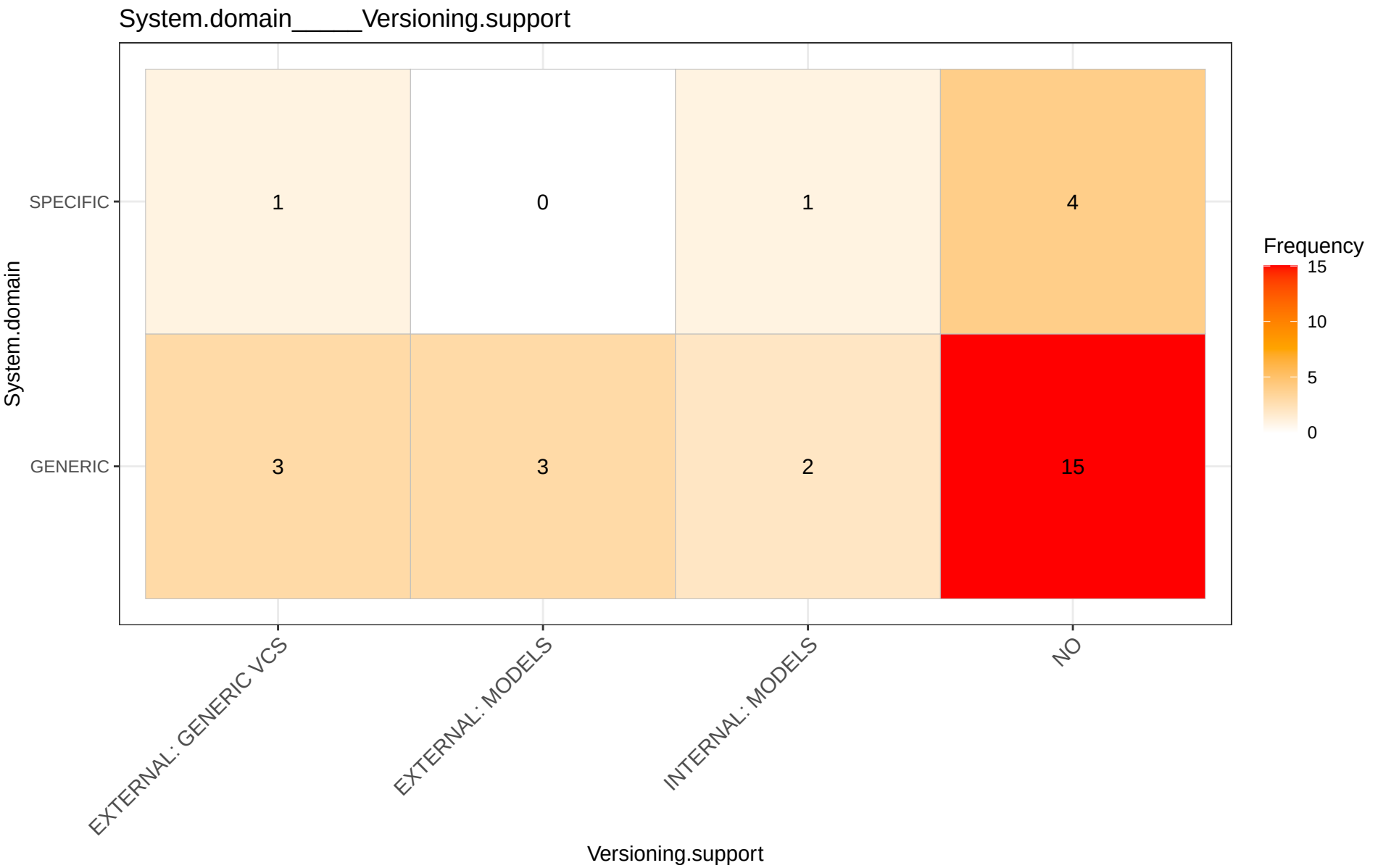

System.domain_____Collaboration.types
SPECIFIC
GENERIC
1
1
4
7
3
15
System.domain
Frequency
15
10
5
0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types

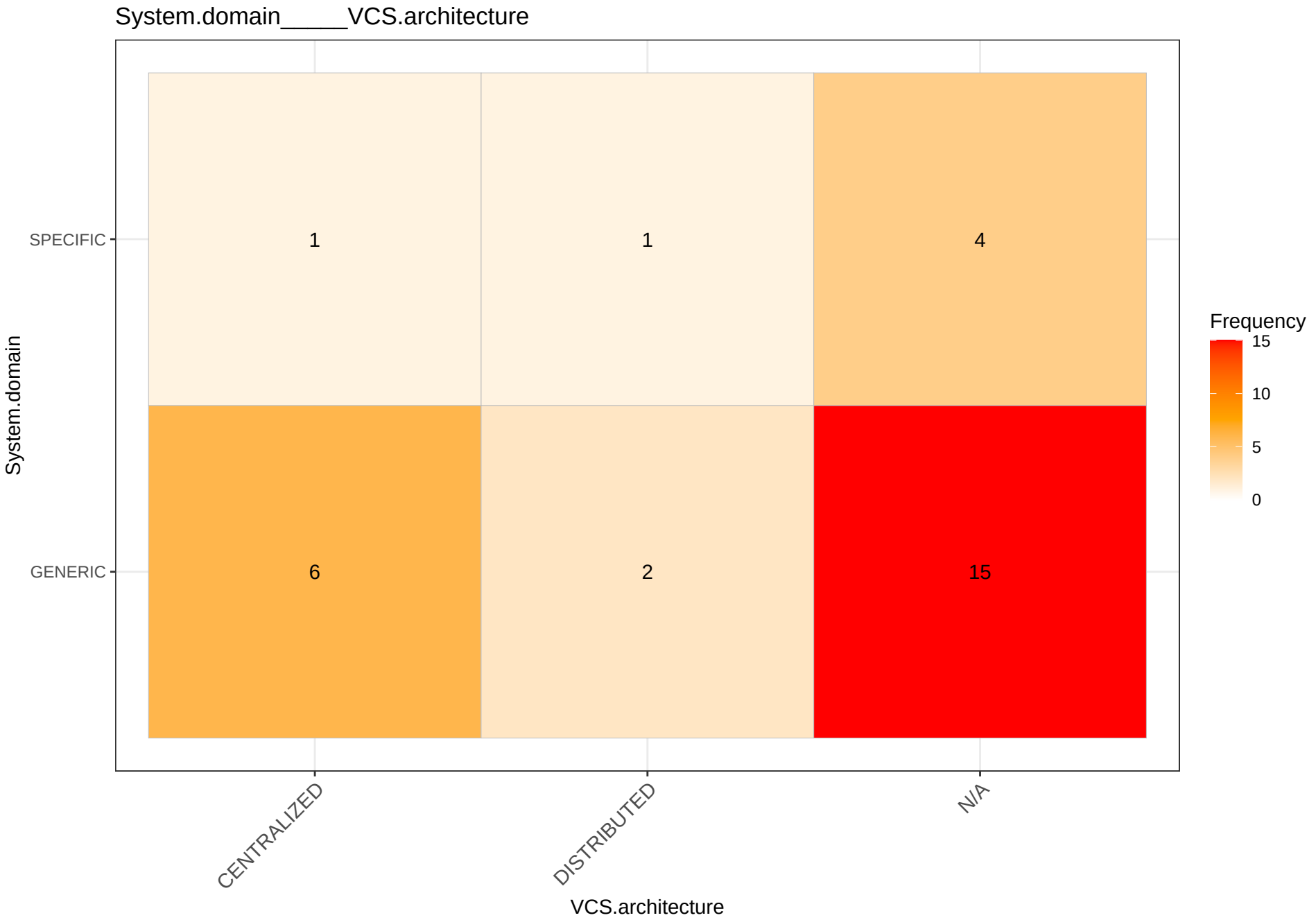

System.domain_____Collaboration.workflow
SPECIFIC
GENERIC
4
2
14
9
NO
YES
Collaboration.workflow
System.domain
Frequency
10
5
0

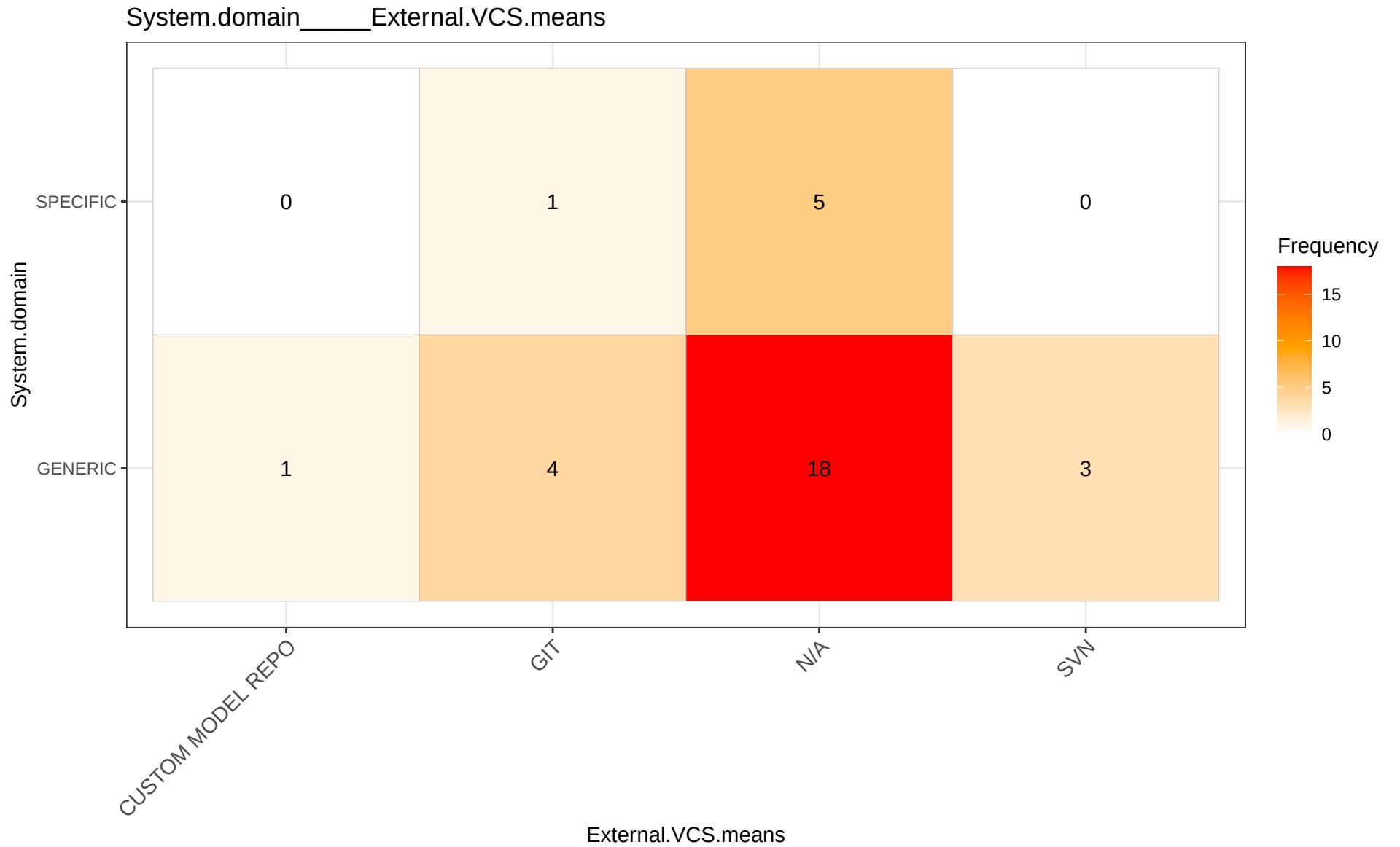

System.domain_____Consistency.model
SPECIFIC
GENERIC
4
3
1
15
15
7
System.domain
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
15
10
5
0

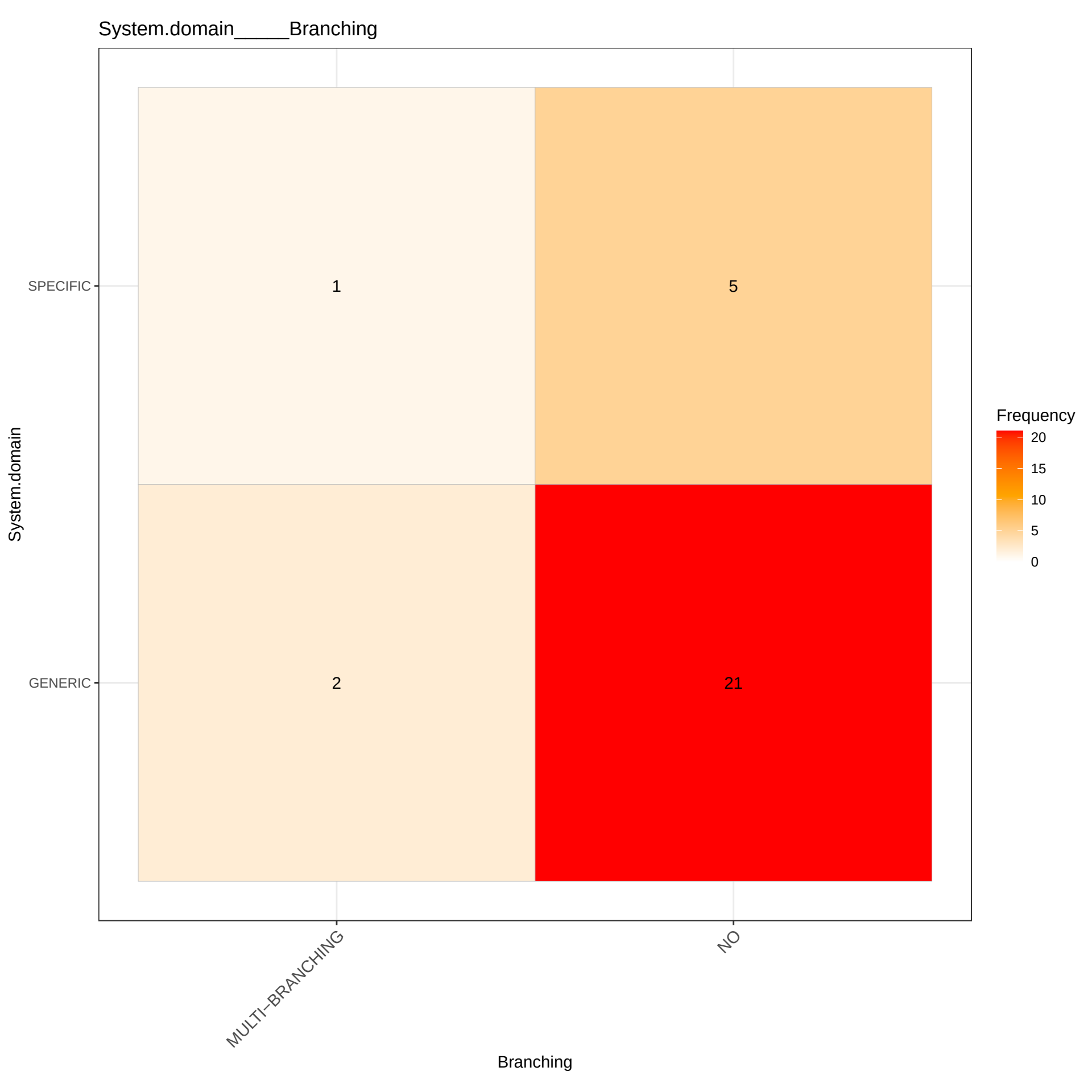

System.domain_____Unit.of.sync
SPECIFIC
GENERIC
3
3
13
10
System.domain
CHANGE
STATE
Unit.of.sync
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

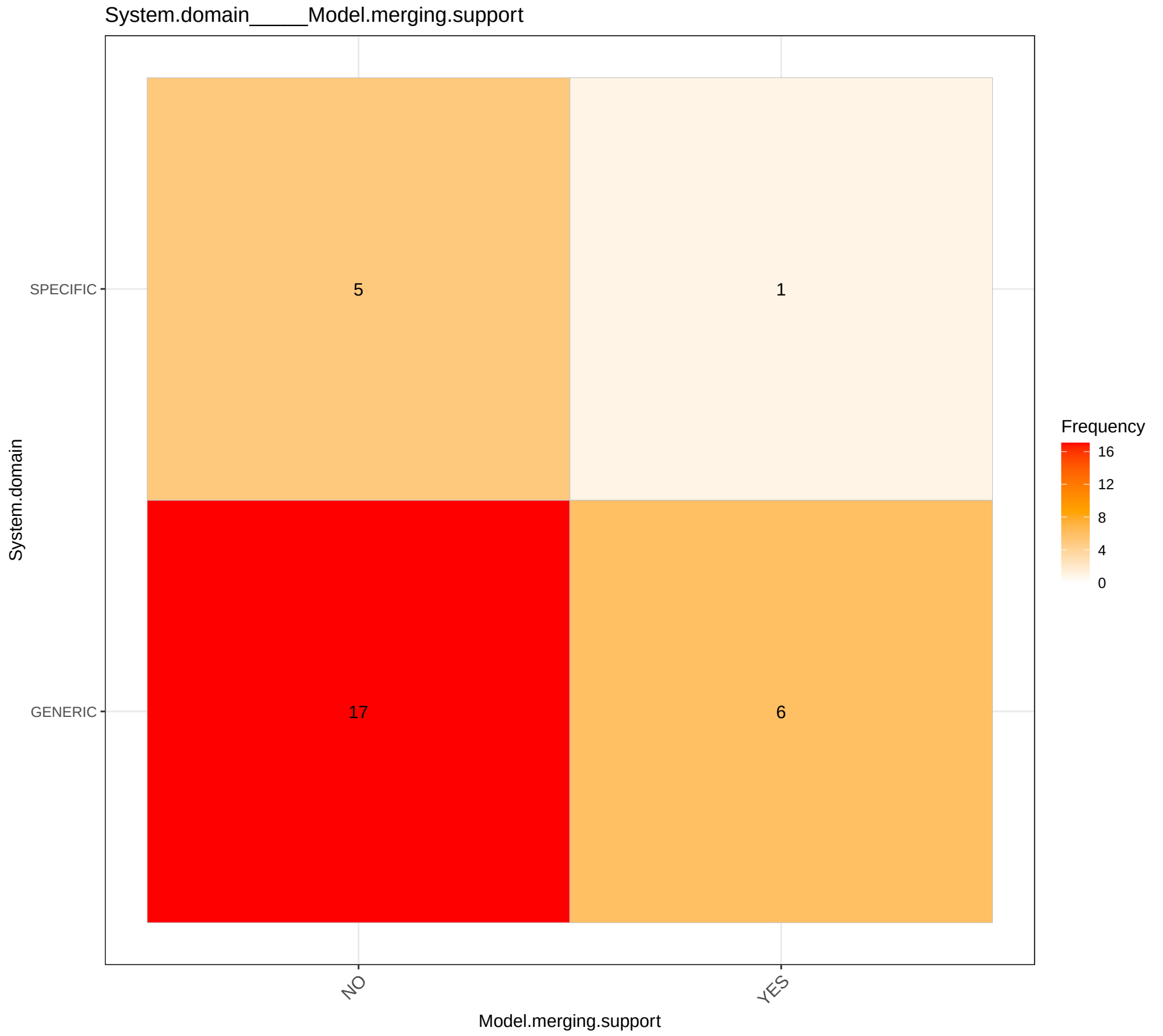

System.domain_____Locking
SPECIFIC
GENERIC
System.domain
5
0
1
17
2
4
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
16
12
8
4
0

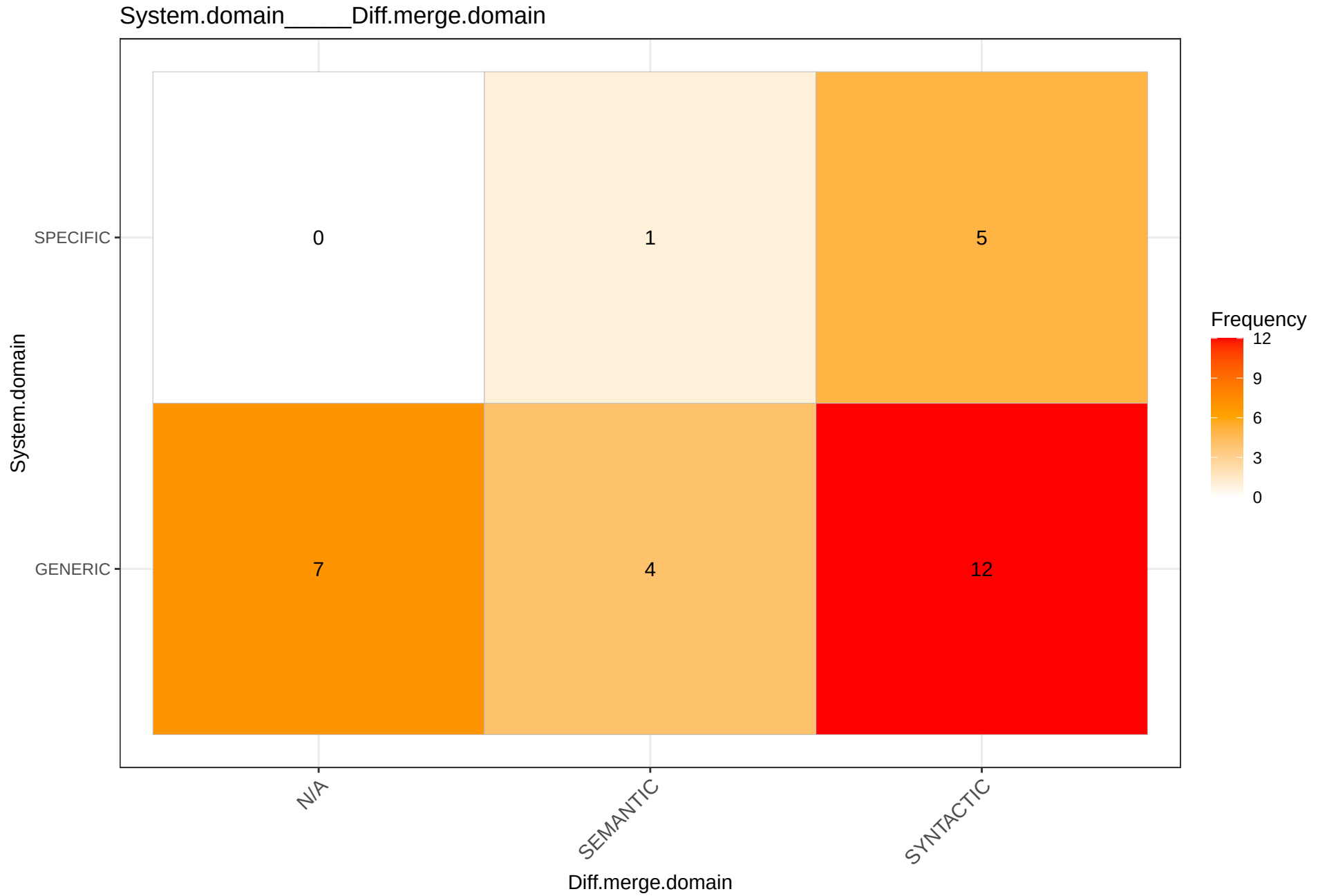

System.domain_____Versioning.support
SPECIFIC
GENERIC
System.domain
1
0
1
4
3
3
2
15
Frequency
15
10
5
0
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support

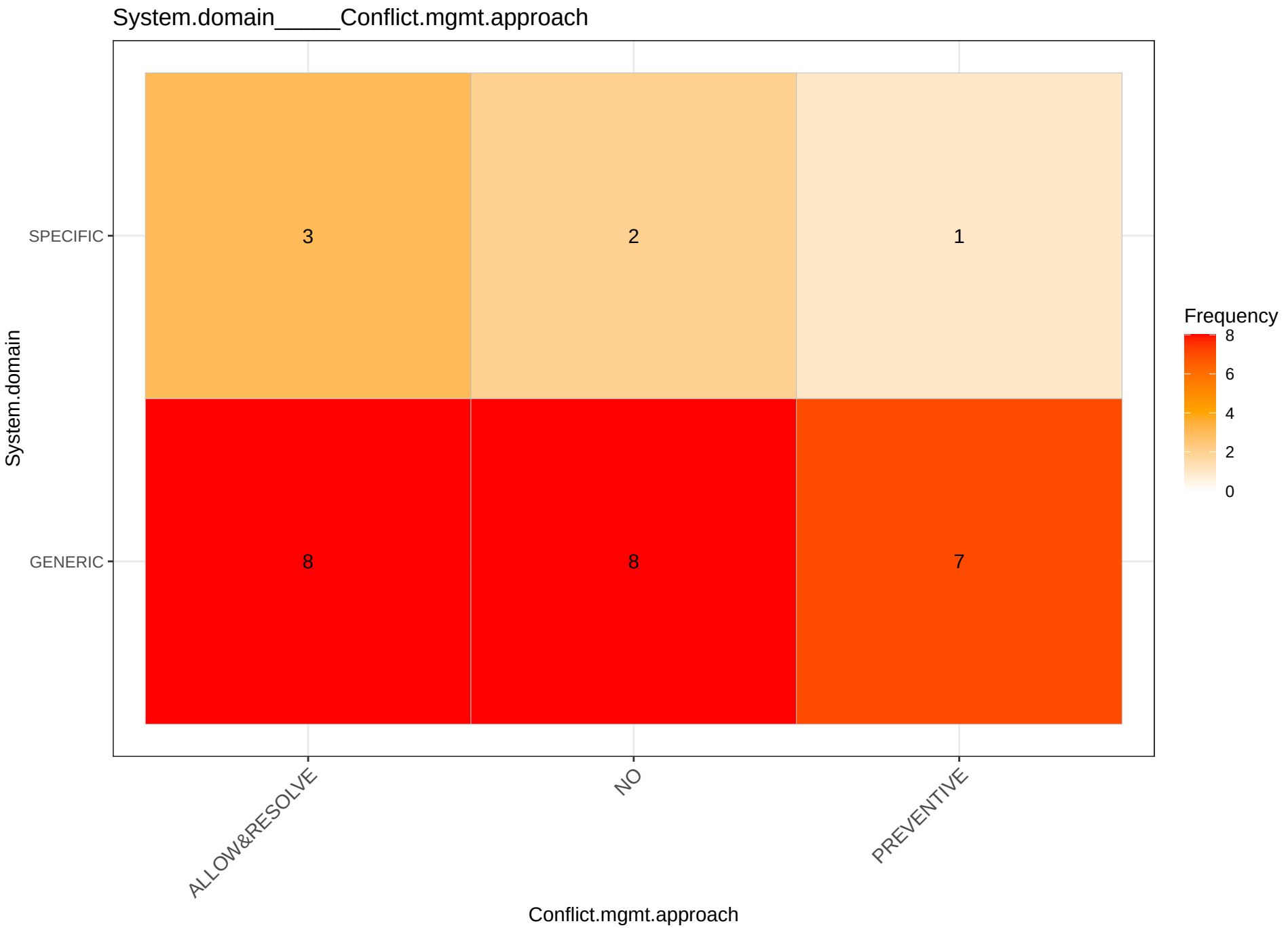

System.domain_____VCS.architecture
SPECIFIC
GENERIC
System.domain
1
1
4
6
2
15
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
15
10
5
0

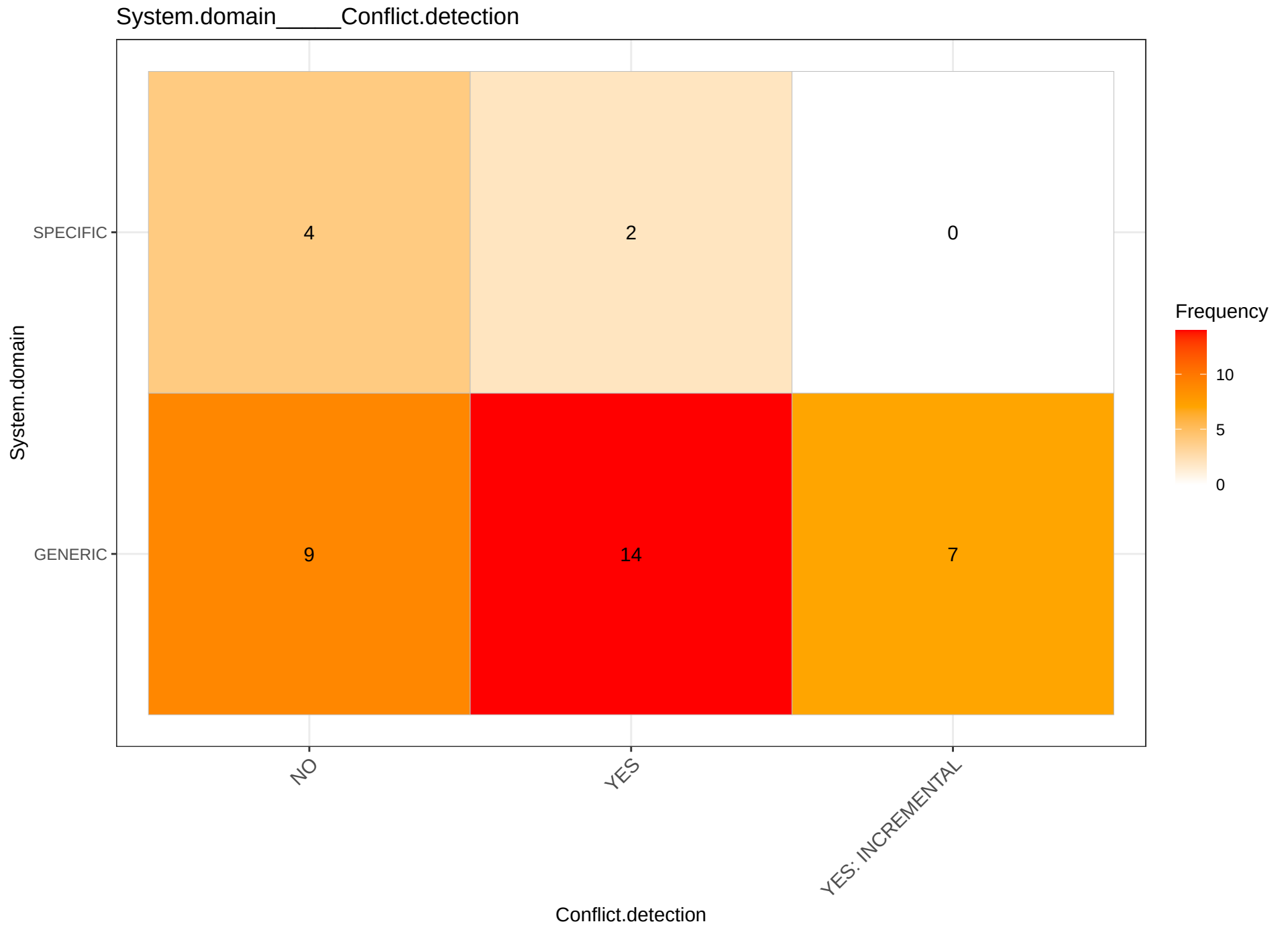

System.domain_____External.VCS.means
SPECIFIC
GENERIC
System.domain
0
1
5
0
1
4
18
3
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
15
10
5
0

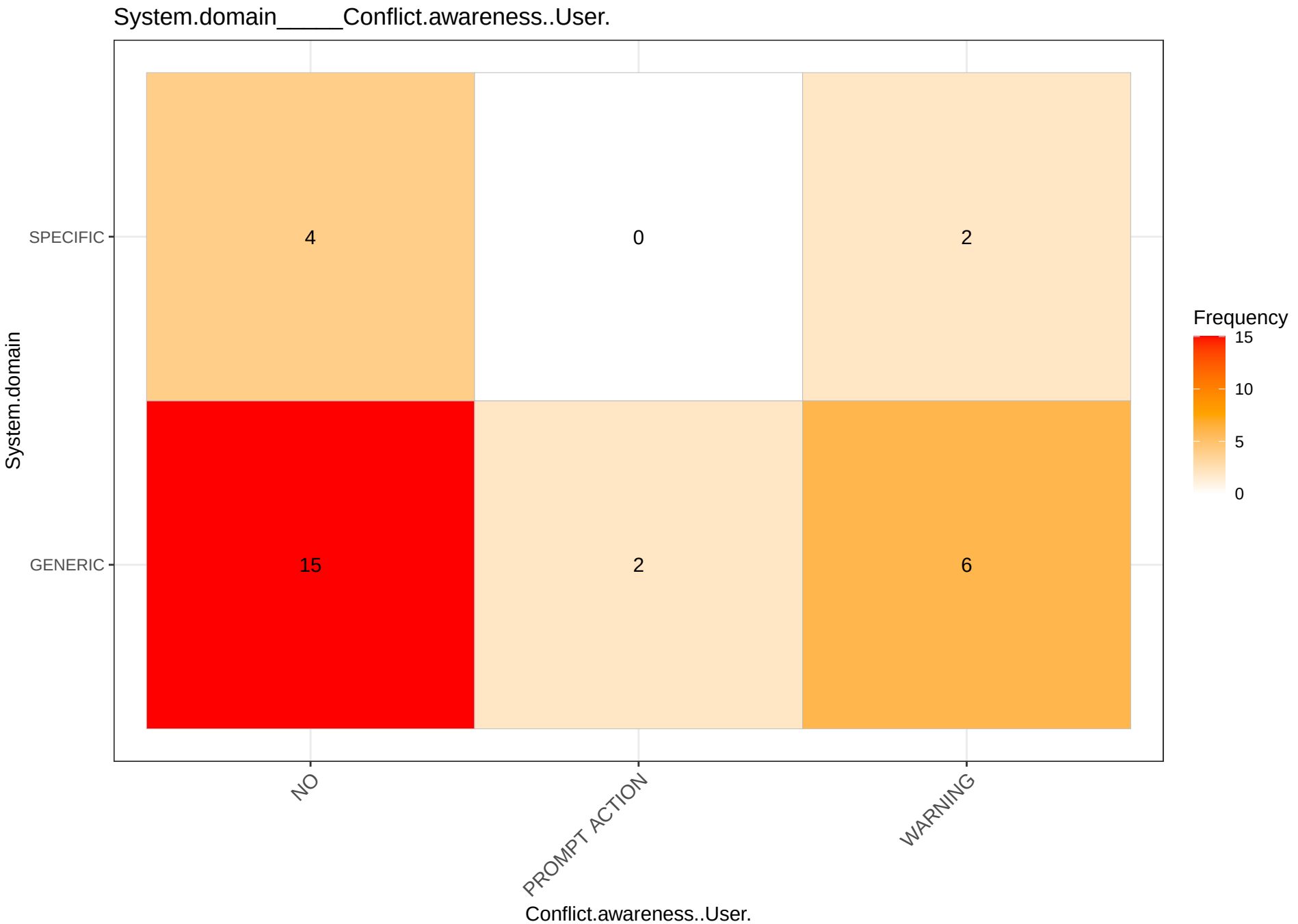

System.domain_____Branching
SPECIFIC
GENERIC
1
5
2
21
System.domain
MULTI−BRANCHING
NO
Branching
Frequency
20
15
10
5
0

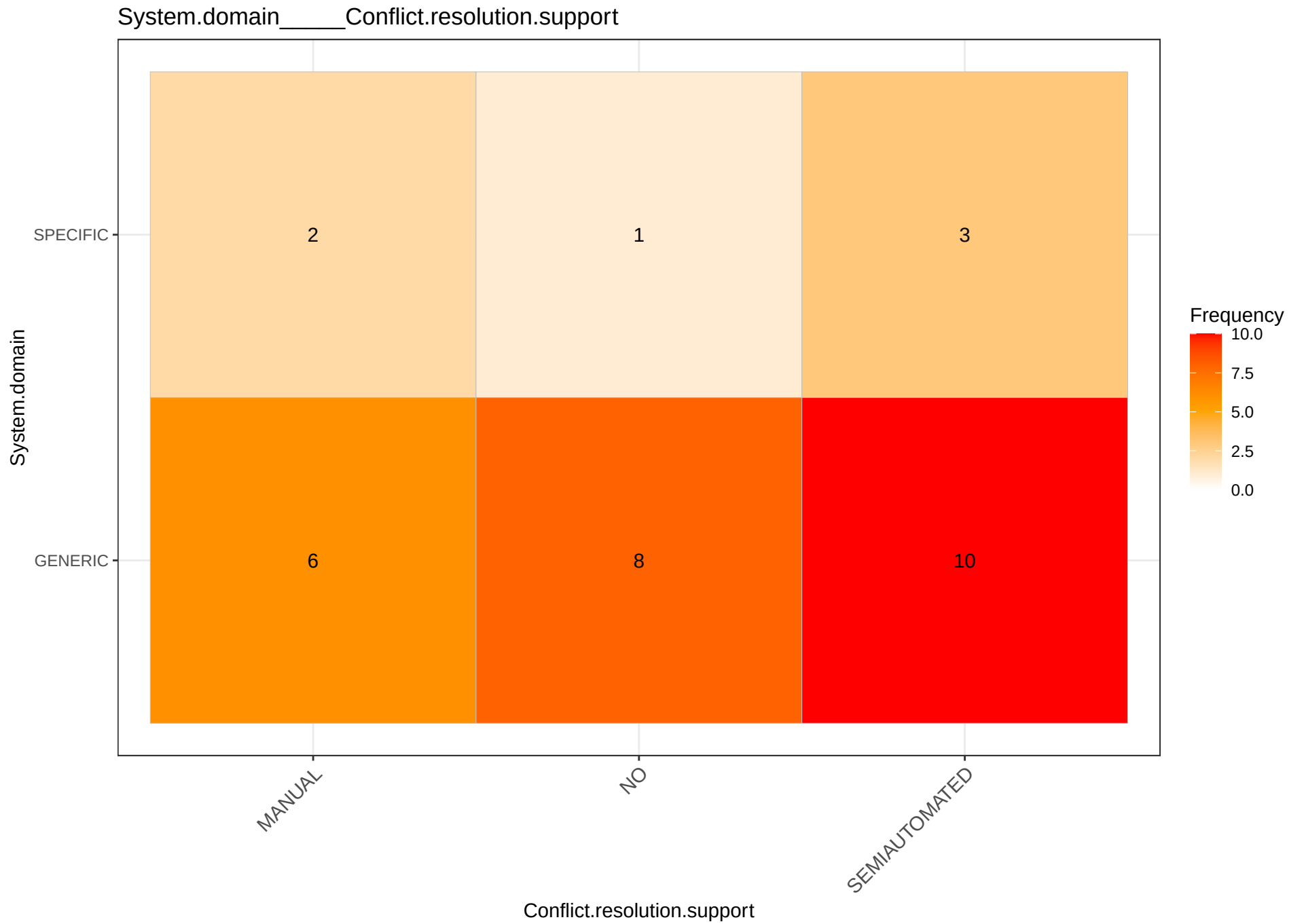

System.domain_____Model.merging.support
SPECIFIC
GENERIC
5
1
17
6
NO
YES
Model.merging.support
System.domain
Frequency
16
12
8
4
0

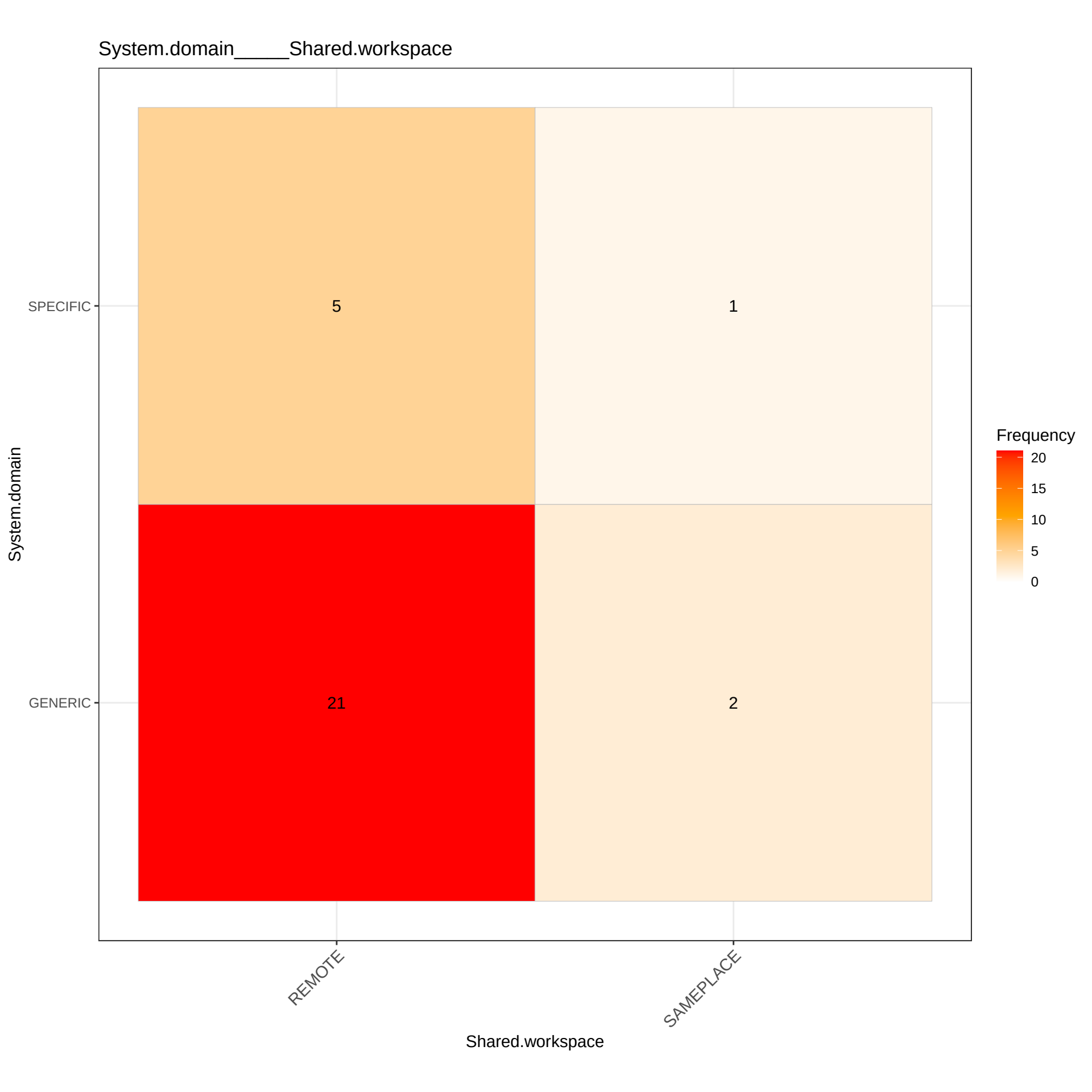

System.domain_____Diff.merge.domain
SPECIFIC
GENERIC
System.domain
0
1
5
7
4
12
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0

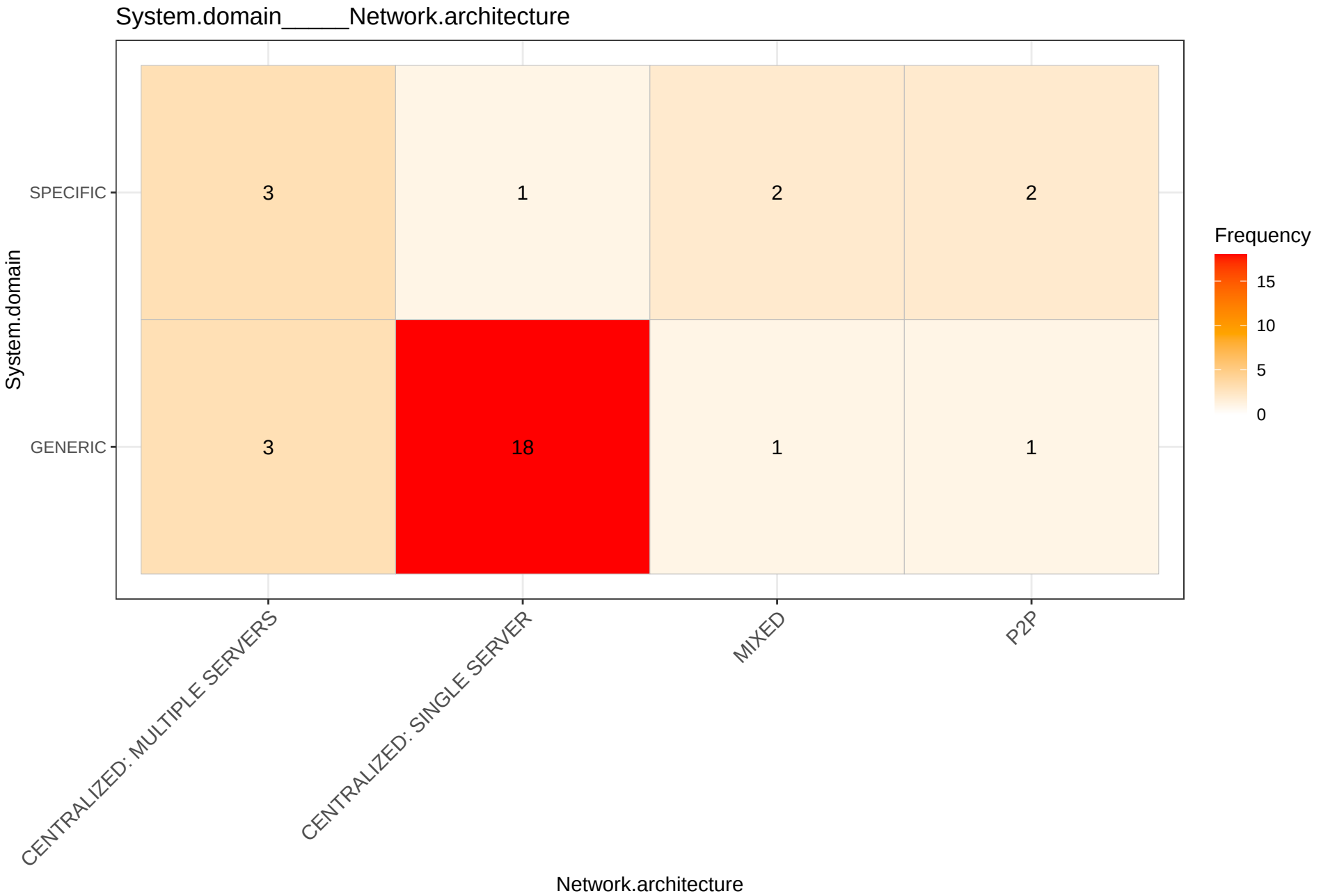

System.domain_____Conflict.mgmt.approach
SPECIFIC
GENERIC
System.domain
3
2
1
8
8
7
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

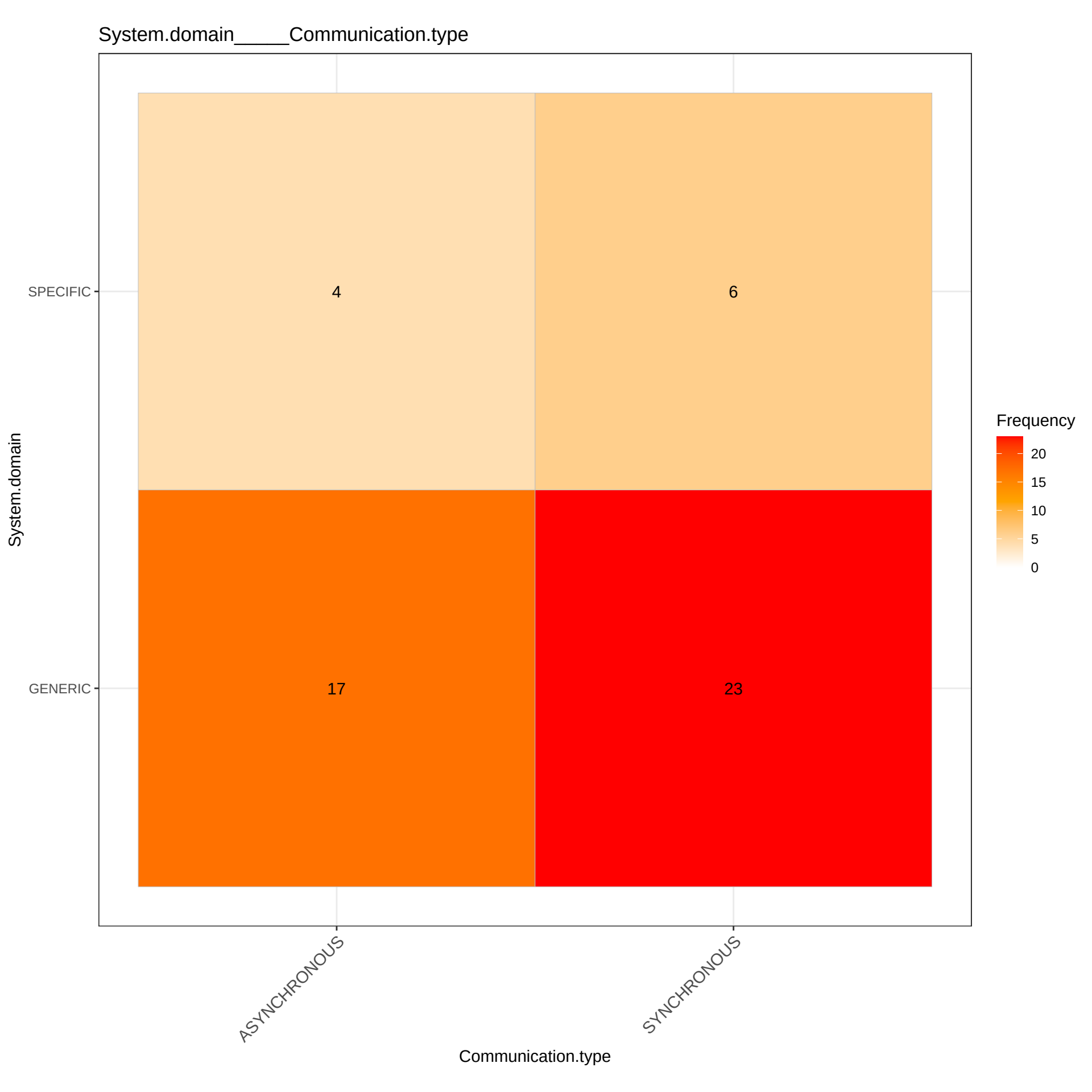

System.domain_____Conflict.detection
SPECIFIC
GENERIC
System.domain
4
2
0
9
14
7
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10
5
0

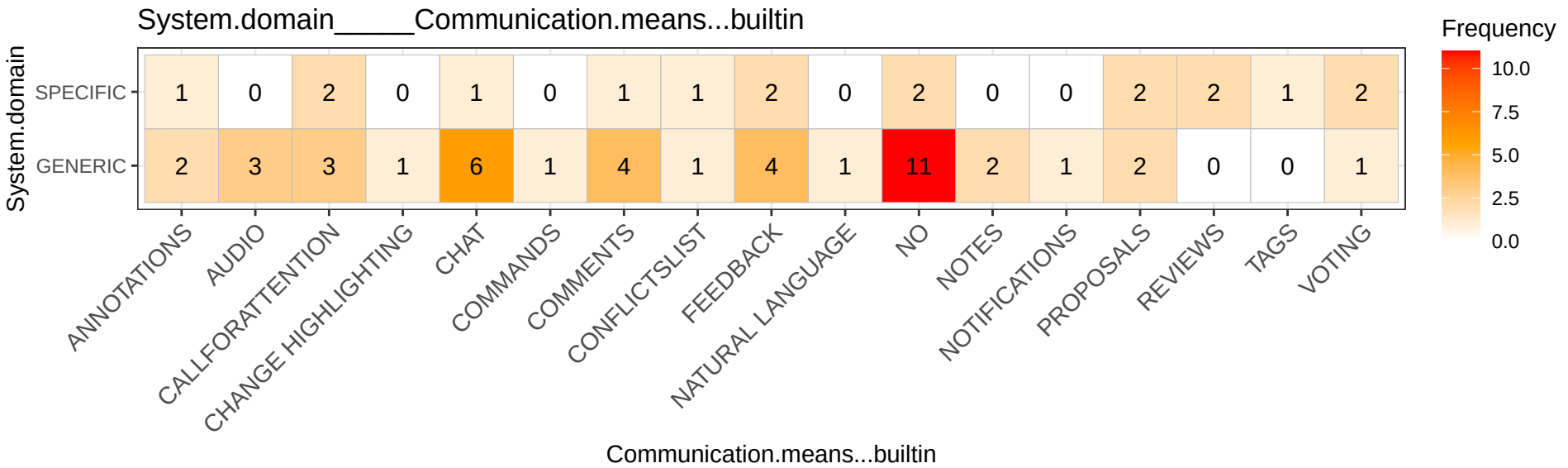

System.domain_____Conflict.awareness..User.
SPECIFIC
GENERIC
4
0
2
15
2
6
NO
PROMPT ACTION
WARNING
System.domain
Conflict.awareness..User.
Frequency
15
10
5
0

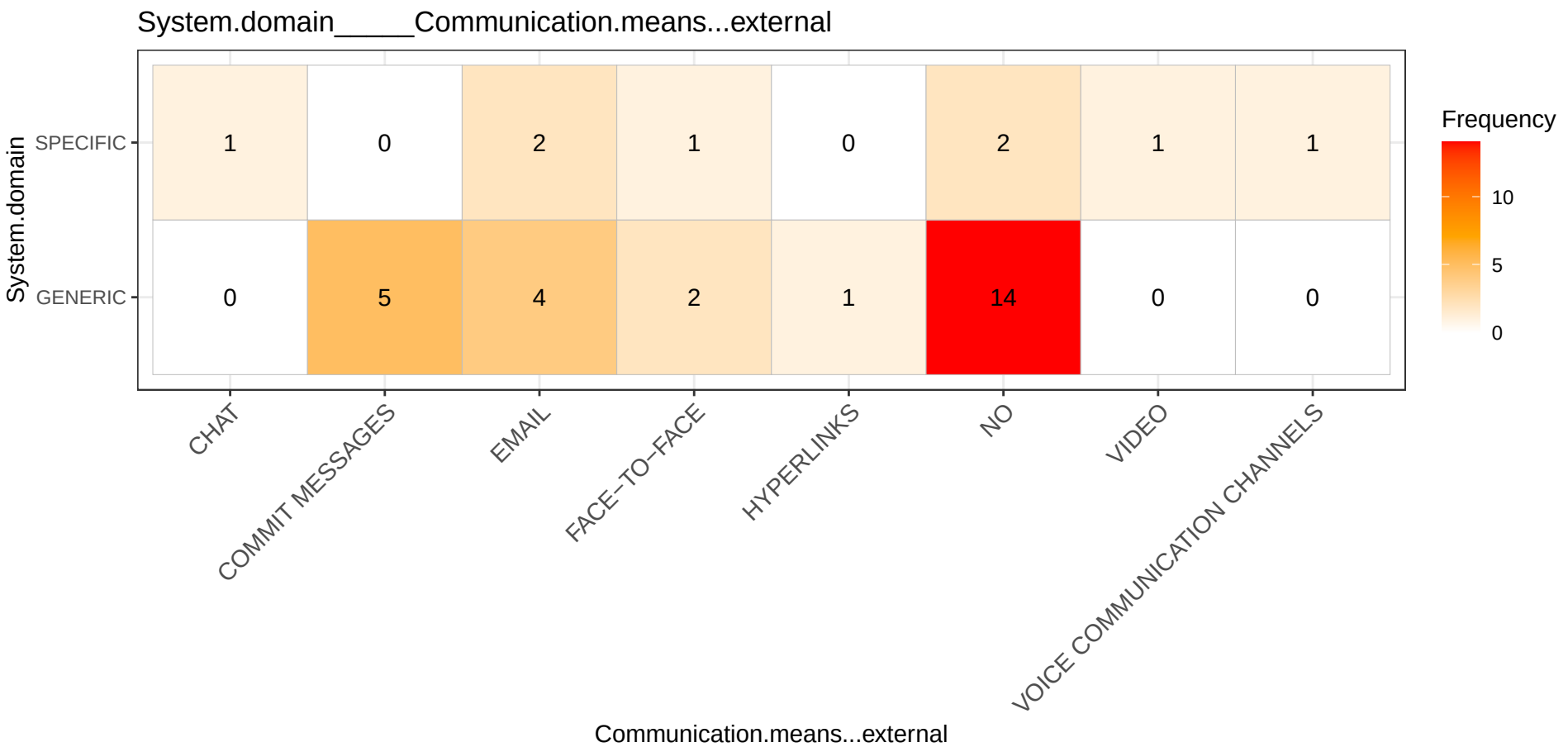

System.domain_____Conflict.resolution.support
SPECIFIC
GENERIC
System.domain
2
1
3
6
8
10
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
10.0
7.5
5.0
2.5
0.0

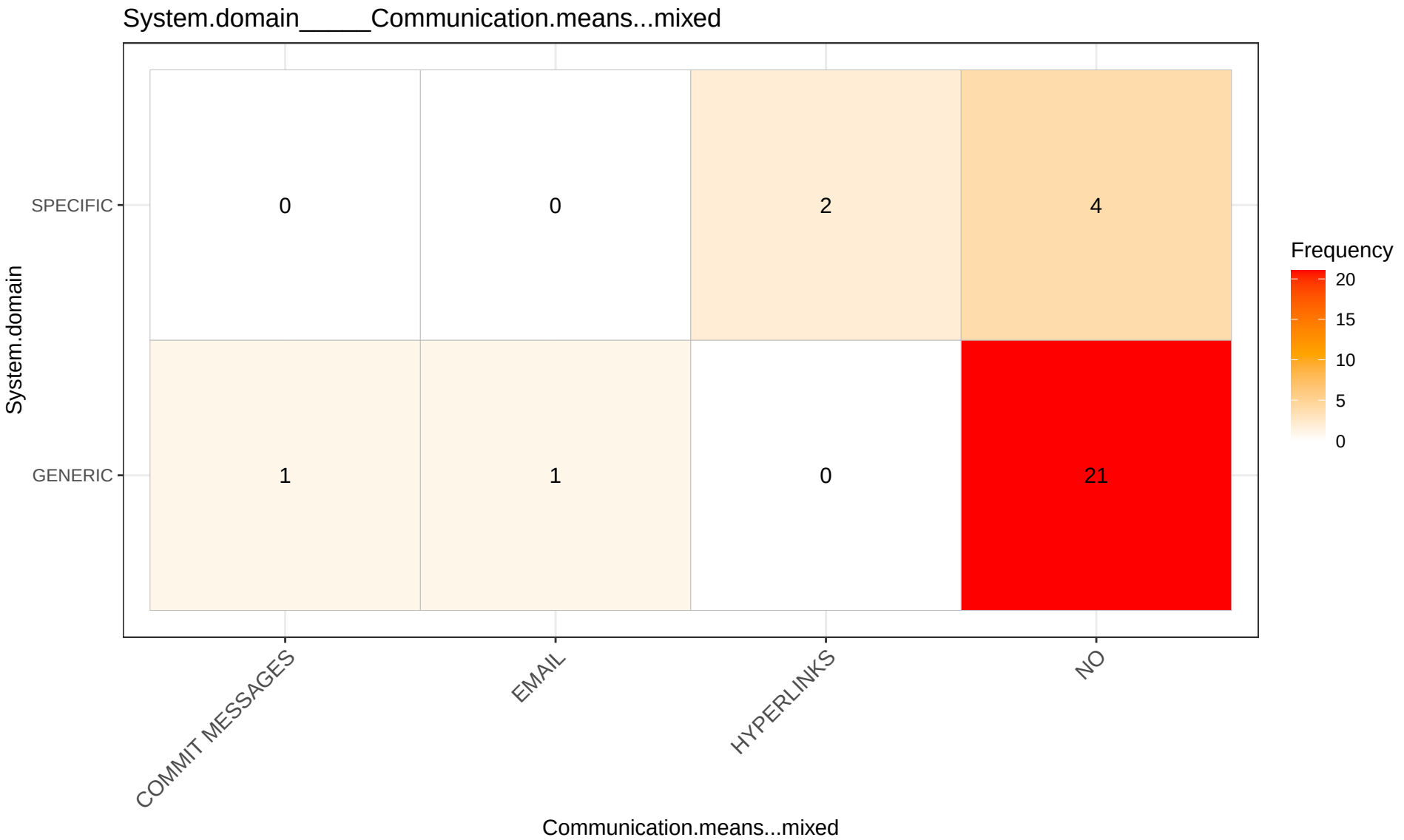

System.domain_____Shared.workspace
SPECIFIC
GENERIC
5
1
21
2
System.domain
REMOTE
SAMEPLACE
Shared.workspace
Frequency
20
15
10
5
0

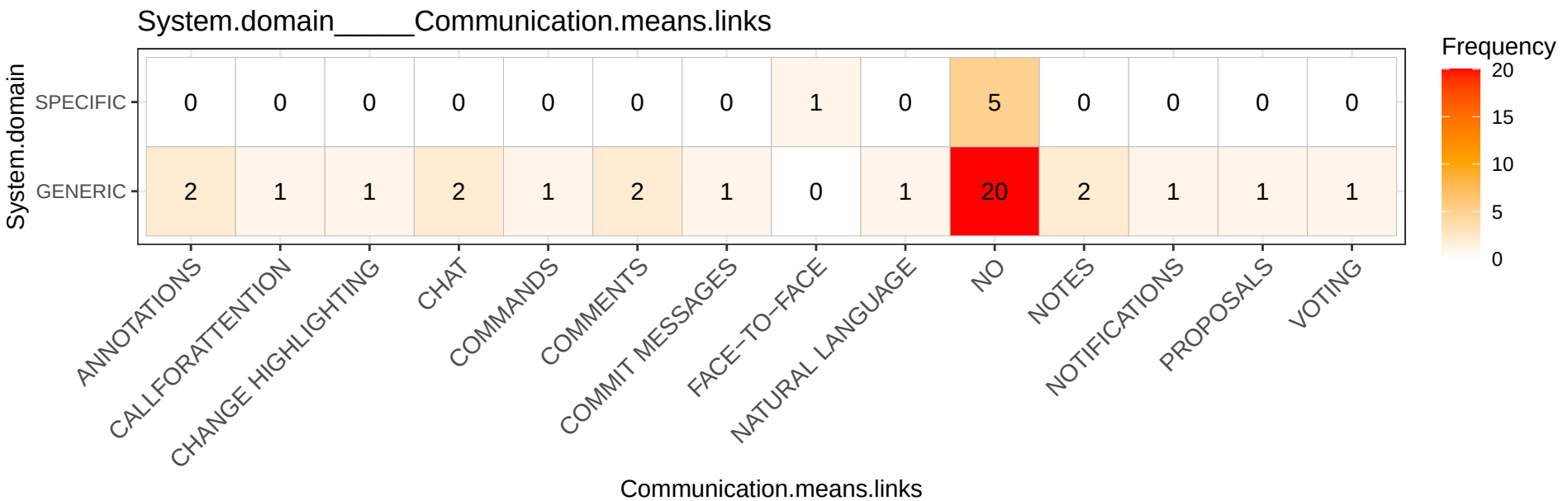

System.domain_____Network.architecture
SPECIFIC
GENERIC
System.domain
3
1
2
2
3
18
1
1
Frequency
15
10
5
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture

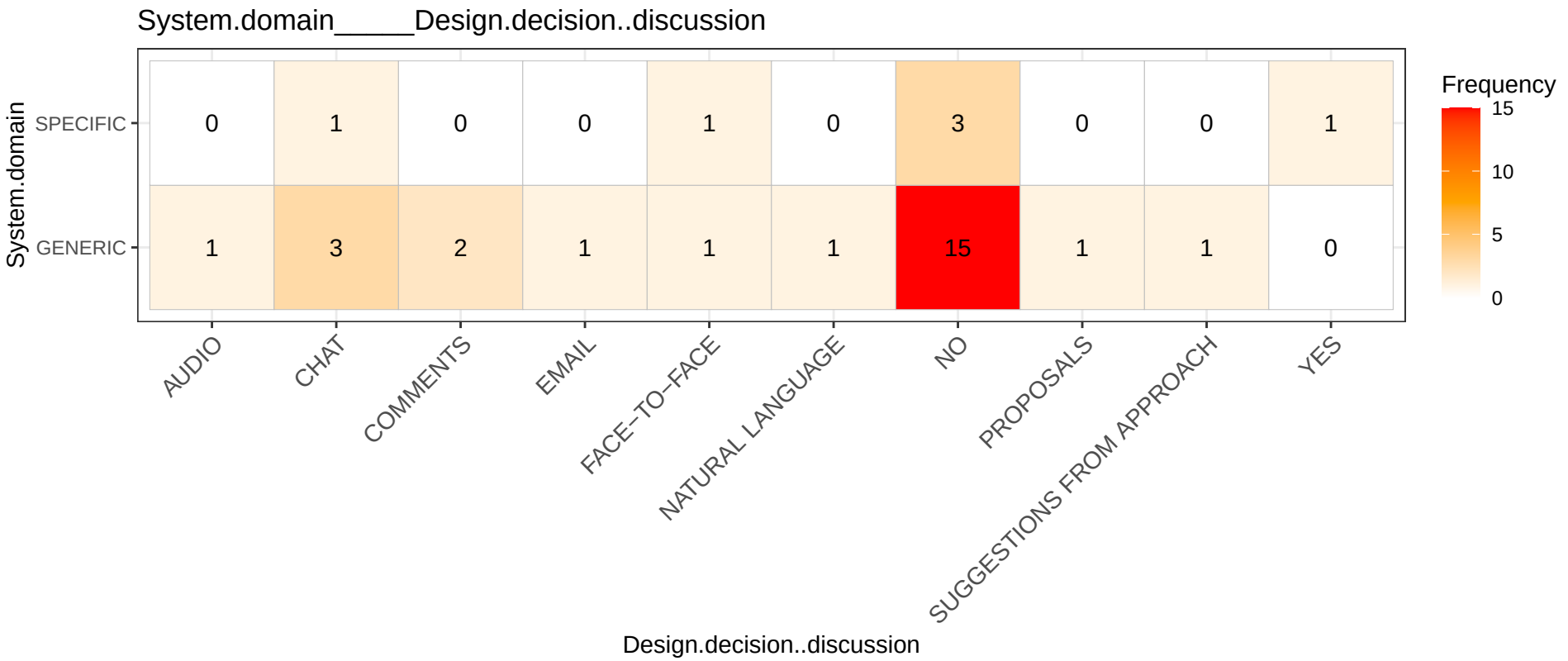

System.domain_____Communication.type
SPECIFIC
GENERIC
4
6
17
23
System.domain
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
20
15
10
5
0


System.domain_____Communication.means...builtin
System.domain
SPECIFIC
GENERIC
1 0 2 0 1 0 1 1 2 0 2 0 0 2 2 1 2
2 3 3 1 6 1 4 1 4 1 11 2 1 2 0 0 1
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
10.0
7.5
5.0
2.5
0.0


System.domain_____Communication.means...external
System.domain
SPECIFIC
GENERIC
1
0
2
1
0
2
1
1
0
5
4
2
1
14
0
0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10
5
0


System.domain_____Communication.means...mixed
SPECIFIC
GENERIC
System.domain
0
0
2
4
1
1
0
21
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
20
15
10
5
0


System.domain_____Communication.means.links
System.domain
SPECIFIC
GENERIC
0 0 0 0 0 0 0 1 0 5 0 0 0 0
2 1 1 2 1 2 1 0 1 20 2 1 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
20
15
10
5
0


System.domain_____Design.decision..discussion
System.domain
SPECIFIC
GENERIC
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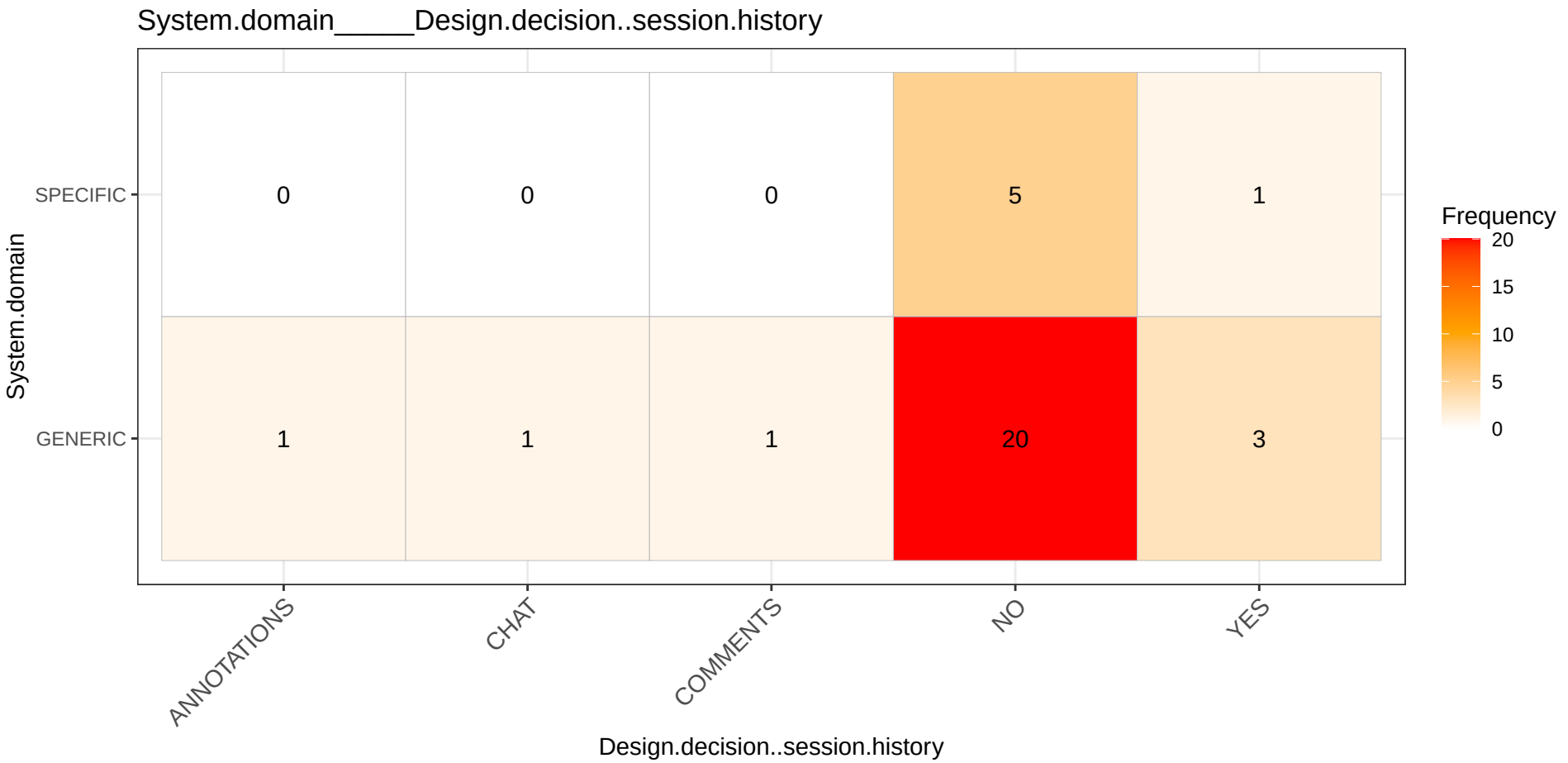
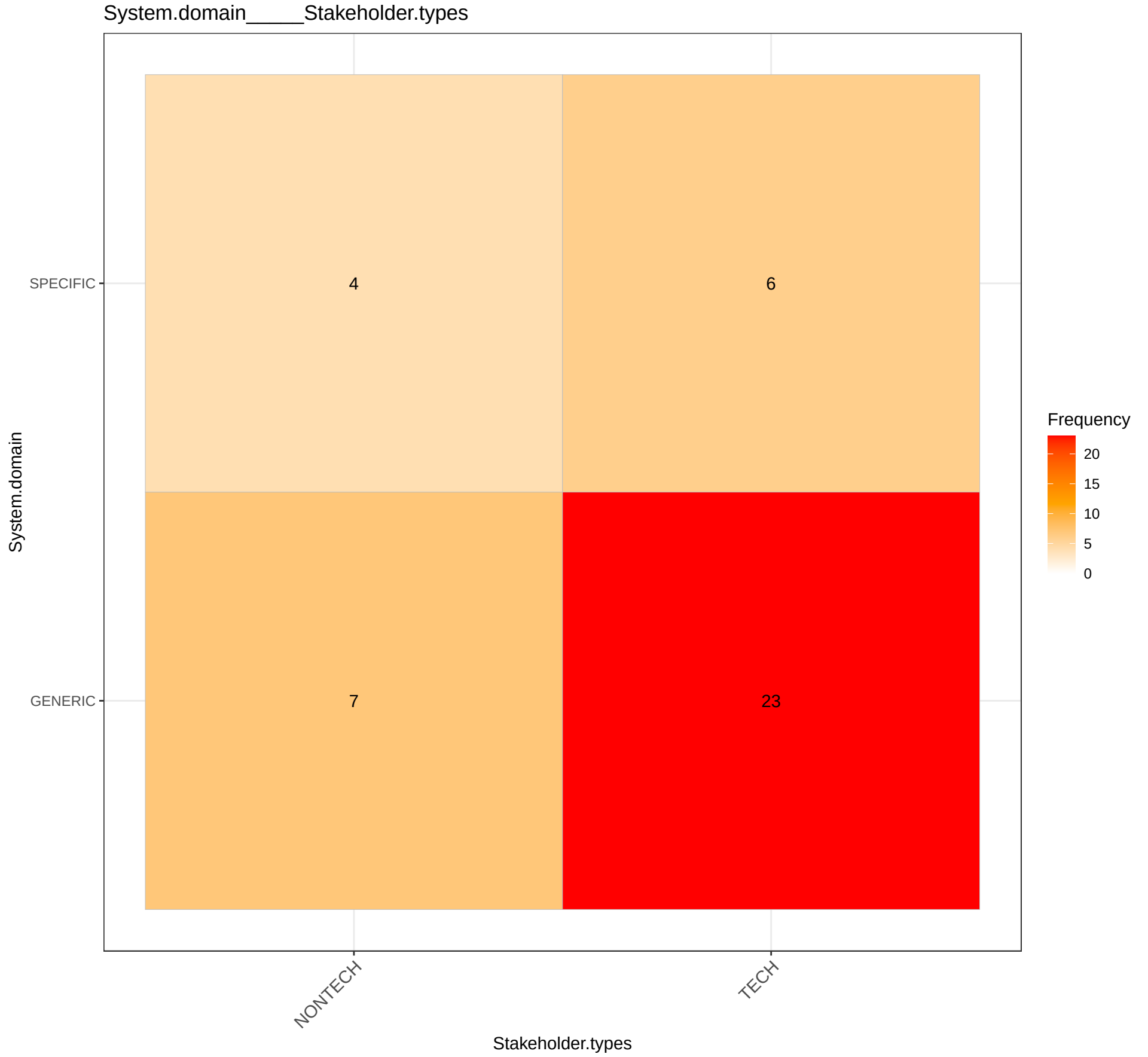
1
0
0
1
0
3
0
0
1
1
3
2
1
1
1
15
1
1
0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
15
10
5
0


System.domain_____Design.decision..session.history
SPECIFIC
GENERIC
System.domain
0
0
0
5
1
1
1
1
20
3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
20
15
10
5
0


System.domain_____Stakeholder.types
SPECIFIC
GENERIC
4
6
7
23
NONTECH
TECH
Stakeholder.types
System.domain
Frequency
20
15
10
5
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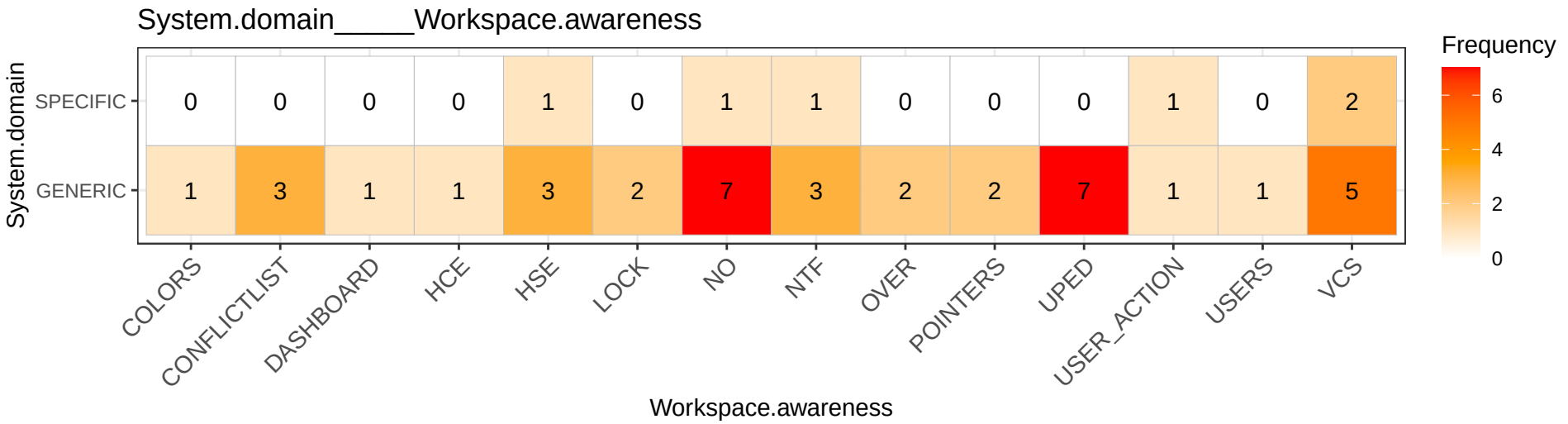
System.domain_____Workspace.awareness
System.domain
SPECIFIC
GENERIC
0 0 0 0 1 0 1 1 0 0 0 1 0 2
1 3 1 1 3 2 7 3 2 2 7 1 1 5
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
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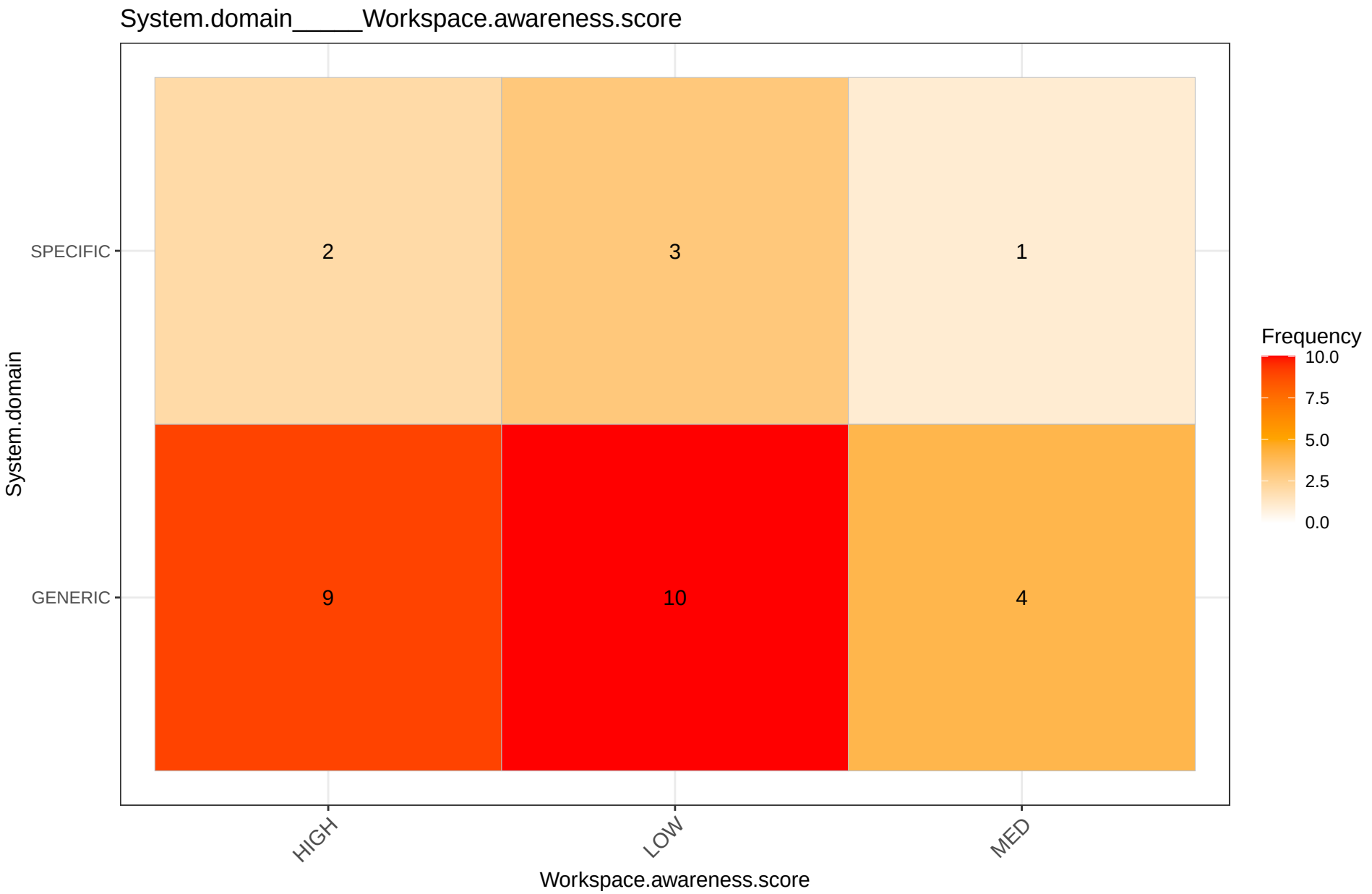
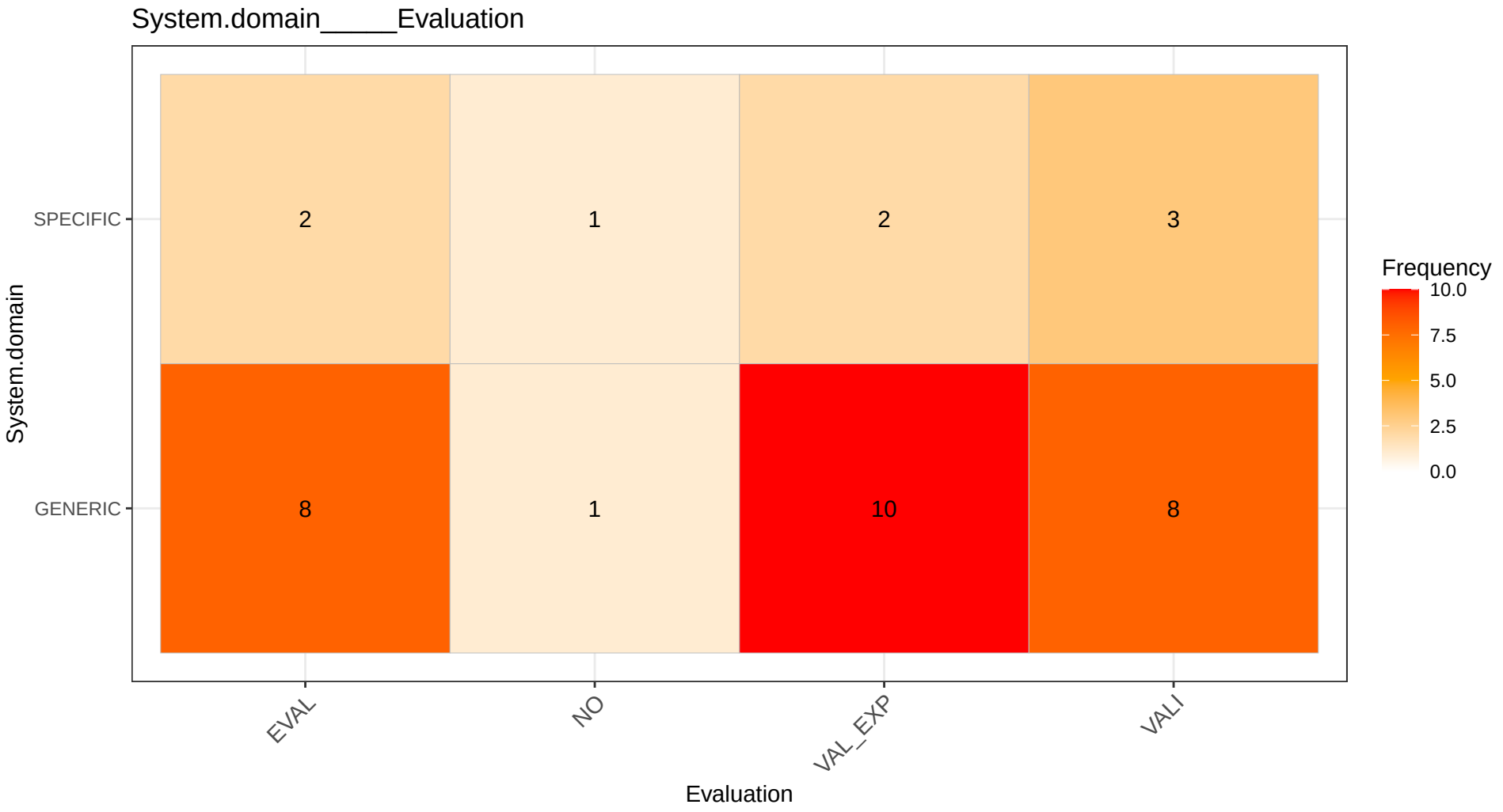
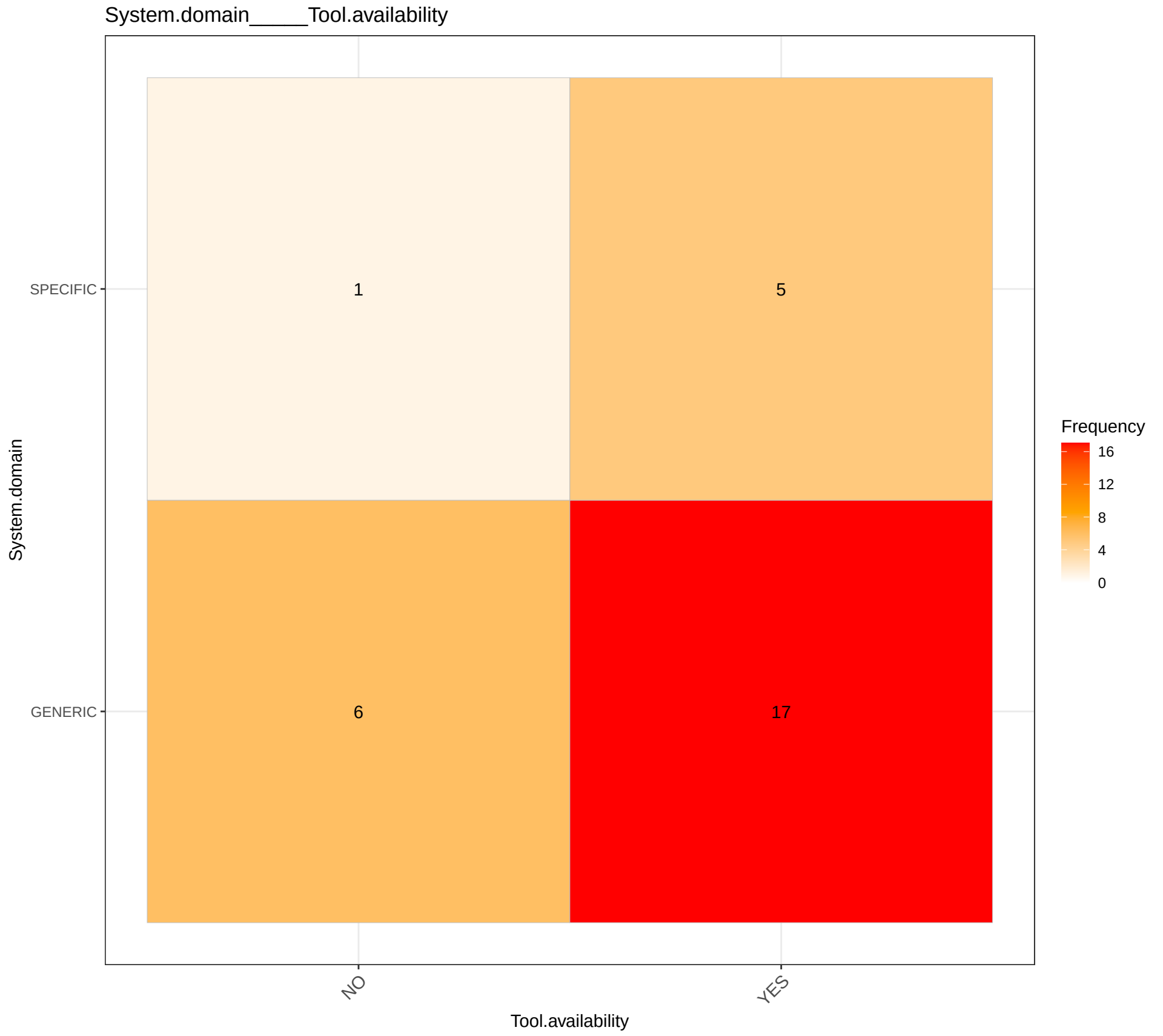
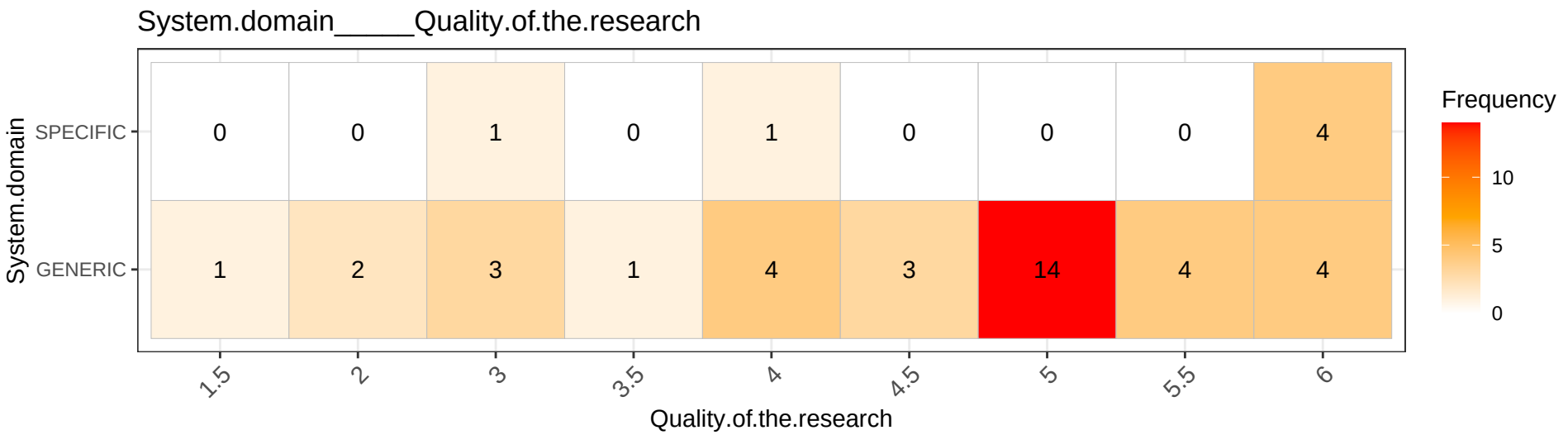
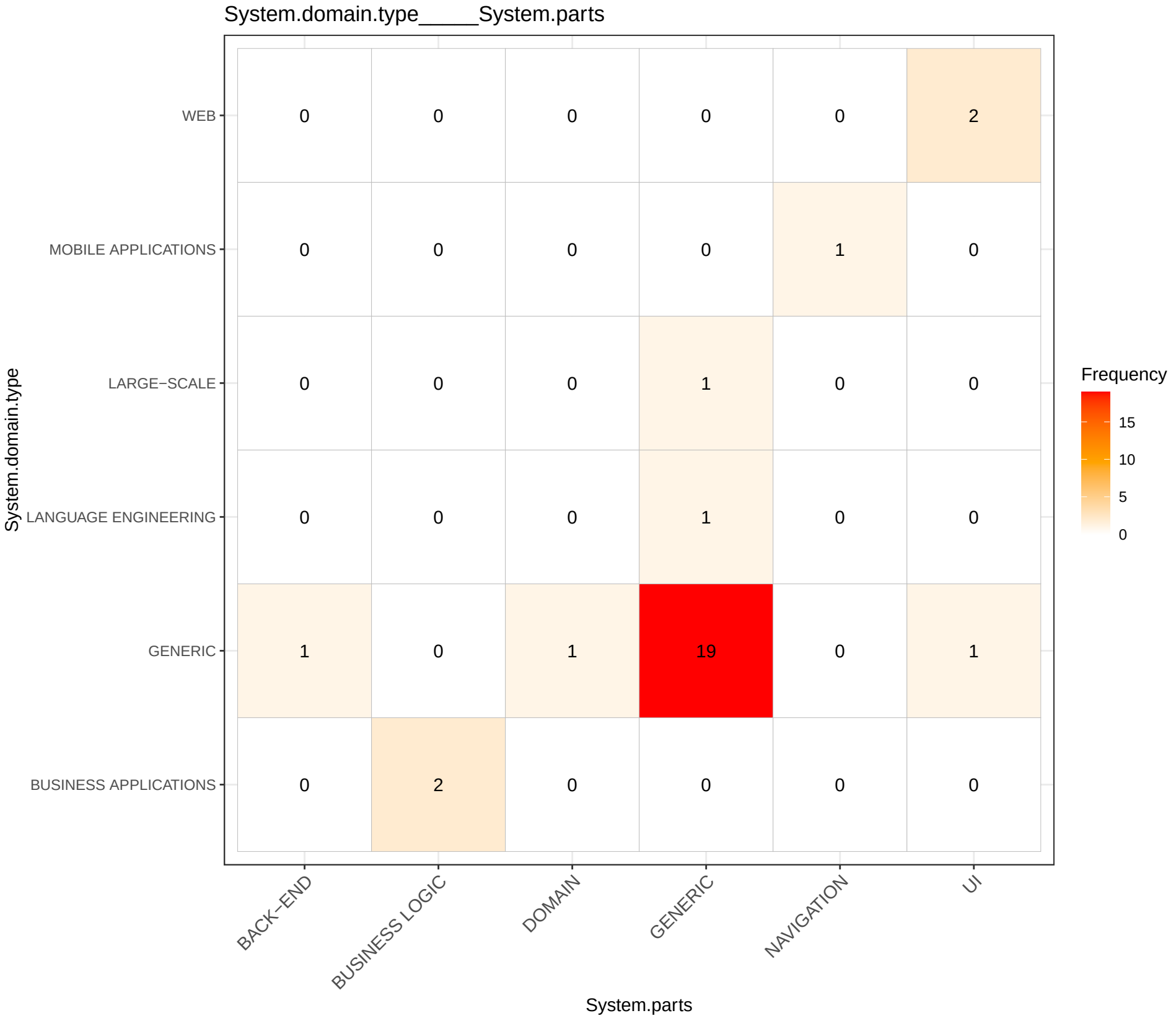
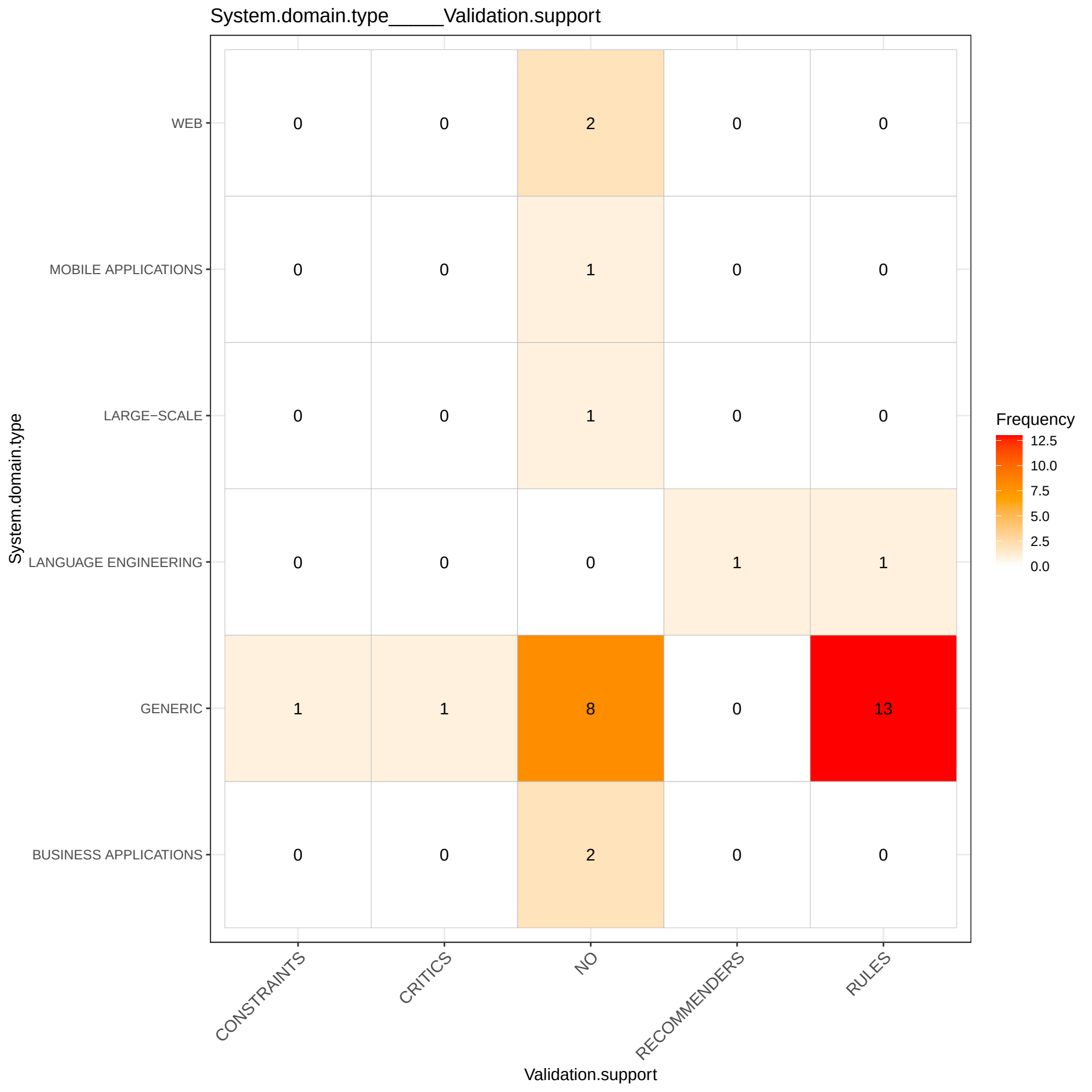

System.domain_____Workspace.awareness.score
SPECIFIC
GENERIC
System.domain
2
3
1
9
10
4
HIGH
LOW
MED
Workspace.awareness.score
Frequency
10.0
7.5
5.0
2.5
0.0

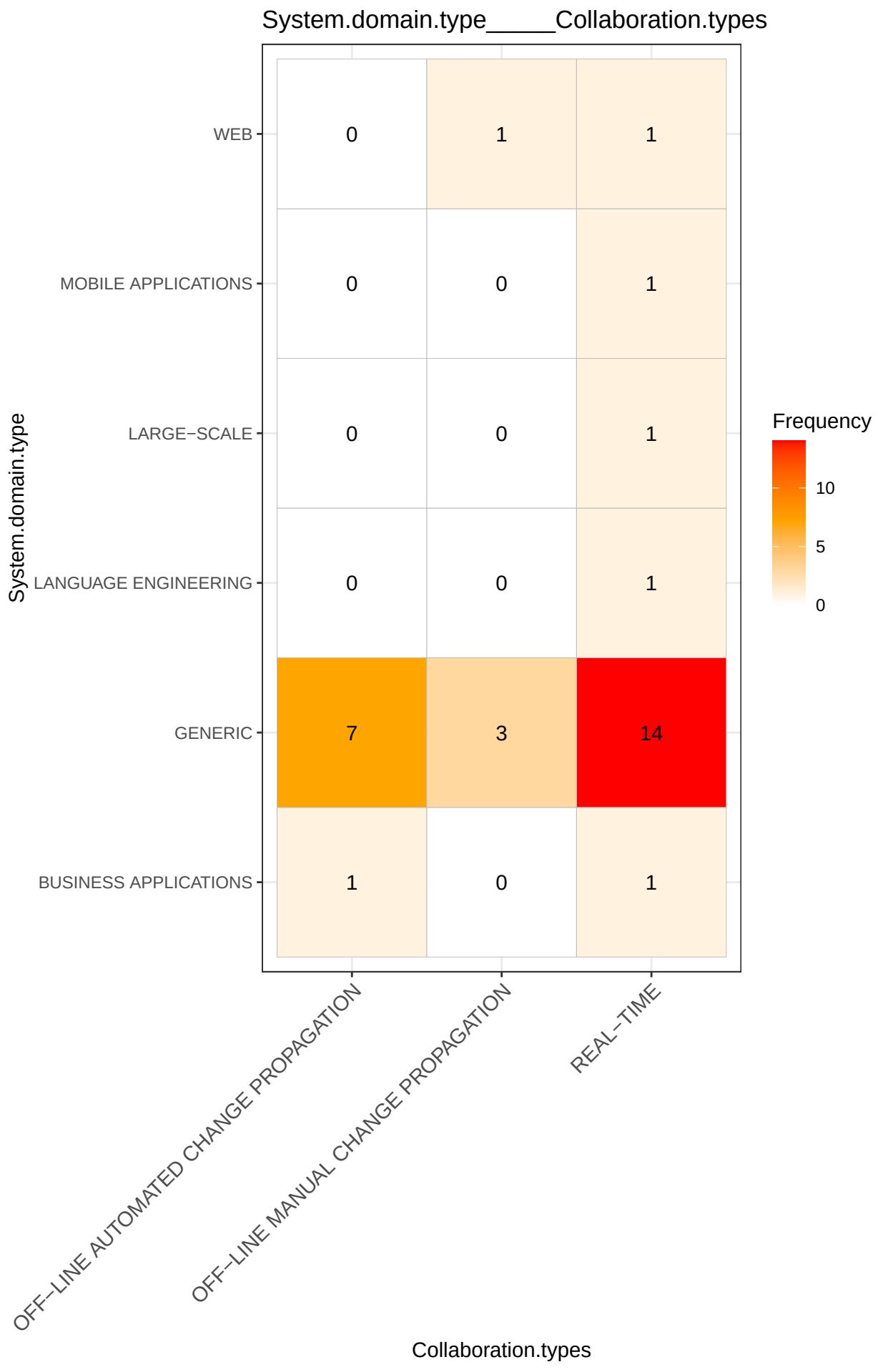

System.domain_____Evaluation
SPECIFIC
GENERIC
System.domain
2
1
2
3
8
1
10
8
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0

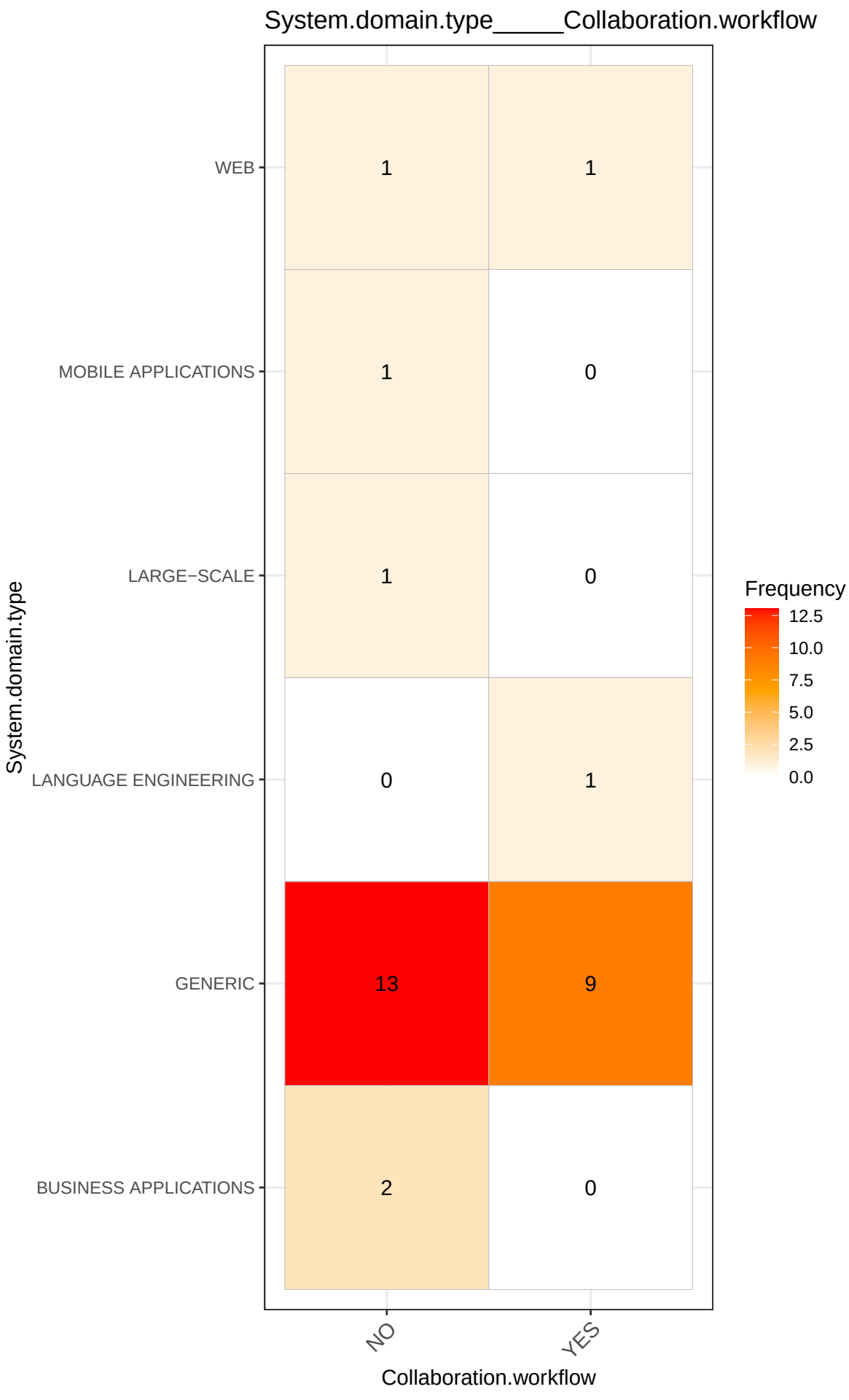

System.domain_____Tool.availability
SPECIFIC
GENERIC
1
5
6
17
NO
YES
Tool.availability
System.domain
Frequency
16
12
8
4
0

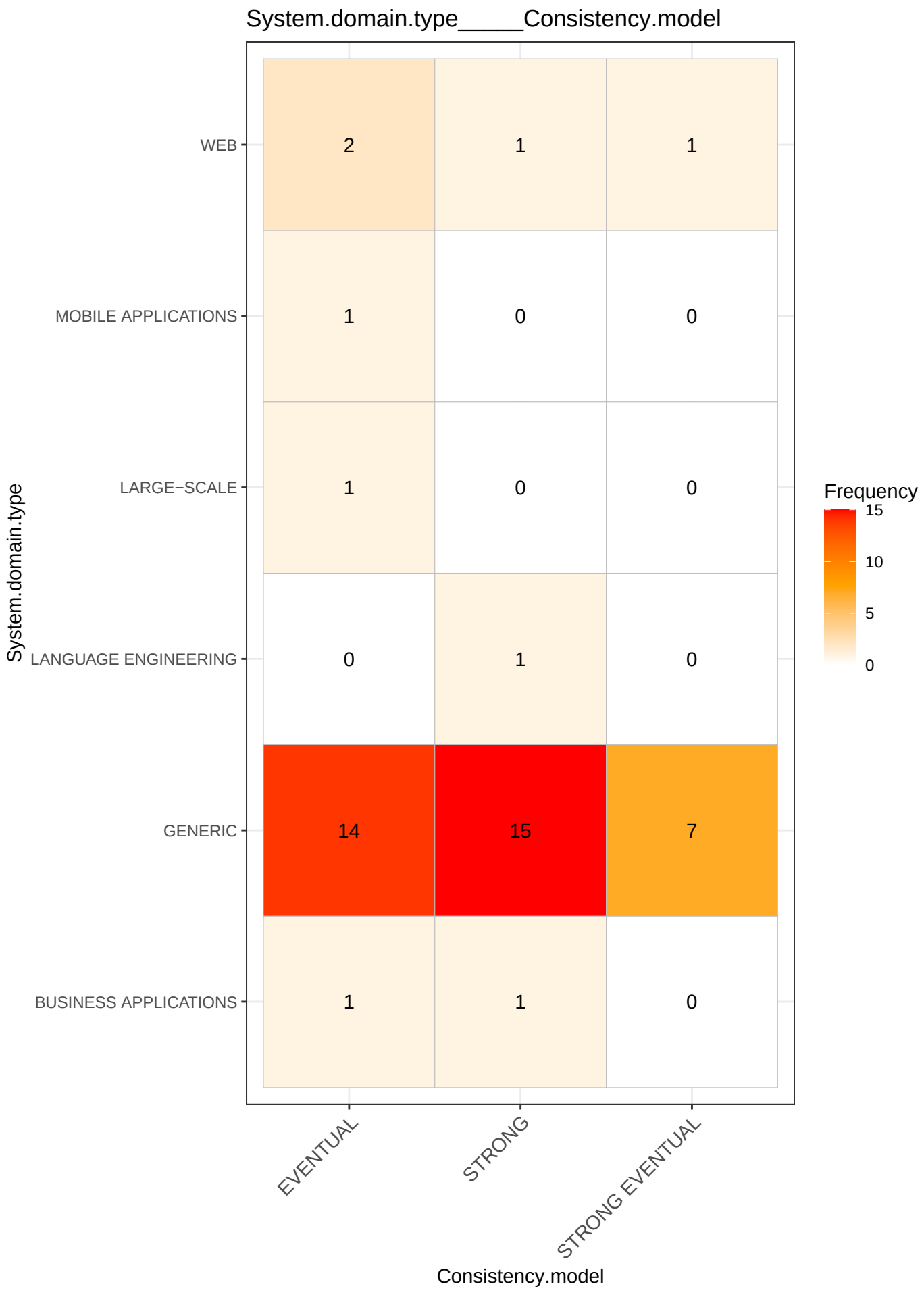

System.domain_____Quality.of.the.research
System.domain
SPECIFIC
GENERIC
0 0 1 0 1 0 0 0 4
1 2 3 1 4 3 14 4 4
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10
5
0

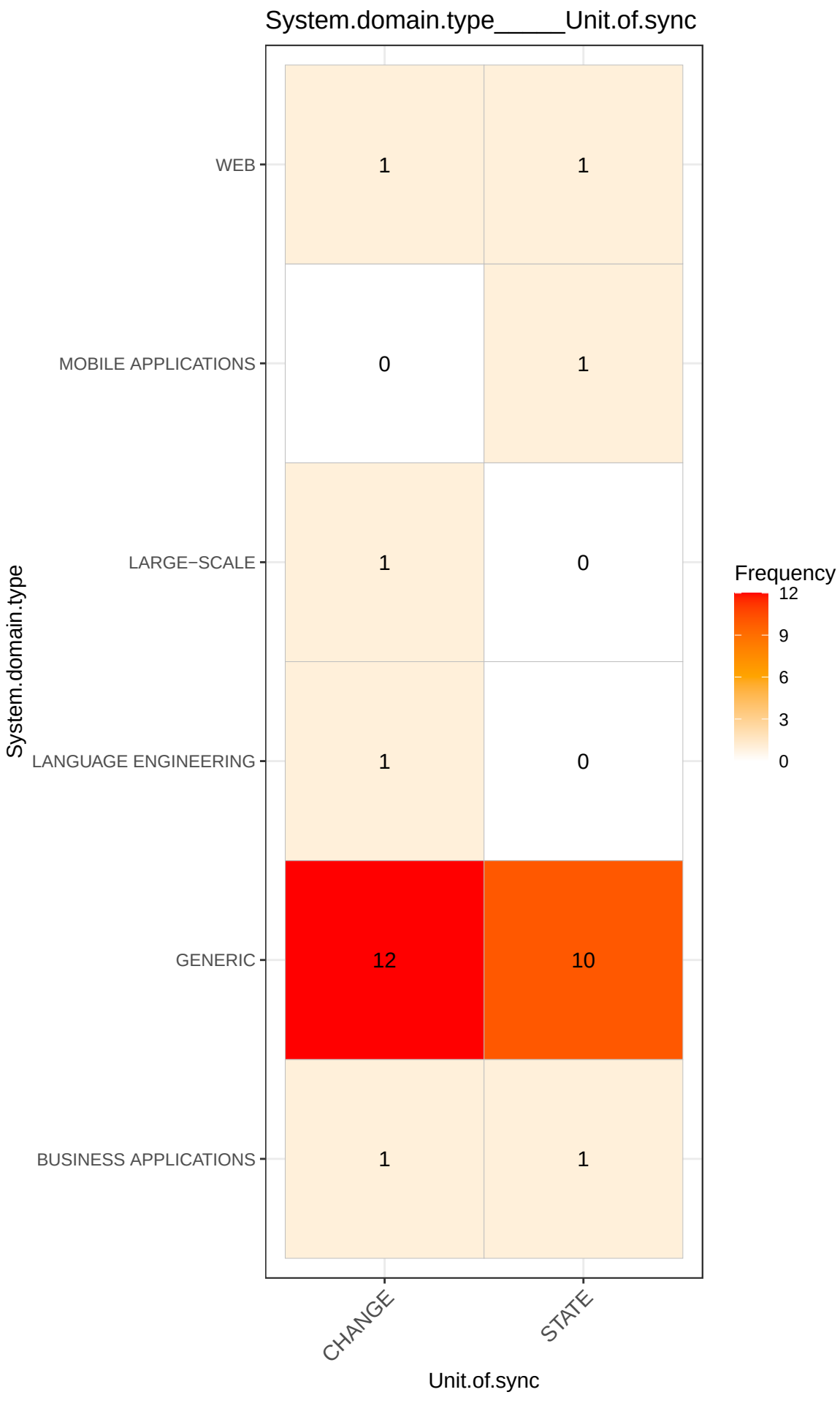

System.domain.type_____System.parts
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0 0 0 0 0 2
0 0 0 0 1 0
0 0 0 1 0 0
0 0 0 1 0 0
1 0 1 19 0 1
0 2 0 0 0 0
BACK−END
BUSINESS LOGIC
DOMAIN
GENERIC
NAVIGATION
UI
System.parts
Frequency
15
10
5
0

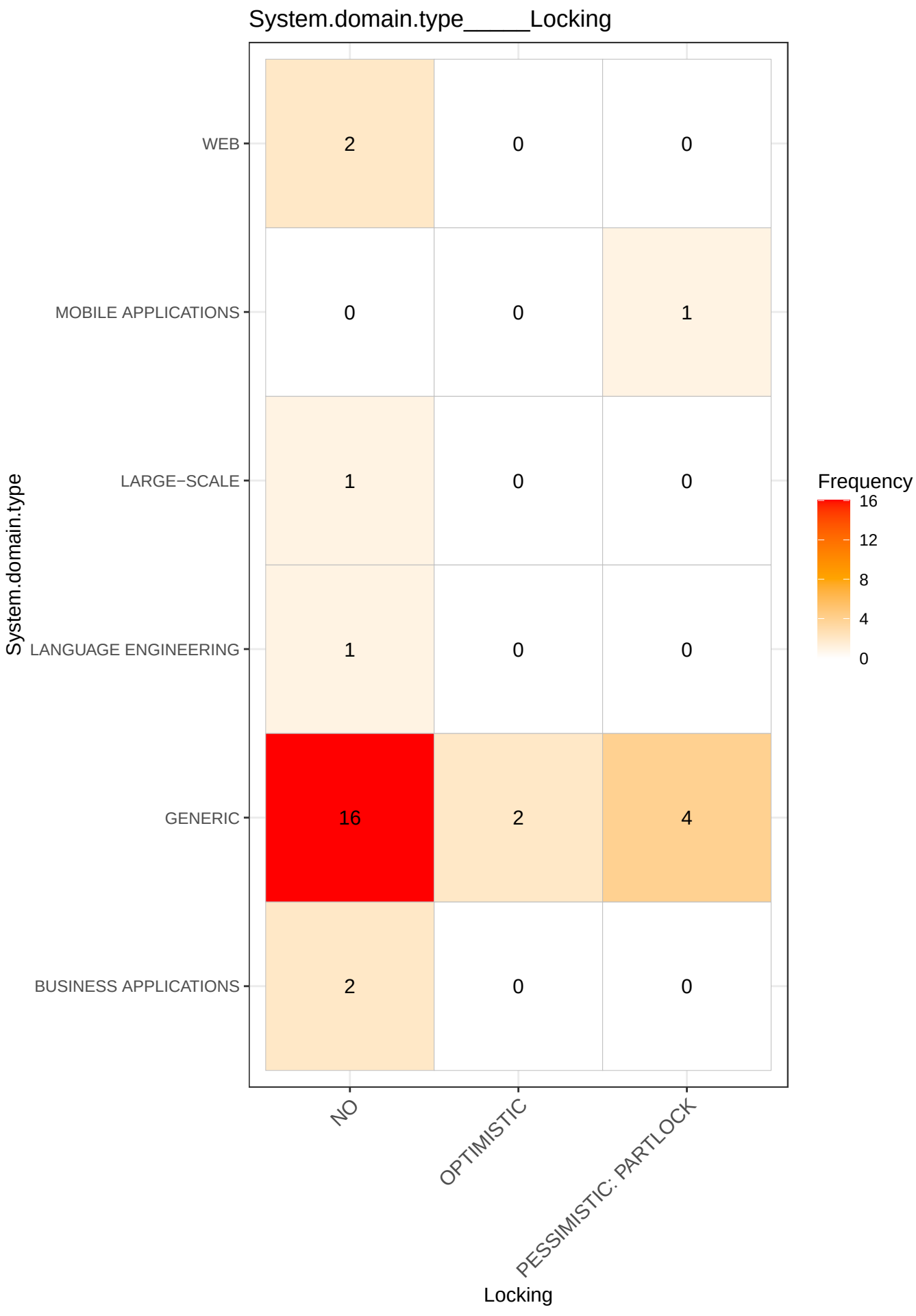

System.domain.type_____Validation.support
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0 0 2 0 0
0 0 1 0 0
0 0 1 0 0
0 0 0 1 1
1 1 8 0 13
0 0 2 0 0
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

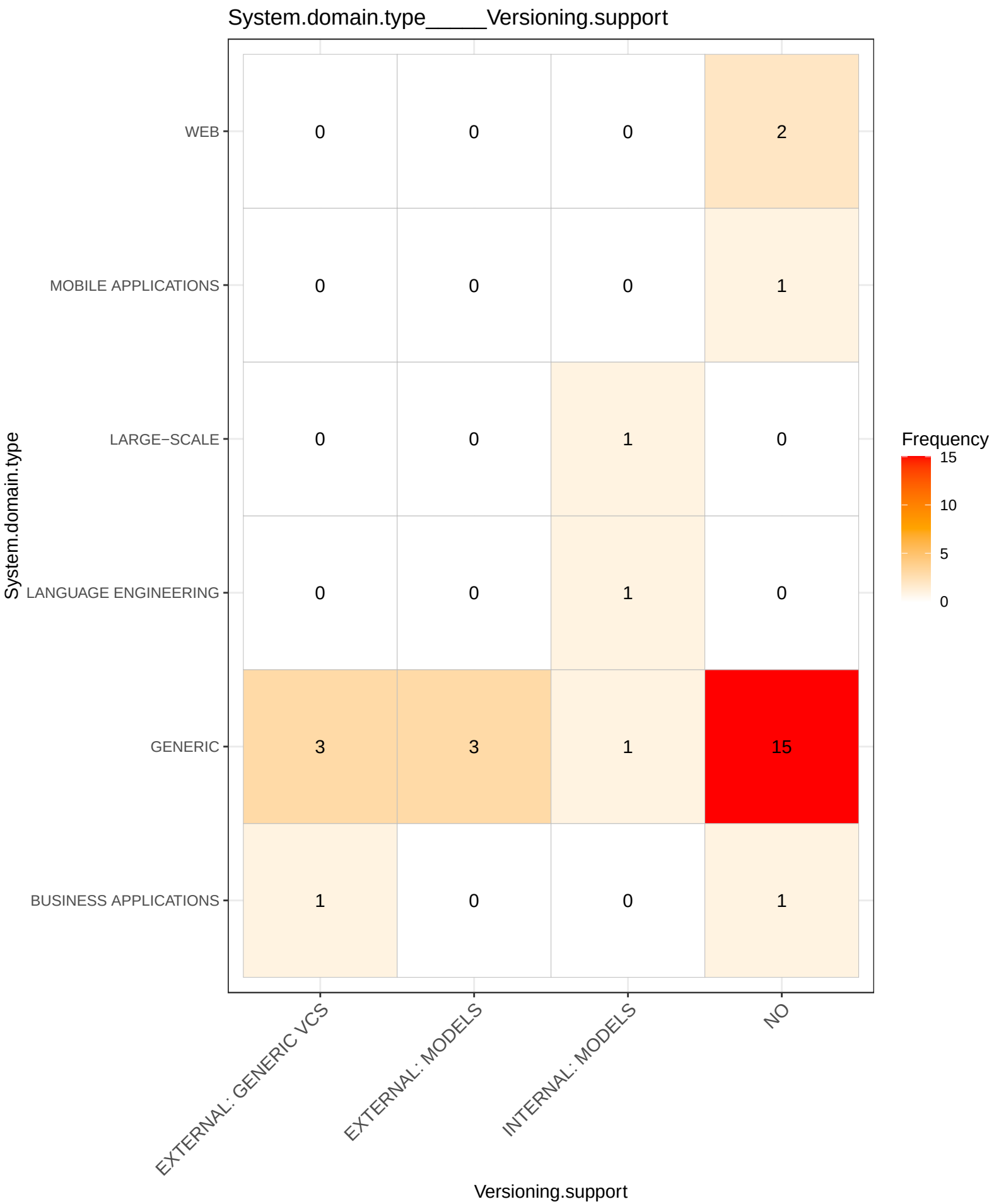

System.domain.type_____Collaboration.types
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
1
1
0
0
1
0
0
1
0
0
1
7
3
14
1
0
1
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types
Frequency
10
5
0

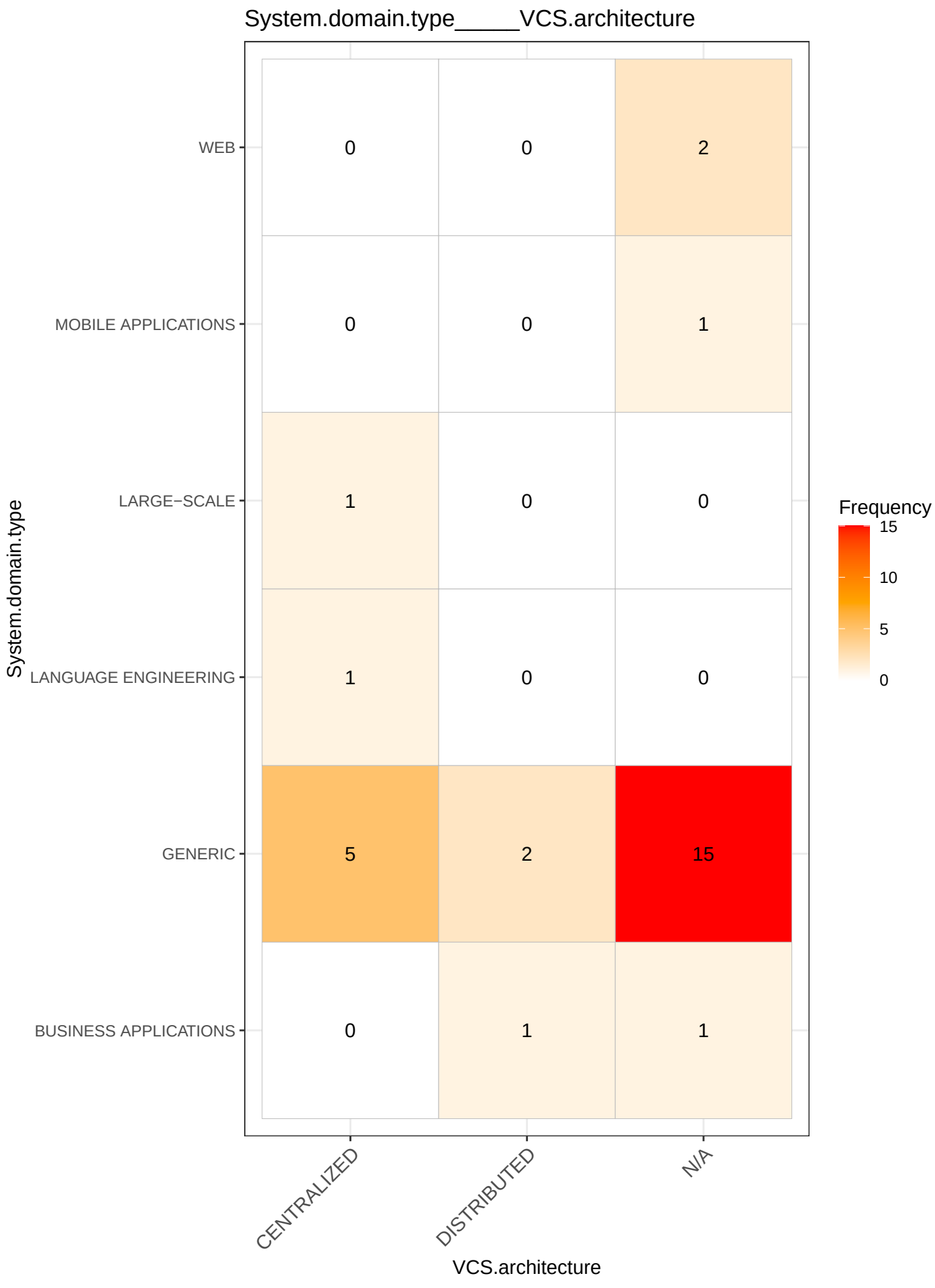

System.domain.type_____Collaboration.workflow
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1
1
1
0
1
0
0
1
13
9
2
0
NO
YES
Collaboration.workflow
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Consistency.model
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
2
1
1
1
0
0
1
0
0
0
1
0
14
15
7
1
1
0
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
15
10
5
0


System.domain.type_____Unit.of.sync
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1
1
0
1
1
0
1
0
12
10
1
1
CHANGE
STATE
Unit.of.sync
Frequency
12
9
6
3
0


System.domain.type_____Locking
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
2
0
0
0
0
1
1
0
0
1
0
0
16
2
4
2
0
0
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
16
12
8
4
0


System.domain.type_____Versioning.support
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0 0 0 2
0 0 0 1
0 0 1 0
0 0 1 0
3 3 1 15
1 0 0 1
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
15
10
5
0


System.domain.type_____VCS.architecture
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
0
2
0
0
1
1
0
0
1
0
0
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2
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1
1
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
15
10
5
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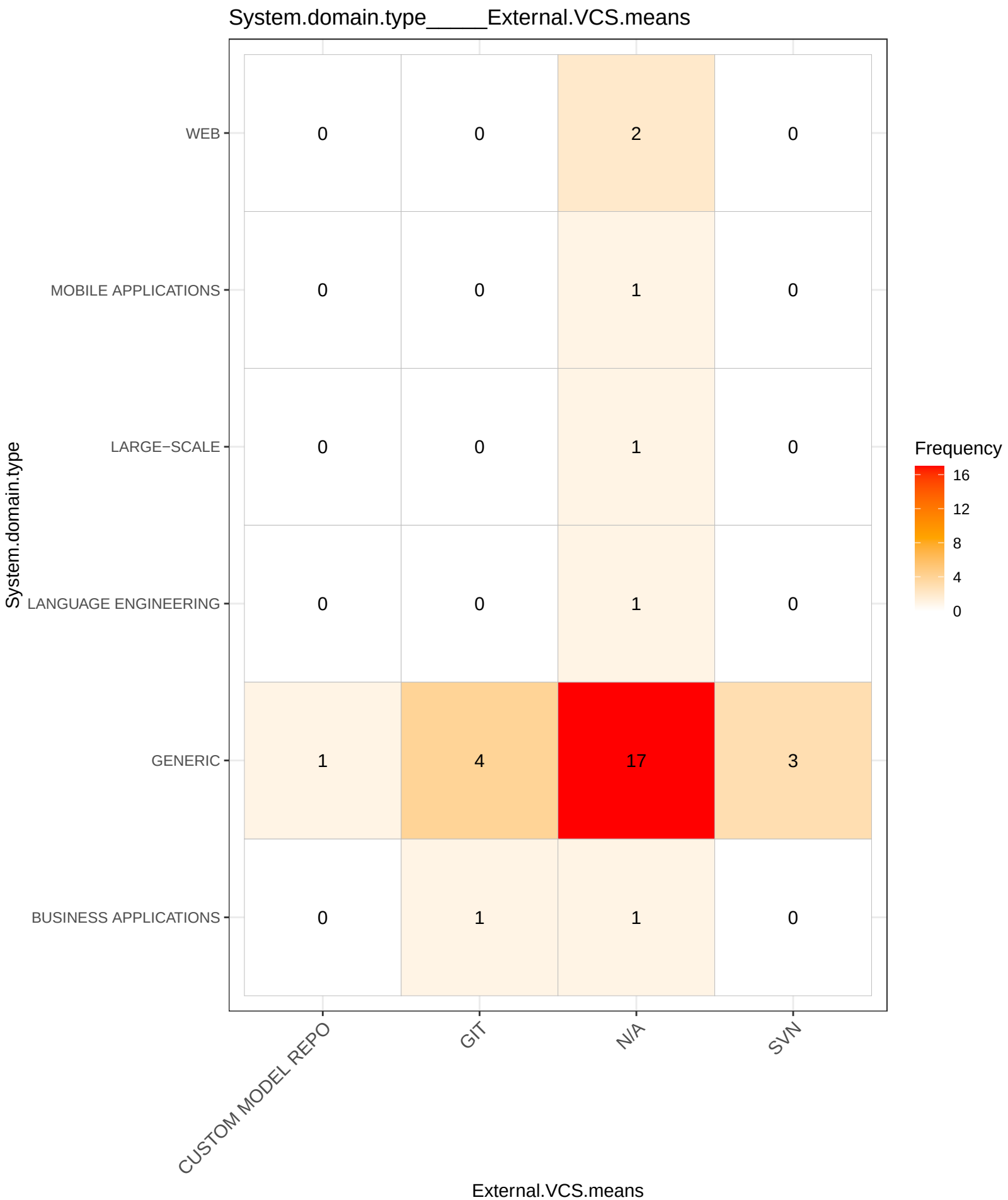
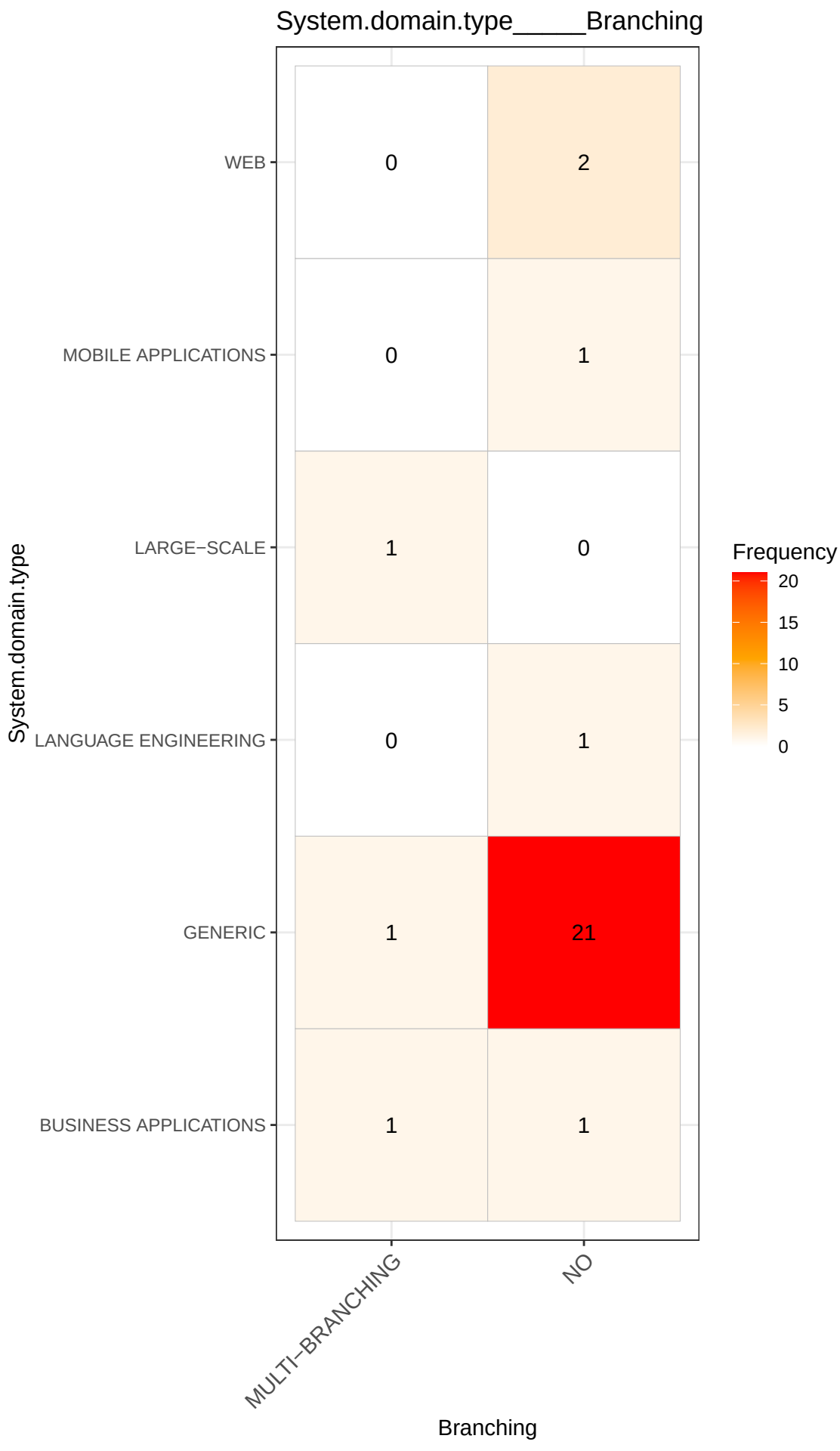

System.domain.type_____External.VCS.means
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0 0 2 0
0 0 1 0
0 0 1 0
0 0 1 0
1 4 17 3
0 1 1 0
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
16
12
8
4
0


System.domain.type_____Branching
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
2
0
1
1
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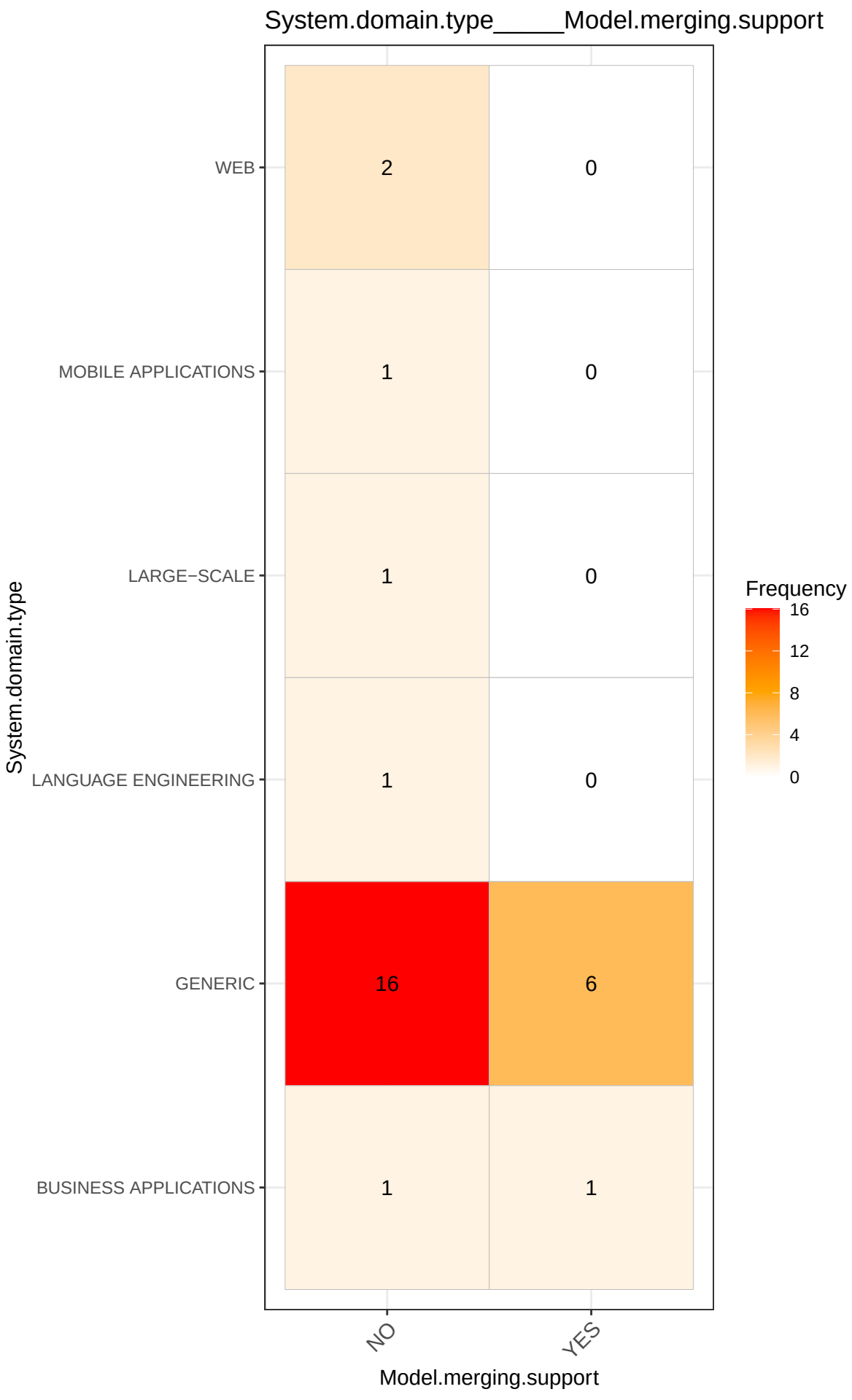
1
21
1
1
MULTI−BRANCHING
NO
Branching
Frequency
20
15
10
5
0


System.domain.type_____Model.merging.support
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
2
0
1
0
1
0
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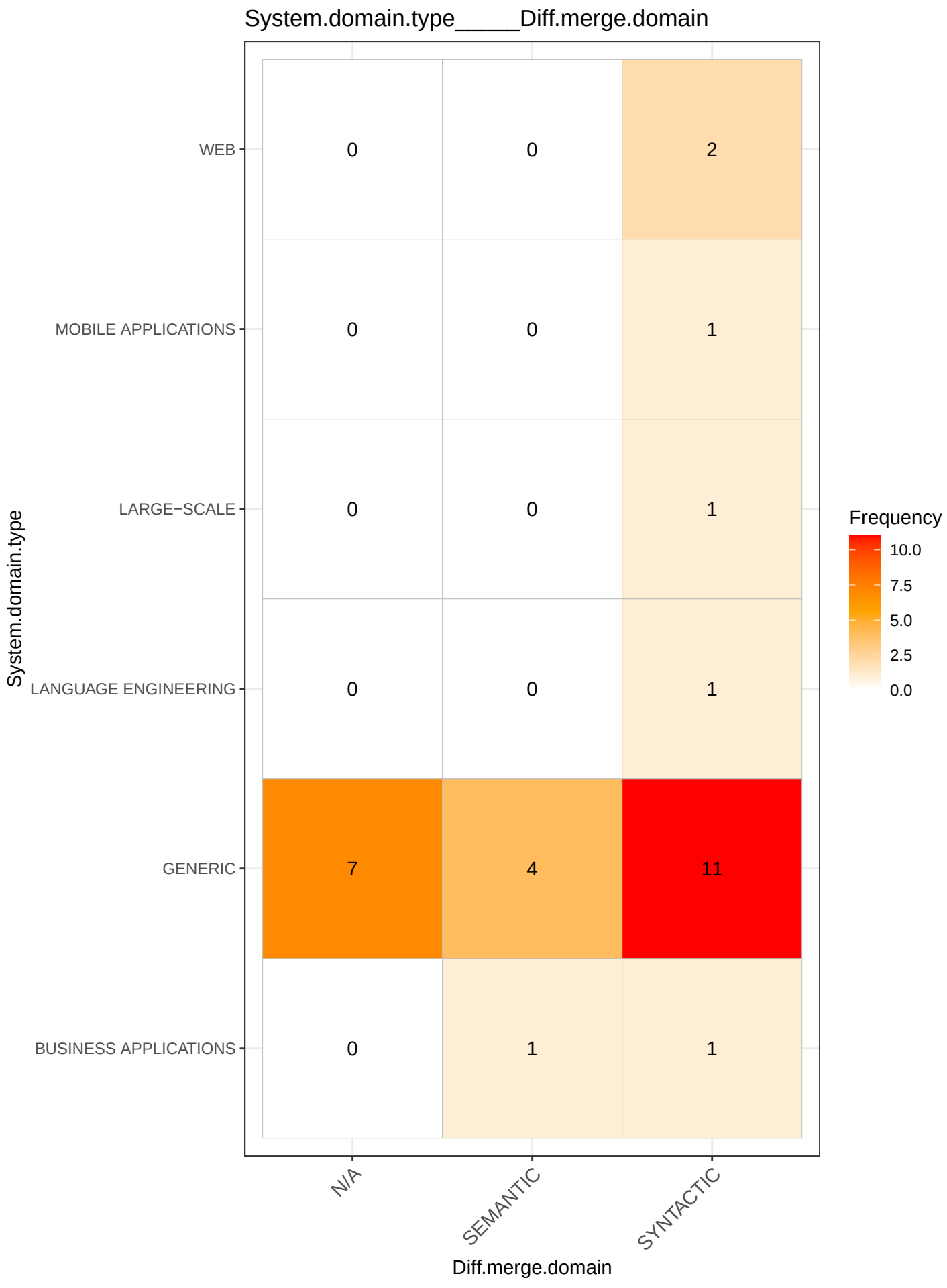
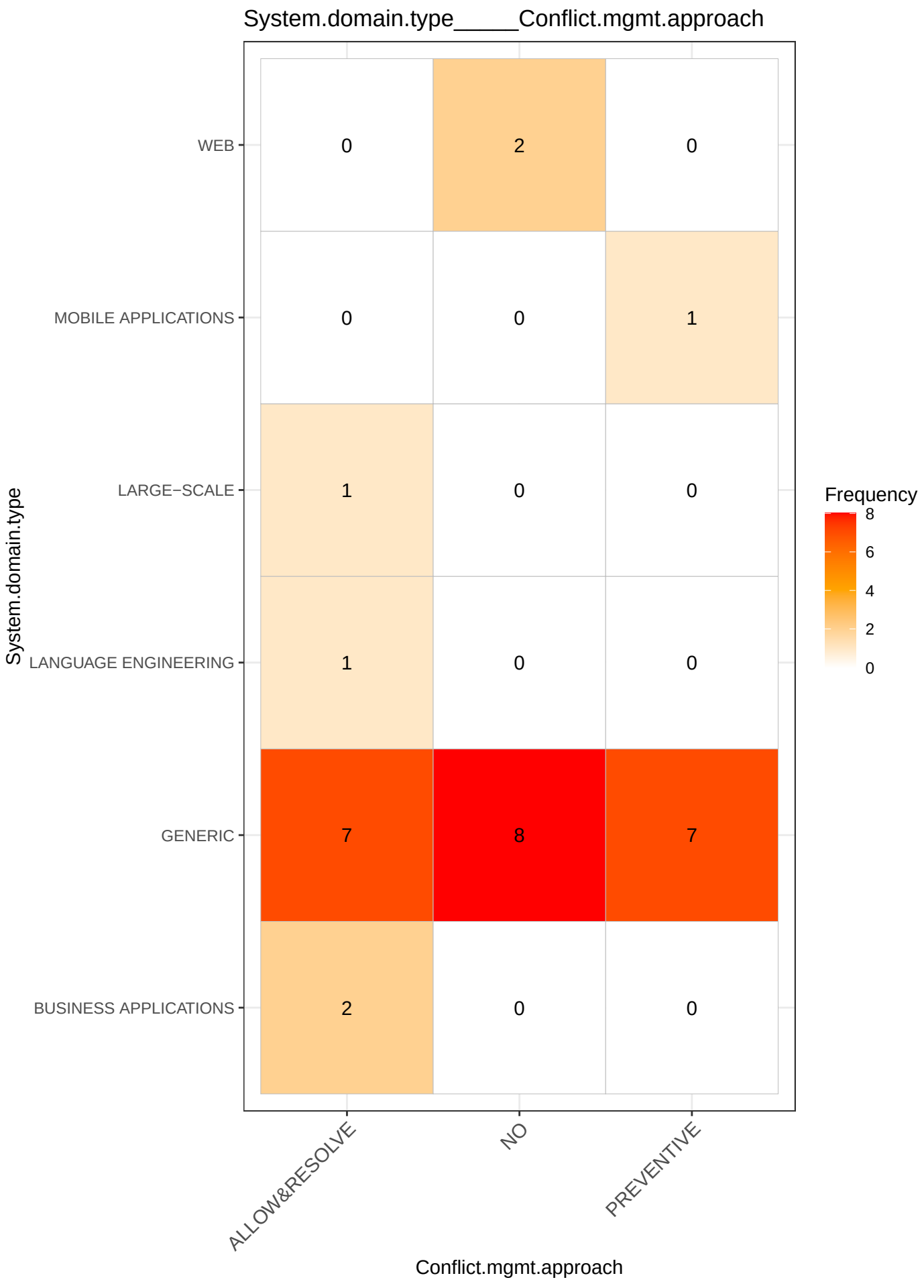
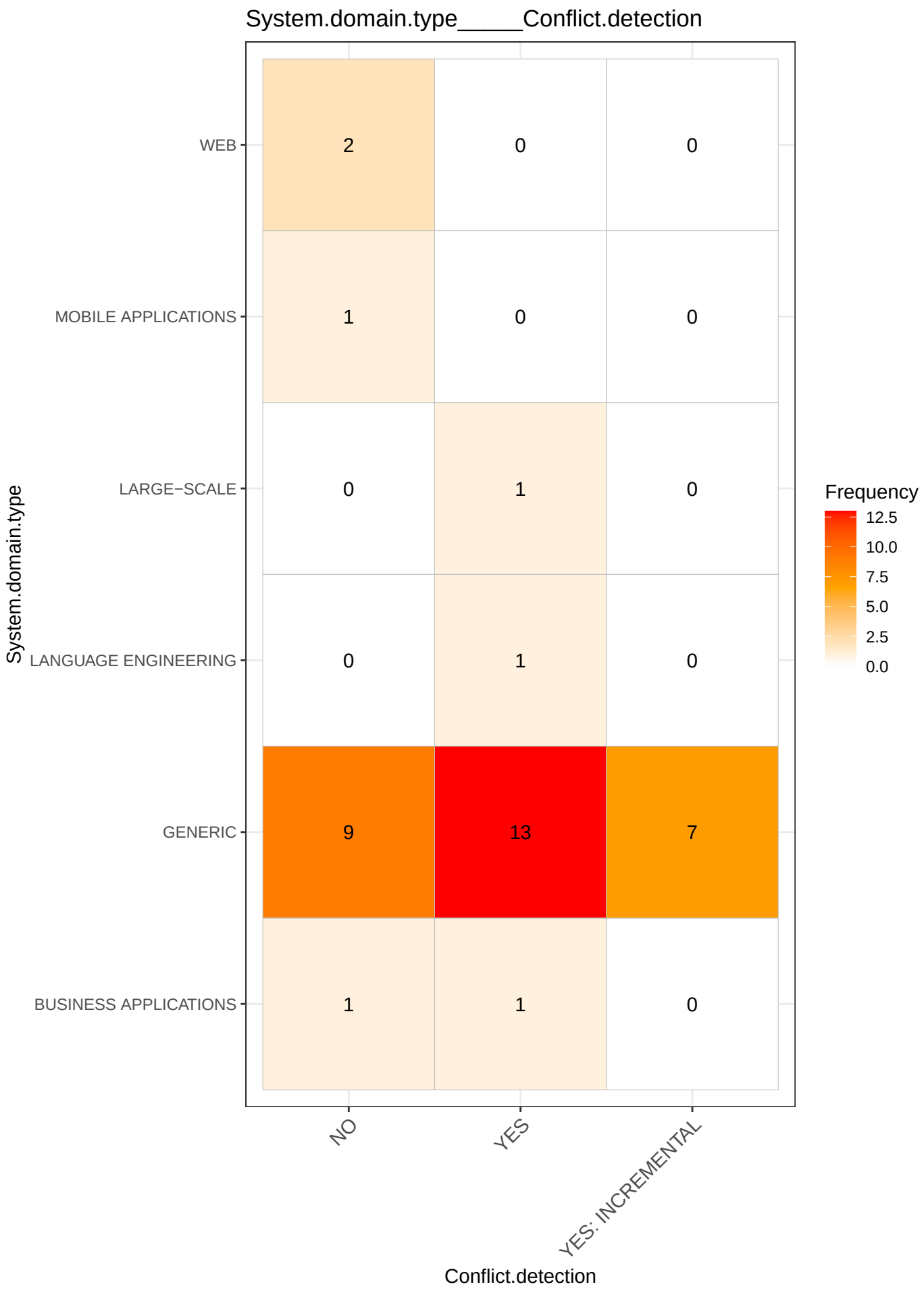
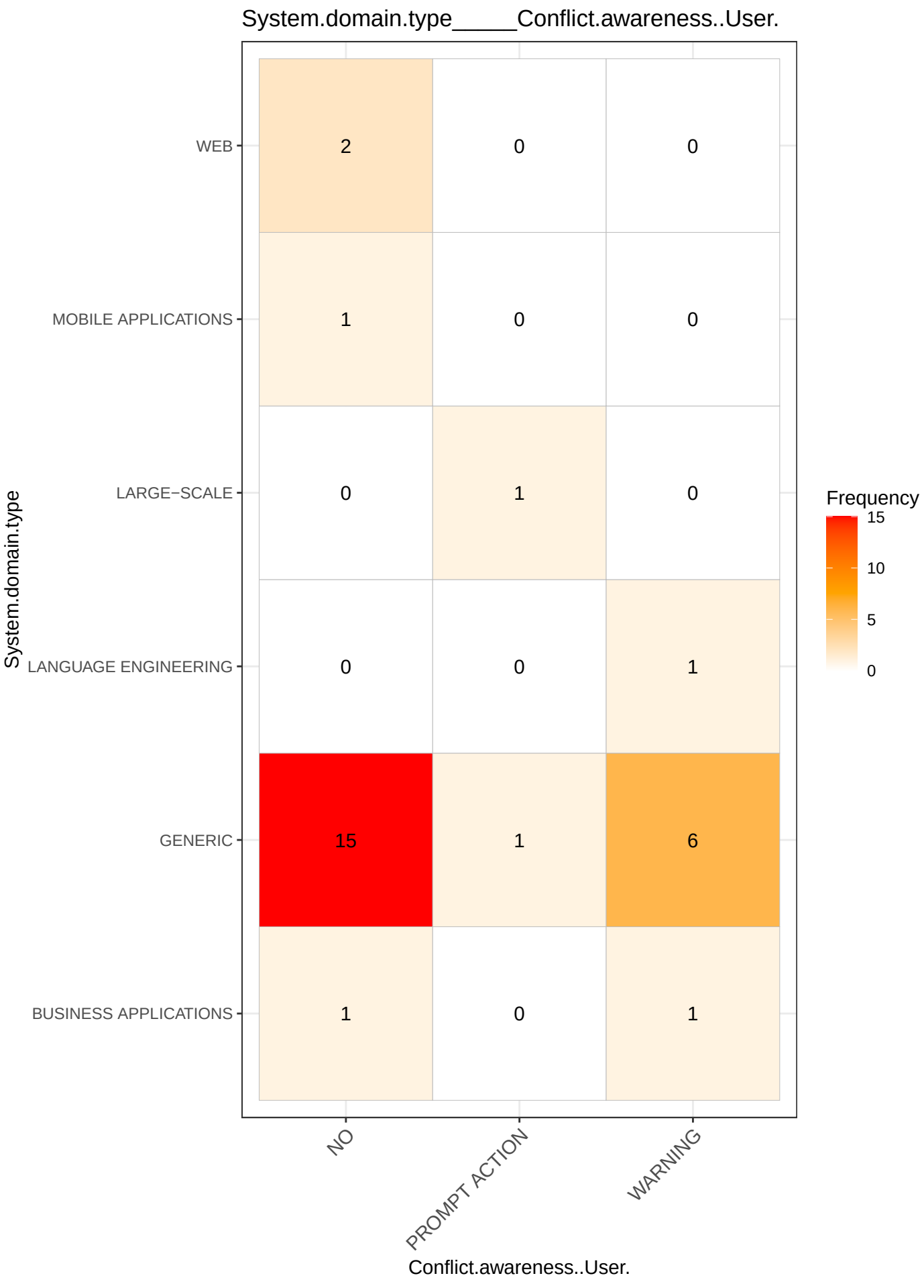
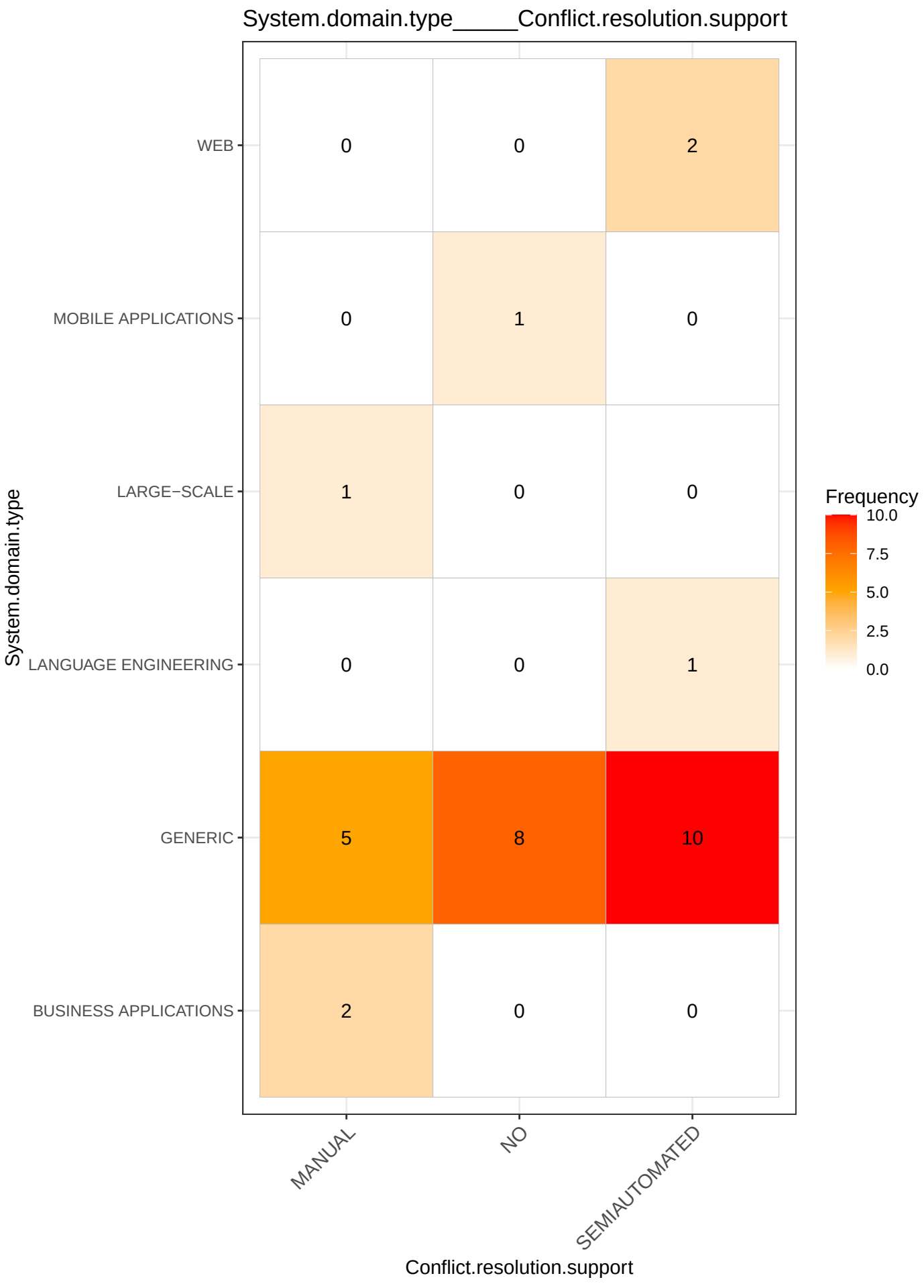
0
16
6
1
1
NO
YES
Model.merging.support
System.domain.type
Frequency
16
12
8
4
0

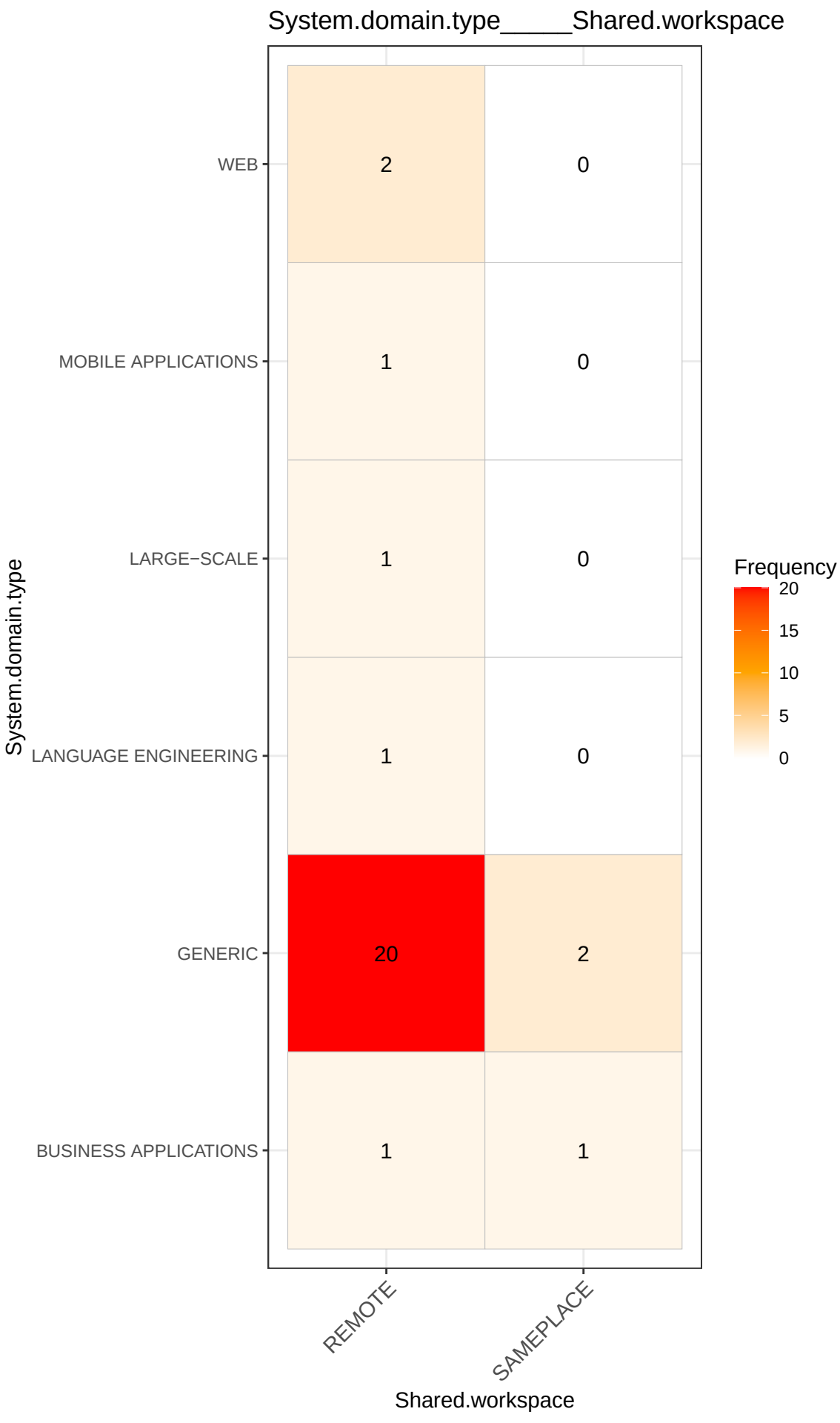

System.domain.type_____Diff.merge.domain
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
0
2
0
0
1
0
0
1
0
0
1
7
4
11
0
1
1
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Conflict.mgmt.approach
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
2
0
0
0
1
1
0
0
1
0
0
7
8
7
2
0
0
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0


System.domain.type_____Conflict.detection
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
2
0
0
1
0
0
0
1
0
0
1
0
9
13
7
1
1
0
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Conflict.awareness..User.
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
2
0
0
1
0
0
0
1
0
0
0
1
15
1
6
1
0
1
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
15
10
5
0


System.domain.type_____Conflict.resolution.support
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
0
2
0
1
0
1
0
0
0
0
1
5
8
10
2
0
0
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Shared.workspace
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
2
0
1
0
1
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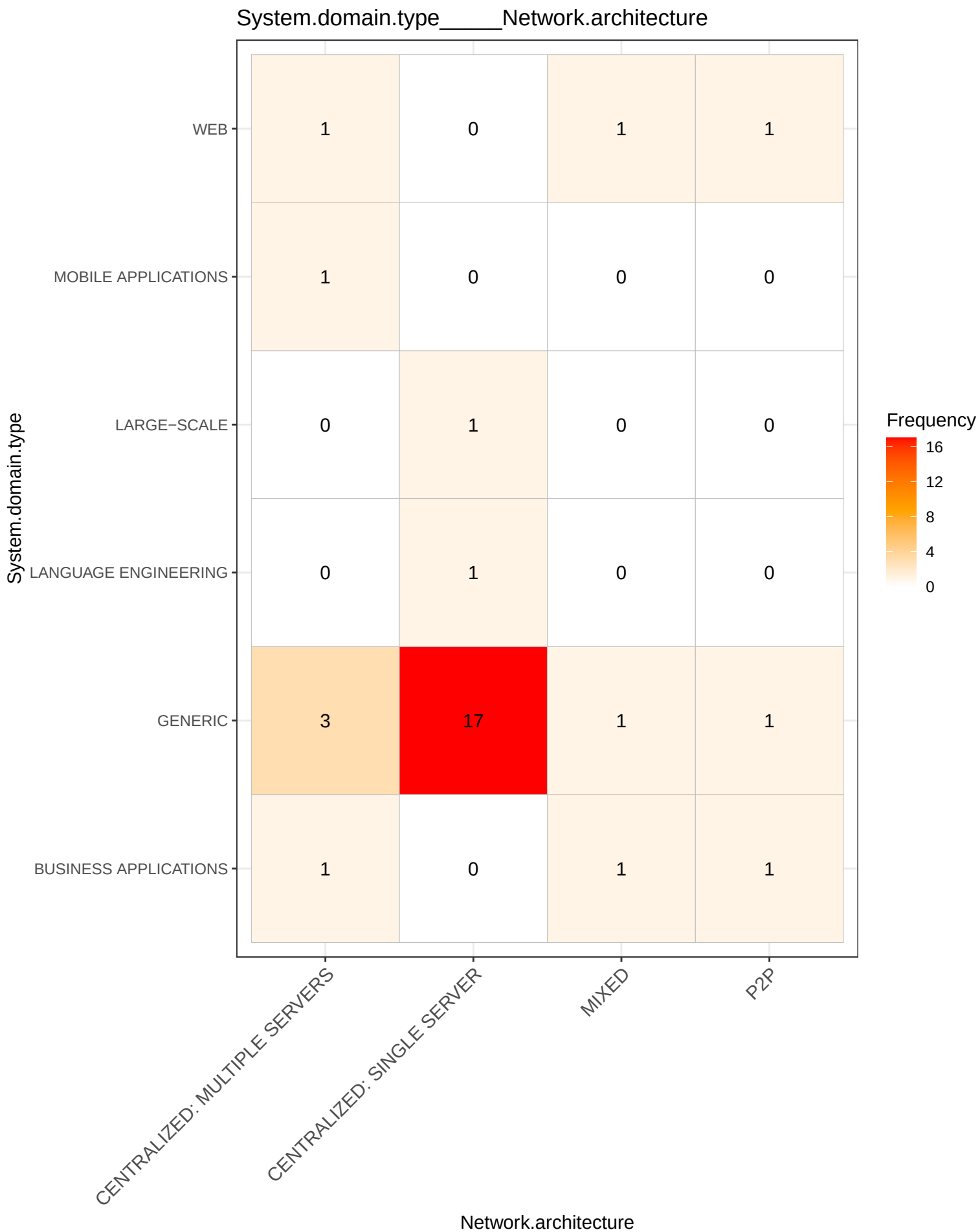
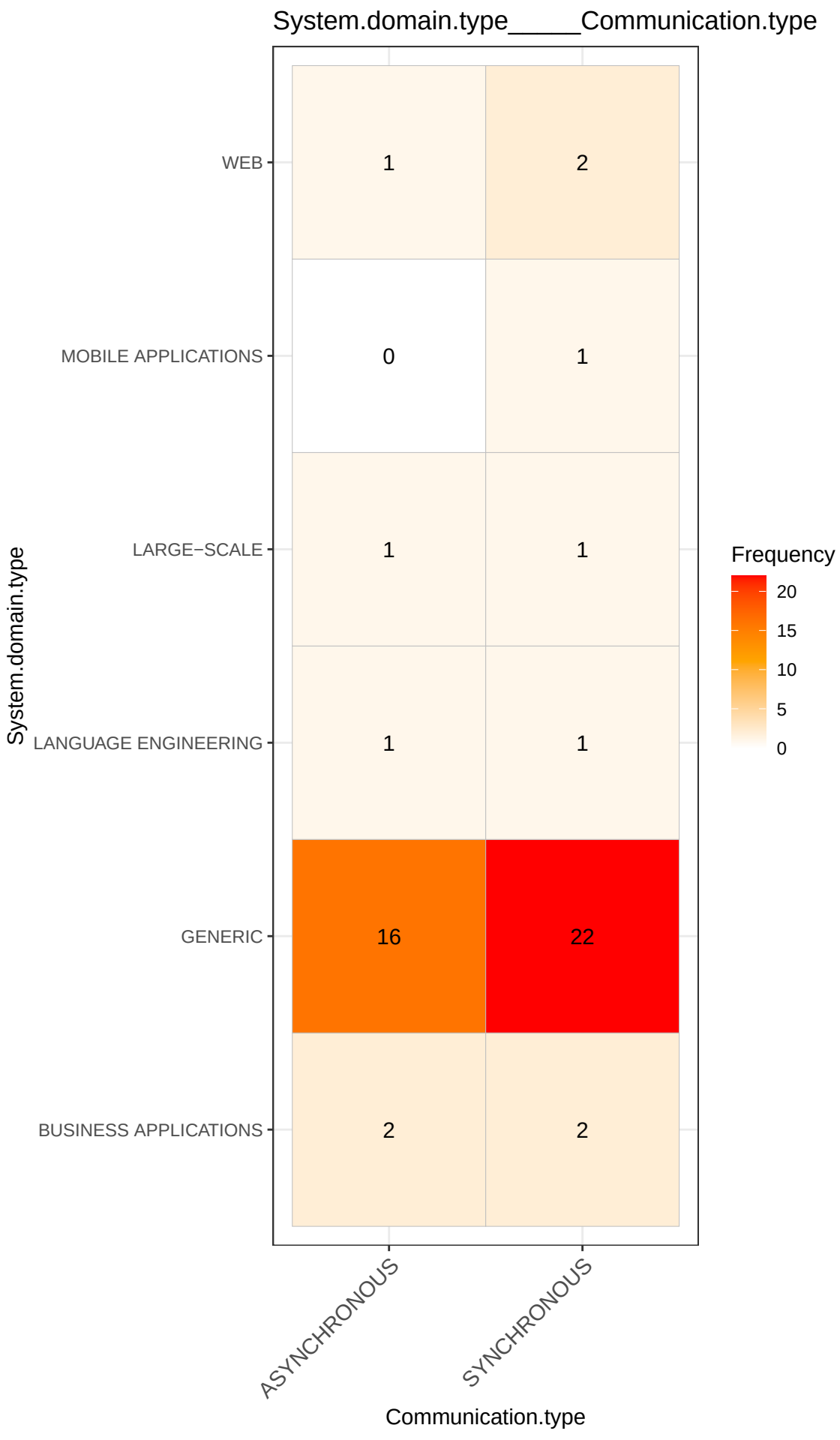
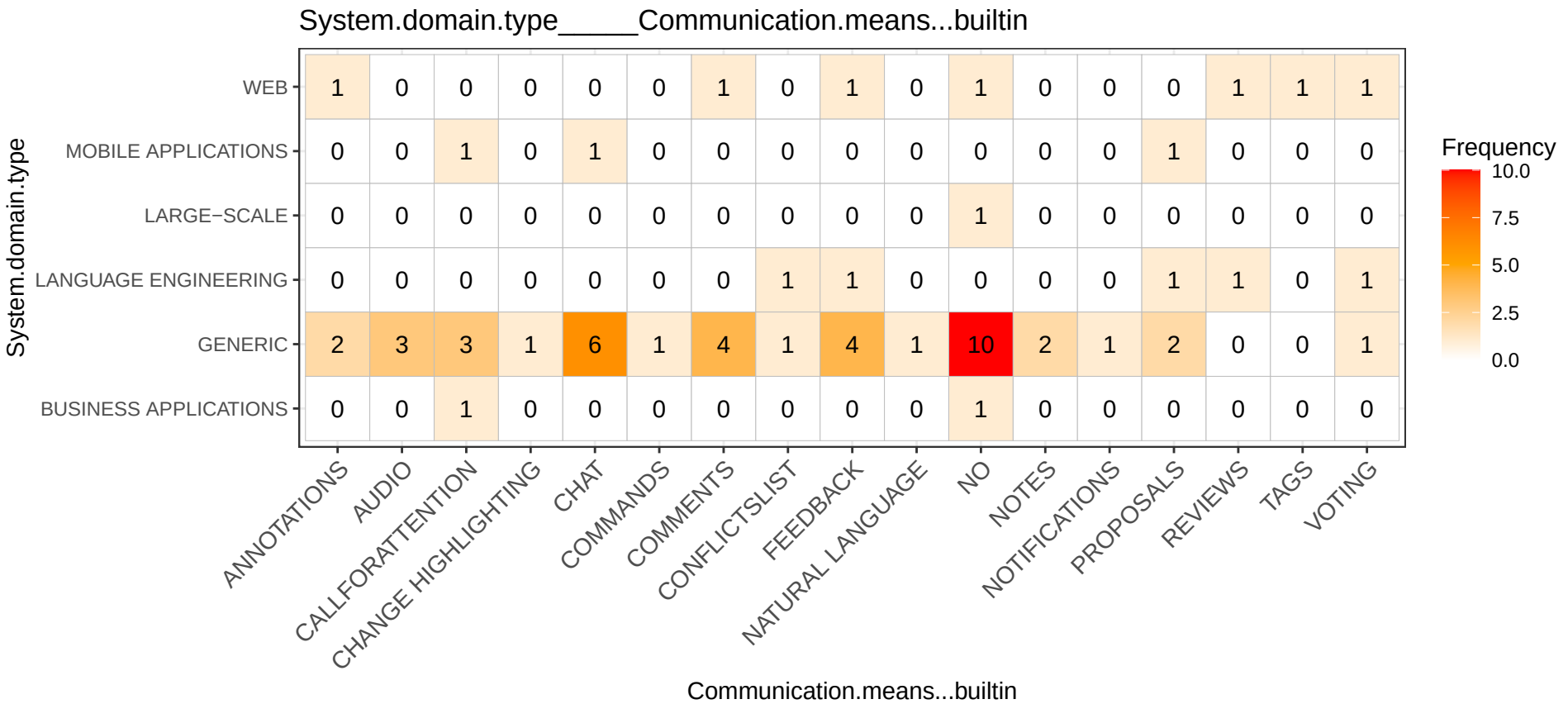
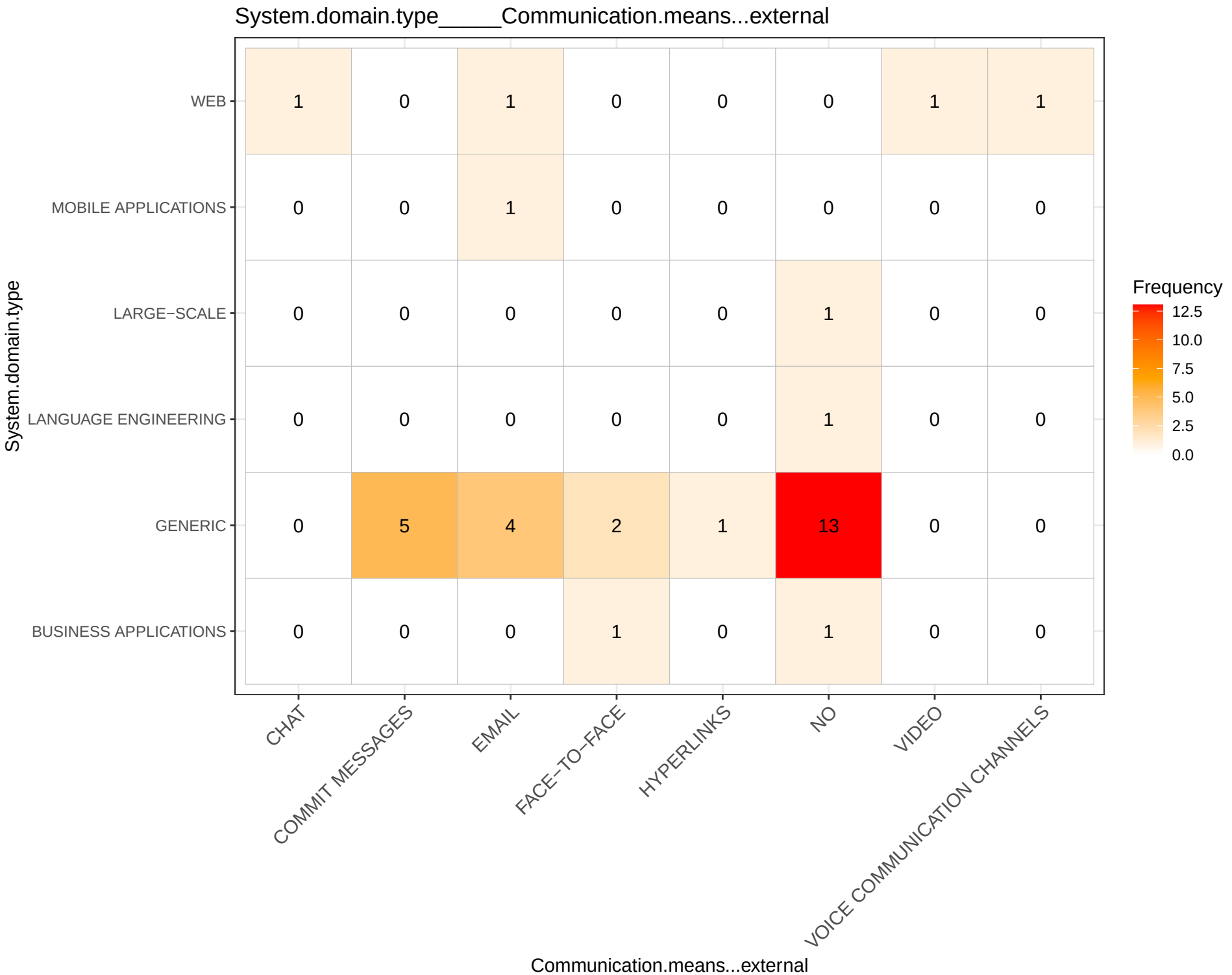
20
2
1
1
REMOTE
SAMEPLACE
Shared.workspace
Frequency
20
15
10
5
0


System.domain.type_____Network.architecture
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1 0 1 1
1 0 0 0
0 1 0 0
0 1 0 0
3 17 1 1
1 0 1 1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
16
12
8
4
0


System.domain.type_____Communication.type
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1
2
0
1
1
1
1
1
16
22
2
2
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
20
15
10
5
0


System.domain.type_____Communication.means...builtin
System.domain.type
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
1 0 0 0 0 0 1 0 1 0 1 0 0 0 1 1 1
0 0 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 1 1 0 0 0 0 1 1 0 1
2 3 3 1 6 1 4 1 4 1 10 2 1 2 0 0 1
0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Communication.means...external
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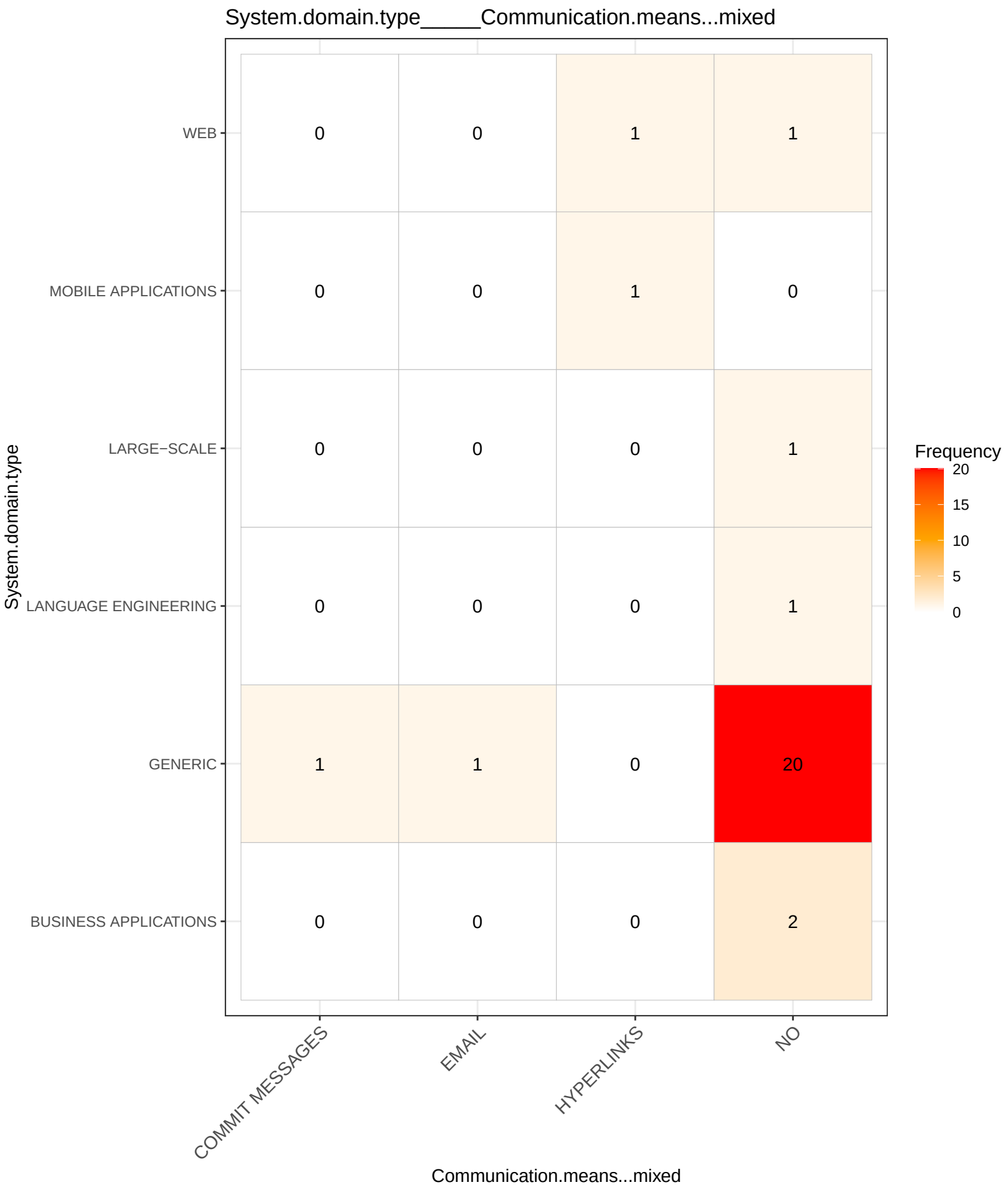
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1 0 1 0 0 0 1 1
0 0 1 0 0 0 0 0
0 0 0 0 0 1 0 0
0 0 0 0 0 1 0 0
0 5 4 2 1 13 0 0
0 0 0 1 0 1 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Communication.means...mixed
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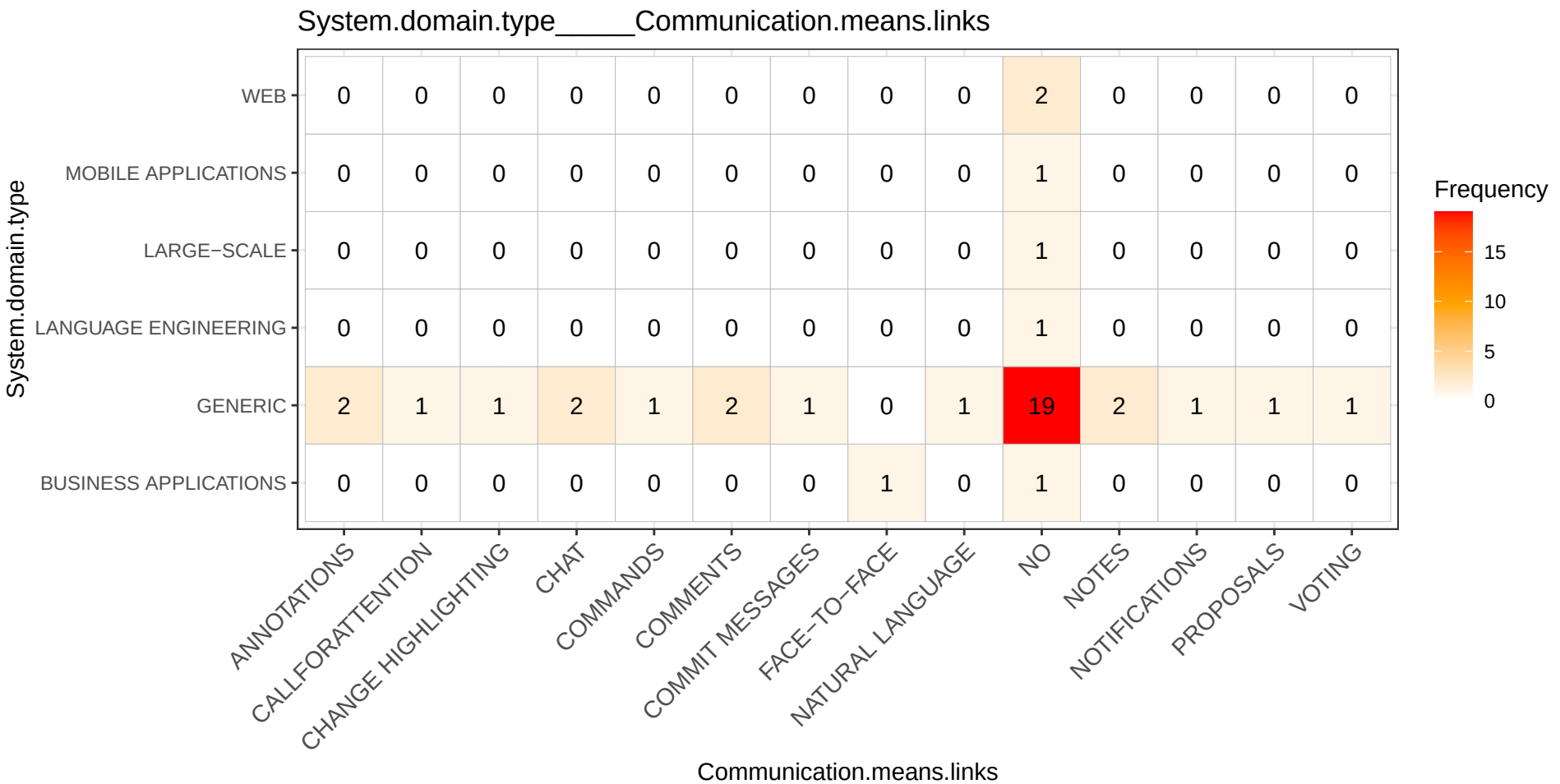
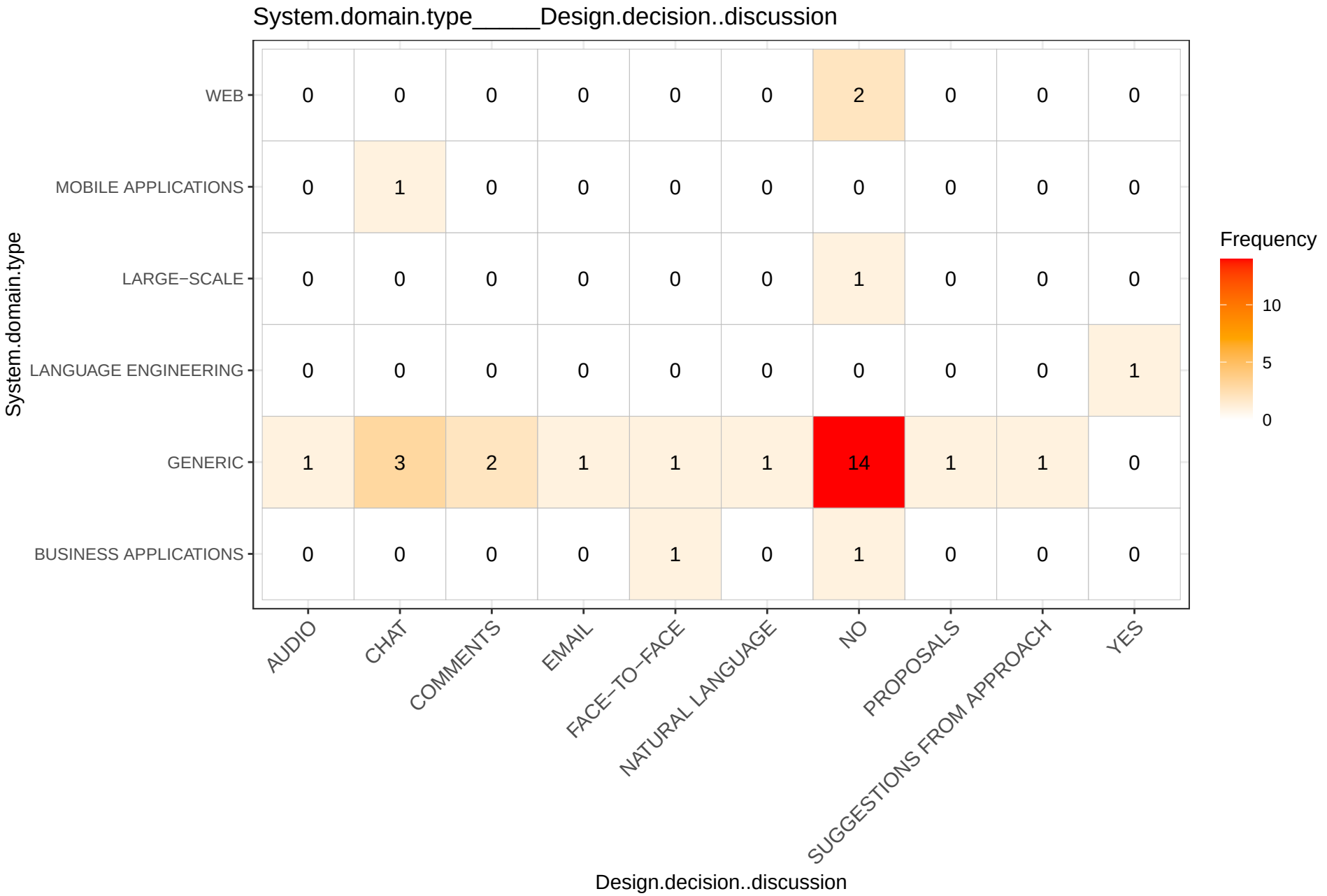
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0 0 1 1
0 0 1 0
0 0 0 1
0 0 0 1
1 1 0 20
0 0 0 2
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
20
15
10
5
0


System.domain.type_____Communication.means.links
System.domain.type
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
0 0 0 0 0 0 0 0 0 2 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
2 1 1 2 1 2 1 0 1 19 2 1 1 1
0 0 0 0 0 0 0 1 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0


System.domain.type_____Design.decision..discussion
System.domain.type
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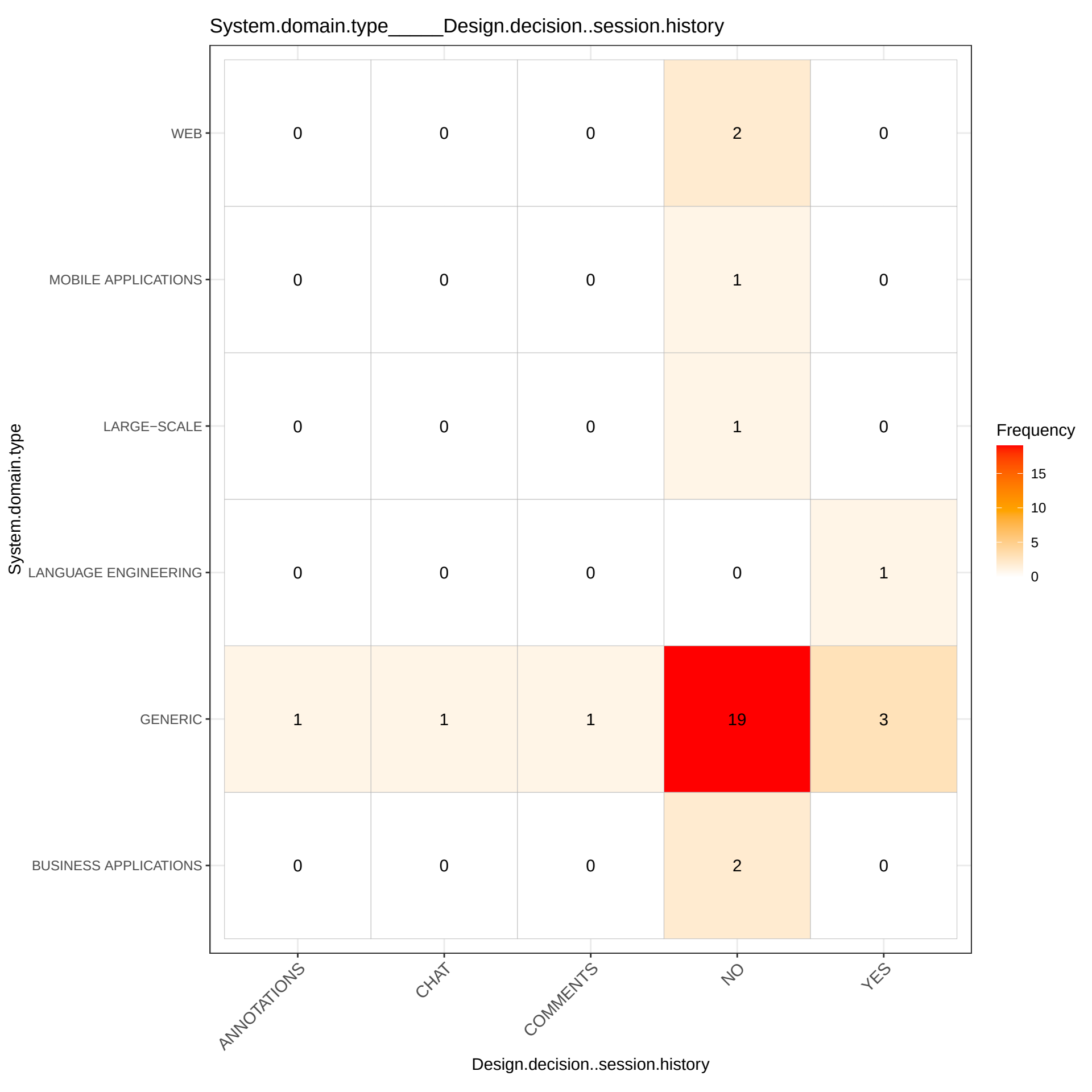
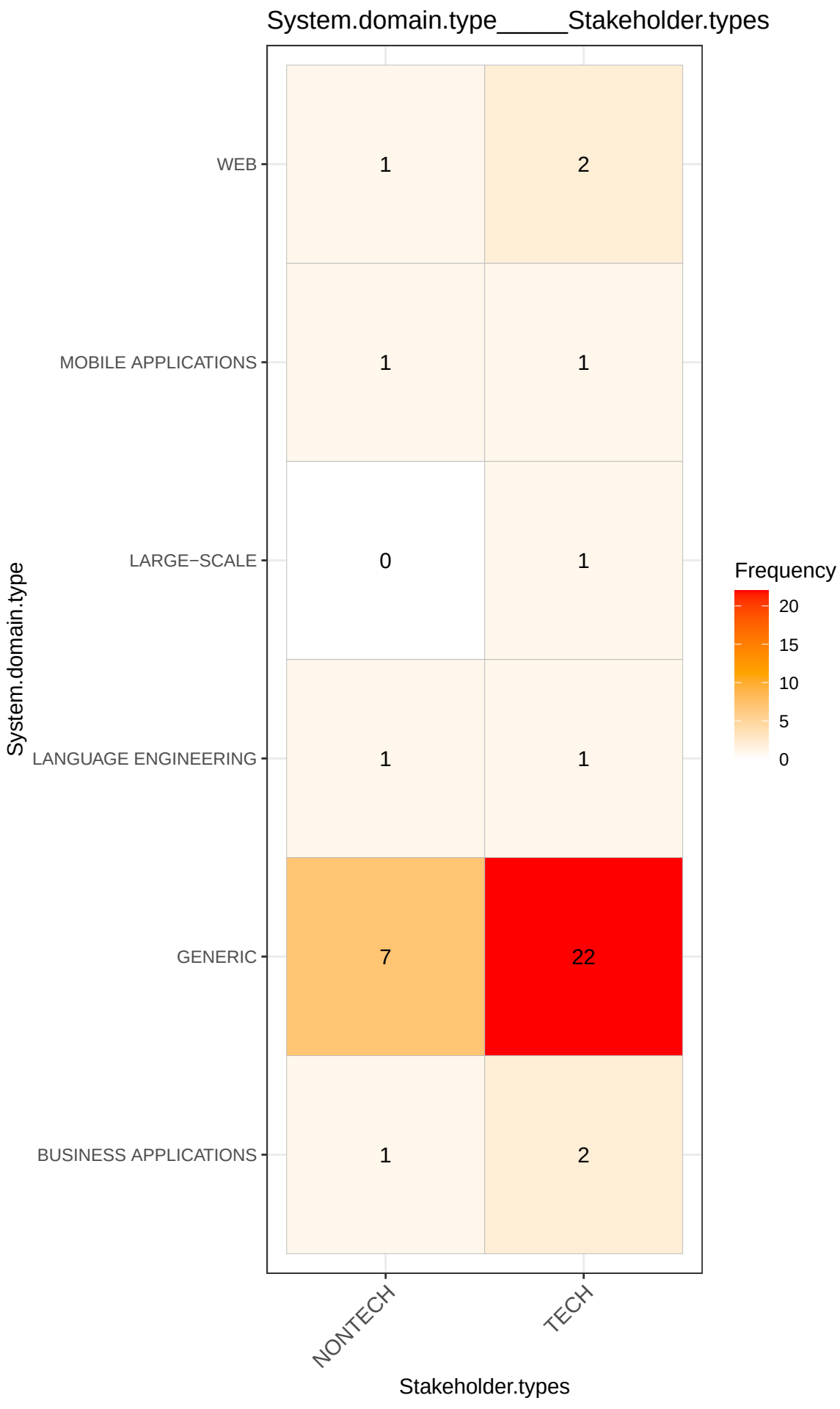
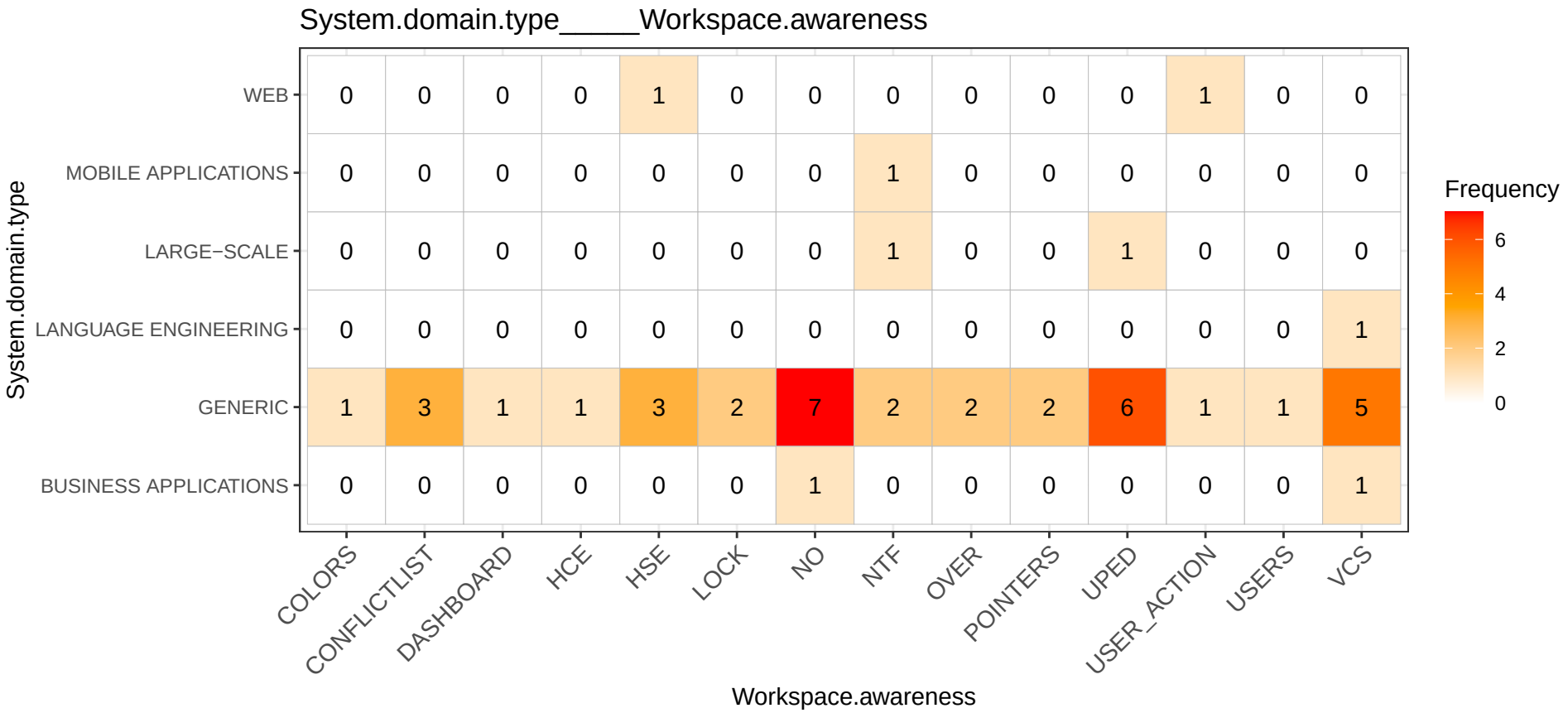
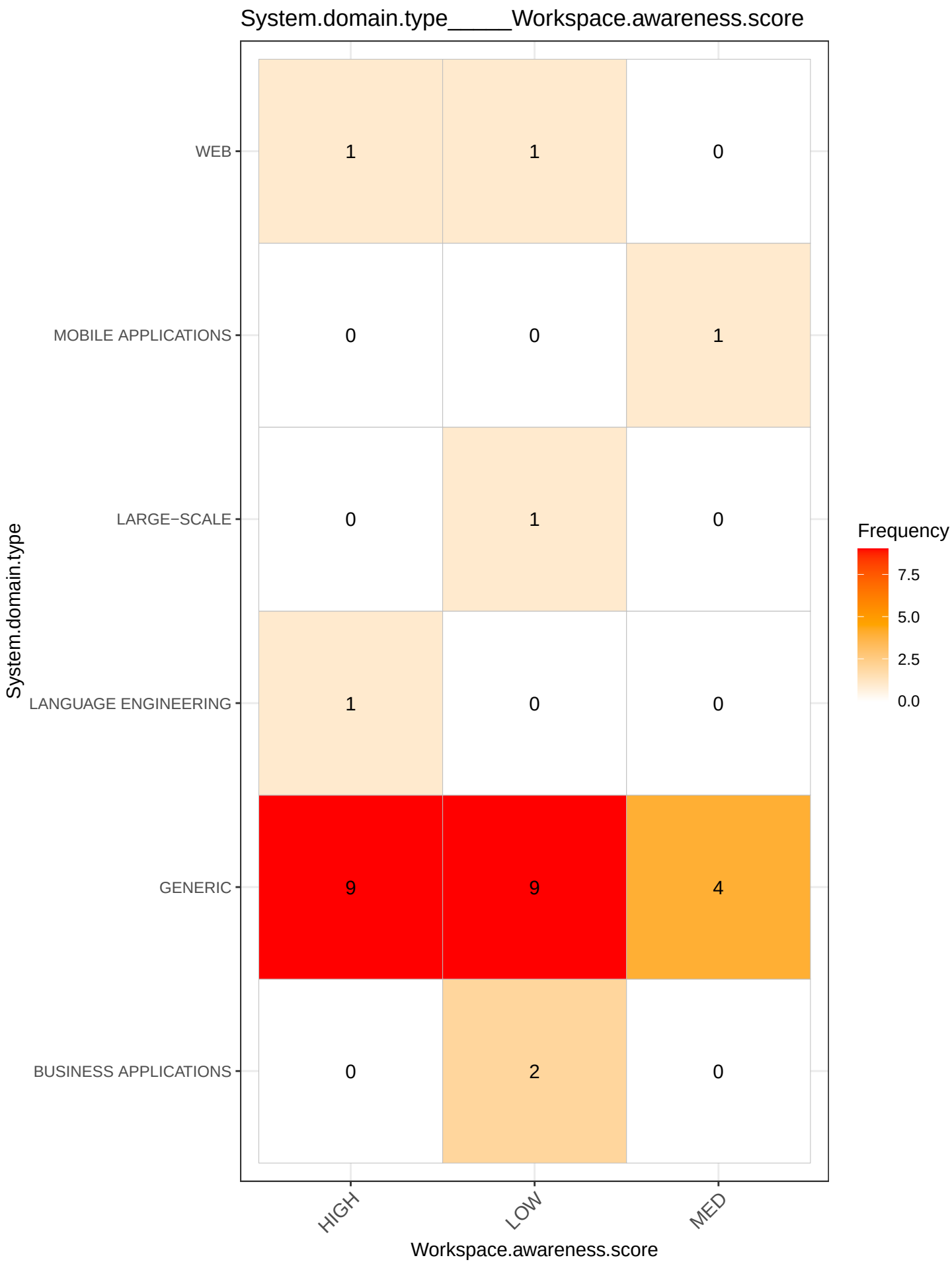
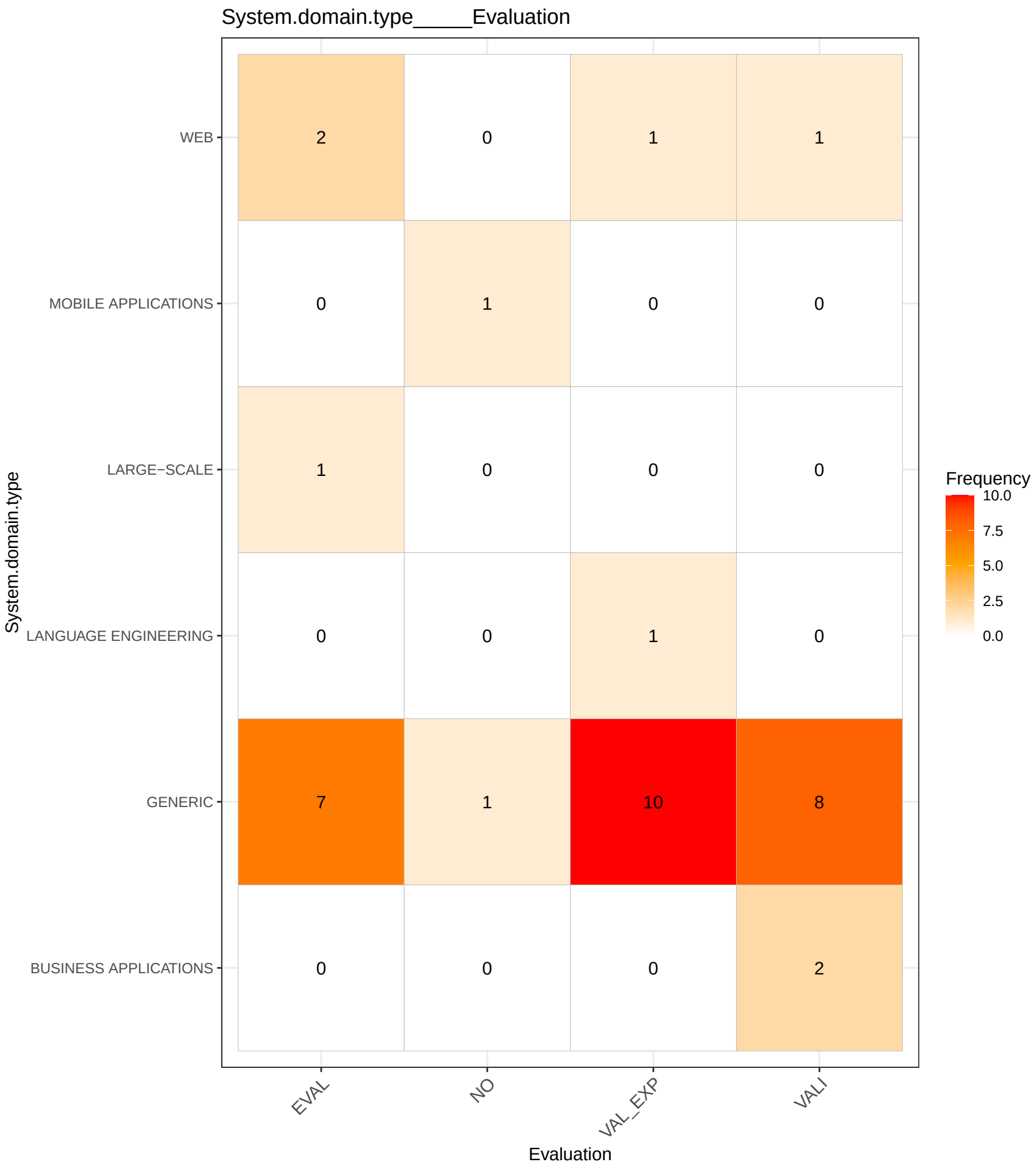
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
0 0 0 0 0 0 2 0 0 0
0 1 0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0 0 1
1 3 2 1 1 1 14 1 1 0
0 0 0 0 1 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10
5
0


System.domain.type_____Design.decision..session.history
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0 0 0 2 0
0 0 0 1 0
0 0 0 1 0
0 0 0 0 1
1 1 1 19 3
0 0 0 2 0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
15
10
5
0


System.domain.type_____Stakeholder.types
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1
2
1
1
0
1
1
1
7
22
1
2
NONTECH
TECH
Stakeholder.types
Frequency
20
15
10
5
0


System.domain.type_____Workspace.awareness
System.domain.type
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
0 0 0 0 1 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 1 0 0 1 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 1
1 3 1 1 3 2 7 2 2 2 6 1 1 5
0 0 0 0 0 0 1 0 0 0 0 0 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0


System.domain.type_____Workspace.awareness.score
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
1
1
0
0
0
1
0
1
0
1
0
0
9
9
4
0
2
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
7.5
5.0
2.5
0.0


System.domain.type_____Evaluation
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
2
0
1
1
0
1
0
0
1
0
0
0
0
0
1
0
7
1
10
8
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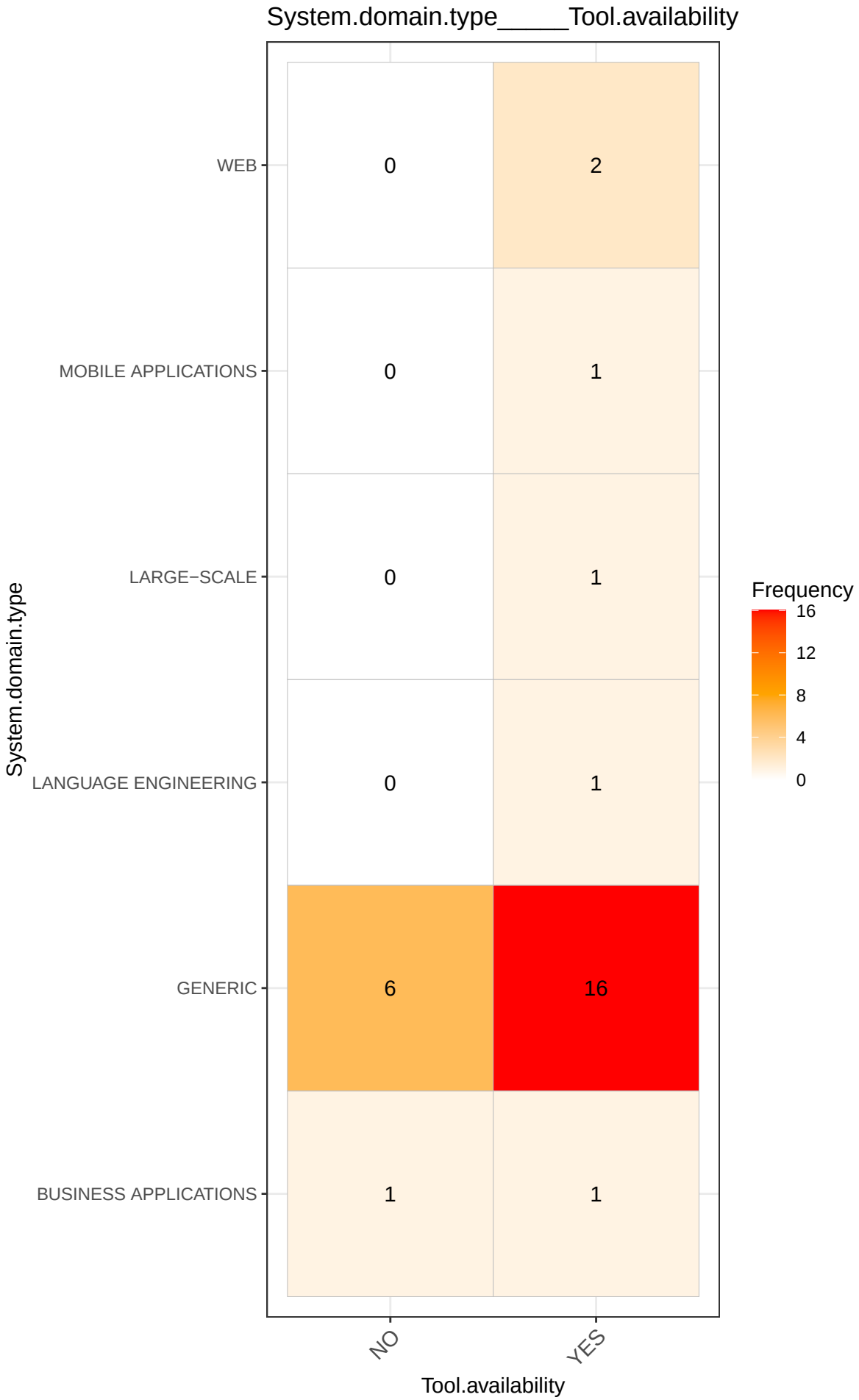
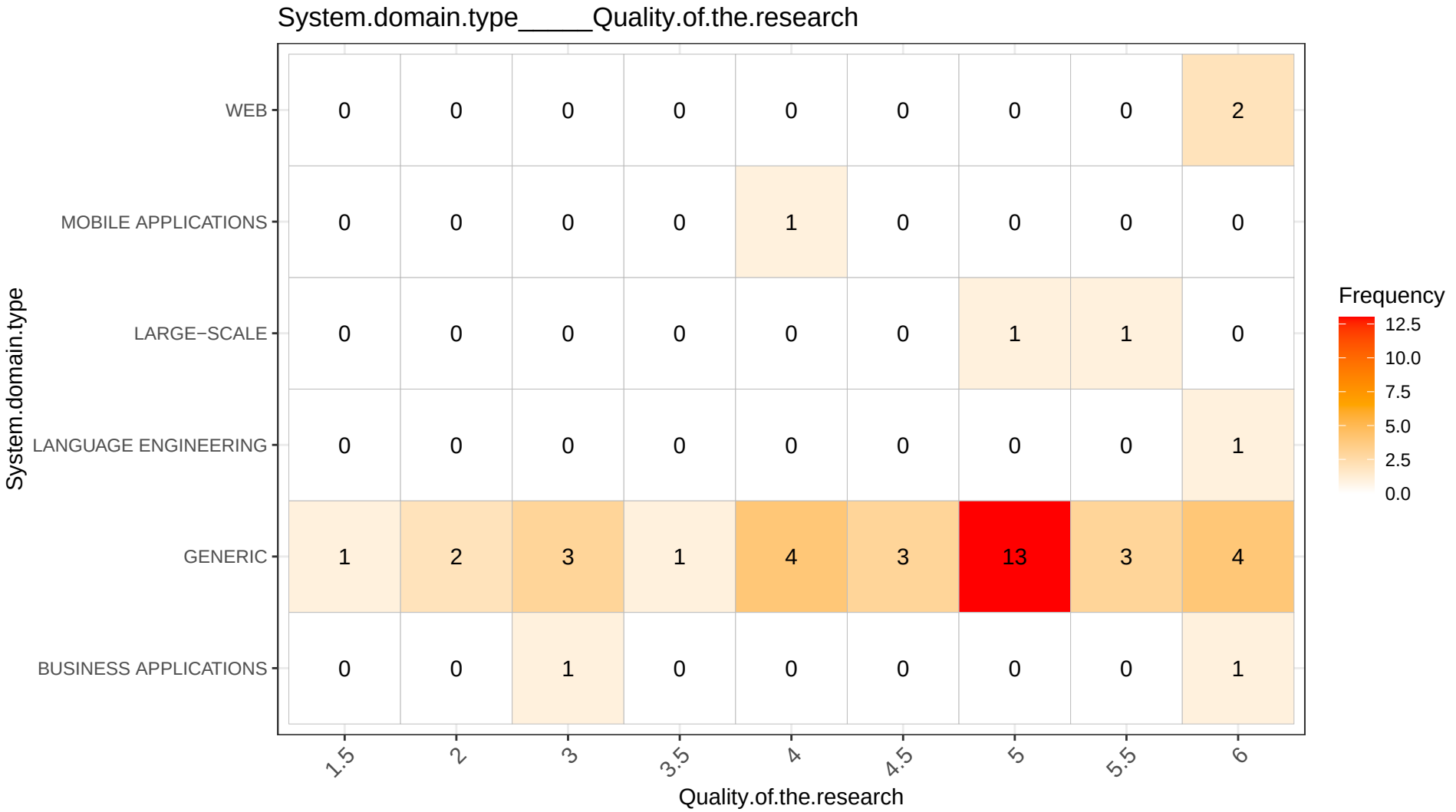
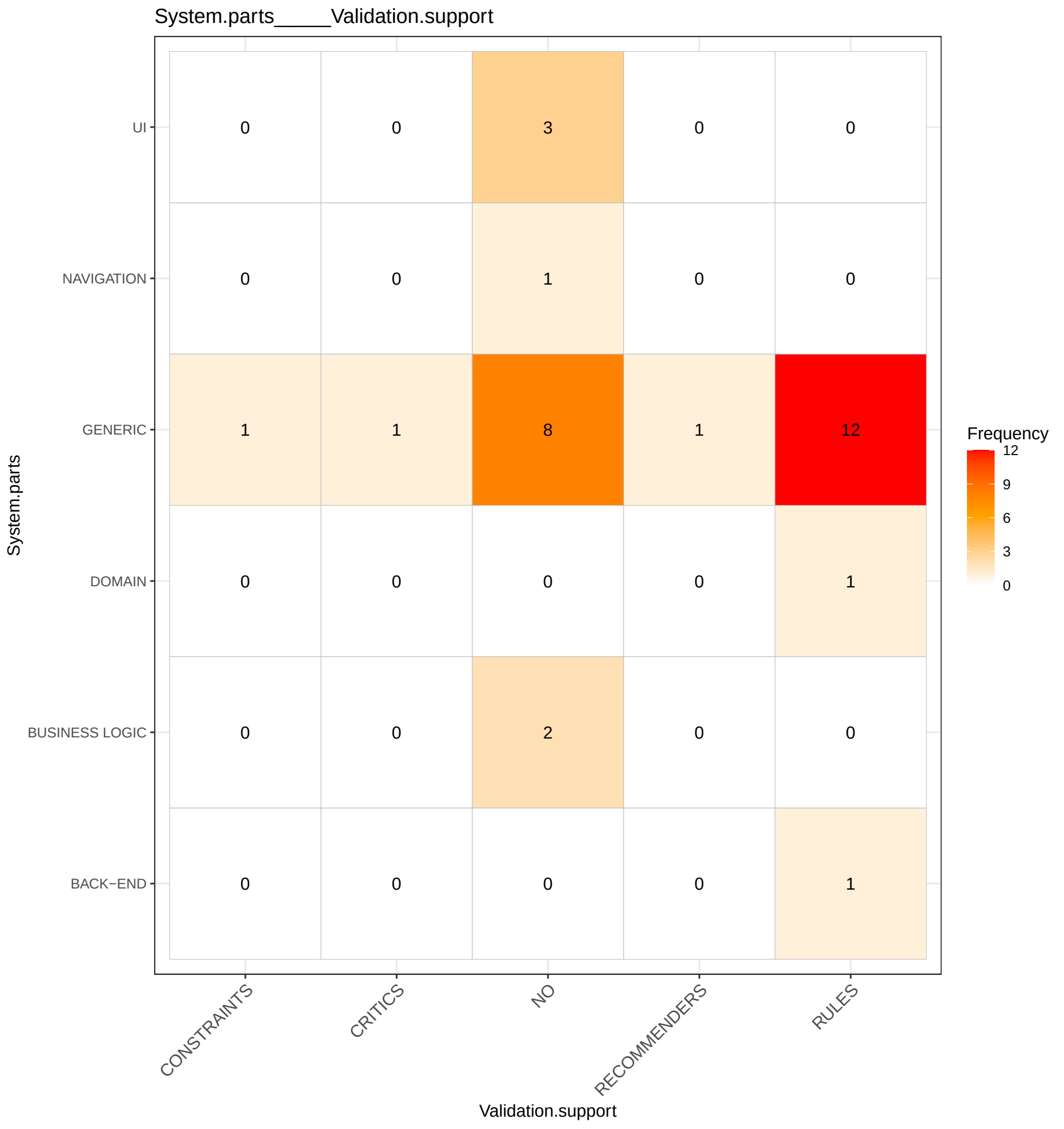
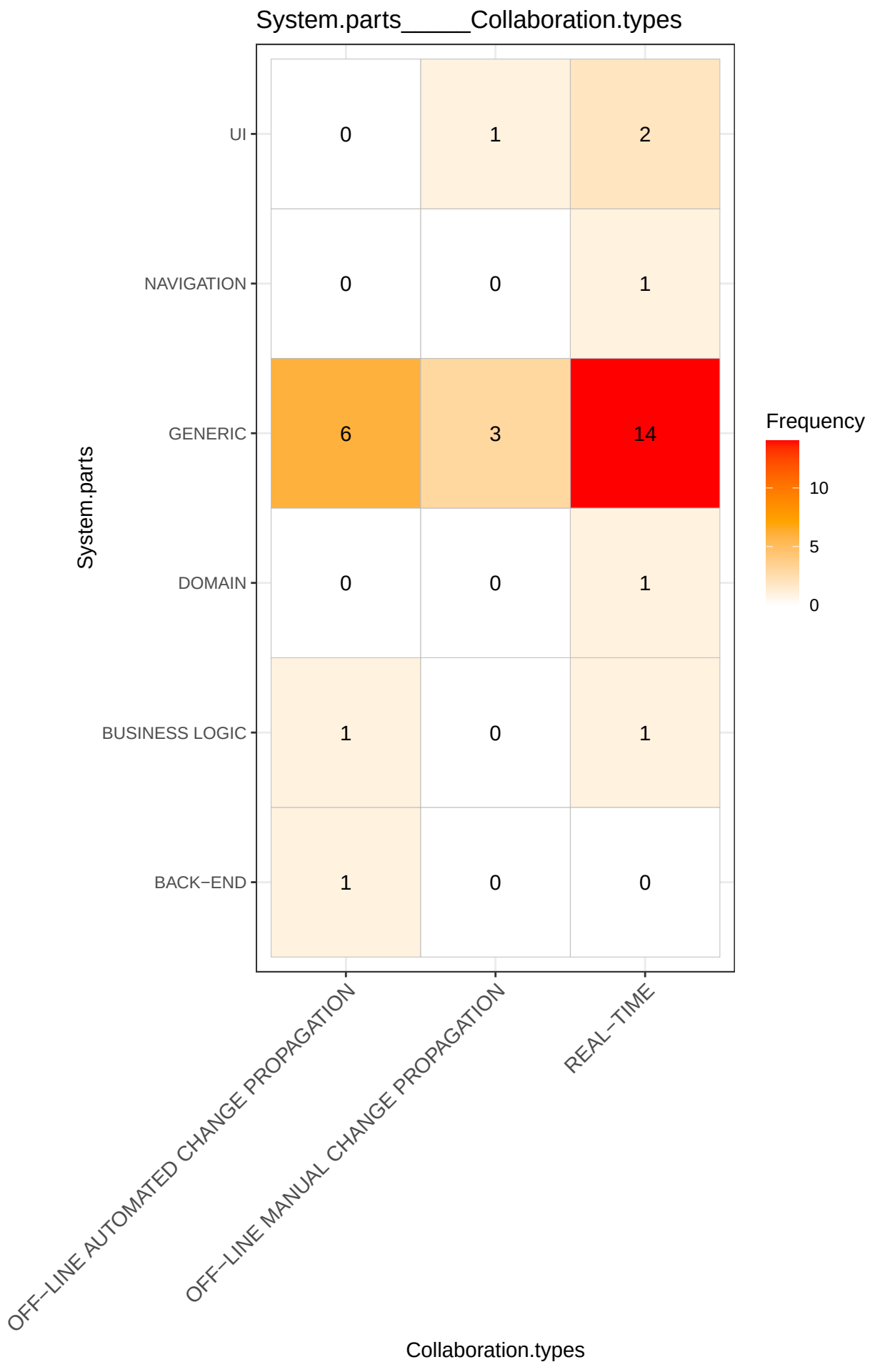
0
2
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0


System.domain.type_____Tool.availability
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
System.domain.type
0
2
0
1
0
1
0
1
6
16
1
1
NO
YES
Tool.availability
Frequency
16
12
8
4
0


System.domain.type_____Quality.of.the.research
System.domain.type
WEB
MOBILE APPLICATIONS
LARGE−SCALE
LANGUAGE ENGINEERING
GENERIC
BUSINESS APPLICATIONS
0 0 0 0 0 0 0 0 2
0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 1 1 0
0 0 0 0 0 0 0 0 1
1 2 3 1 4 3 13 3 4
0 0 1 0 0 0 0 0 1
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


System.parts_____Validation.support
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0 0 3 0 0
0 0 1 0 0
1 1 8 1 12
0 0 0 0 1
0 0 2 0 0
0 0 0 0 1
CONSTRAINTS
CRITICS
NO
RECOMMENDERS
RULES
Validation.support
Frequency
12
9
6
3
0


System.parts_____Collaboration.types
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0
1
2
0
0
1
6
3
14
0
0
1
1
0
1
1
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OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types
Frequency
10
5
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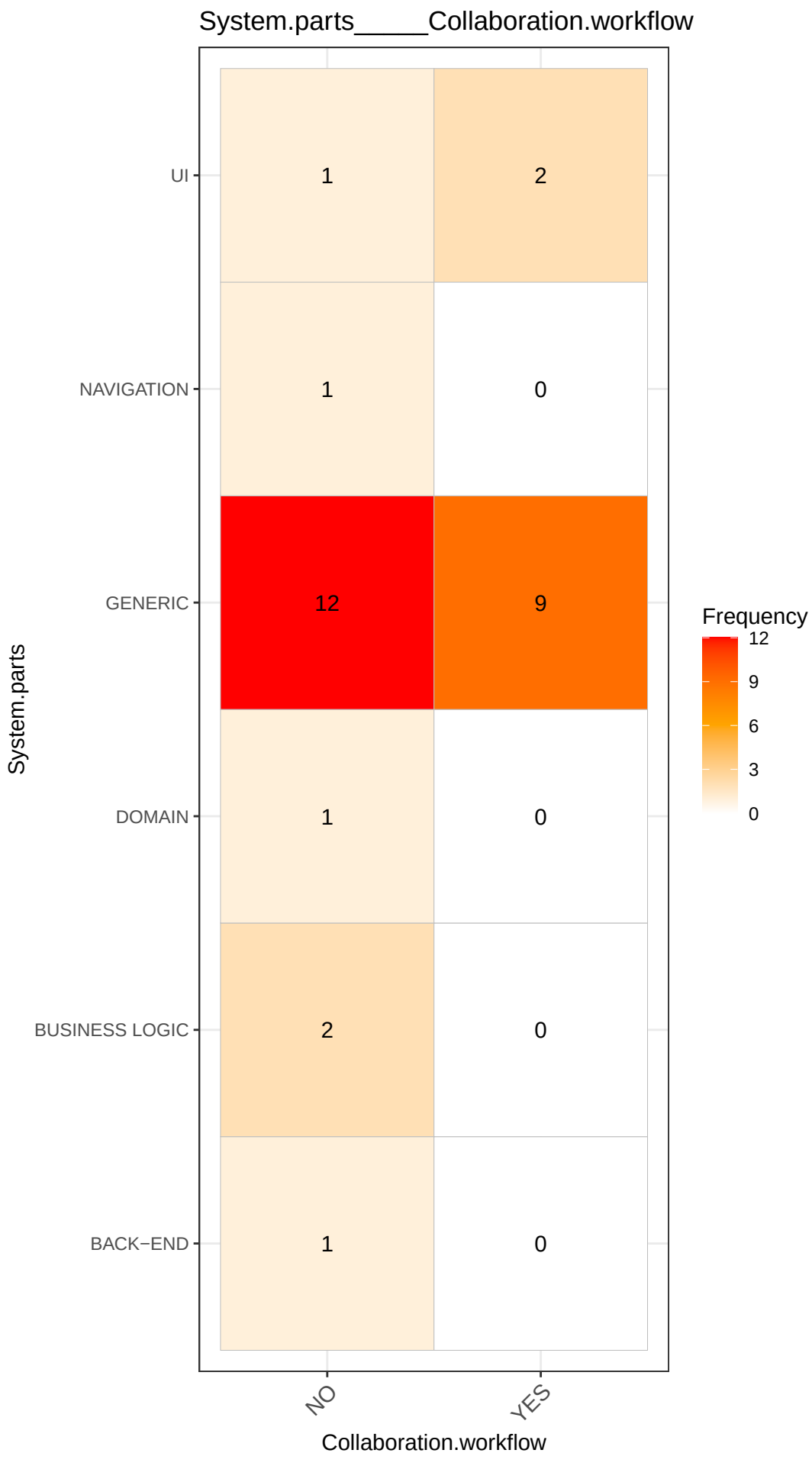
System.parts_____Collaboration.workflow
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
1
2
1
0
12
9
1
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2
0
1
0
System.parts
NO
YES
Collaboration.workflow
Frequency
12
9
6
3
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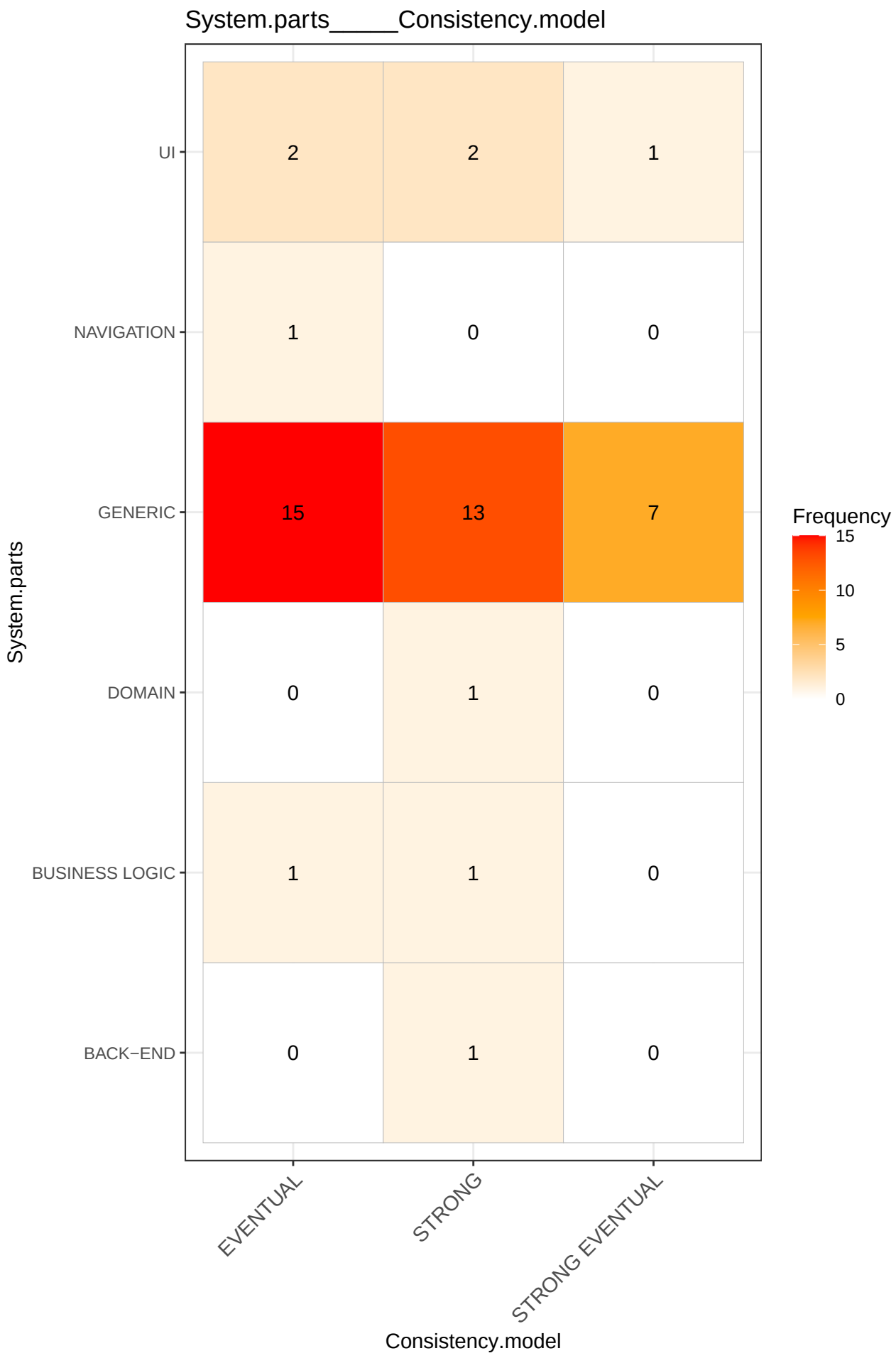
System.parts_____Consistency.model
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
2
2
1
1
0
0
15
13
7
0
1
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1
0
0
1
0
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
15
10
5
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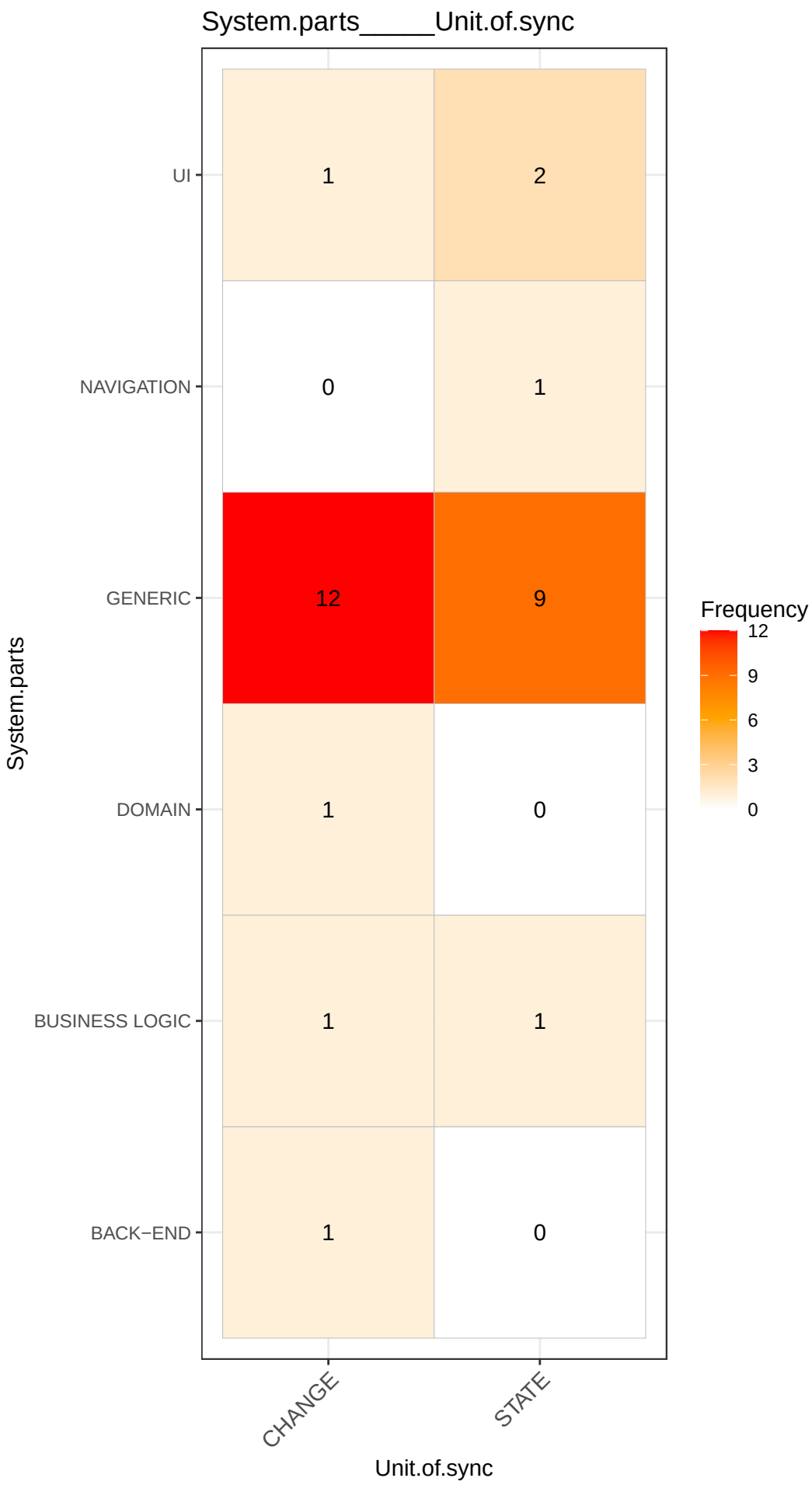
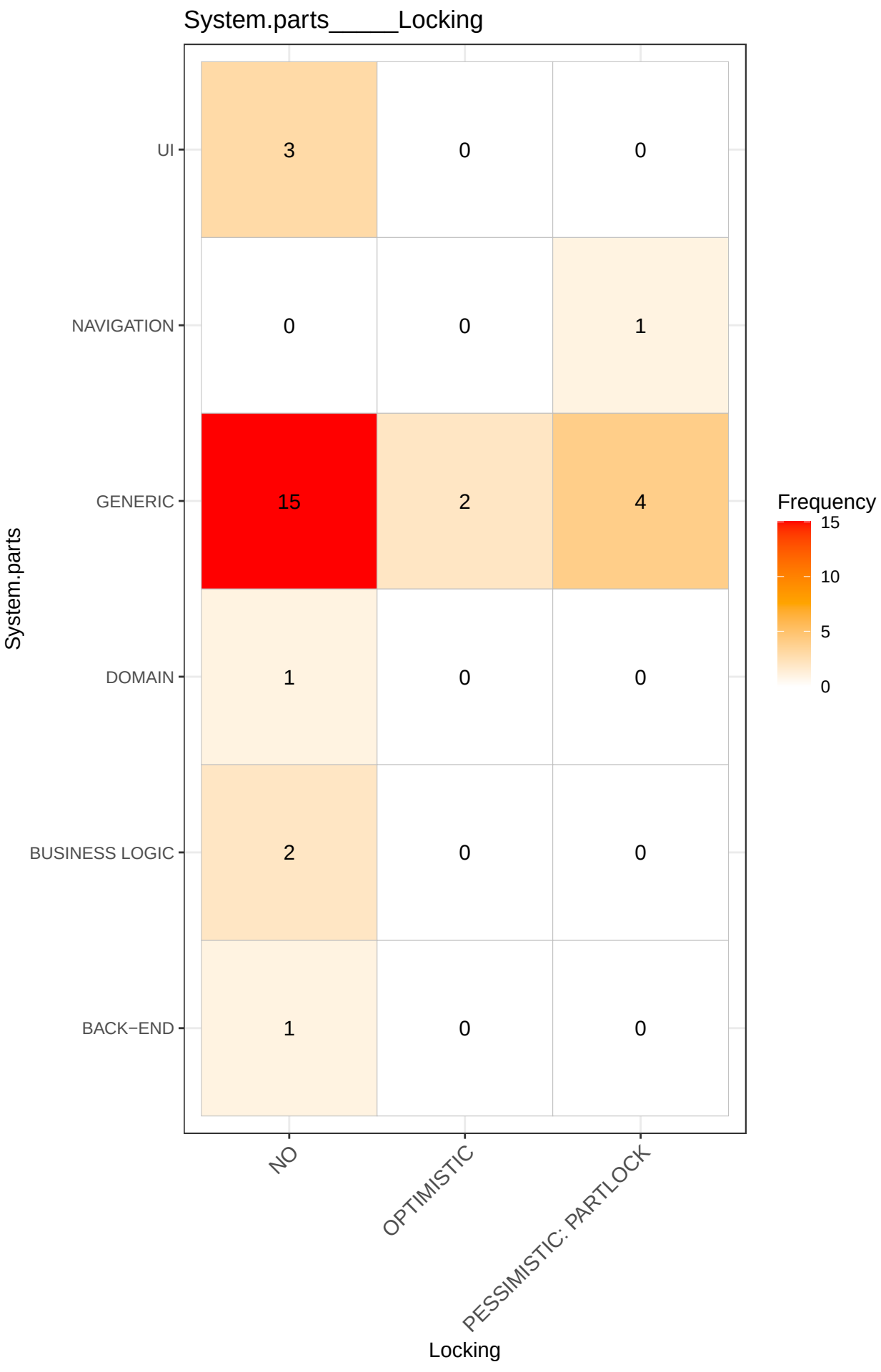

System.parts_____Unit.of.sync
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
1
2
0
1
12
9
1
0
1
1
1
0
CHANGE
STATE
Unit.of.sync
Frequency
12
9
6
3
0


System.parts_____Locking
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
3
0
0
0
0
1
15
2
4
1
0
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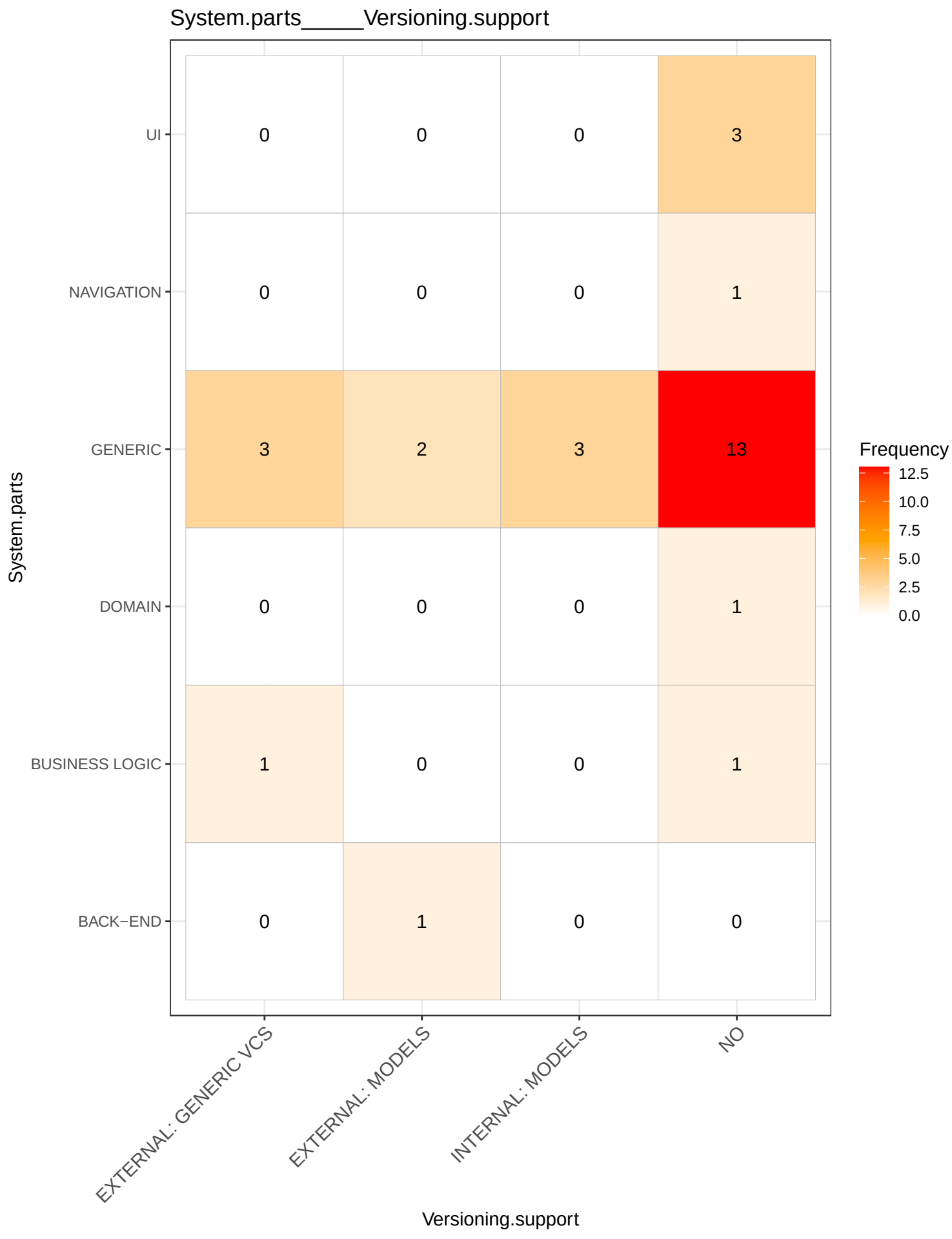
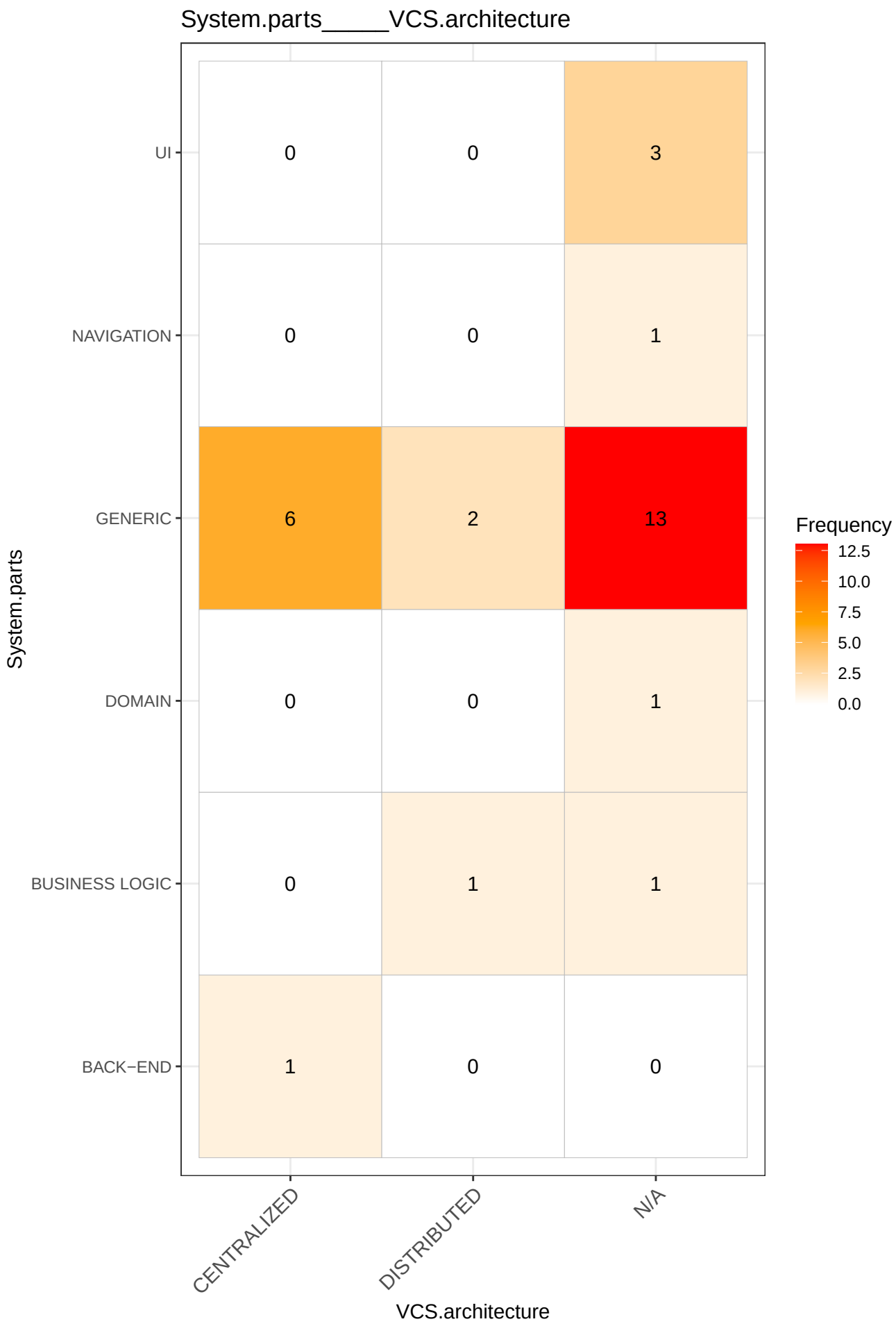
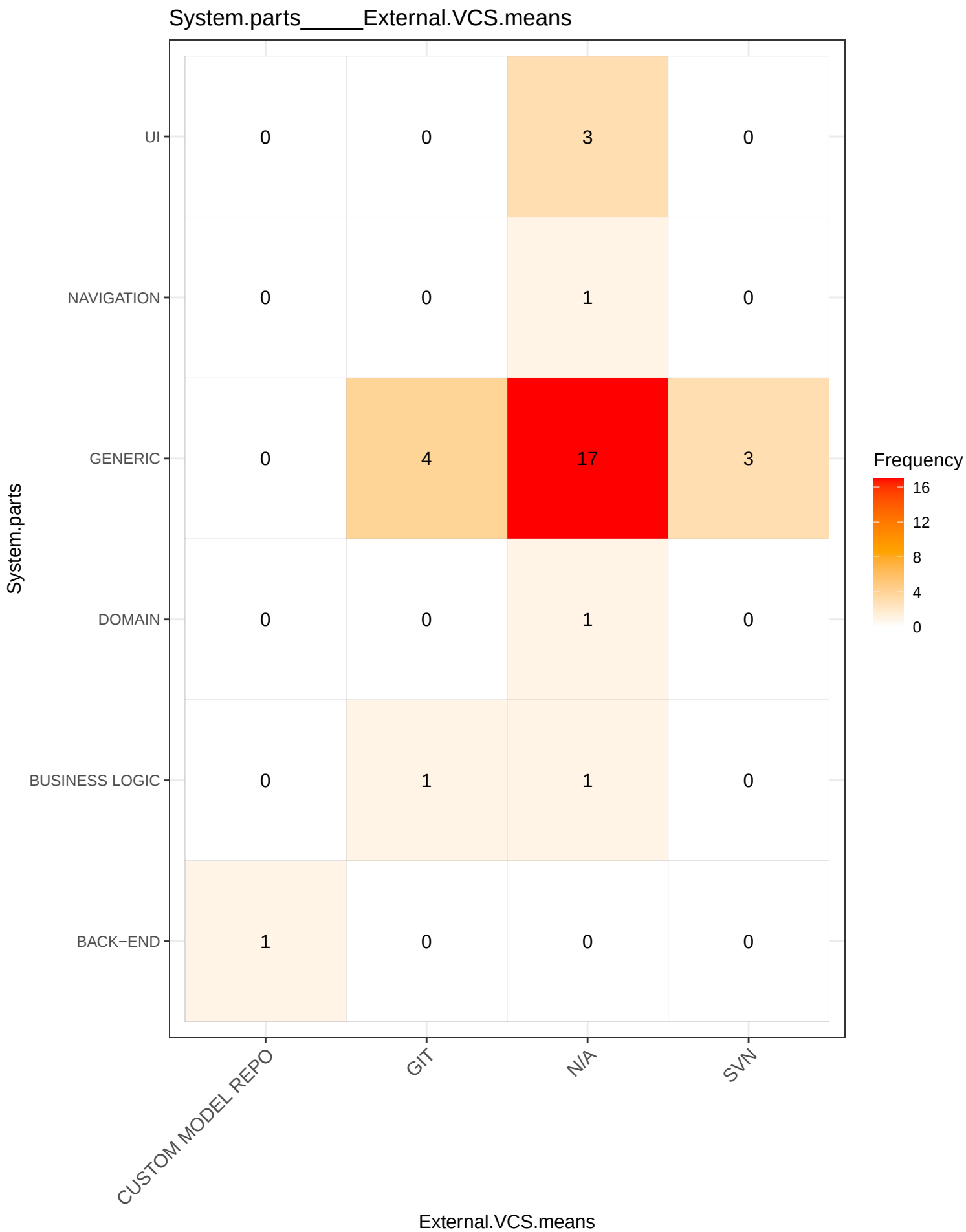
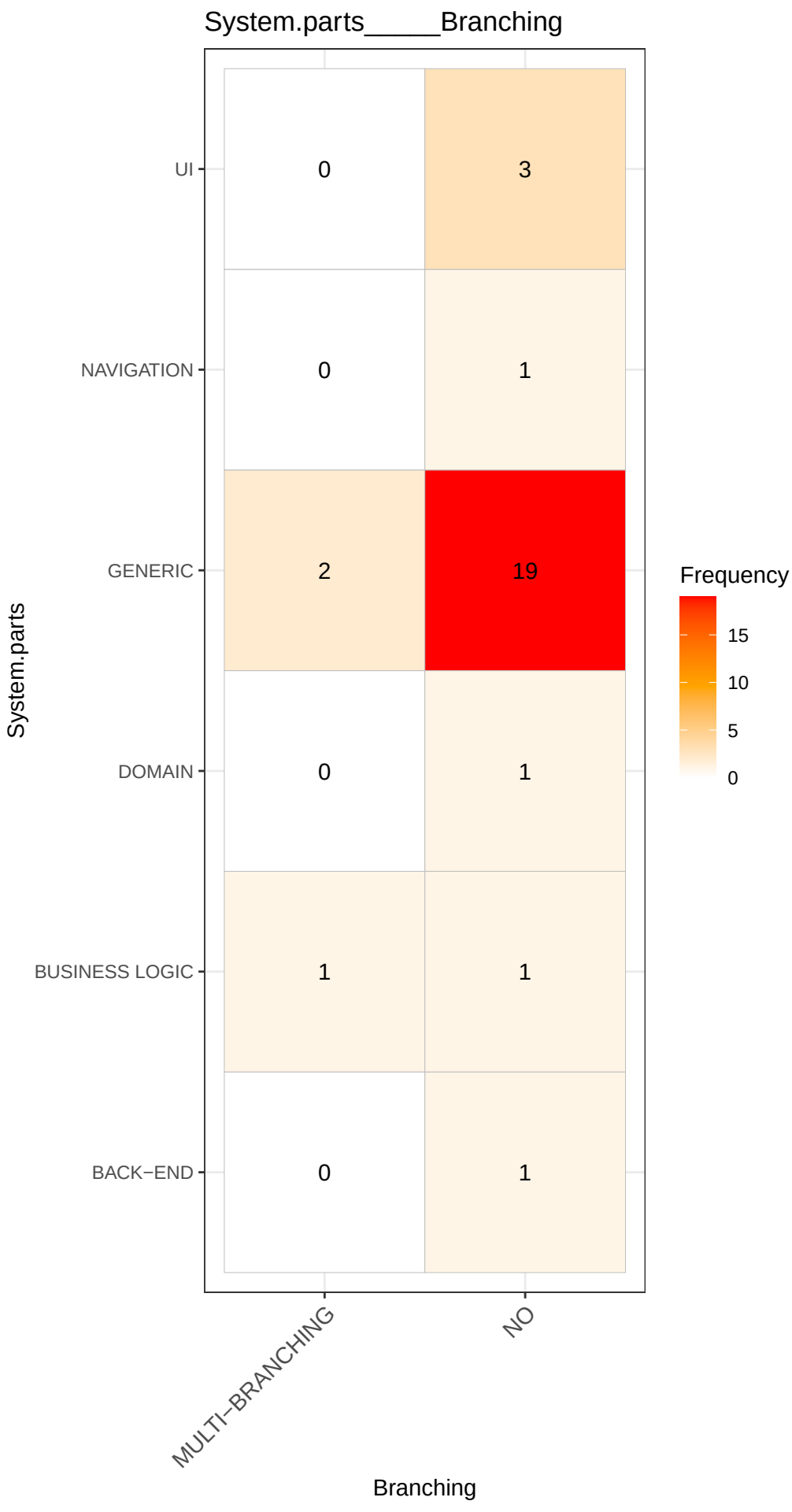
2
0
0
1
0
0
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
15
10
5
0


System.parts_____Versioning.support
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0
0
0
3
0
0
0
1
3
2
3
13
0
0
0
1
1
0
0
1
0
1
0
0
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


System.parts_____VCS.architecture
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0
0
3
0
0
1
6
2
13
0
0
1
0
1
1
1
0
0
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


System.parts_____External.VCS.means
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0 0 3 0
0 0 1 0
0 4 17 3
0 0 1 0
0 1 1 0
1 0 0 0
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
16
12
8
4
0


System.parts_____Branching
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0
3
0
1
2
19
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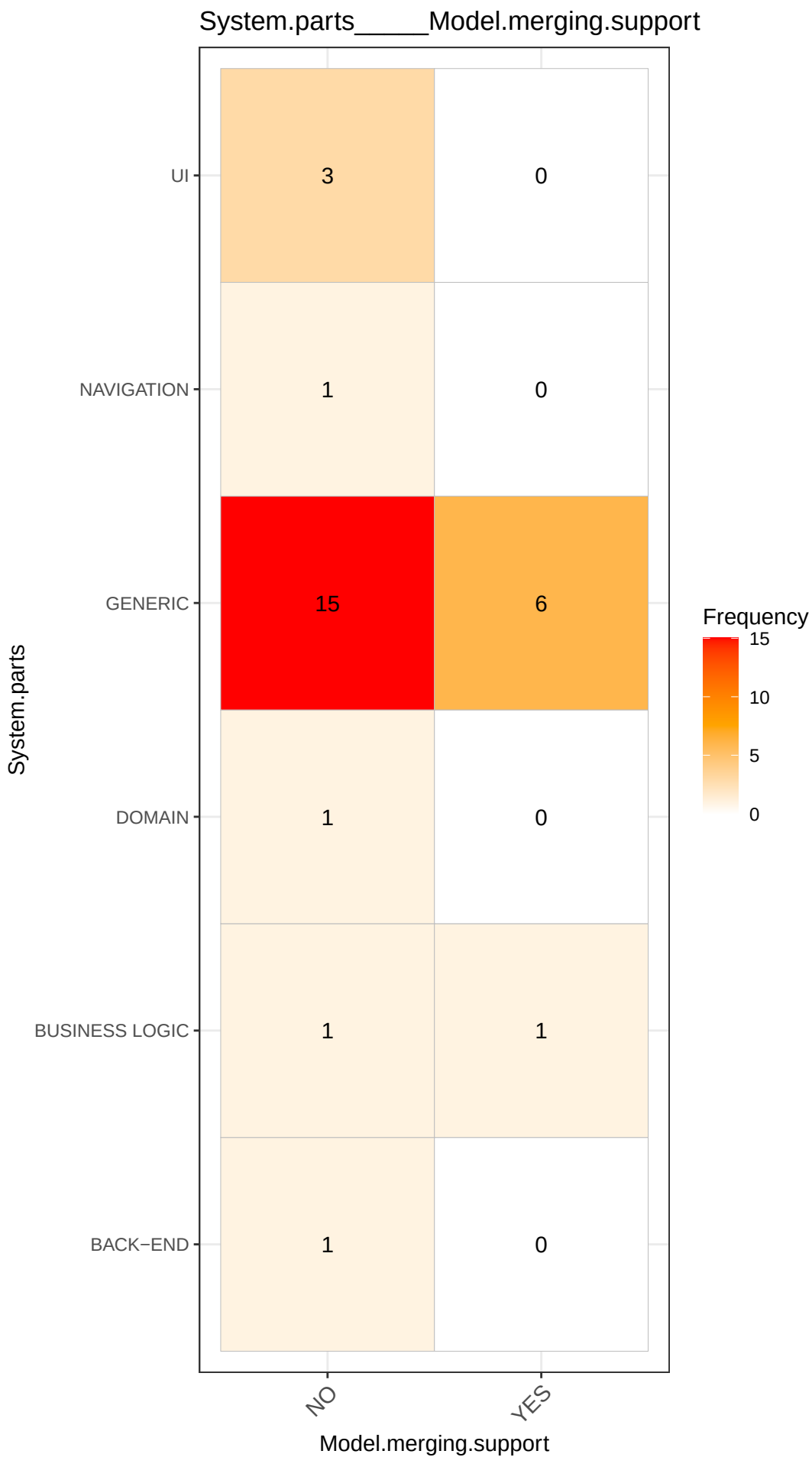
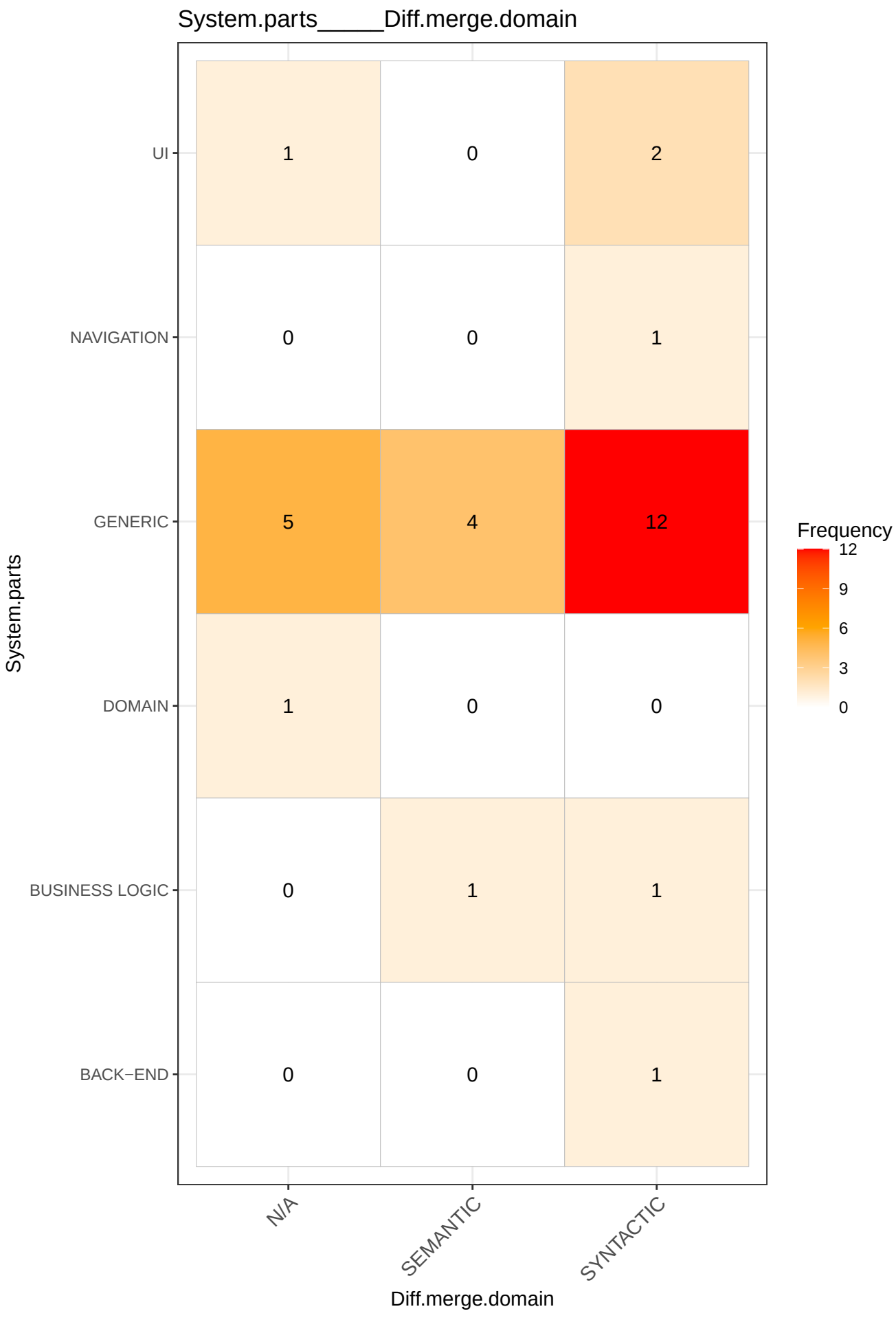
1
1
1
0
1
MULTI−BRANCHING
NO
Branching
Frequency
15
10
5
0


System.parts_____Model.merging.support
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
3
0
1
0
15
6
1
0
1
1
1
0
NO
YES
Model.merging.support
Frequency
15
10
5
0


System.parts_____Diff.merge.domain
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
1
0
2
0
0
1
5
4
12
1
0
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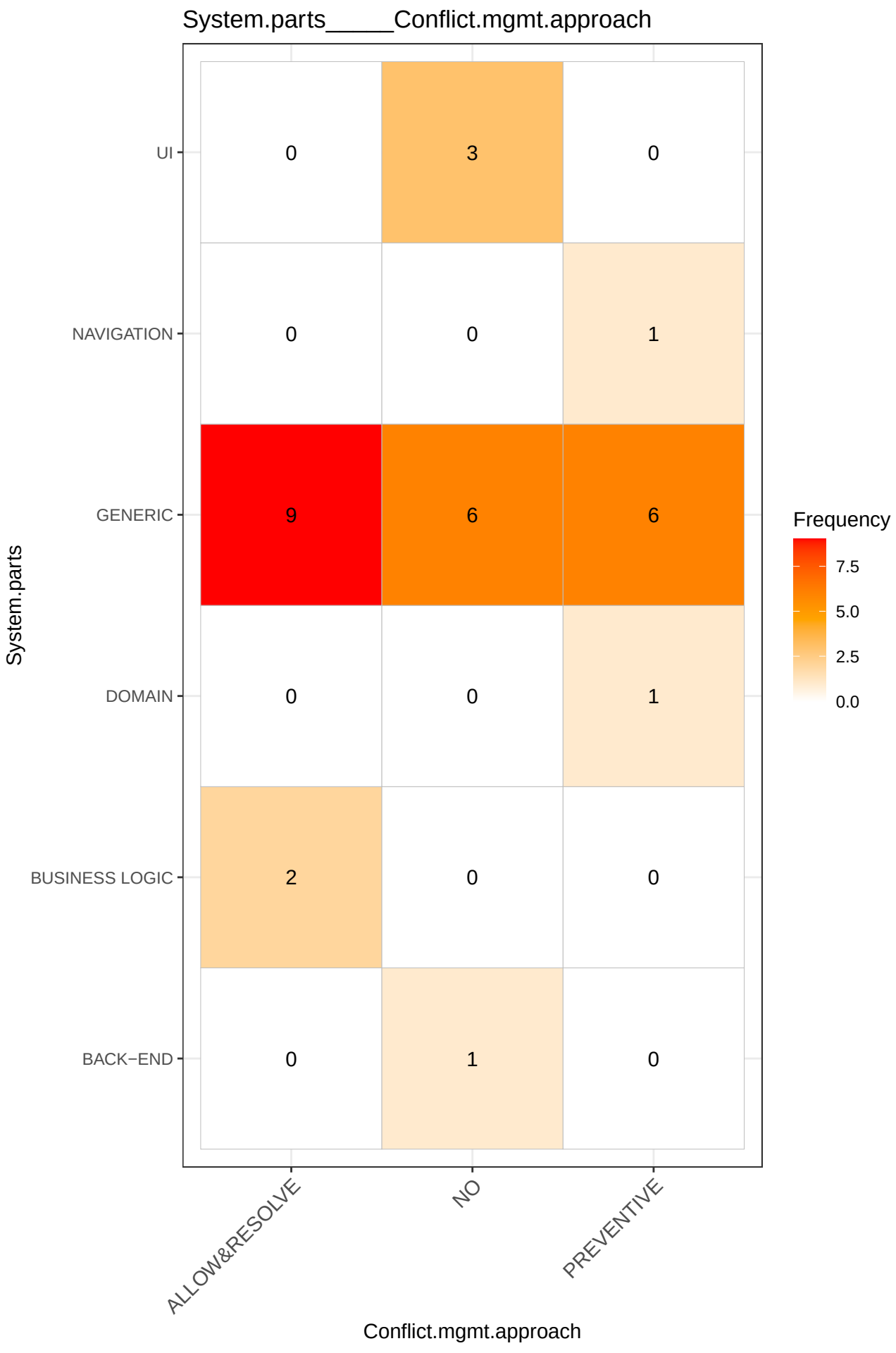
1
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0


System.parts_____Conflict.mgmt.approach
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0
3
0
0
0
1
9
6
6
0
0
1
2
0
0
0
1
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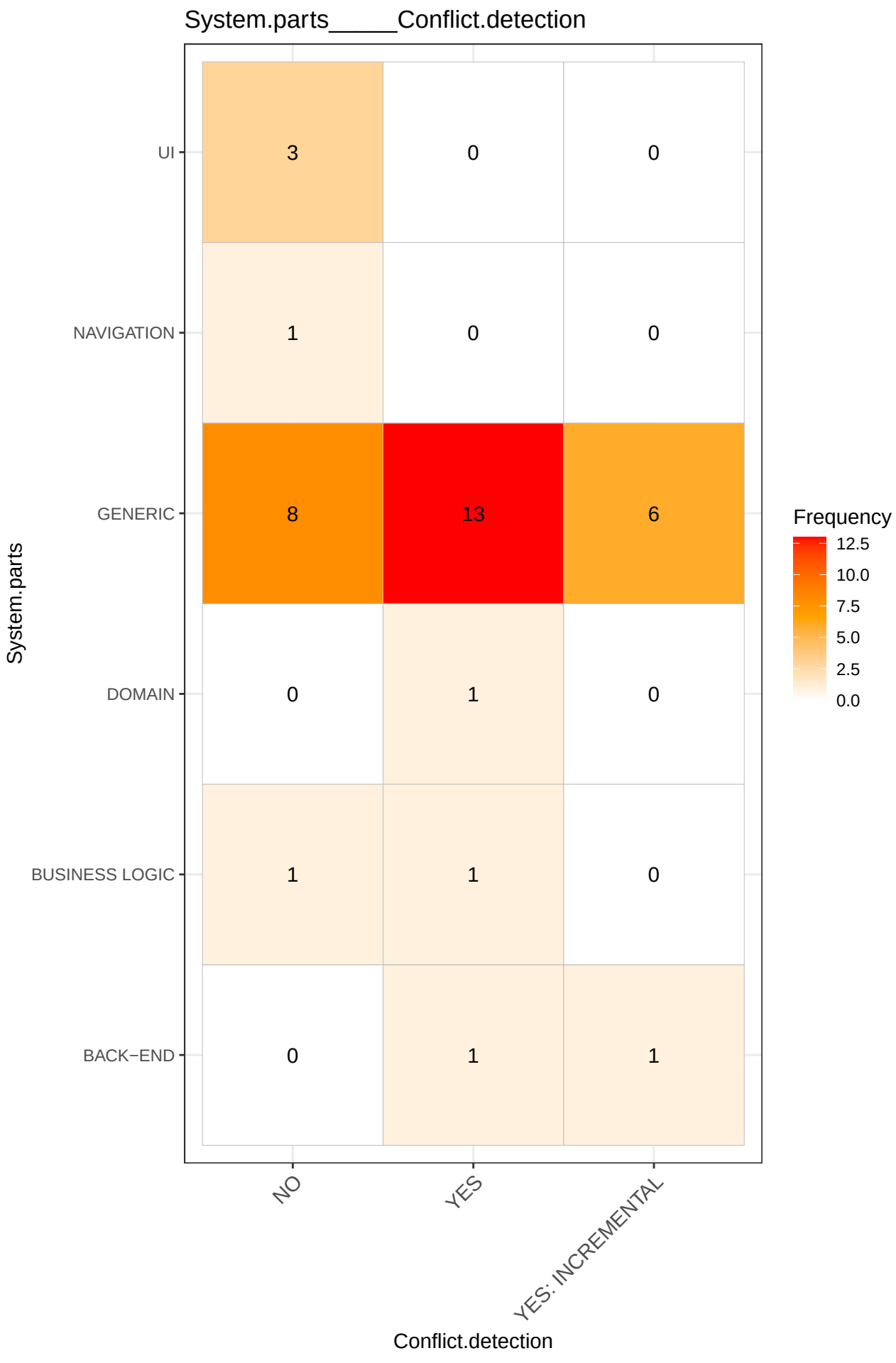
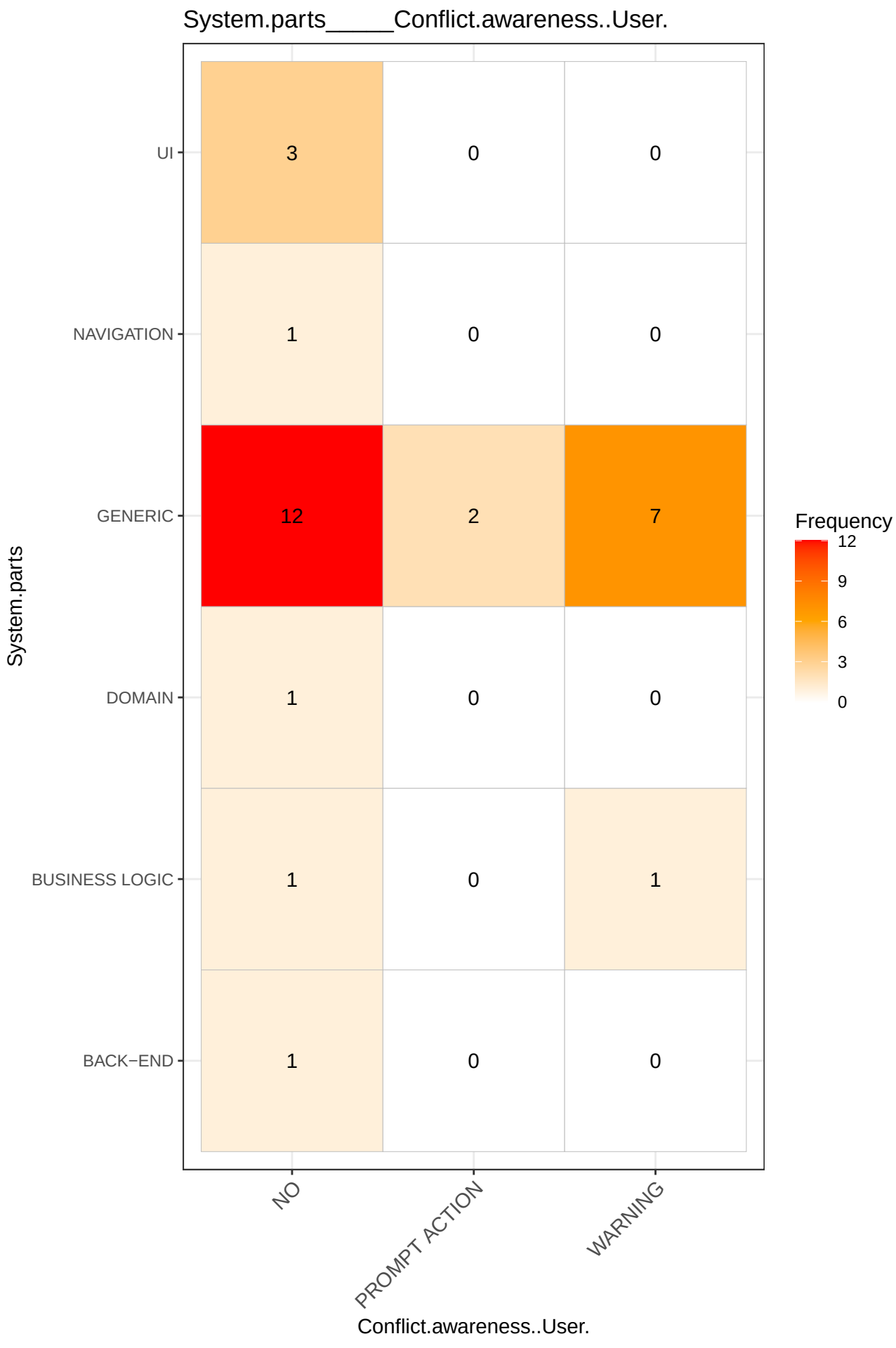
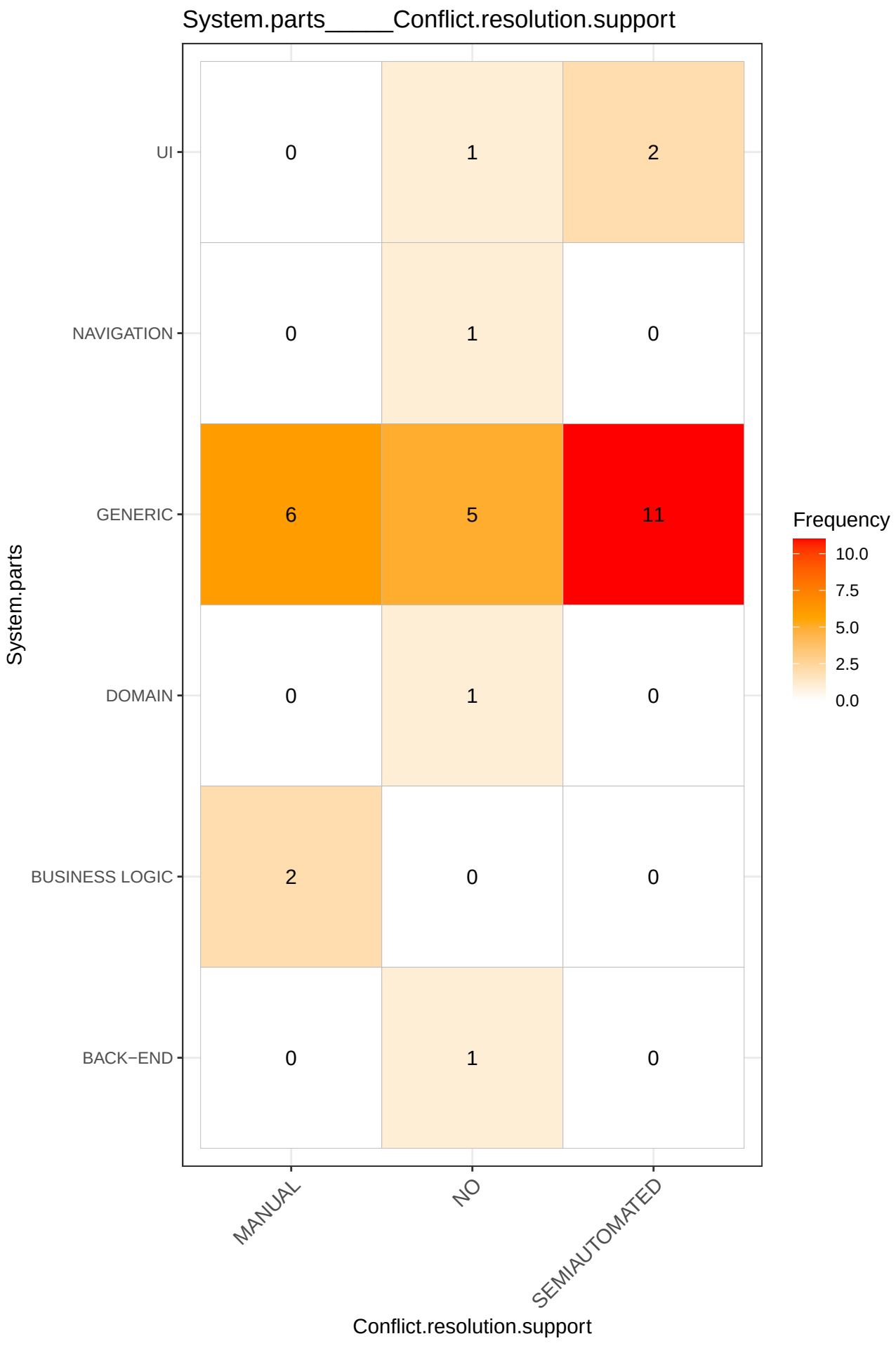
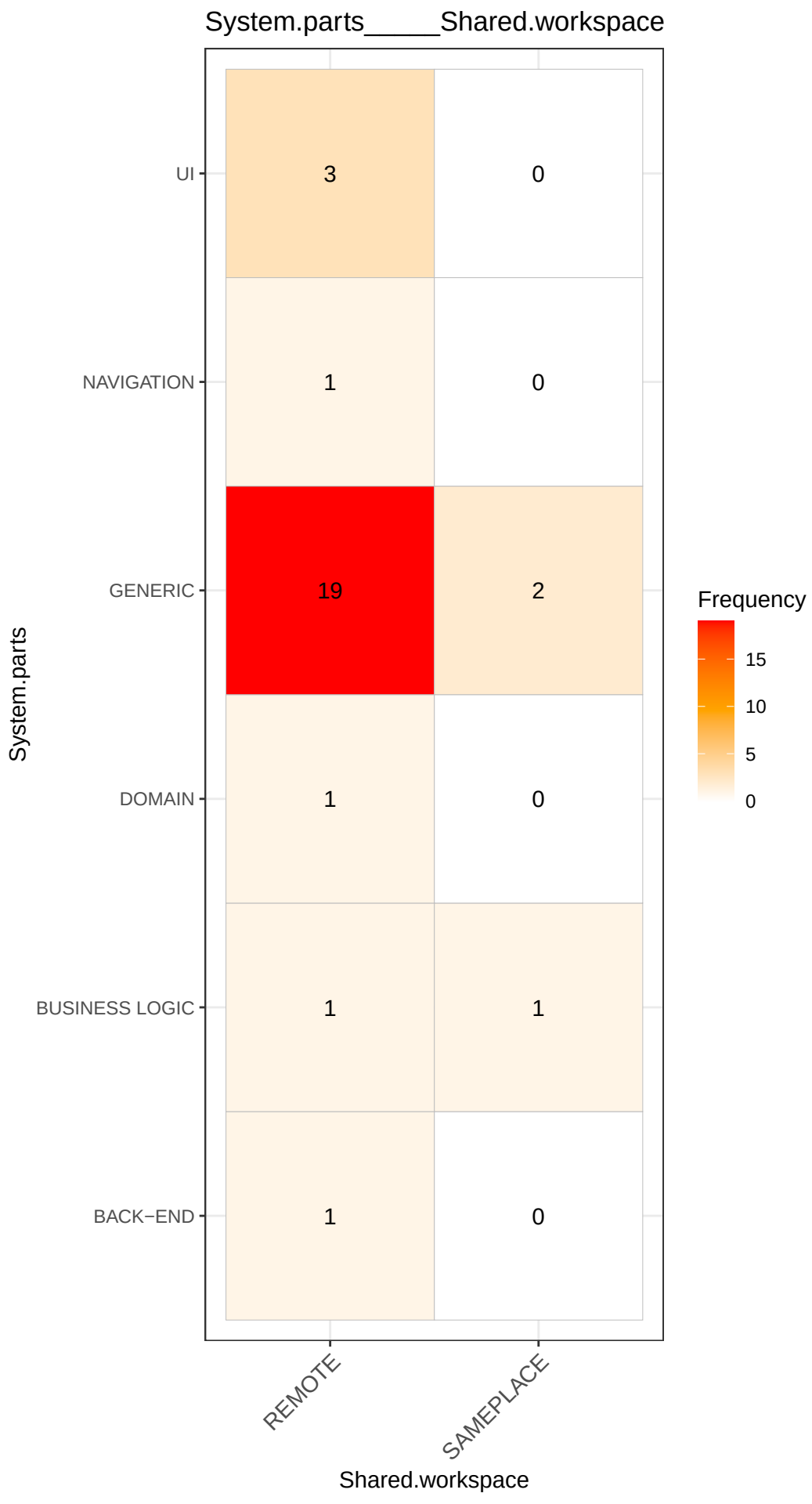
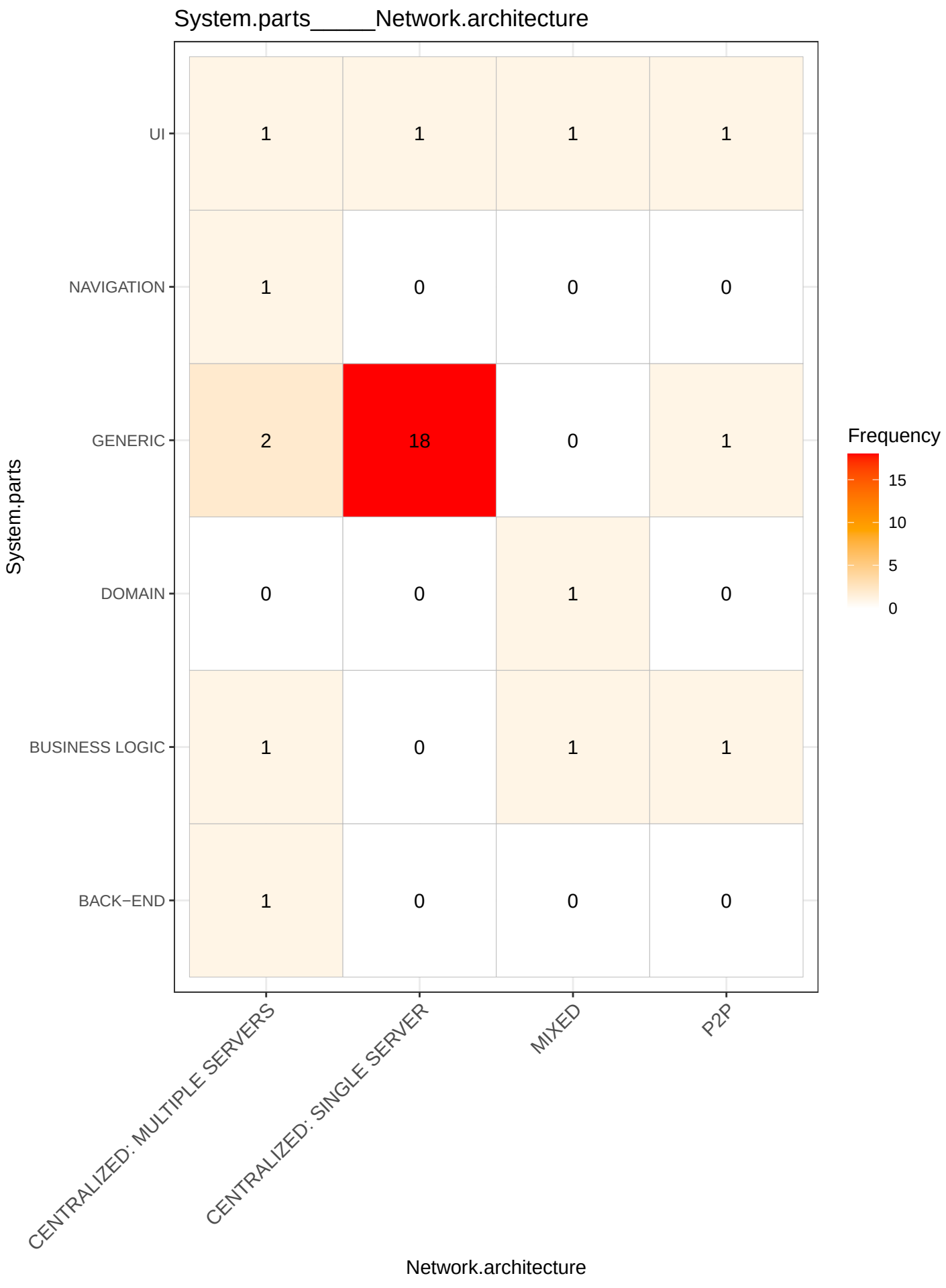
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
7.5
5.0
2.5
0.0

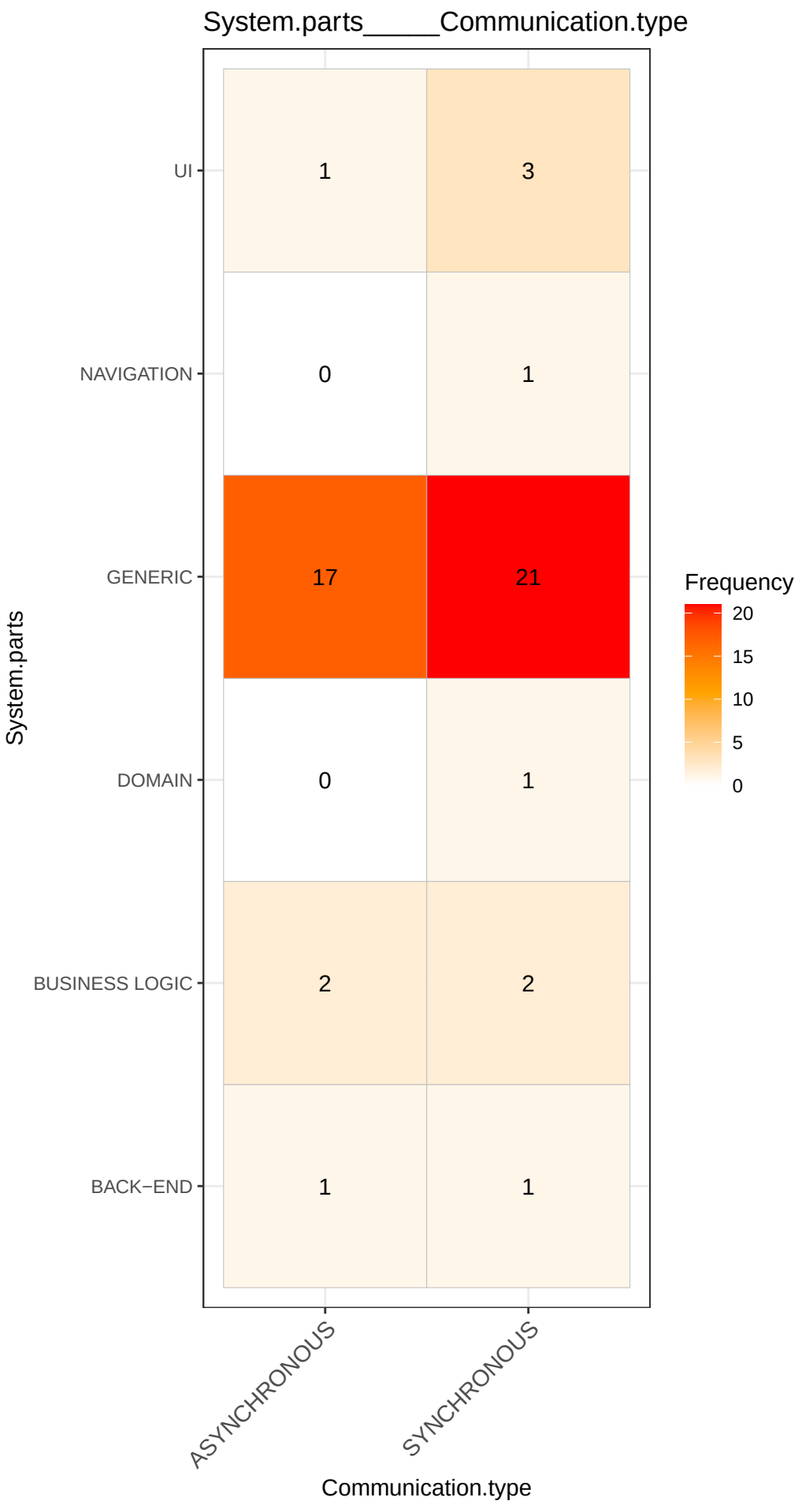

System.parts_____Conflict.detection
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
3
0
0
1
0
0
8
13
6
0
1
0
1
1
0
0
1
1
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

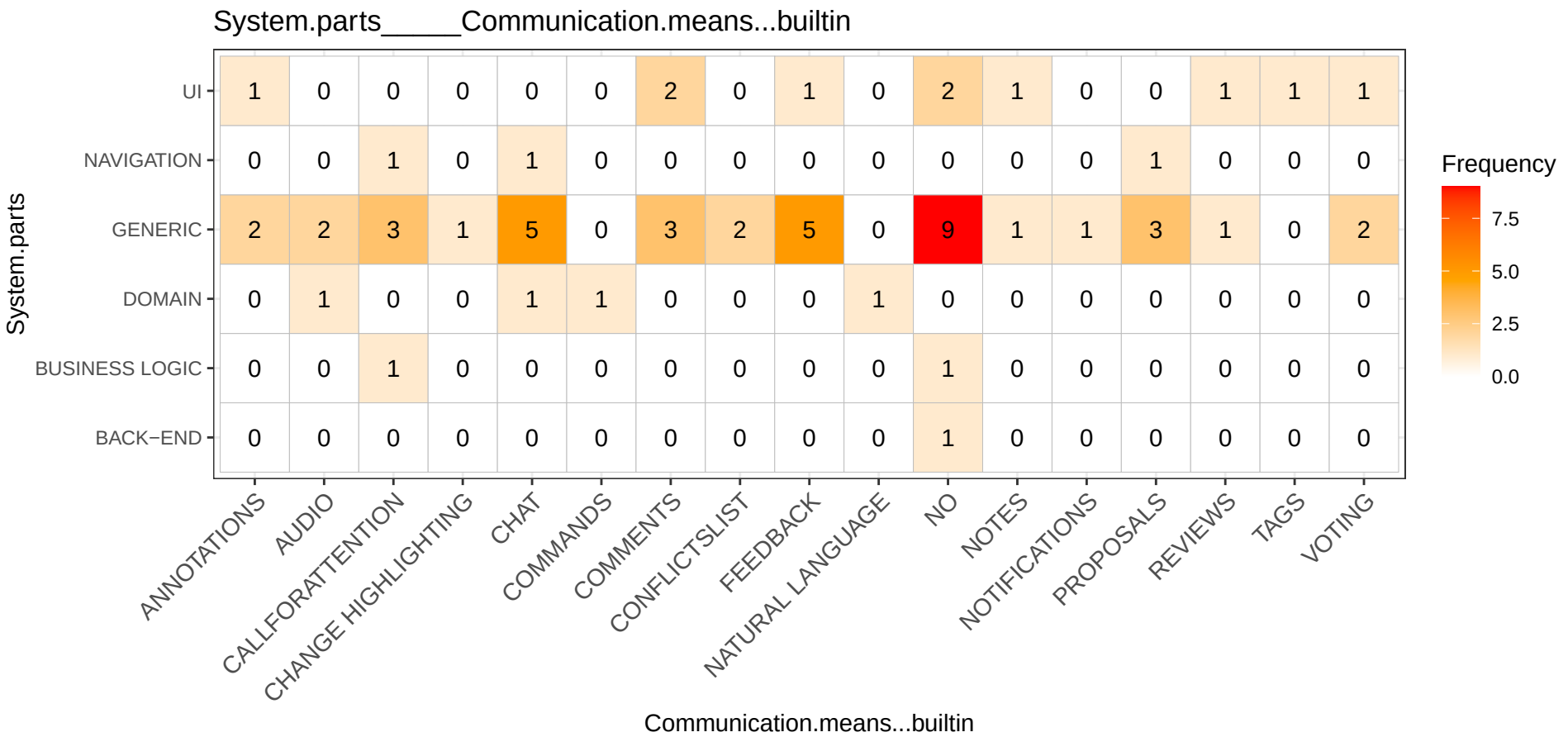

System.parts_____Conflict.awareness..User.
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
3
0
0
1
0
0
12
2
7
1
0
0
1
0
1
1
0
0
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
12
9
6
3
0

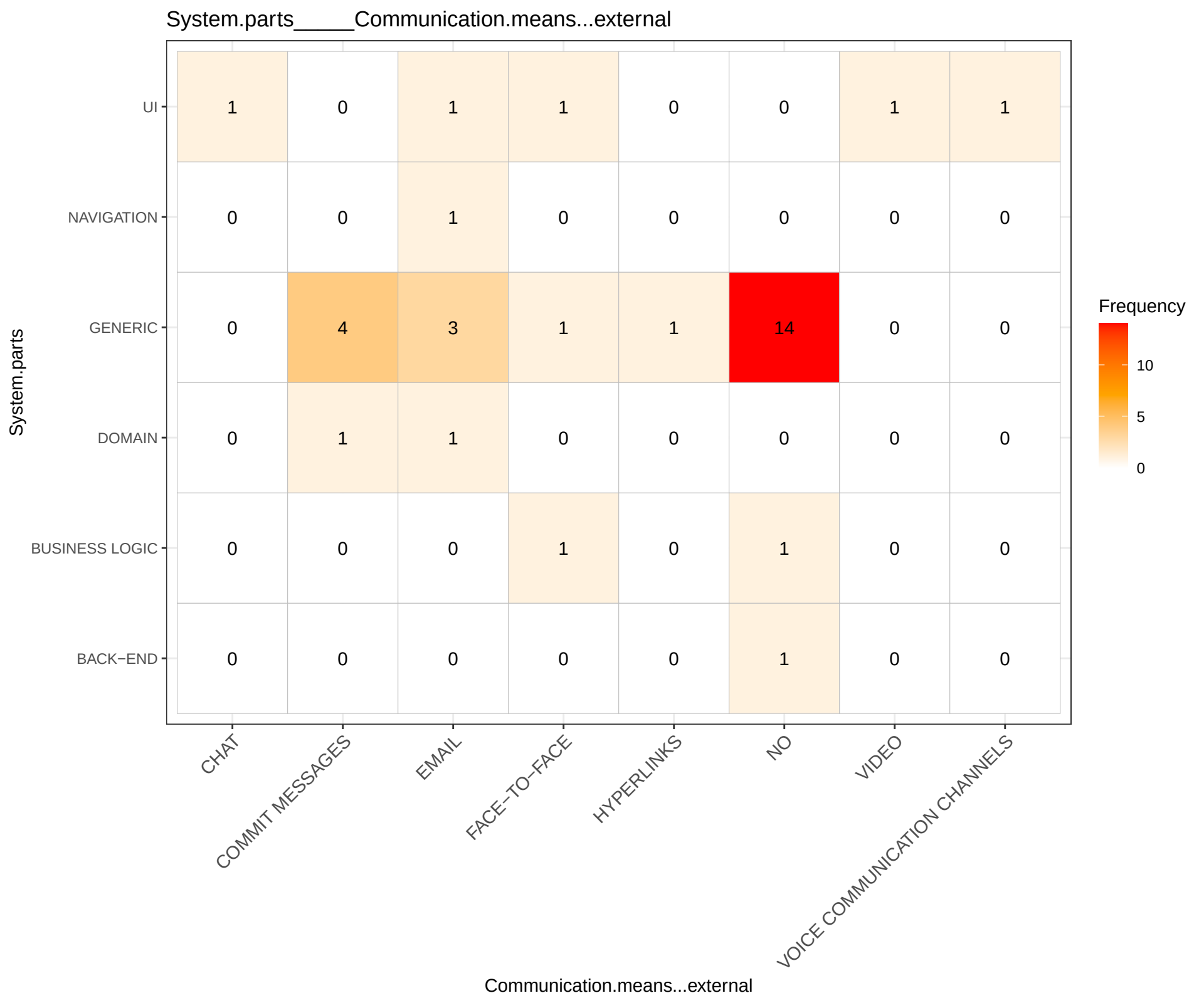

System.parts_____Conflict.resolution.support
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0
1
2
0
1
0
6
5
11
0
1
0
2
0
0
0
1
0
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
10.0
7.5
5.0
2.5
0.0

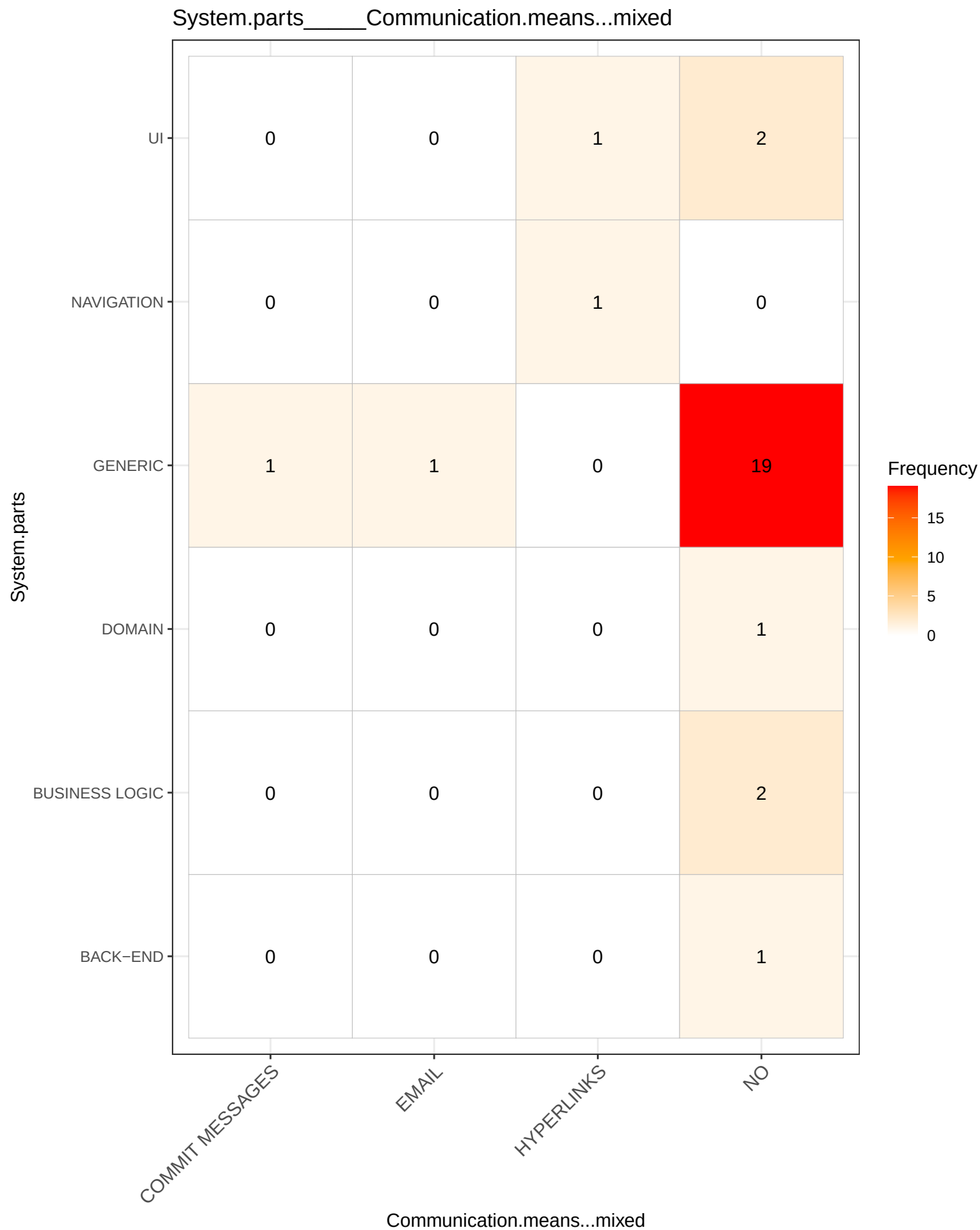

System.parts_____Shared.workspace
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
3
0
1
0
19
2
1
0
1
1
1
0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
15
10
5
0

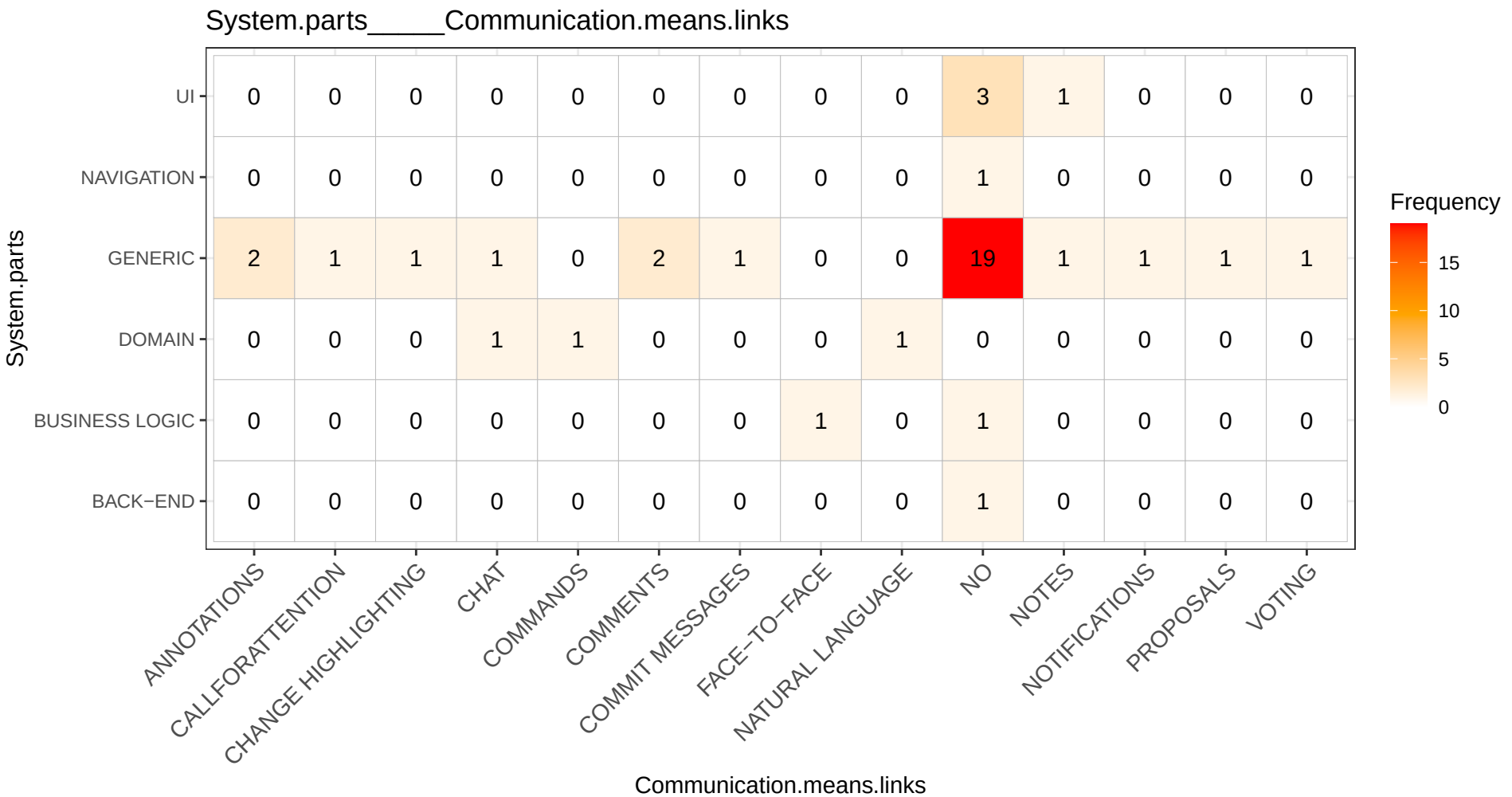

System.parts_____Network.architecture
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
1 1 1 1
1 0 0 0
2 18 0 1
0 0 1 0
1 0 1 1
1 0 0 0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
15
10
5
0

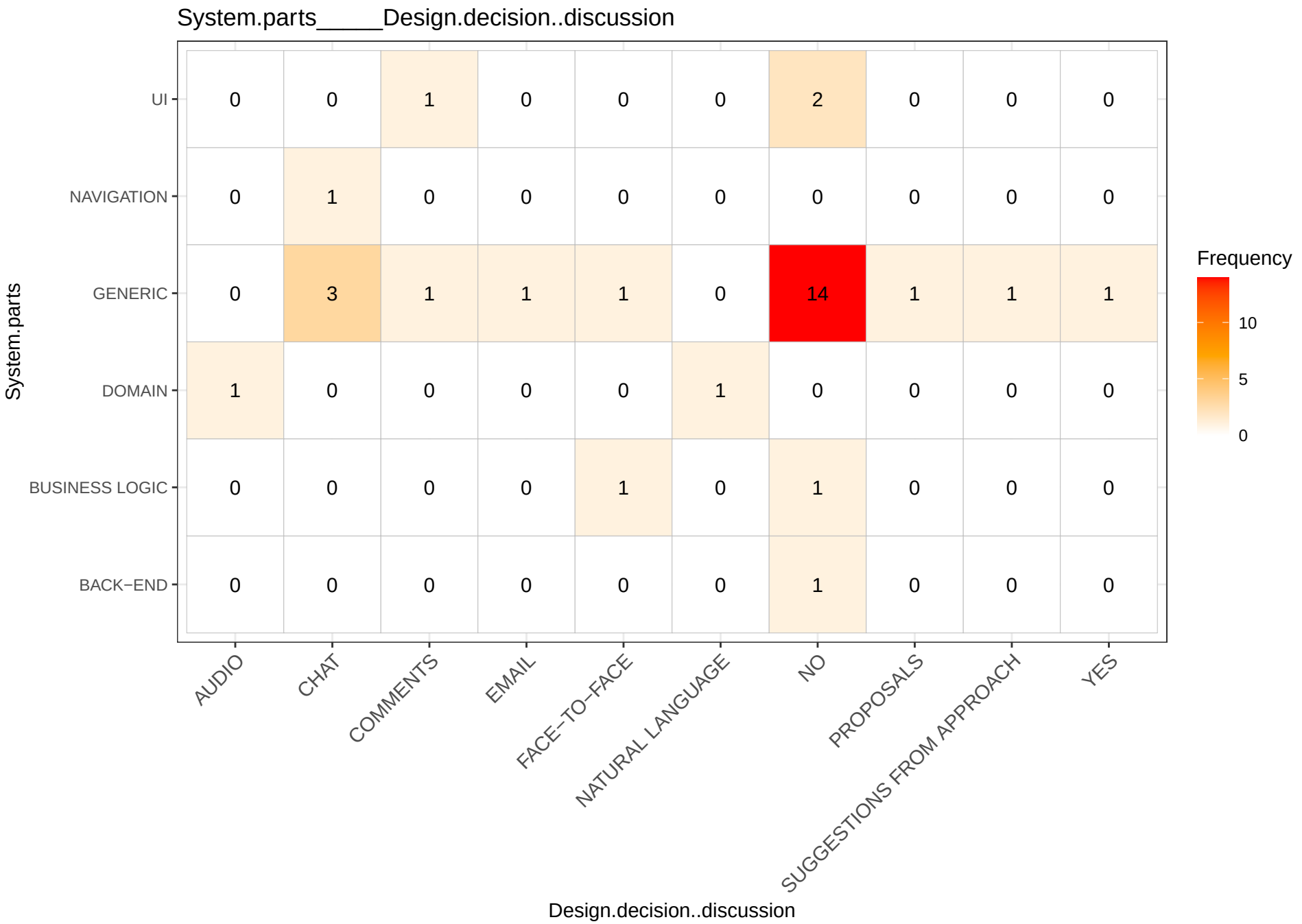

System.parts_____Communication.type
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
1
3
0
1
17
21
0
1
2
2
1
1
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
20
15
10
5
0

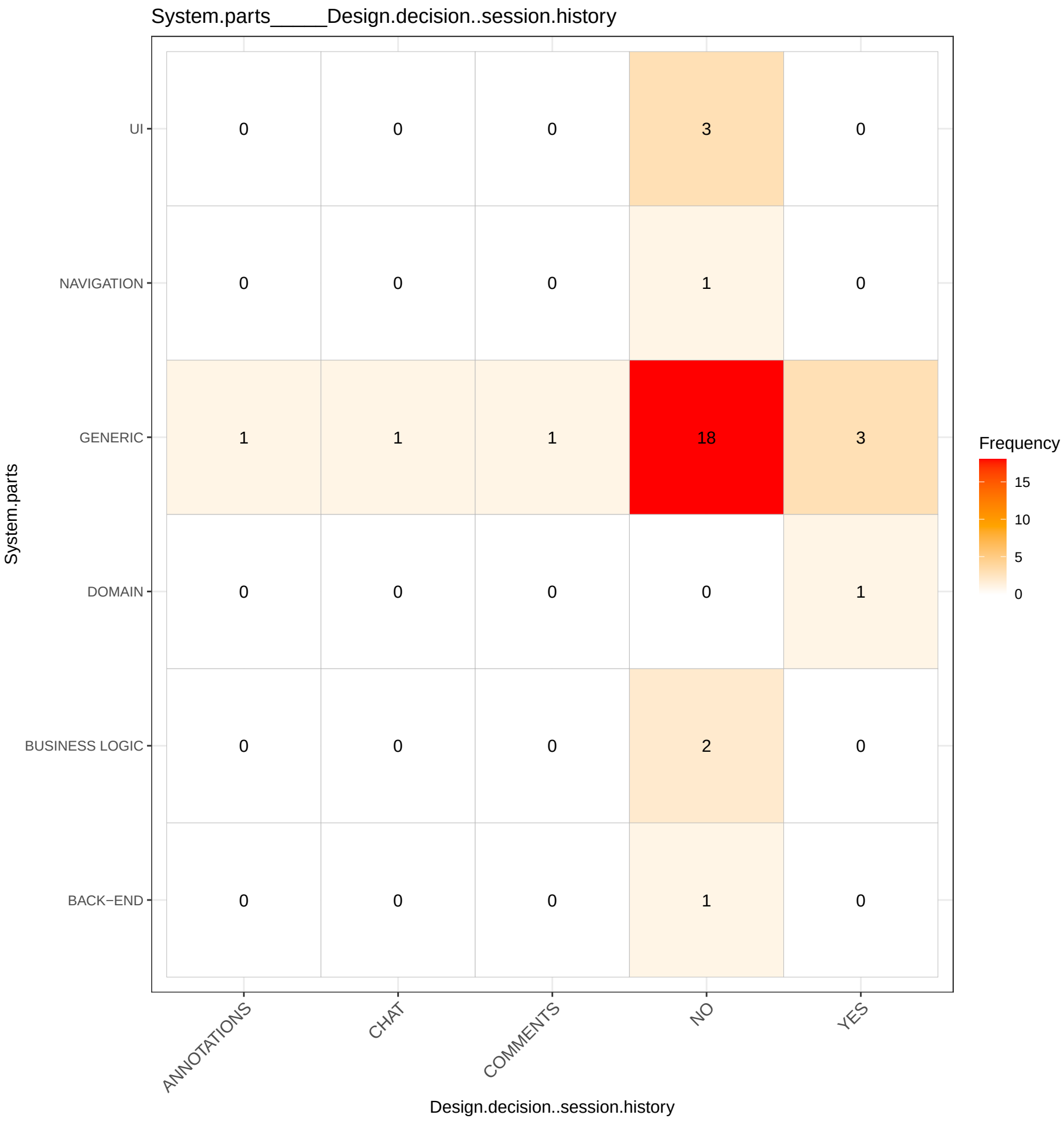

System.parts_____Communication.means...builtin
System.parts
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
1 0 0 0 0 0 2 0 1 0 2 1 0 0 1 1 1
0 0 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0
2 2 3 1 5 0 3 2 5 0 9 1 1 3 1 0 2
0 1 0 0 1 1 0 0 0 1 0 0 0 0 0 0 0
0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

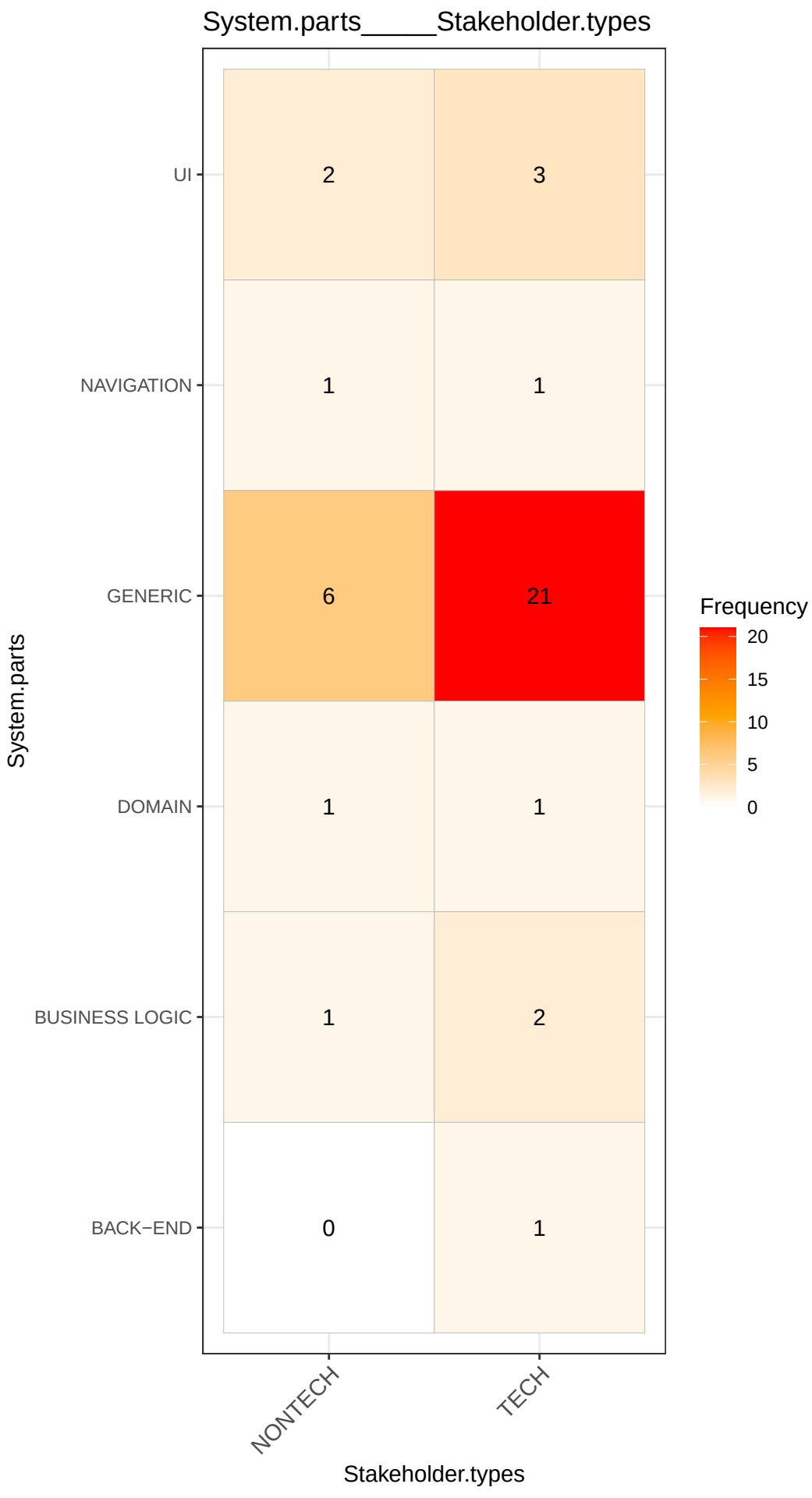

System.parts_____Communication.means...external
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
1 0 1 1 0 0 1 1
0 0 1 0 0 0 0 0
0 4 3 1 1 14 0 0
0 1 1 0 0 0 0 0
0 0 0 1 0 1 0 0
0 0 0 0 0 1 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10
5
0

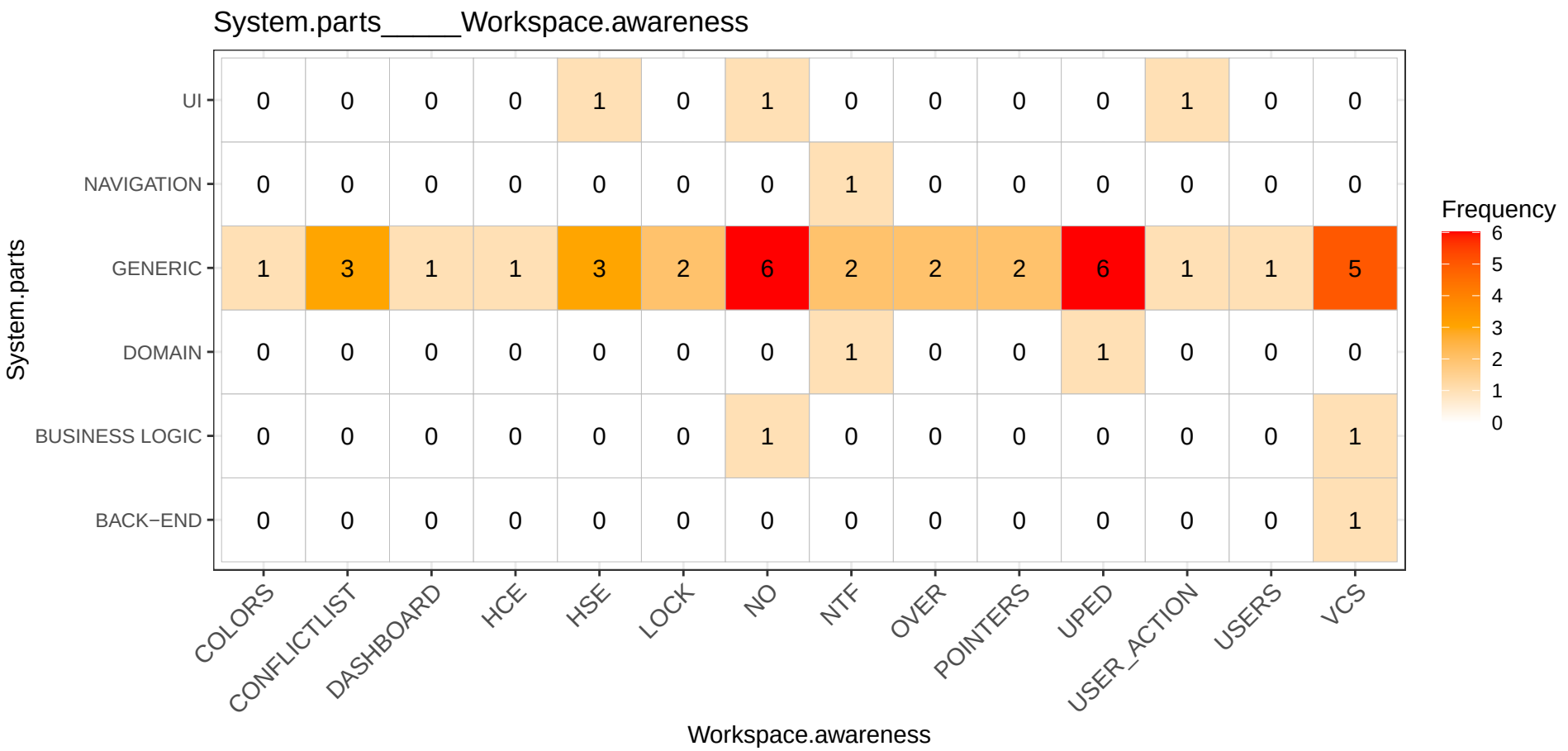

System.parts_____Communication.means...mixed
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0 0 1 2
0 0 1 0
1 1 0 19
0 0 0 1
0 0 0 2
0 0 0 1
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
15
10
5
0

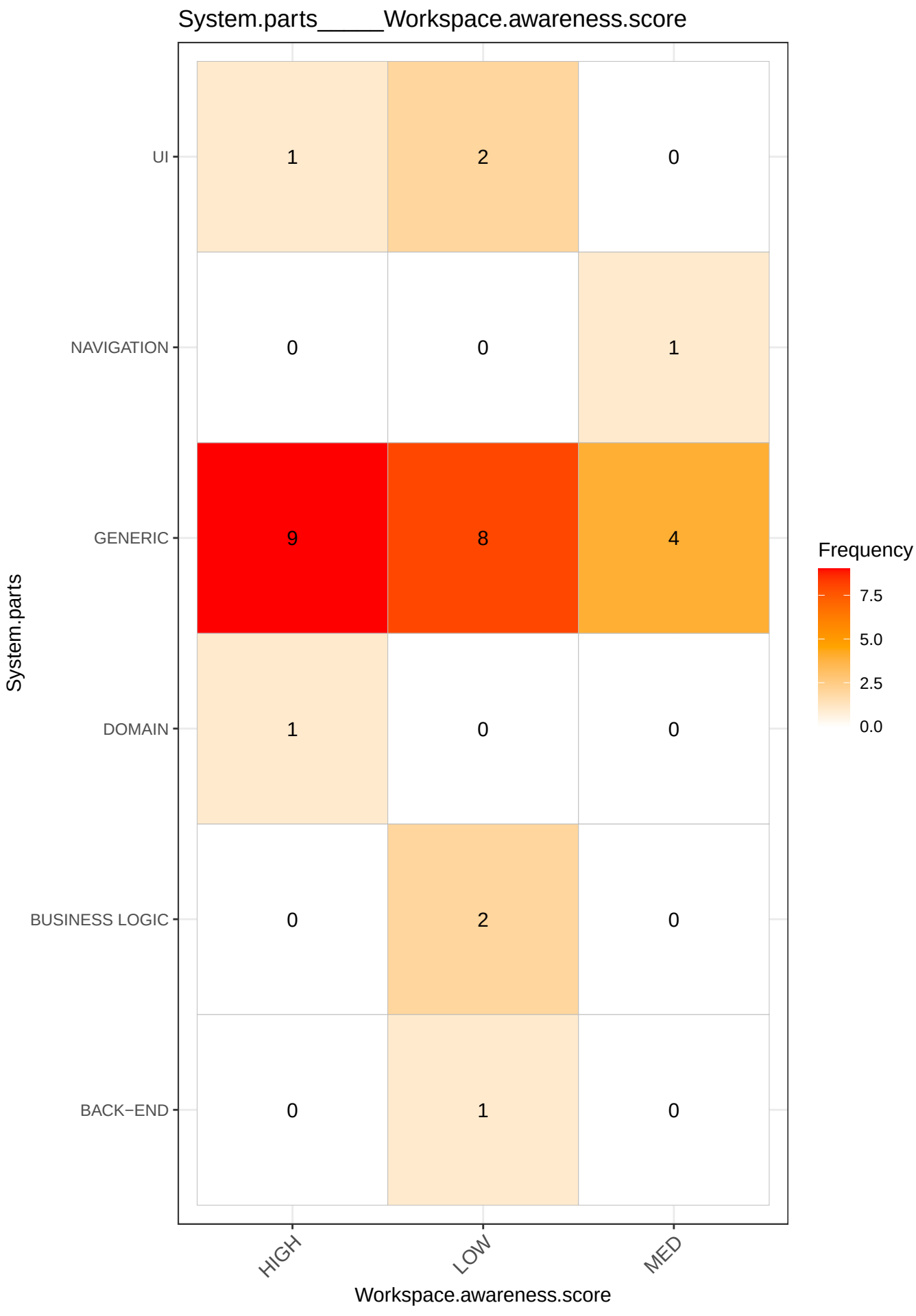

System.parts_____Communication.means.links
UI 0 0 0 0 0 0 0 0 0 3 1 0 0 0
NAVIGATION 0 0 0 0 0 0 0 0 0 1 0 0 0 0
GENERIC 2 1 1 1 0 2 1 0 0 19 1 1 1 1
DOMAIN 0 0 0 1 1 0 0 0 1 0 0 0 0 0
BUSINESS LOGIC 0 0 0 0 0 0 0 1 0 1 0 0 0 0
BACK−END 0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
System.parts
Communication.means.links
Frequency
15
10
5
0

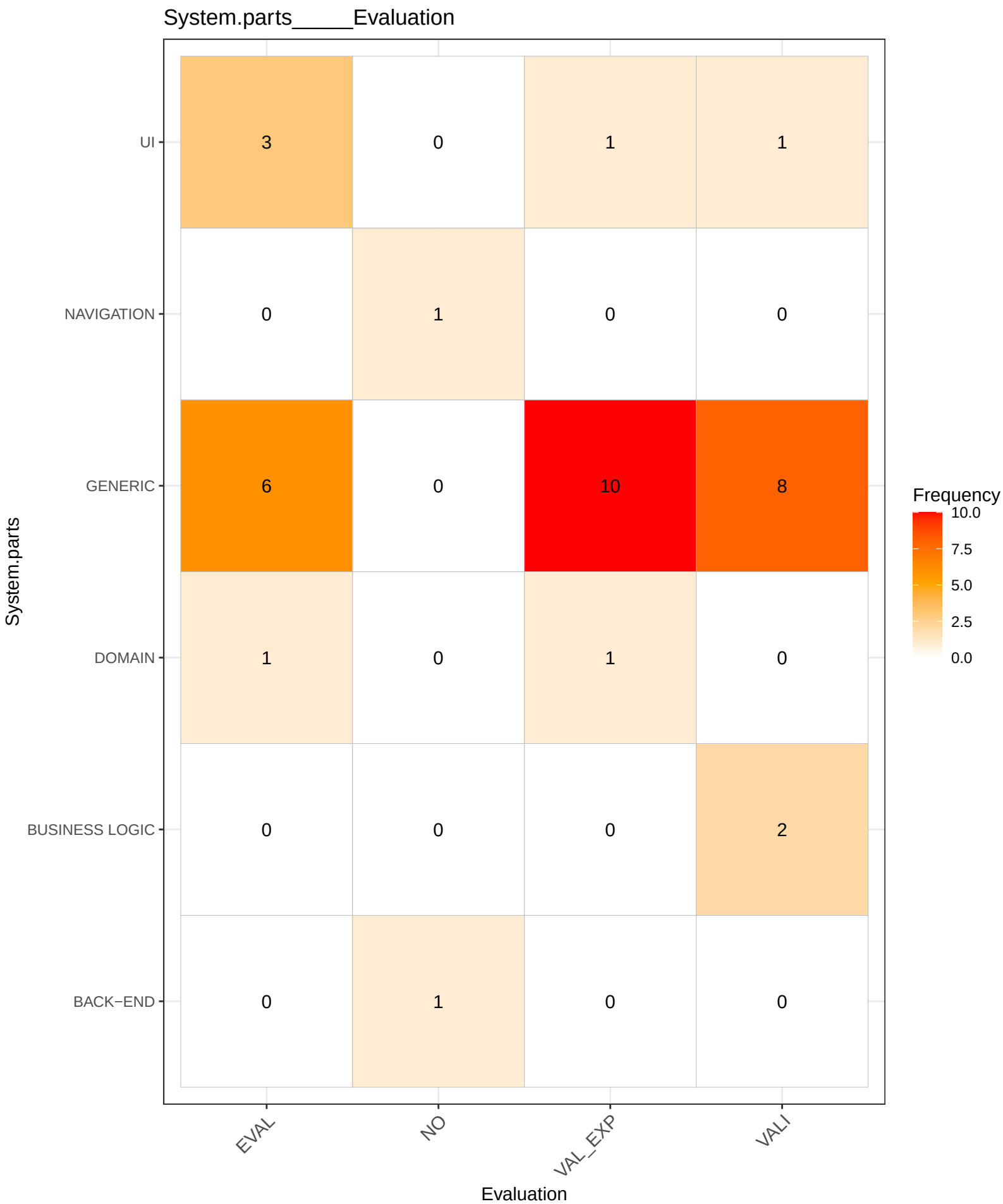

System.parts_____Design.decision..discussion
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0 0 1 0 0 0 2 0 0 0
0 1 0 0 0 0 0 0 0 0
0 3 1 1 1 0 14 1 1 1
1 0 0 0 0 1 0 0 0 0
0 0 0 0 1 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10
5
0

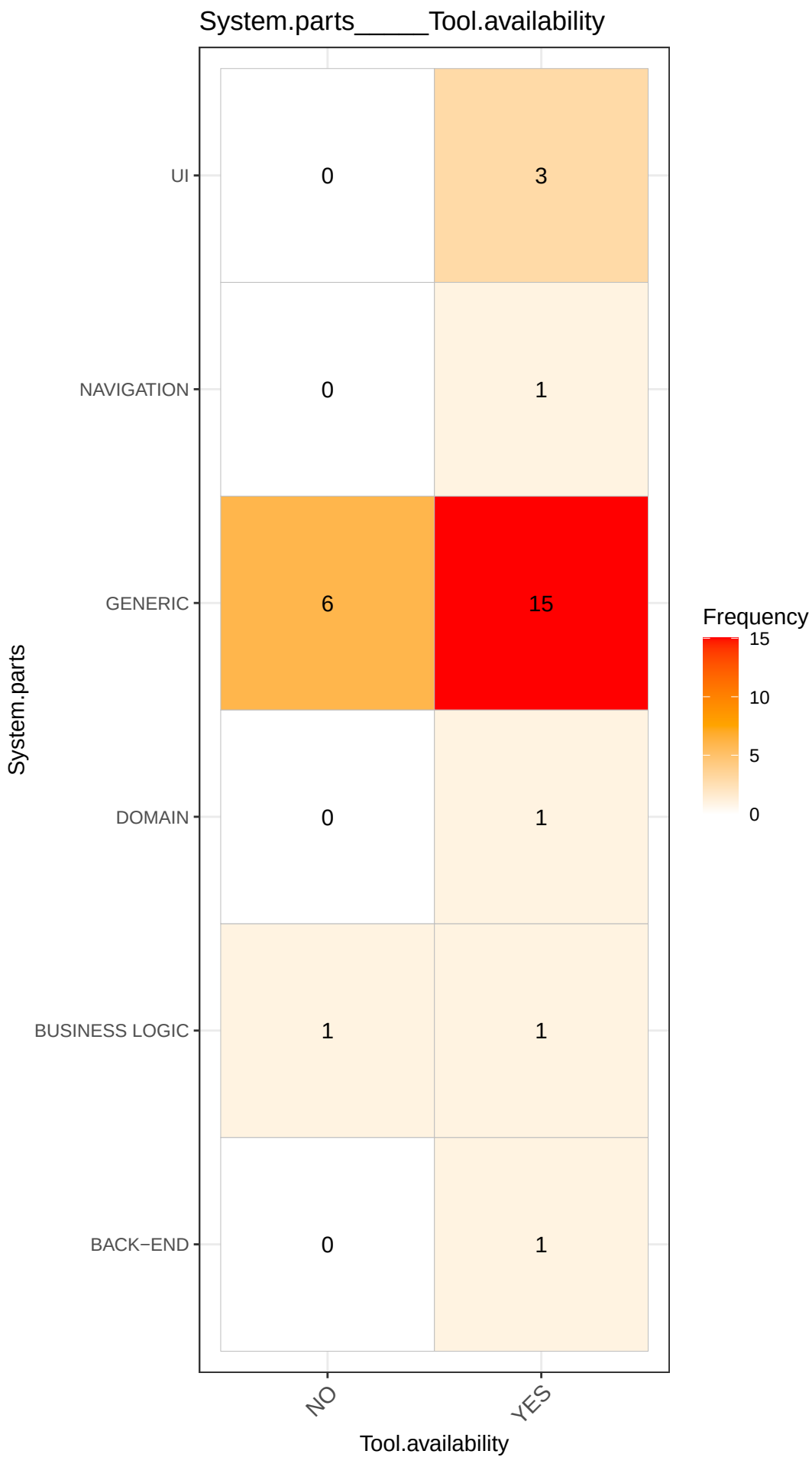

System.parts_____Design.decision..session.history
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
0 0 0 3 0
0 0 0 1 0
1 1 1 18 3
0 0 0 0 1
0 0 0 2 0
0 0 0 1 0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
System.parts
Design.decision..session.history
Frequency
15
10
5
0

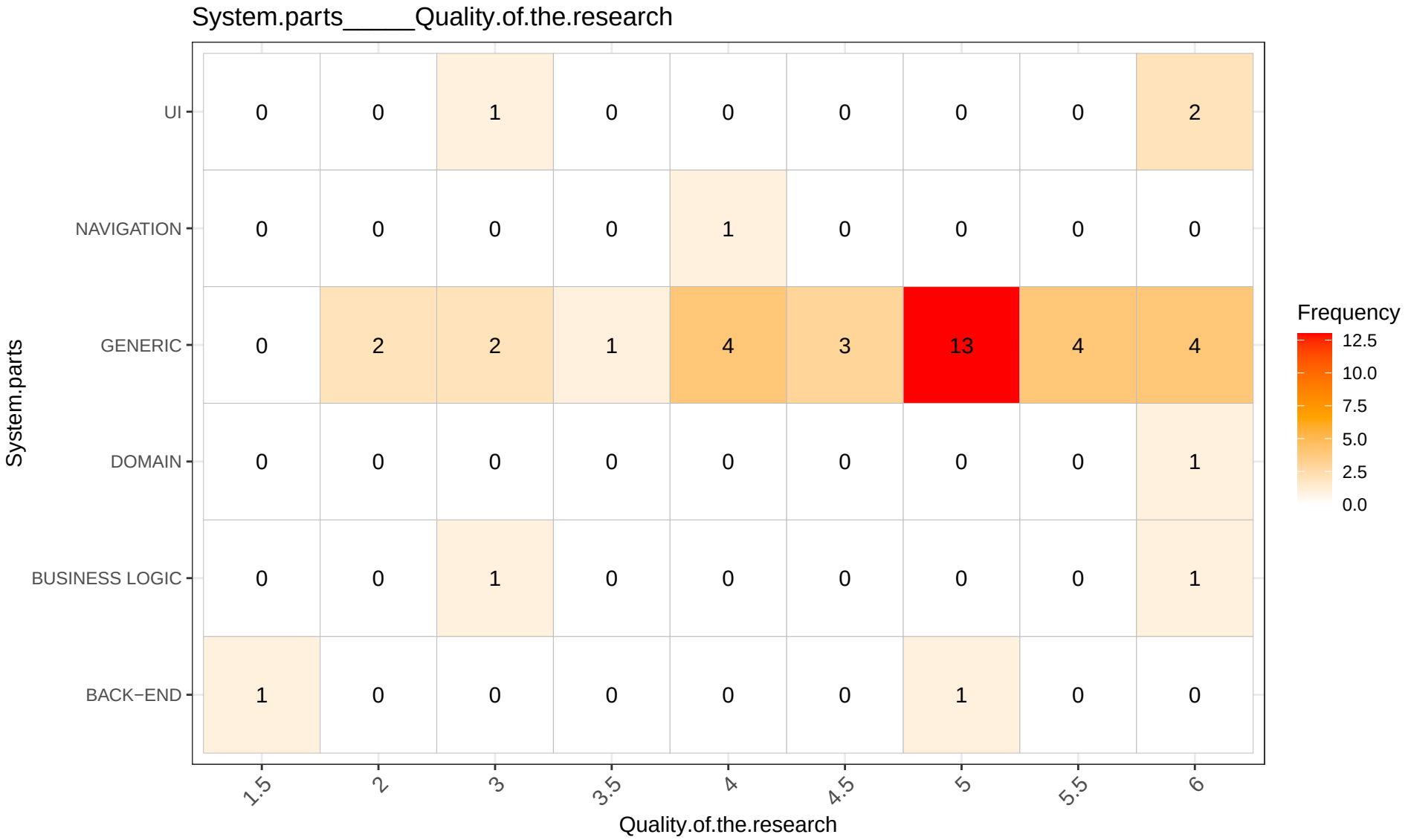

System.parts_____Stakeholder.types
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
2
3
1
1
6
21
1
1
1
2
0
1
NONTECH
TECH
Stakeholder.types
Frequency
20
15
10
5
0

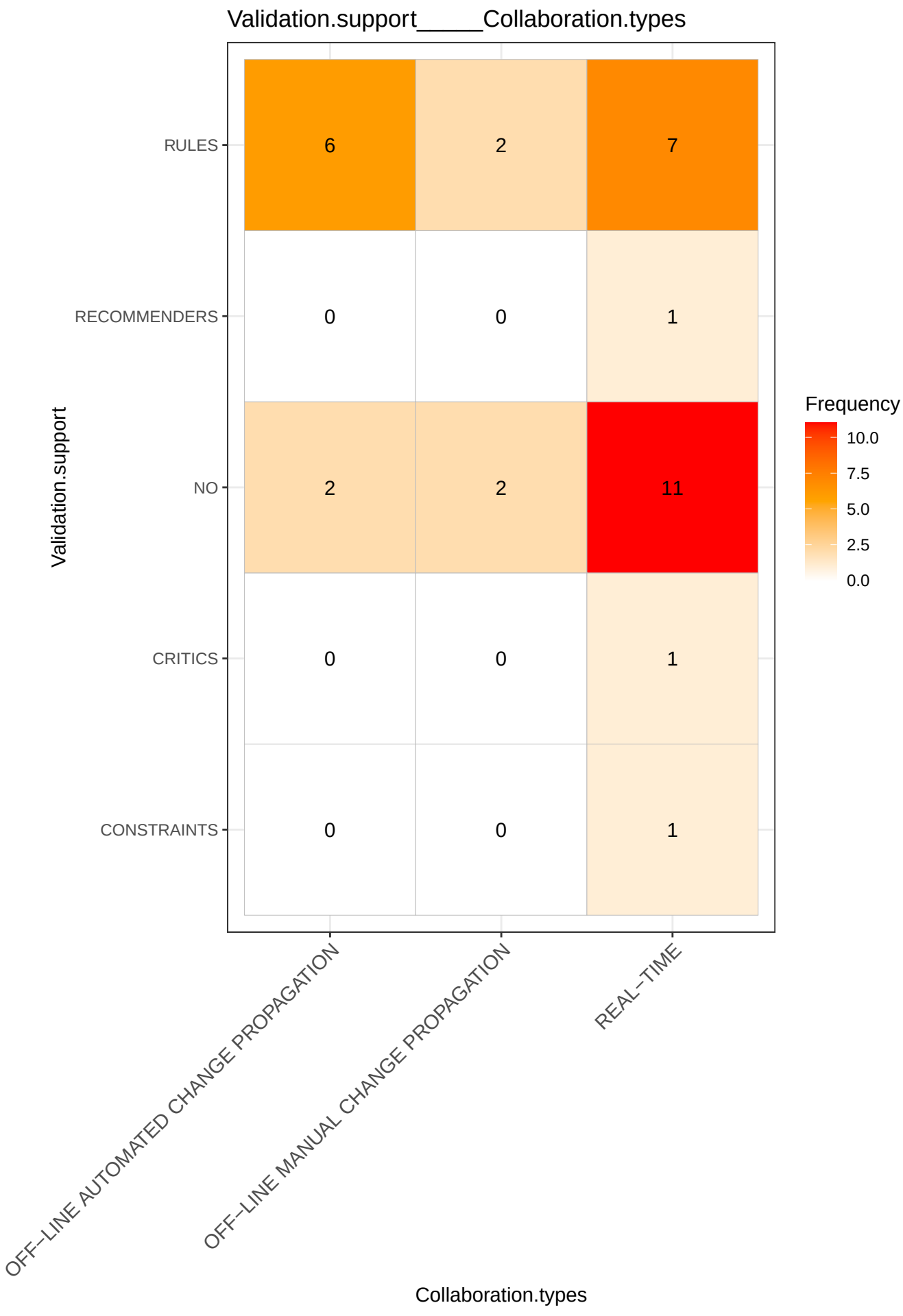

System.parts_____Workspace.awareness
System.parts
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
0 0 0 0 1 0 1 0 0 0 0 1 0 0
0 0 0 0 0 0 0 1 0 0 0 0 0 0
1 3 1 1 3 2 6 2 2 2 6 1 1 5
0 0 0 0 0 0 0 1 0 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0 0 0 0 0 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

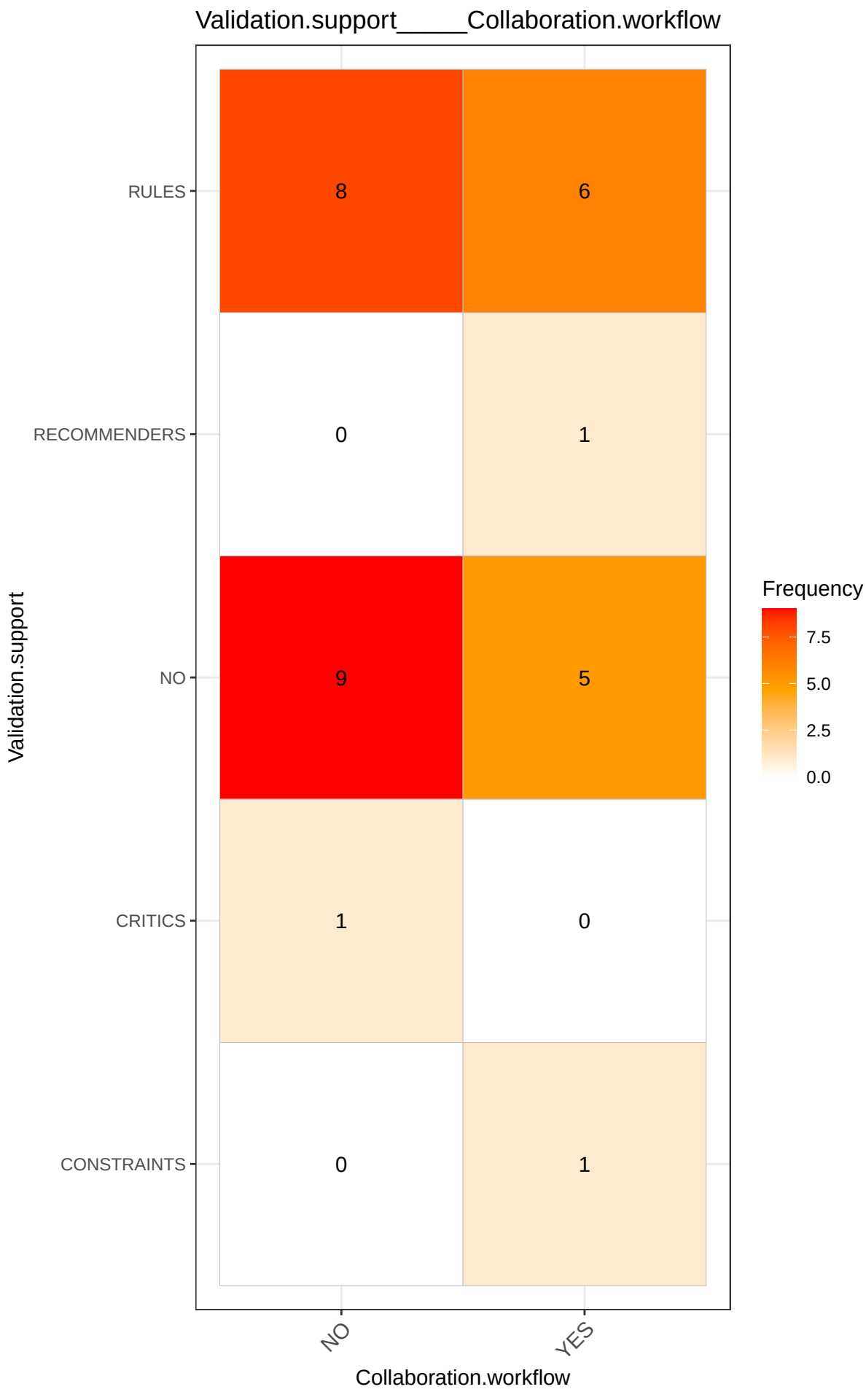

System.parts_____Workspace.awareness.score
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
1
2
0
0
0
1
9
8
4
1
0
0
0
2
0
0
1
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
7.5
5.0
2.5
0.0


System.parts_____Evaluation
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
3
0
1
1
0
1
0
0
6
0
10
8
1
0
1
0
0
0
0
2
0
1
0
0
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0


System.parts_____Tool.availability
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
0
3
0
1
6
15
0
1
1
1
0
1
System.parts
NO
YES
Tool.availability
Frequency
15
10
5
0


System.parts_____Quality.of.the.research
UI
NAVIGATION
GENERIC
DOMAIN
BUSINESS LOGIC
BACK−END
System.parts
0 0 1 0 0 0 0 0 2
0 0 0 0 1 0 0 0 0
0 2 2 1 4 3 13 4 4
0 0 0 0 0 0 0 0 1
0 0 1 0 0 0 0 0 1
1 0 0 0 0 0 1 0 0
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Validation.support_____Collaboration.types
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
6
2
7
0
0
1
2
2
11
0
0
1
0
0
1
Frequency
10.0
7.5
5.0
2.5
0.0
OFF−LINE AUTOMATED CHANGE PROPAGATION
OFF−LINE MANUAL CHANGE PROPAGATION
REAL−TIME
Collaboration.types


Validation.support_____Collaboration.workflow
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
8
6
0
1
9
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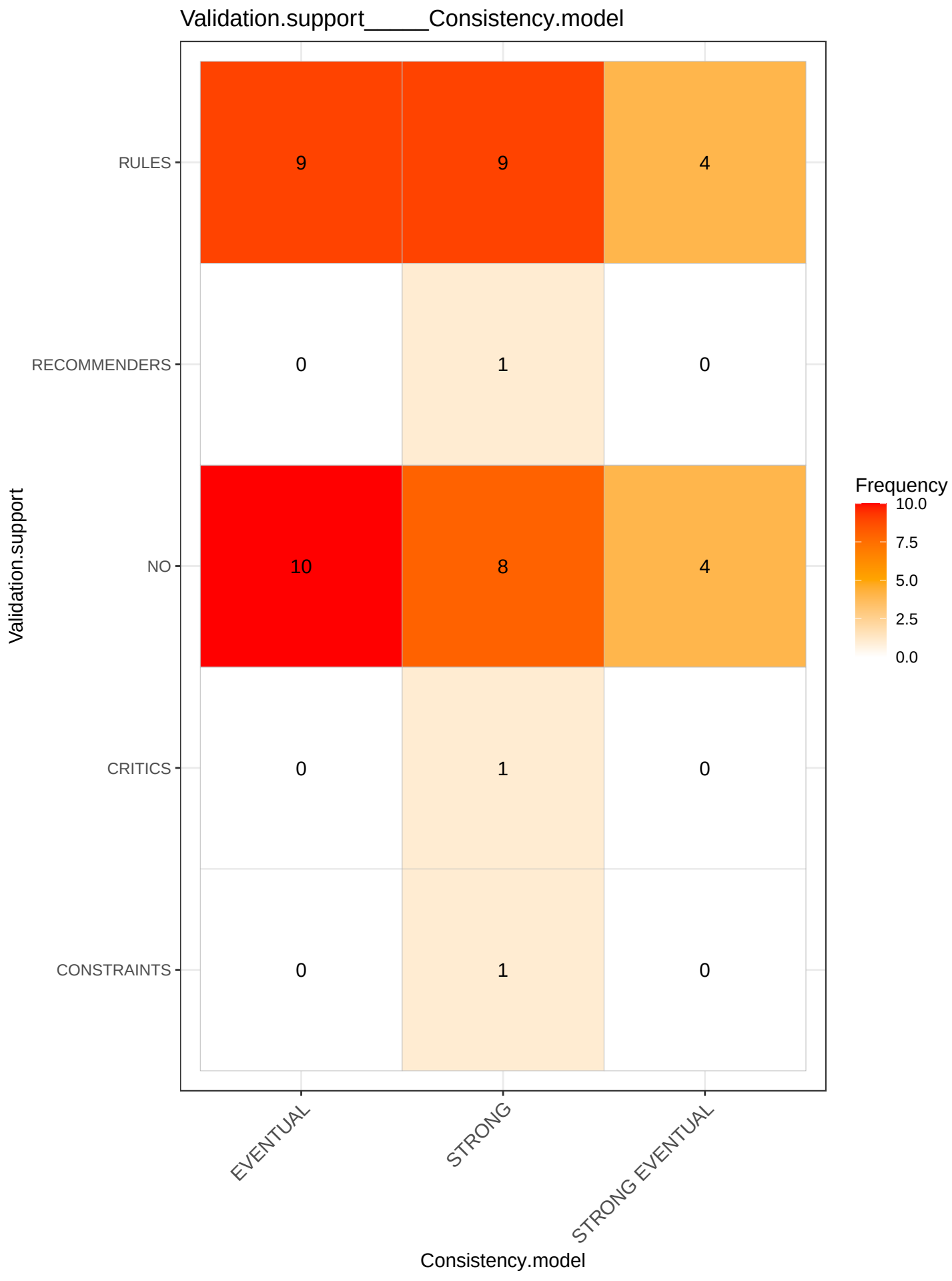
1
0
0
1
NO
YES
Collaboration.workflow
Frequency
7.5
5.0
2.5
0.0


Validation.support_____Consistency.model
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
9
9
4
0
1
0
10
8
4
0
1
0
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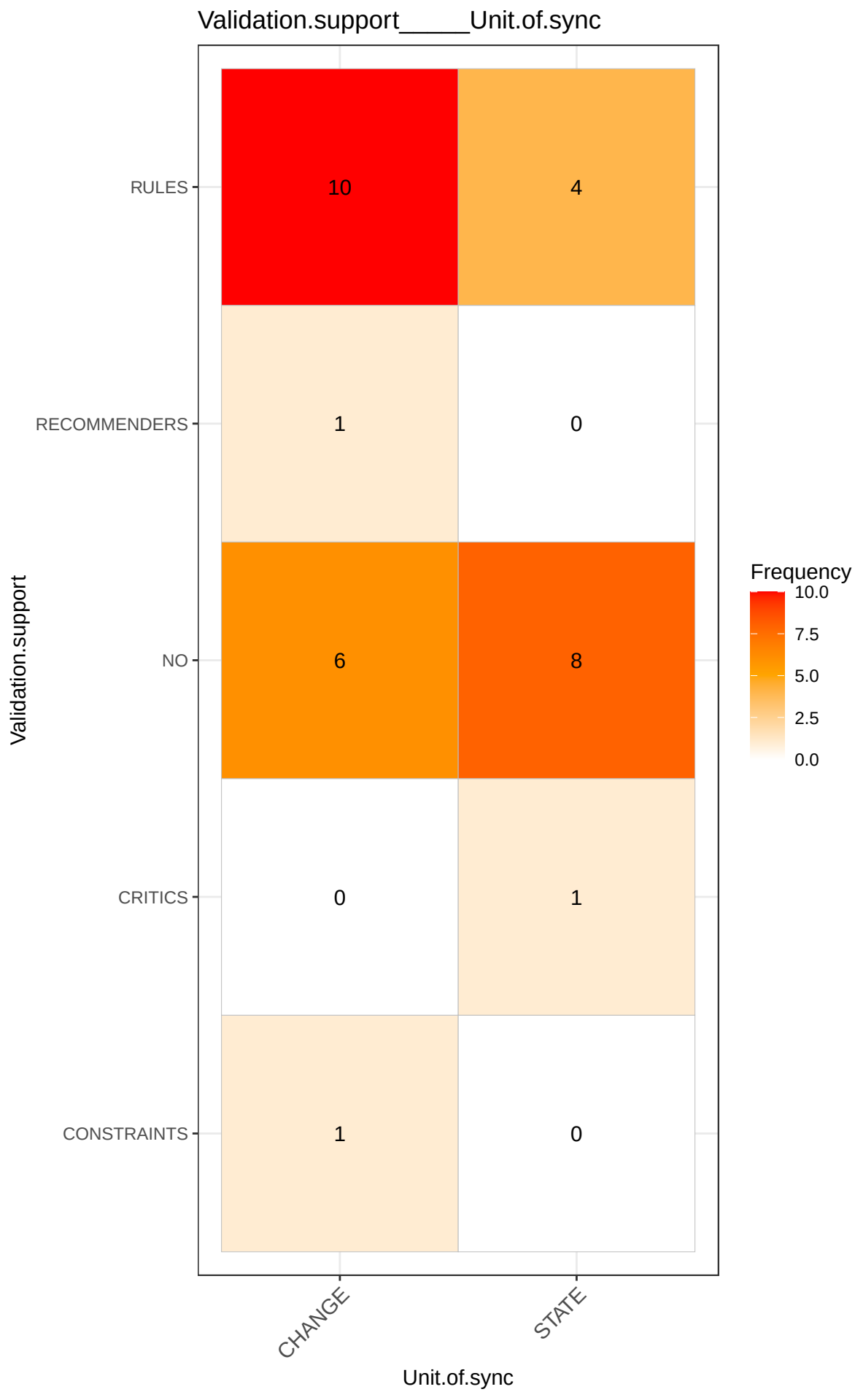
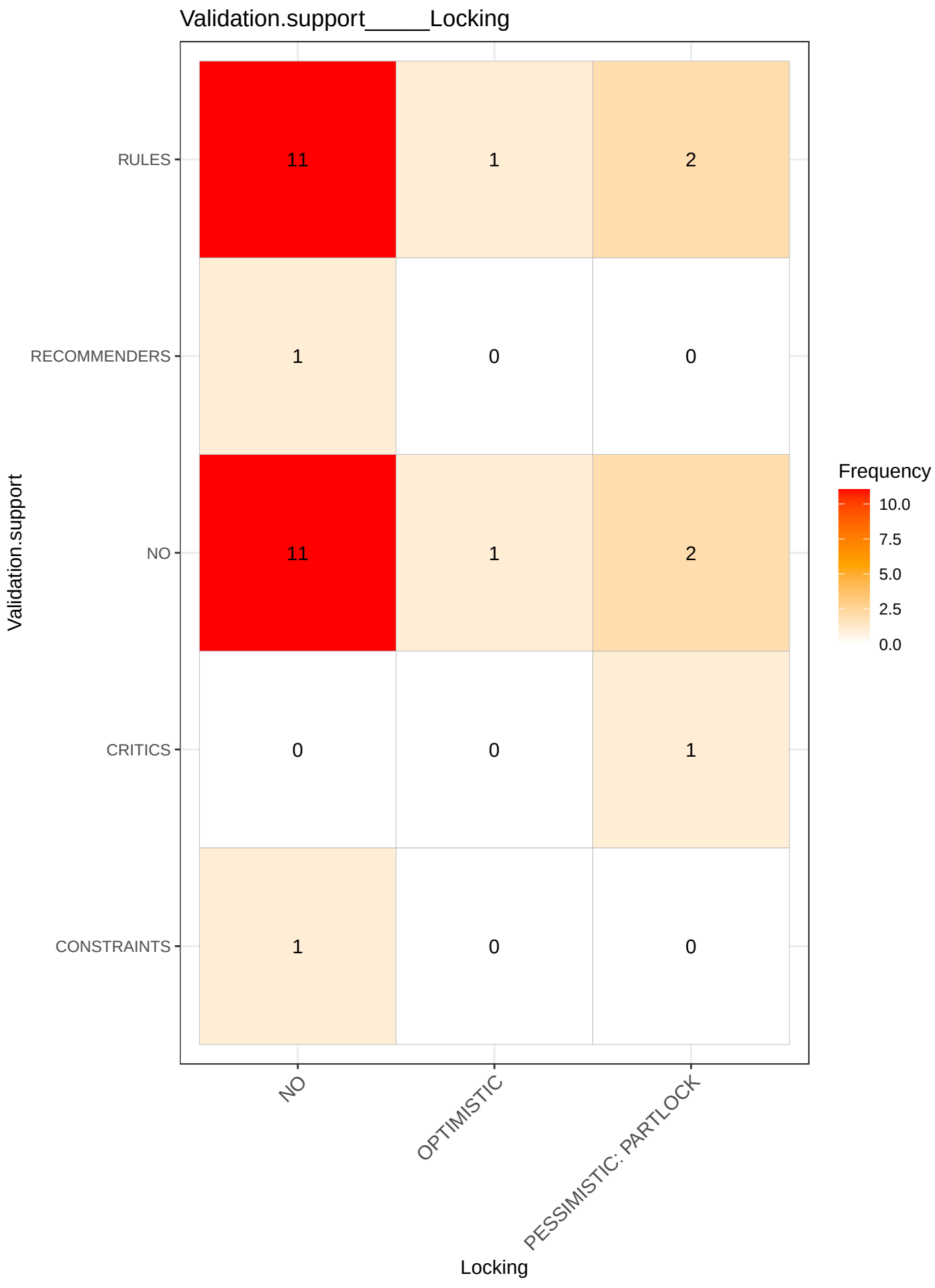
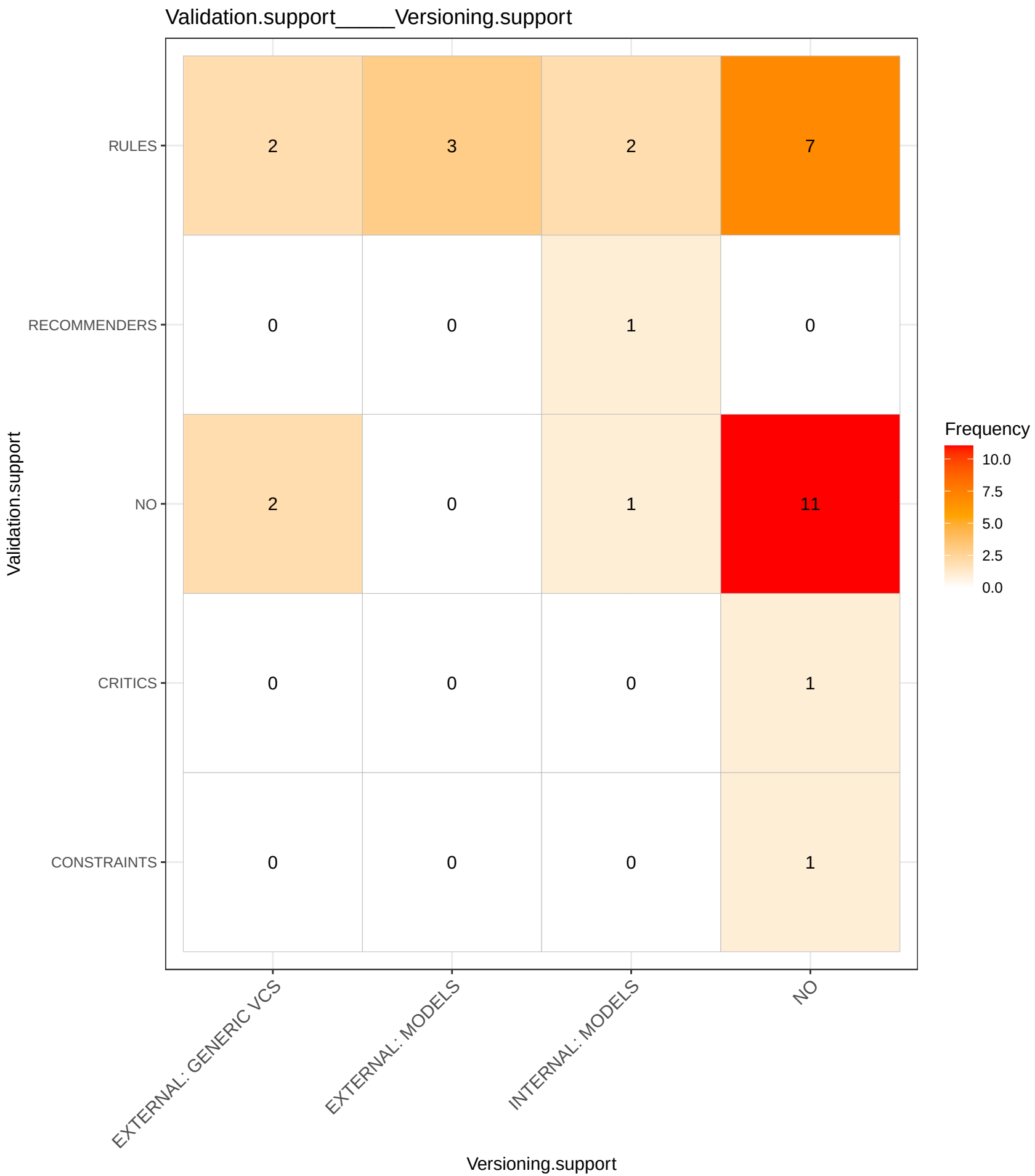
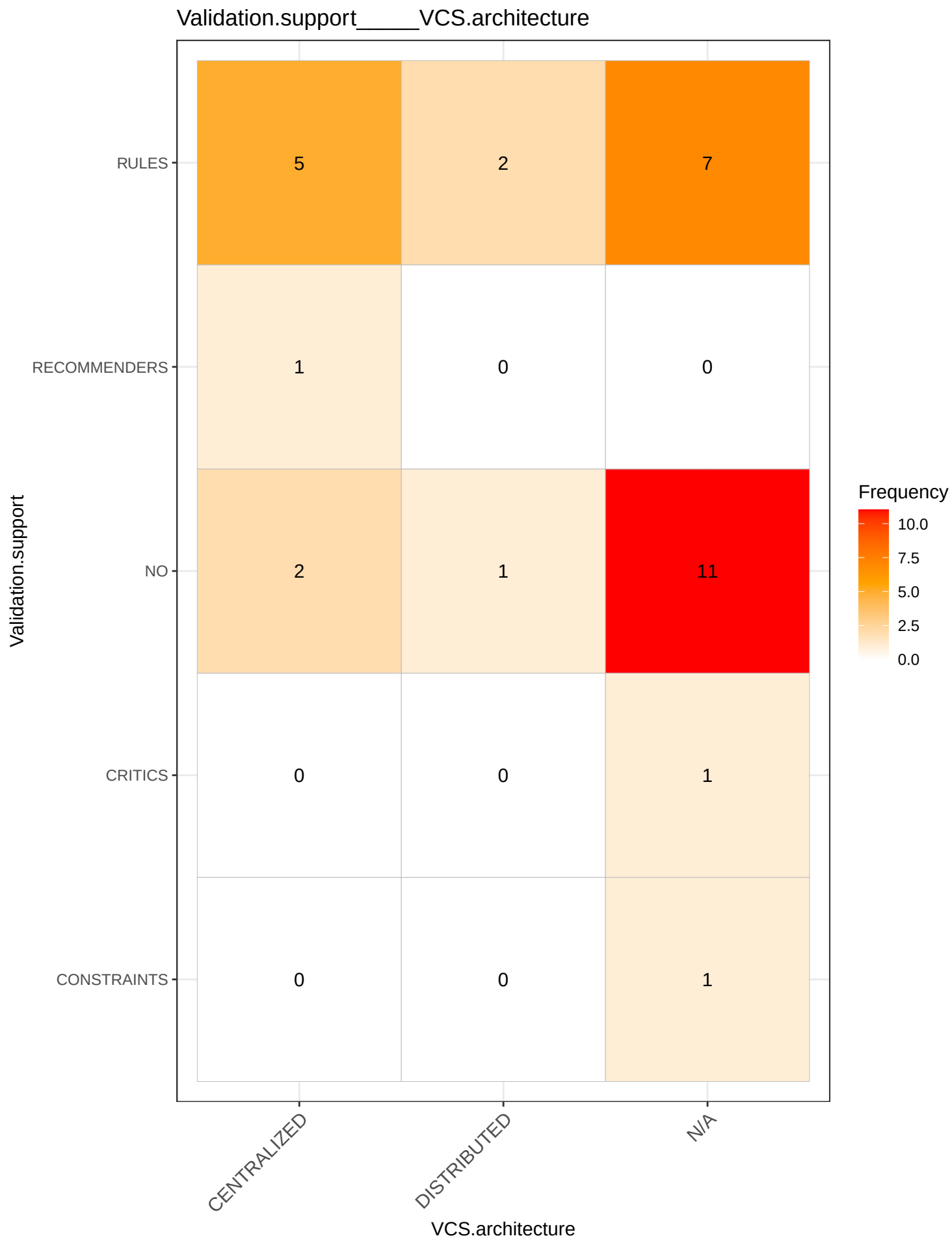
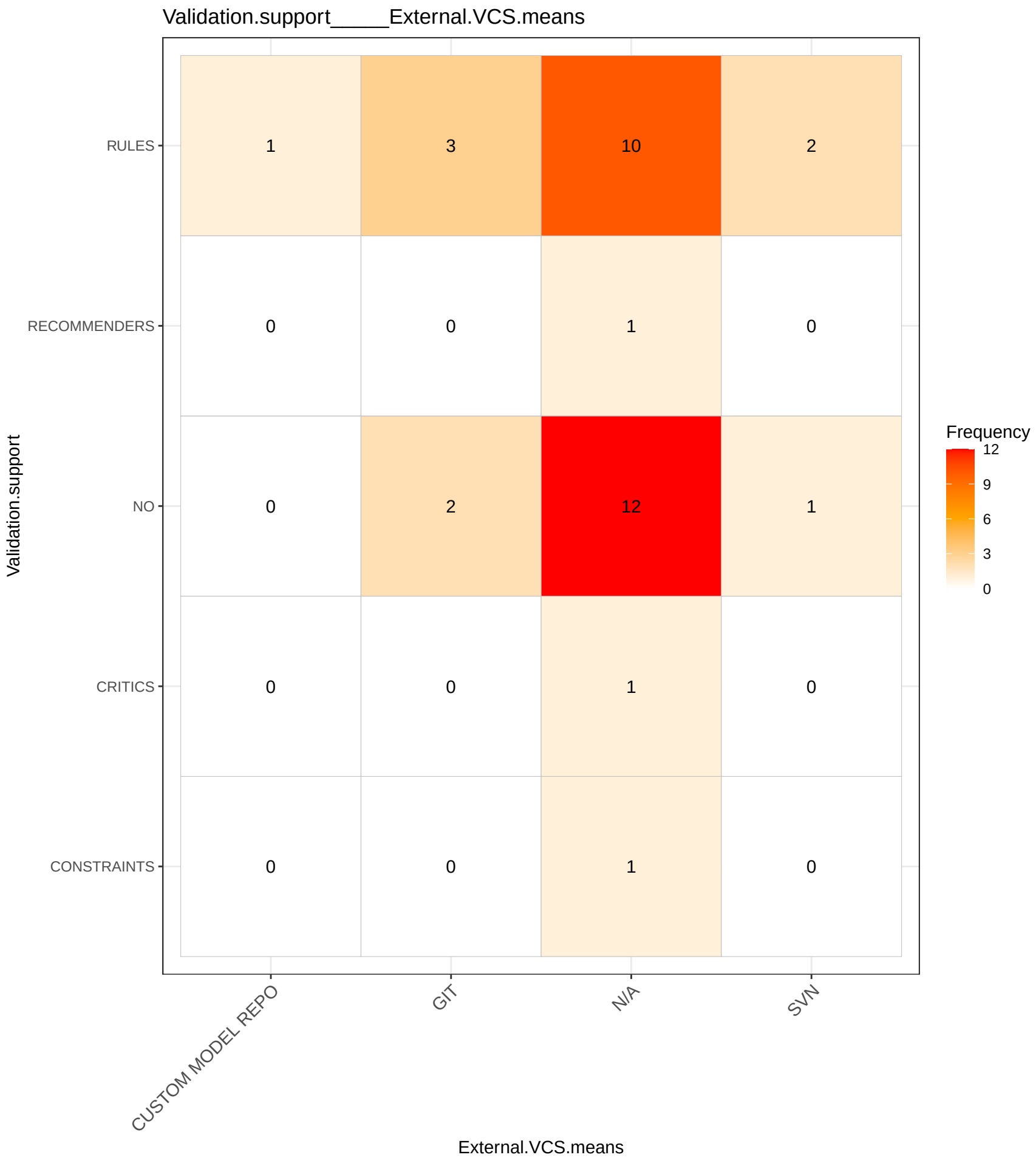
1
0
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Unit.of.sync
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
10
4
1
0
6
8
0
1
1
0
CHANGE
STATE
Unit.of.sync
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Locking
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
11
1
2
1
0
0
11
1
2
0
0
1
1
0
0
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Versioning.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
2
3
2
7
0
0
1
0
2
0
1
11
0
0
0
1
0
0
0
1
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____VCS.architecture
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
5
2
7
1
0
0
2
1
11
0
0
1
0
0
1
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____External.VCS.means
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
1
3
10
2
0
0
1
0
0
2
12
1
0
0
1
0
0
0
1
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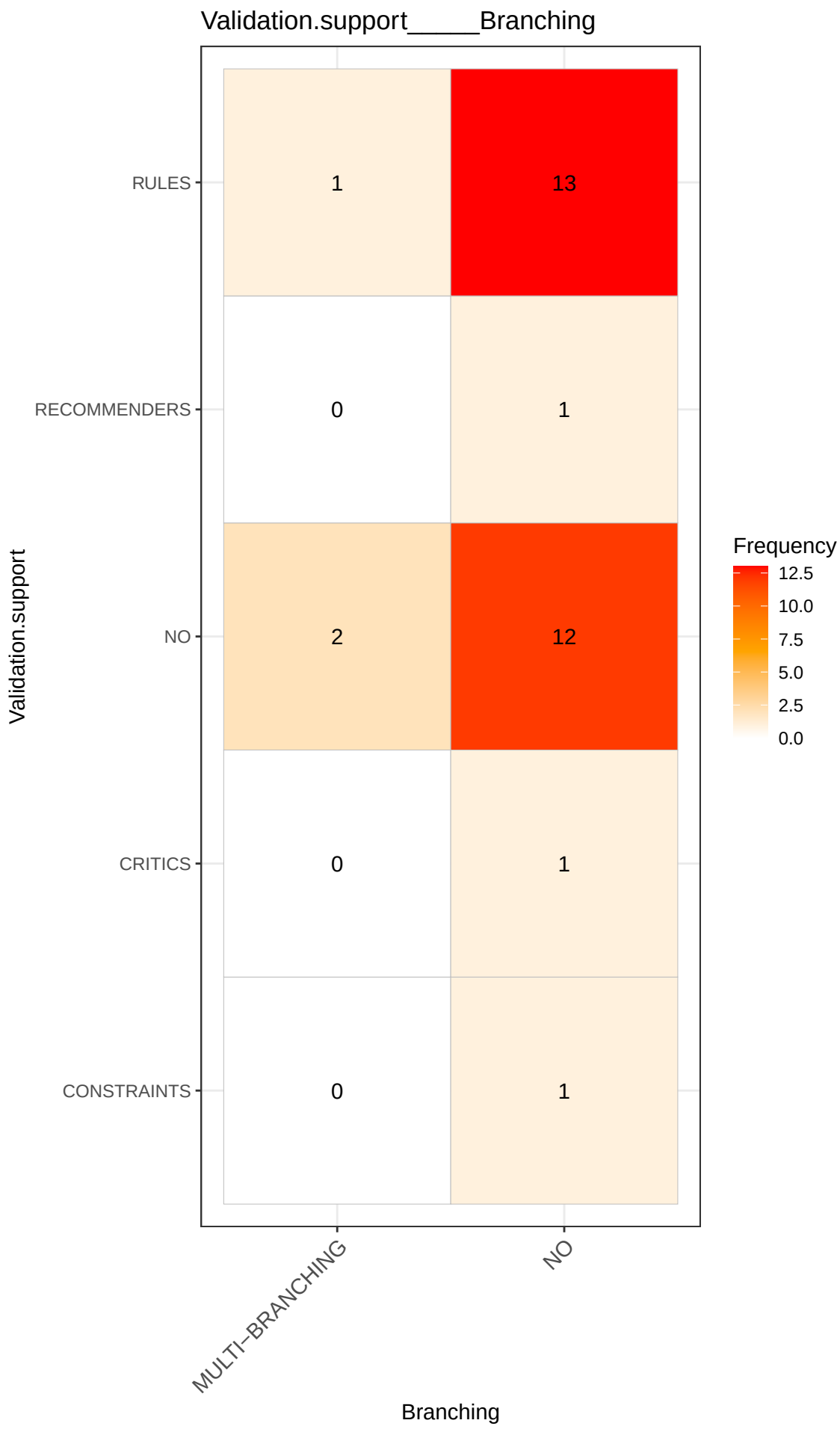
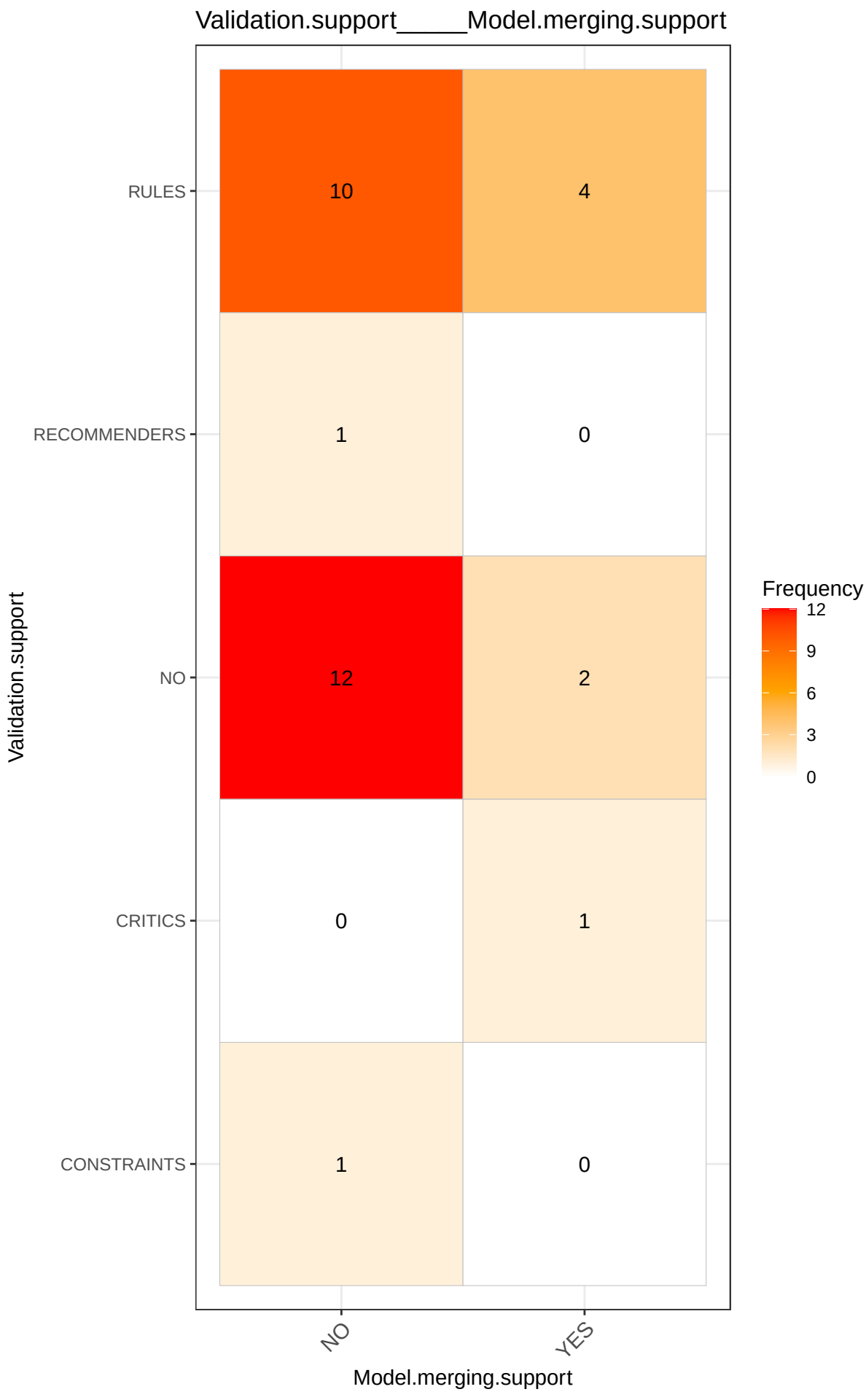
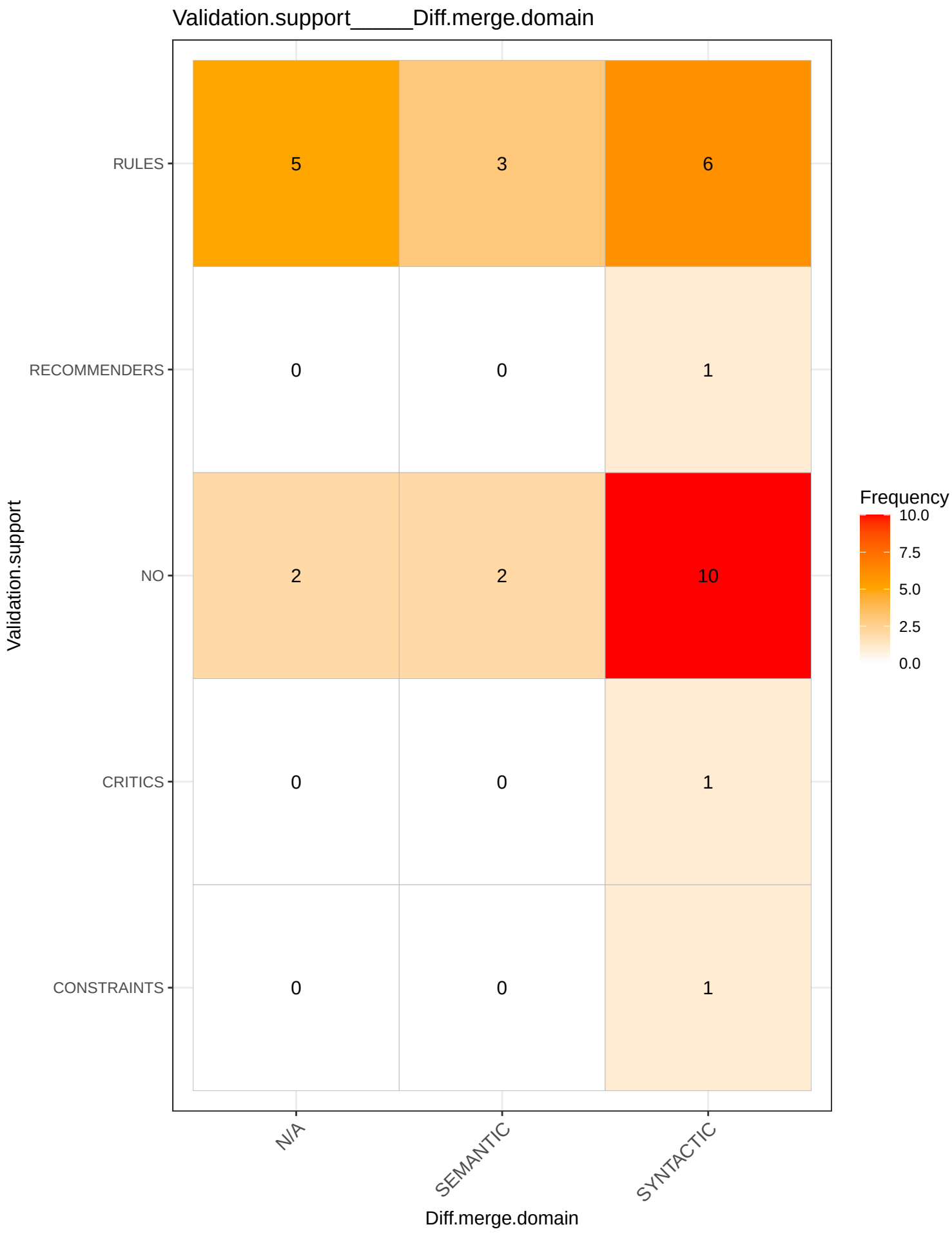
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
12
9
6
3
0


Validation.support_____Branching
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
1
13
0
1
2
12
0
1
0
1
Frequency
12.5
10.0
7.5
5.0
2.5
0.0
MULTI−BRANCHING
NO
Branching


Validation.support_____Model.merging.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
10
4
1
0
12
2
0
1
1
0
NO
YES
Model.merging.support
Frequency
12
9
6
3
0


Validation.support_____Diff.merge.domain
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
5
3
6
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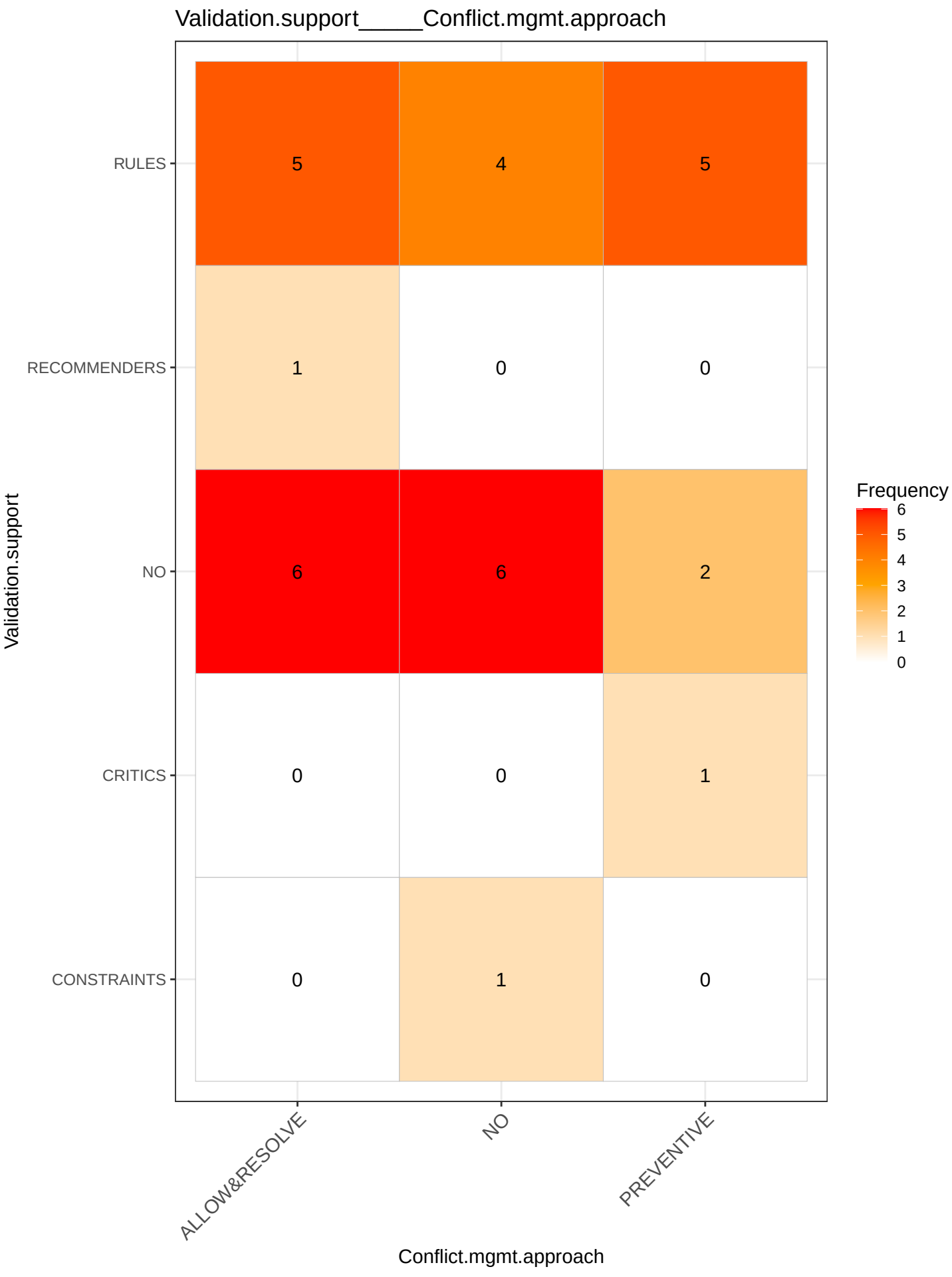
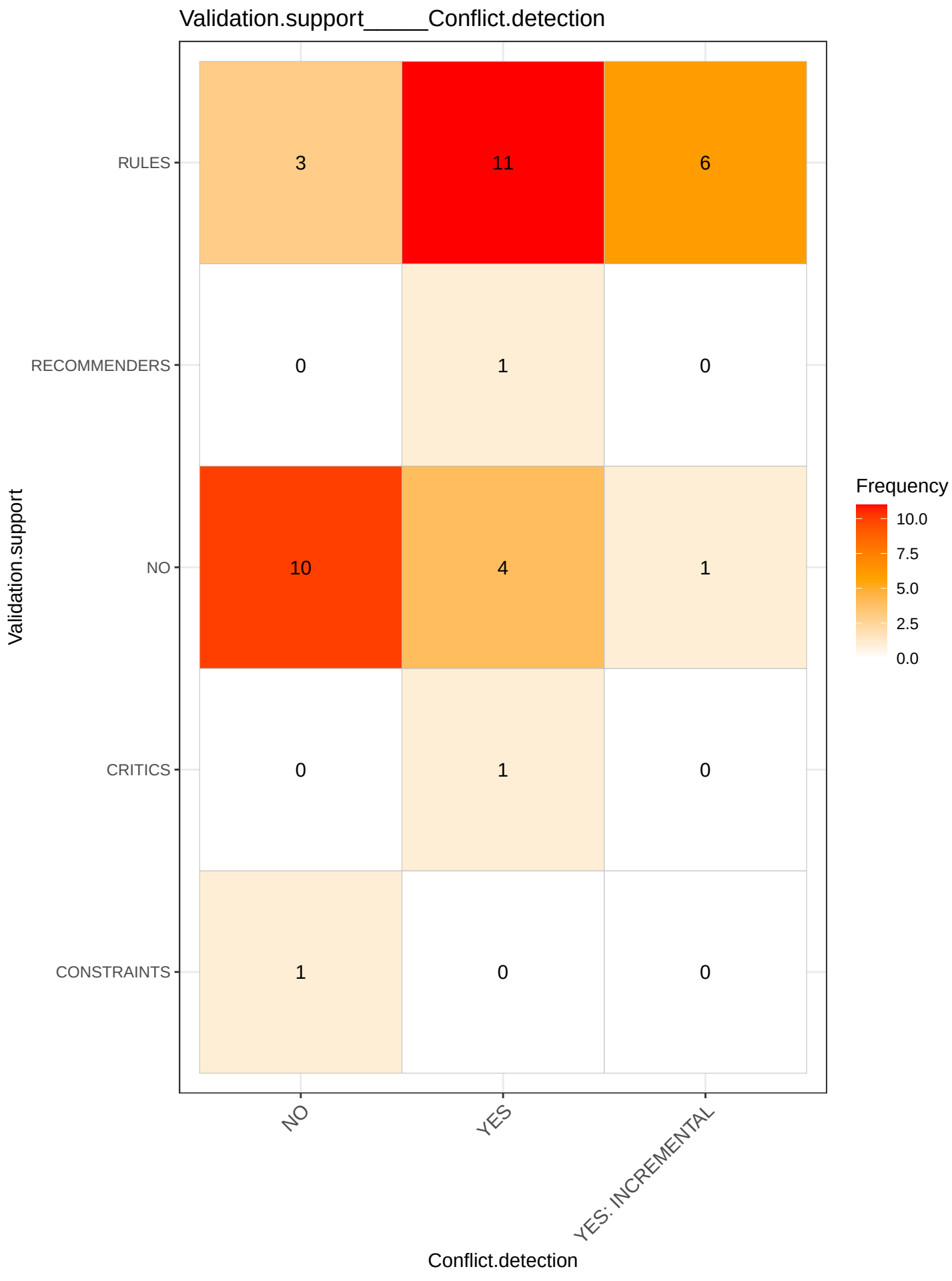
0
1
2
2
10
0
0
1
0
0
1
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Conflict.mgmt.approach
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
5
4
5
1
0
0
6
6
2
0
0
1
0
1
0
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
5
4
3
2
1
0


Validation.support_____Conflict.detection
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
3
11
6
0
1
0
10
4
1
0
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NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10.0
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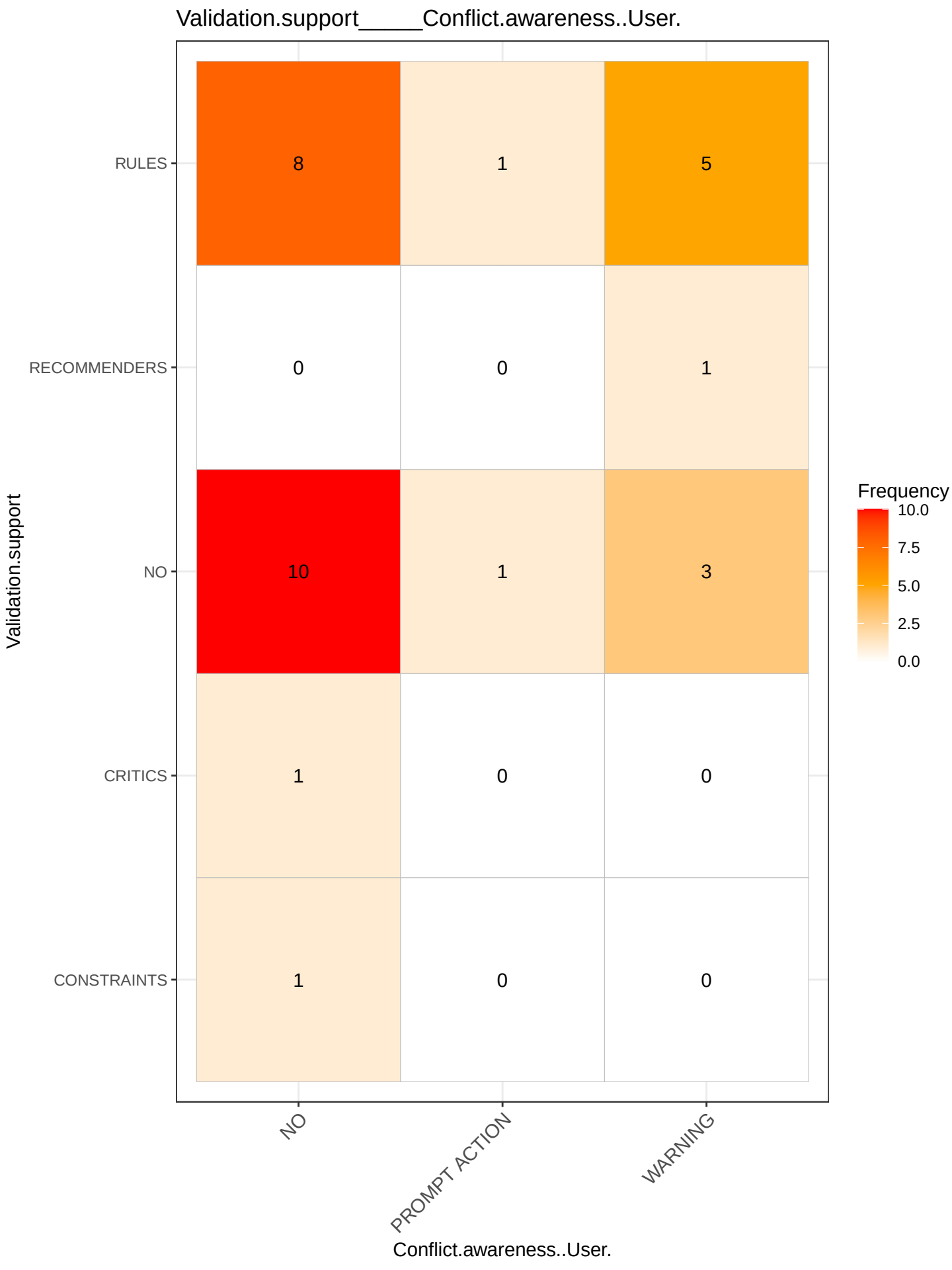
5.0
2.5
0.0


Validation.support_____Conflict.awareness..User.
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
8
1
5
0
0
1
10
1
3
1
0
0
1
0
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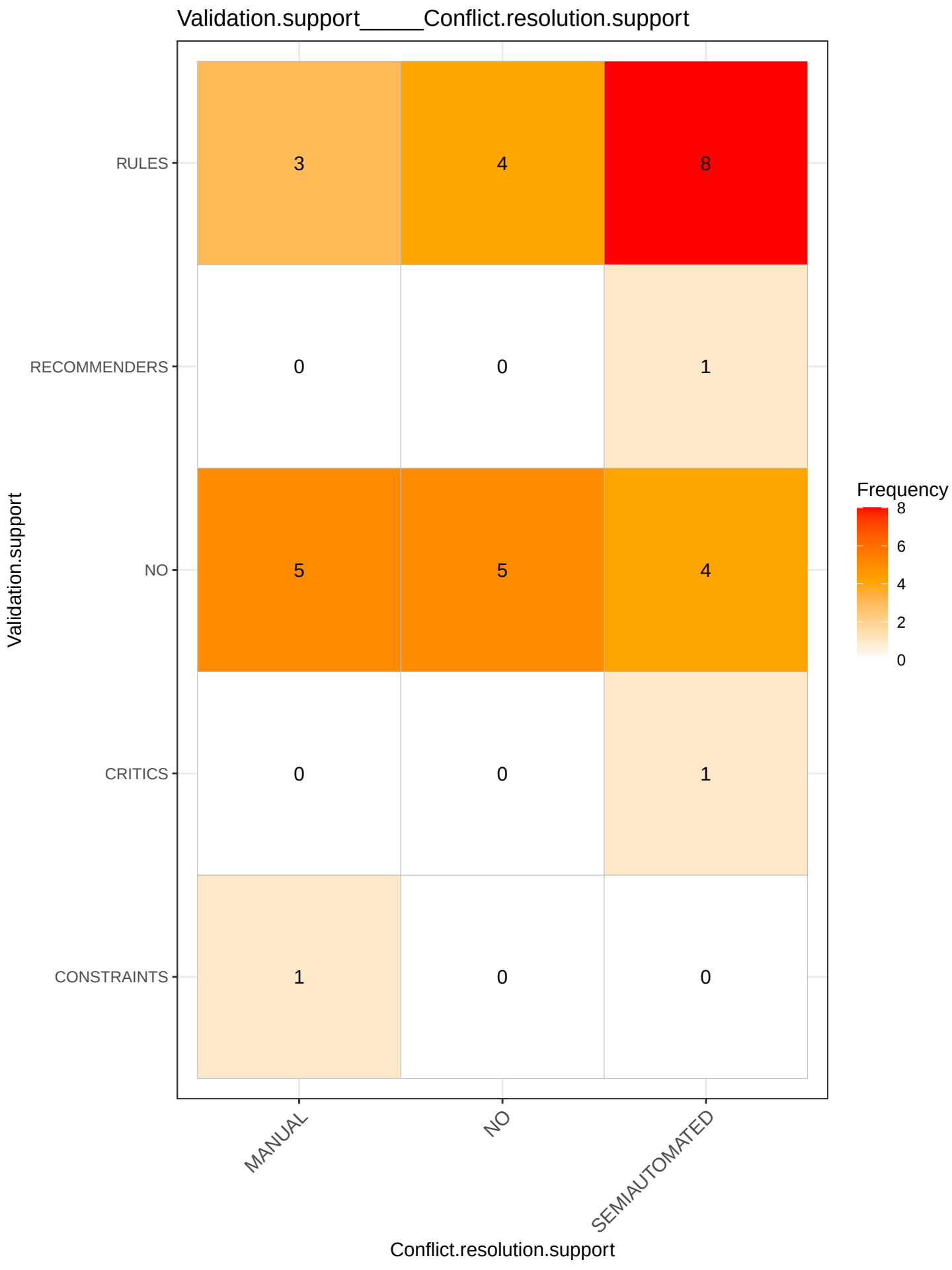
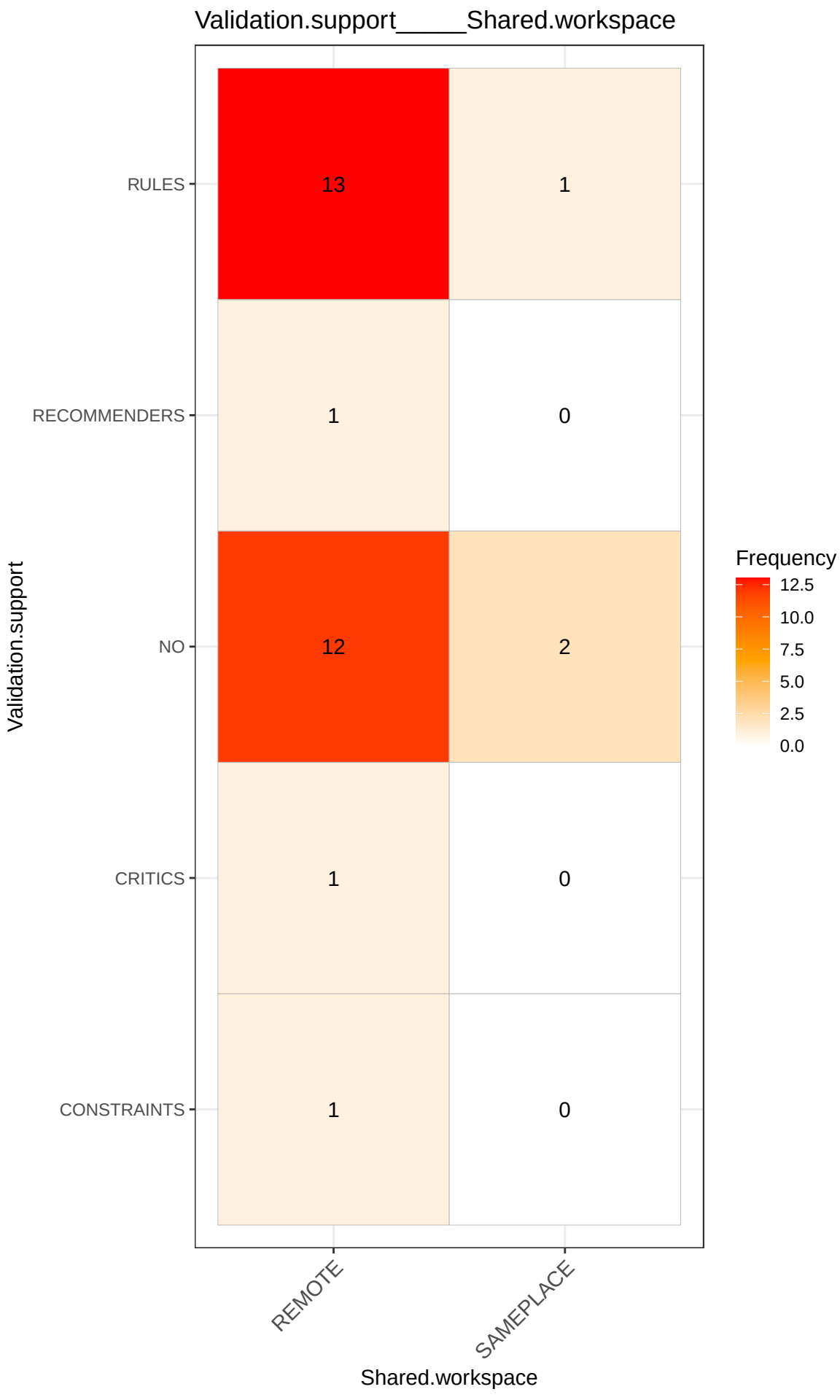
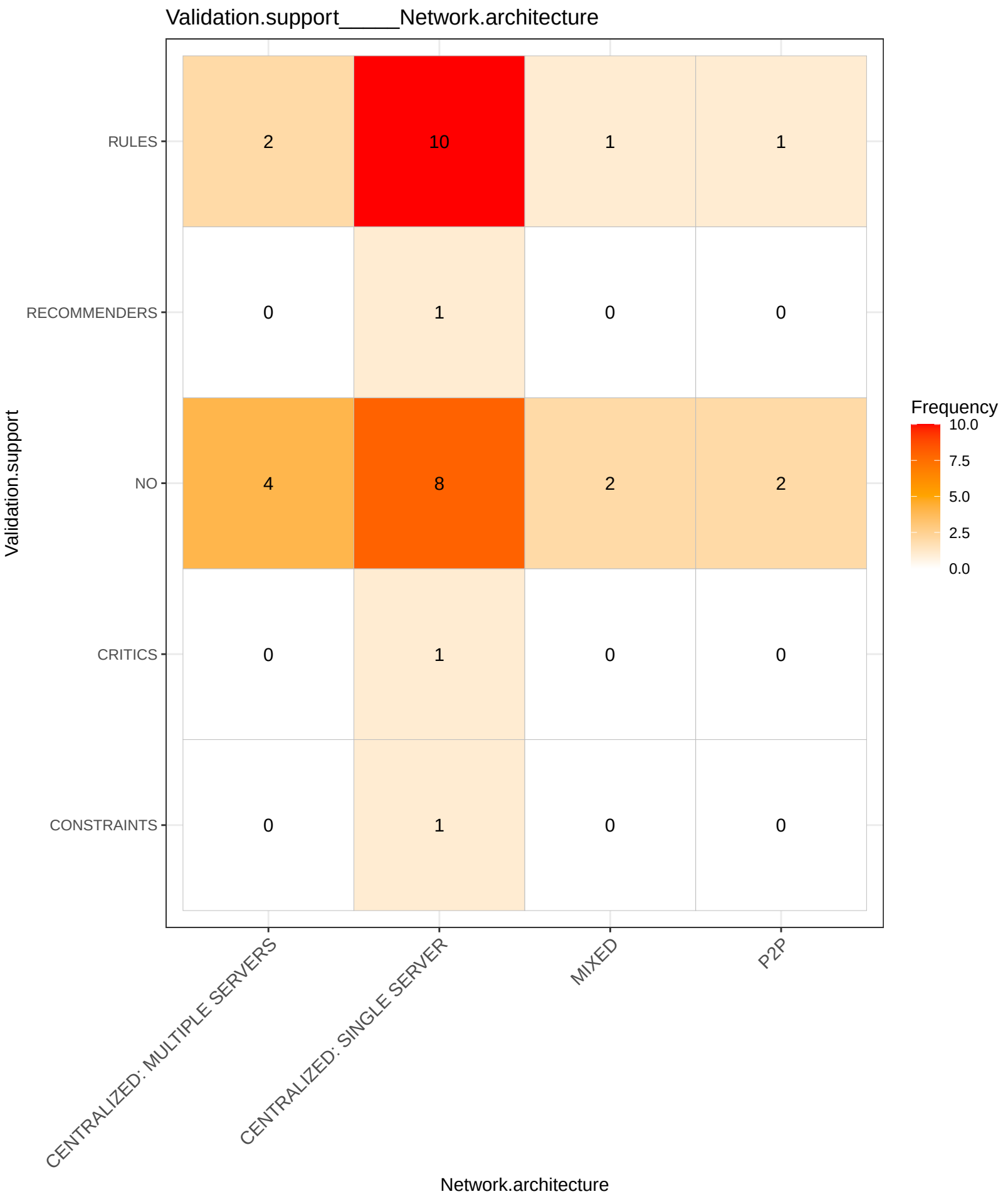
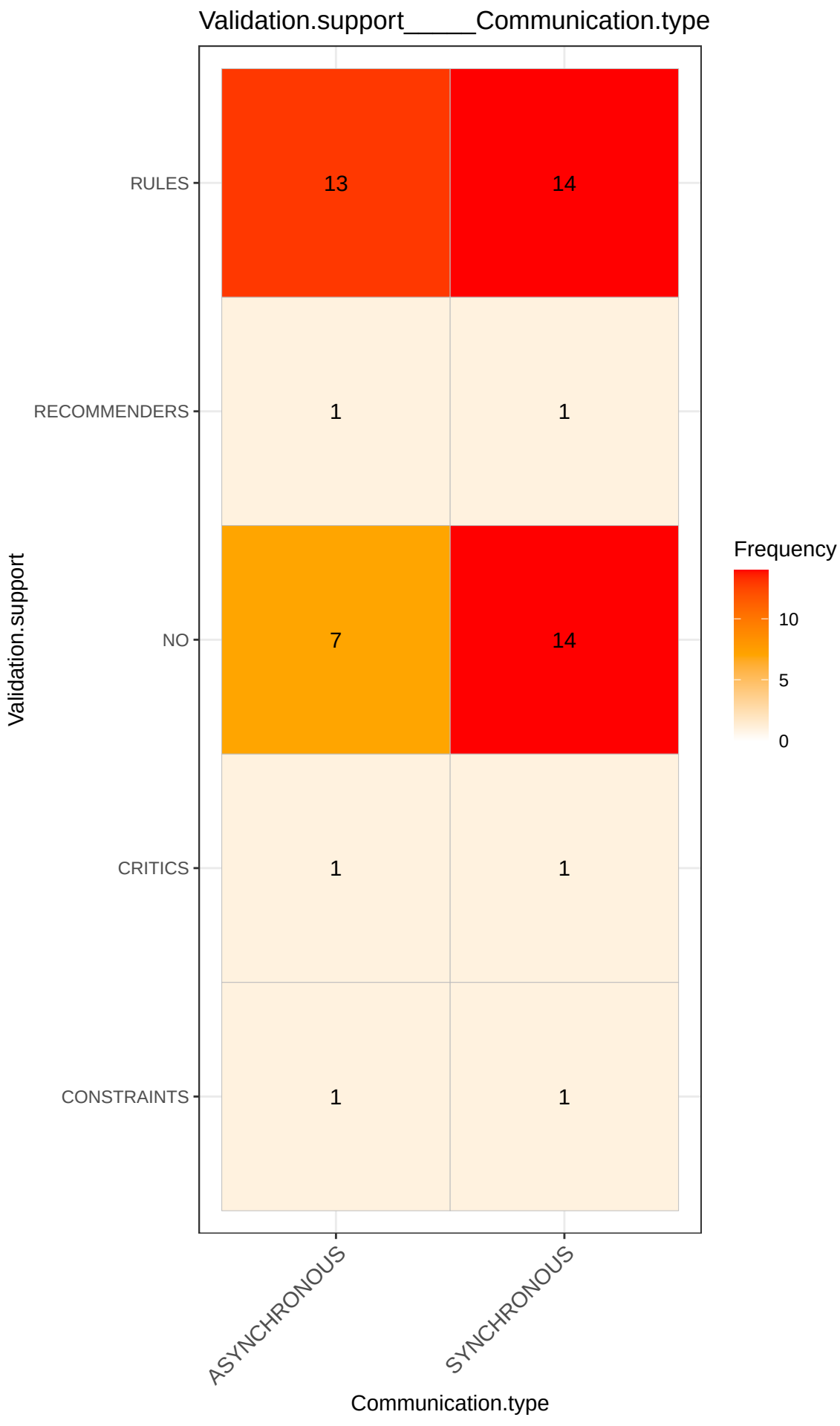
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Conflict.resolution.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
3
4
8
0
0
1
5
5
4
0
0
1
1
0
0
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0


Validation.support_____Shared.workspace
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
13
1
1
0
12
2
1
0
1
0
Validation.support
REMOTE
SAMEPLACE
Shared.workspace
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Validation.support_____Network.architecture
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
2
10
1
1
0
1
0
0
4
8
2
2
0
1
0
0
0
1
0
0
Frequency
10.0
7.5
5.0
2.5
0.0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture


Validation.support_____Communication.type
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
13
14
1
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7
14
1
1
1
1
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
10
5
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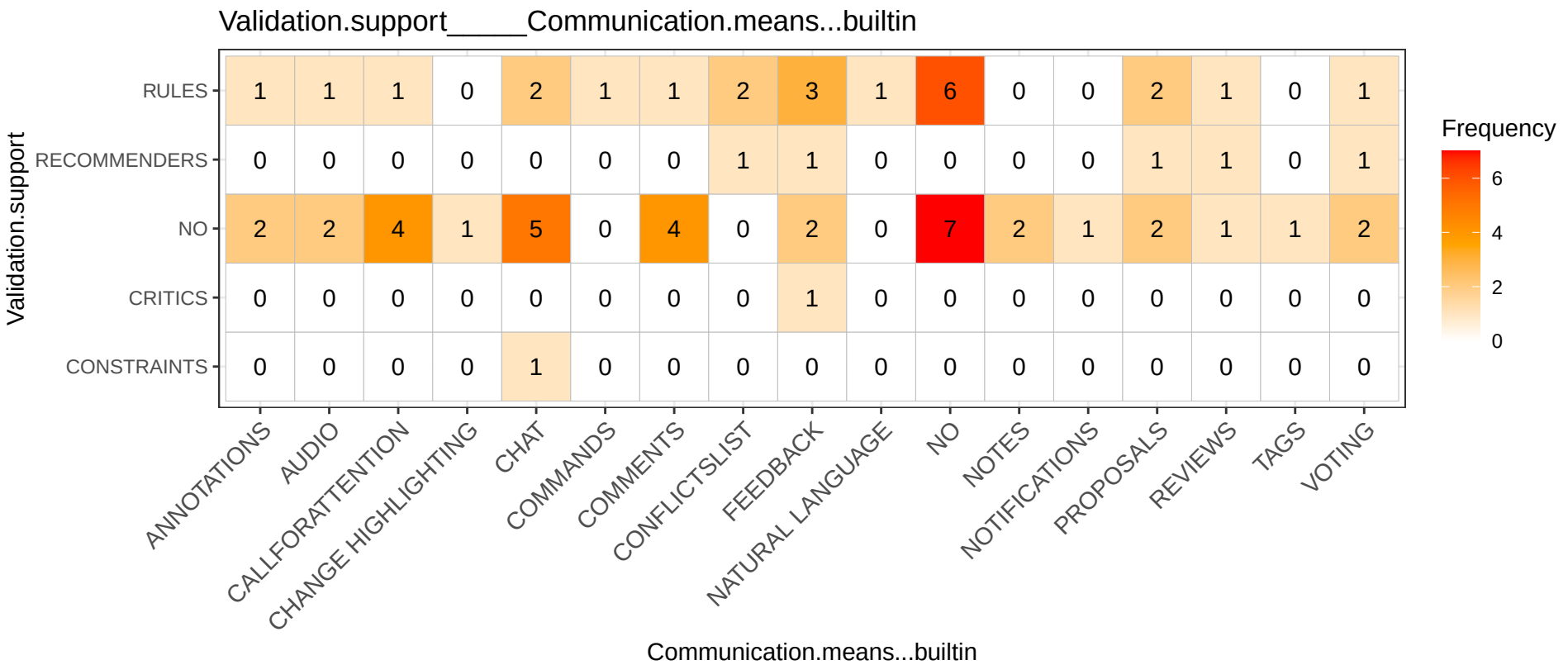
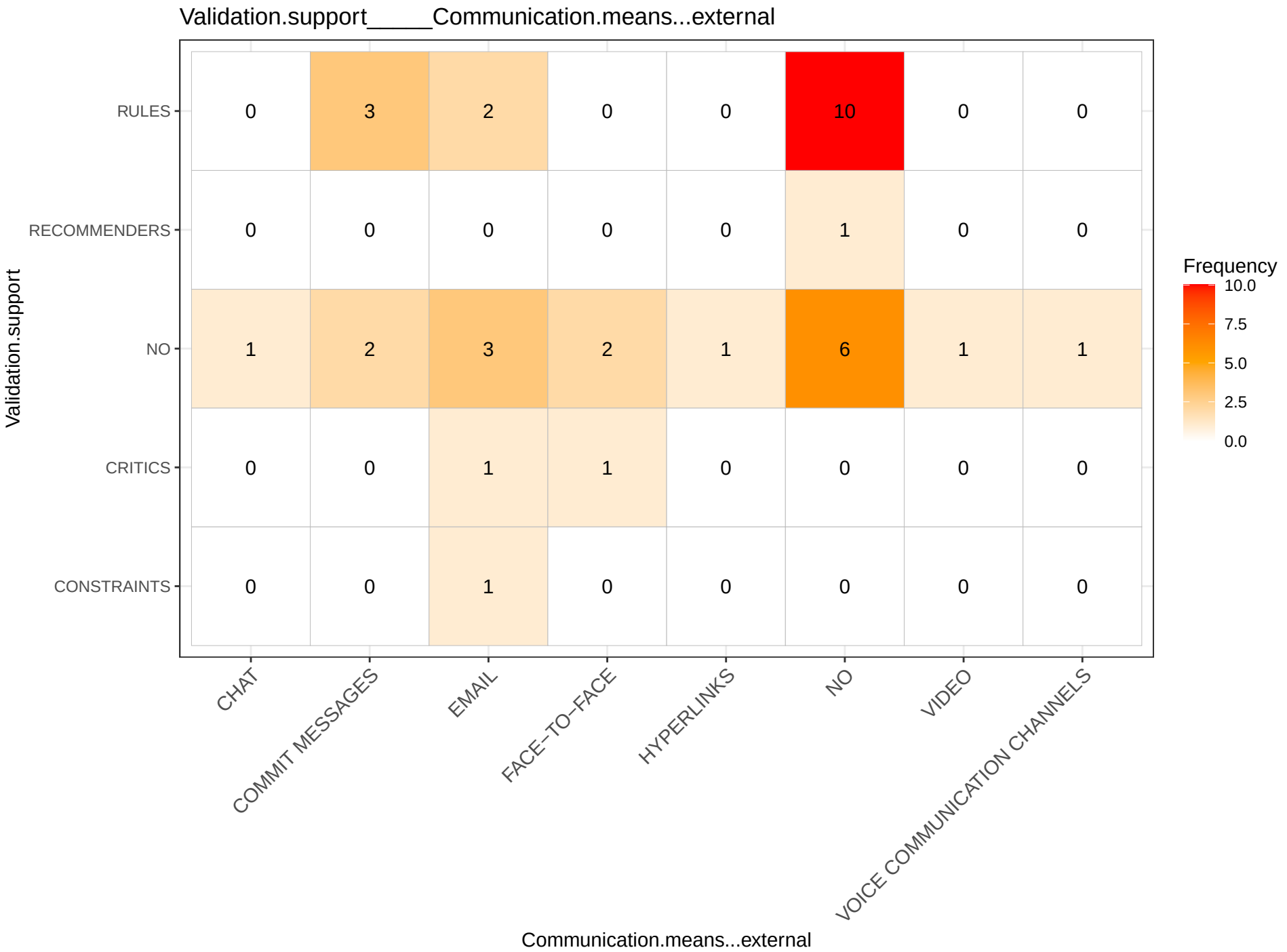
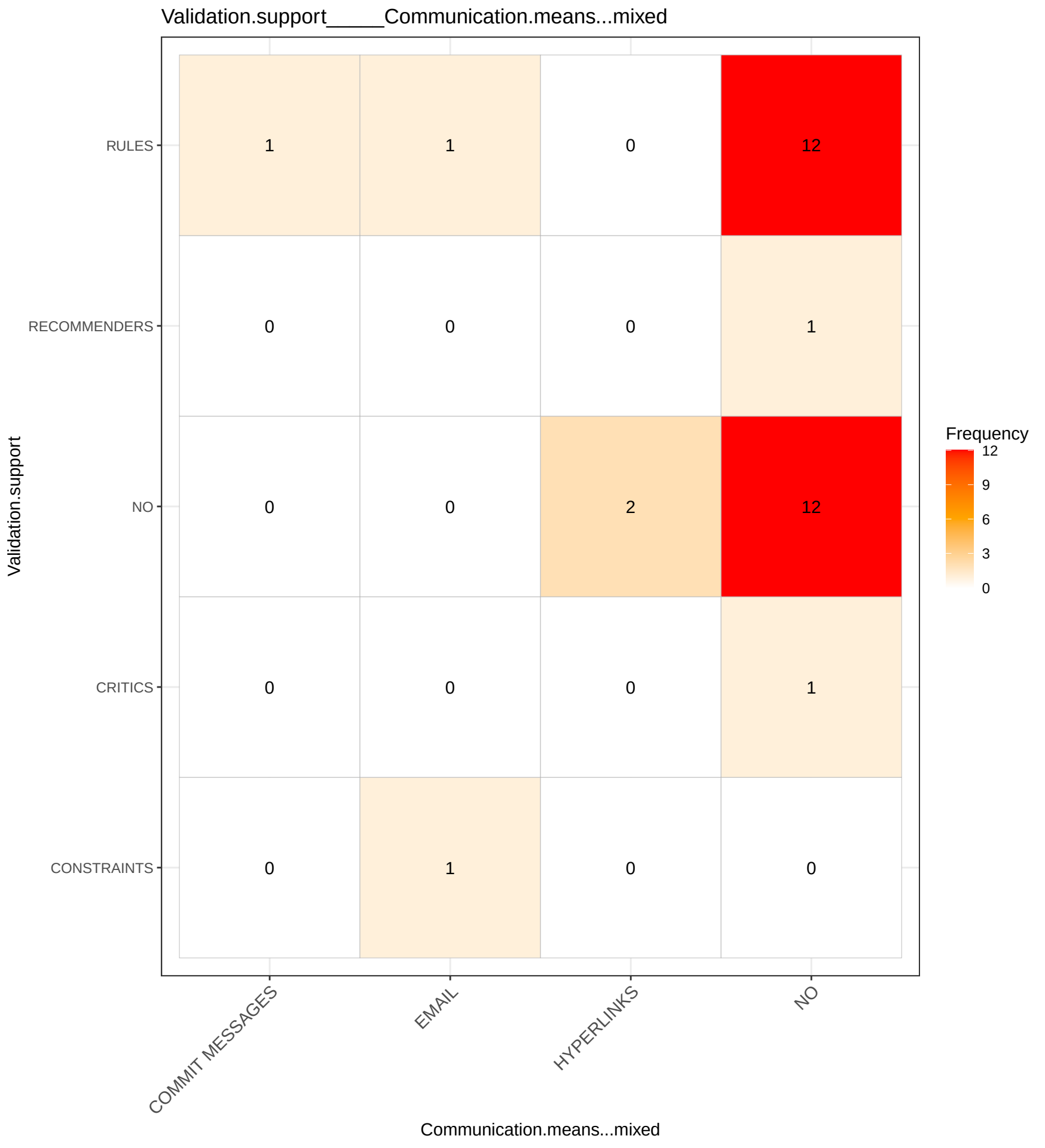
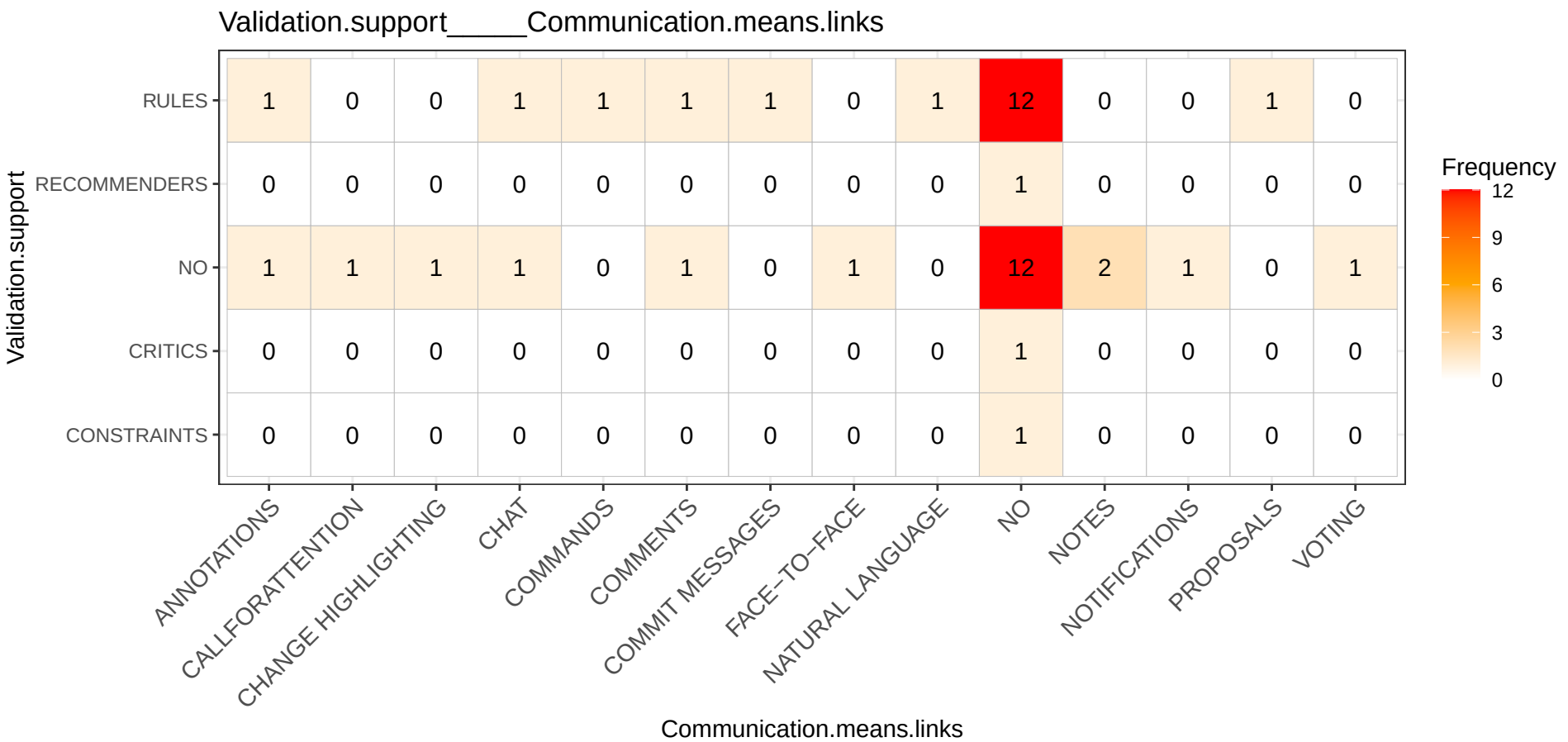
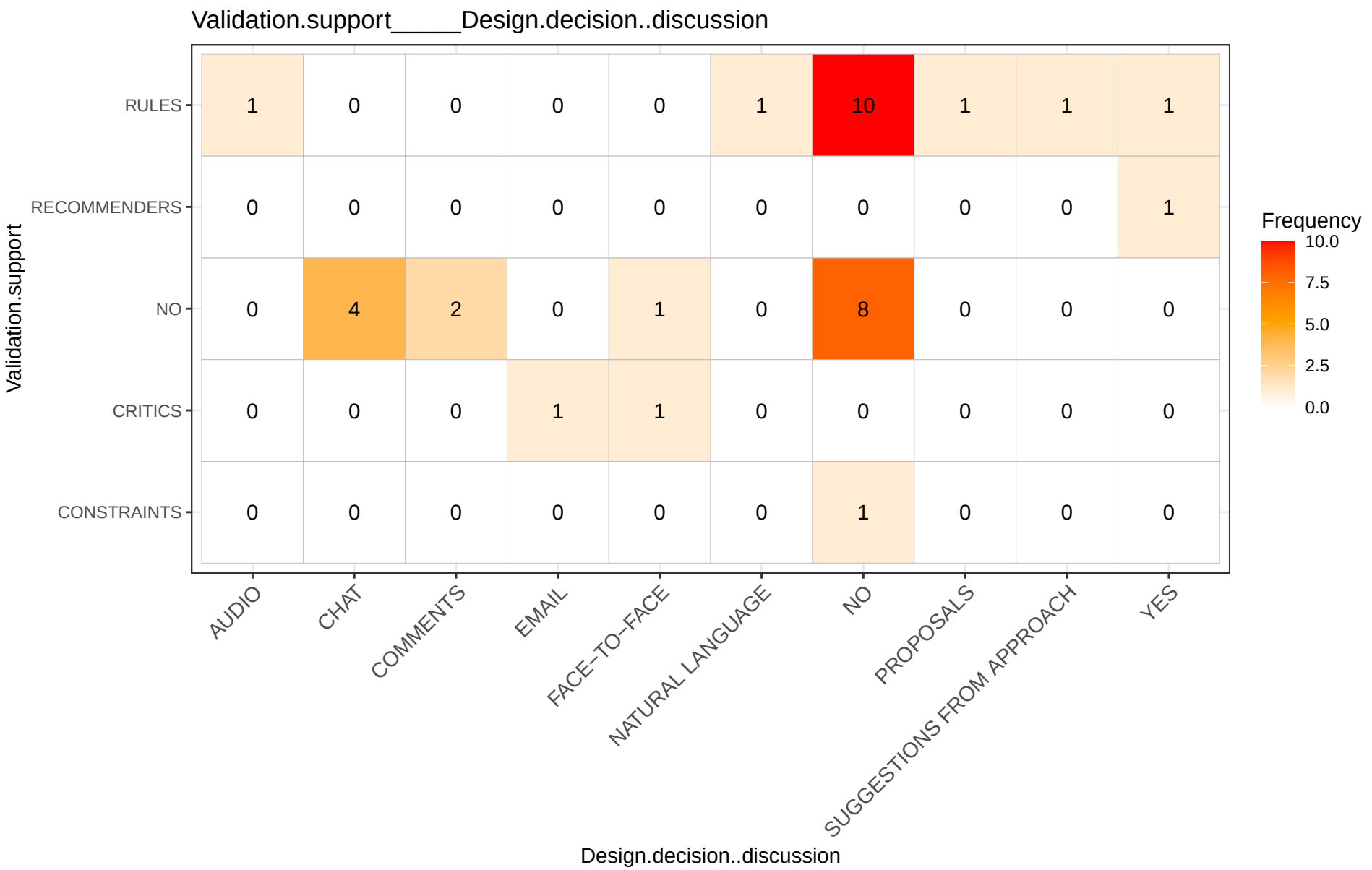
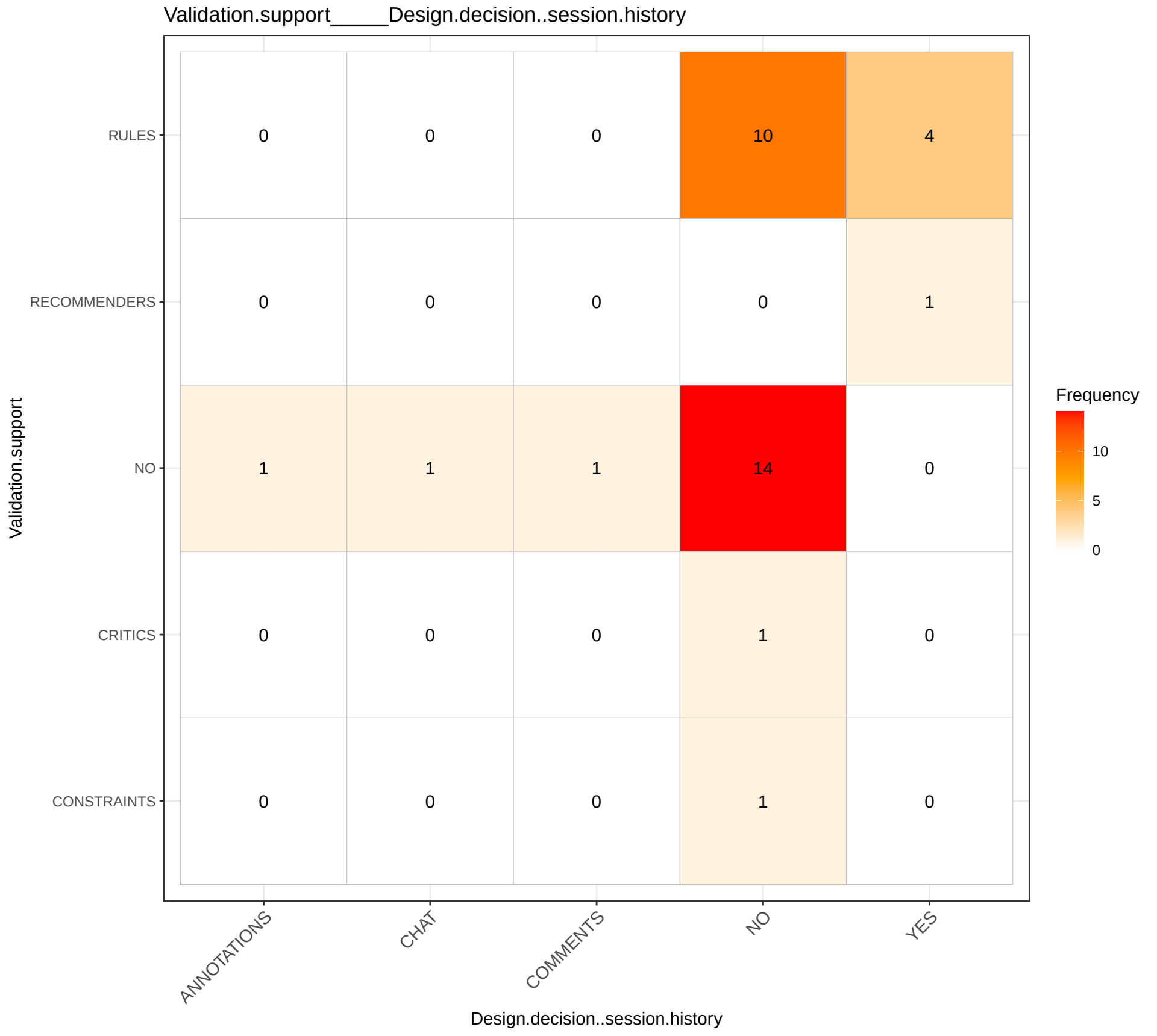

Validation.support_____Communication.means...builtin
Validation.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
1 1 1 0 2 1 1 2 3 1 6 0 0 2 1 0 1
0 0 0 0 0 0 0 1 1 0 0 0 0 1 1 0 1
2 2 4 1 5 0 4 0 2 0 7 2 1 2 1 1 2
0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
4
2
0

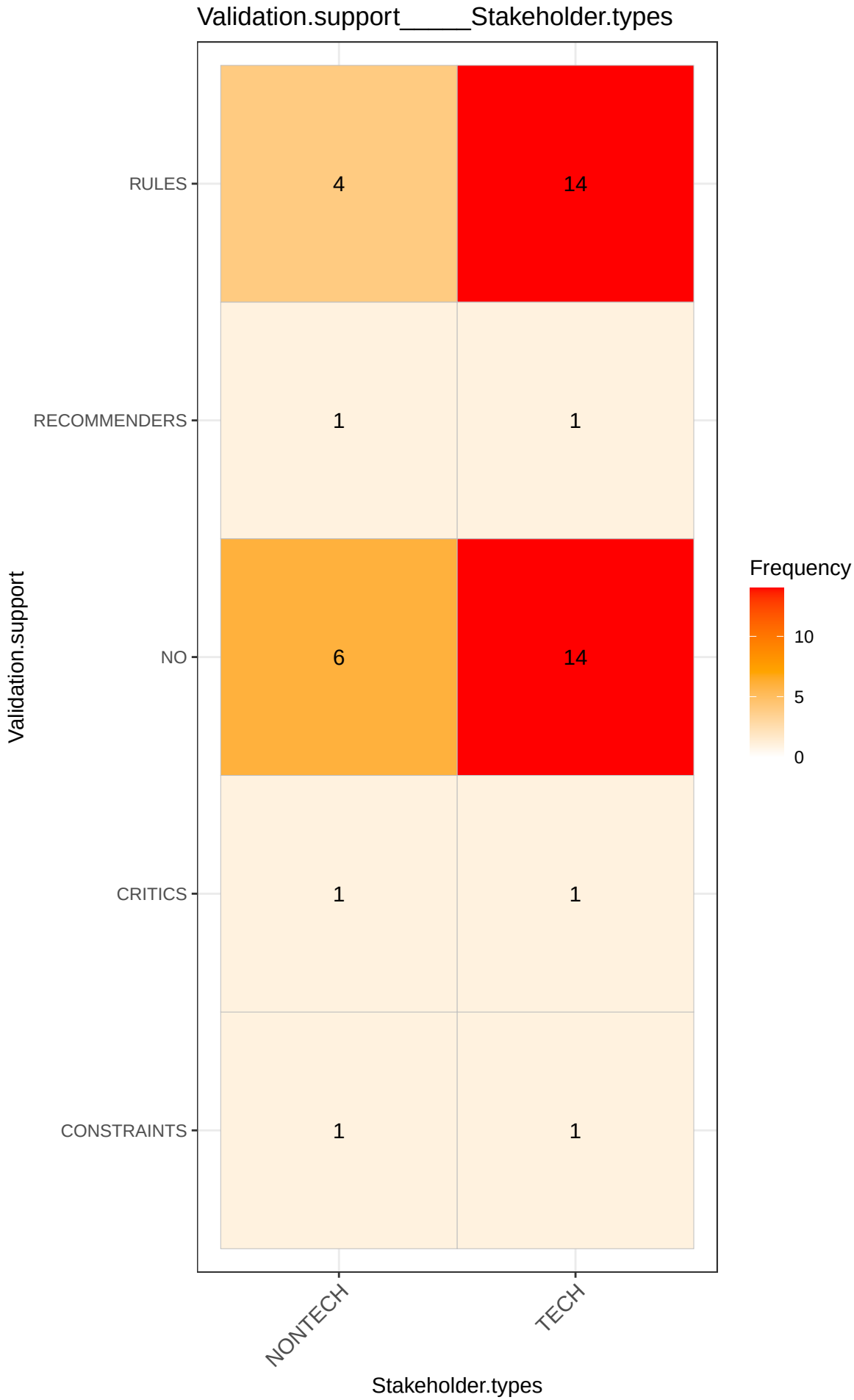

Validation.support_____Communication.means...external
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
0 3 2 0 0 10 0 0
0 0 0 0 0 1 0 0
1 2 3 2 1 6 1 1
0 0 1 1 0 0 0 0
0 0 1 0 0 0 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Communication.means...mixed
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
1
1
0
12
0
0
0
1
0
0
2
12
0
0
0
1
0
1
0
0
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
12
9
6
3
0


Validation.support_____Communication.means.links
Validation.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
1 0 0 1 1 1 1 0 1 12 0 0 1 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
1 1 1 1 0 1 0 1 0 12 2 1 0 1
0 0 0 0 0 0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE-TO-FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
12
9
6
3
0


Validation.support_____Design.decision..discussion
Validation.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
1 0 0 0 0 1 10 1 1 1
0 0 0 0 0 0 0 0 0 1
0 4 2 0 1 0 8 0 0 0
0 0 0 1 1 0 0 0 0 0
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Design.decision..session.history
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
0 0 0 10 4
0 0 0 0 1
1 1 1 14 0
0 0 0 1 0
0 0 0 1 0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
10
5
0


Validation.support_____Stakeholder.types
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
4
14
1
1
6
14
1
1
1
1
NONTECH
TECH
Stakeholder.types
Frequency
10
5
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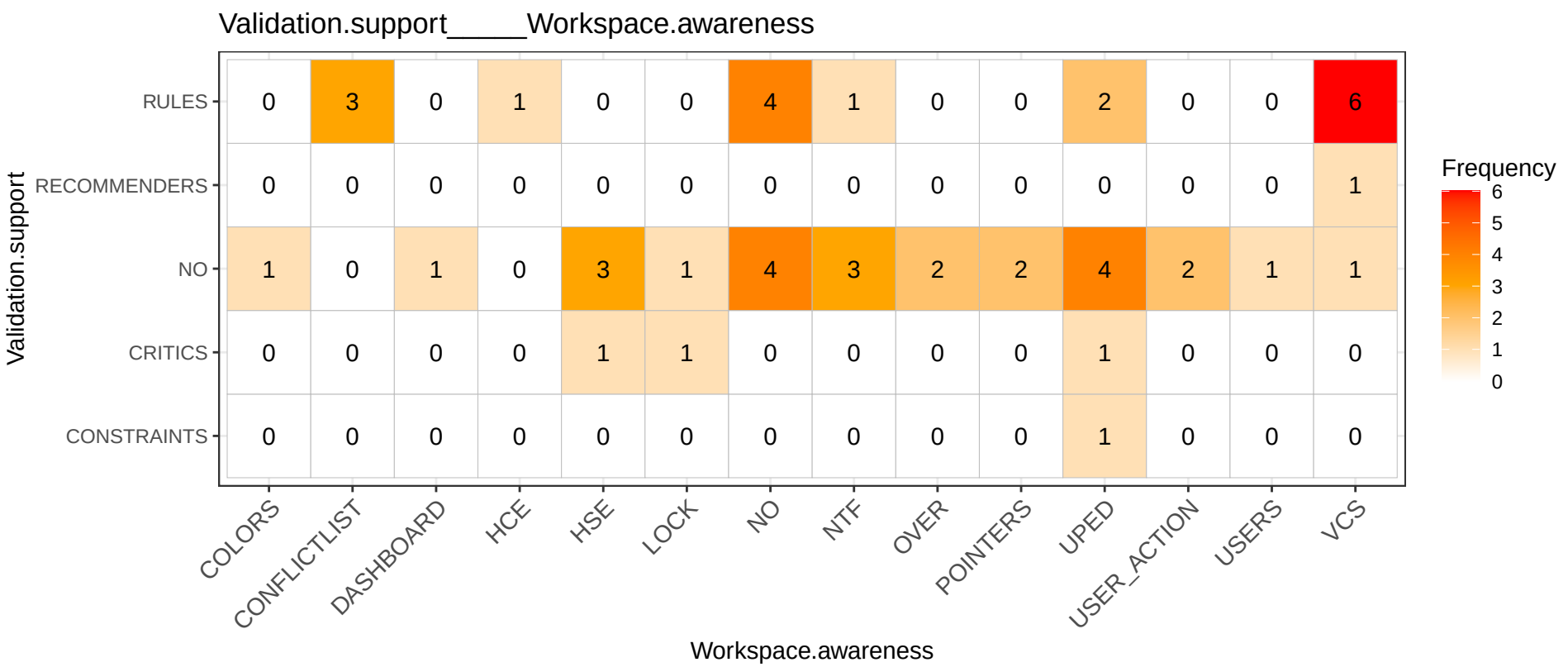
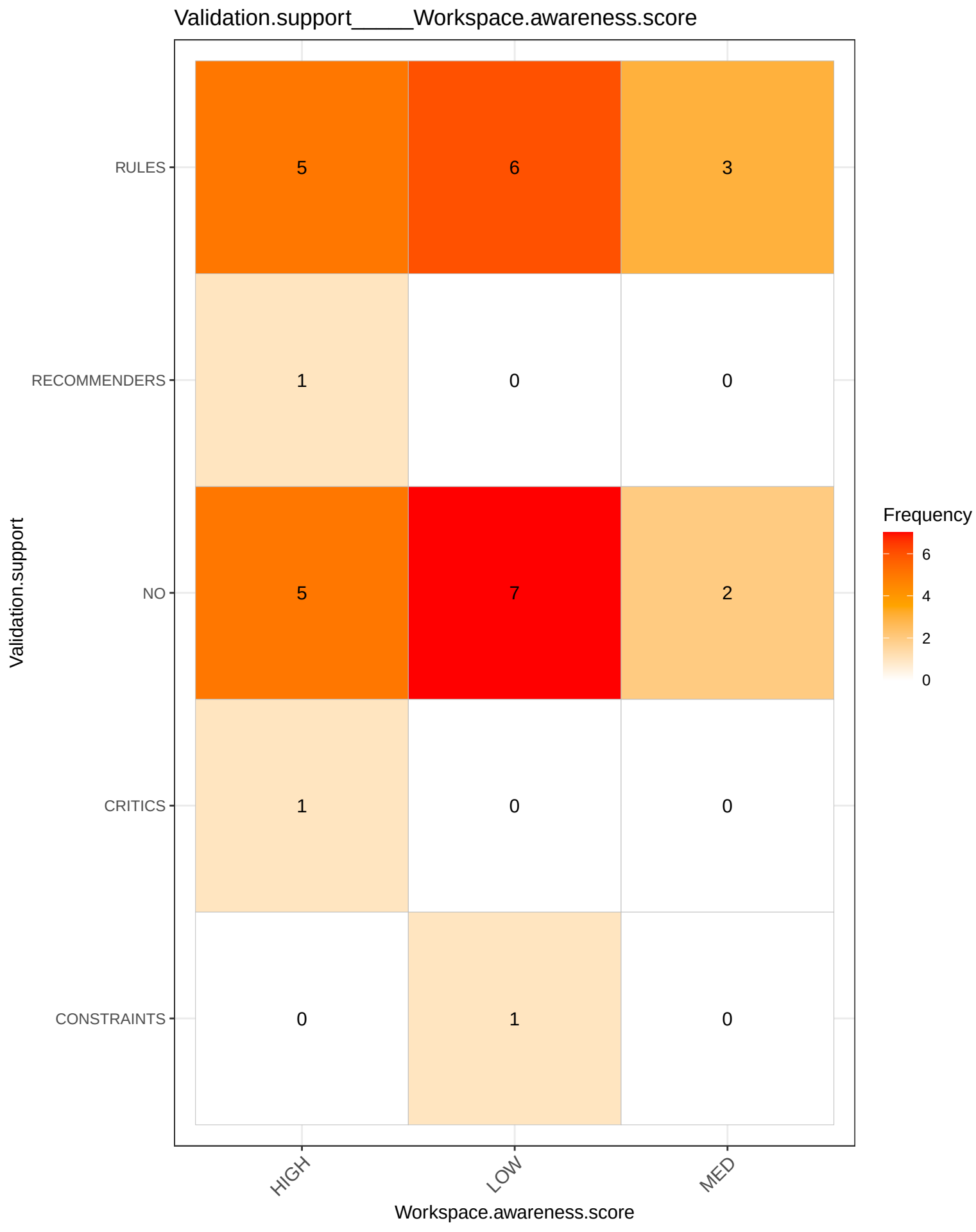

Validation.support_____Workspace.awareness
Validation.support
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
0 3 0 1 0 0 4 1 0 0 2 0 0 6
0 0 0 0 0 0 0 0 0 0 0 0 0 1
1 0 1 0 3 1 4 3 2 2 4 2 1 1
0 0 0 0 1 1 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0


Validation.support_____Workspace.awareness.score
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
5
6
3
1
0
0
5
7
2
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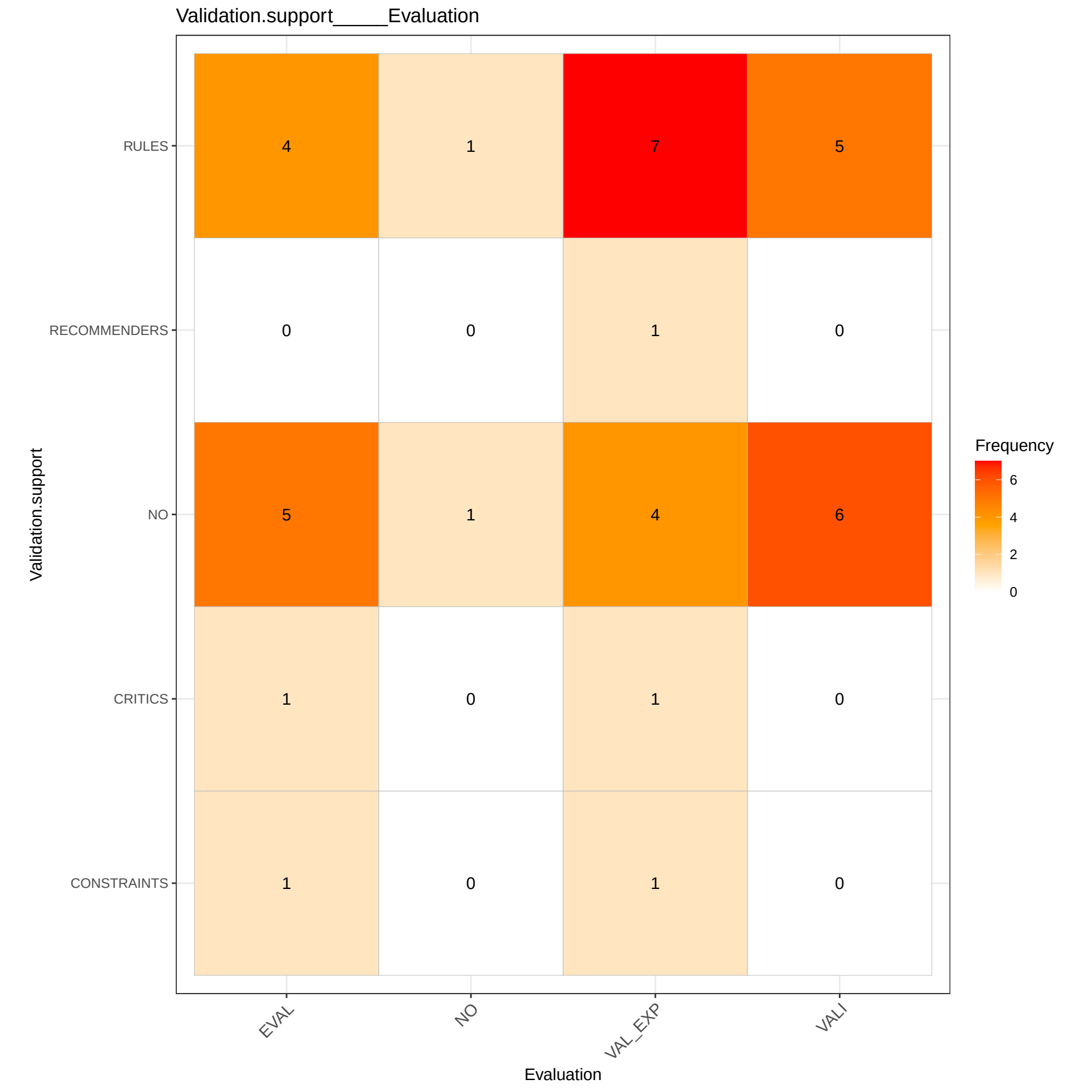
0
0
0
1
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
6
4
2
0


Validation.support_____Evaluation
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
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1
7
5
0
0
1
0
5
1
4
6
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1
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EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
6
4
2
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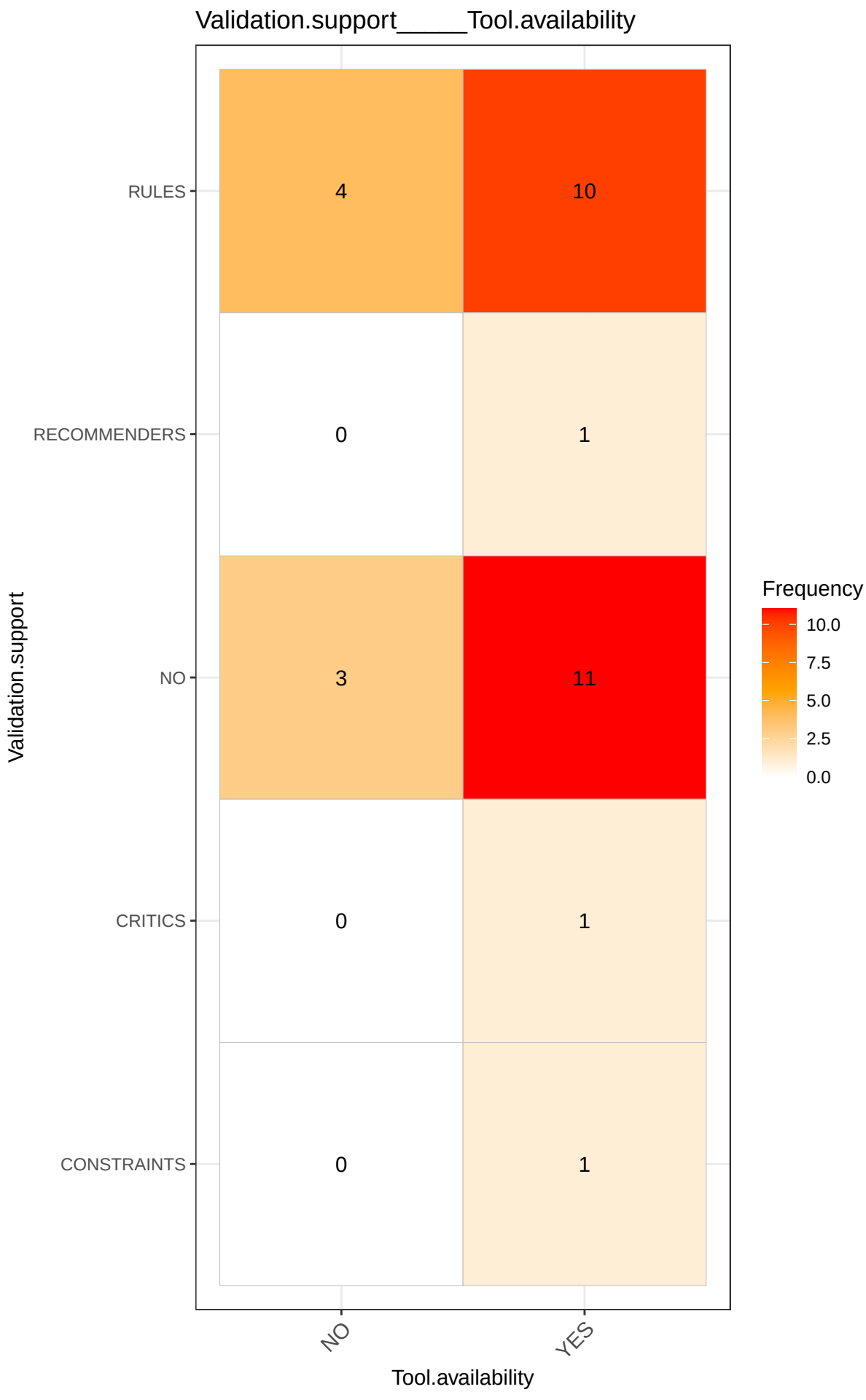
Validation.support_____Tool.availability
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
4
10
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1
3
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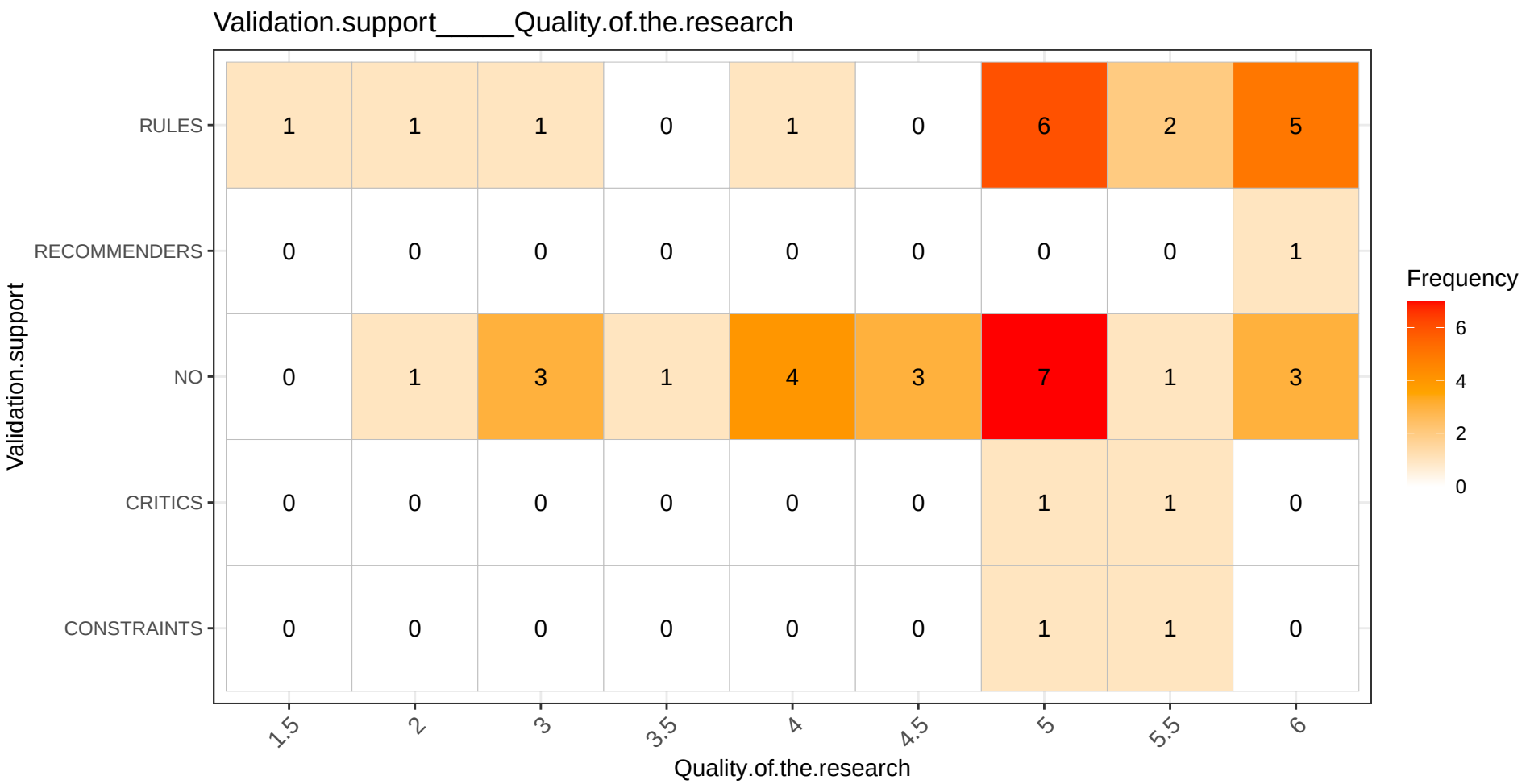
1
0
1
NO
YES
Tool.availability
Frequency
10.0
7.5
5.0
2.5
0.0


Validation.support_____Quality.of.the.research
RULES
RECOMMENDERS
NO
CRITICS
CONSTRAINTS
Validation.support
1 1 1 0 1 0 6 2 5
0 0 0 0 0 0 0 0 1
0 1 3 1 4 3 7 1 3
0 0 0 0 0 0 1 1 0
0 0 0 0 0 0 1 1 0
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2
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3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
6
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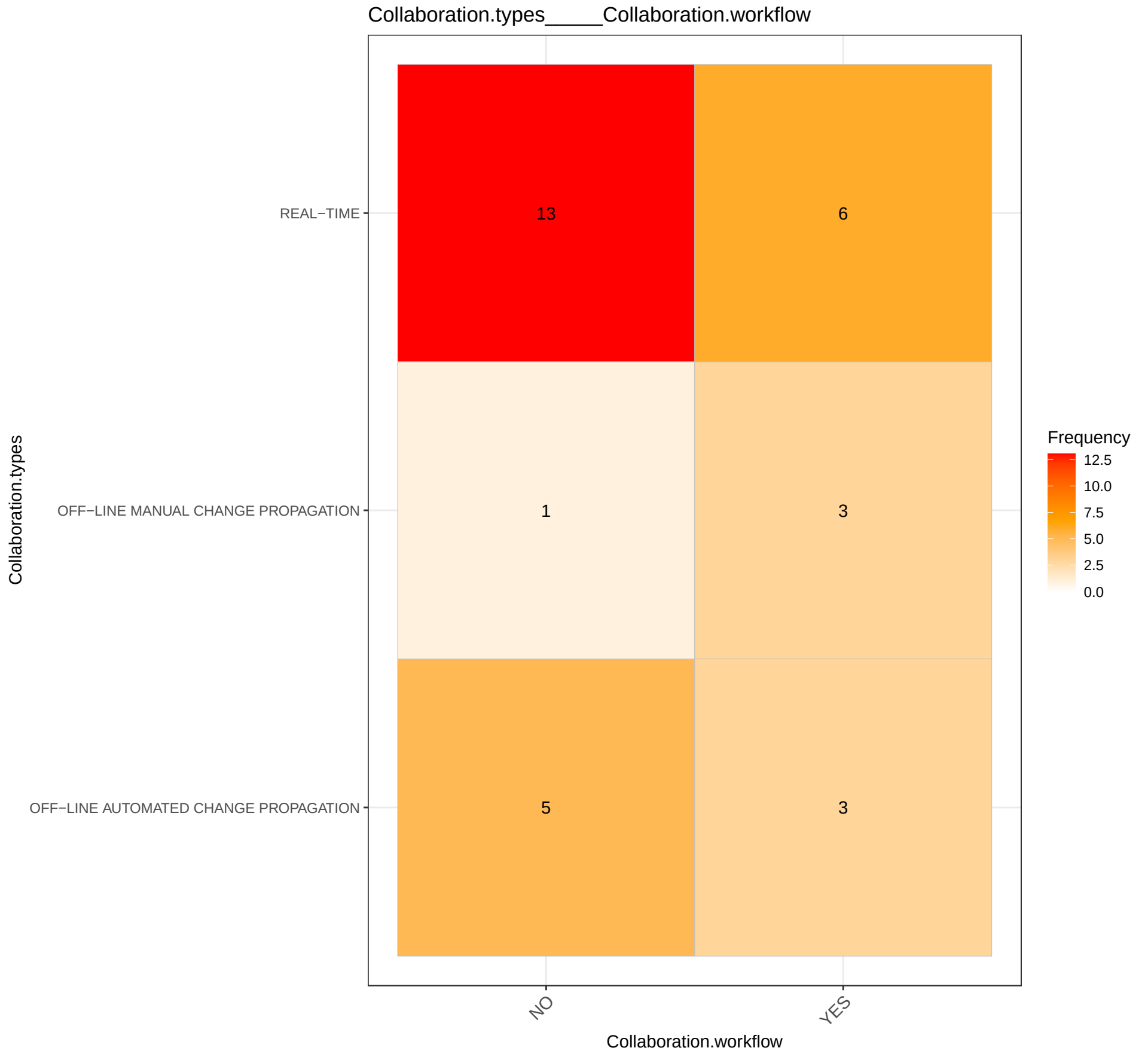
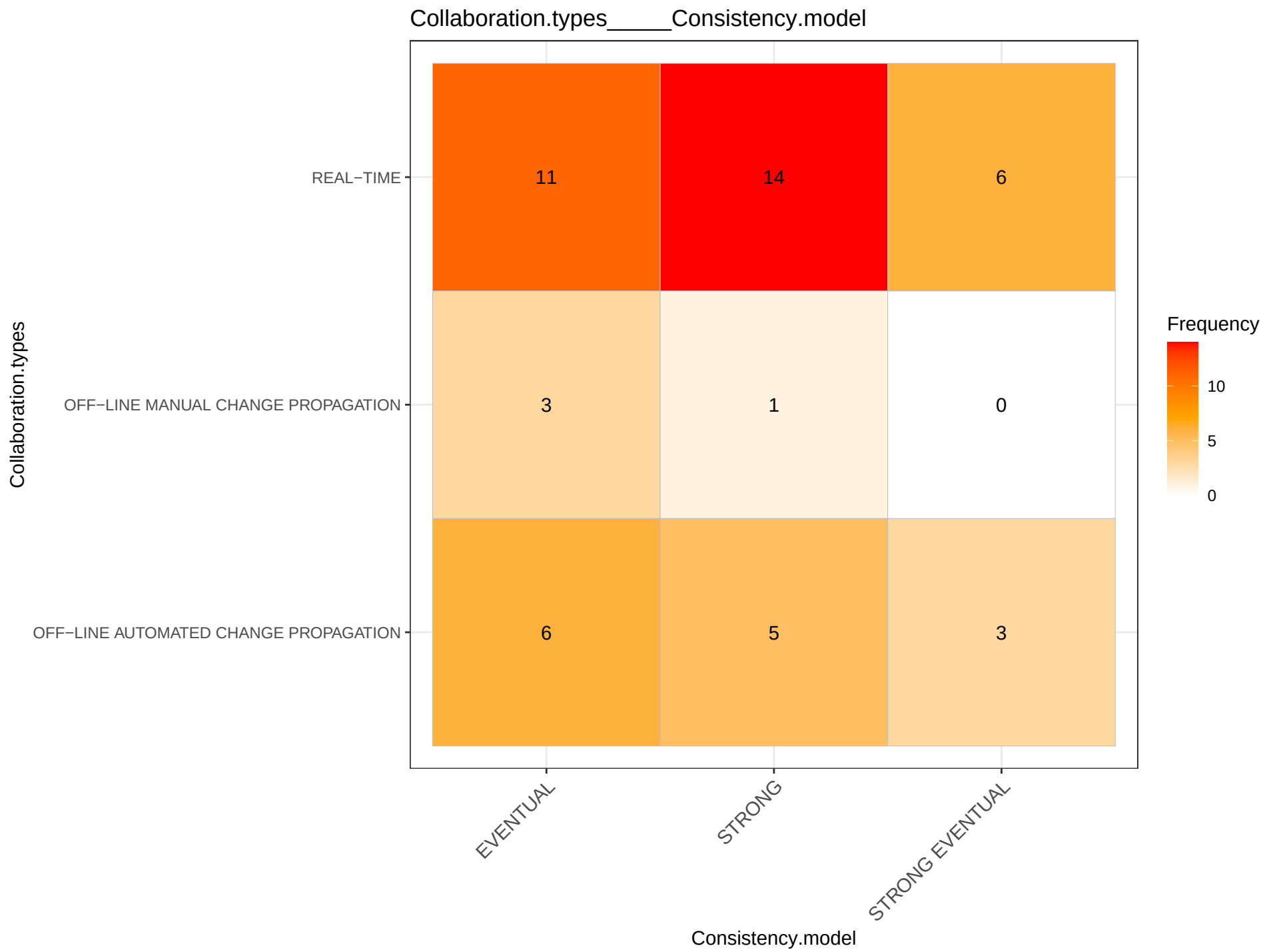
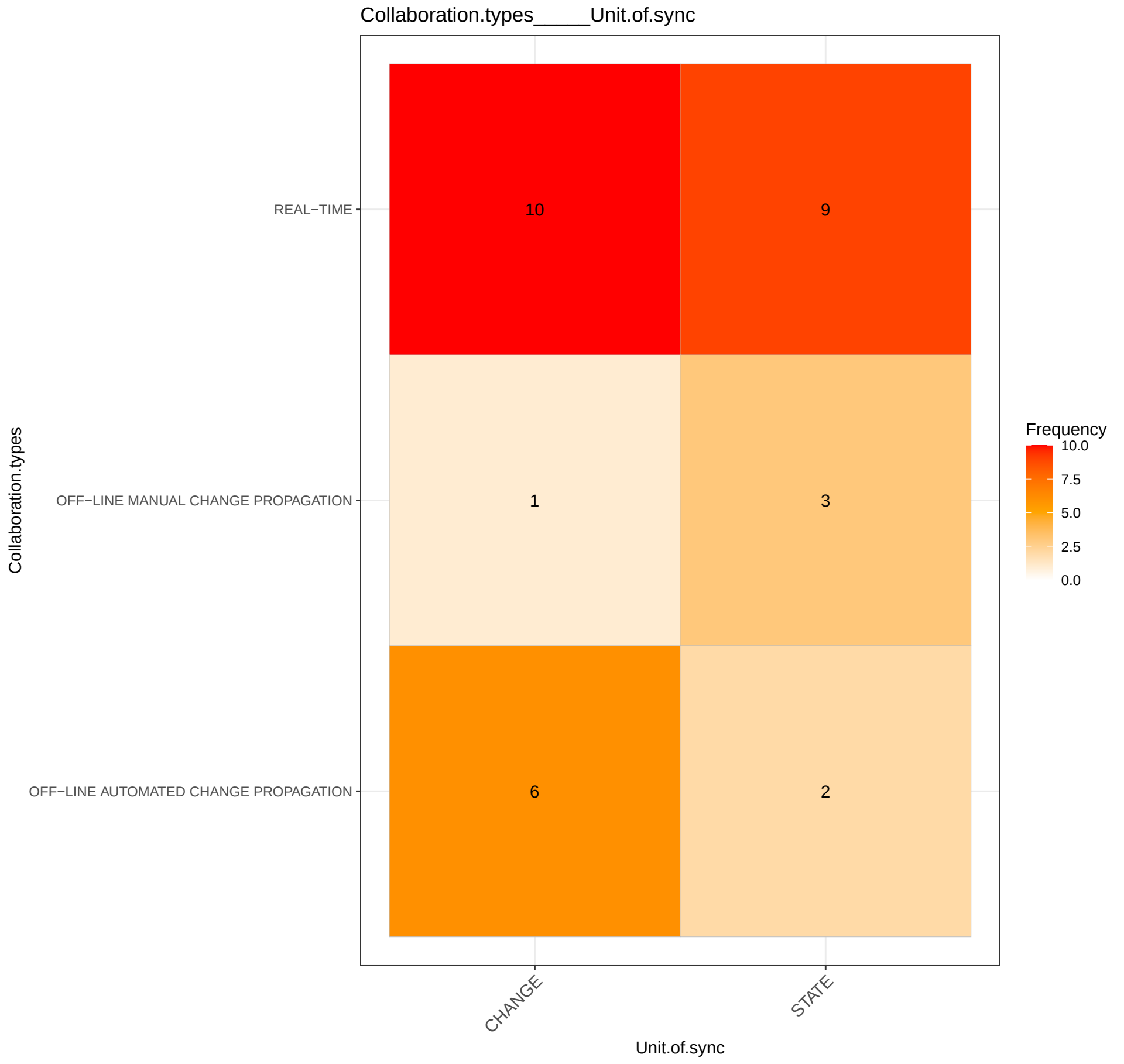
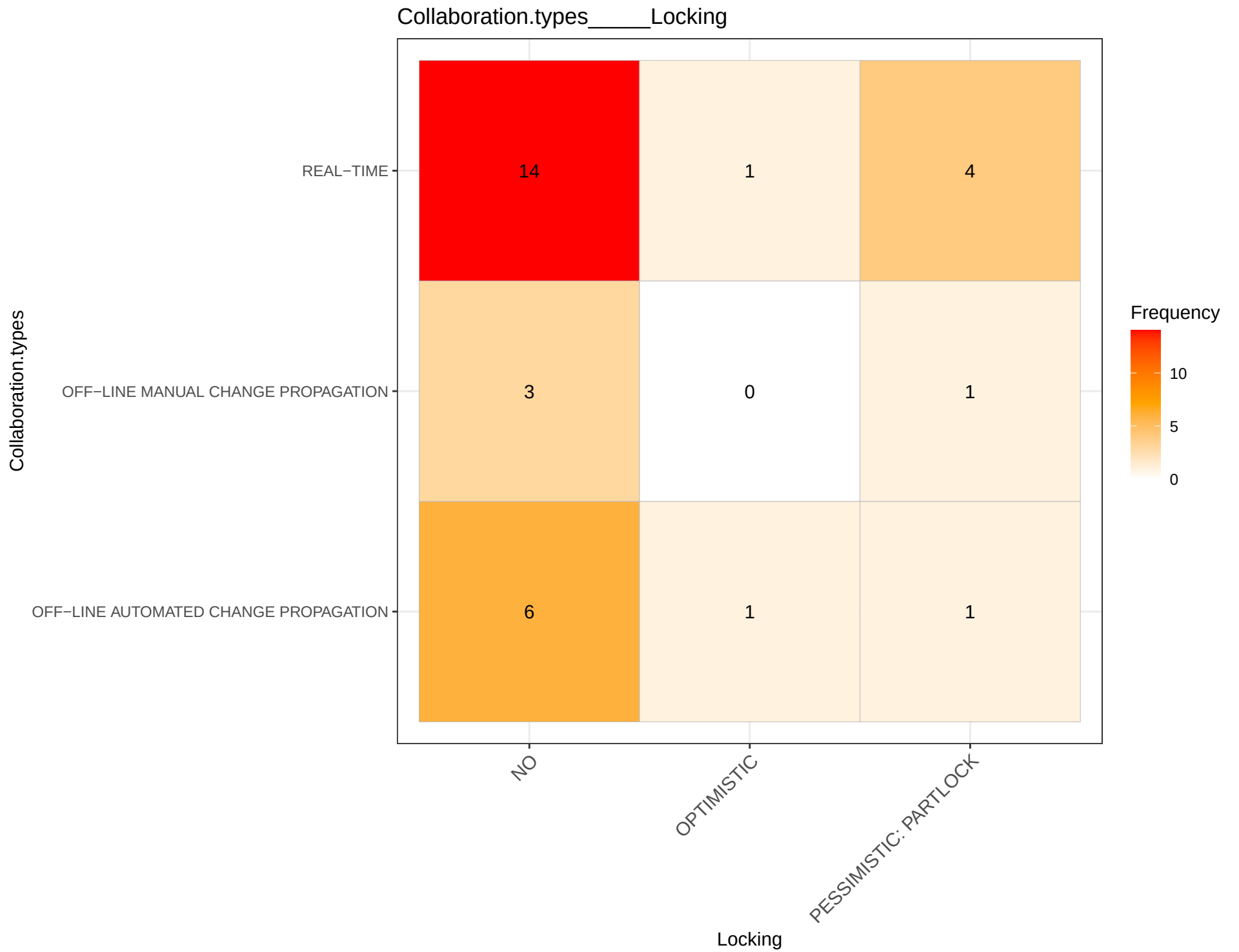
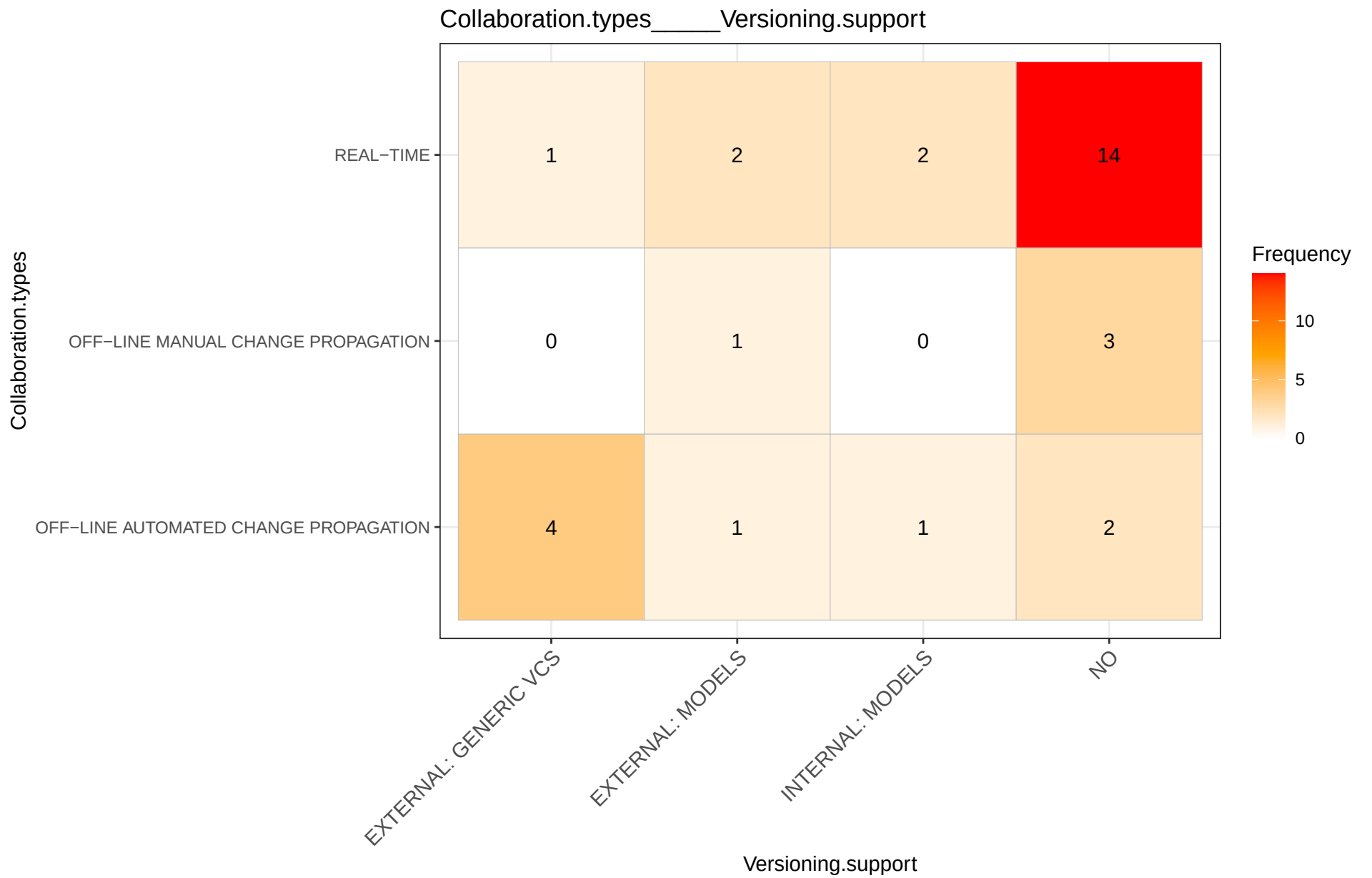
2
0

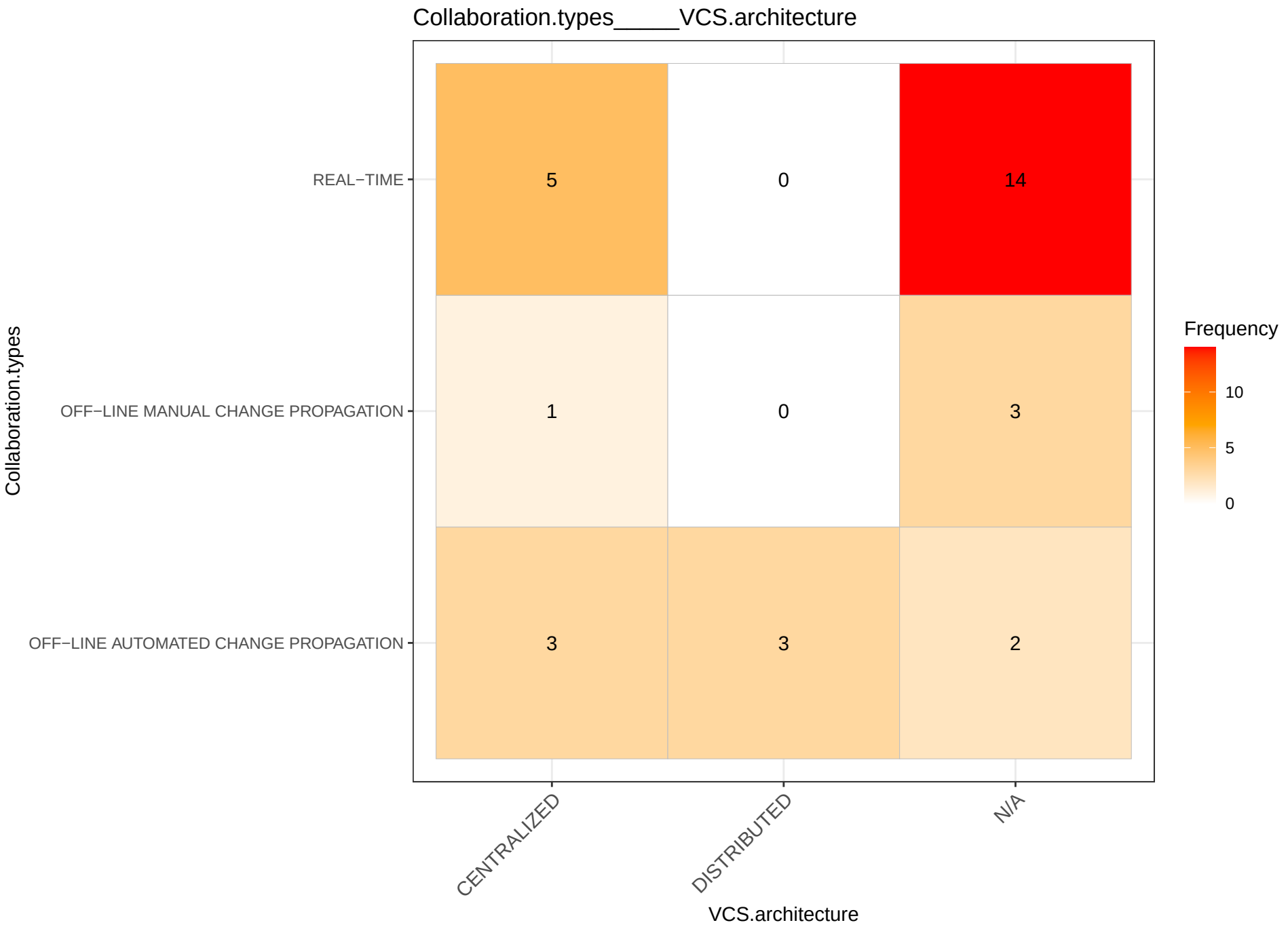

Collaboration.types_____Collaboration.workflow
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
13
6
1
3
5
3
NO
YES
Collaboration.workflow
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Collaboration.types_____Consistency.model
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
11
14
6
3
1
0
6
5
3
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
10
5
0


Collaboration.types_____Unit.of.sync
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
10
9
1
3
6
2
CHANGE
STATE
Unit.of.sync
Frequency
10.0
7.5
5.0
2.5
0.0


Collaboration.types_____Locking
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
14
1
4
3
0
1
6
1
1
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
10
5
0


Collaboration.types_____Versioning.support
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
1
2
2
14
0
1
0
3
4
1
1
2
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
10
5
0


Collaboration.types_____VCS.architecture
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
5
0
14
1
0
3
3
3
2
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
10
5
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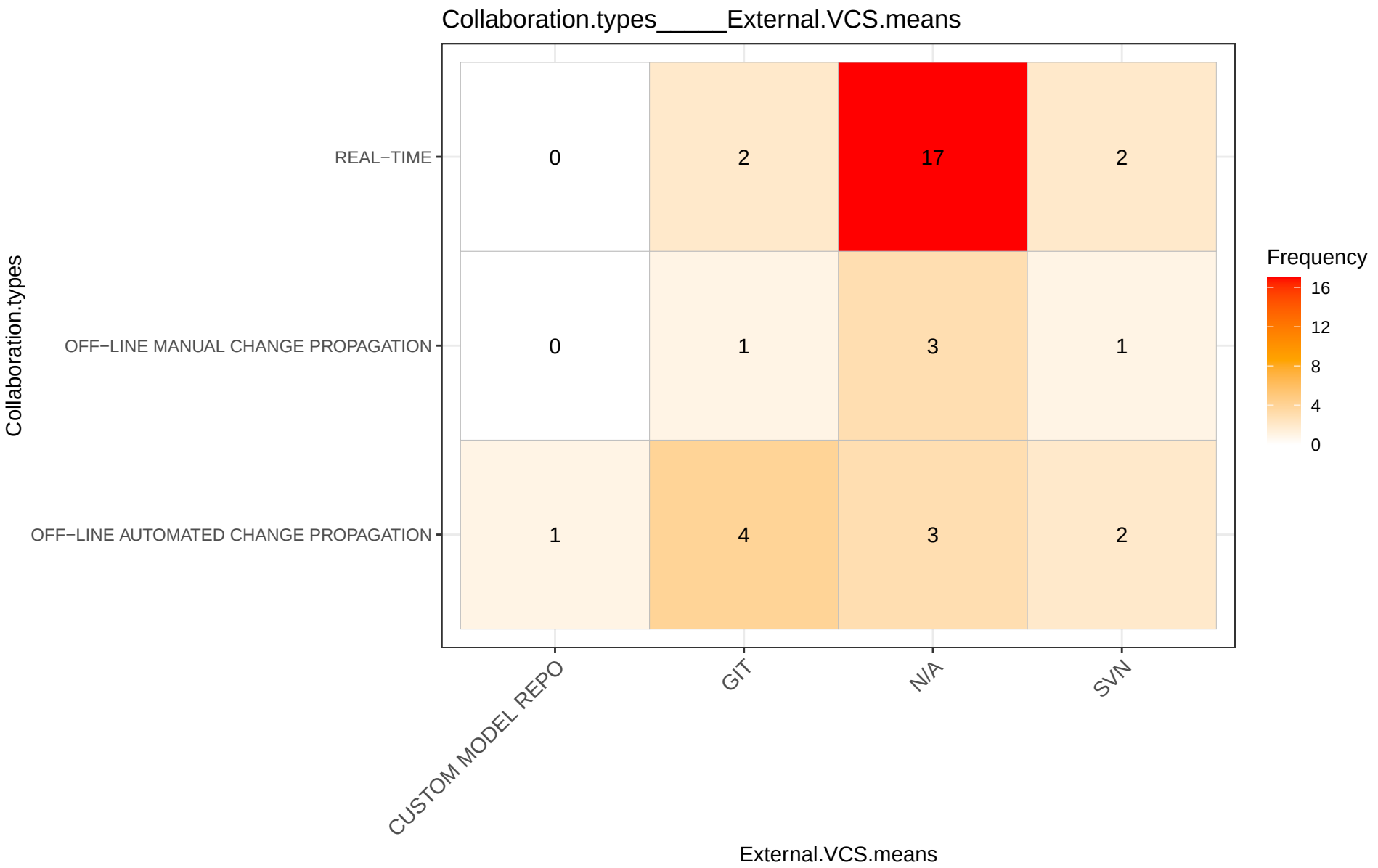
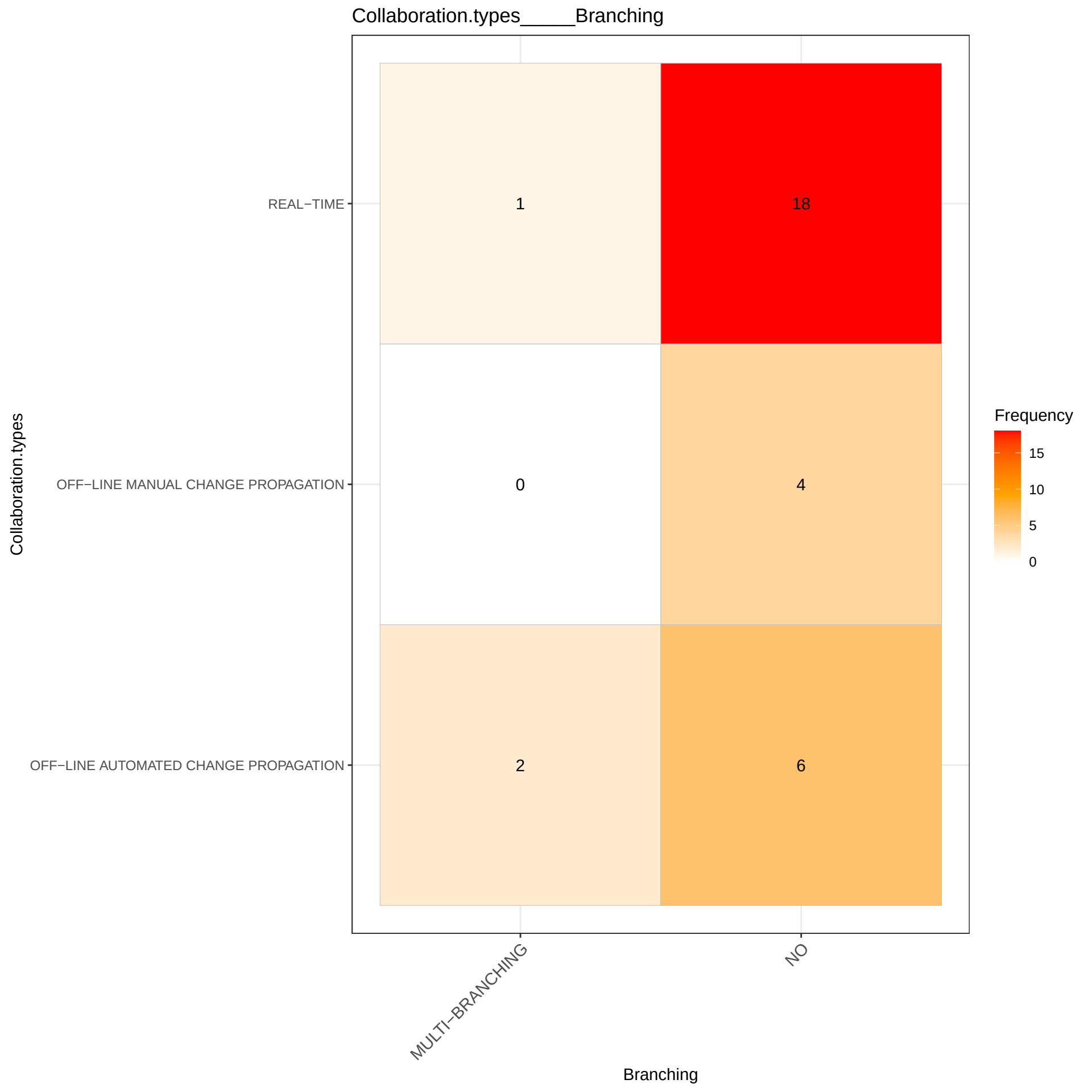
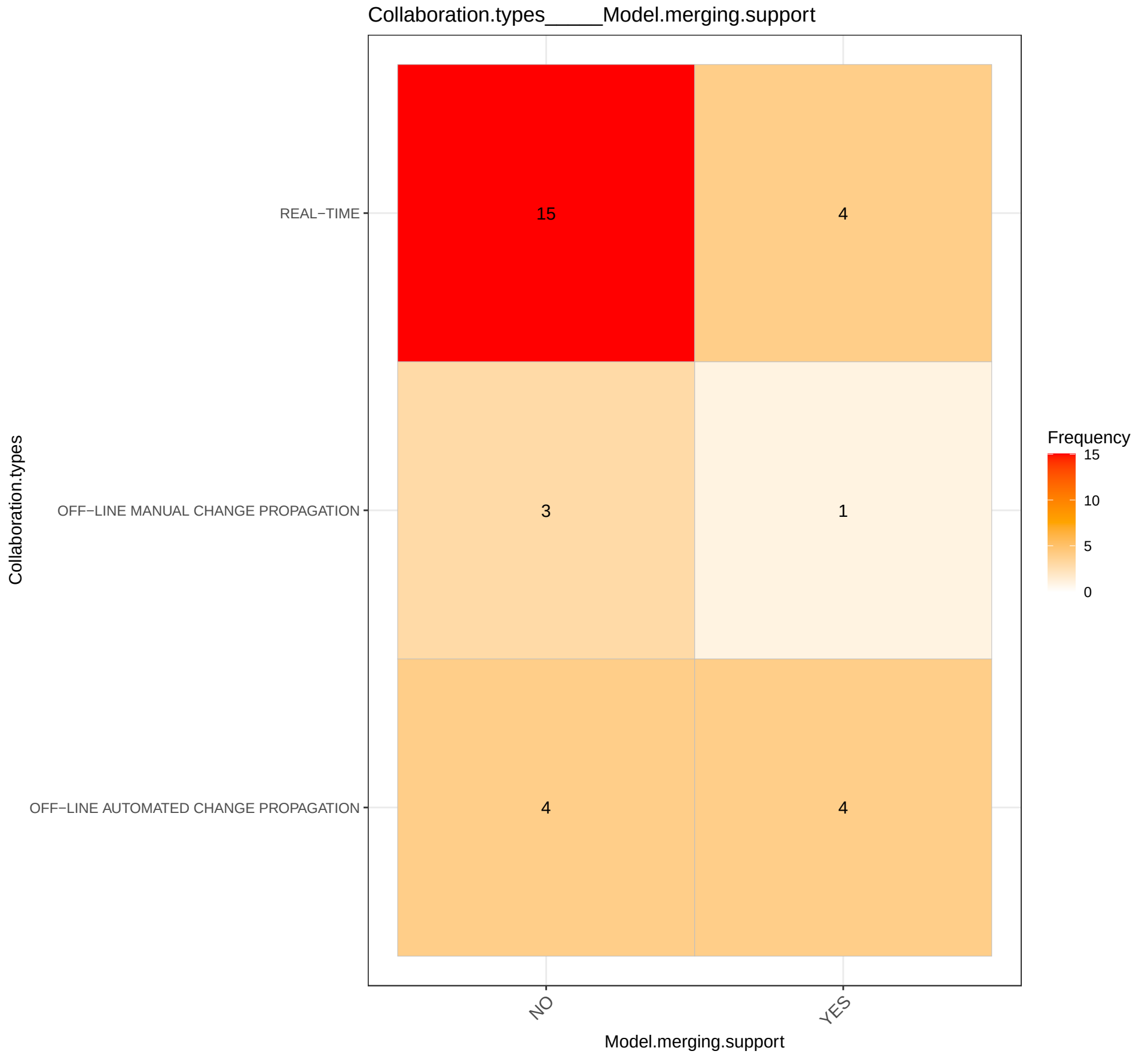
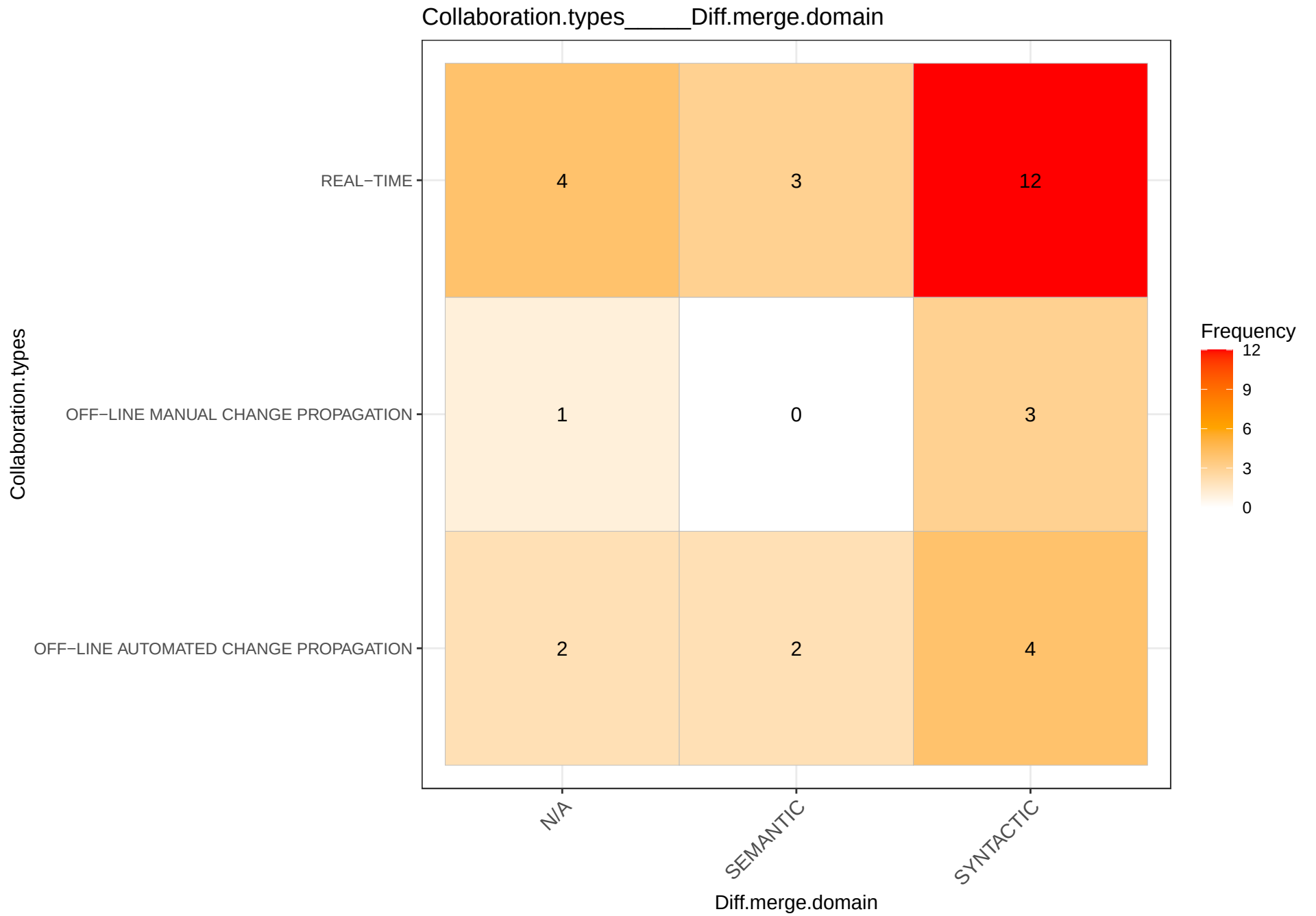
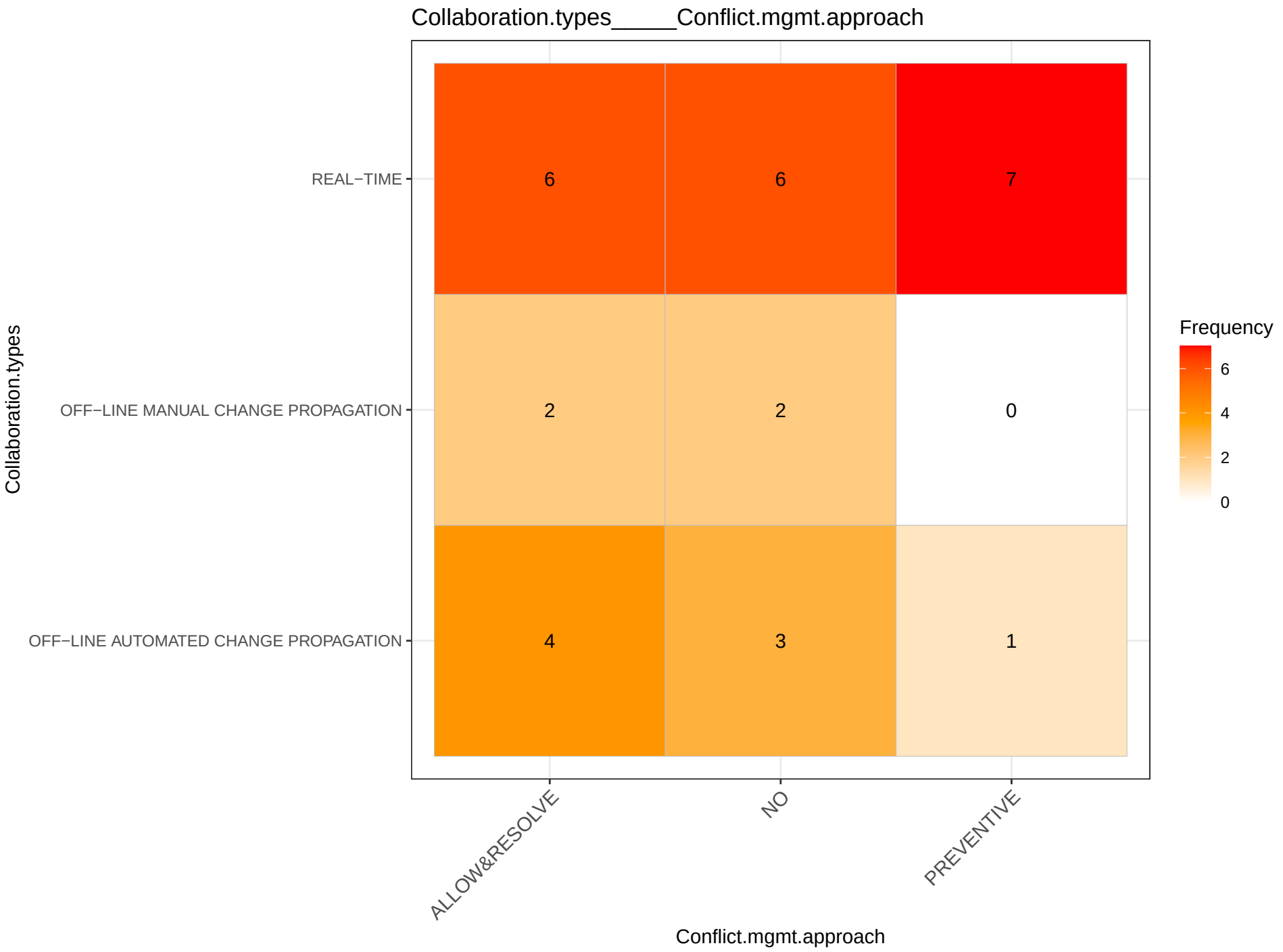
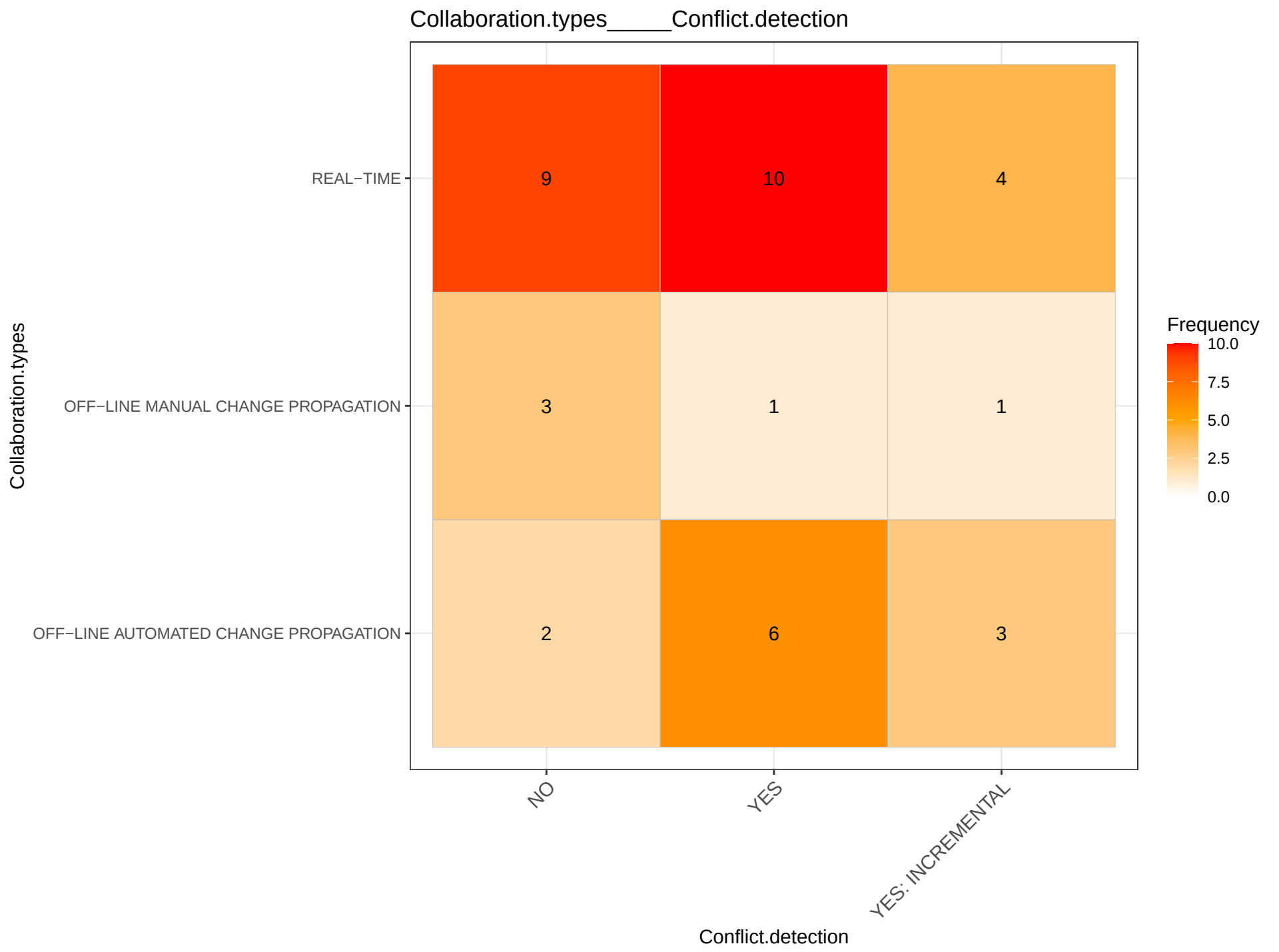

Collaboration.types_____External.VCS.means
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
0
2
17
2
0
1
3
1
1
4
3
2
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
16
12
8
4
0

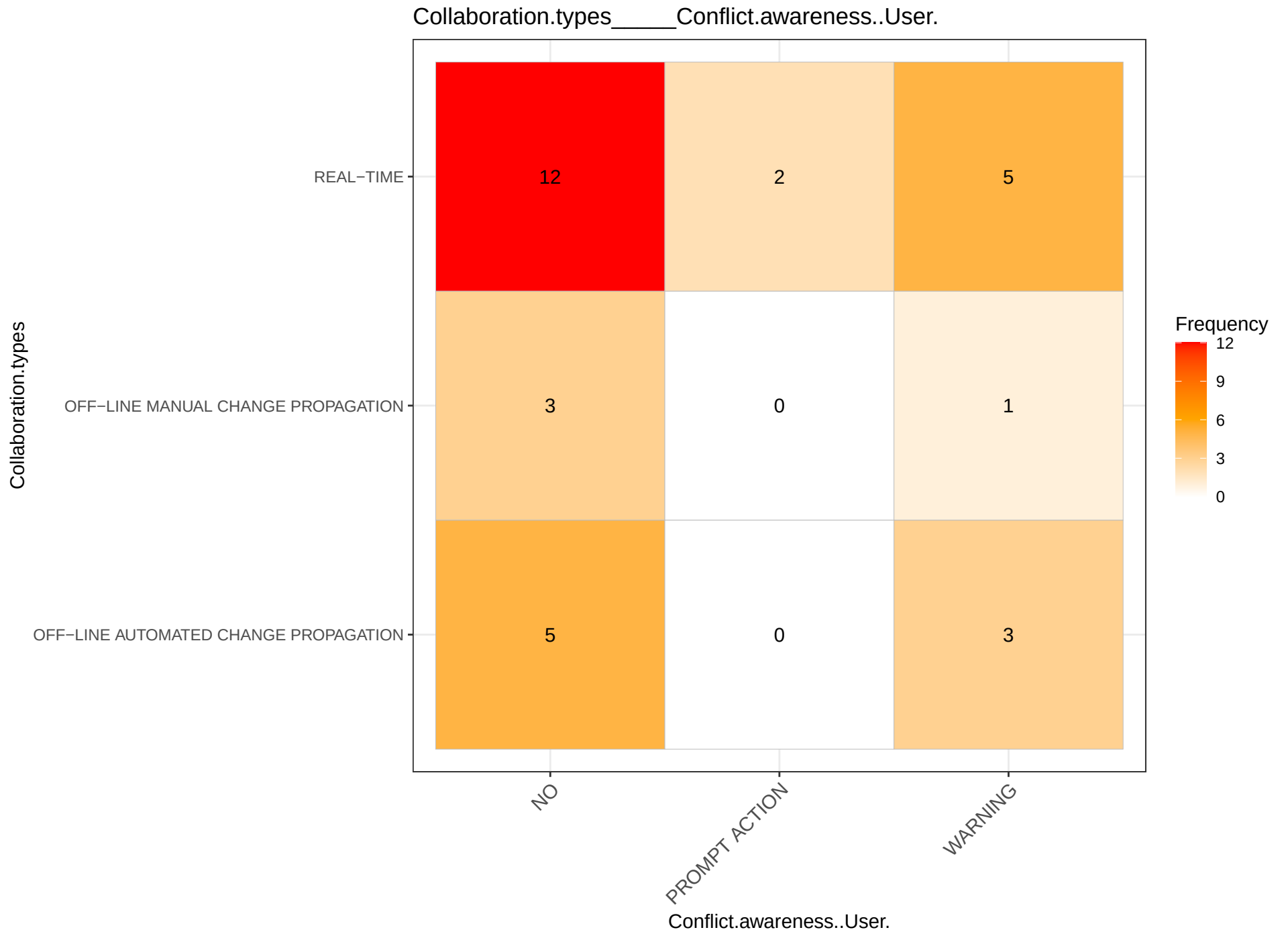

Collaboration.types_____Branching
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
1
18
0
4
2
6
Frequency
15
10
5
0
MULTI−BRANCHING
NO
Branching

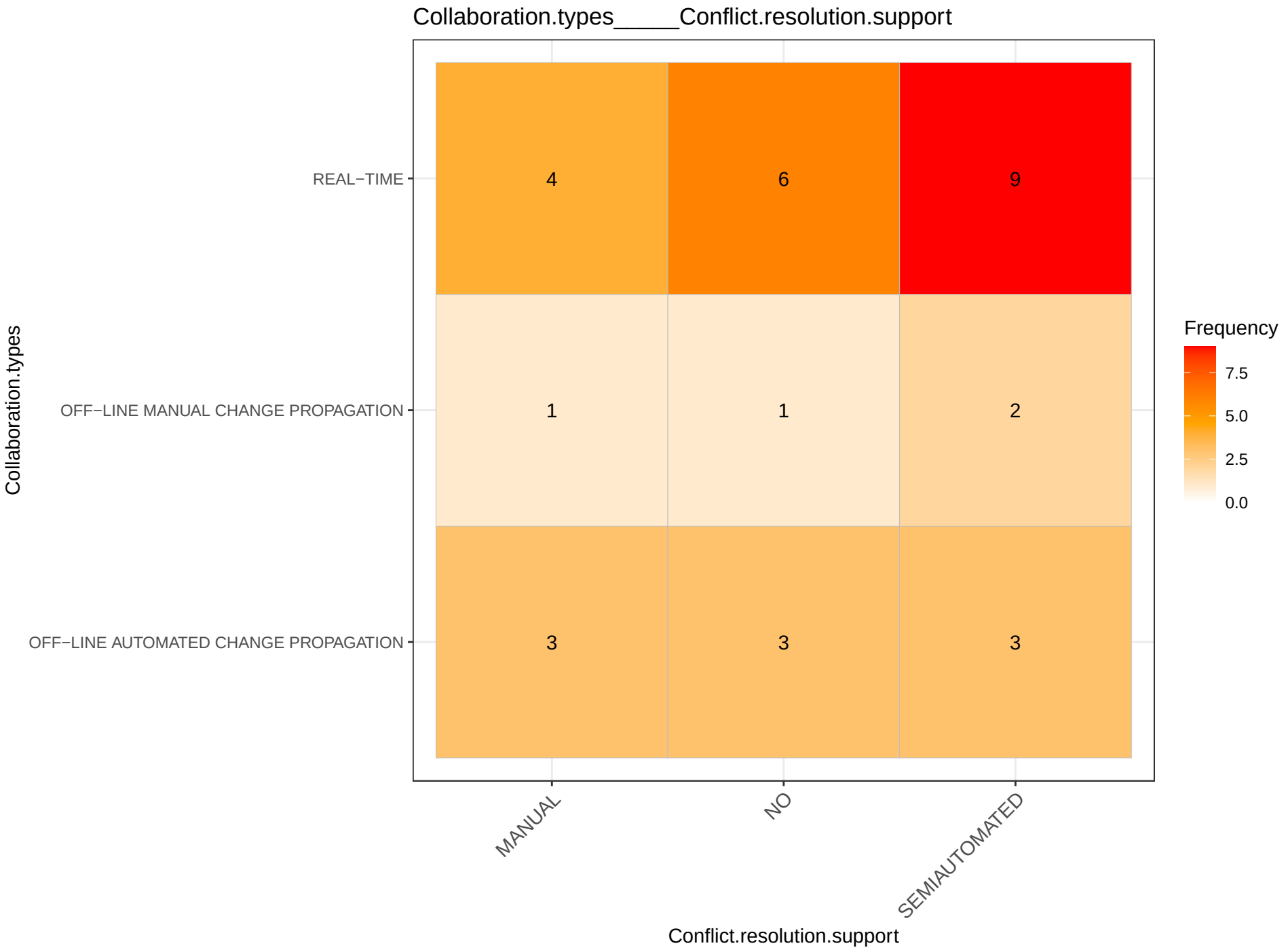

Collaboration.types_____Model.merging.support
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
15
4
3
1
4
4
NO
YES
Model.merging.support
Frequency
15
10
5
0

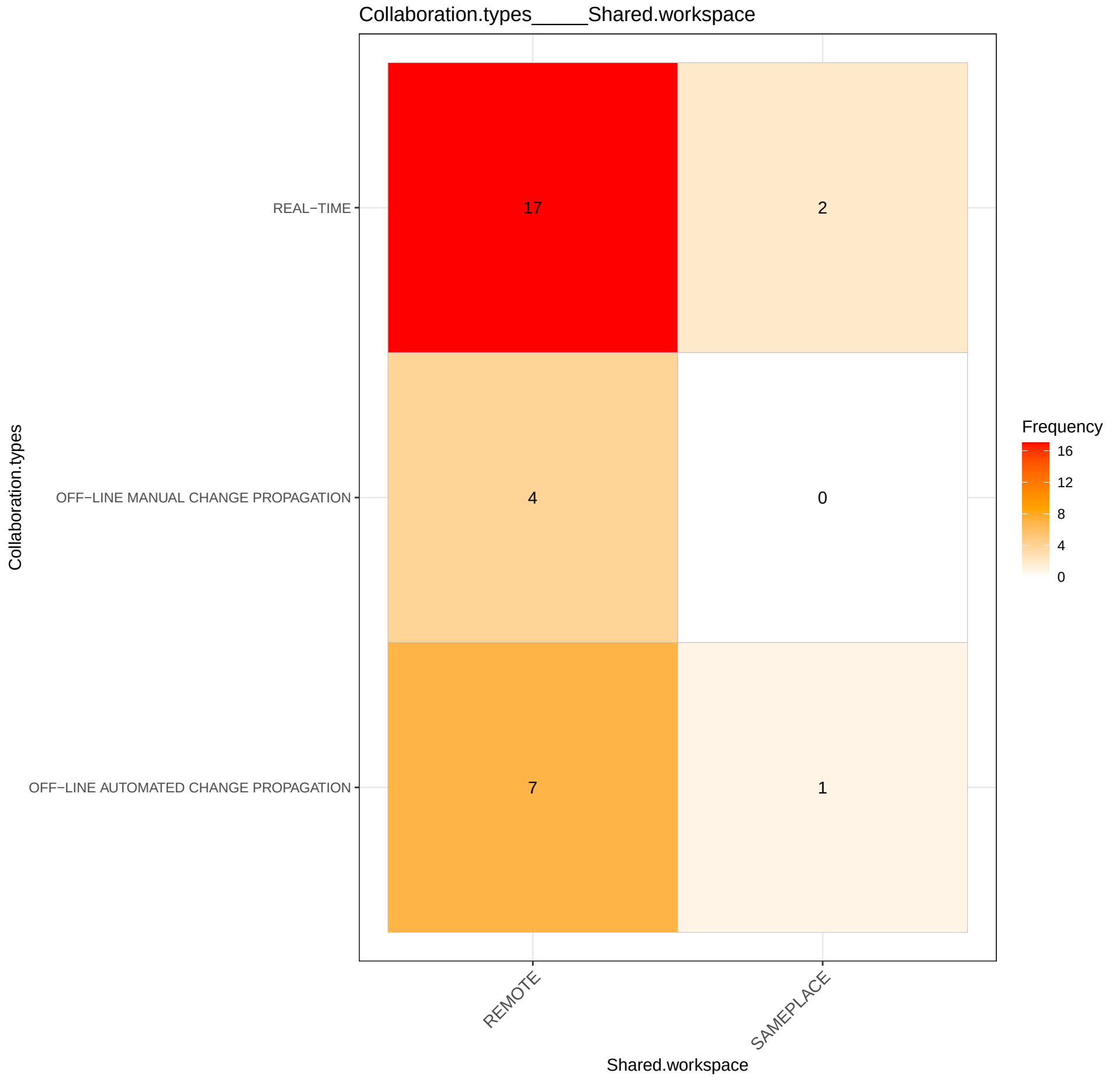

Collaboration.types_____Diff.merge.domain
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
4
3
12
1
0
3
2
2
4
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0

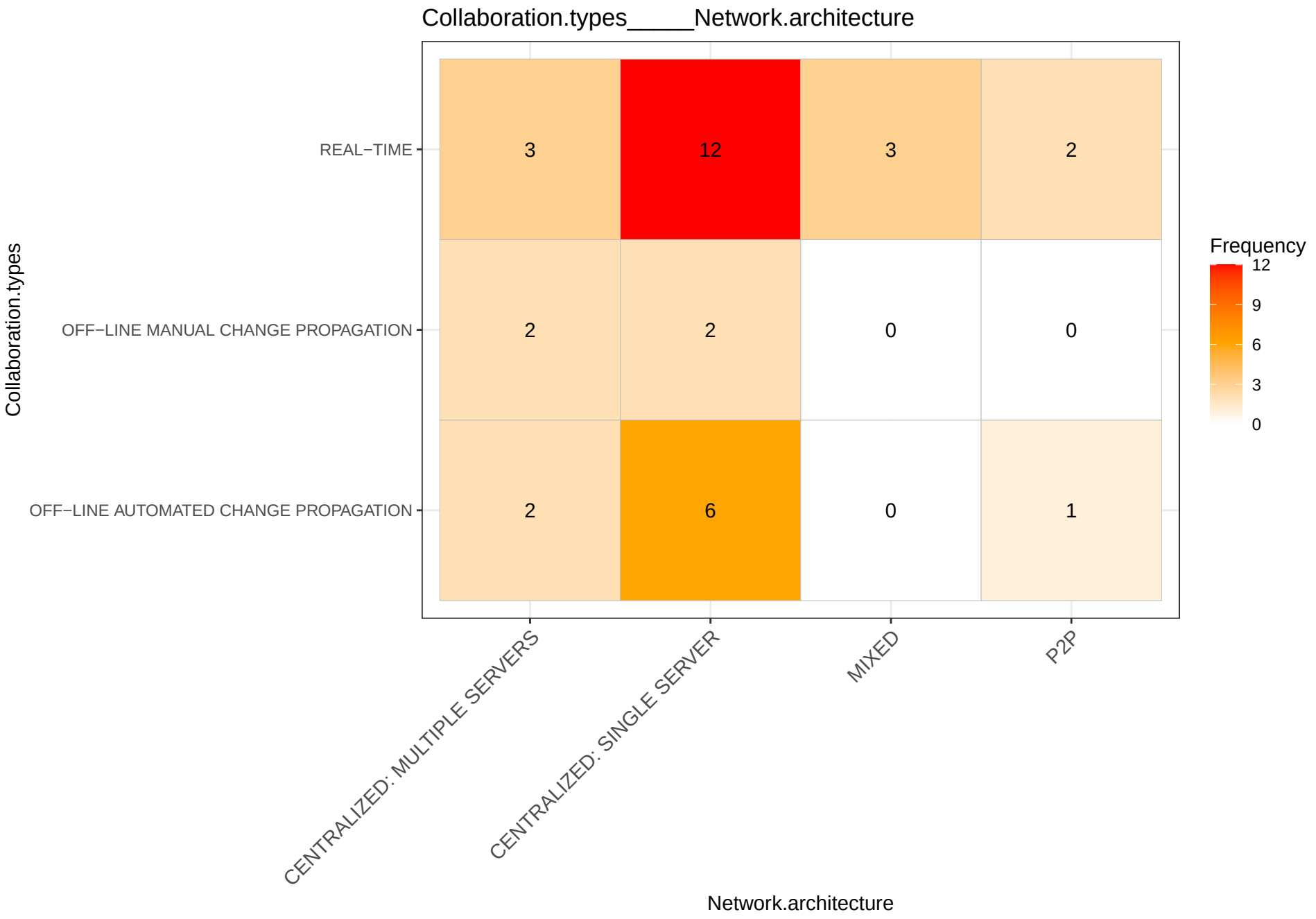

Collaboration.types_____Conflict.mgmt.approach
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
6
6
7
2
2
0
4
3
1
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
4
2
0

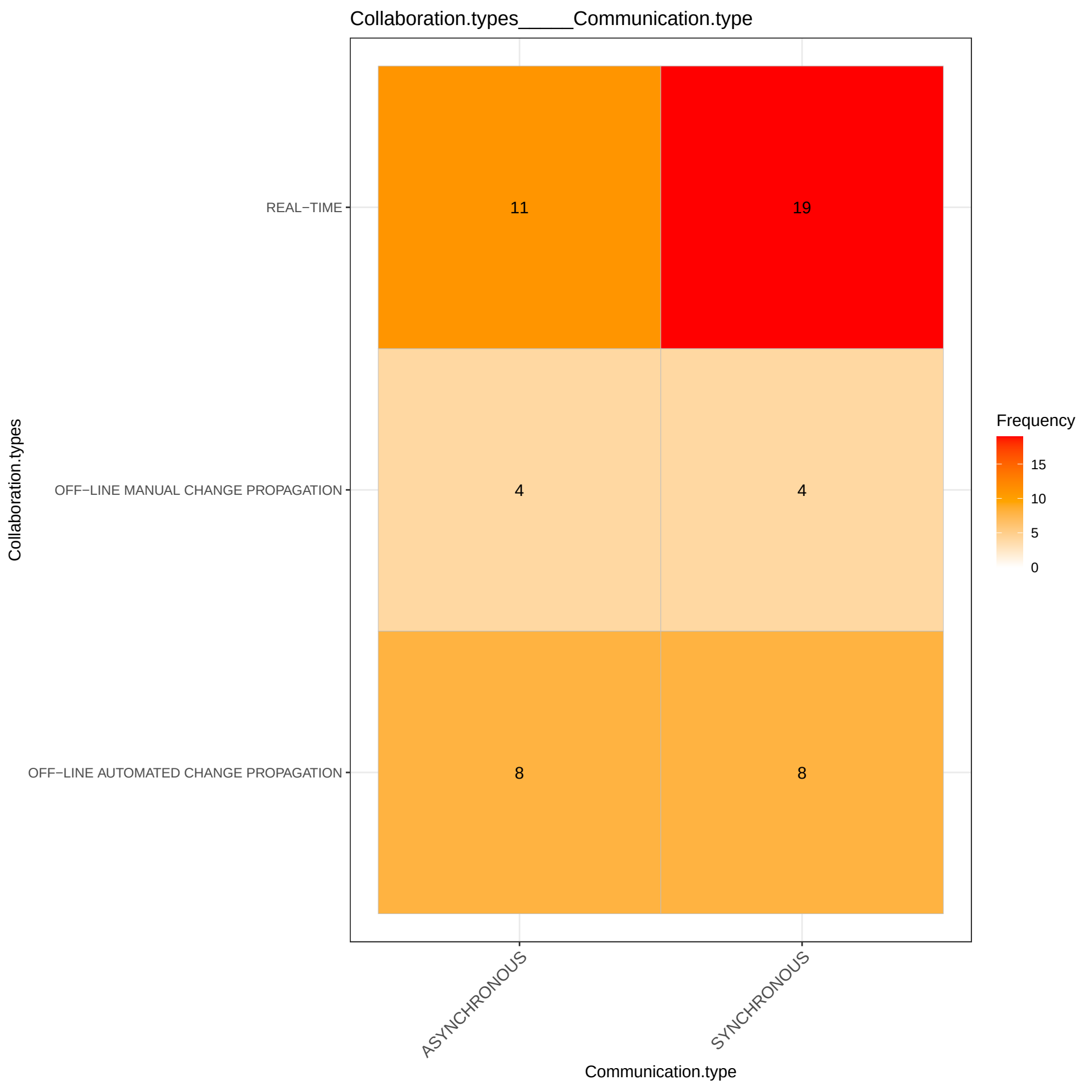

Collaboration.types_____Conflict.detection
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
9
10
4
3
1
1
2
6
3
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10.0
7.5
5.0
2.5
0.0

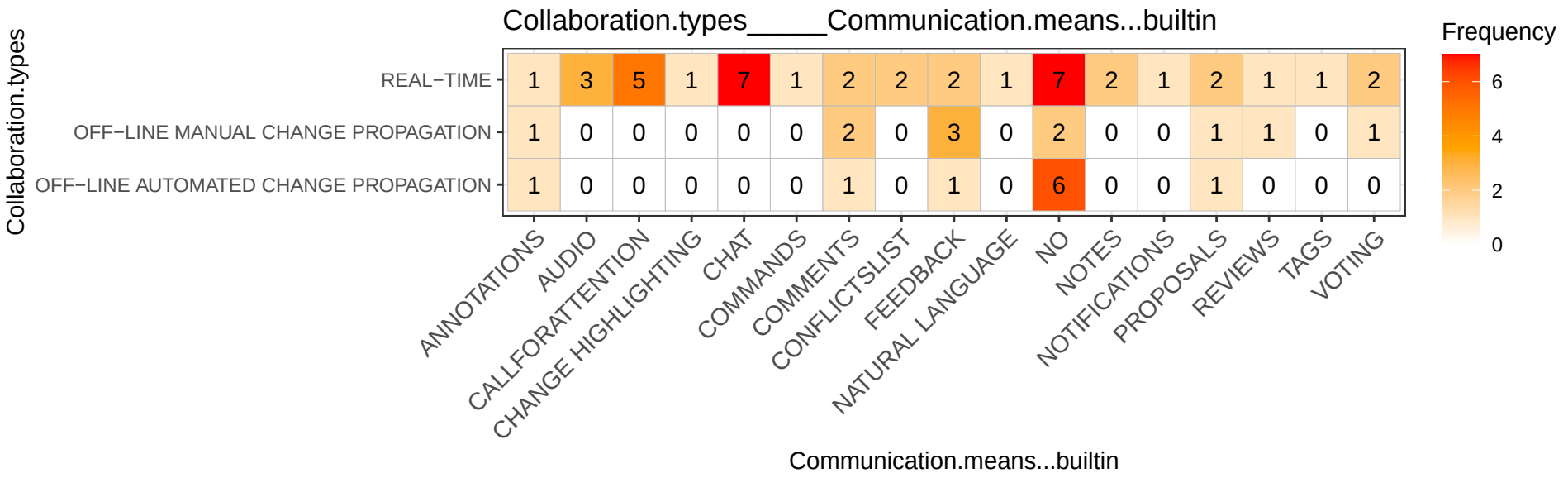

Collaboration.types_____Conflict.awareness..User.
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
12
2
5
3
0
1
5
0
3
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
12
9
6
3
0

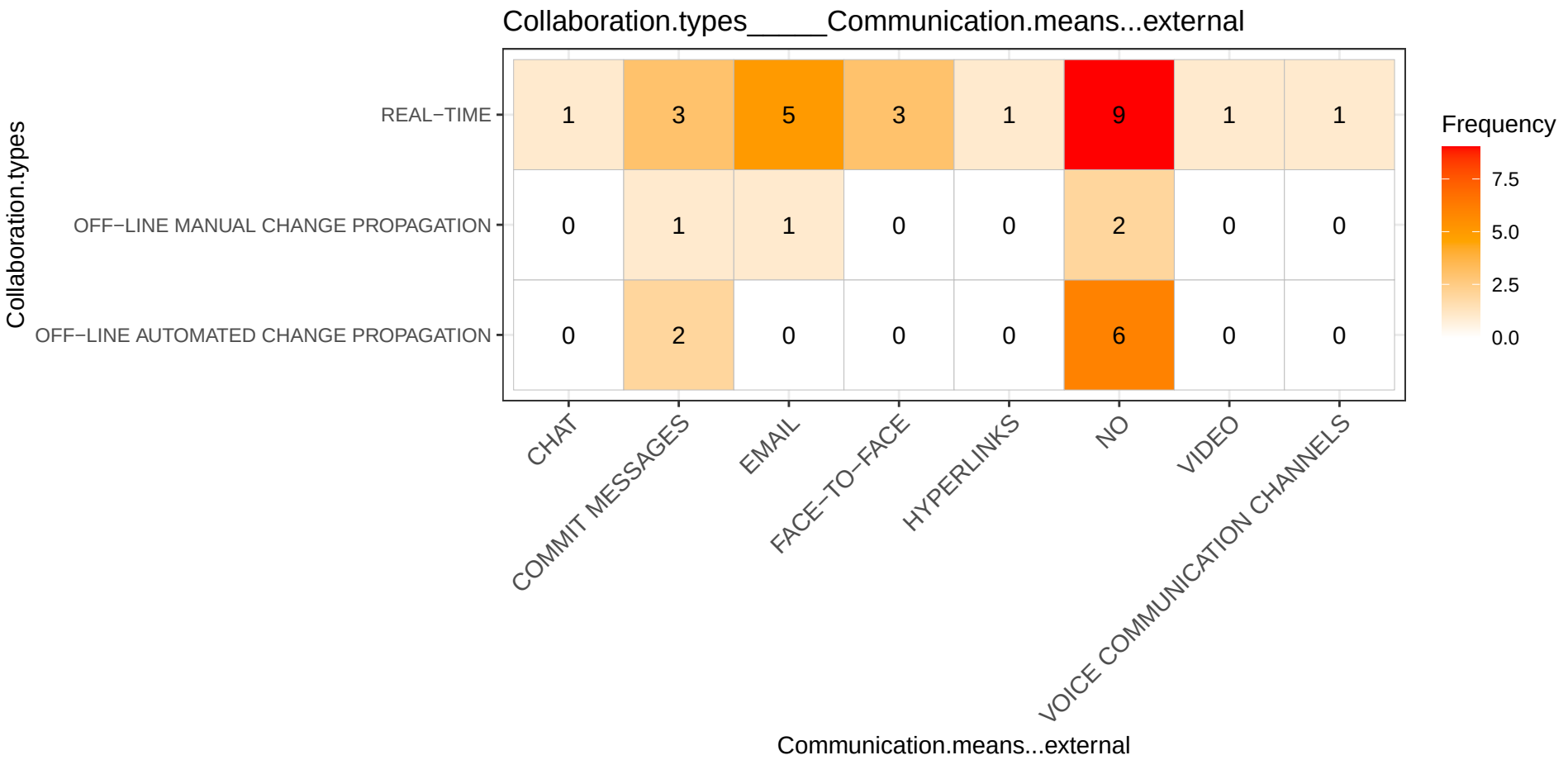

Collaboration.types_____Conflict.resolution.support
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
4
6
9
1
1
2
3
3
3
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

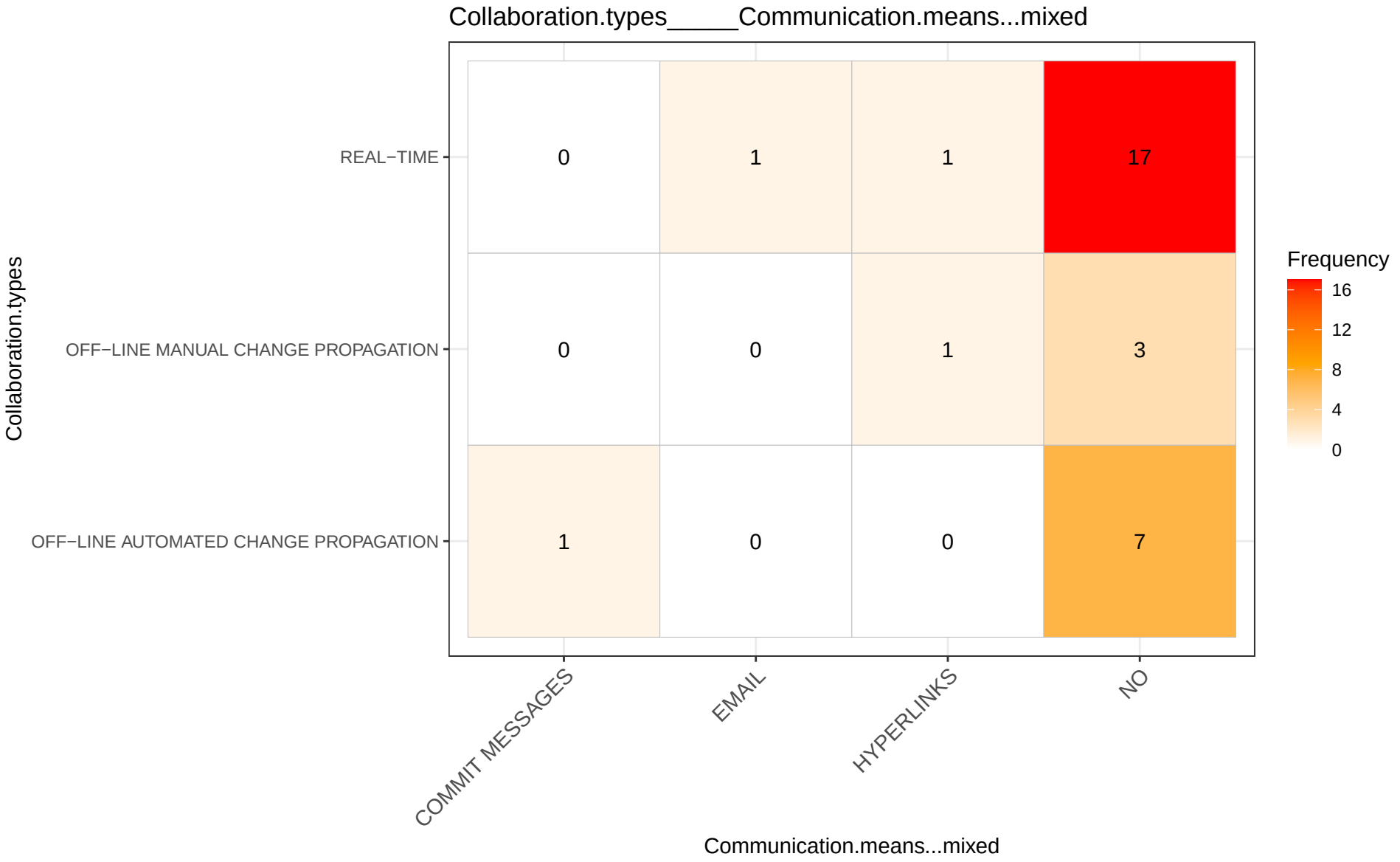

Collaboration.types_____Shared.workspace
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
17
2
4
0
7
1
Collaboration.types
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

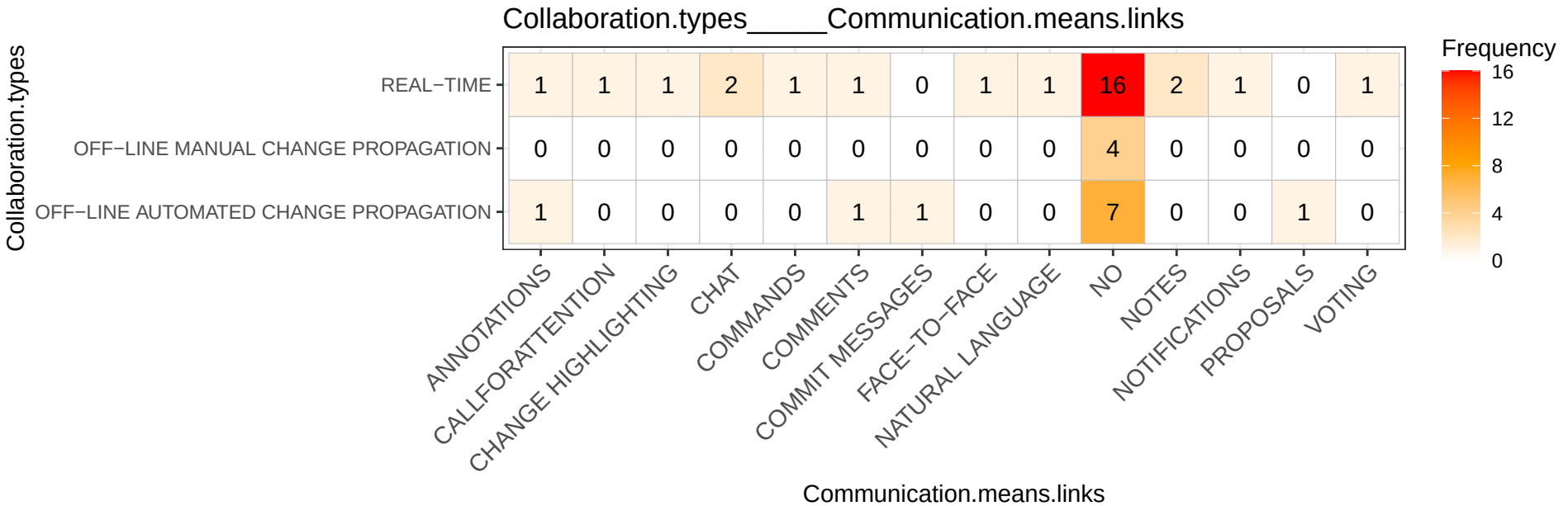

Collaboration.types_____Network.architecture
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
3
12
3
2
2
2
0
0
2
6
0
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
12
9
6
3
0

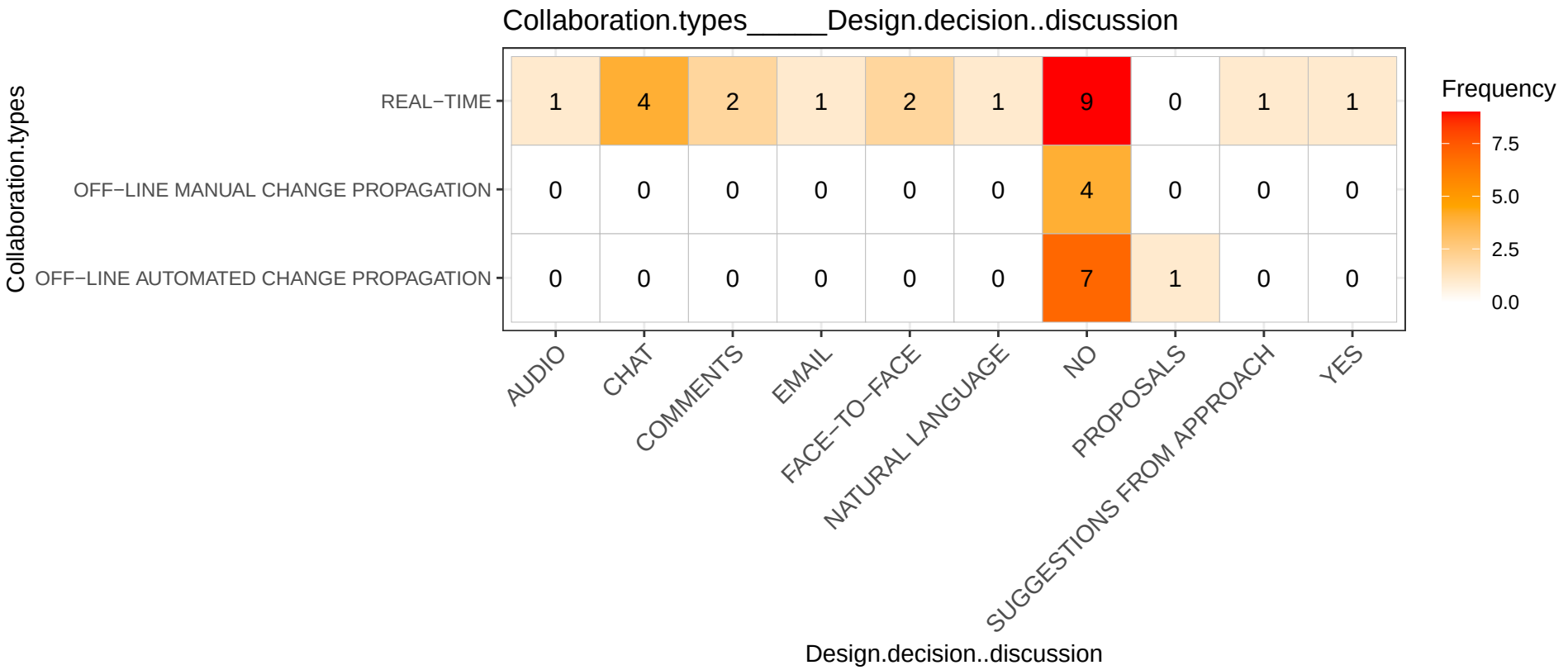

Collaboration.types_____Communication.type
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
11
19
4
4
8
8
Collaboration.types
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

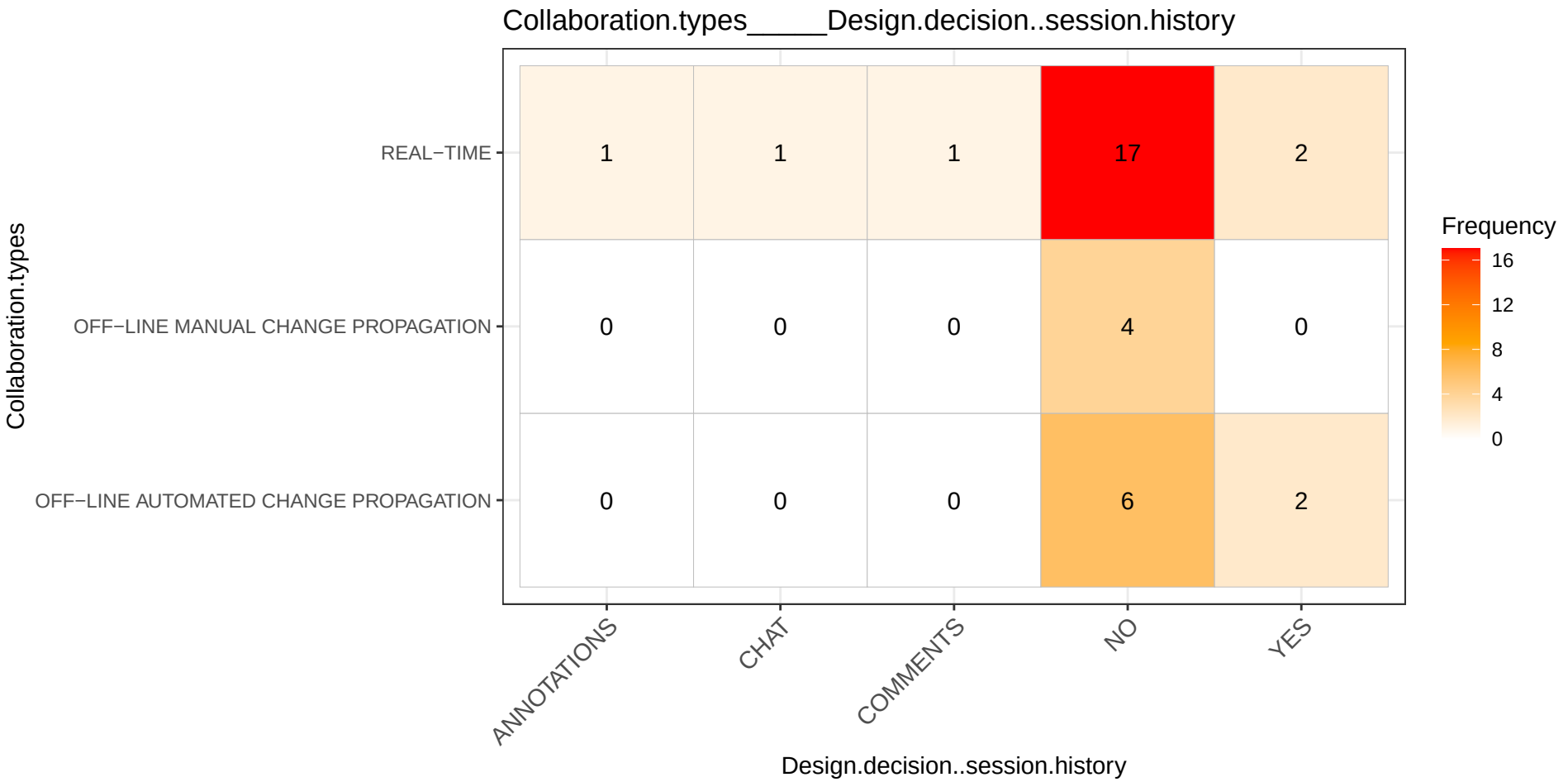

Collaboration.types_____Communication.means...builtin
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
1 3 5 1 7 1 2 2 2 1 7 2 1 2 1 1 2
1 0 0 0 0 0 2 0 3 0 2 0 0 1 1 0 1
1 0 0 0 0 0 1 0 1 0 6 0 0 1 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
4
2
0

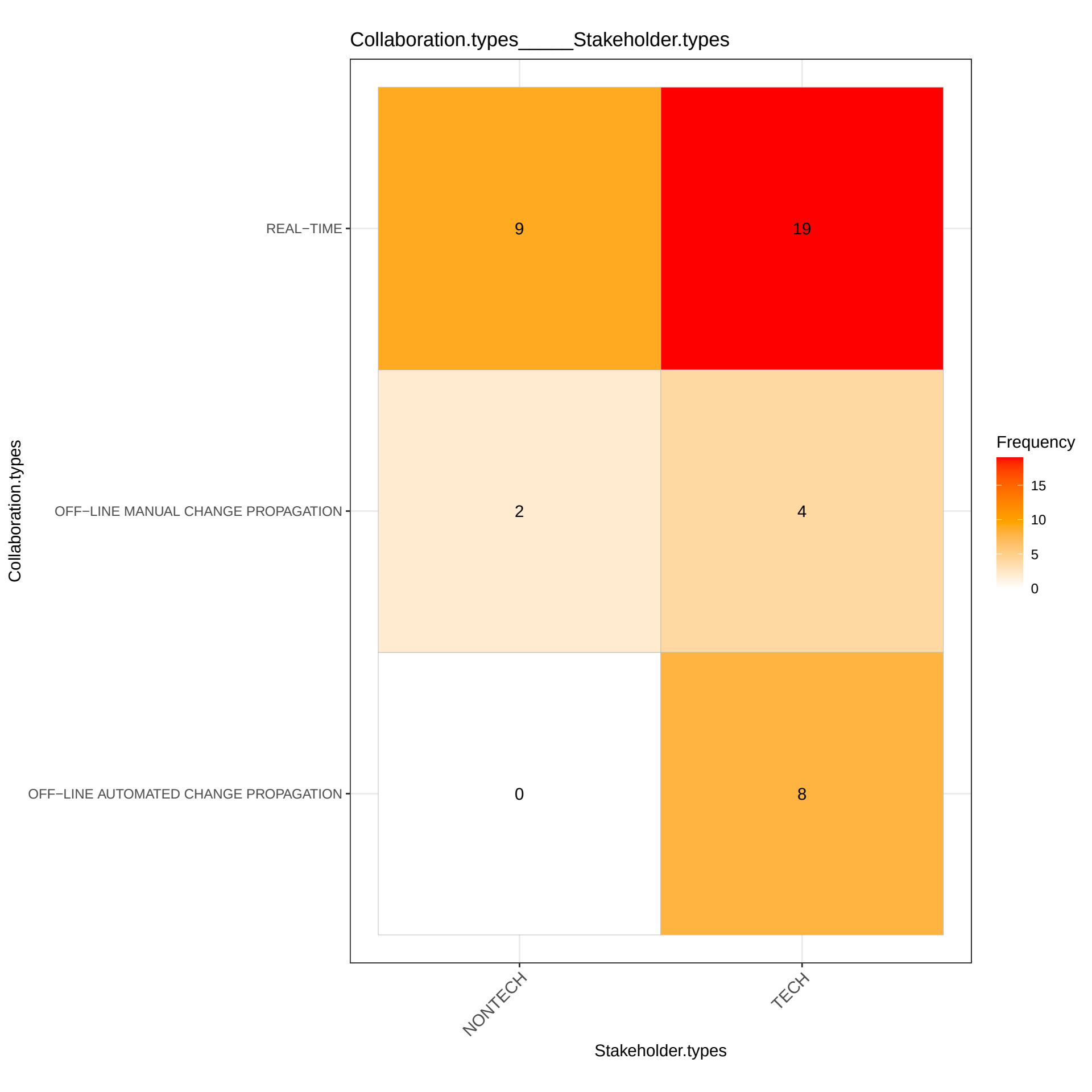

Collaboration.types_____Communication.means...external
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
1 3 5 3 1 9 1 1
0 1 1 0 0 2 0 0
0 2 0 0 0 6 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
7.5
5.0
2.5
0.0

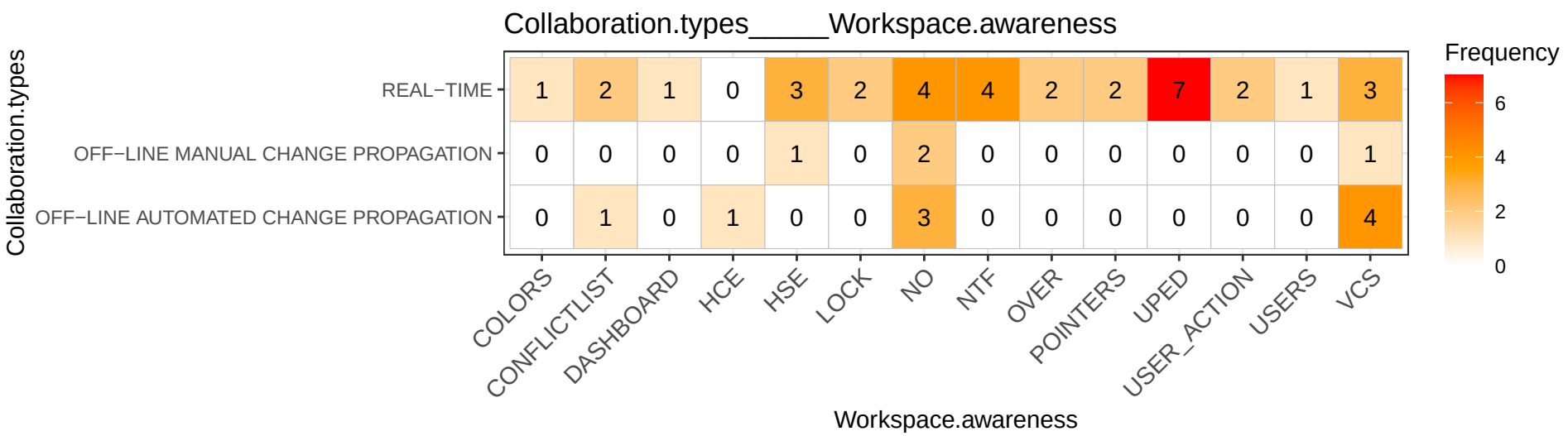

Collaboration.types_____Communication.means...mixed
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
0
1
1
17
0
0
1
3
1
0
0
7
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
16
12
8
4
0

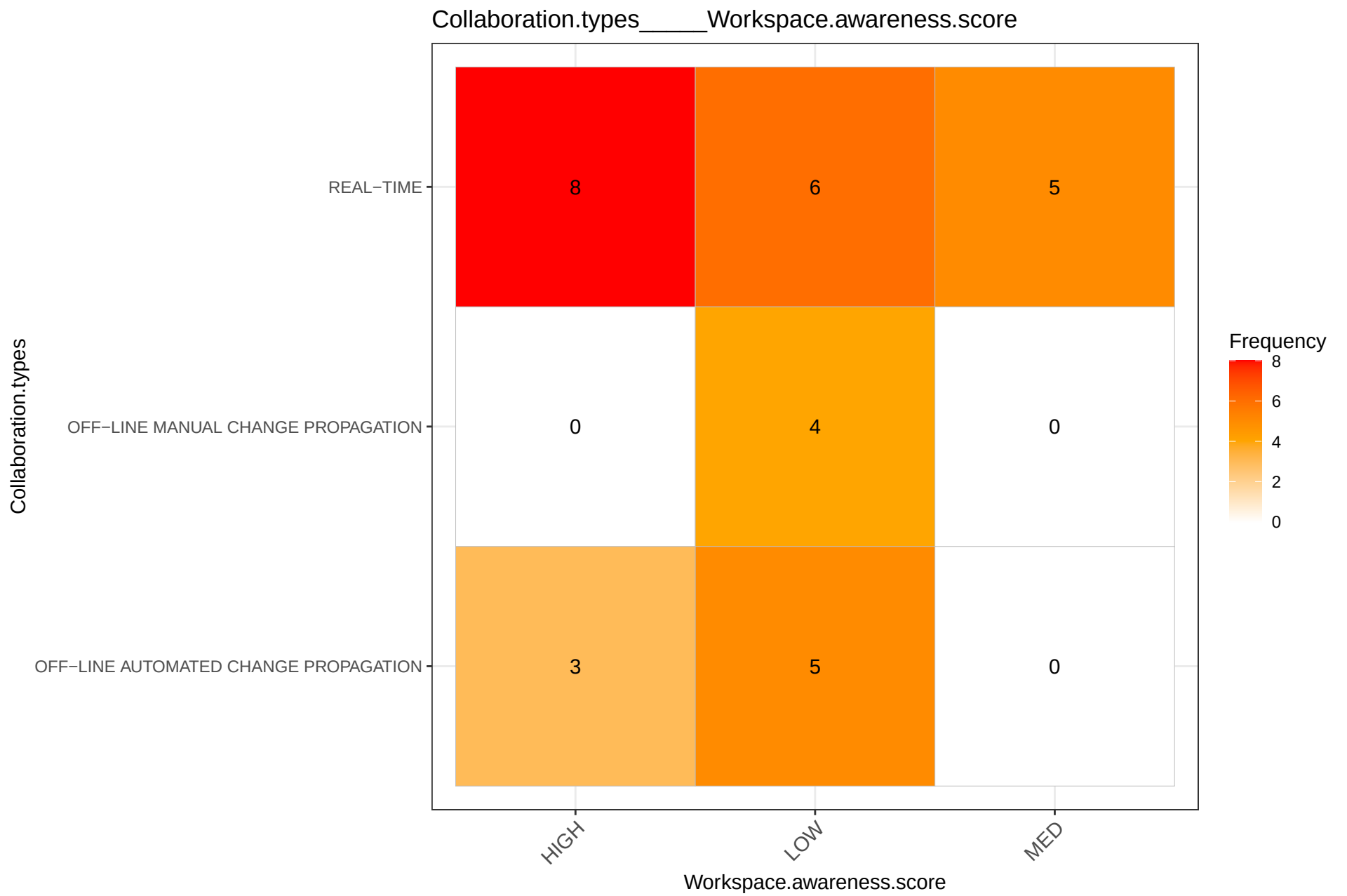

Collaboration.types_____Communication.means.links
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
1 1 1 2 1 1 0 1 1 16 2 1 0 1
0 0 0 0 0 0 0 0 0 4 0 0 0 0
1 0 0 0 0 1 1 0 0 7 0 0 1 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0

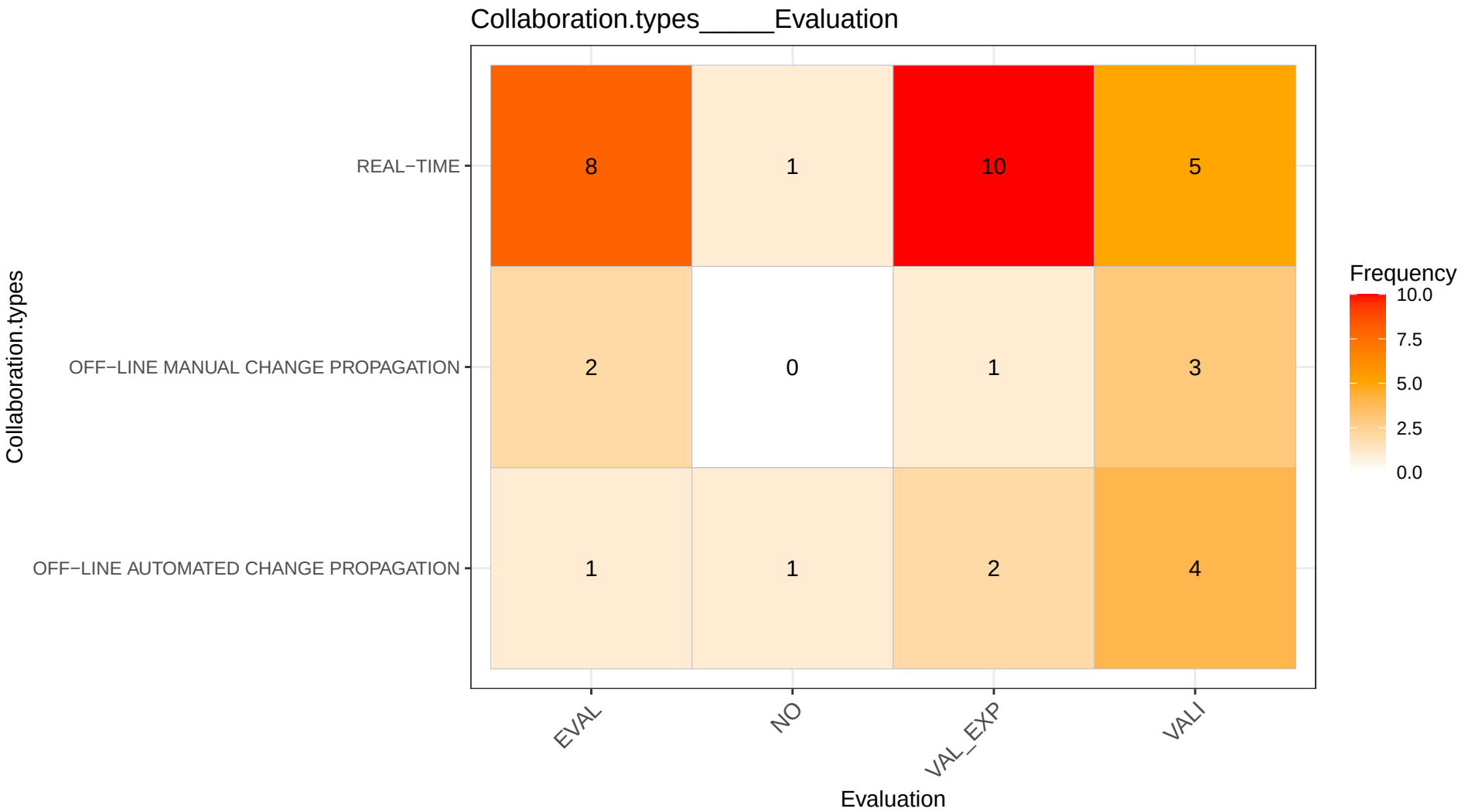

Collaboration.types_____Design.decision..discussion
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
1 4 2 1 2 1 9 0 1 1
0 0 0 0 0 0 4 0 0 0
0 0 0 0 0 0 7 1 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
7.5
5.0
2.5
0.0

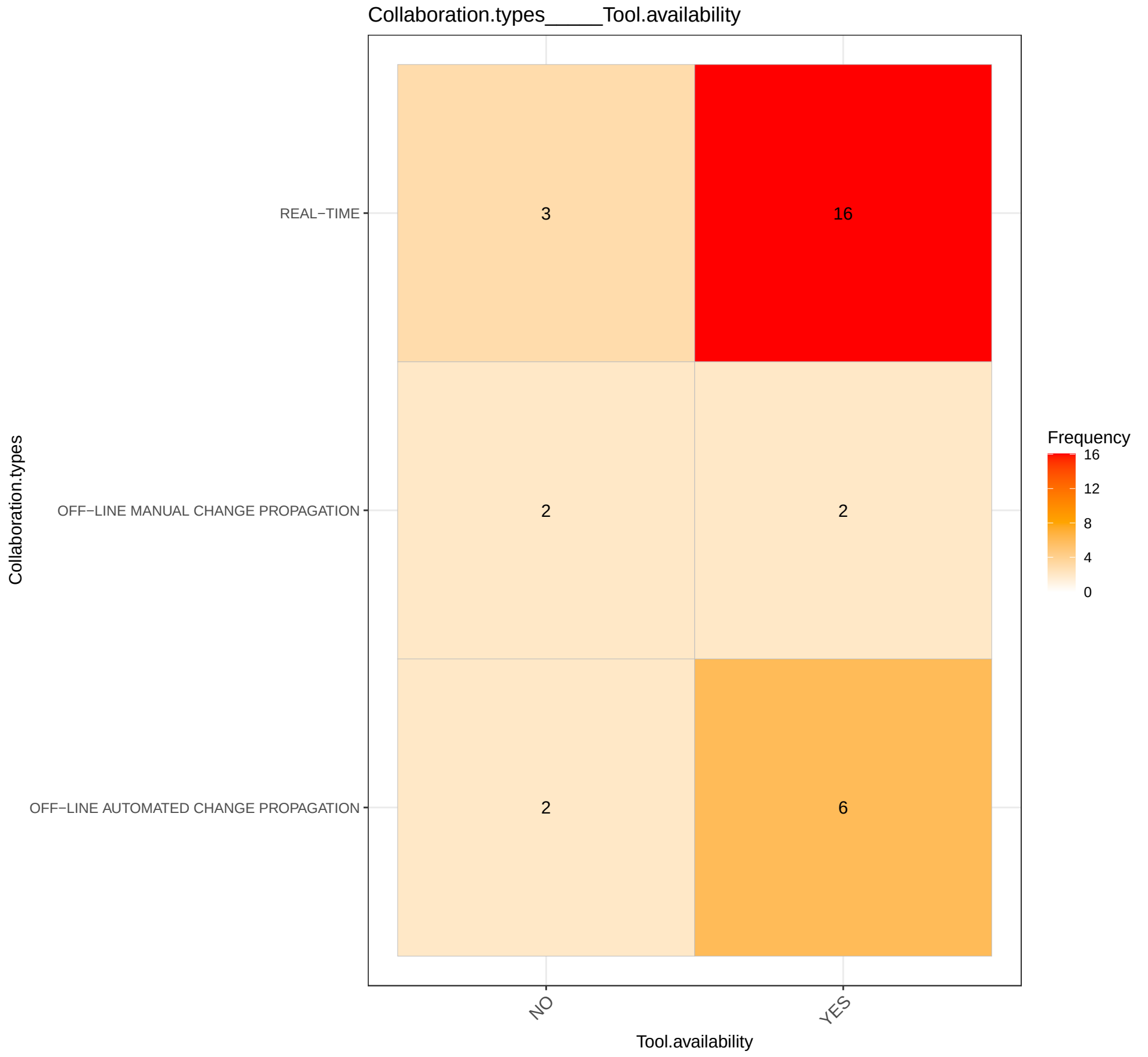

Collaboration.types_____Design.decision..session.history
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
1
1
1
17
2
0
0
0
4
0
0
0
0
6
2
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

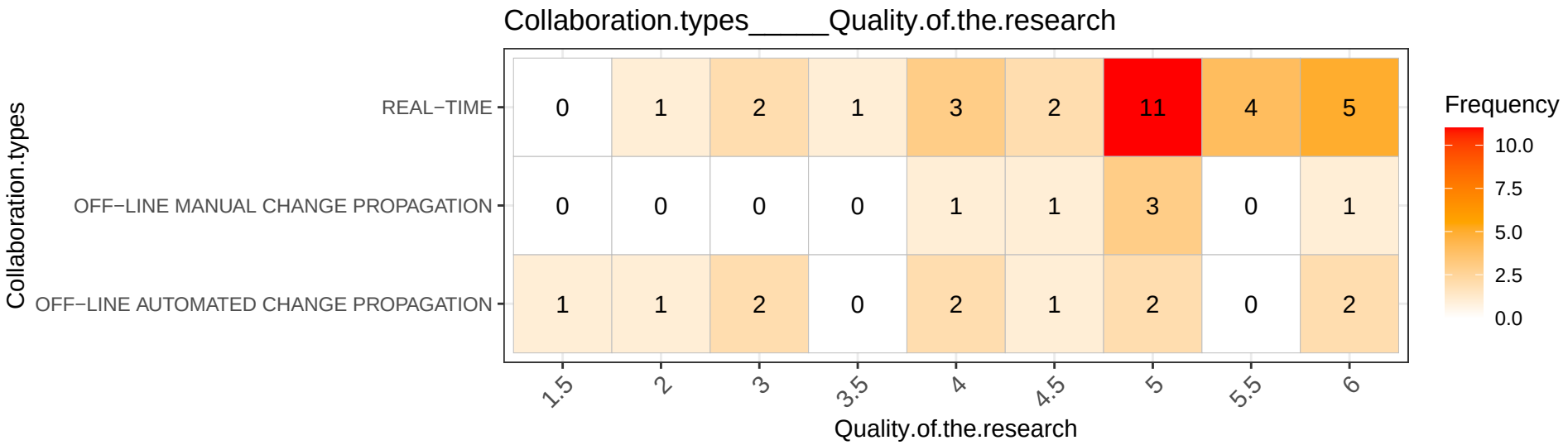

Collaboration.types_____Stakeholder.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
9
19
2
4
0
8
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

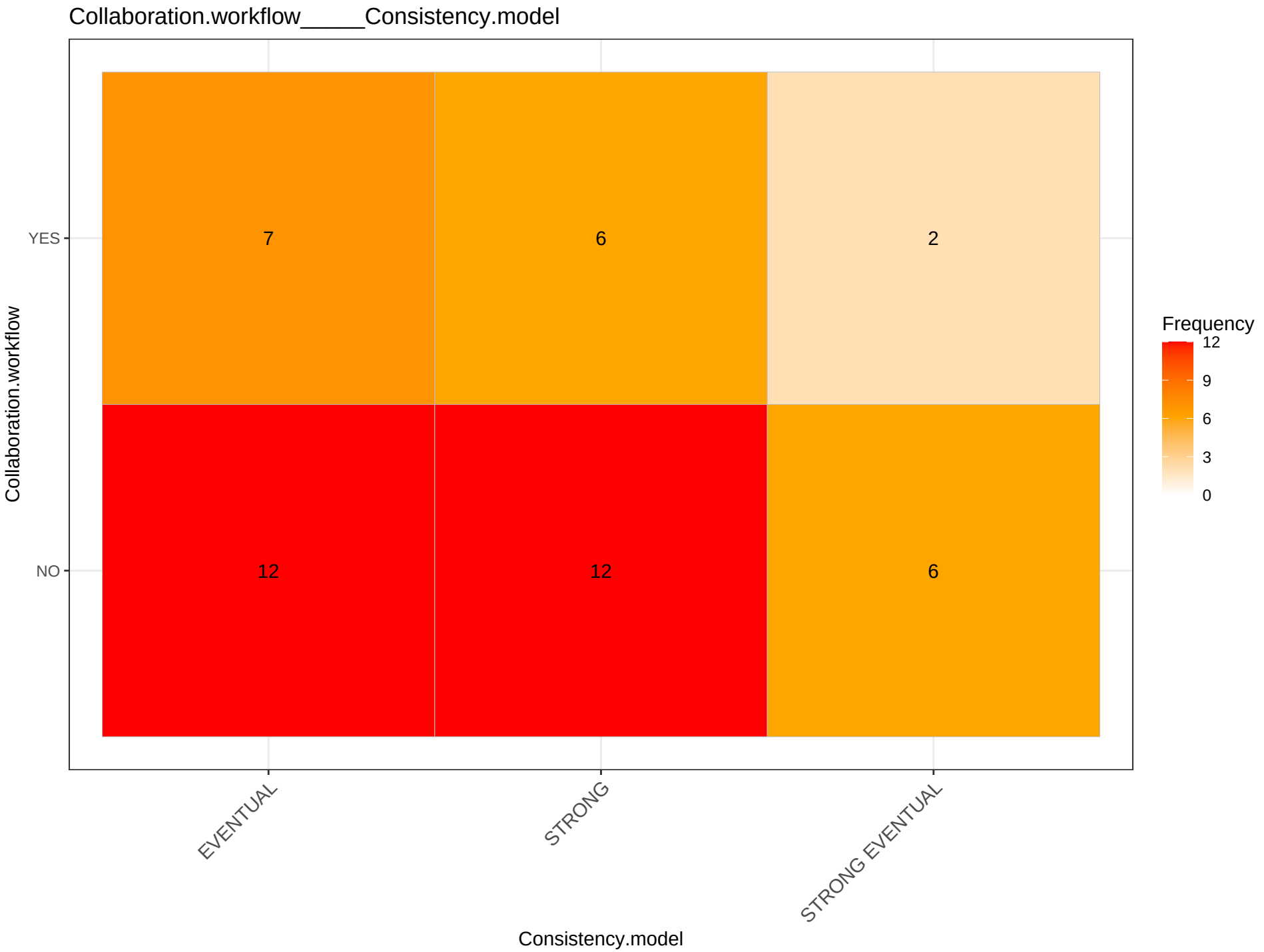

Collaboration.types_____Workspace.awareness
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
1 2 1 0 3 2 4 4 2 2 7 2 1 3
0 0 0 0 1 0 2 0 0 0 0 0 0 1
0 1 0 1 0 0 3 0 0 0 0 0 0 4
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0

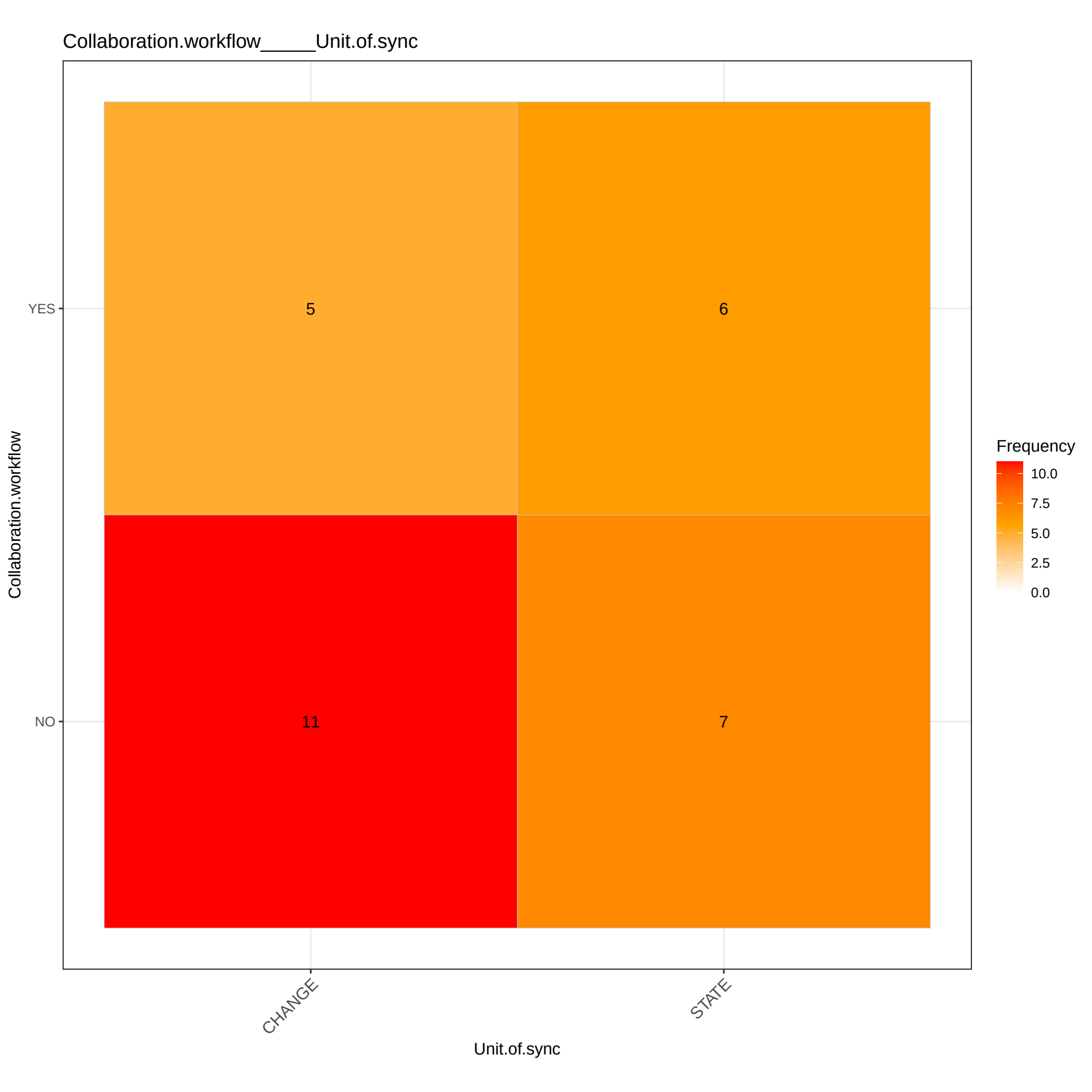

Collaboration.types_____Workspace.awareness.score
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
8
6
5
0
4
0
3
5
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0

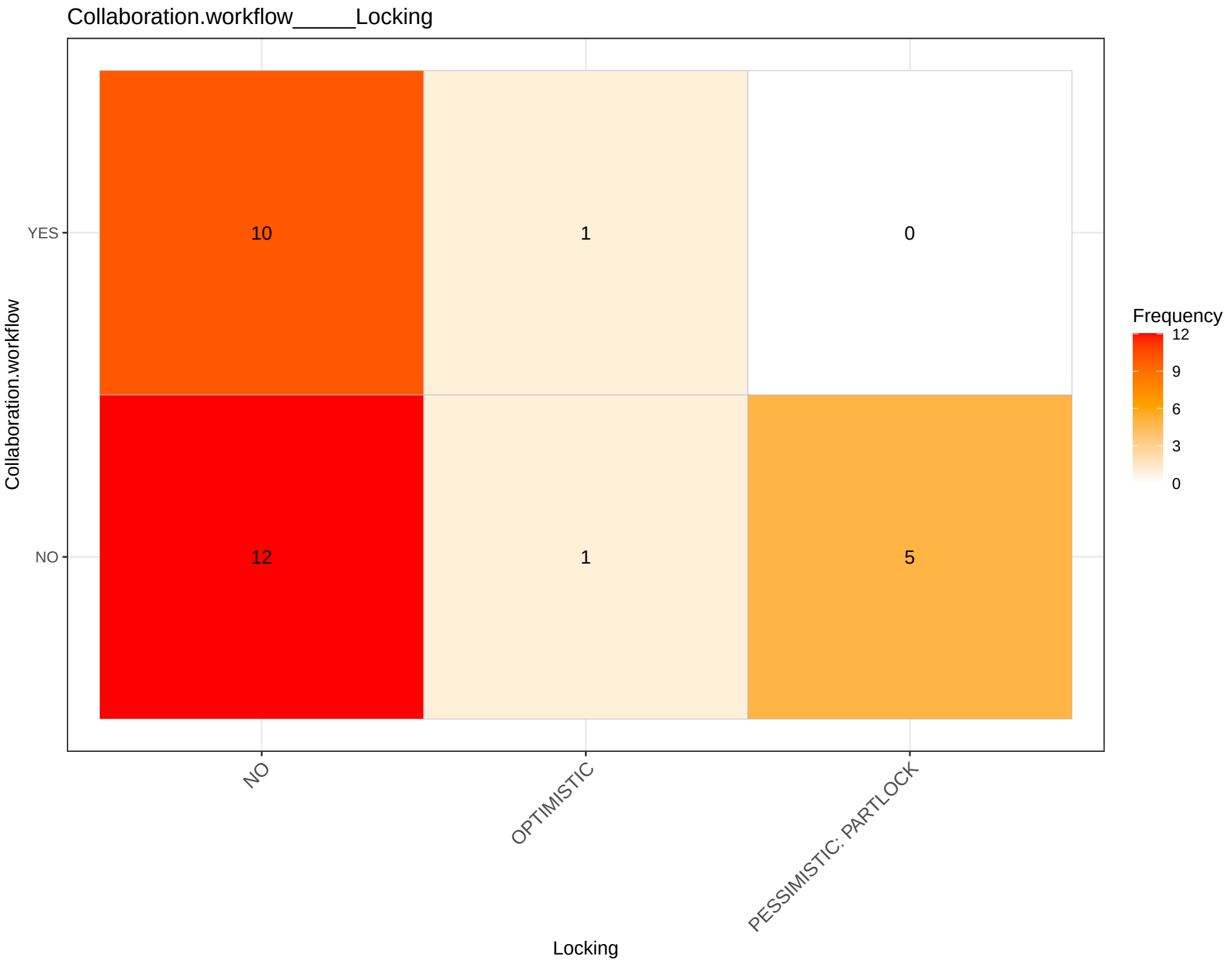

Collaboration.types_____Evaluation
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
8
1
10
5
2
0
1
3
1
1
2
4
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0

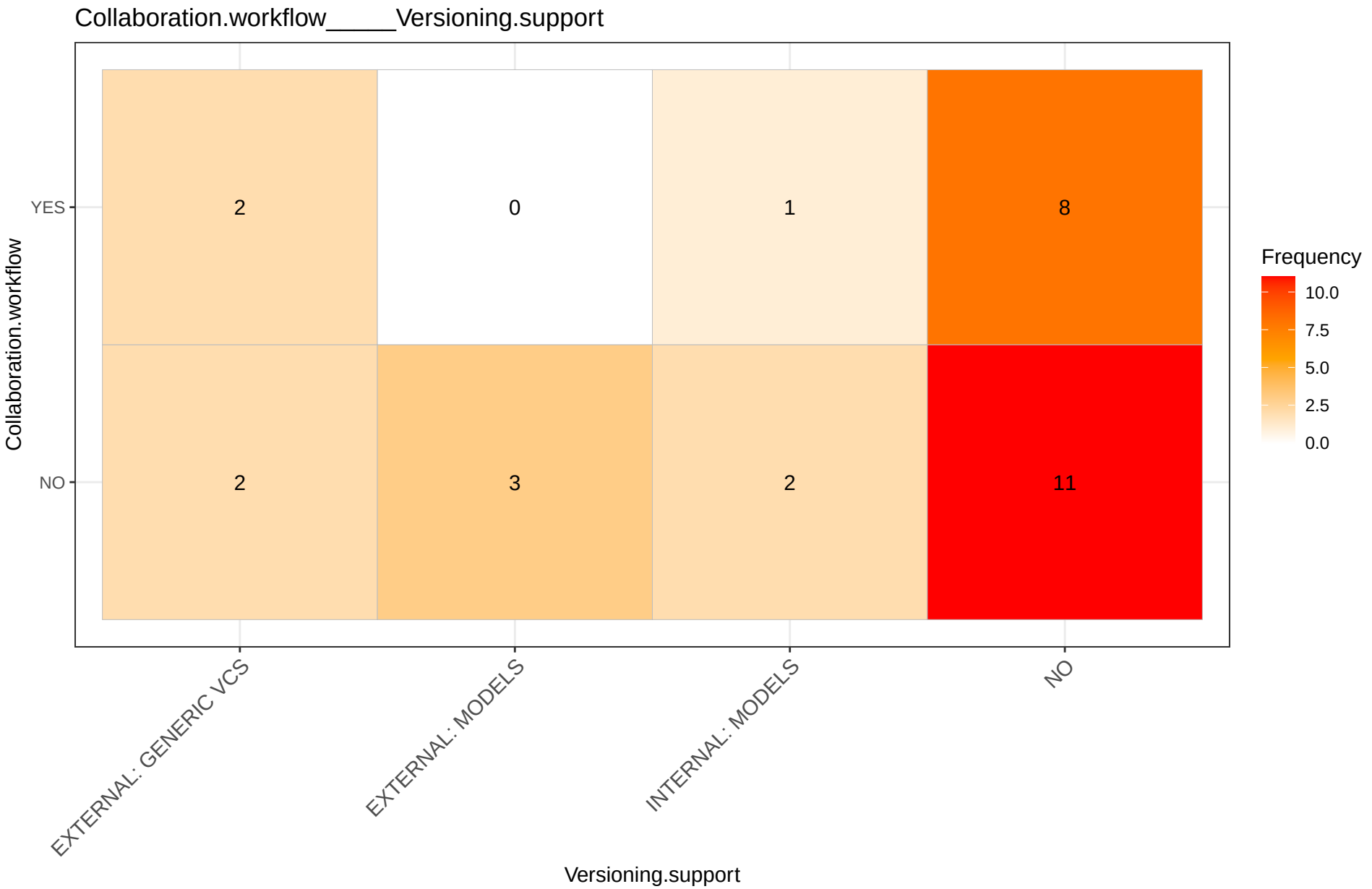

Collaboration.types_____Tool.availability
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
Collaboration.types
3
16
2
2
2
6
NO
YES
Tool.availability
Frequency
16
12
8
4
0

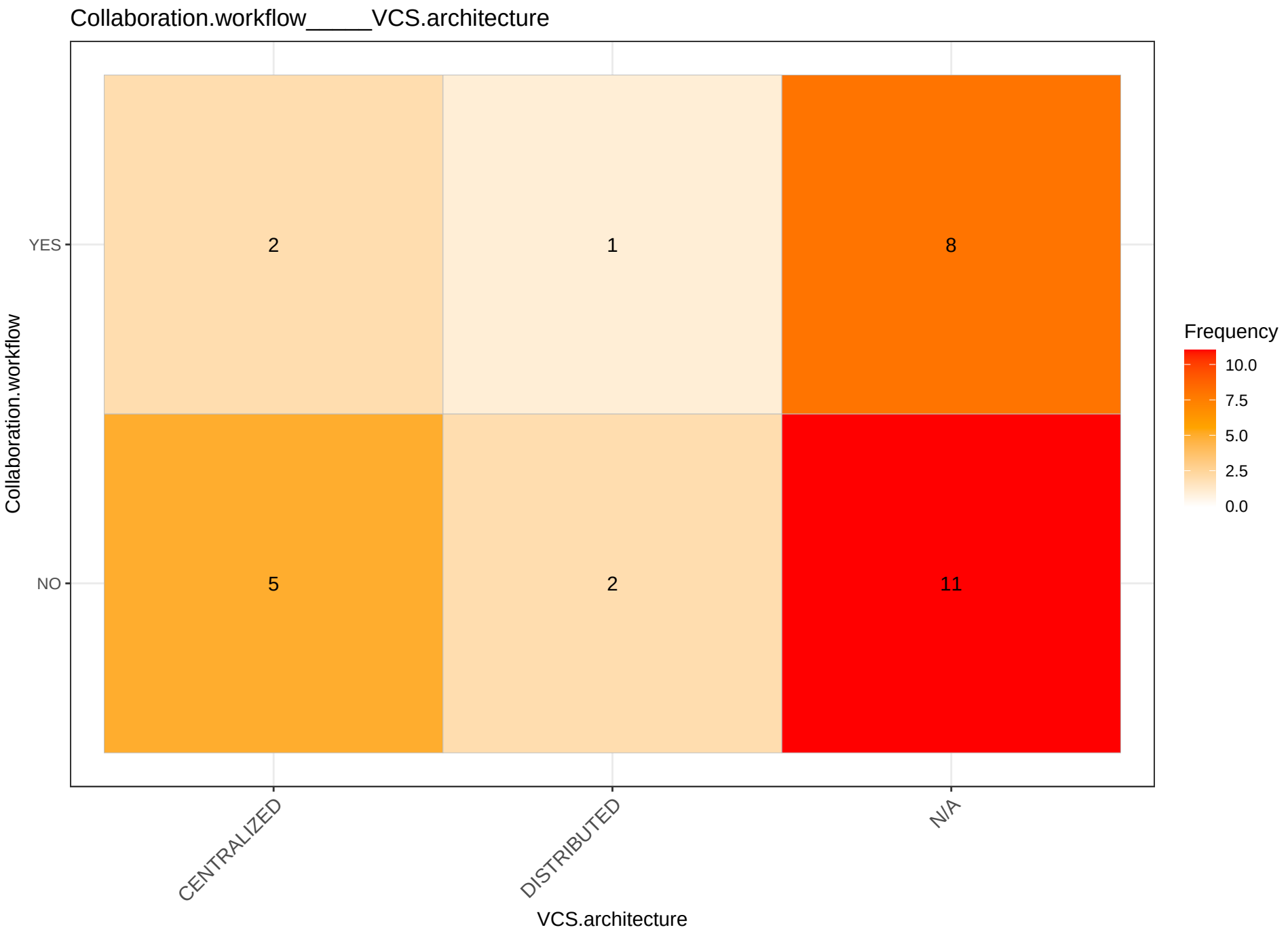

Collaboration.types_____Quality.of.the.research
Collaboration.types
REAL−TIME
OFF−LINE MANUAL CHANGE PROPAGATION
OFF−LINE AUTOMATED CHANGE PROPAGATION
0 1 2 1 3 2 11 4 5
0 0 0 0 1 1 3 0 1
1 1 2 0 2 1 2 0 2
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

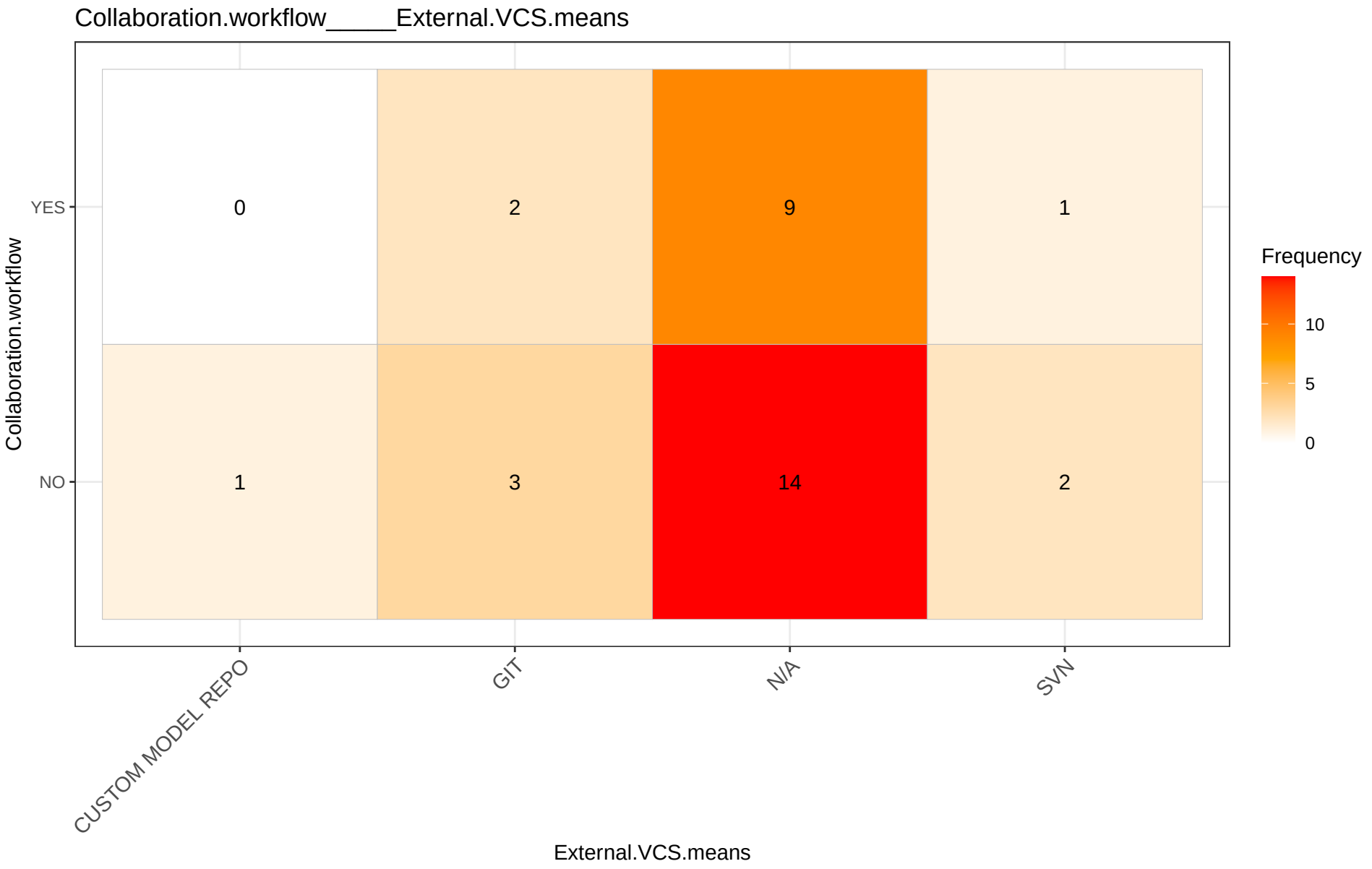

Collaboration.workflow_____Consistency.model
YES
NO
7
6
2
12
12
6
Collaboration.workflow
EVENTUAL
STRONG
STRONG EVENTUAL
Consistency.model
Frequency
12
9
6
3
0

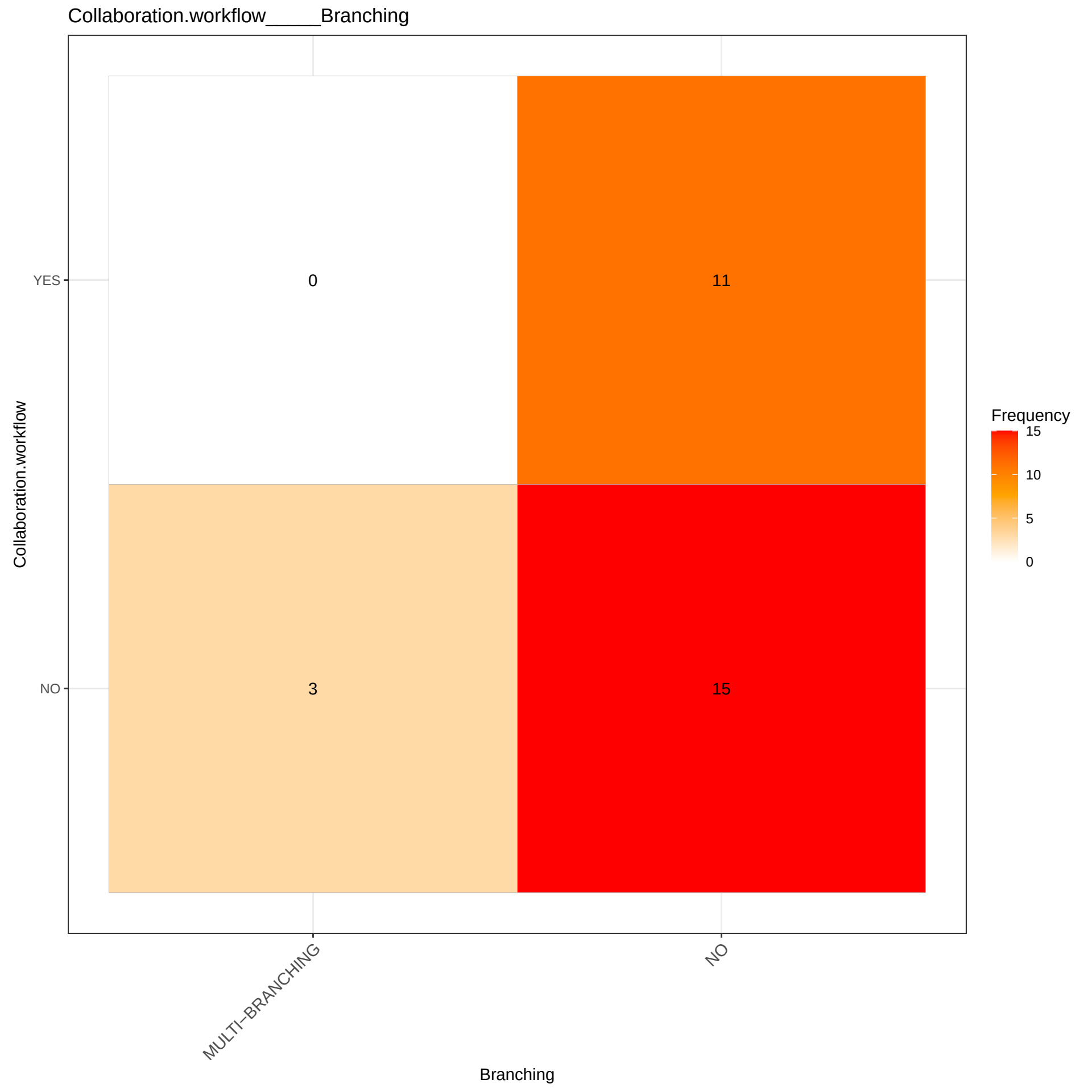

Collaboration.workflow_____Unit.of.sync
YES
NO
5
6
11
7
Collaboration.workflow
CHANGE
STATE
Unit.of.sync
Frequency
10.0
7.5
5.0
2.5
0.0

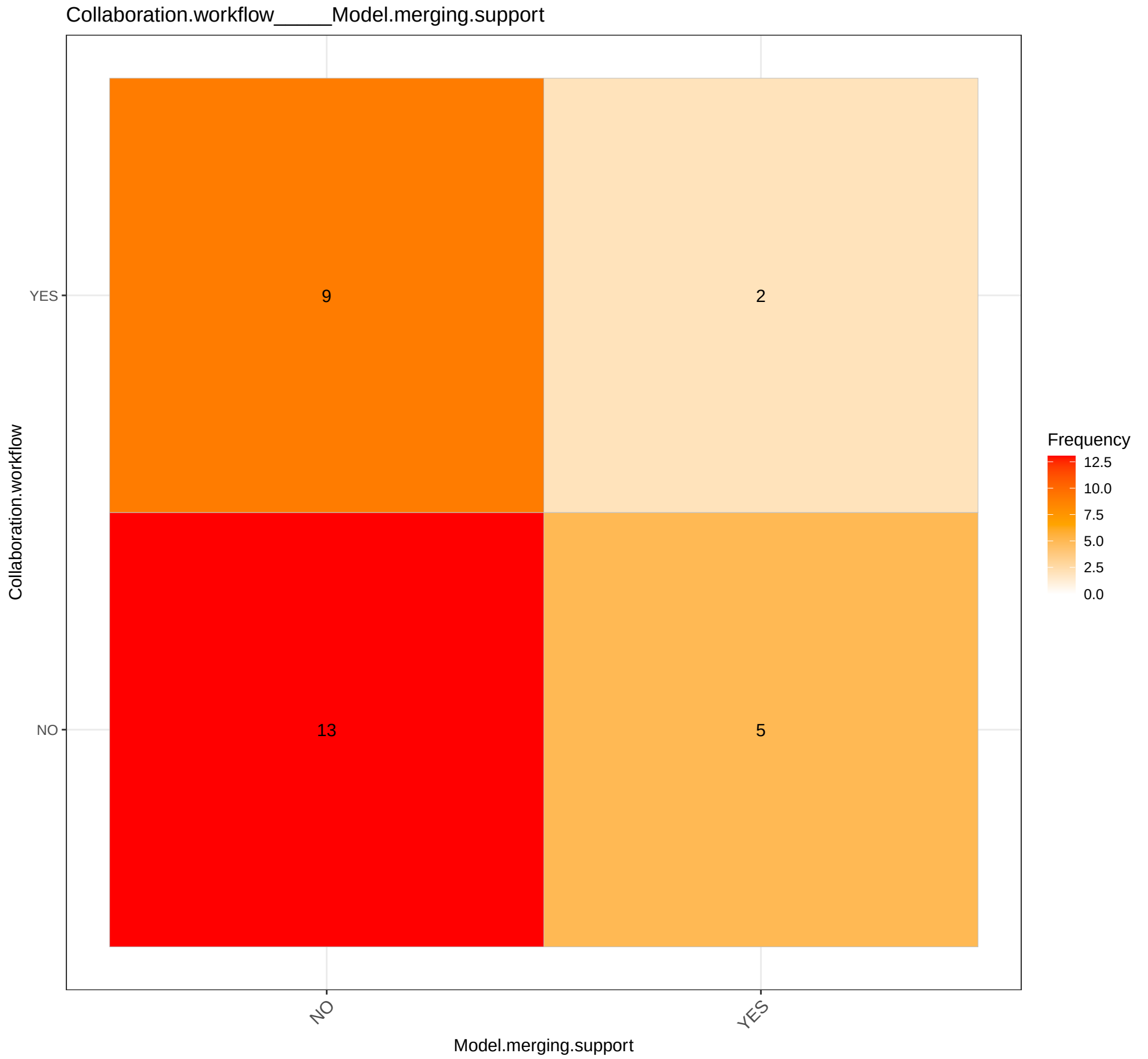

Collaboration.workflow_____Locking
YES
NO
10
1
0
12
1
5
Collaboration.workflow
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
12
9
6
3
0

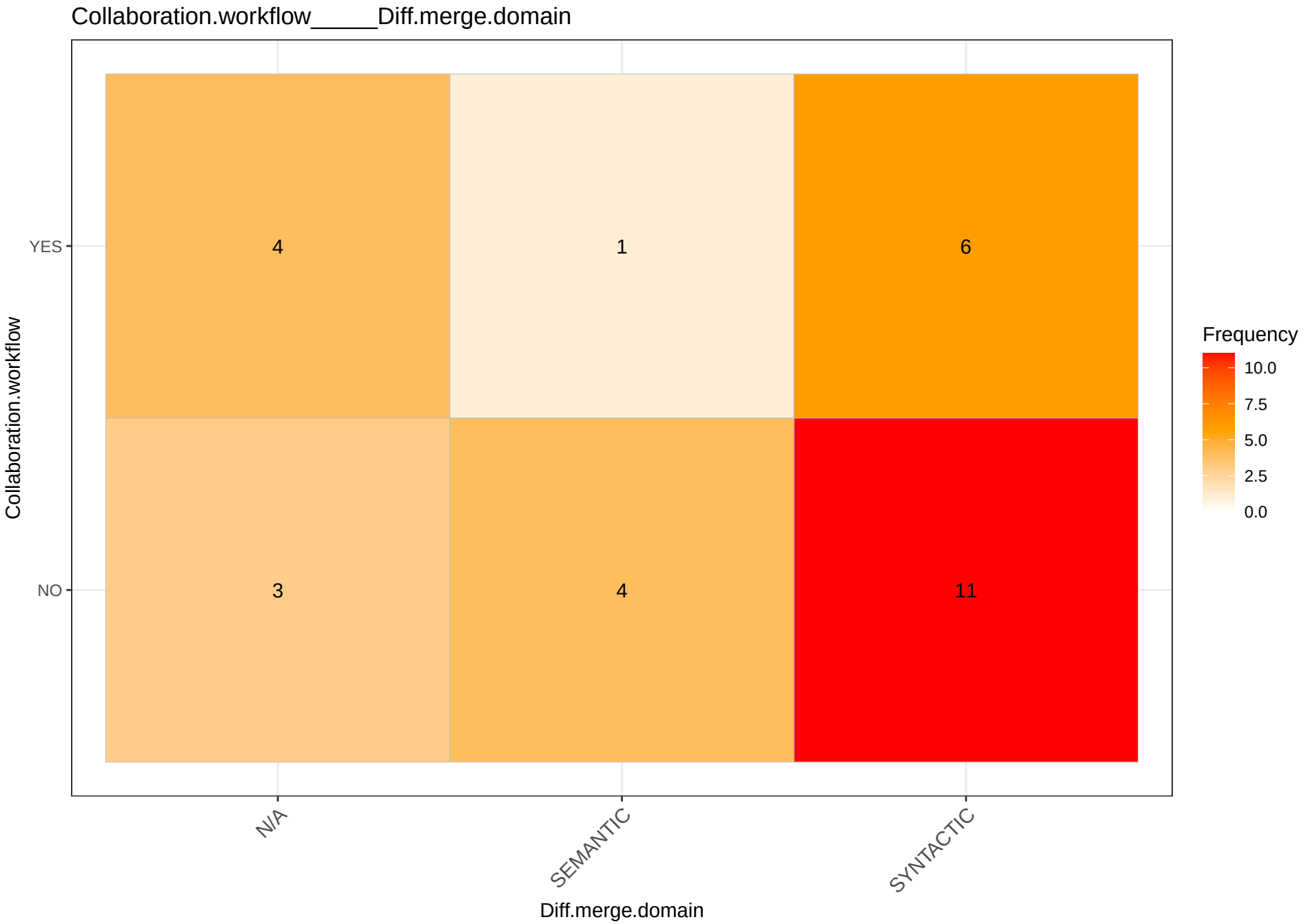

Collaboration.workflow_____Versioning.support
Collaboration.workflow
YES
NO
2
0
1
8
2
3
2
11
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
10.0
7.5
5.0
2.5
0.0

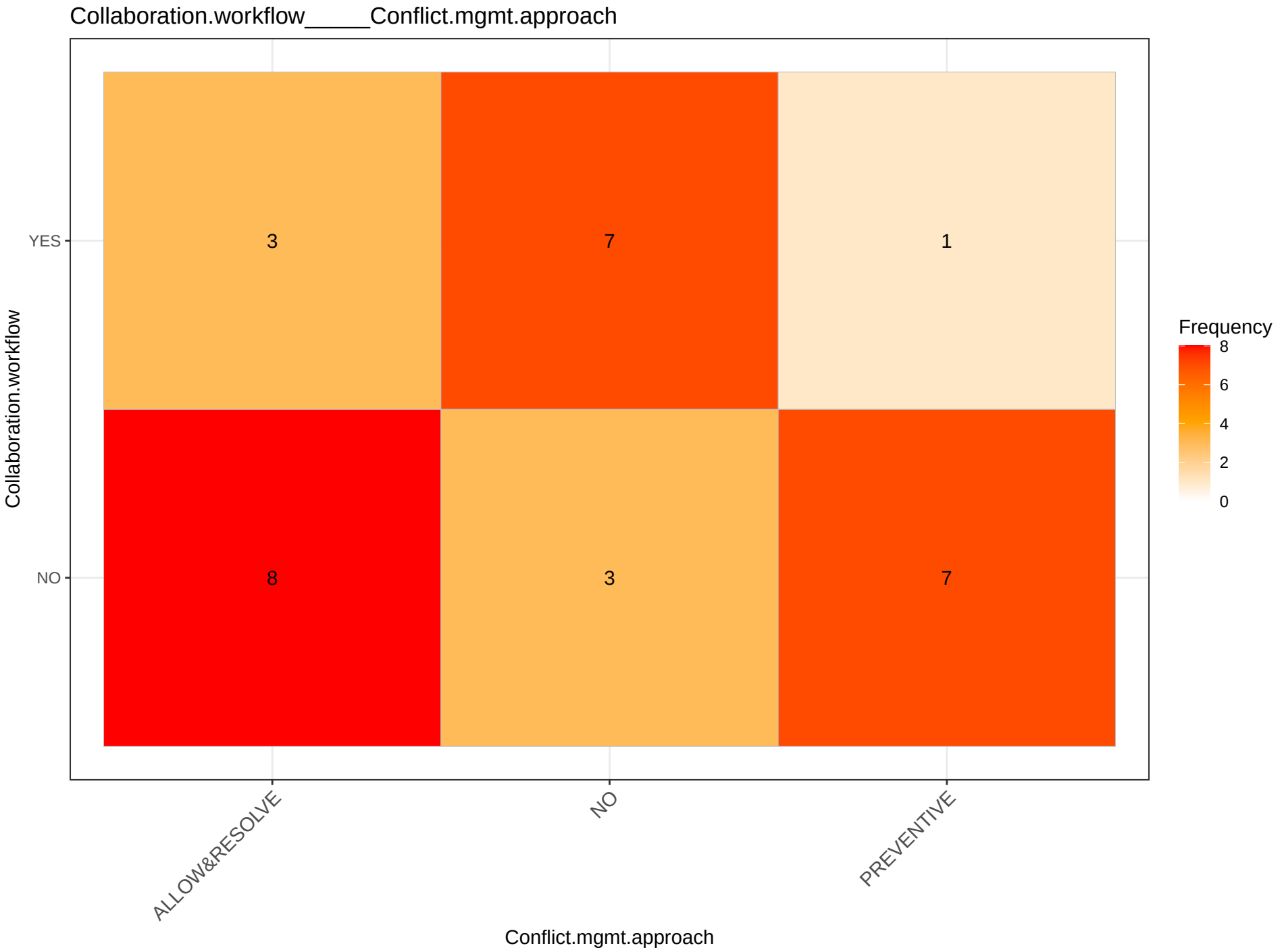

Collaboration.workflow_____VCS.architecture
YES
NO
2
1
8
5
2
11
Collaboration.workflow
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

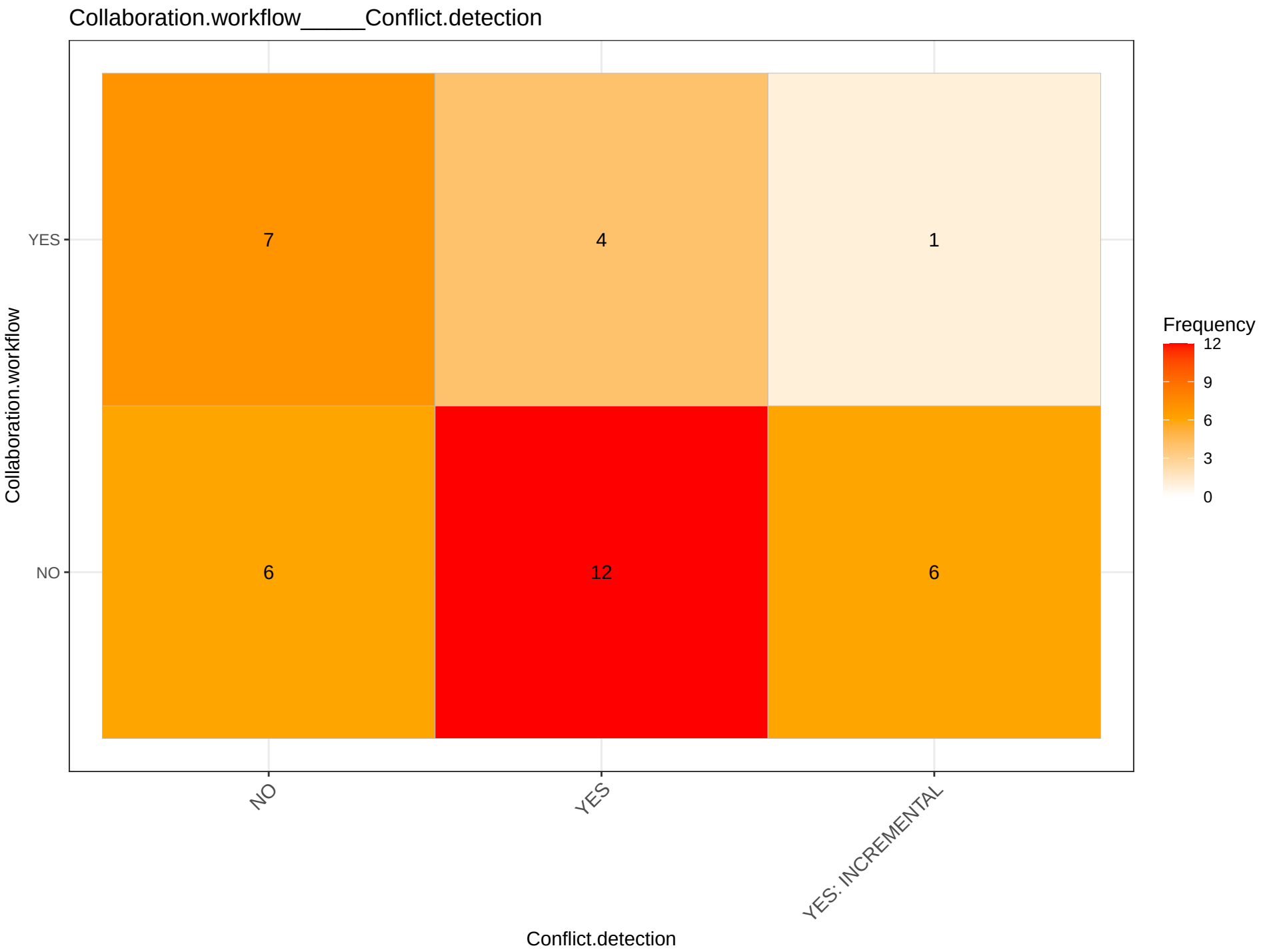

Collaboration.workflow_____External.VCS.means
YES
NO
0
2
9
1
1
3
14
2
Collaboration.workflow
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
10
5
0

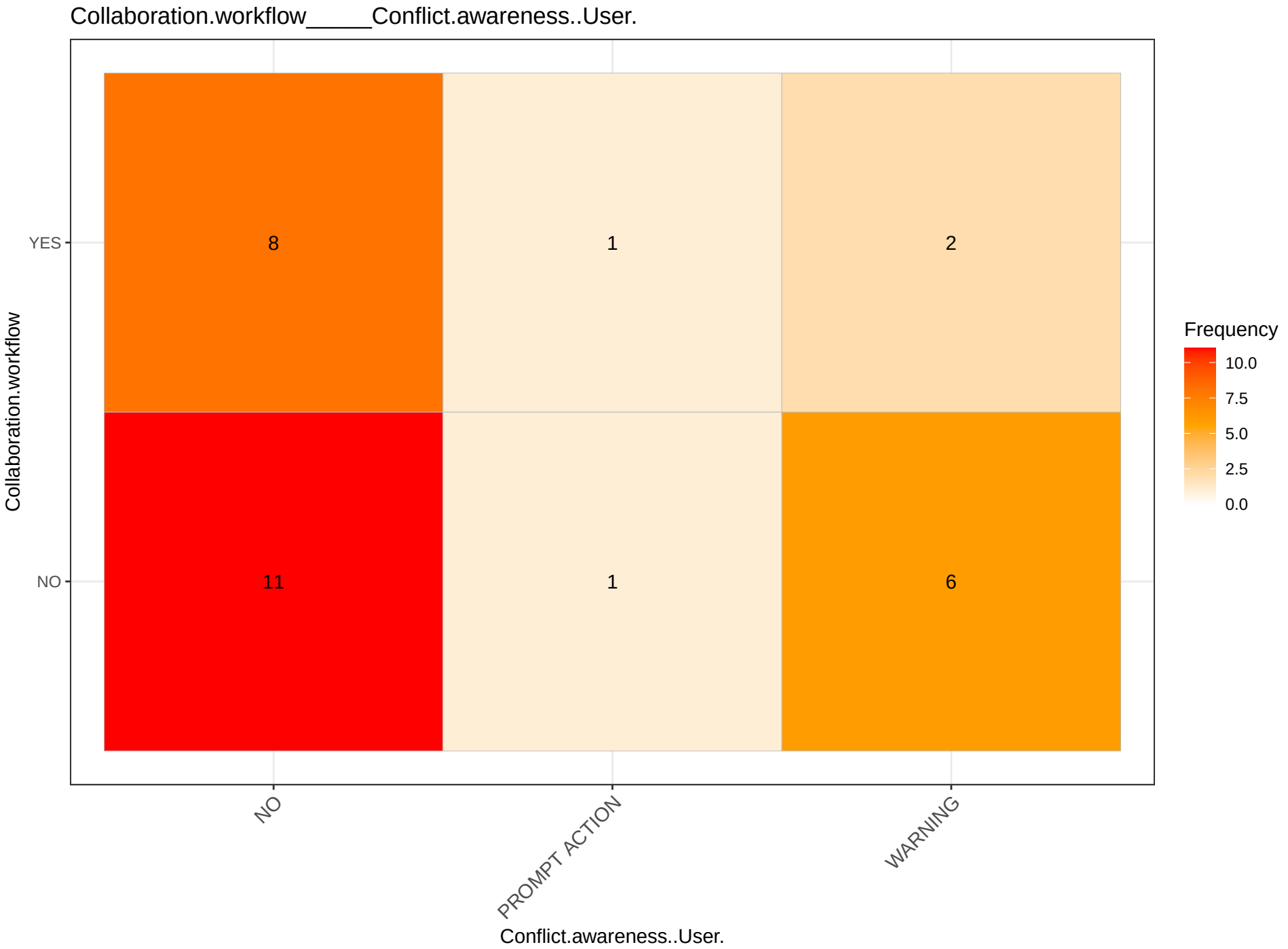

Collaboration.workflow_____Branching
YES
NO
0
11
3
15
Collaboration.workflow
MULTI−BRANCHING
NO
Branching
Frequency
15
10
5
0

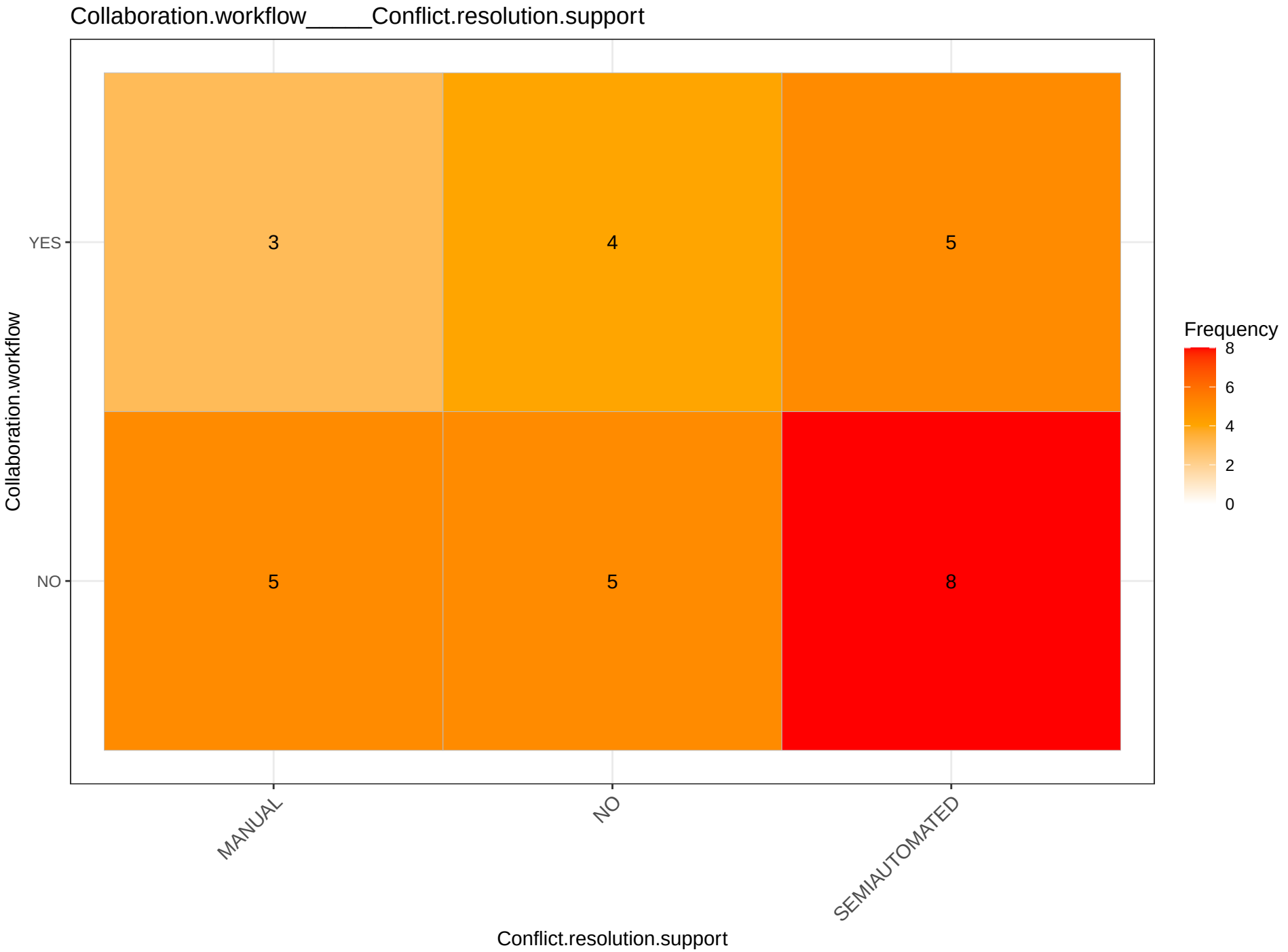

Collaboration.workflow_____Model.merging.support
YES
NO
9
2
13
5
Collaboration.workflow
NO
YES
Model.merging.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

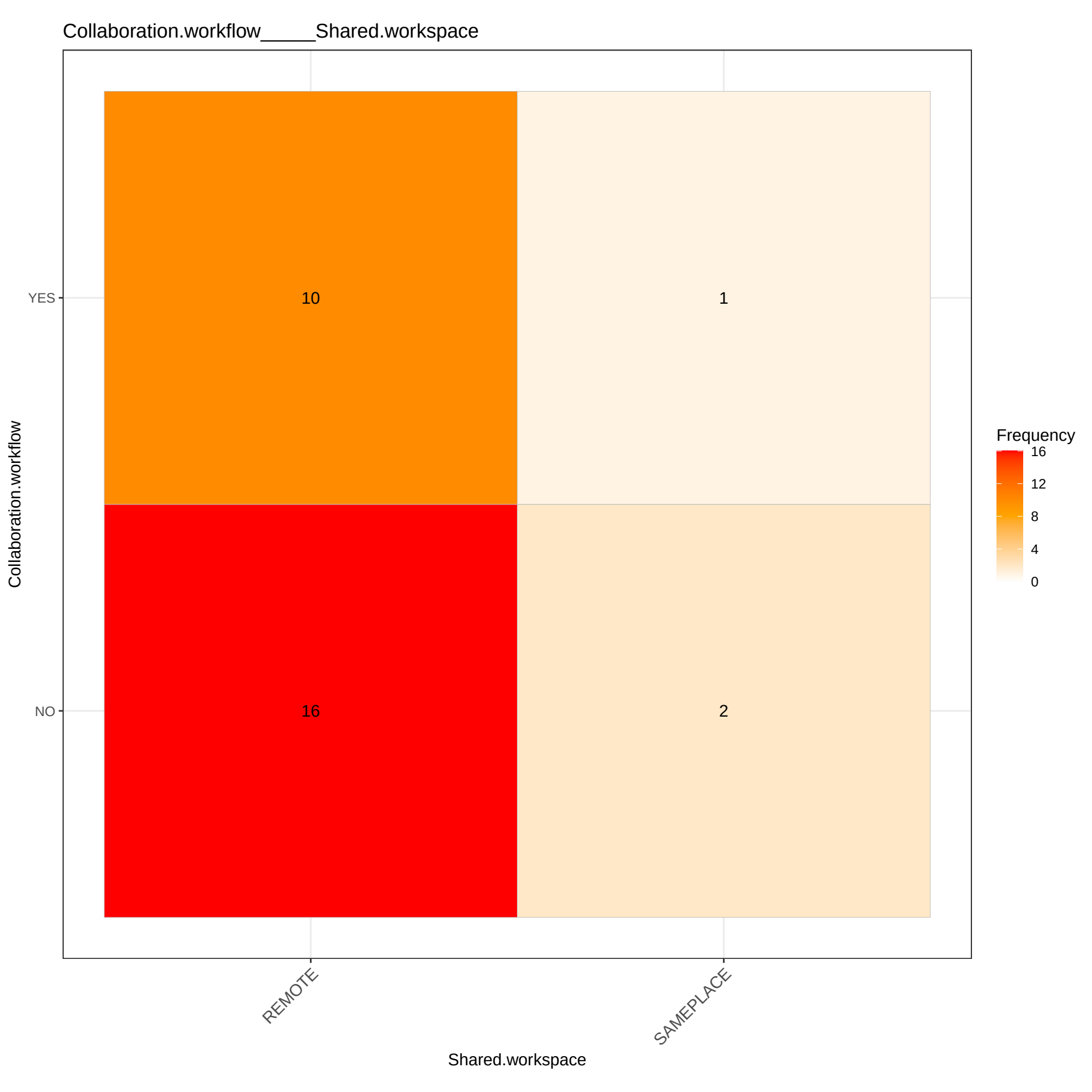

Collaboration.workflow_____Diff.merge.domain
YES
NO
4
1
6
3
4
11
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Collaboration.workflow
Frequency
10.0
7.5
5.0
2.5
0.0

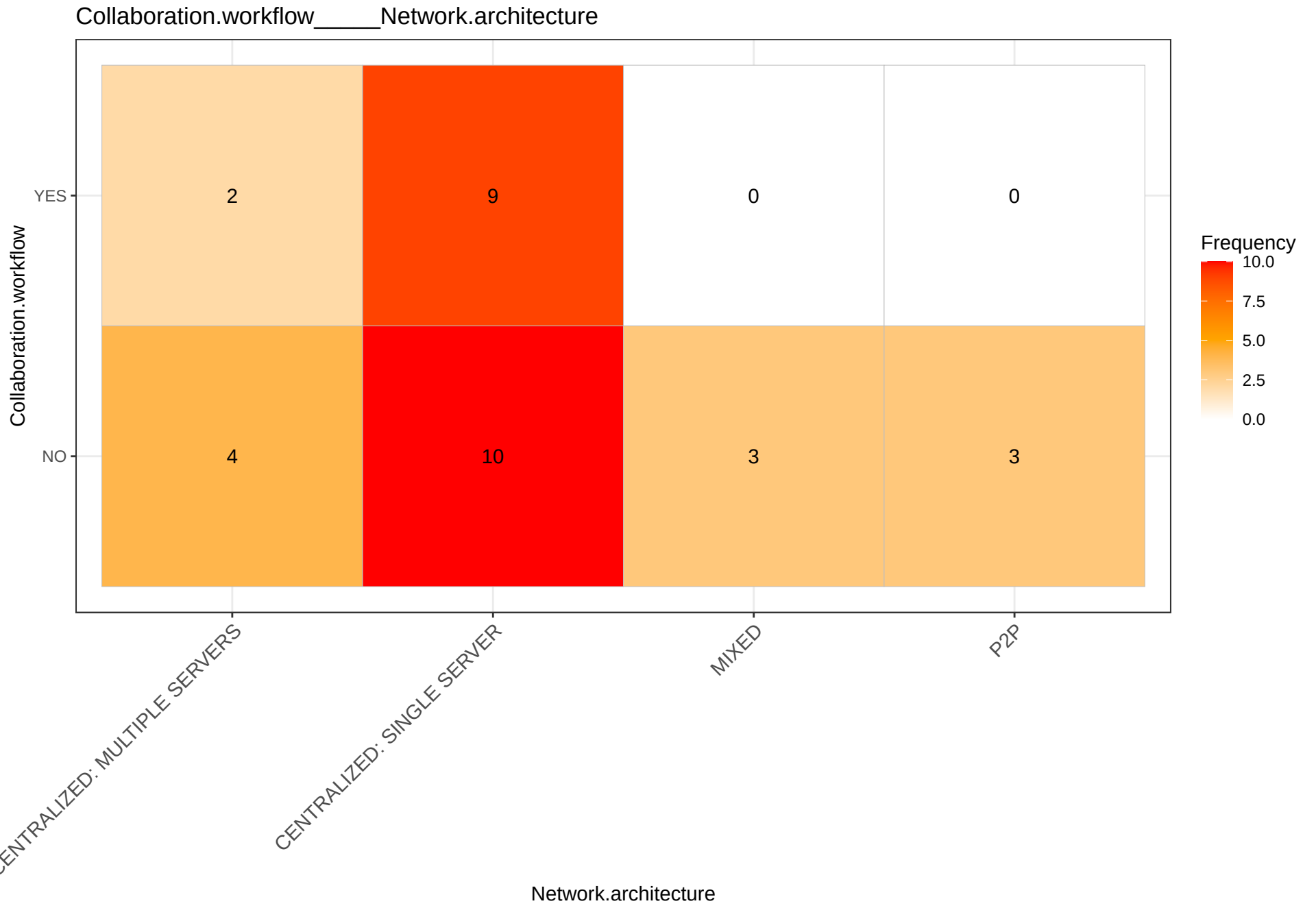

Collaboration.workflow_____Conflict.mgmt.approach
YES
NO
3
7
1
8
3
7
Collaboration.workflow
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

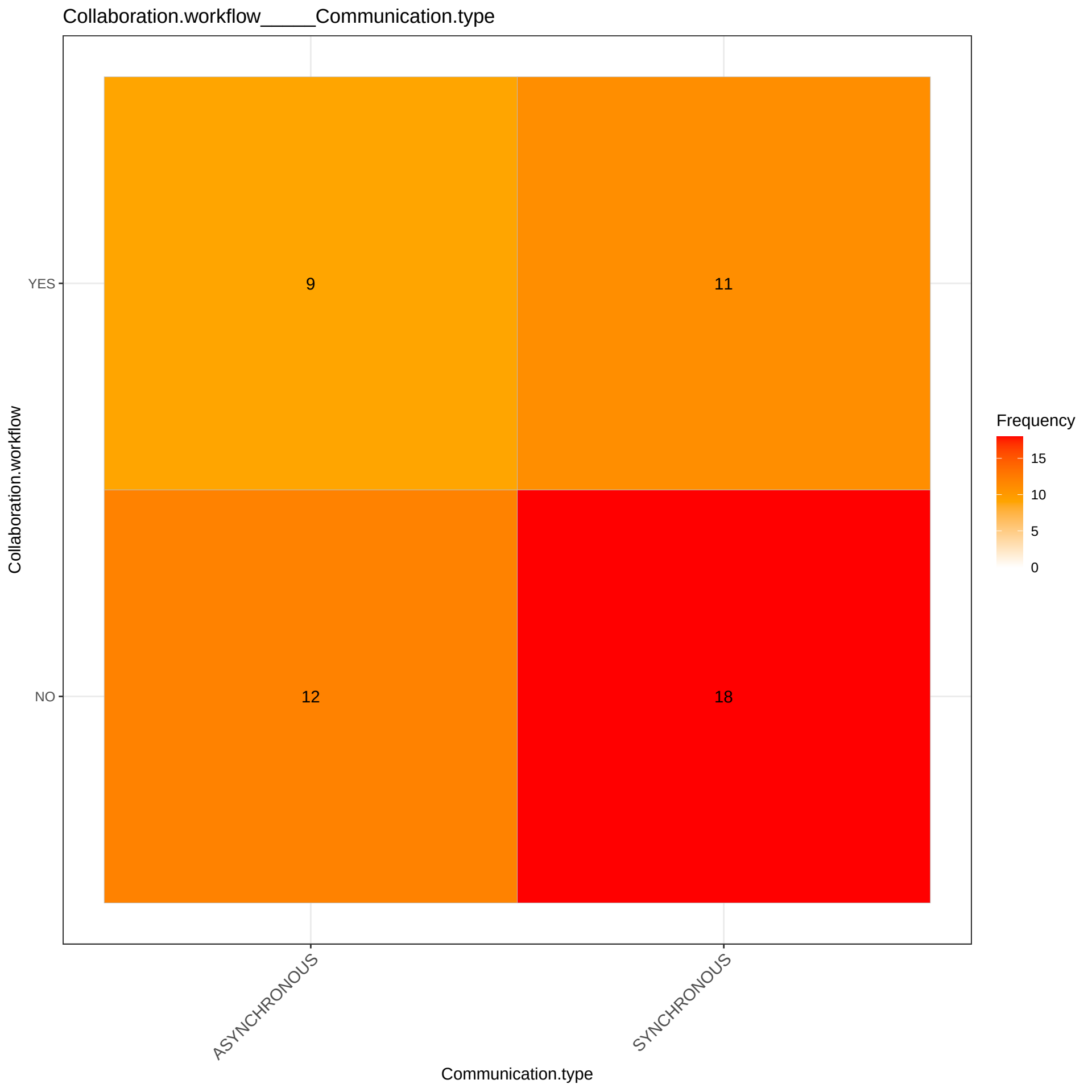

Collaboration.workflow_____Conflict.detection
YES
NO
7
4
1
6
12
6
Collaboration.workflow
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

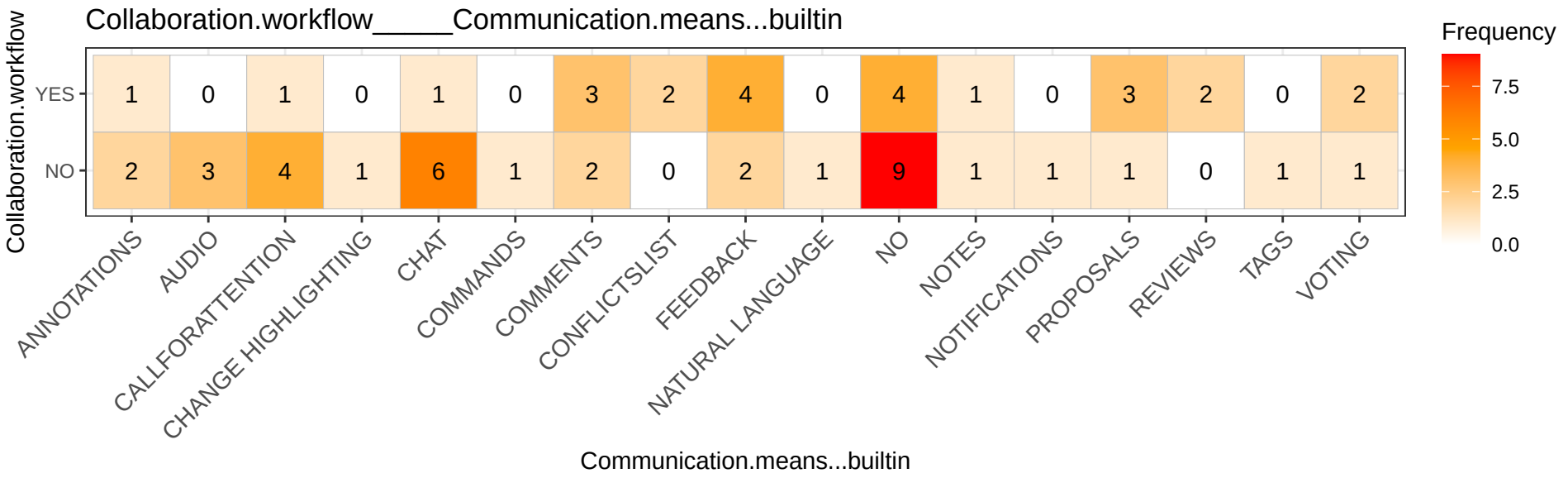

Collaboration.workflow_____Conflict.awareness..User.
YES
NO
8
1
2
11
1
6
Collaboration.workflow
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0

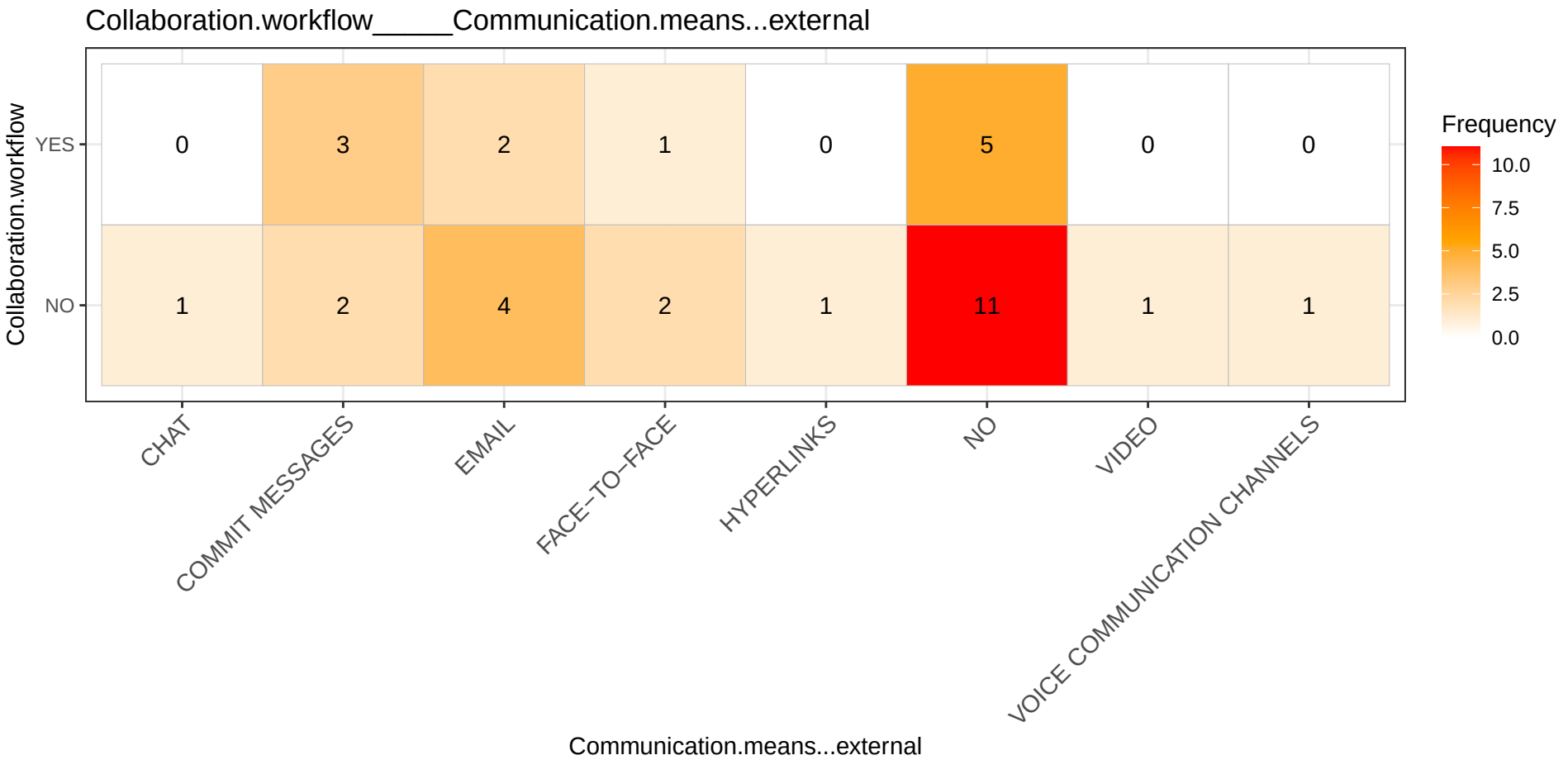

Collaboration.workflow_____Conflict.resolution.support
YES
NO
3
4
5
5
5
8
Collaboration.workflow
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

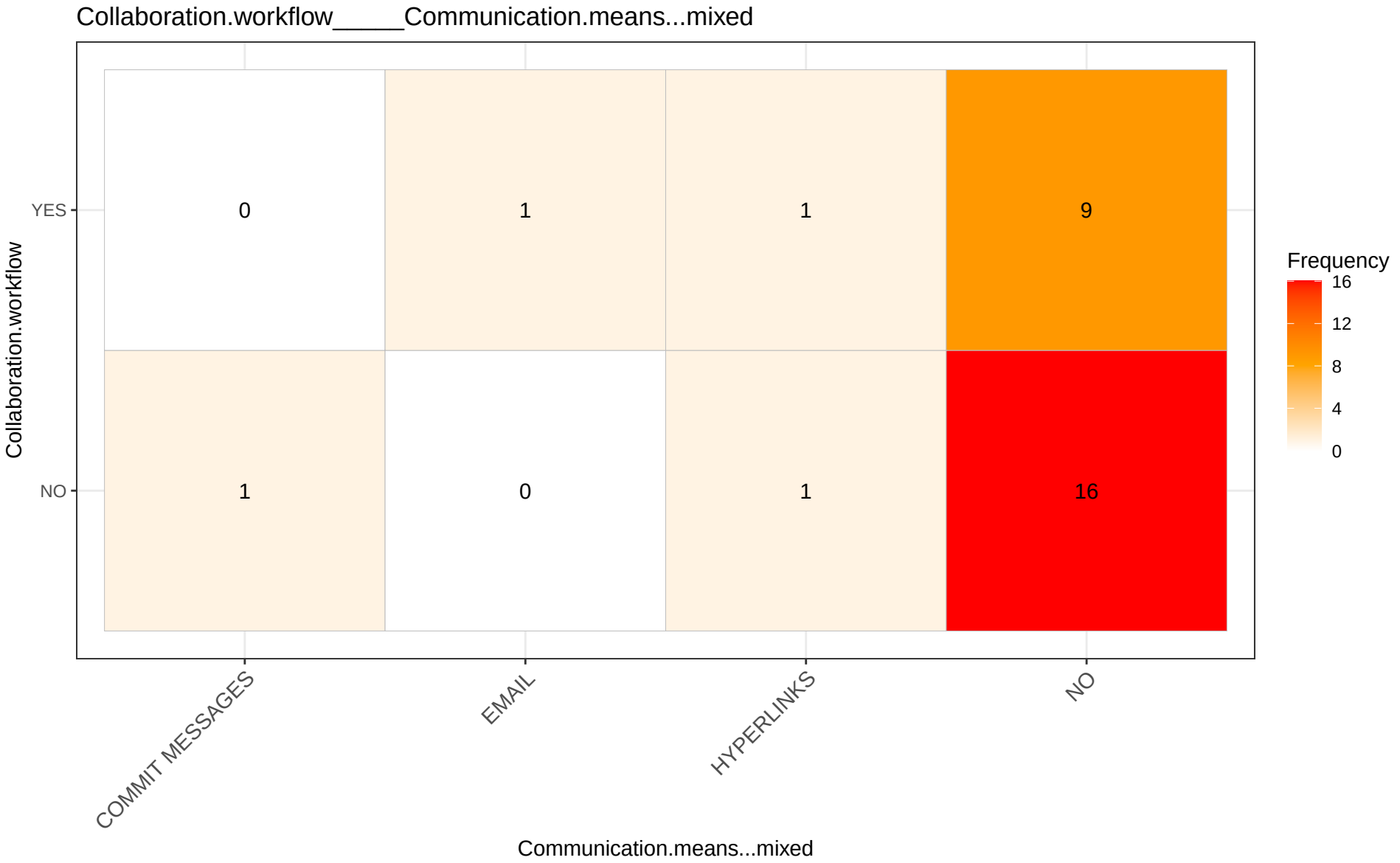

Collaboration.workflow_____Shared.workspace
YES
NO
10
1
16
2
REMOTE
SAMEPLACE
Collaboration.workflow
Shared.workspace
Frequency
16
12
8
4
0

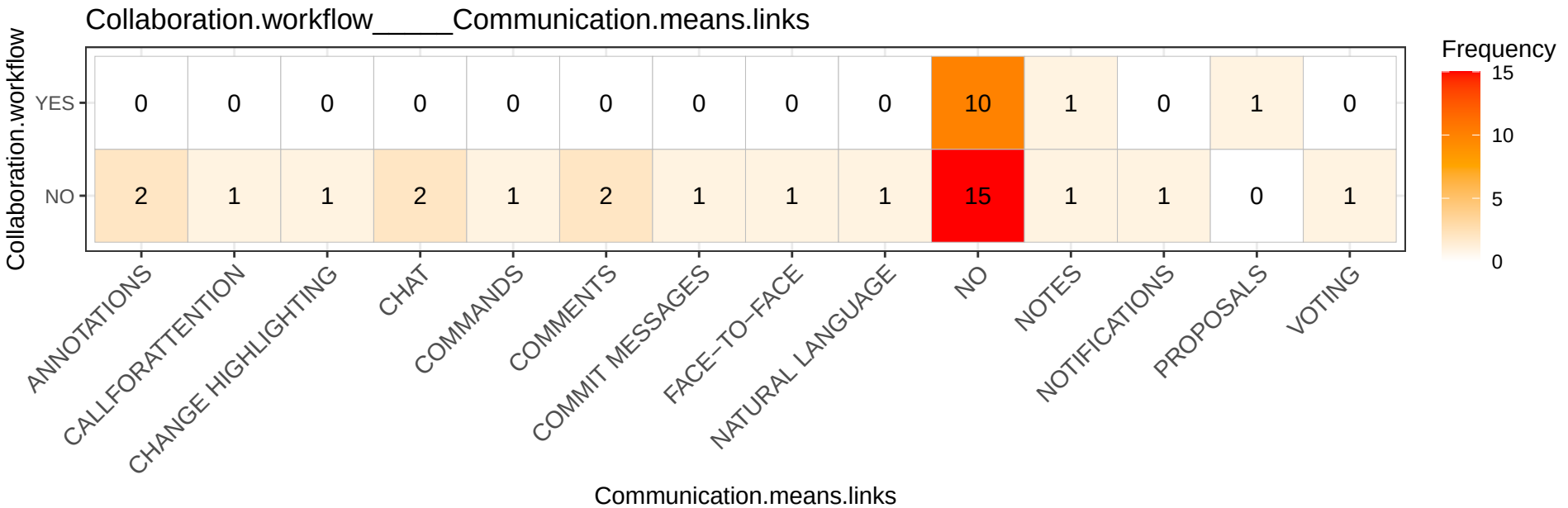

Collaboration.workflow_____Network.architecture
YES
NO
Collaboration.workflow
2
9
0
0
4
10
3
3
Frequency
10.0
7.5
5.0
2.5
0.0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture

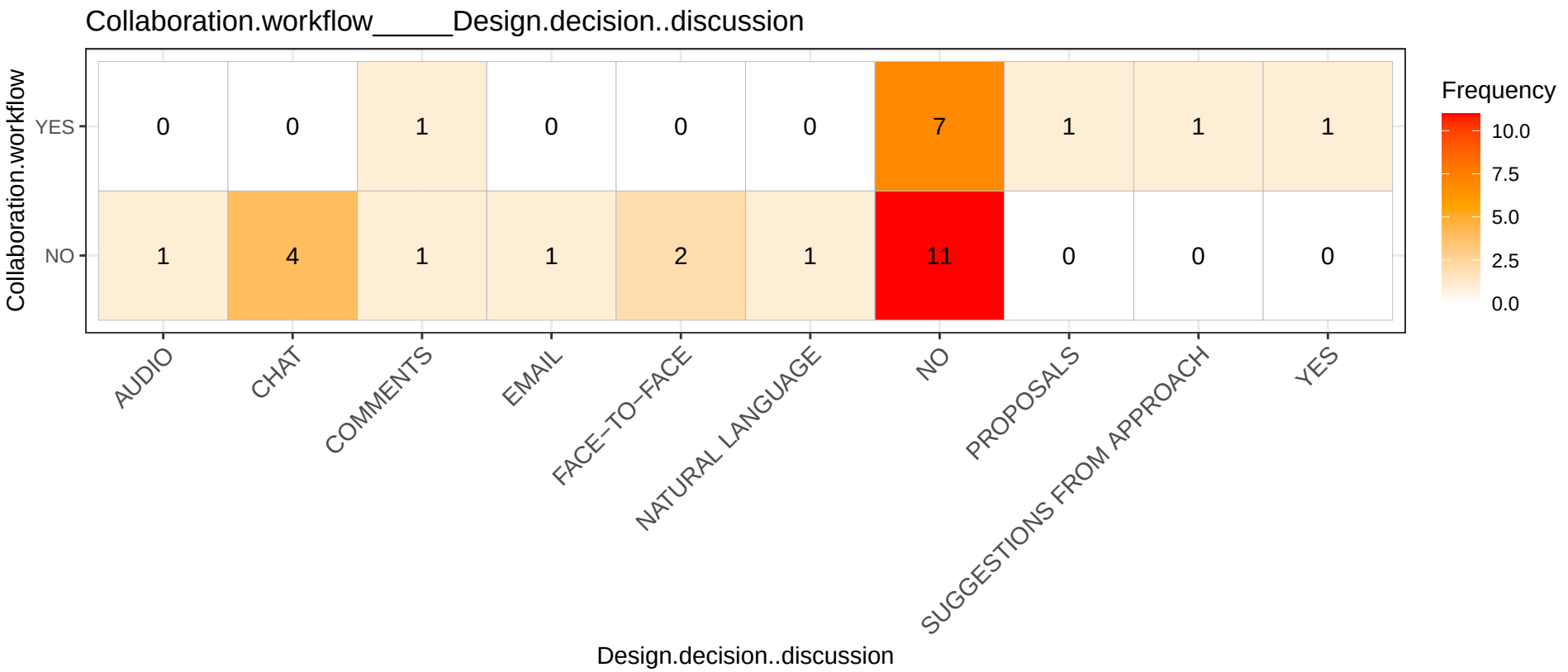

Collaboration.workflow_____Communication.type
YES
NO
9
11
12
18
Collaboration.workflow
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

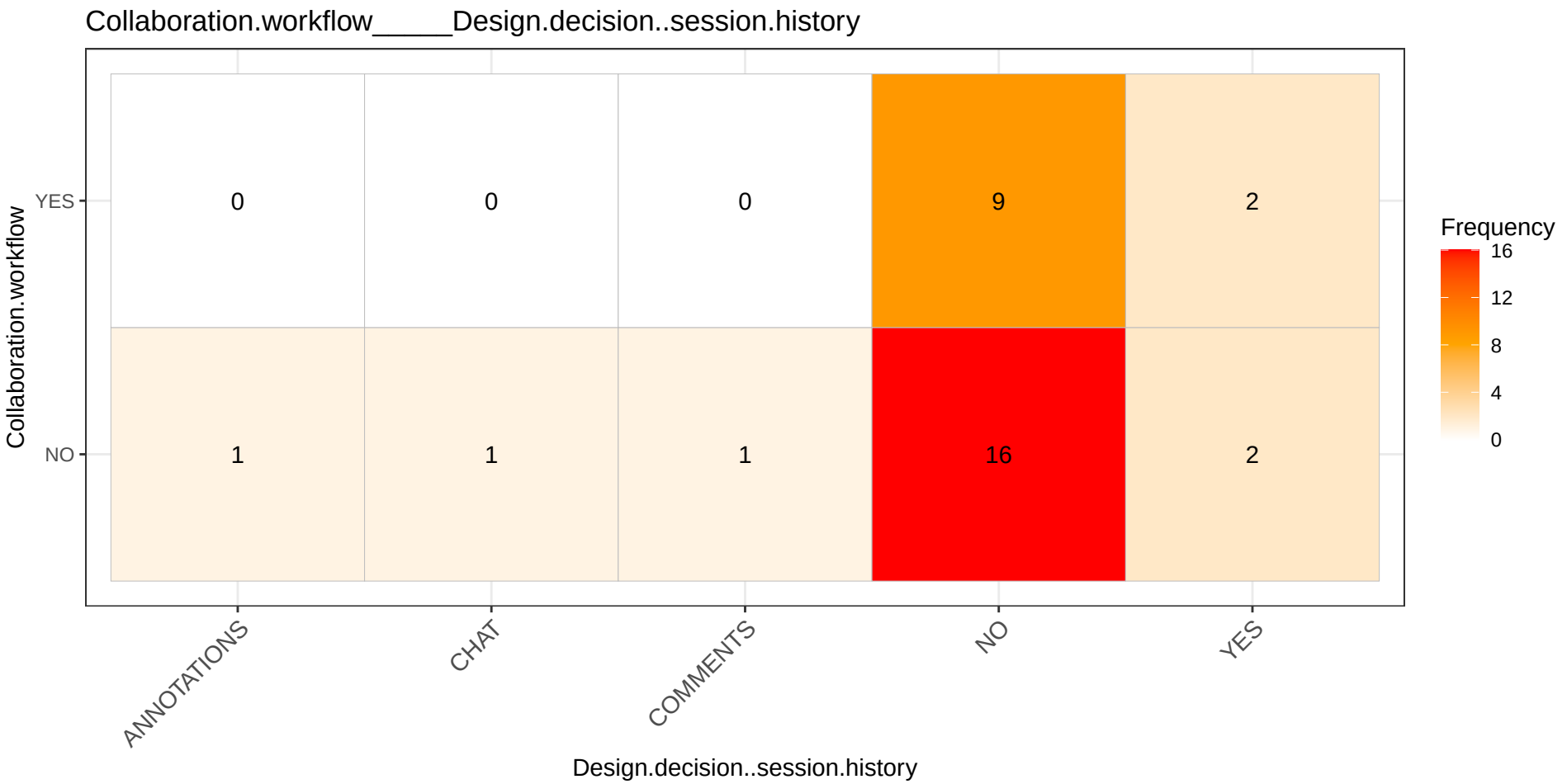

Collaboration.workflow_____Communication.means...builtin
Collaboration.workflow
YES
NO
1 0 1 0 1 0 3 2 4 0 4 1 0 3 2 0 2
2 3 4 1 6 1 2 0 2 1 9 1 1 1 0 1 1
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

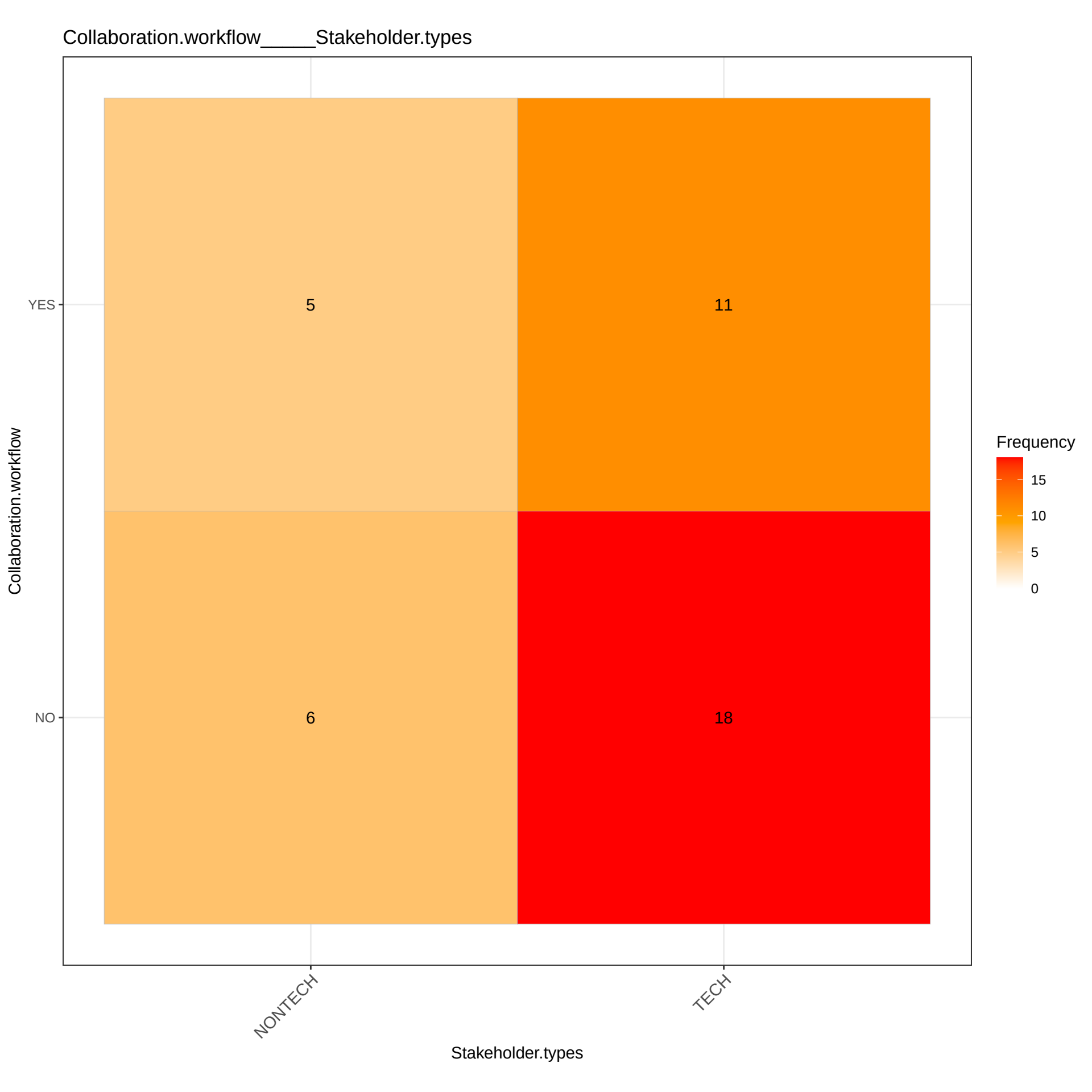

Collaboration.workflow_____Communication.means...external
Collaboration.workflow
YES
NO
0
3
2
1
0
5
0
0
1
2
4
2
1
11
1
1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10.0
7.5
5.0
2.5
0.0

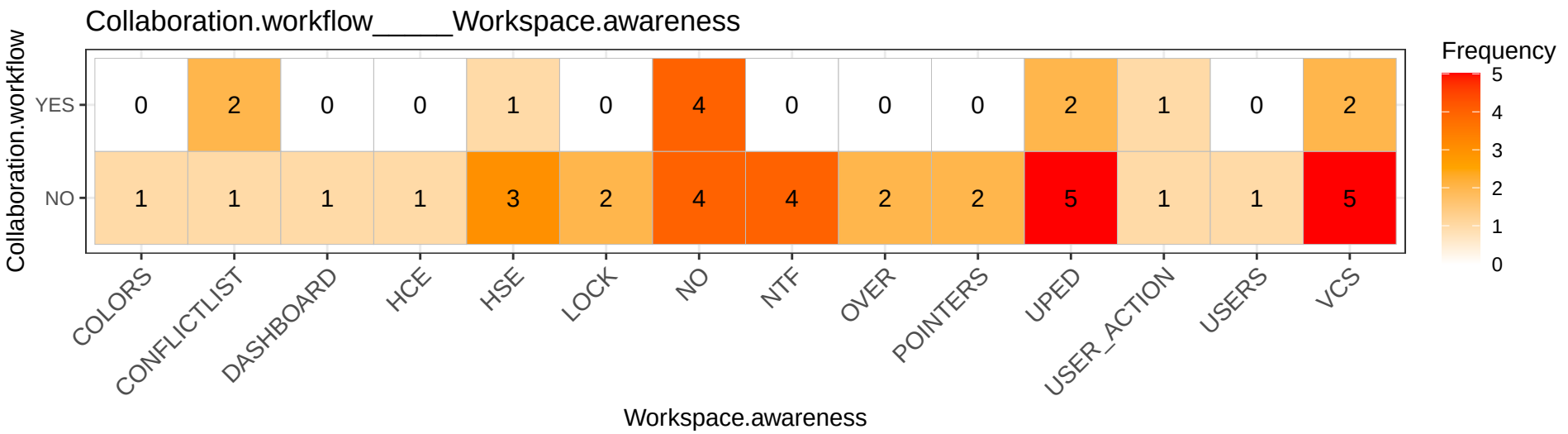

Collaboration.workflow_____Communication.means...mixed
Collaboration.workflow
YES
NO
0
1
1
9
1
0
1
16
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
16
12
8
4
0

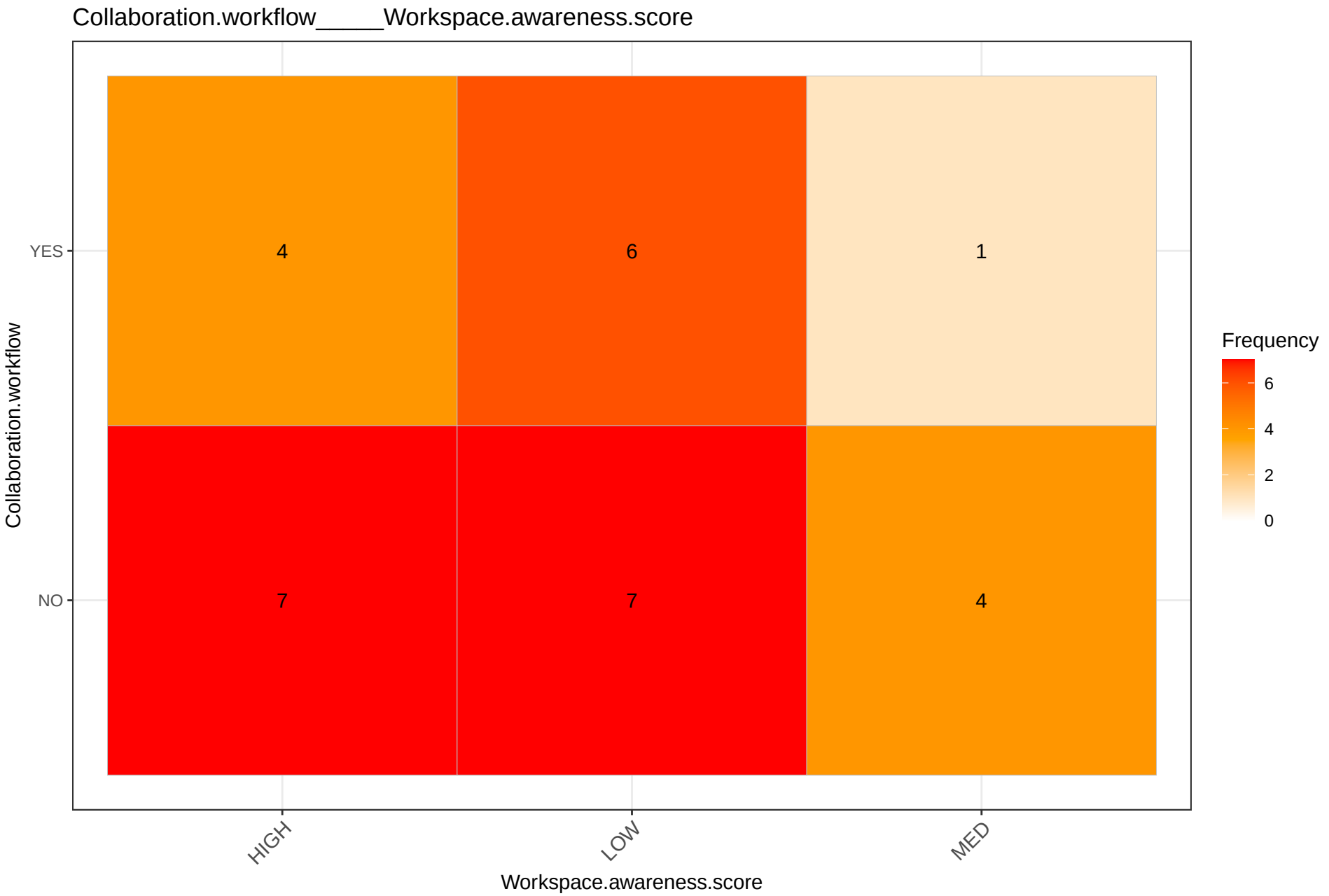

Collaboration.workflow_____Communication.means.links
Collaboration.workflow
YES
NO
0 0 0 0 0 0 0 0 0 10 1 0 1 0
2 1 1 2 1 2 1 1 1 15 1 1 0 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

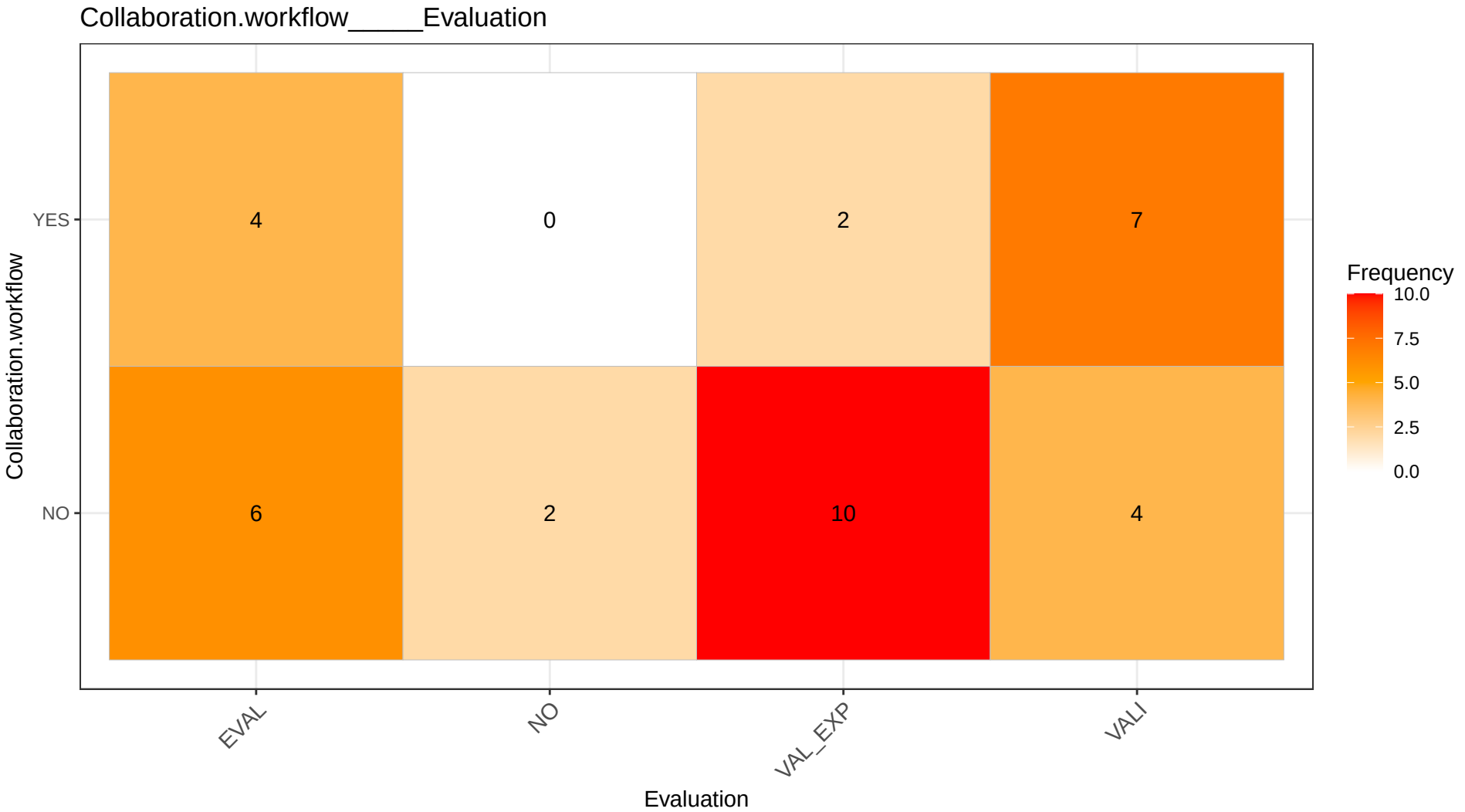

Collaboration.workflow_____Design.decision..discussion
Collaboration.workflow
YES
NO
0
0
1
0
0
0
7
1
1
1
1
4
1
1
2
1
11
0
0
0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0

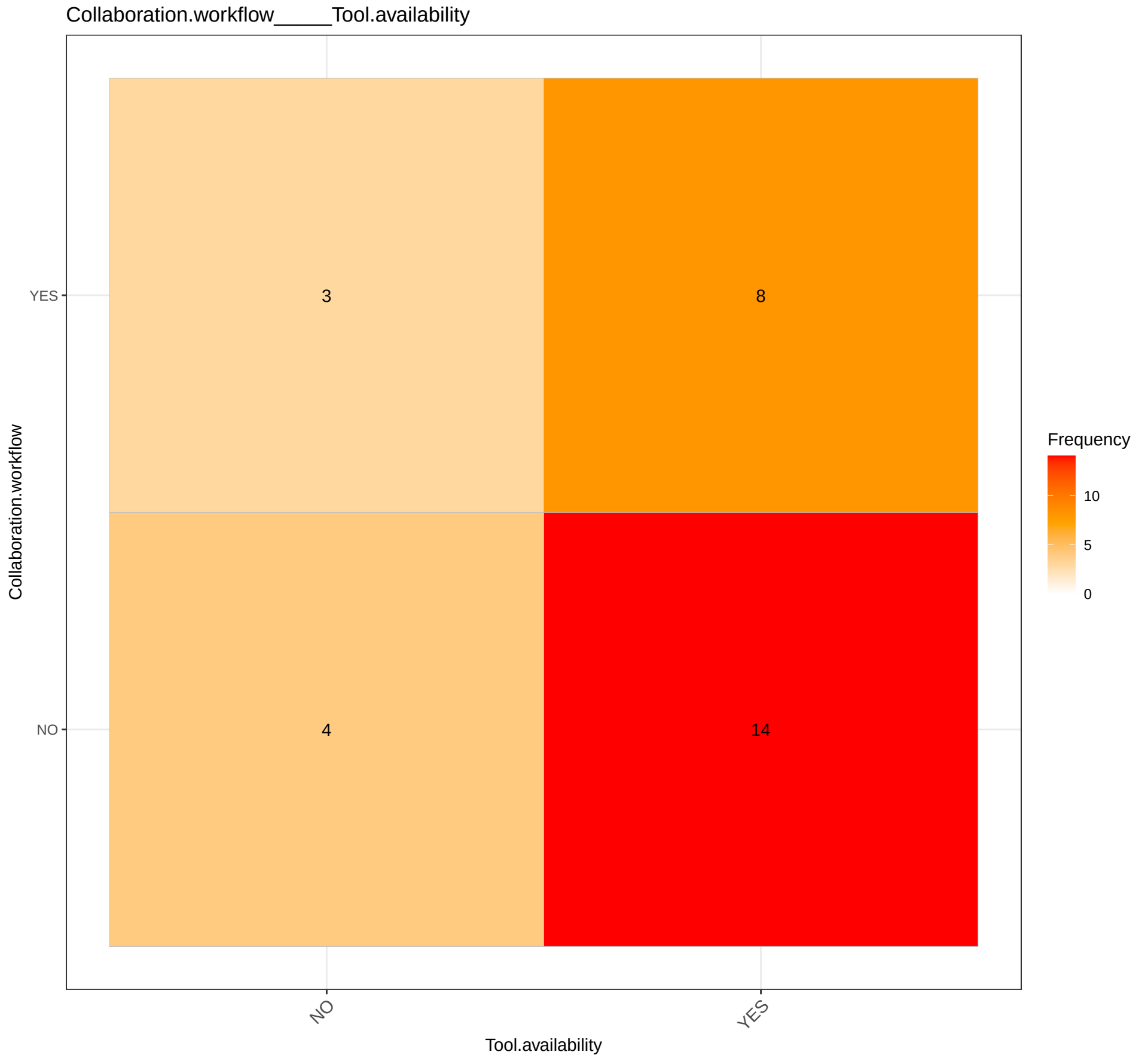

Collaboration.workflow_____Design.decision..session.history
Collaboration.workflow
YES
NO
0
0
0
9
2
1
1
1
16
2
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

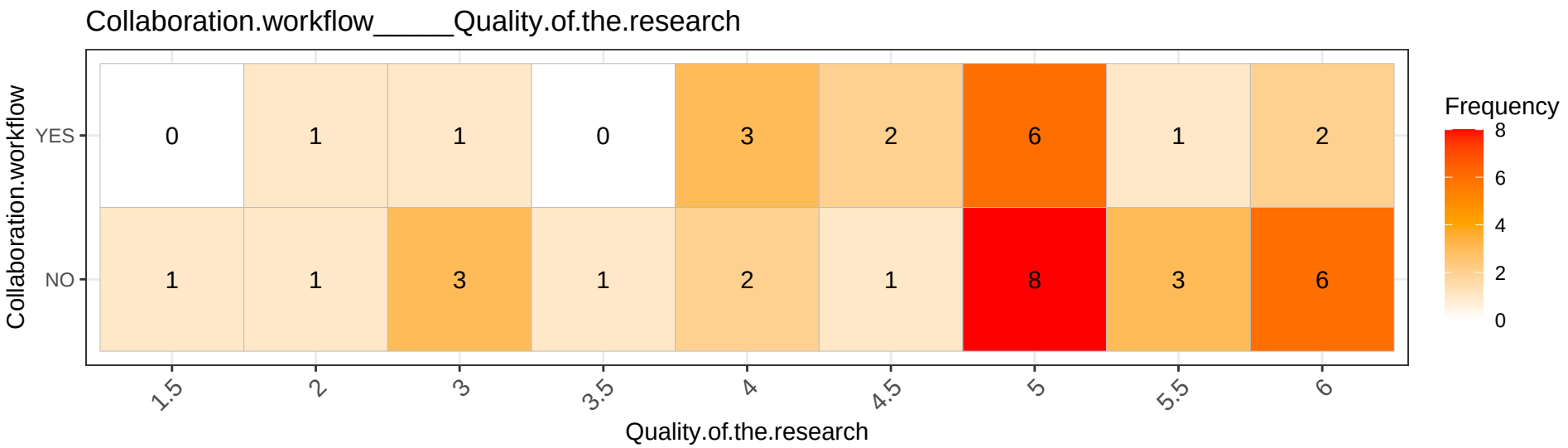

Collaboration.workflow_____Stakeholder.types
YES
NO
5
11
6
18
Collaboration.workflow
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

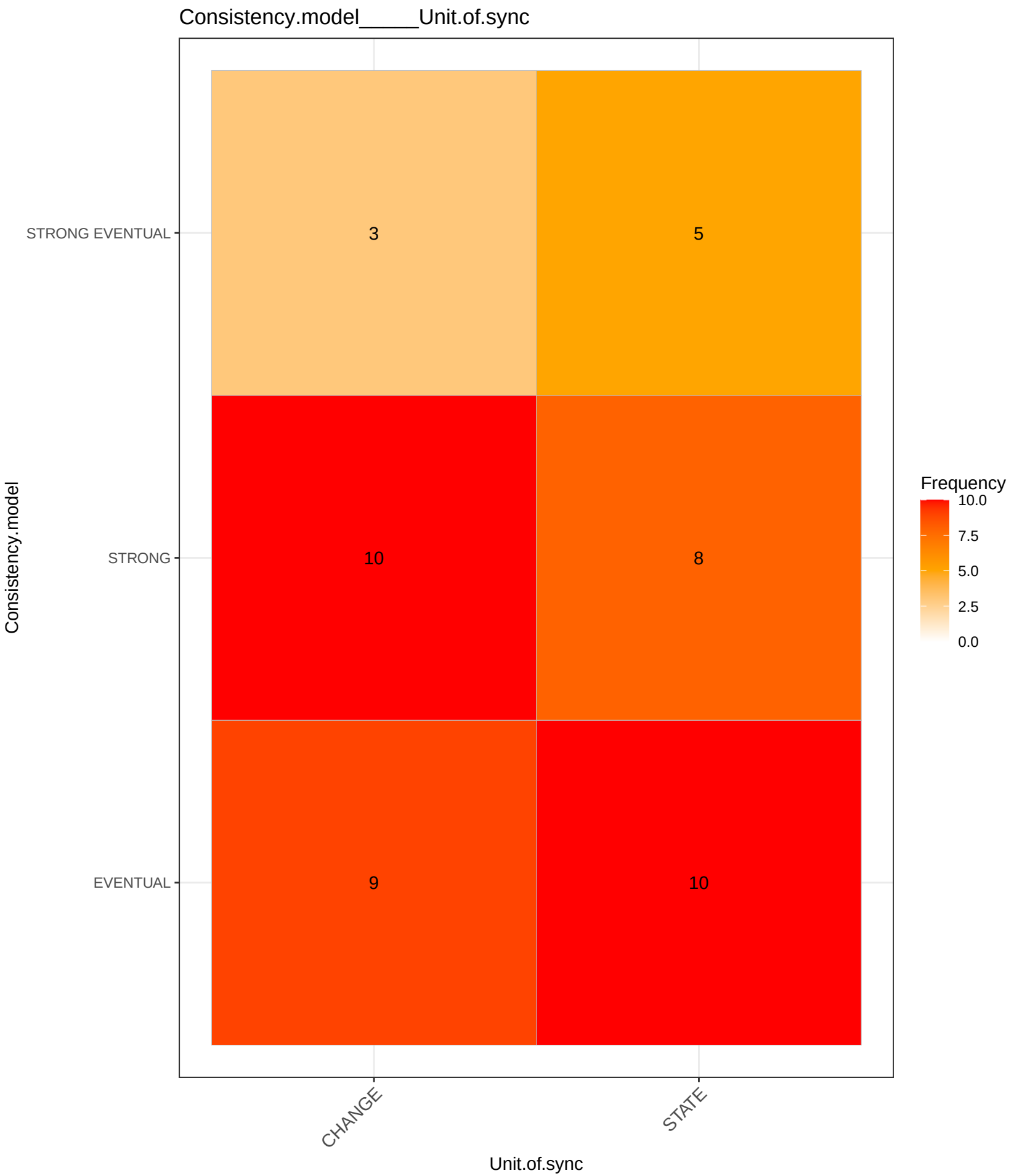

Collaboration.workflow_____Workspace.awareness
Collaboration.workflow
YES
NO
0 2 0 0 1 0 4 0 0 0 2 1 0 2
1 1 1 1 3 2 4 4 2 2 5 1 1 5
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
5
4
3
2
1
0

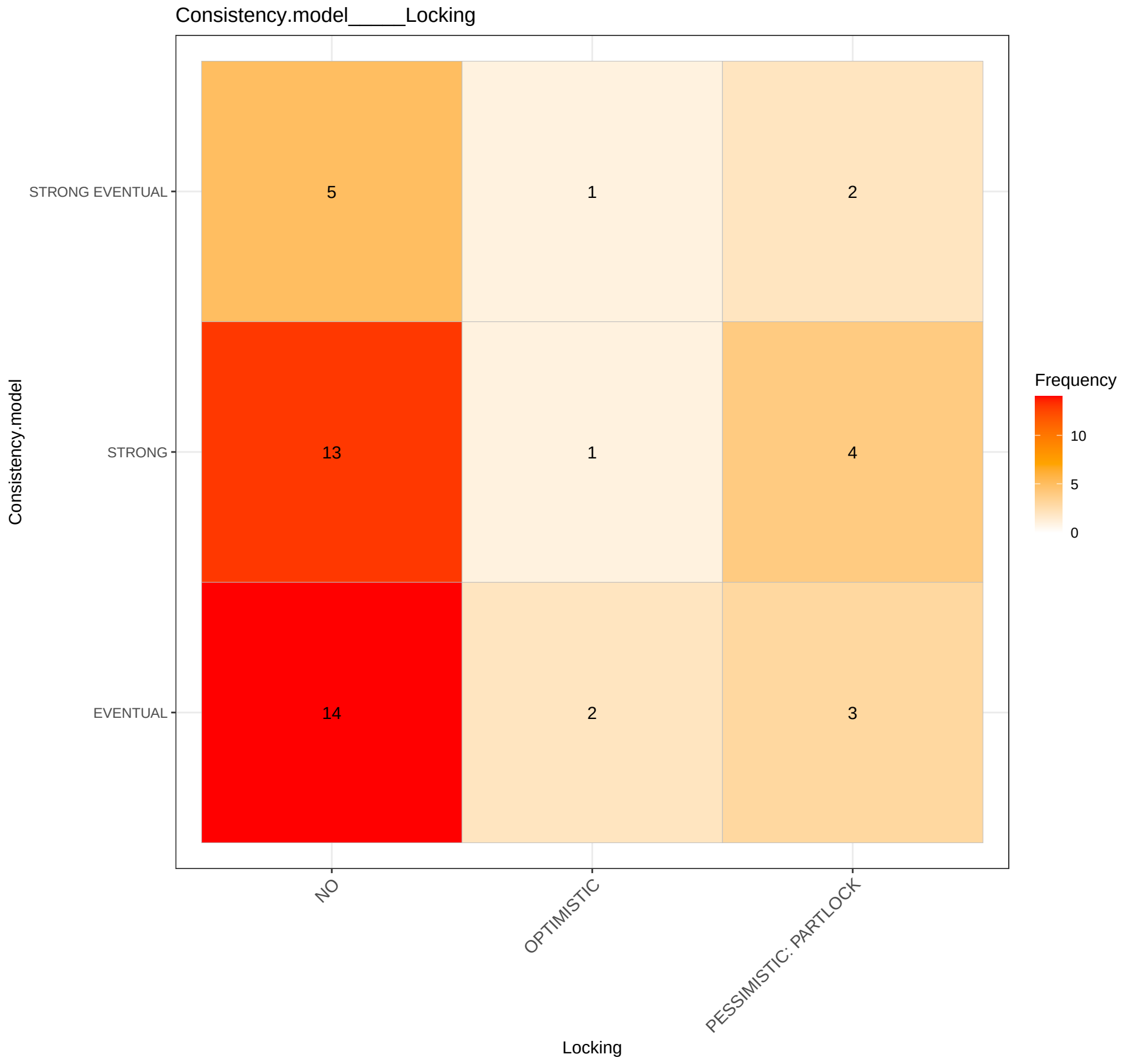

Collaboration.workflow_____Workspace.awareness.score
YES
NO
4
6
1
7
7
4
HIGH
LOW
MED
Workspace.awareness.score
Collaboration.workflow
Frequency
6
4
2
0

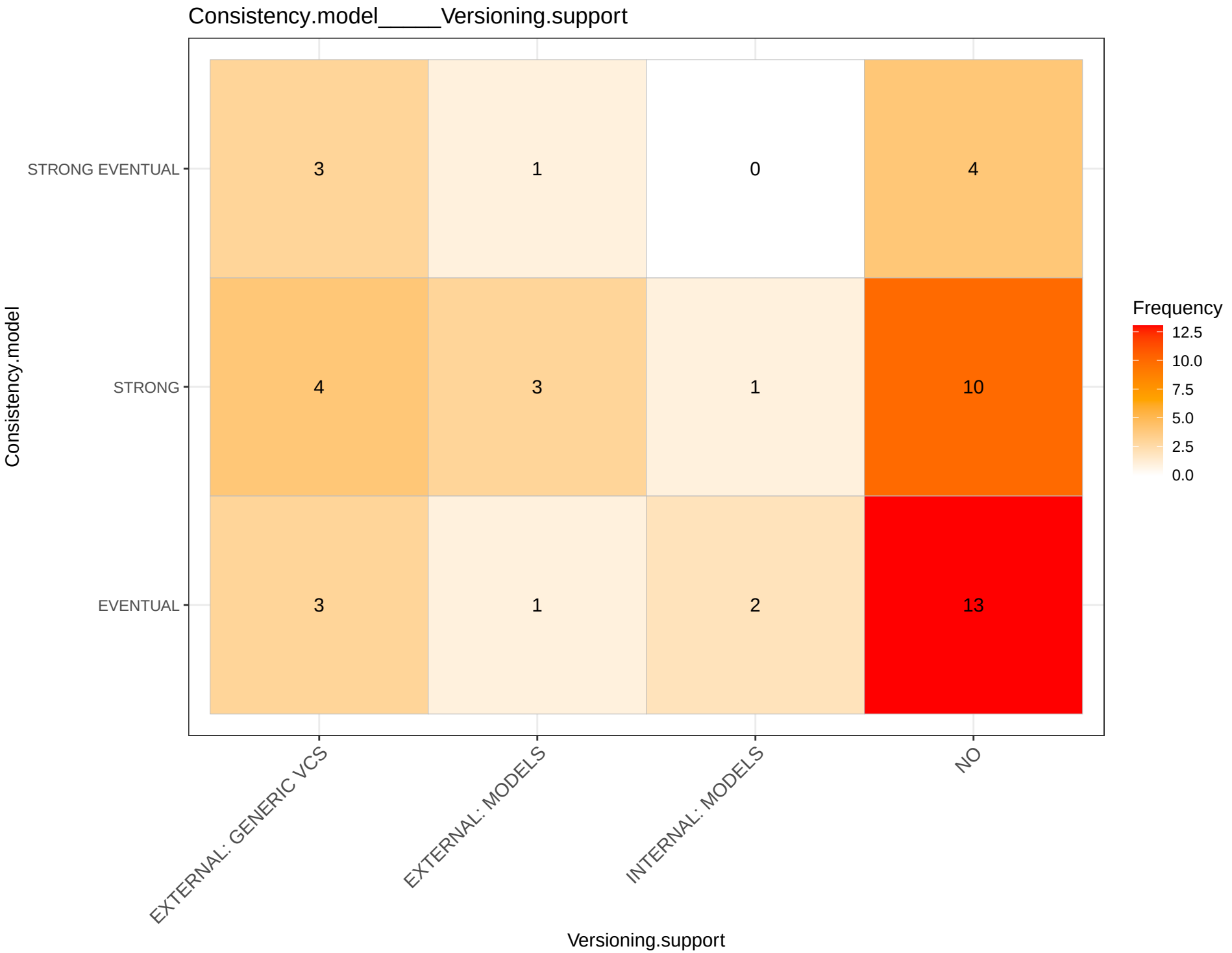

Collaboration.workflow_____Evaluation
Collaboration.workflow
YES
NO
4
0
2
7
6
2
10
4
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0

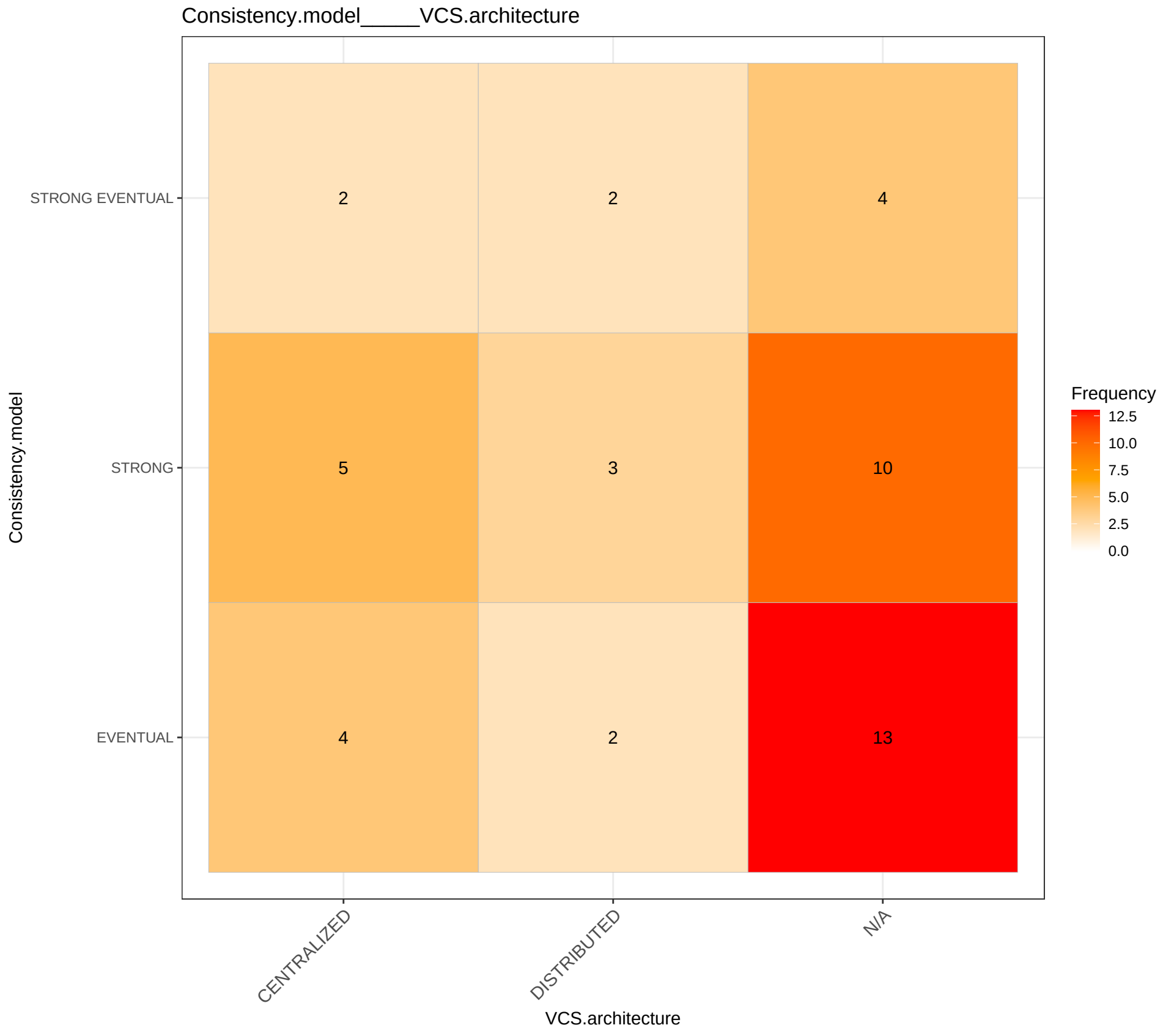

Collaboration.workflow_____Tool.availability
YES
NO
3
8
4
14
Collaboration.workflow
NO
YES
Tool.availability
Frequency
10
5
0

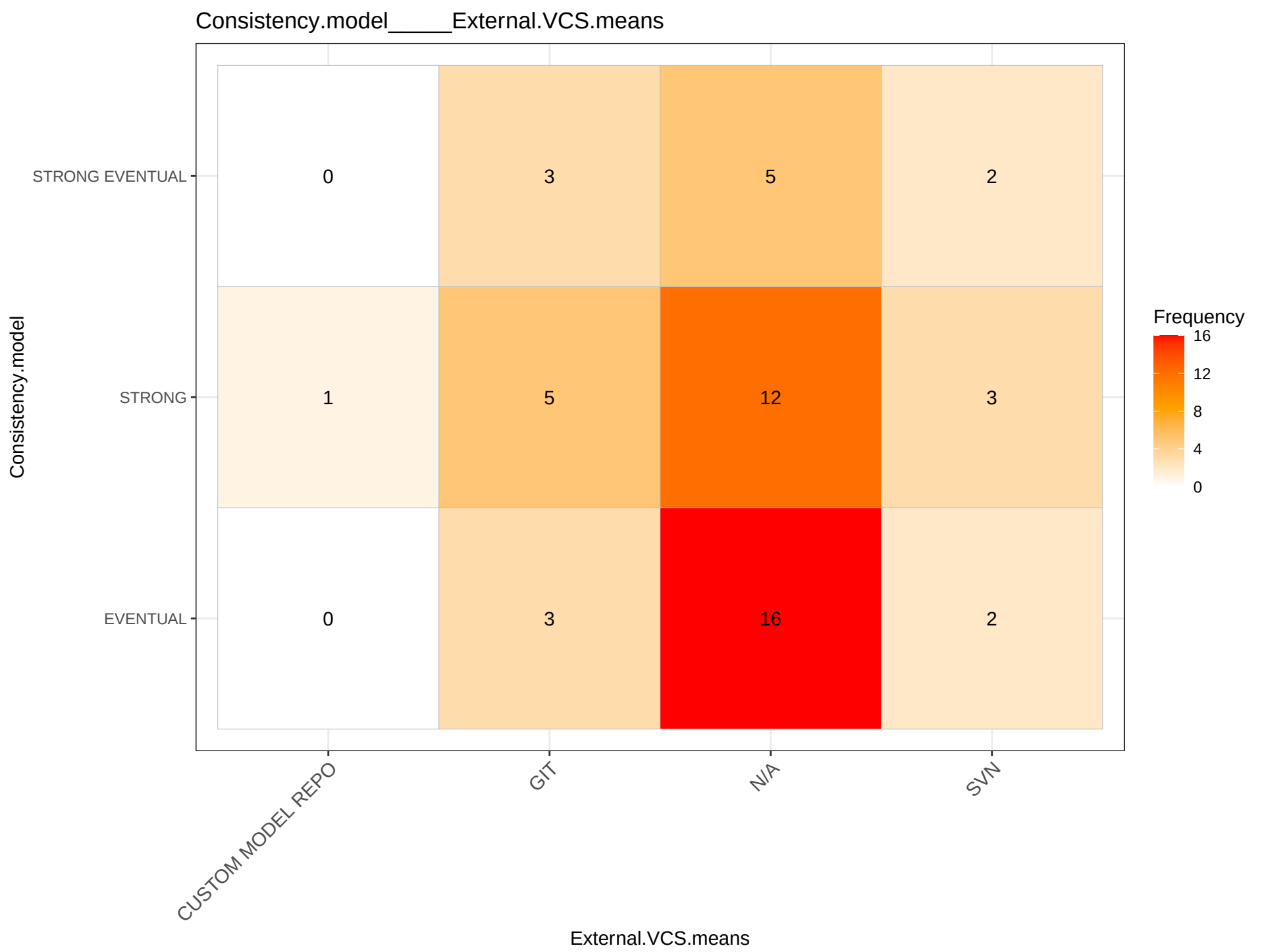

Collaboration.workflow_____Quality.of.the.research
Collaboration.workflow
YES
NO
0
1
1
0
3
2
6
1
2
1
1
3
1
2
1
8
3
6
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
8
6
4
2
0

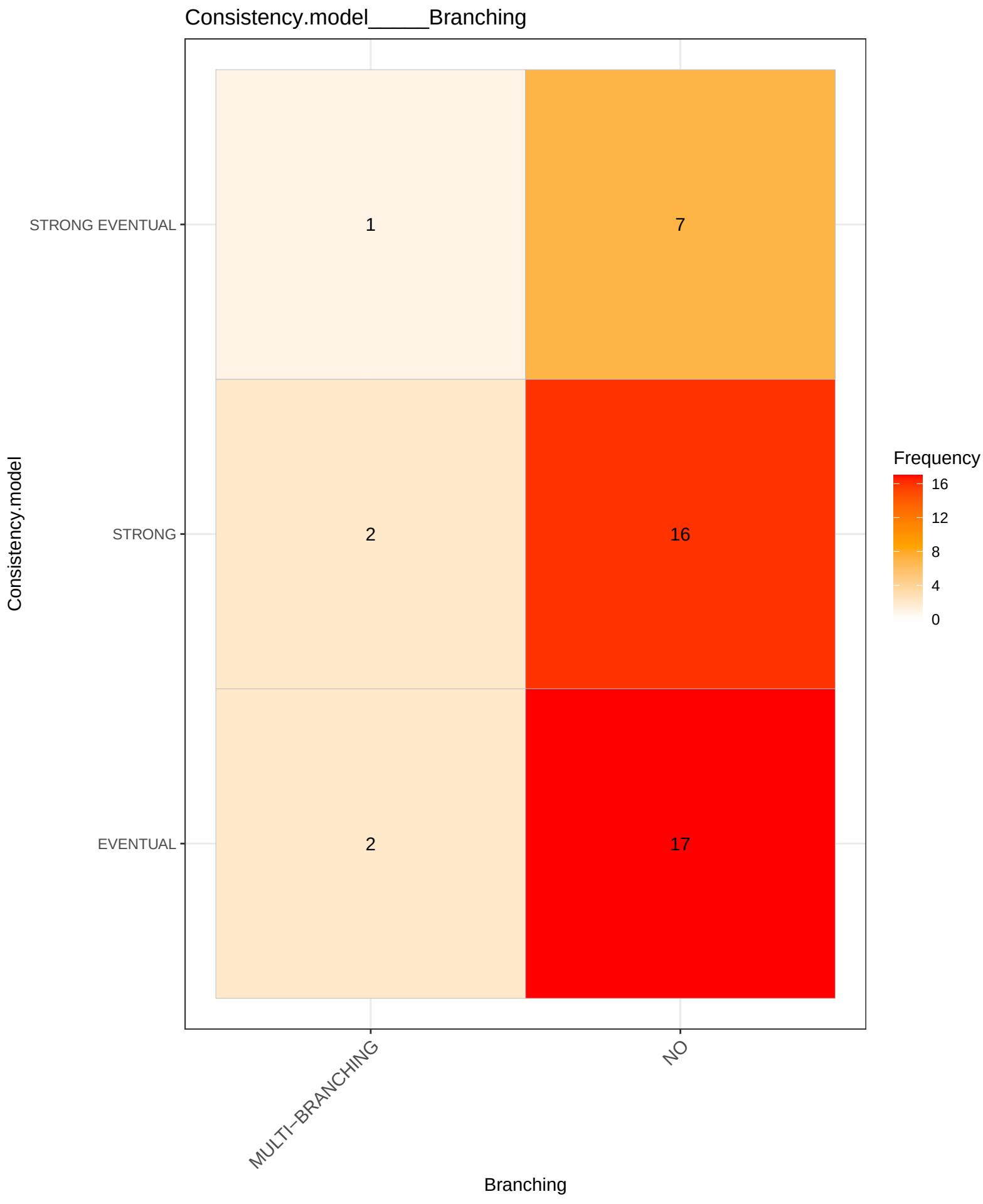

Consistency.model_____Unit.of.sync
STRONG EVENTUAL
STRONG
EVENTUAL
3
5
10
8
9
10
Consistency.model
CHANGE
STATE
Unit.of.sync
Frequency
10.0
7.5
5.0
2.5
0.0

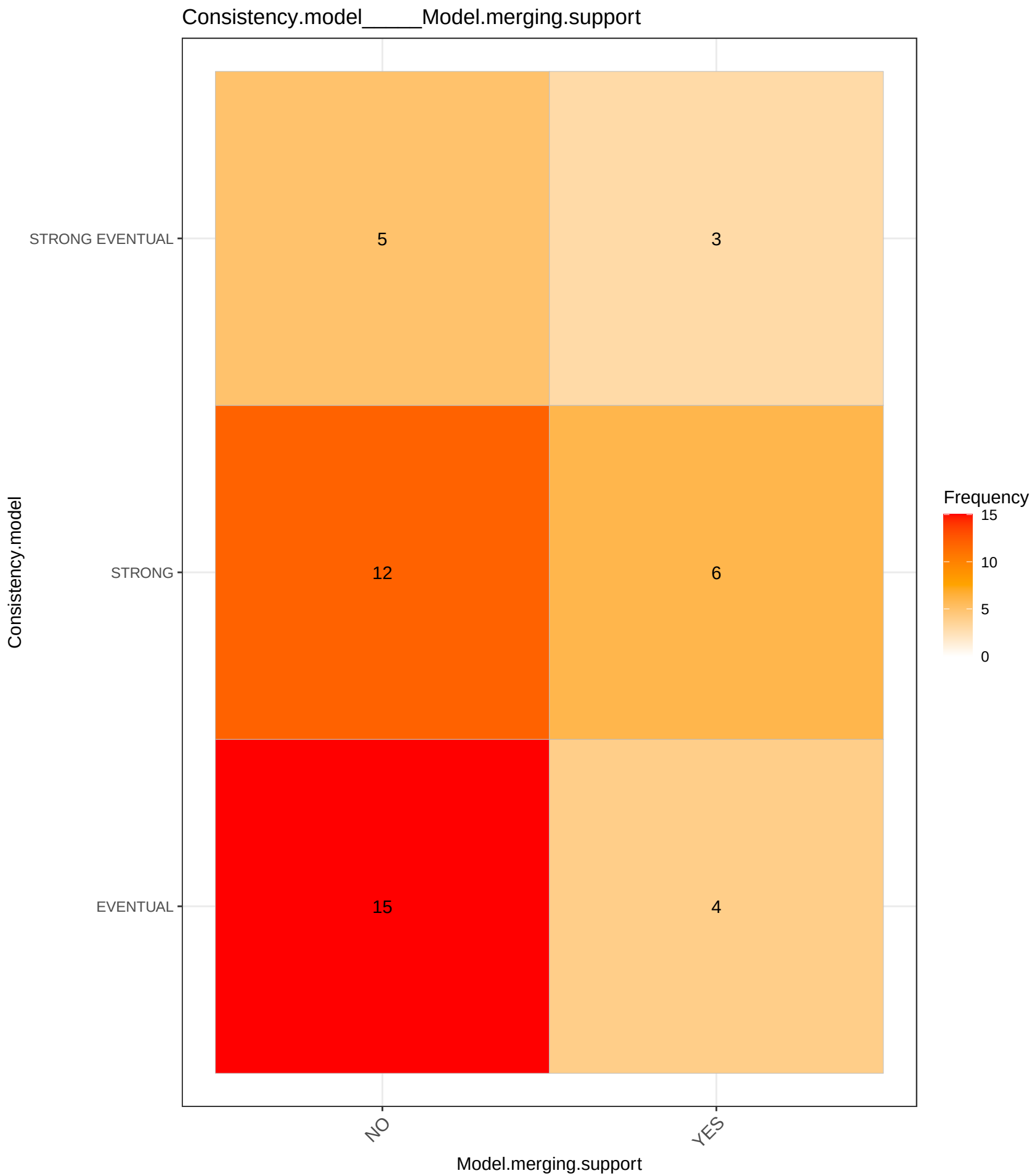

Consistency.model_____Locking
STRONG EVENTUAL
STRONG
EVENTUAL
5
1
2
13
1
4
14
2
3
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Consistency.model
Locking
Frequency
10
5
0

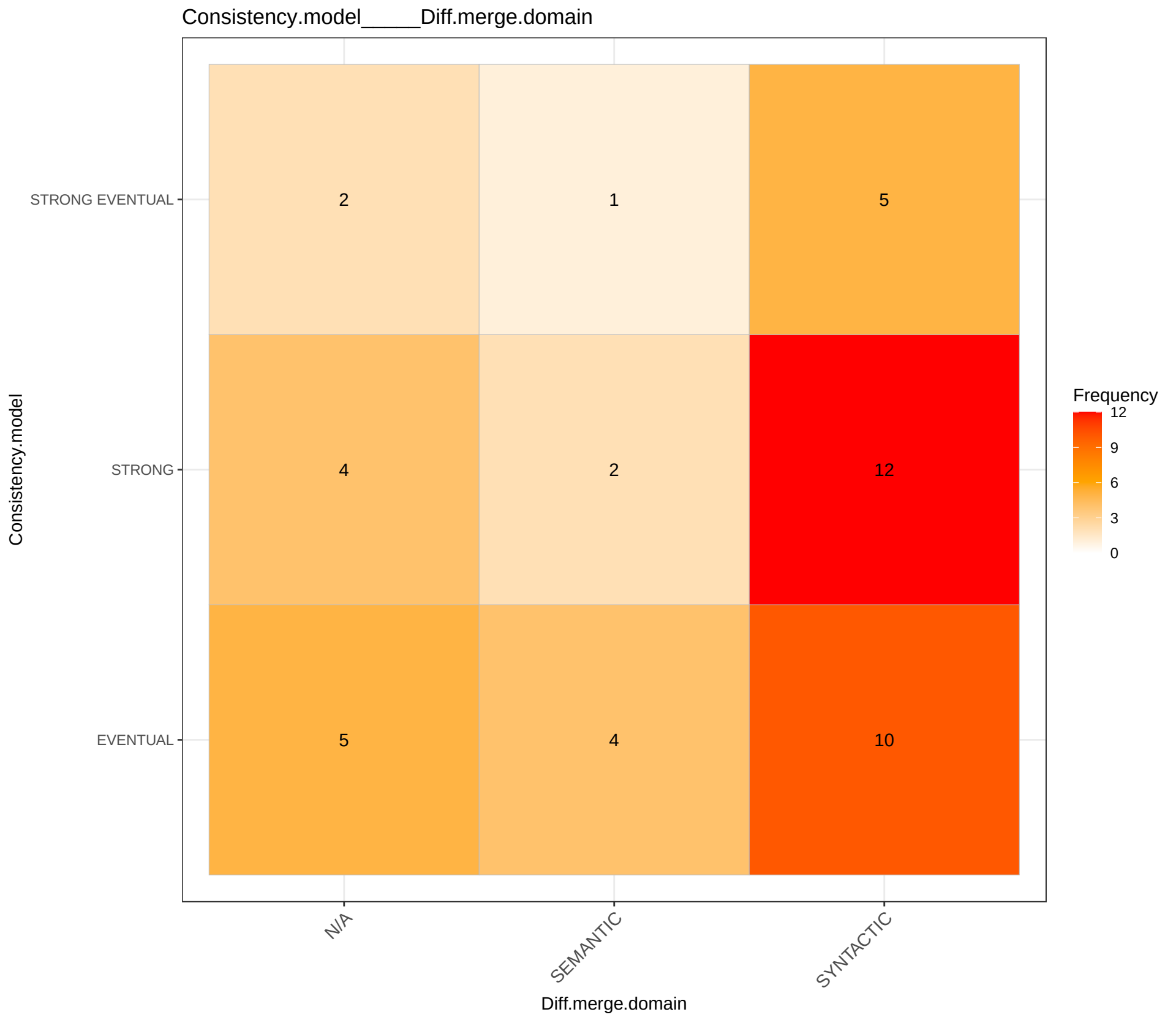

Consistency.model_____Versioning.support
STRONG EVENTUAL
STRONG
EVENTUAL
Consistency.model
3
1
0
4
4
3
1
10
3
1
2
13
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

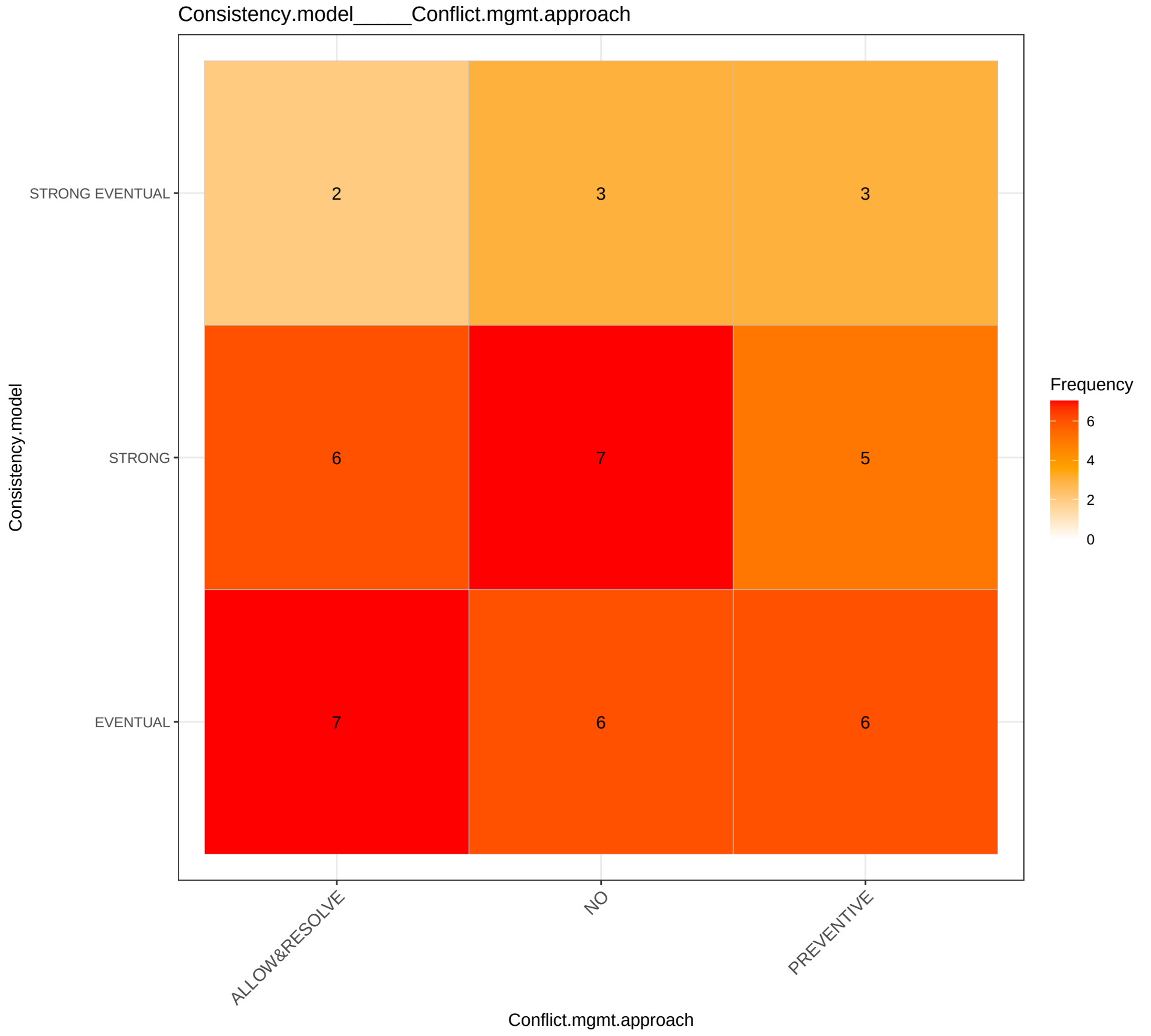

Consistency.model_____VCS.architecture
STRONG EVENTUAL
STRONG
EVENTUAL
2
2
4
5
3
10
4
2
13
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Consistency.model
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

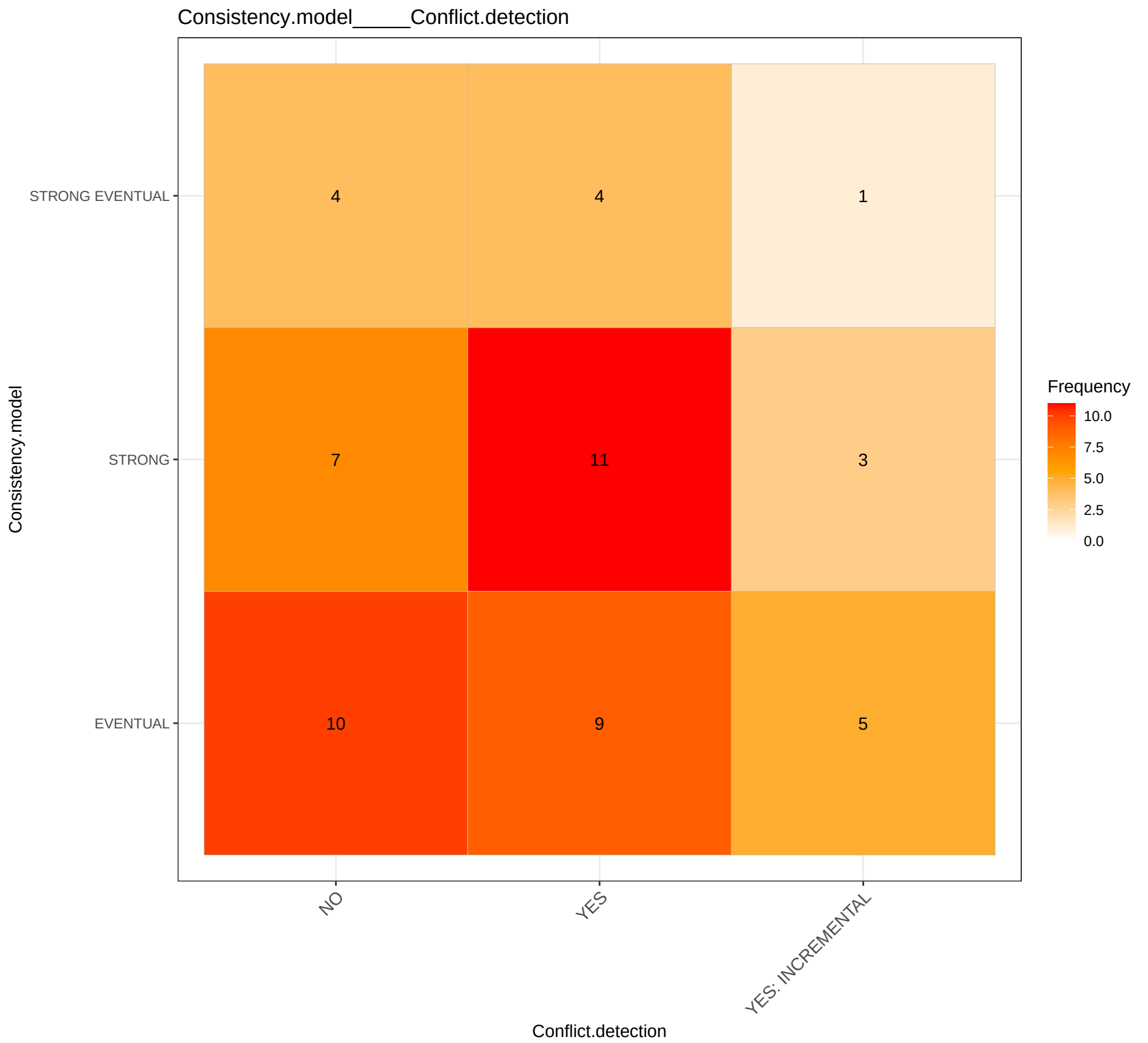

Consistency.model_____External.VCS.means
STRONG EVENTUAL
STRONG
EVENTUAL
0
3
5
2
1
5
12
3
0
3
16
2
CUSTOM MODEL REPO
GIT
N/A
SVN
Consistency.model
External.VCS.means
Frequency
16
12
8
4
0

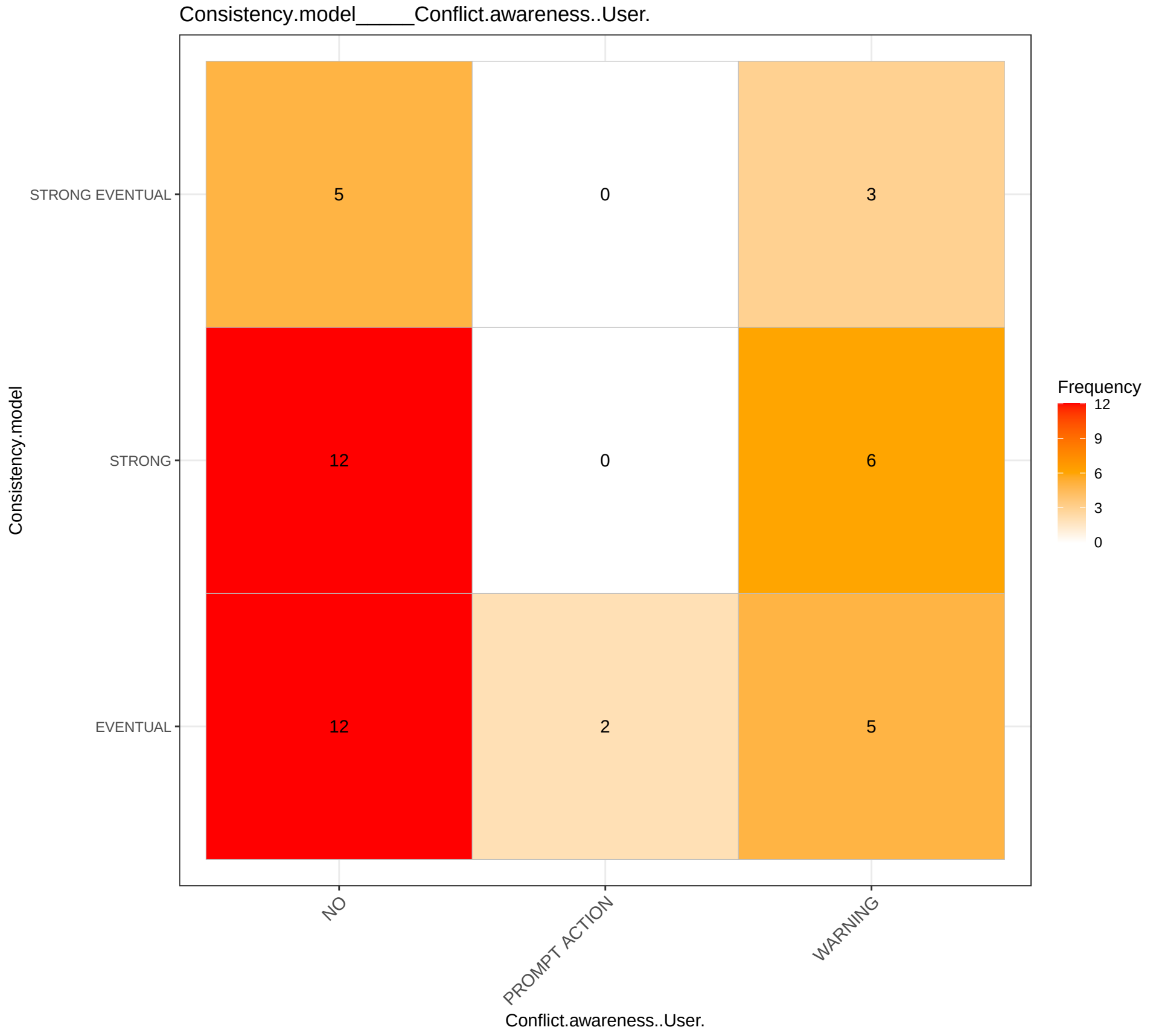

Consistency.model_____Branching
STRONG EVENTUAL
STRONG
EVENTUAL
1
7
2
16
2
17
Consistency.model
MULTI−BRANCHING
NO
Branching
Frequency
16
12
8
4
0

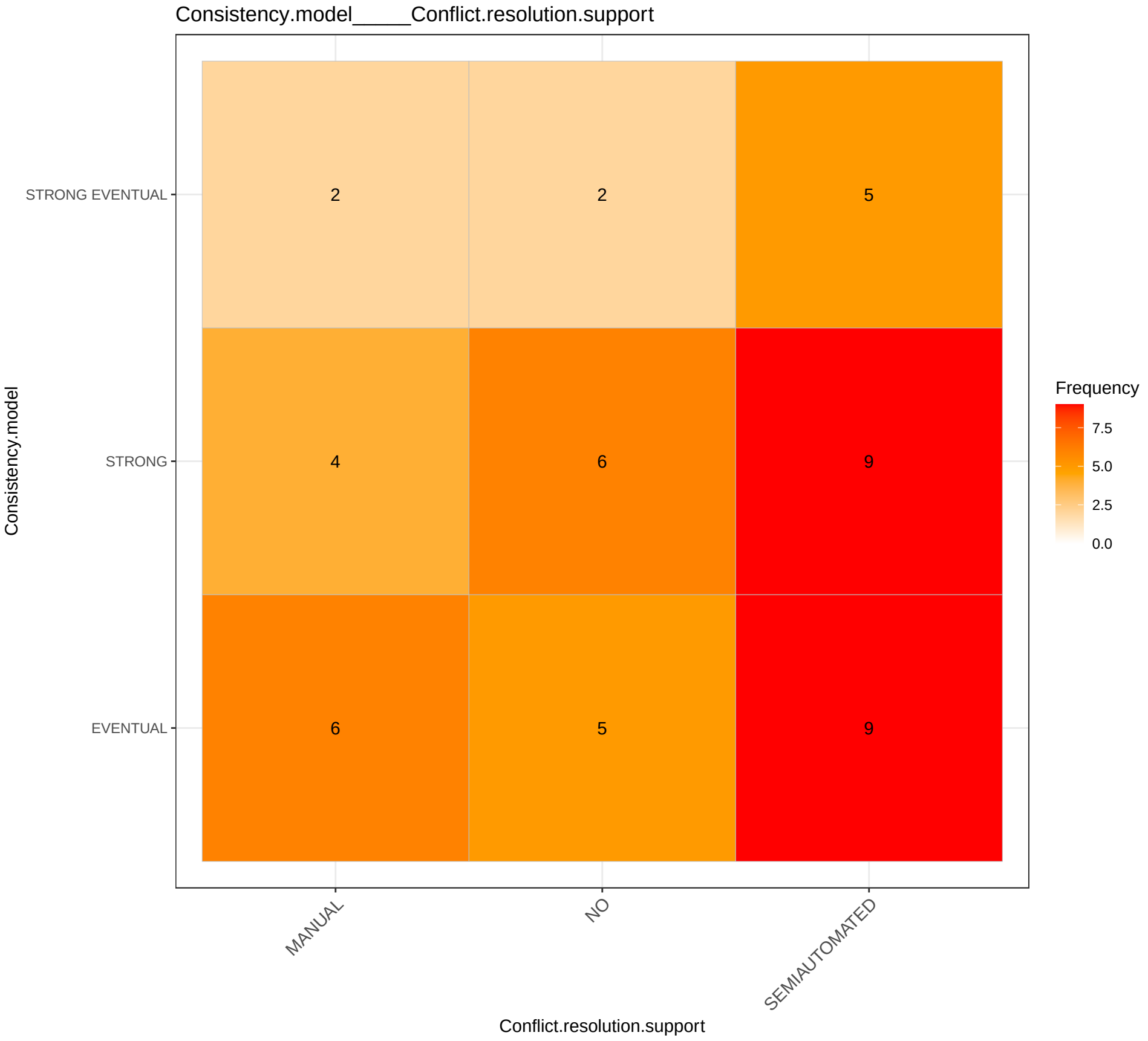

Consistency.model_____Model.merging.support
STRONG EVENTUAL
STRONG
EVENTUAL
5
3
12
6
15
4
Consistency.model
NO
YES
Model.merging.support
Frequency
15
10
5
0

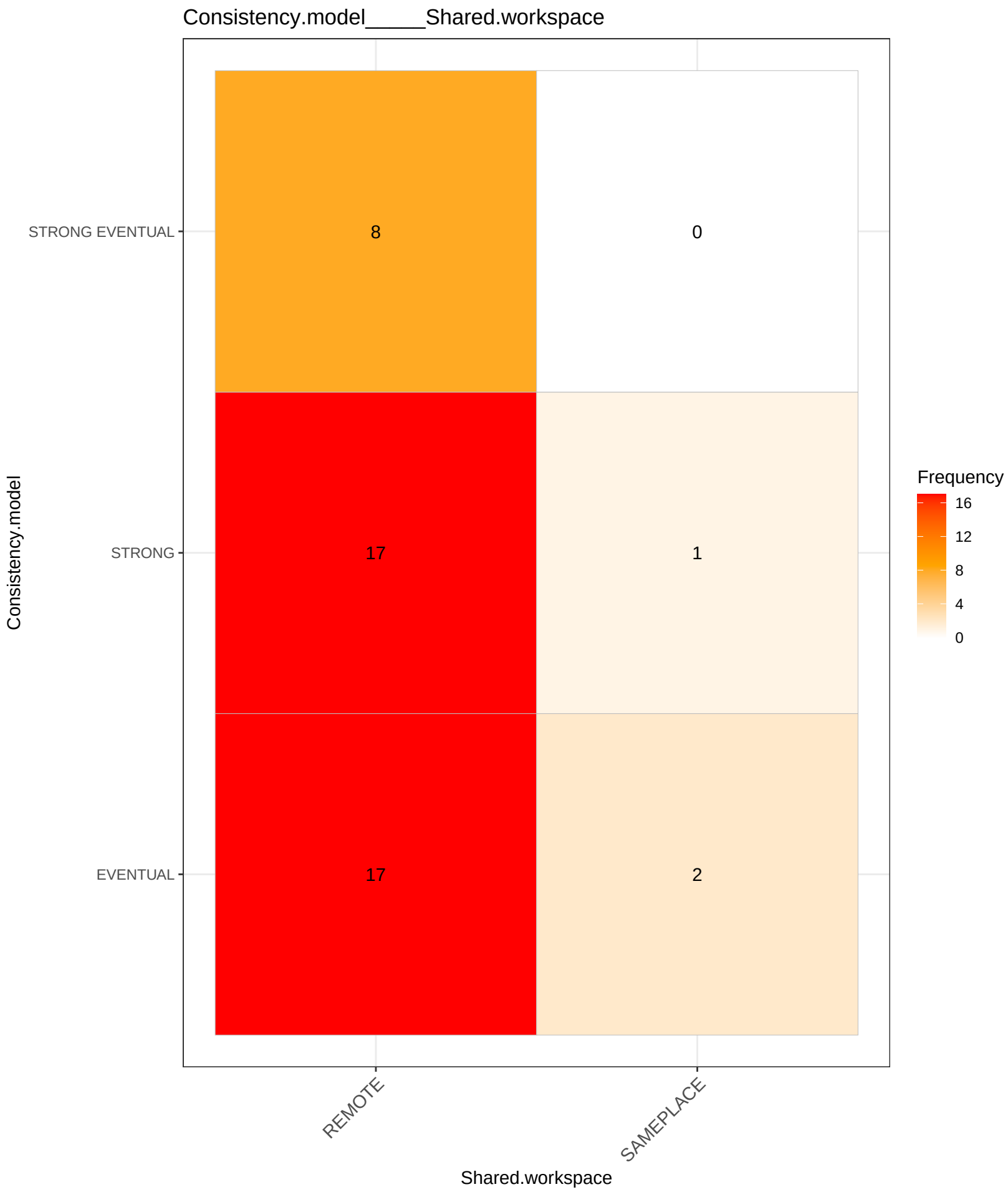

Consistency.model_____Diff.merge.domain
STRONG EVENTUAL
STRONG
EVENTUAL
Consistency.model
2
1
5
4
2
12
5
4
10
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0

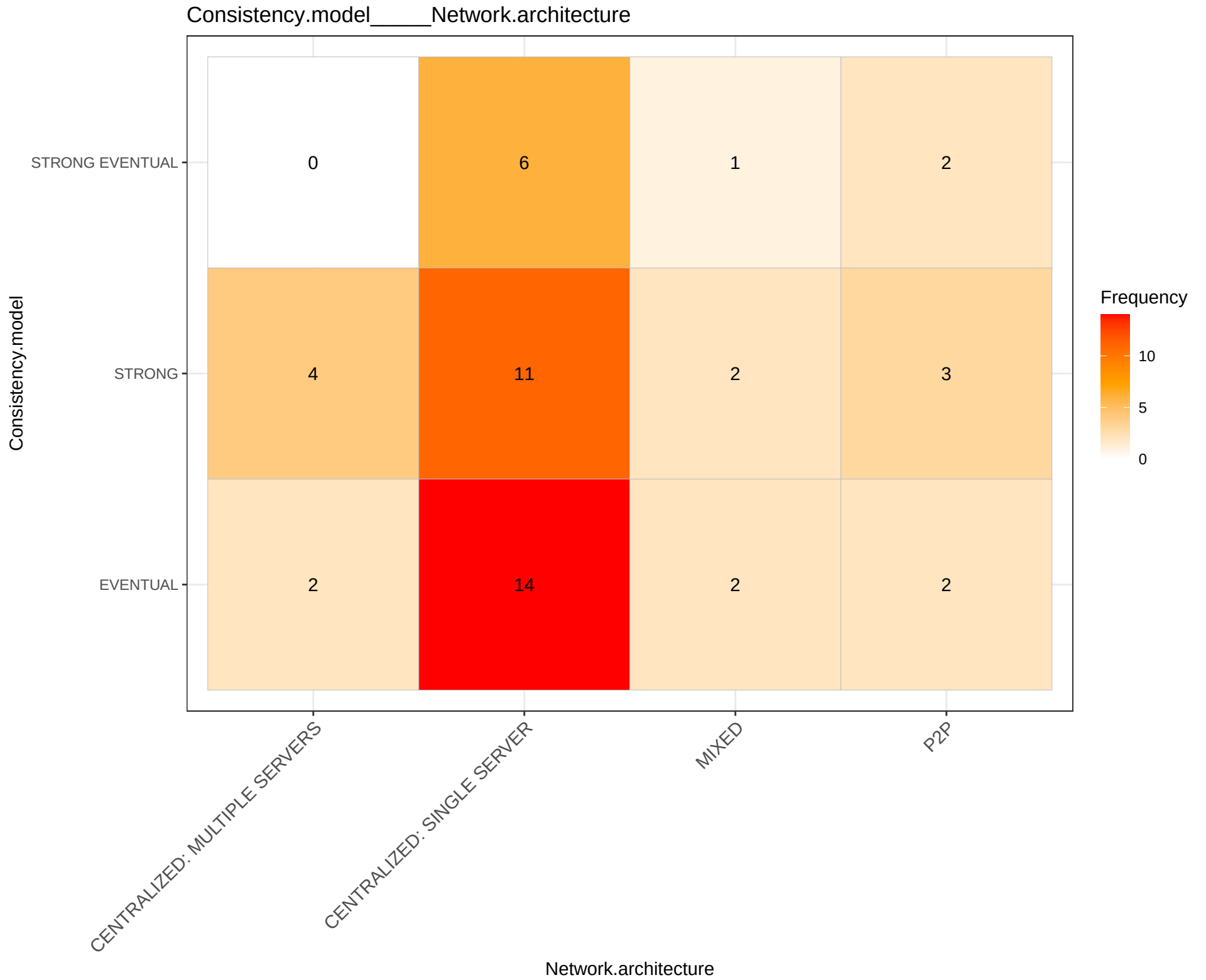

Consistency.model_____Conflict.mgmt.approach
STRONG EVENTUAL
STRONG
EVENTUAL
2
3
3
6
7
5
7
6
6
Consistency.model
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
4
2
0

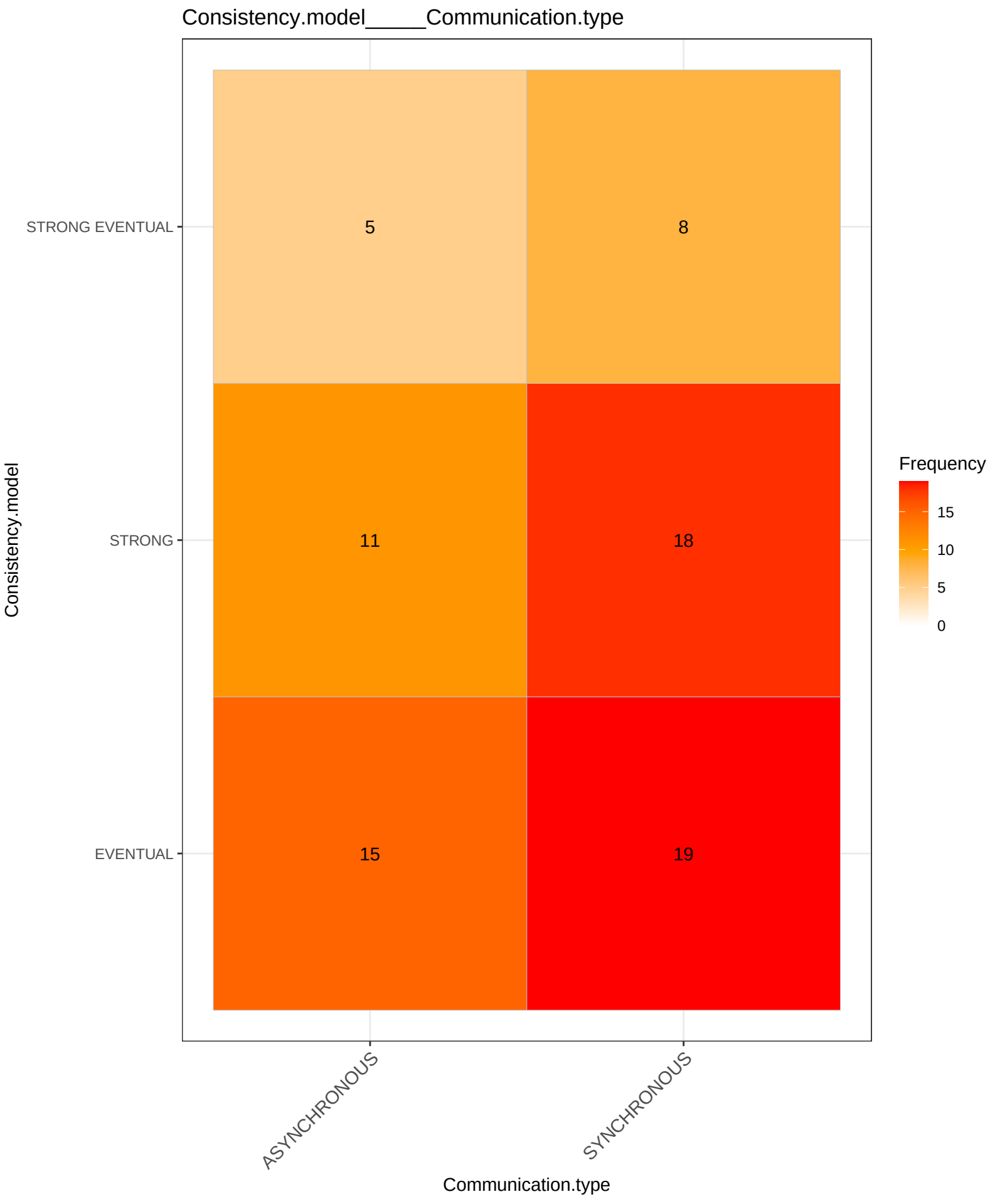

Consistency.model_____Conflict.detection
STRONG EVENTUAL
STRONG
EVENTUAL
4
4
1
7
11
3
10
9
5
Consistency.model
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10.0
7.5
5.0
2.5
0.0

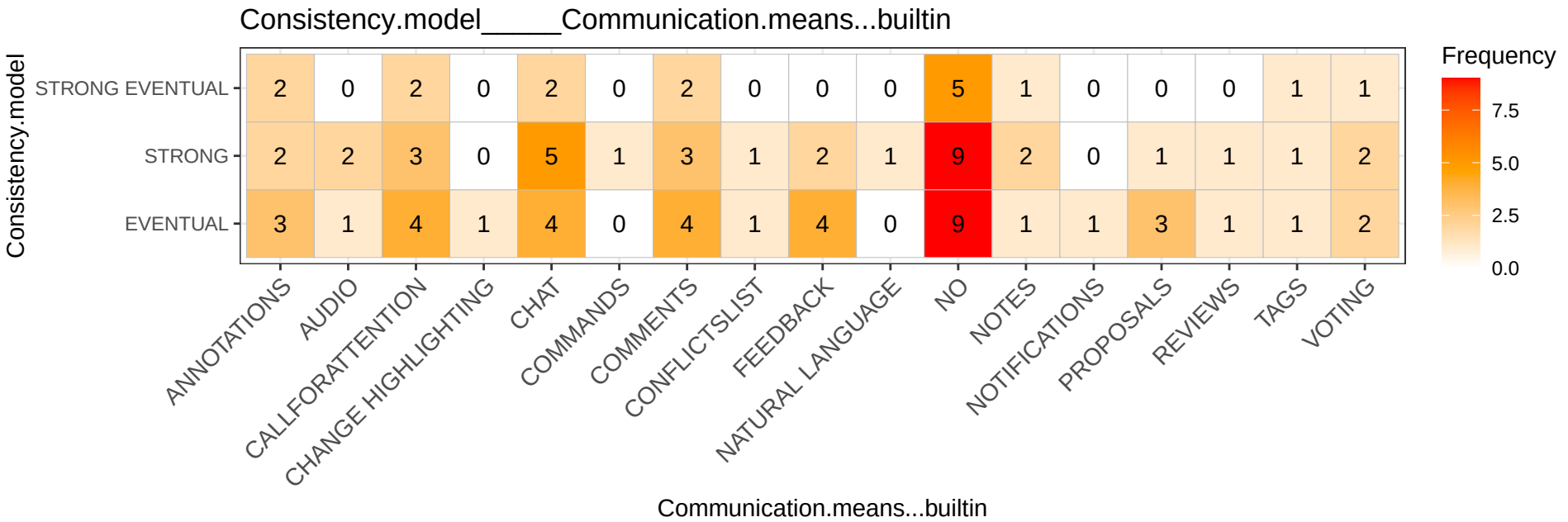

Consistency.model_____Conflict.awareness..User.
STRONG EVENTUAL
STRONG
EVENTUAL
Consistency.model
5
0
3
12
0
6
12
2
5
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
12
9
6
3
0

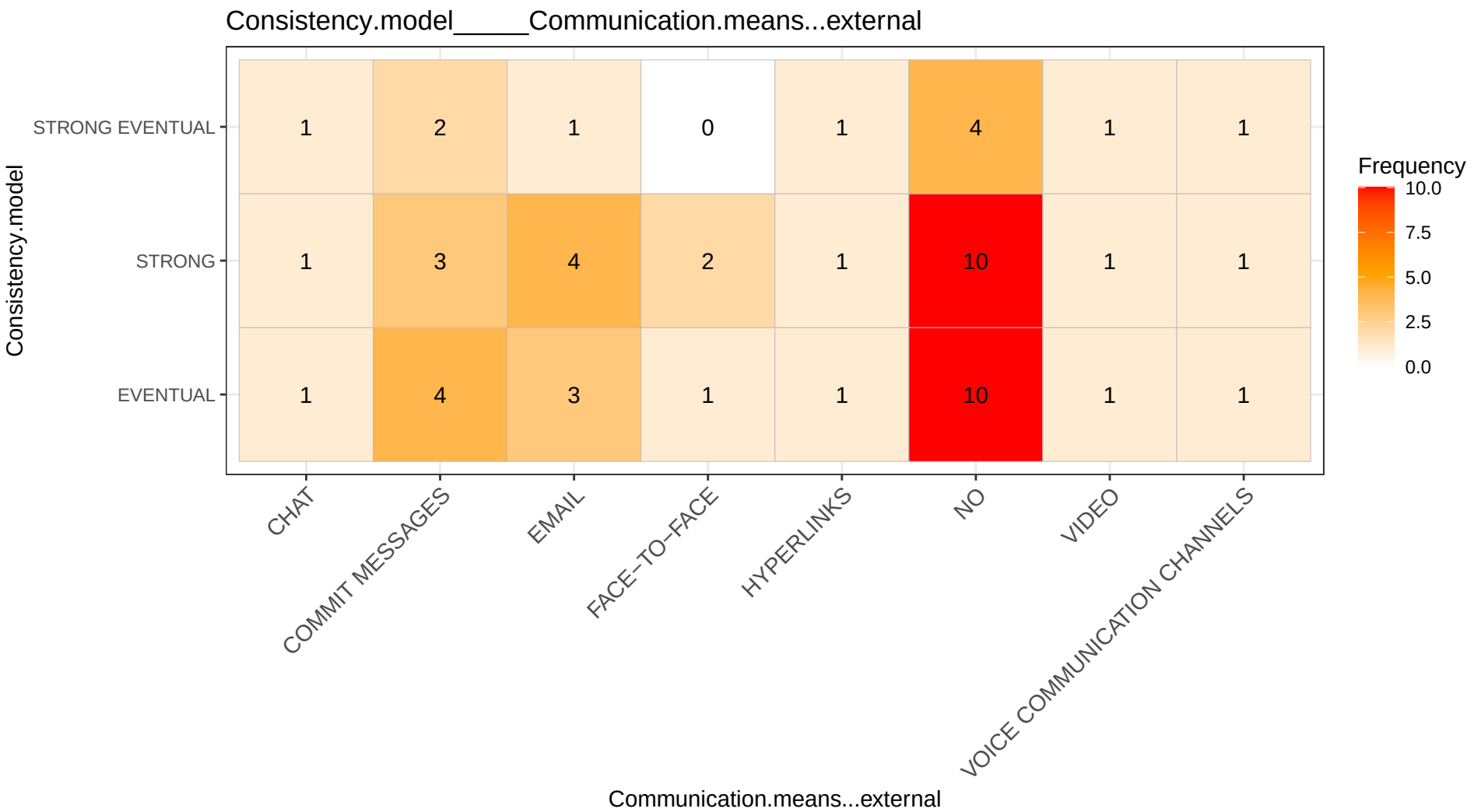

Consistency.model_____Conflict.resolution.support
STRONG EVENTUAL
STRONG
EVENTUAL
2
2
5
4
6
9
6
5
9
MANUAL
NO
SEMIAUTOMATED
Consistency.model
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

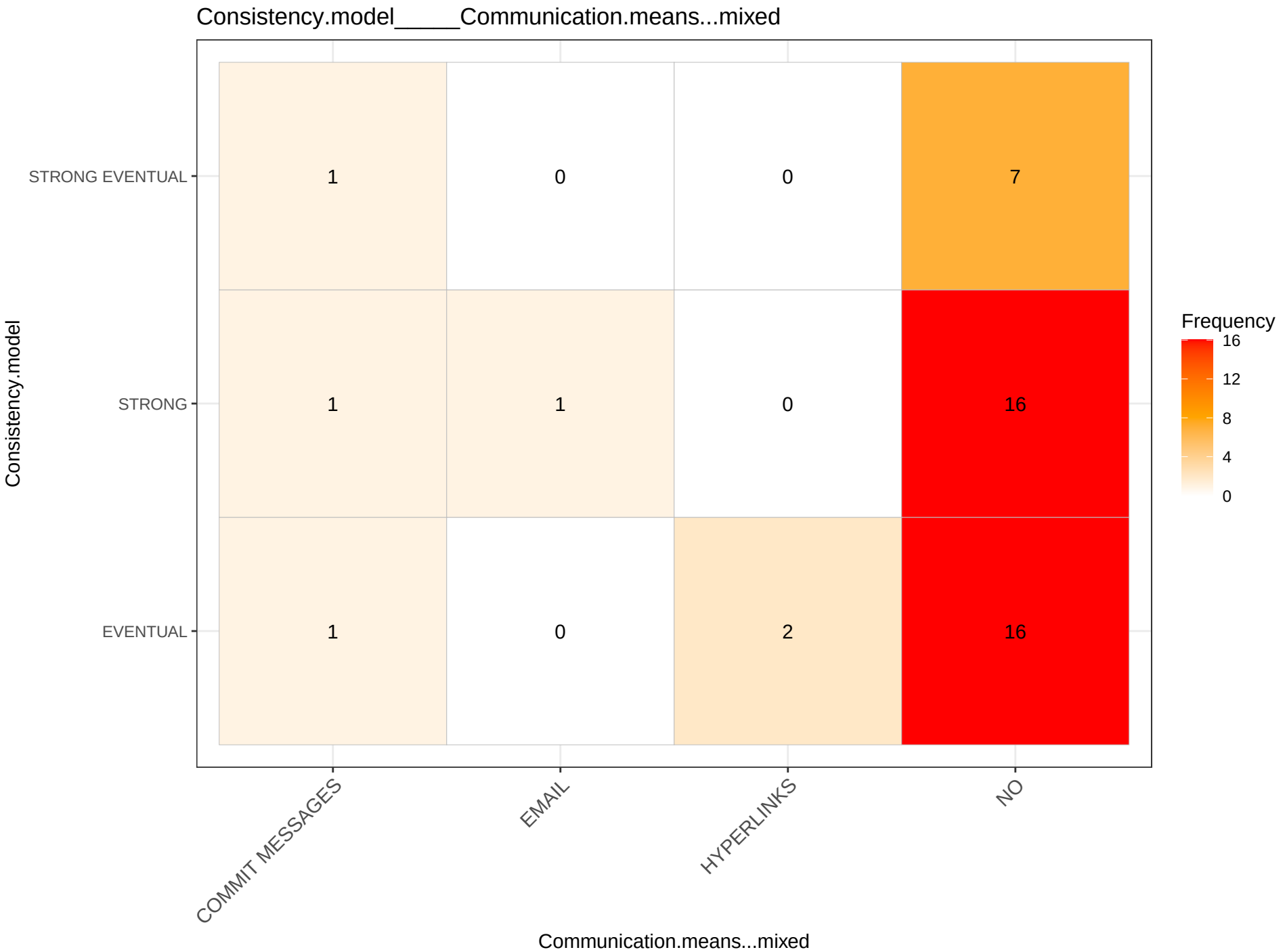

Consistency.model_____Shared.workspace
STRONG EVENTUAL
STRONG
EVENTUAL
8
0
17
1
17
2
Consistency.model
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

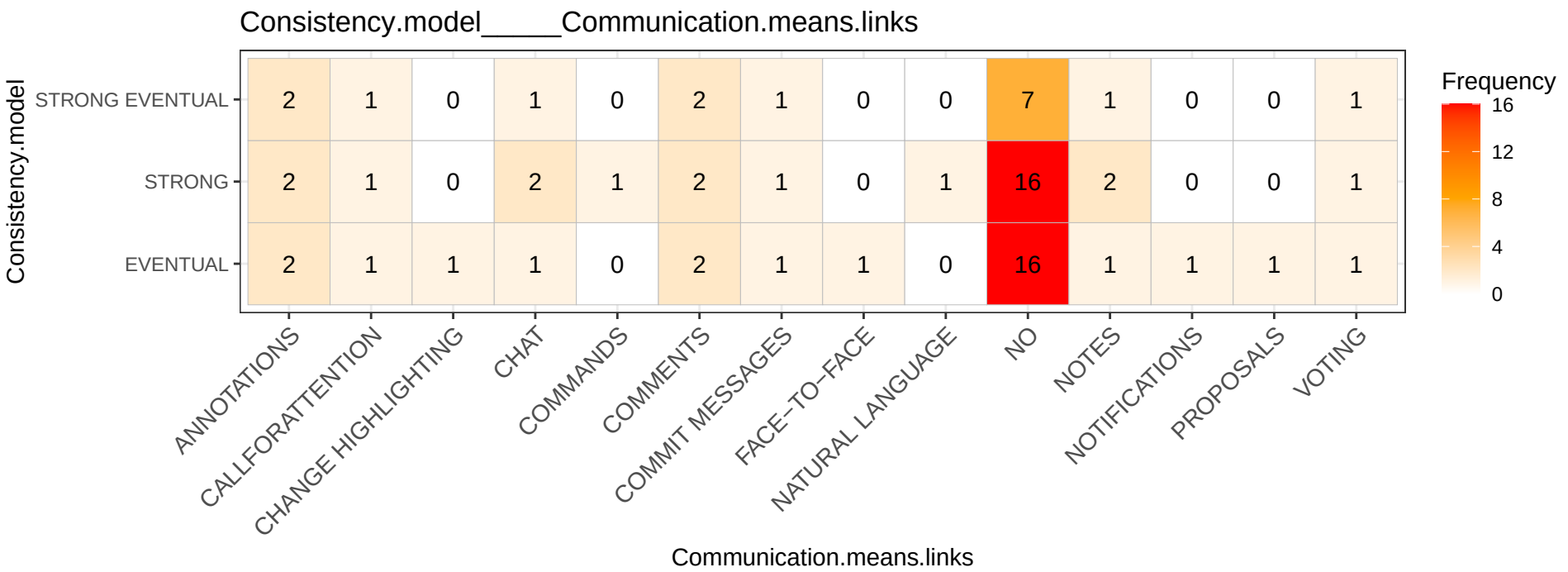

Consistency.model_____Network.architecture
STRONG EVENTUAL
STRONG
EVENTUAL
0
6
1
2
4
11
2
3
2
14
2
2
Consistency.model
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10
5
0

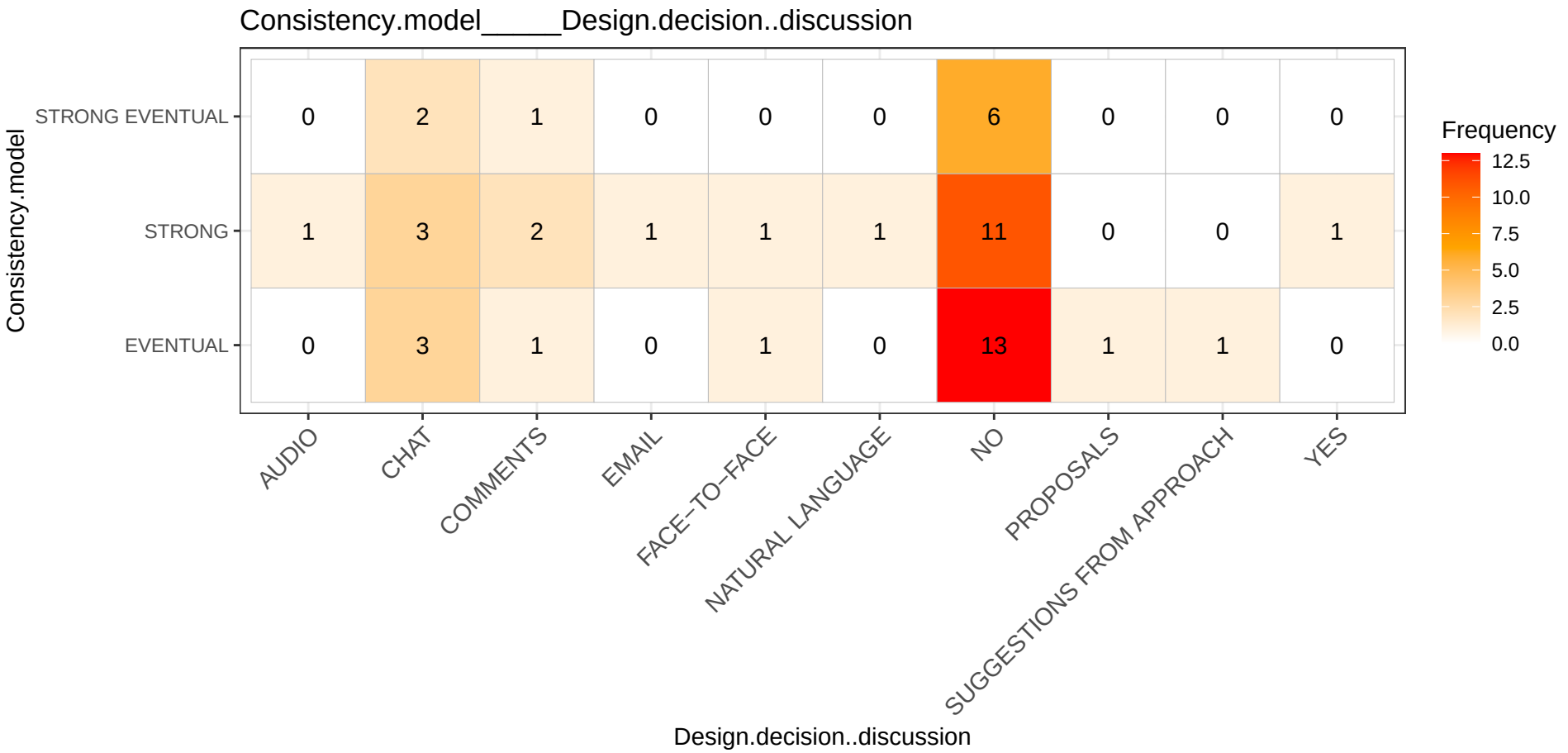

Consistency.model_____Communication.type
STRONG EVENTUAL
STRONG
EVENTUAL
5
8
11
18
15
19
Consistency.model
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

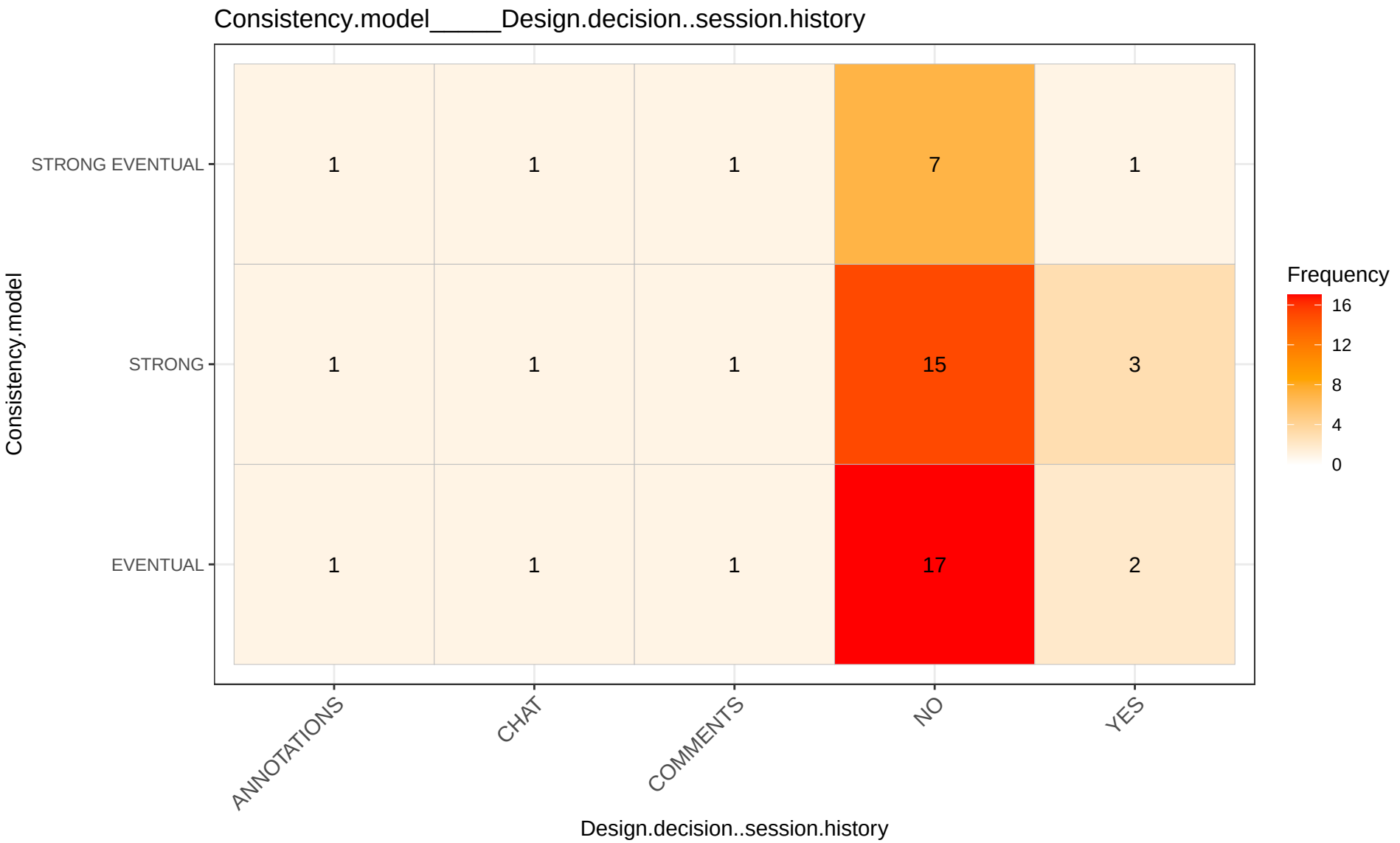

Consistency.model_____Communication.means...builtin
Consistency.model
STRONG EVENTUAL
STRONG
EVENTUAL
2 0 2 0 2 0 2 0 0 0 5 1 0 0 0 1 1
2 2 3 0 5 1 3 1 2 1 9 2 0 1 1 1 2
3 1 4 1 4 0 4 1 4 0 9 1 1 3 1 1 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

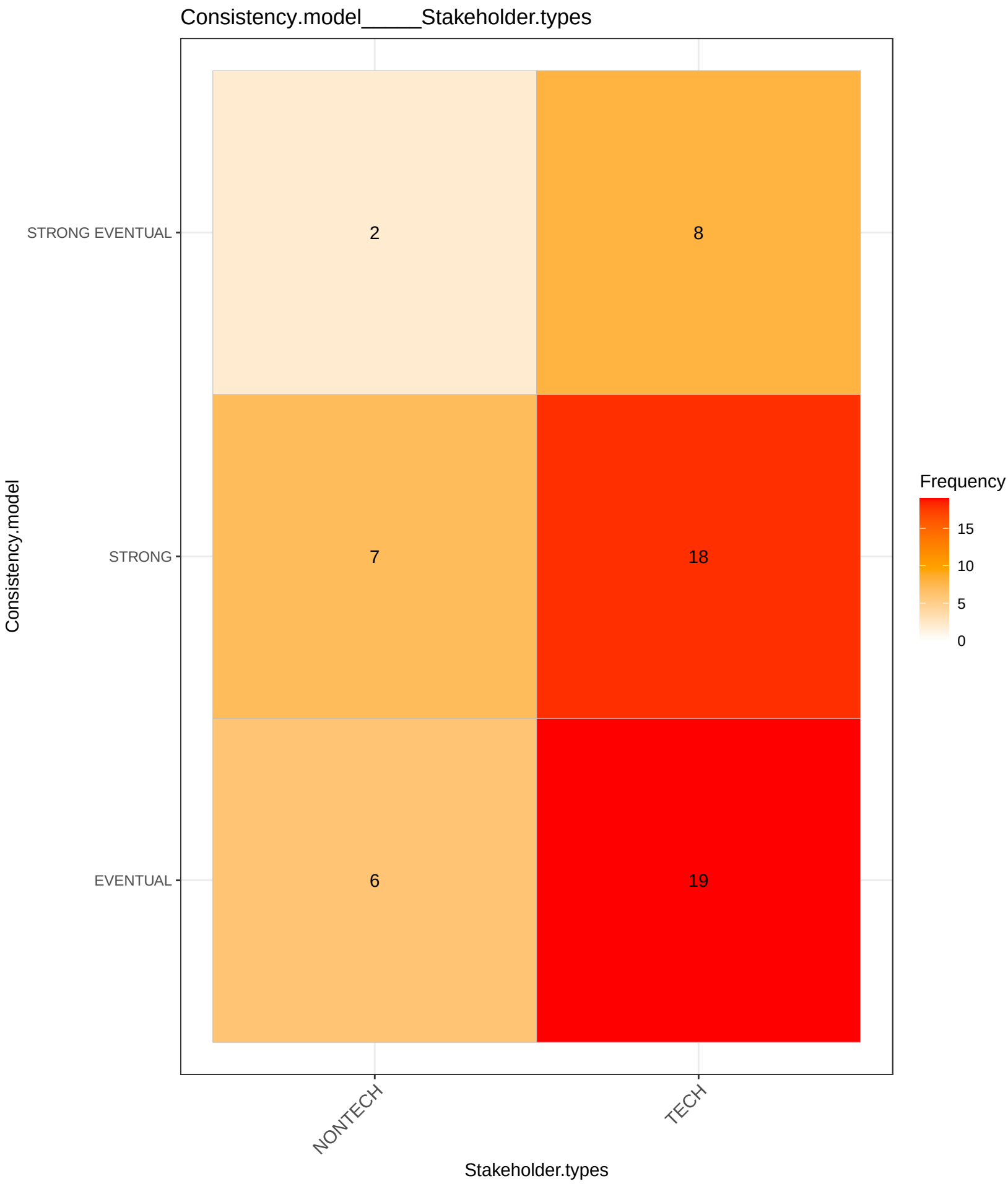

Consistency.model_____Communication.means...external
Consistency.model
STRONG EVENTUAL
STRONG
EVENTUAL
1
2
1
0
1
4
1
1
1
3
4
2
1
10
1
1
1
4
3
1
1
10
1
1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10.0
7.5
5.0
2.5
0.0

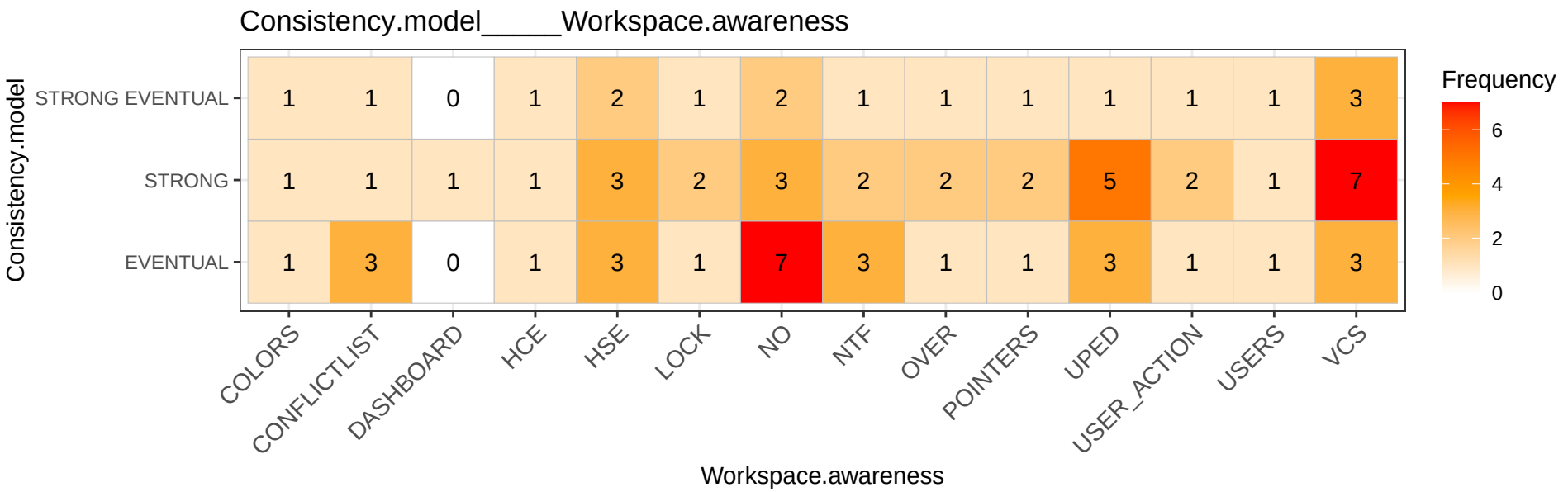

Consistency.model_____Communication.means...mixed
STRONG EVENTUAL
STRONG
EVENTUAL
1
0
0
7
1
1
0
16
1
0
2
16
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Consistency.model
Frequency
16
12
8
4
0

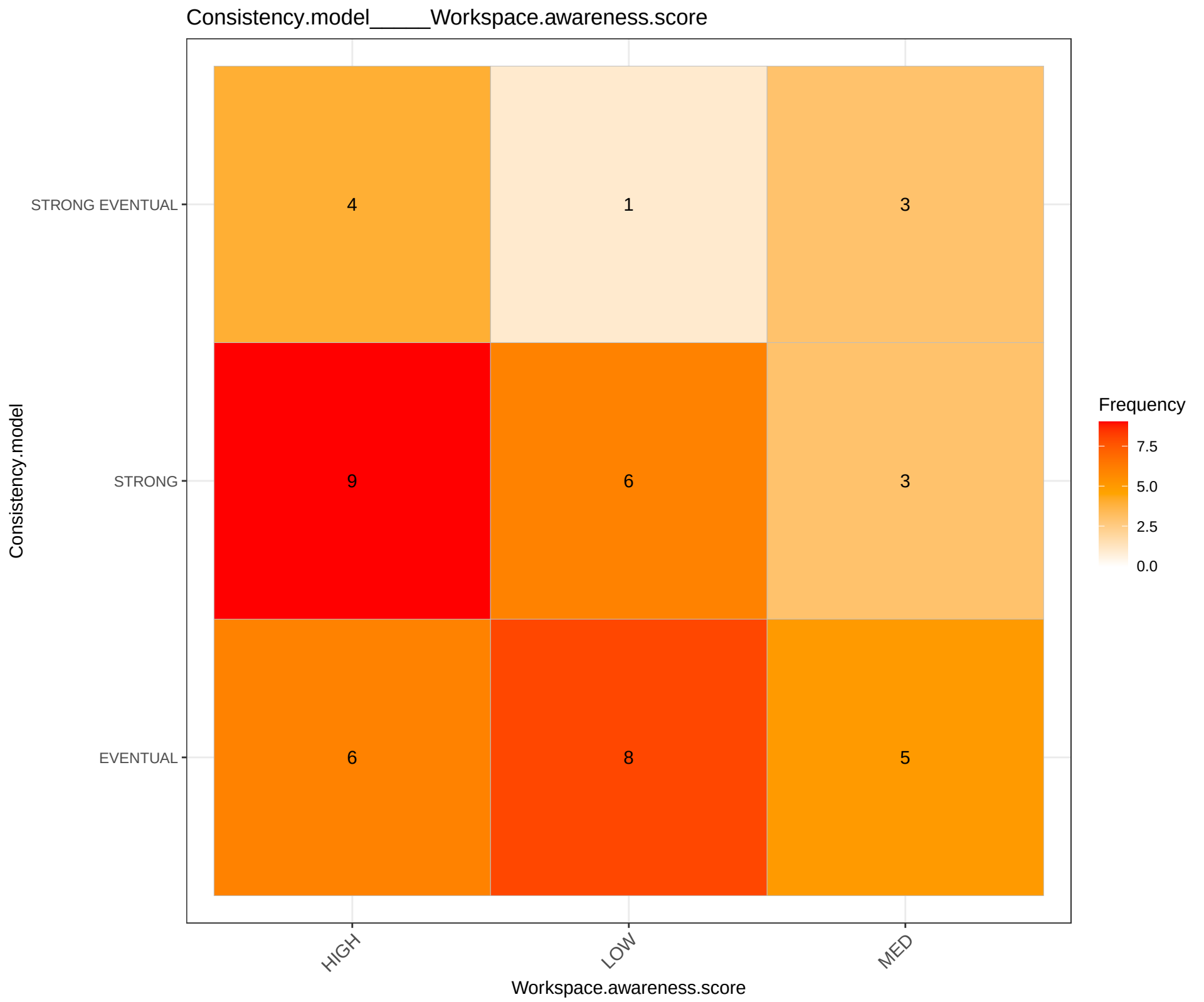

Consistency.model_____Communication.means.links
Consistency.model
STRONG EVENTUAL
STRONG
EVENTUAL
2 1 0 1 0 2 1 0 0 7 1 0 0 1
2 1 0 2 1 2 1 0 1 16 2 0 0 1
2 1 1 1 0 2 1 1 0 16 1 1 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0

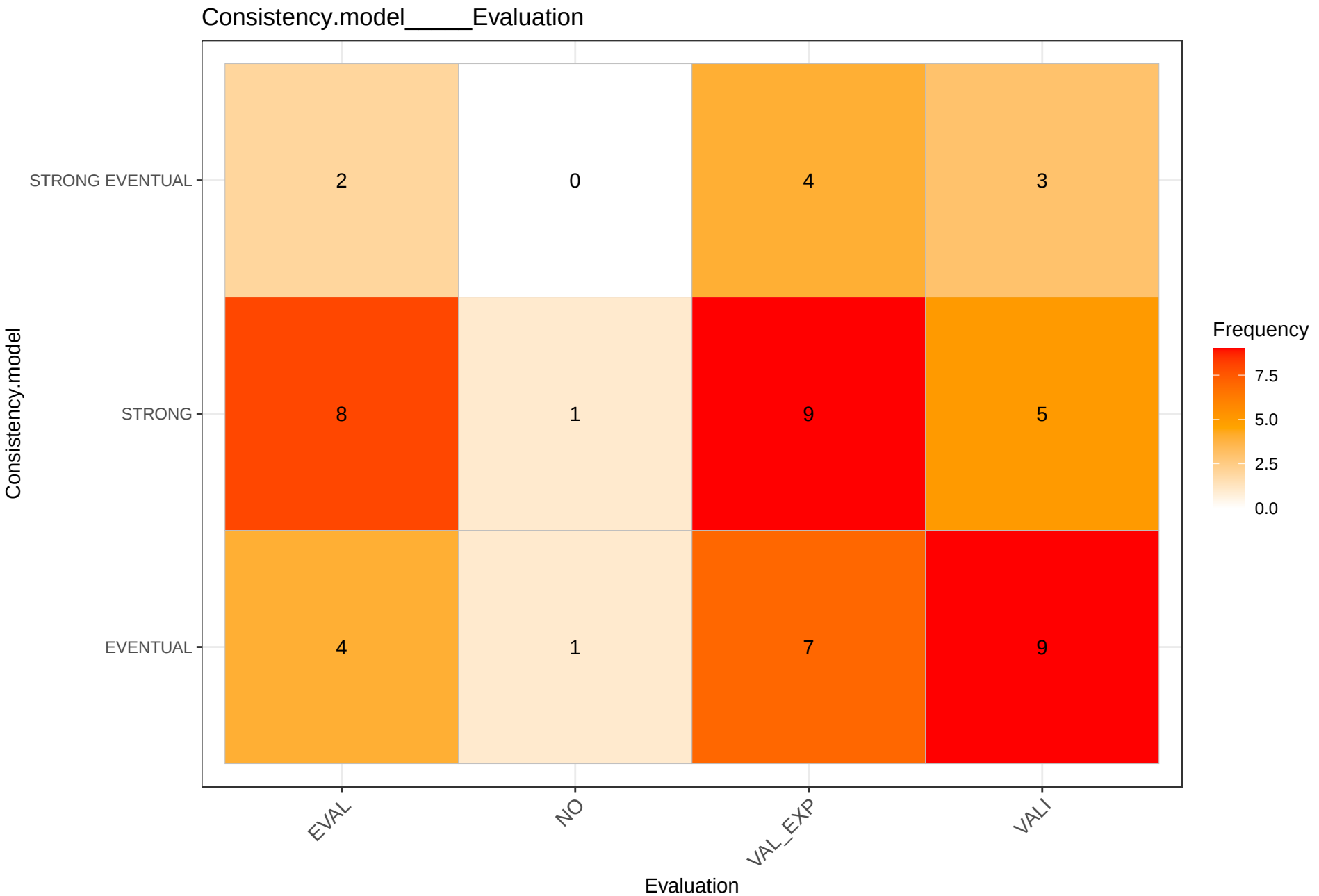

Consistency.model_____Design.decision..discussion
Consistency.model
STRONG EVENTUAL
STRONG
EVENTUAL
0 2 1 0 0 0 6 0 0 0
1 3 2 1 1 1 11 0 0 1
0 3 1 0 1 0 13 1 1 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

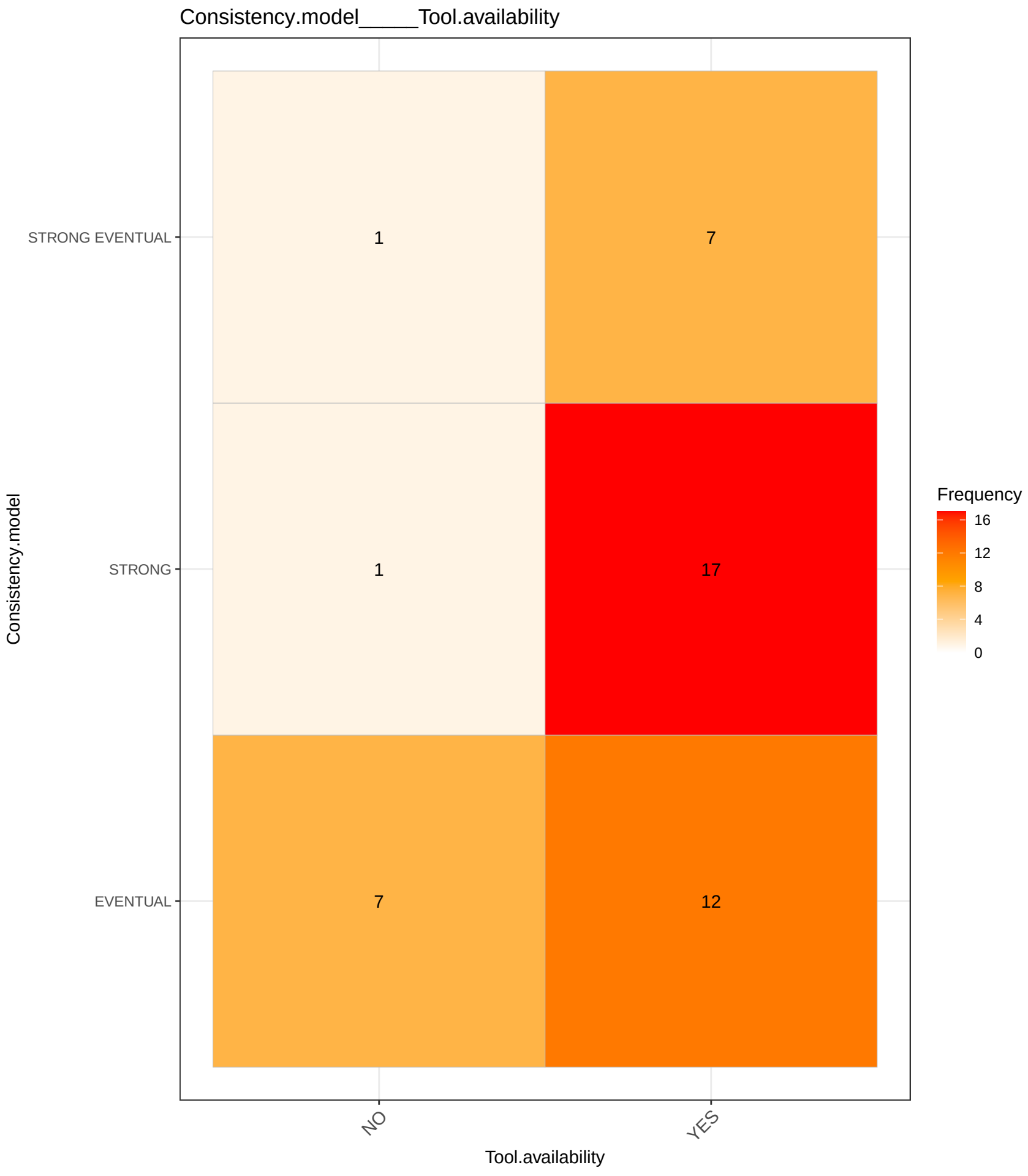

Consistency.model_____Design.decision..session.history
STRONG EVENTUAL
STRONG
EVENTUAL
1
1
1
7
1
1
1
1
15
3
1
1
1
17
2
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Consistency.model
Design.decision..session.history
Frequency
16
12
8
4
0

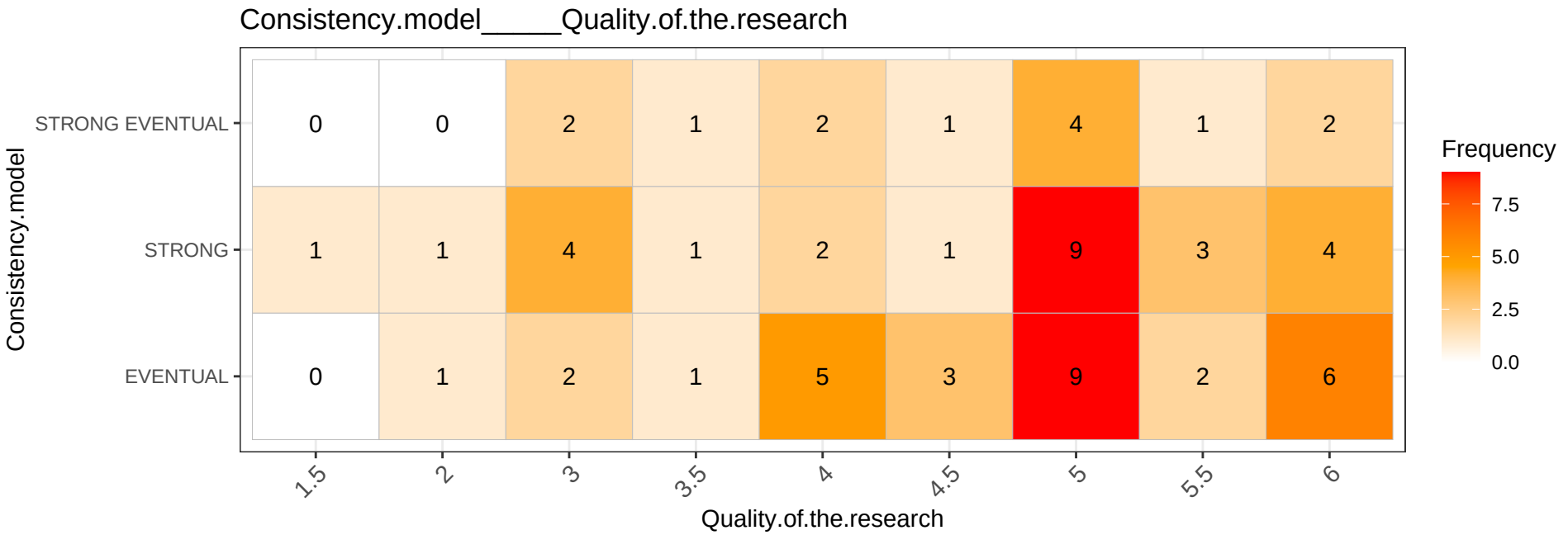

Consistency.model_____Stakeholder.types
STRONG EVENTUAL
STRONG
EVENTUAL
2
8
7
18
6
19
Consistency.model
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

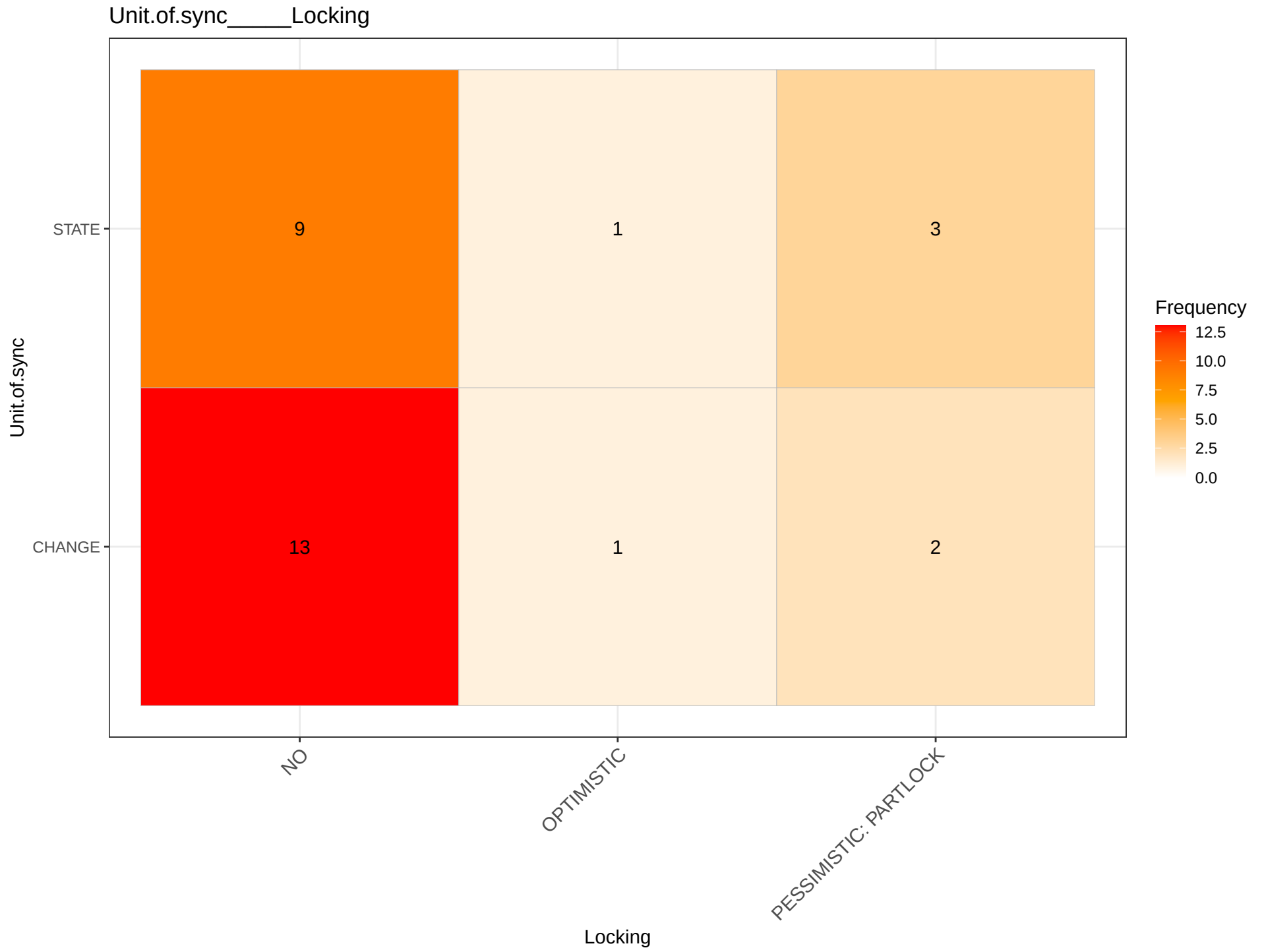

Consistency.model_____Workspace.awareness
Consistency.model
STRONG EVENTUAL
STRONG
EVENTUAL
1 1 0 1 2 1 2 1 1 1 1 1 1 3
1 1 1 1 3 2 3 2 2 2 5 2 1 7
1 3 0 1 3 1 7 3 1 1 3 1 1 3
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0

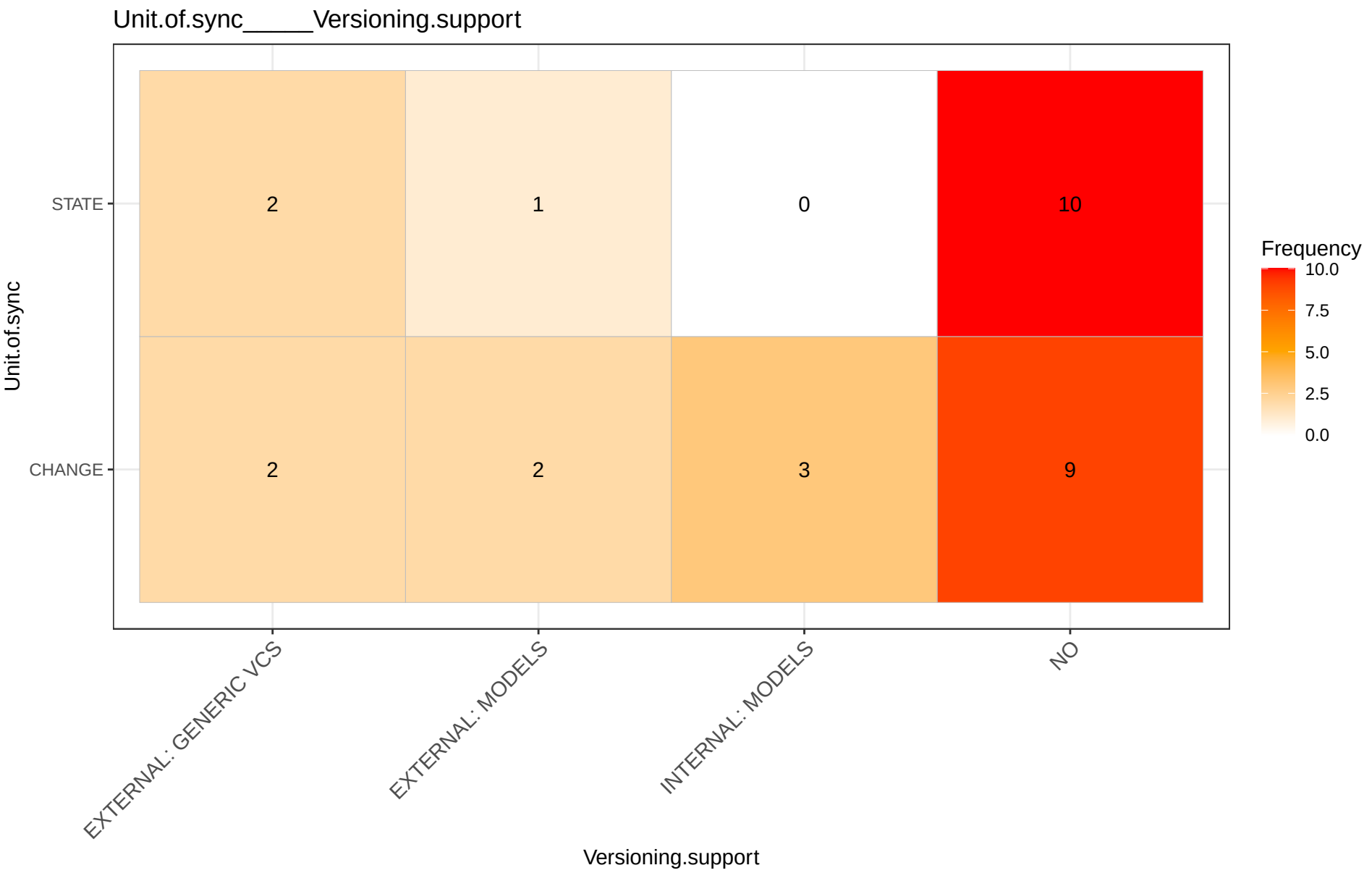

Consistency.model_____Workspace.awareness.score
STRONG EVENTUAL
STRONG
EVENTUAL
4
1
3
9
6
3
6
8
5
HIGH
LOW
MED
Workspace.awareness.score
Consistency.model
Frequency
7.5
5.0
2.5
0.0

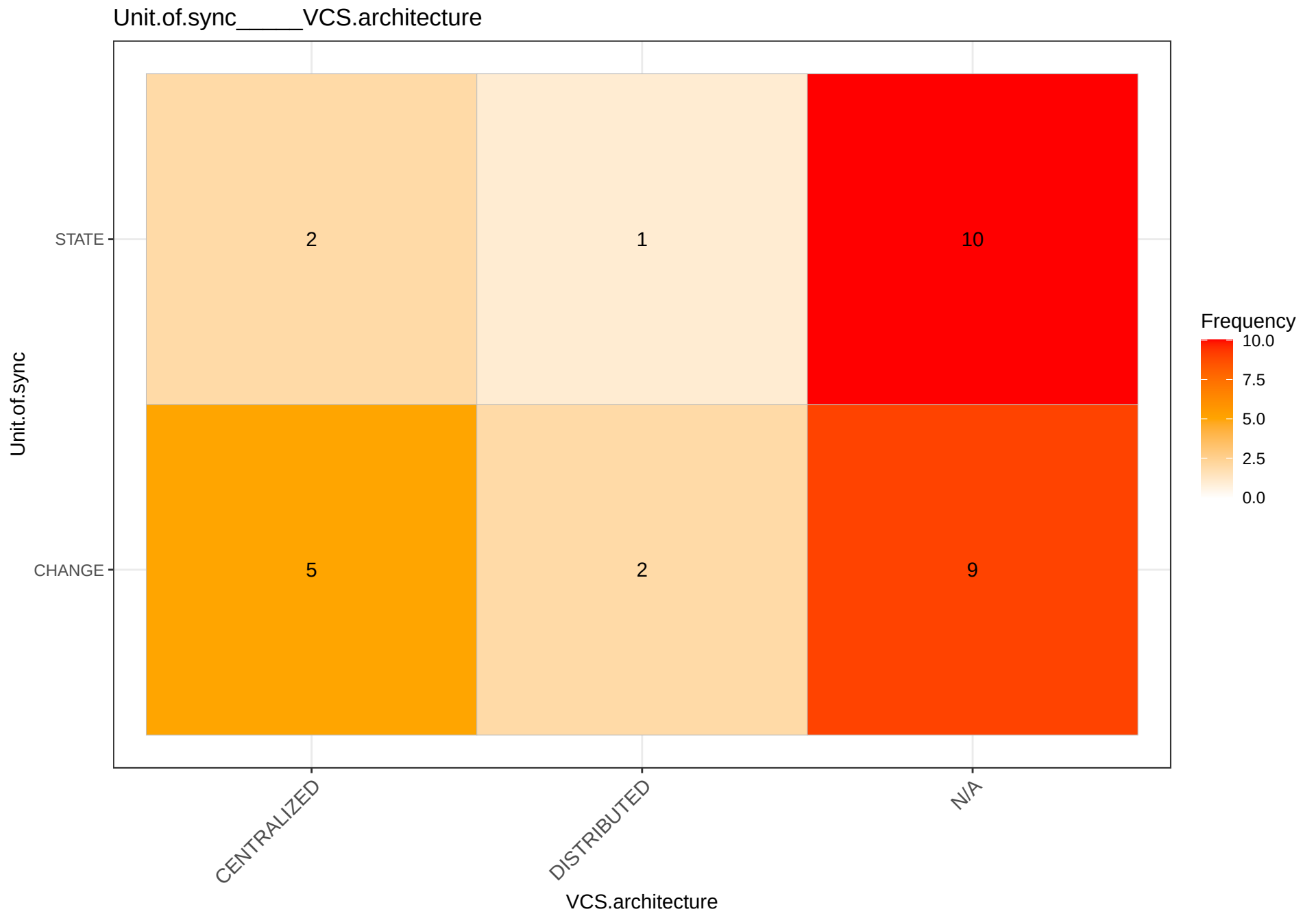

Consistency.model_____Evaluation
STRONG EVENTUAL
STRONG
EVENTUAL
2
0
4
3
8
1
9
5
4
1
7
9
EVAL
NO
VAL_EXP
VALI
Evaluation
Consistency.model
Frequency
7.5
5.0
2.5
0.0

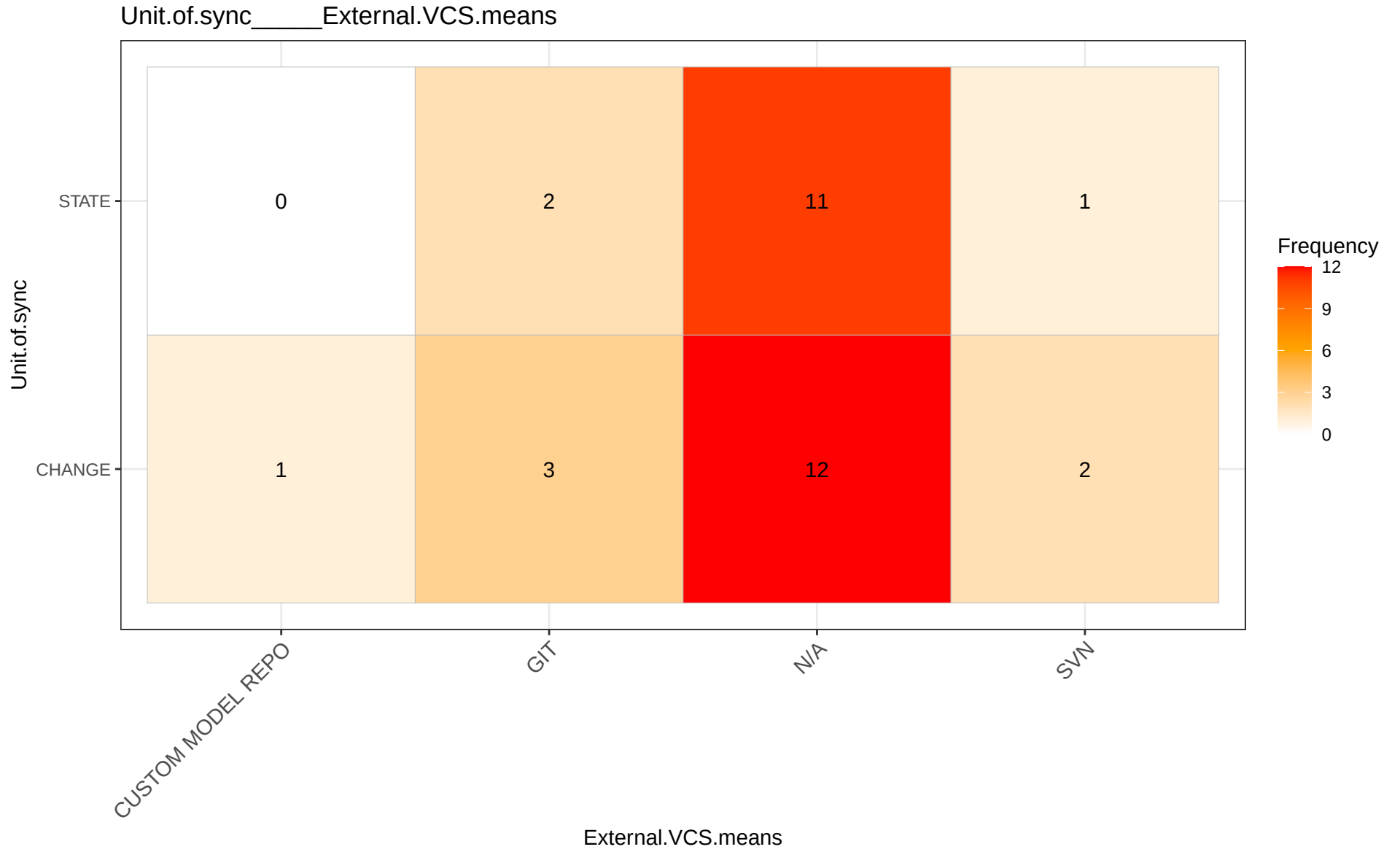

Consistency.model_____Tool.availability
STRONG EVENTUAL
STRONG
EVENTUAL
1
7
1
17
7
12
Consistency.model
NO
YES
Tool.availability
Frequency
16
12
8
4
0

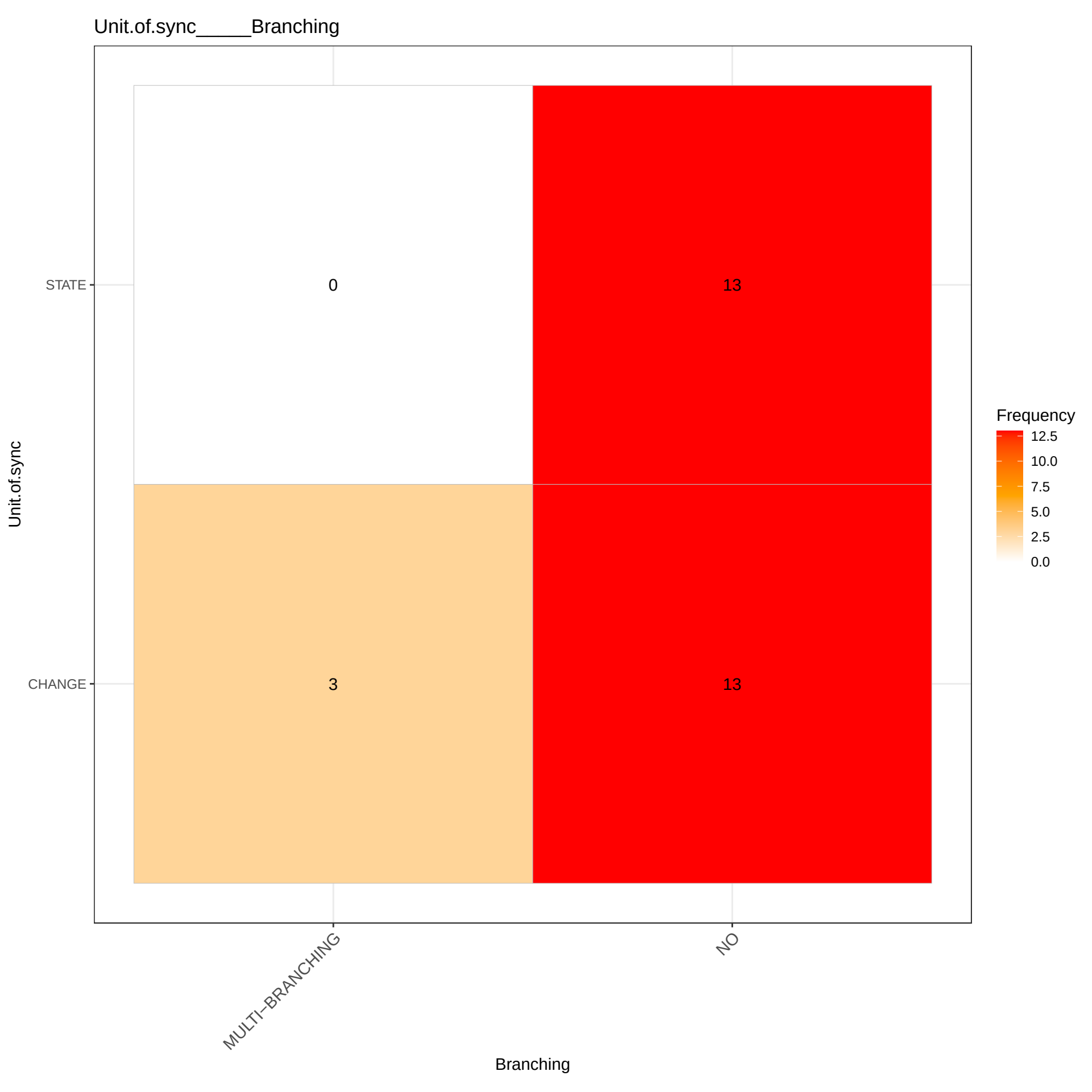

Consistency.model_____Quality.of.the.research
STRONG EVENTUAL
STRONG
EVENTUAL
Consistency.model
0 0 2 1 2 1 4 1 2
1 1 4 1 2 1 9 3 4
0 1 2 1 5 3 9 2 6
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
7.5
5.0
2.5
0.0

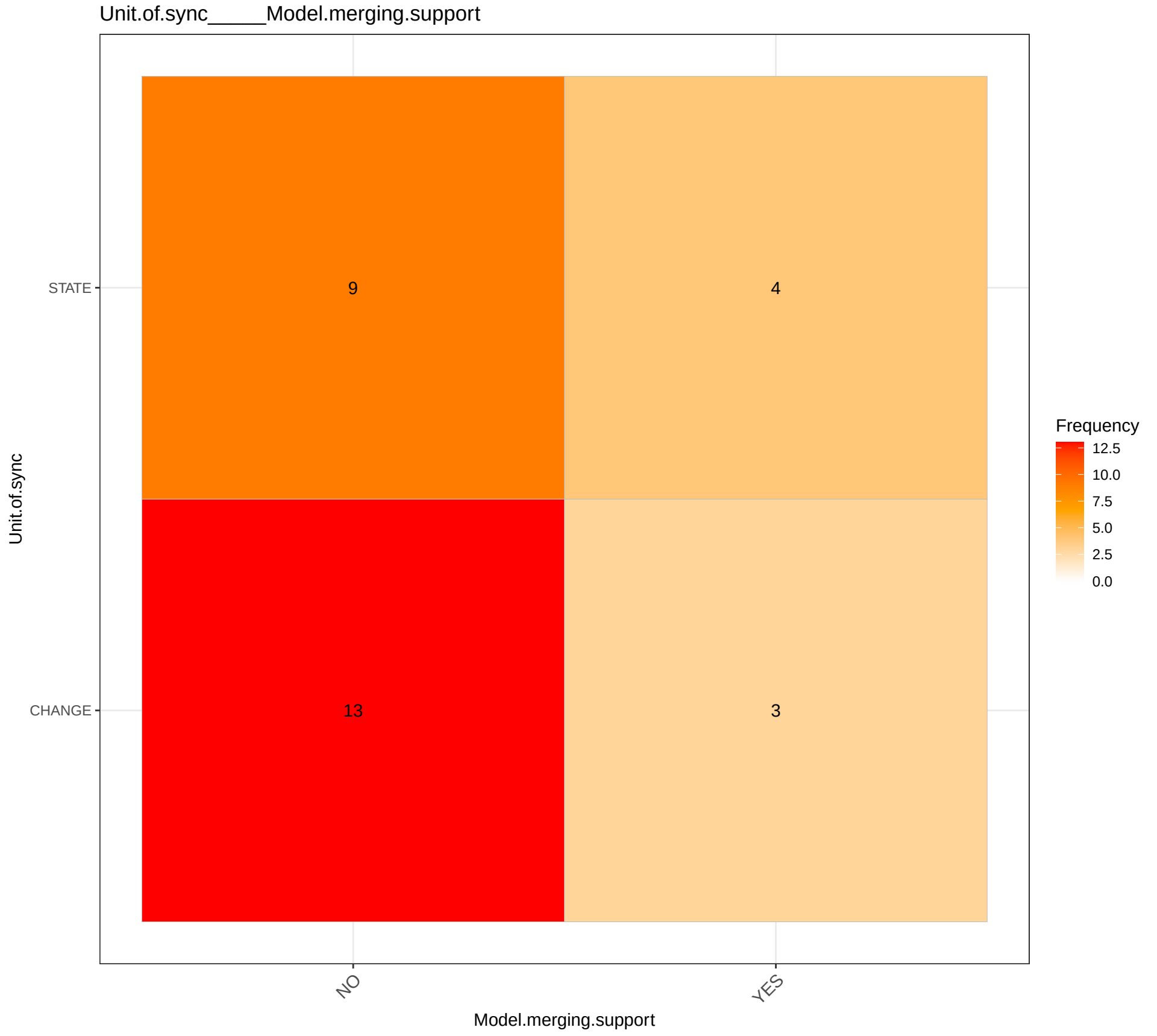

Unit.of.sync_____Locking
STATE
CHANGE
9
1
3
13
1
2
Unit.of.sync
NO
OPTIMISTIC
PESSIMISTIC: PARTLOCK
Locking
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

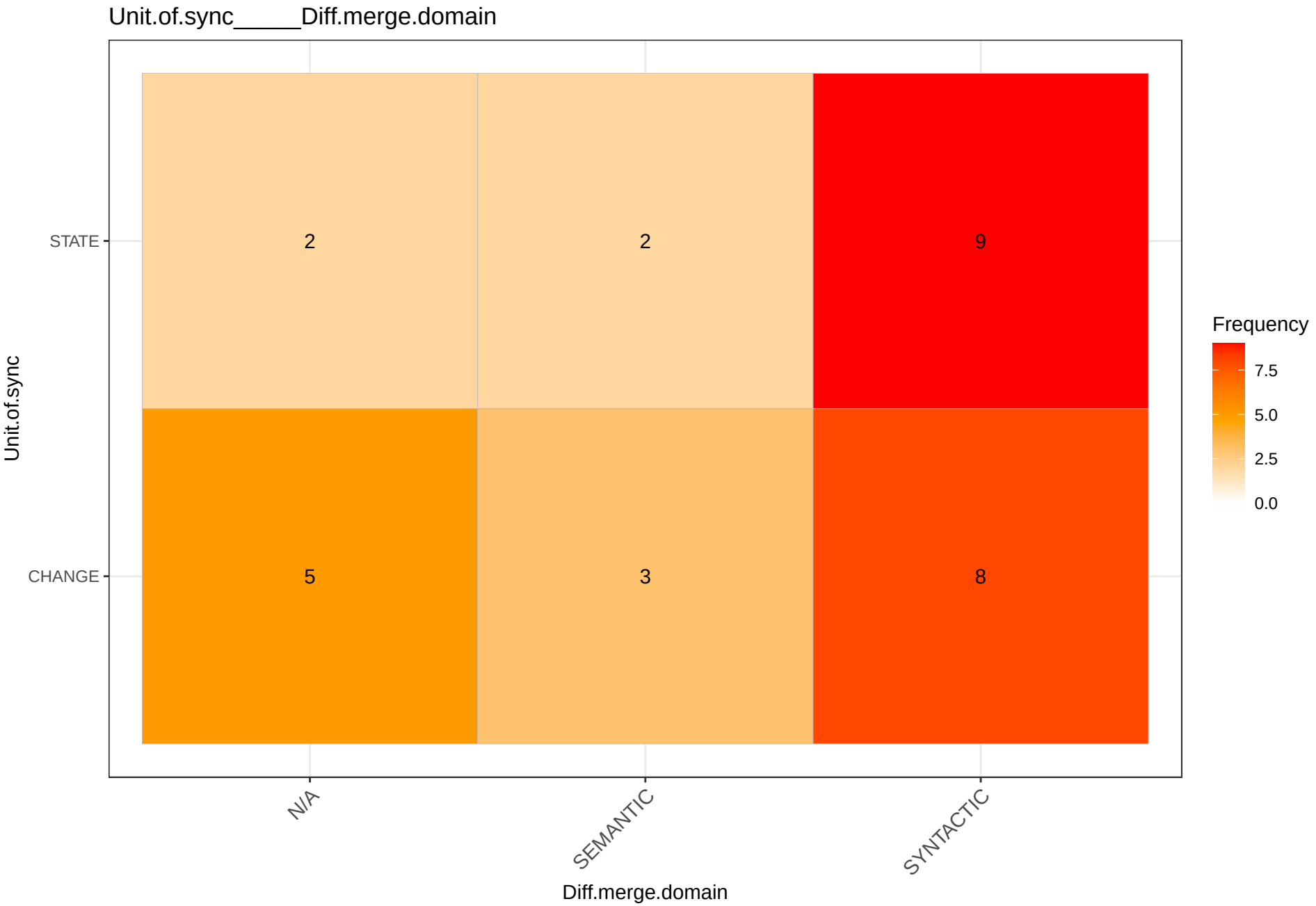

Unit.of.sync_____Versioning.support
STATE
CHANGE
Unit.of.sync
2
1
0
10
2
2
3
9
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
10.0
7.5
5.0
2.5
0.0

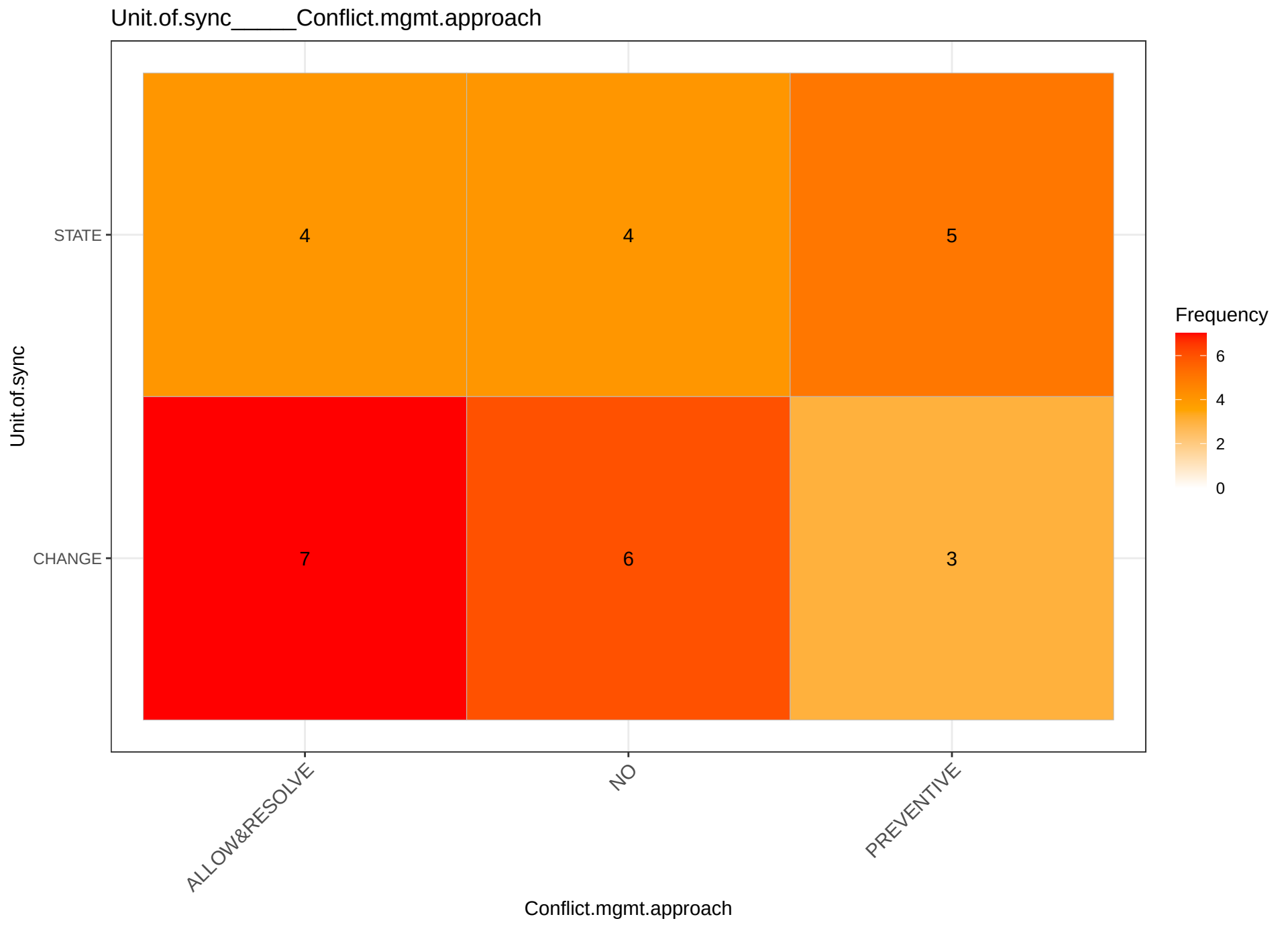

Unit.of.sync_____VCS.architecture
STATE
CHANGE
Unit.of.sync
2
1
10
5
2
9
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

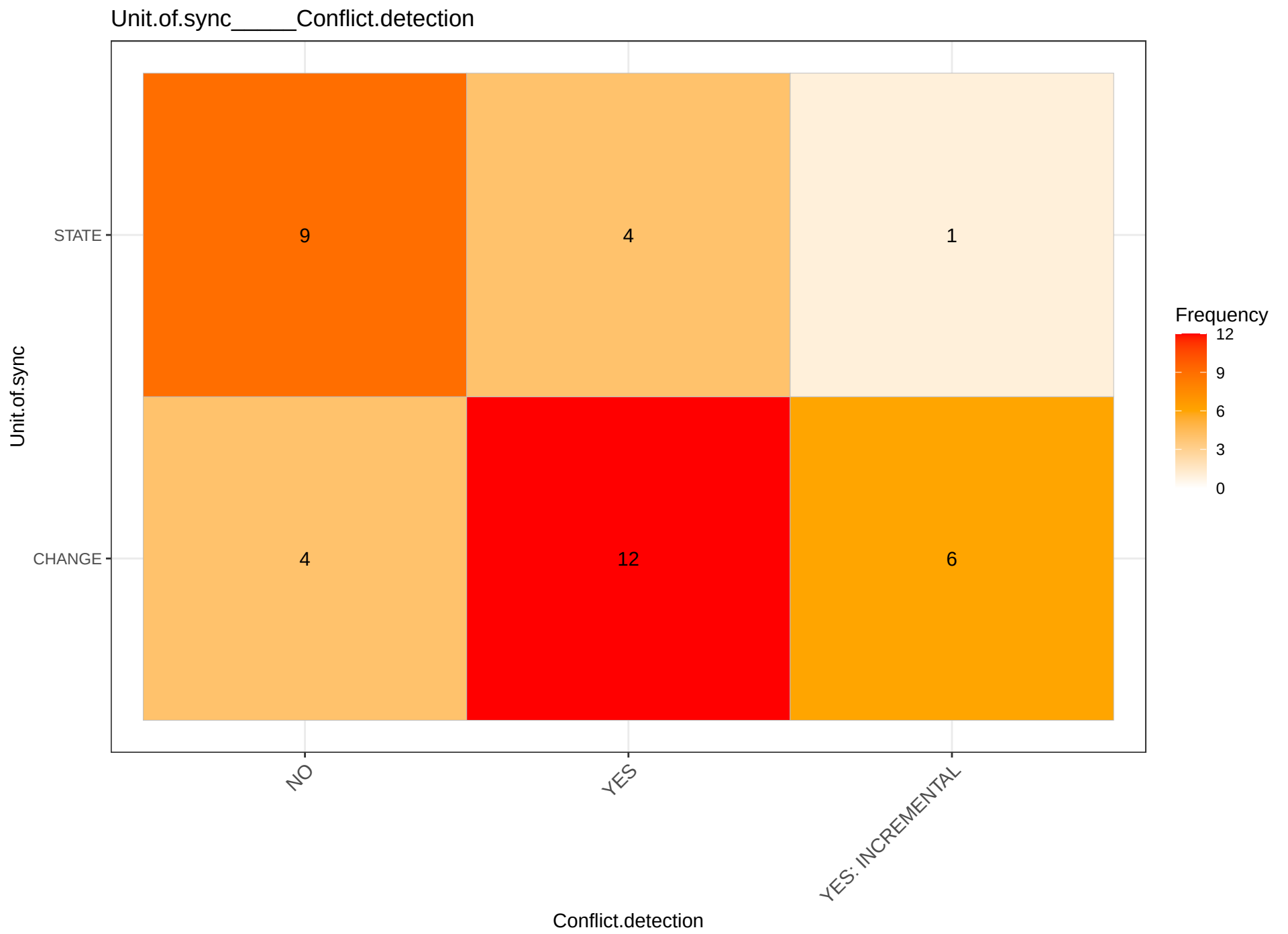

Unit.of.sync_____External.VCS.means
STATE
CHANGE
0
2
11
1
1
3
12
2
Unit.of.sync
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
12
9
6
3
0

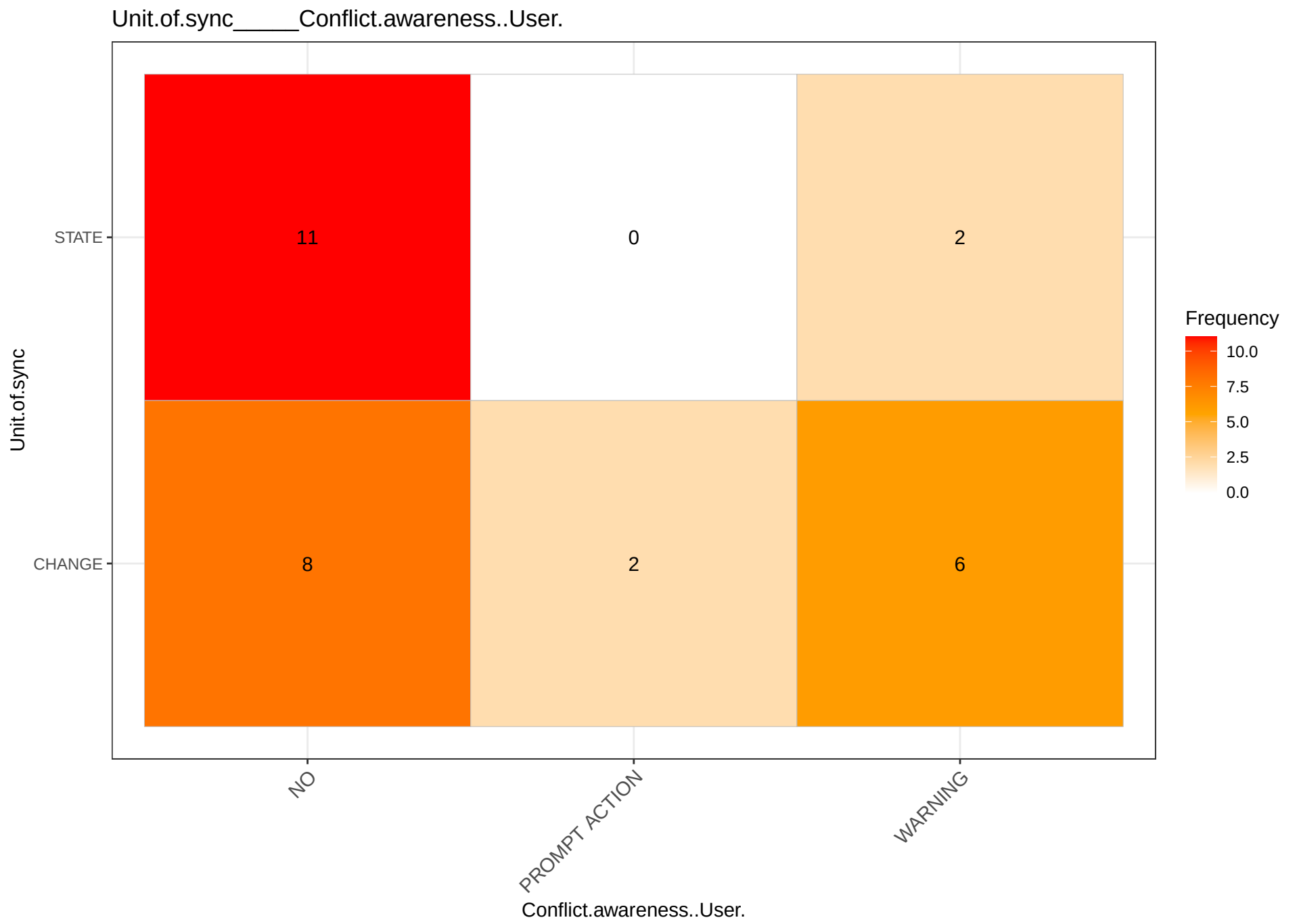

Unit.of.sync_____Branching
STATE
CHANGE
0
13
3
13
Unit.of.sync
MULTI-BRANCHING
NO
Branching
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

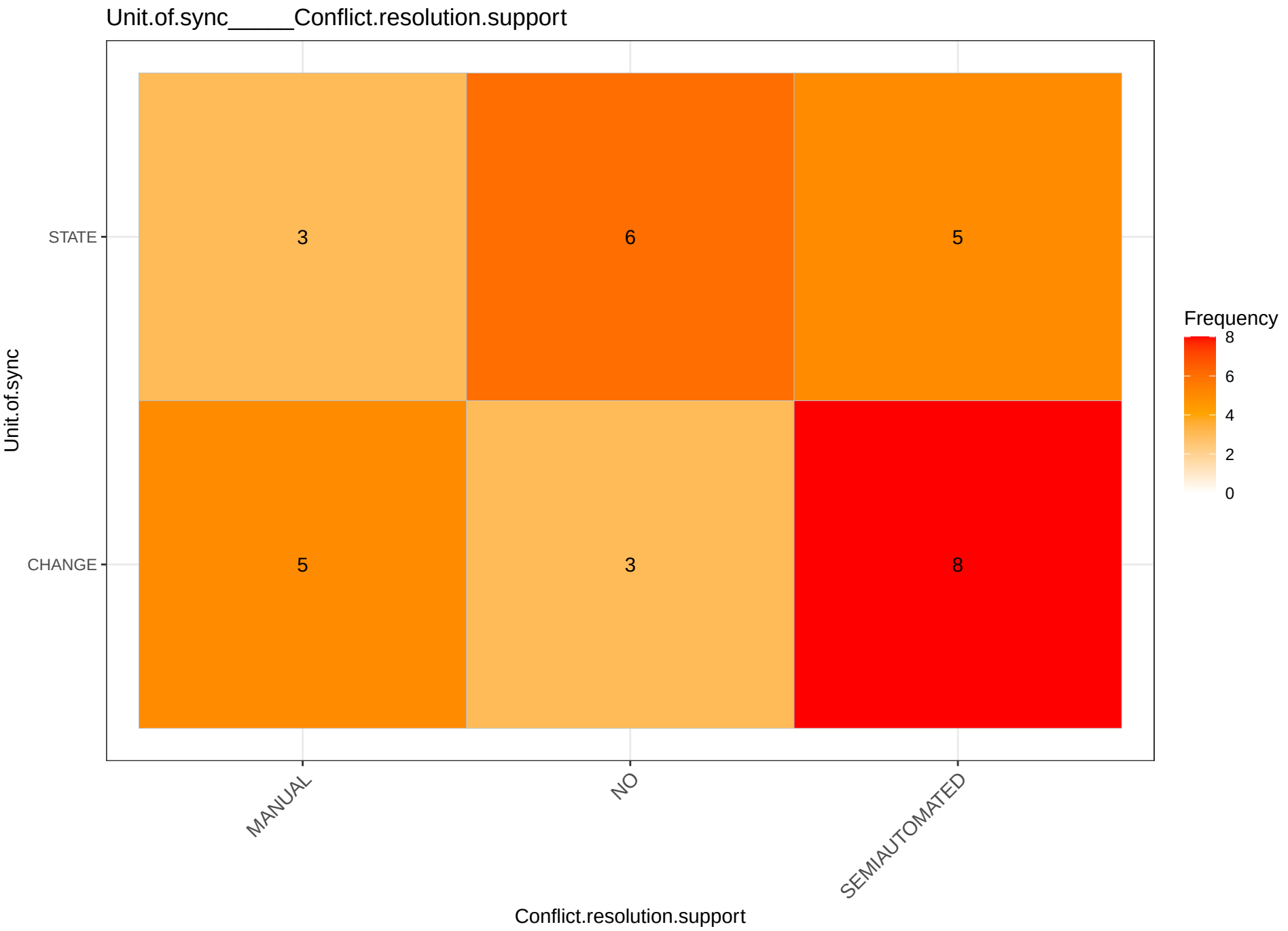

Unit.of.sync_____Model.merging.support
STATE
CHANGE
9
4
13
3
Unit.of.sync
NO
YES
Model.merging.support
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

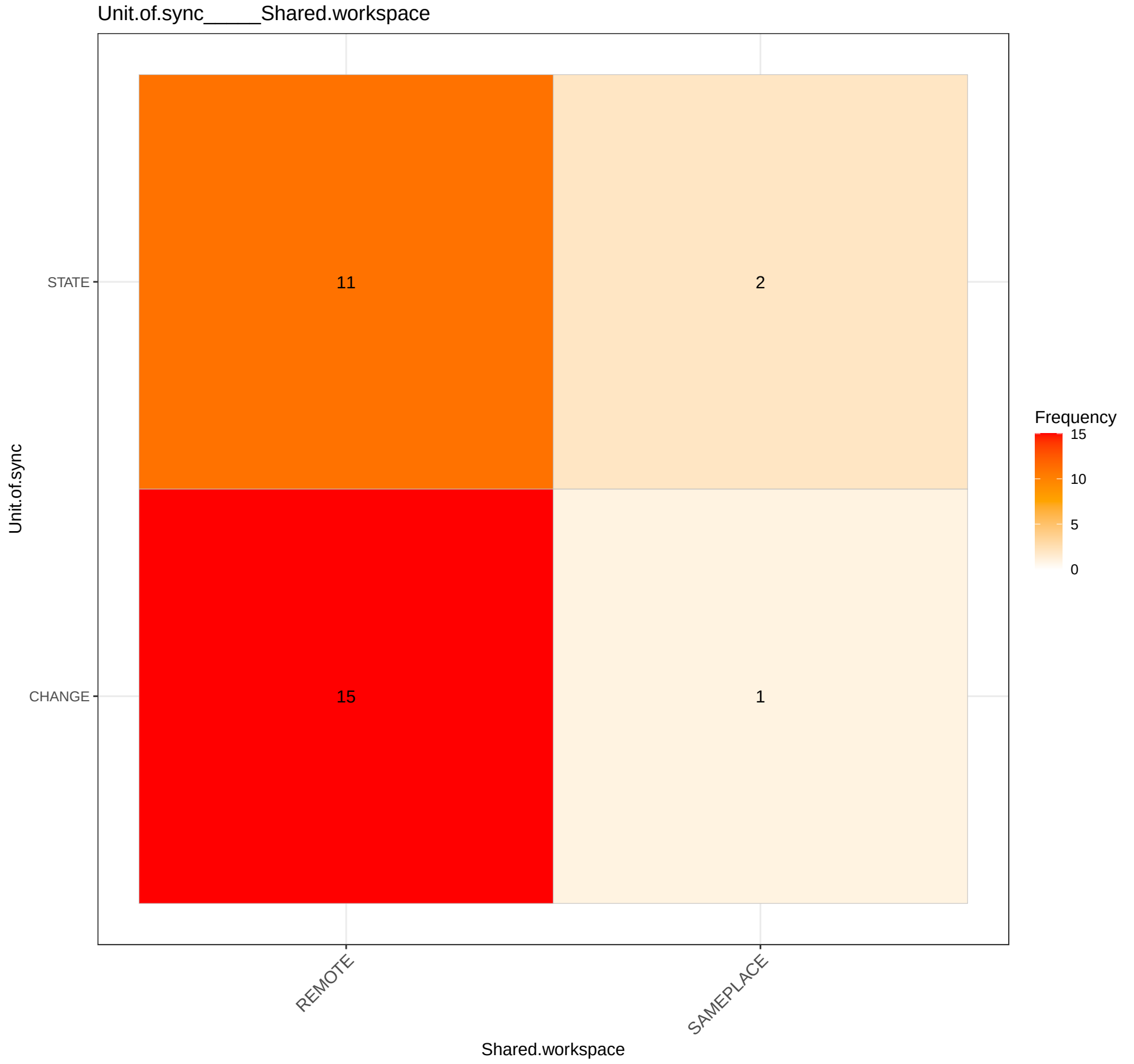

Unit.of.sync_____Diff.merge.domain
STATE
CHANGE
2
2
9
5
3
8
Unit.of.sync
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
7.5
5.0
2.5
0.0

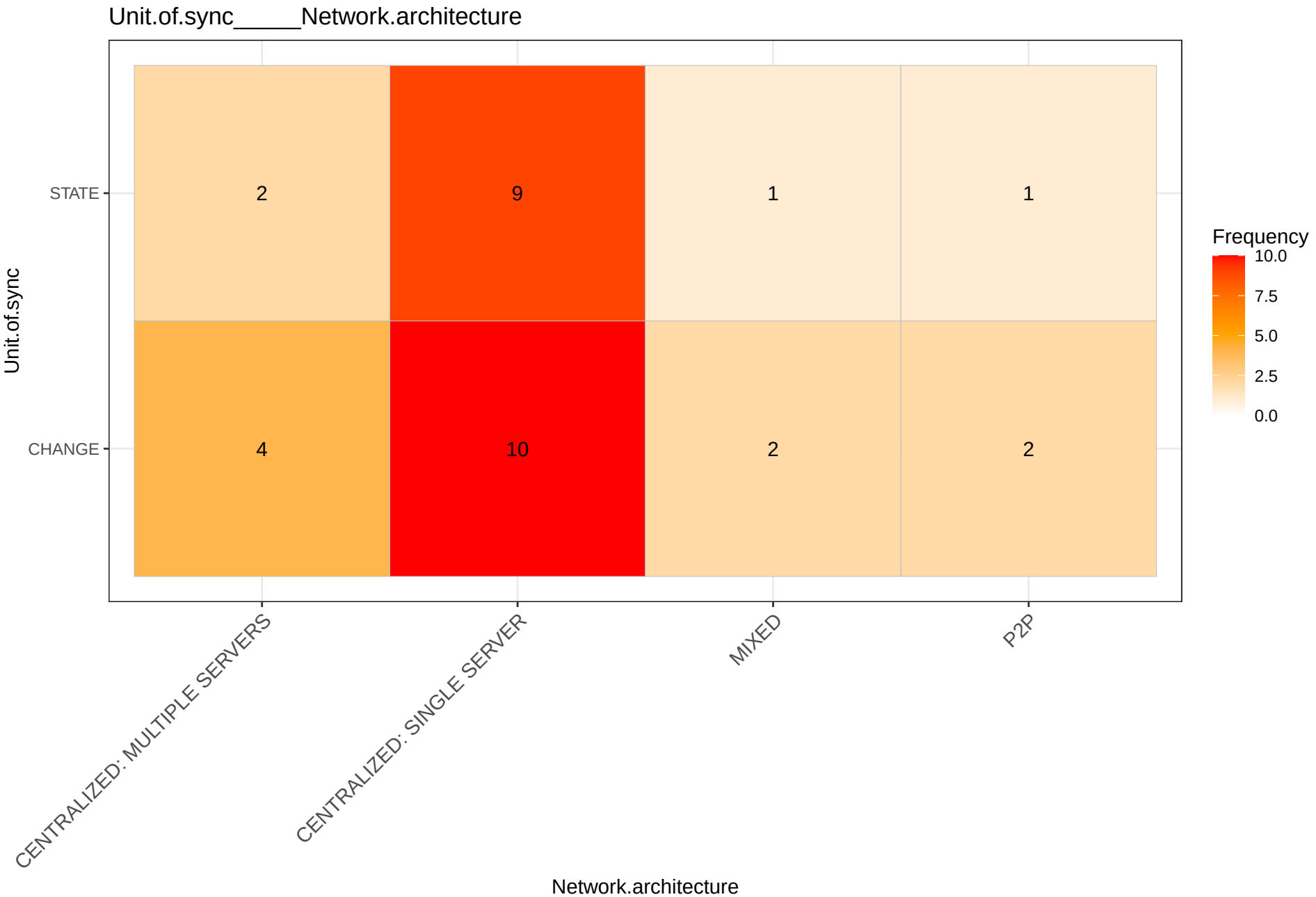

Unit.of.sync_____Conflict.mgmt.approach
STATE
CHANGE
Unit.of.sync
4
4
5
7
6
3
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
6
4
2
0

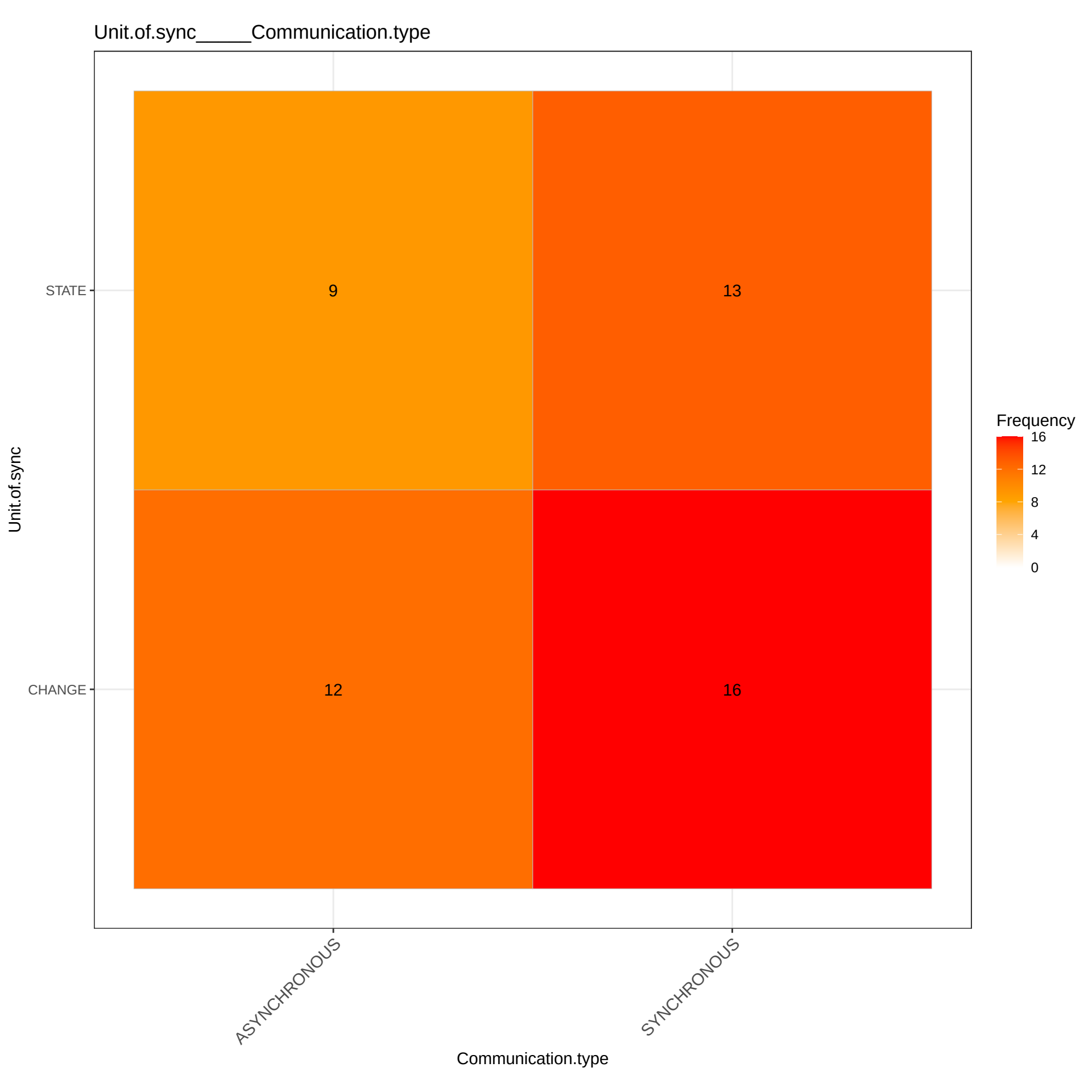

Unit.of.sync_____Conflict.detection
STATE
CHANGE
9
4
1
4
12
6
Unit.of.sync
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

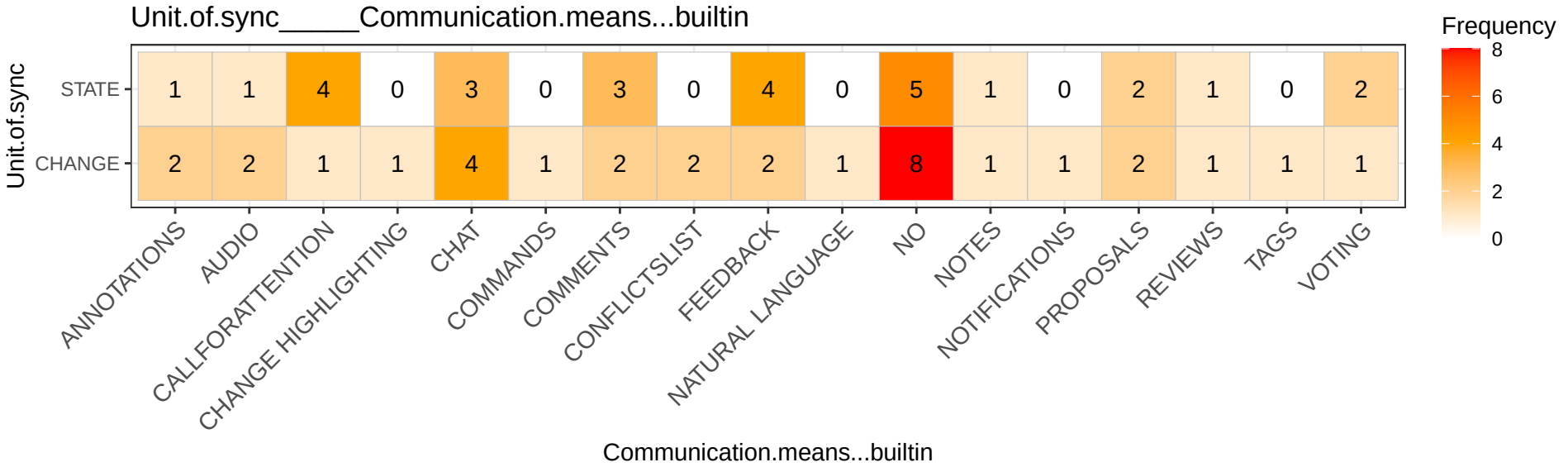

Unit.of.sync_____Conflict.awareness..User.
STATE
CHANGE
11
0
2
8
2
6
Unit.of.sync
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0

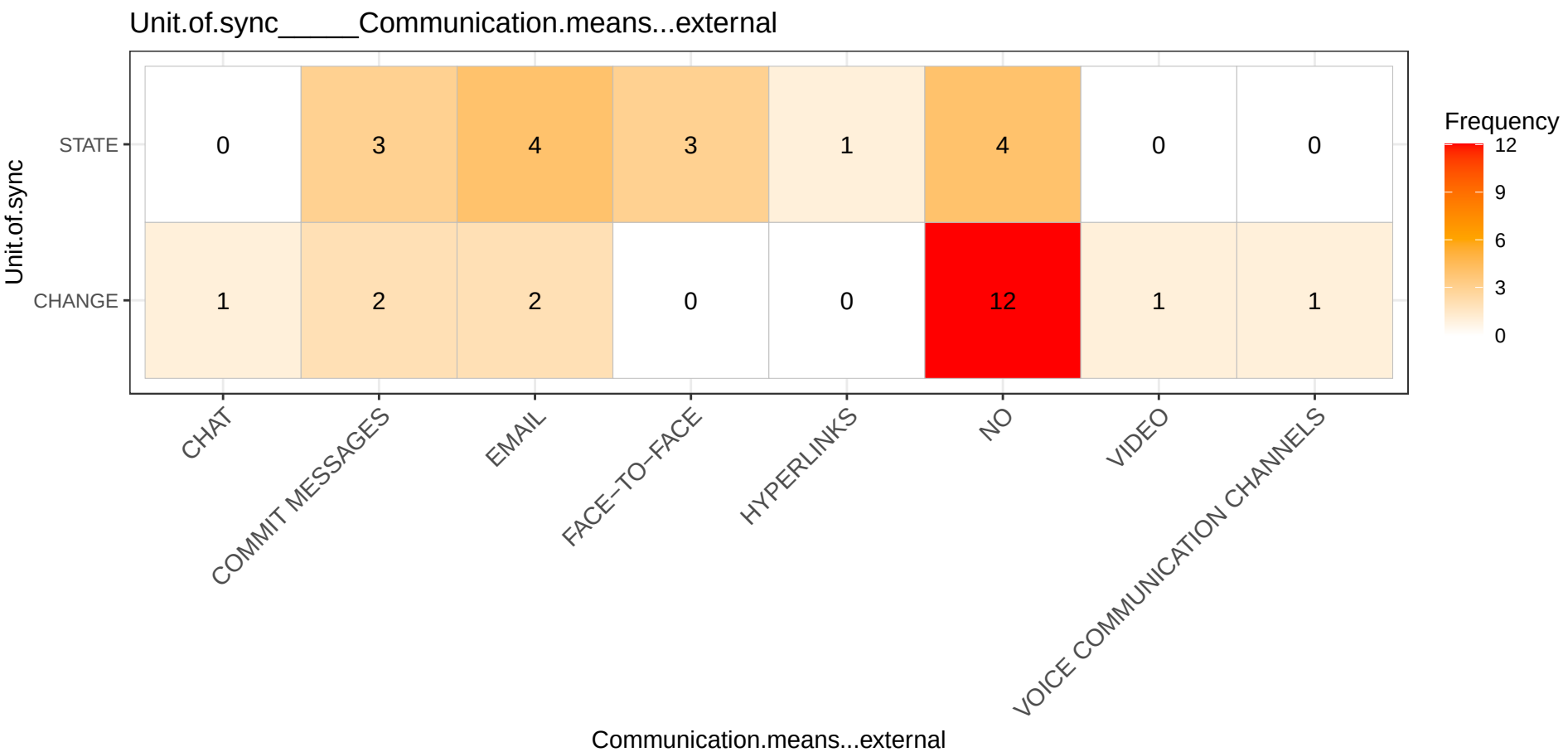

Unit.of.sync_____Conflict.resolution.support
STATE
CHANGE
Unit.of.sync
3
6
5
5
3
8
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

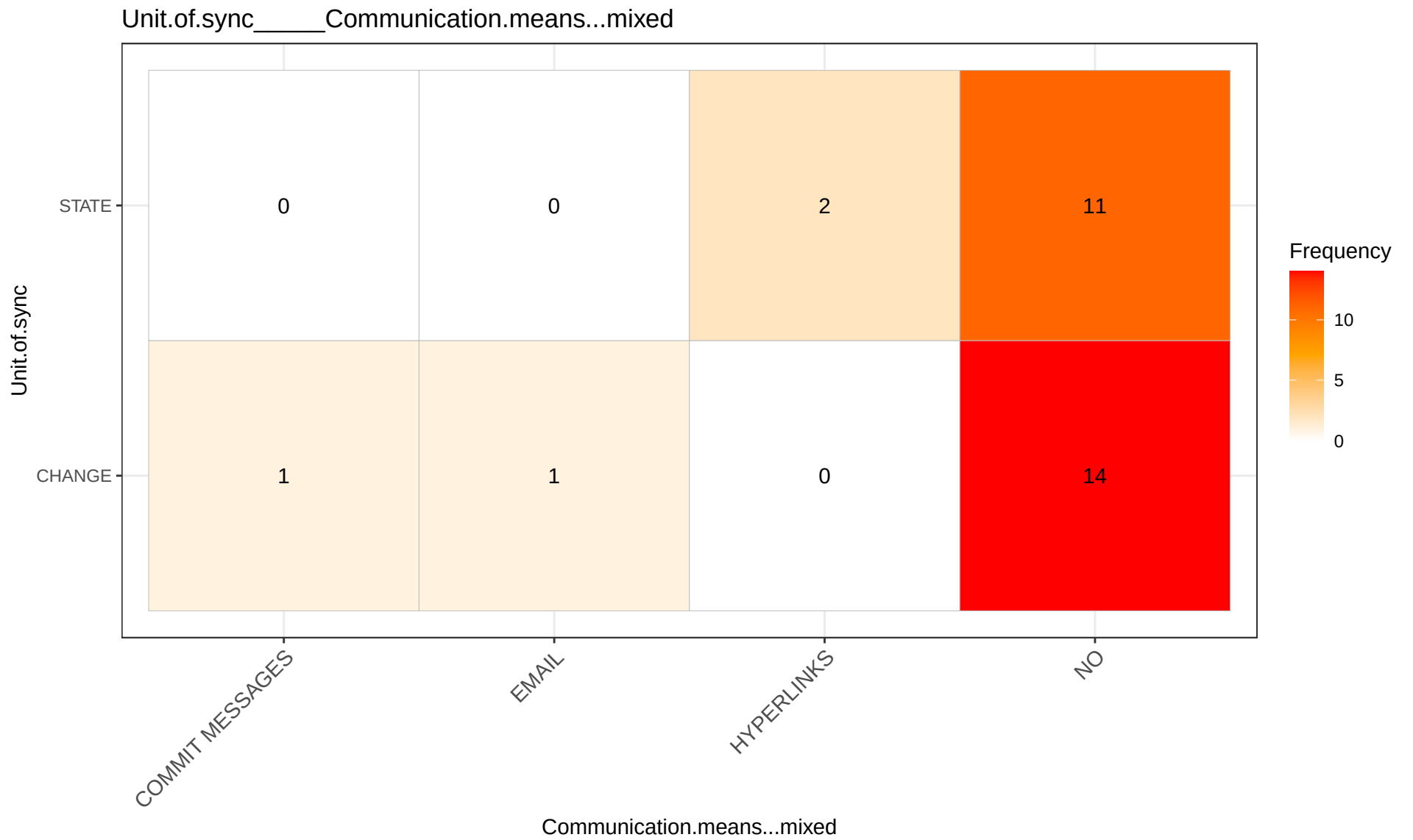

Unit.of.sync_____Shared.workspace
STATE
CHANGE
11
2
15
1
Unit.of.sync
REMOTE
SAMEPLACE
Shared.workspace
Frequency
15
10
5
0

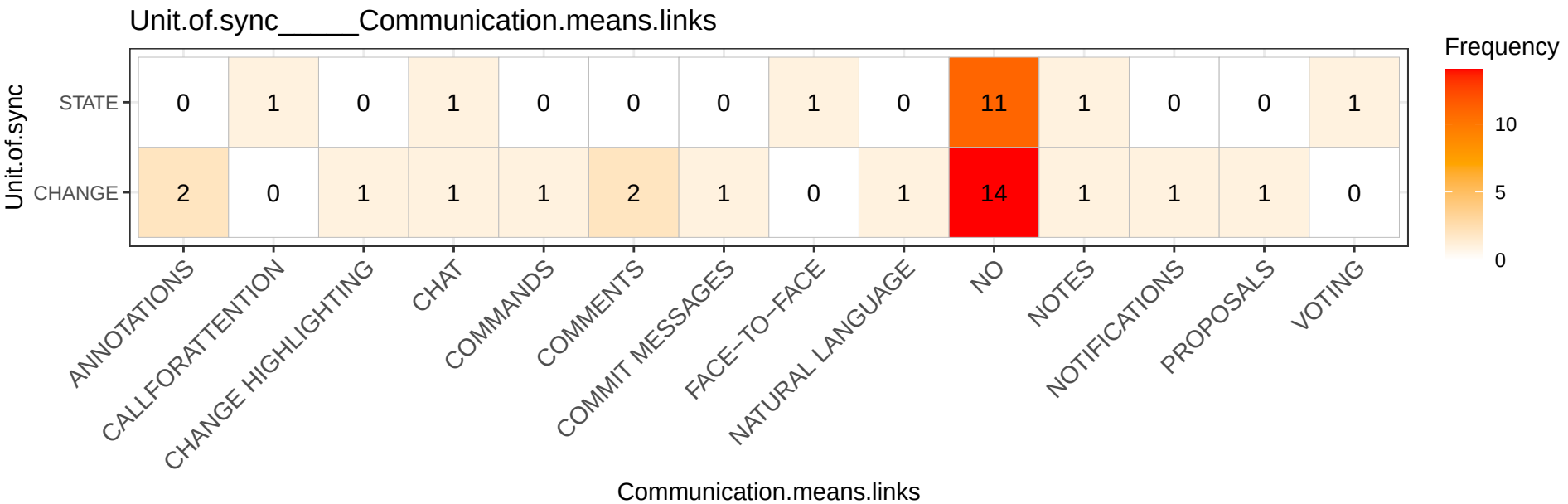

Unit.of.sync_____Network.architecture
STATE
CHANGE
Unit.of.sync
2
9
1
1
4
10
2
2
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

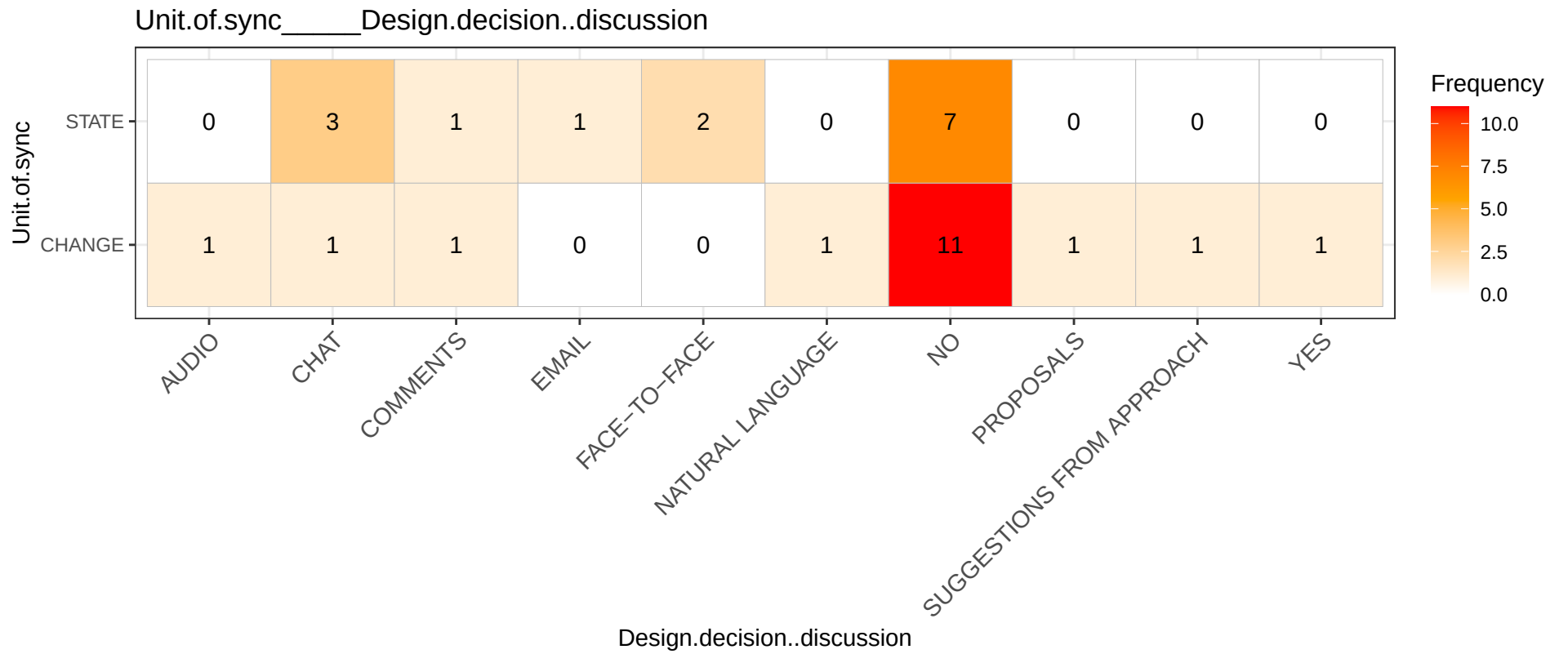

Unit.of.sync_____Communication.type
STATE
CHANGE
9
13
12
16
Unit.of.sync
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
16
12
8
4
0

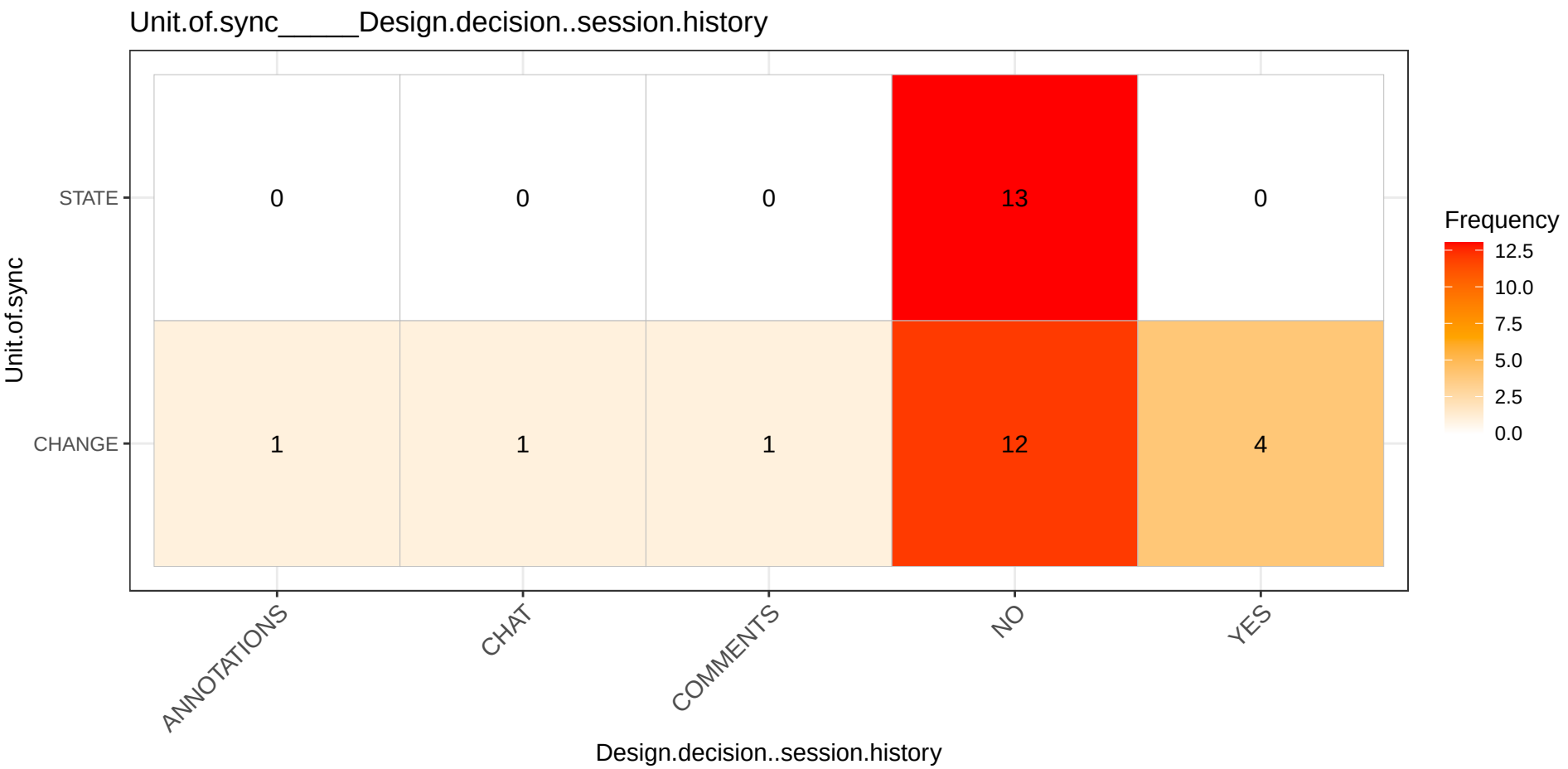

Unit.of.sync_____Communication.means...builtin
Unit.of.sync
STATE
CHANGE
1 1 4 0 3 0 3 0 4 0 5 1 0 2 1 0 2
2 2 1 1 4 1 2 2 2 1 8 1 1 2 1 1 1
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
8
6
4
2
0

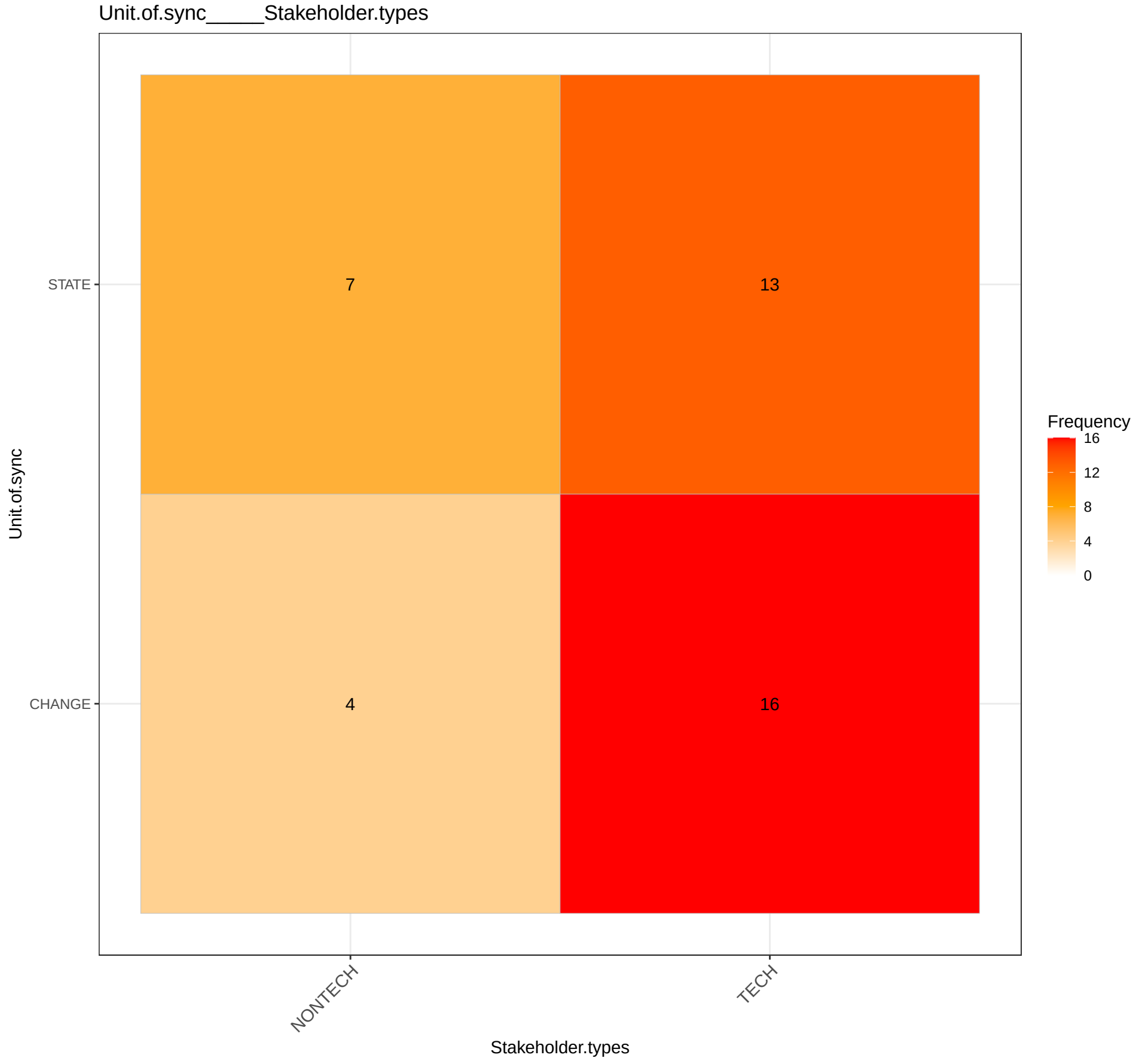

Unit.of.sync_____Communication.means...external
Unit.of.sync
STATE
CHANGE
0
3
4
3
1
4
0
0
1
2
2
0
0
12
1
1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
12
9
6
3
0

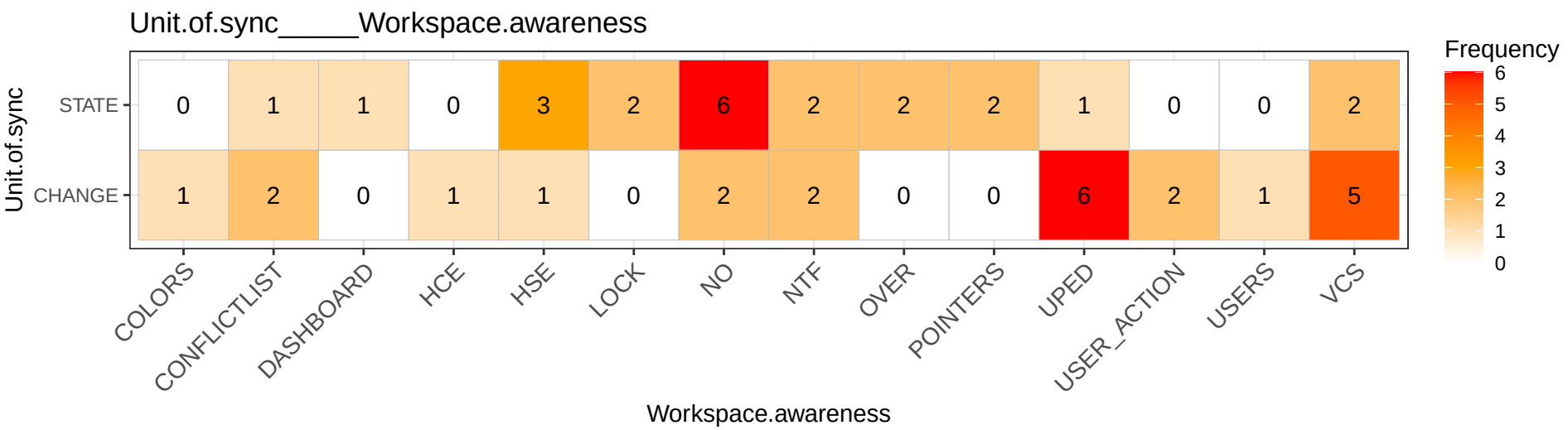

Unit.of.sync_____Communication.means...mixed
STATE
CHANGE
Unit.of.sync
0
0
2
11
1
1
0
14
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
10
5
0

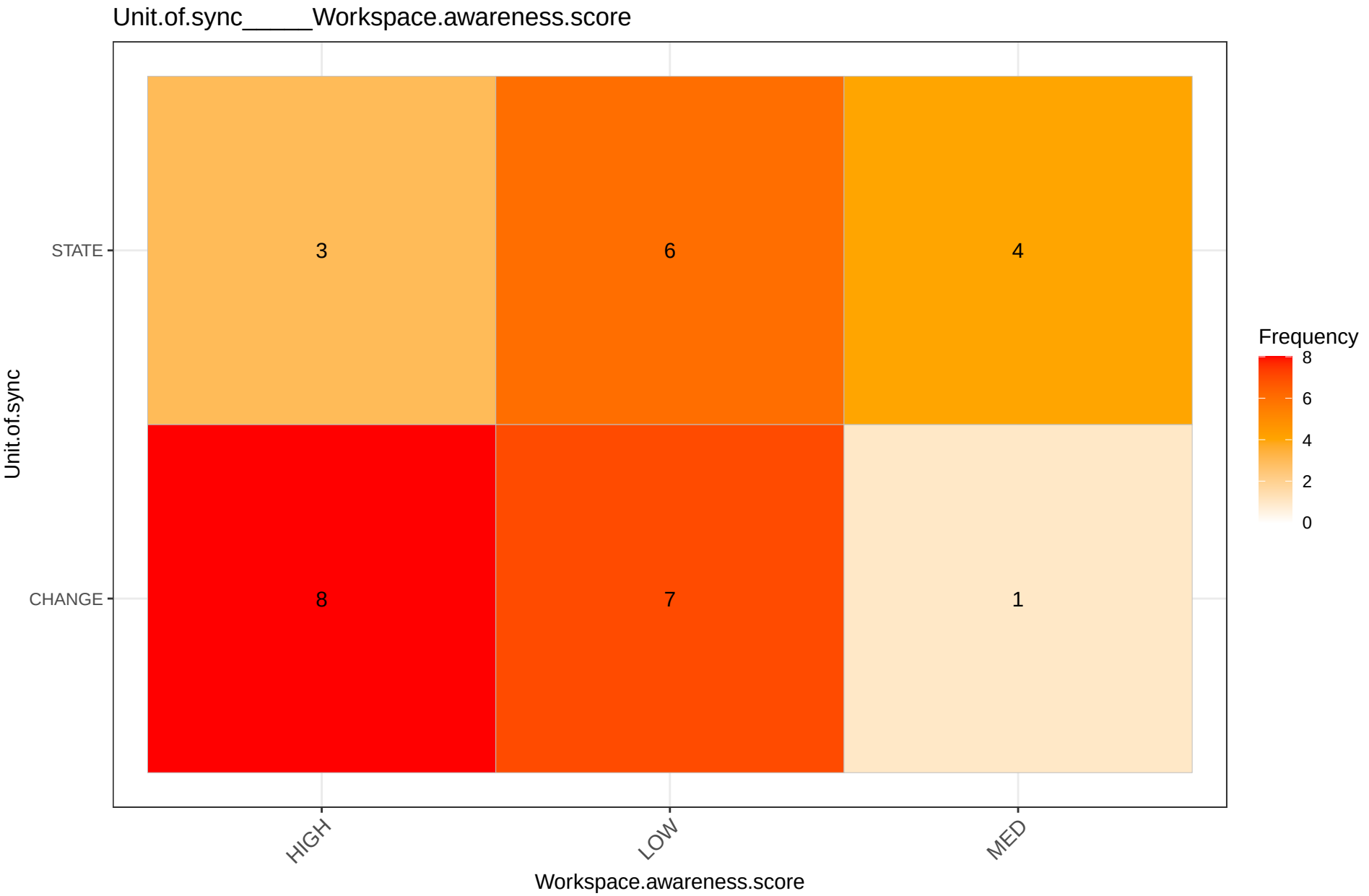

Unit.of.sync_____Communication.means.links
Unit.of.sync
STATE
CHANGE
0 1 0 1 0 0 0 1 0 11 1 0 0 1
2 0 1 1 1 2 1 0 1 14 1 1 1 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE-TO-FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
10
5
0

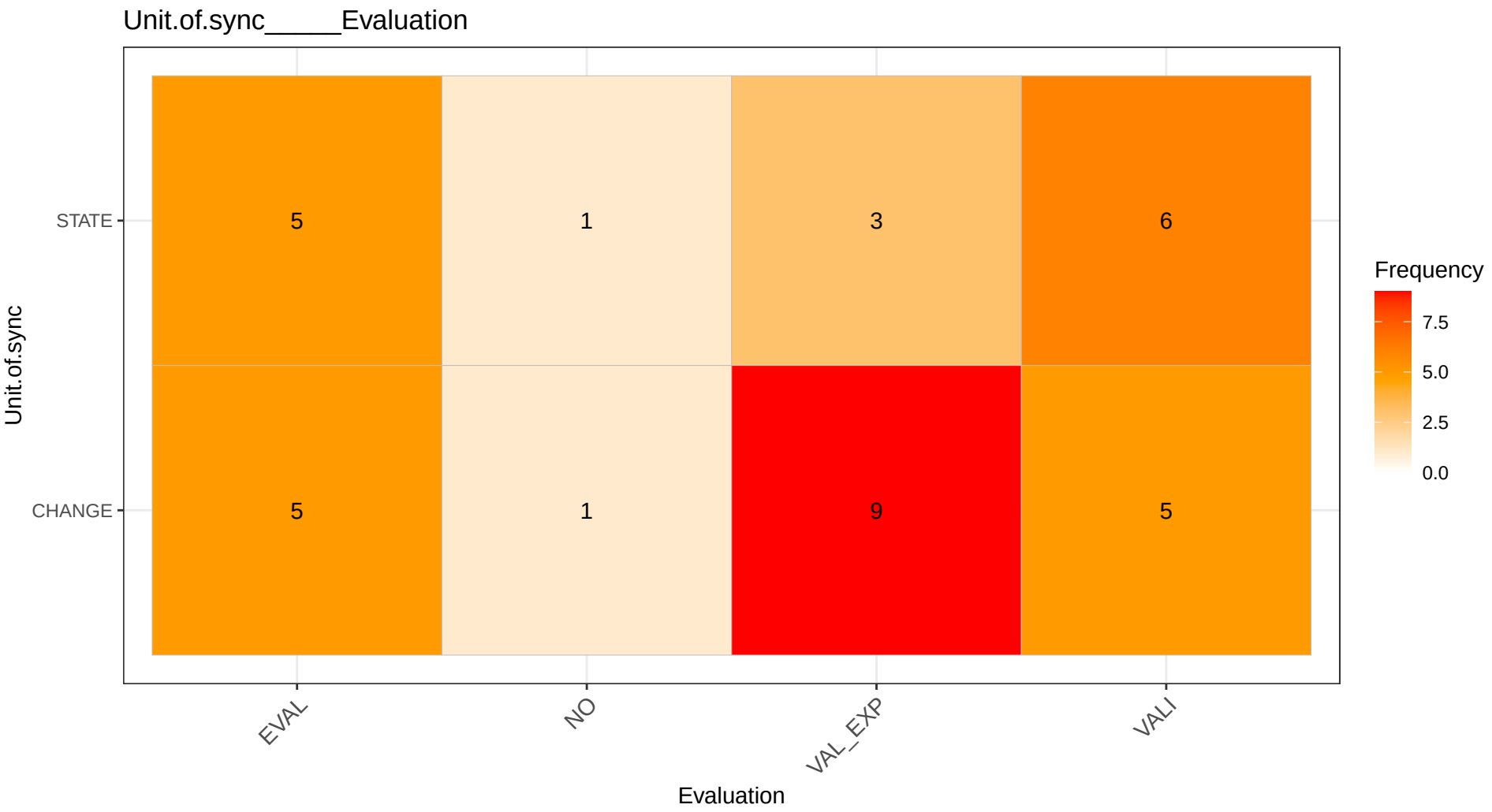

Unit.of.sync_____Design.decision..discussion
Unit.of.sync
STATE
CHANGE
0
3
1
1
2
0
7
0
0
0
1
1
1
0
0
1
11
1
1
1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0

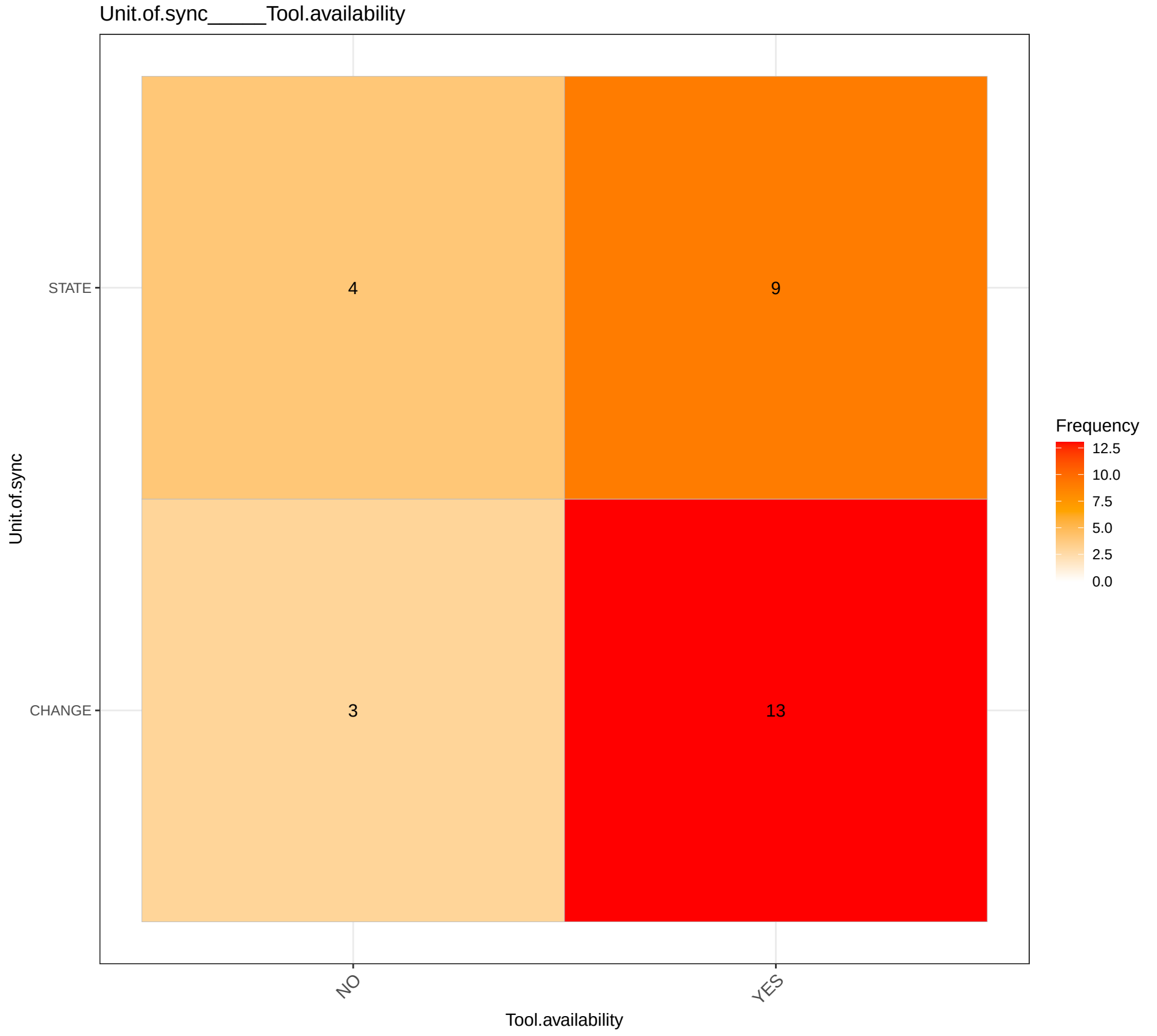

Unit.of.sync_____Design.decision..session.history
Unit.of.sync
STATE
CHANGE
0
0
0
13
0
1
1
1
12
4
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

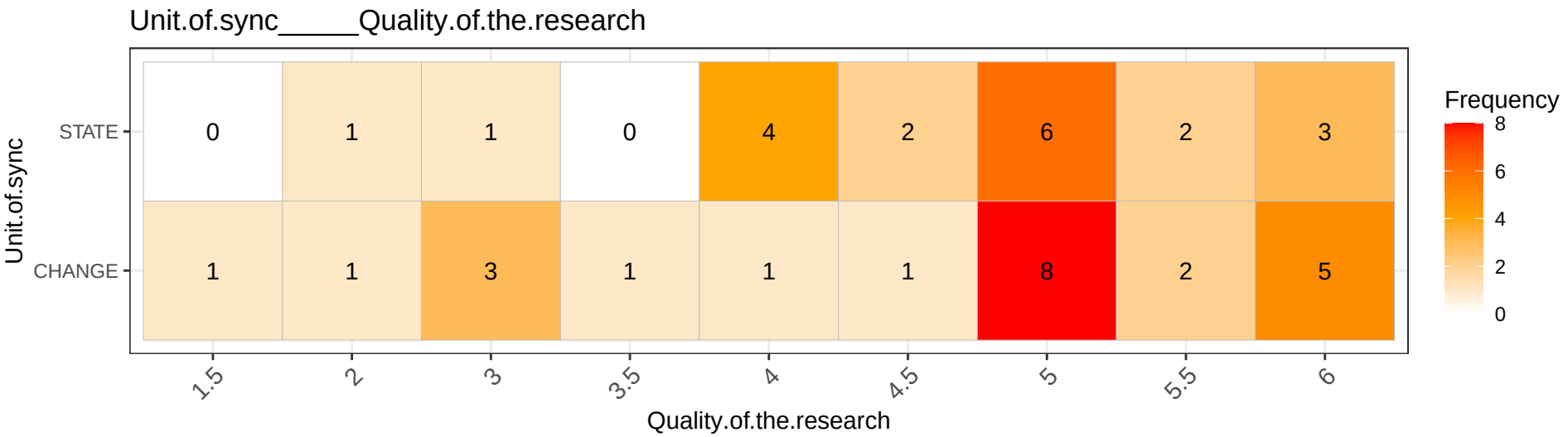

Unit.of.sync_____Stakeholder.types
STATE
CHANGE
7
13
4
16
Unit.of.sync
NONTECH
TECH
Stakeholder.types
Frequency
16
12
8
4
0

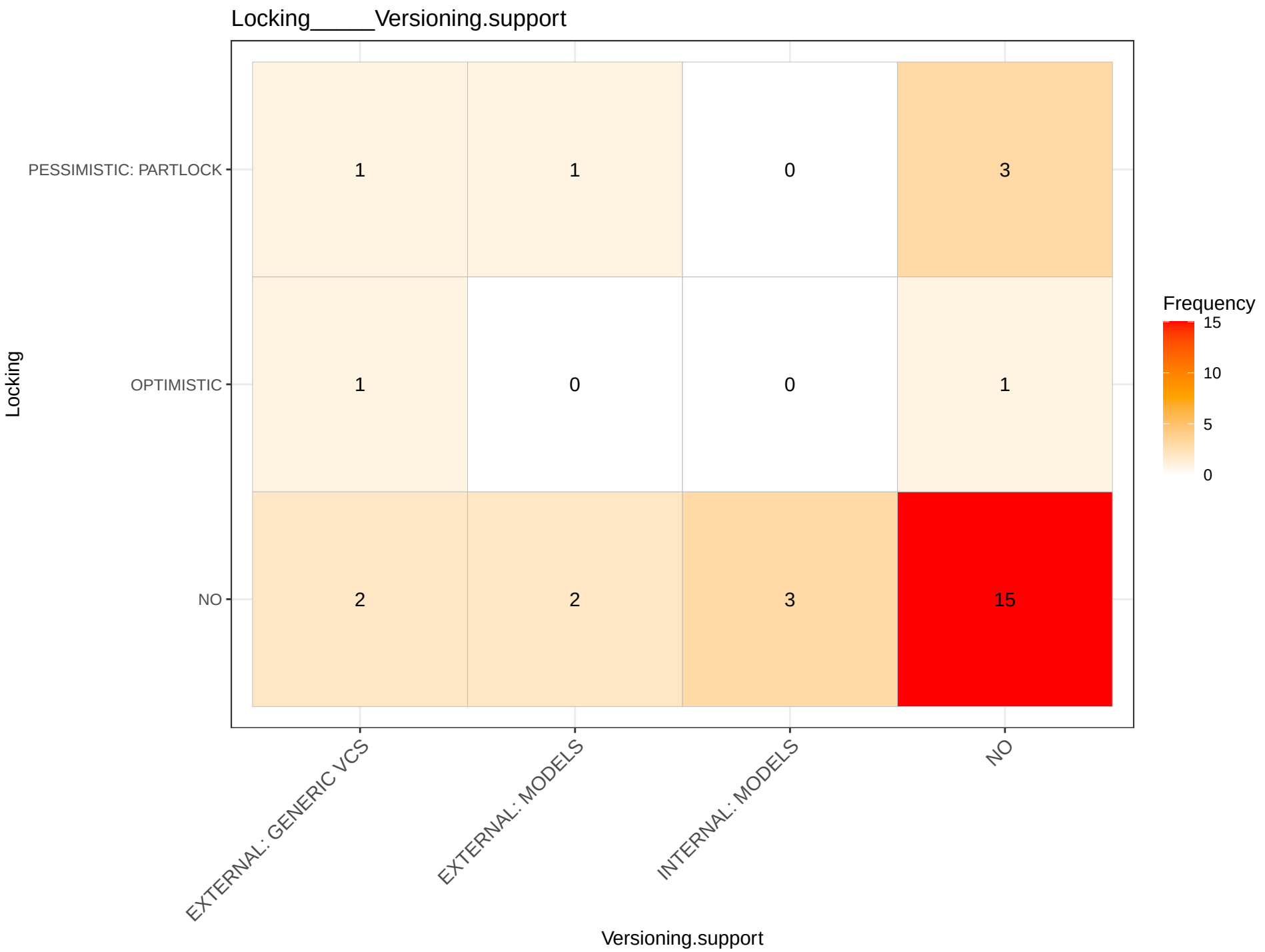

Unit.of.sync_____Workspace.awareness
Unit.of.sync
STATE
CHANGE
0 1 1 0 3 2 6 2 2 2 1 0 0 2
1 2 0 1 1 0 2 2 0 0 6 2 1 5
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

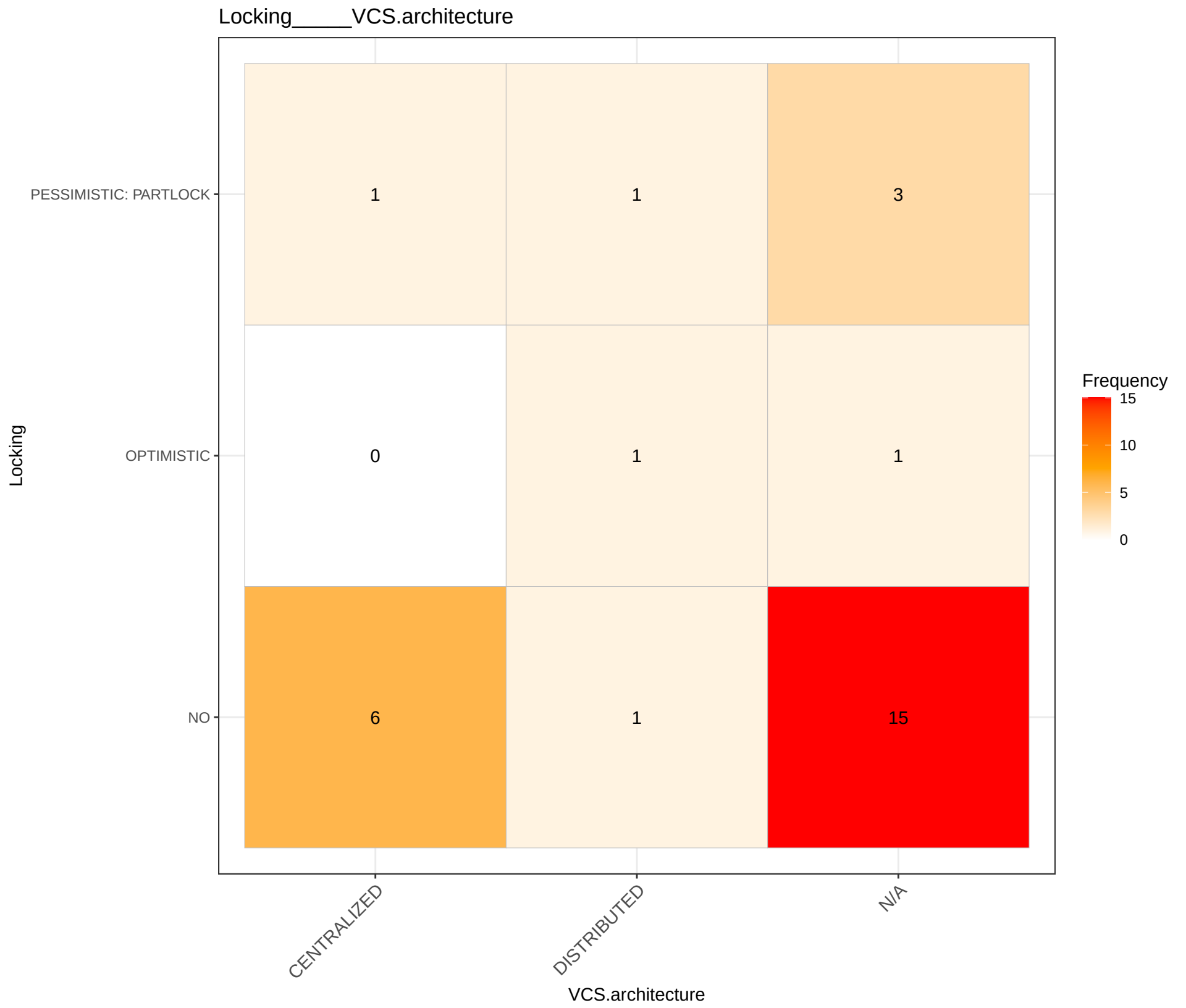

Unit.of.sync_____Workspace.awareness.score
STATE
CHANGE
Unit.of.sync
3
6
4
8
7
1
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0

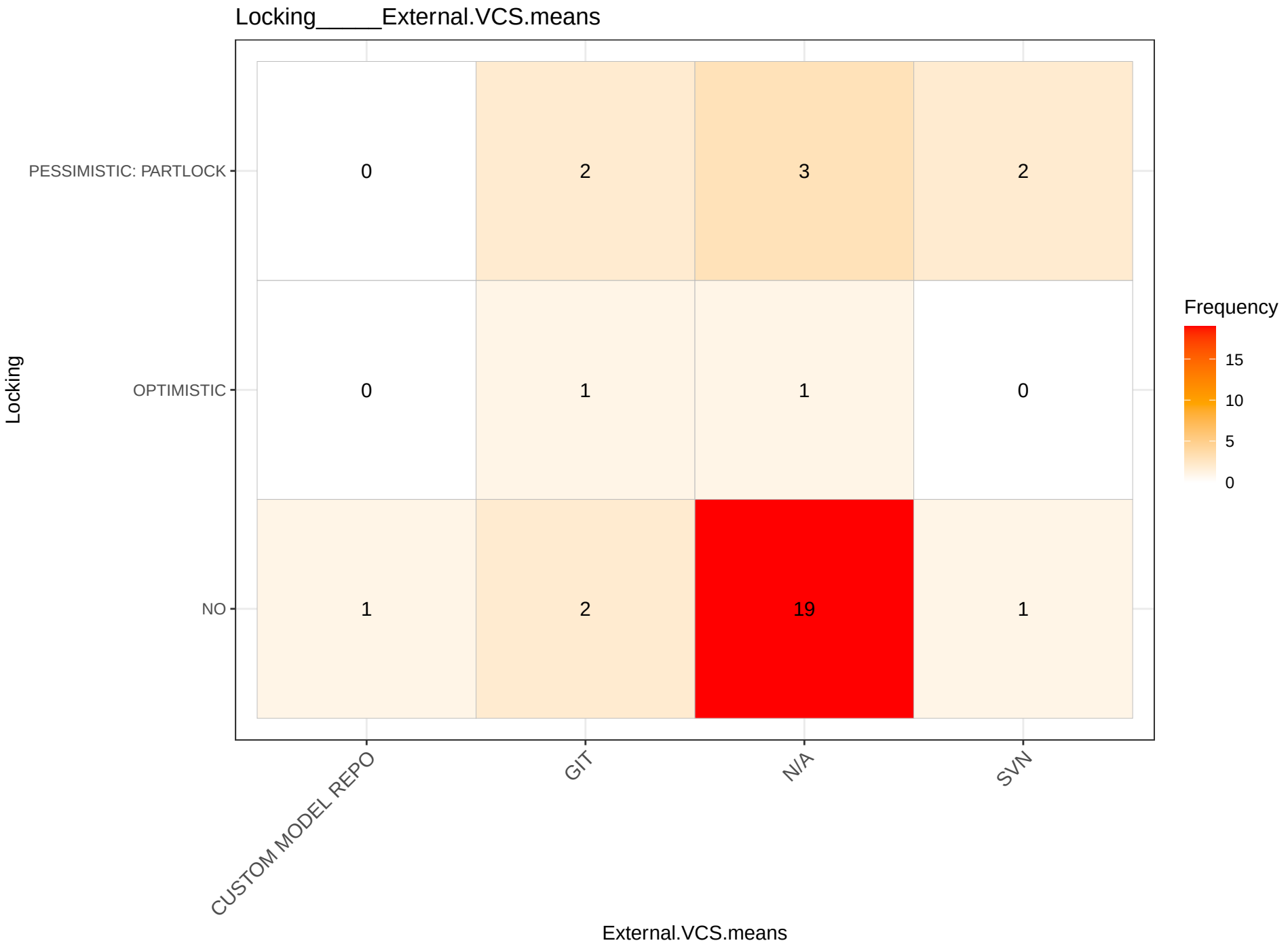

Unit.of.sync_____Evaluation
STATE
CHANGE
Unit.of.sync
5
1
3
6
5
1
9
5
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
7.5
5.0
2.5
0.0

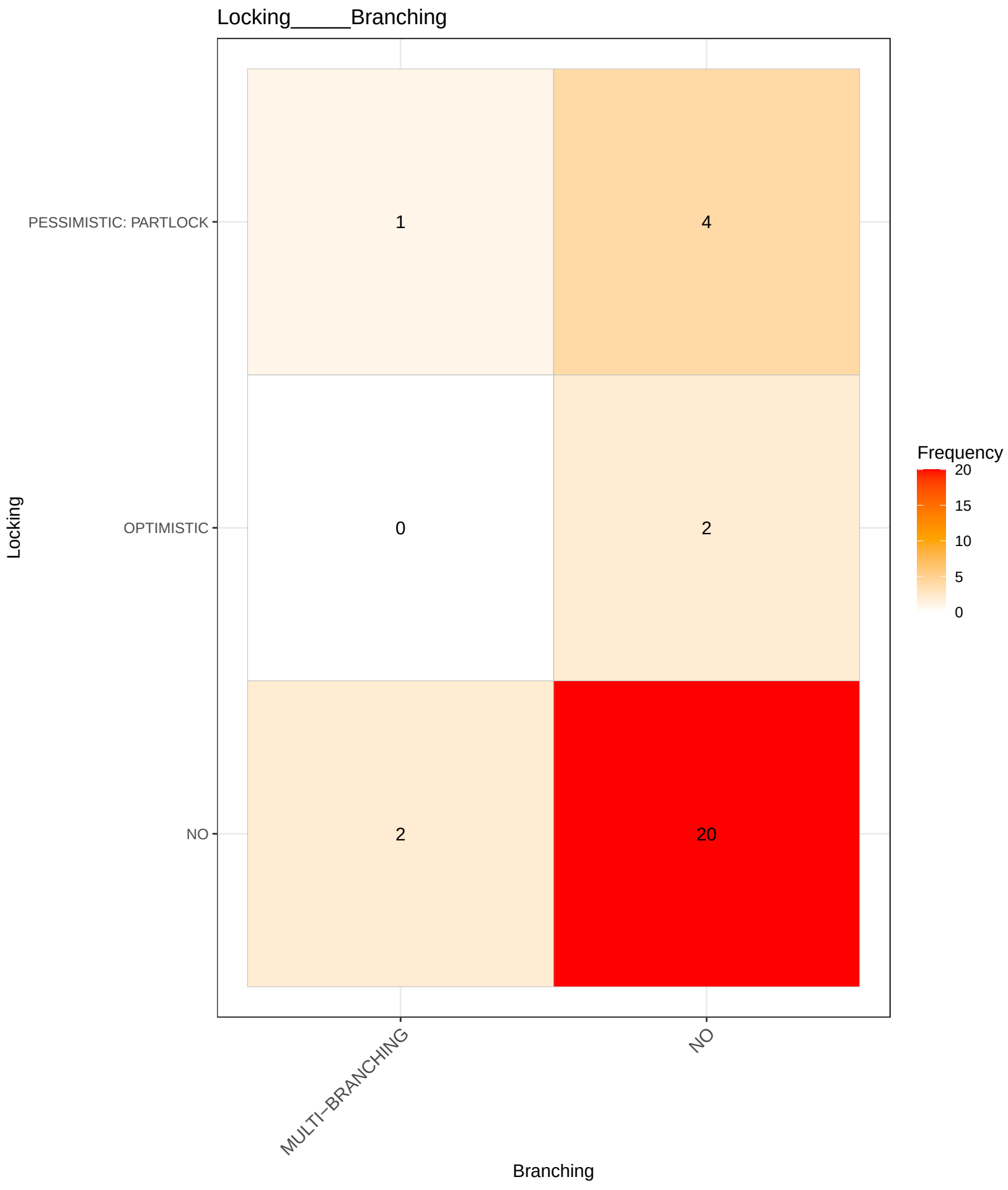

Unit.of.sync_____Tool.availability
STATE
CHANGE
Unit.of.sync
4
9
3
13
NO
YES
Tool.availability
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

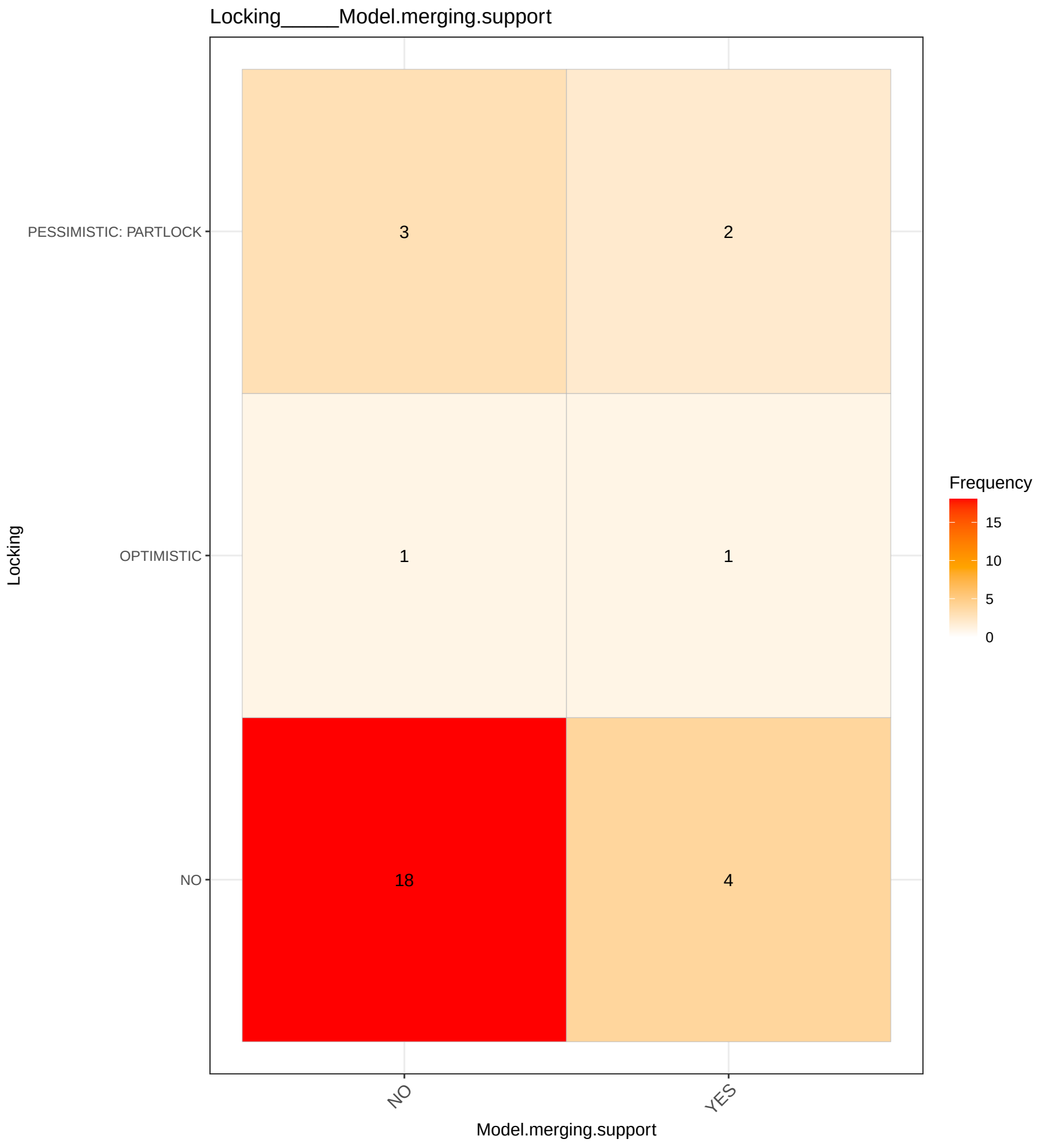

Unit.of.sync_____Quality.of.the.research
Unit.of.sync
STATE
CHANGE
0
1
1
0
4
2
6
2
3
1
1
3
1
1
1
8
2
5
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
8
6
4
2
0

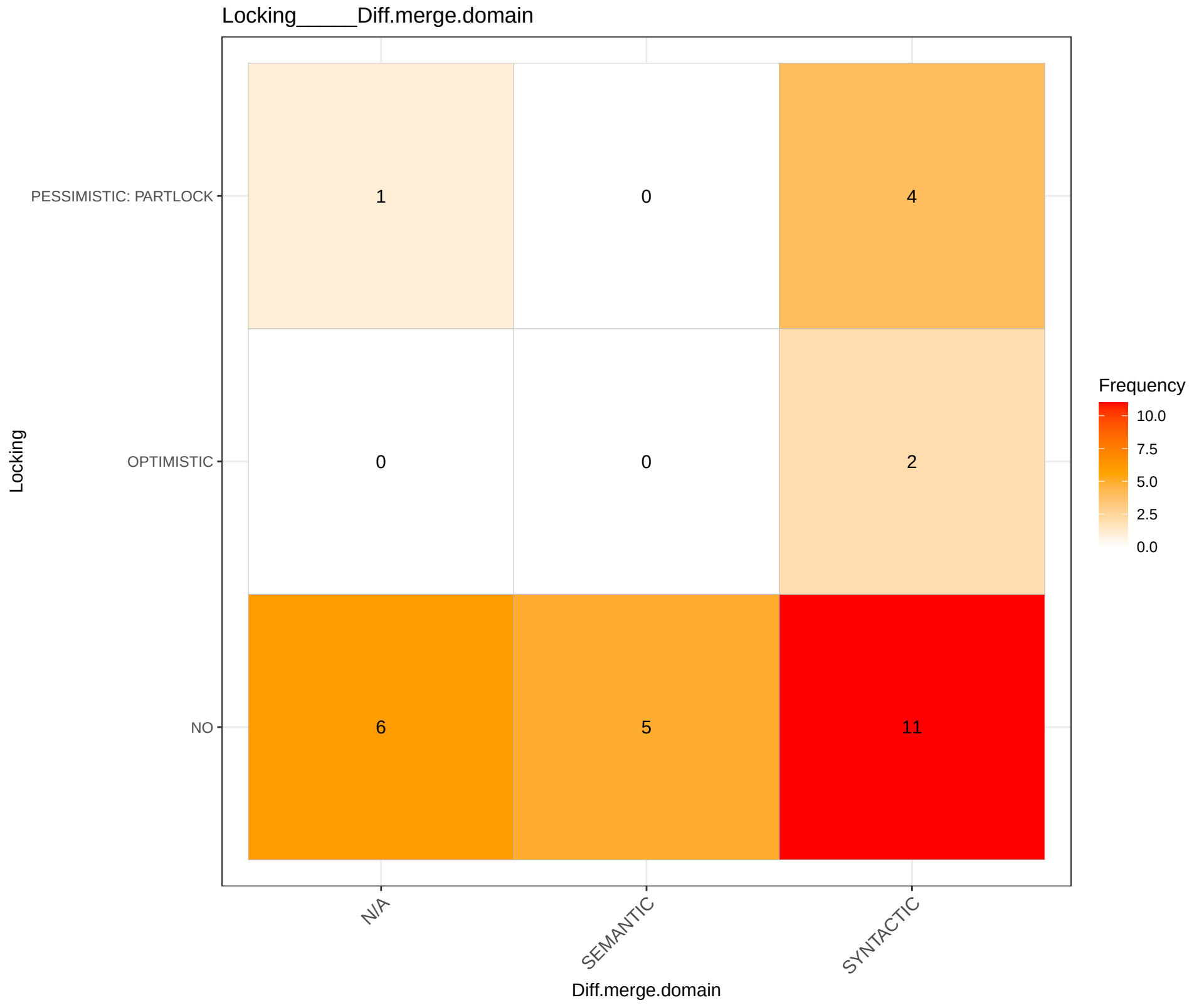

Locking_____Versioning.support
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
1
1
0
3
1
0
0
1
2
2
3
15
EXTERNAL: GENERIC VCS
EXTERNAL: MODELS
INTERNAL: MODELS
NO
Versioning.support
Frequency
15
10
5
0

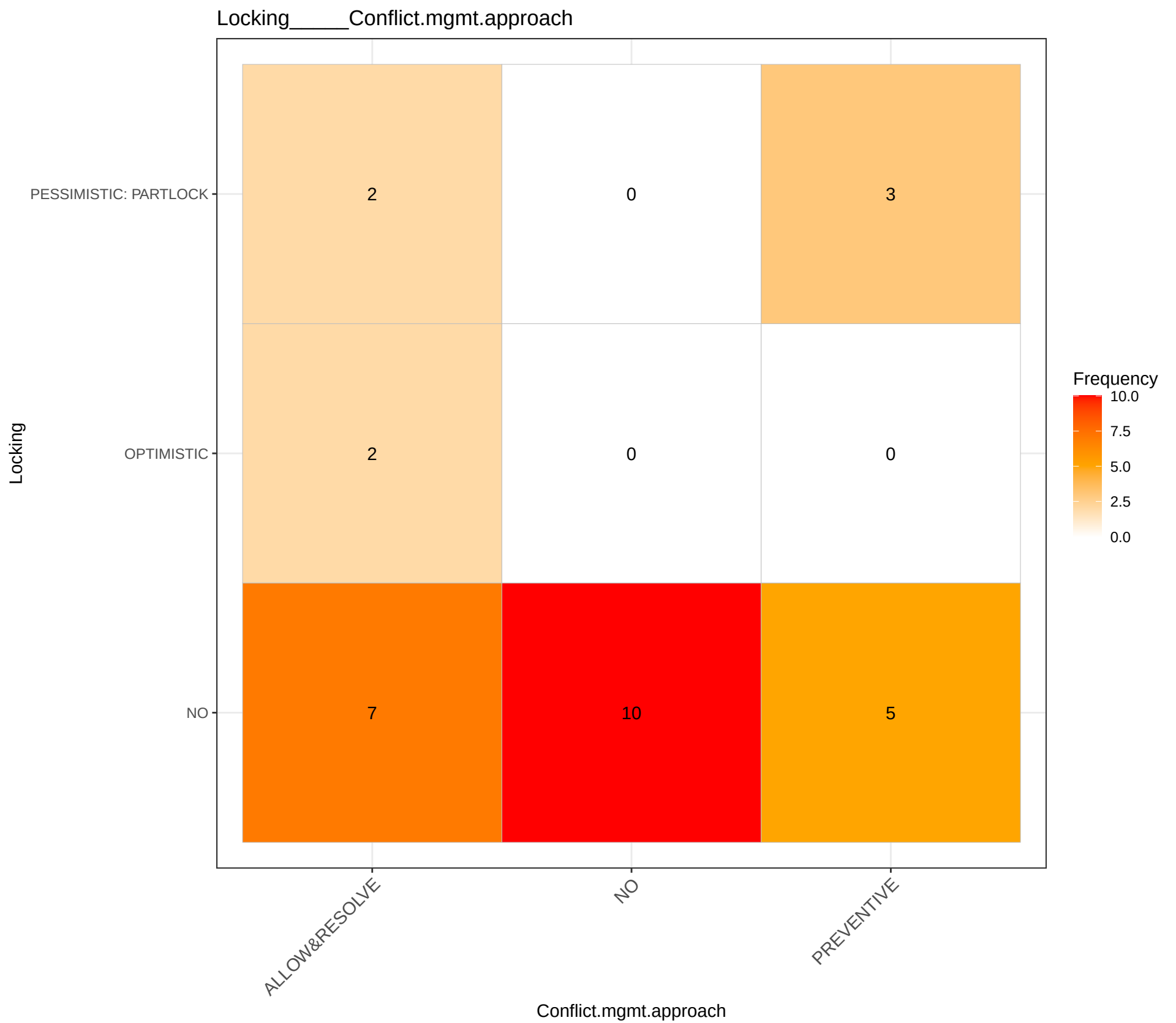

Locking_____VCS.architecture
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
1
1
3
0
1
1
6
1
15
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
15
10
5
0

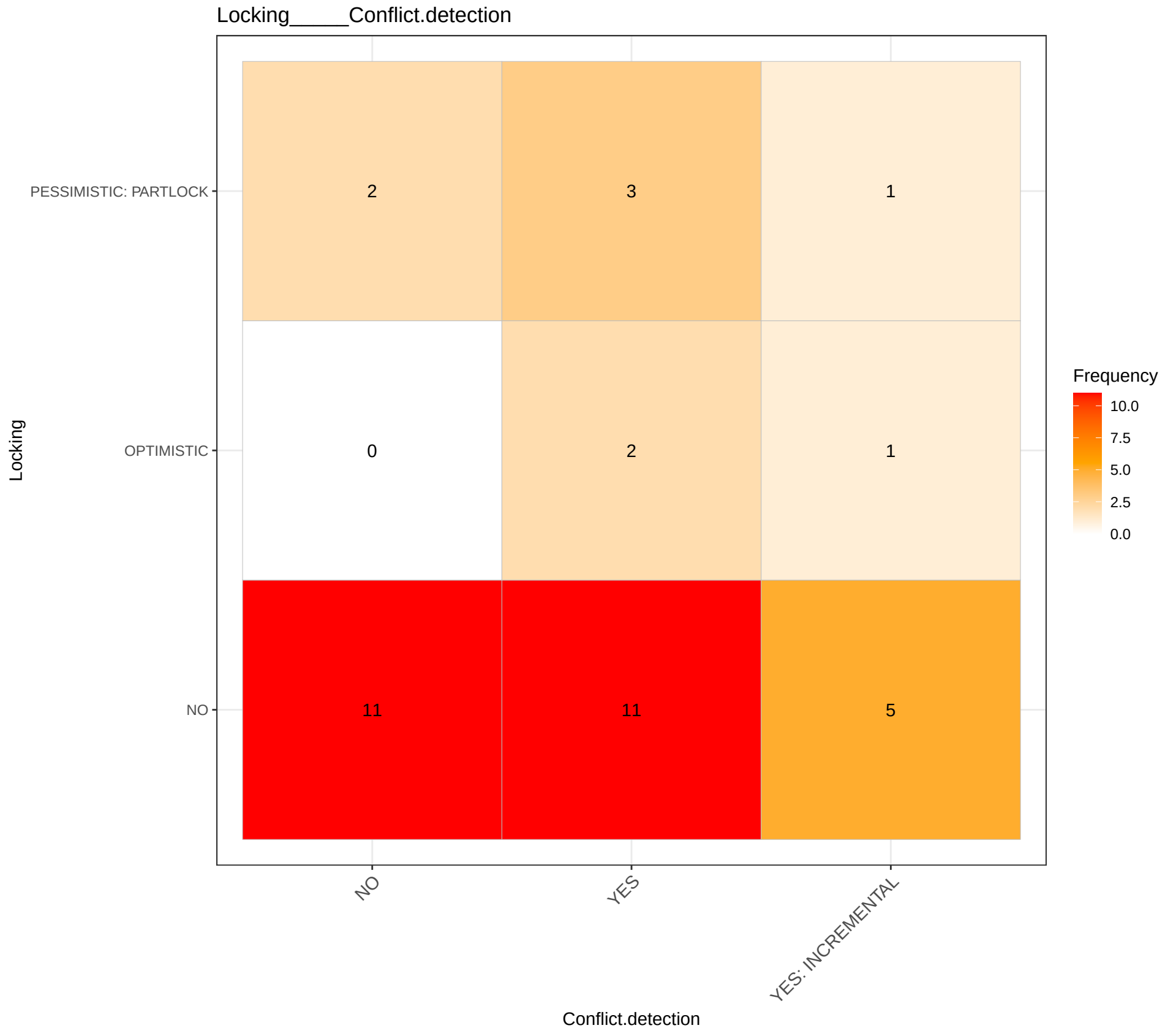

Locking_____External.VCS.means
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
0
2
3
2
0
1
1
0
1
2
19
1
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
15
10
5
0

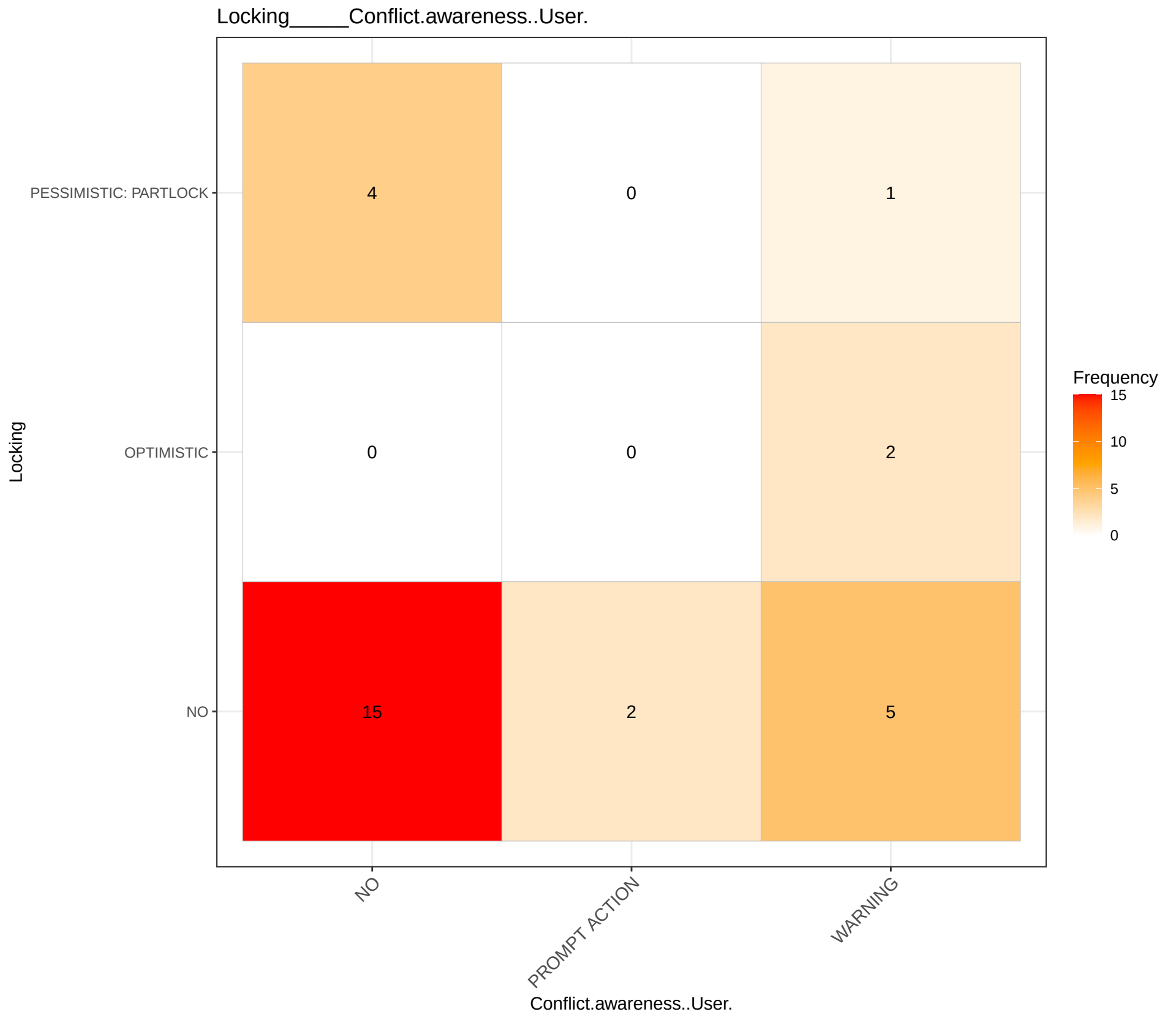

Locking_____Branching
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
1
4
0
2
2
20
MULTI−BRANCHING
NO
Branching
Frequency
20
15
10
5
0

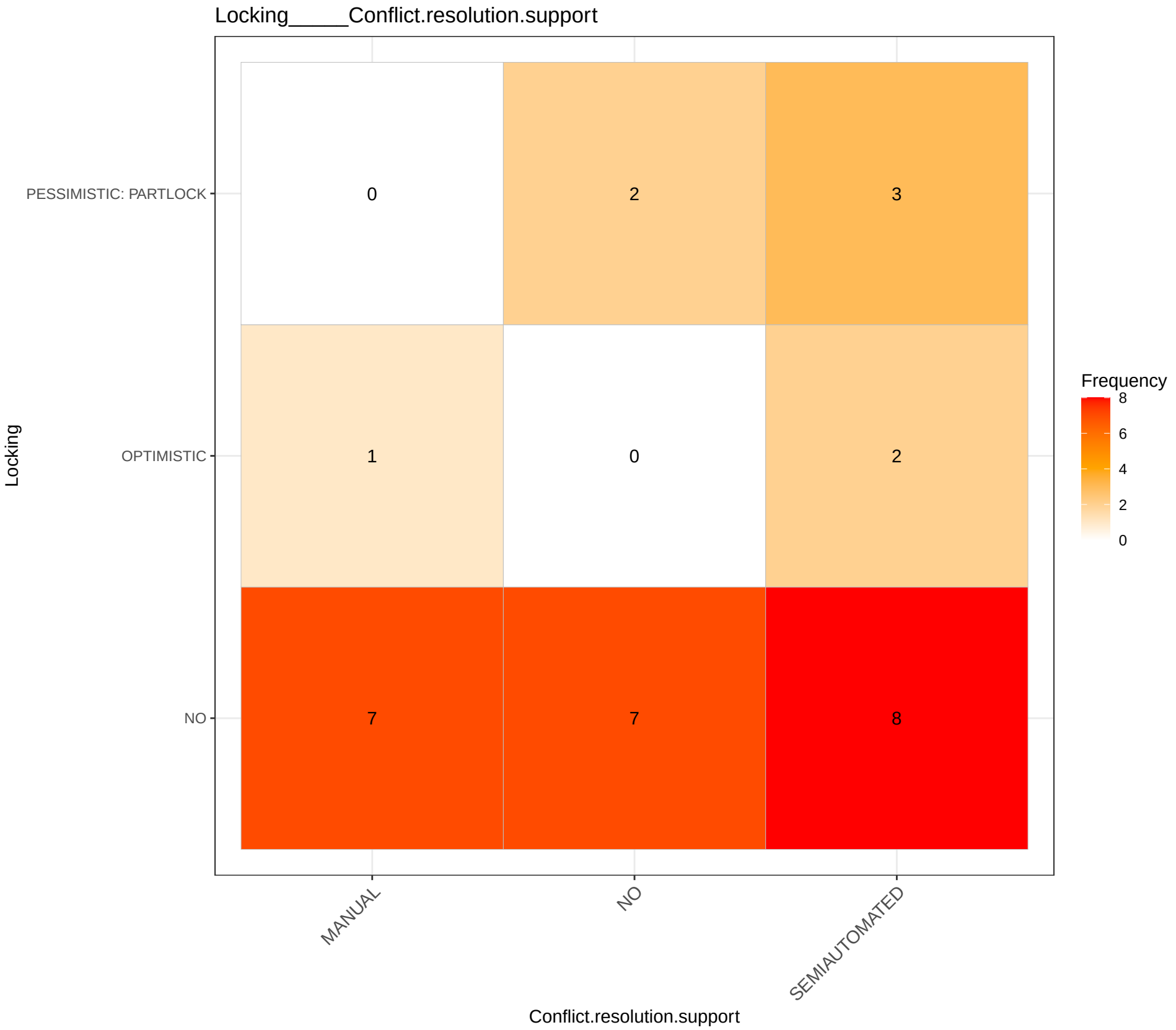

Locking_____Model.merging.support
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
3
2
1
1
18
4
NO
YES
Model.merging.support
Frequency
15
10
5
0

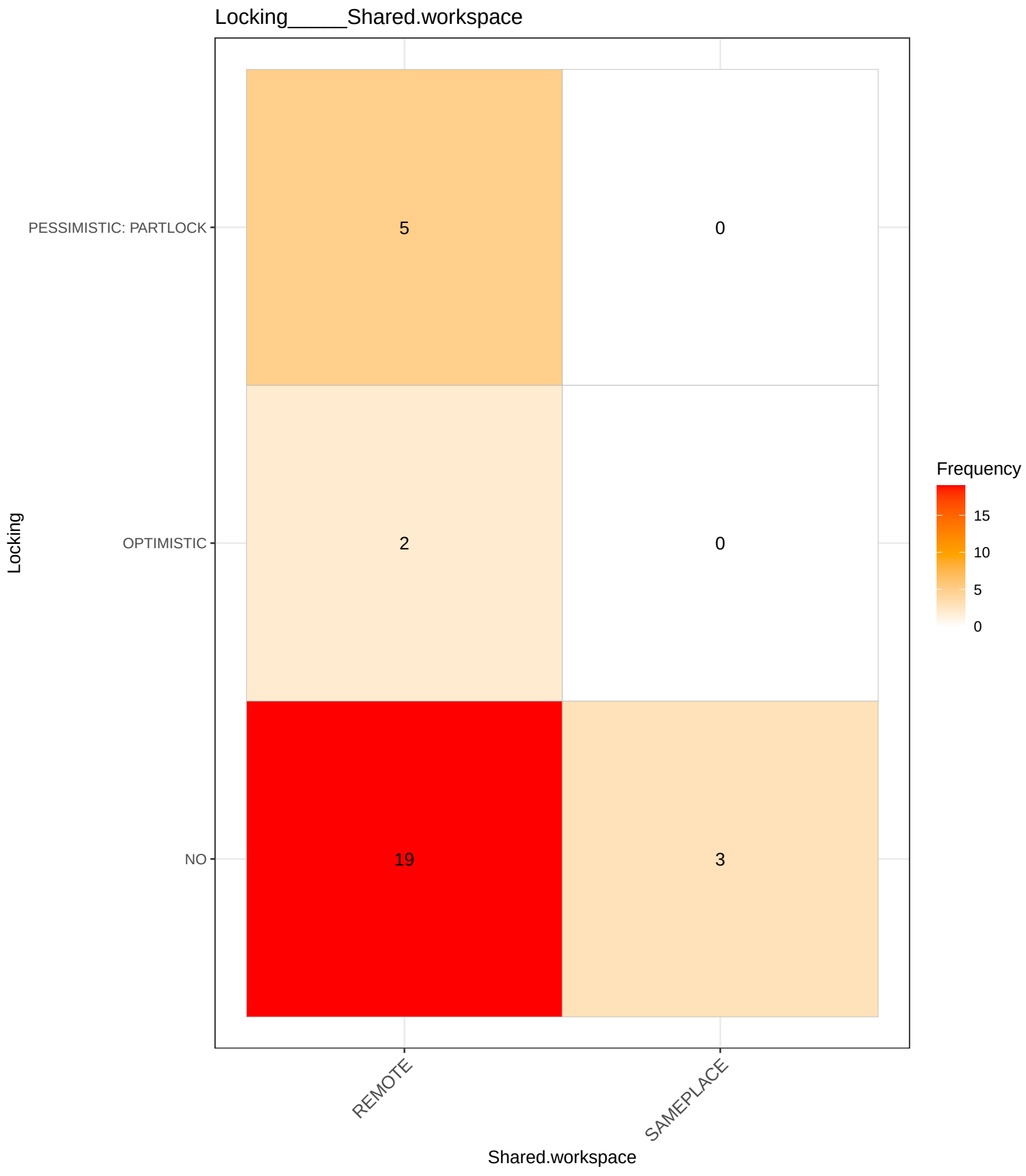

Locking_____Diff.merge.domain
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
1
0
4
0
0
2
6
5
11
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10.0
7.5
5.0
2.5
0.0

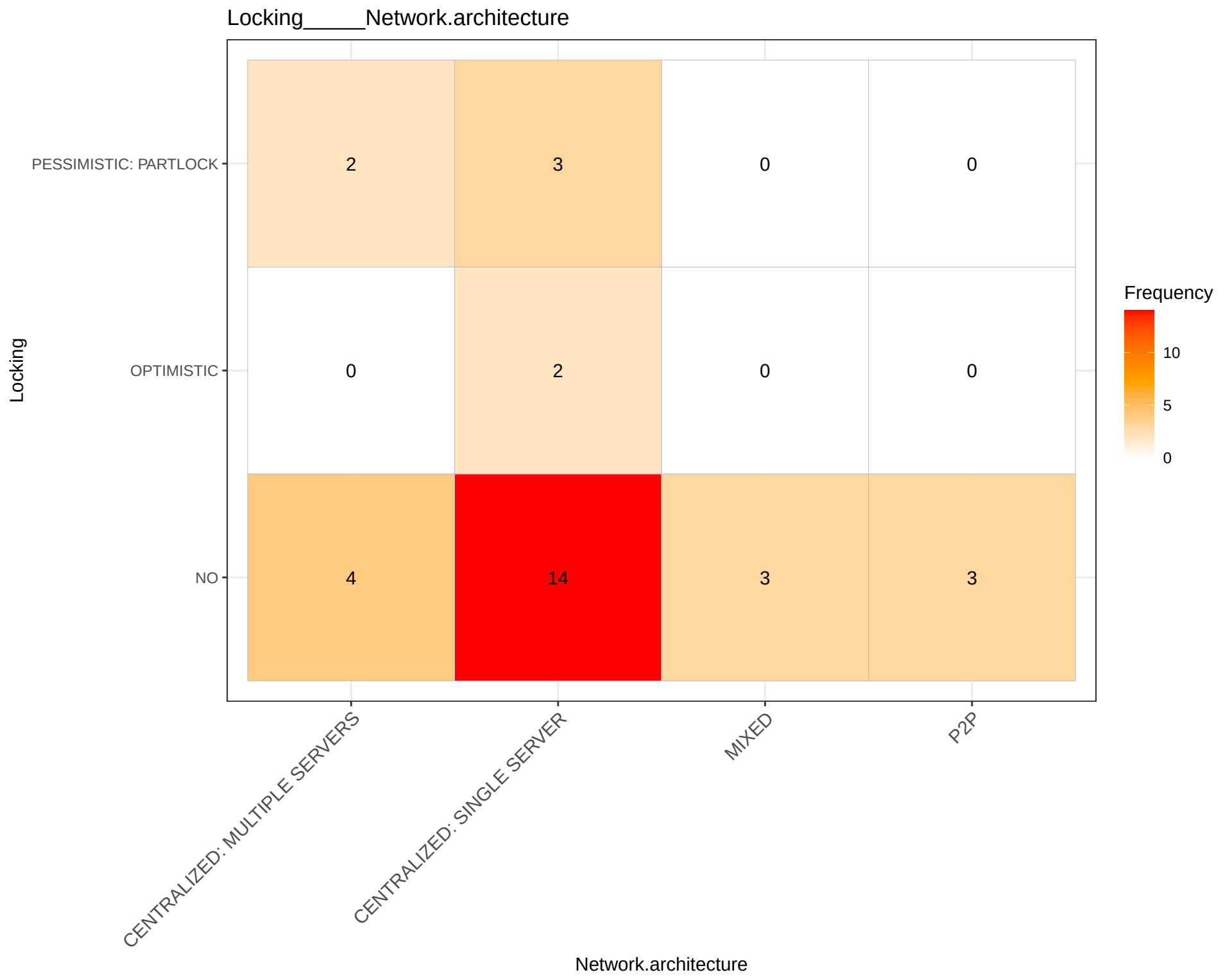

Locking_____Conflict.mgmt.approach
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
2
0
3
2
0
0
7
10
5
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
10.0
7.5
5.0
2.5
0.0

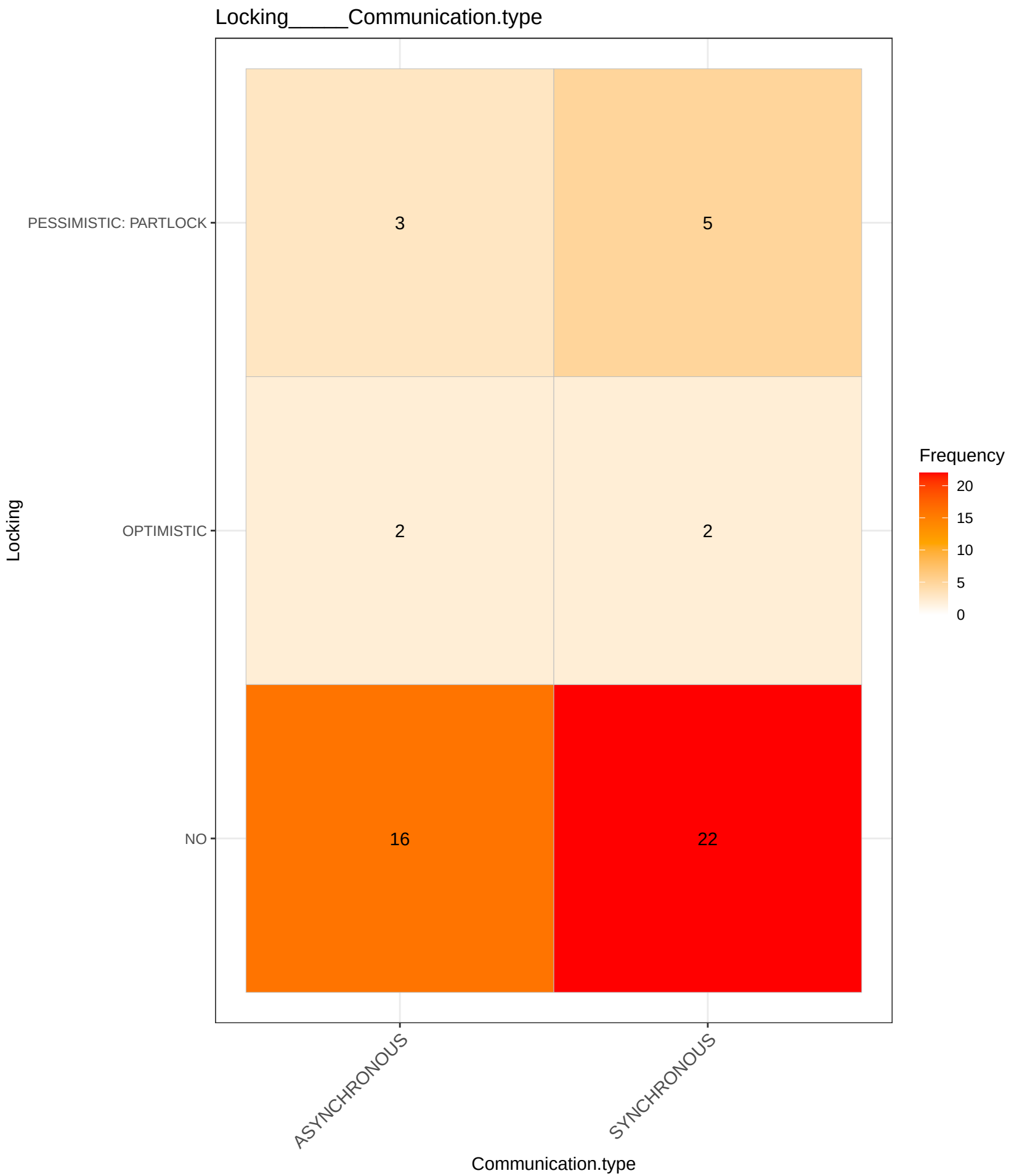

Locking_____Conflict.detection
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
2
3
1
0
2
1
11
11
5
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
10.0
7.5
5.0
2.5
0.0

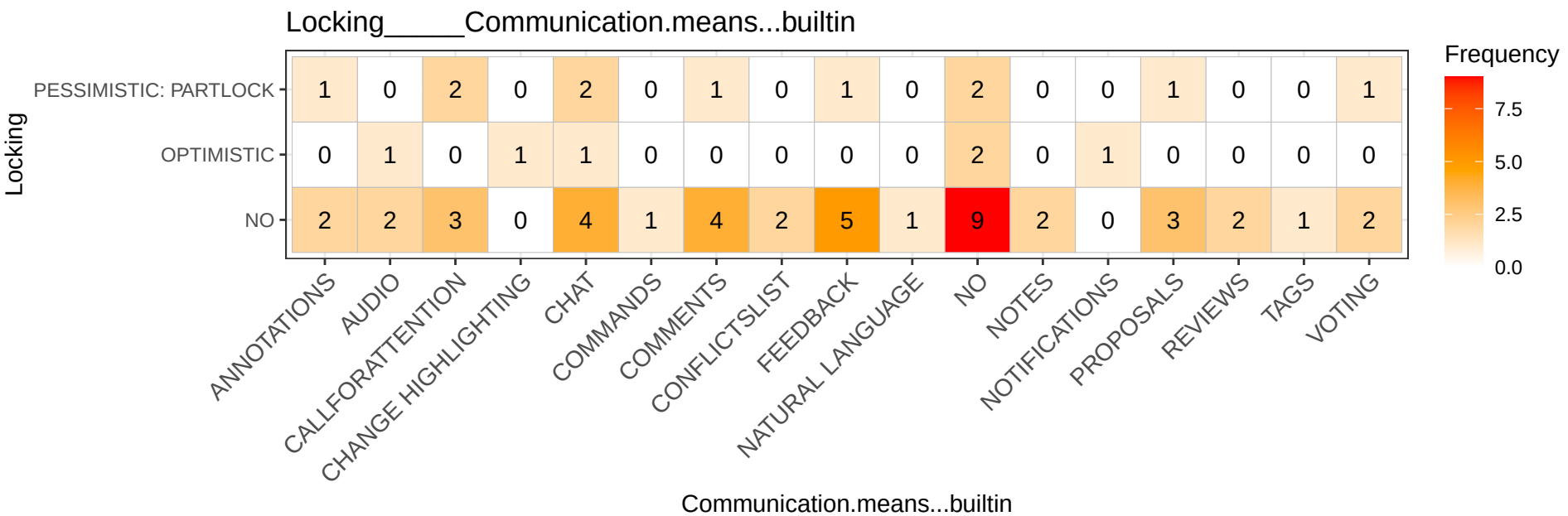

Locking_____Conflict.awareness..User.
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
4
0
1
0
0
2
15
2
5
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
15
10
5
0

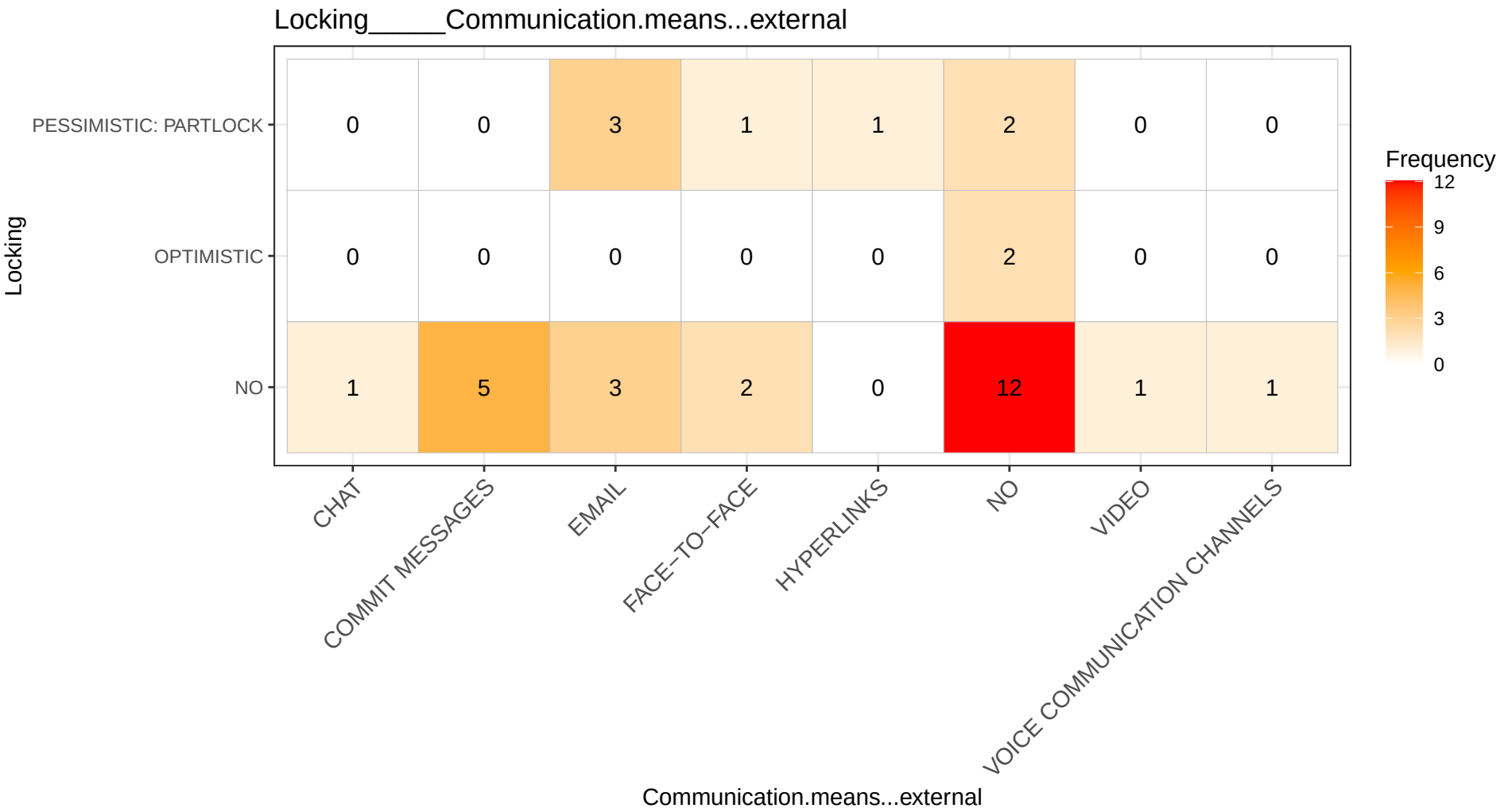

Locking_____Conflict.resolution.support
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
0
2
3
1
0
2
7
7
8
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

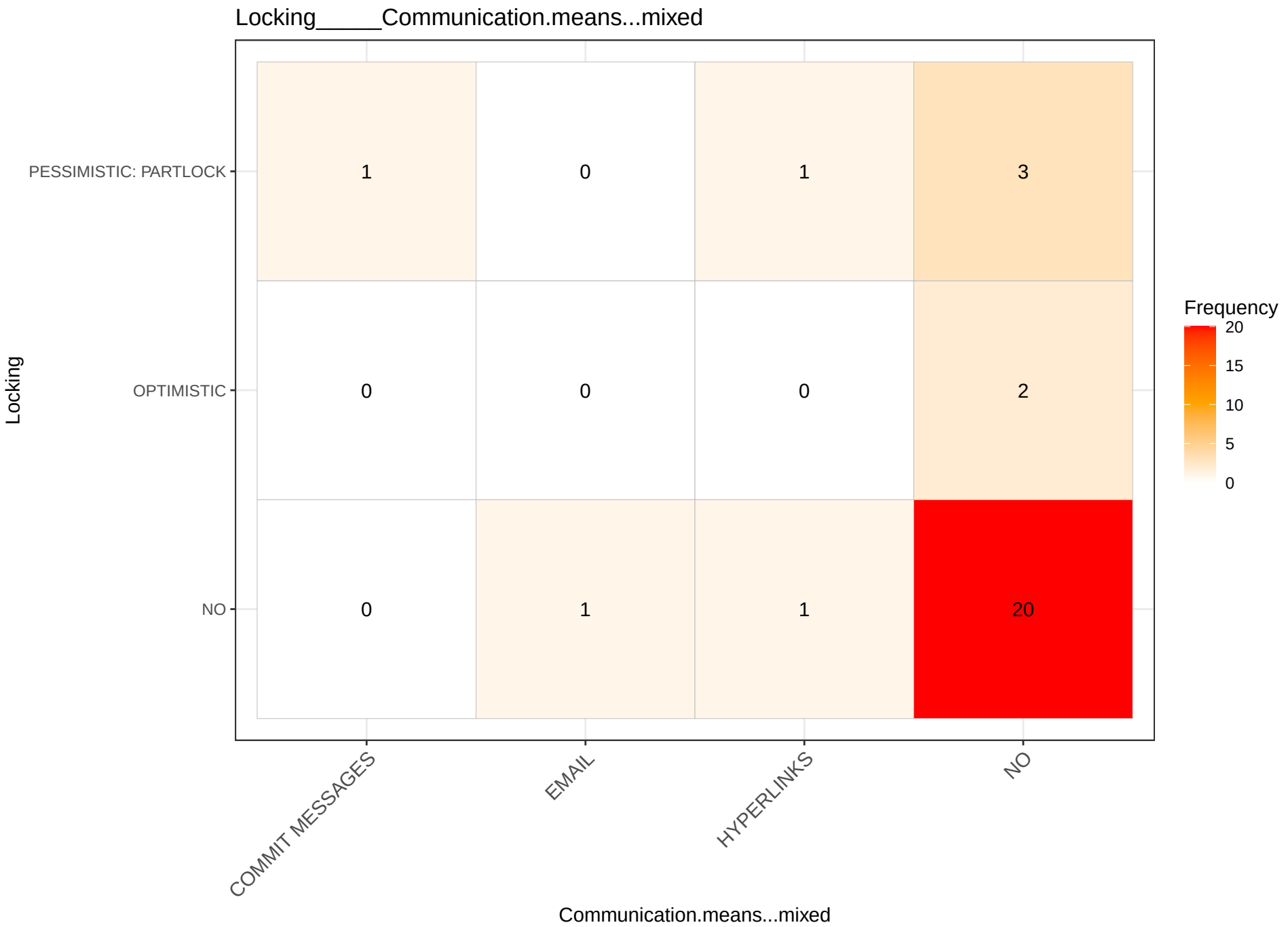

Locking_____Shared.workspace
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
5
0
2
0
19
3
REMOTE
SAMEPLACE
Shared.workspace
Frequency
15
10
5
0

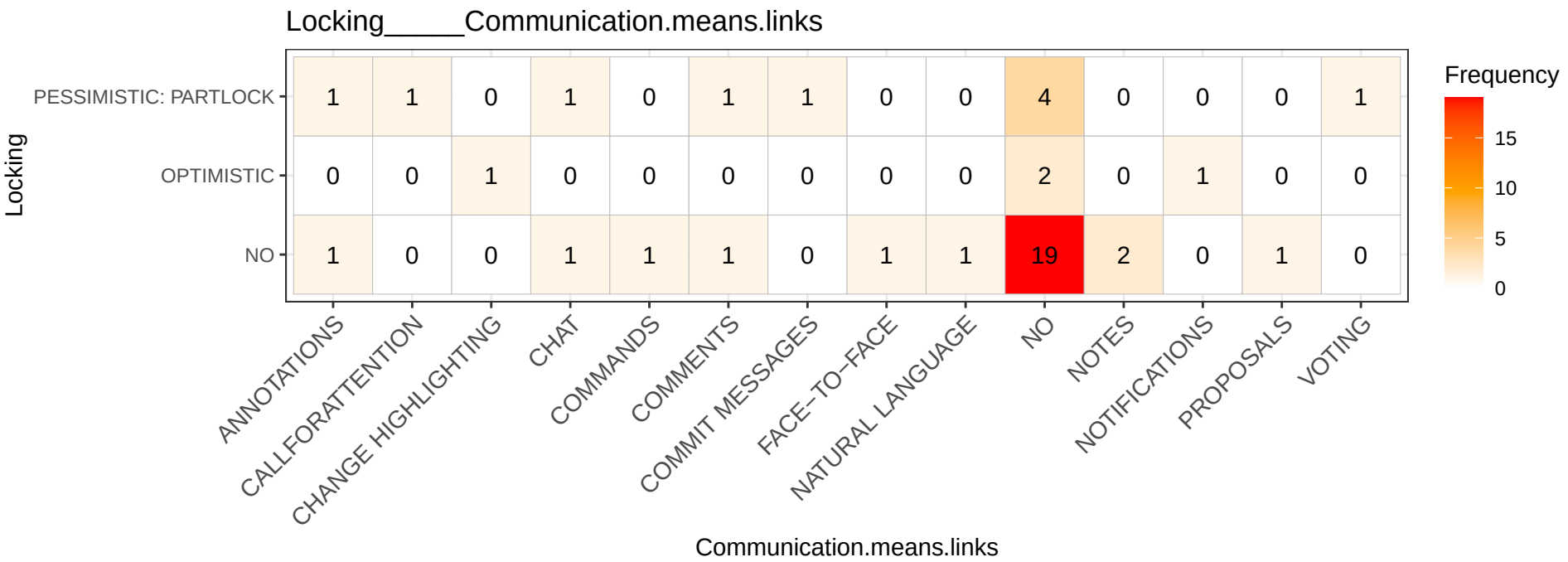

Locking_____Network.architecture
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
2
3
0
0
0
2
0
0
4
14
3
3
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10
5
0

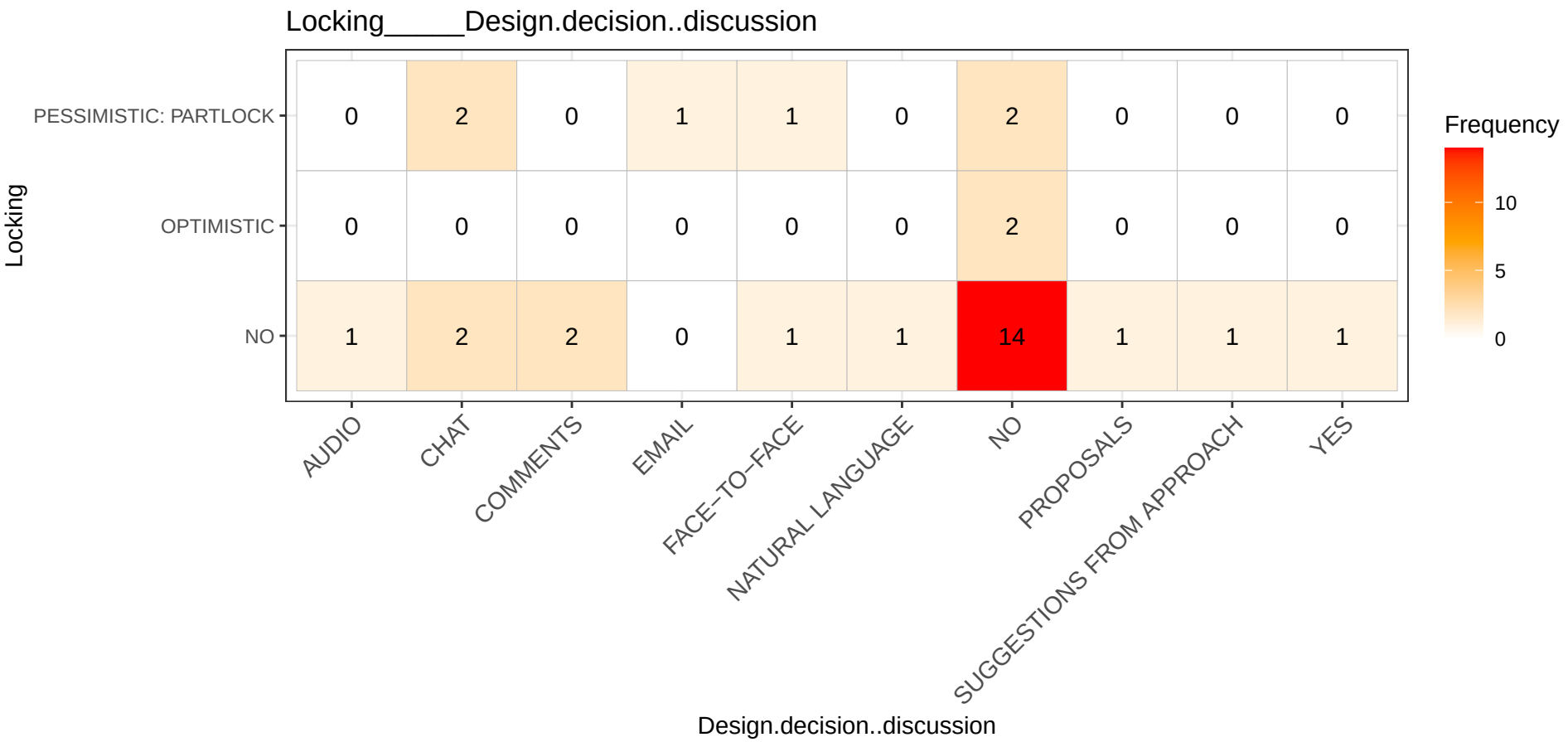

Locking_____Communication.type
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
3
5
2
2
16
22
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
20
15
10
5
0

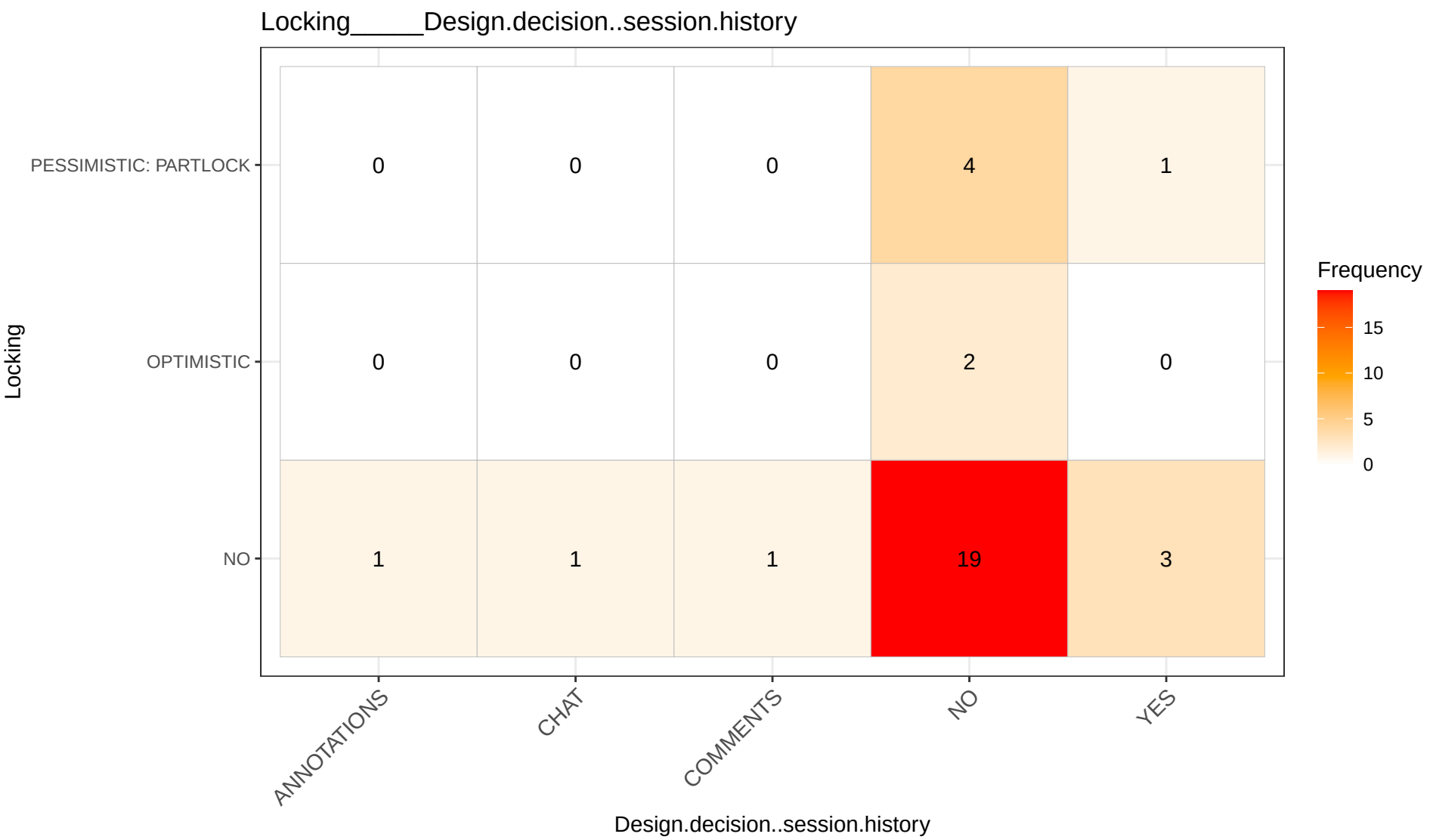

Locking_____Communication.means...builtin
Locking
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
1 0 2 0 2 0 1 0 1 0 2 0 0 1 0 0 1
0 1 0 1 1 0 0 0 0 0 2 0 1 0 0 0 0
2 2 3 0 4 1 4 2 5 1 9 2 0 3 2 1 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

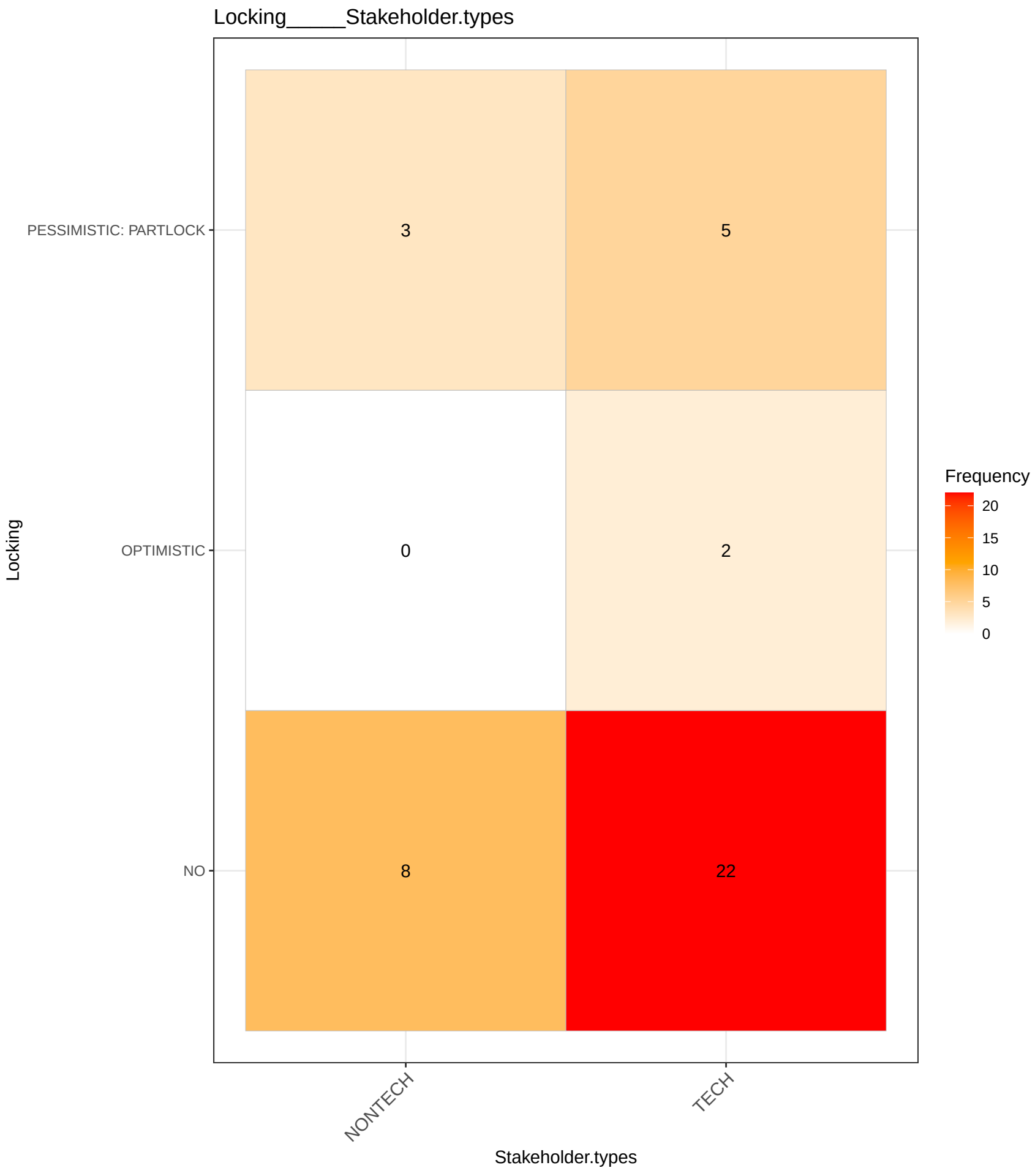

Locking_____Communication.means...external
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
0 0 3 1 1 2 0 0
0 0 0 0 0 2 0 0
1 5 3 2 0 12 1 1
CHAT
COMMIT MESSAGES
EMAIL
FACE-TO-FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
12
9
6
3
0

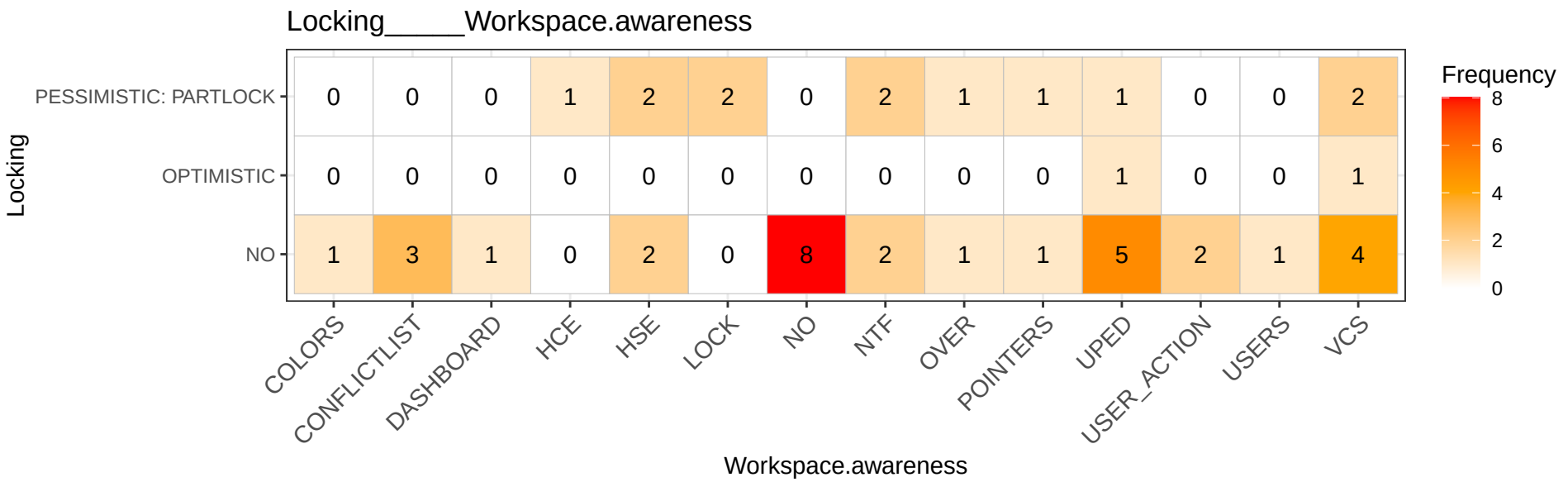

Locking_____Communication.means...mixed
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
1
0
1
3
0
0
0
2
0
1
1
20
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
20
15
10
5
0

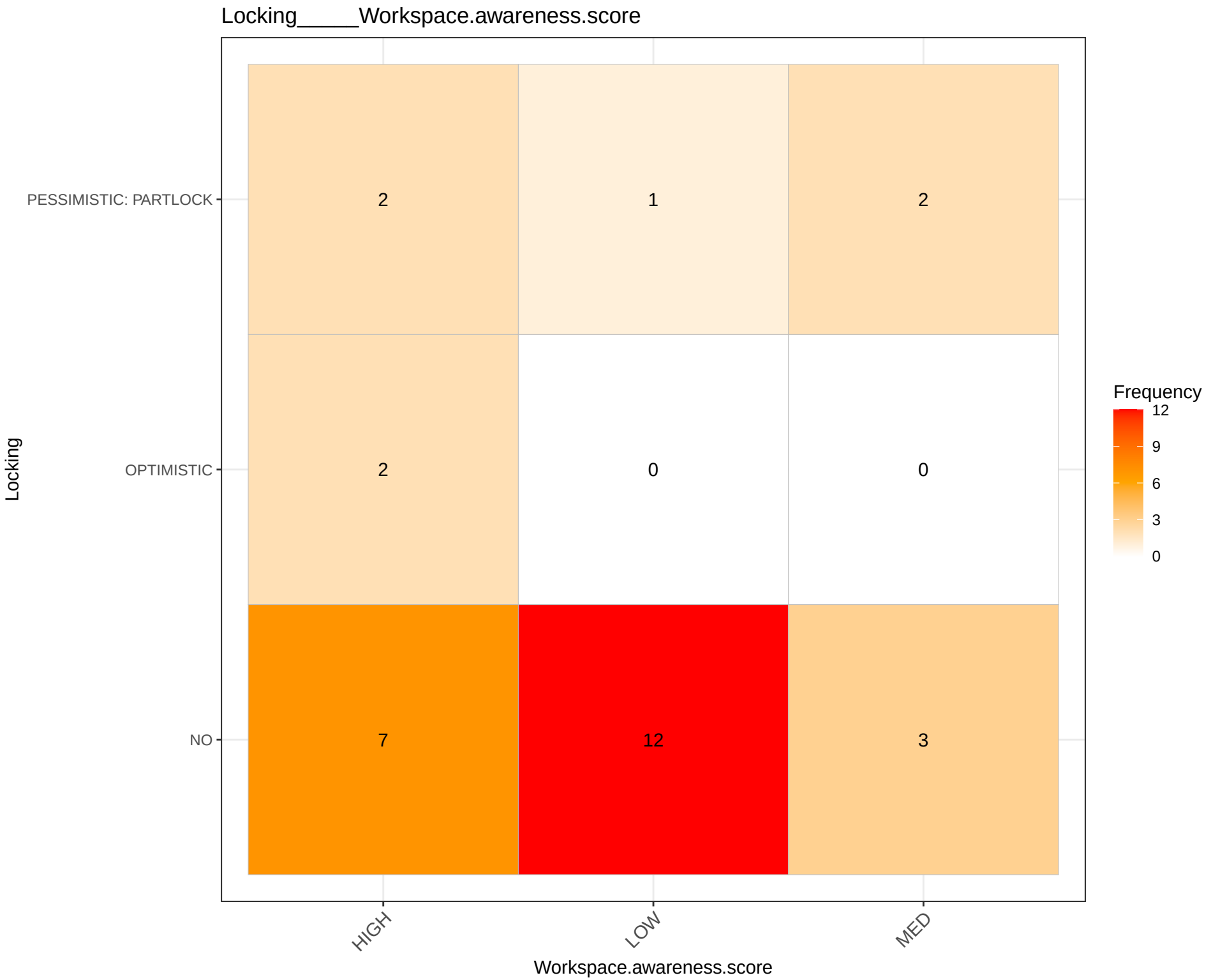

Locking_____Communication.means.links
Locking
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
1 1 0 1 0 1 1 0 0 4 0 0 0 1
0 0 1 0 0 0 0 0 0 2 0 1 0 0
1 0 0 1 1 1 0 1 1 19 2 0 1 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

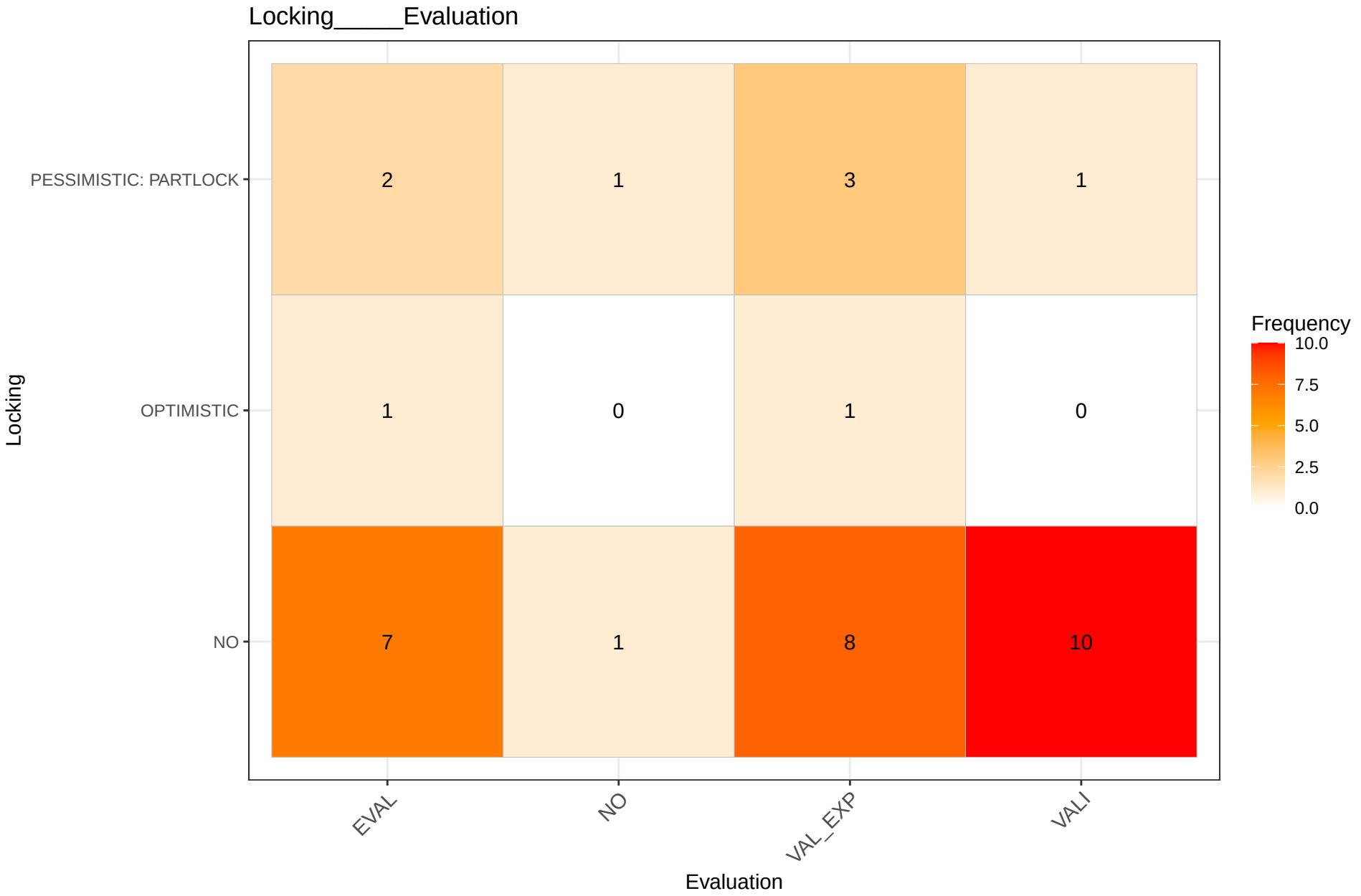

Locking_____Design.decision..discussion
Locking
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
0 2 0 1 1 0 2 0 0 0
0 0 0 0 0 0 2 0 0 0
1 2 2 0 1 1 14 1 1 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10
5
0

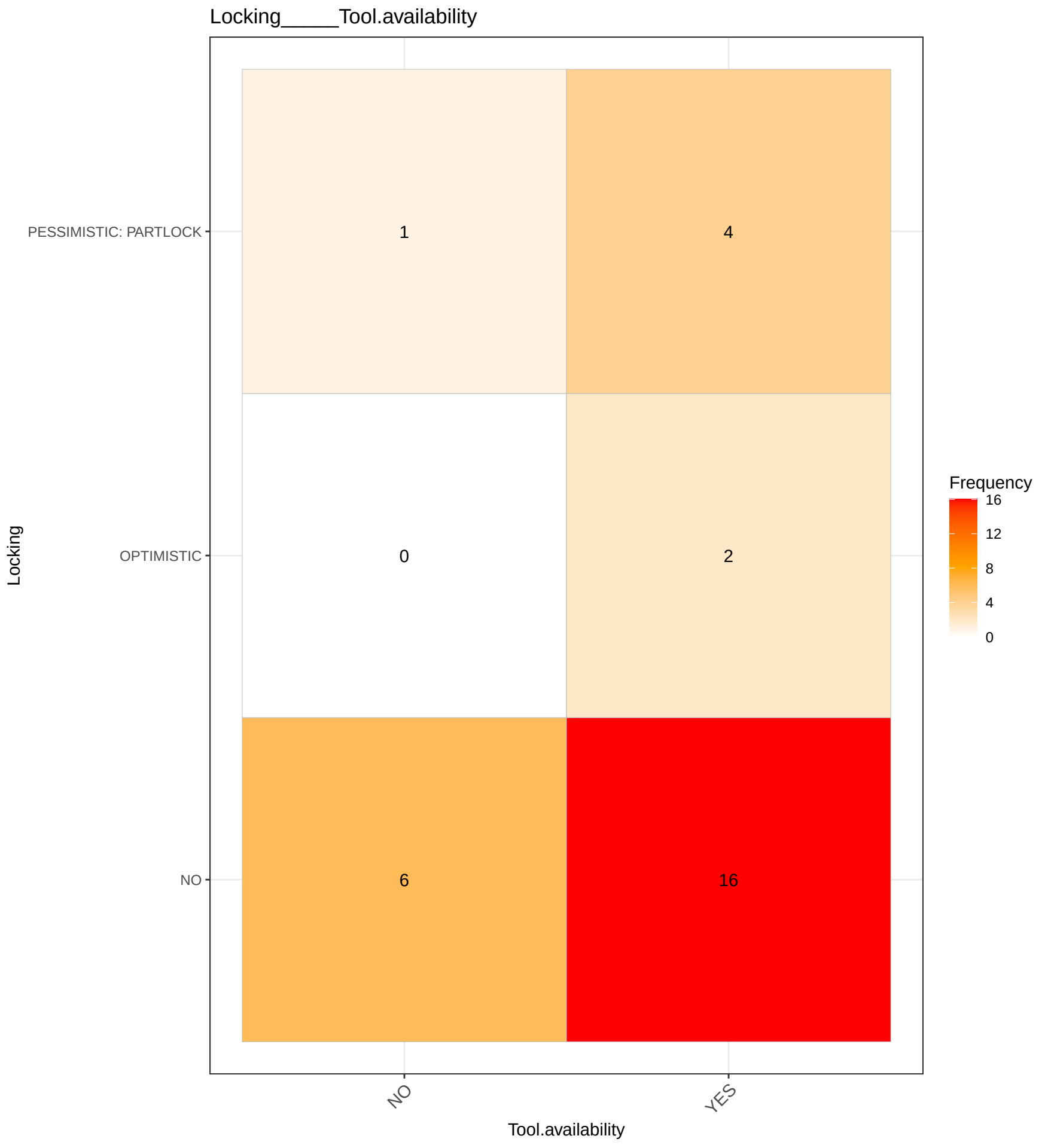

Locking_____Design.decision..session.history
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
0
0
0
4
1
0
0
0
2
0
1
1
1
19
3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
15
10
5
0

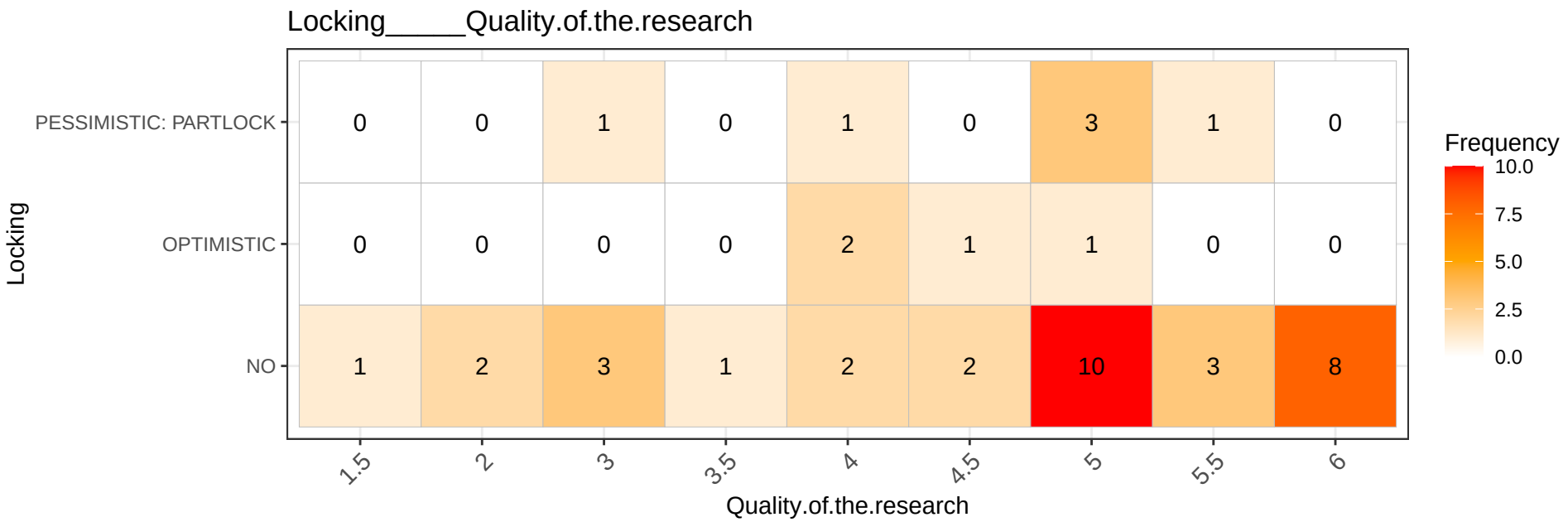

Locking_____Stakeholder.types
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
3
5
0
2
8
22
NONTECH
TECH
Stakeholder.types
Frequency
20
15
10
5
0

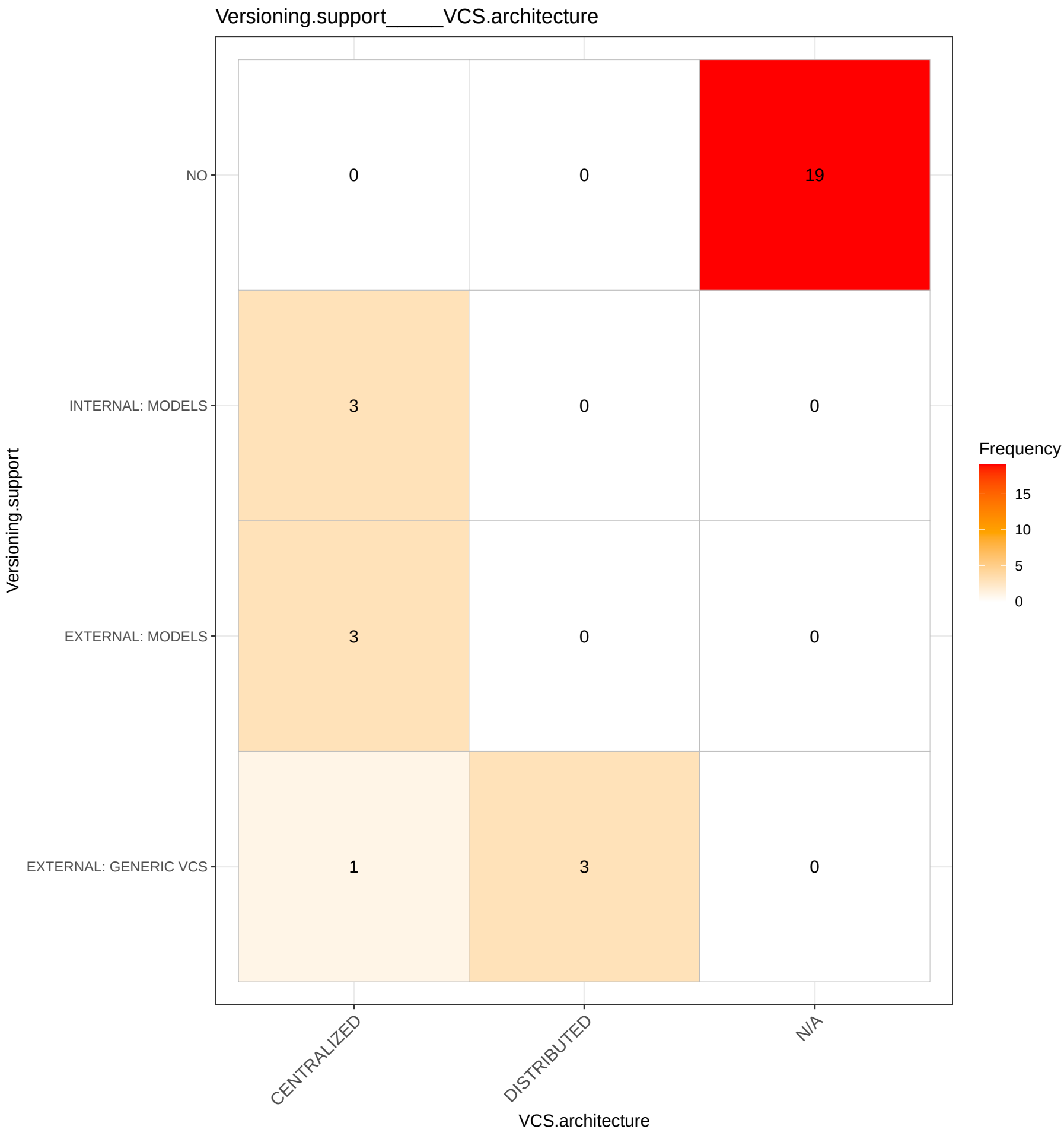

Locking_____Workspace.awareness
Locking
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
0 0 0 1 2 2 0 2 1 1 1 0 0 2
0 0 0 0 0 0 0 0 0 0 1 0 0 1
1 3 1 0 2 0 8 2 1 1 5 2 1 4
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
8
6
4
2
0

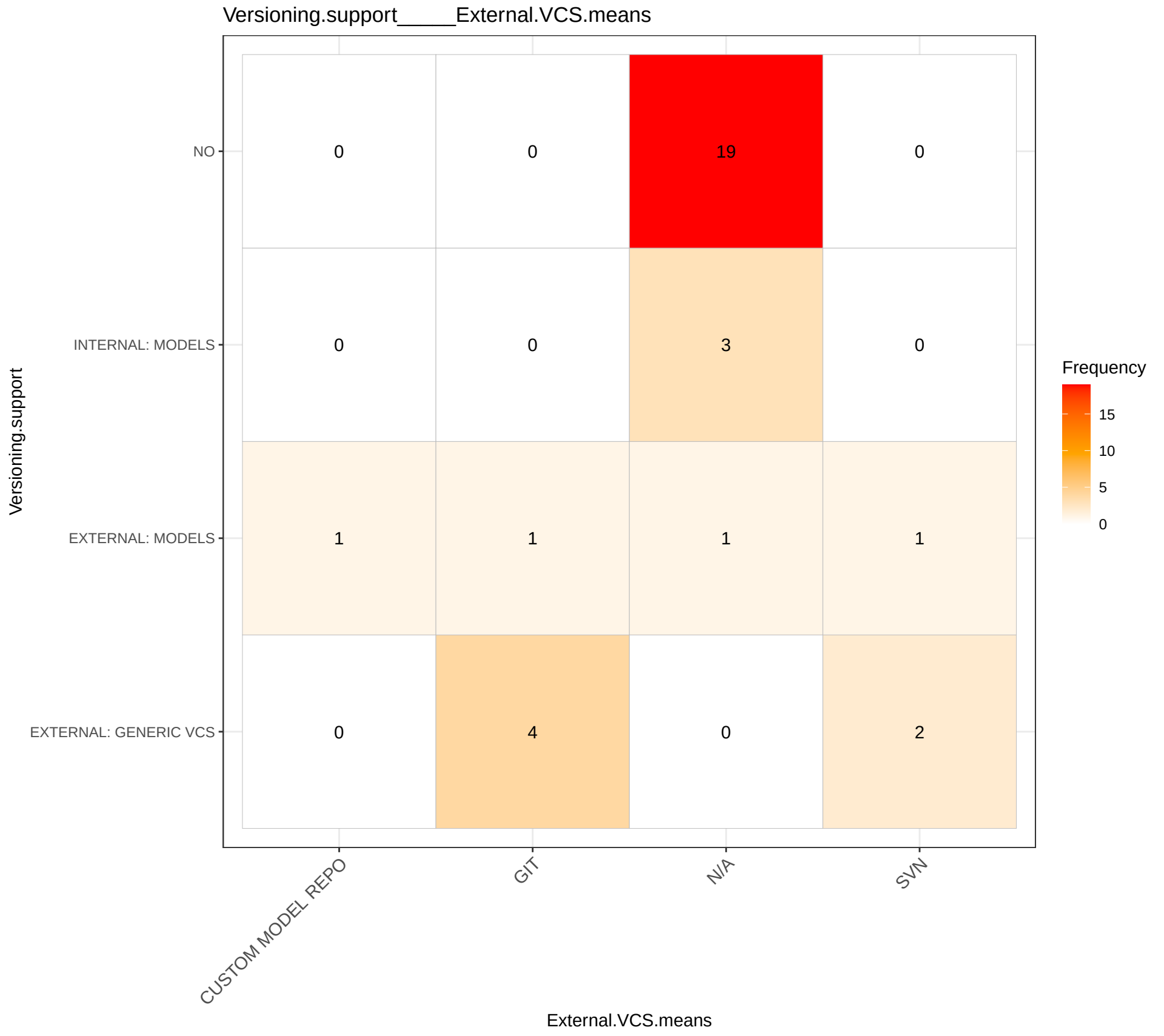

Locking_____Workspace.awareness.score
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
2
1
2
2
0
0
7
12
3
HIGH
LOW
MED
Workspace.awareness.score
Frequency
12
9
6
3
0

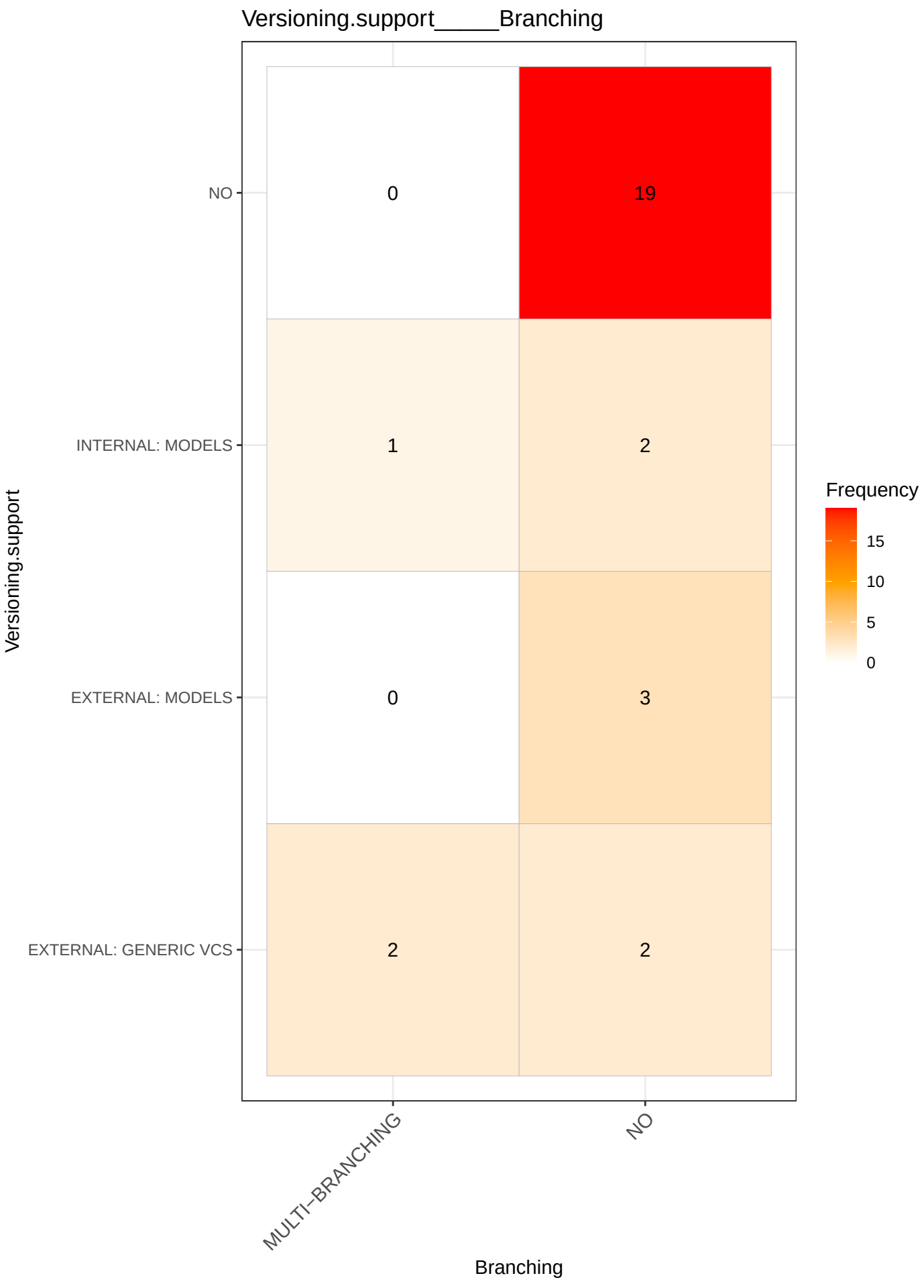

Locking_____Evaluation
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
2
1
3
1
1
0
1
0
7
1
8
10
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0

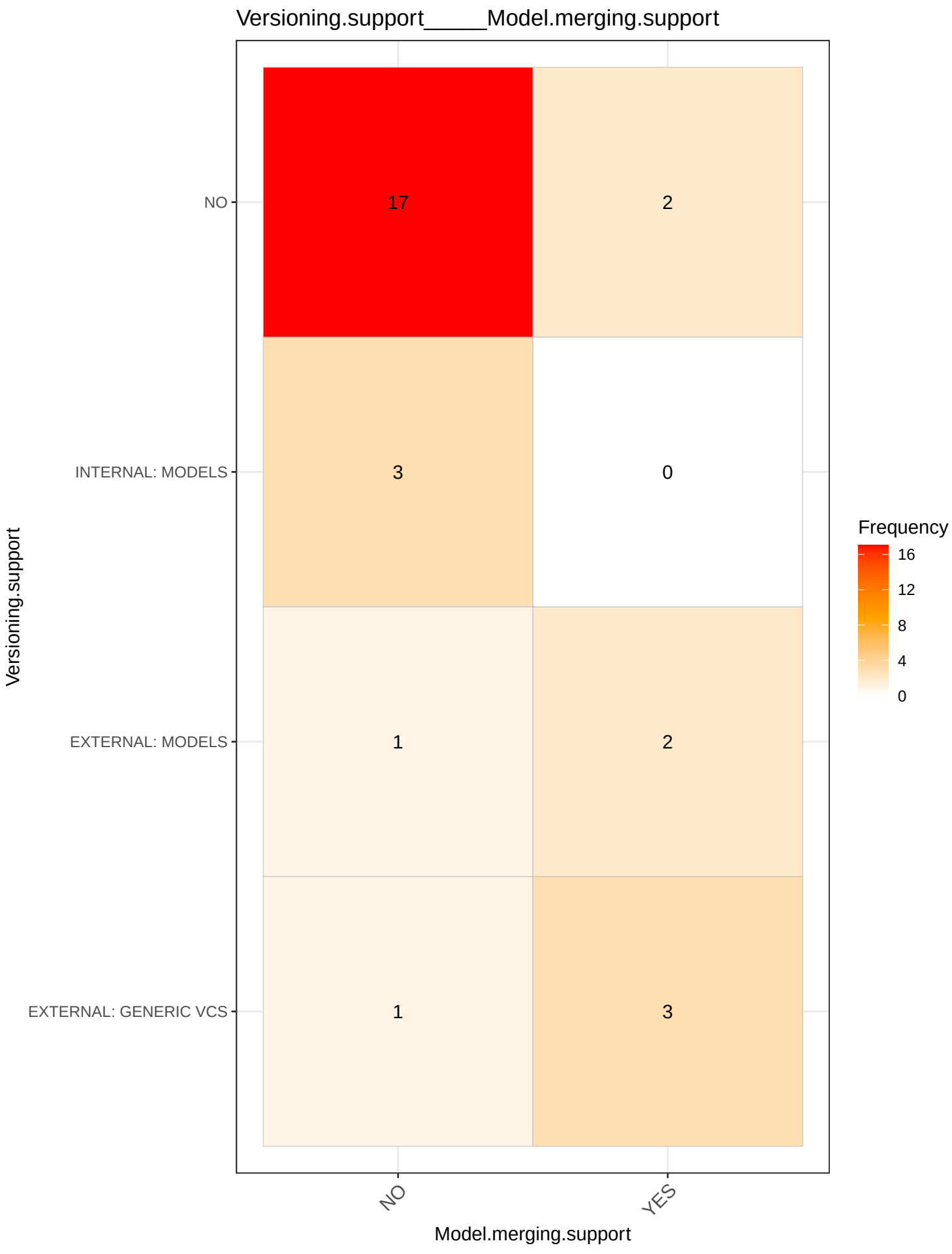

Locking_____Tool.availability
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
1
4
0
2
6
16
NO
YES
Tool.availability
Frequency
16
12
8
4
0

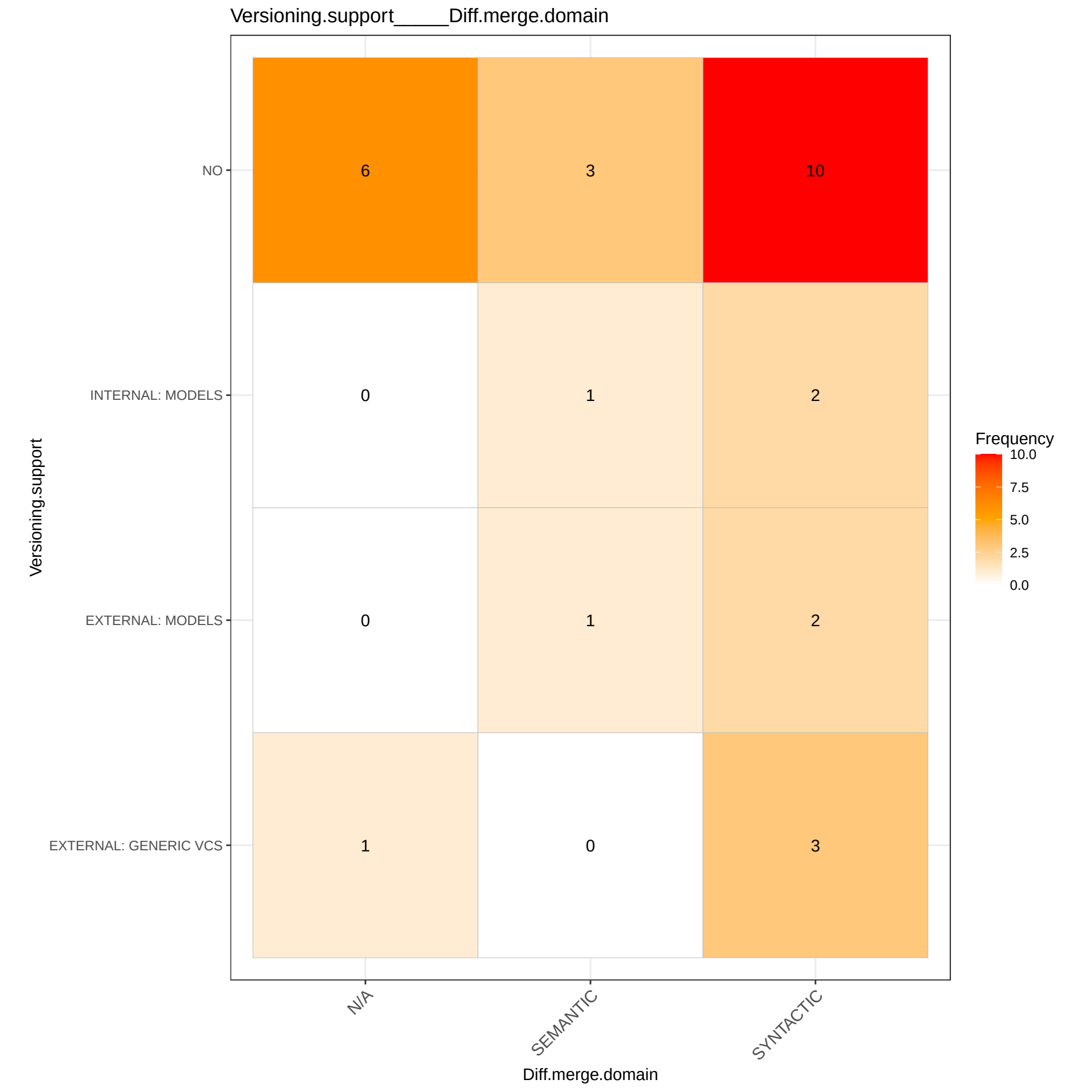

Locking_____Quality.of.the.research
PESSIMISTIC: PARTLOCK
OPTIMISTIC
NO
Locking
0 0 1 0 1 0 3 1 0
0 0 0 0 2 1 1 0 0
1 2 3 1 2 2 10 3 8
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

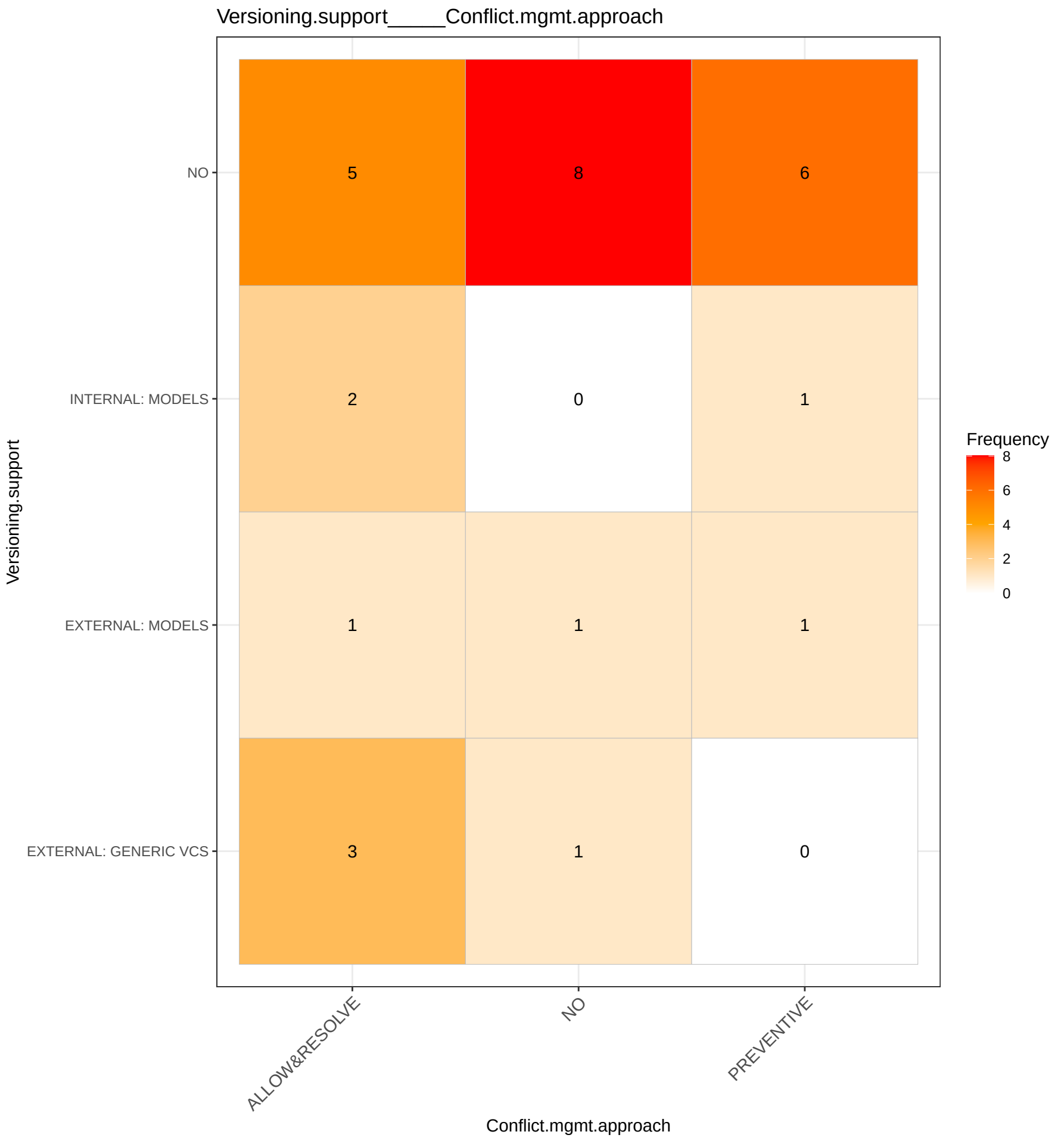

Versioning.support_____VCS.architecture
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
0
0
19
3
0
0
3
0
0
1
3
0
CENTRALIZED
DISTRIBUTED
N/A
VCS.architecture
Frequency
15
10
5
0

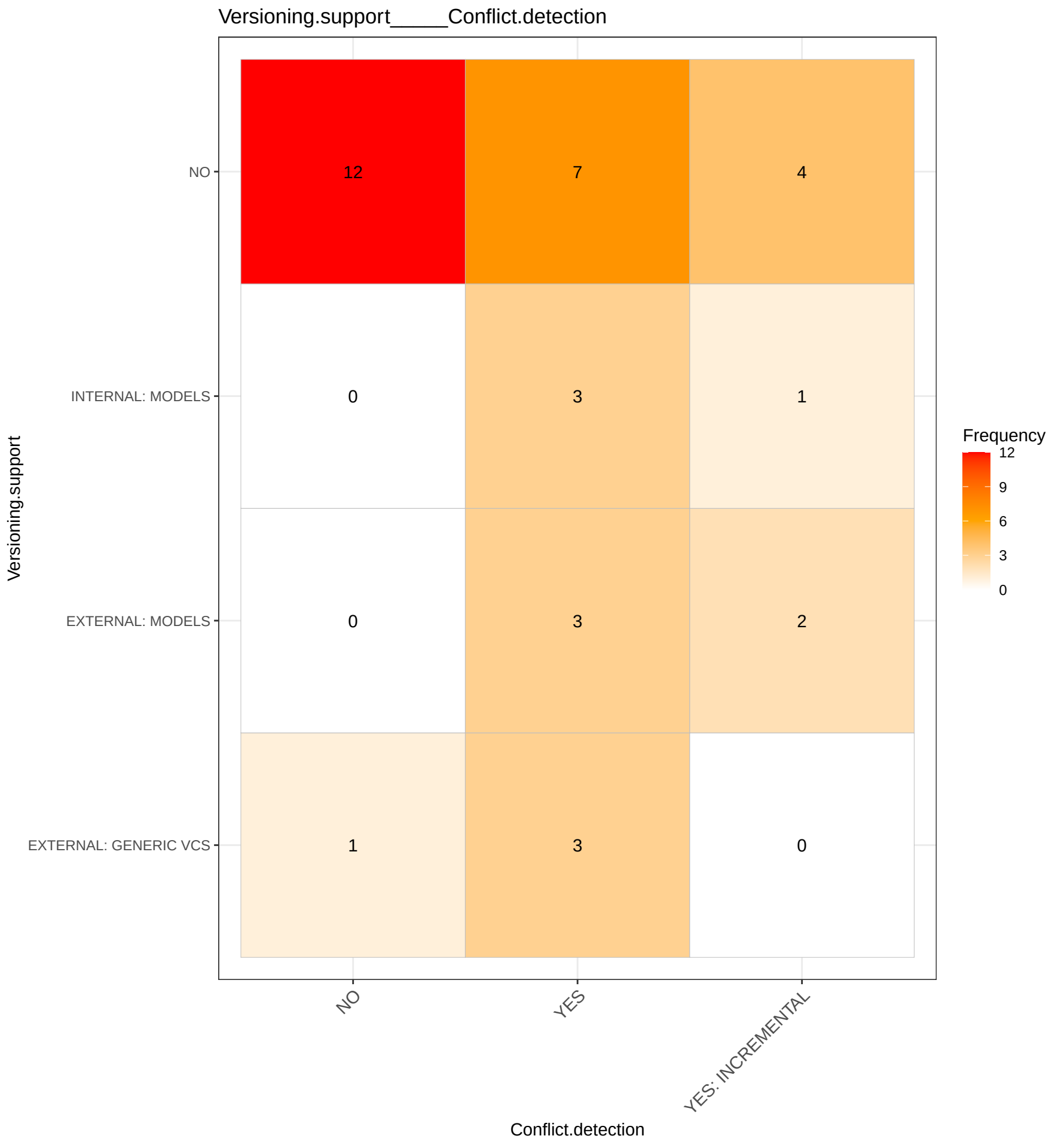

Versioning.support_____External.VCS.means
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
0
0
19
0
0
0
3
0
1
1
1
1
0
4
0
2
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
15
10
5
0

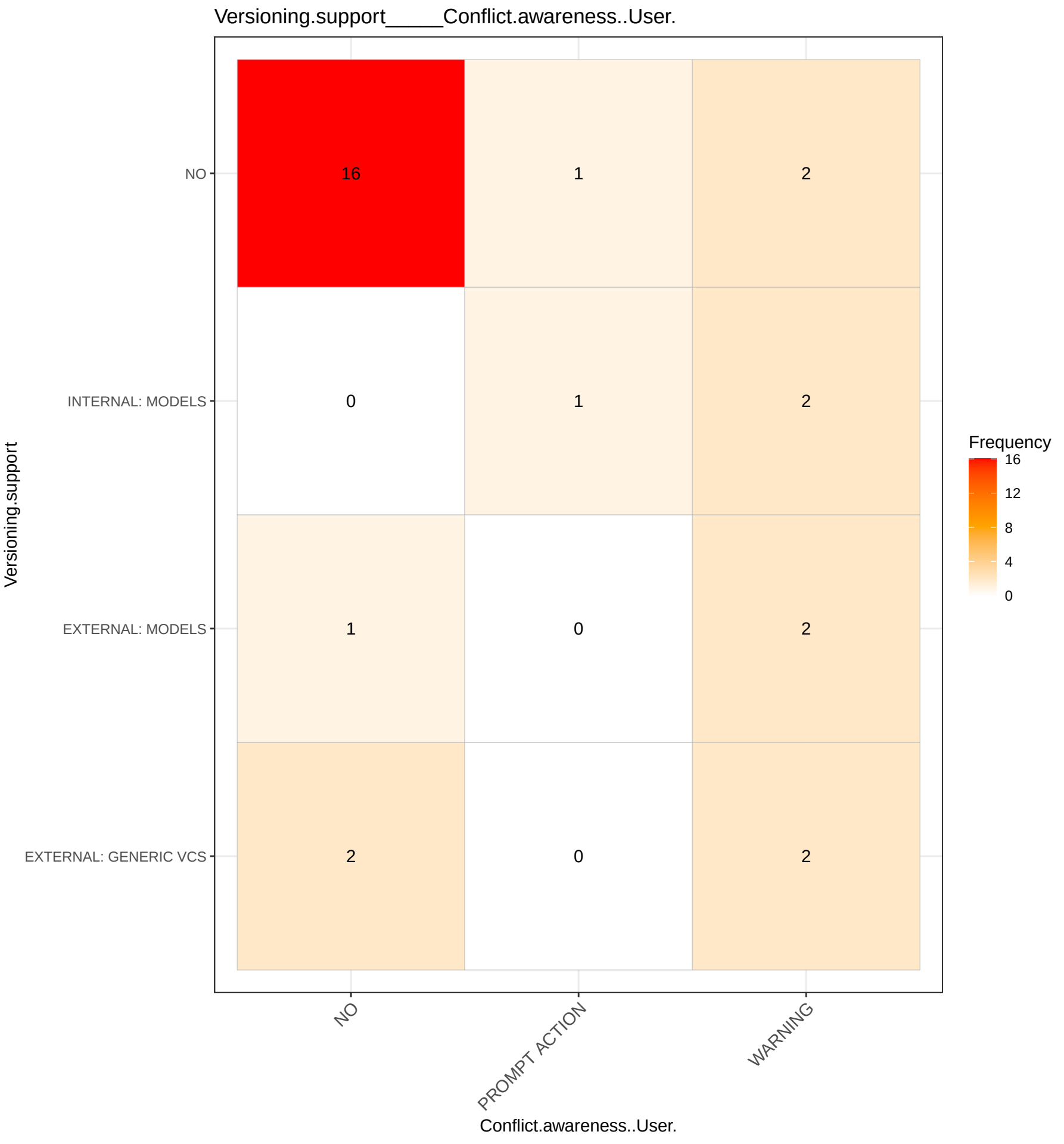

Versioning.support_____Branching
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
0
19
1
2
0
3
2
2
MULTI−BRANCHING
NO
Branching
Frequency
15
10
5
0

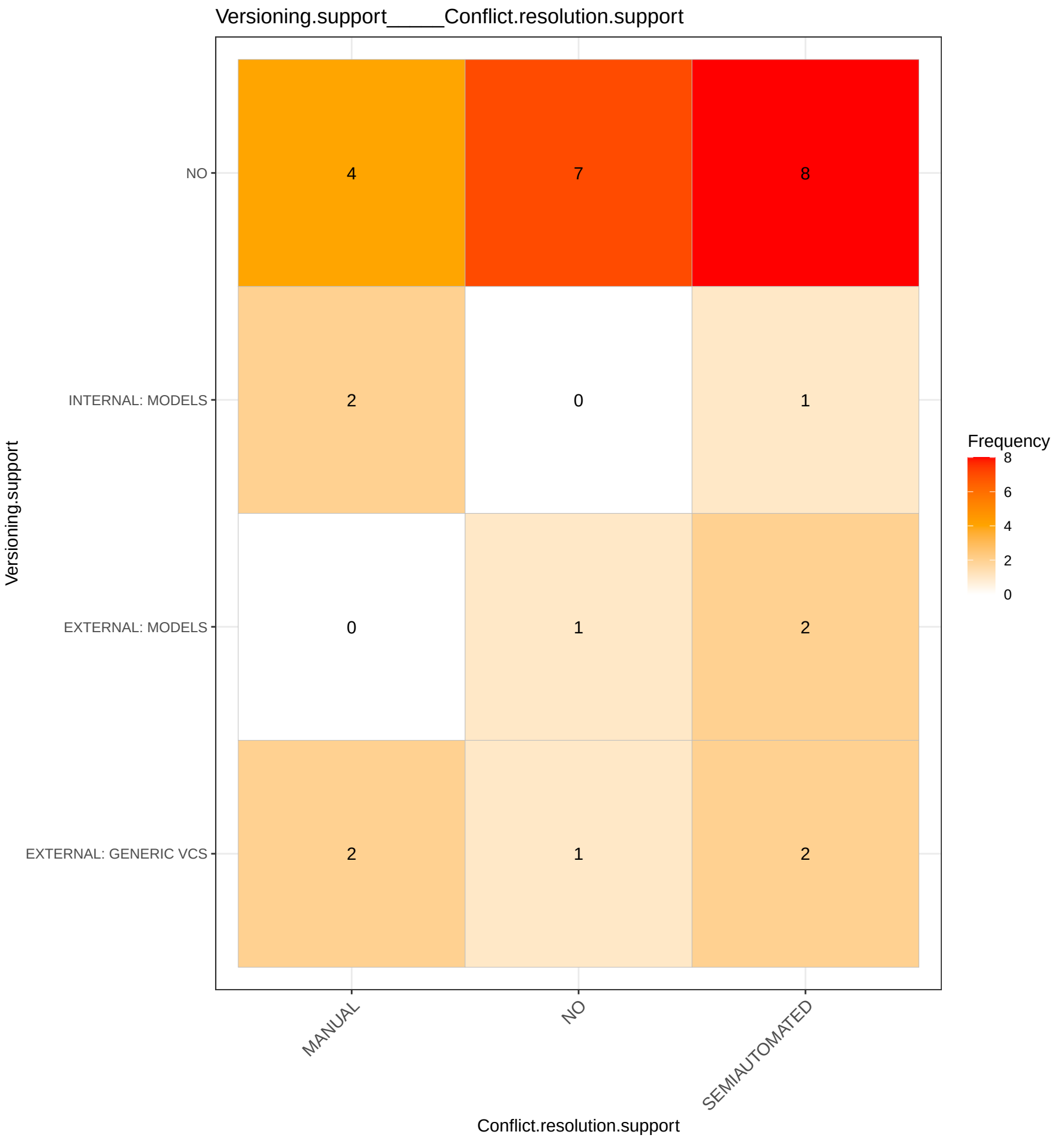

Versioning.support_____Model.merging.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
17
2
3
0
1
2
1
3
NO
YES
Model.merging.support
Frequency
16
12
8
4
0

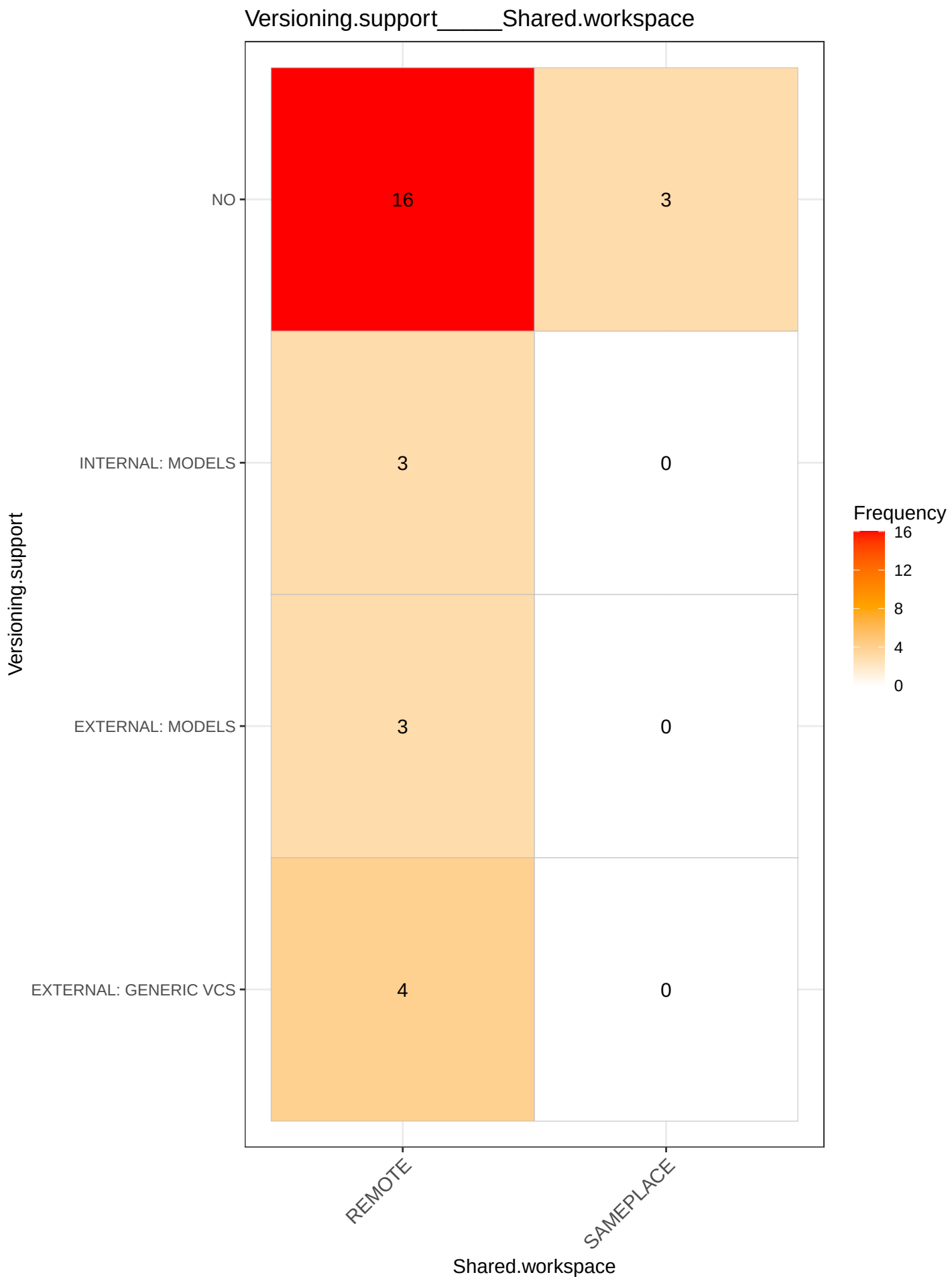

Versioning.support_____Diff.merge.domain
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
6
3
10
0
1
2
0
1
2
1
0
3
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10.0
7.5
5.0
2.5
0.0

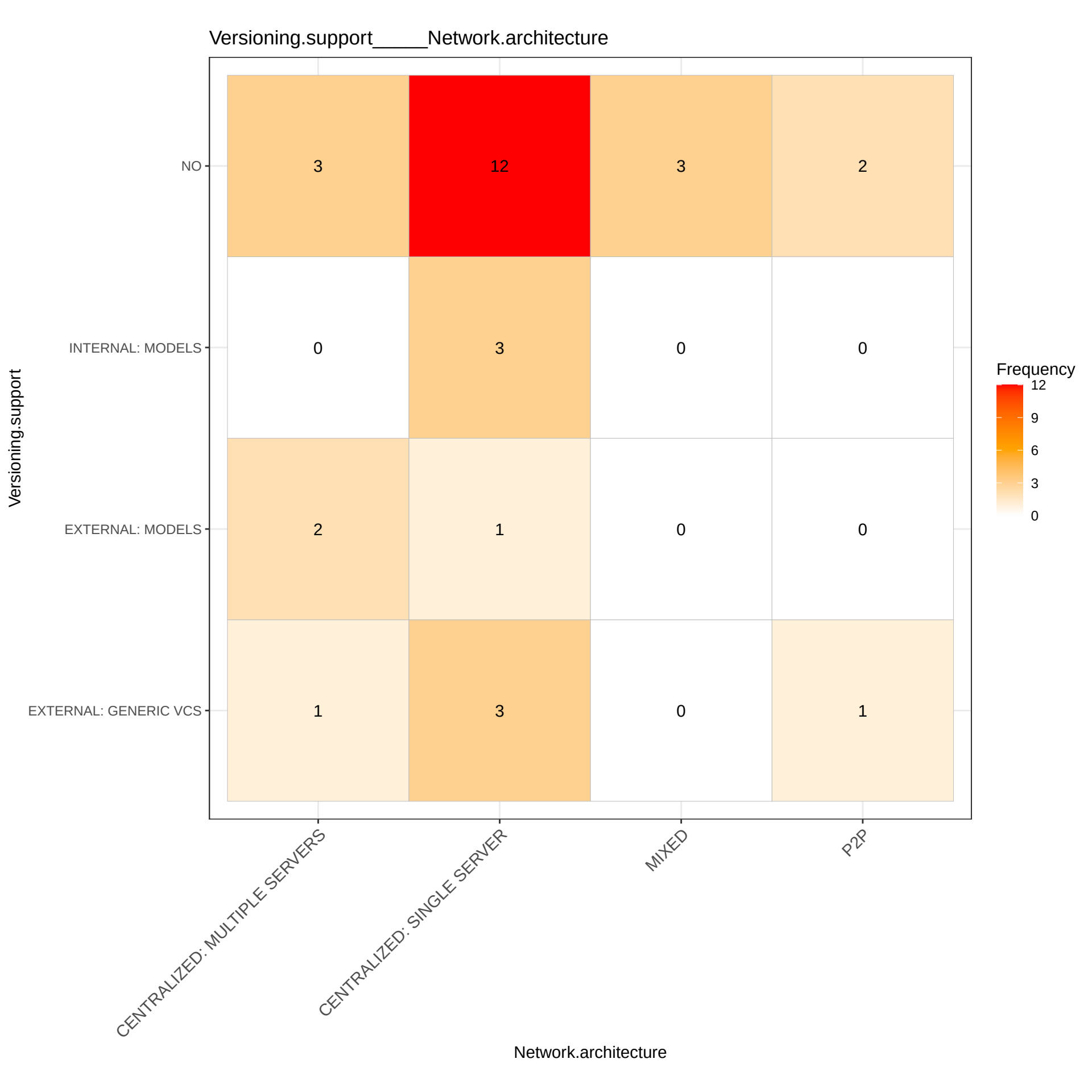

Versioning.support_____Conflict.mgmt.approach
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
5
8
6
2
0
1
1
1
1
3
1
0
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

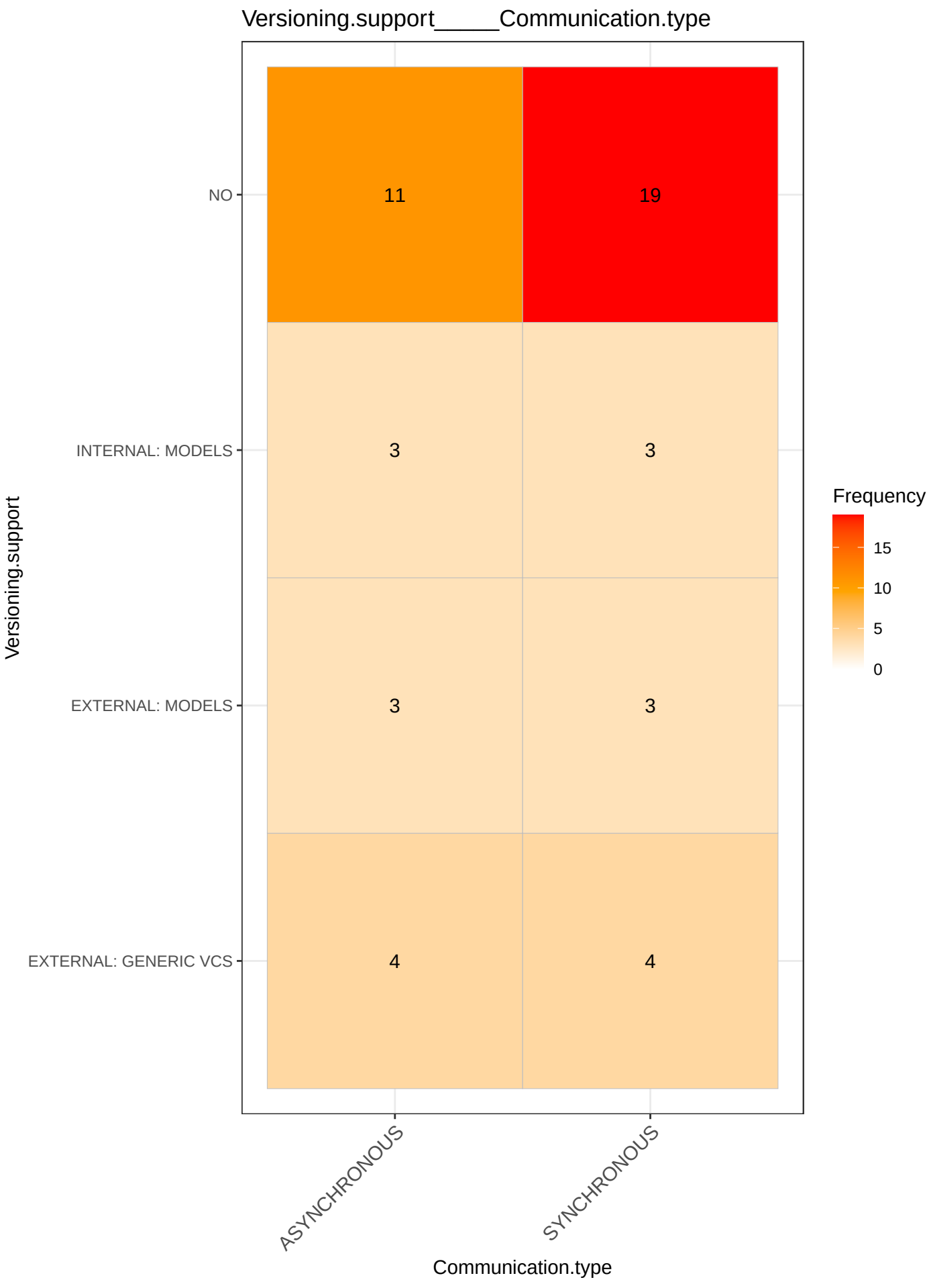

Versioning.support_____Conflict.detection
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
12
7
4
0
3
1
0
3
2
1
3
0
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

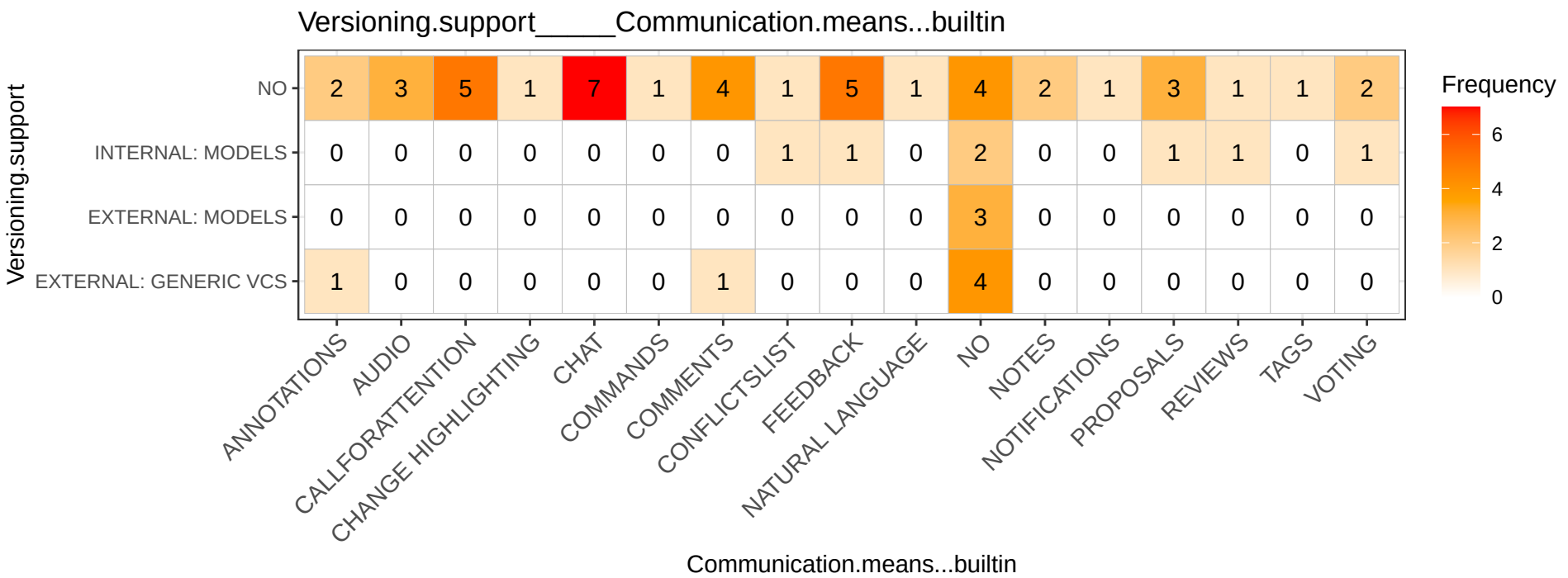

Versioning.support_____Conflict.awareness..User.
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
16
1
2
0
1
2
1
0
2
2
0
2
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
16
12
8
4
0

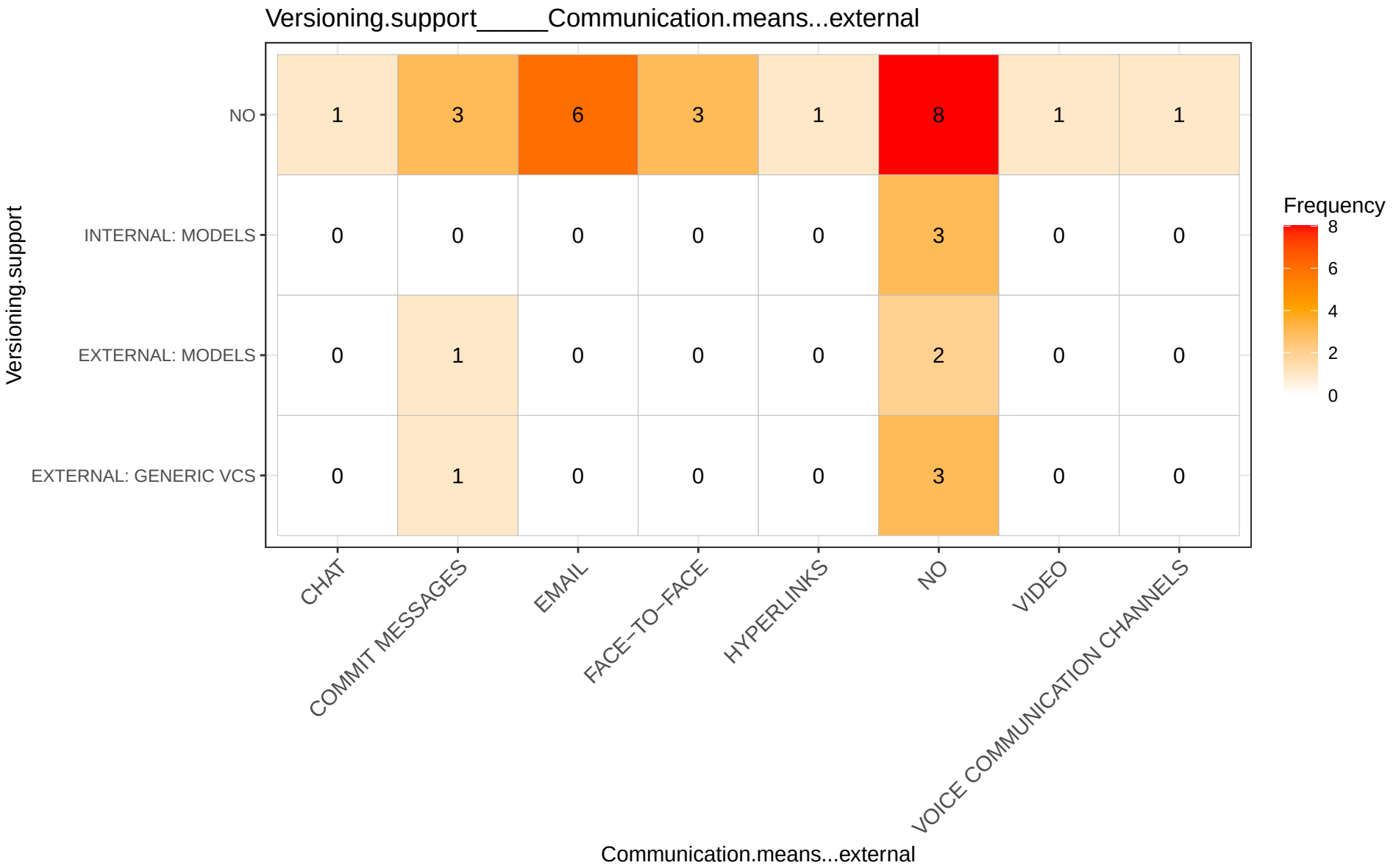

Versioning.support_____Conflict.resolution.support
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
4
7
8
2
0
1
0
1
2
2
1
2
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

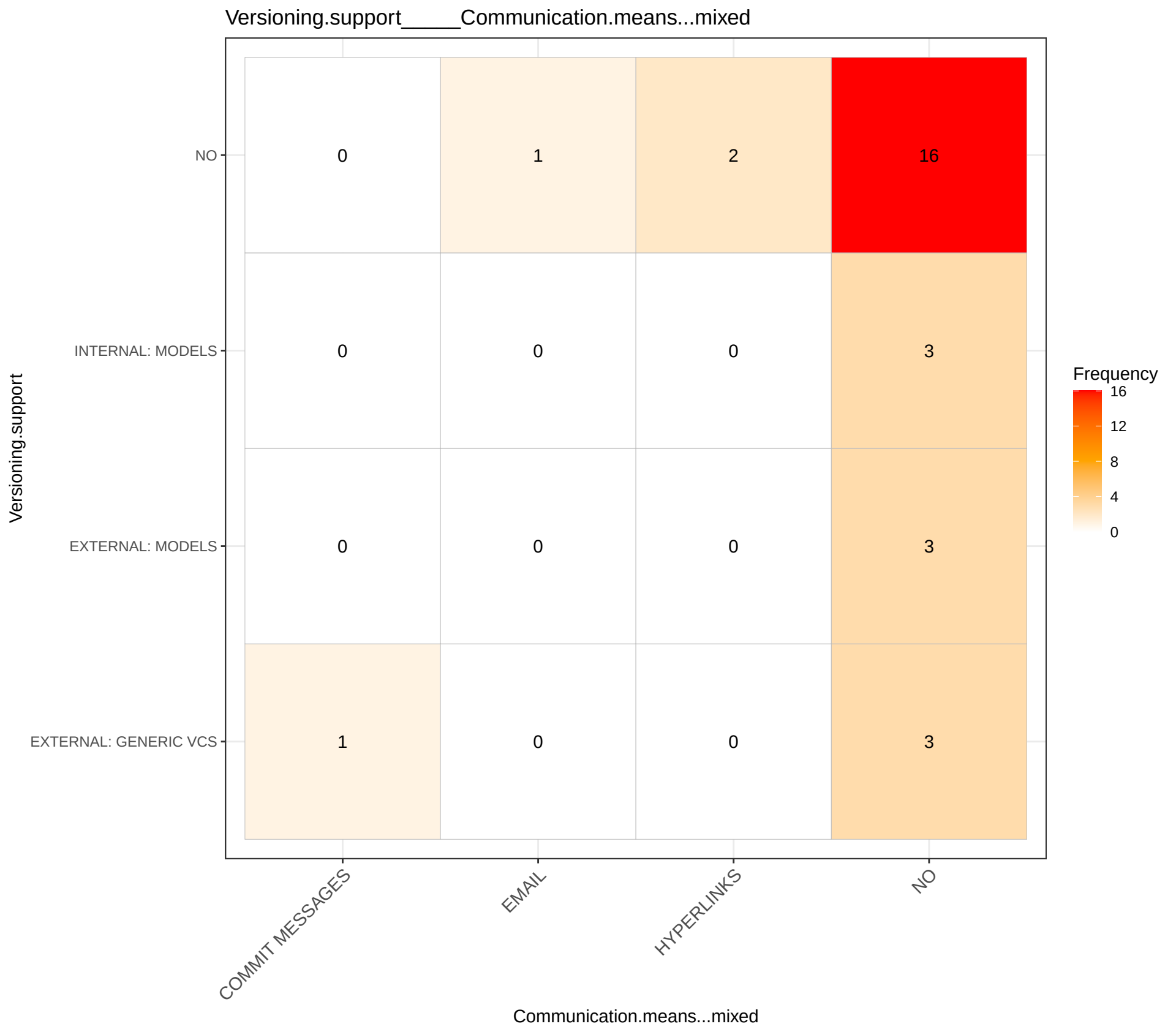

Versioning.support_____Shared.workspace
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
16
3
3
0
3
0
4
0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

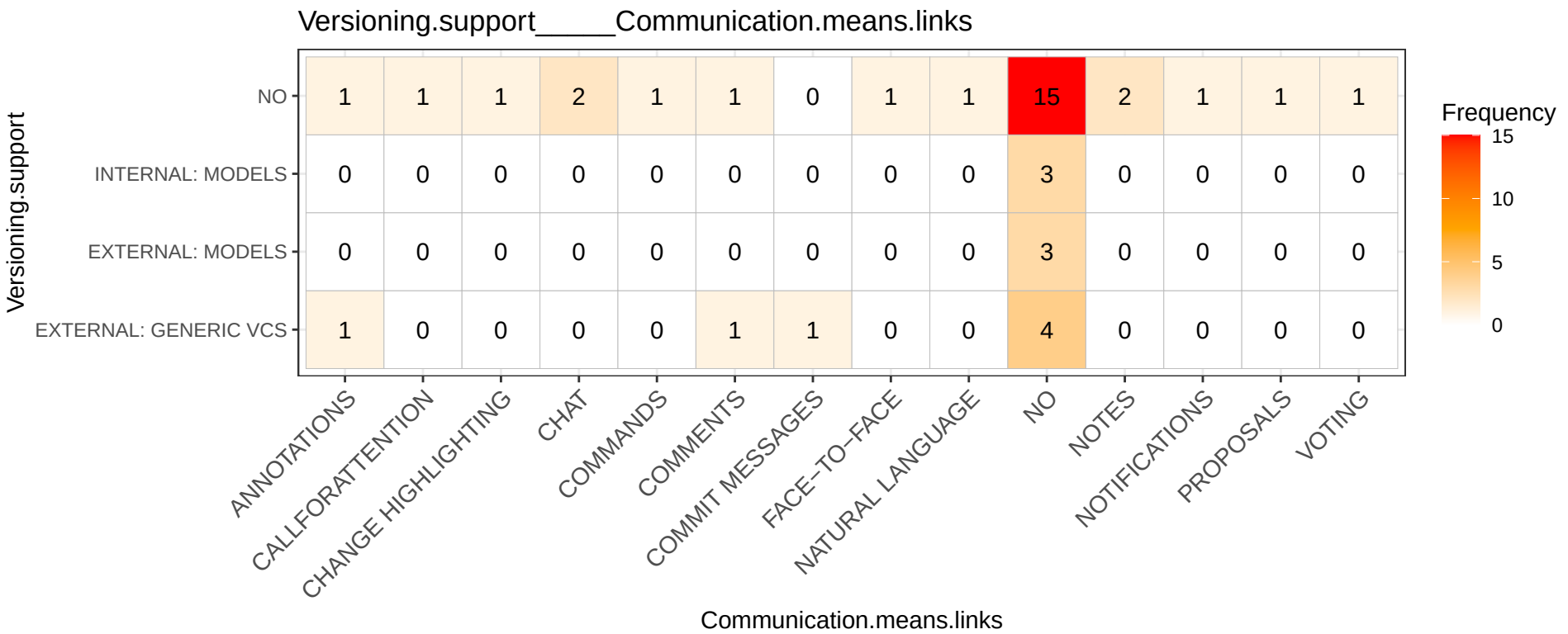

Versioning.support_____Network.architecture
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
3
12
3
2
0
3
0
0
2
1
0
0
1
3
0
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
12
9
6
3
0

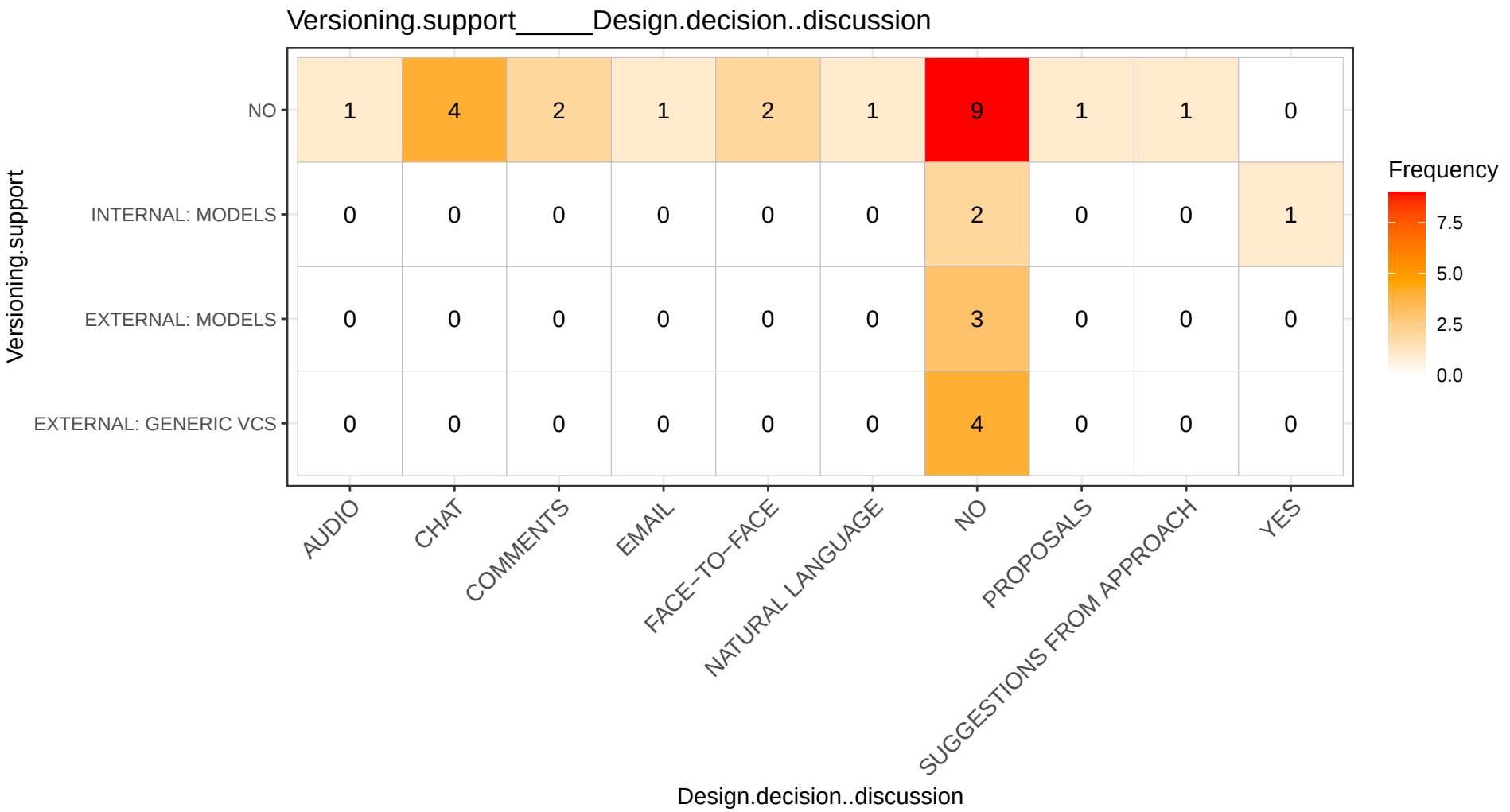

Versioning.support_____Communication.type
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
11
19
3
3
3
3
4
4
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

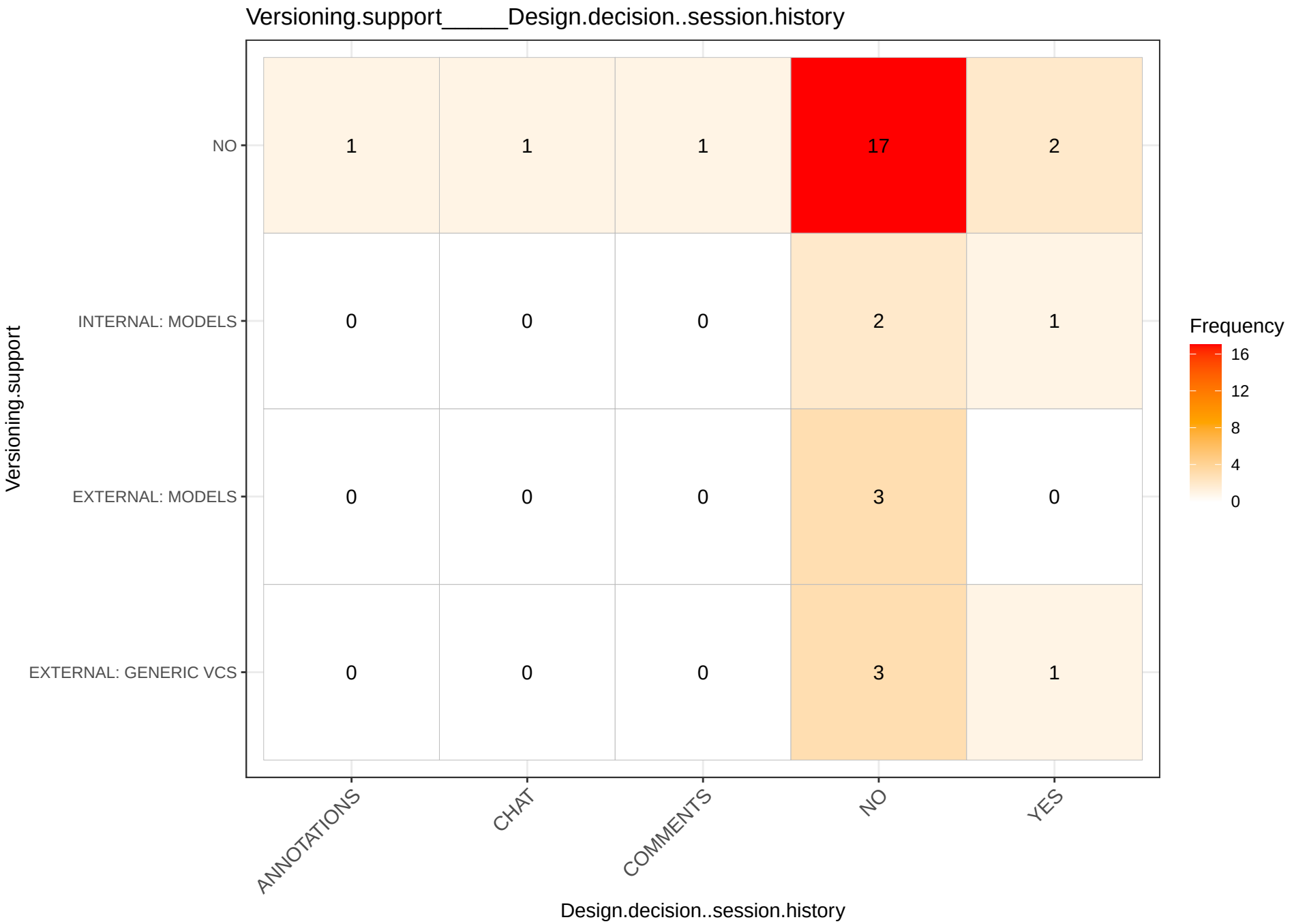

Versioning.support_____Communication.means...builtin
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
2 3 5 1 7 1 4 1 5 1 4 2 1 3 1 1 2
0 0 0 0 0 0 0 1 1 0 2 0 0 1 1 0 1
0 0 0 0 0 0 0 0 0 0 3 0 0 0 0 0 0
1 0 0 0 0 0 1 0 0 0 4 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
4
2
0

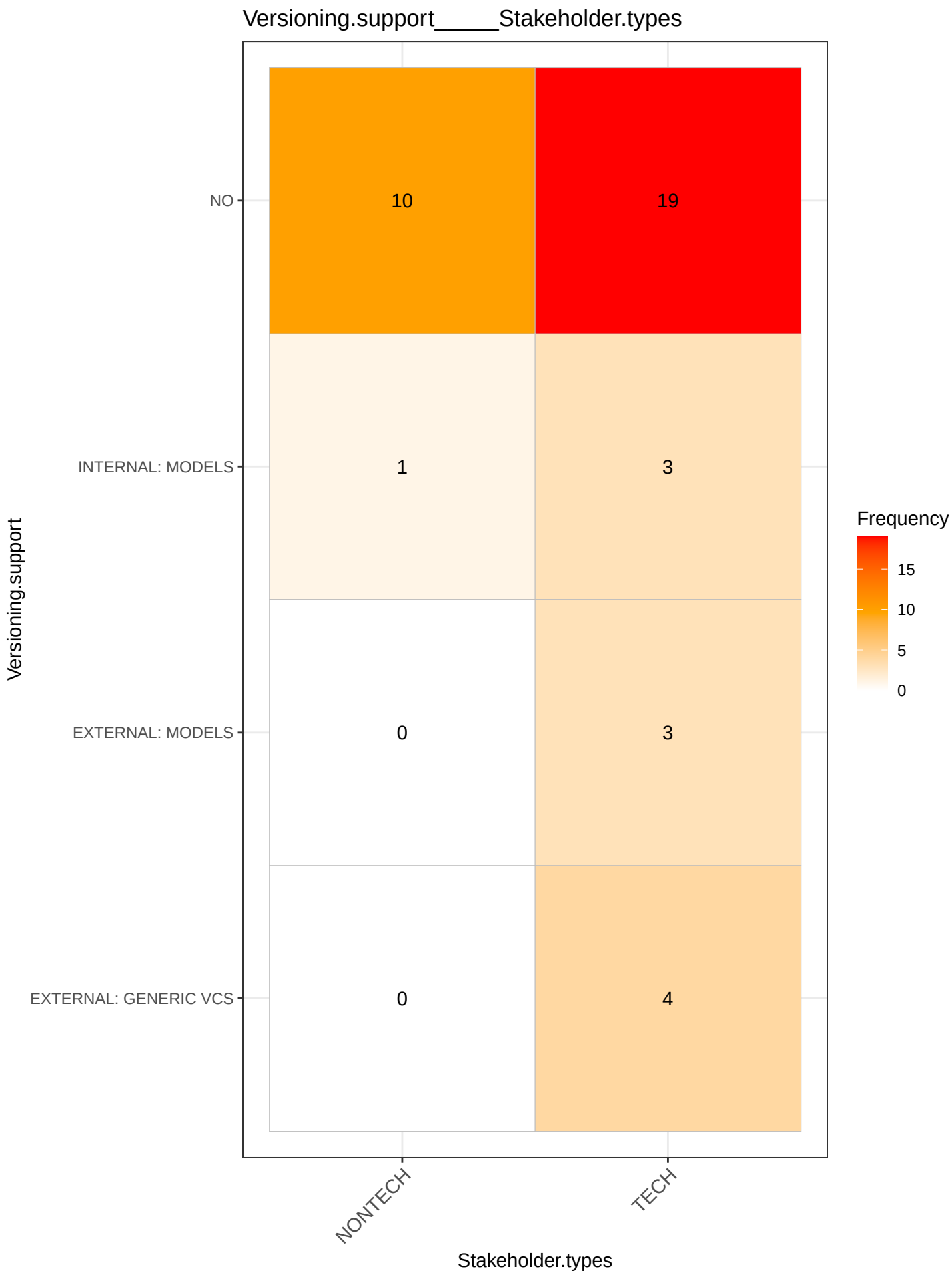

Versioning.support_____Communication.means...external
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
1 3 6 3 1 8 1 1
0 0 0 0 0 3 0 0
0 1 0 0 0 2 0 0
0 1 0 0 0 3 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
8
6
4
2
0

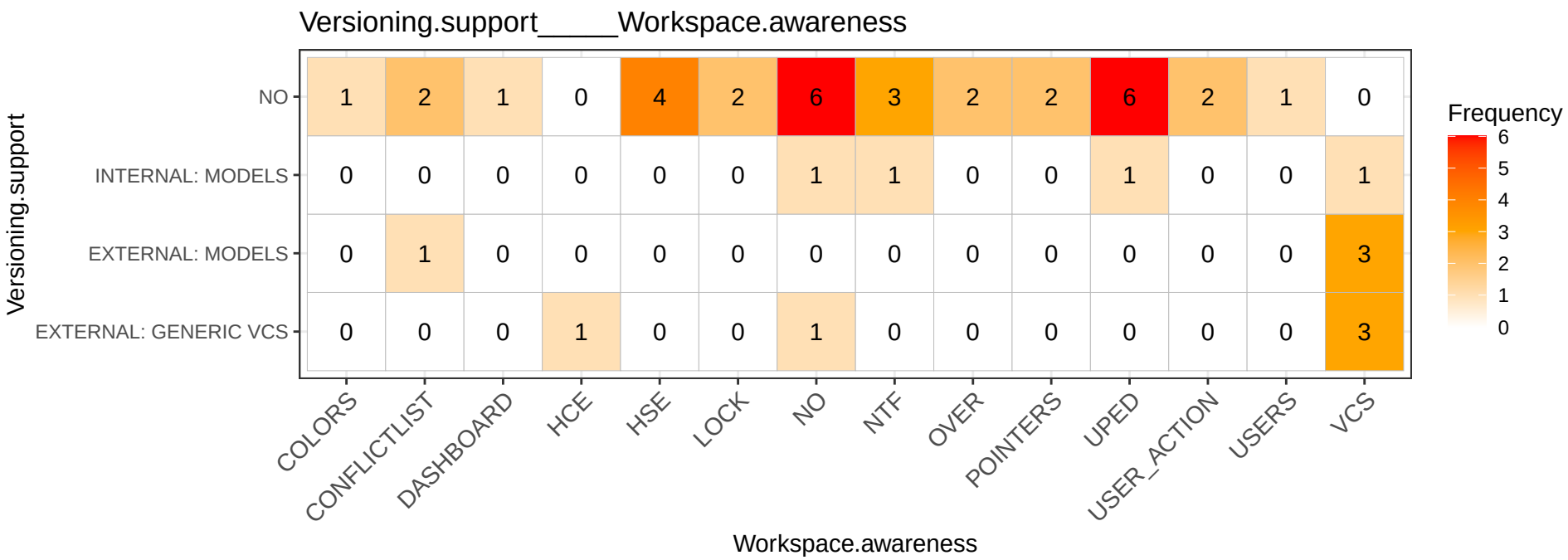

Versioning.support_____Communication.means...mixed
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
0
1
2
16
0
0
0
3
0
0
0
3
1
0
0
3
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
16
12
8
4
0

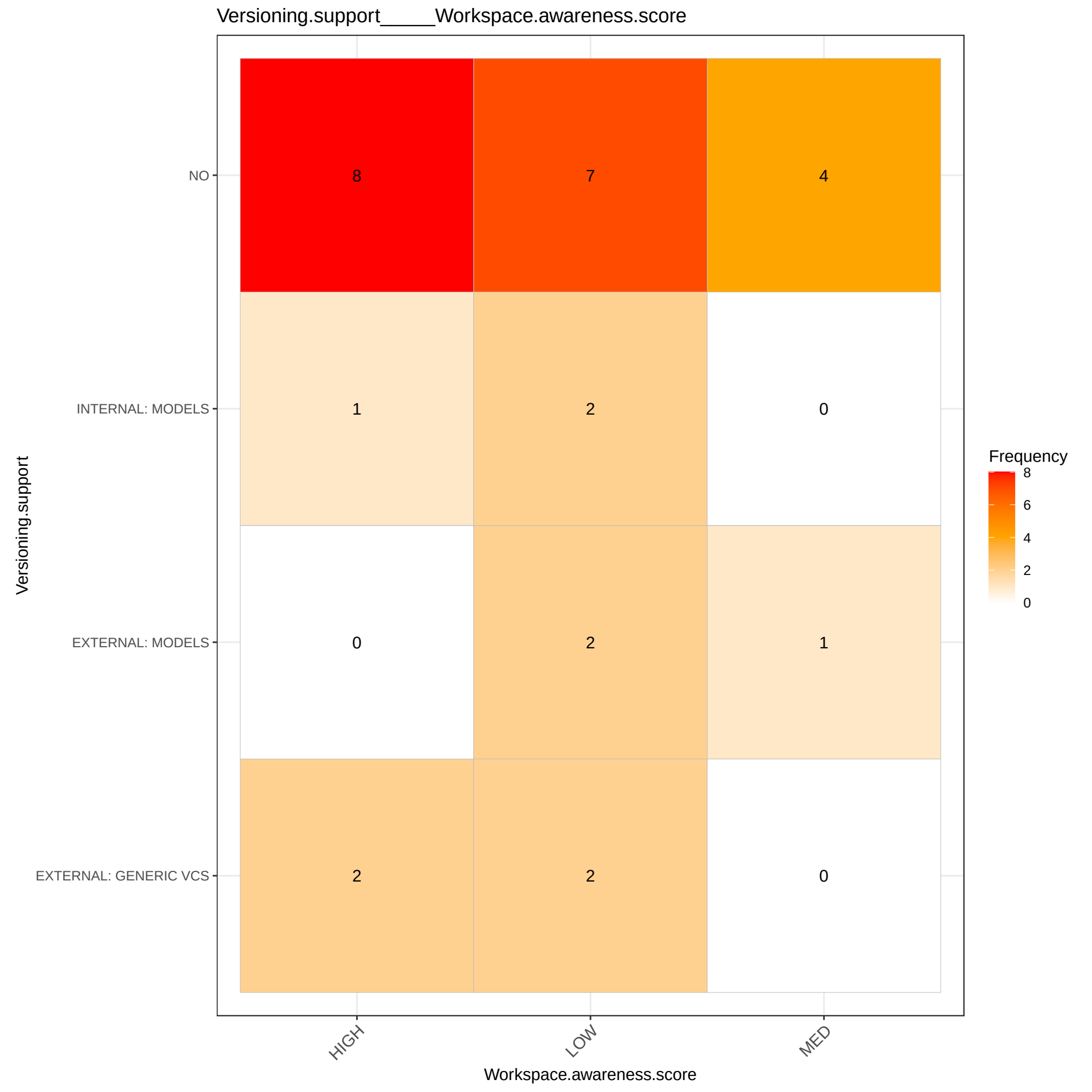

Versioning.support_____Communication.means.links
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
1 1 1 2 1 1 0 1 1 15 2 1 1 1
0 0 0 0 0 0 0 0 0 3 0 0 0 0
0 0 0 0 0 0 0 0 0 3 0 0 0 0
1 0 0 0 0 1 1 0 0 4 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE-TO-FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

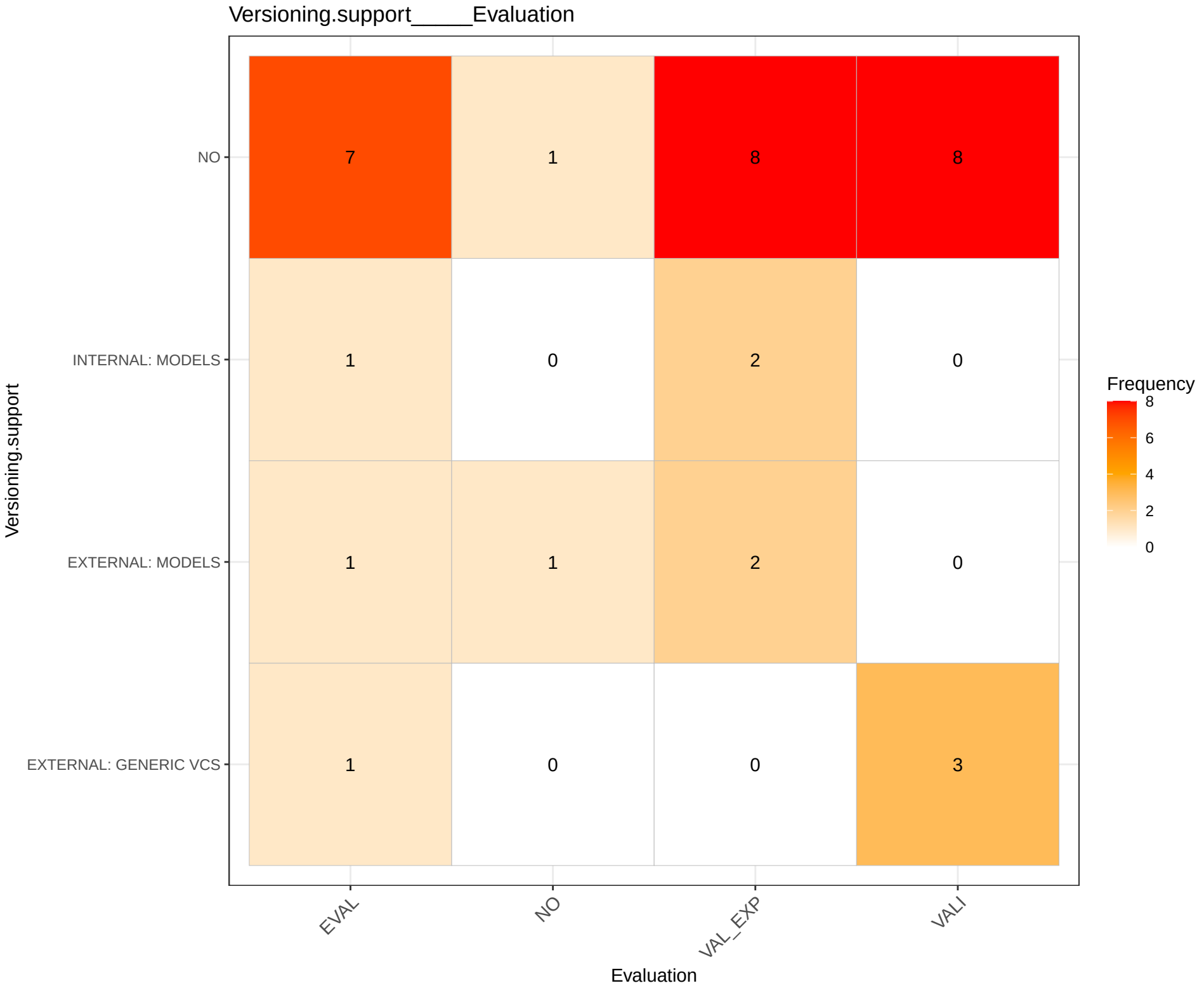

Versioning.support_____Design.decision..discussion
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
1 4 2 1 2 1 9 1 1 0
0 0 0 0 0 0 2 0 0 1
0 0 0 0 0 0 3 0 0 0
0 0 0 0 0 0 4 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
7.5
5.0
2.5
0.0

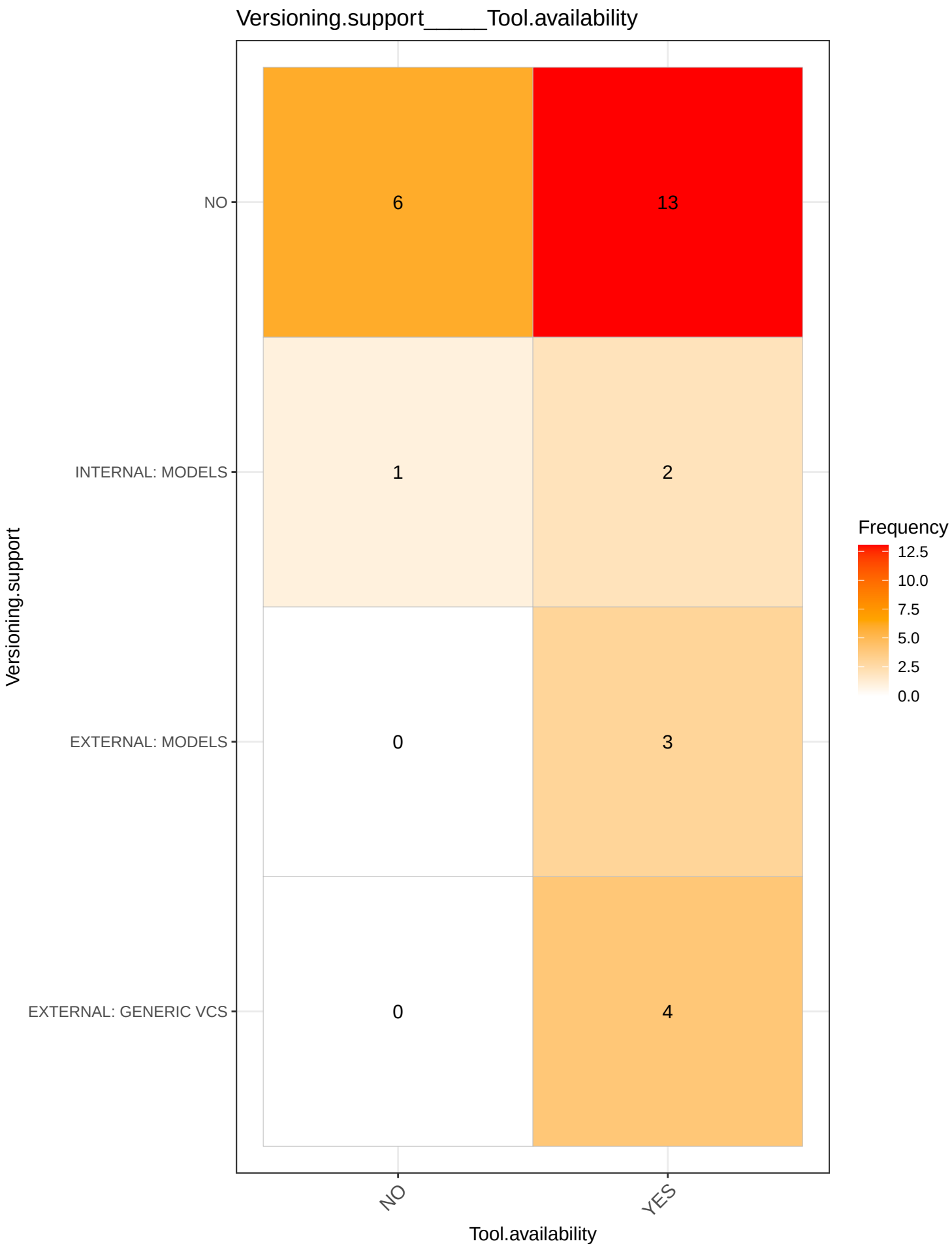

Versioning.support_____Design.decision..session.history
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
1
1
1
17
2
0
0
0
2
1
0
0
0
3
0
0
0
0
3
1
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

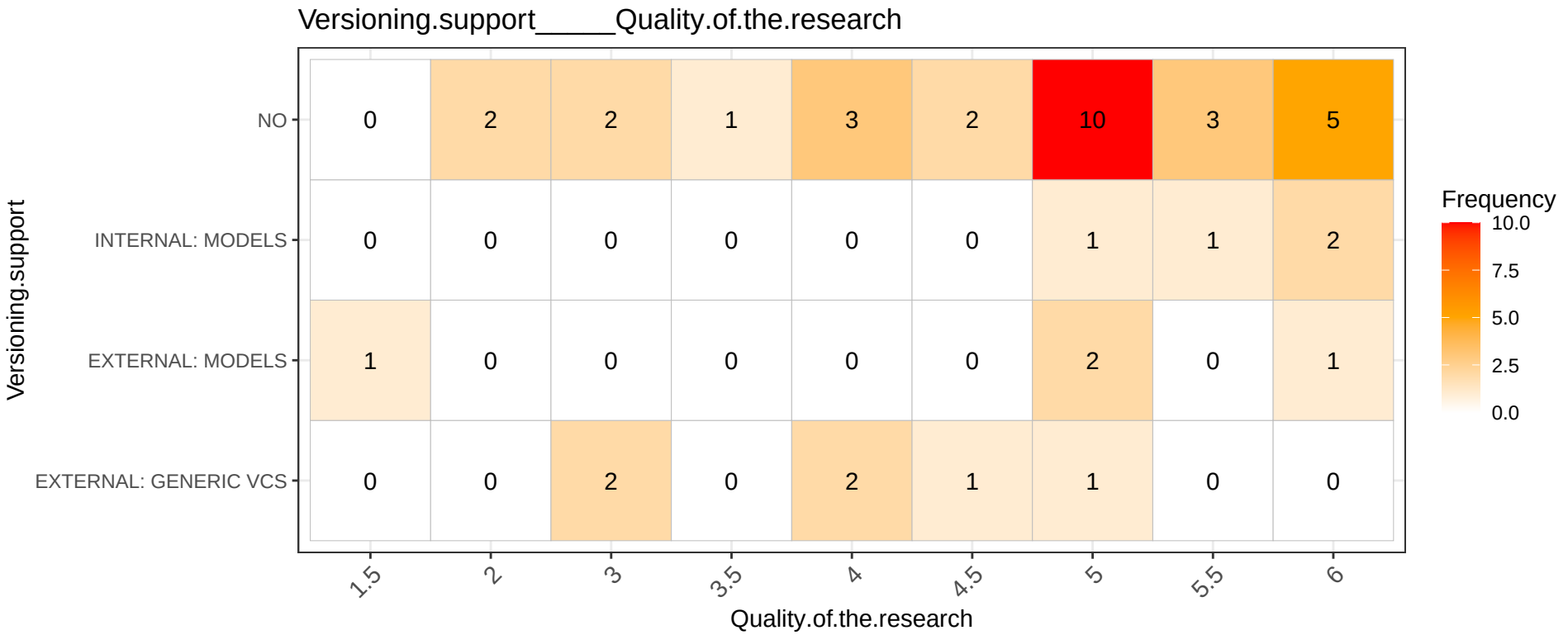

Versioning.support_____Stakeholder.types
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
10
19
1
3
0
3
0
4
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

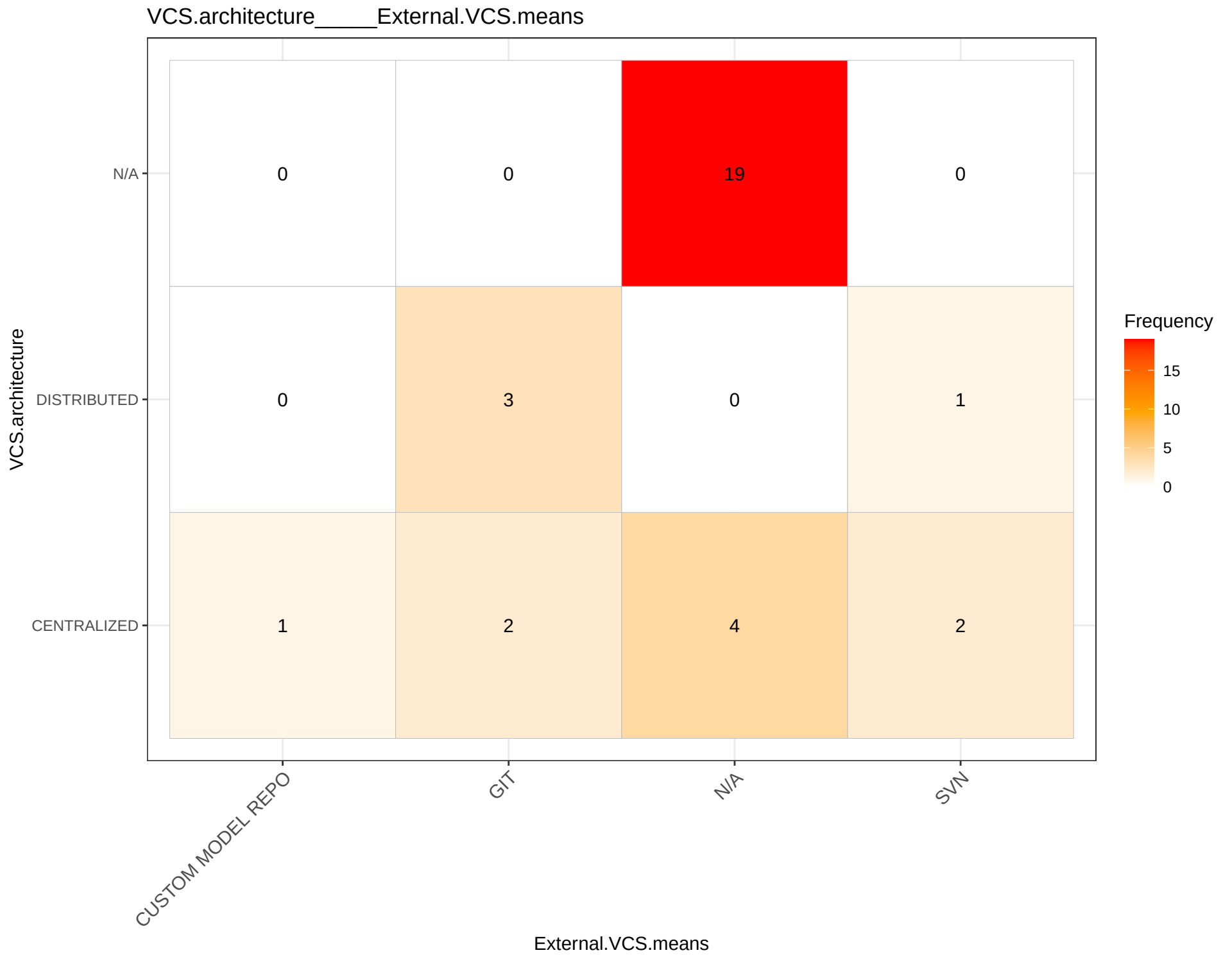

Versioning.support_____Workspace.awareness
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
1 2 1 0 4 2 6 3 2 2 6 2 1 0
0 0 0 0 0 0 1 1 0 0 1 0 0 1
0 1 0 0 0 0 0 0 0 0 0 0 0 3
0 0 0 1 0 0 1 0 0 0 0 0 0 3
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

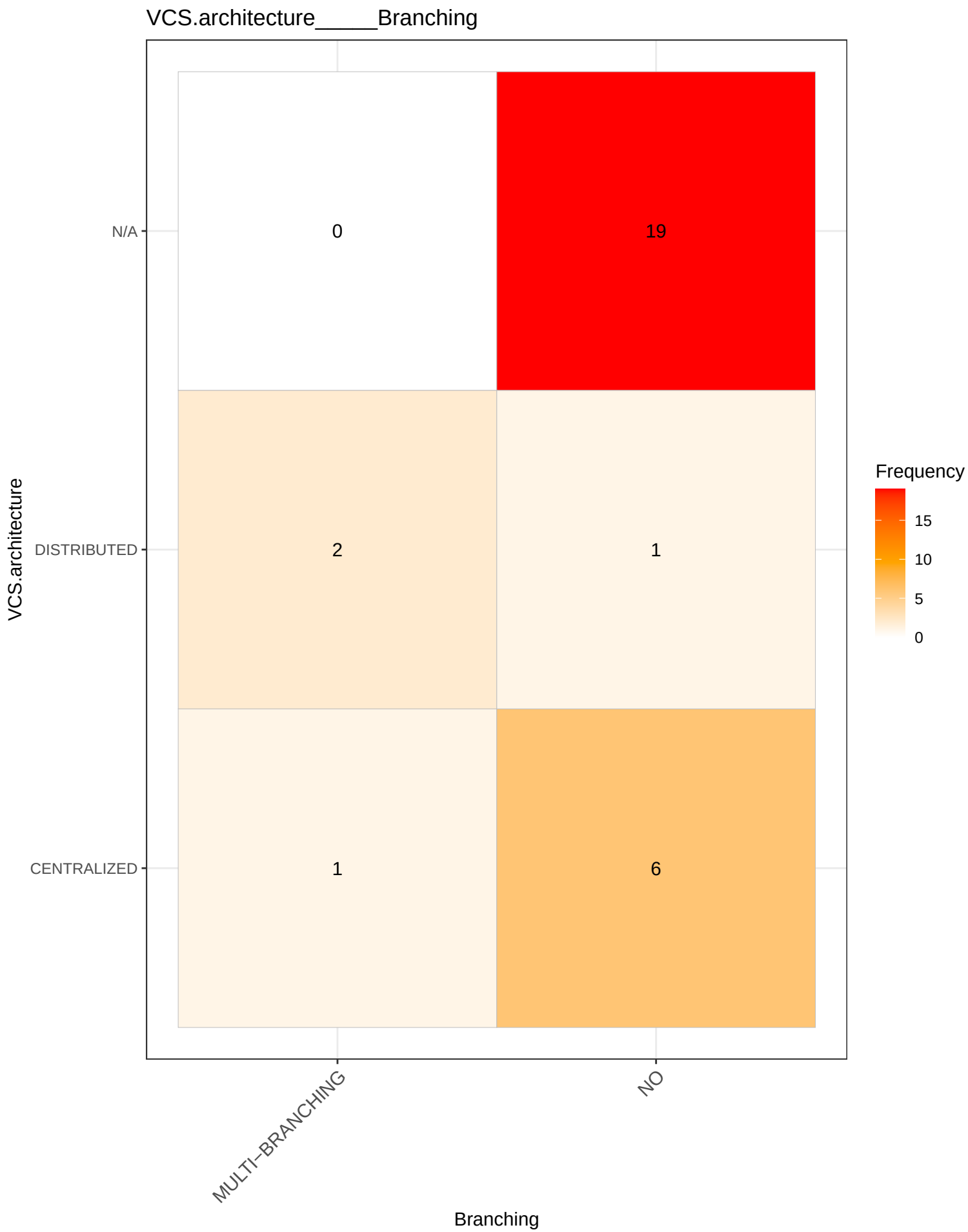

Versioning.support_____Workspace.awareness.score
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
8
7
4
1
2
0
0
2
1
2
2
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0

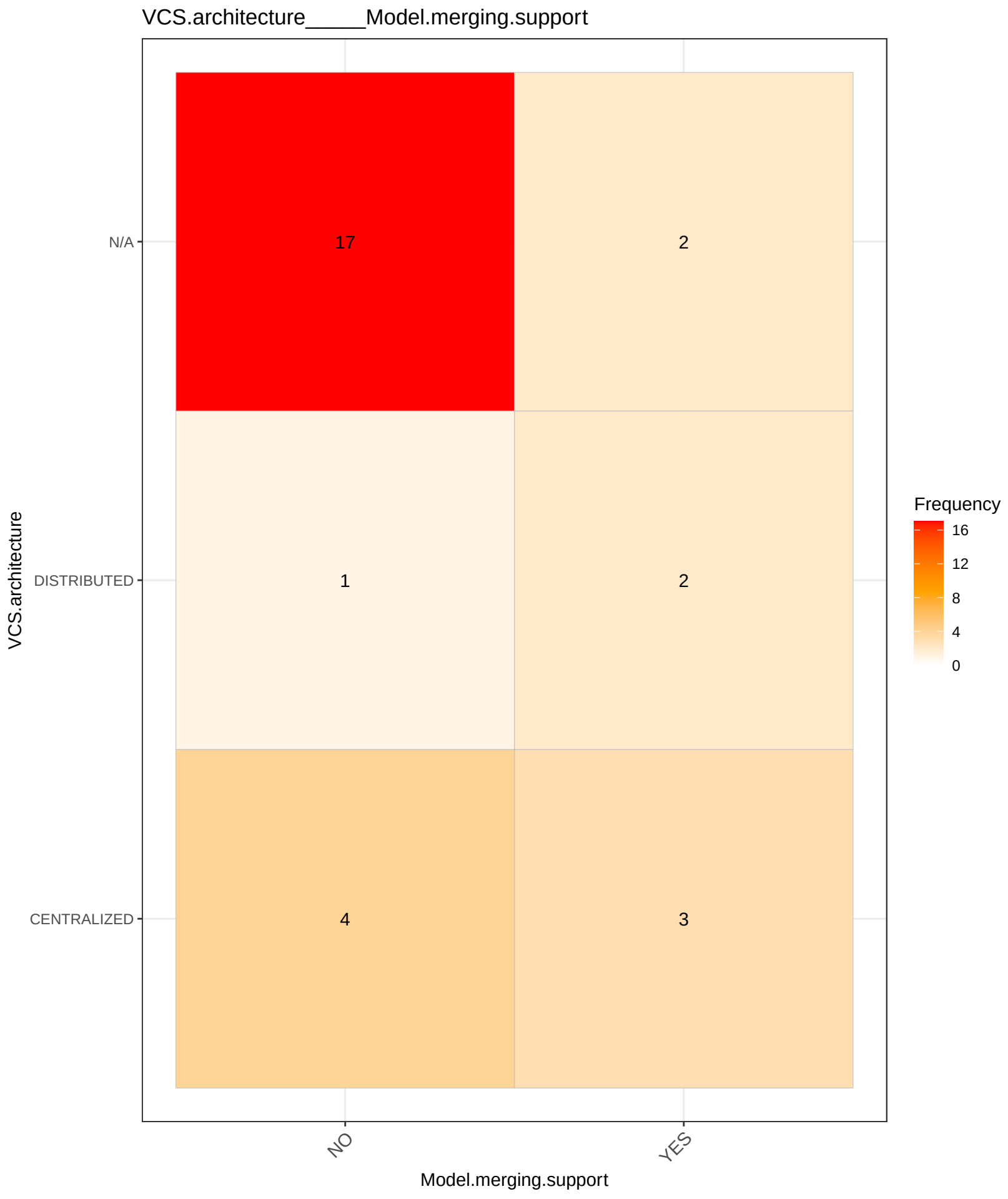

Versioning.support_____Evaluation
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
7
1
8
8
1
0
2
0
1
1
2
0
1
0
0
3
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
8
6
4
2
0

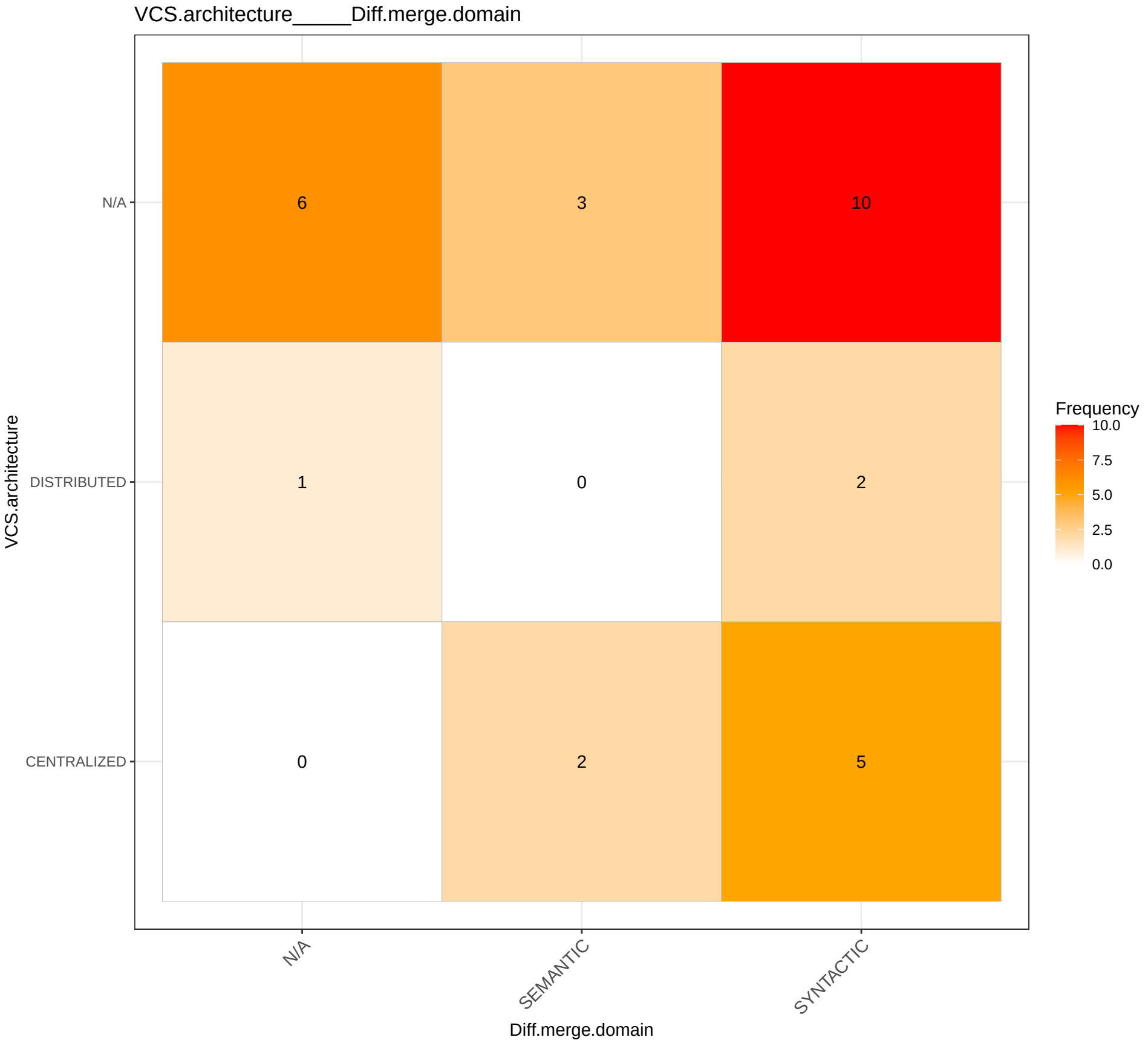

Versioning.support_____Tool.availability
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
Versioning.support
6
13
1
2
0
3
0
4
NO
YES
Tool.availability
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

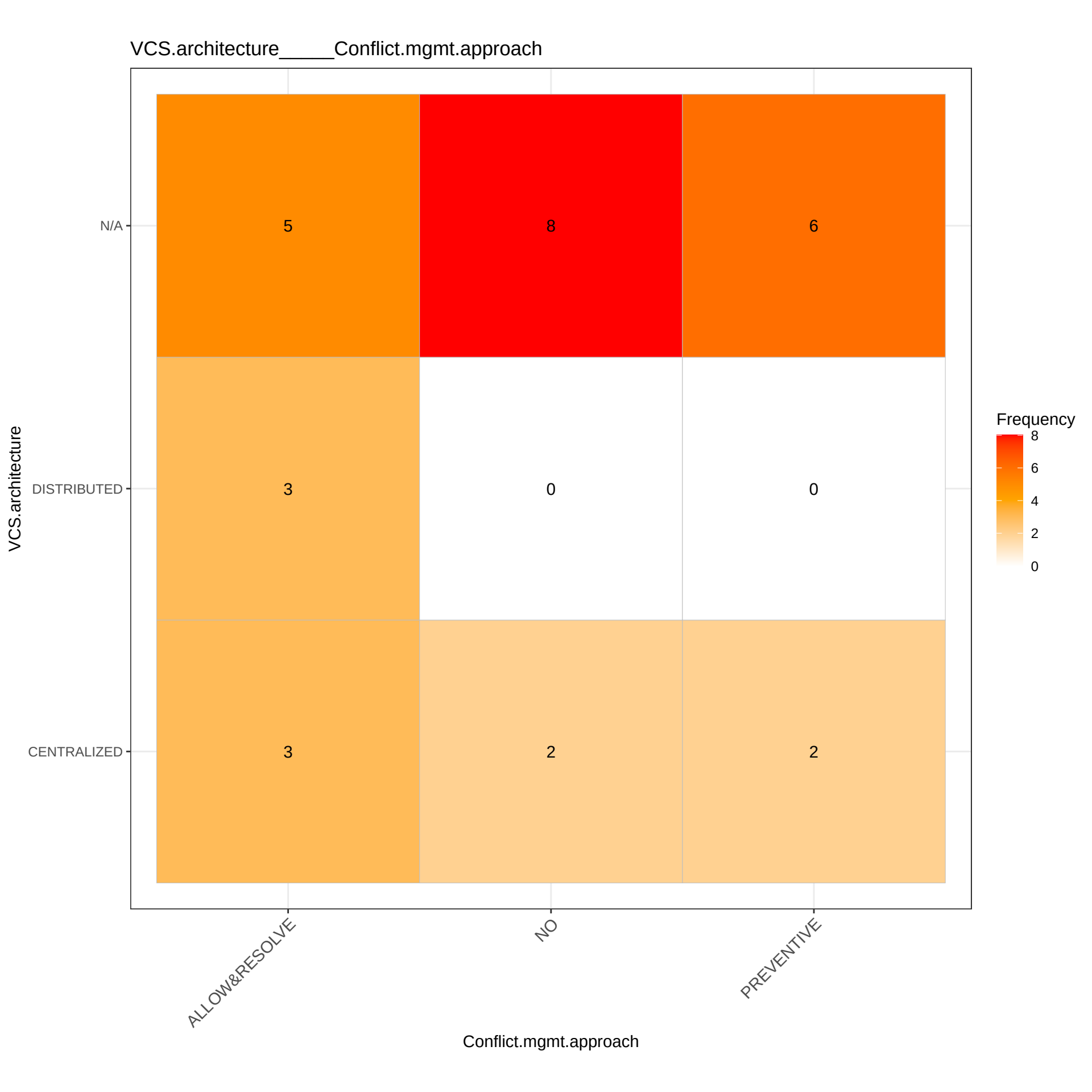

Versioning.support_____Quality.of.the.research
Versioning.support
NO
INTERNAL: MODELS
EXTERNAL: MODELS
EXTERNAL: GENERIC VCS
0 2 2 1 3 2 10 3 5
0 0 0 0 0 0 1 1 2
1 0 0 0 0 0 2 0 1
0 0 2 0 2 1 1 0 0
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

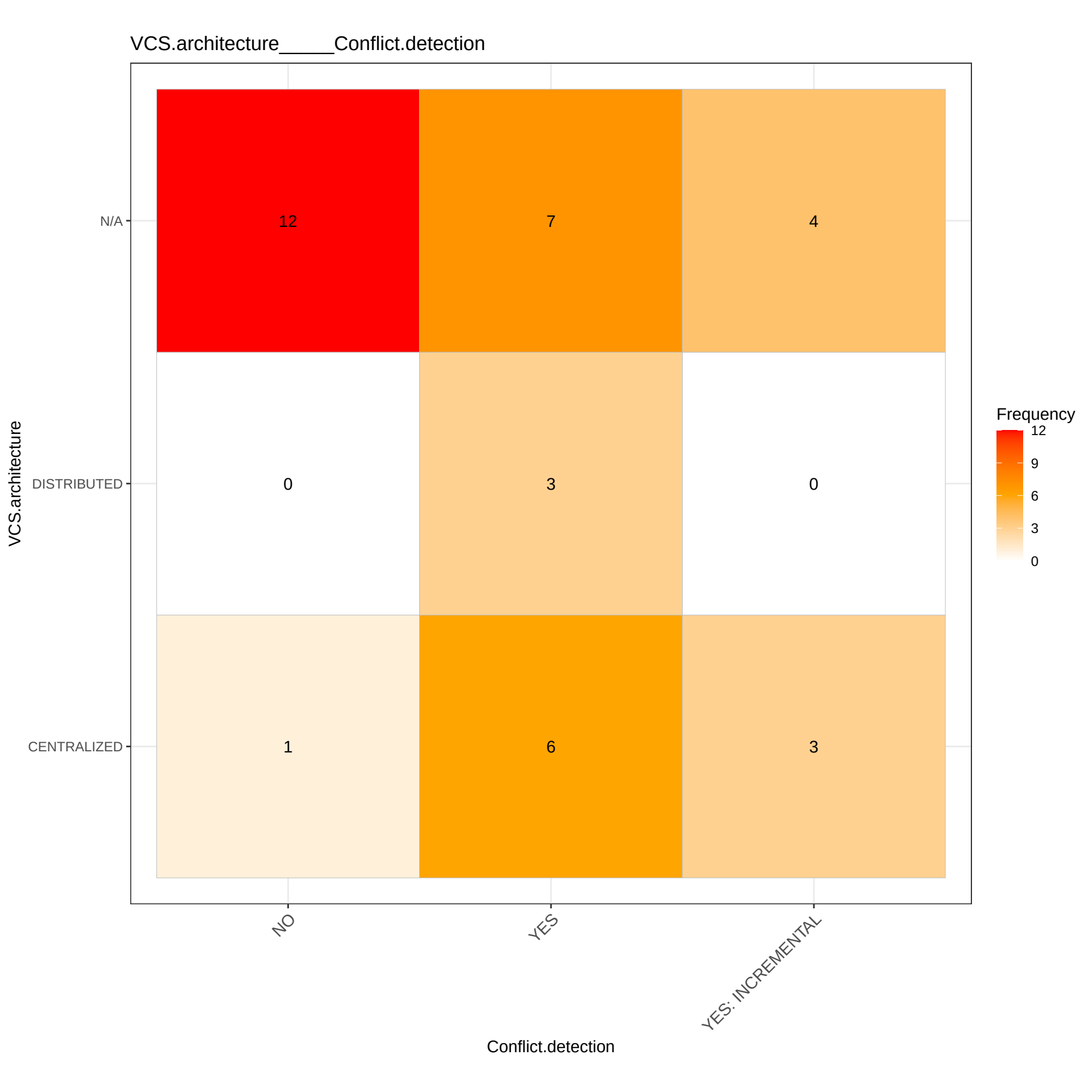

VCS.architecture_____External.VCS.means
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
0
0
19
0
0
3
0
1
1
2
4
2
CUSTOM MODEL REPO
GIT
N/A
SVN
External.VCS.means
Frequency
15
10
5
0

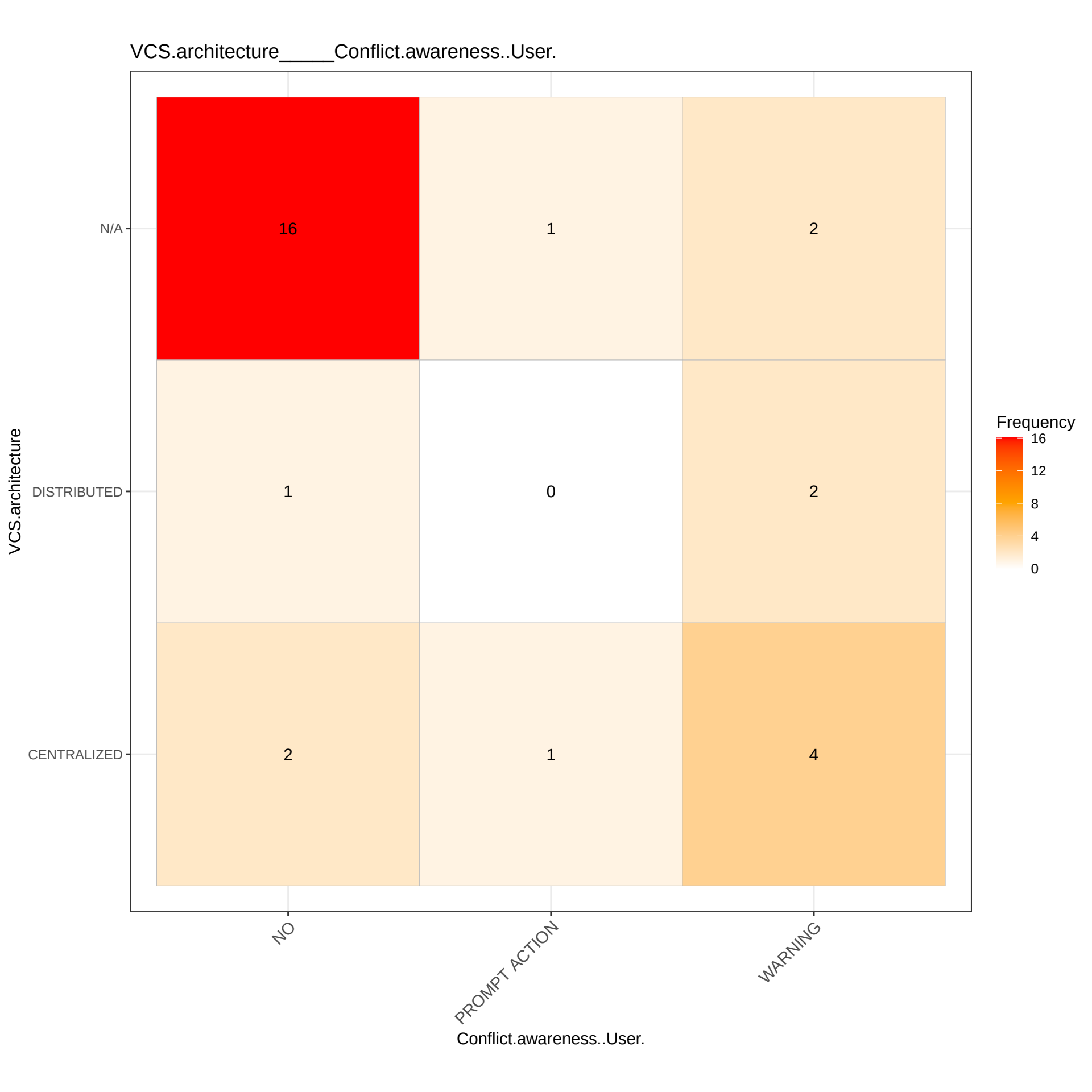

VCS.architecture_____Branching
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
0
19
2
1
1
6
MULTI−BRANCHING
NO
Branching
Frequency
15
10
5
0

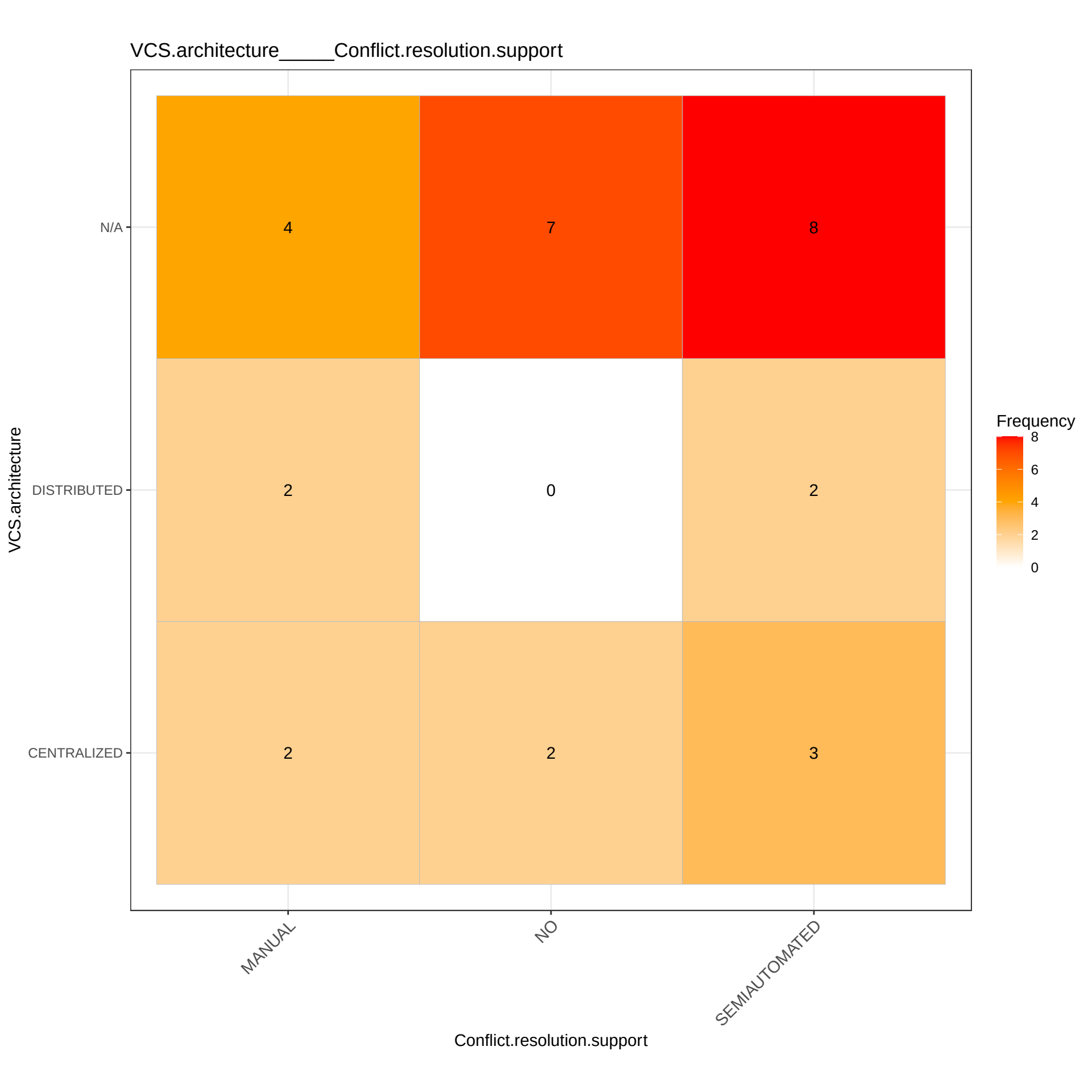

VCS.architecture_____Model.merging.support
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
17
2
1
2
4
3
NO
YES
Model.merging.support
Frequency
16
12
8
4
0

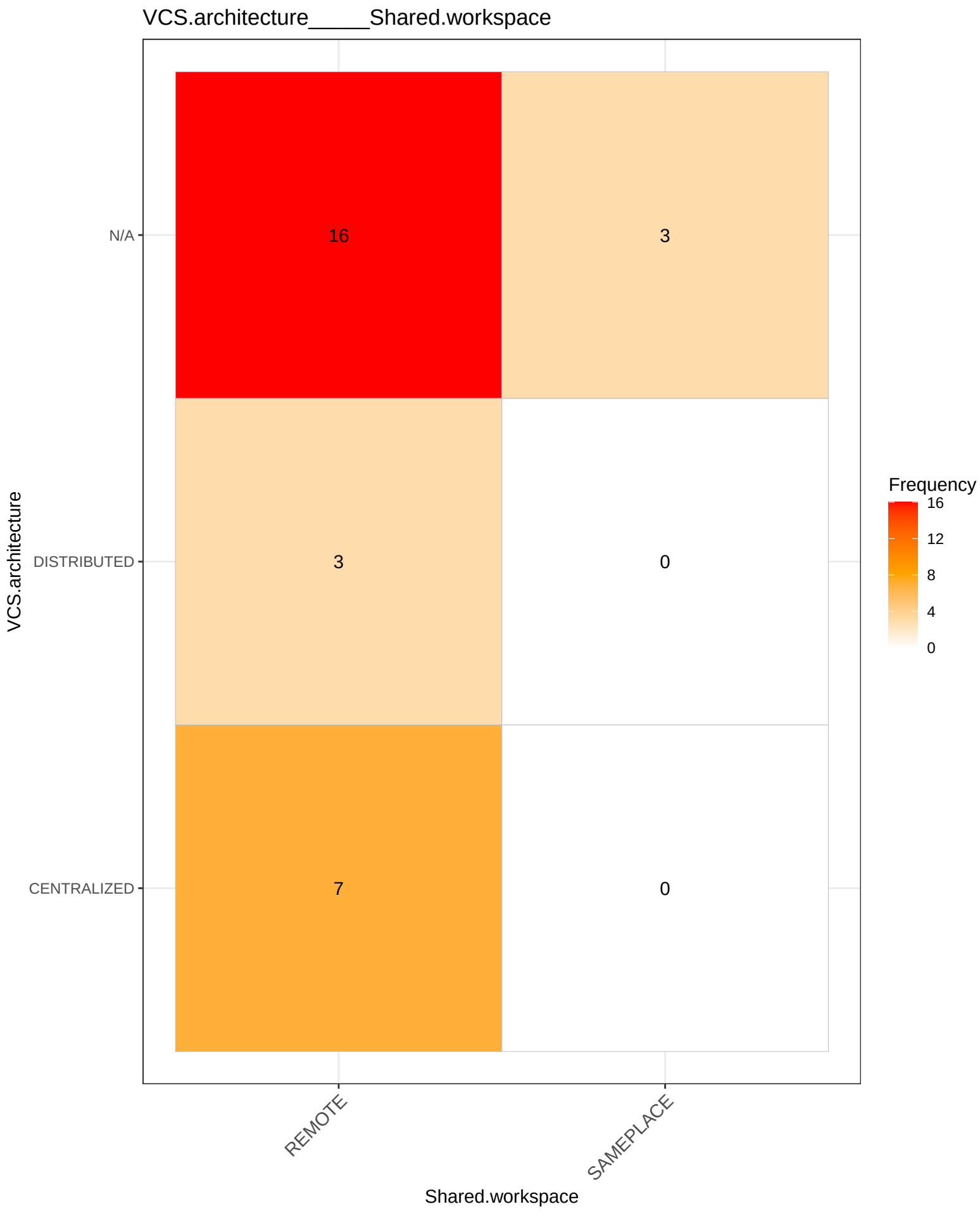

VCS.architecture_____Diff.merge.domain
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
6
3
10
1
0
2
0
2
5
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
10.0
7.5
5.0
2.5
0.0

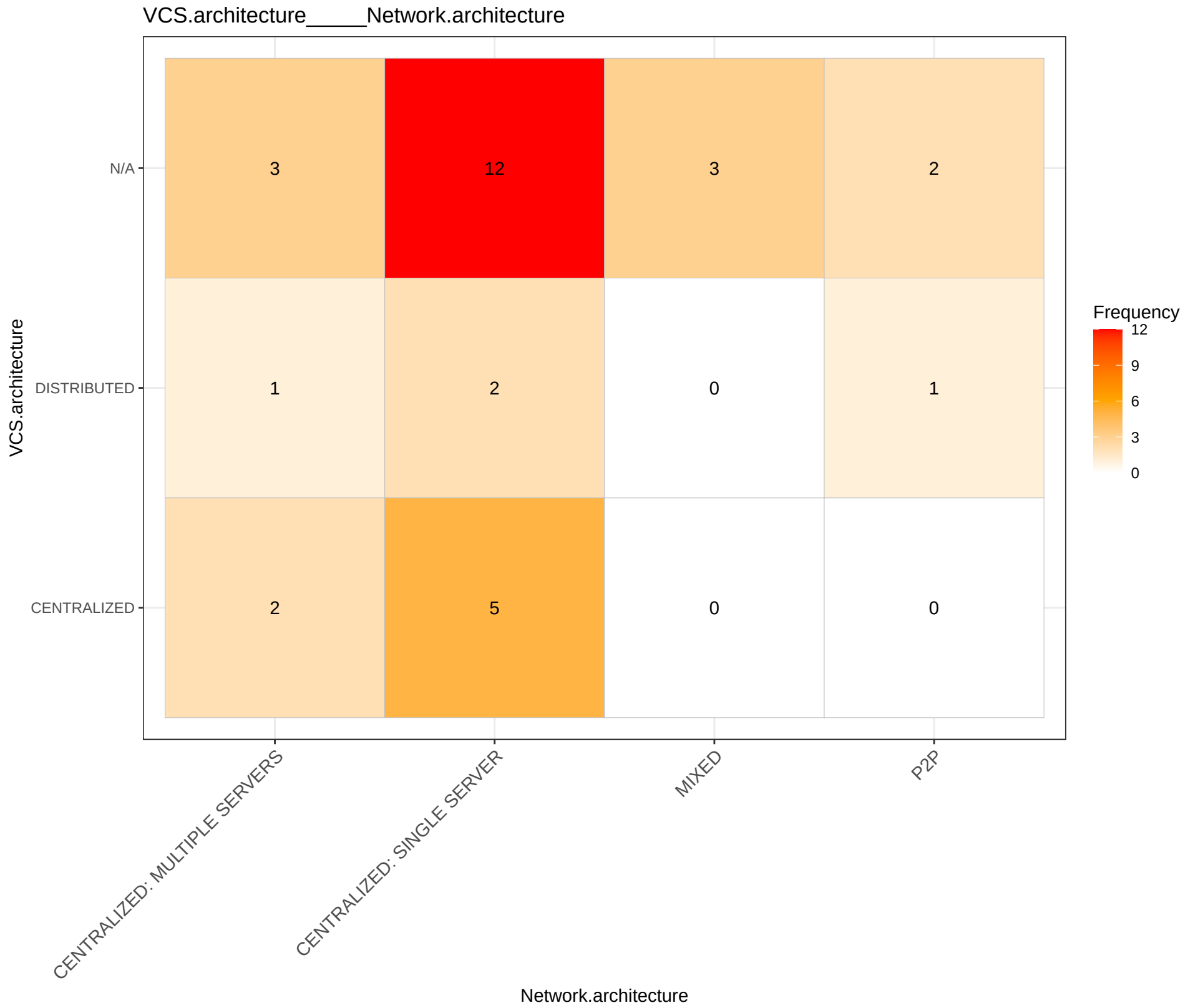

VCS.architecture_____Conflict.mgmt.approach
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
5
8
6
3
0
0
3
2
2
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

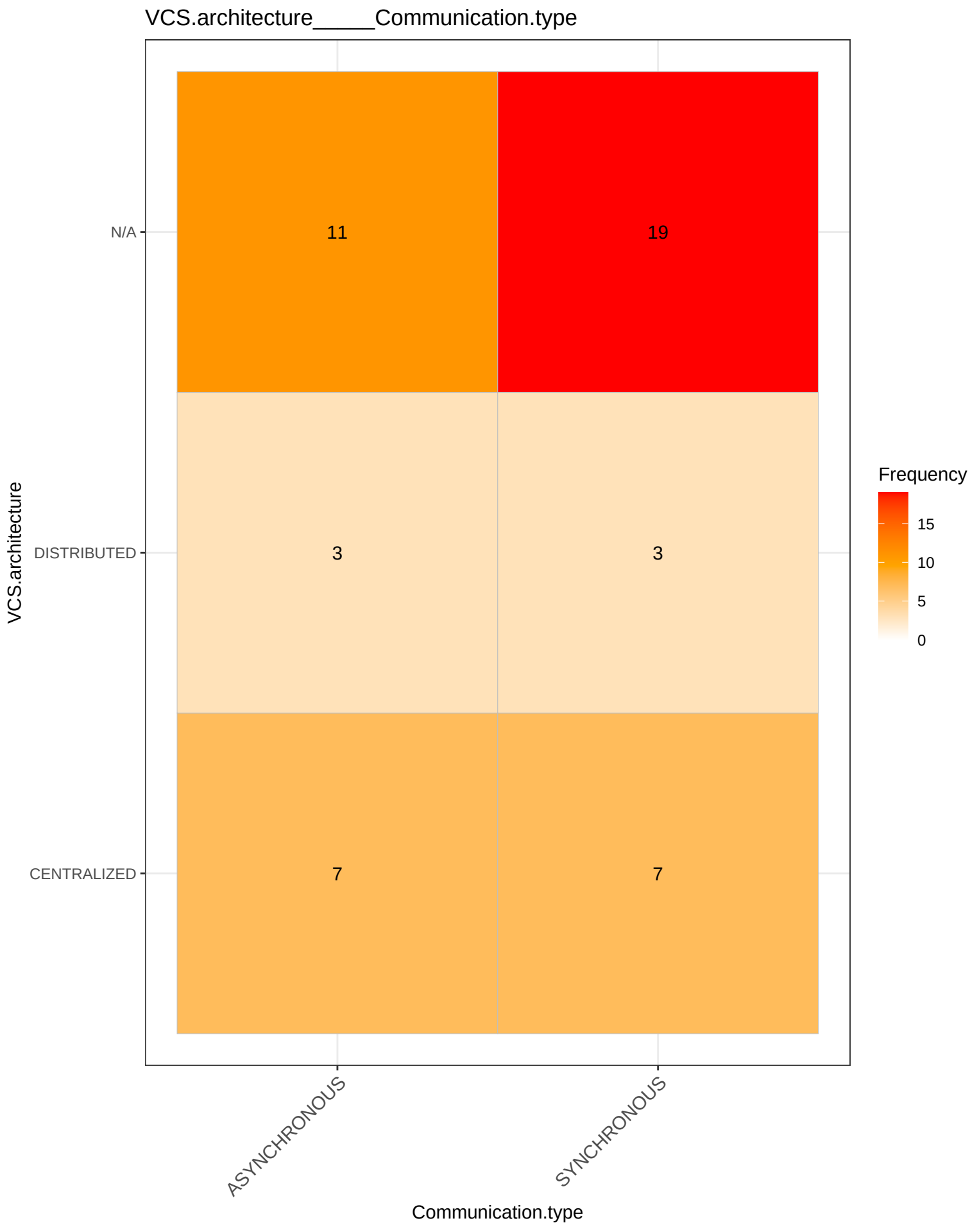

VCS.architecture_____Conflict.detection
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
12
7
4
0
3
0
1
6
3
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

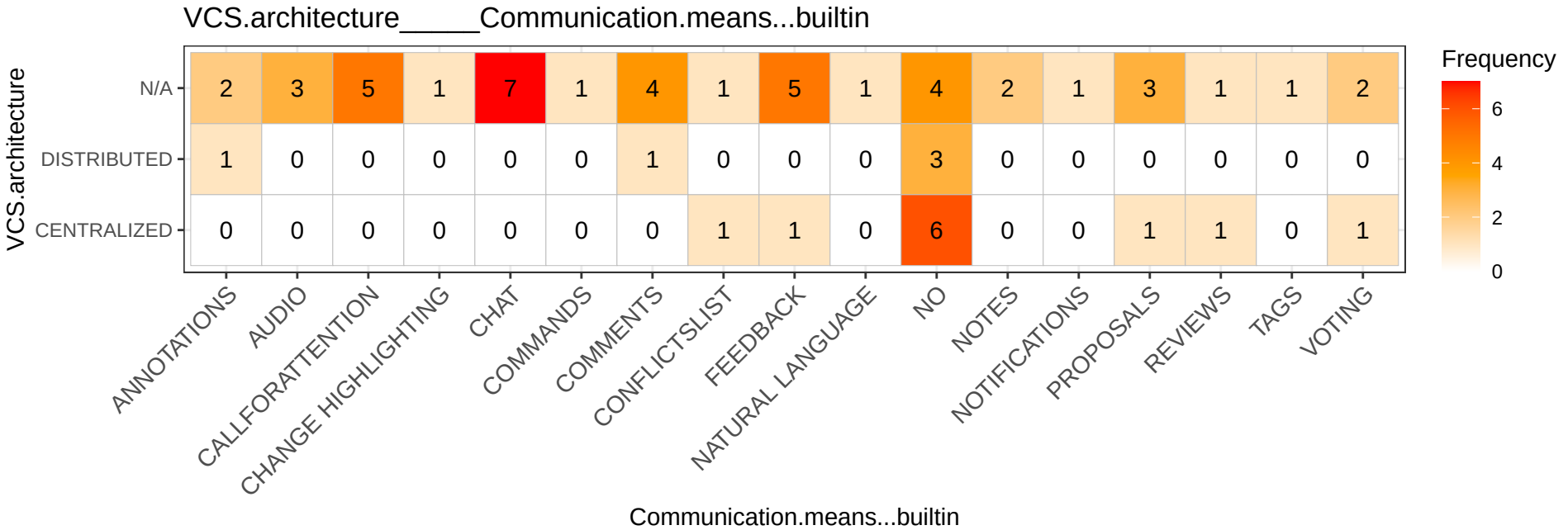

VCS.architecture_____Conflict.awareness..User.
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
16
1
2
1
0
2
2
1
4
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
16
12
8
4
0

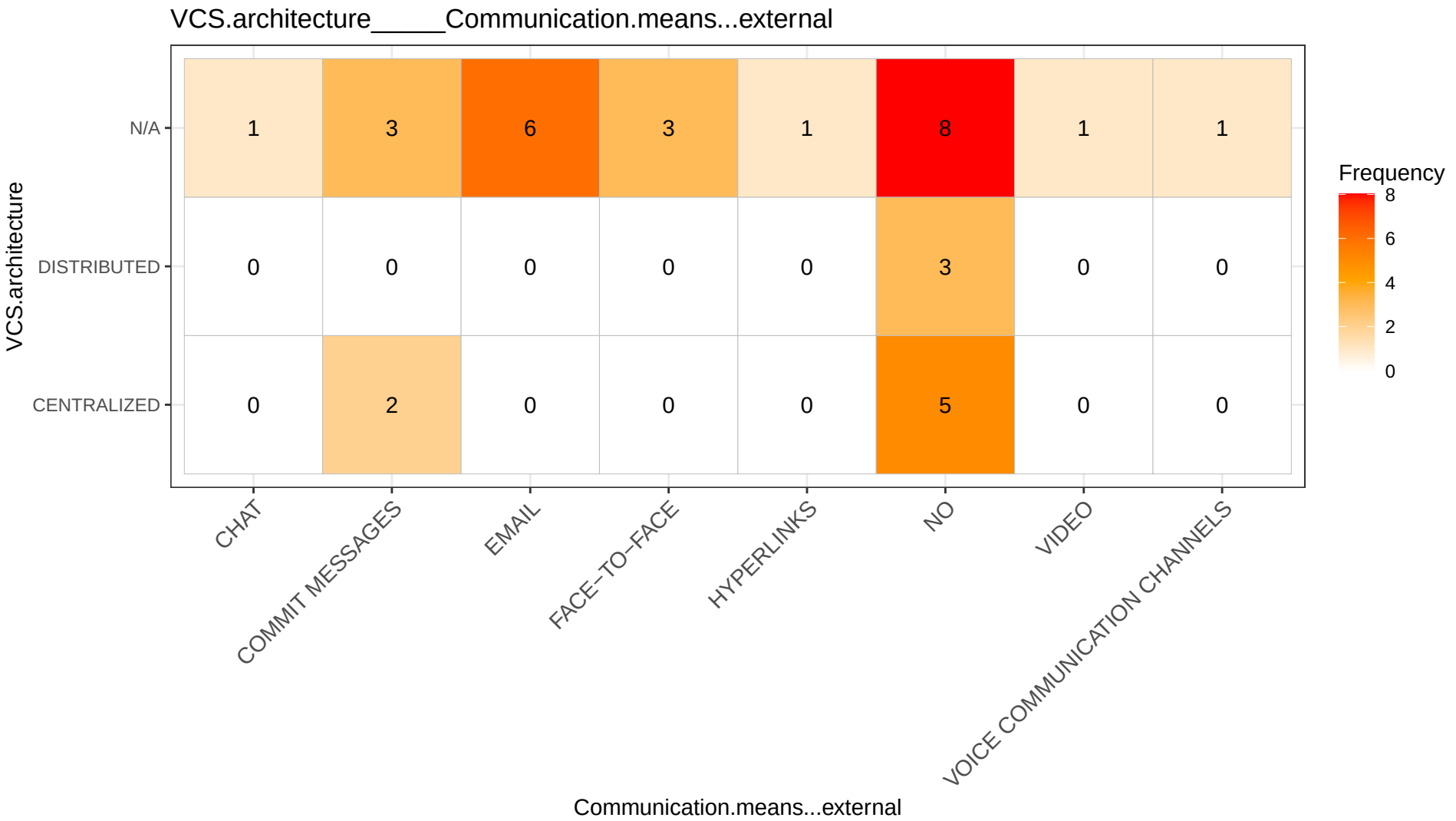

VCS.architecture_____Conflict.resolution.support
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
4
7
8
2
0
2
2
2
3
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

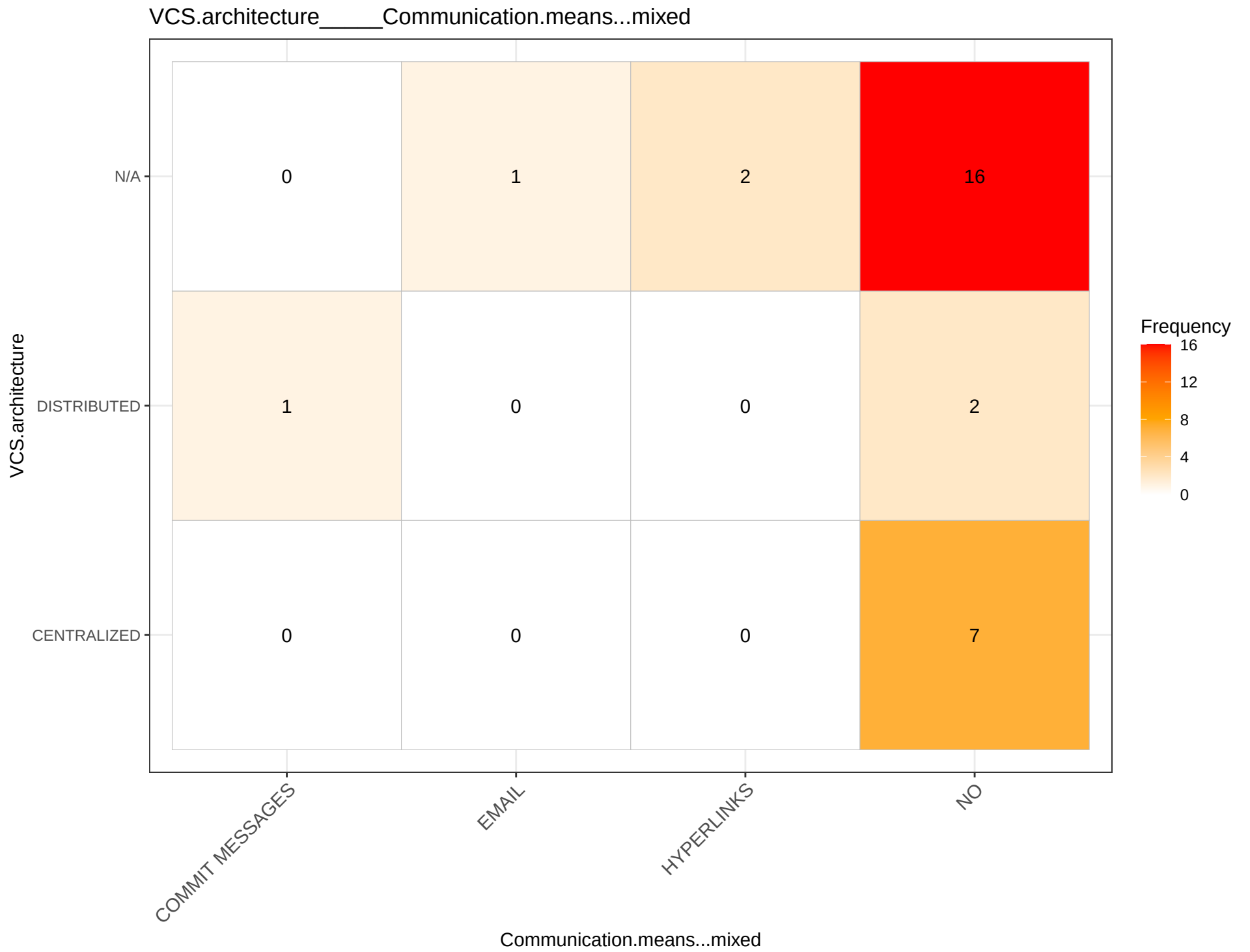

VCS.architecture_____Shared.workspace
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
16
3
3
0
7
0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

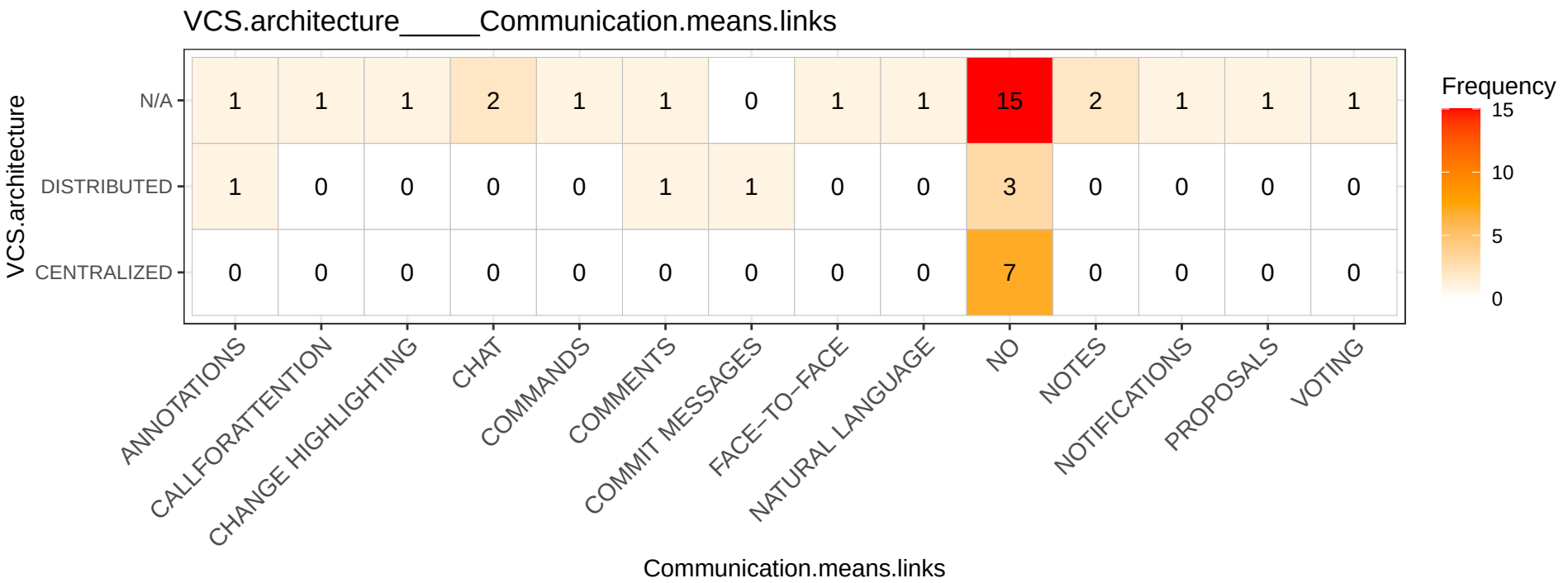

VCS.architecture_____Network.architecture
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
3
12
3
2
1
2
0
1
2
5
0
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
12
9
6
3
0

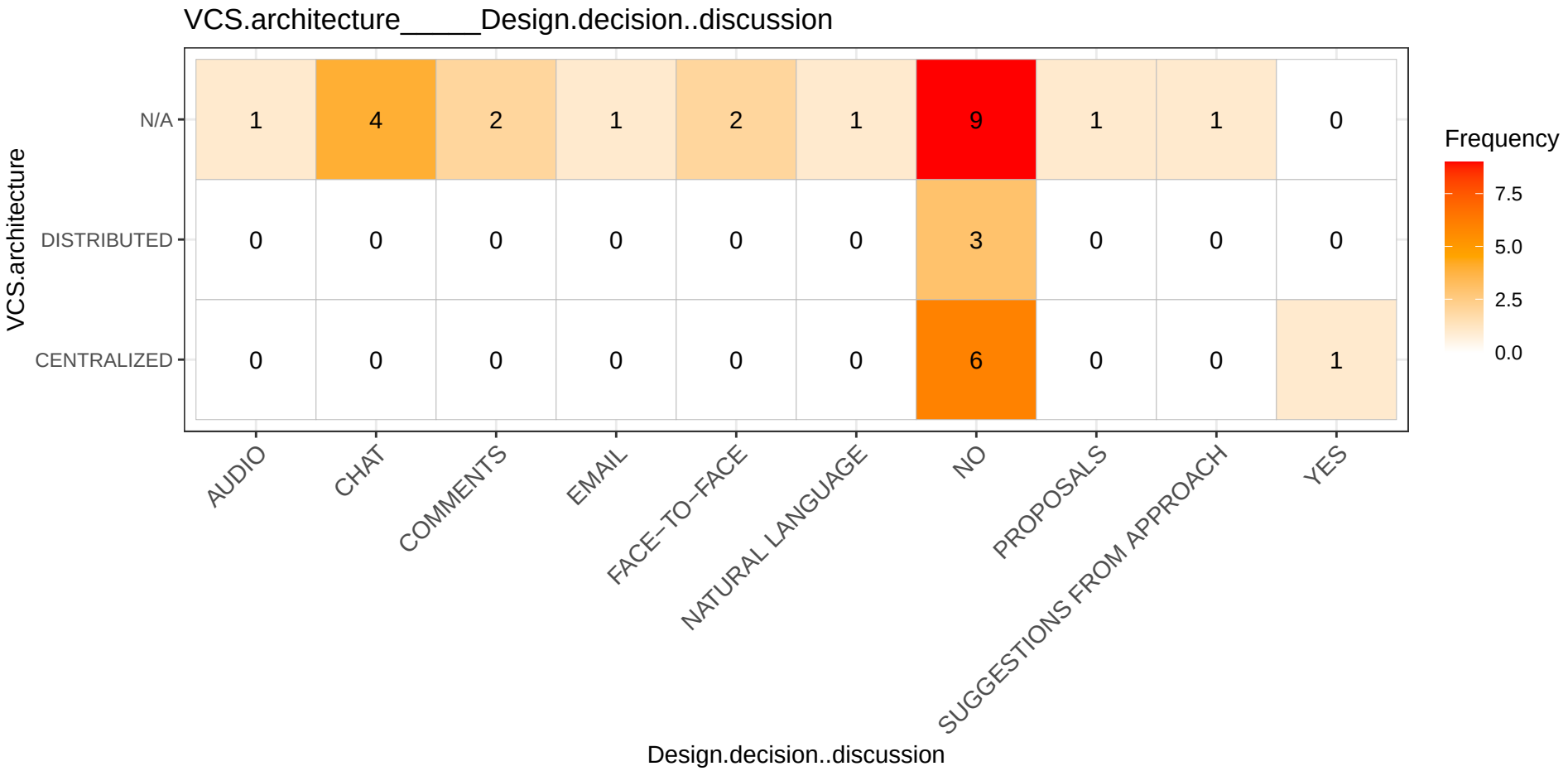

VCS.architecture_____Communication.type
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
11
19
3
3
7
7
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

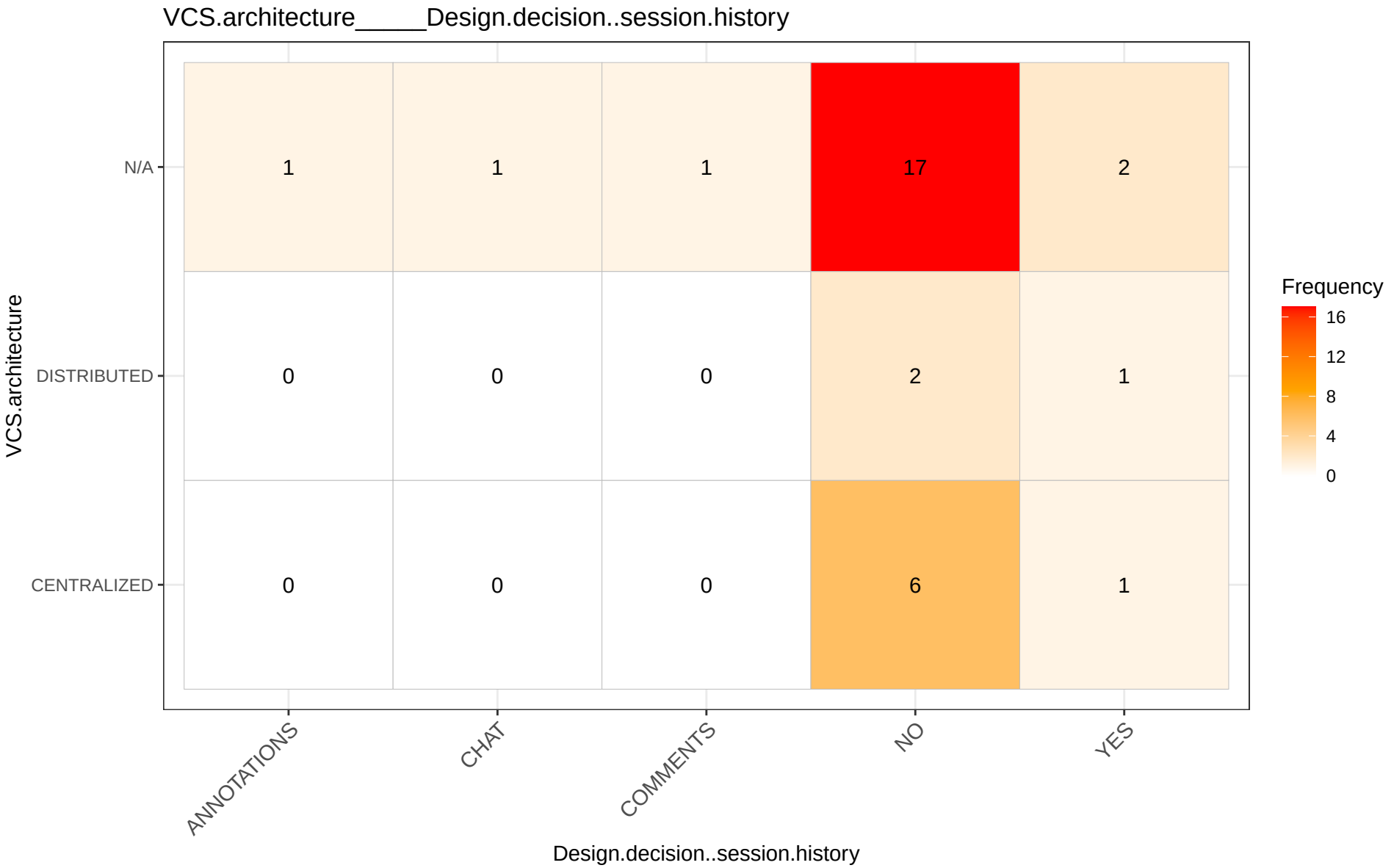

VCS.architecture_____Communication.means...builtin
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
2 3 5 1 7 1 4 1 5 1 4 2 1 3 1 1 2
1 0 0 0 0 0 1 0 0 0 3 0 0 0 0 0 0
0 0 0 0 0 0 0 1 1 0 6 0 0 1 1 0 1
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
4
2
0

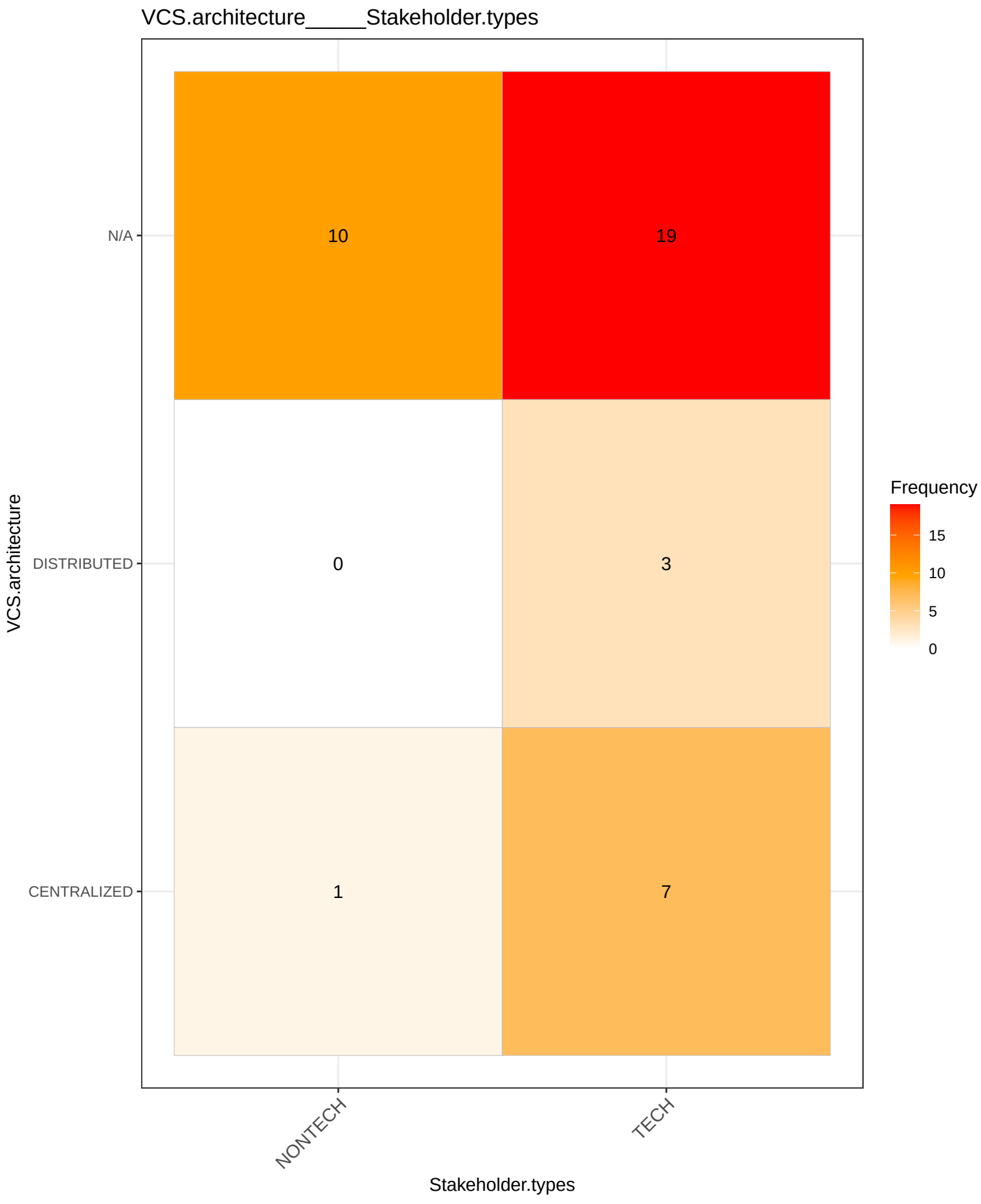

VCS.architecture_____Communication.means...external
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
1
3
6
3
1
8
1
1
0
0
0
0
0
3
0
0
0
2
0
0
0
5
0
0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
8
6
4
2
0

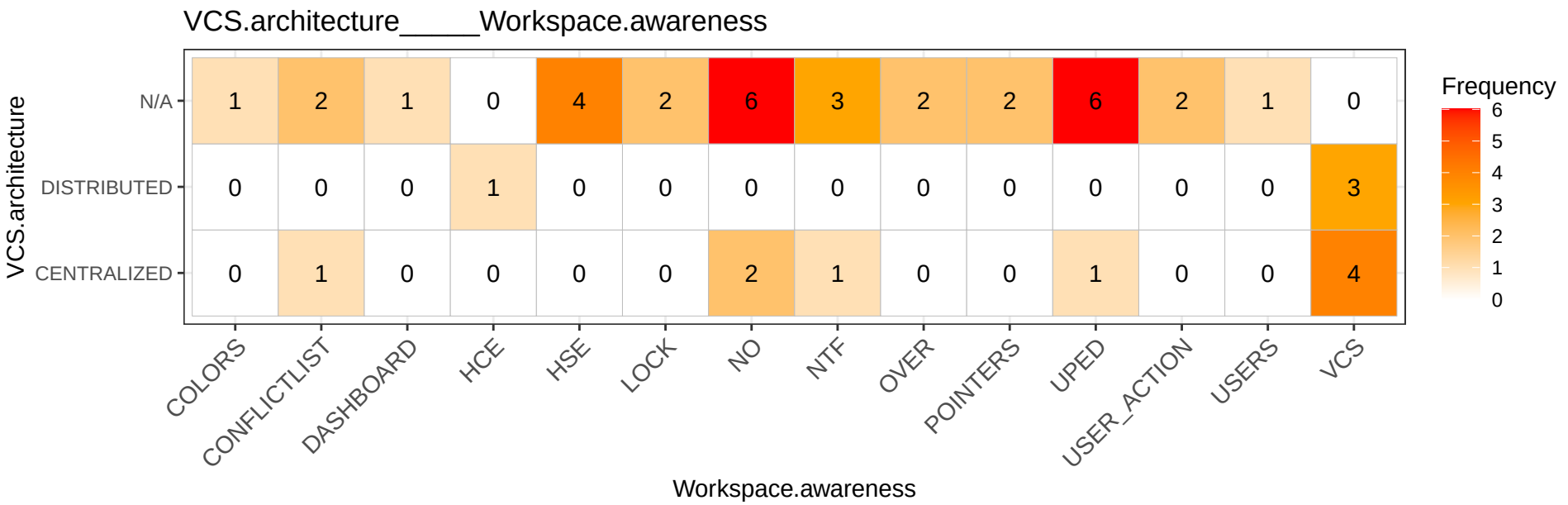

VCS.architecture_____Communication.means...mixed
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
0
1
2
16
1
0
0
2
0
0
0
7
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
16
12
8
4
0

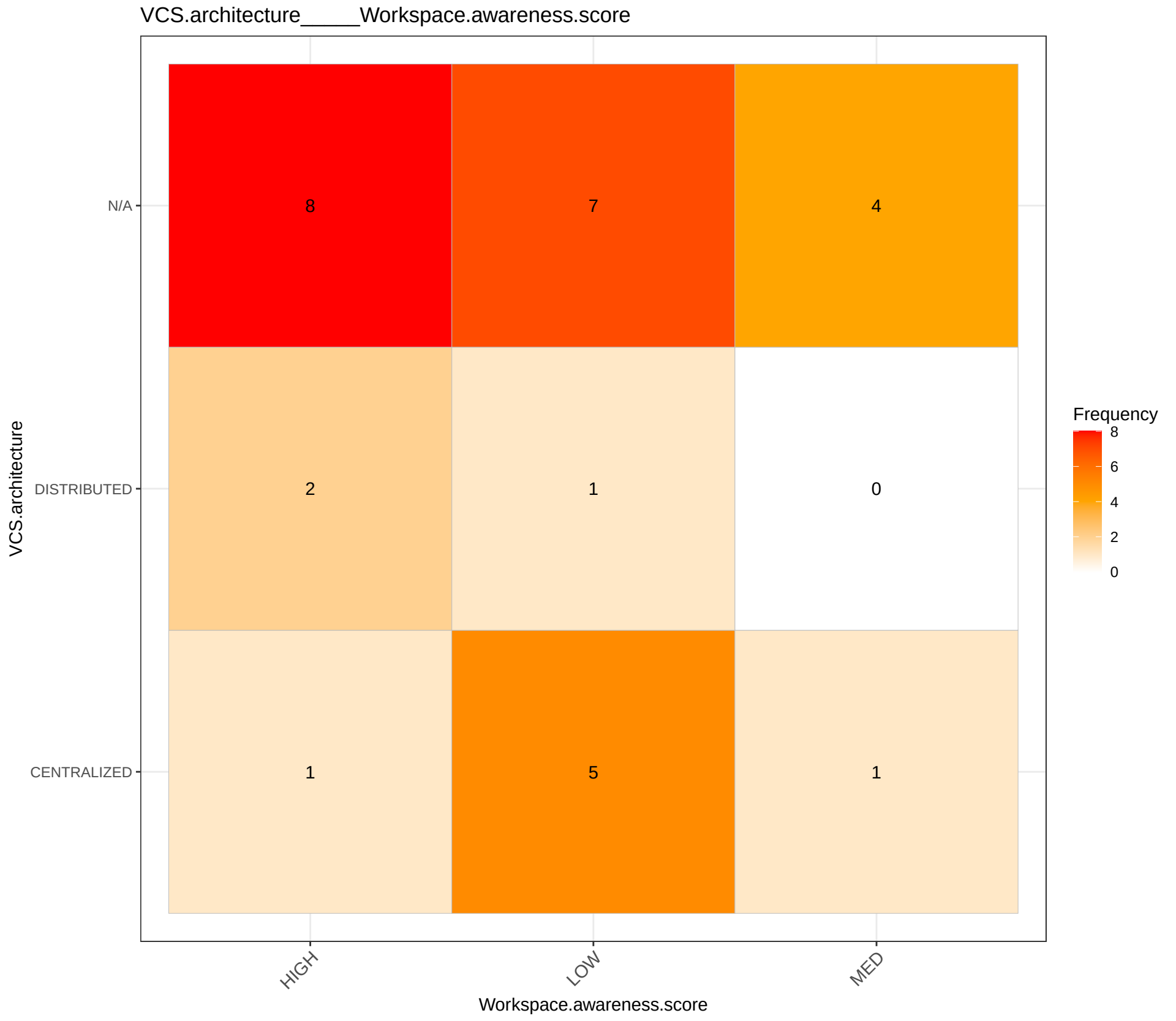

VCS.architecture_____Communication.means.links
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
1 1 1 2 1 1 0 1 1 15 2 1 1 1
1 0 0 0 0 1 1 0 0 3 0 0 0 0
0 0 0 0 0 0 0 0 0 7 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

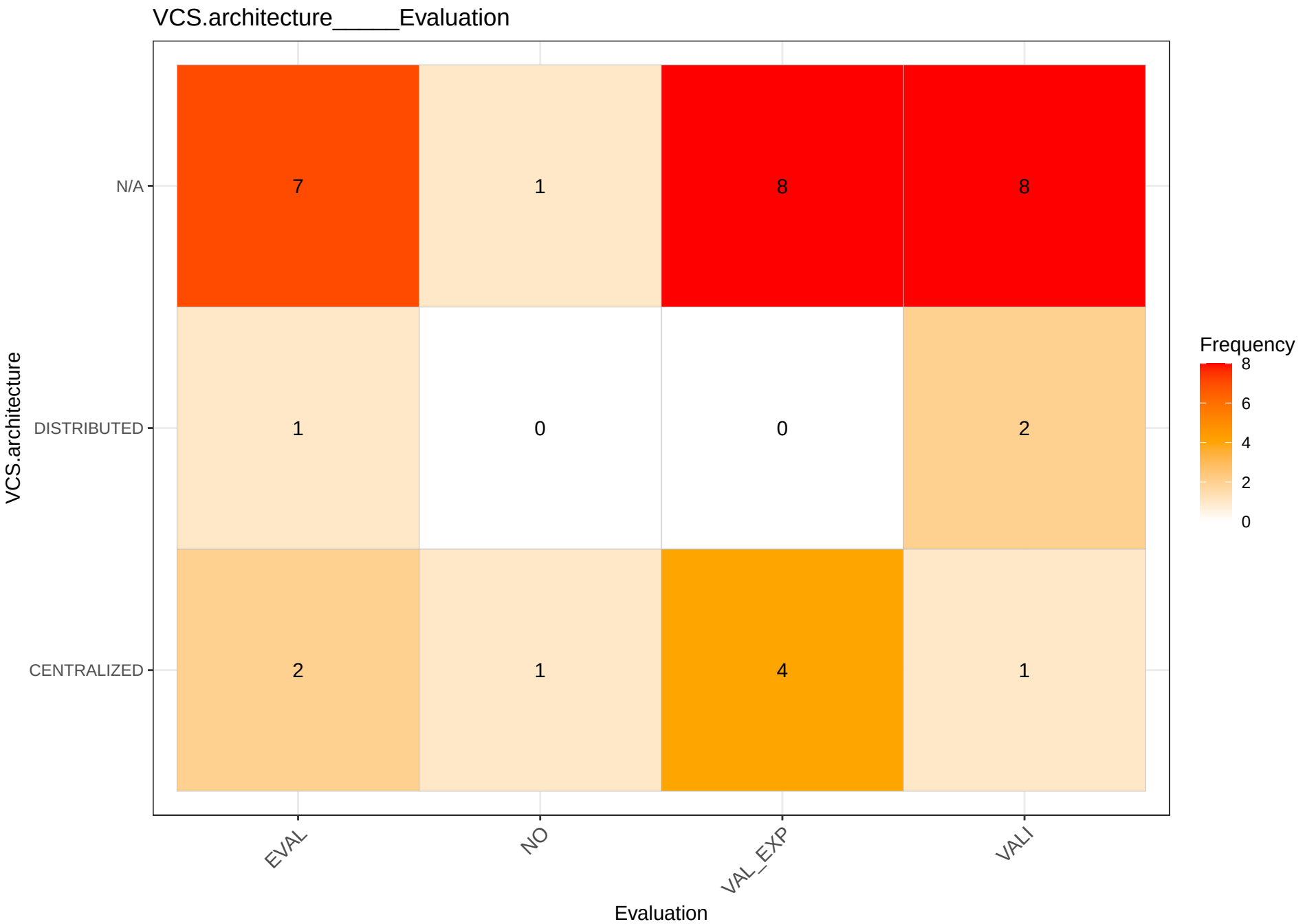

VCS.architecture_____Design.decision..discussion
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
1 4 2 1 2 1 9 1 1 0
0 0 0 0 0 0 3 0 0 0
0 0 0 0 0 0 6 0 0 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
7.5
5.0
2.5
0.0

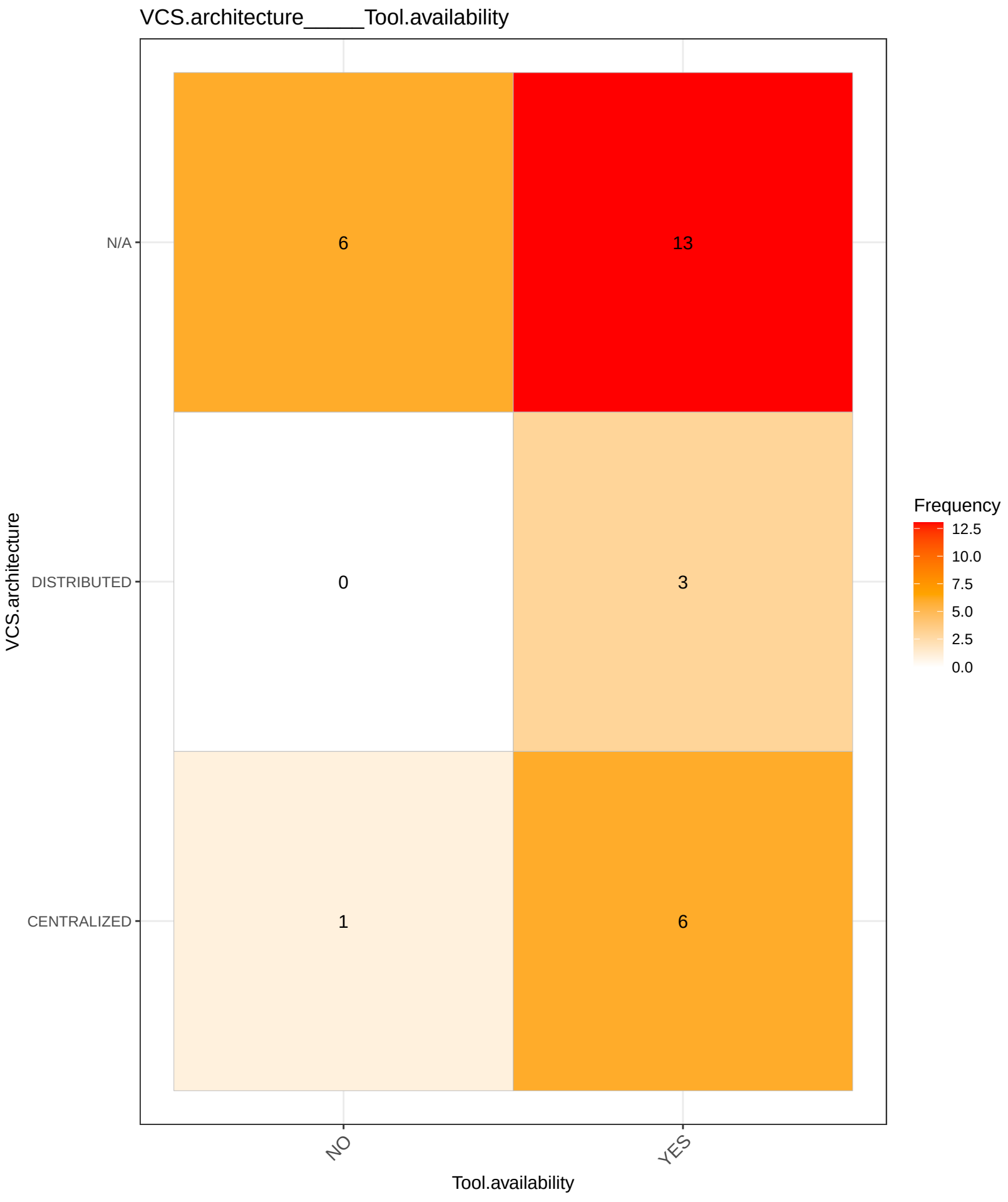

VCS.architecture_____Design.decision..session.history
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
1
1
1
17
2
0
0
0
2
1
0
0
0
6
1
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

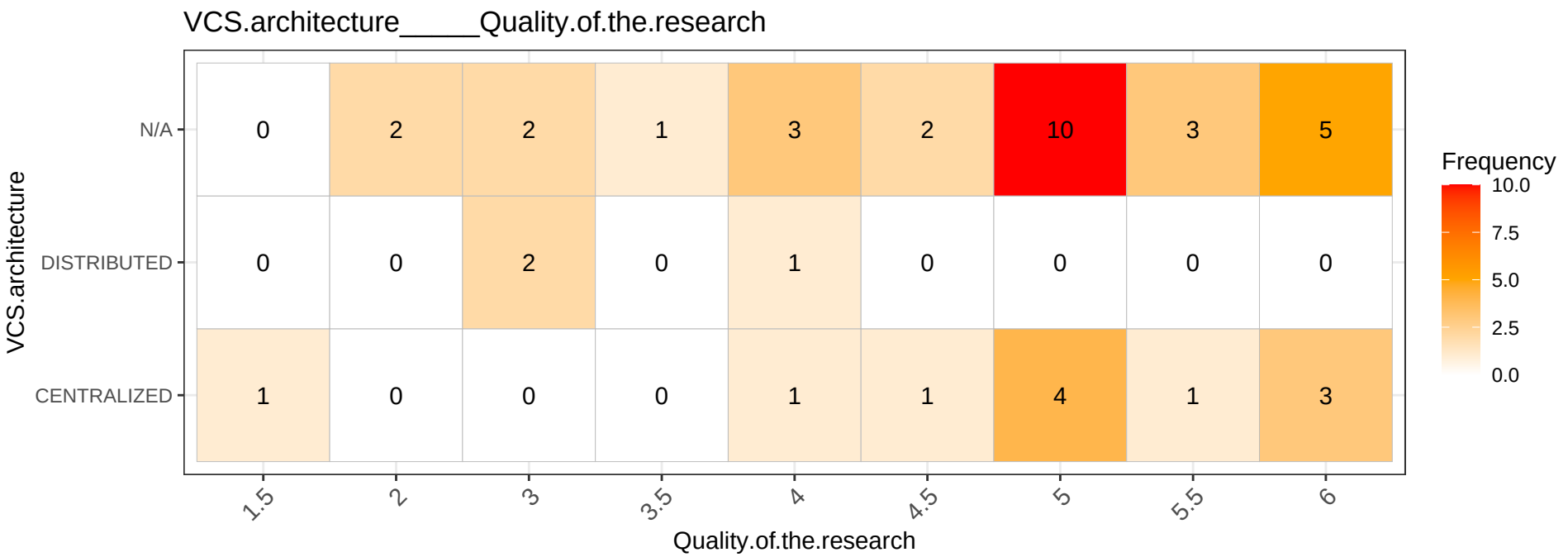

VCS.architecture_____Stakeholder.types
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
10
19
0
3
1
7
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

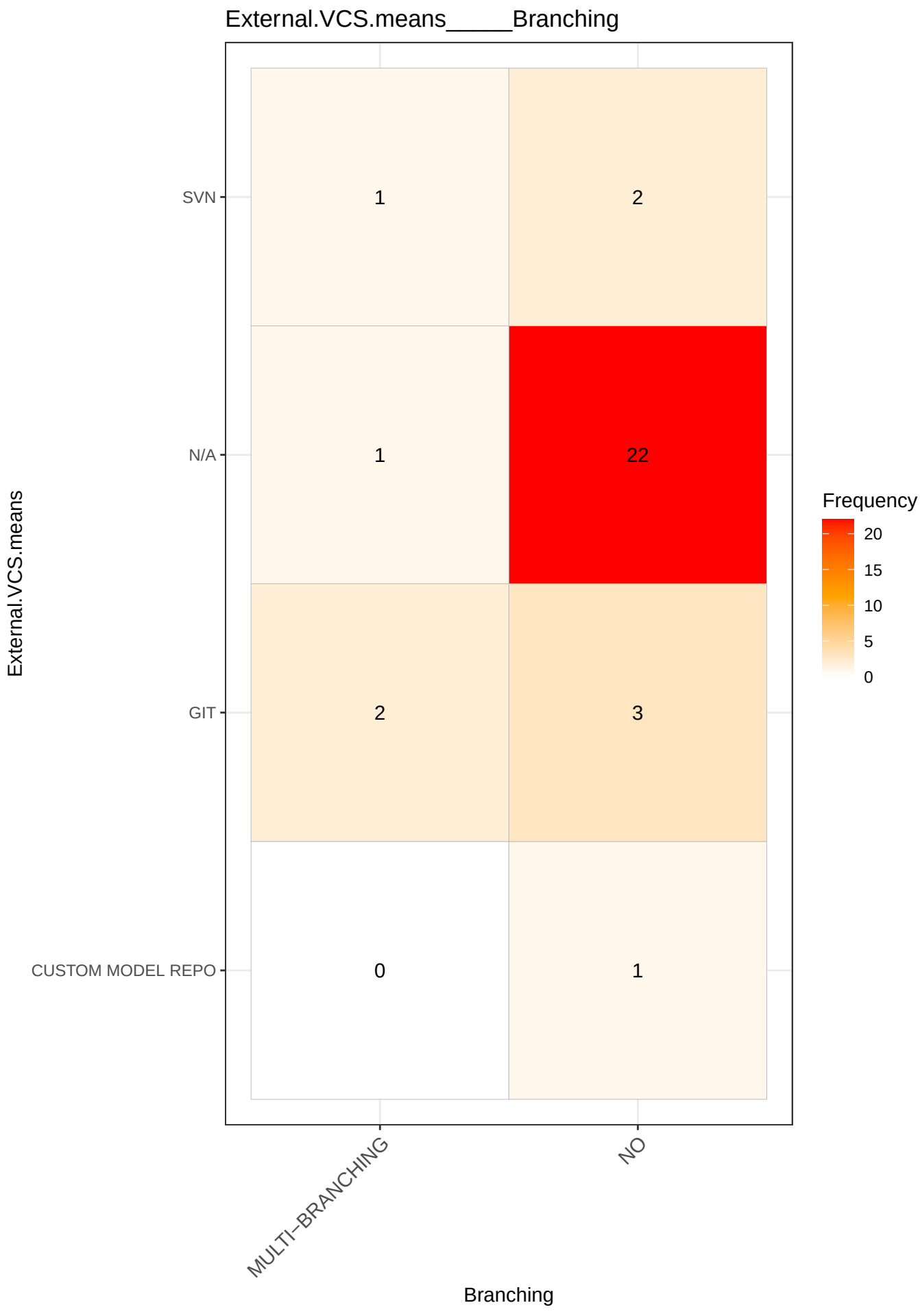

VCS.architecture_____Workspace.awareness
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
1 2 1 0 4 2 6 3 2 2 6 2 1 0
0 0 0 1 0 0 0 0 0 0 0 0 0 3
0 1 0 0 0 0 2 1 0 0 1 0 0 4
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

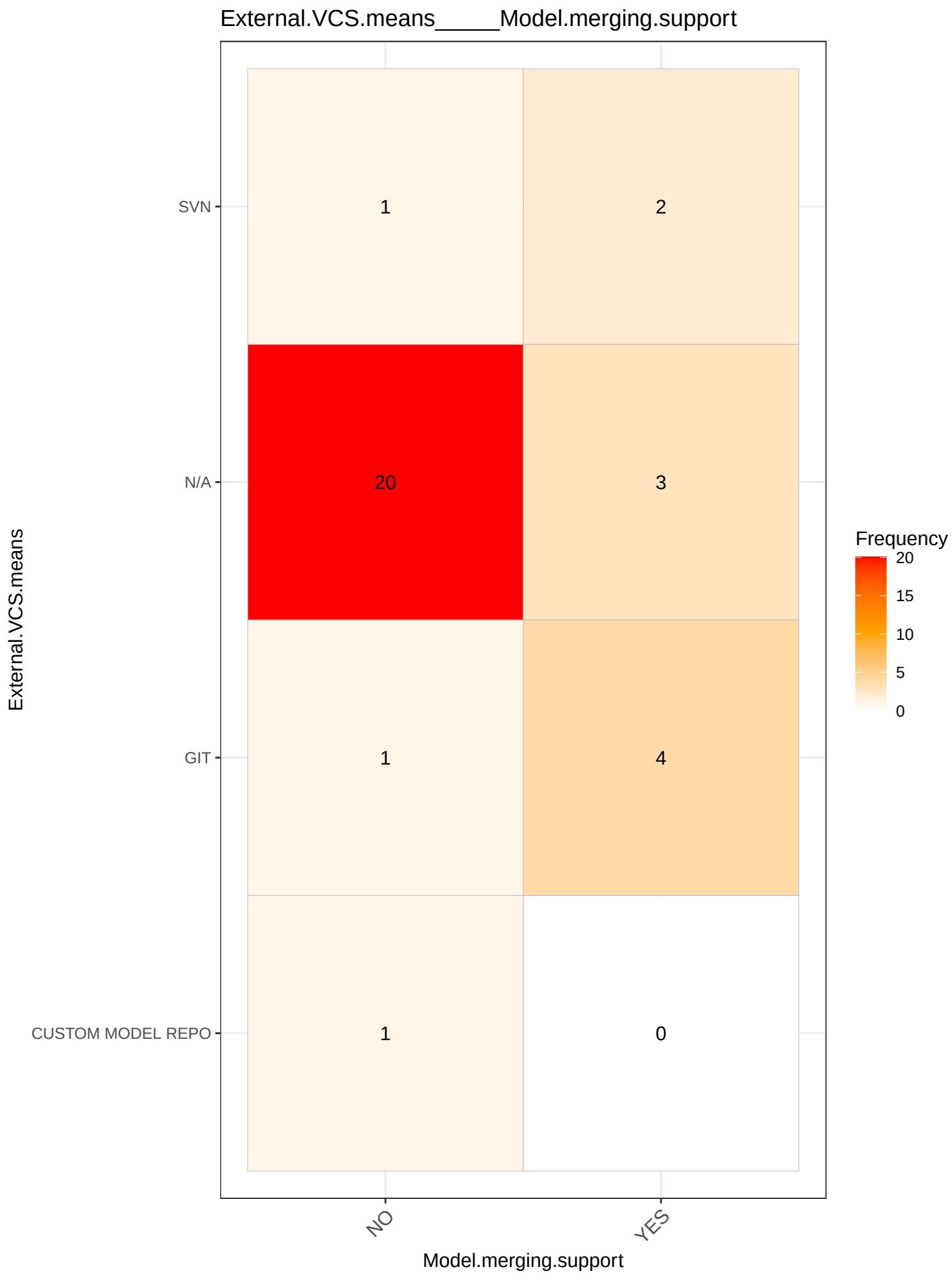

VCS.architecture_____Workspace.awareness.score
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
8
7
4
2
1
0
1
5
1
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0

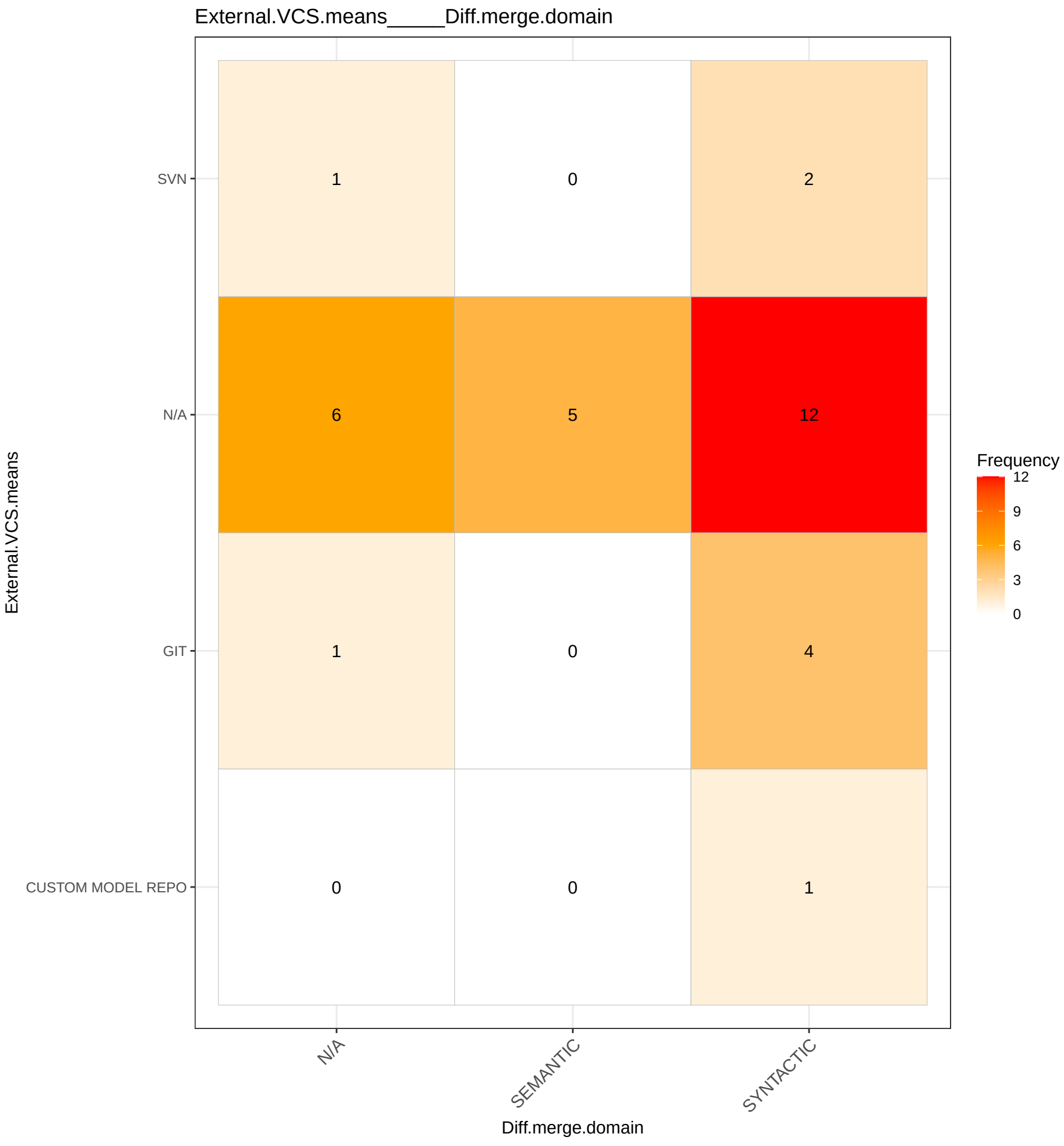

VCS.architecture_____Evaluation
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
7
1
8
8
1
0
0
2
2
1
4
1
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
8
6
4
2
0

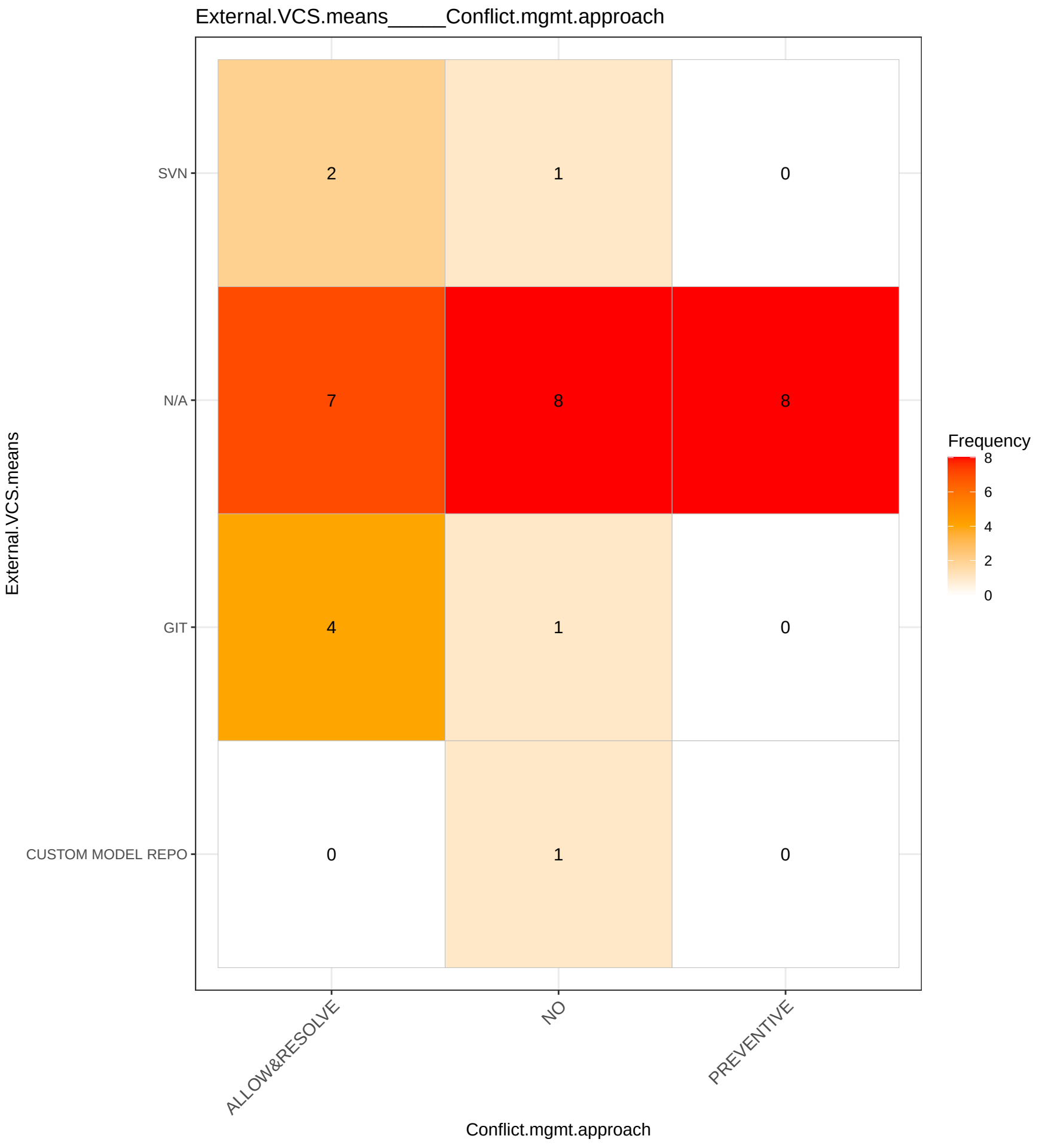

VCS.architecture_____Tool.availability
N/A
DISTRIBUTED
CENTRALIZED
VCS.architecture
6
13
0
3
1
6
NO
YES
Tool.availability
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

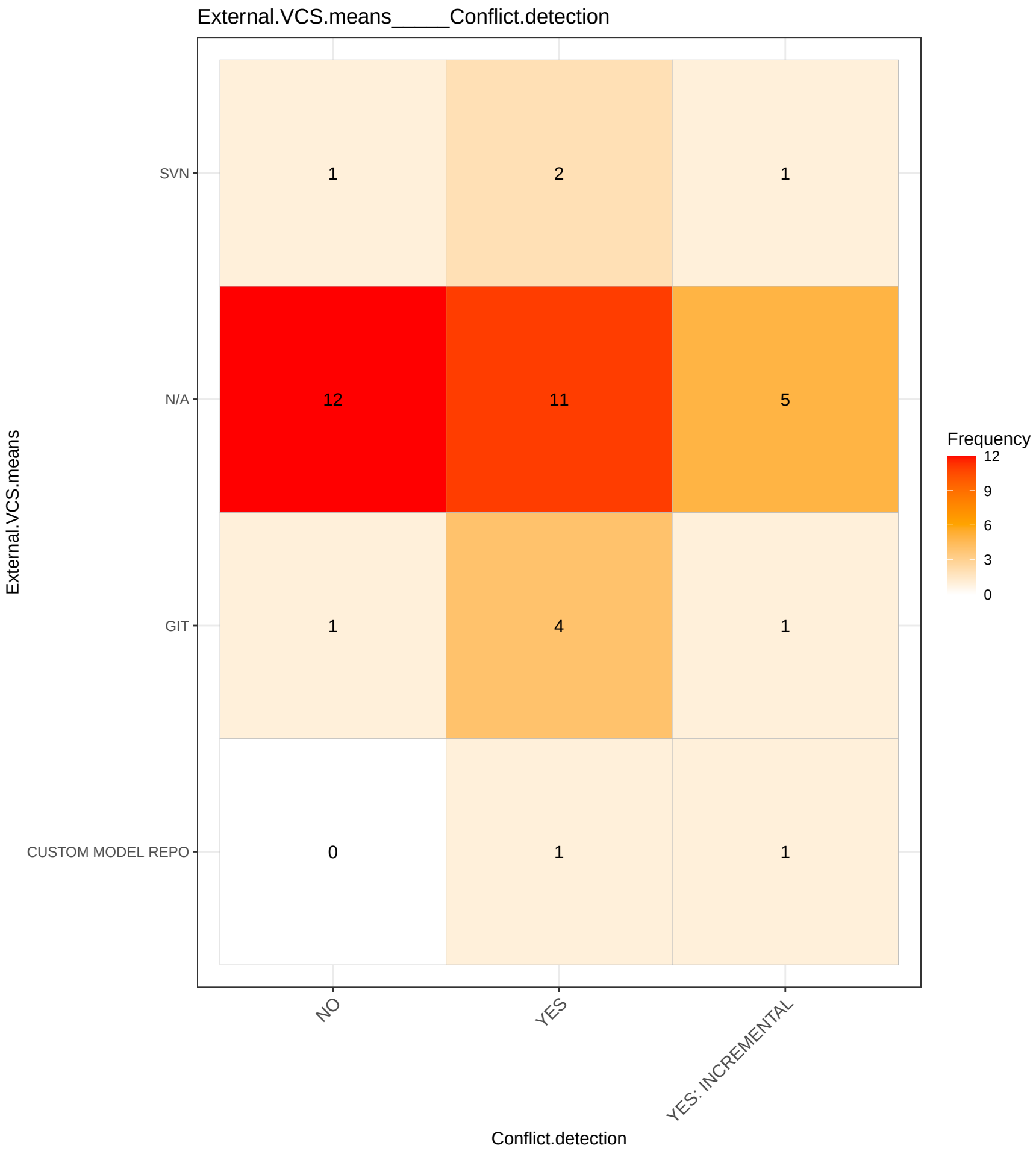

VCS.architecture_____Quality.of.the.research
VCS.architecture
N/A
DISTRIBUTED
CENTRALIZED
0
2
2
1
3
2
10
3
5
0
0
2
0
1
0
0
0
0
1
0
0
0
1
1
4
1
3
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

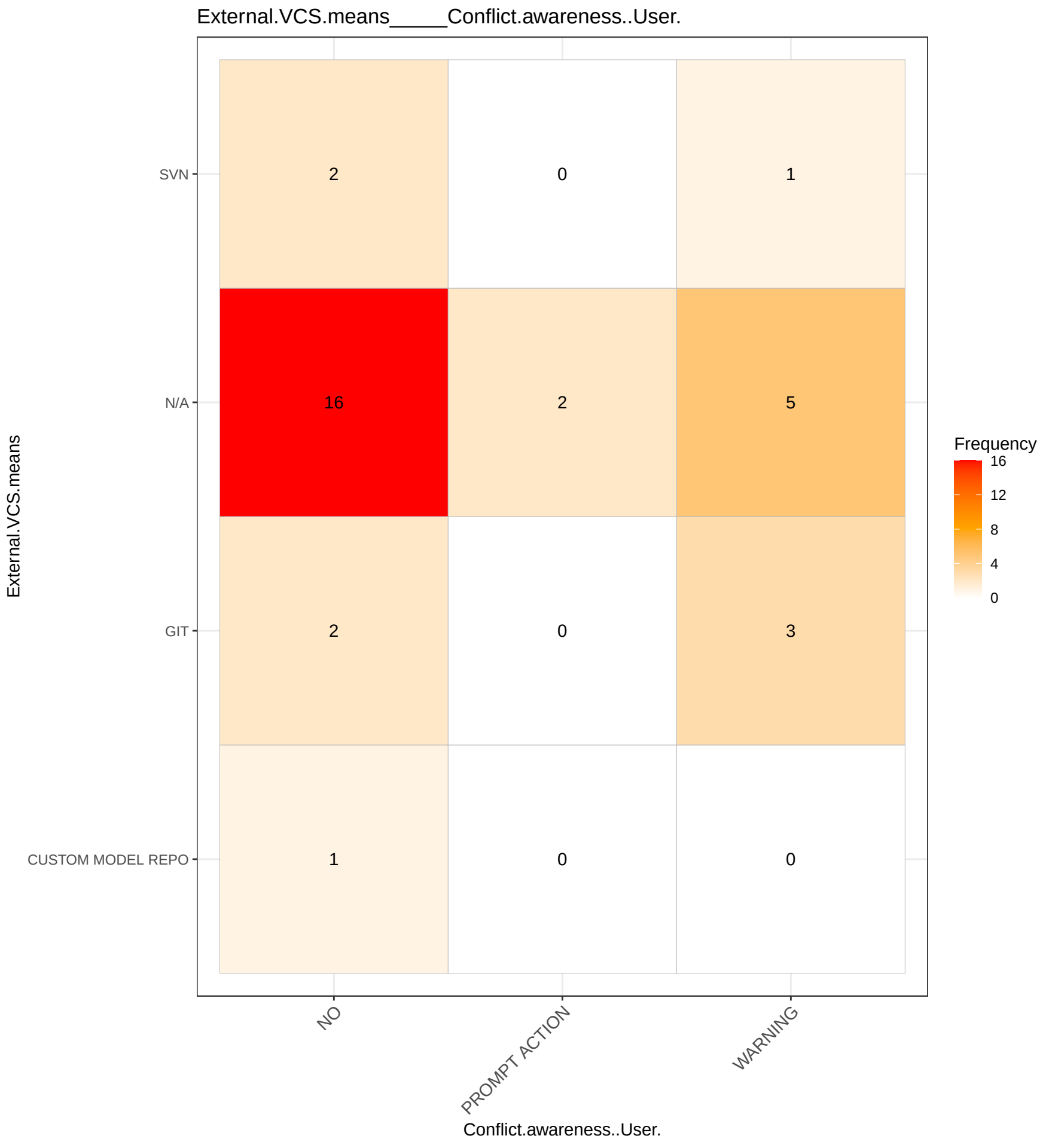

External.VCS.means_____Branching
SVN
N/A
GIT
CUSTOM MODEL REPO
1
2
1
22
2
3
0
1
External.VCS.means
MULTI−BRANCHING
NO
Branching
Frequency
20
15
10
5
0

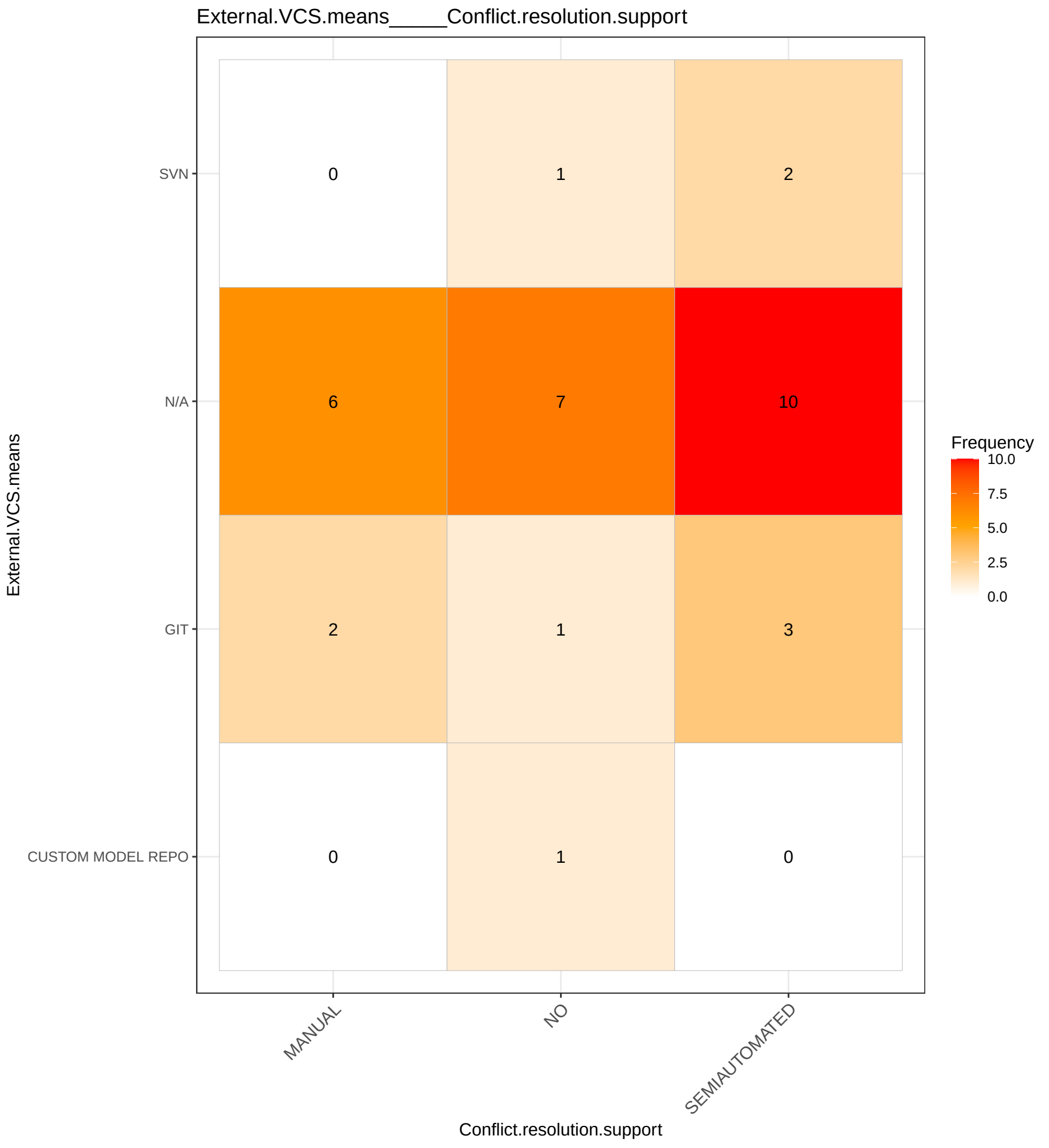

External.VCS.means_____Model.merging.support
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
1
2
20
3
1
4
1
0
NO
YES
Model.merging.support
Frequency
20
15
10
5
0

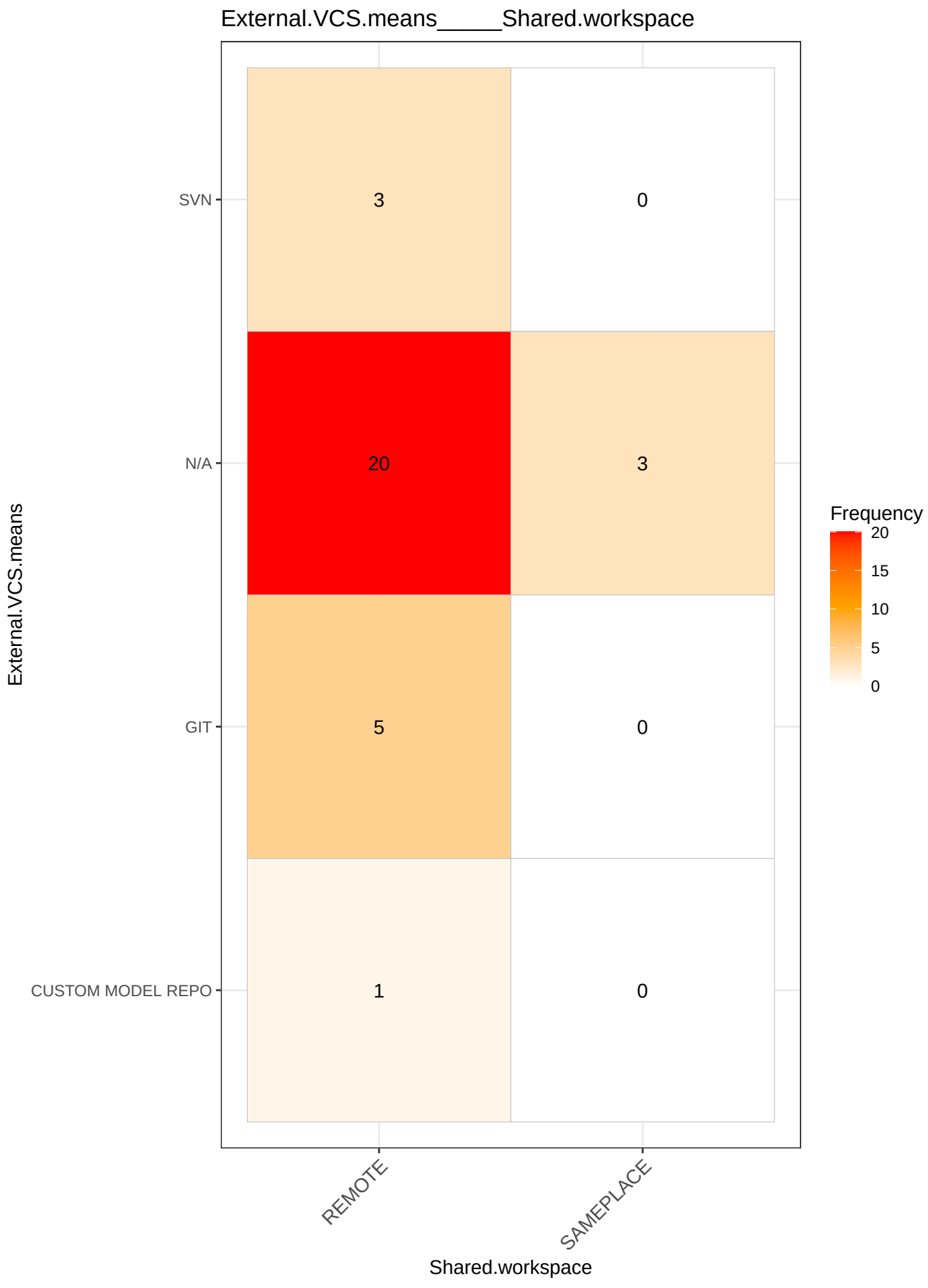

External.VCS.means_____Diff.merge.domain
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
1
0
2
6
5
12
1
0
4
0
0
1
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0

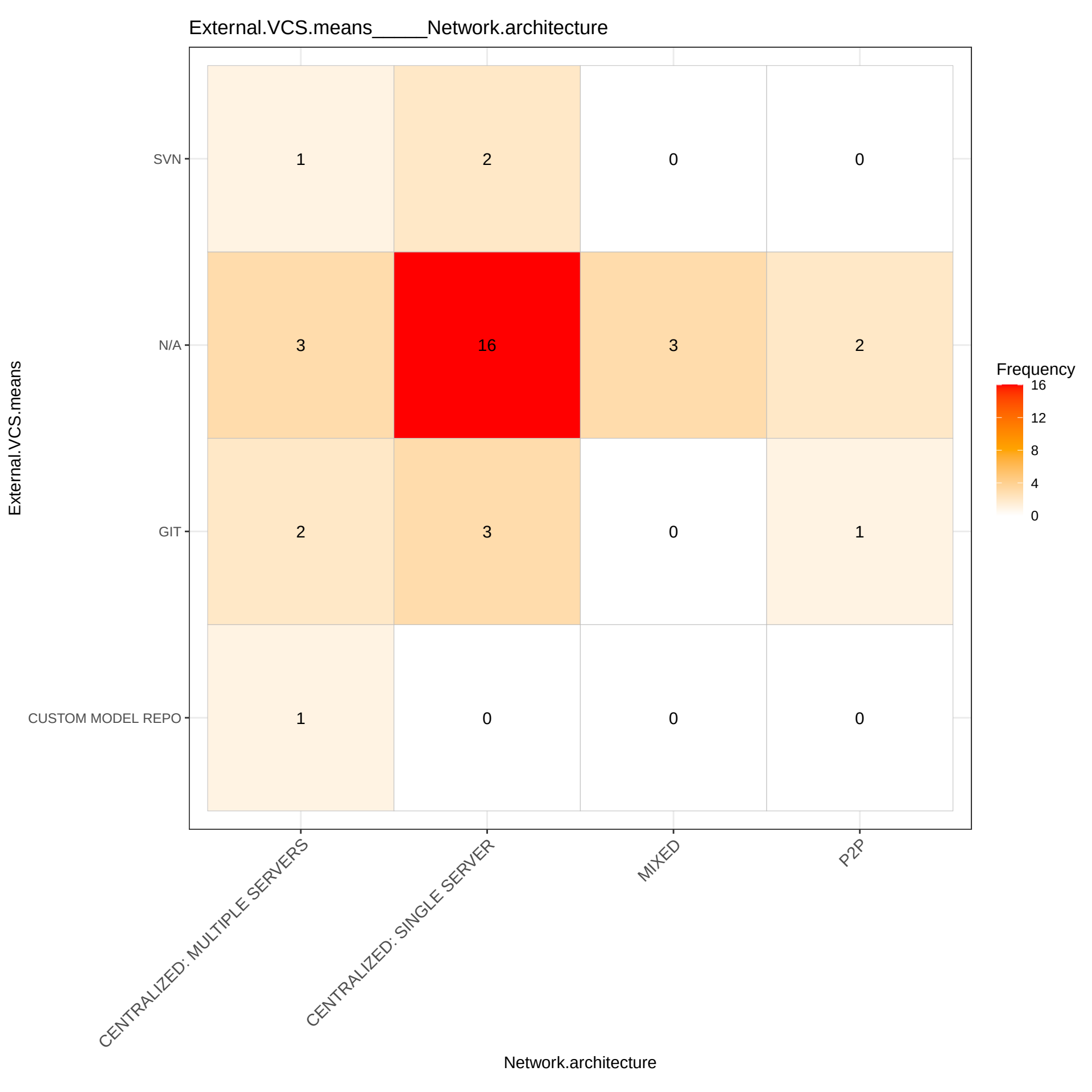

External.VCS.means_____Conflict.mgmt.approach
SVN
N/A
GIT
CUSTOM MODEL REPO
2
1
0
7
8
8
4
1
0
0
1
0
ALLOW&RESOLVE
NO
PREVENTIVE
External.VCS.means
Conflict.mgmt.approach
Frequency
8
6
4
2
0

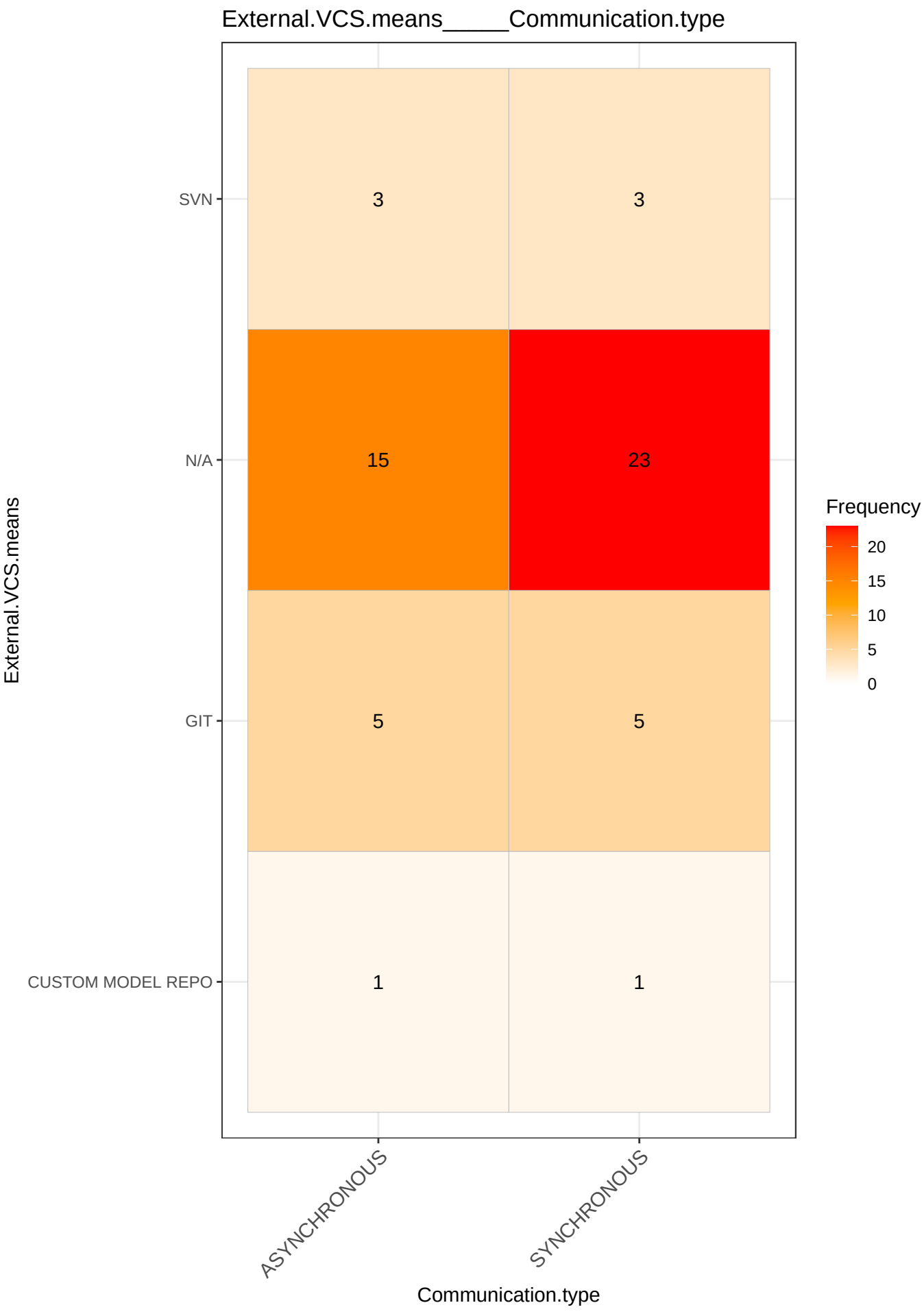

External.VCS.means_____Conflict.detection
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
1
2
1
12
11
5
1
4
1
0
1
1
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

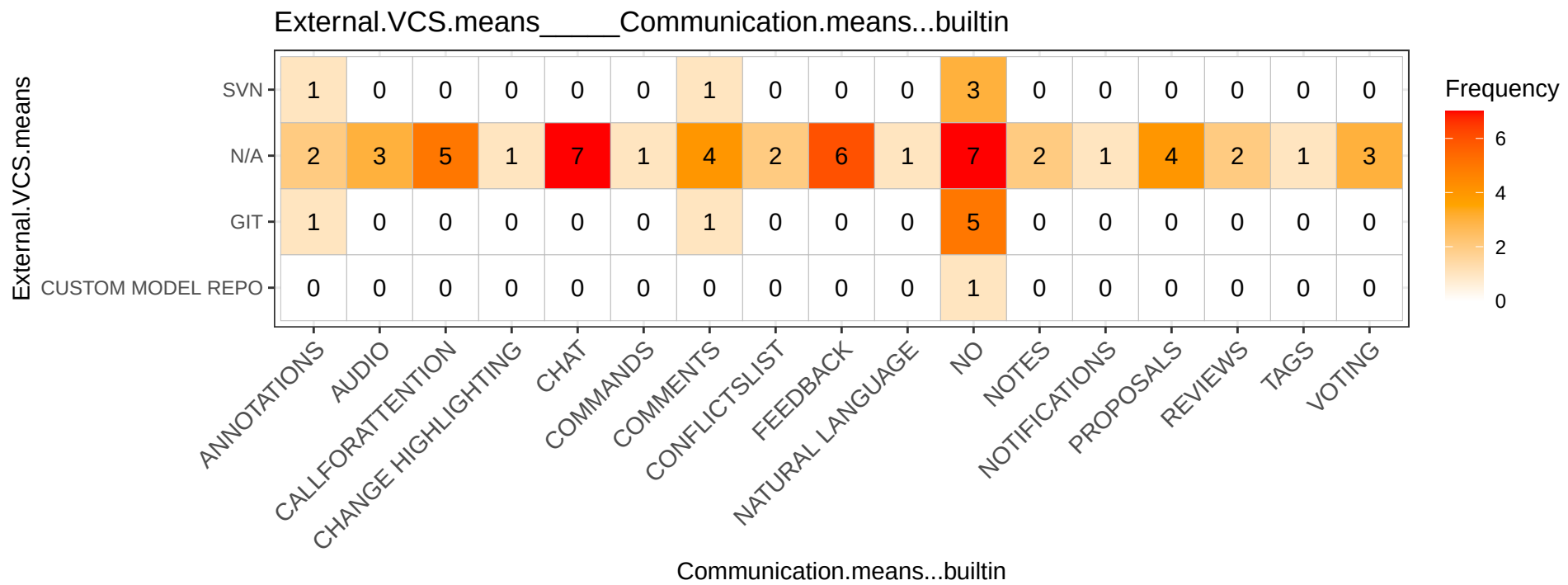

External.VCS.means_____Conflict.awareness..User.
SVN
N/A
GIT
CUSTOM MODEL REPO
2
0
1
16
2
5
2
0
3
1
0
0
NO
PROMPT ACTION
WARNING
External.VCS.means
Conflict.awareness..User.
Frequency
16
12
8
4
0

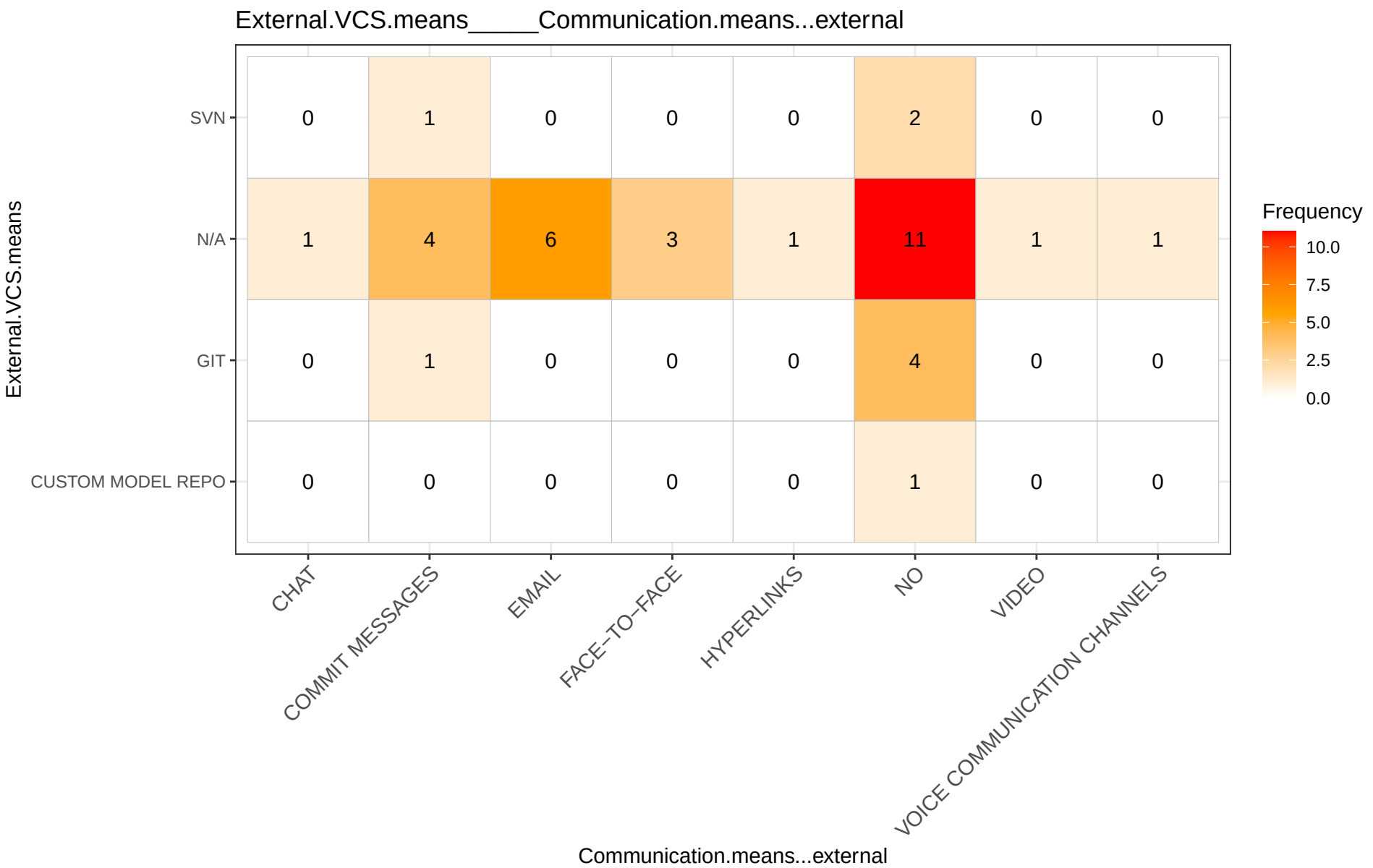

External.VCS.means_____Conflict.resolution.support
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
0
1
2
6
7
10
2
1
3
0
1
0
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
10.0
7.5
5.0
2.5
0.0

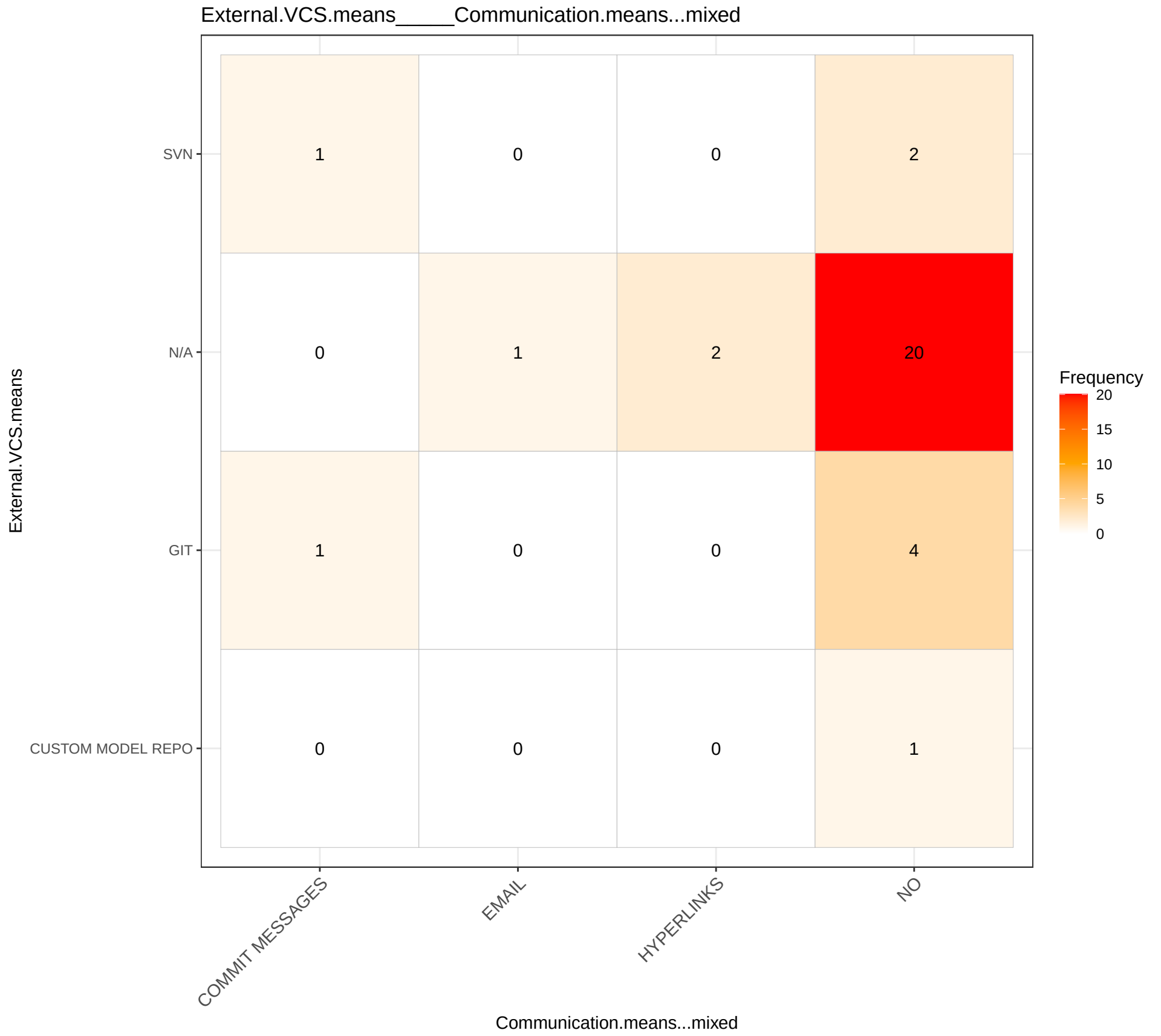

External.VCS.means_____Shared.workspace
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
3
0
20
3
5
0
1
0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
20
15
10
5
0

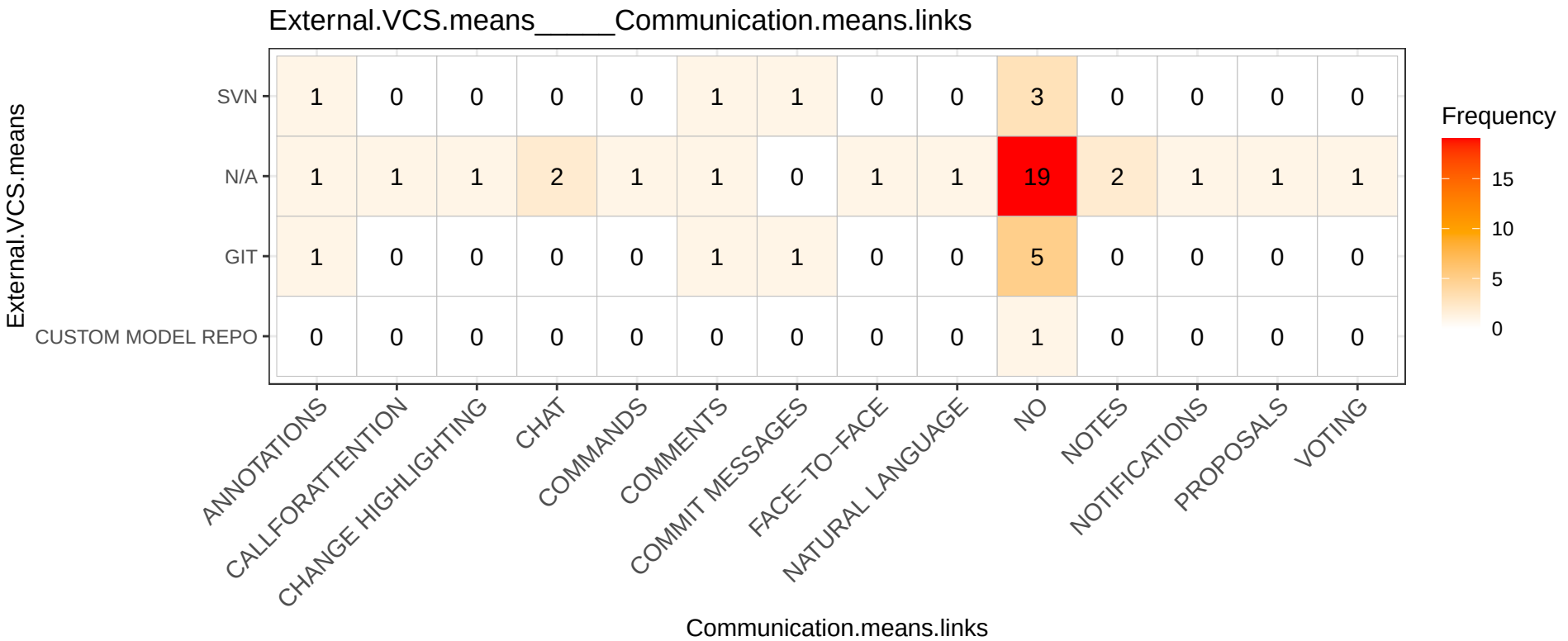

External.VCS.means_____Network.architecture
SVN
N/A
GIT
CUSTOM MODEL REPO
1
2
0
0
3
16
3
2
2
3
0
1
1
0
0
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
External.VCS.means
Network.architecture
Frequency
16
12
8
4
0

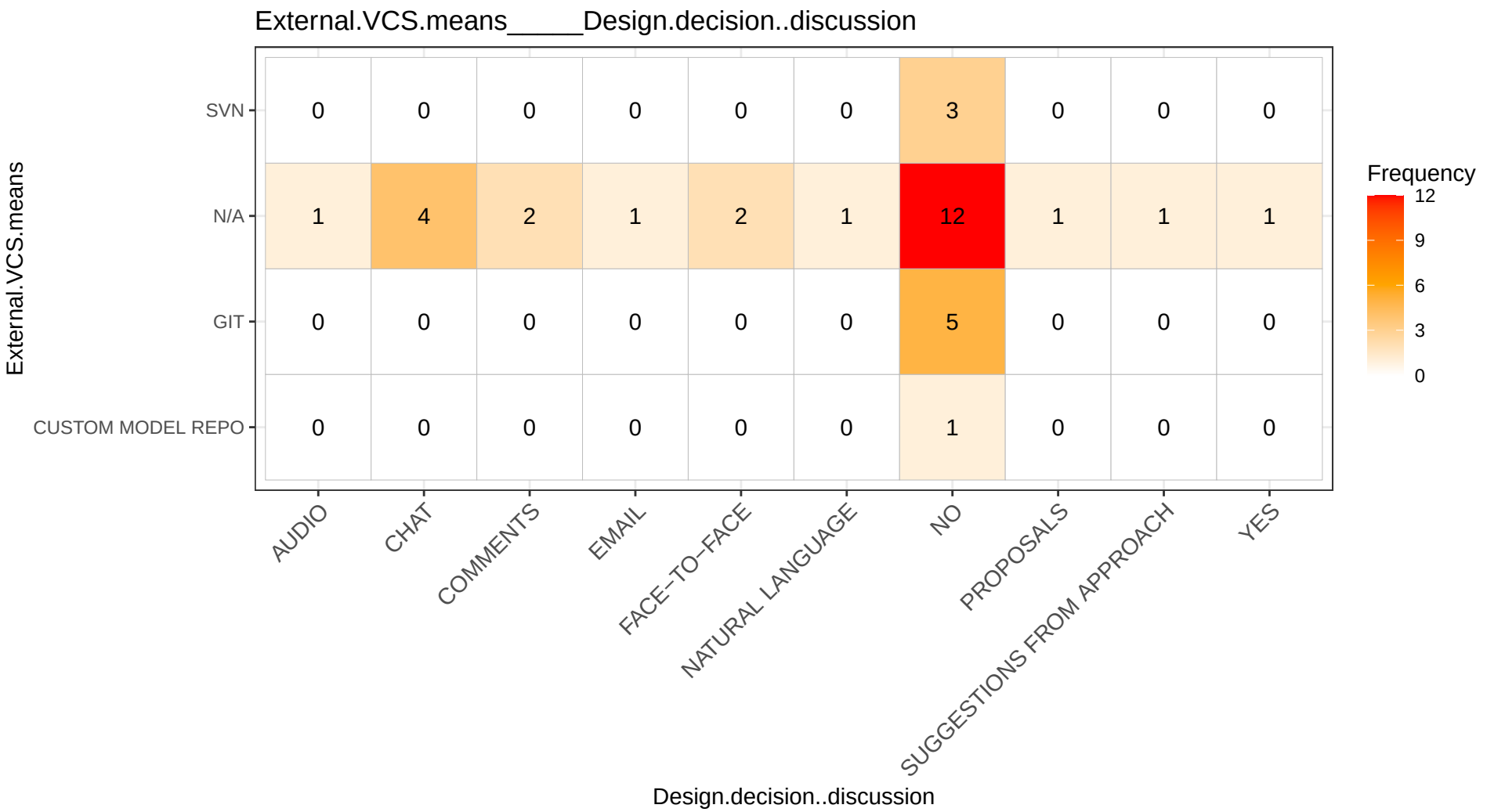

External.VCS.means_____Communication.type
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
3
3
15
23
5
5
1
1
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
20
15
10
5
0

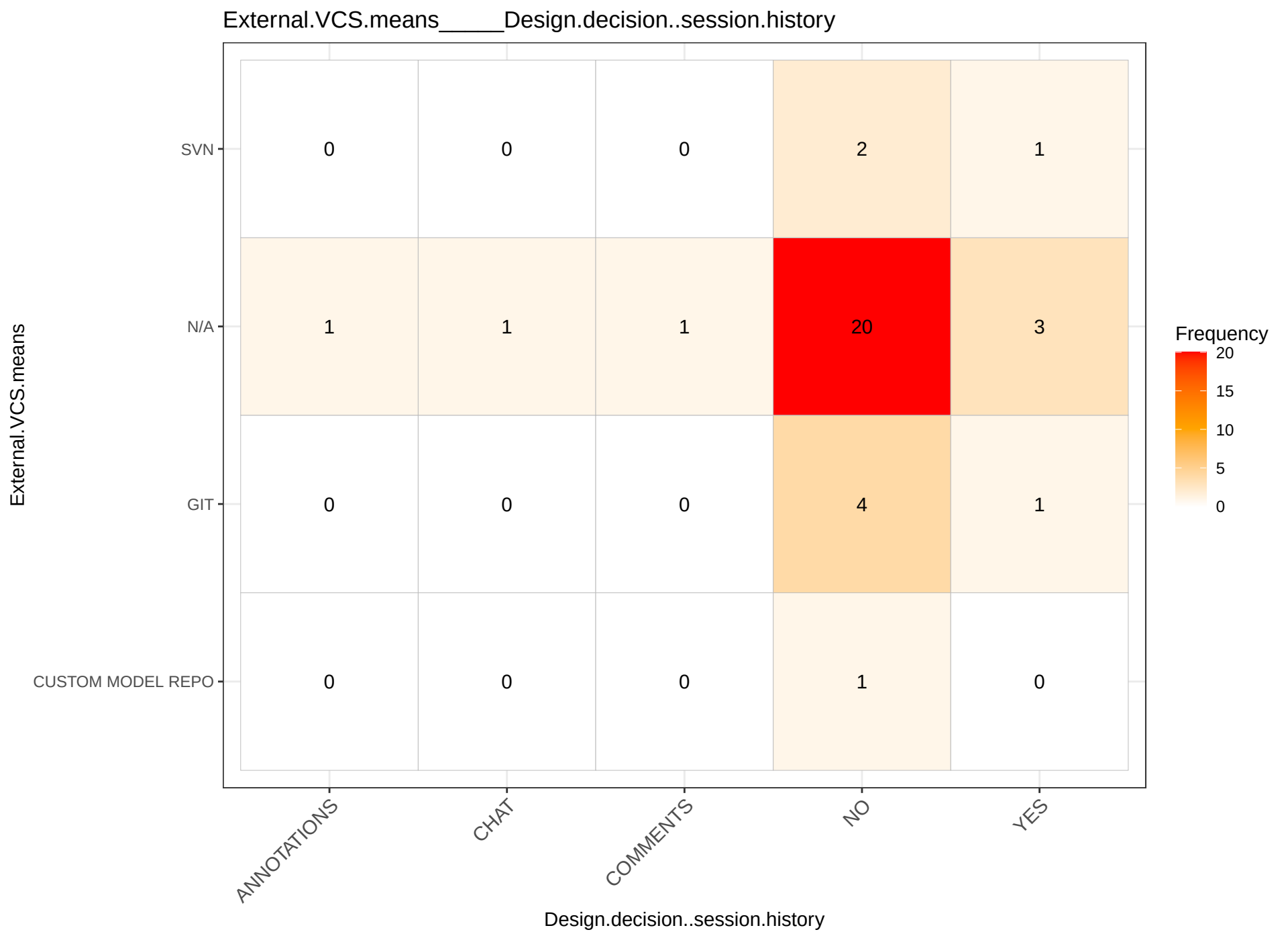

External.VCS.means_____Communication.means...builtin
External.VCS.means
SVN
N/A
GIT
CUSTOM MODEL REPO
1 0 0 0 0 0 1 0 0 0 3 0 0 0 0 0 0
2 3 5 1 7 1 4 2 6 1 7 2 1 4 2 1 3
1 0 0 0 0 0 1 0 0 0 5 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
4
2
0

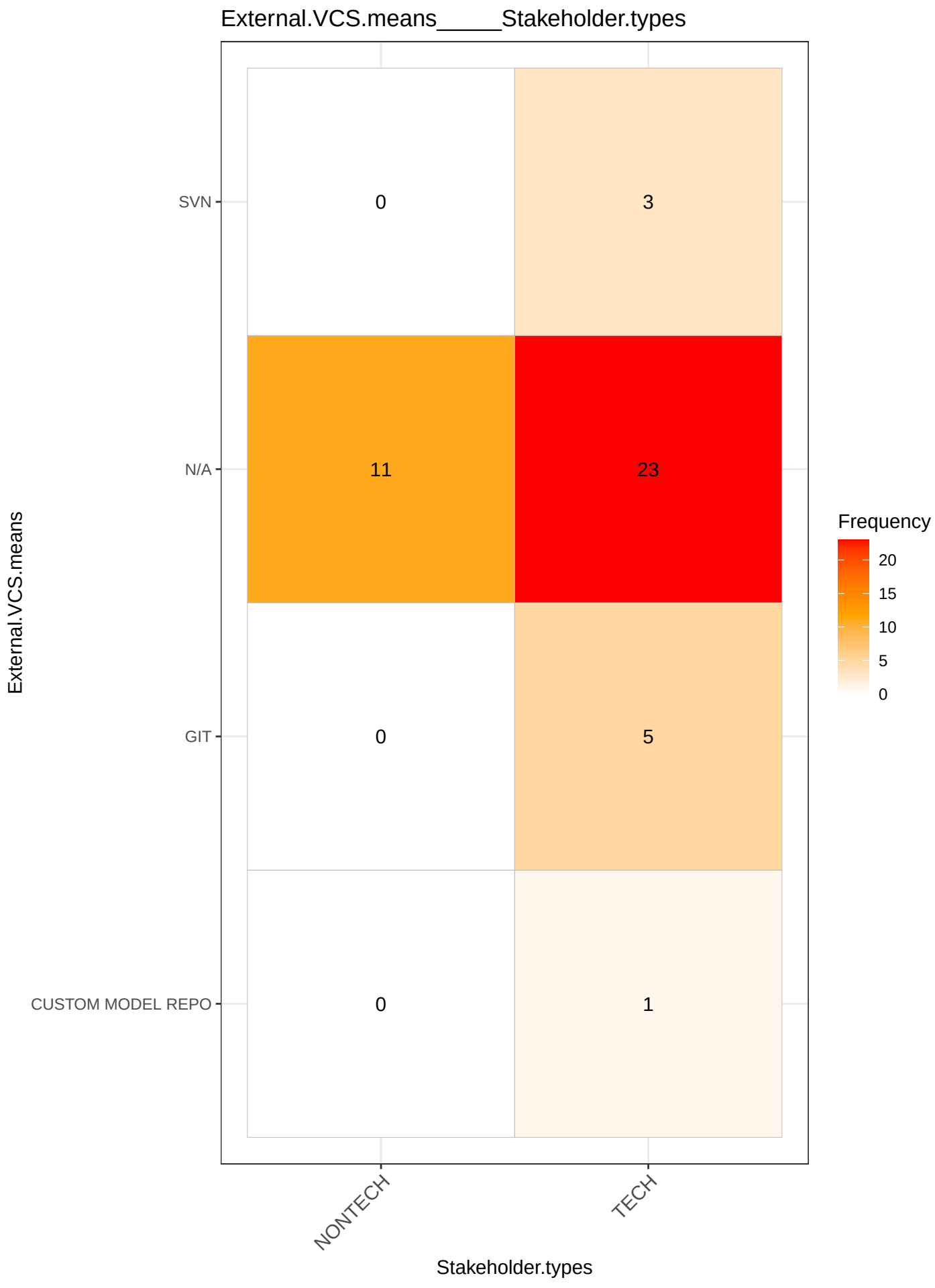

External.VCS.means_____Communication.means...external
External.VCS.means
SVN
N/A
GIT
CUSTOM MODEL REPO
0 1 0 0 0 2 0 0
1 4 6 3 1 11 1 1
0 1 0 0 0 4 0 0
0 0 0 0 0 1 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10.0
7.5
5.0
2.5
0.0

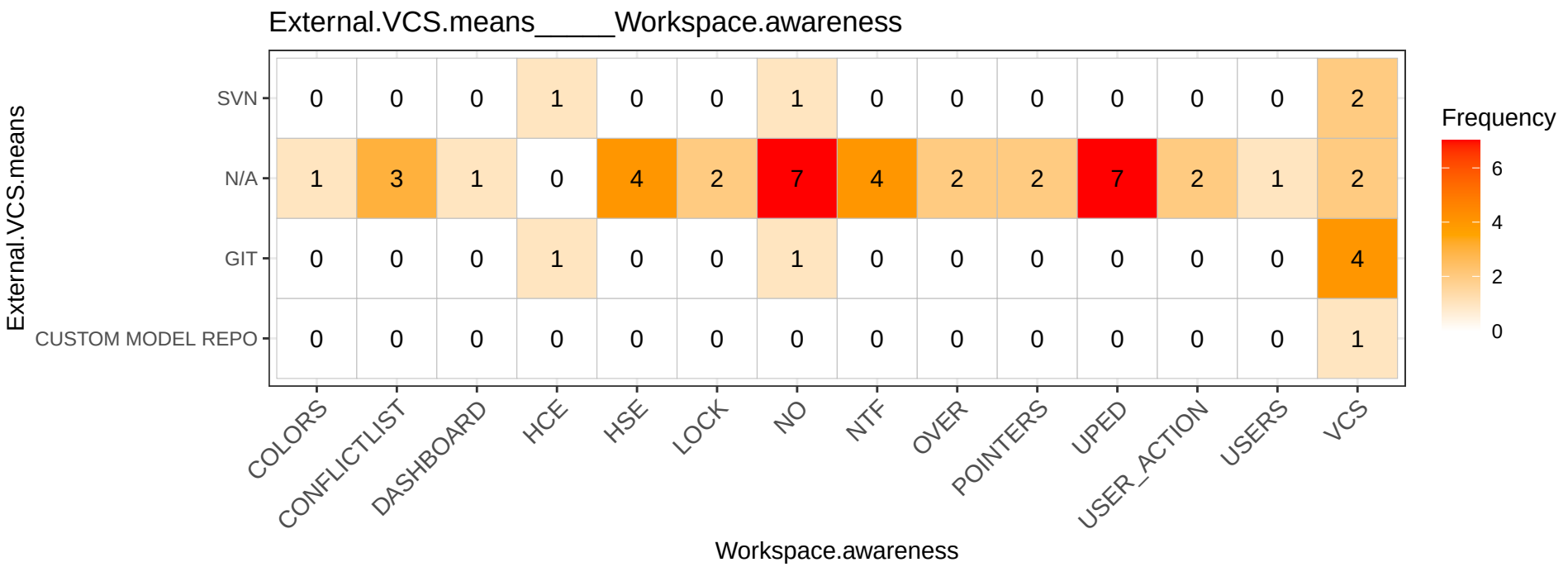

External.VCS.means_____Communication.means...mixed
SVN
N/A
GIT
CUSTOM MODEL REPO
1
0
0
2
0
1
2
20
1
0
0
4
0
0
0
1
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
External.VCS.means
Communication.means...mixed
Frequency
20
15
10
5
0

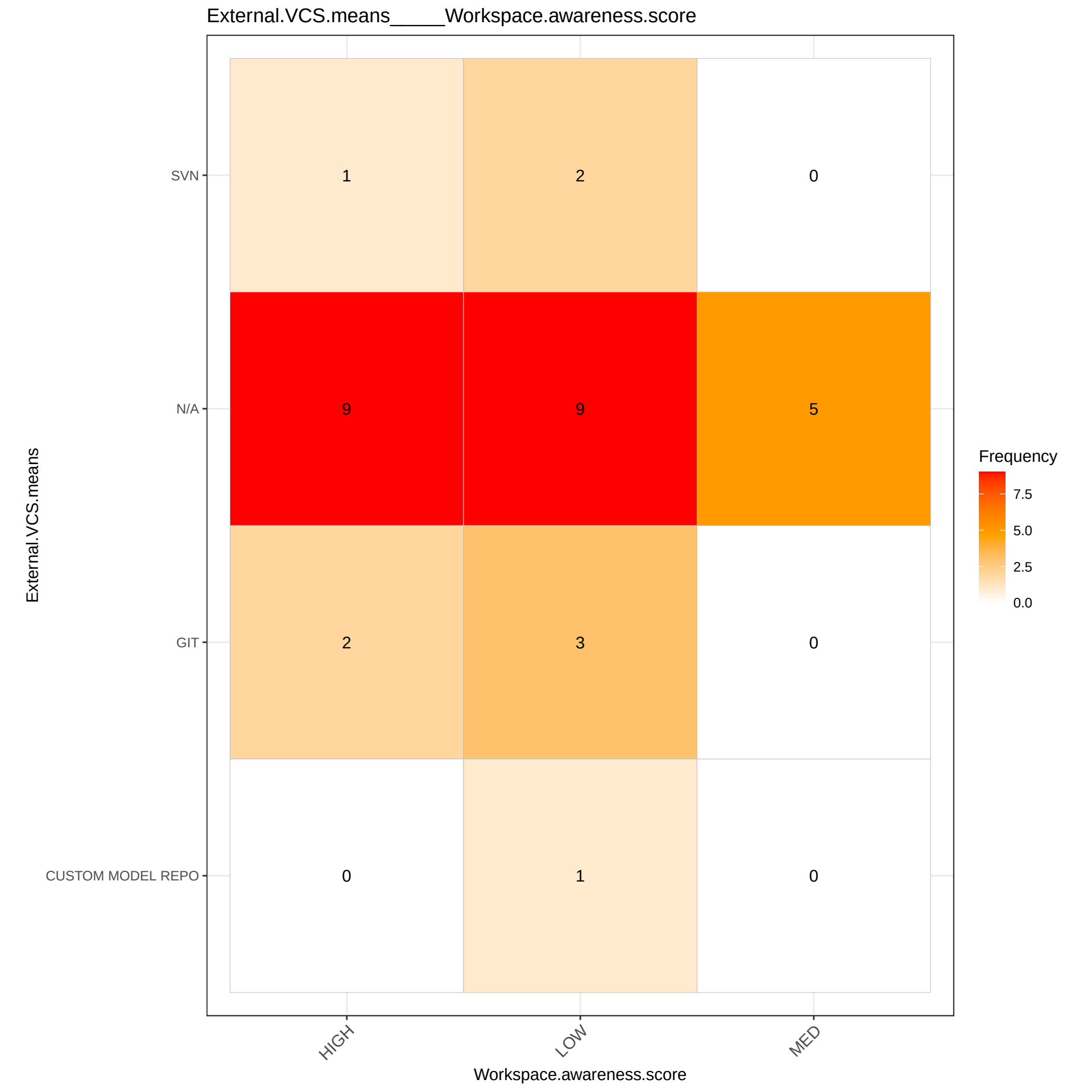

External.VCS.means_____Communication.means.links
External.VCS.means
SVN
N/A
GIT
CUSTOM MODEL REPO
1 0 0 0 0 1 1 0 0 3 0 0 0 0
1 1 1 2 1 1 0 1 1 19 2 1 1 1
1 0 0 0 0 1 1 0 0 5 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

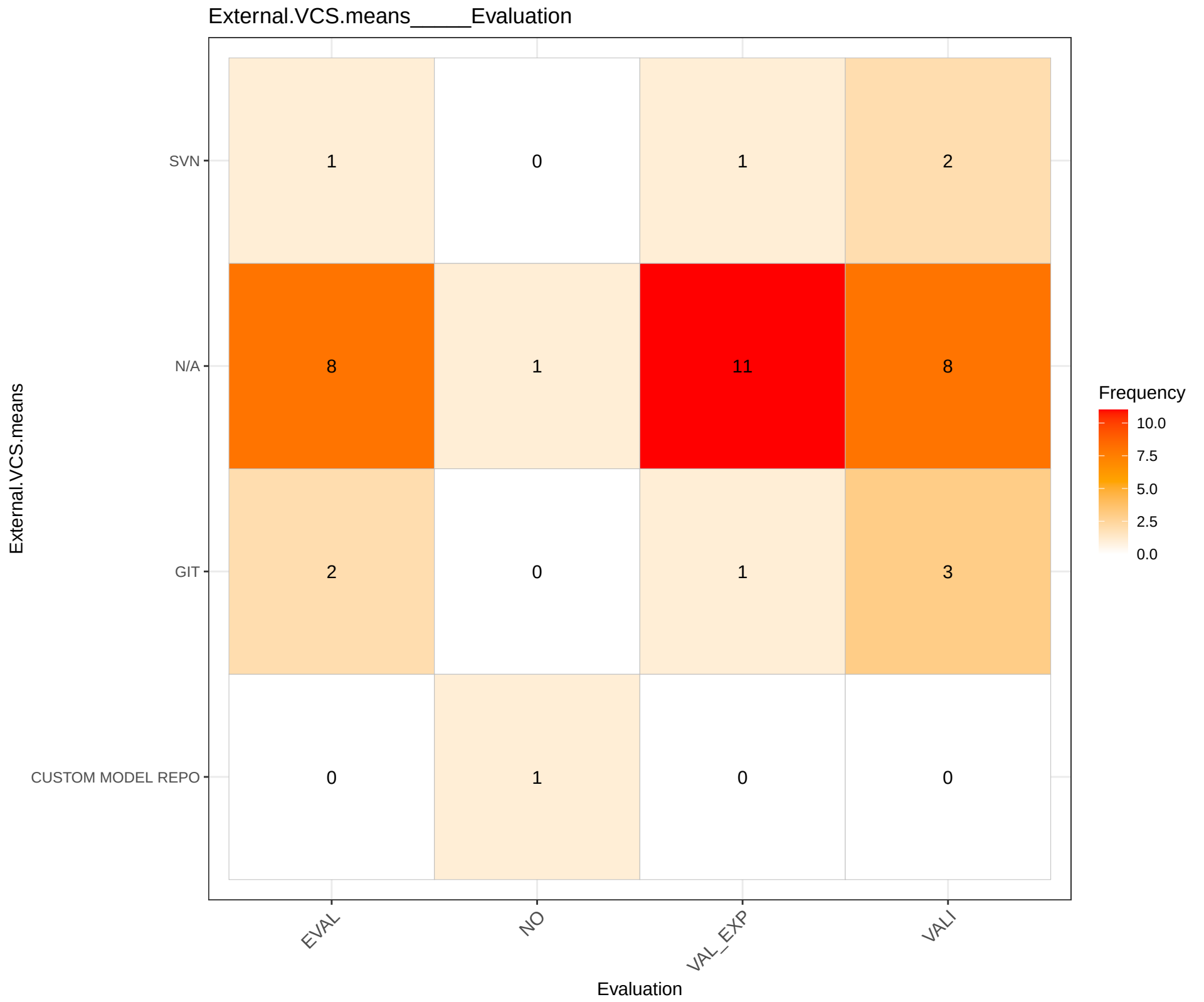

External.VCS.means_____Design.decision..discussion
External.VCS.means
SVN
N/A
GIT
CUSTOM MODEL REPO
0 0 0 0 0 0 3 0 0 0
1 4 2 1 2 1 12 1 1 1
0 0 0 0 0 0 5 0 0 0
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12
9
6
3
0

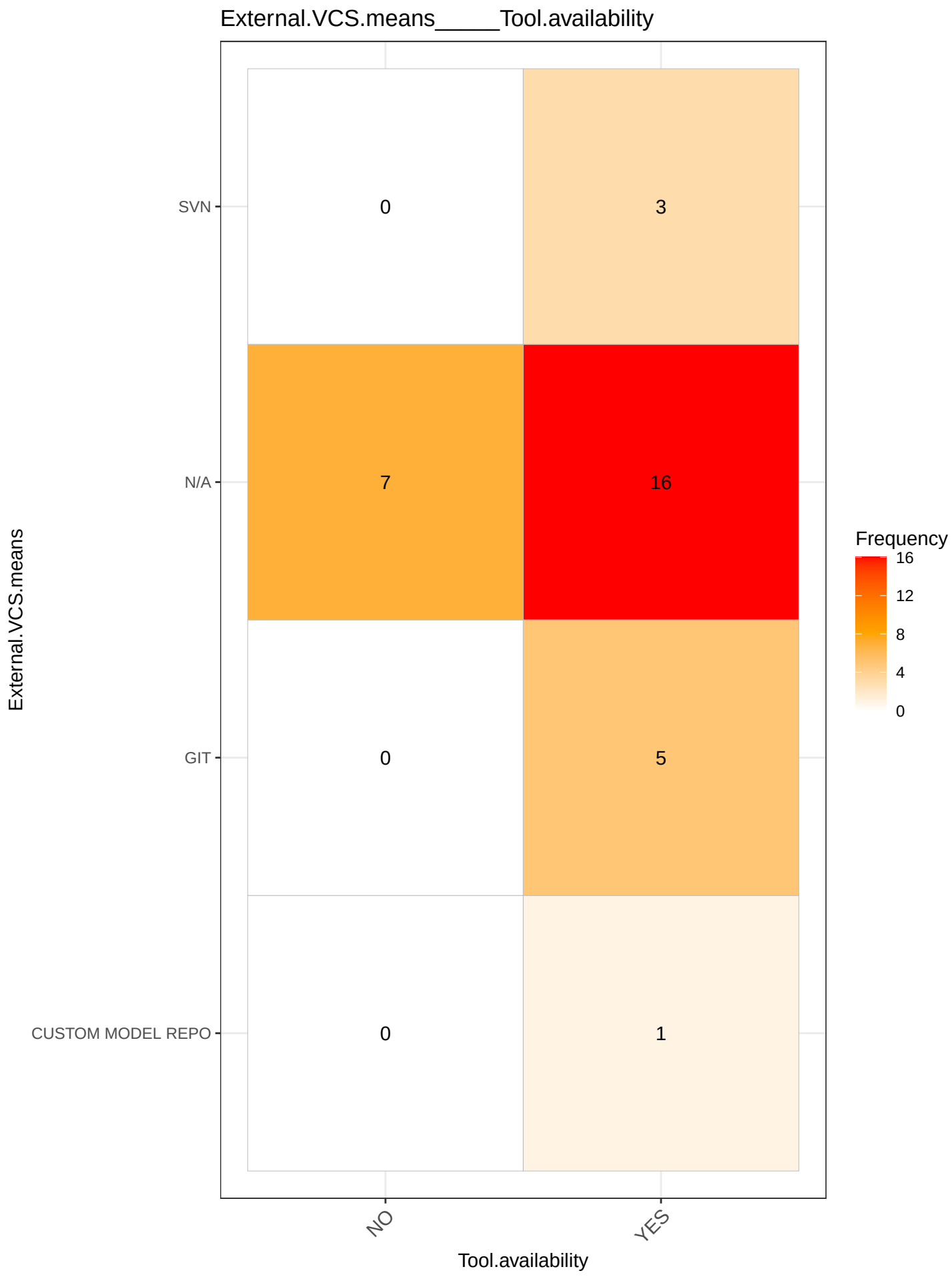

External.VCS.means_____Design.decision..session.history
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
0 0 0 2 1
1 1 1 20 3
0 0 0 4 1
0 0 0 1 0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
20
15
10
5
0

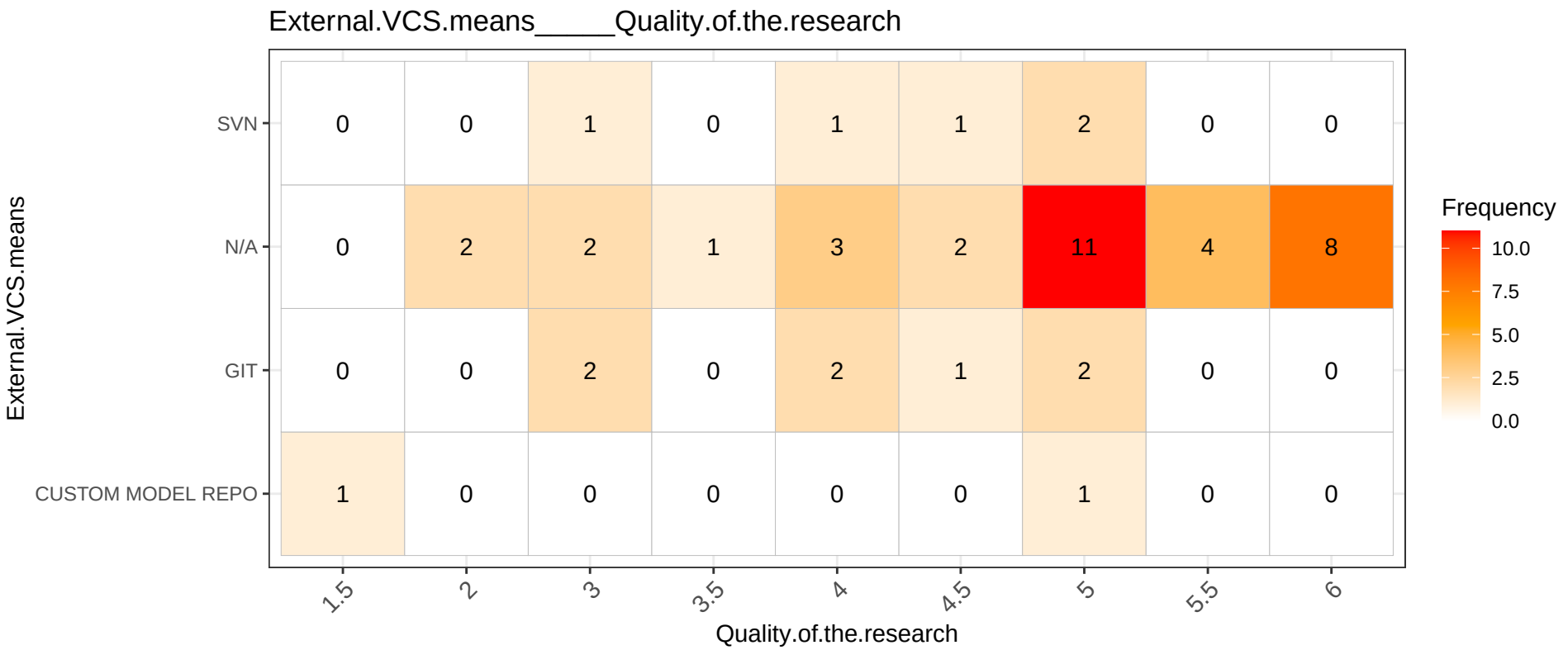

External.VCS.means_____Stakeholder.types
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
0
3
11
23
0
5
0
1
NONTECH
TECH
Stakeholder.types
Frequency
20
15
10
5
0

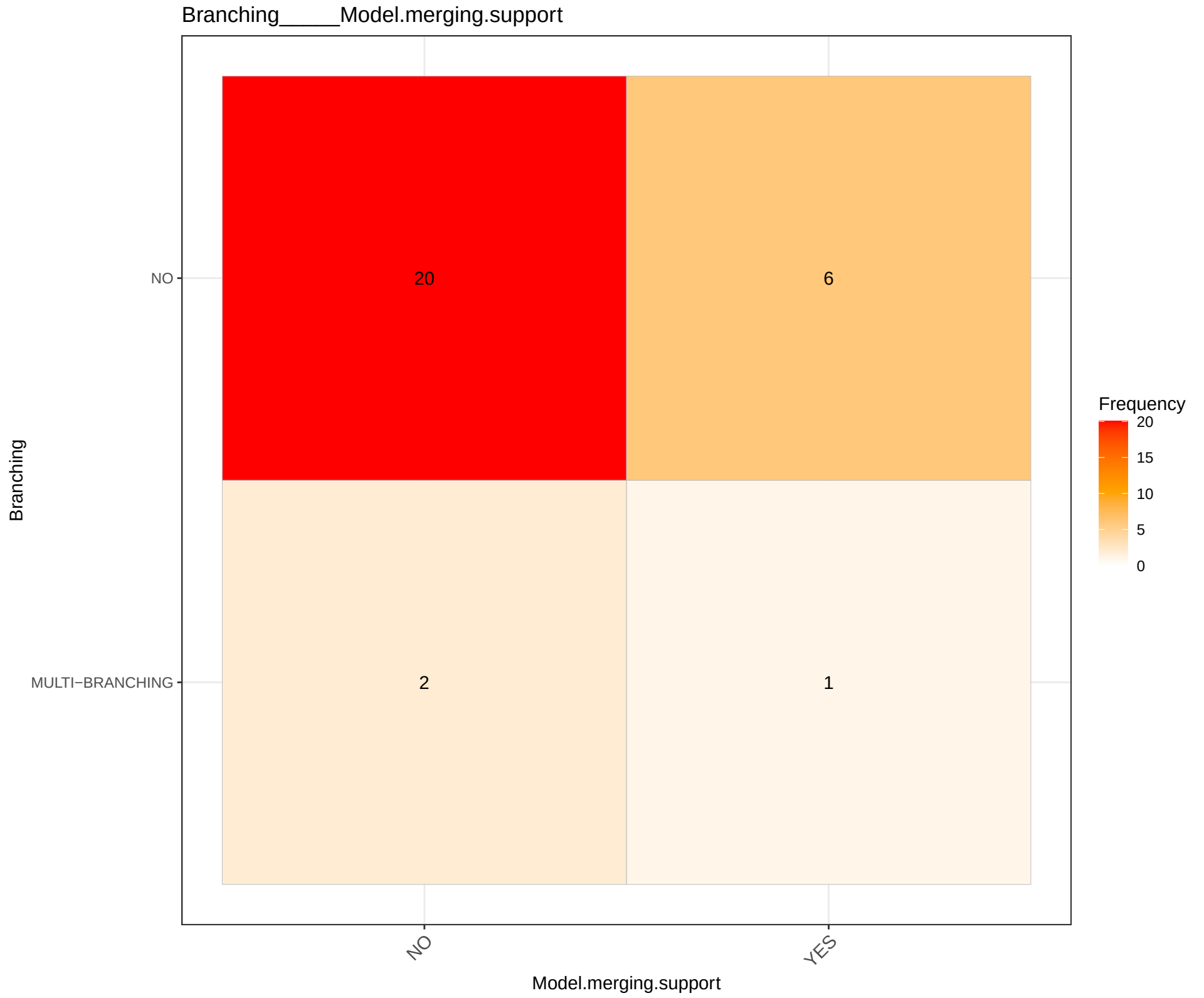

External.VCS.means_____Workspace.awareness
External.VCS.means
SVN
N/A
GIT
CUSTOM MODEL REPO
0 0 0 1 0 0 1 0 0 0 0 0 0 2
1 3 1 0 4 2 7 4 2 2 7 2 1 2
0 0 0 1 0 0 1 0 0 0 0 0 0 4
0 0 0 0 0 0 0 0 0 0 0 0 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0

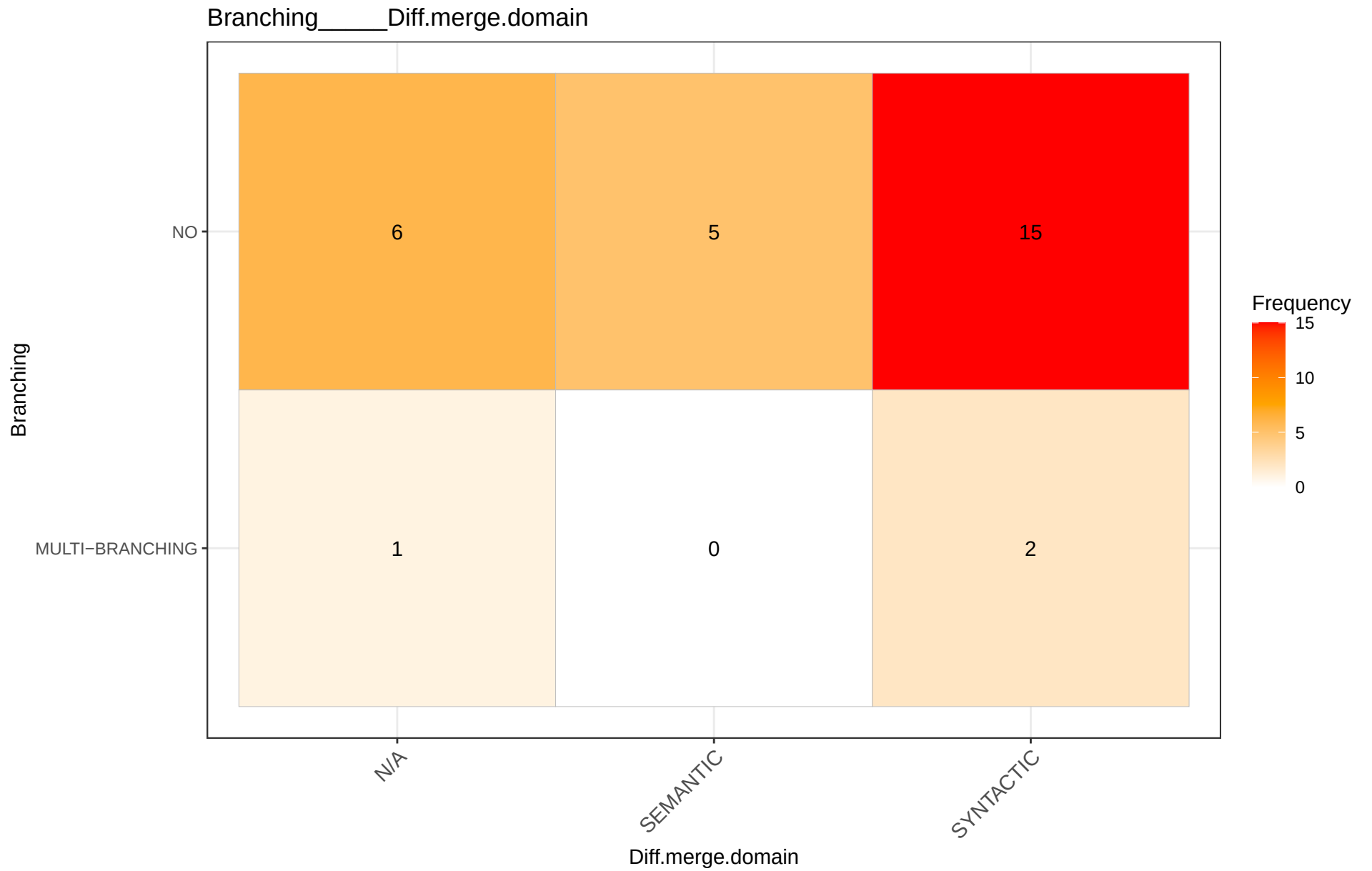

External.VCS.means_____Workspace.awareness.score
SVN
N/A
GIT
CUSTOM MODEL REPO
1
2
0
9
9
5
2
3
0
0
1
0
HIGH
LOW
MED
Workspace.awareness.score
External.VCS.means
Frequency
7.5
5.0
2.5
0.0

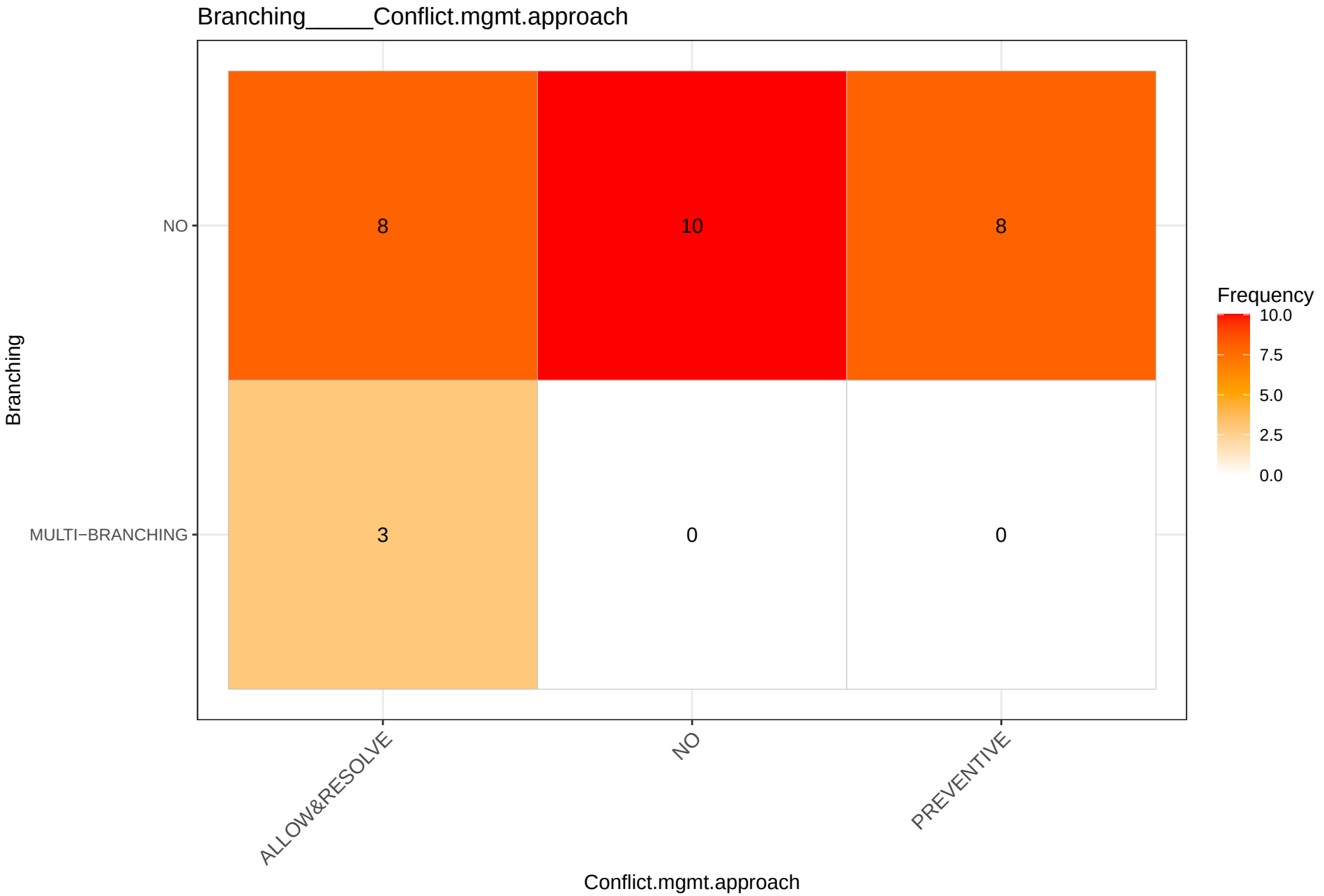

External.VCS.means_____Evaluation
SVN
N/A
GIT
CUSTOM MODEL REPO
1
0
1
2
8
1
11
8
2
0
1
3
0
1
0
0
EVAL
NO
VAL_EXP
VALI
Evaluation
External.VCS.means
Frequency
10.0
7.5
5.0
2.5
0.0

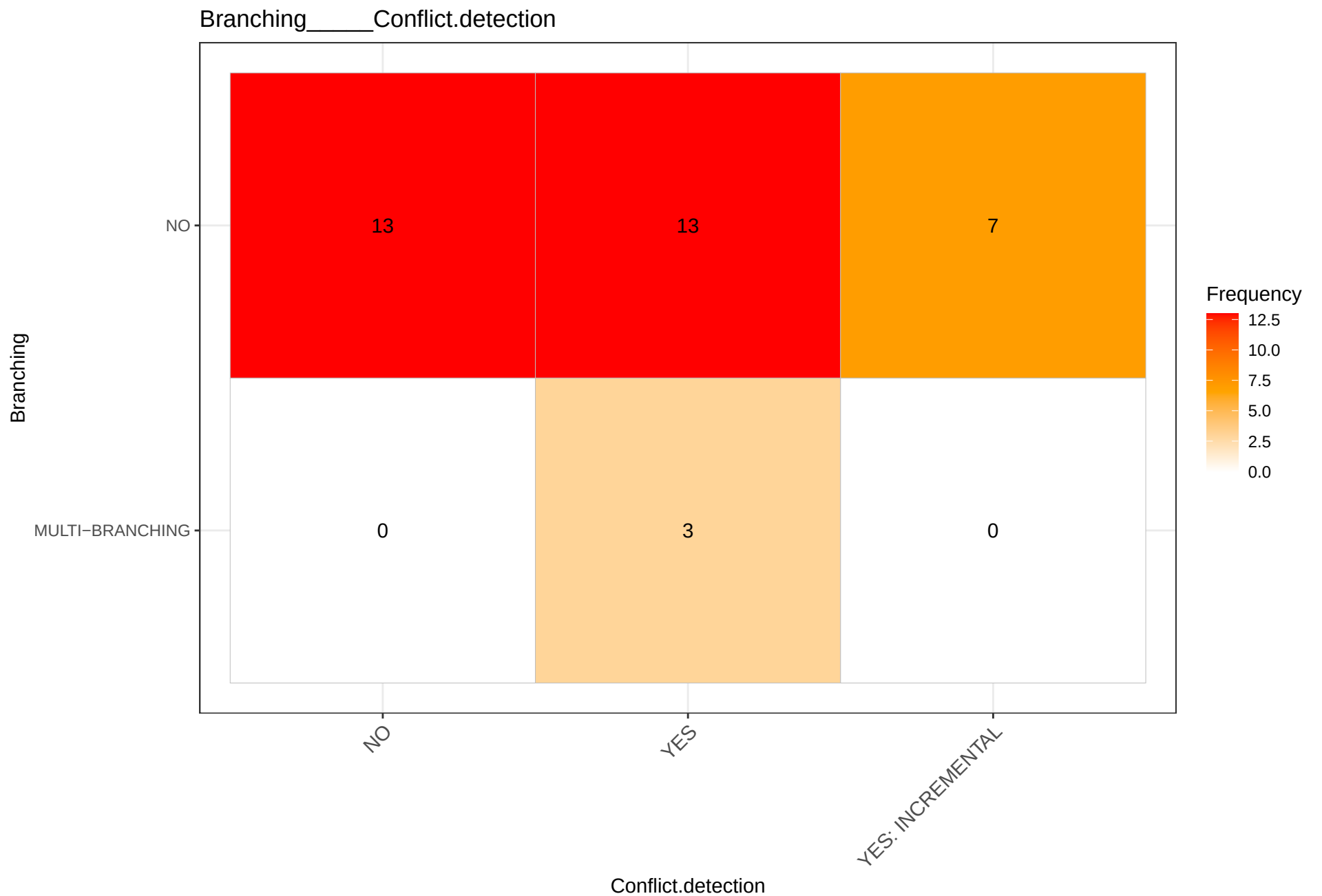

External.VCS.means_____Tool.availability
SVN
N/A
GIT
CUSTOM MODEL REPO
External.VCS.means
0
3
7
16
0
5
0
1
NO
YES
Tool.availability
Frequency
16
12
8
4
0

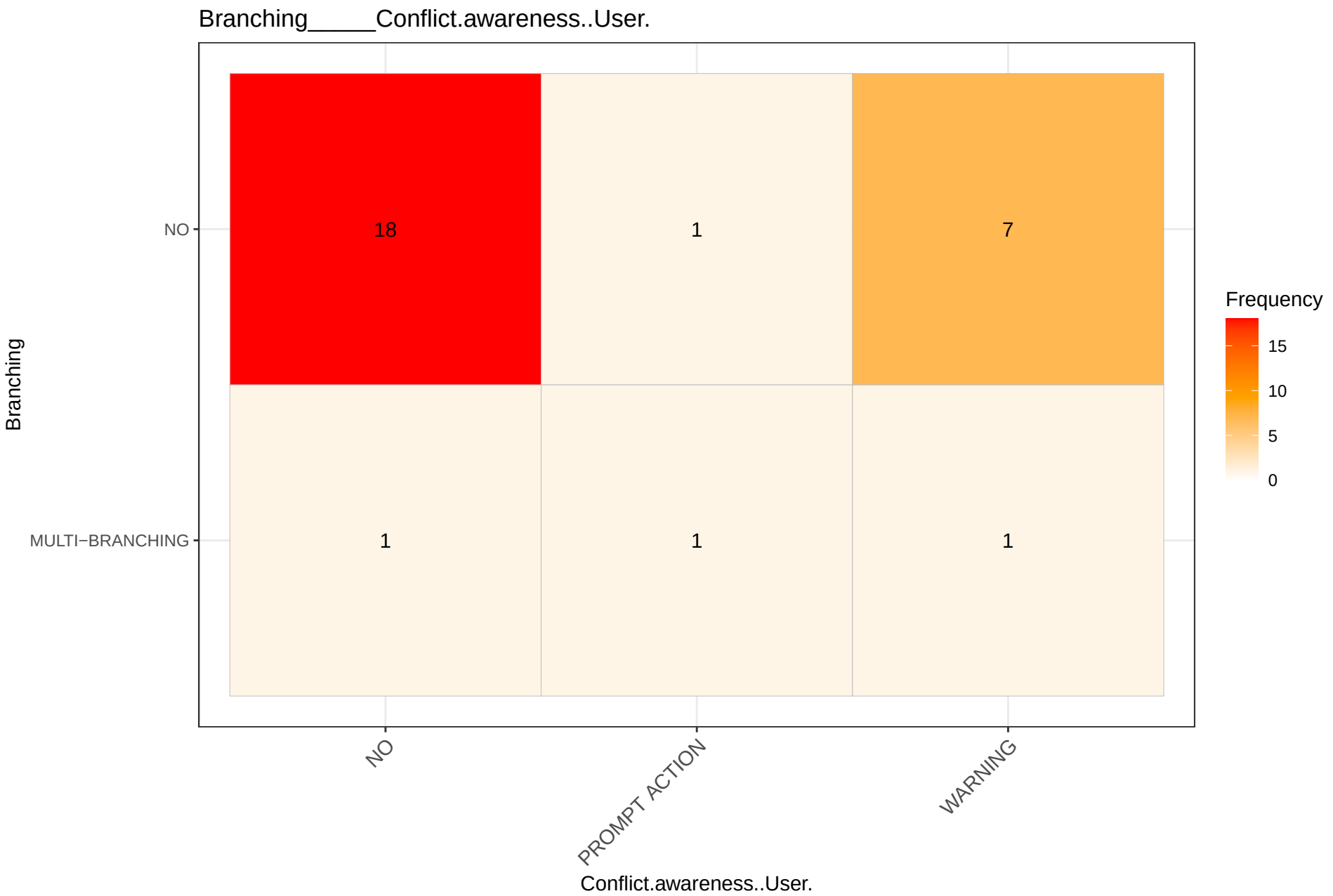

External.VCS.means_____Quality.of.the.research
External.VCS.means
SVN
N/A
GIT
CUSTOM MODEL REPO
0 0 1 0 1 1 2 0 0
0 2 2 1 3 2 11 4 8
0 0 2 0 2 1 2 0 0
1 0 0 0 0 0 1 0 0
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

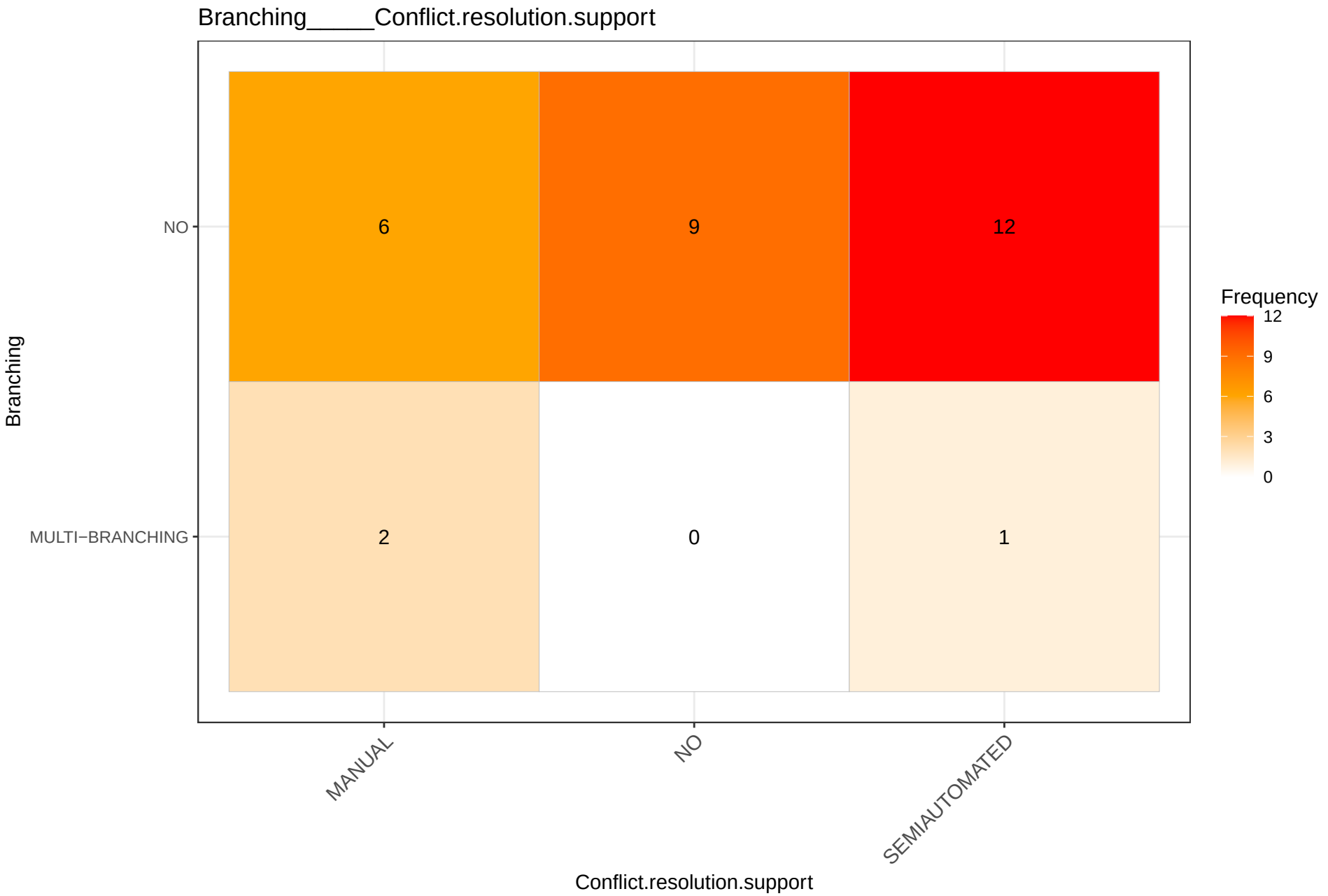

Branching_____Model.merging.support
NO
MULTI−BRANCHING
Branching
20
6
2
1
NO
YES
Model.merging.support
Frequency
20
15
10
5
0

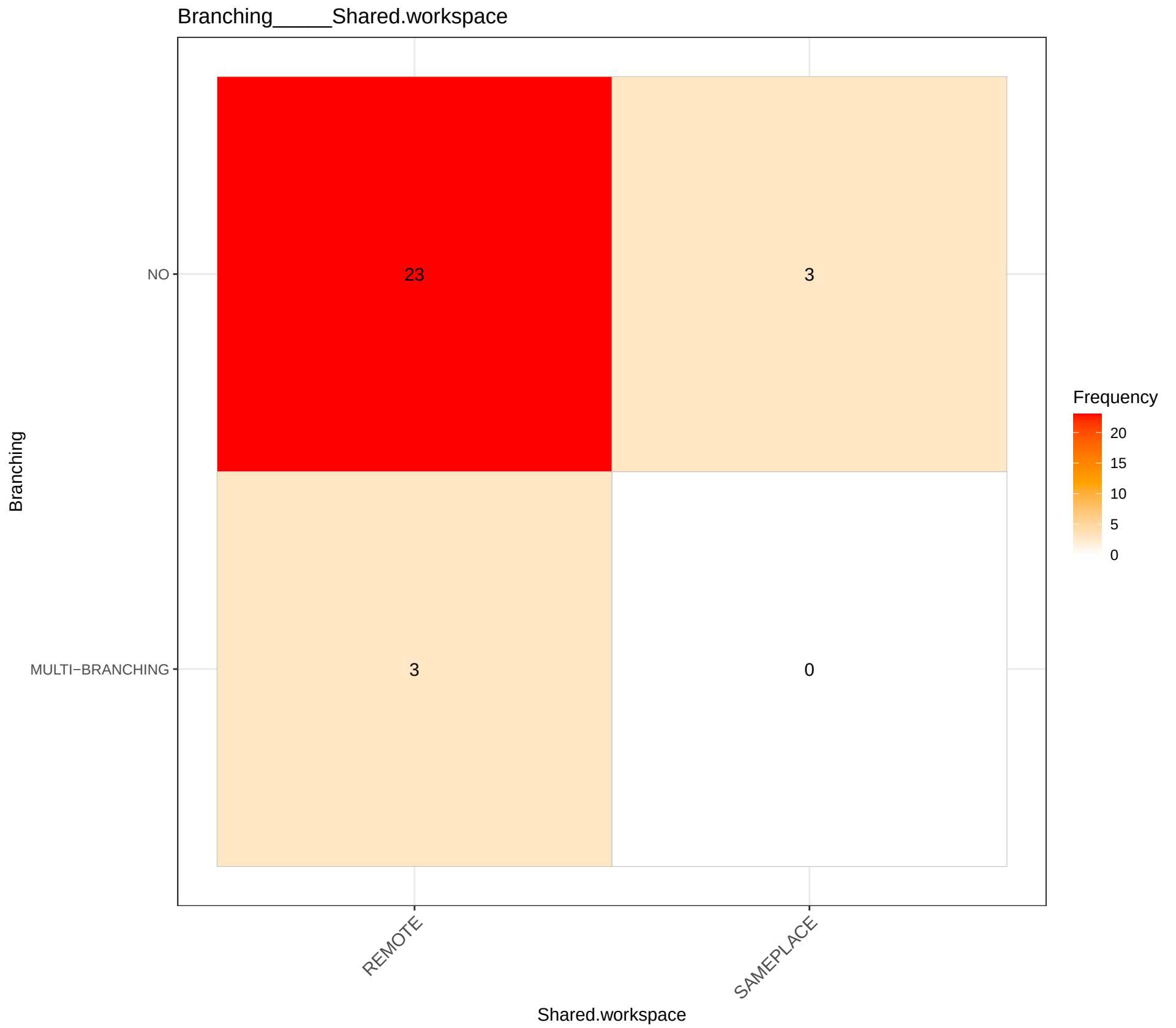

Branching_____Diff.merge.domain
NO
MULTI−BRANCHING
Branching
6
5
15
1
0
2
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
15
10
5
0

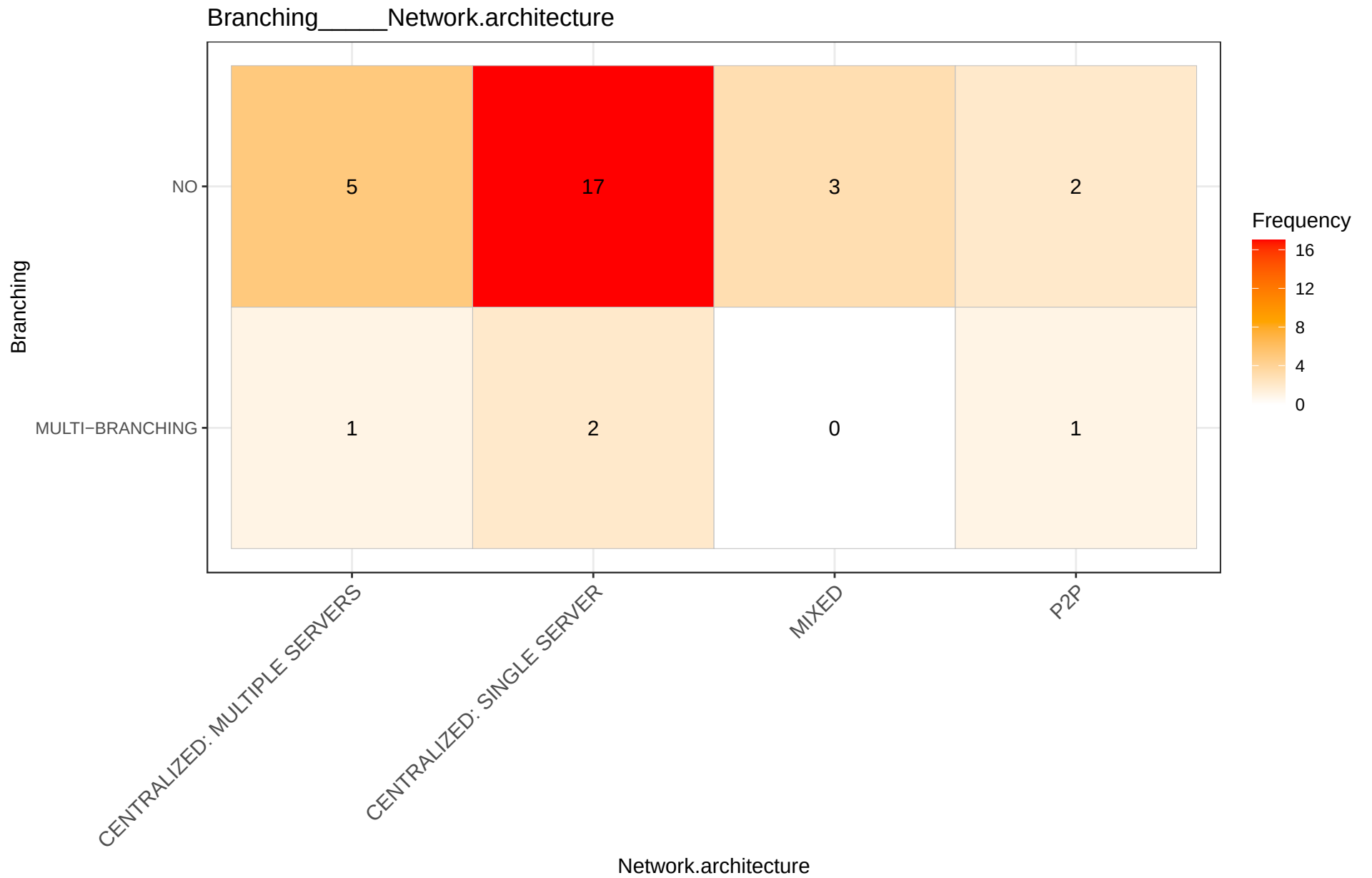

Branching_____Conflict.mgmt.approach
NO
MULTI−BRANCHING
Branching
8
10
8
3
0
0
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
10.0
7.5
5.0
2.5
0.0

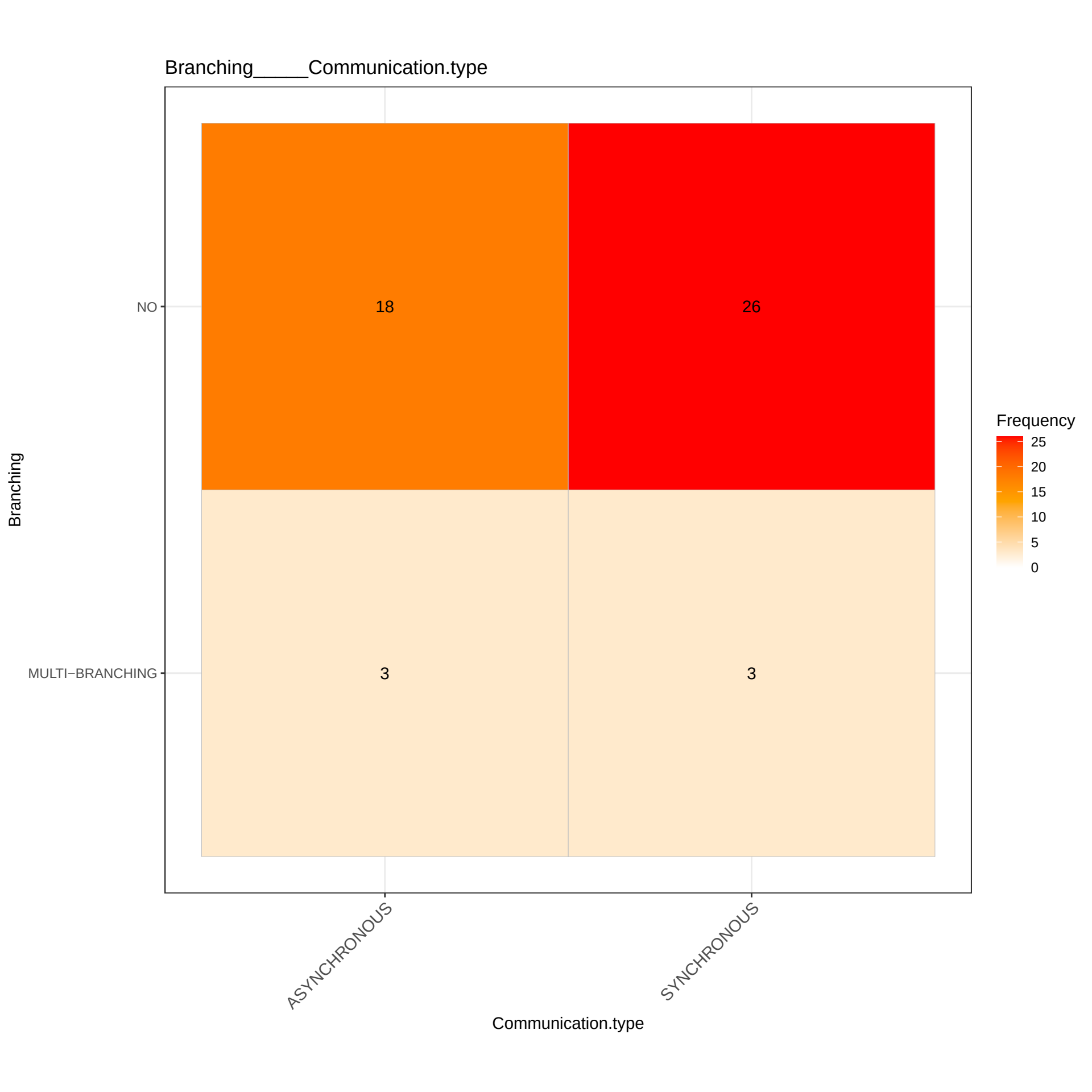

Branching_____Conflict.detection
Branching
NO
MULTI−BRANCHING
13
13
7
0
3
0
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

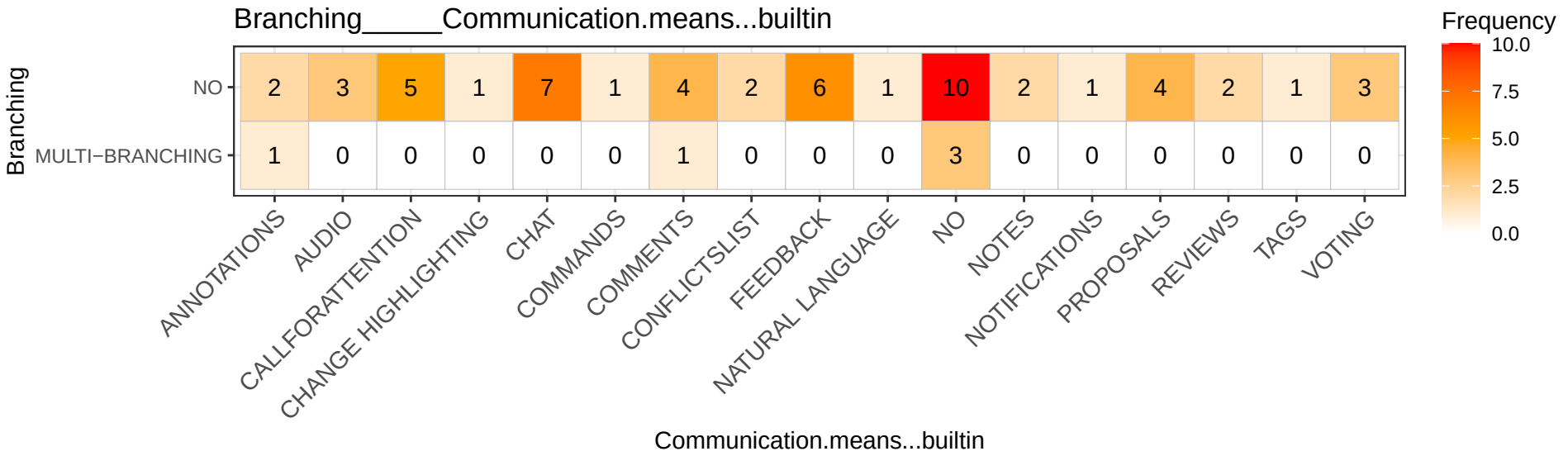

Branching_____Conflict.awareness..User.
Branching
NO
MULTI−BRANCHING
18
1
7
1
1
1
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
15
10
5
0

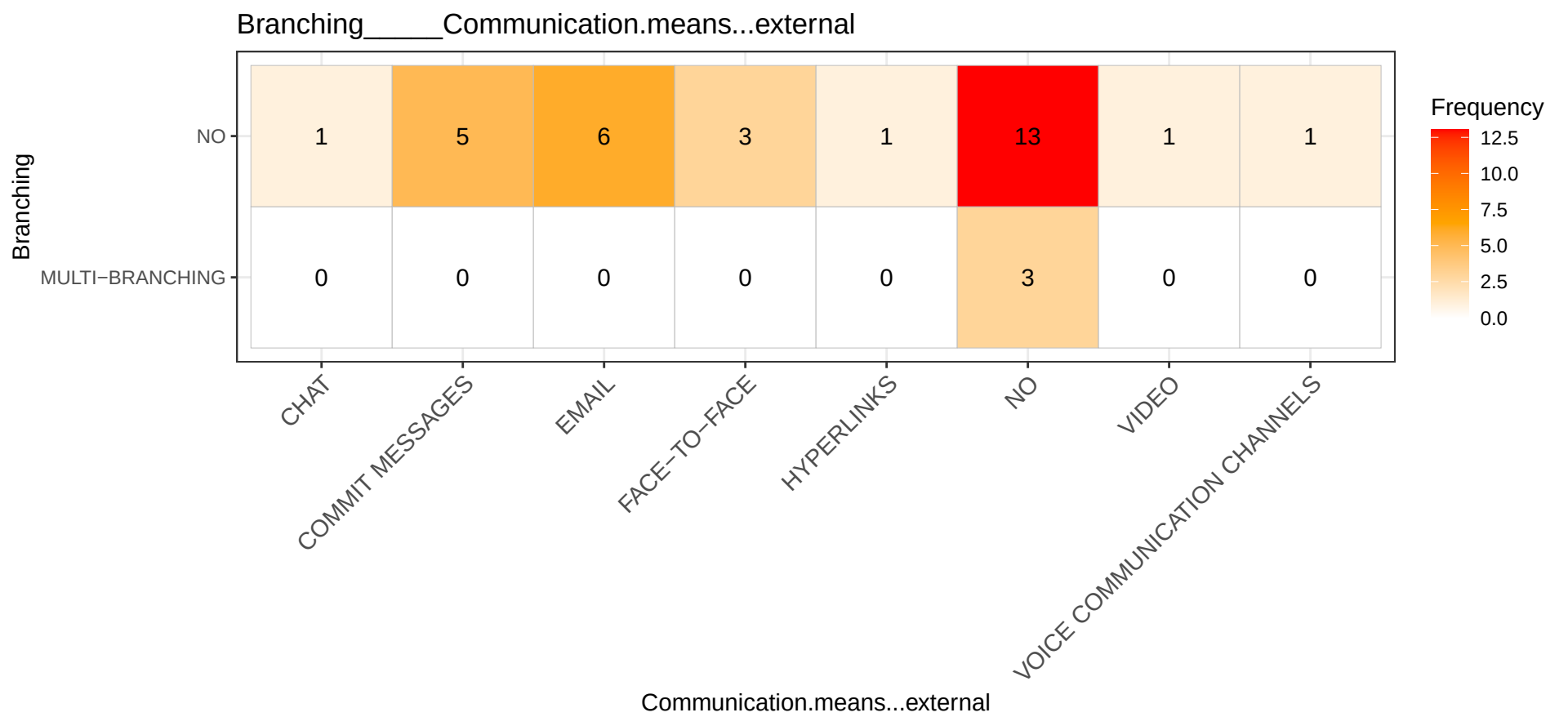

Branching_____Conflict.resolution.support
Branching
NO
MULTI−BRANCHING
6
9
12
2
0
1
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
12
9
6
3
0

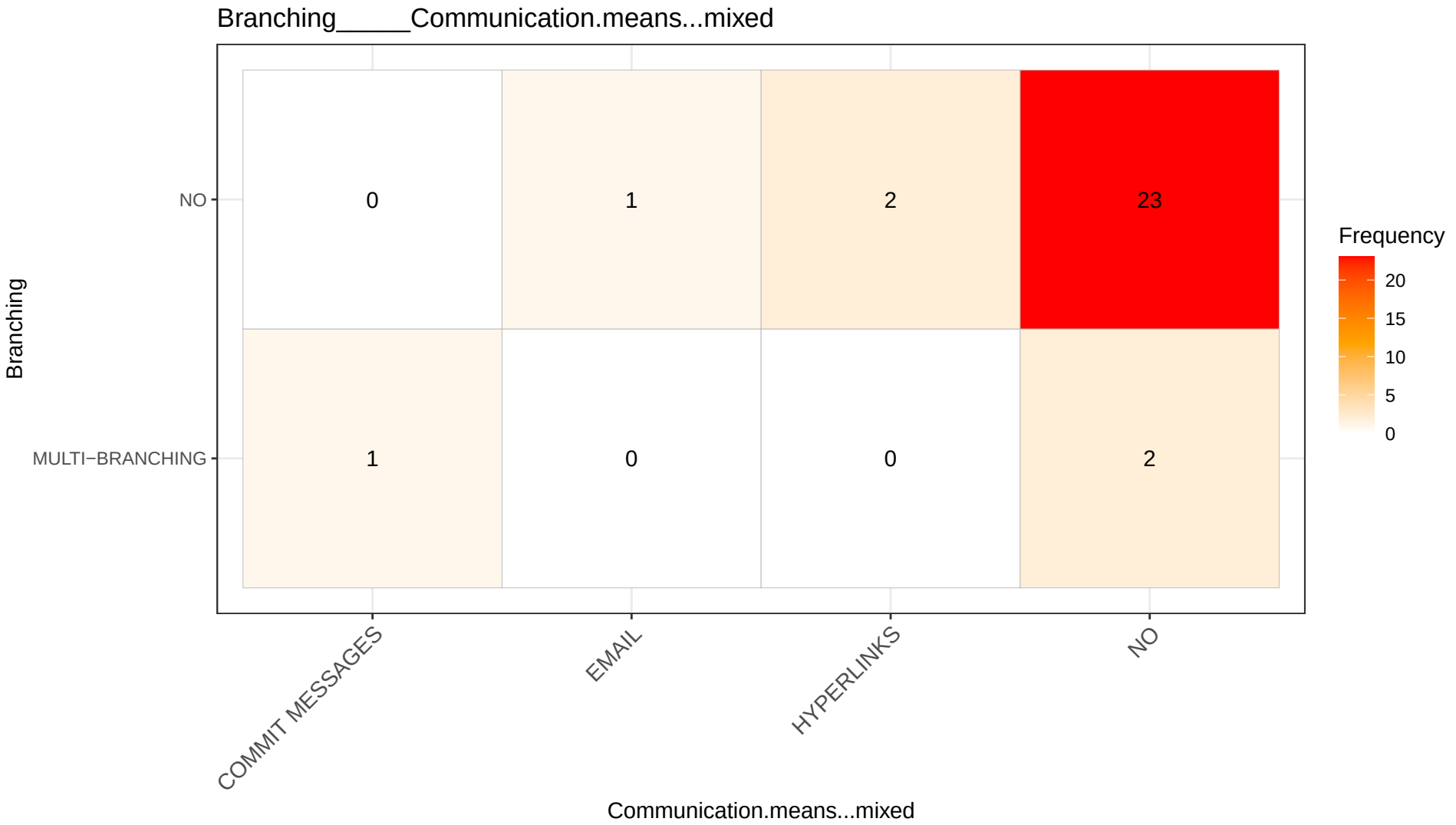

Branching_____Shared.workspace
NO
MULTI−BRANCHING
Branching
23
3
3
0
REMOTE
SAMEPLACE
Shared.workspace
Frequency
20
15
10
5
0

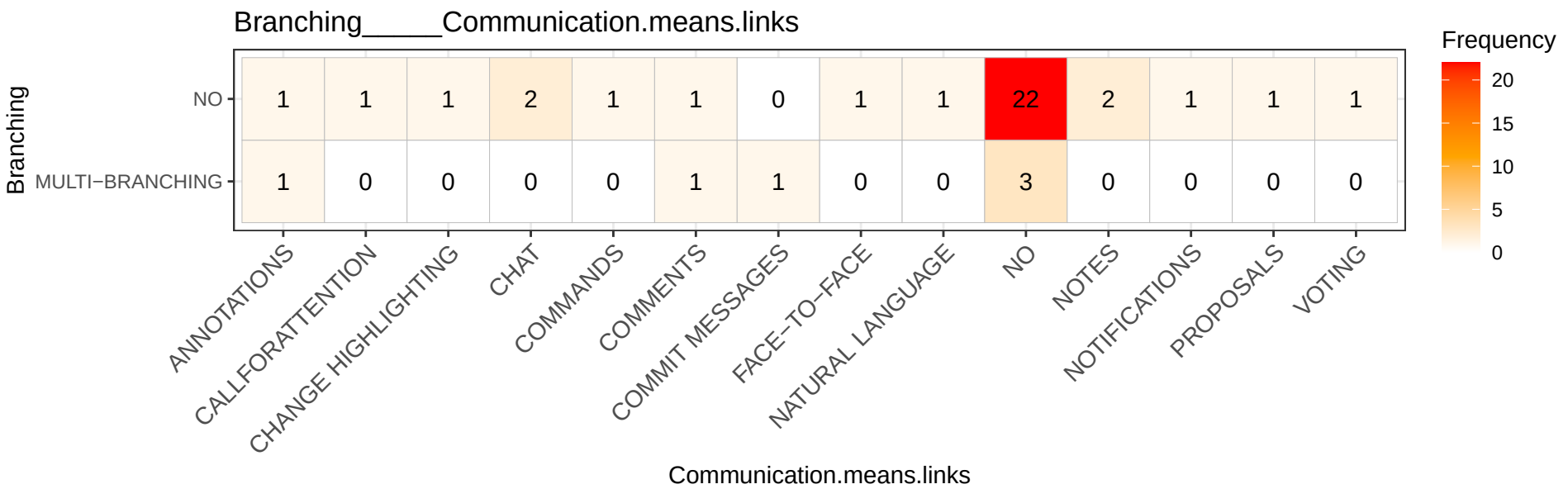

Branching_____Network.architecture
NO
MULTI−BRANCHING
Branching
5
17
3
2
1
2
0
1
Frequency
16
12
8
4
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture

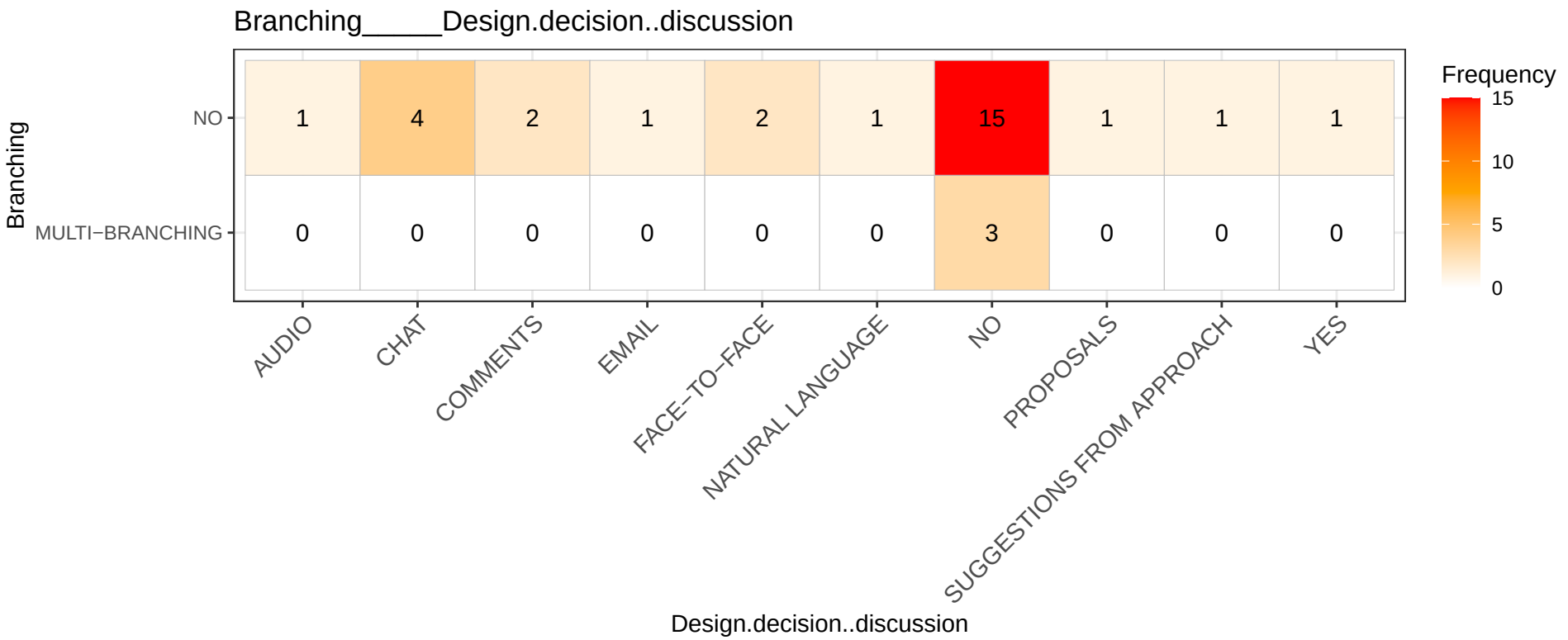

Branching_____Communication.type
NO
MULTI−BRANCHING
Branching
18
26
3
3
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
25
20
15
10
5
0

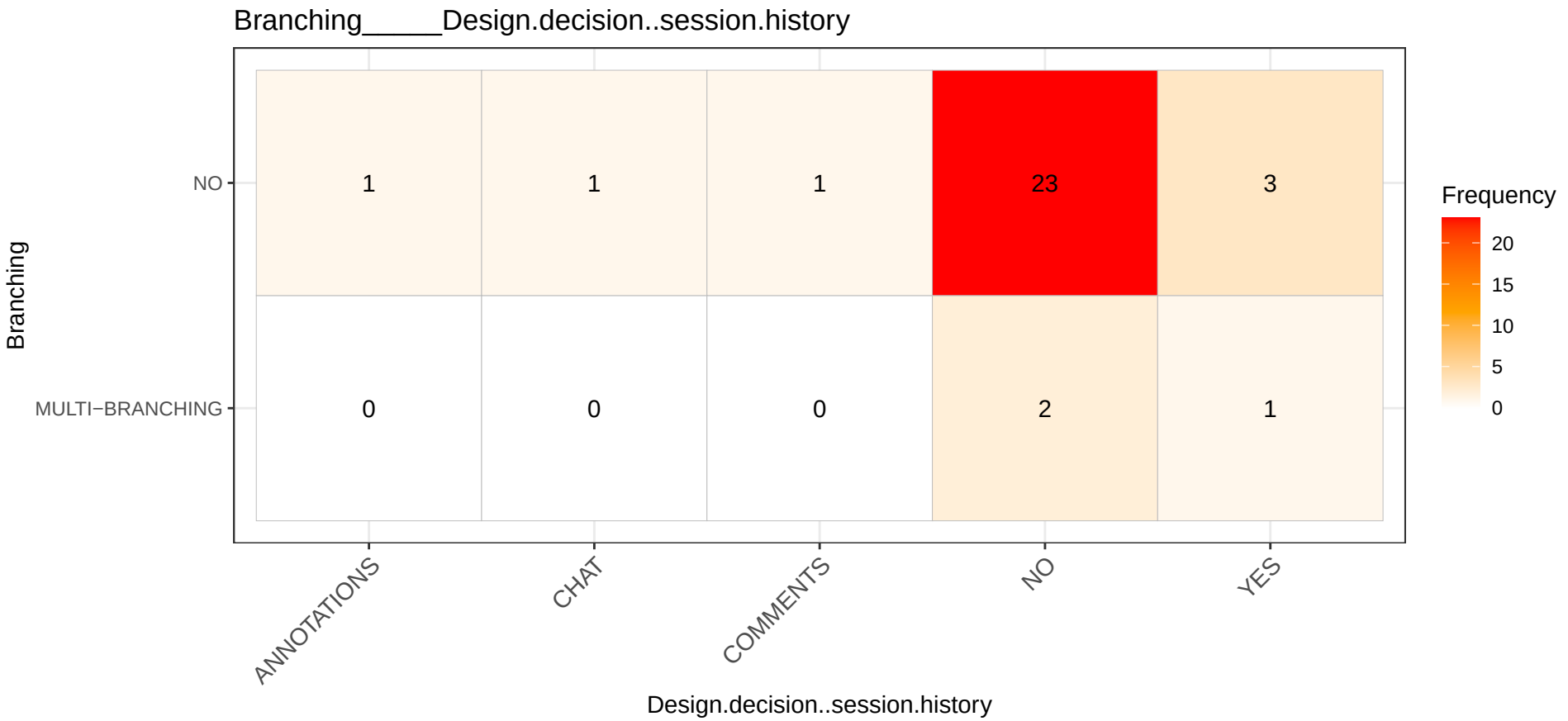

Branching_____Communication.means...builtin
Branching
NO
MULTI−BRANCHING
2 3 5 1 7 1 4 2 6 1 10 2 1 4 2 1 3
1 0 0 0 0 0 1 0 0 0 3 0 0 0 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
10.0
7.5
5.0
2.5
0.0

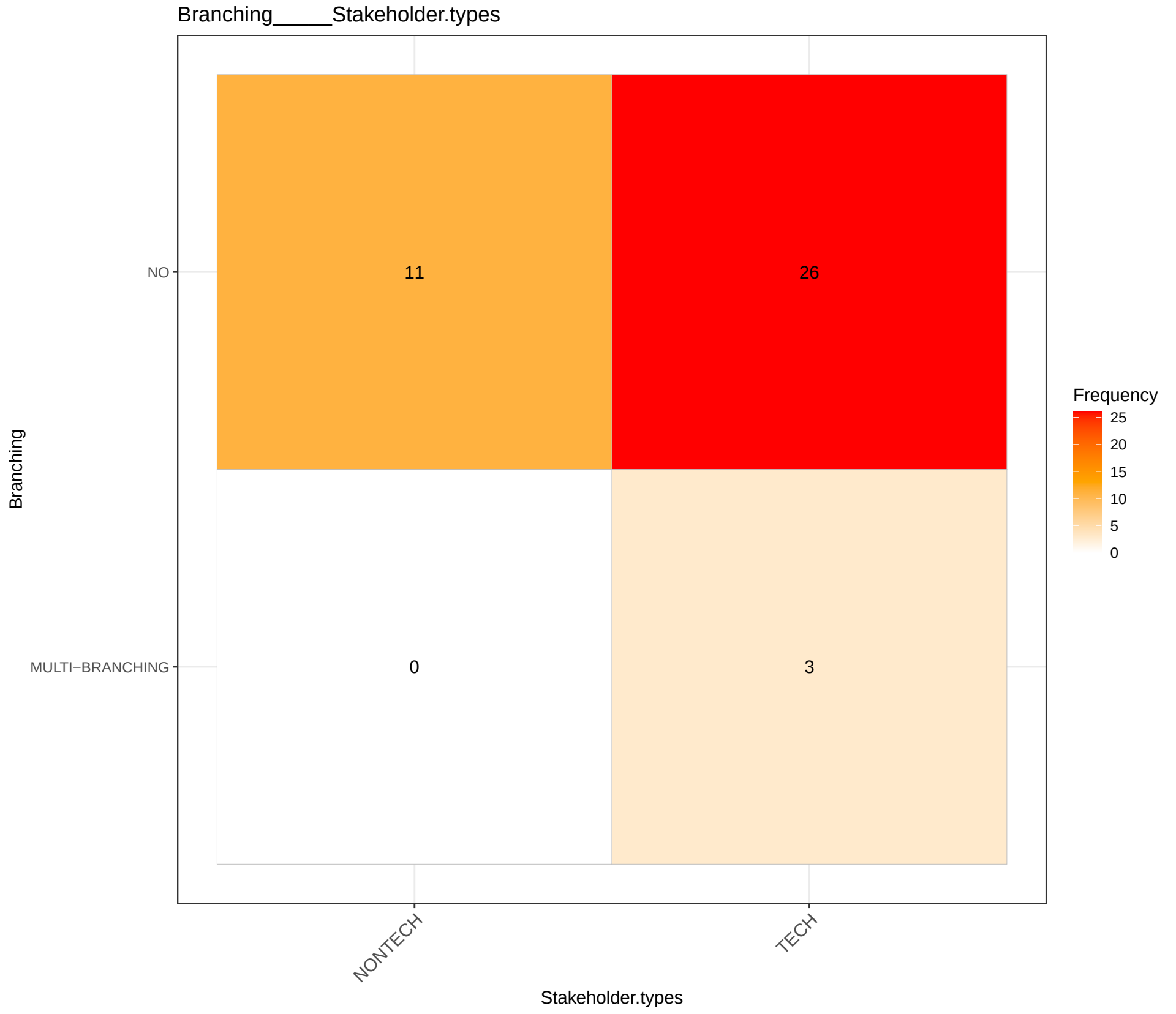

Branching_____Communication.means...external
Branching
NO
MULTI−BRANCHING
1
5
6
3
1
13
1
1
0
0
0
0
0
3
0
0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

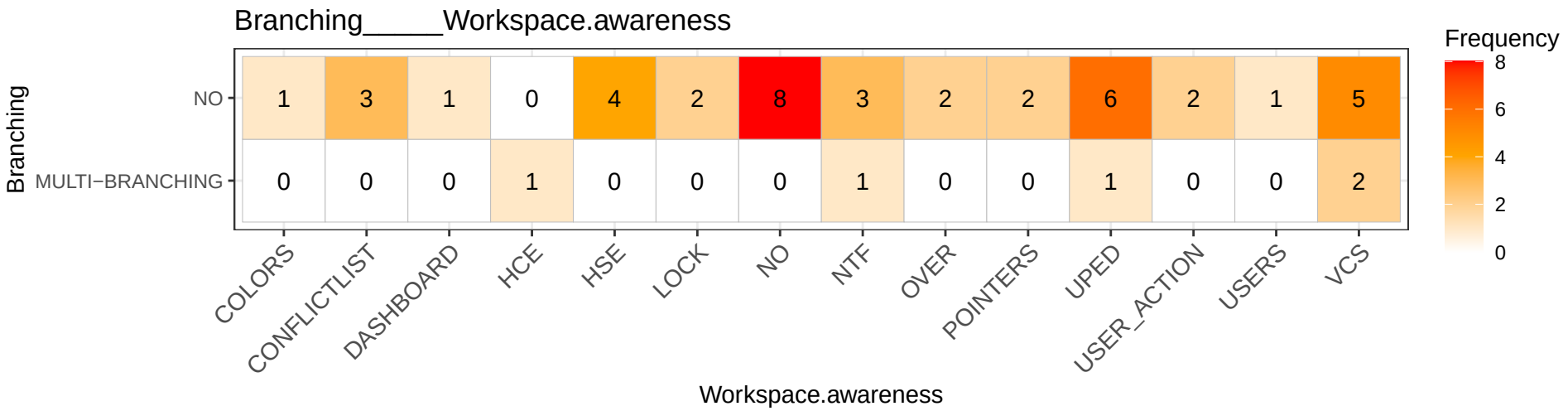

Branching_____Communication.means...mixed
NO
MULTI−BRANCHING
Branching
0
1
2
23
1
0
0
2
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
20
15
10
5
0

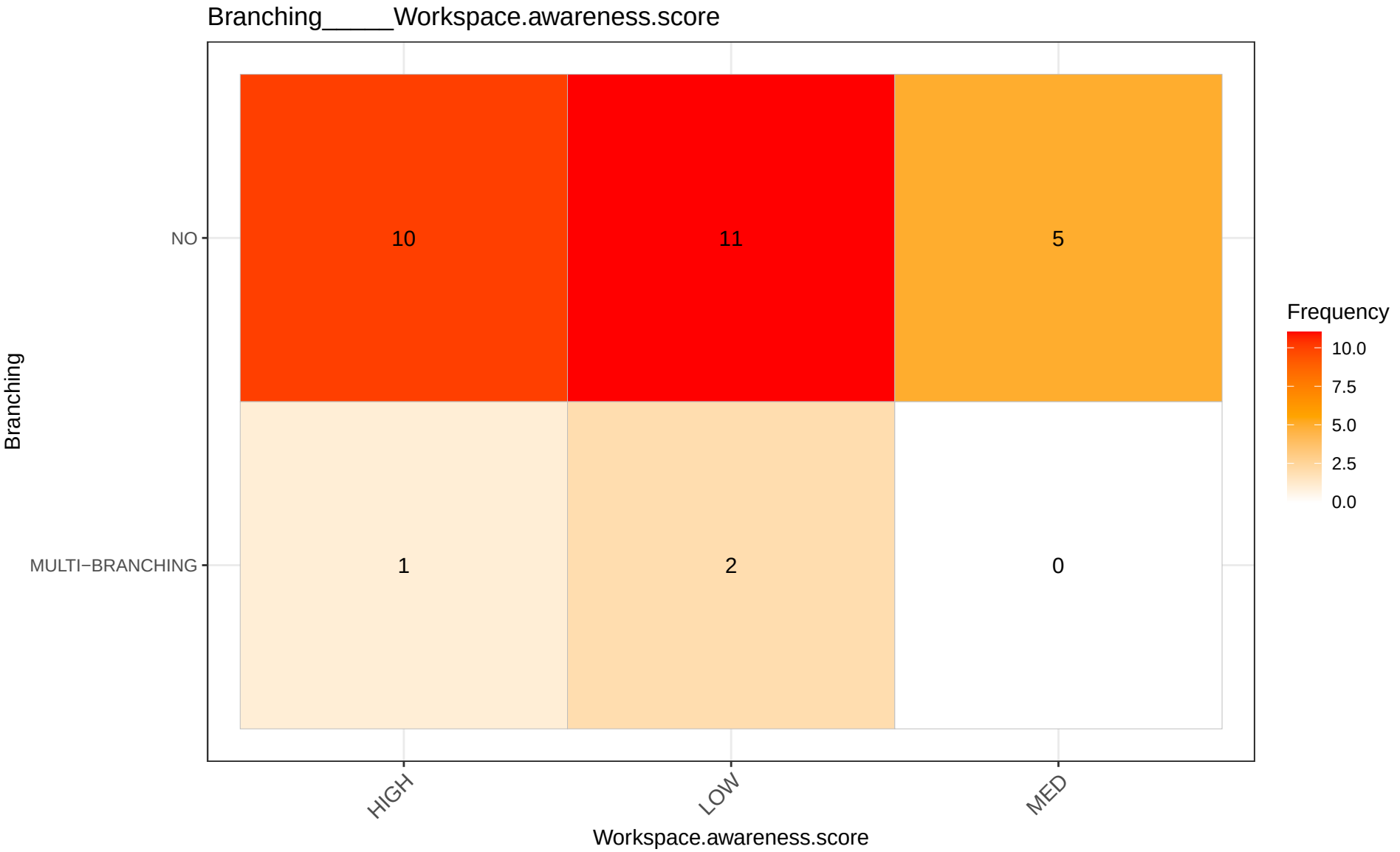

Branching_____Communication.means.links
Branching
NO
MULTI−BRANCHING
1 1 1 2 1 1 0 1 1 22 2 1 1 1
1 0 0 0 0 1 1 0 0 3 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
20
15
10
5
0

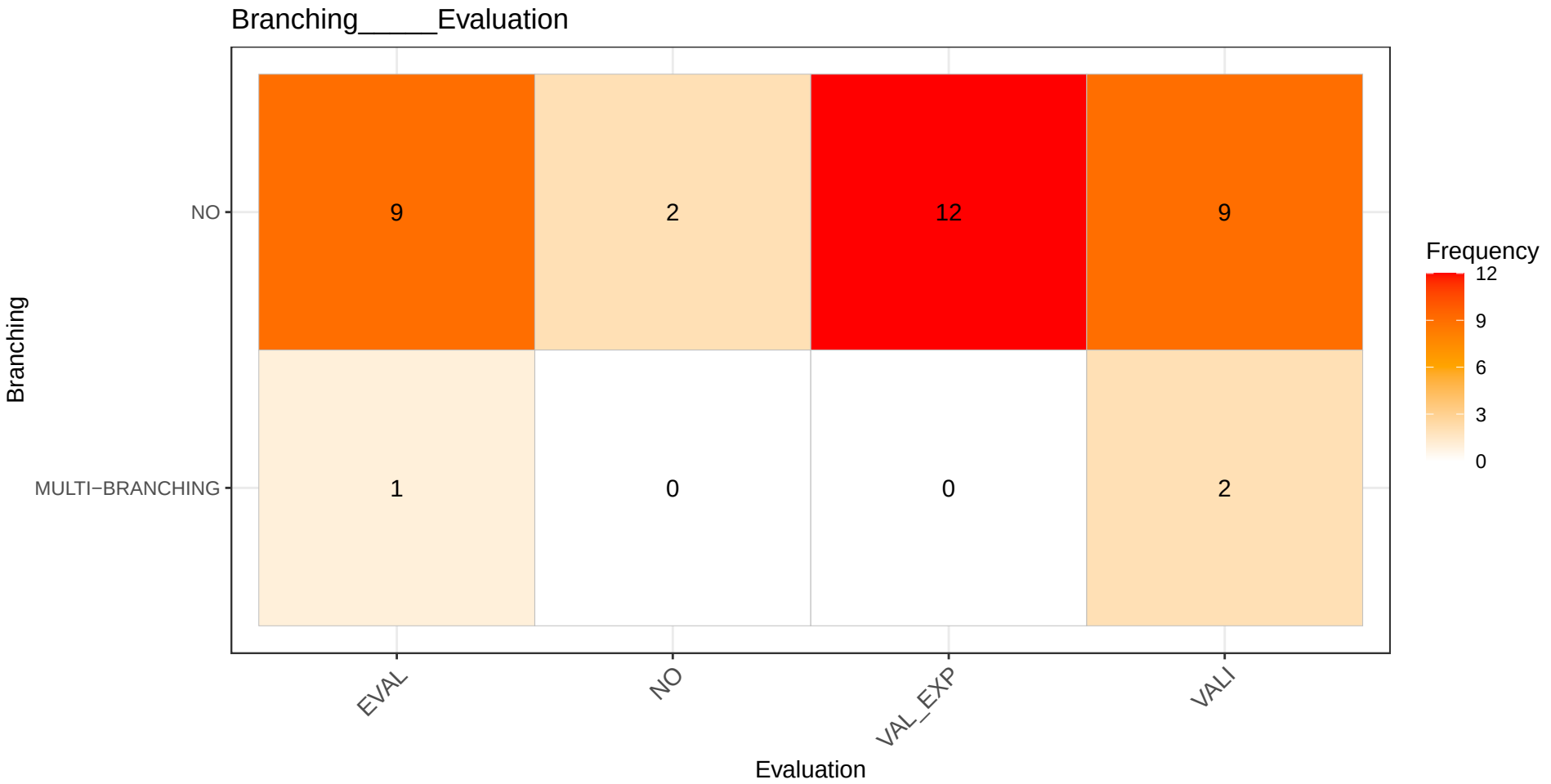

Branching_____Design.decision..discussion
Branching
NO
MULTI−BRANCHING
1
4
2
1
2
1
15
1
1
1
0
0
0
0
0
0
3
0
0
0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
15
10
5
0

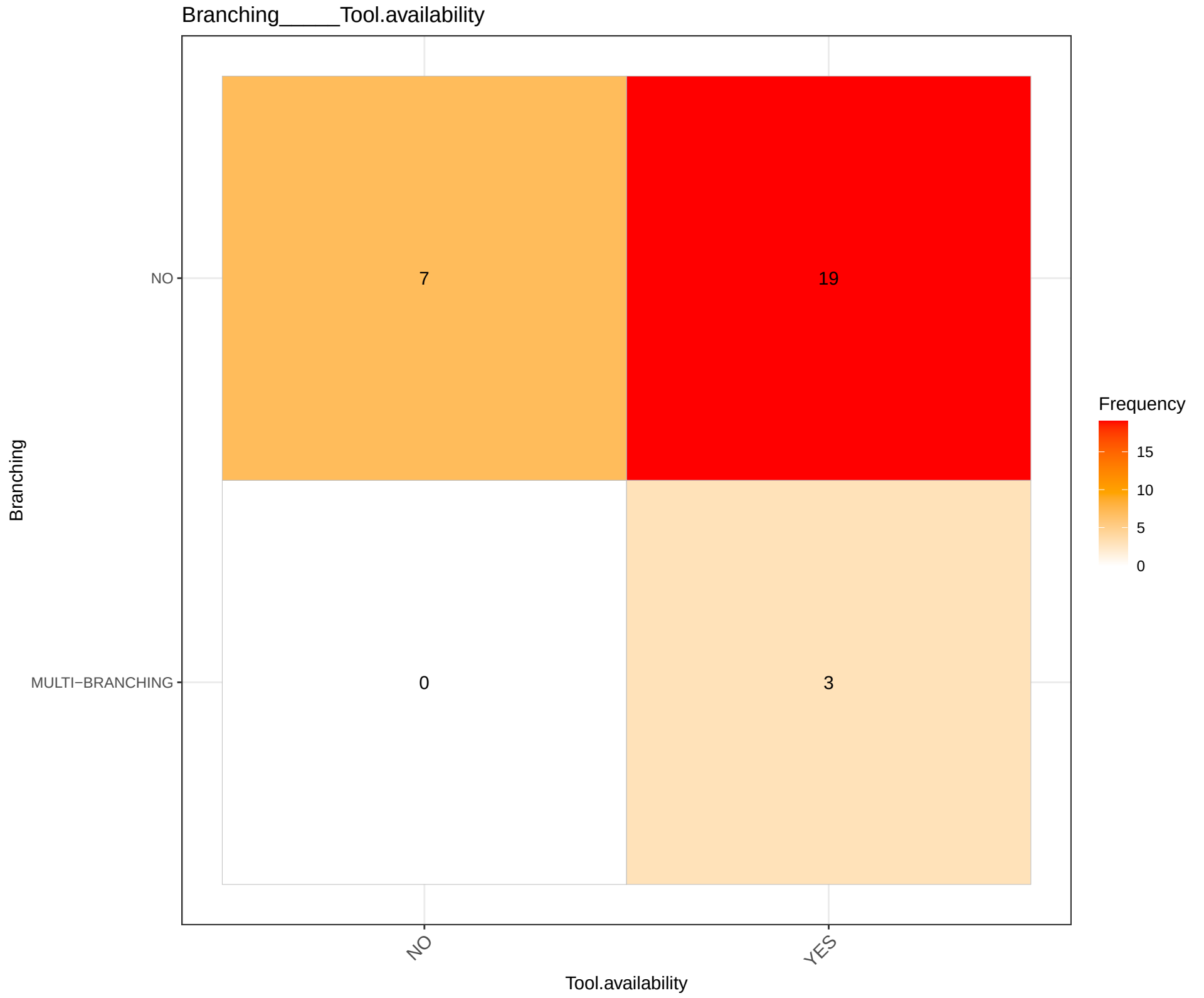

Branching_____Design.decision..session.history
Branching
NO
MULTI−BRANCHING
1
1
1
23
3
0
0
0
2
1
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
20
15
10
5
0

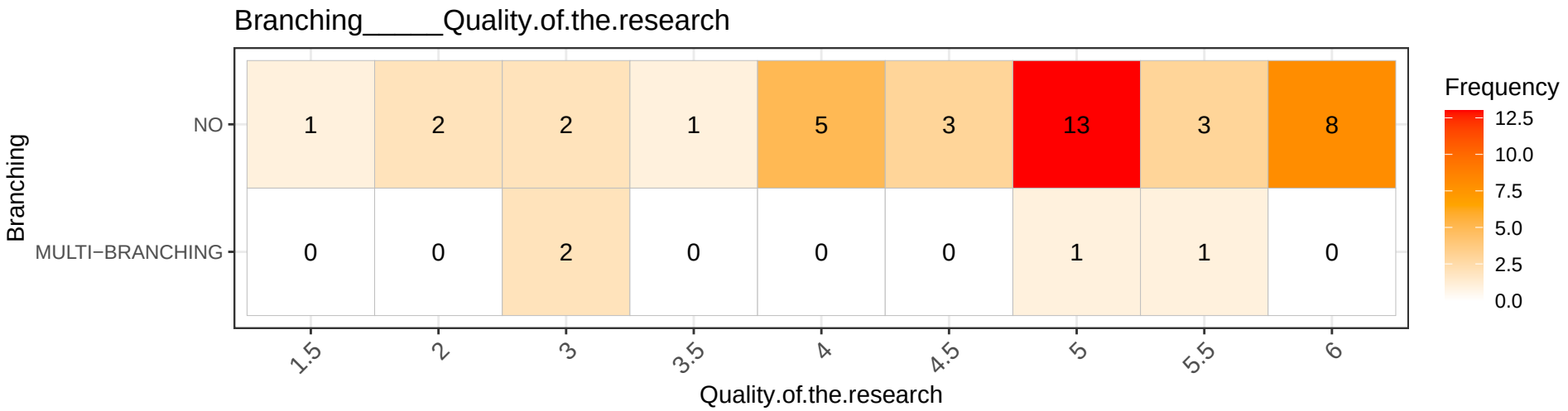

Branching_____Stakeholder.types
NO
MULTI−BRANCHING
Branching
11
26
0
3
NONTECH
TECH
Stakeholder.types
Frequency
25
20
15
10
5
0

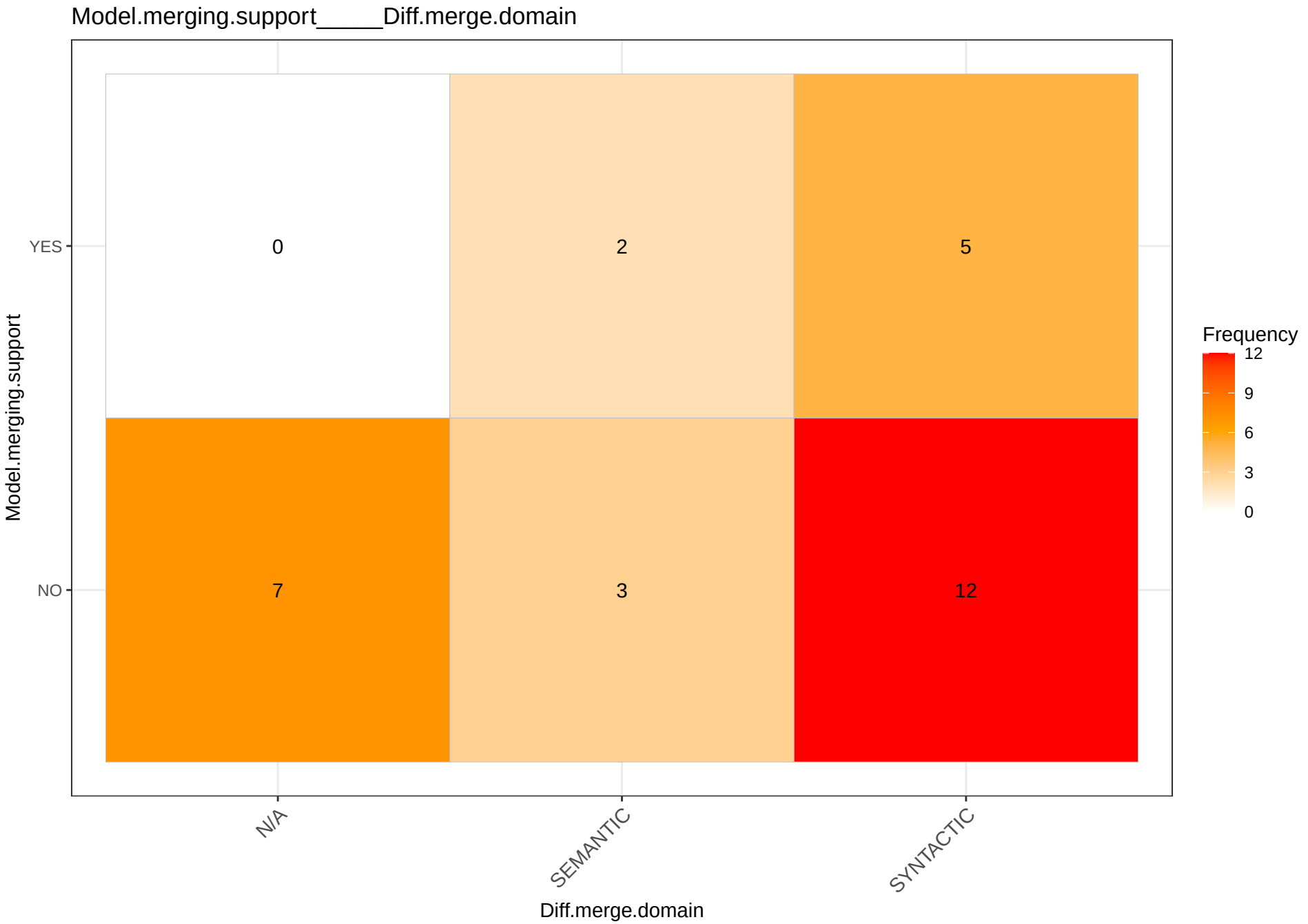

Branching_____Workspace.awareness
Branching
NO
MULTI−BRANCHING
1 3 1 0 4 2 8 3 2 2 6 2 1 5
0 0 0 1 0 0 0 1 0 0 1 0 0 2
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
8
6
4
2
0

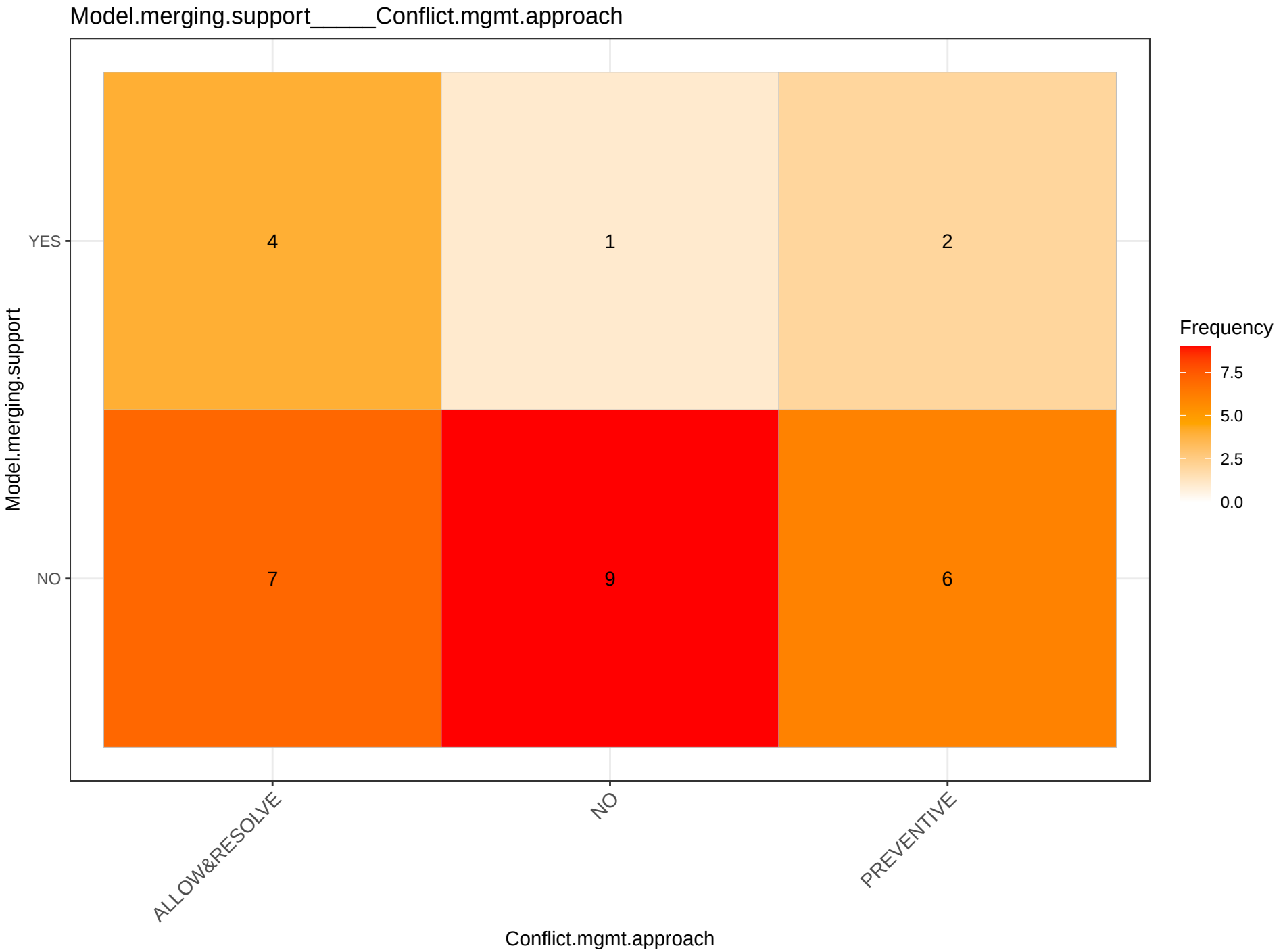

Branching_____Workspace.awareness.score
Branching
NO
MULTI−BRANCHING
10
11
5
1
2
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
10.0
7.5
5.0
2.5
0.0

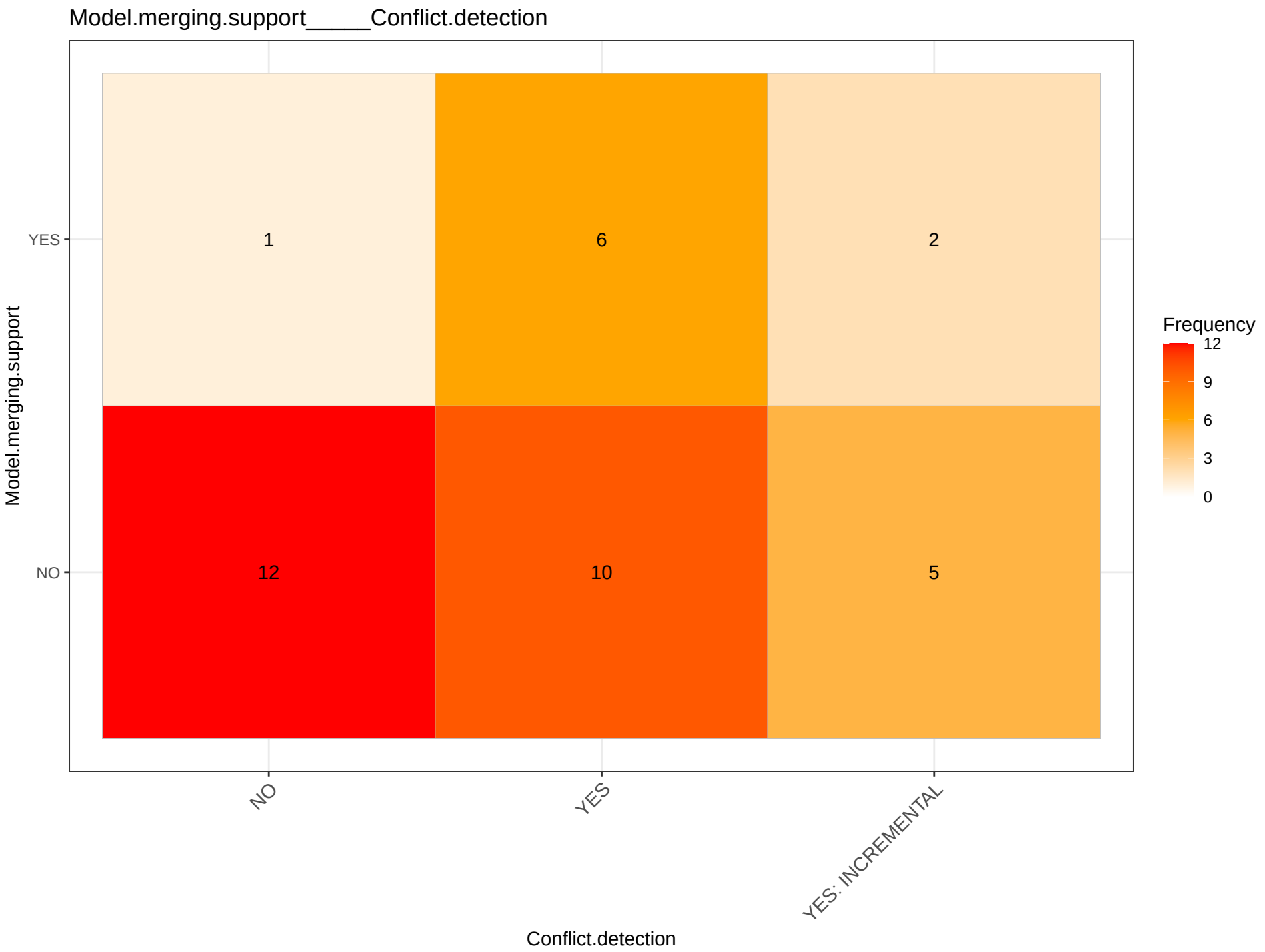

Branching_____Evaluation
NO
MULTI−BRANCHING
9
2
12
9
1
0
0
2
EVAL
NO
VAL_EXP
VALI
Evaluation
Branching
Frequency
12
9
6
3
0

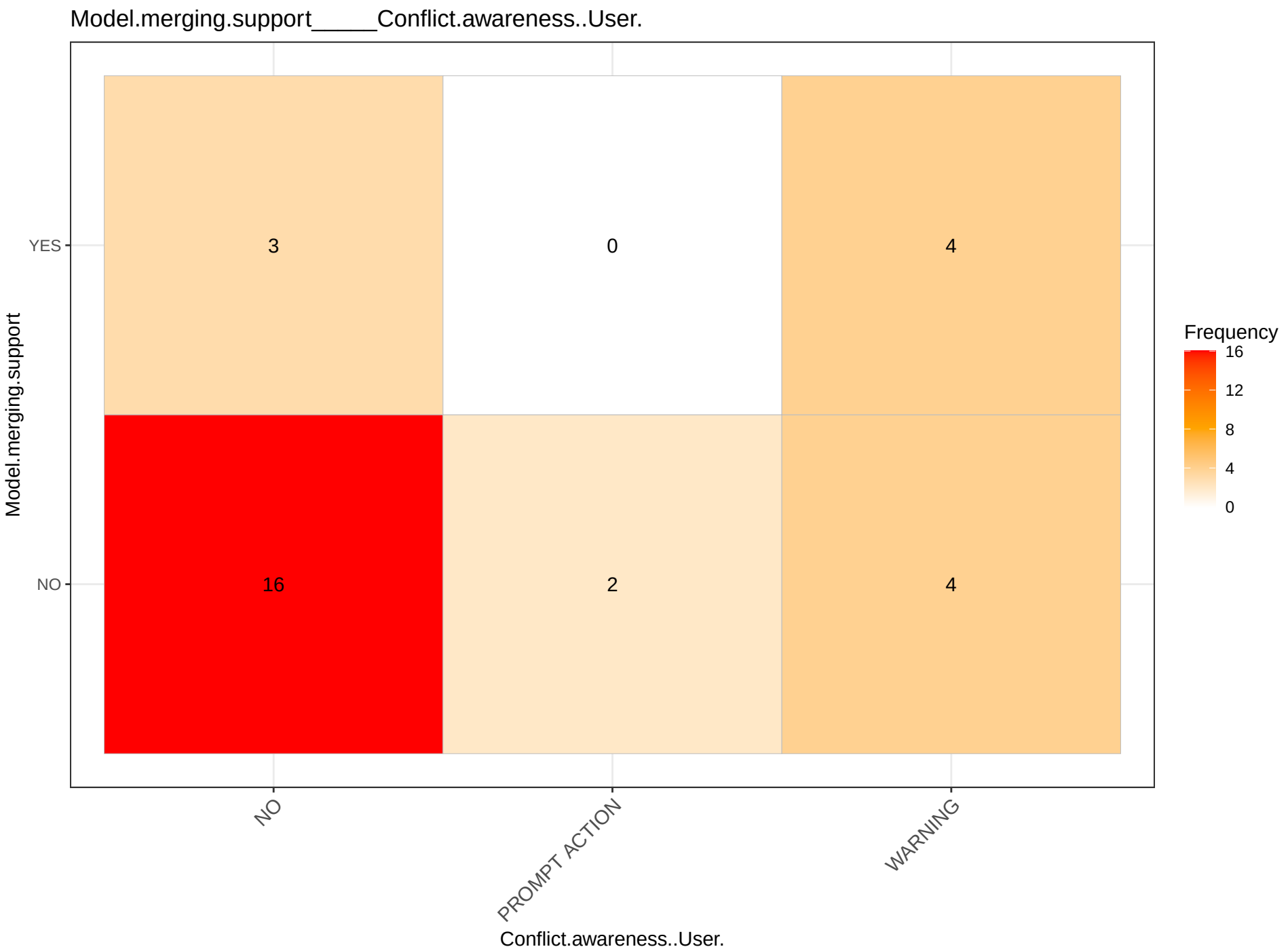

Branching_____Tool.availability
NO
MULTI−BRANCHING
Branching
7
19
0
3
NO
YES
Tool.availability
Frequency
15
10
5
0

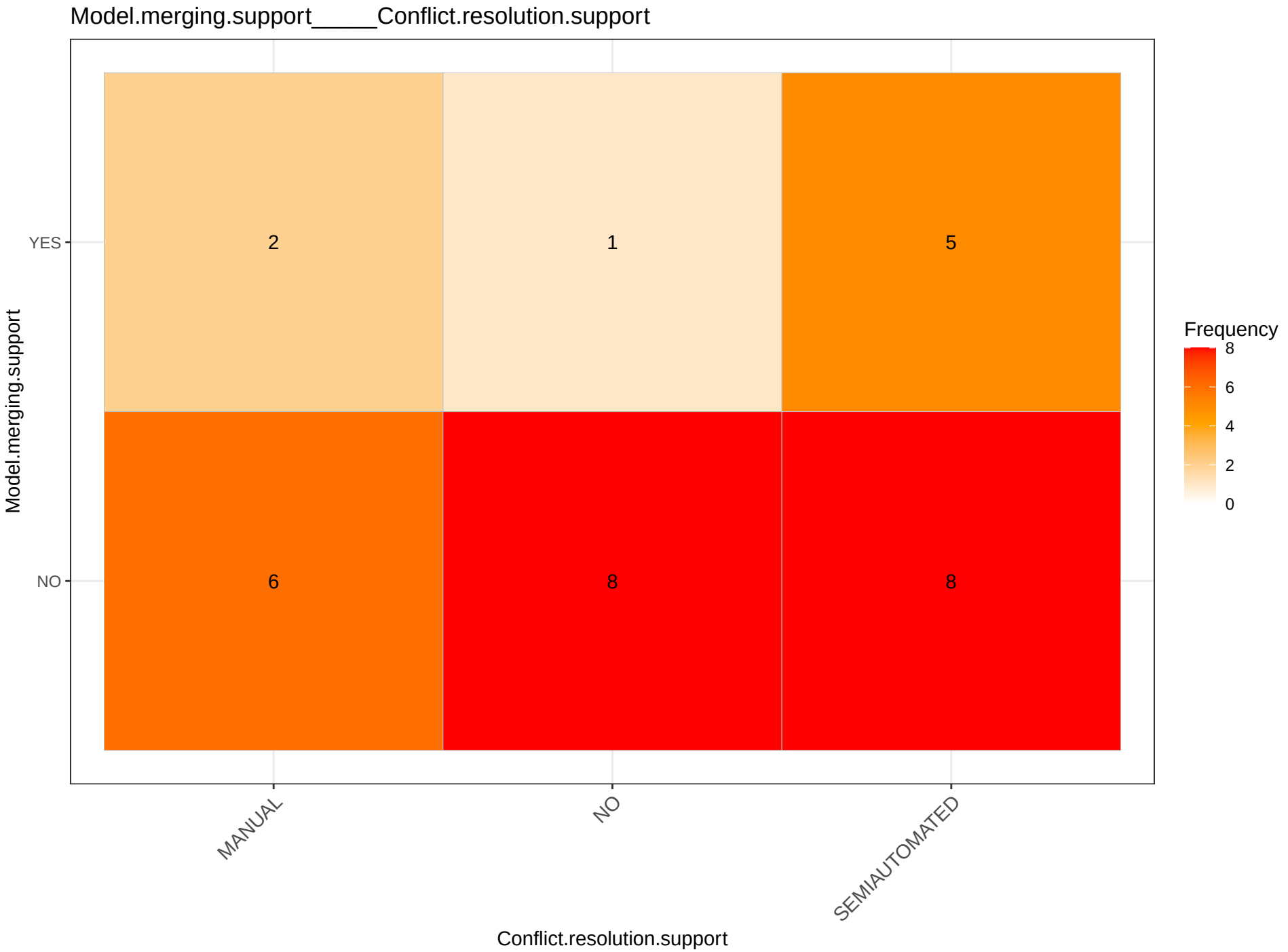

Branching_____Quality.of.the.research
Branching
NO
MULTI−BRANCHING
1
2
2
1
5
3
13
3
8
0
0
2
0
0
0
1
1
0
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

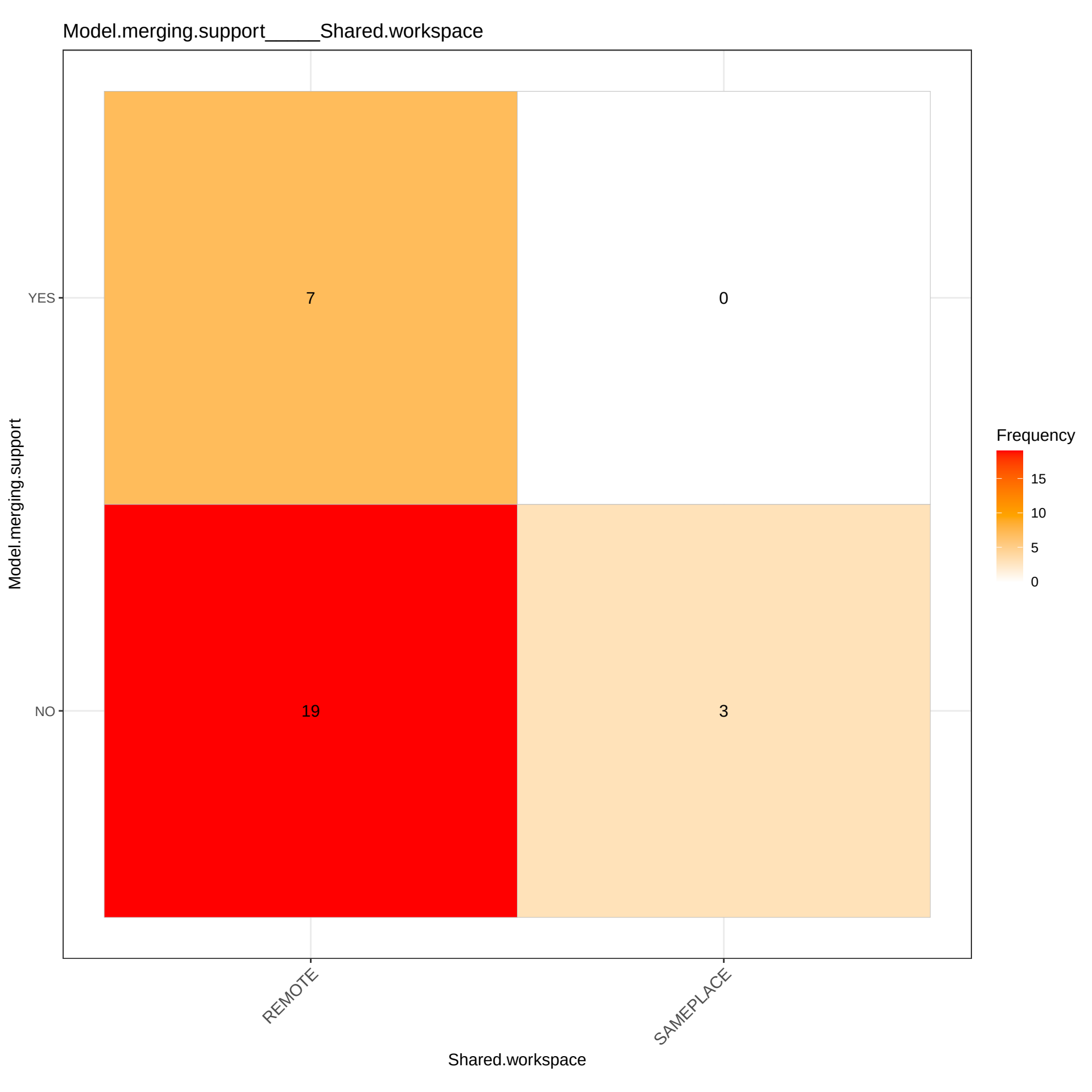

Model.merging.support_____Diff.merge.domain
YES
NO
0
2
5
7
3
12
Model.merging.support
N/A
SEMANTIC
SYNTACTIC
Diff.merge.domain
Frequency
12
9
6
3
0

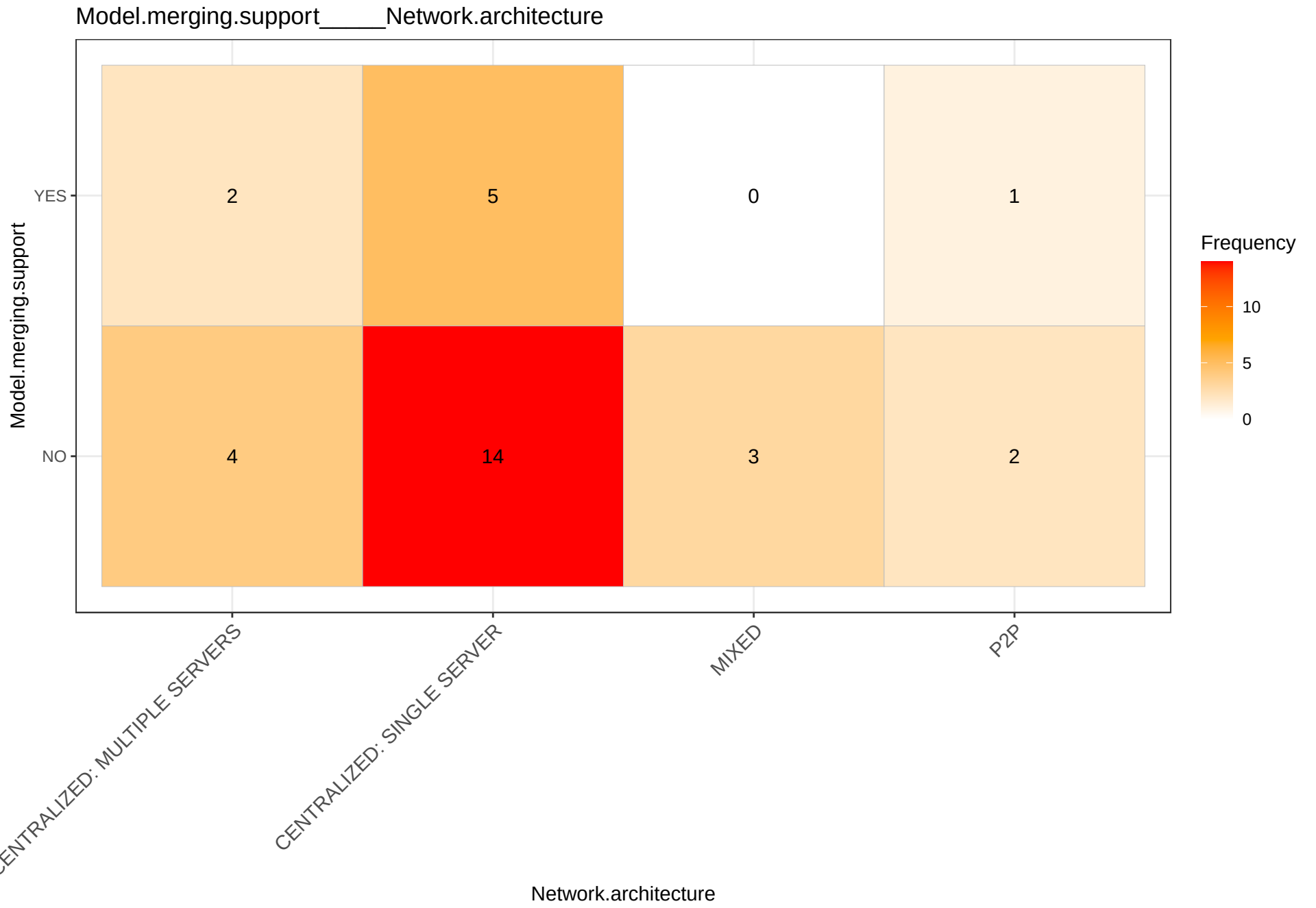

Model.merging.support_____Conflict.mgmt.approach
YES
NO
4
1
2
7
9
6
Model.merging.support
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
7.5
5.0
2.5
0.0

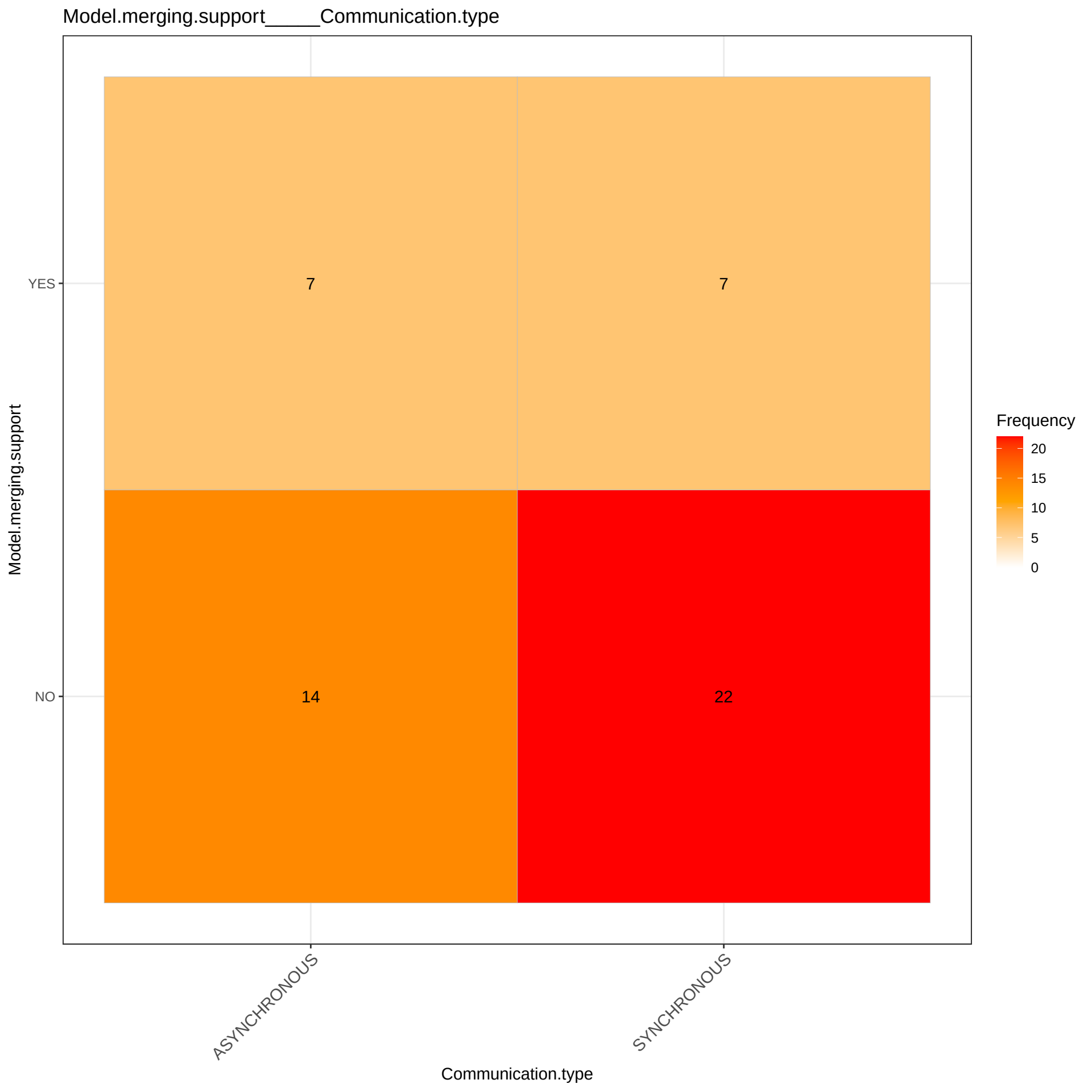

Model.merging.support_____Conflict.detection
Model.merging.support
YES
NO
1
6
2
12
10
5
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
12
9
6
3
0

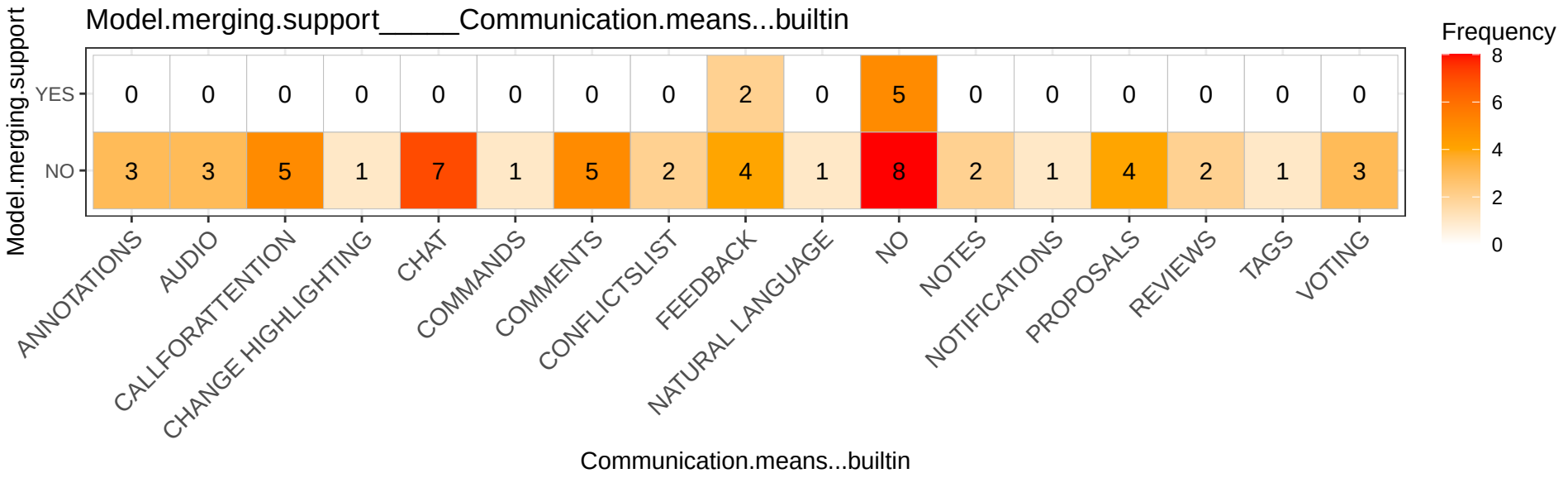

Model.merging.support_____Conflict.awareness..User.
YES
NO
3
0
4
16
2
4
Model.merging.support
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
16
12
8
4
0

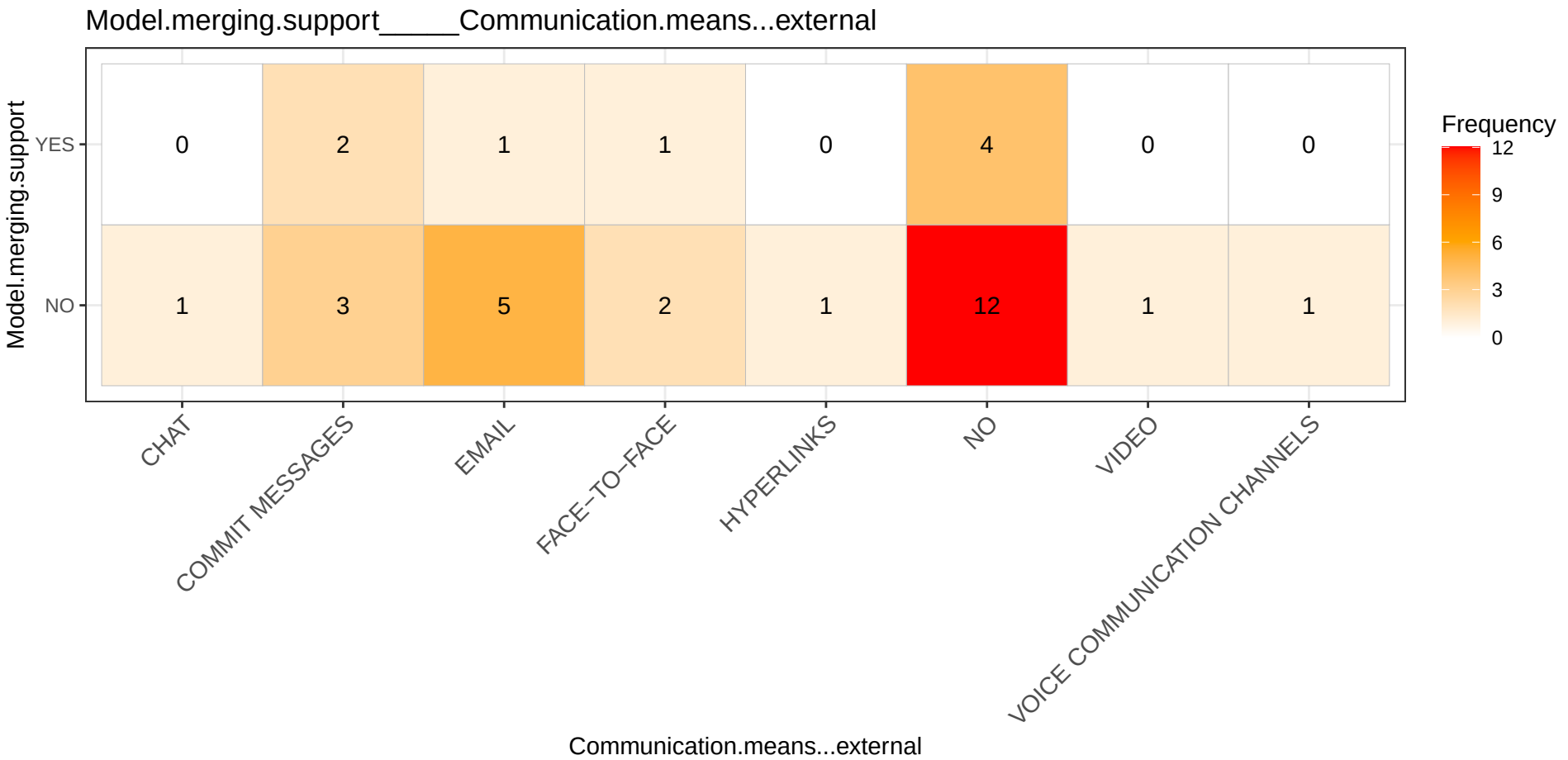

Model.merging.support_____Conflict.resolution.support
YES
NO
2
1
5
6
8
8
Model.merging.support
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

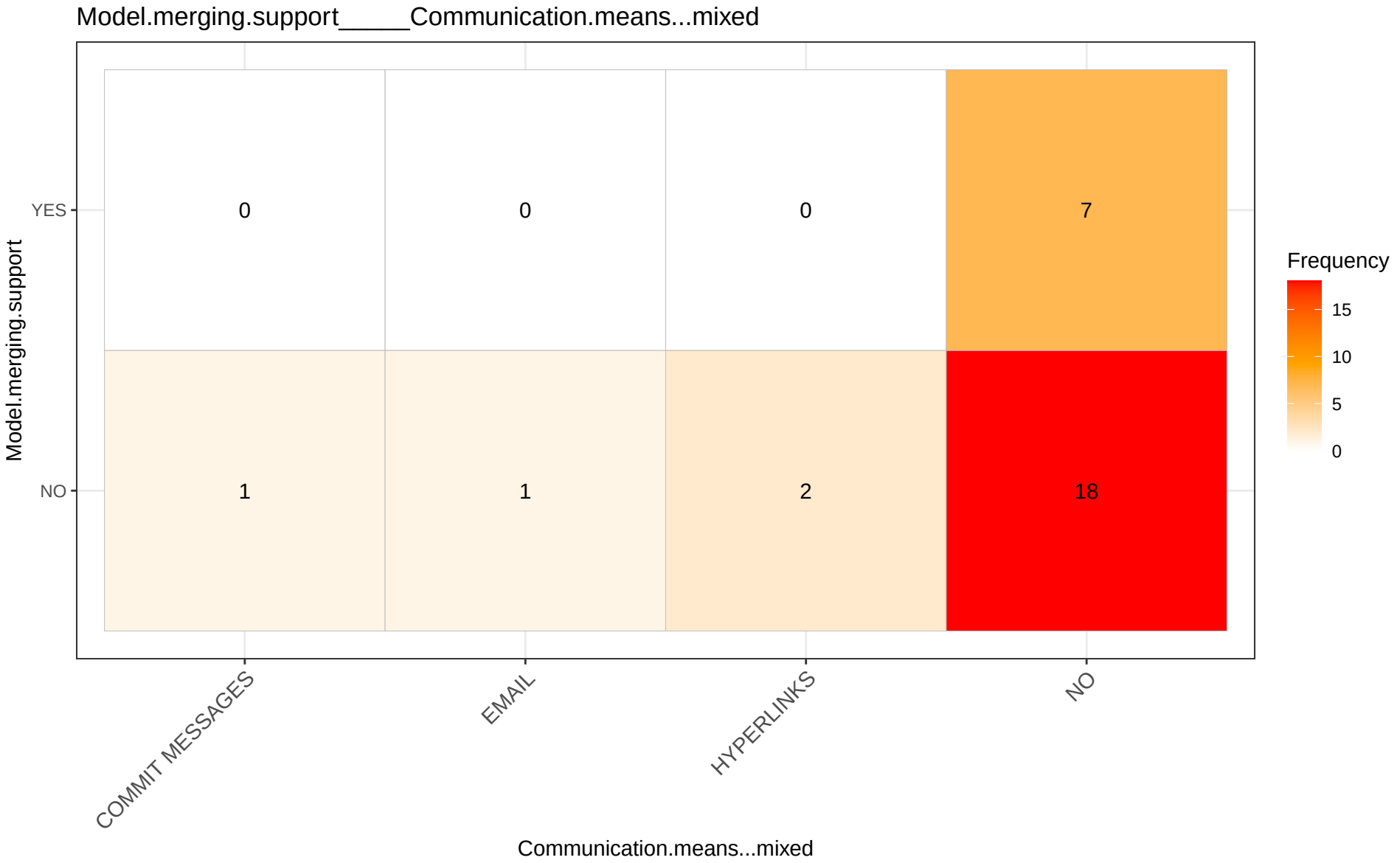

Model.merging.support_____Shared.workspace
YES
NO
7
0
19
3
Model.merging.support
REMOTE
SAMEPLACE
Shared.workspace
Frequency
15
10
5
0

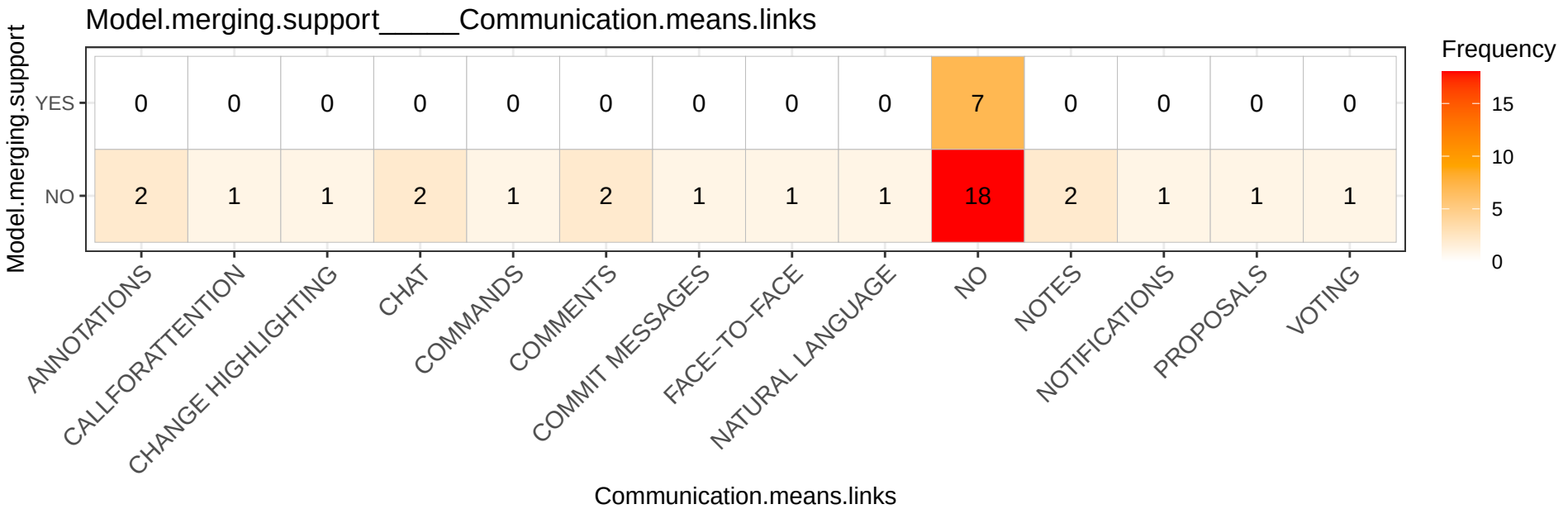

Model.merging.support_____Network.architecture
YES
NO
Model.merging.support
2
5
0
1
4
14
3
2
Frequency
10
5
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture

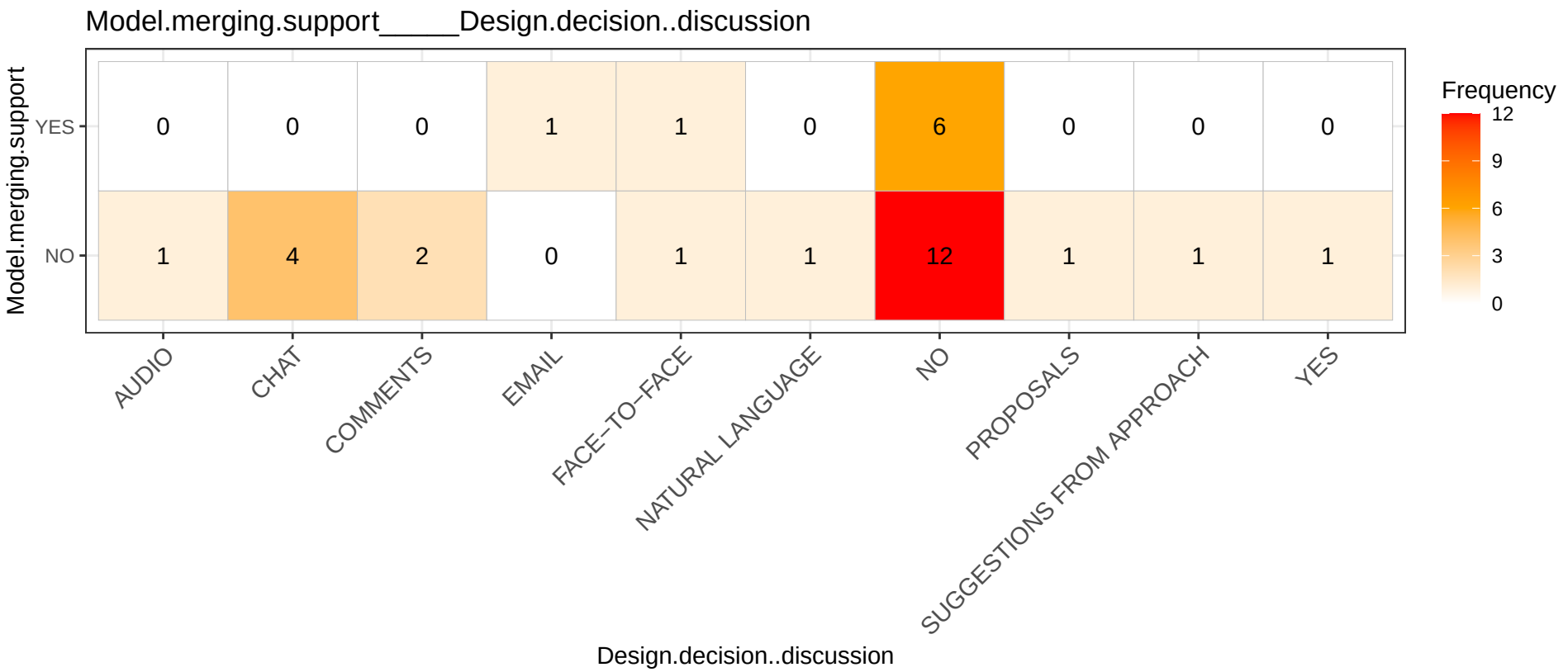

Model.merging.support_____Communication.type
YES
NO
7
7
14
22
Model.merging.support
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
20
15
10
5
0

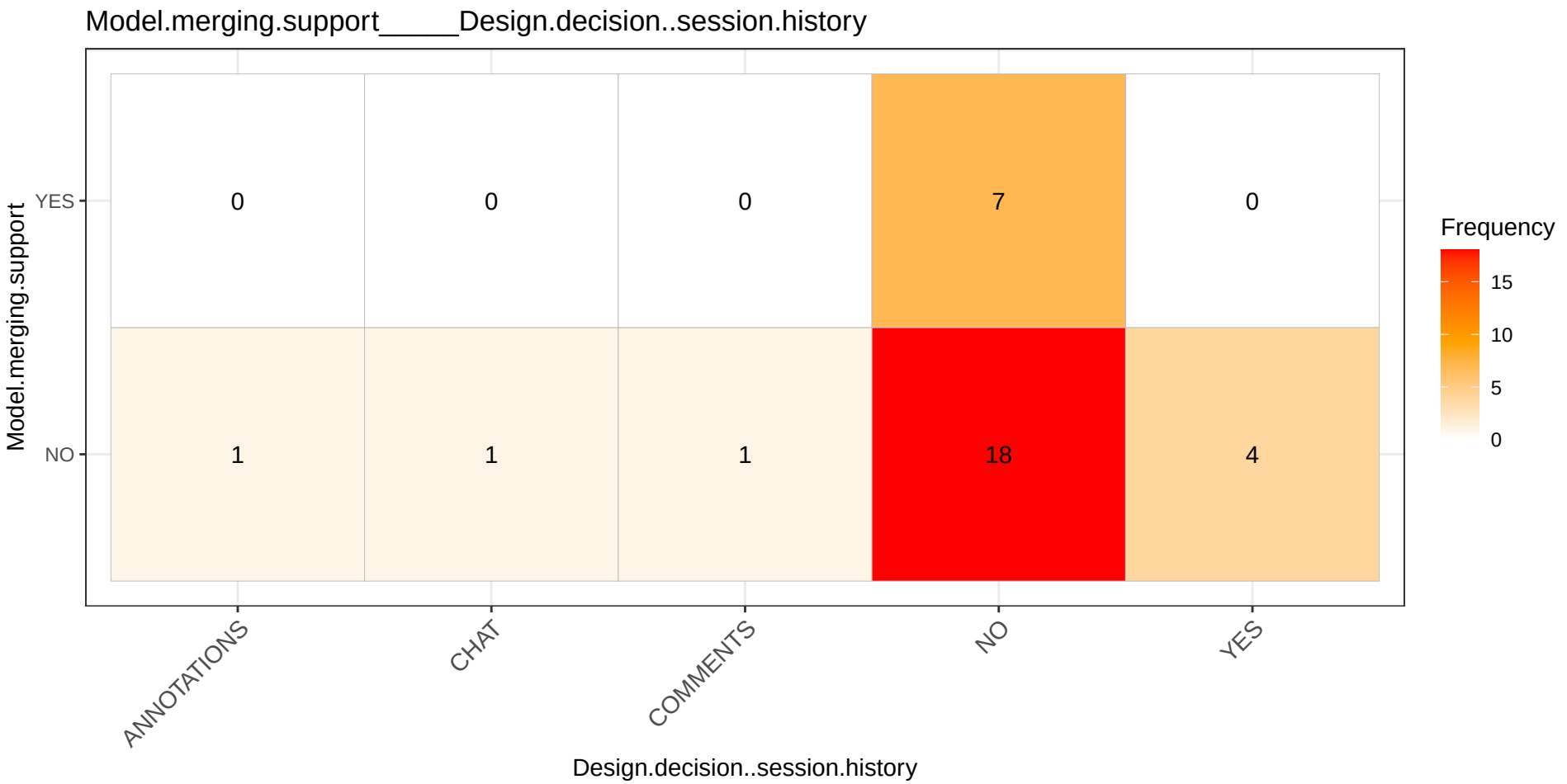

Model.merging.support_____Communication.means...builtin
Model.merging.support
YES
NO
0 0 0 0 0 0 0 0 2 0 5 0 0 0 0 0 0
3 3 5 1 7 1 5 2 4 1 8 2 1 4 2 1 3
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
8
6
4
2
0

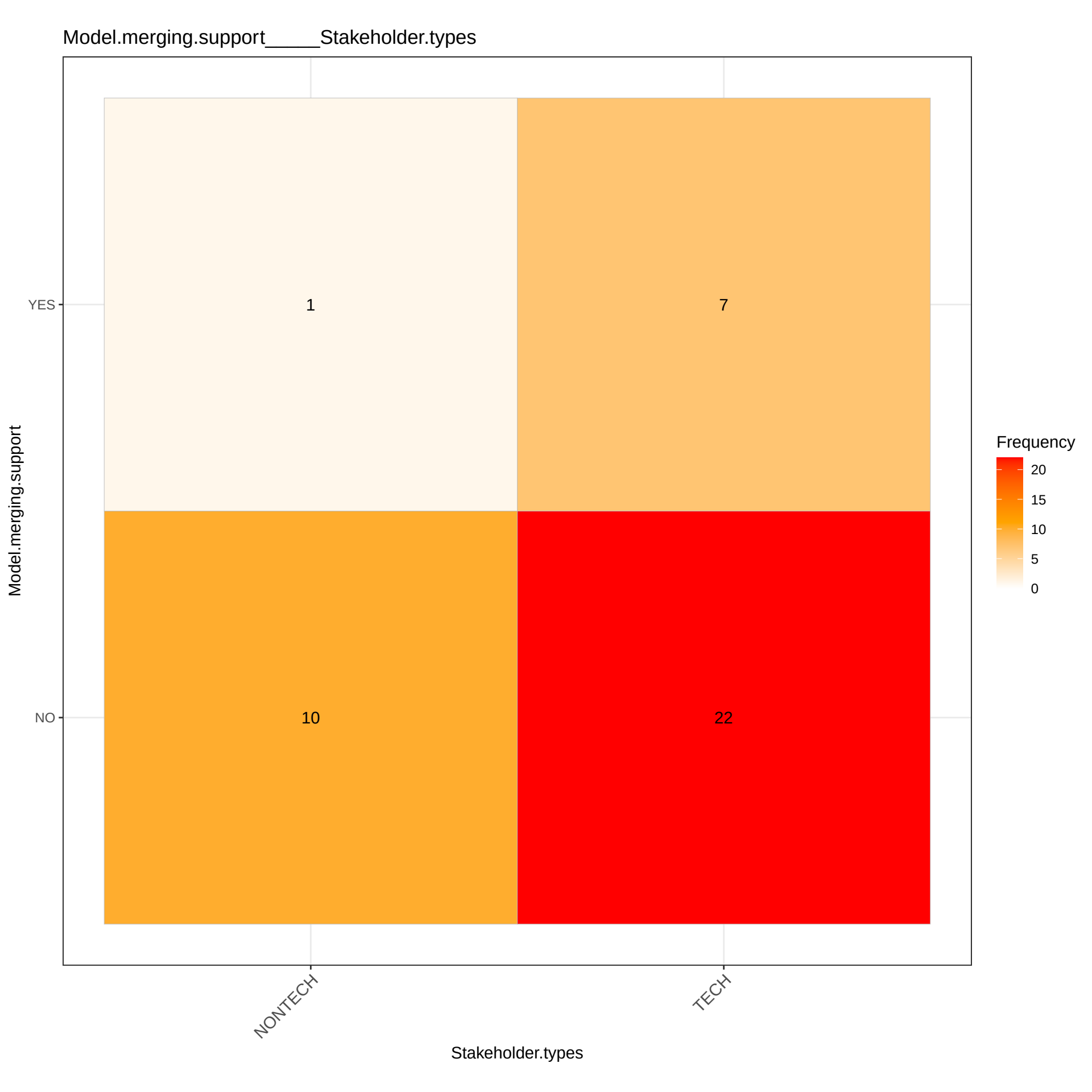

Model.merging.support_____Communication.means...external
Model.merging.support
YES
NO
0
2
1
1
0
4
0
0
1
3
5
2
1
12
1
1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
12
9
6
3
0

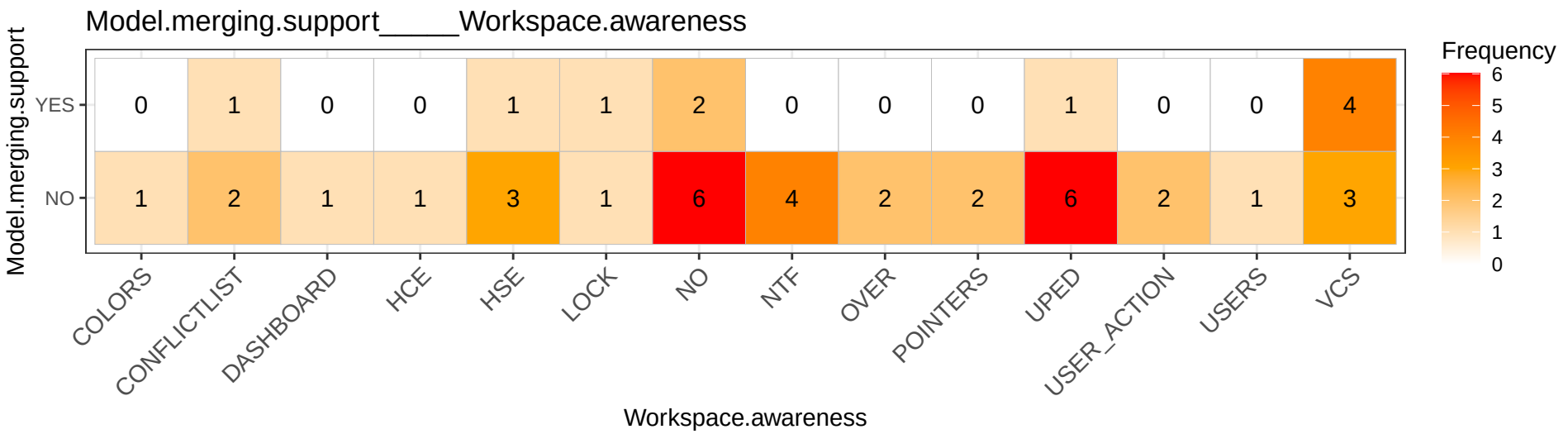

Model.merging.support_____Communication.means...mixed
Model.merging.support
YES
NO
0
0
0
7
1
1
2
18
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
15
10
5
0

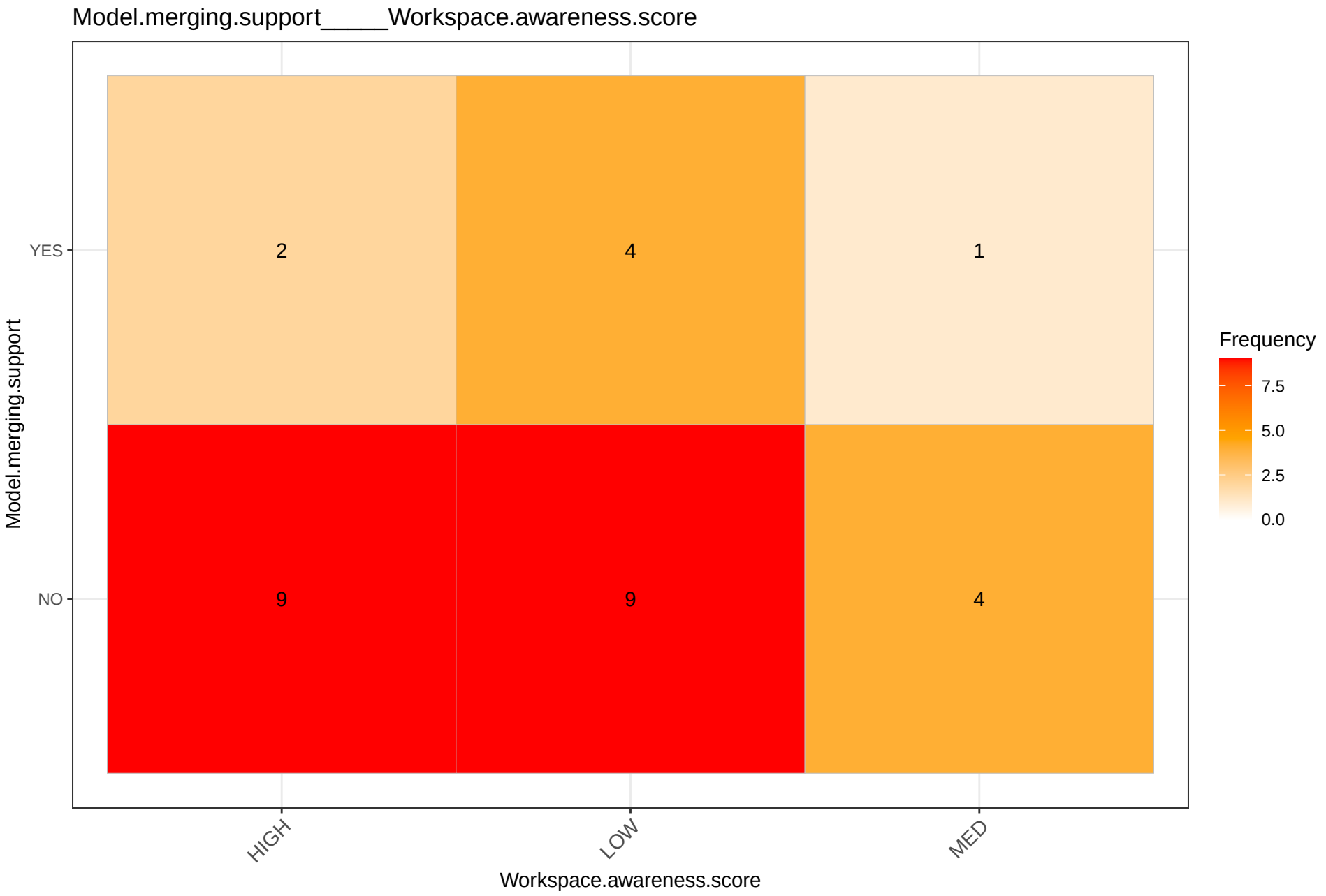

Model.merging.support_____Communication.means.links
Model.merging.support
YES
NO
0 0 0 0 0 0 0 0 0 7 0 0 0 0
2 1 1 2 1 2 1 1 1 18 2 1 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

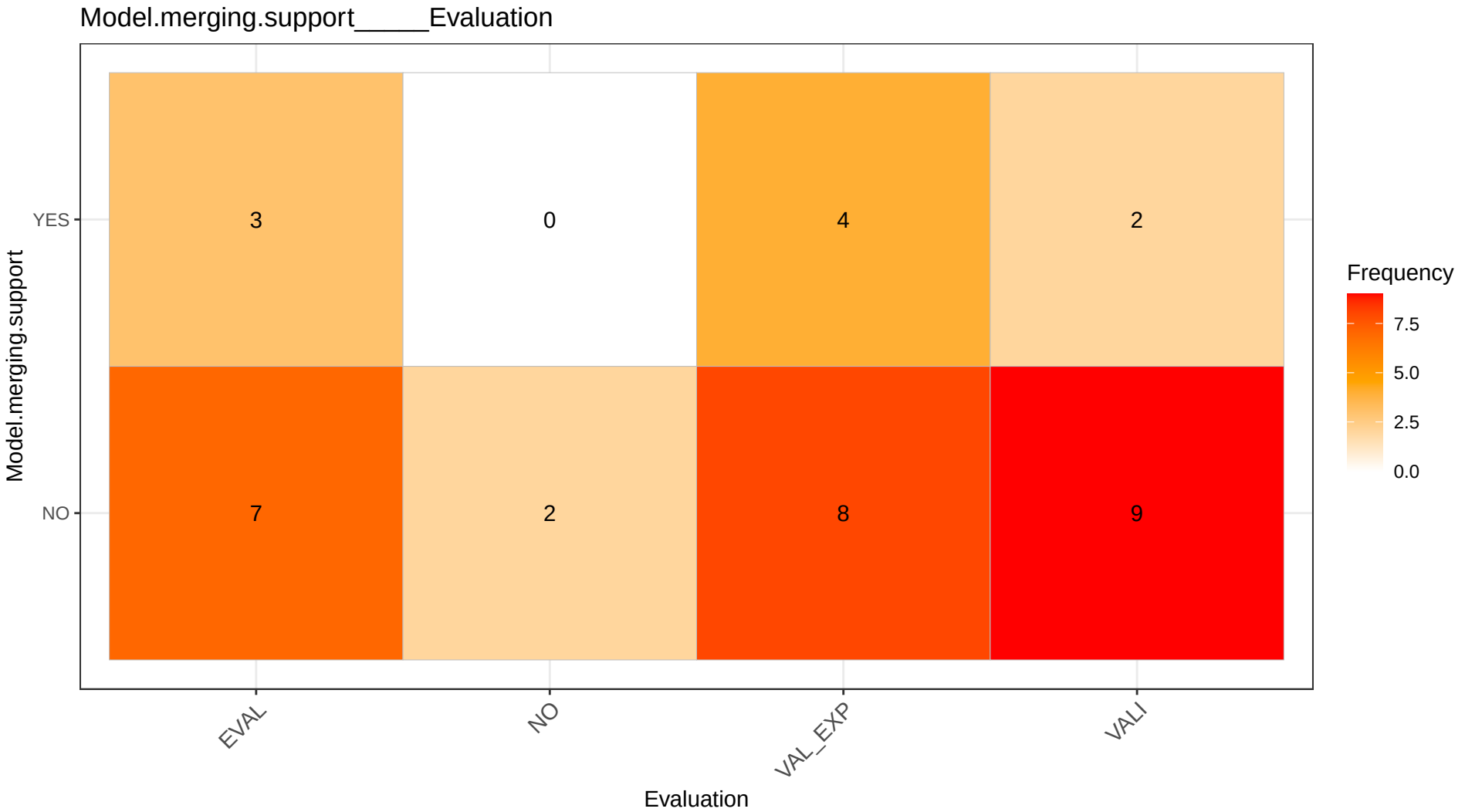

Model.merging.support_____Design.decision..discussion
Model.merging.support
YES
NO
0 0 0 1 1 0 6 0 0 0
1 4 2 0 1 1 12 1 1 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12
9
6
3
0

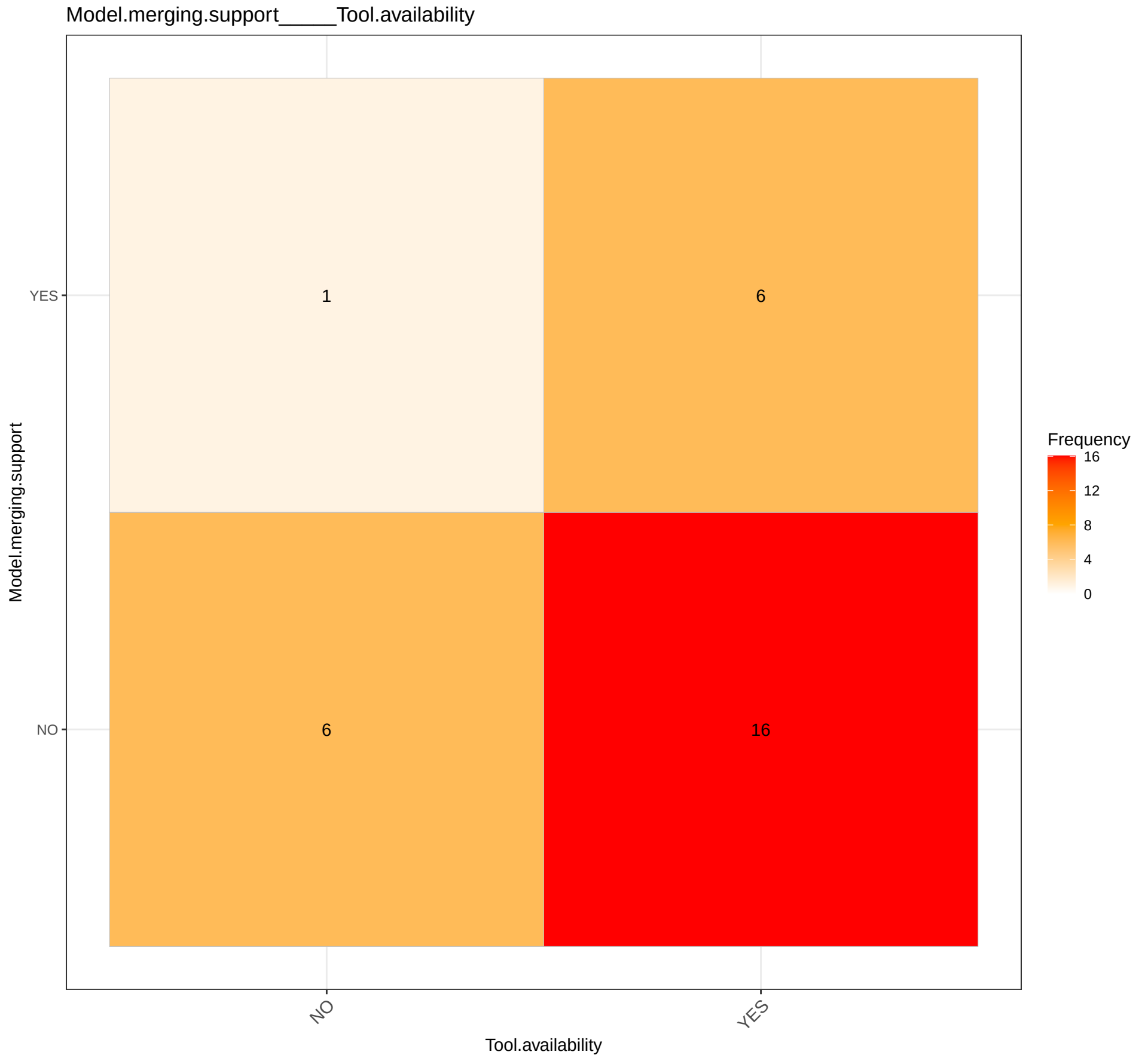

Model.merging.support_____Design.decision..session.history
Model.merging.support
YES
NO
0
0
0
7
0
1
1
1
18
4
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
15
10
5
0

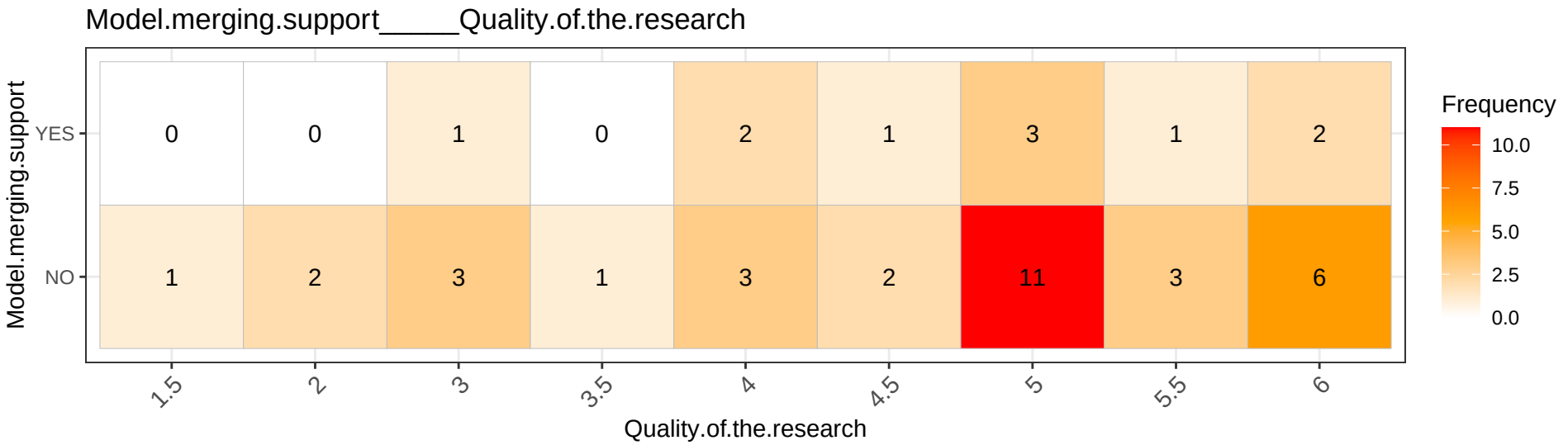

Model.merging.support_____Stakeholder.types
YES
NO
1
7
10
22
Model.merging.support
NONTECH
TECH
Stakeholder.types
Frequency
20
15
10
5
0

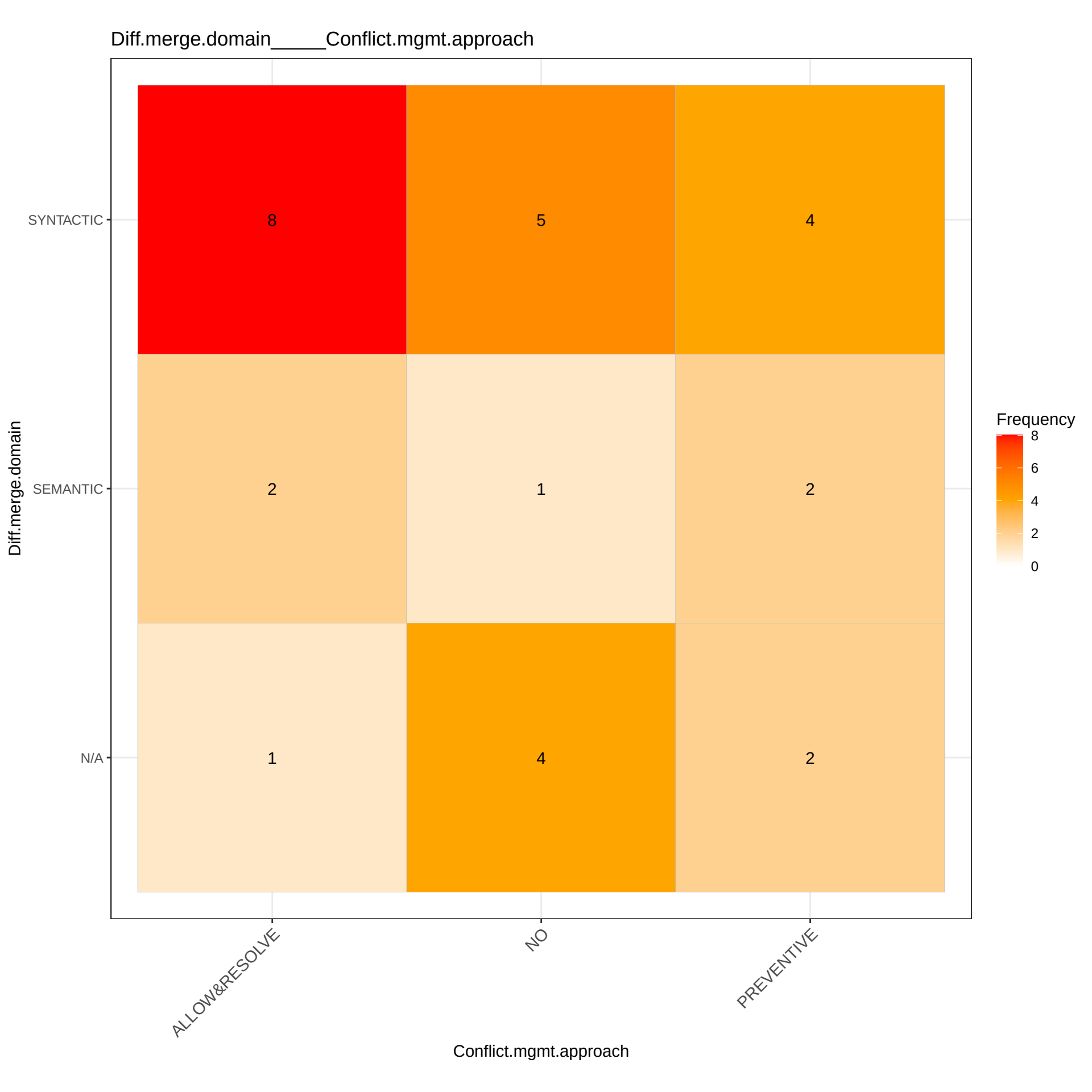

Model.merging.support_____Workspace.awareness
Model.merging.support
YES
NO
0 1 0 0 1 1 2 0 0 0 1 0 0 4
1 2 1 1 3 1 6 4 2 2 6 2 1 3
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

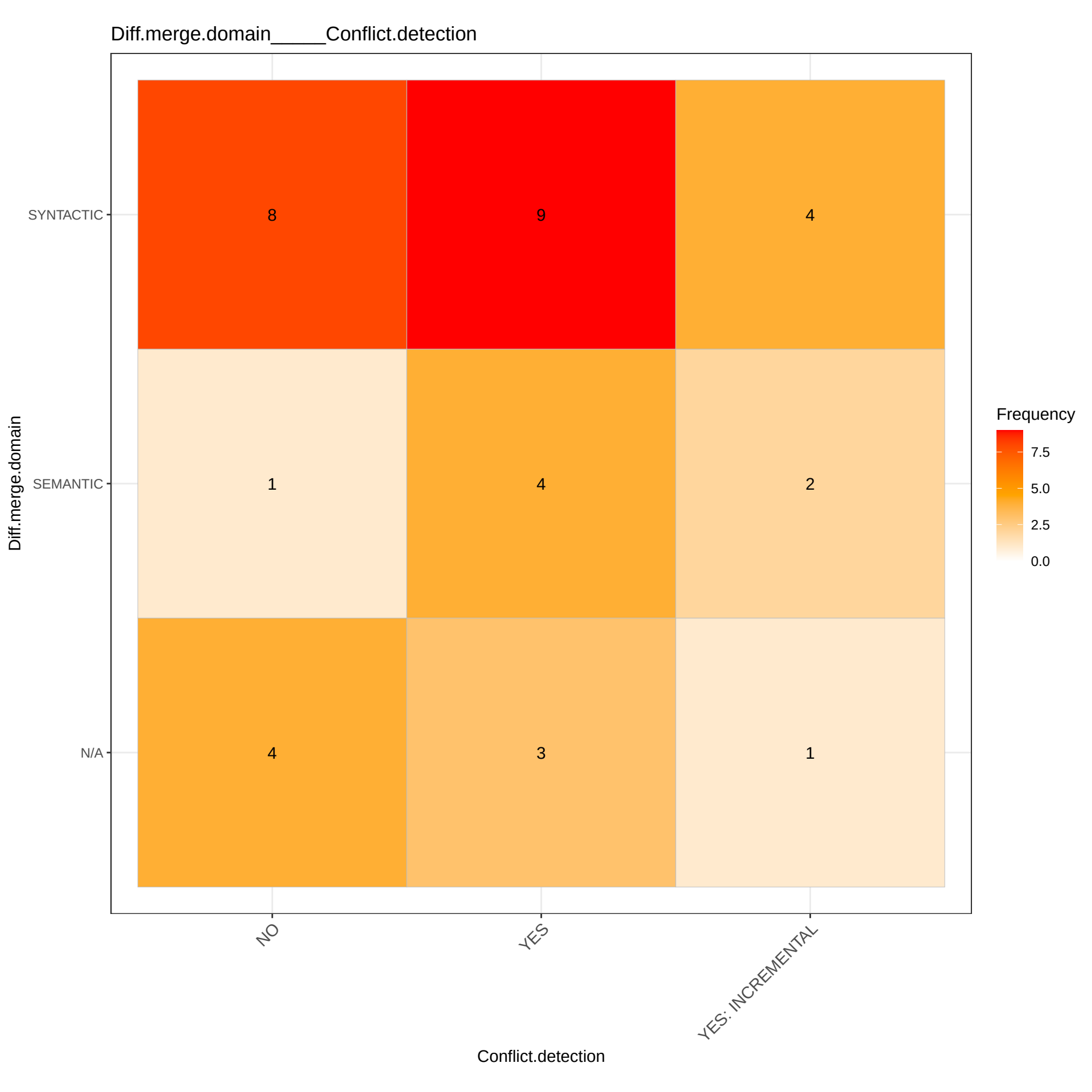

Model.merging.support_____Workspace.awareness.score
YES
NO
2
4
1
9
9
4
Model.merging.support
HIGH
LOW
MED
Workspace.awareness.score
Frequency
7.5
5.0
2.5
0.0

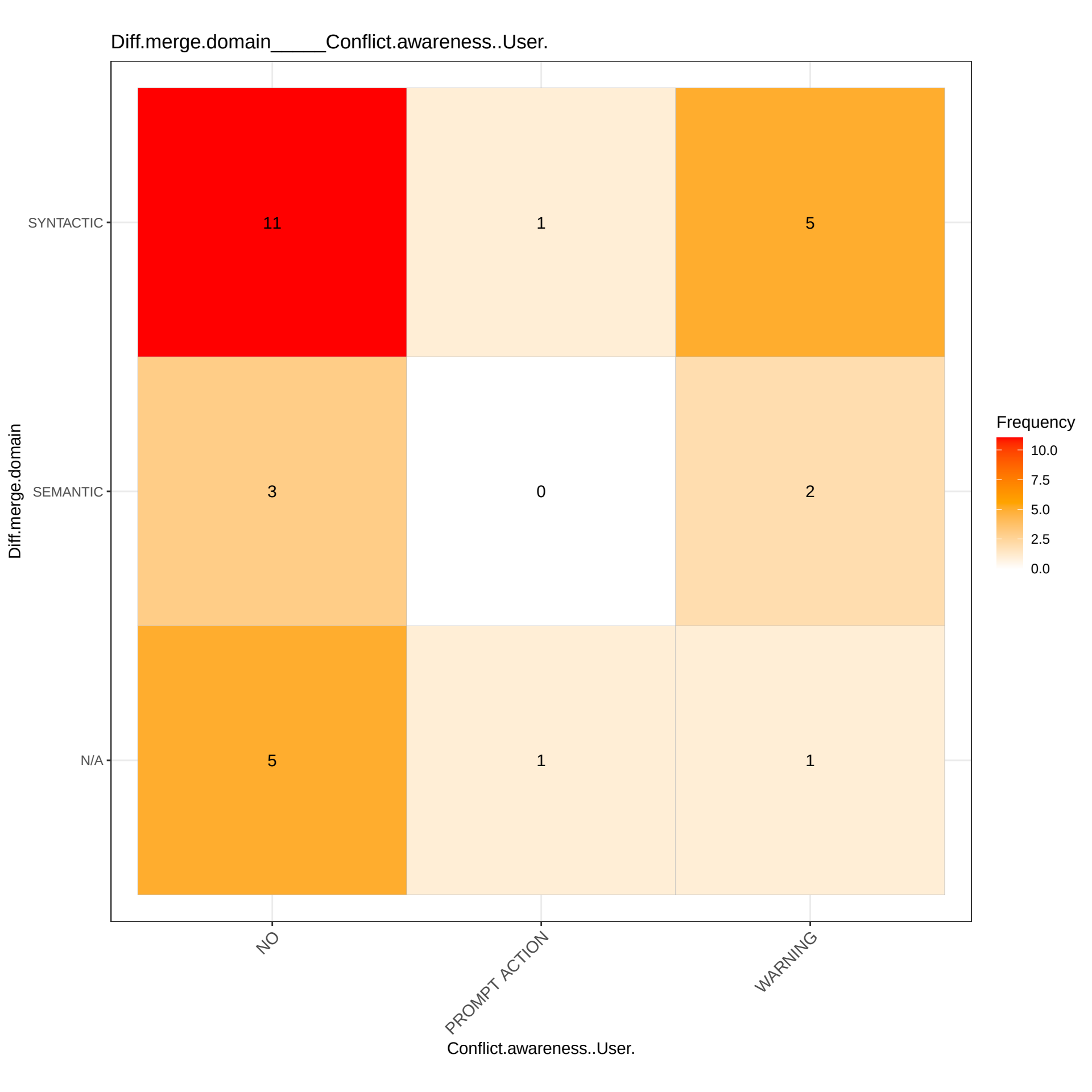

Model.merging.support_____Evaluation
Model.merging.support
YES
NO
3
0
4
2
7
2
8
9
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
7.5
5.0
2.5
0.0

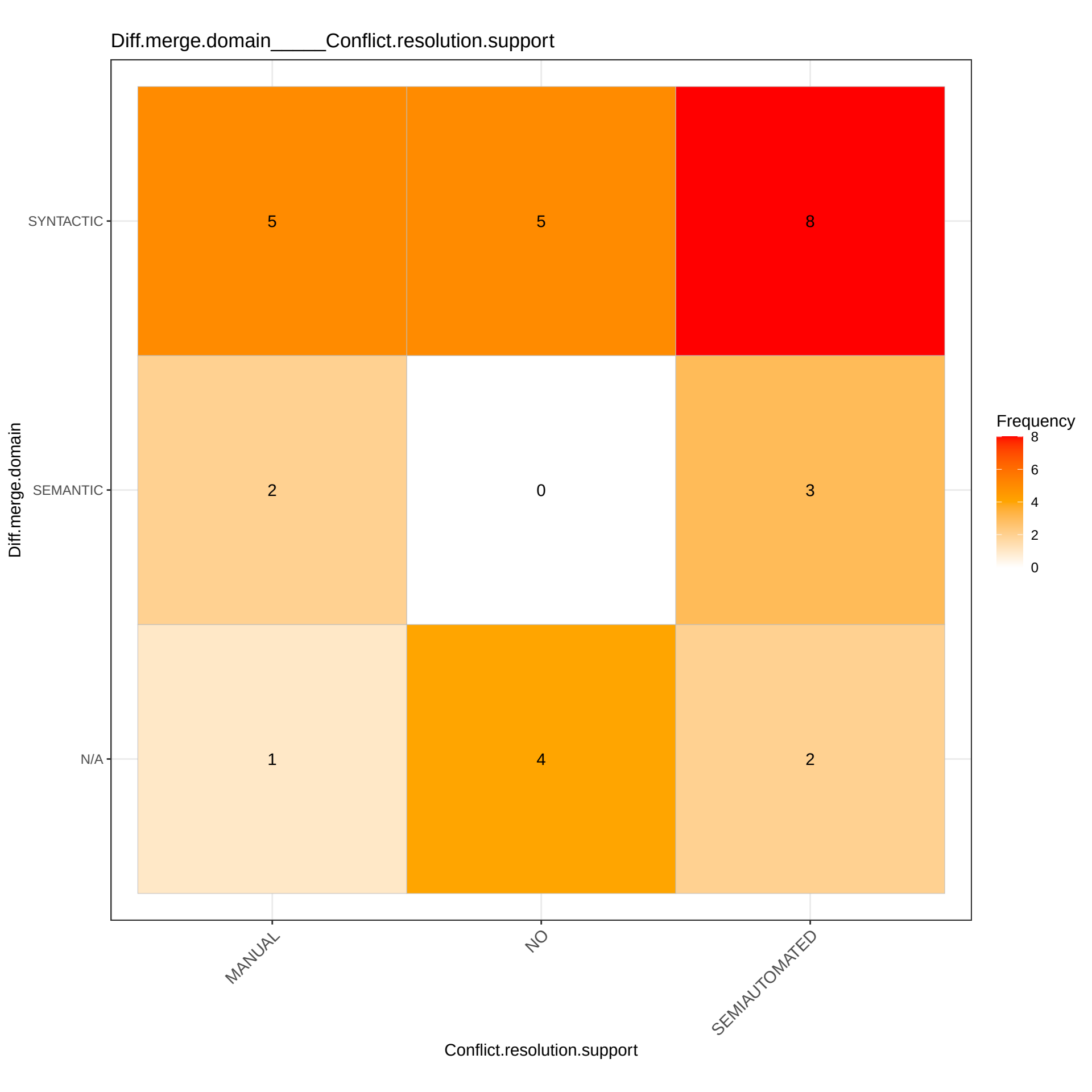

Model.merging.support_____Tool.availability
YES
NO
1
6
6
16
Model.merging.support
NO
YES
Tool.availability
Frequency
16
12
8
4
0

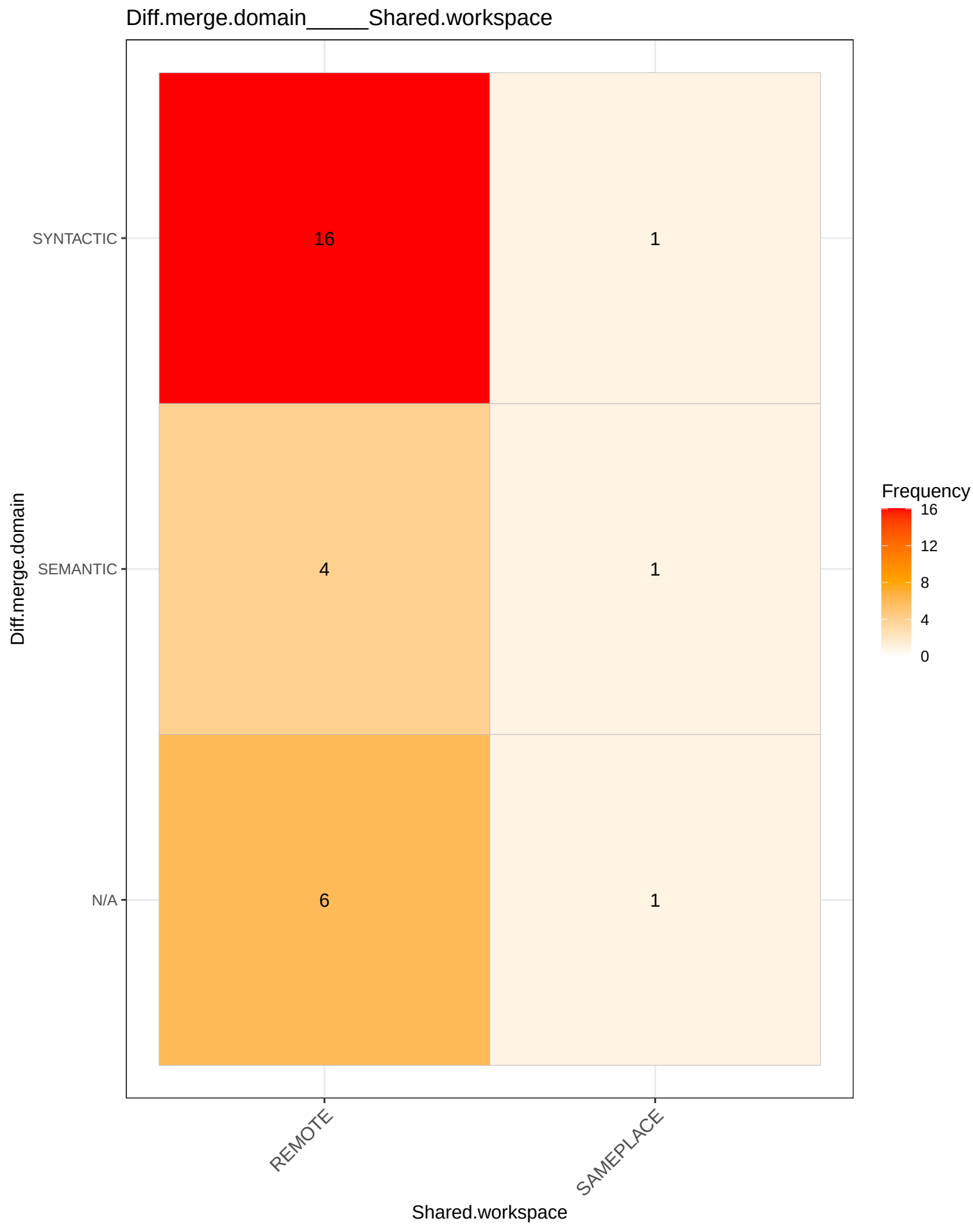

Model.merging.support_____Quality.of.the.research
Model.merging.support
YES
NO
0
0
1
0
2
1
3
1
2
1
2
3
1
3
2
11
3
6
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

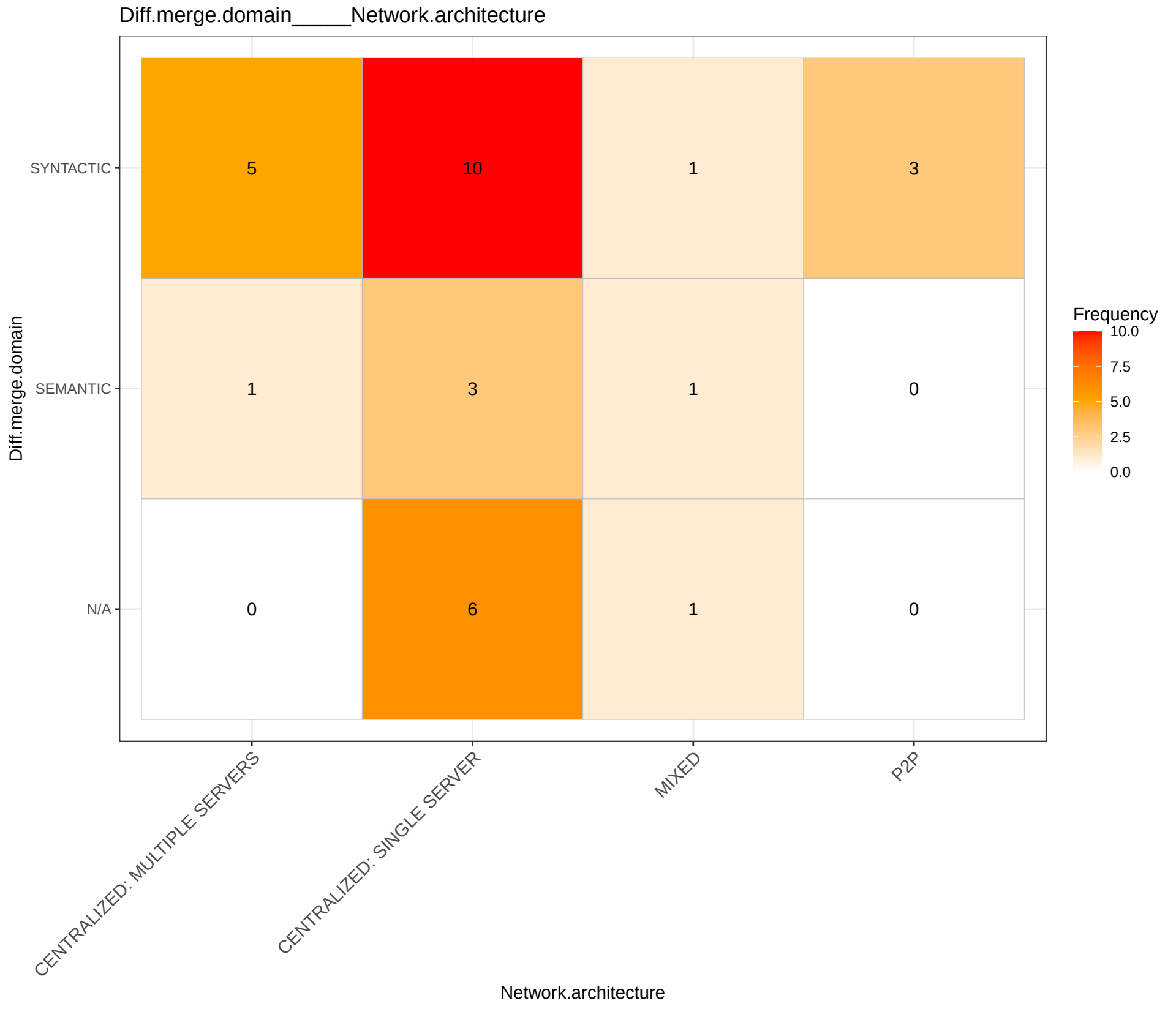

Diff.merge.domain_____Conflict.mgmt.approach
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
8
5
4
2
1
2
1
4
2
ALLOW&RESOLVE
NO
PREVENTIVE
Conflict.mgmt.approach
Frequency
8
6
4
2
0

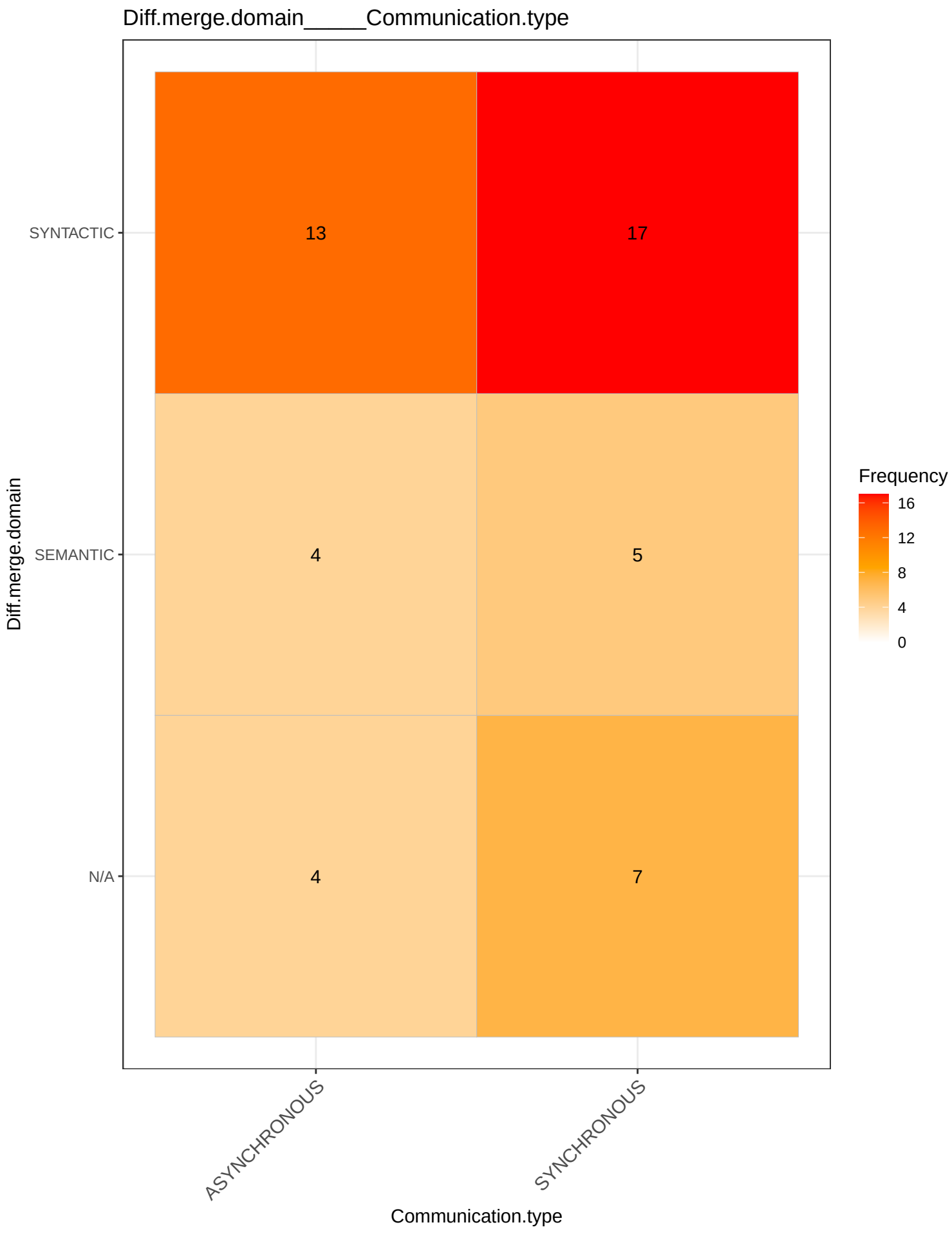

Diff.merge.domain_____Conflict.detection
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
8
9
4
1
4
2
4
3
1
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
7.5
5.0
2.5
0.0

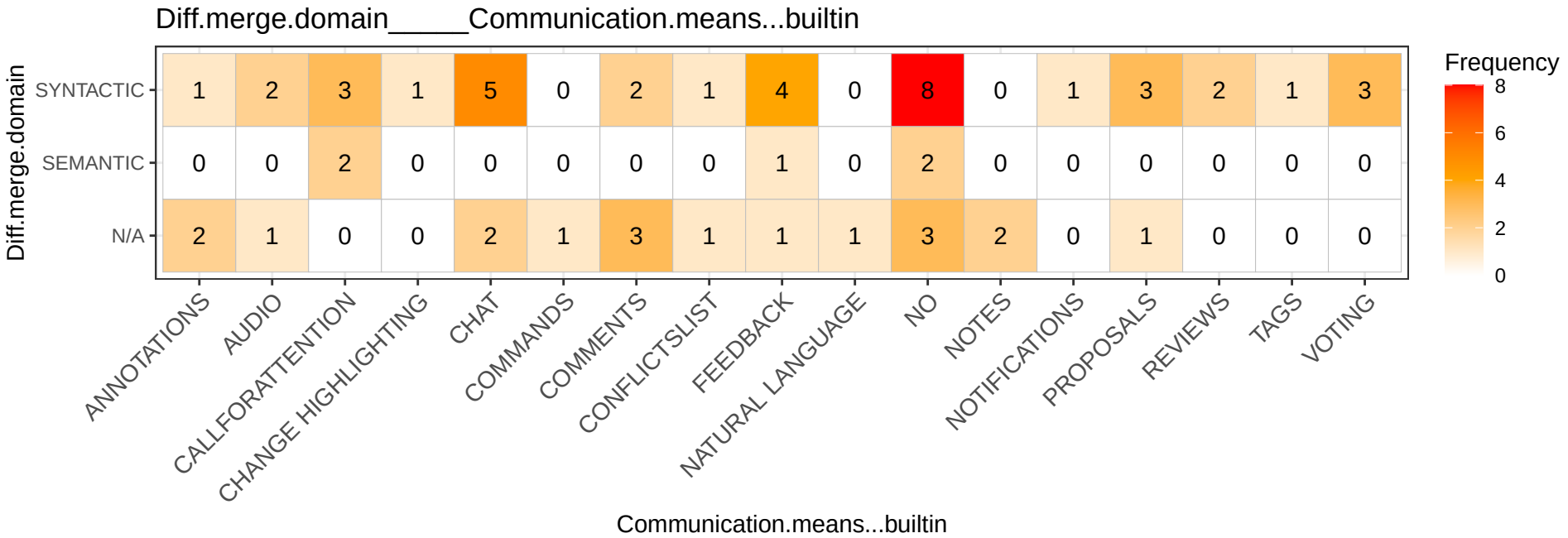

Diff.merge.domain_____Conflict.awareness..User.
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
11
1
5
3
0
2
5
1
1
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
10.0
7.5
5.0
2.5
0.0

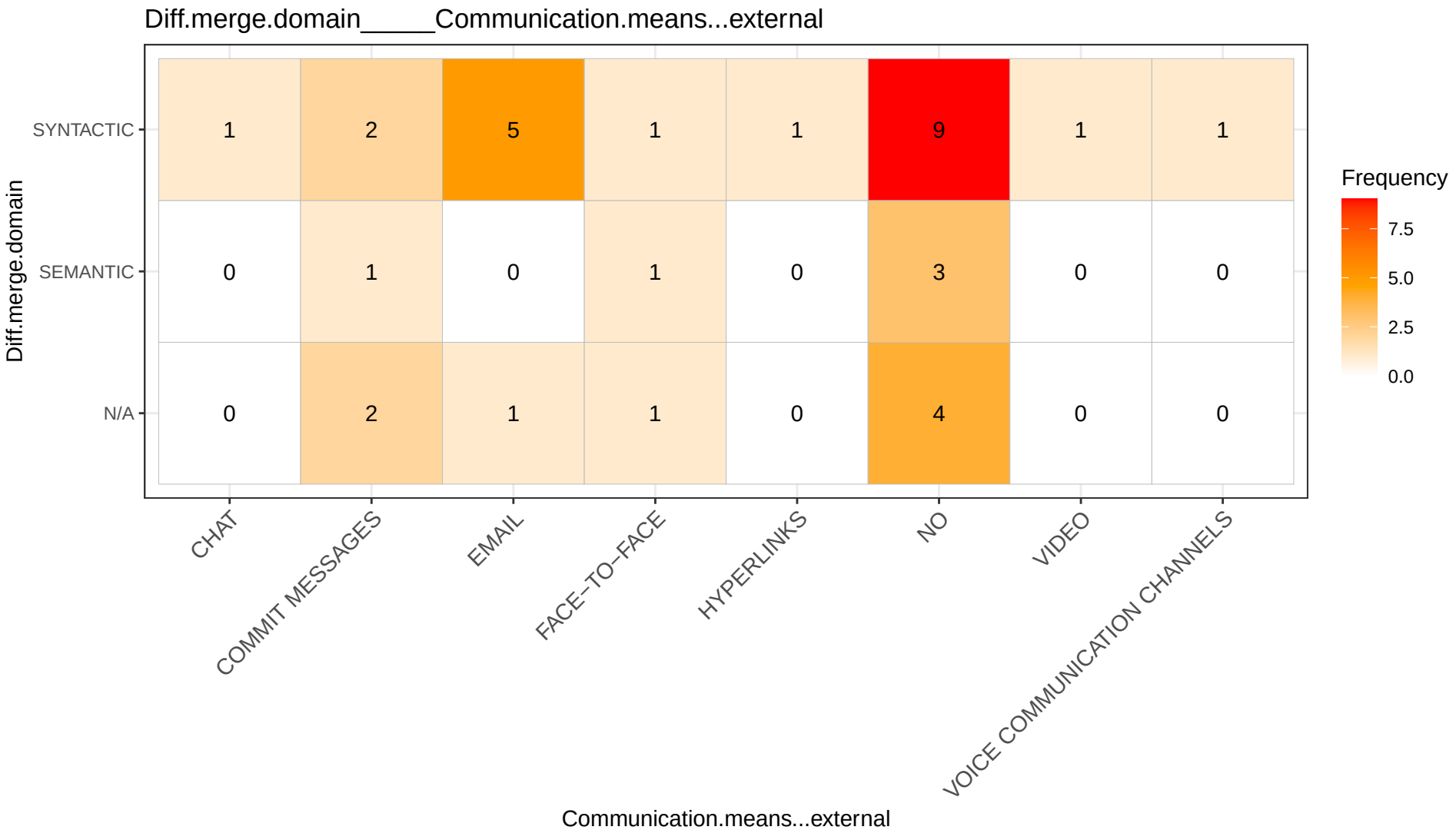

Diff.merge.domain_____Conflict.resolution.support
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
5
5
8
2
0
3
1
4
2
MANUAL
NO
SEMIAUTOMATED
Conflict.resolution.support
Frequency
8
6
4
2
0

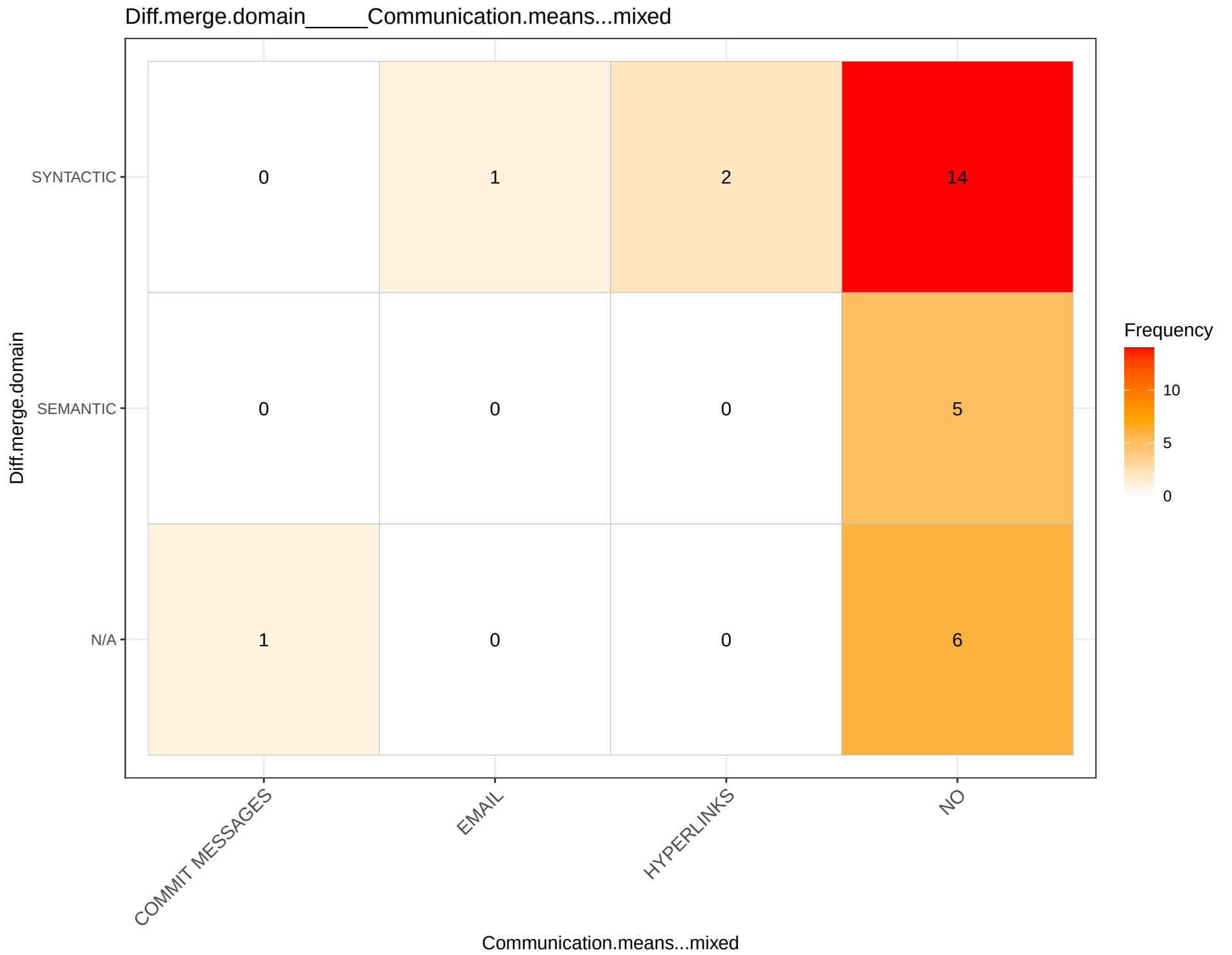

Diff.merge.domain_____Shared.workspace
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
16
1
4
1
6
1
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

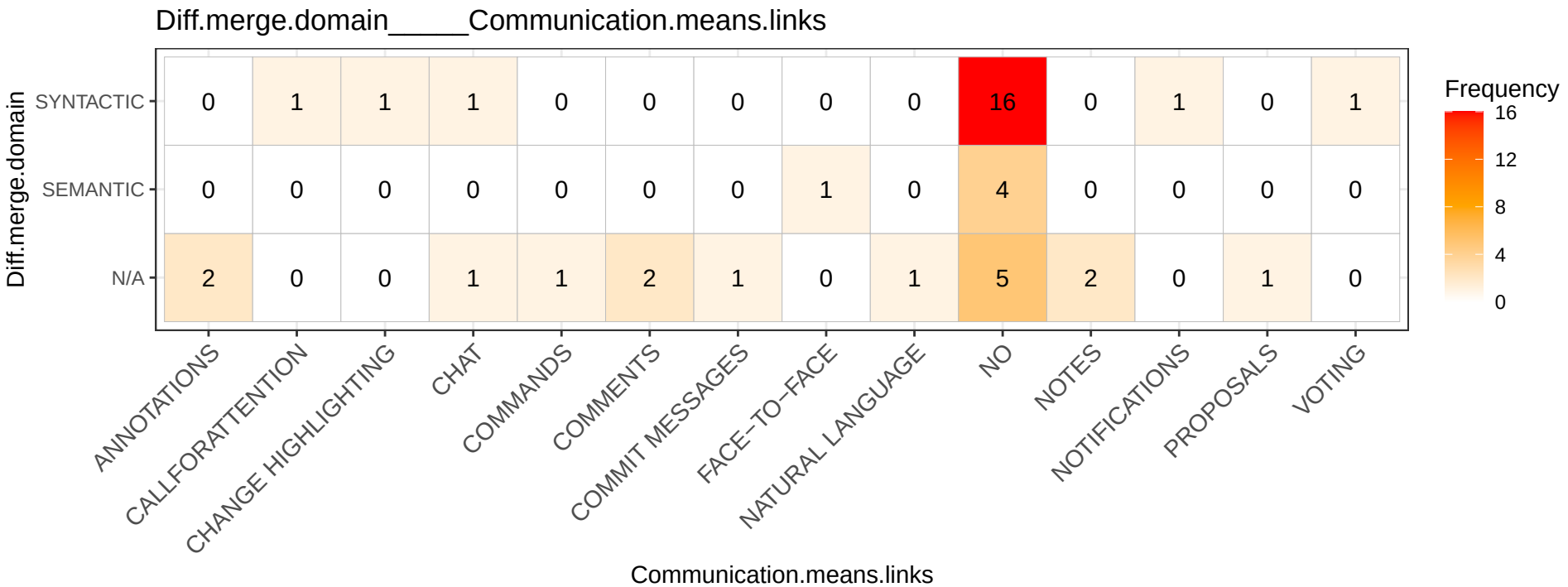

Diff.merge.domain_____Network.architecture
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
5
10
1
3
1
3
1
0
0
6
1
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

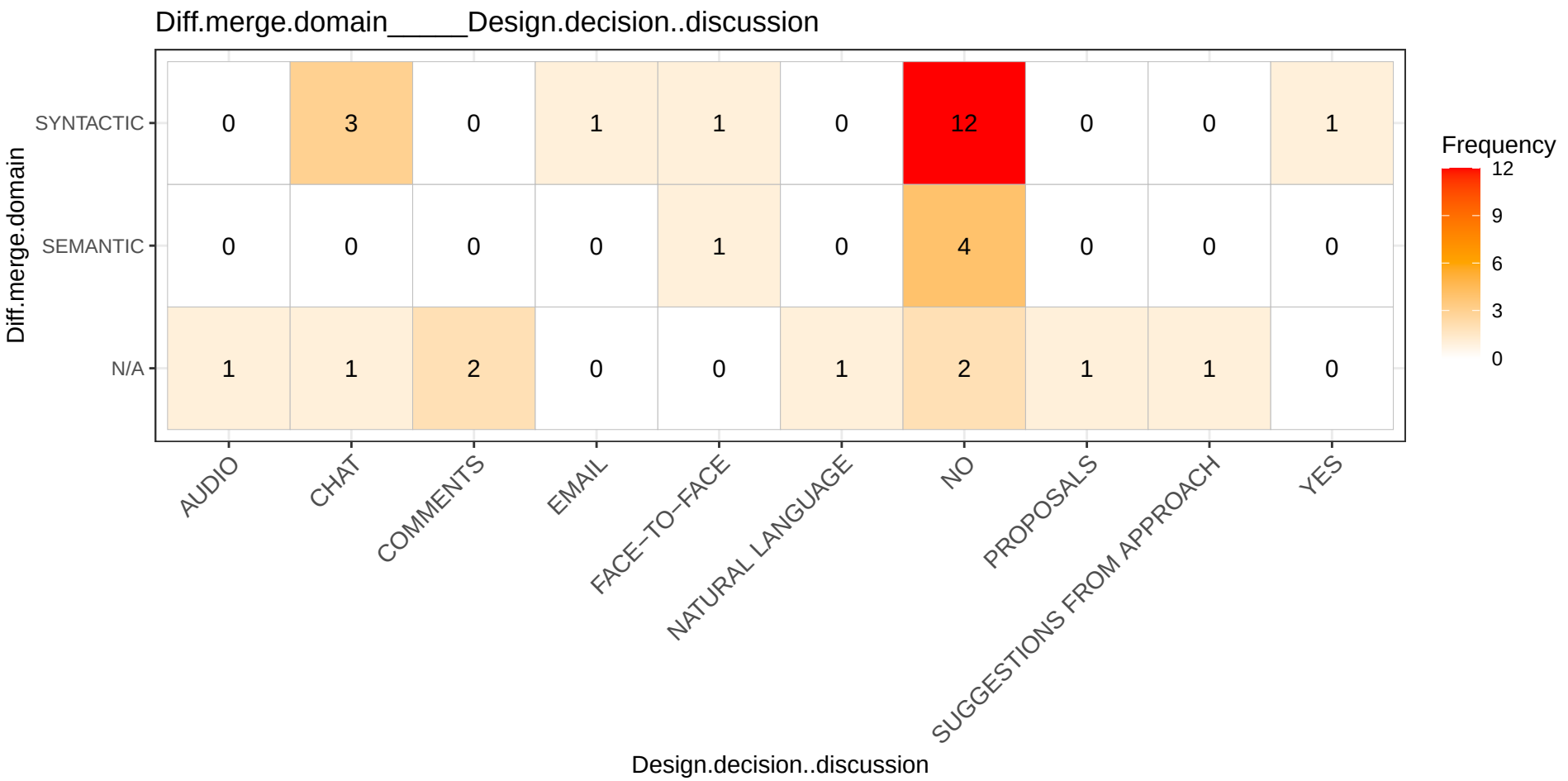

Diff.merge.domain_____Communication.type
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
13
17
4
5
4
7
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
16
12
8
4
0

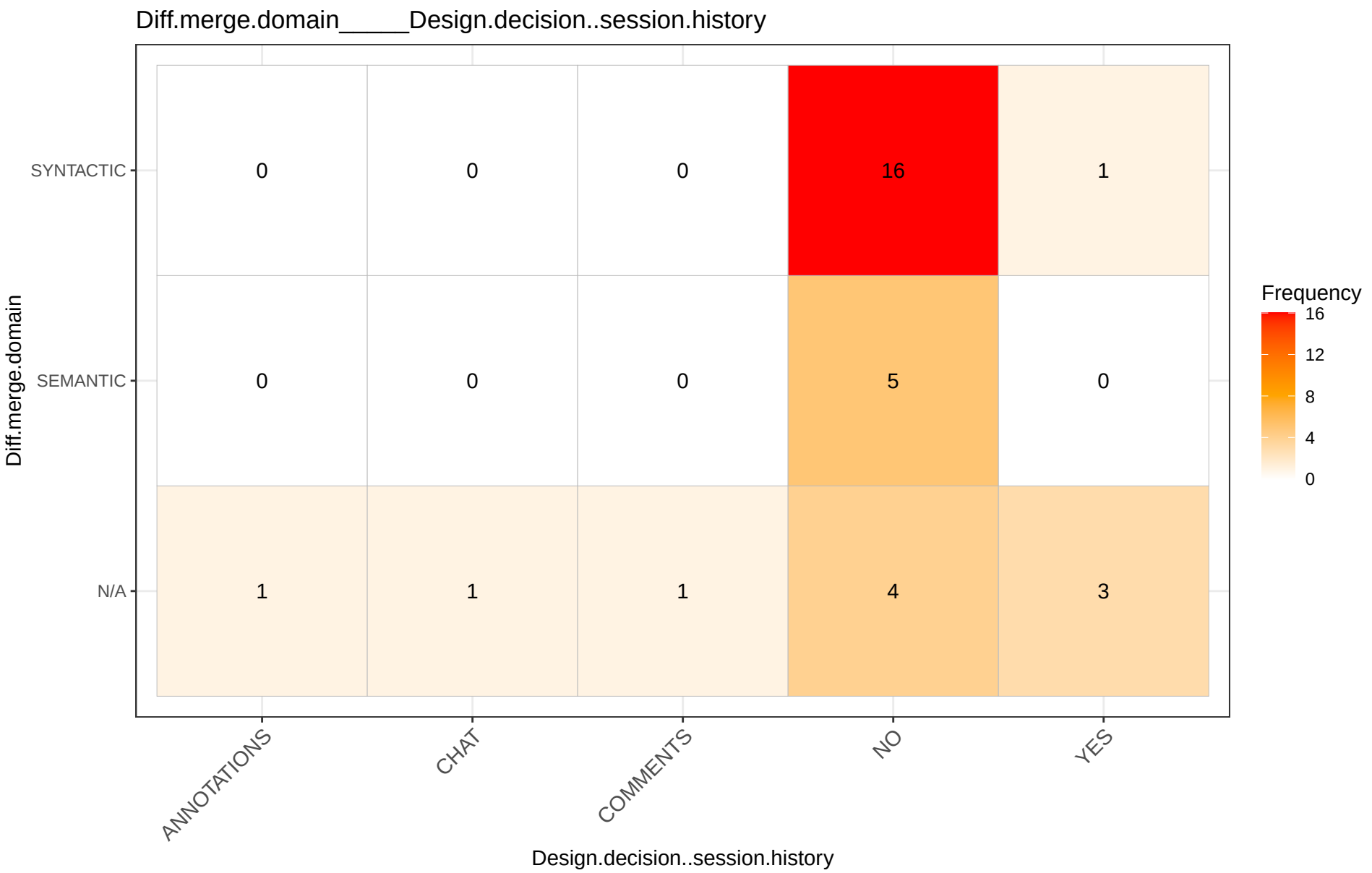

Diff.merge.domain_____Communication.means...builtin
Diff.merge.domain
SYNTACTIC
SEMANTIC
N/A
1 2 3 1 5 0 2 1 4 0 8 0 1 3 2 1 3
0 0 2 0 0 0 0 0 1 0 2 0 0 0 0 0 0
2 1 0 0 2 1 3 1 1 1 3 2 0 1 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
8
6
4
2
0

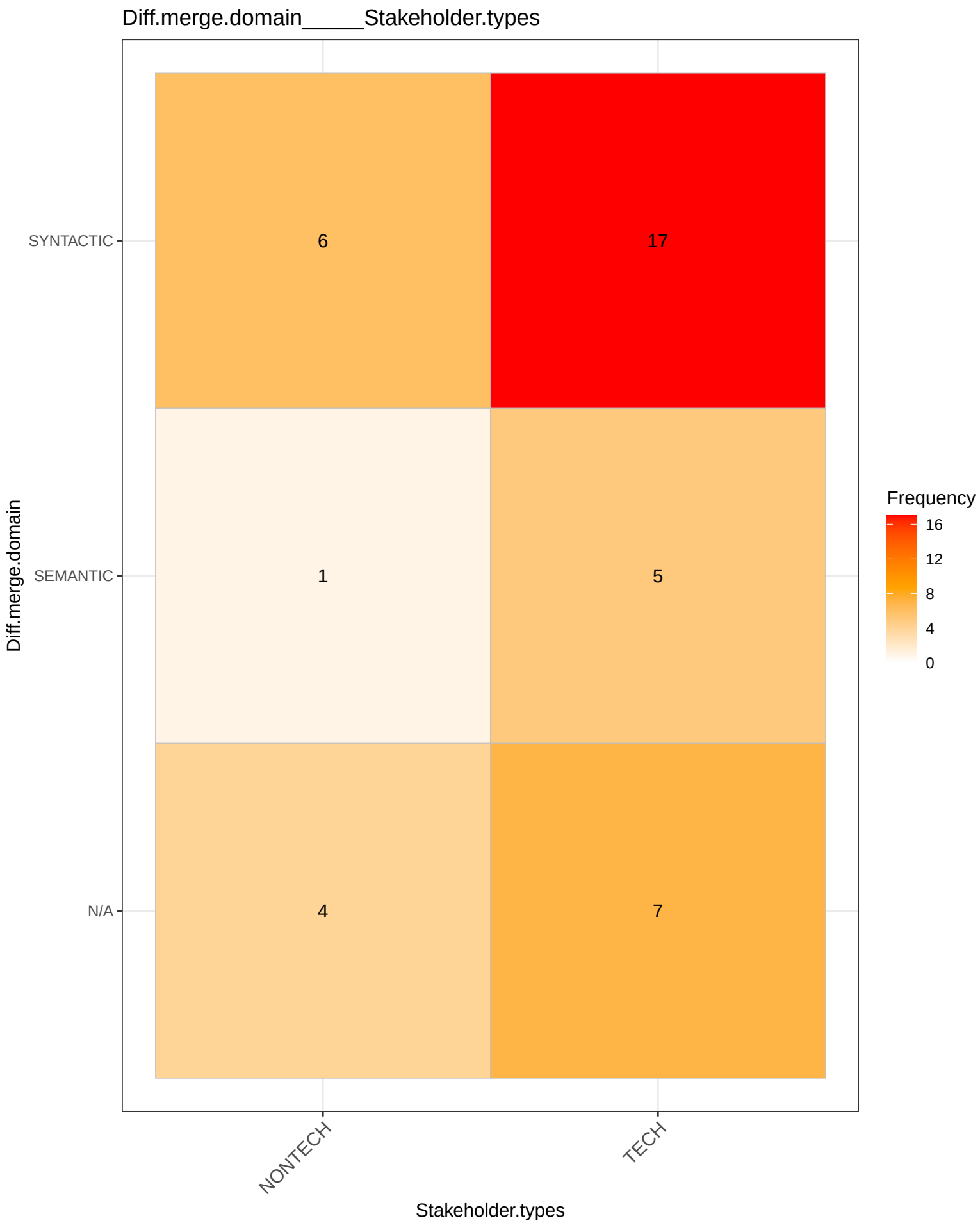

Diff.merge.domain_____Communication.means...external
Diff.merge.domain
SYNTACTIC
SEMANTIC
N/A
1
2
5
1
1
9
1
1
0
1
0
1
0
3
0
0
0
2
1
1
0
4
0
0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
7.5
5.0
2.5
0.0

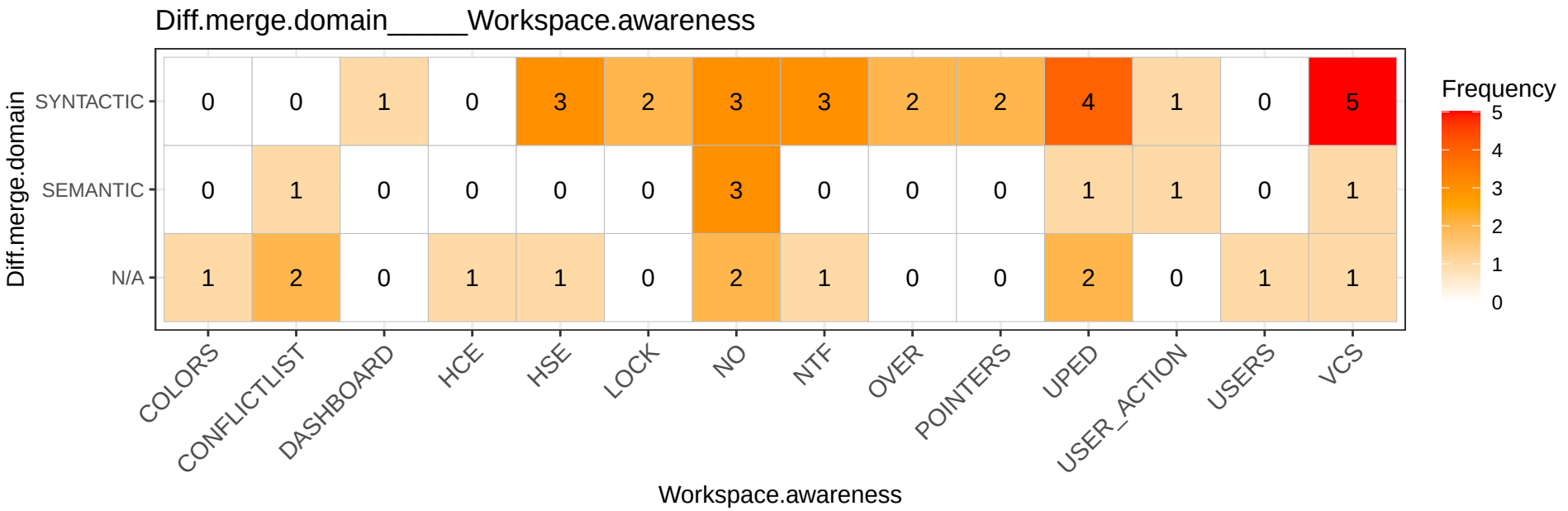

Diff.merge.domain_____Communication.means...mixed
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
0
1
2
14
0
0
0
5
1
0
0
6
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
10
5
0

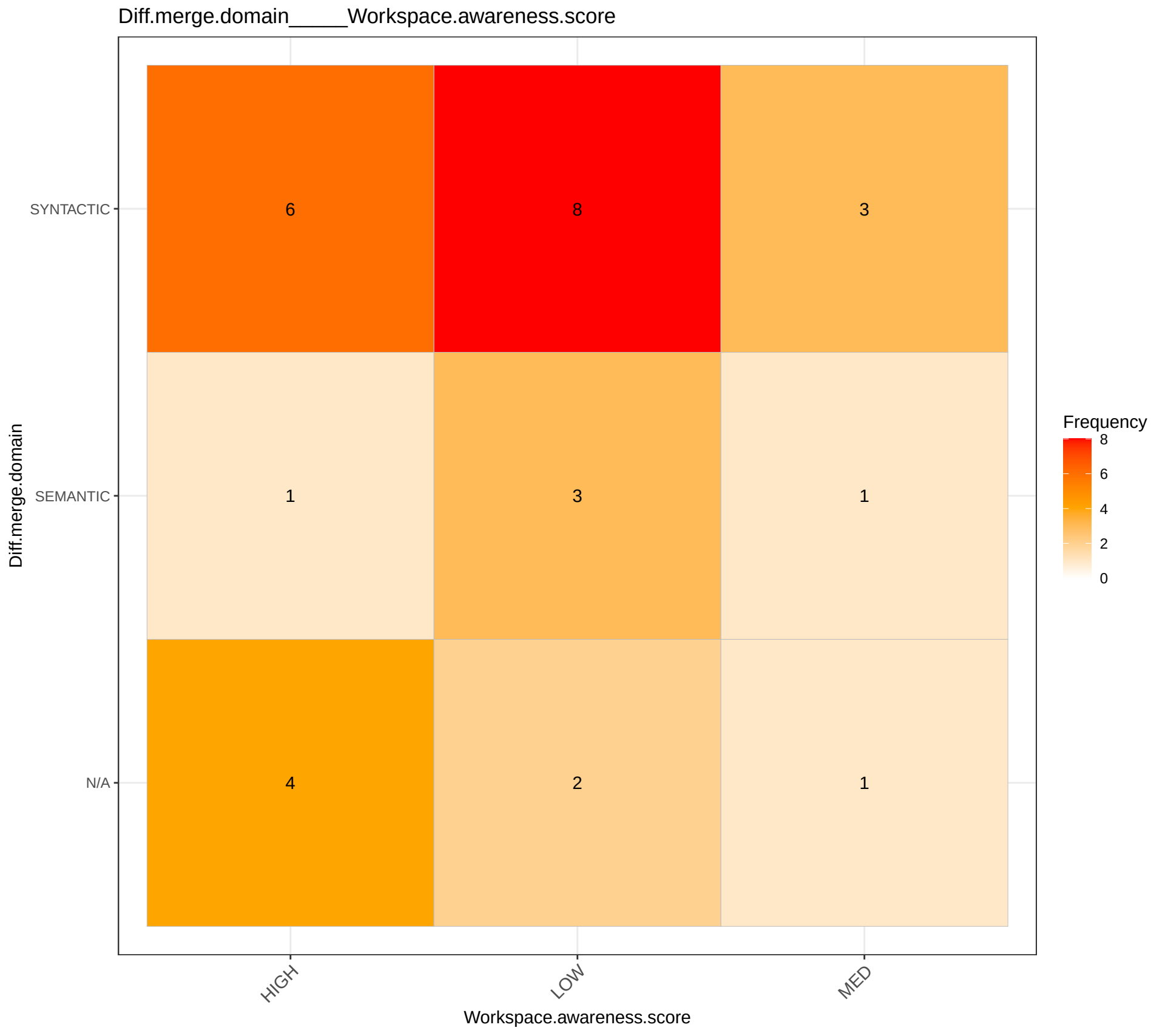

Diff.merge.domain_____Communication.means.links
Diff.merge.domain
SYNTACTIC
SEMANTIC
N/A
0 1 1 1 0 0 0 0 0 16 0 1 0 1
0 0 0 0 0 0 0 1 0 4 0 0 0 0
2 0 0 1 1 2 1 0 1 5 2 0 1 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0

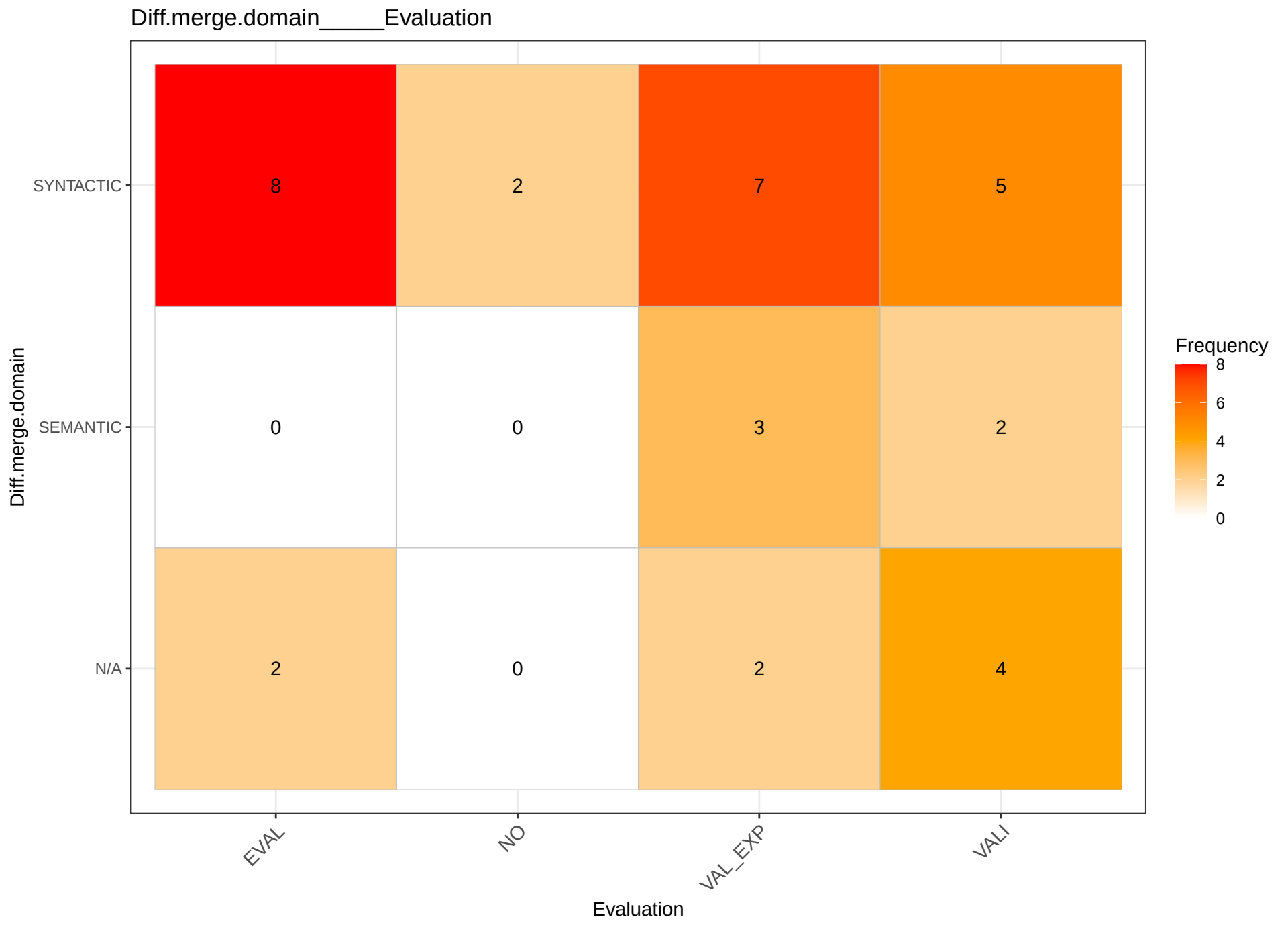

Diff.merge.domain_____Design.decision..discussion
Diff.merge.domain
SYNTACTIC
SEMANTIC
N/A
0 3 0 1 1 0 12 0 0 1
0 0 0 0 1 0 4 0 0 0
1 1 2 0 0 1 2 1 1 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12
9
6
3
0

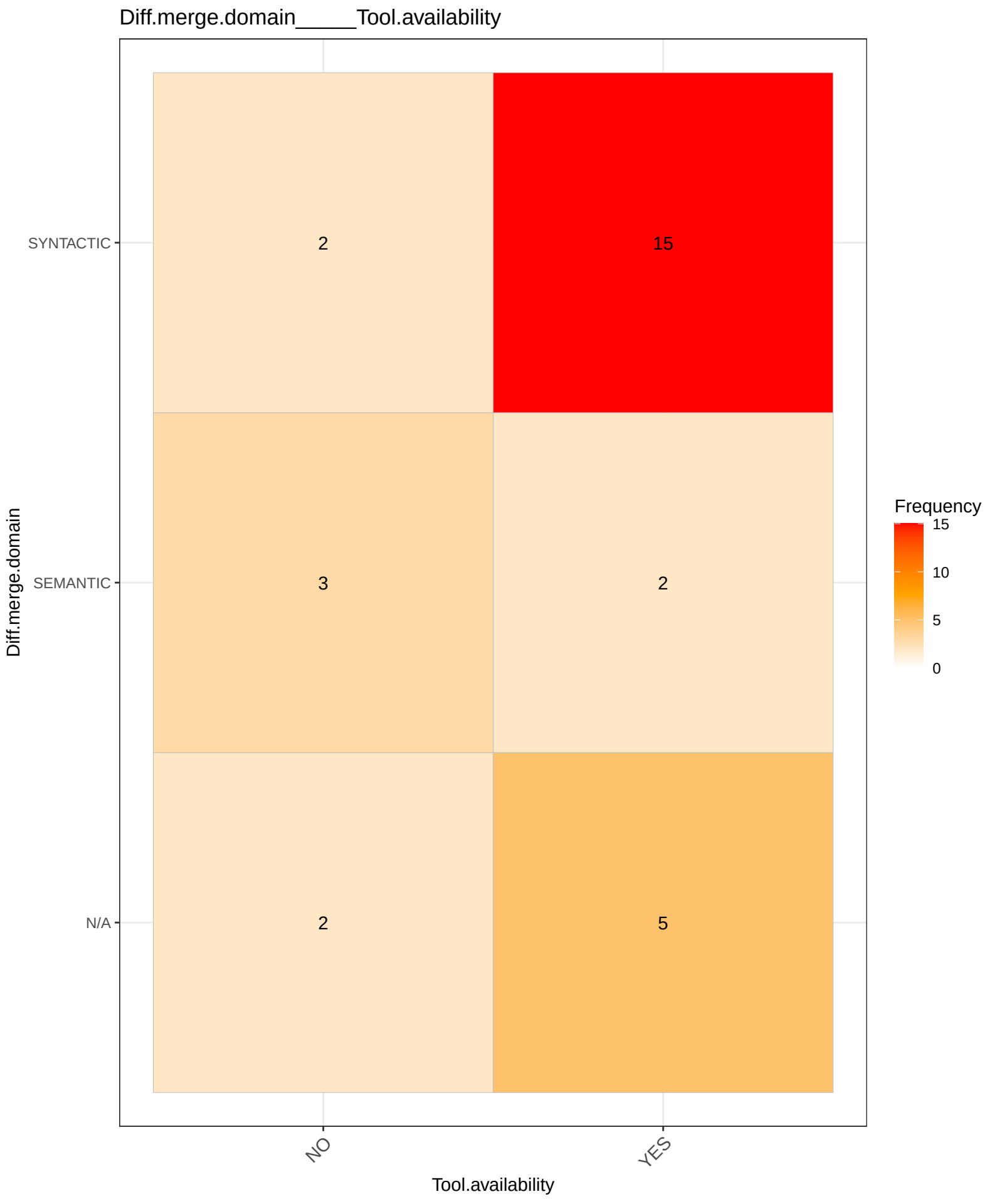

Diff.merge.domain_____Design.decision..session.history
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
0
0
0
16
1
0
0
0
5
0
1
1
1
4
3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

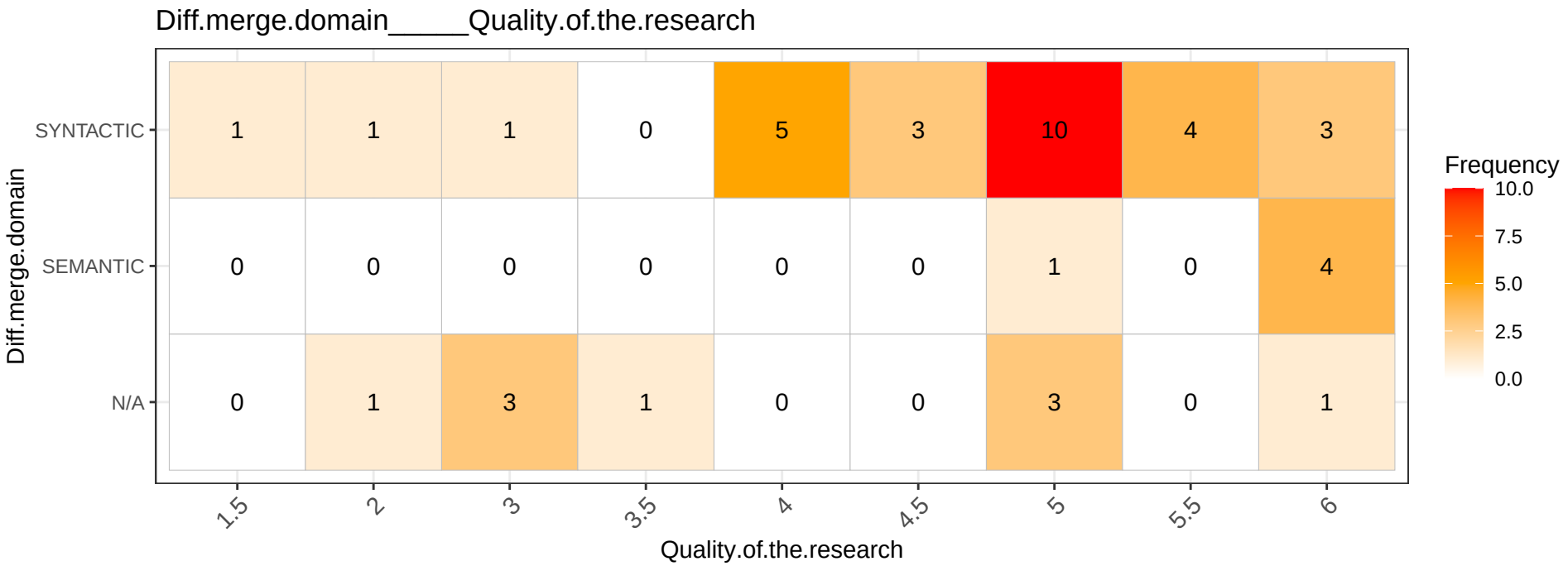

Diff.merge.domain_____Stakeholder.types
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
6
17
1
5
4
7
NONTECH
TECH
Stakeholder.types
Frequency
16
12
8
4
0

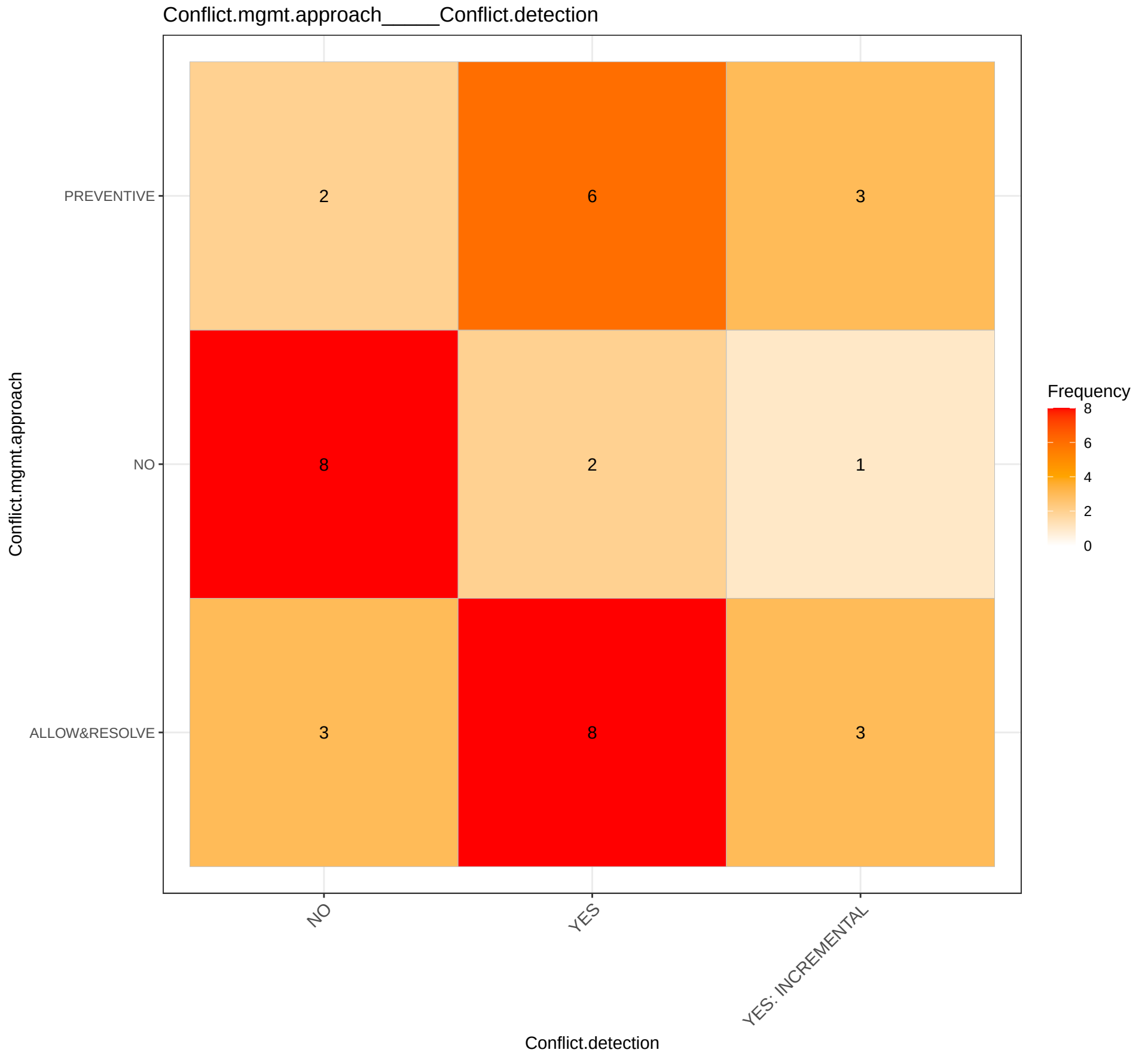

Diff.merge.domain_____Workspace.awareness
Diff.merge.domain
SYNTACTIC
SEMANTIC
N/A
0 0 1 0 3 2 3 3 2 2 4 1 0 5
0 1 0 0 0 0 3 0 0 0 1 1 0 1
1 2 0 1 1 0 2 1 0 0 2 0 1 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
5
4
3
2
1
0

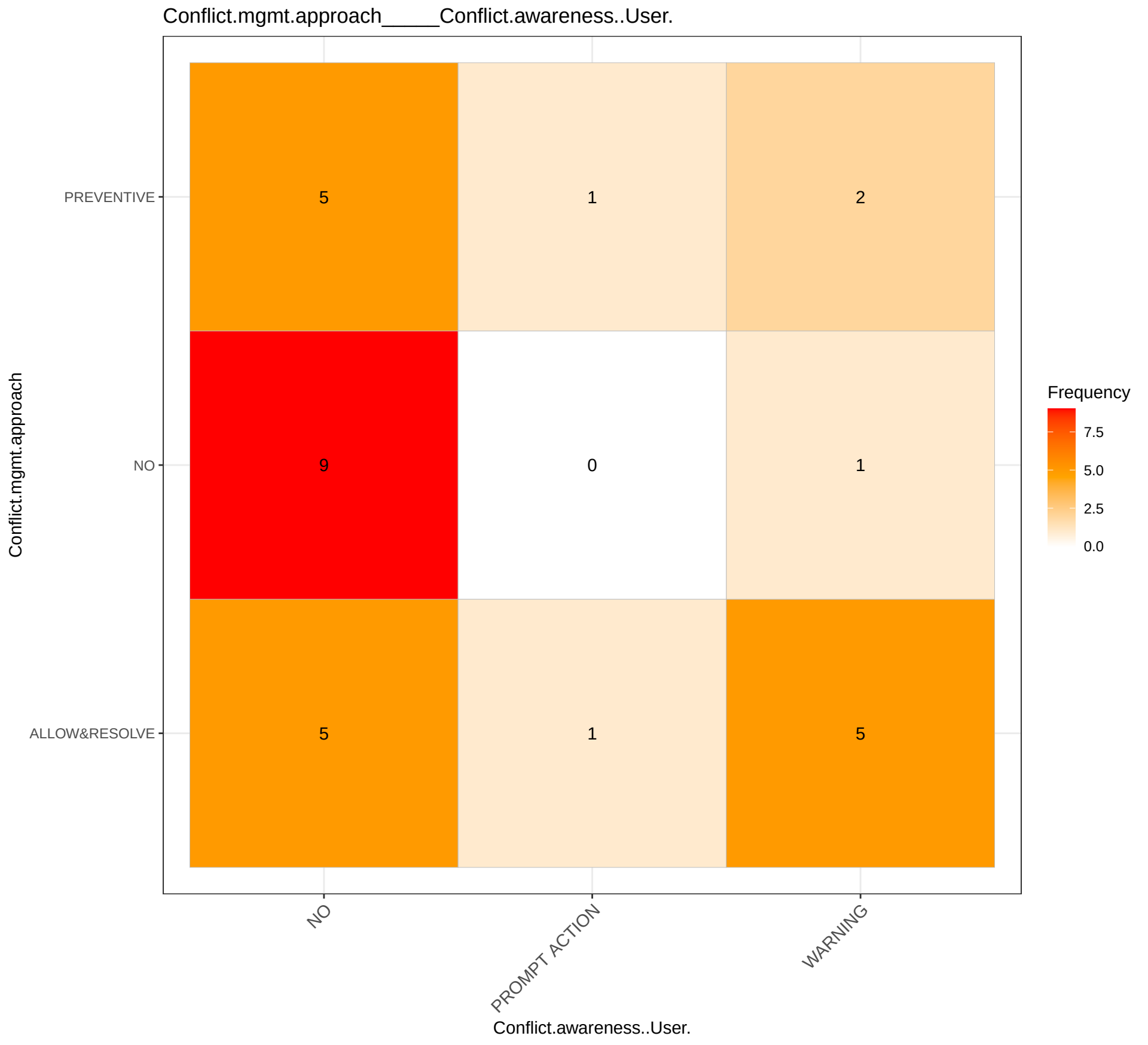

Diff.merge.domain_____Workspace.awareness.score
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
6
8
3
1
3
1
4
2
1
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0

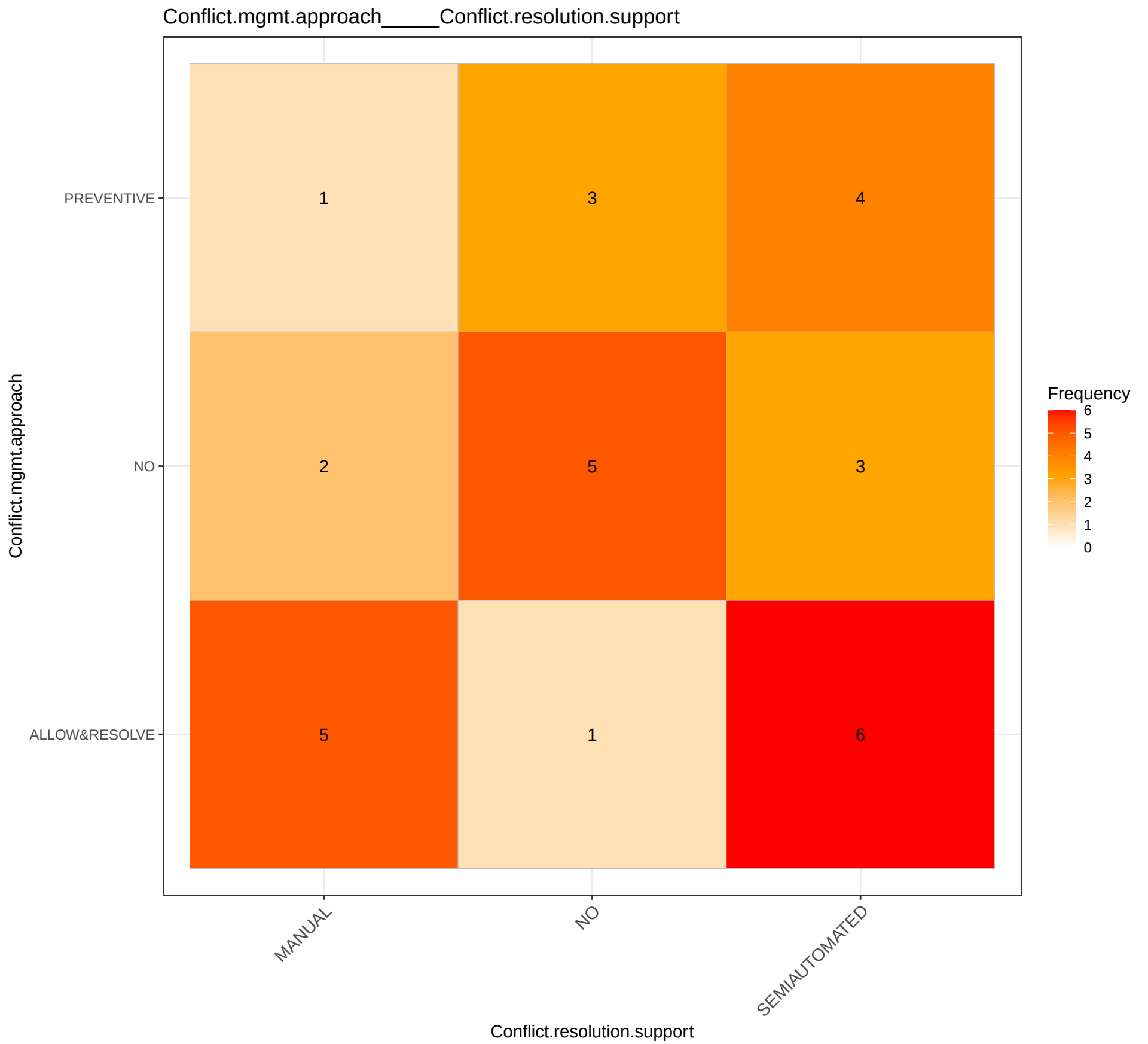

Diff.merge.domain_____Evaluation
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
8
2
7
5
0
0
3
2
2
0
2
4
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
8
6
4
2
0

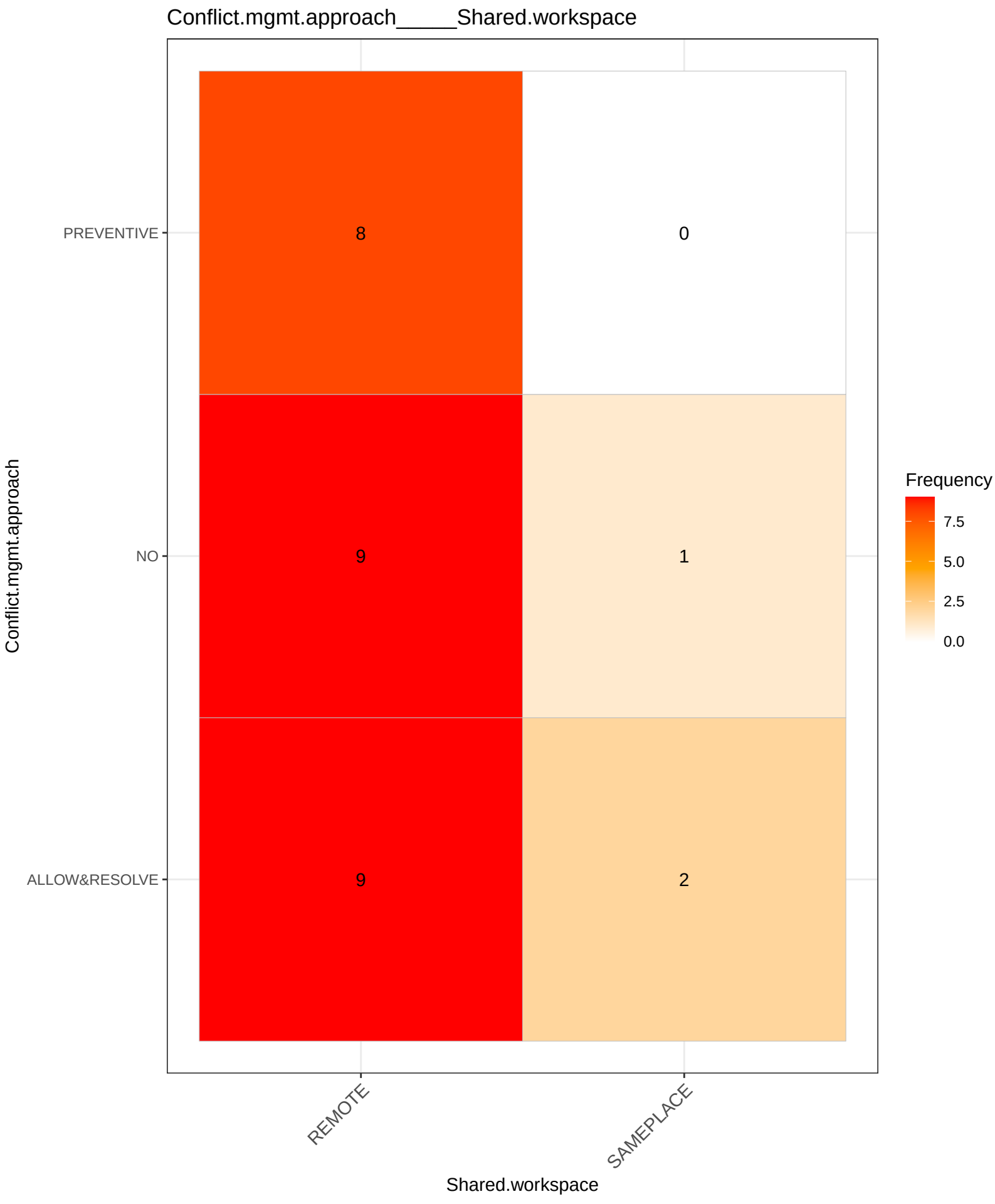

Diff.merge.domain_____Tool.availability
SYNTACTIC
SEMANTIC
N/A
Diff.merge.domain
2
15
3
2
2
5
NO
YES
Tool.availability
Frequency
15
10
5
0

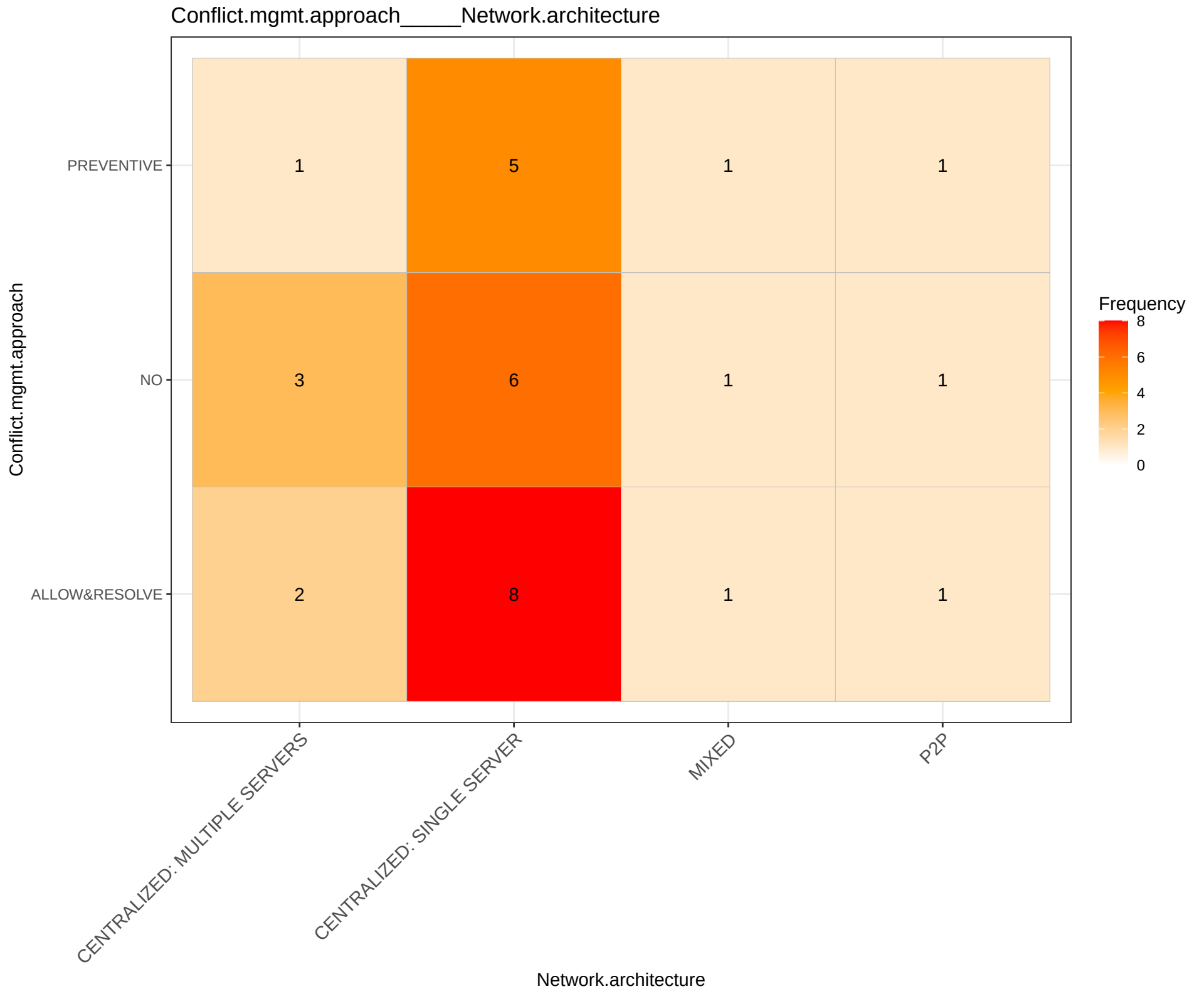

Diff.merge.domain_____Quality.of.the.research
Diff.merge.domain
SYNTACTIC
SEMANTIC
N/A
1 1 1 0 5 3 10 4 3
0 0 0 0 0 0 1 0 4
0 1 3 1 0 0 3 0 1
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

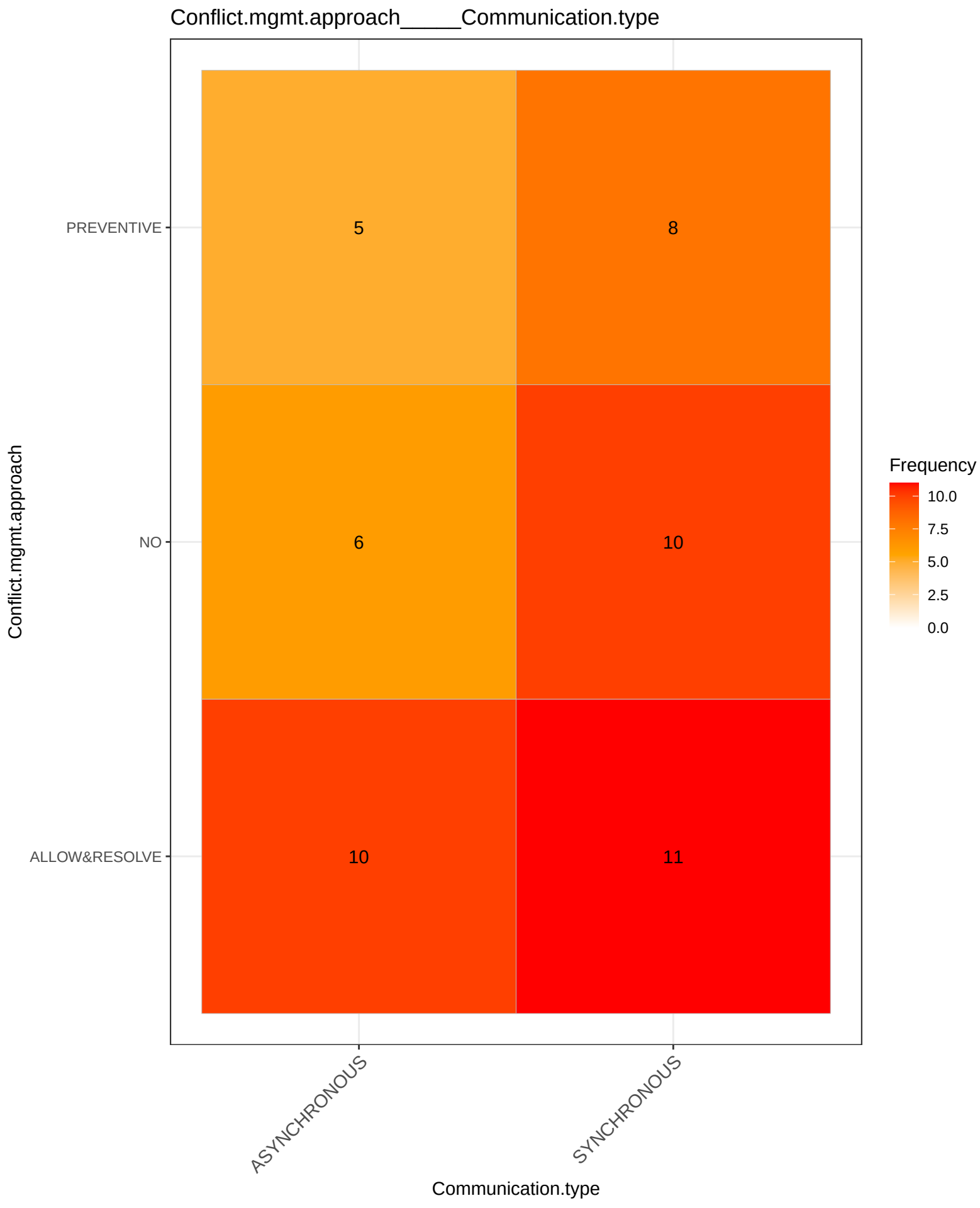

Conflict.mgmt.approach_____Conflict.detection
PREVENTIVE
NO
ALLOW&RESOLVE
2
6
3
8
2
1
3
8
3
Conflict.mgmt.approach
NO
YES
YES: INCREMENTAL
Conflict.detection
Frequency
8
6
4
2
0

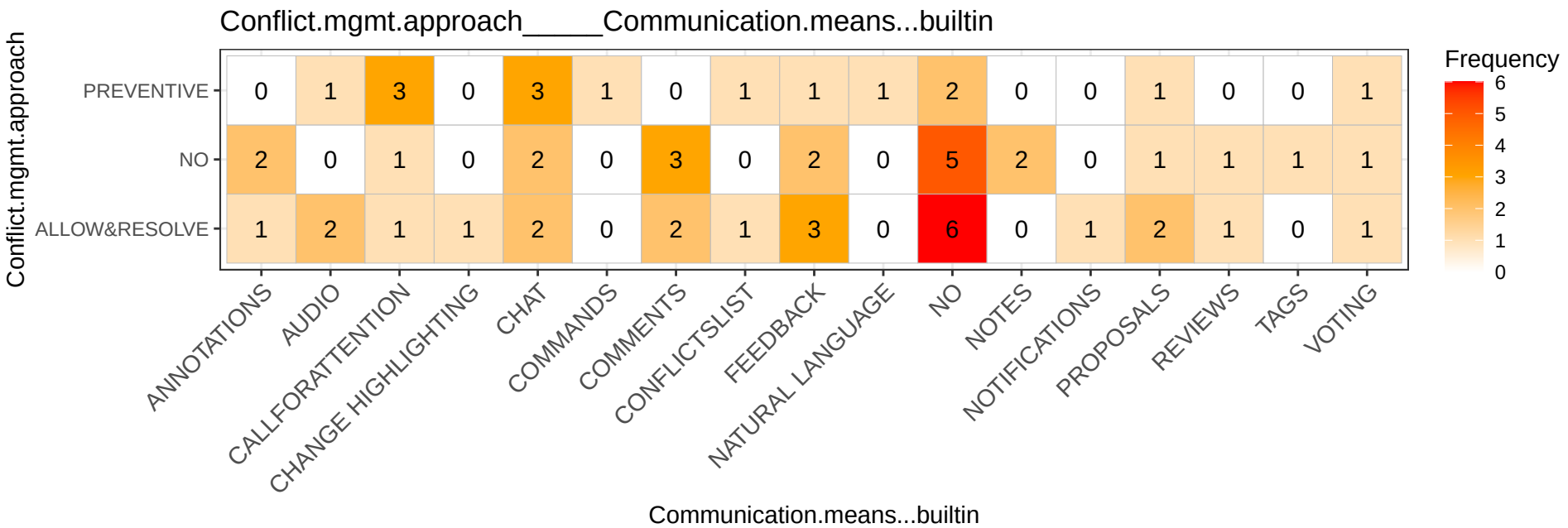

Conflict.mgmt.approach_____Conflict.awareness..User.
PREVENTIVE
NO
ALLOW&RESOLVE
5
1
2
9
0
1
5
1
5
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Conflict.mgmt.approach
Frequency
7.5
5.0
2.5
0.0

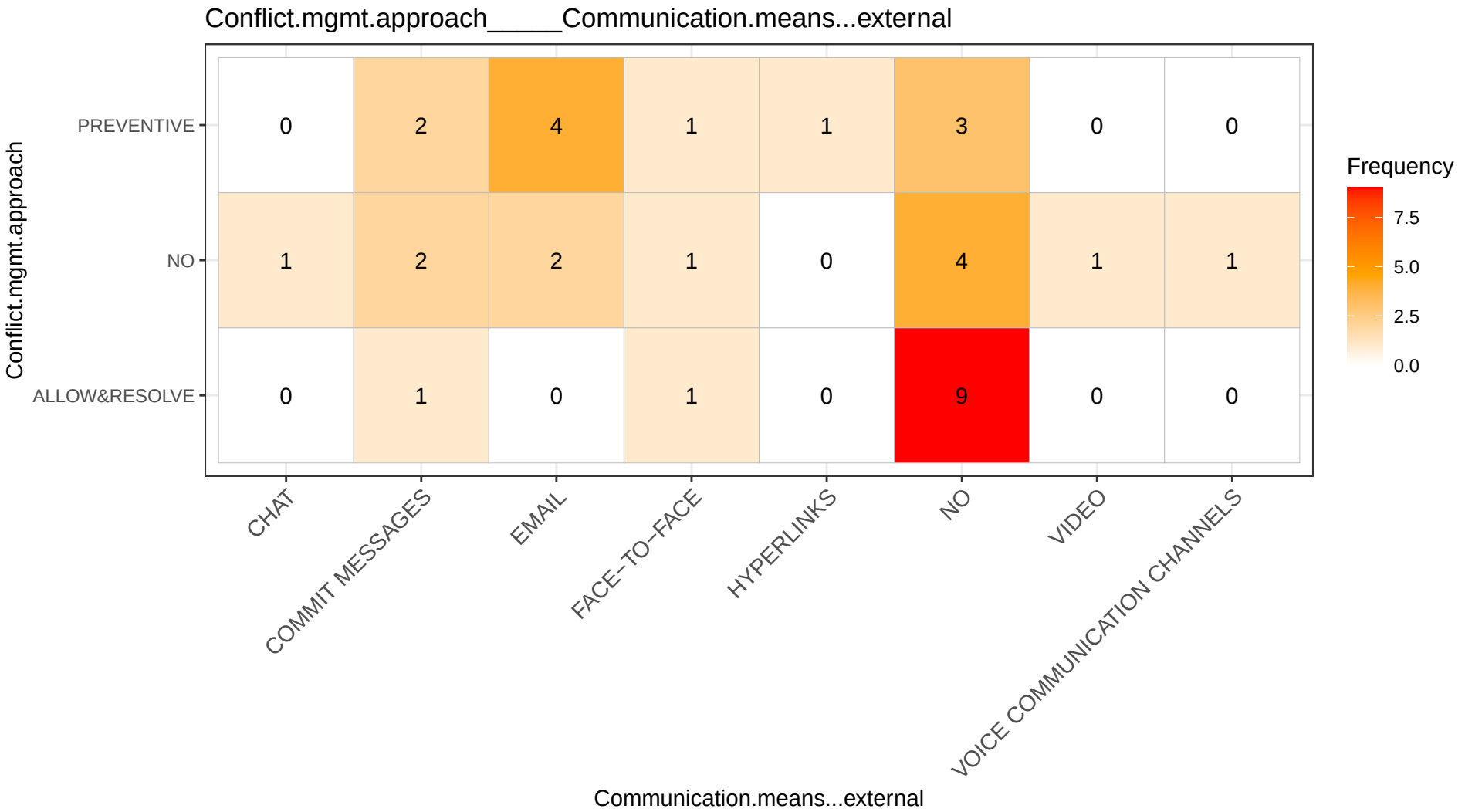

Conflict.mgmt.approach_____Conflict.resolution.support
PREVENTIVE
NO
ALLOW&RESOLVE
1
3
4
2
5
3
5
1
6
MANUAL
NO
SEMIAUTOMATED
Conflict.mgmt.approach
Conflict.resolution.support
Frequency
6
5
4
3
2
1
0

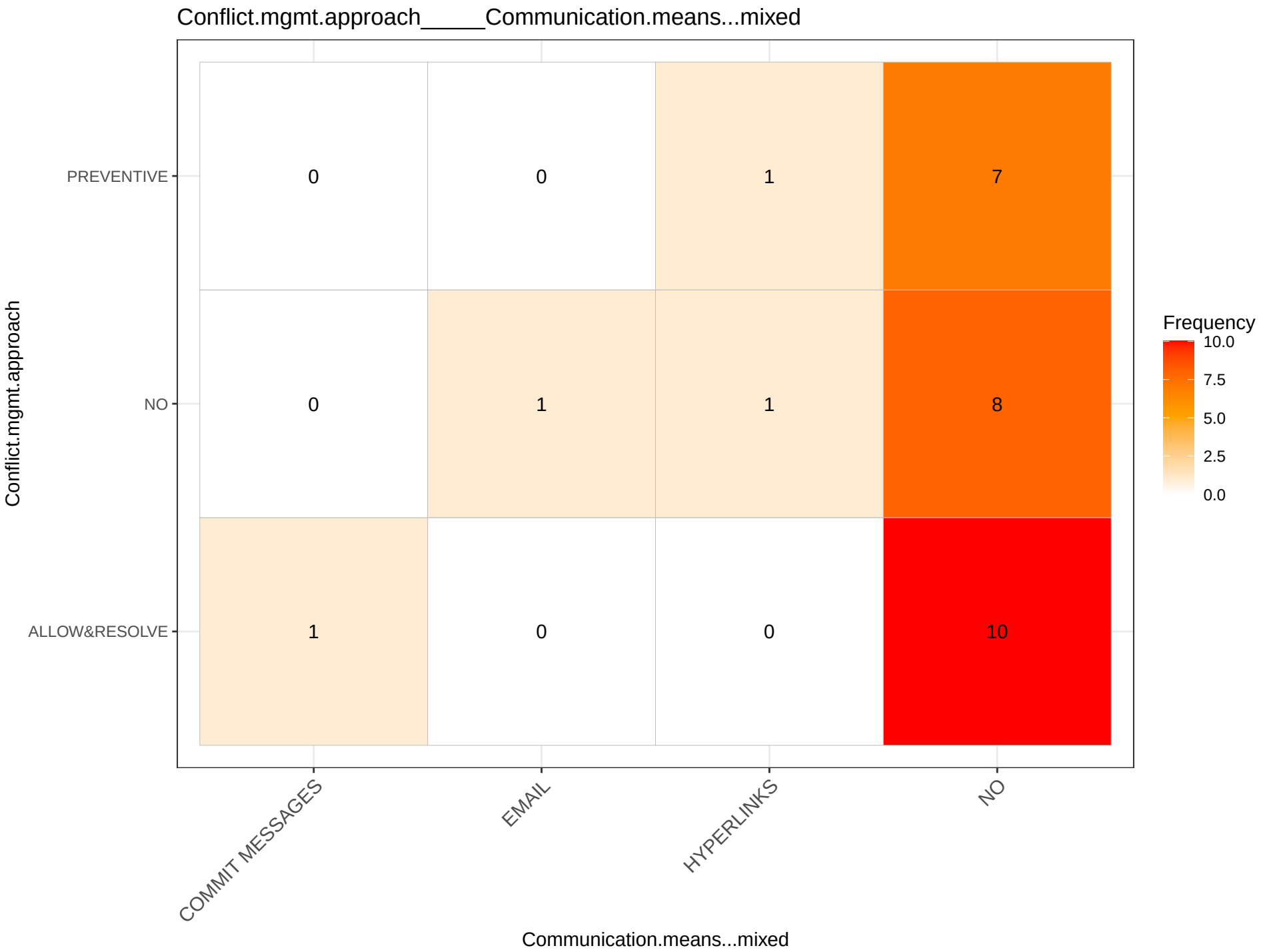

Conflict.mgmt.approach_____Shared.workspace
PREVENTIVE
NO
ALLOW&RESOLVE
8
0
9
1
9
2
Conflict.mgmt.approach
REMOTE
SAMEPLACE
Shared.workspace
Frequency
7.5
5.0
2.5
0.0

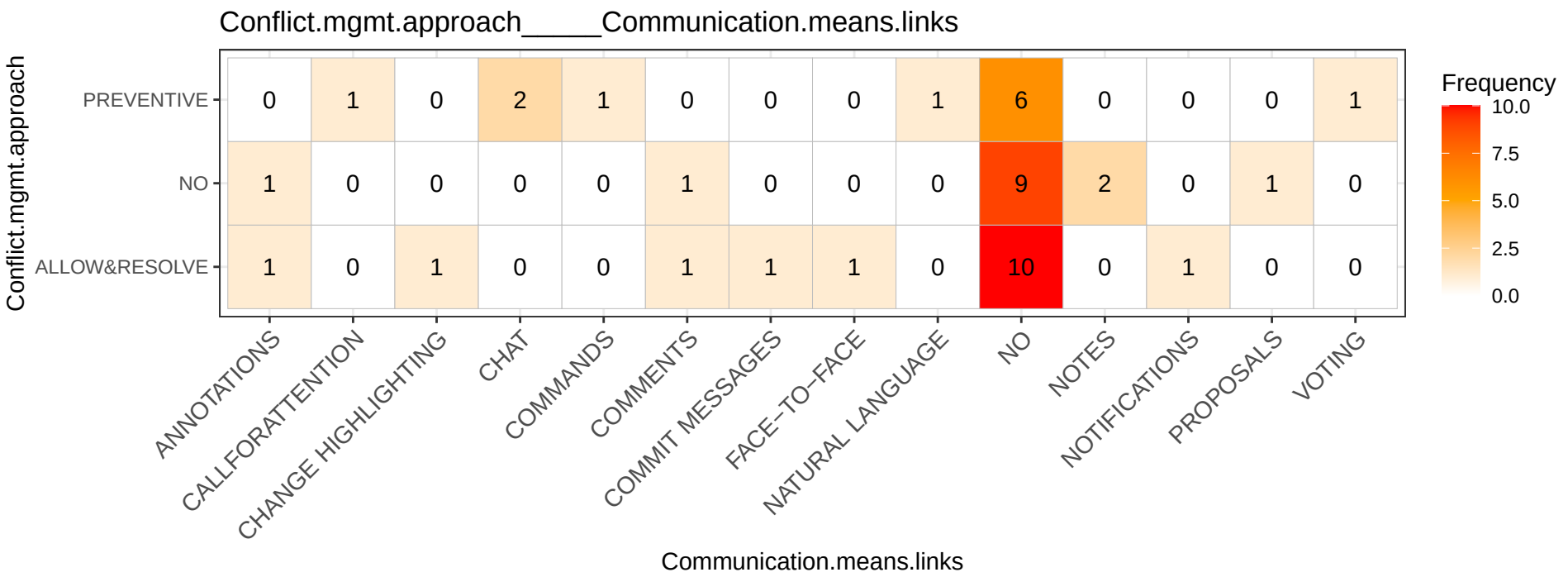

Conflict.mgmt.approach_____Network.architecture
PREVENTIVE
NO
ALLOW&RESOLVE
Conflict.mgmt.approach
1
5
1
1
3
6
1
1
2
8
1
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
8
6
4
2
0

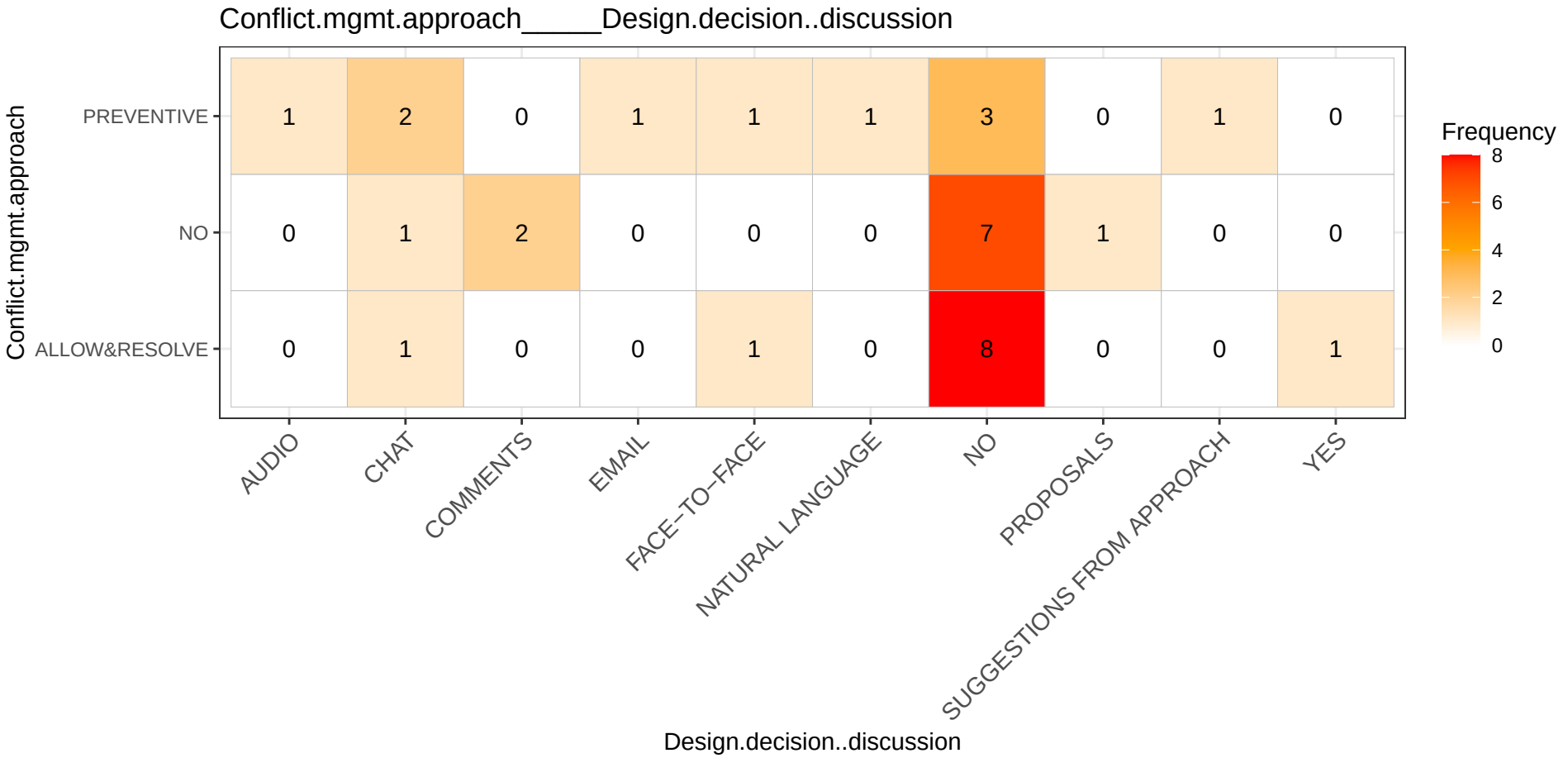

Conflict.mgmt.approach_____Communication.type
PREVENTIVE
NO
ALLOW&RESOLVE
5
8
6
10
10
11
Conflict.mgmt.approach
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
10.0
7.5
5.0
2.5
0.0

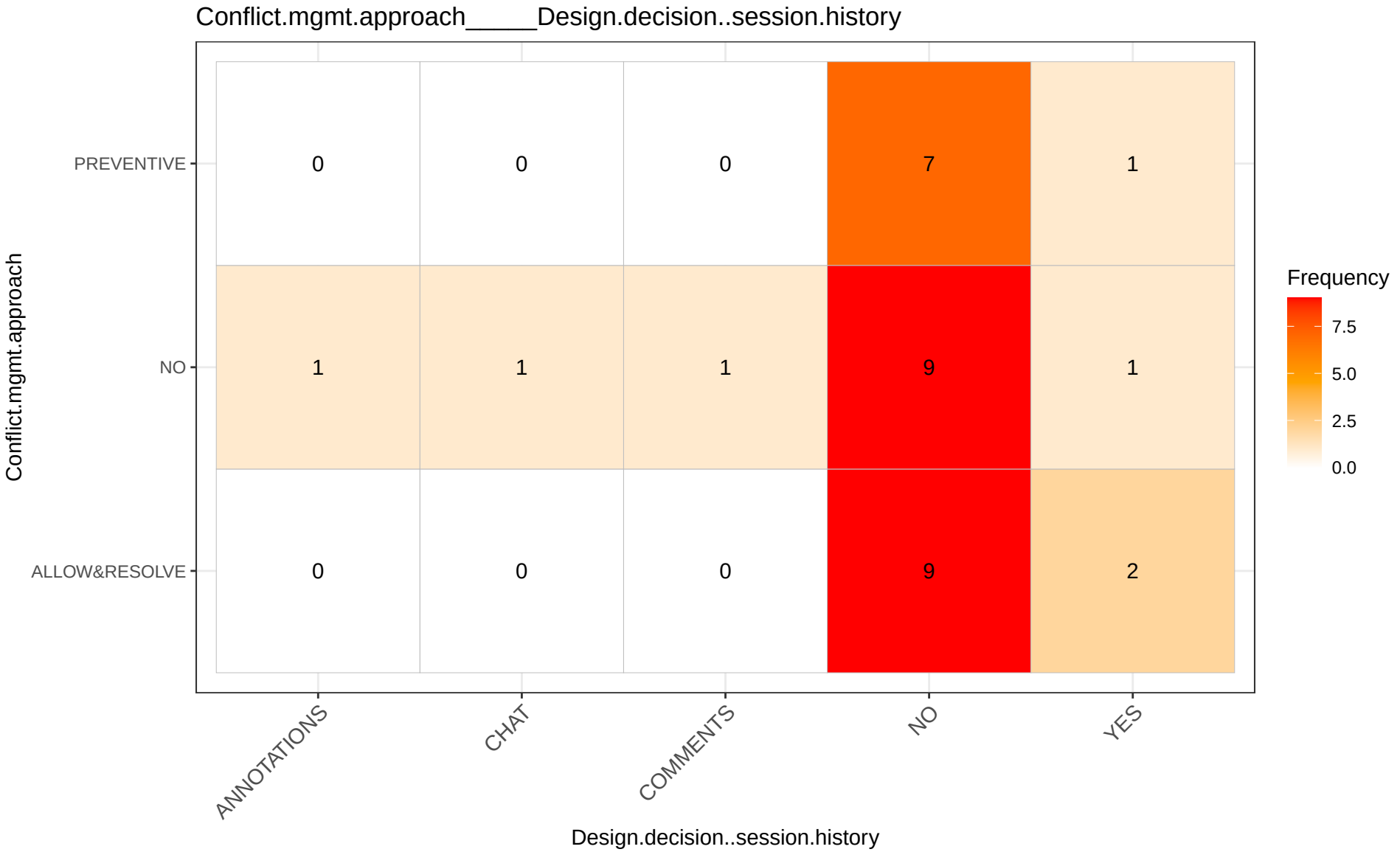

Conflict.mgmt.approach_____Communication.means...builtin
Conflict.mgmt.approach
PREVENTIVE
NO
ALLOW&RESOLVE
0 1 3 0 3 1 0 1 1 1 2 0 0 1 0 0 1
2 0 1 0 2 0 3 0 2 0 5 2 0 1 1 1 1
1 2 1 1 2 0 2 1 3 0 6 0 1 2 1 0 1
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
5
4
3
2
1
0

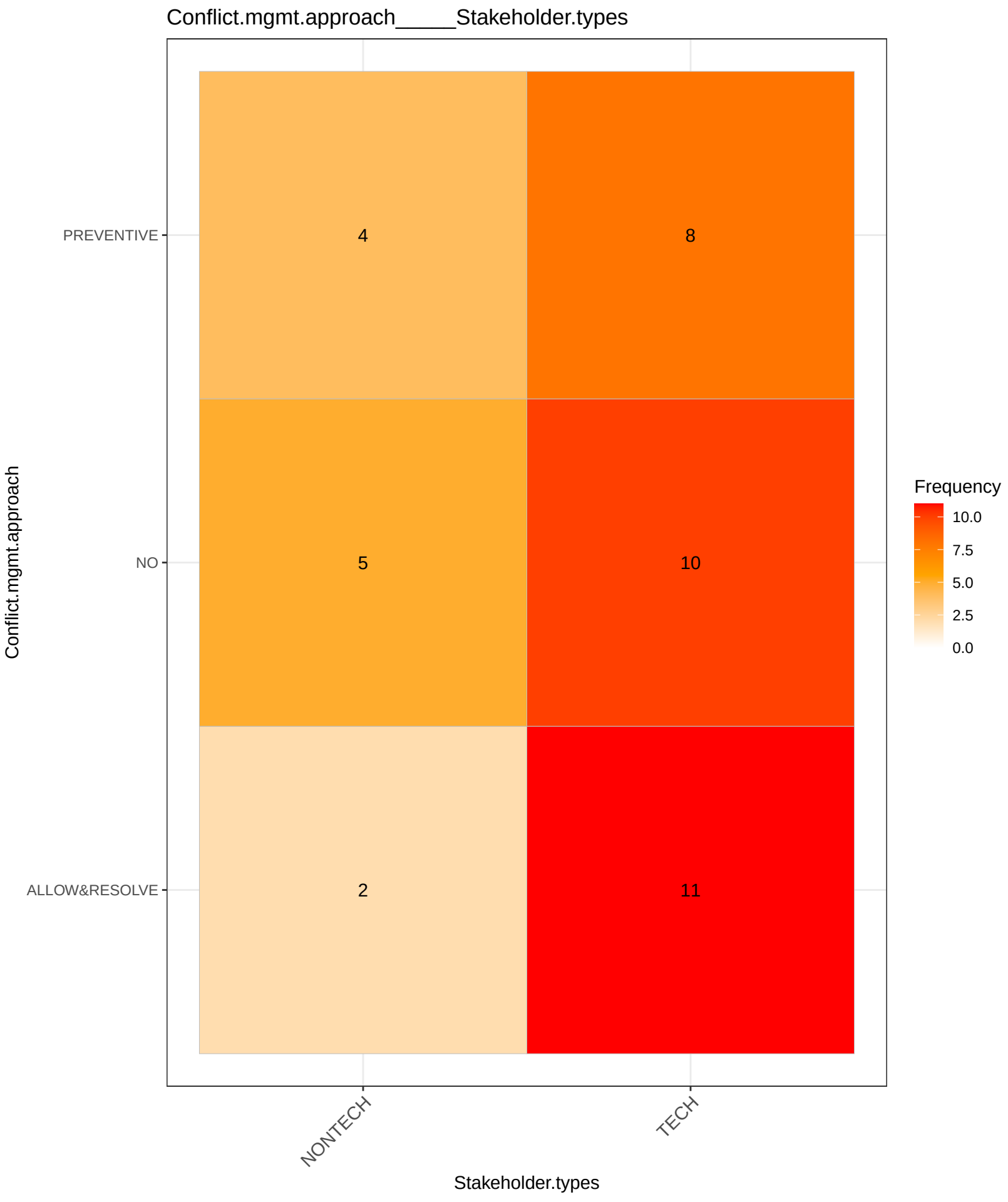

Conflict.mgmt.approach_____Communication.means...external
Conflict.mgmt.approach
PREVENTIVE
NO
ALLOW&RESOLVE
0 2 4 1 1 3 0 0
1 2 2 1 0 4 1 1
0 1 0 1 0 9 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE-TO-FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
7.5
5.0
2.5
0.0

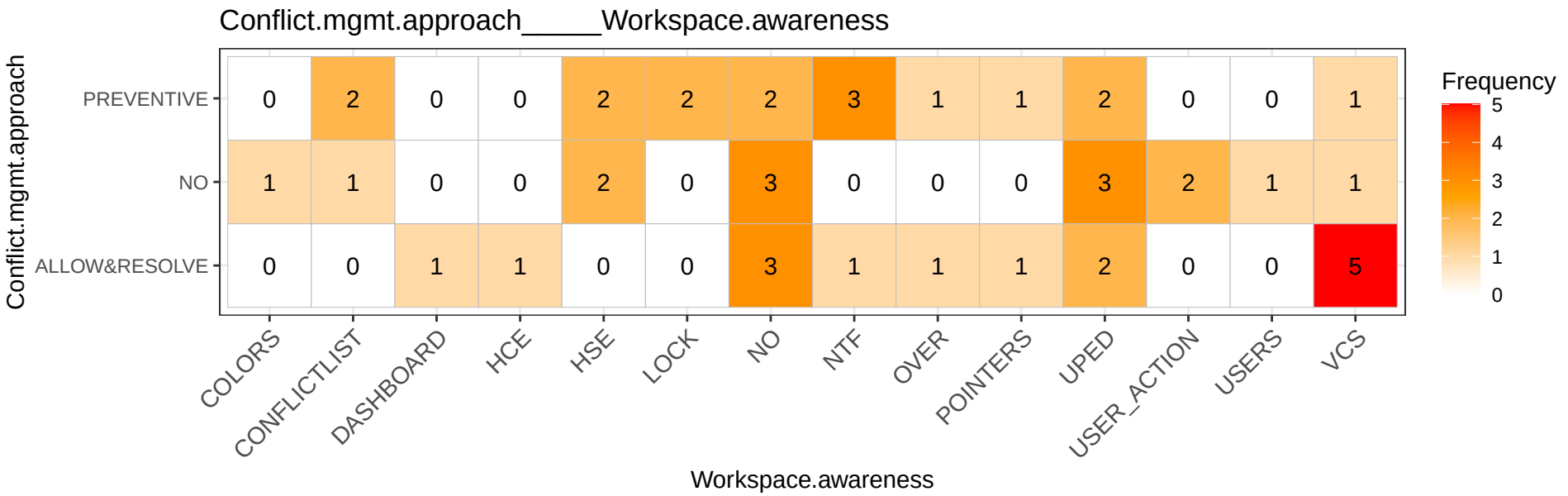

Conflict.mgmt.approach_____Communication.means...mixed
PREVENTIVE
NO
ALLOW&RESOLVE
Conflict.mgmt.approach
0
0
1
7
0
1
1
8
1
0
0
10
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
10.0
7.5
5.0
2.5
0.0

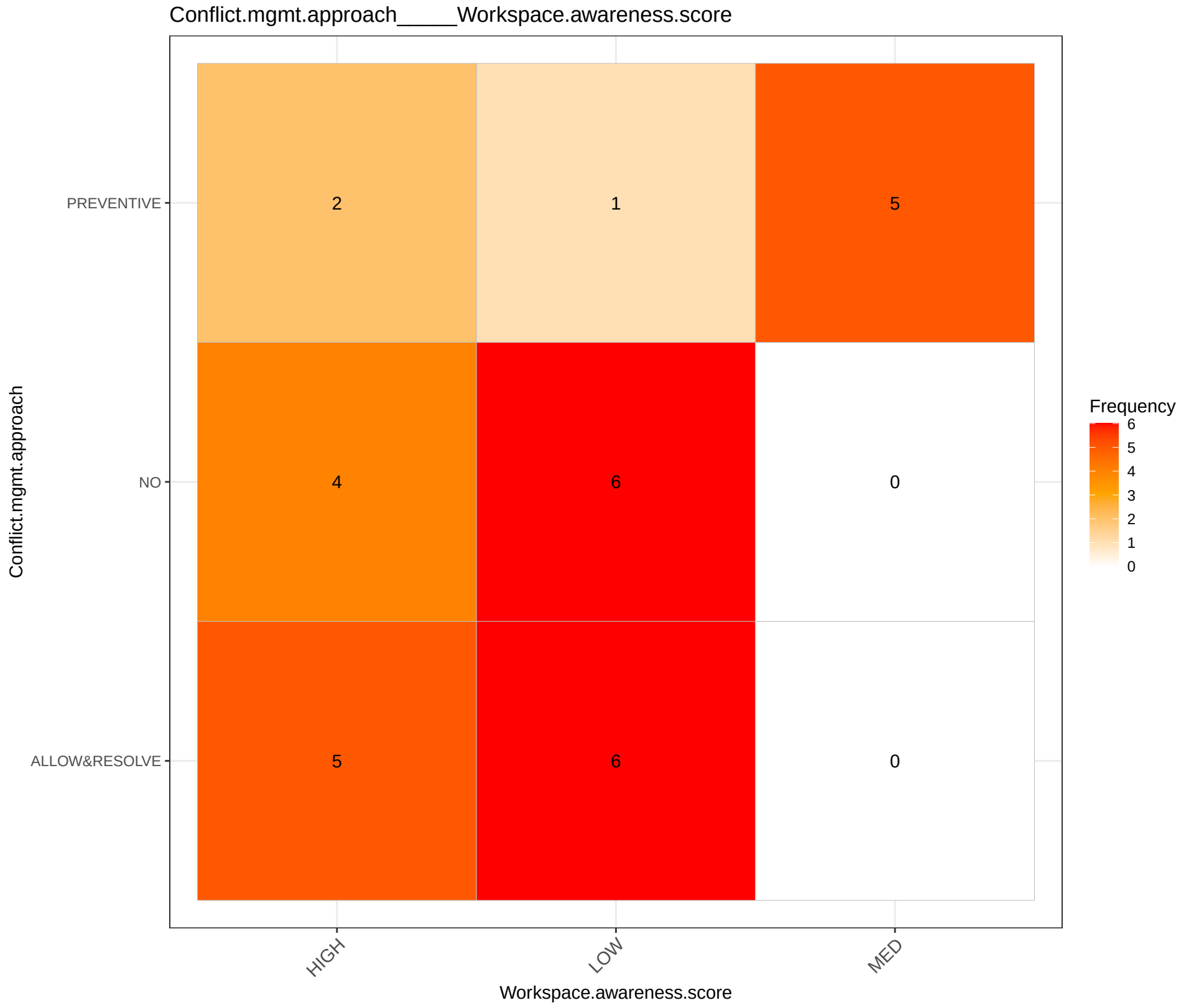

Conflict.mgmt.approach_____Communication.means.links
Conflict.mgmt.approach
PREVENTIVE
NO
ALLOW&RESOLVE
0 1 0 2 1 0 0 0 1 6 0 0 0 1
1 0 0 0 0 1 0 0 0 9 2 0 1 0
1 0 1 0 0 1 1 1 0 10 0 1 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
10.0
7.5
5.0
2.5
0.0

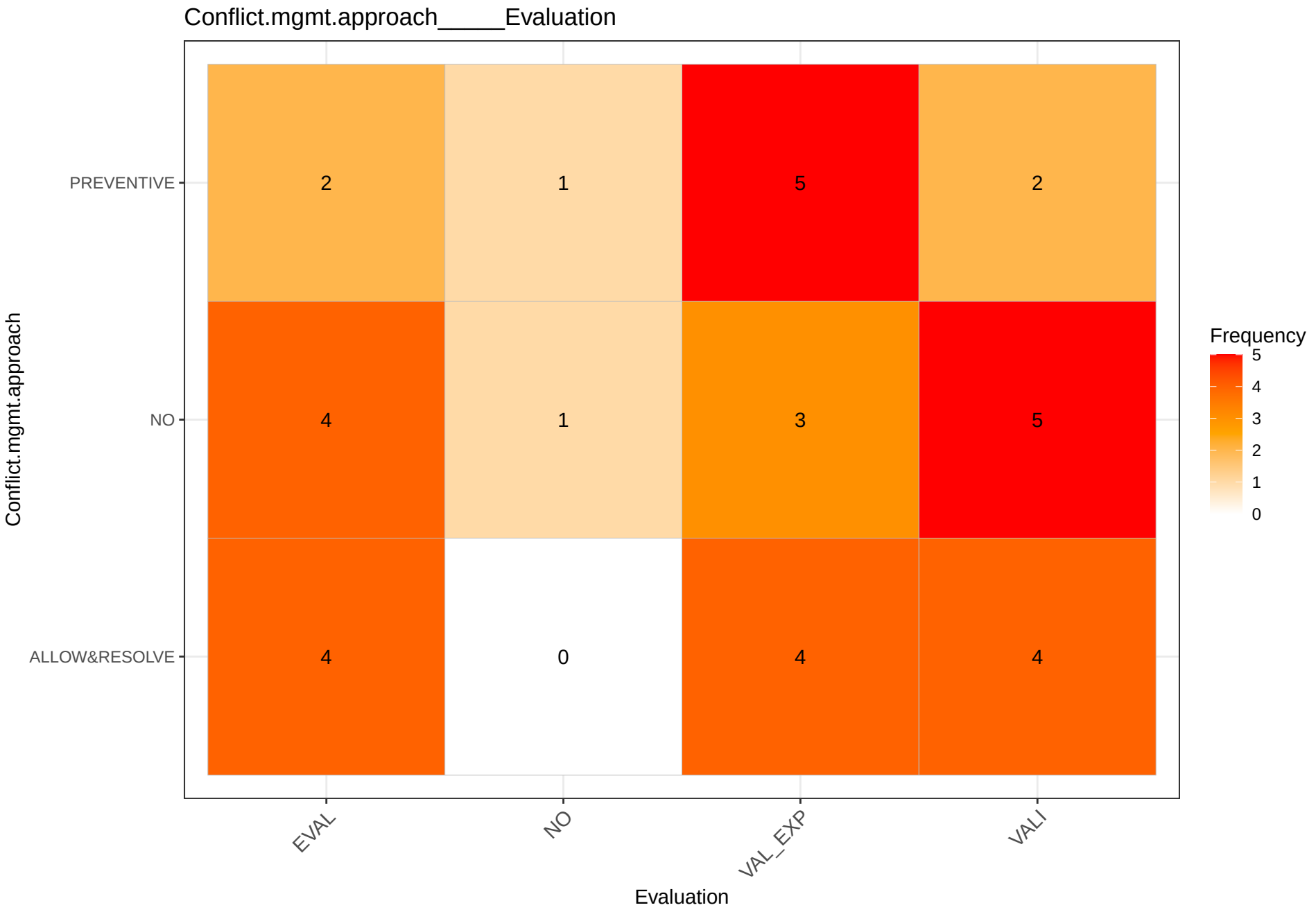

Conflict.mgmt.approach_____Design.decision..discussion
Conflict.mgmt.approach
PREVENTIVE
NO
ALLOW&RESOLVE
1 2 0 1 1 1 3 0 1 0
0 1 2 0 0 0 7 1 0 0
0 1 0 0 1 0 8 0 0 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
8
6
4
2
0

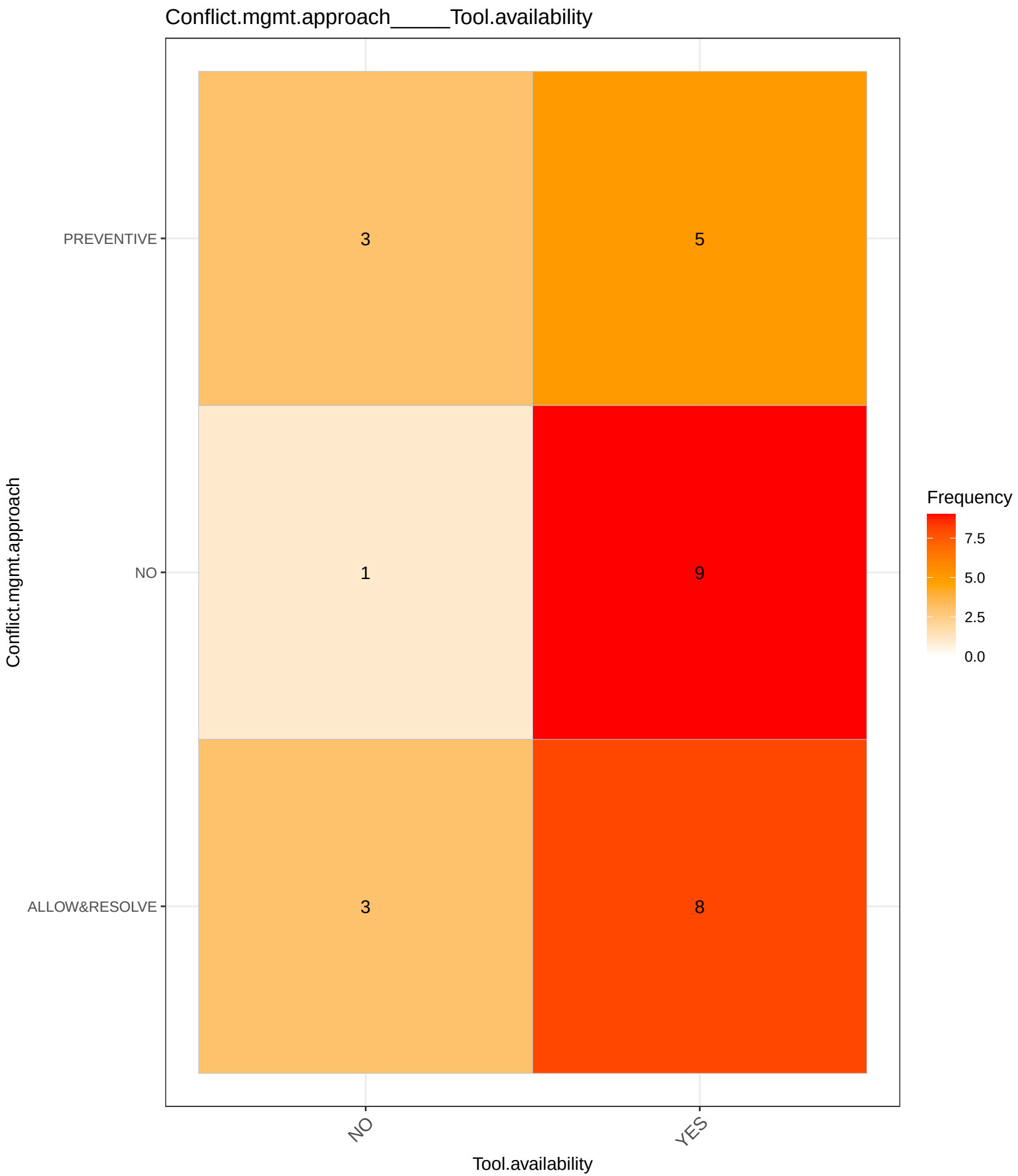

Conflict.mgmt.approach_____Design.decision..session.history
PREVENTIVE
NO
ALLOW&RESOLVE
0
0
0
7
1
1
1
1
9
1
0
0
0
9
2
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Conflict.mgmt.approach
Frequency
7.5
5.0
2.5
0.0

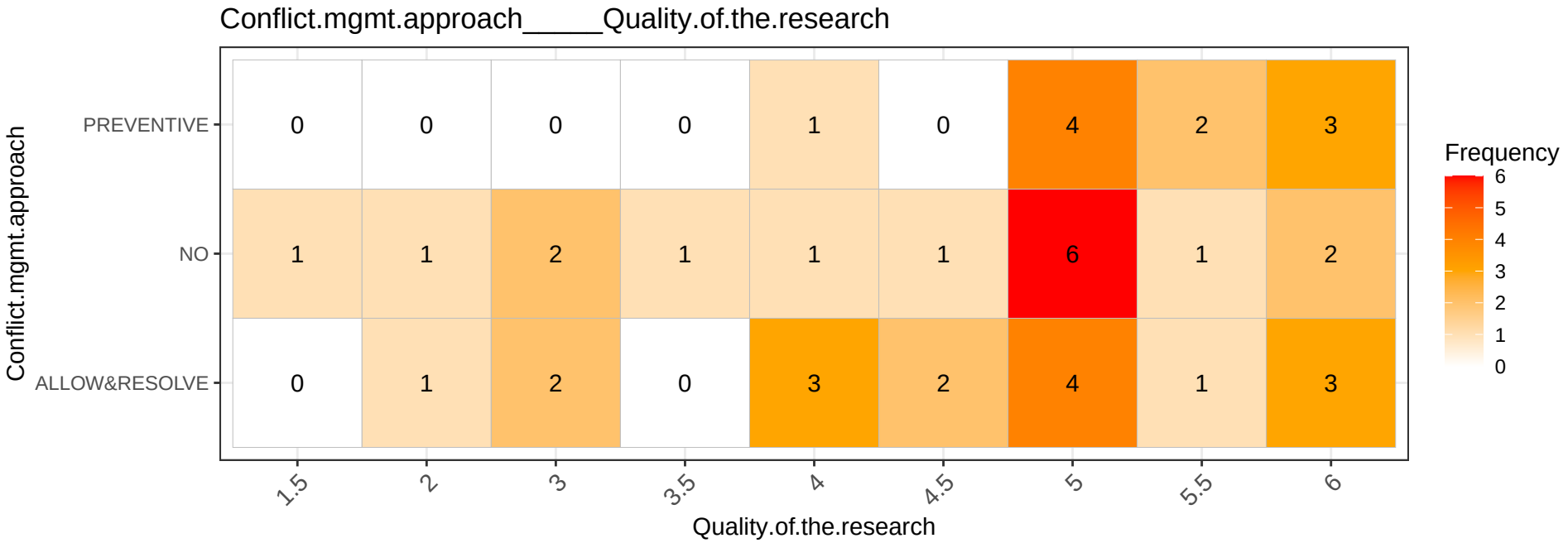

Conflict.mgmt.approach_____Stakeholder.types
PREVENTIVE
NO
ALLOW&RESOLVE
Conflict.mgmt.approach
4
8
5
10
2
11
NONTECH
TECH
Stakeholder.types
Frequency
10.0
7.5
5.0
2.5
0.0

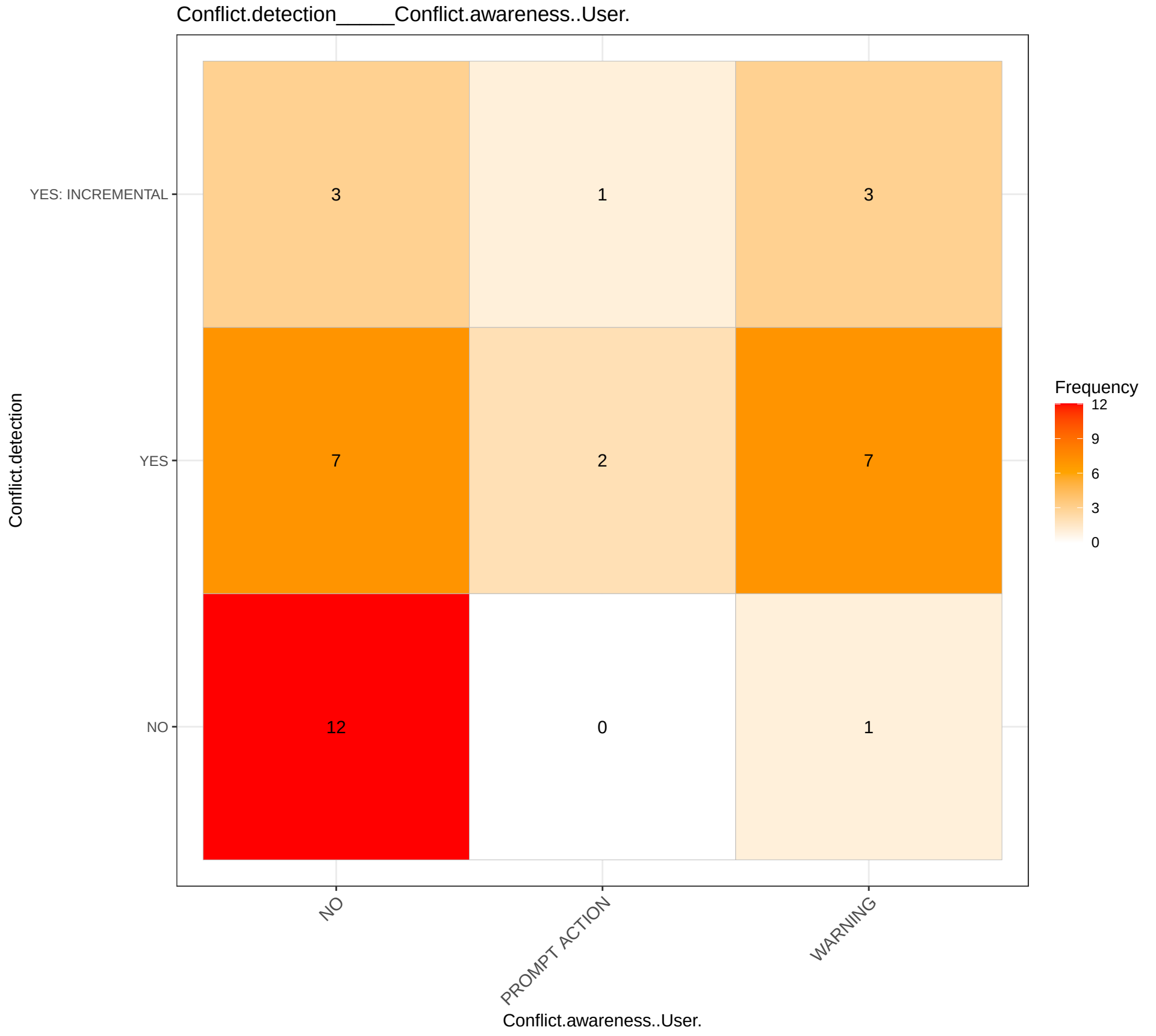

Conflict.mgmt.approach_____Workspace.awareness
Conflict.mgmt.approach
PREVENTIVE
NO
ALLOW&RESOLVE
0 2 0 0 2 2 2 3 1 1 2 0 0 1
1 1 0 0 2 0 3 0 0 0 3 2 1 1
0 0 1 1 0 0 3 1 1 1 2 0 0 5
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
5
4
3
2
1
0

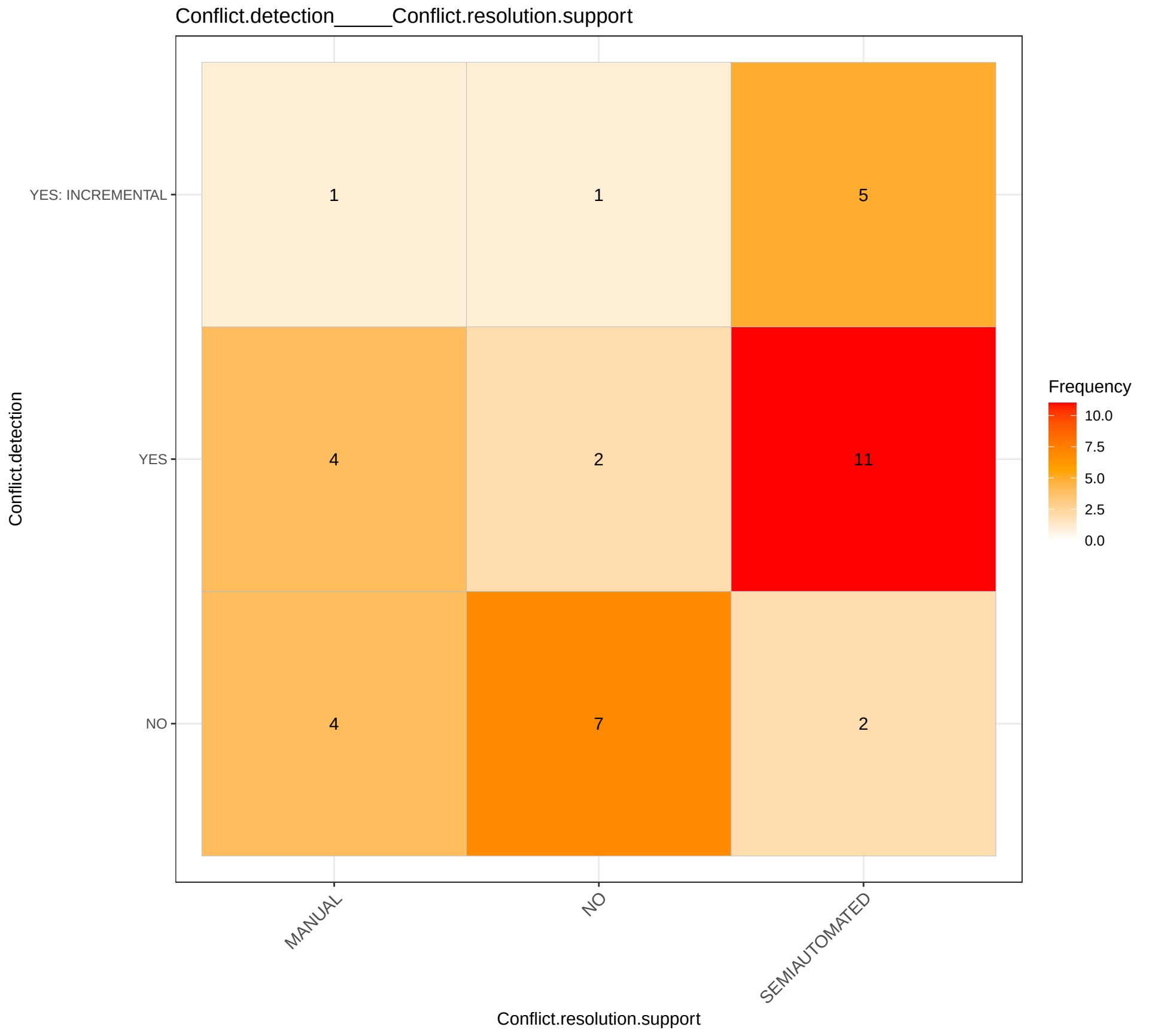

Conflict.mgmt.approach_____Workspace.awareness.score
PREVENTIVE
NO
ALLOW&RESOLVE
Conflict.mgmt.approach
2
1
5
4
6
0
5
6
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
6
5
4
3
2
1
0

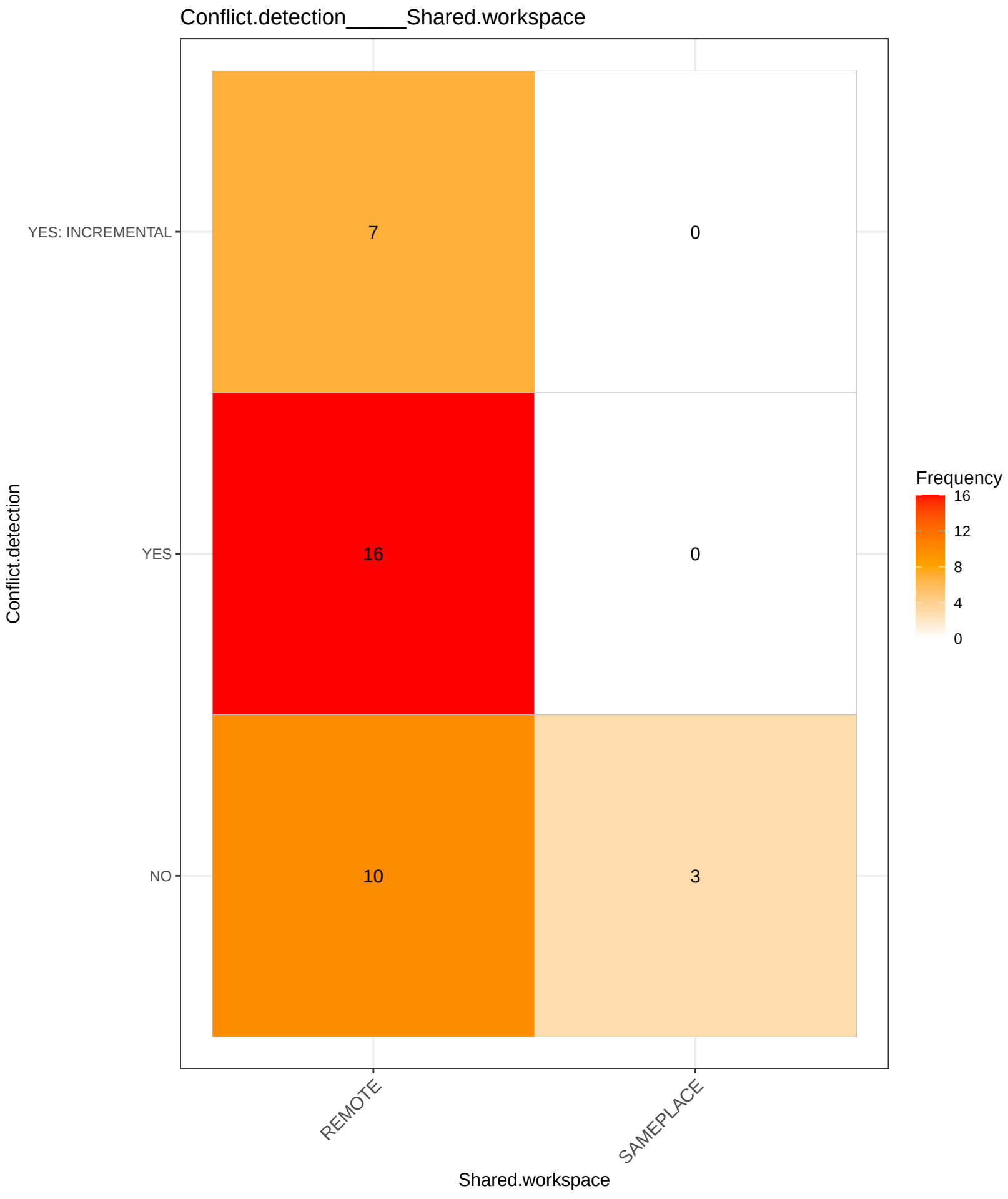

Conflict.mgmt.approach_____Evaluation
PREVENTIVE
NO
ALLOW&RESOLVE
Conflict.mgmt.approach
2
1
5
2
4
1
3
5
4
0
4
4
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
5
4
3
2
1
0

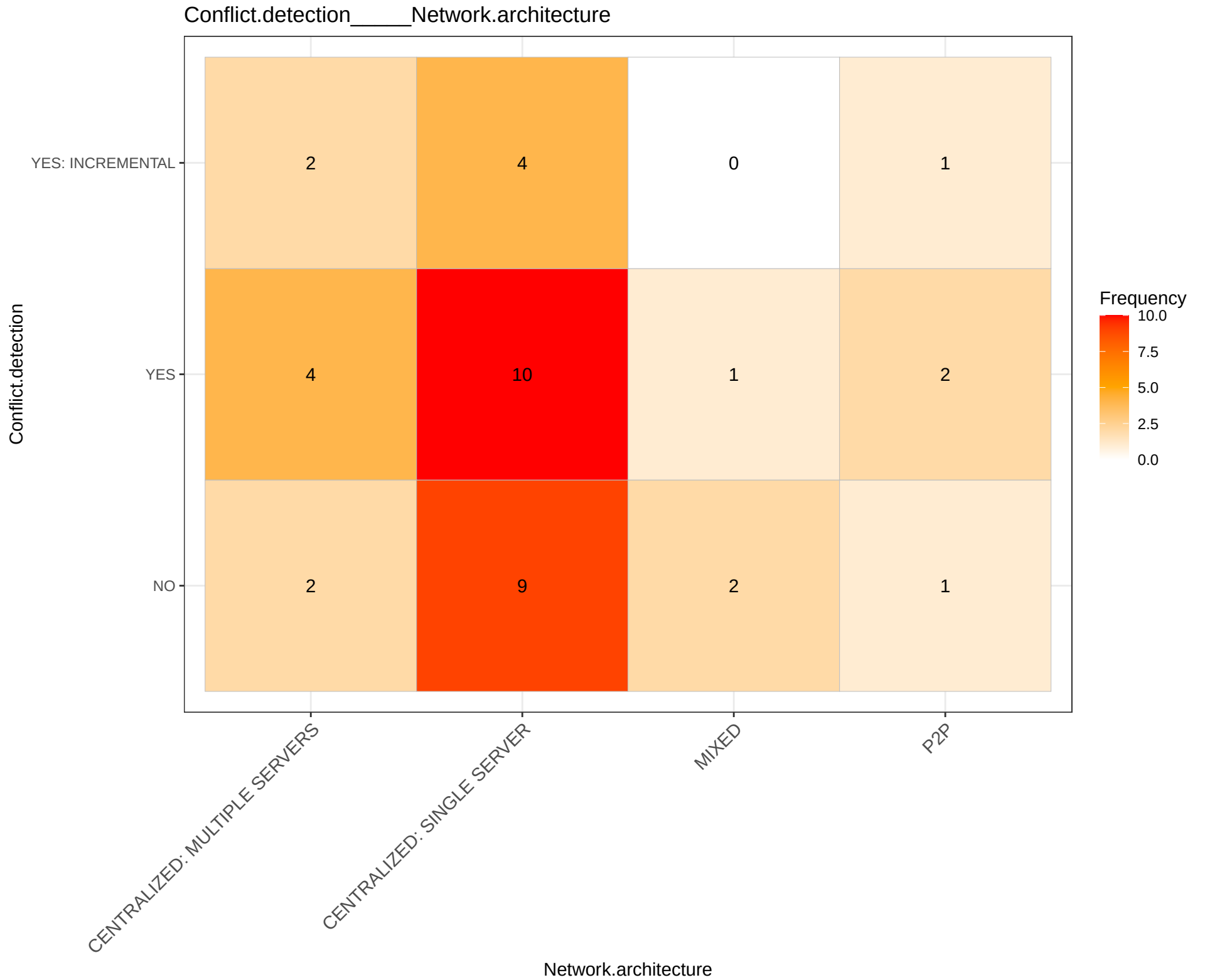

Conflict.mgmt.approach_____Tool.availability
PREVENTIVE
NO
ALLOW&RESOLVE
Conflict.mgmt.approach
3
5
1
9
3
8
NO
YES
Tool.availability
Frequency
7.5
5.0
2.5
0.0

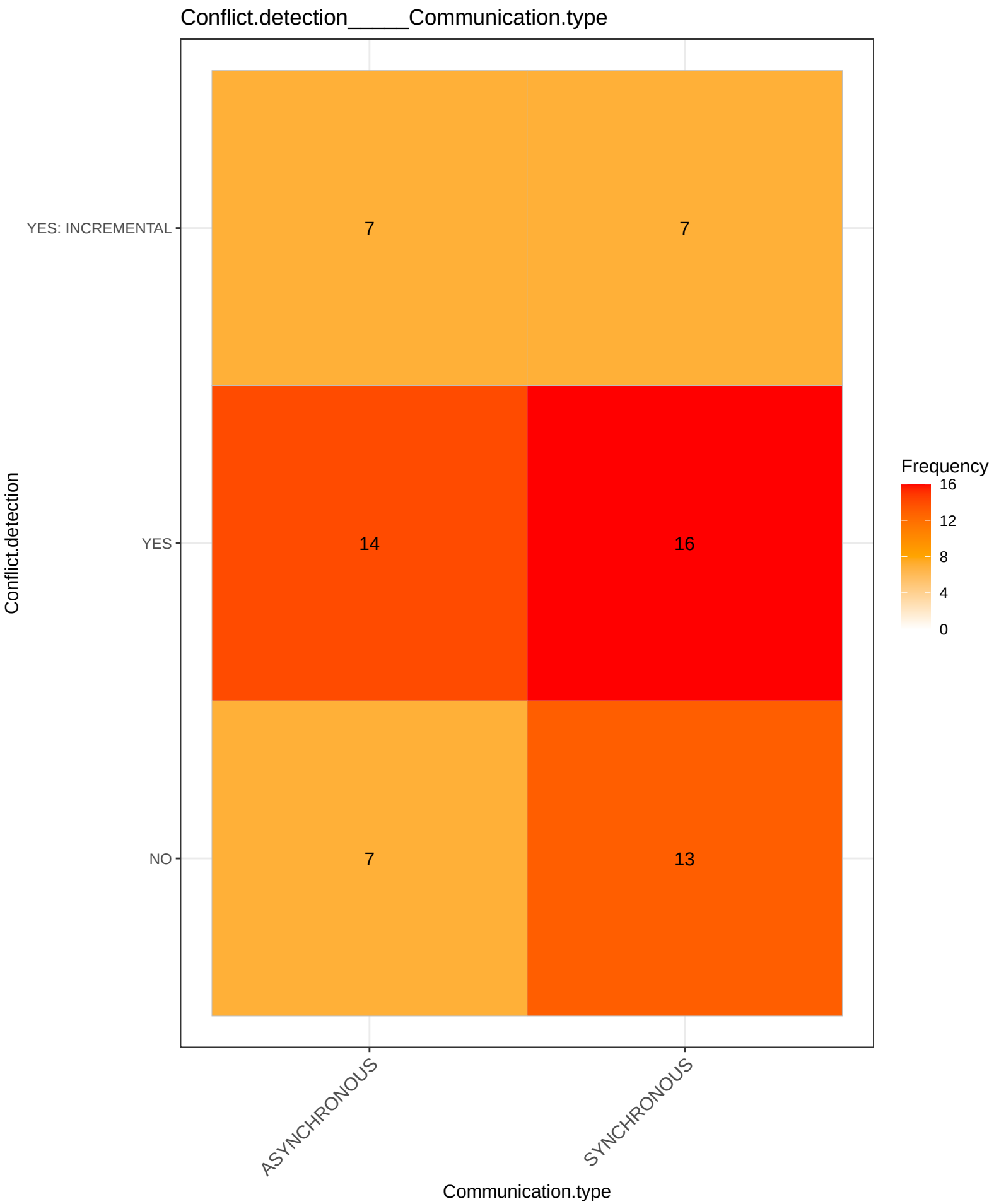

Conflict.mgmt.approach_____Quality.of.the.research
Conflict.mgmt.approach
PREVENTIVE
NO
ALLOW&RESOLVE
0 0 0 0 1 0 4 2 3
1 1 2 1 1 1 6 1 2
0 1 2 0 3 2 4 1 3
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
6 5 4 3 2 1 0

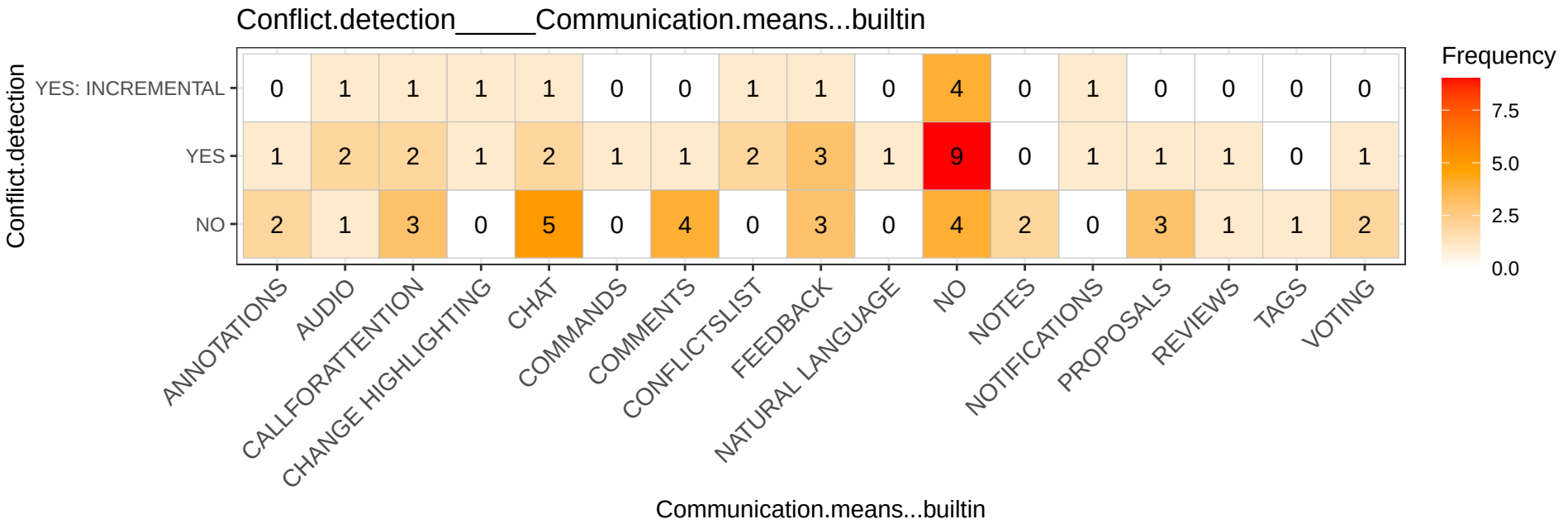

Conflict.detection_____Conflict.awareness..User.
YES: INCREMENTAL
YES
NO
3
1
3
7
2
7
12
0
1
Conflict.detection
NO
PROMPT ACTION
WARNING
Conflict.awareness..User.
Frequency
12
9
6
3
0

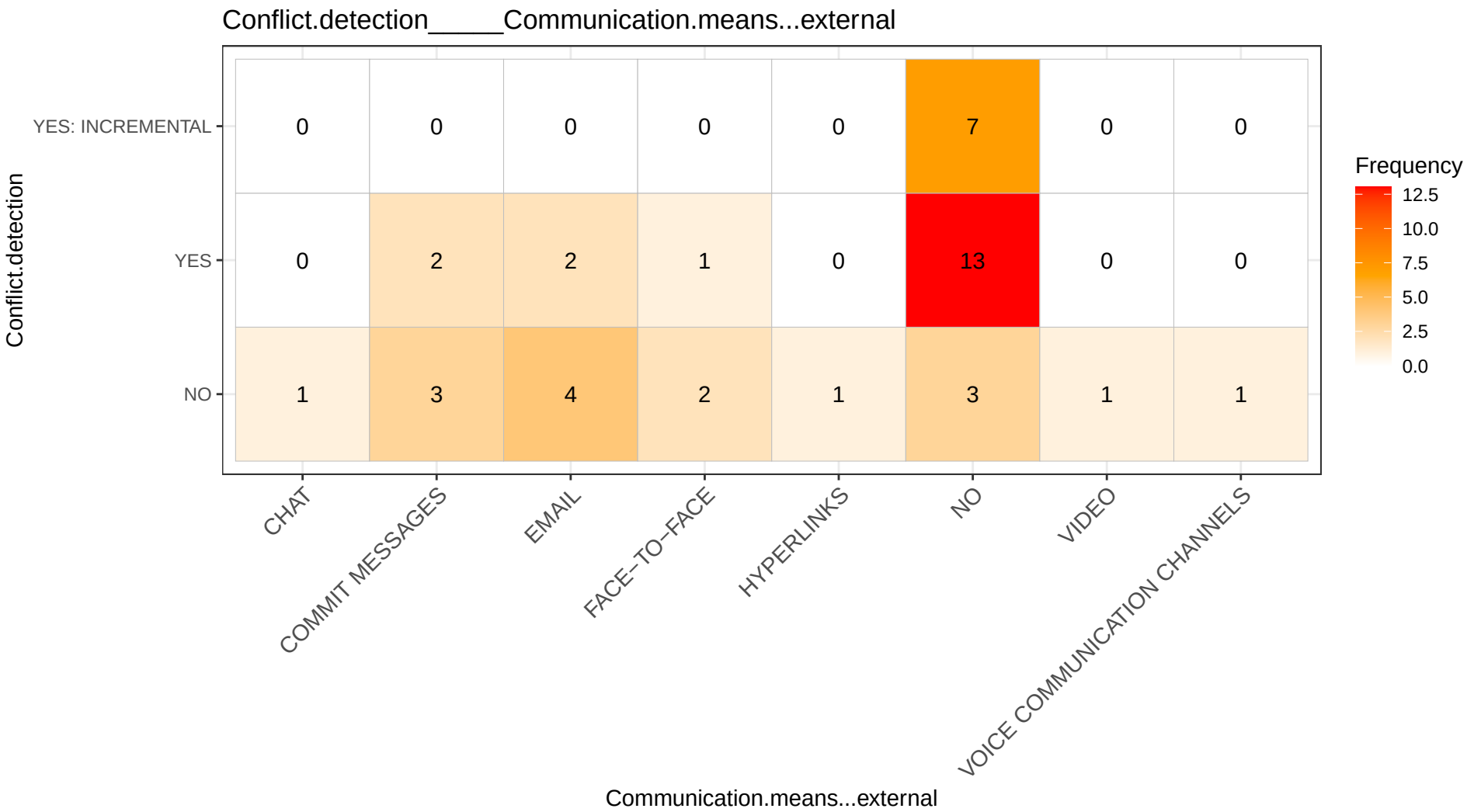

Conflict.detection_____Conflict.resolution.support
YES: INCREMENTAL
YES
NO
1
1
5
4
2
11
4
7
2
MANUAL
NO
SEMIAUTOMATED
Conflict.detection
Conflict.resolution.support
Frequency
10.0
7.5
5.0
2.5
0.0

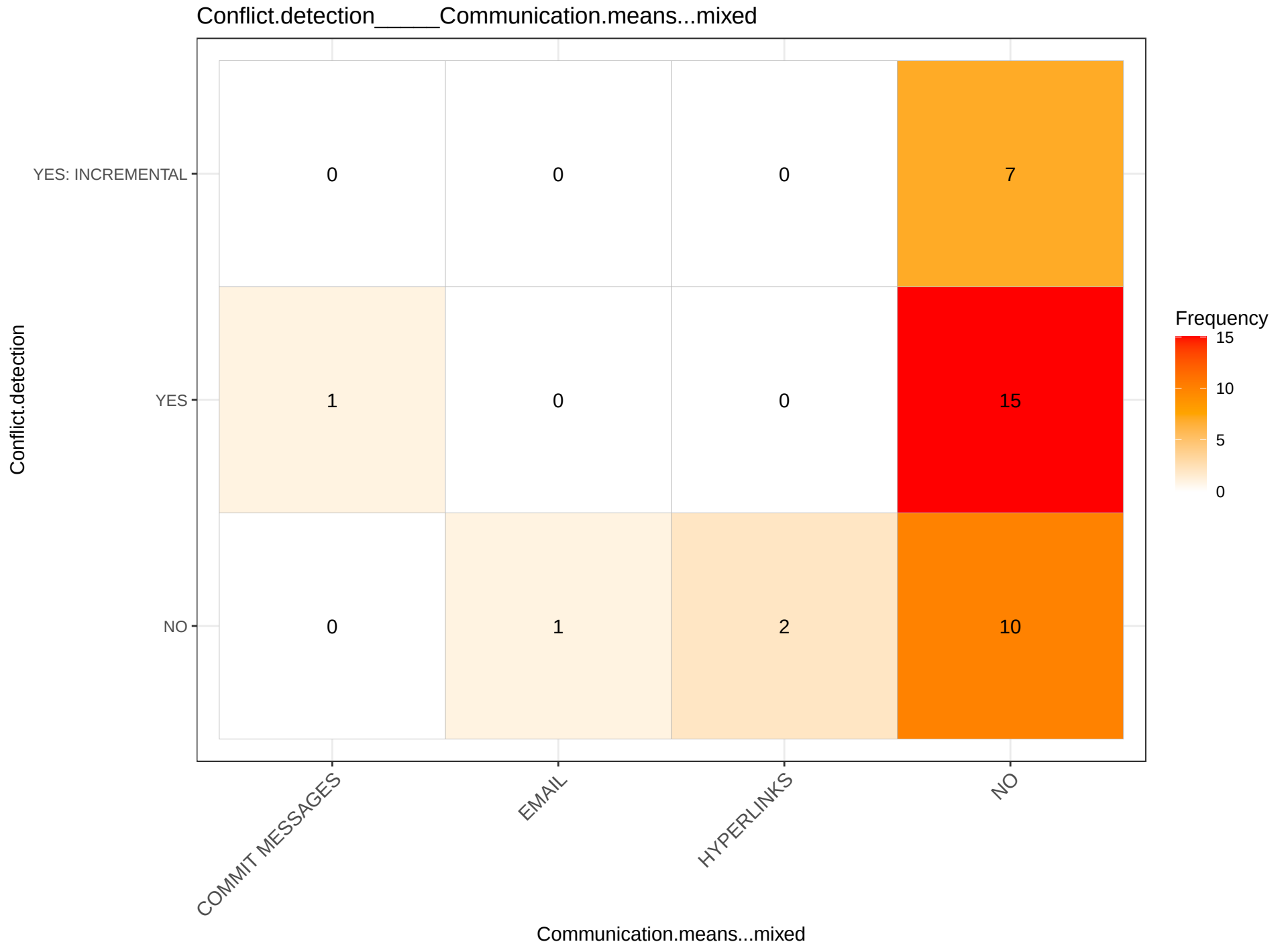

Conflict.detection_____Shared.workspace
YES: INCREMENTAL
YES
NO
7
0
16
0
10
3
Conflict.detection
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

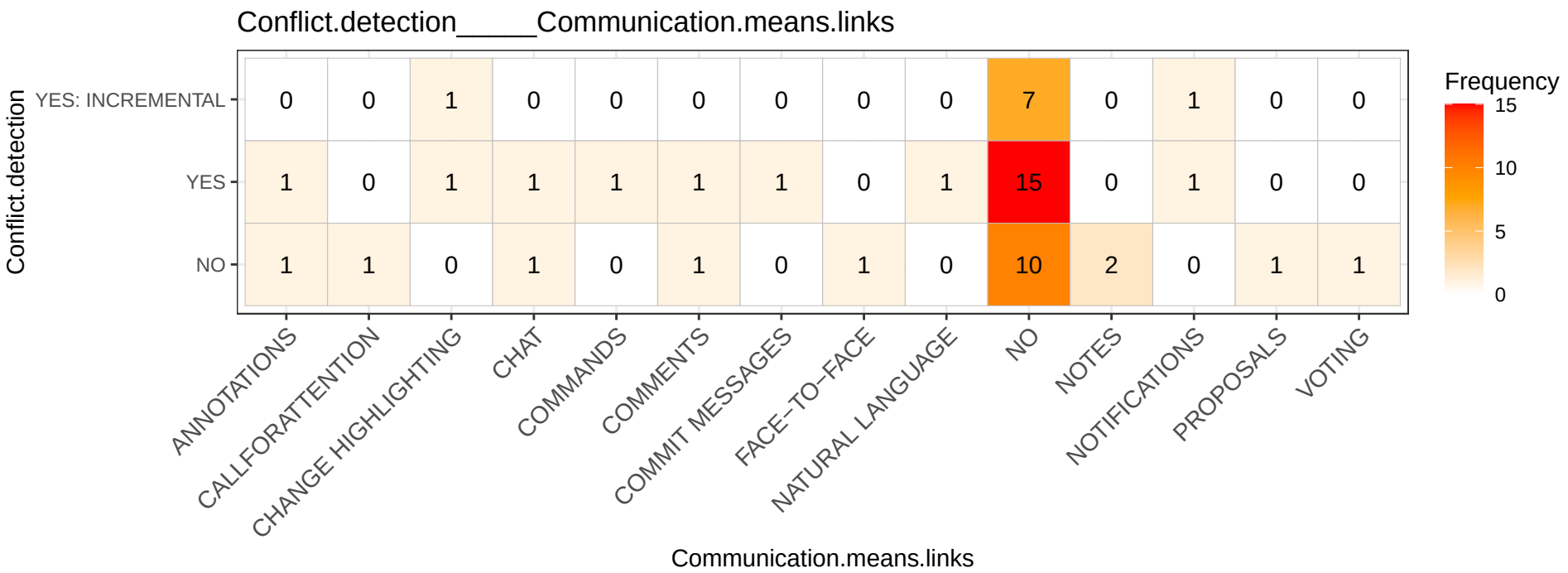

Conflict.detection_____Network.architecture
YES: INCREMENTAL
YES
NO
Conflict.detection
2
4
0
1
4
10
1
2
2
9
2
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

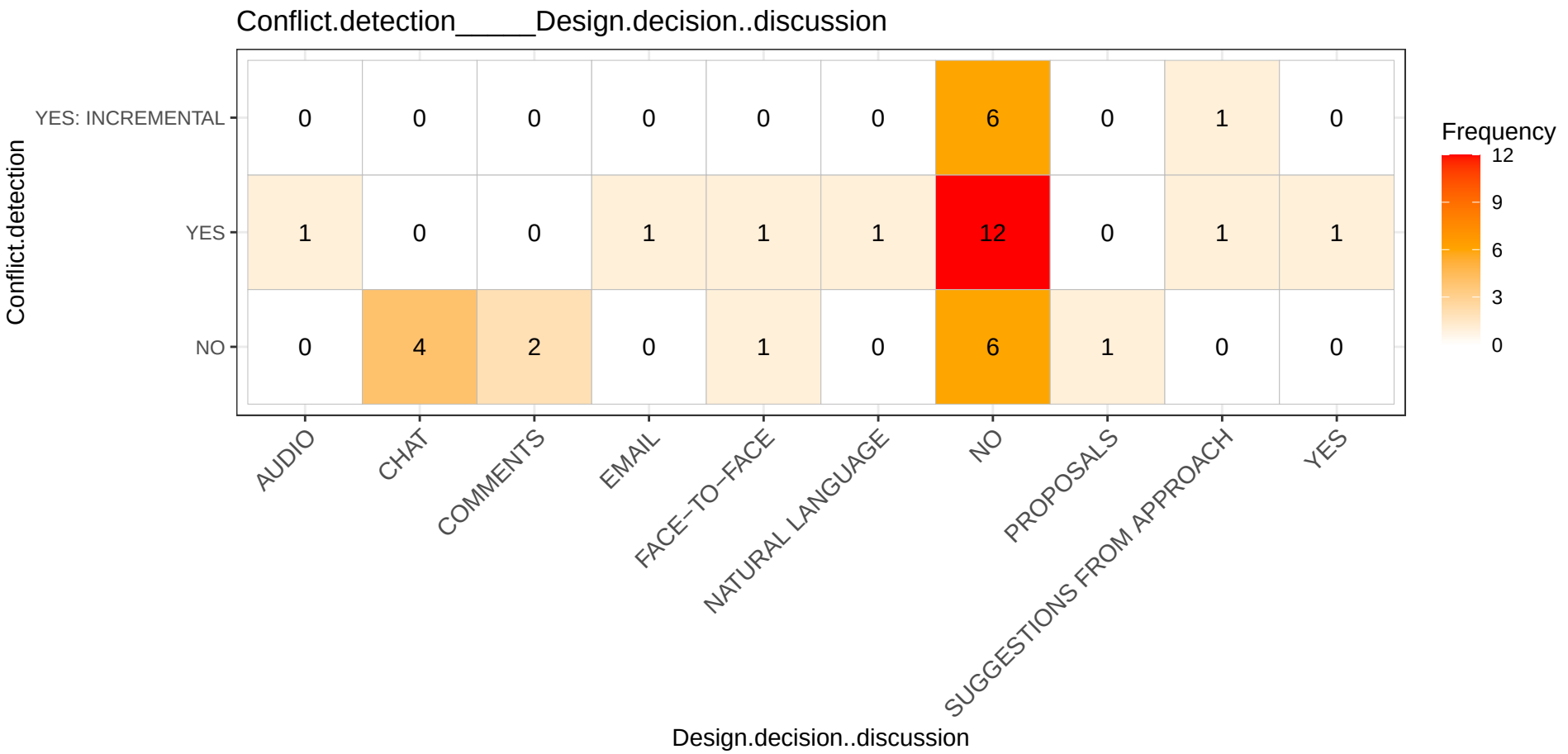

Conflict.detection_____Communication.type
YES: INCREMENTAL
YES
NO
7
7
14
16
7
13
Conflict.detection
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
16
12
8
4
0

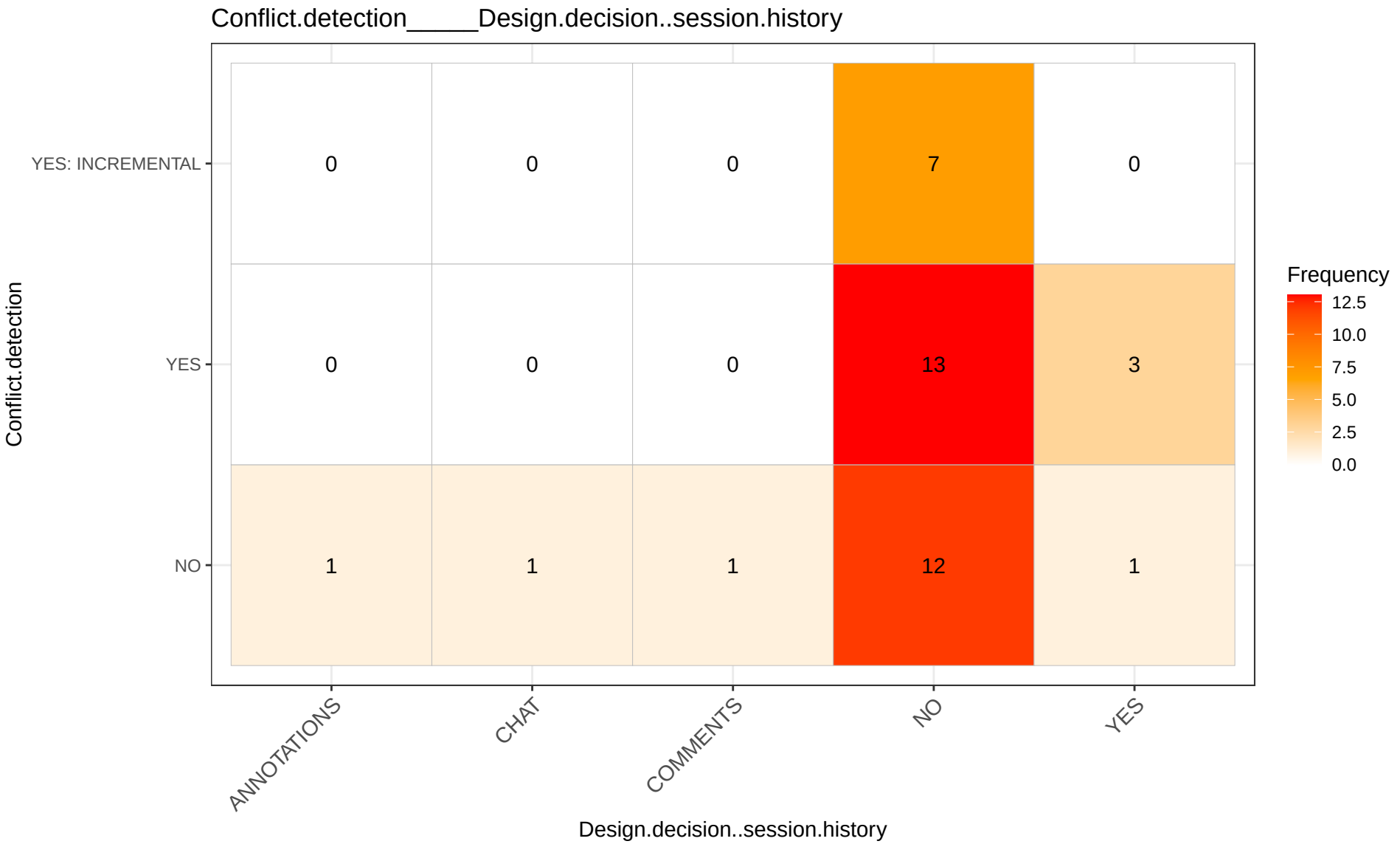

Conflict.detection_____Communication.means...builtin
Conflict.detection
YES: INCREMENTAL
YES
NO
0 1 1 1 1 0 0 1 1 0 4 0 1 0 0 0 0
1 2 2 1 2 1 1 2 3 1 9 0 1 1 1 0 1
2 1 3 0 5 0 4 0 3 0 4 2 0 3 1 1 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

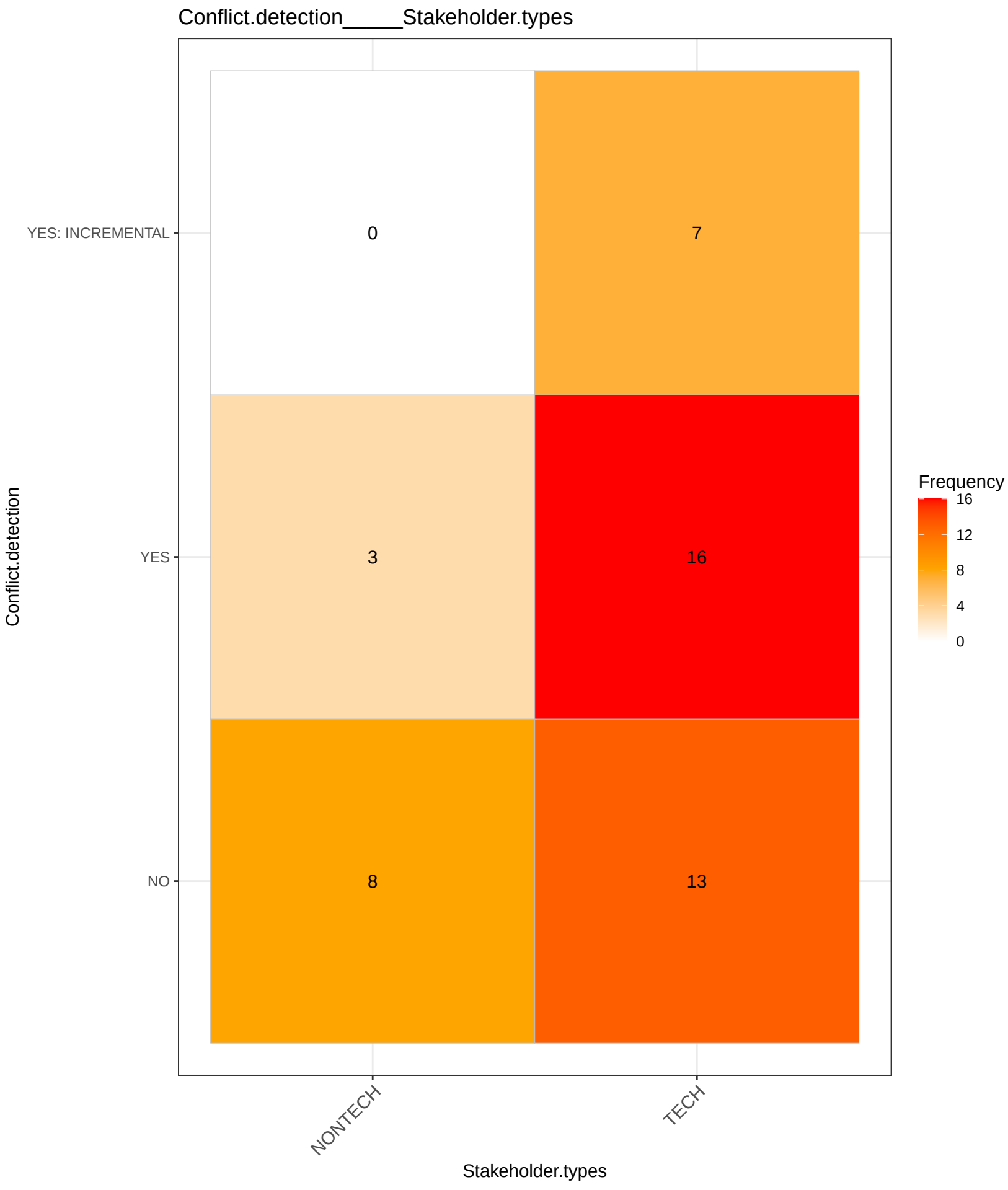

Conflict.detection_____Communication.means...external
YES: INCREMENTAL
YES
NO
0 0 0 0 0 7 0 0
0 2 2 1 0 13 0 0
1 3 4 2 1 3 1 1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Conflict.detection
Communication.means...external
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

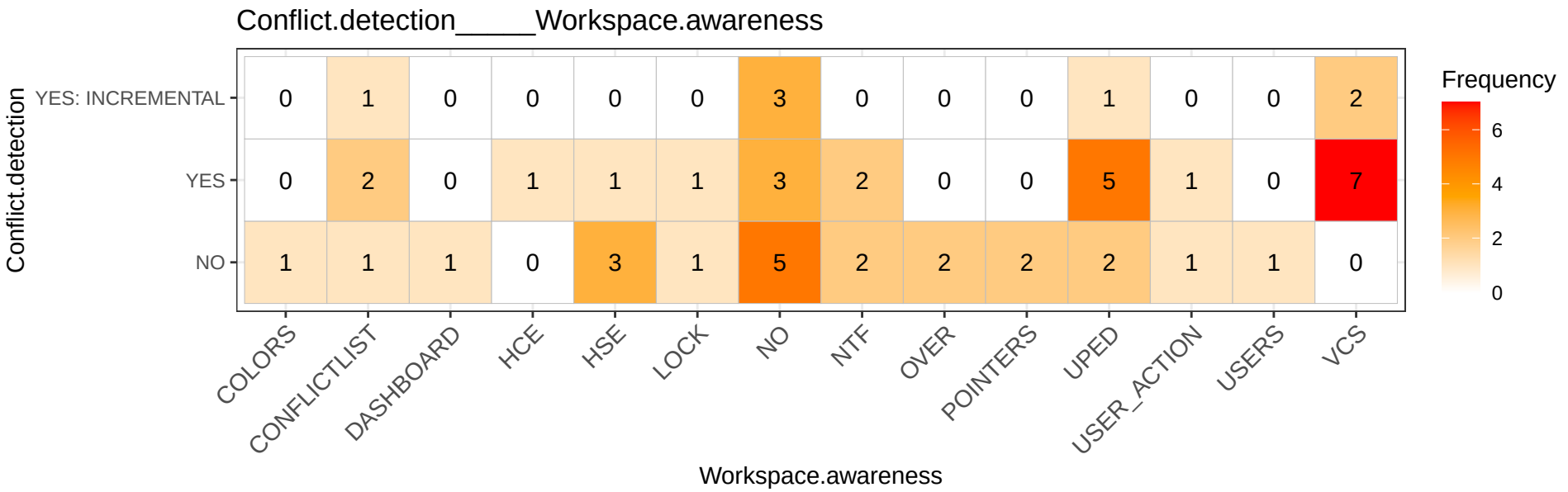

Conflict.detection_____Communication.means...mixed
YES: INCREMENTAL
YES
NO
0
0
0
7
1
0
0
15
0
1
2
10
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Conflict.detection
Frequency
15
10
5
0

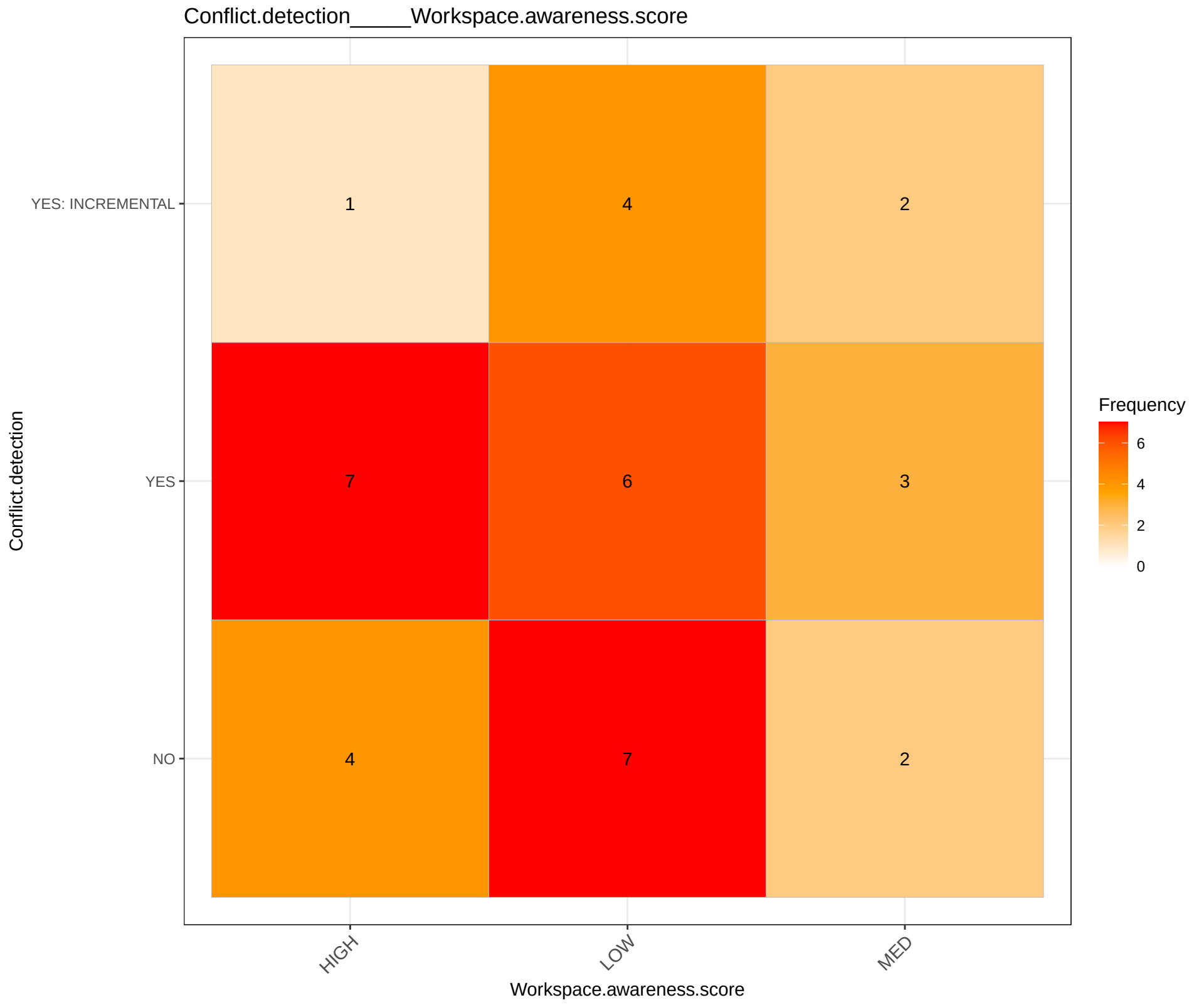

Conflict.detection_____Communication.means.links
Conflict.detection
YES: INCREMENTAL
YES
NO
0 0 1 0 0 0 0 0 0 7 0 1 0 0
1 0 1 1 1 1 1 0 1 15 0 1 0 0
1 1 0 1 0 1 0 1 0 10 2 0 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

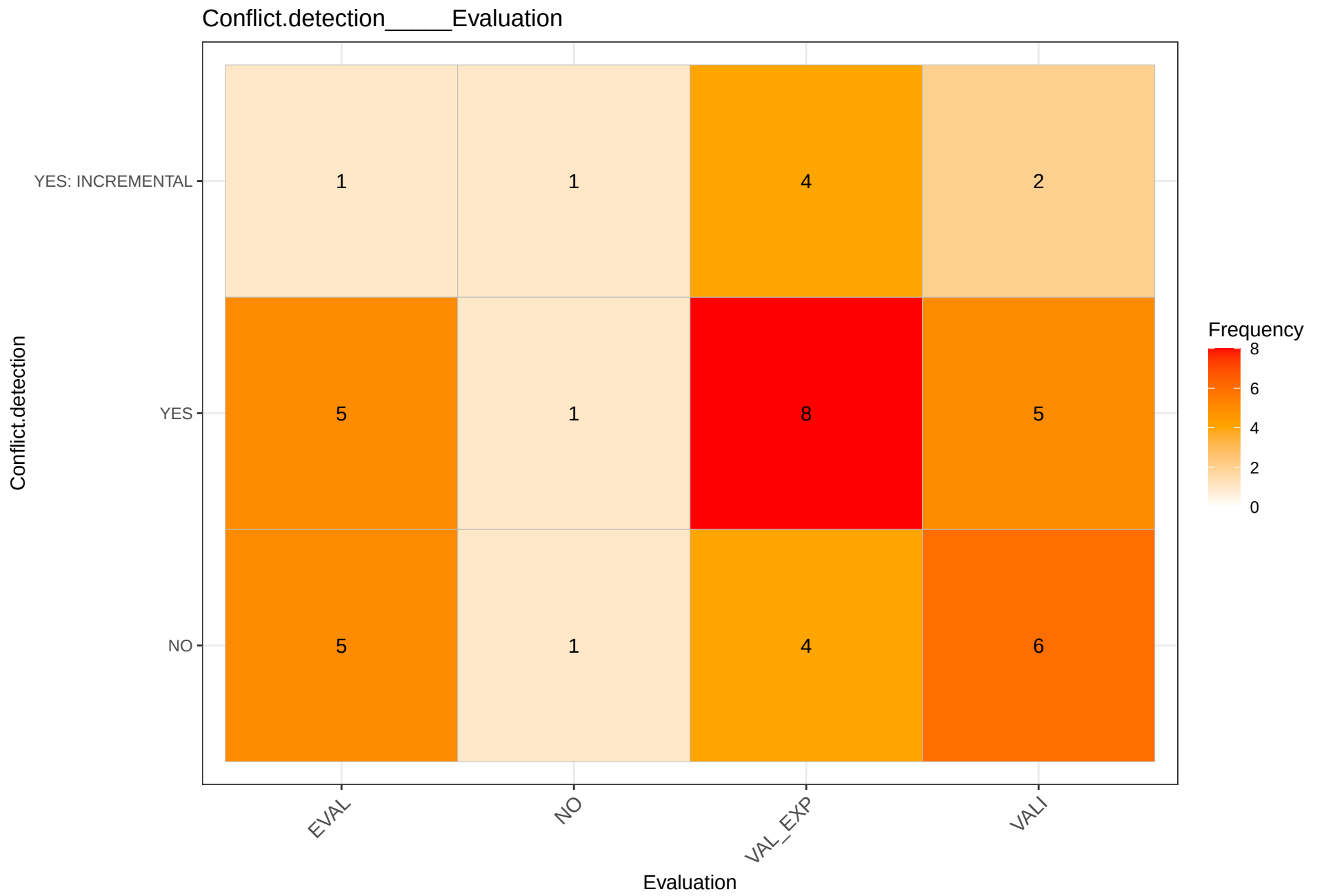

Conflict.detection_____Design.decision..discussion
Conflict.detection
YES: INCREMENTAL
YES
NO
0 0 0 0 0 0 6 0 1 0
1 0 0 1 1 1 12 0 1 1
0 4 2 0 1 0 6 1 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12
9
6
3
0

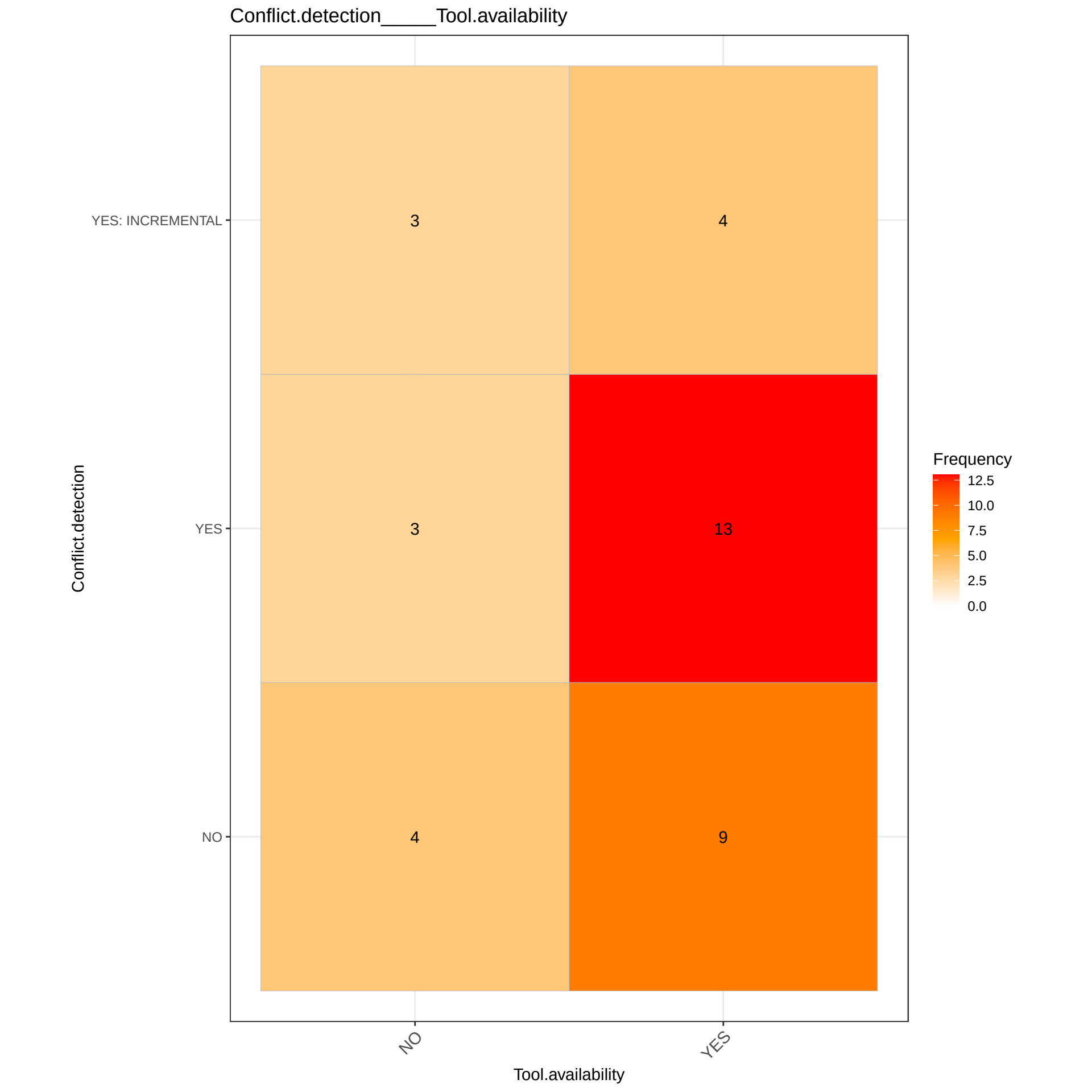

Conflict.detection_____Design.decision..session.history
YES: INCREMENTAL
YES
NO
0
0
0
7
0
0
0
0
13
3
1
1
1
12
1
Conflict.detection
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

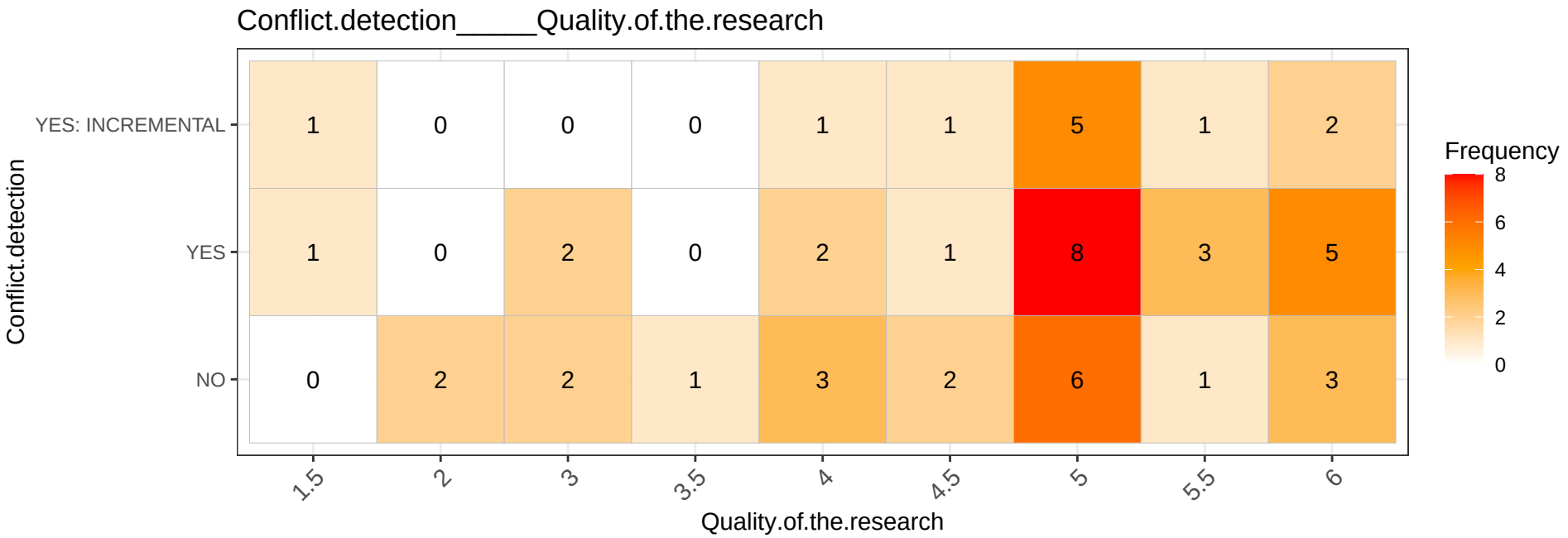

Conflict.detection_____Stakeholder.types
YES: INCREMENTAL
YES
NO
0
7
3
16
8
13
Conflict.detection
NONTECH
TECH
Stakeholder.types
Frequency
16
12
8
4
0

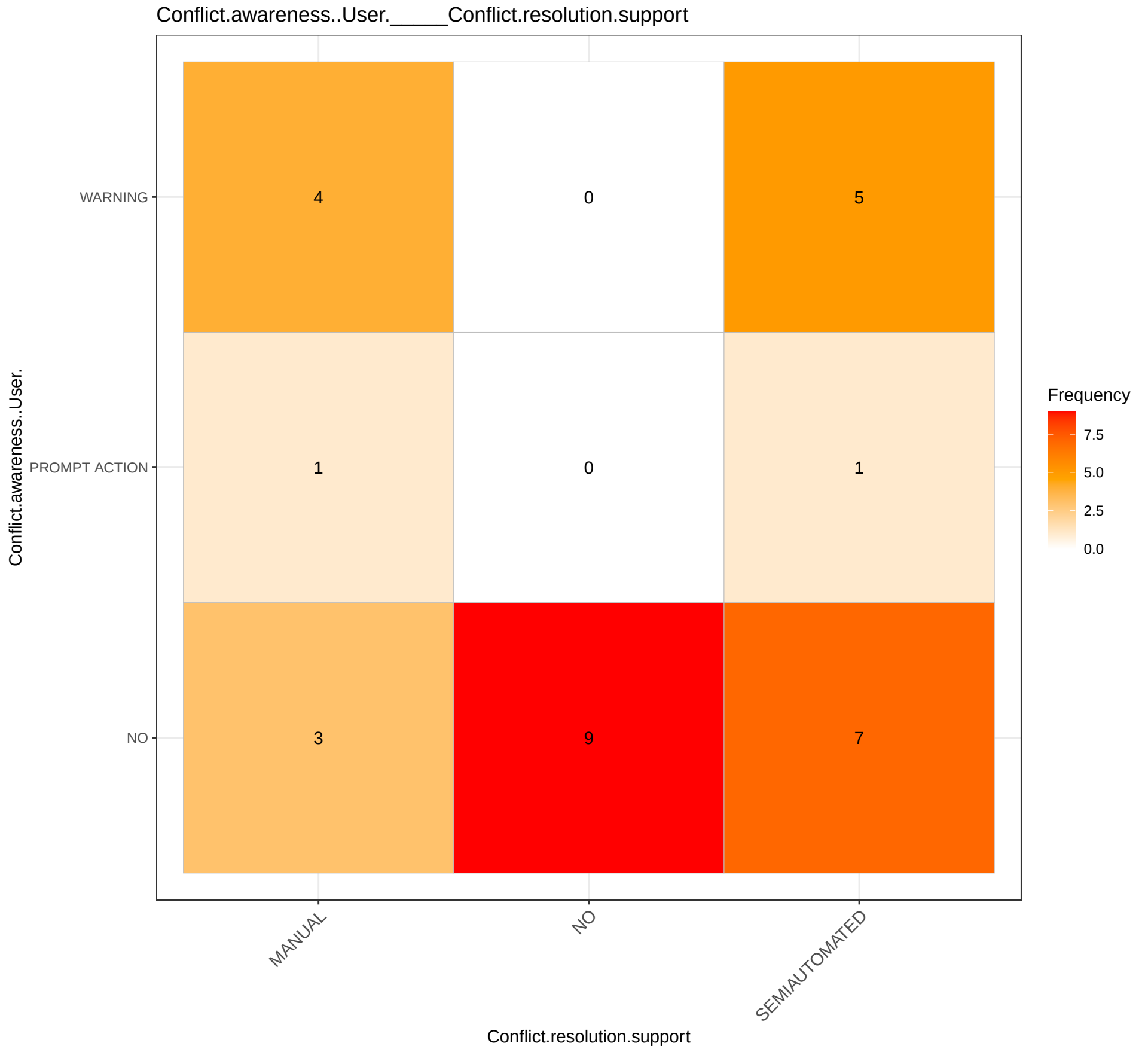

Conflict.detection_____Workspace.awareness
Conflict.detection
YES: INCREMENTAL
YES
NO
0 1 0 0 0 0 3 0 0 0 1 0 0 2
0 2 0 1 1 1 3 2 0 0 5 1 0 7
1 1 1 0 3 1 5 2 2 2 2 1 1 0
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0

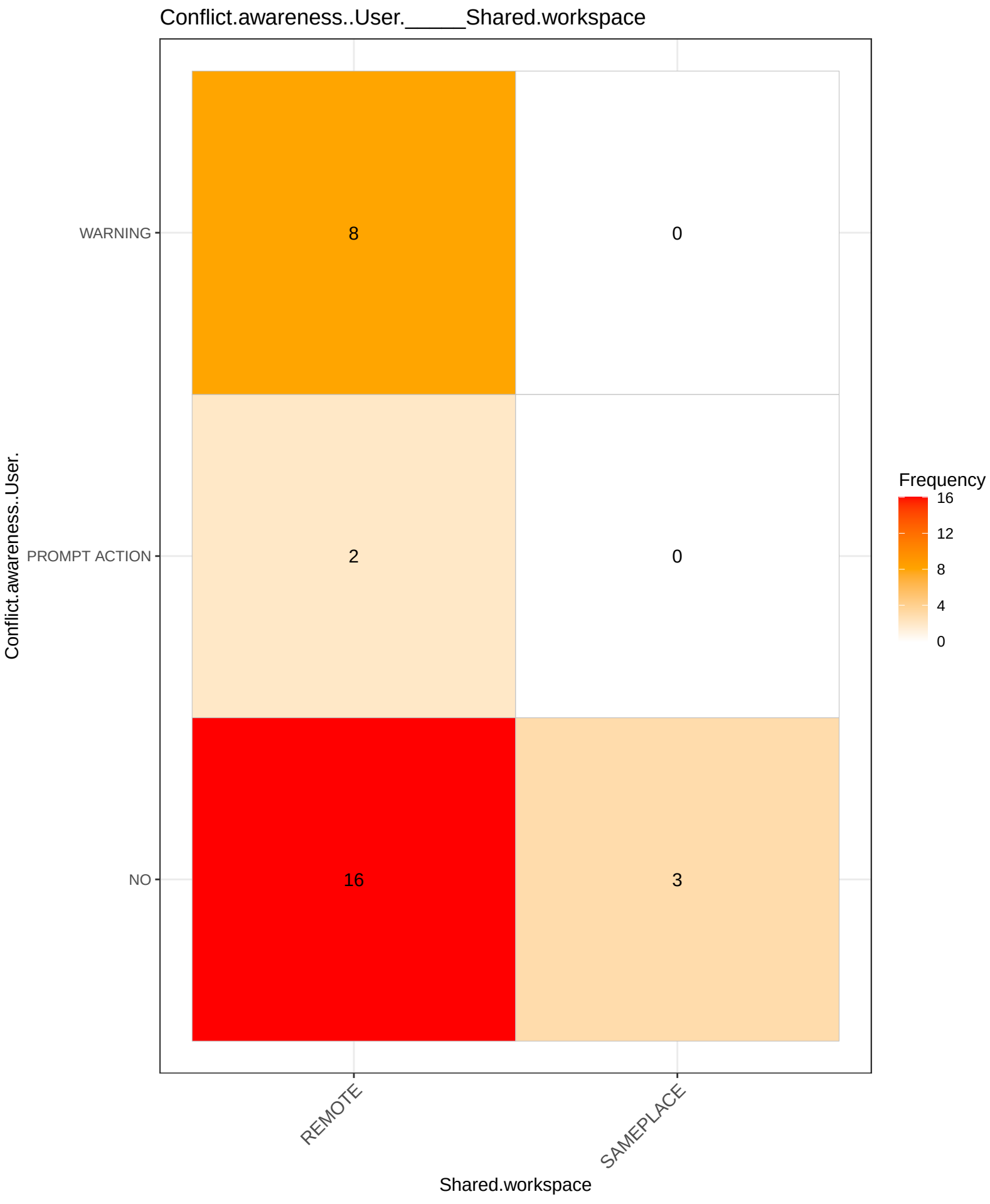

Conflict.detection_____Workspace.awareness.score
YES: INCREMENTAL
YES
NO
1
4
2
7
6
3
4
7
2
HIGH
LOW
MED
Workspace.awareness.score
Conflict.detection
Frequency
6
4
2
0

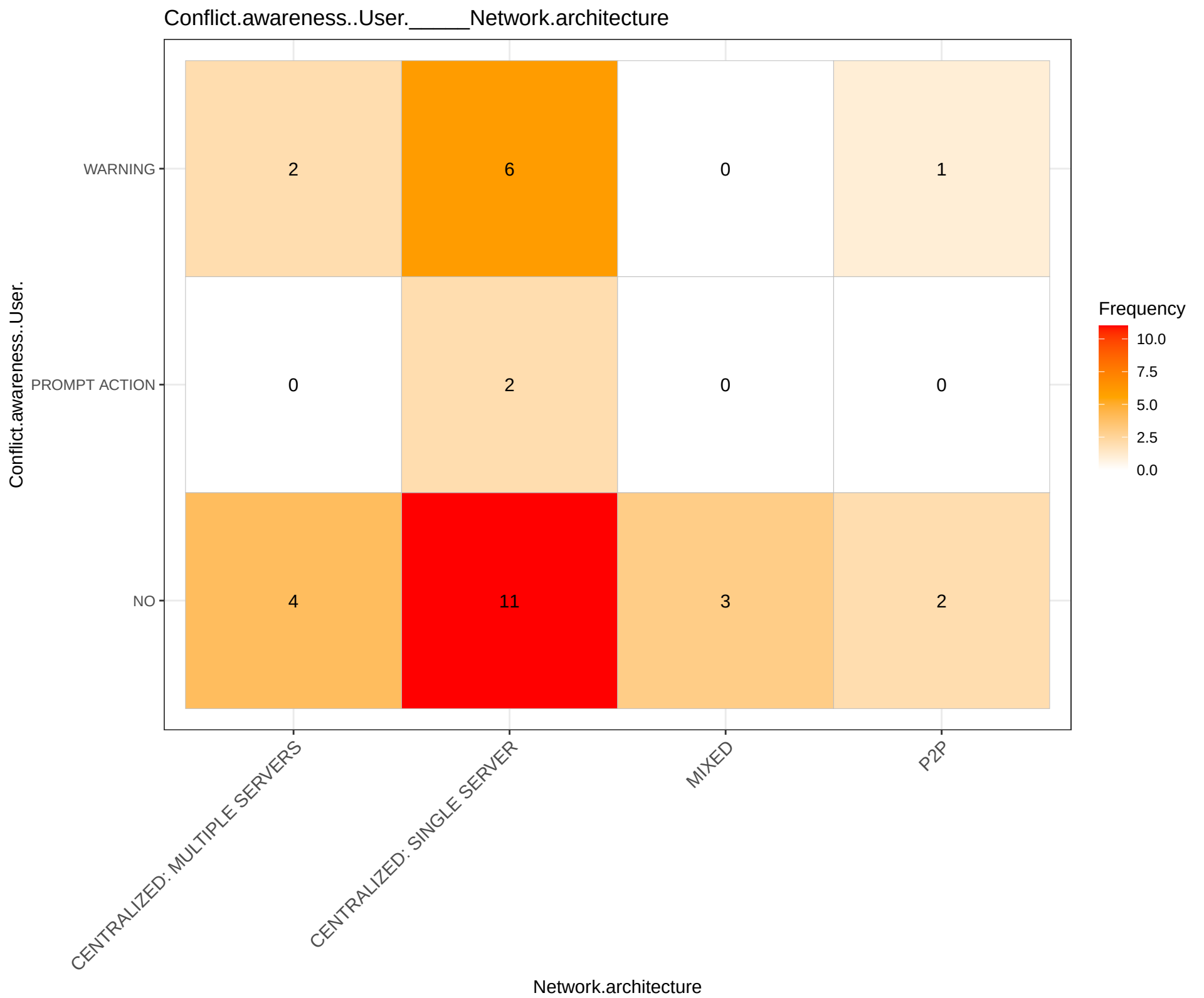

Conflict.detection_____Evaluation
YES: INCREMENTAL
YES
NO
Conflict.detection
1
1
4
2
5
1
8
5
5
1
4
6
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
8
6
4
2
0

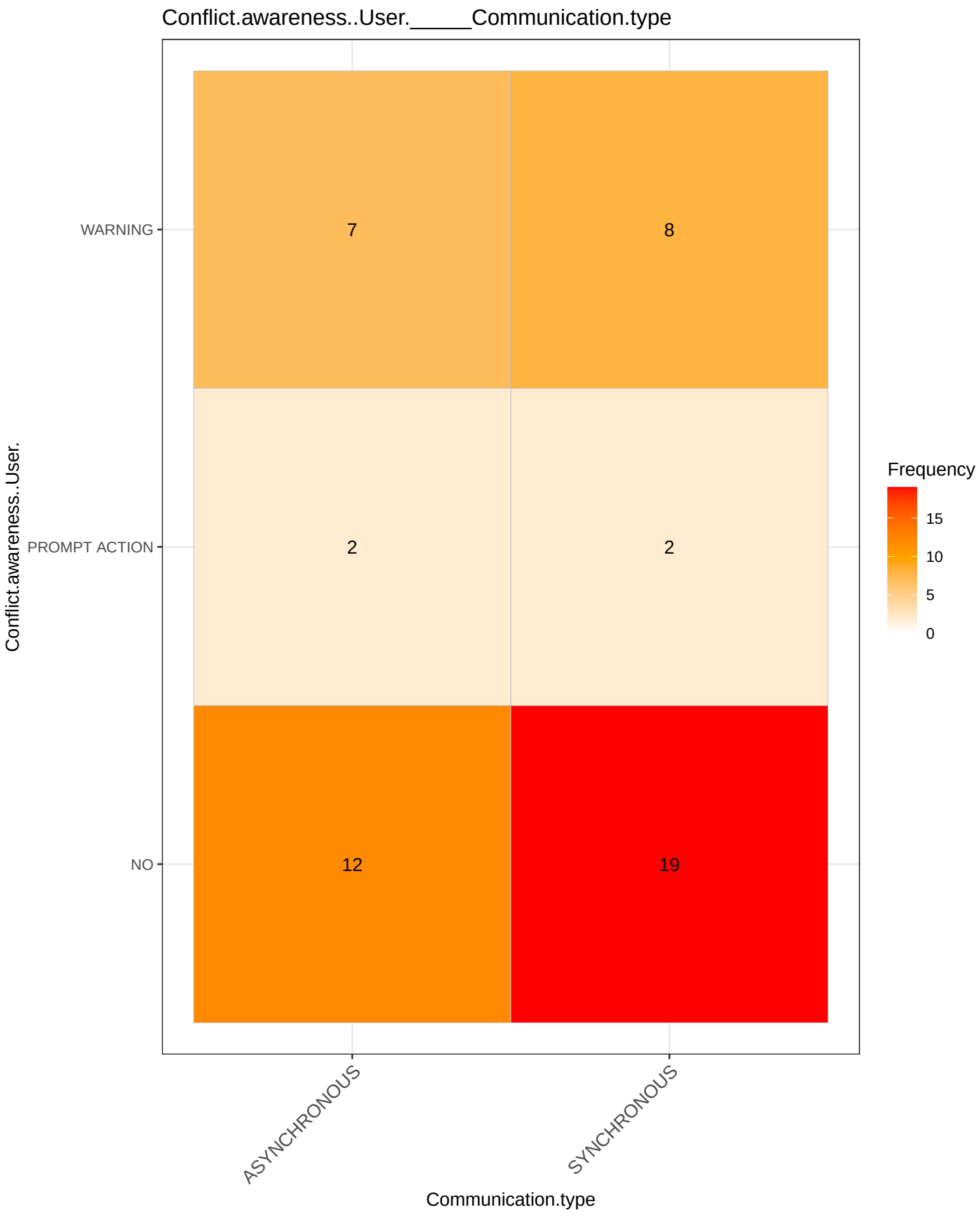

Conflict.detection_____Tool.availability
YES: INCREMENTAL
YES
NO
3
4
3
13
4
9
Conflict.detection
NO
YES
Tool.availability
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

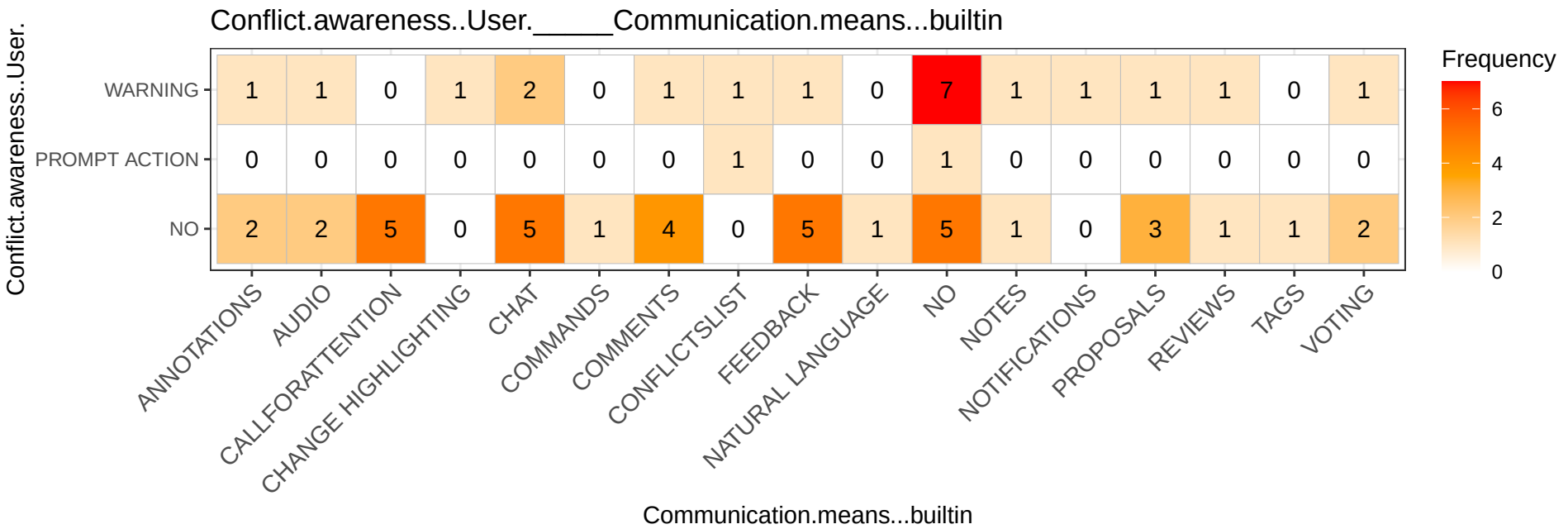

Conflict.detection_____Quality.of.the.research
YES: INCREMENTAL
YES
NO
1 0 0 0 1 1 5 1 2
1 0 2 0 2 1 8 3 5
0 2 2 1 3 2 6 1 3
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Conflict.detection
Frequency
8
6
4
2
0

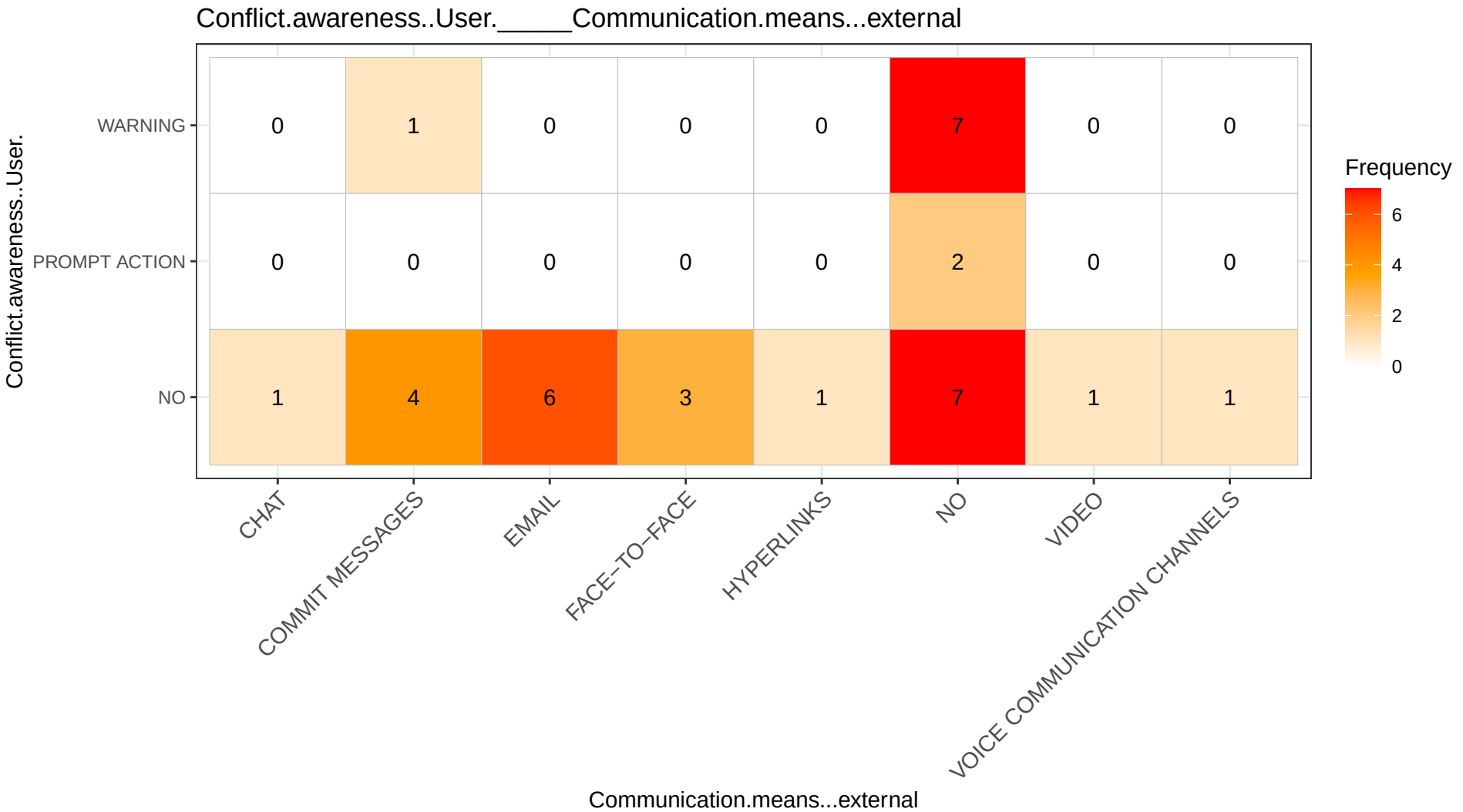

Conflict.awareness..User._____Conflict.resolution.support
WARNING
PROMPT ACTION
NO
4
0
5
1
0
1
3
9
7
MANUAL
NO
SEMIAUTOMATED
Conflict.awareness..User.
Conflict.resolution.support
Frequency
7.5
5.0
2.5
0.0

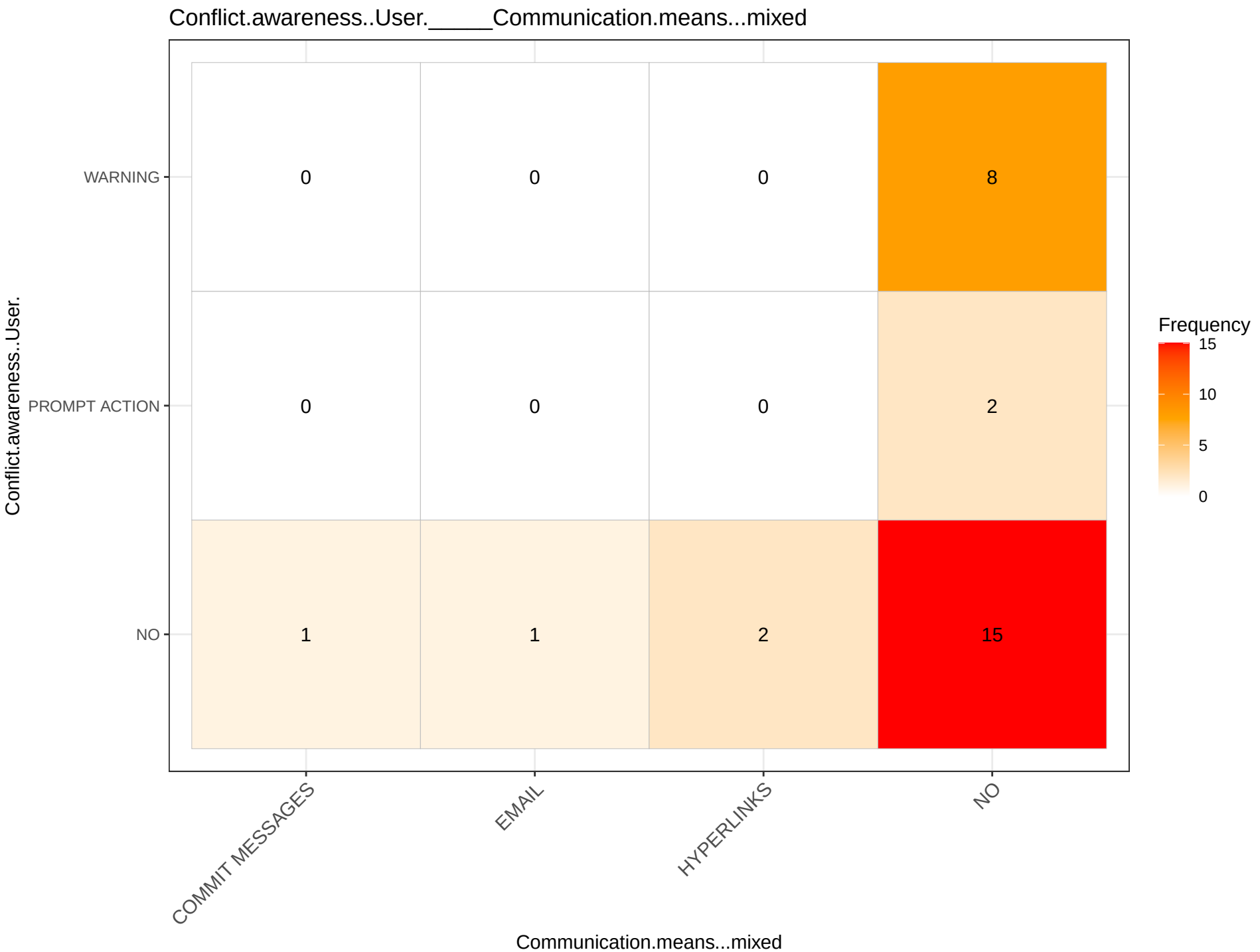

Conflict.awareness..User._____Shared.workspace
WARNING
PROMPT ACTION
NO
8
0
2
0
16
3
Conflict.awareness..User.
REMOTE
SAMEPLACE
Shared.workspace
Frequency
16
12
8
4
0

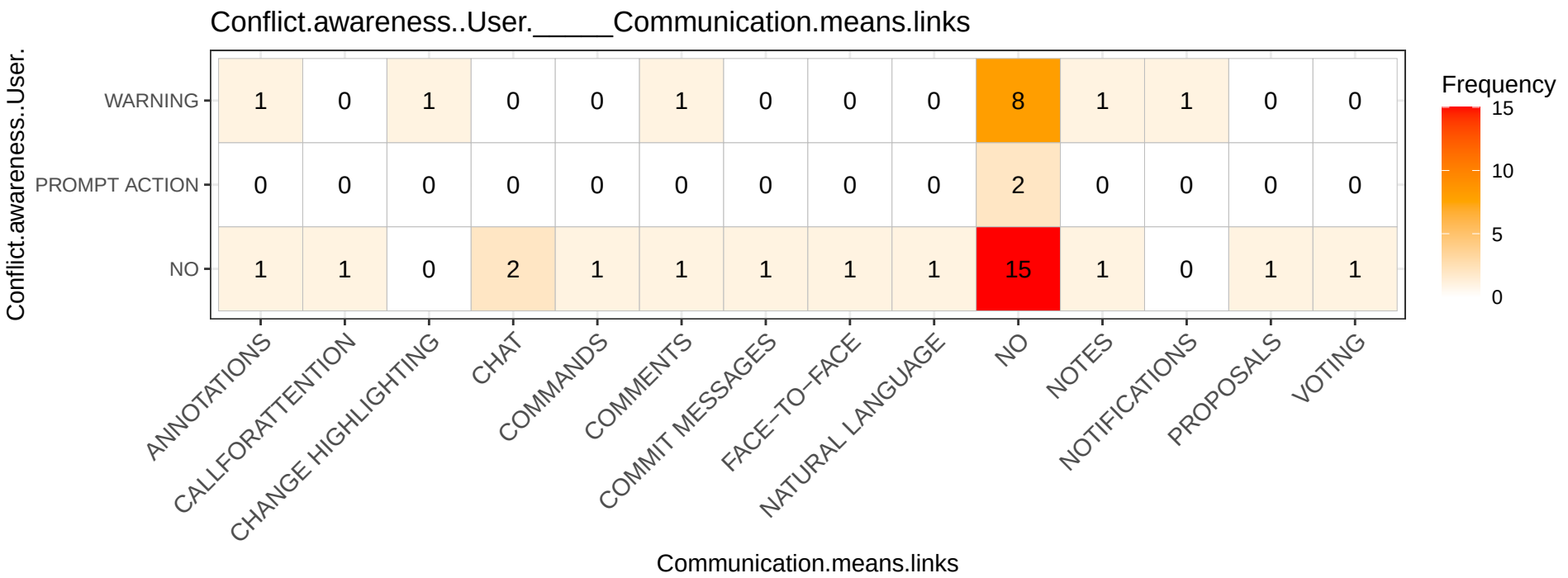

Conflict.awareness..User._____Network.architecture
WARNING
PROMPT ACTION
NO
2
6
0
1
0
2
0
0
4
11
3
2
Conflict.awareness..User.
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
10.0
7.5
5.0
2.5
0.0

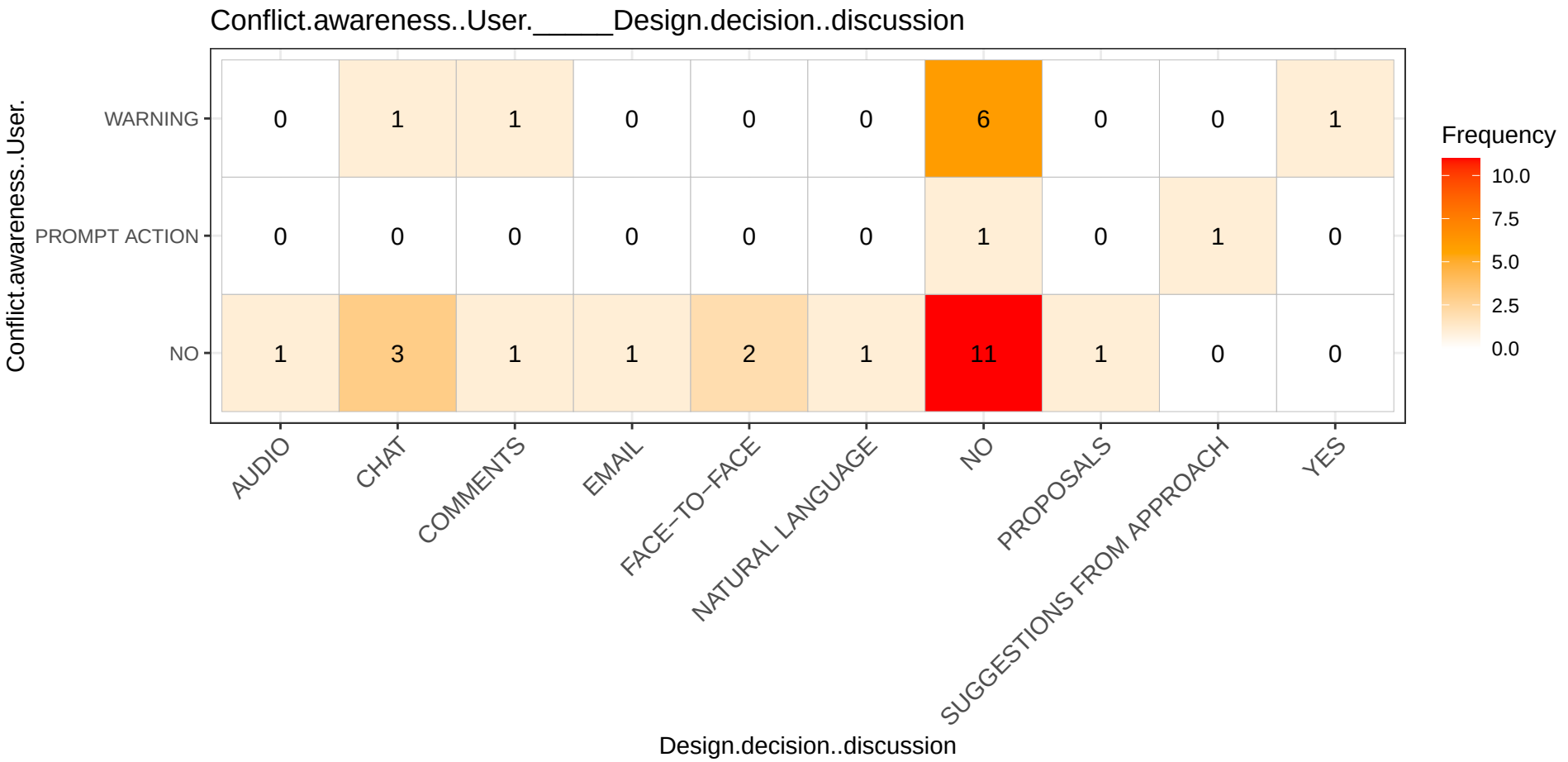

Conflict.awareness..User._____Communication.type
WARNING
PROMPT ACTION
NO
Conflict.awareness..User.
7
8
2
2
12
19
Frequency
15
10
5
0
ASYNCHRONOUS
SYNCHRONOUS
Communication.type

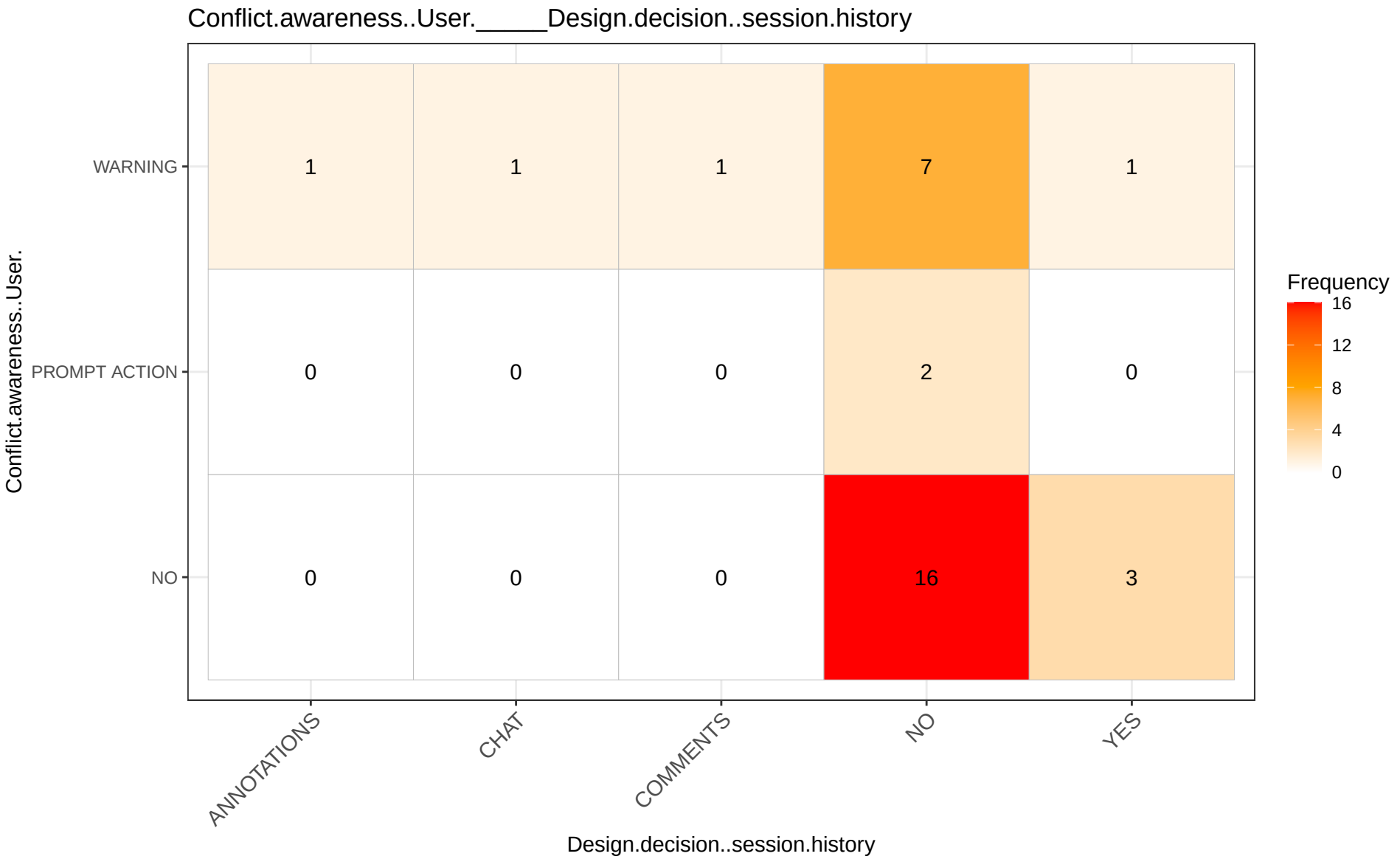

Conflict.awareness..User._____Communication.means...builtin
Conflict.awareness..User.
WARNING
PROMPT ACTION
NO
1 1 0 1 2 0 1 1 1 0 7 1 1 1 1 0 1
0 0 0 0 0 0 0 1 0 0 1 0 0 0 0 0 0
2 2 5 0 5 1 4 0 5 1 5 1 0 3 1 1 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
4
2
0

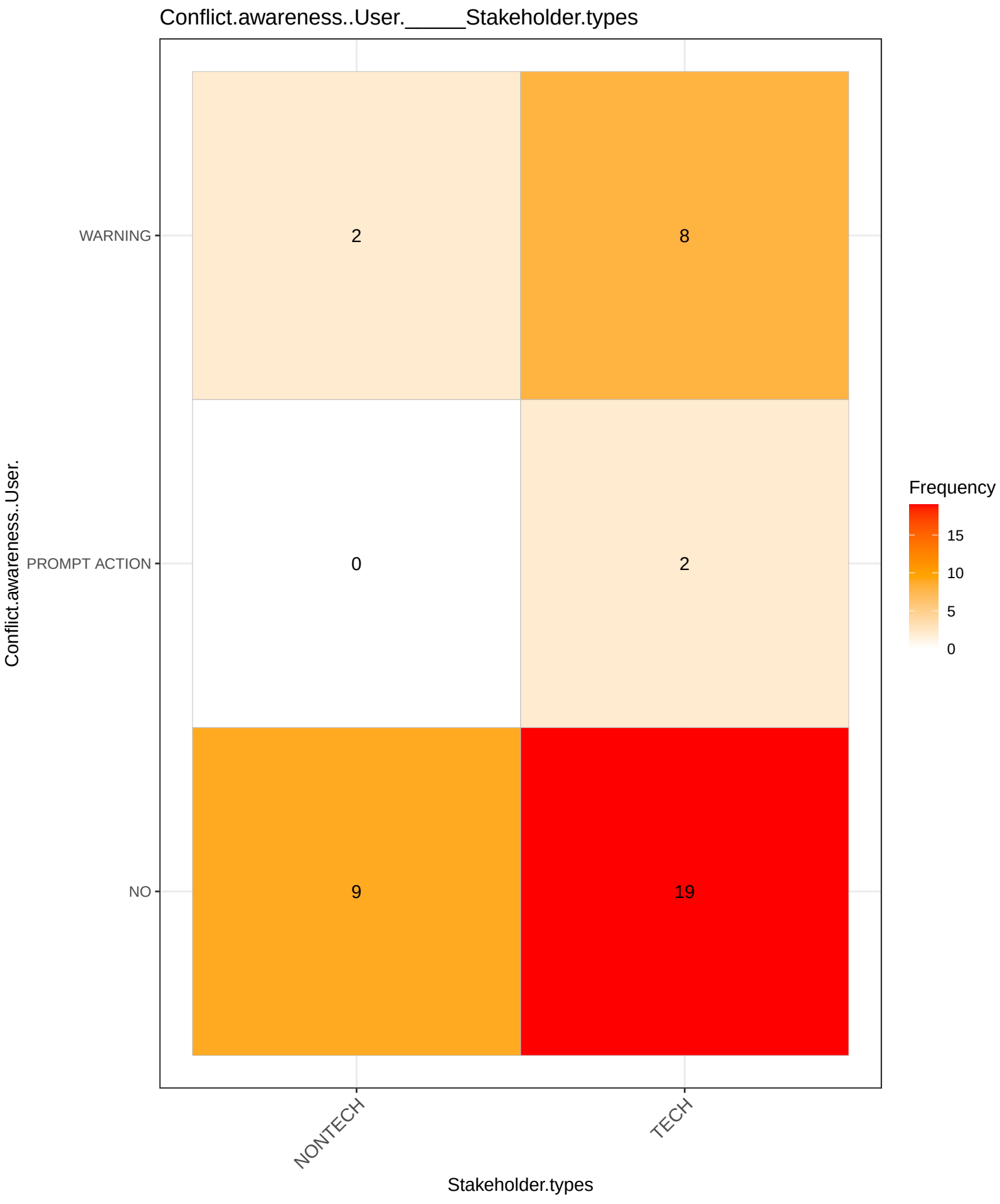

Conflict.awareness..User._____Communication.means...external
Conflict.awareness..User.
WARNING
PROMPT ACTION
NO
0 1 0 0 0 7 0 0
0 0 0 0 0 2 0 0
1 4 6 3 1 7 1 1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
6
4
2
0

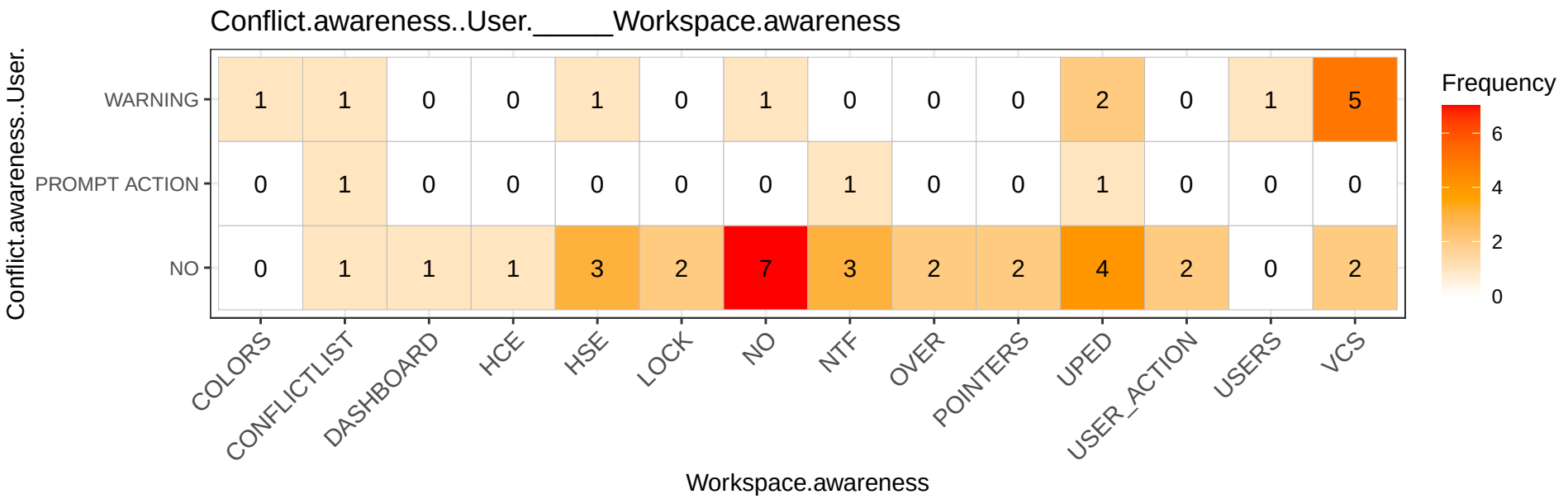

Conflict.awareness..User._____Communication.means...mixed
WARNING
PROMPT ACTION
NO
0
0
0
8
0
0
0
2
1
1
2
15
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Conflict.awareness..User.
Communication.means...mixed
Frequency
15
10
5
0

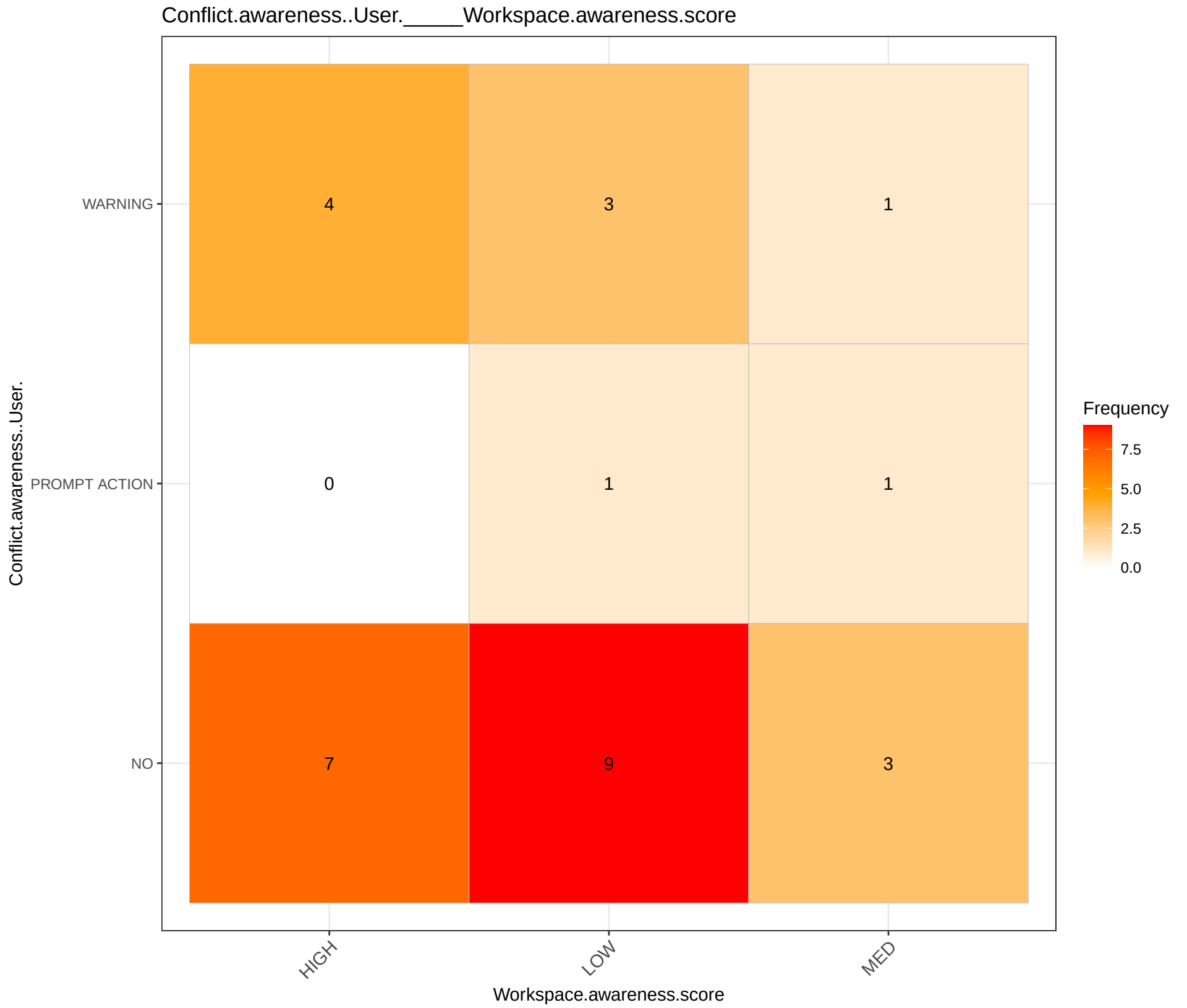

Conflict.awareness..User._____Communication.means.links
Conflict.awareness..User.
WARNING
PROMPT ACTION
NO
1 0 1 0 0 1 0 0 0 8 1 1 0 0
0 0 0 0 0 0 0 0 0 2 0 0 0 0
1 1 0 2 1 1 1 1 1 15 1 0 1 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
15
10
5
0

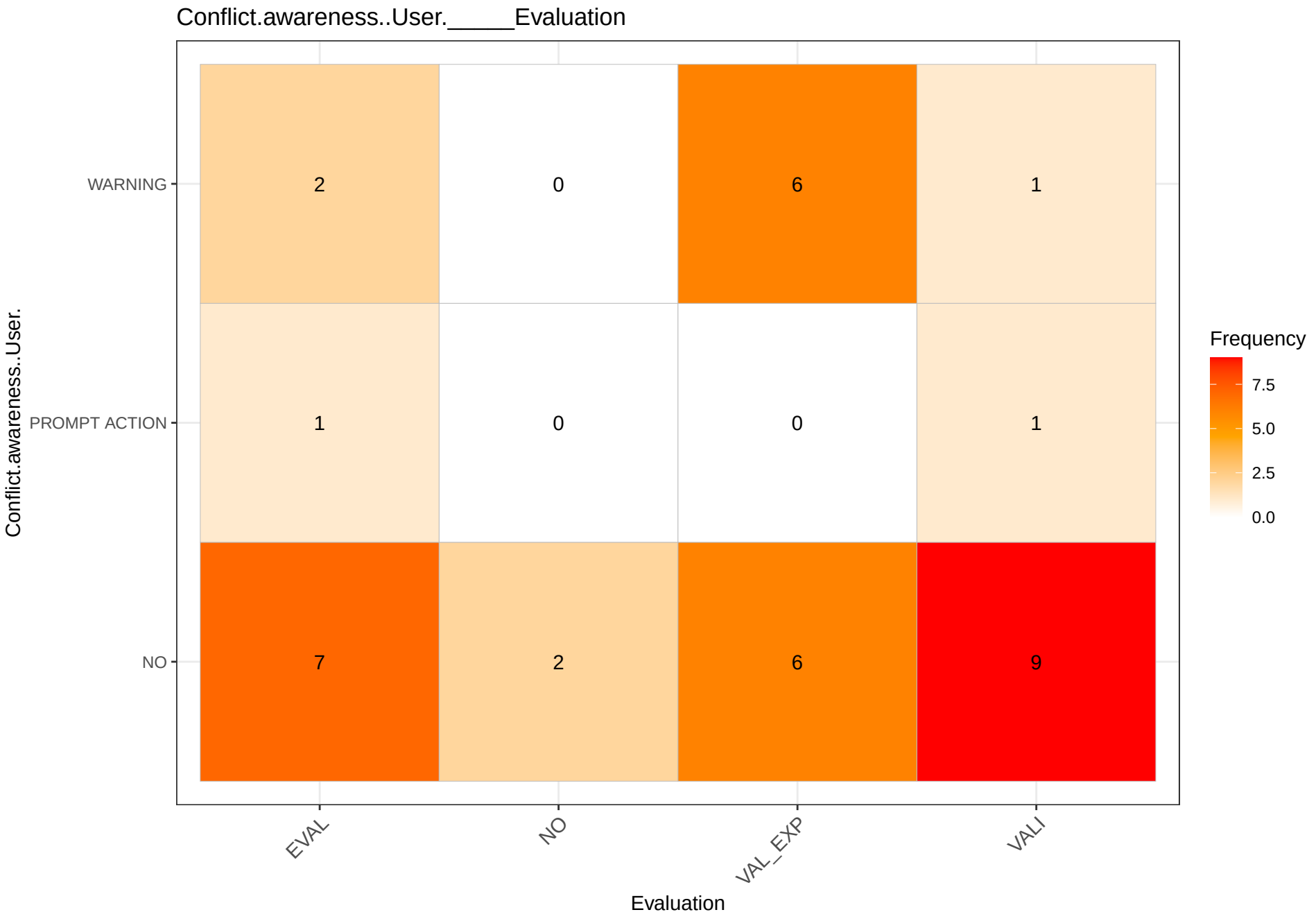

Conflict.awareness..User._____Design.decision..discussion
Conflict.awareness..User.
WARNING
PROMPT ACTION
NO
0 1 1 0 0 0 6 0 0 1
0 0 0 0 0 0 1 0 1 0
1 3 1 1 2 1 11 1 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0

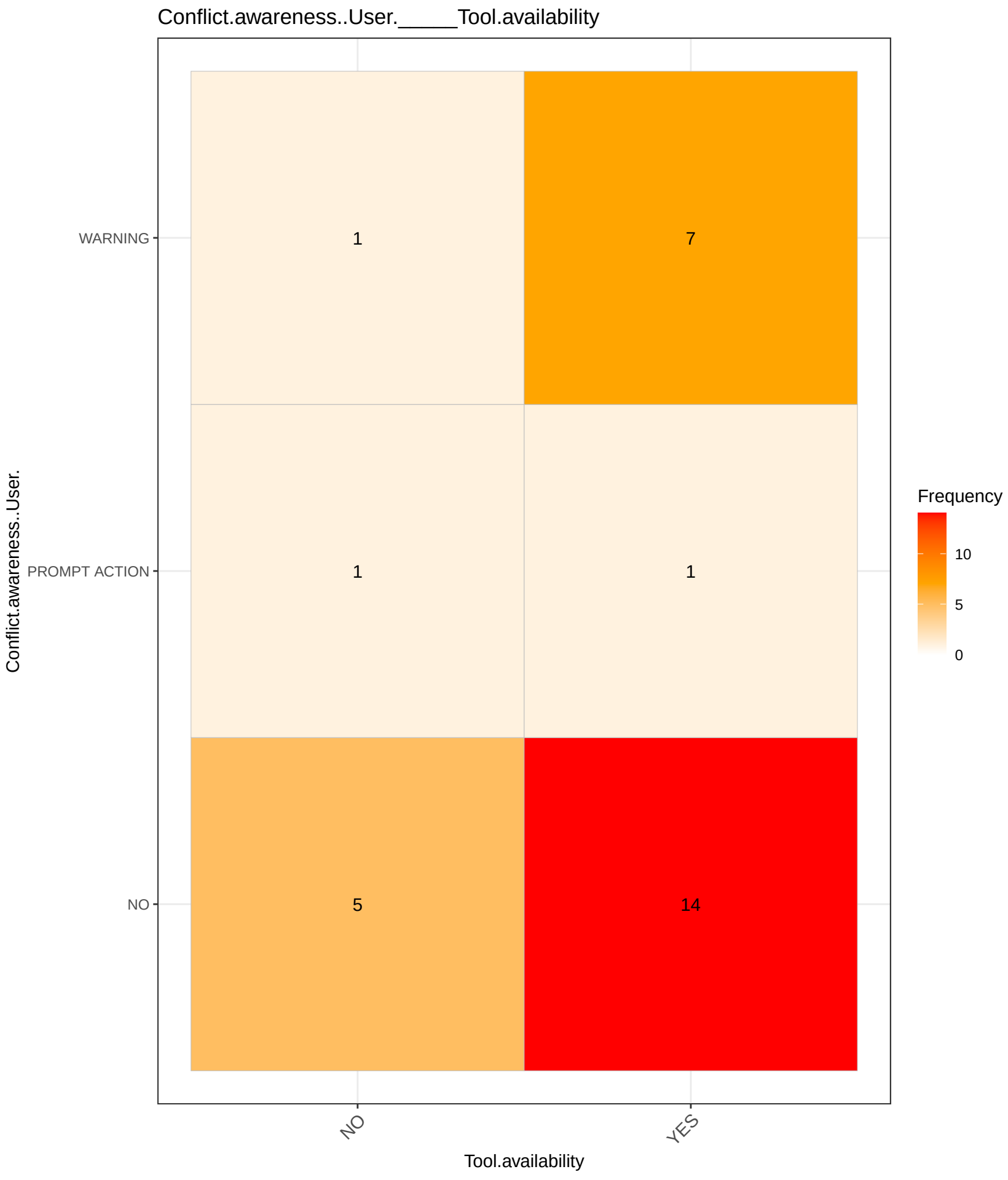

Conflict.awareness..User._____Design.decision..session.history
WARNING
PROMPT ACTION
NO
Conflict.awareness..User.
1
1
1
7
1
0
0
0
2
0
0
0
0
16
3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0

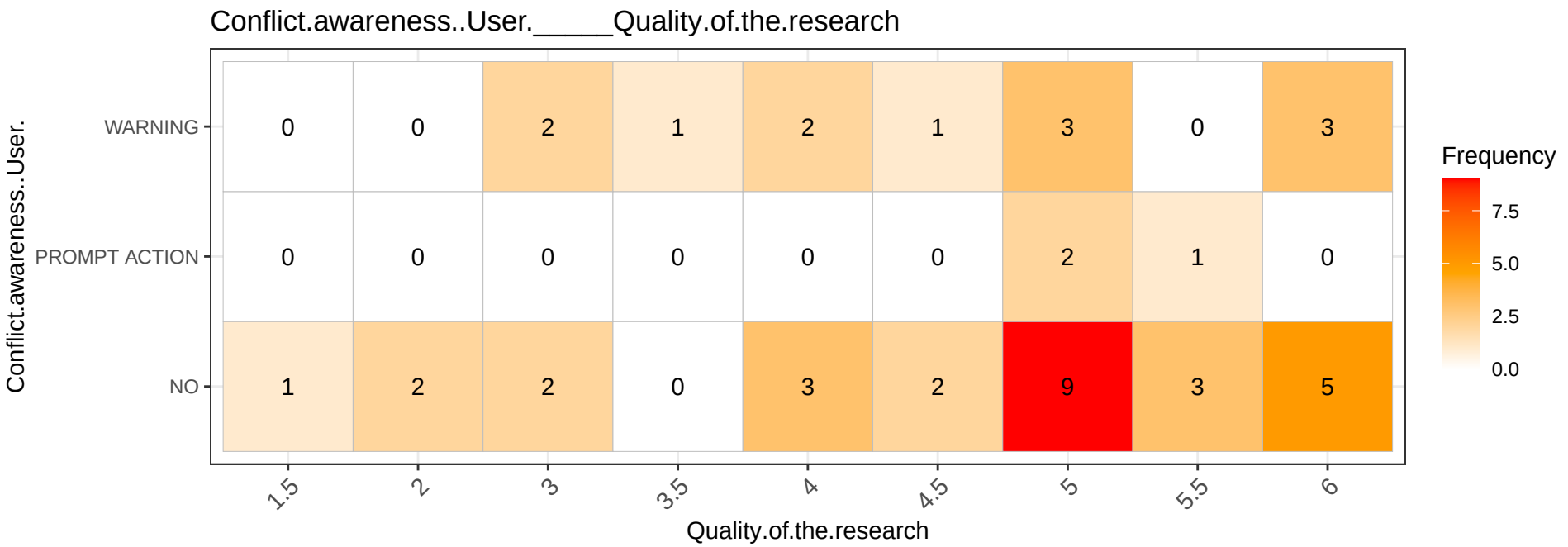

Conflict.awareness..User._____Stakeholder.types
WARNING
PROMPT ACTION
NO
2
8
0
2
9
19
Conflict.awareness..User.
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0

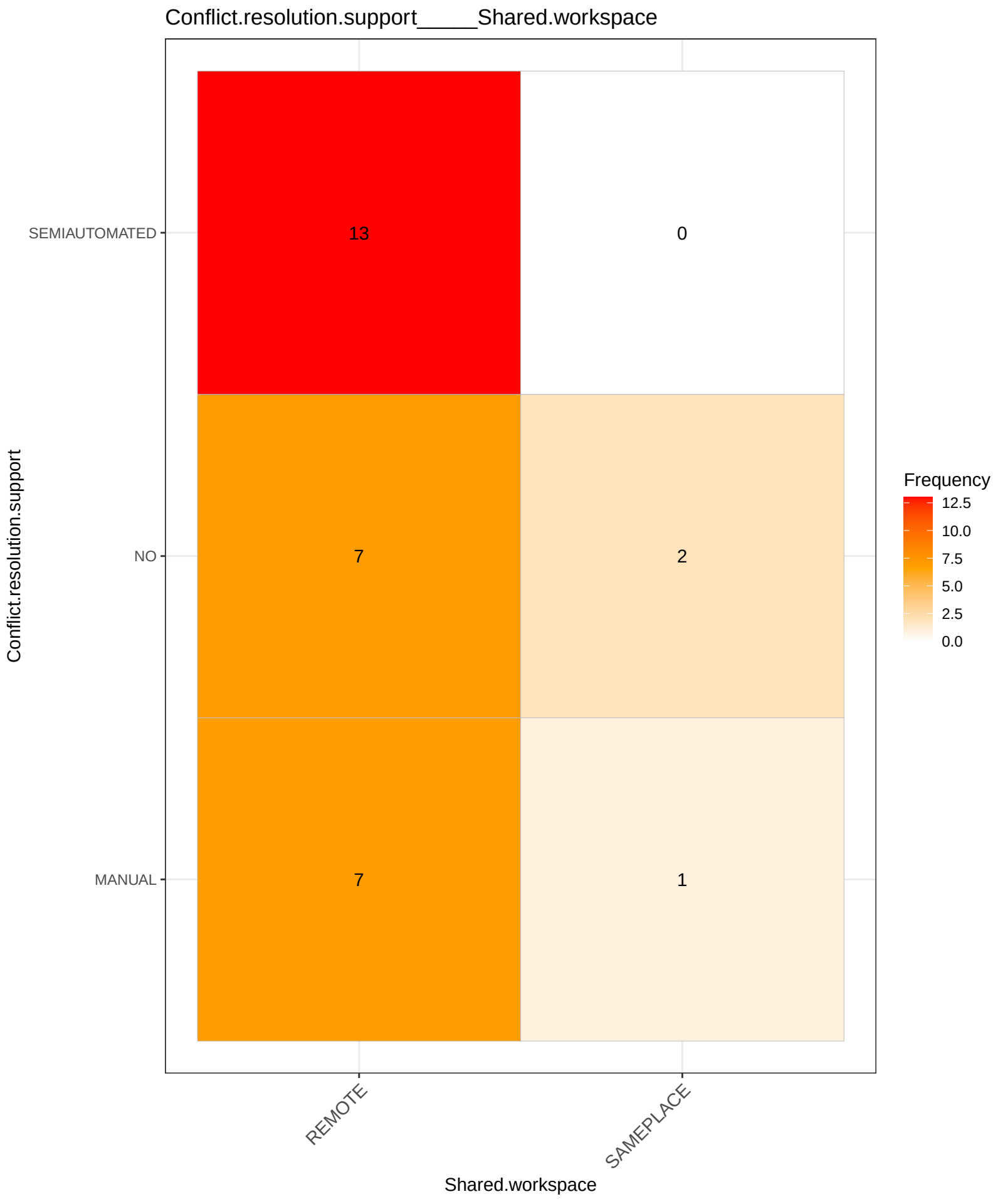

Conflict.awareness..User._____Workspace.awareness
Conflict.awareness..User.
WARNING
PROMPT ACTION
NO
1 1 0 0 1 0 1 0 0 0 2 0 1 5
0 1 0 0 0 0 0 1 0 0 1 0 0 0
0 1 1 1 3 2 7 3 2 2 4 2 0 2
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0

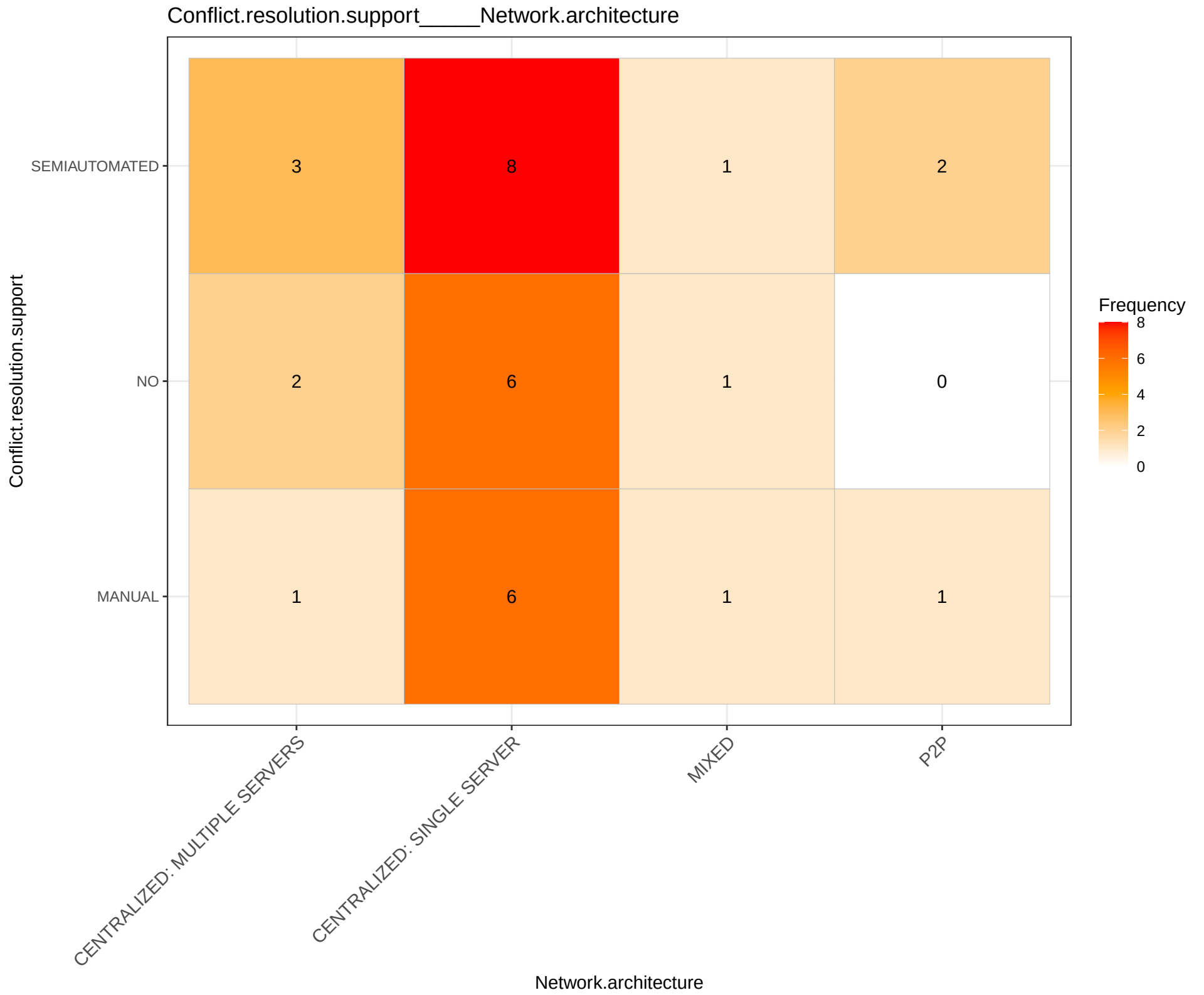

Conflict.awareness..User._____Workspace.awareness.score
WARNING
PROMPT ACTION
NO
Conflict.awareness..User.
4
3
1
0
1
1
7
9
3
HIGH
LOW
MED
Workspace.awareness.score
Frequency
7.5
5.0
2.5
0.0

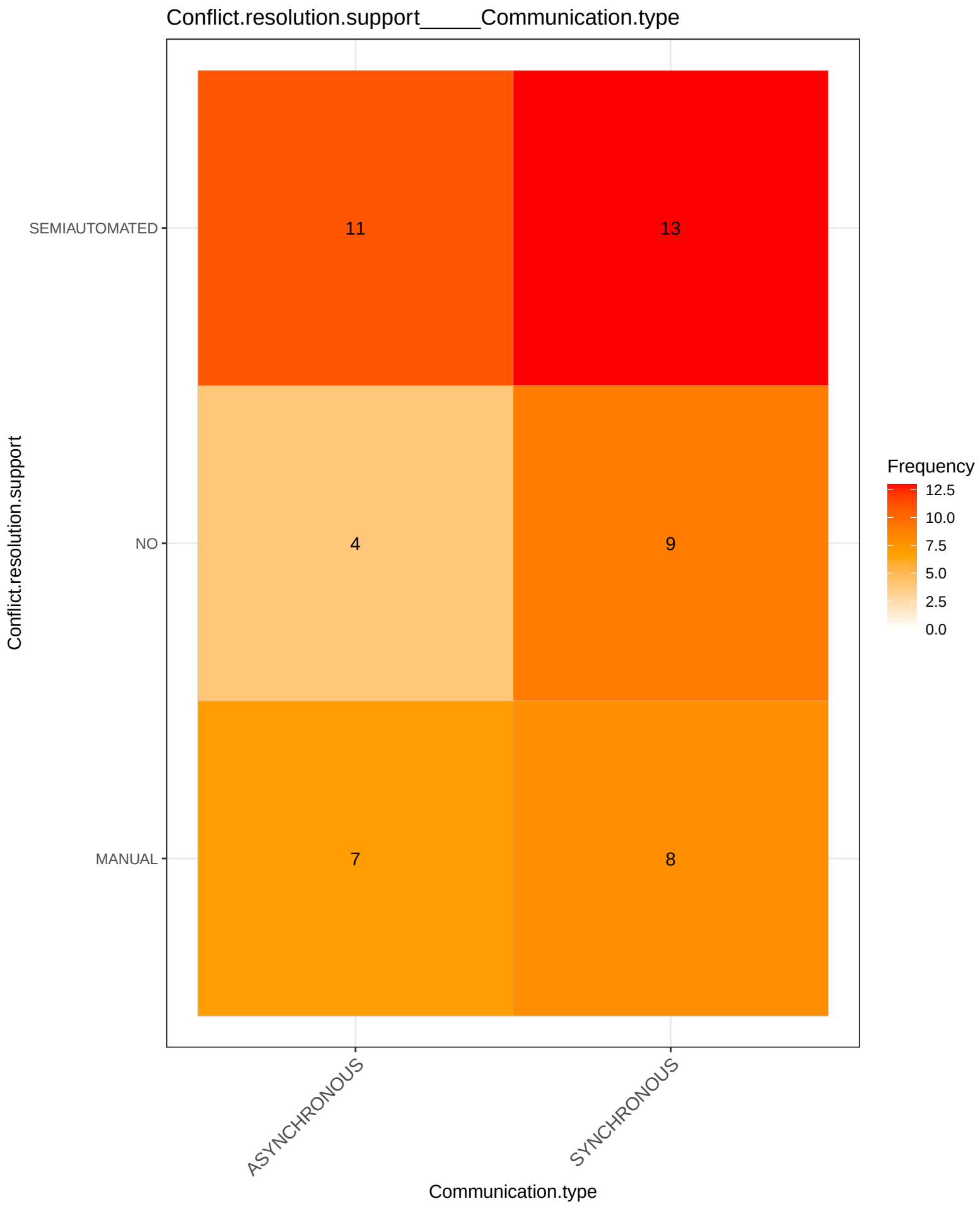

Conflict.awareness..User._____Evaluation
WARNING
PROMPT ACTION
NO
2
0
6
1
1
0
0
1
7
2
6
9
EVAL
NO
VAL_EXP
VALI
Evaluation
Conflict.awareness..User.
Frequency
7.5
5.0
2.5
0.0

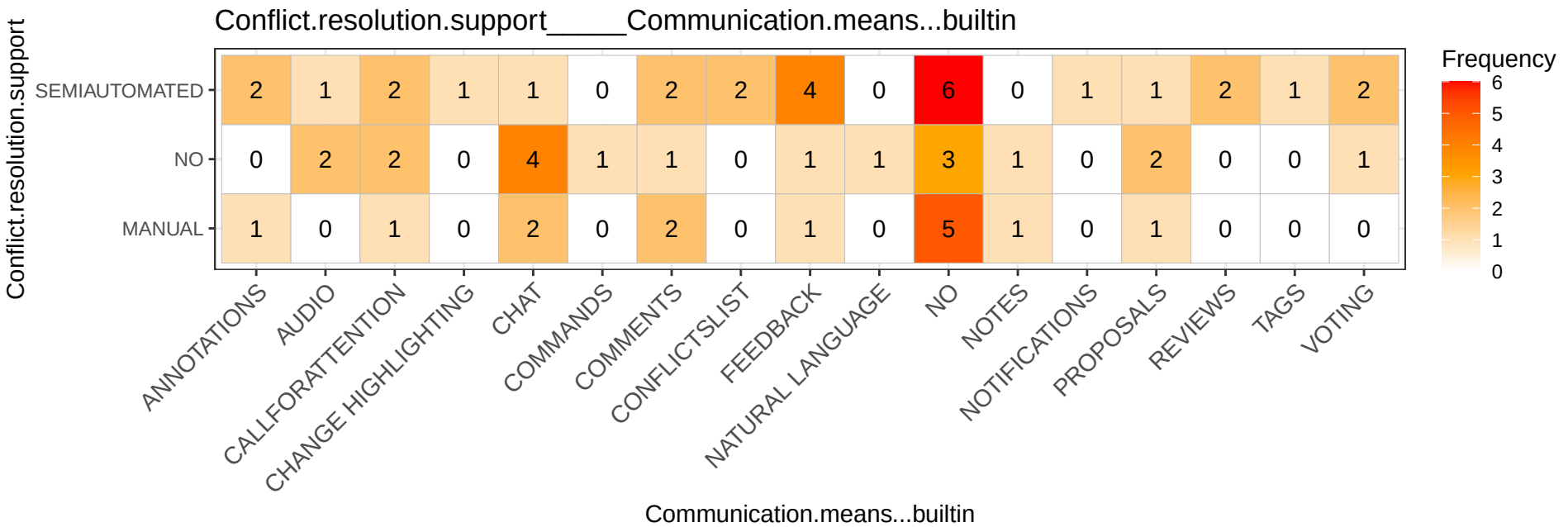

Conflict.awareness..User._____Tool.availability
WARNING
PROMPT ACTION
NO
1
7
1
1
5
14
Conflict.awareness..User.
NO
YES
Tool.availability
Frequency
10
5
0

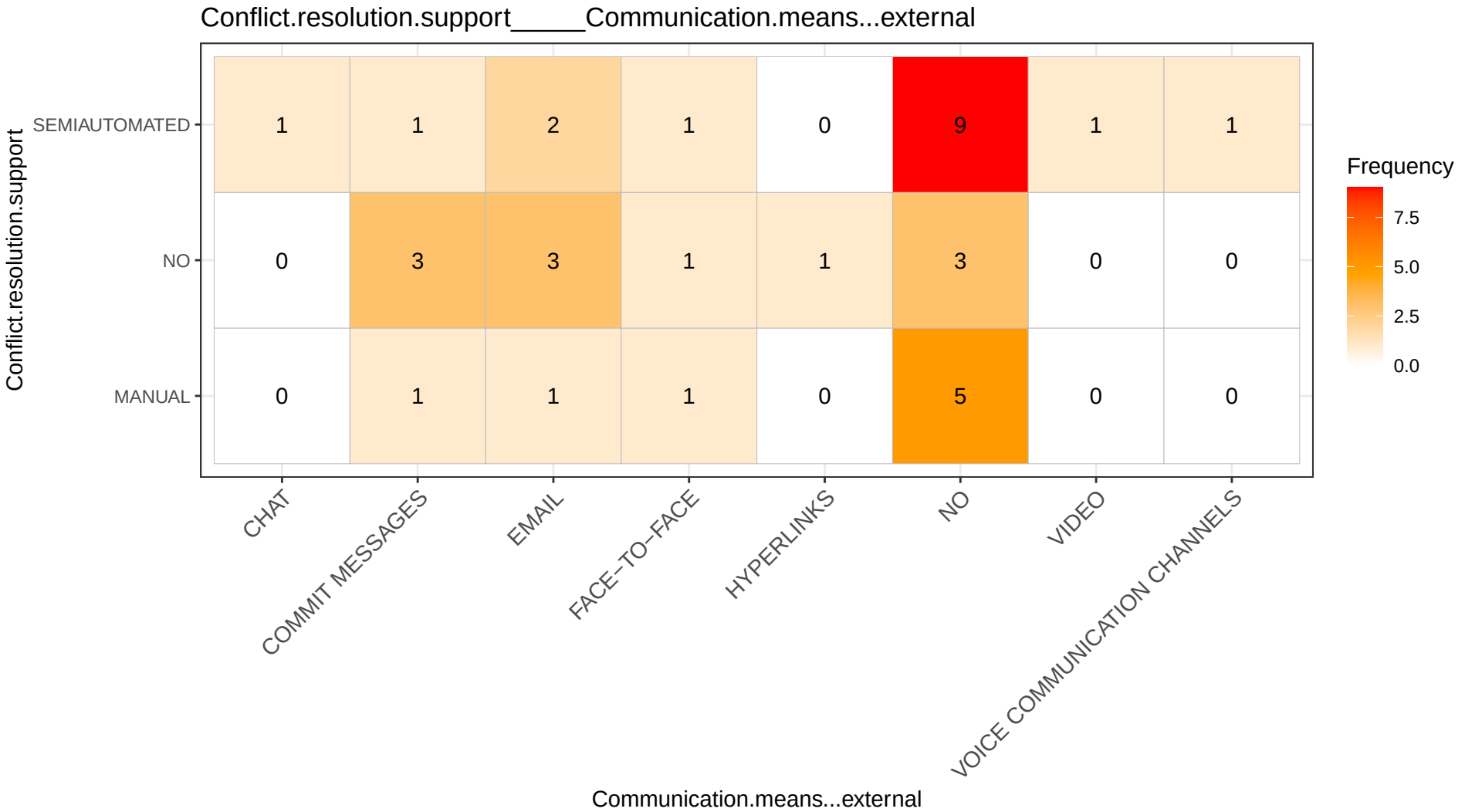

Conflict.awareness..User._____Quality.of.the.research
Conflict.awareness..User.
WARNING
PROMPT ACTION
NO
0 0 2 1 2 1 3 0 3
0 0 0 0 0 0 2 1 0
1 2 2 0 3 2 9 3 5
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
7.5
5.0
2.5
0.0

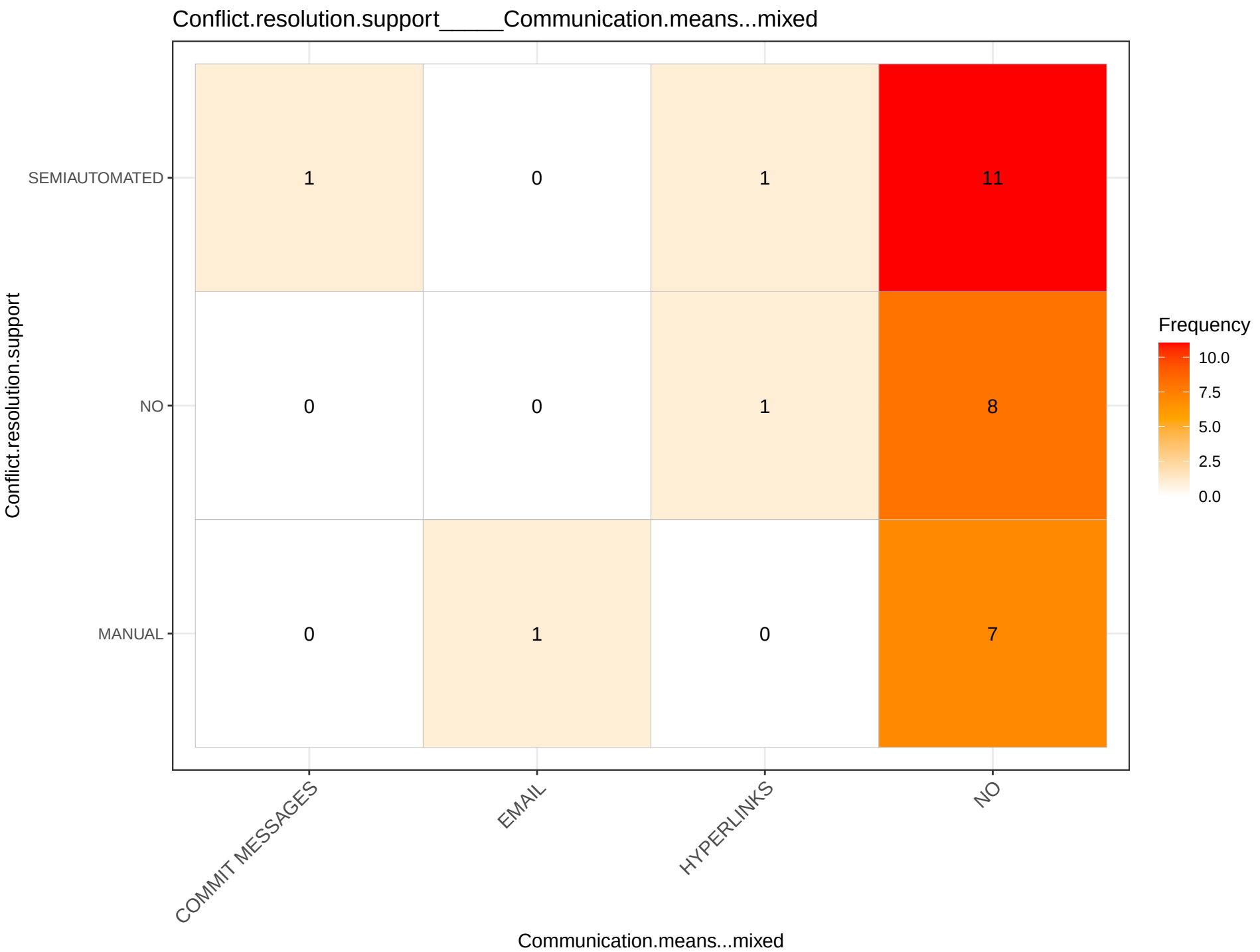

Conflict.resolution.support_____Shared.workspace
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
13
0
7
2
7
1
REMOTE
SAMEPLACE
Shared.workspace
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

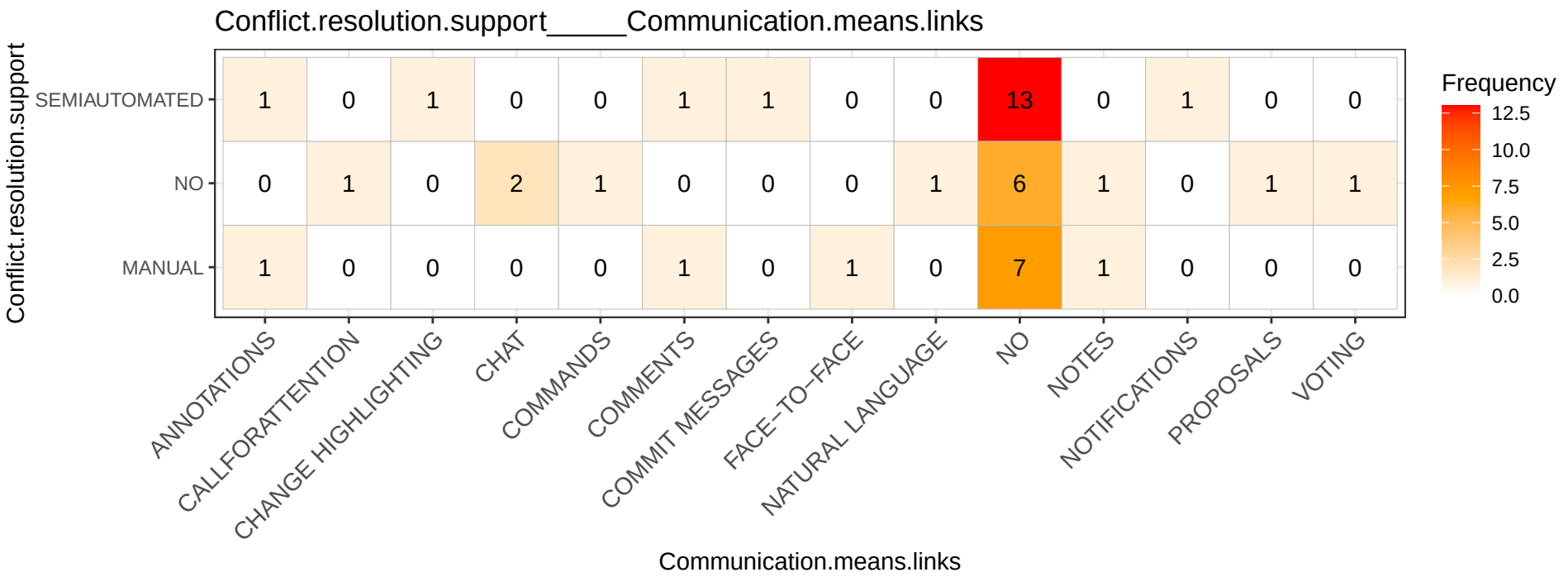

Conflict.resolution.support_____Network.architecture
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
3
8
1
2
2
6
1
0
1
6
1
1
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture
Frequency
8
6
4
2
0

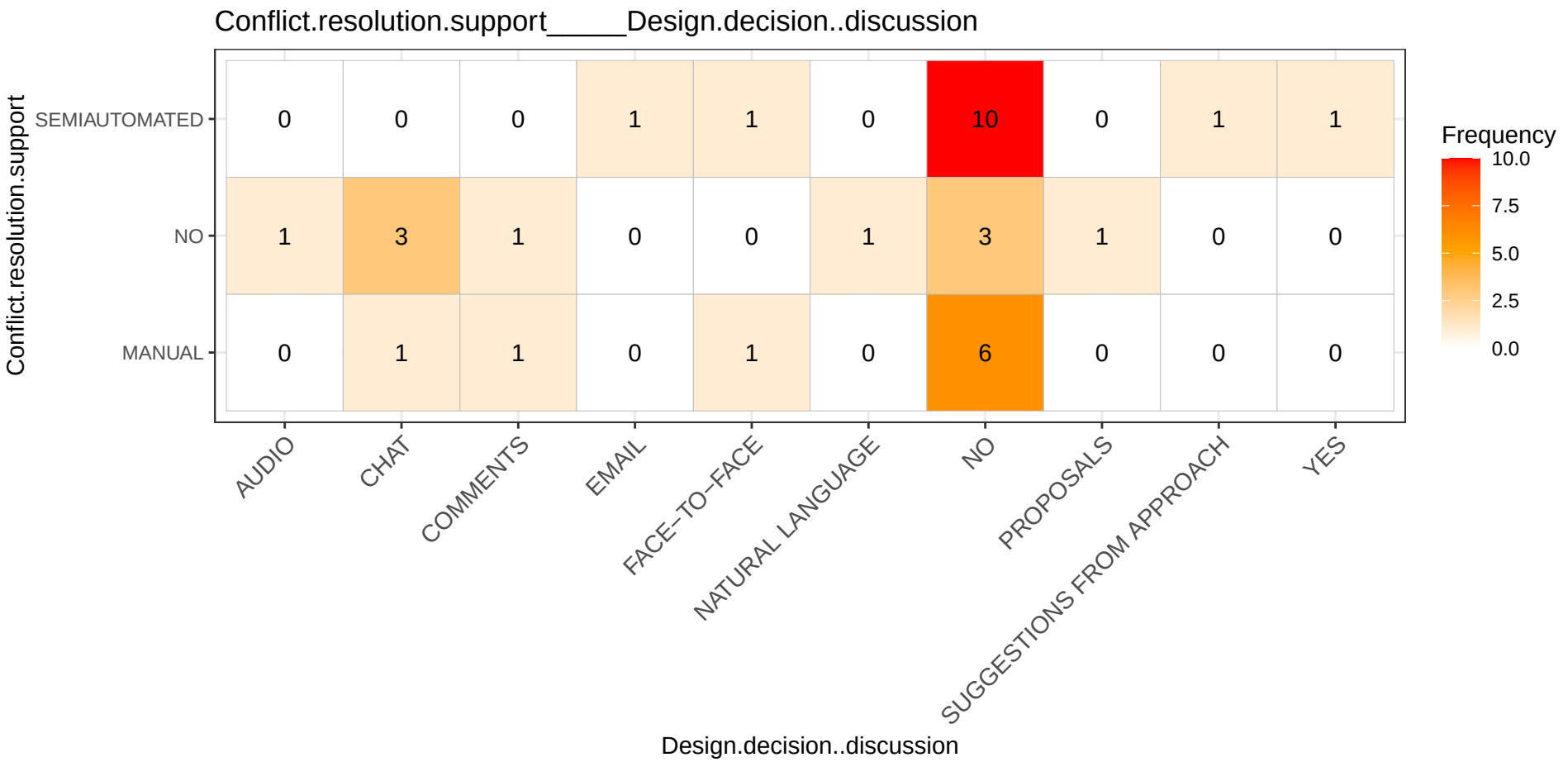

Conflict.resolution.support_____Communication.type
SEMIAUTOMATED
NO
MANUAL
11
13
4
9
7
8
Conflict.resolution.support
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

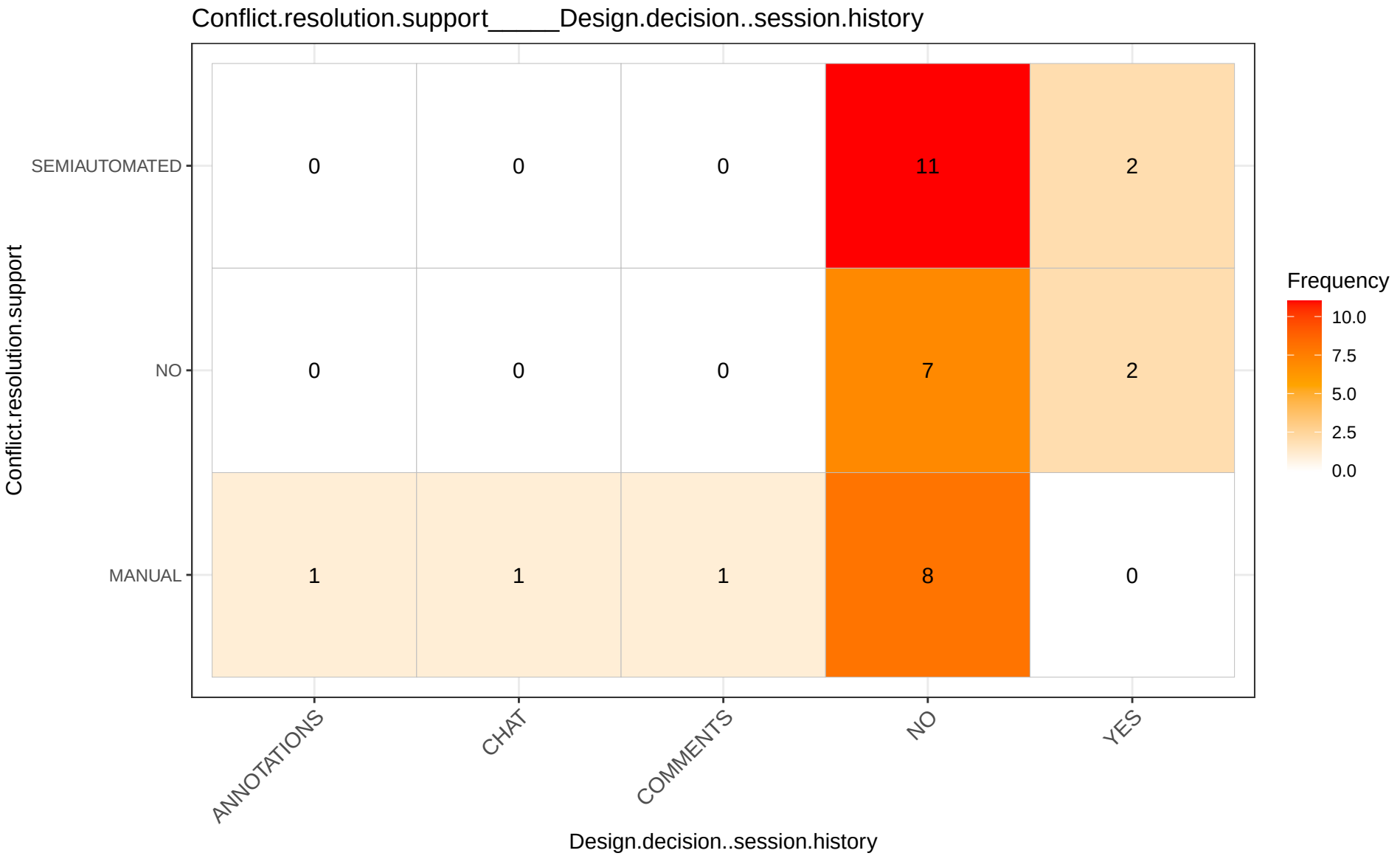

Conflict.resolution.support_____Communication.means...builtin
Conflict.resolution.support
SEMIAUTOMATED
NO
MANUAL
2 1 2 1 1 0 2 2 4 0 6 0 1 1 2 1 2
0 2 2 0 4 1 1 0 1 1 3 1 0 2 0 0 1
1 0 1 0 2 0 2 0 1 0 5 1 0 1 0 0 0
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
6
5
4
3
2
1
0

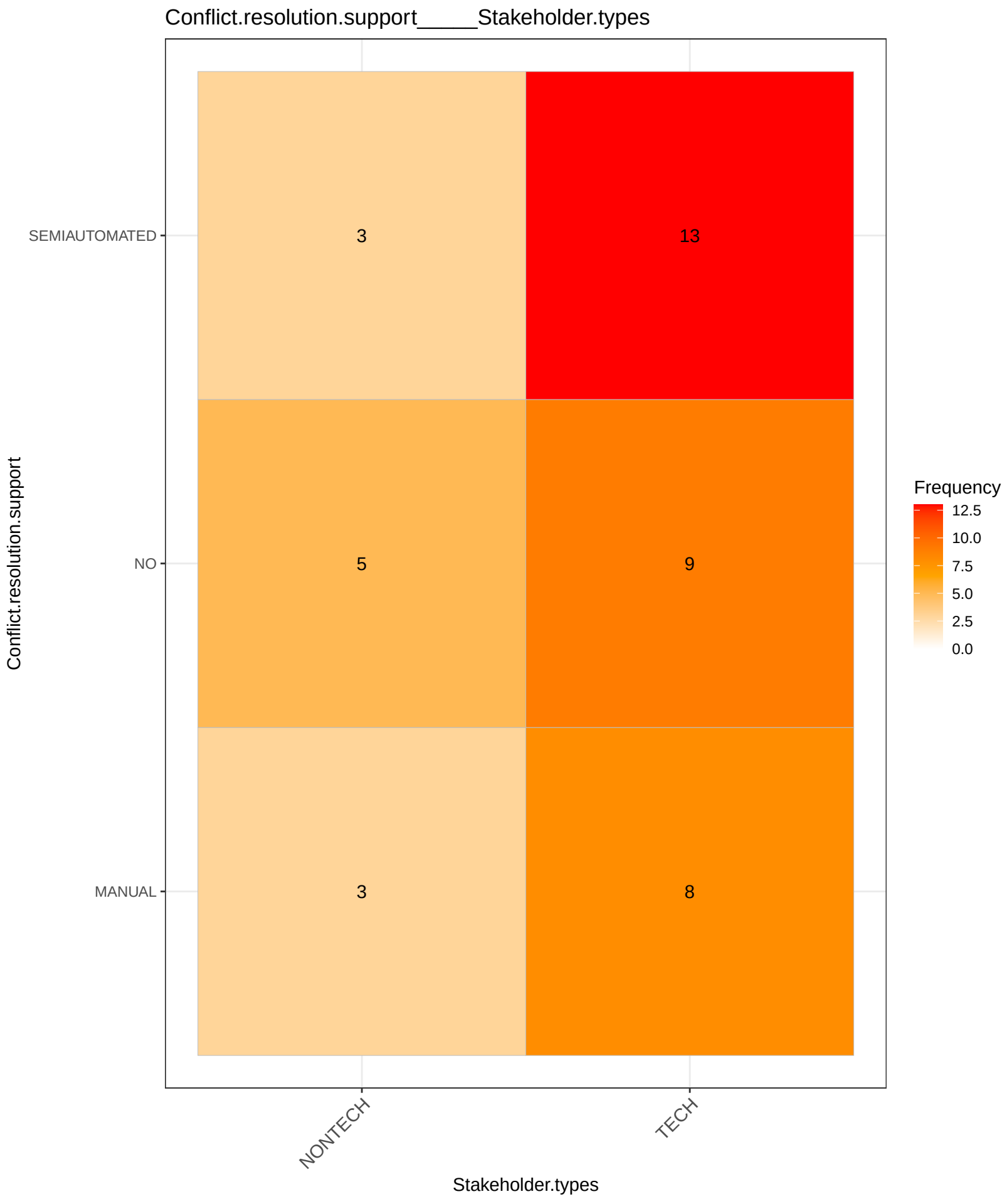

Conflict.resolution.support_____Communication.means...external
Conflict.resolution.support
SEMIAUTOMATED
NO
MANUAL
1 1 2 1 0 9 1 1
0 3 3 1 1 3 0 0
0 1 1 1 0 5 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
7.5
5.0
2.5
0.0

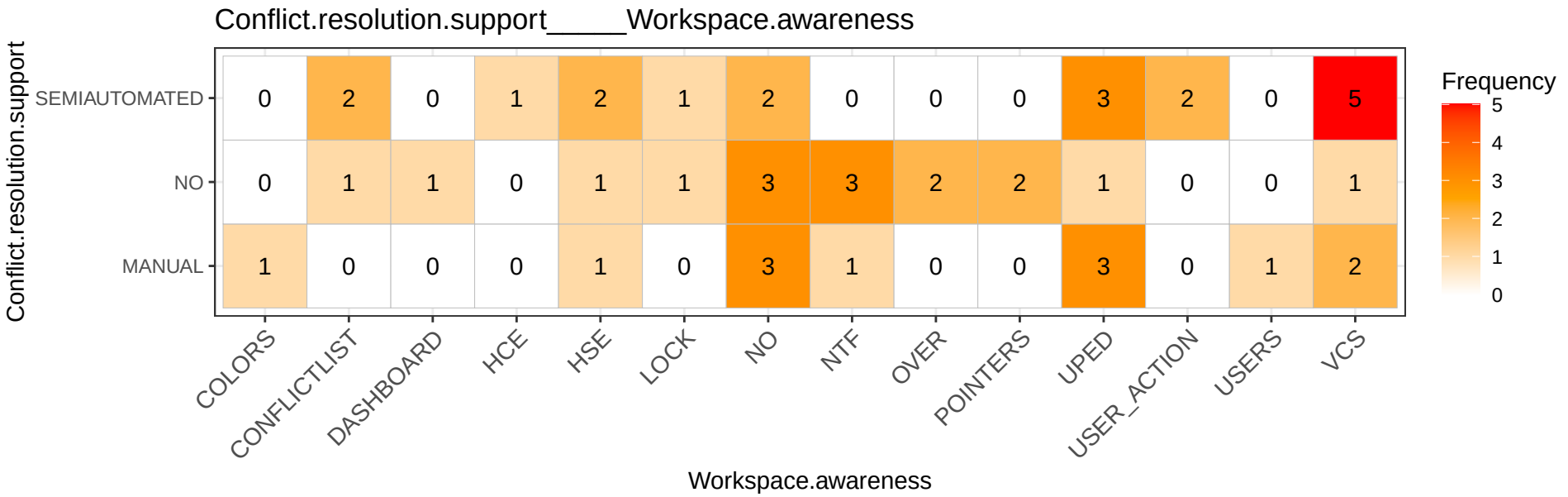

Conflict.resolution.support_____Communication.means...mixed
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
1
0
1
11
0
0
1
8
0
1
0
7
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
10.0
7.5
5.0
2.5
0.0

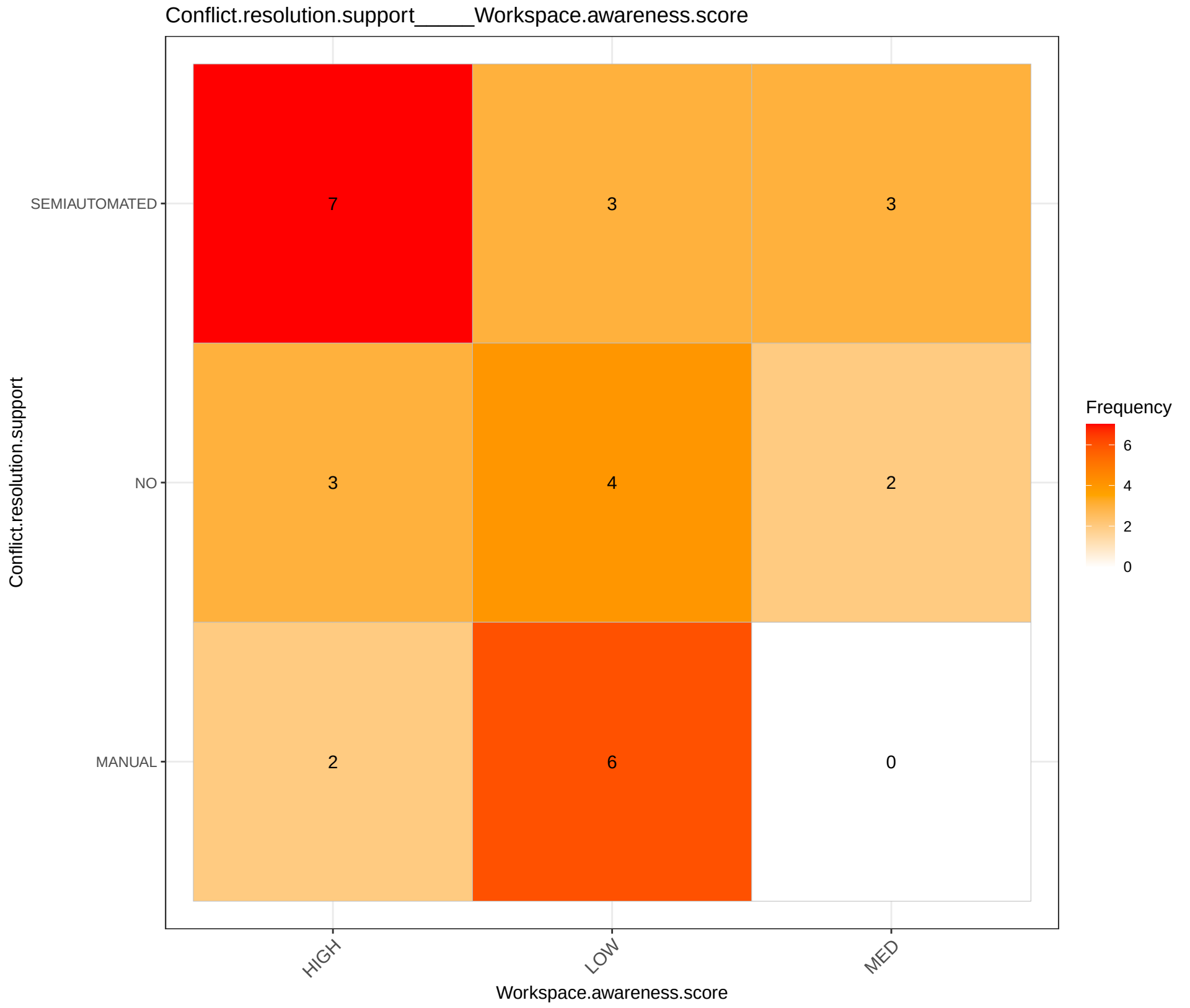

Conflict.resolution.support_____Communication.means.links
Conflict.resolution.support
SEMIAUTOMATED
NO
MANUAL
1 0 1 0 0 1 1 0 0 13 0 1 0 0
0 1 0 2 1 0 0 0 1 6 1 0 1 1
1 0 0 0 0 1 0 1 0 7 1 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

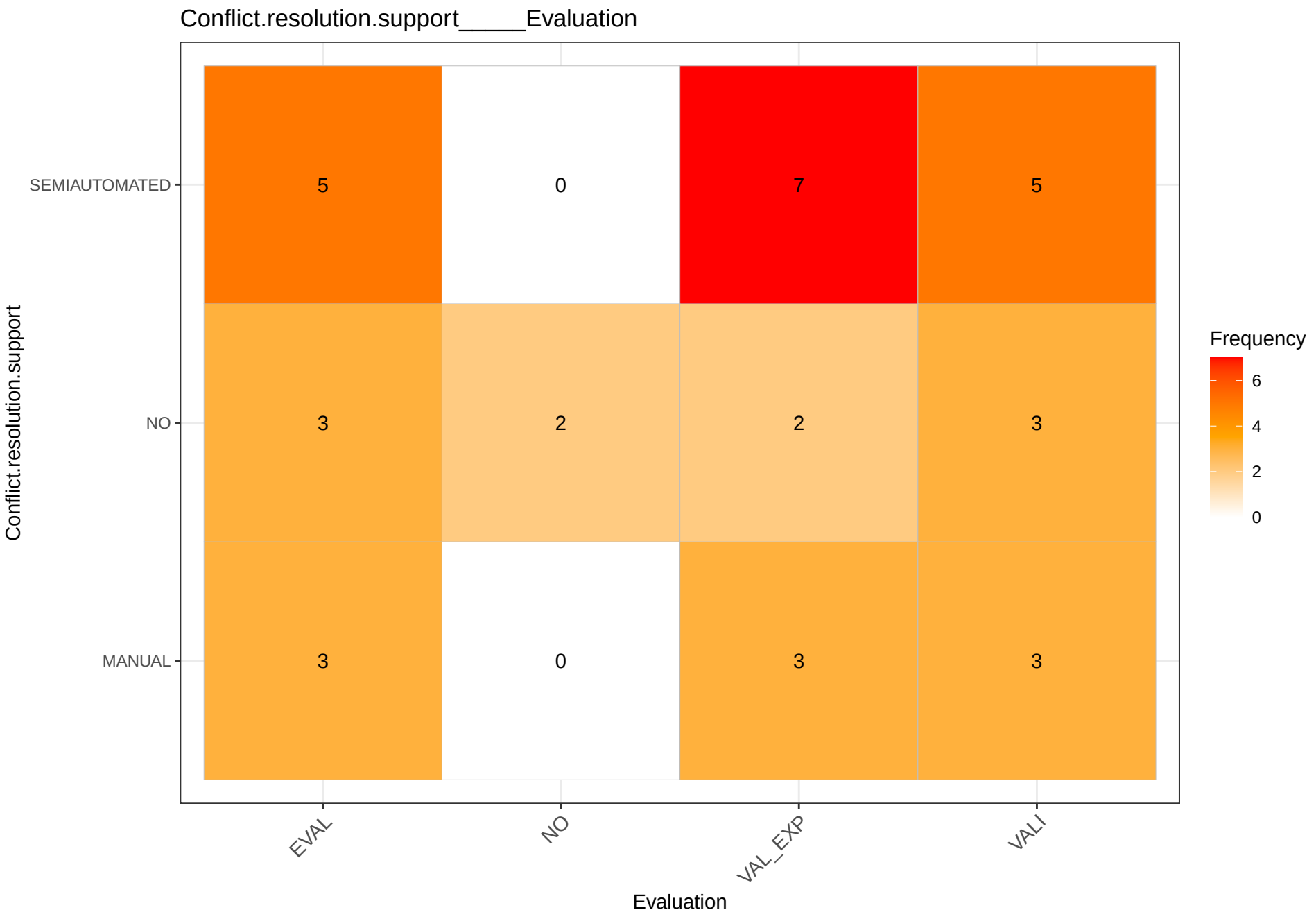

Conflict.resolution.support_____Design.decision..discussion
Conflict.resolution.support
SEMIAUTOMATED
NO
MANUAL
0 0 0 1 1 0 10 0 1 1
1 3 1 0 0 1 3 1 0 0
0 1 1 0 1 0 6 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0

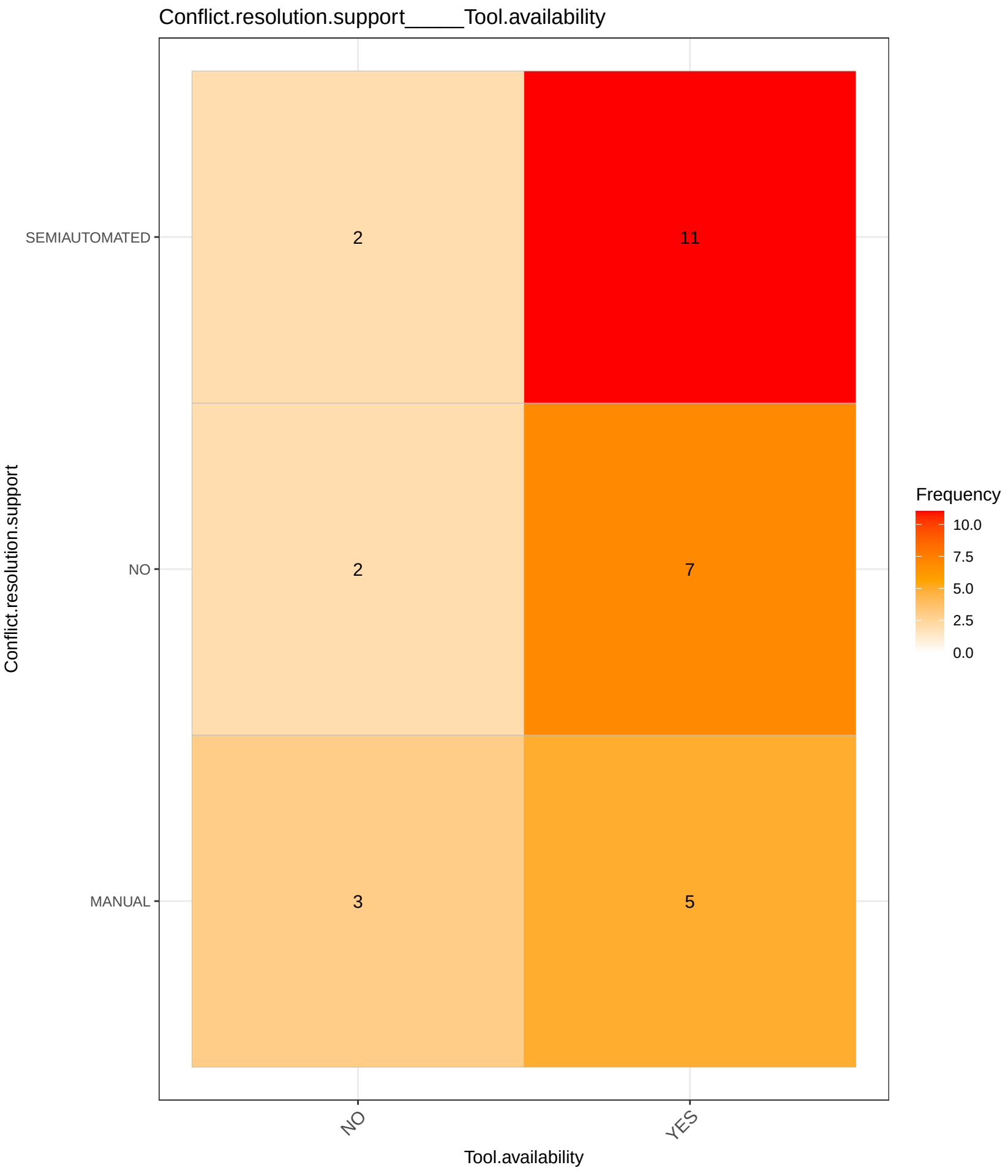

Conflict.resolution.support_____Design.decision..session.history
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
0
0
0
11
2
0
0
0
7
2
1
1
1
8
0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
10.0
7.5
5.0
2.5
0.0

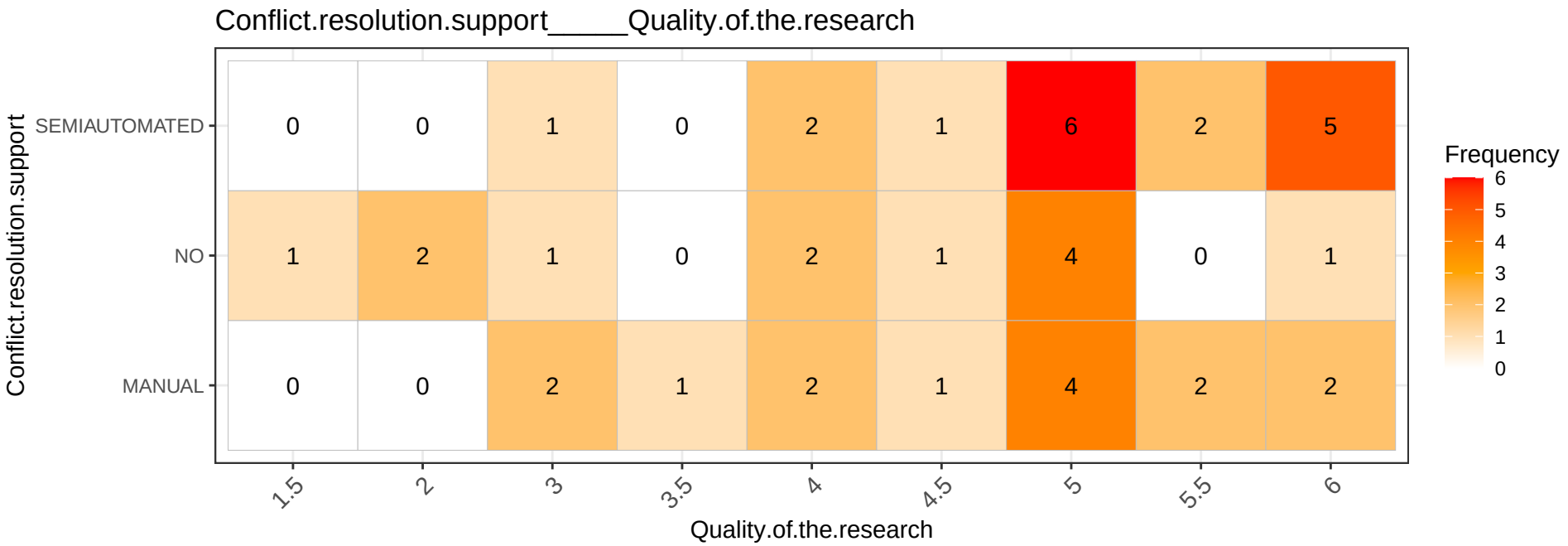

Conflict.resolution.support_____Stakeholder.types
SEMIAUTOMATED
NO
MANUAL
3
13
5
9
3
8
Conflict.resolution.support
NONTECH
TECH
Stakeholder.types
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

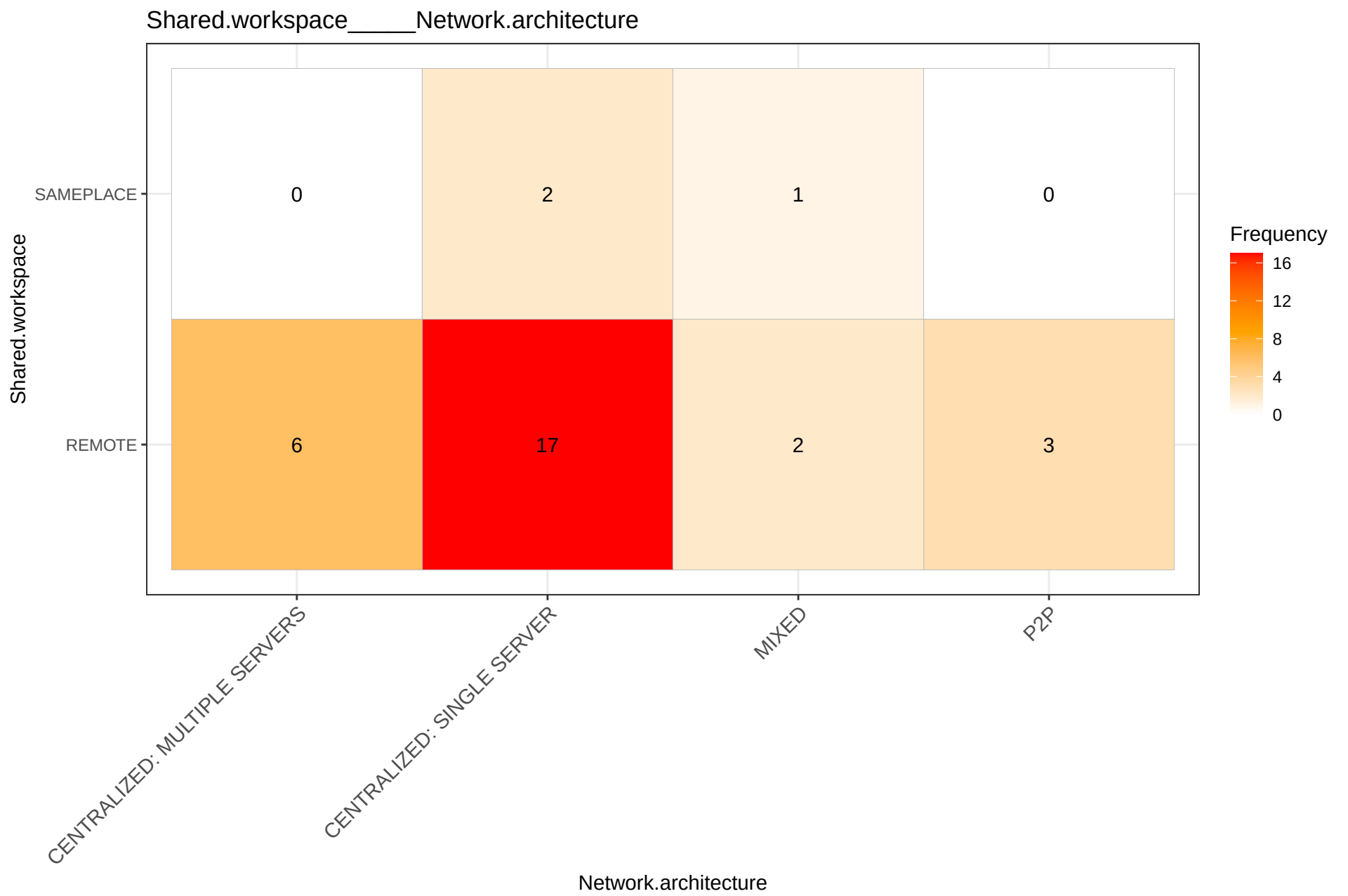

Conflict.resolution.support_____Workspace.awareness
Conflict.resolution.support
SEMIAUTOMATED
NO
MANUAL
0 2 0 1 2 1 2 0 0 0 3 2 0 5
0 1 1 0 1 1 3 3 2 2 1 0 0 1
1 0 0 0 1 0 3 1 0 0 3 0 1 2
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
5
4
3
2
1
0

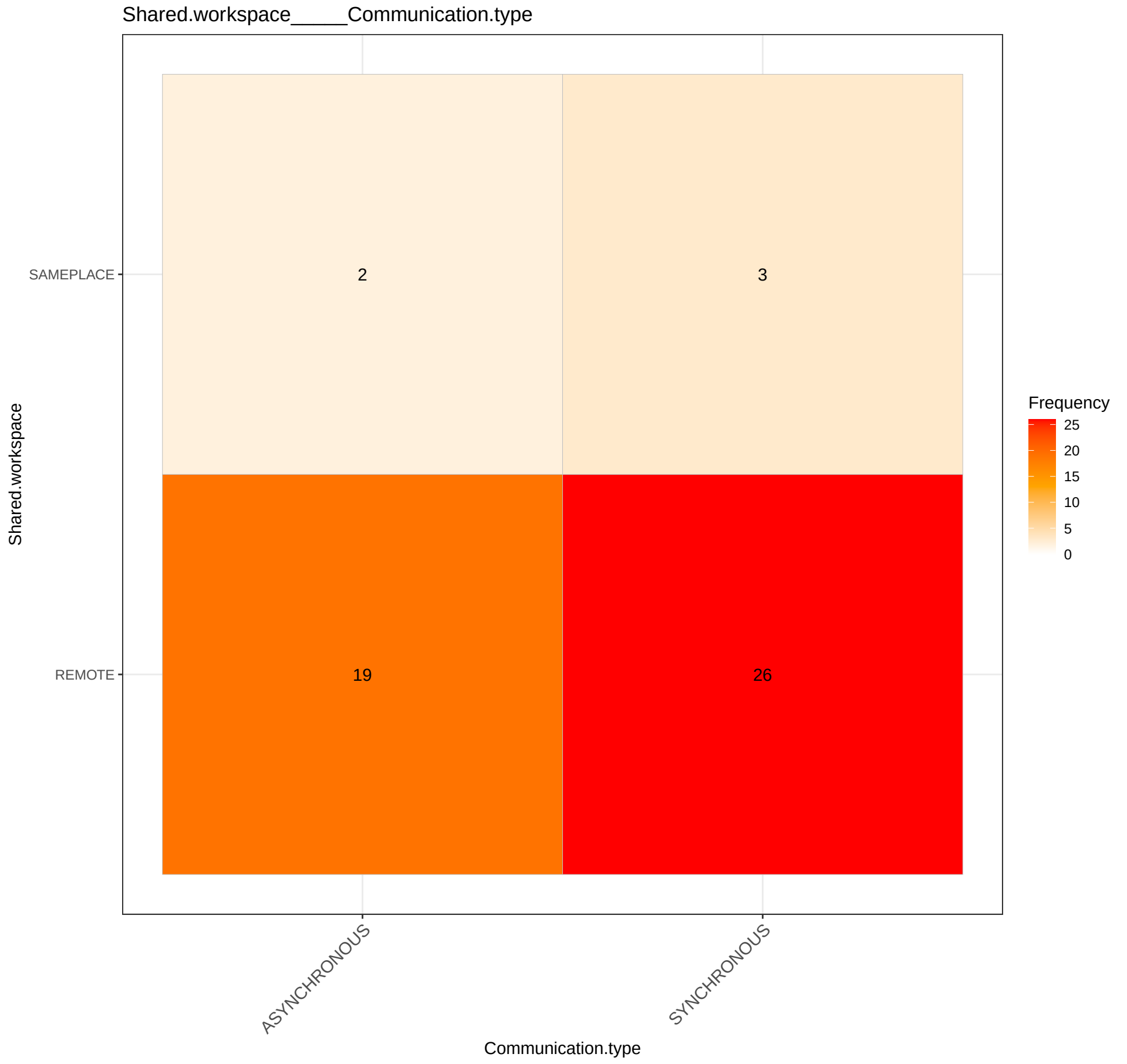

Conflict.resolution.support_____Workspace.awareness.score
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
7
3
3
3
4
2
2
6
0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
6
4
2
0

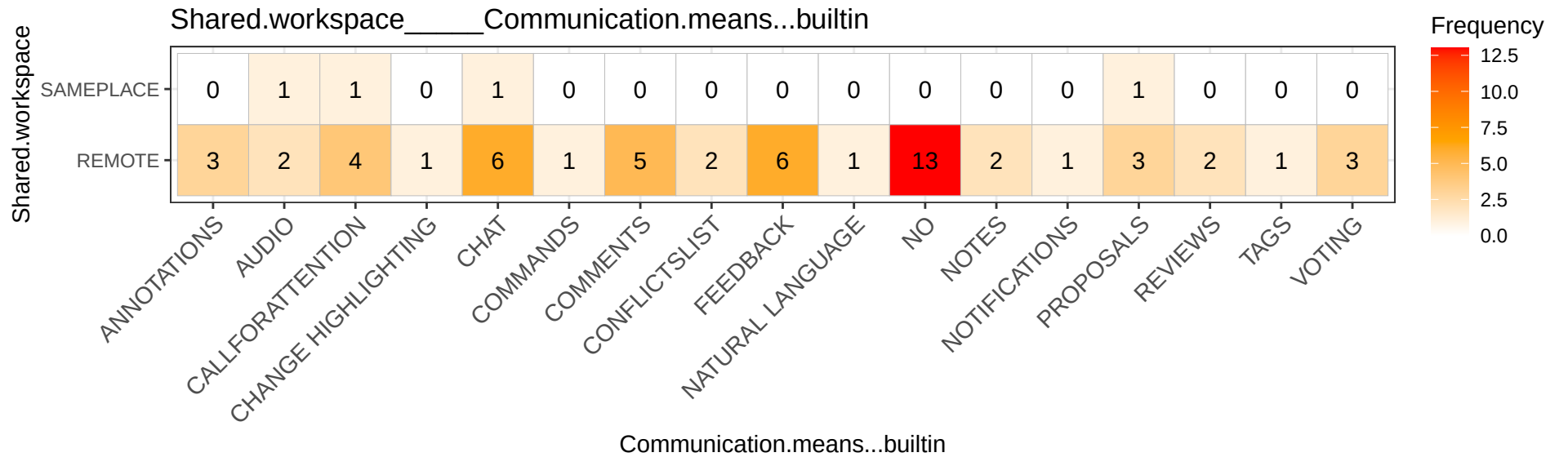

Conflict.resolution.support_____Evaluation
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
5
0
7
5
3
2
2
3
3
0
3
3
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
6
4
2
0

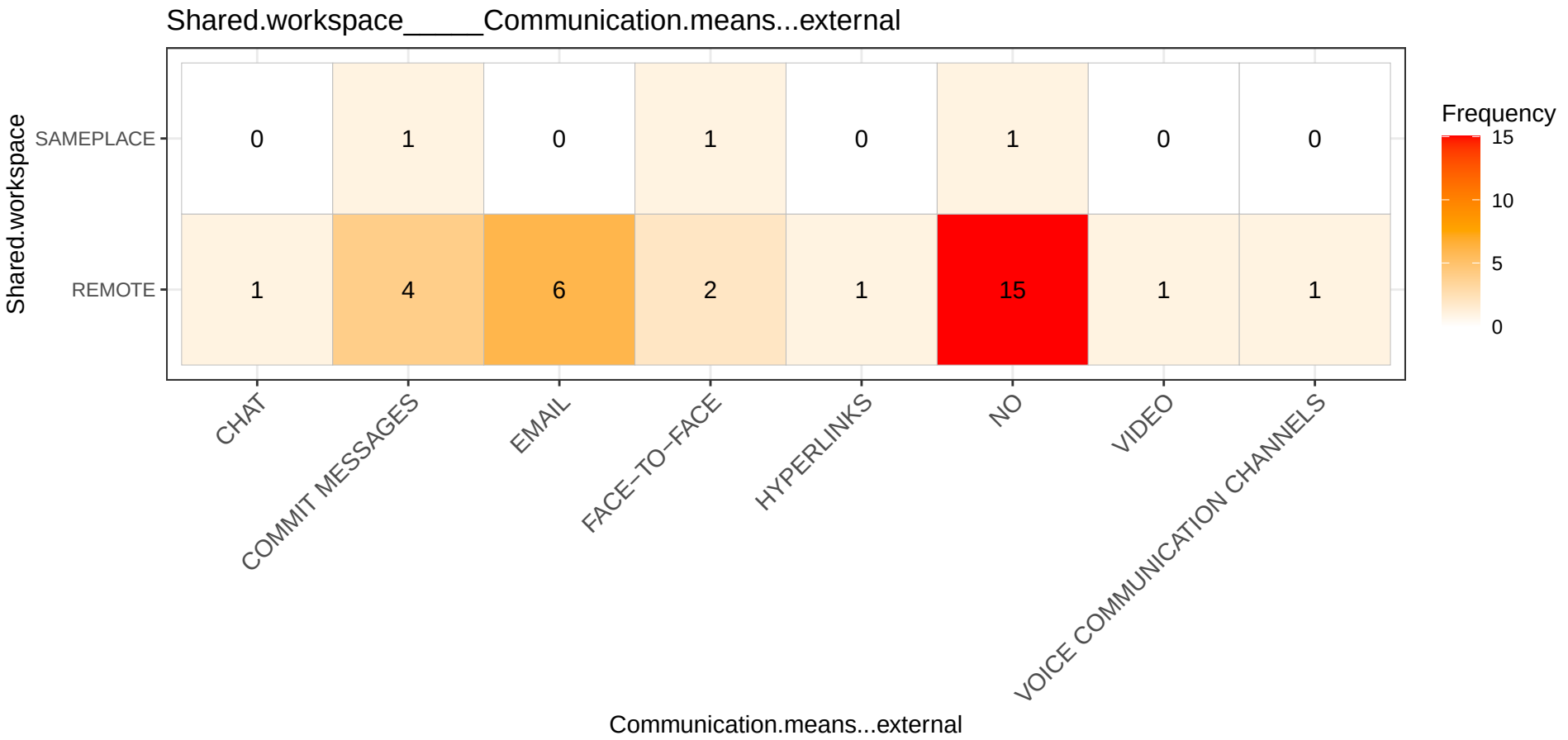

Conflict.resolution.support_____Tool.availability
SEMIAUTOMATED
NO
MANUAL
Conflict.resolution.support
2
11
2
7
3
5
NO
YES
Tool.availability
Frequency
10.0
7.5
5.0
2.5
0.0

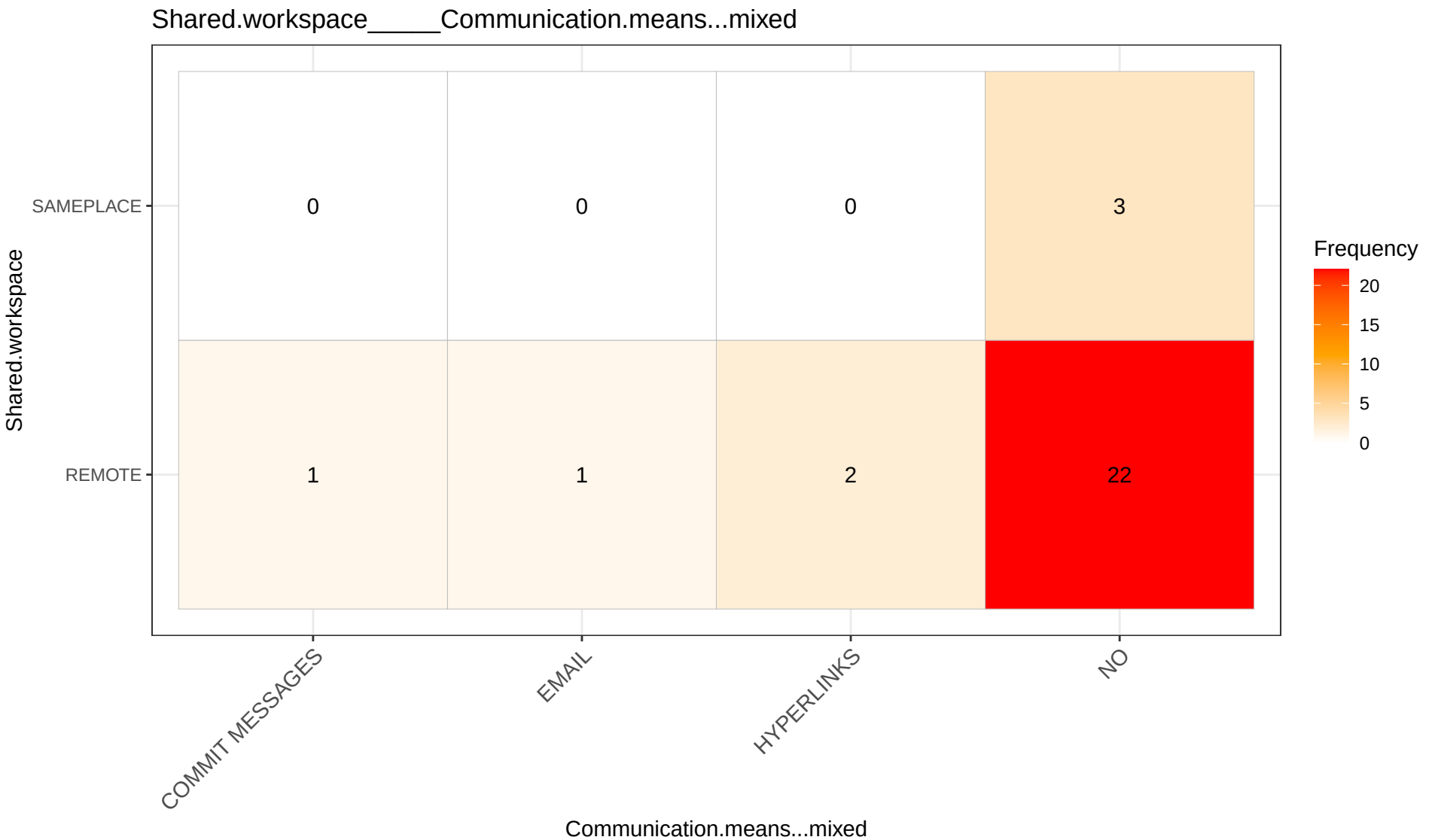

Conflict.resolution.support_____Quality.of.the.research
Conflict.resolution.support
SEMIAUTOMATED
NO
MANUAL
0 0 1 0 2 1 6 2 5
1 2 1 0 2 1 4 0 1
0 0 2 1 2 1 4 2 2
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
6 5 4 3 2 1 0

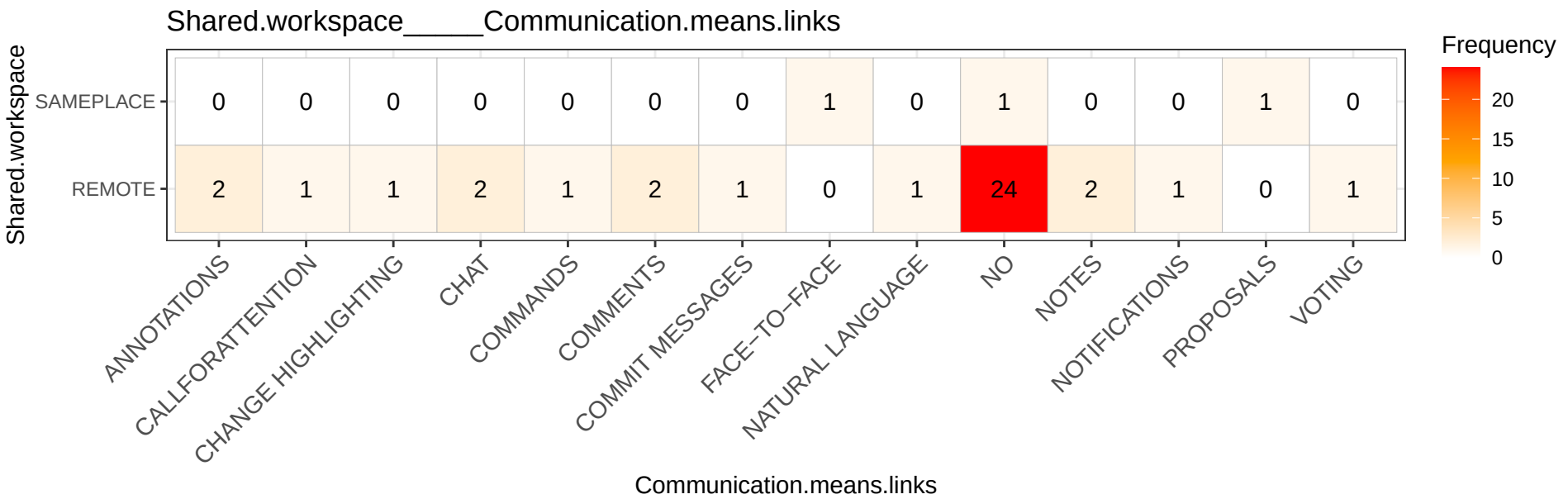

Shared.workspace_____Network.architecture
SAMEPLACE
REMOTE
Shared.workspace
0
2
1
0
6
17
2
3
Frequency
16
12
8
4
0
CENTRALIZED: MULTIPLE SERVERS
CENTRALIZED: SINGLE SERVER
MIXED
P2P
Network.architecture

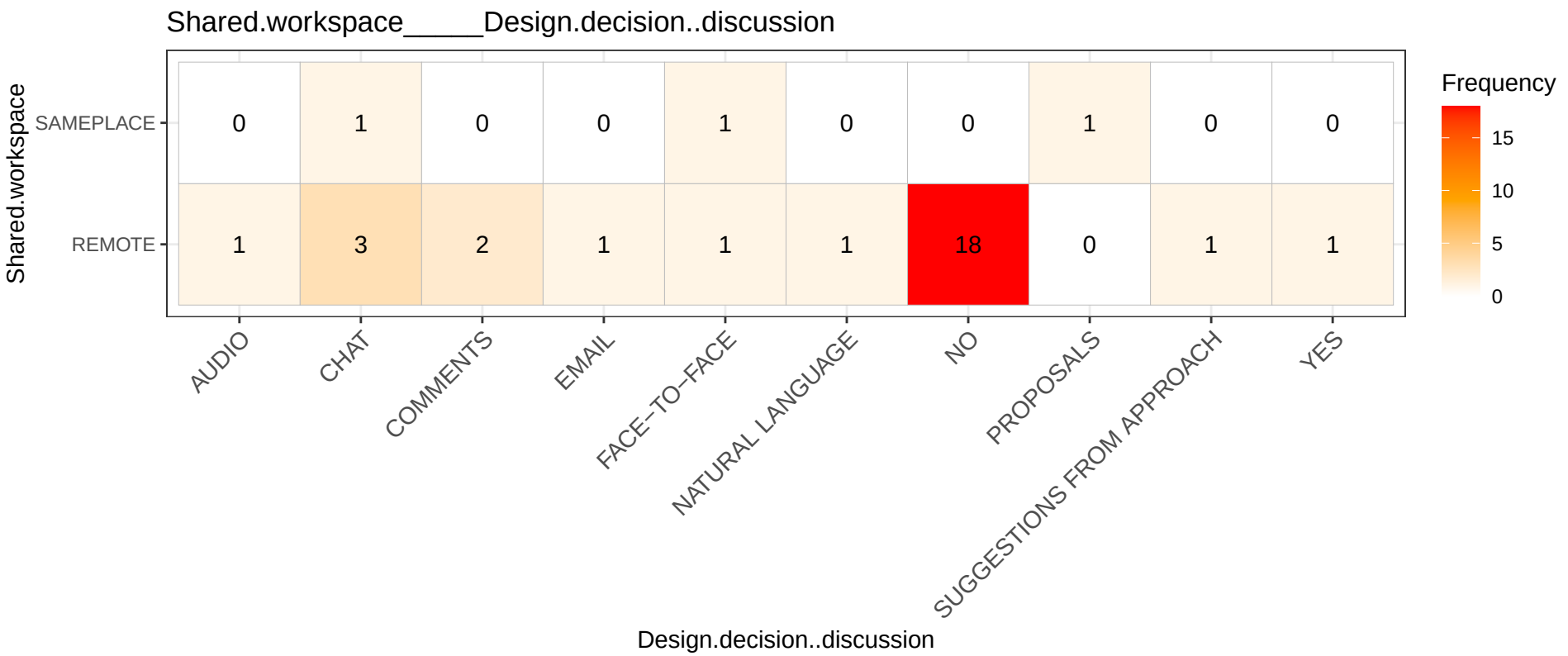

Shared.workspace_____Communication.type
SAMEPLACE
REMOTE
2
3
19
26
Shared.workspace
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
25
20
15
10
5
0

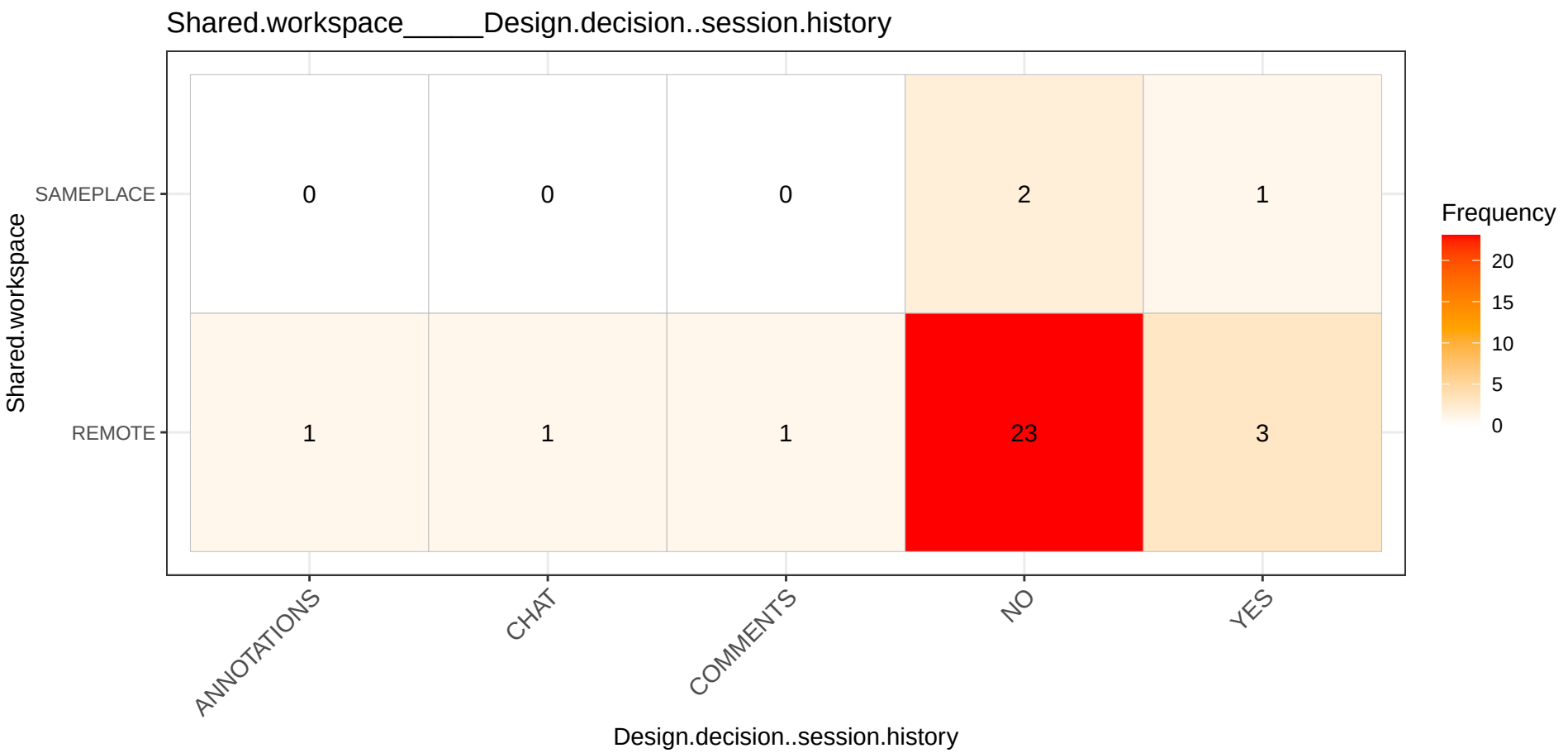

Shared.workspace_____Communication.means...builtin
Shared.workspace
SAMEPLACE
REMOTE
0 1 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0
3 2 4 1 6 1 5 2 6 1 13 2 1 3 2 1 3
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

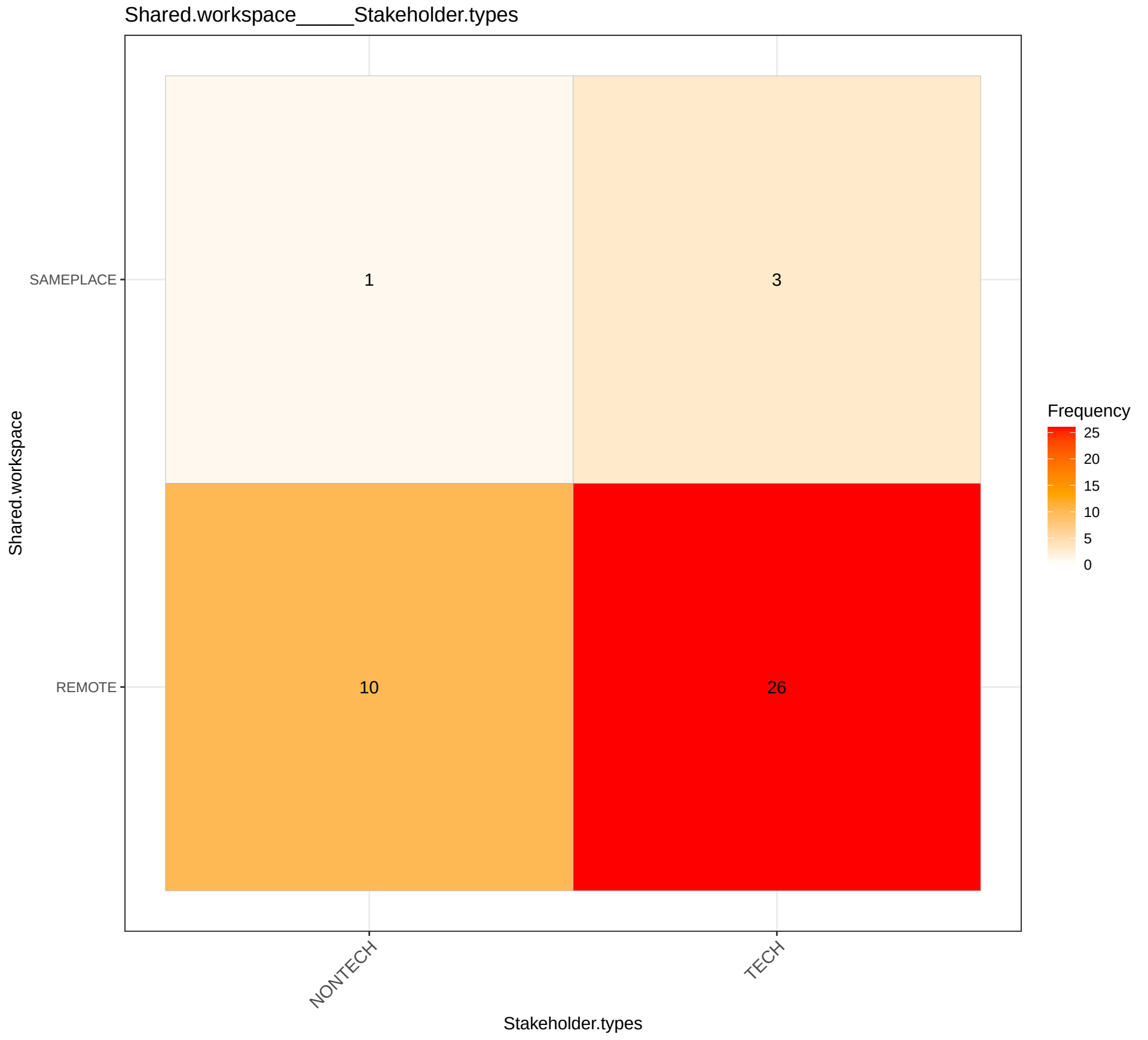

Shared.workspace_____Communication.means...external
Shared.workspace
SAMEPLACE
REMOTE
0
1
0
1
0
1
0
0
1
4
6
2
1
15
1
1
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
15
10
5
0

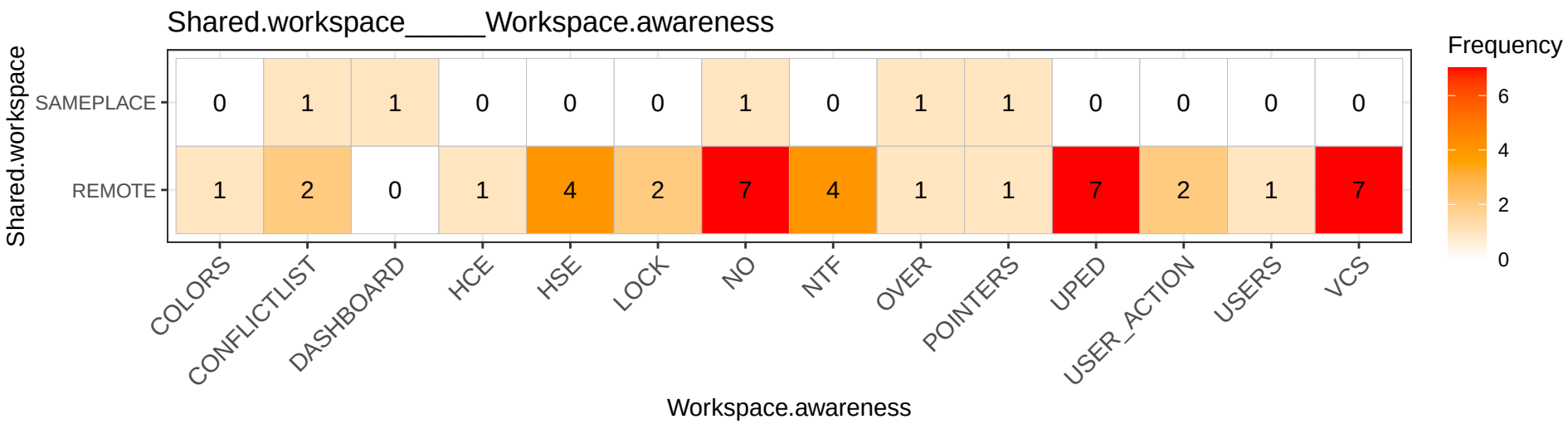

Shared.workspace_____Communication.means...mixed
SAMEPLACE
REMOTE
Shared.workspace
0
0
0
3
1
1
2
22
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
20
15
10
5
0


Shared.workspace_____Communication.means.links
Shared.workspace
SAMEPLACE
REMOTE
0 0 0 0 0 0 0 1 0 1 0 0 1 0
2 1 1 2 1 2 1 0 1 24 2 1 0 1
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
20
15
10
5
0

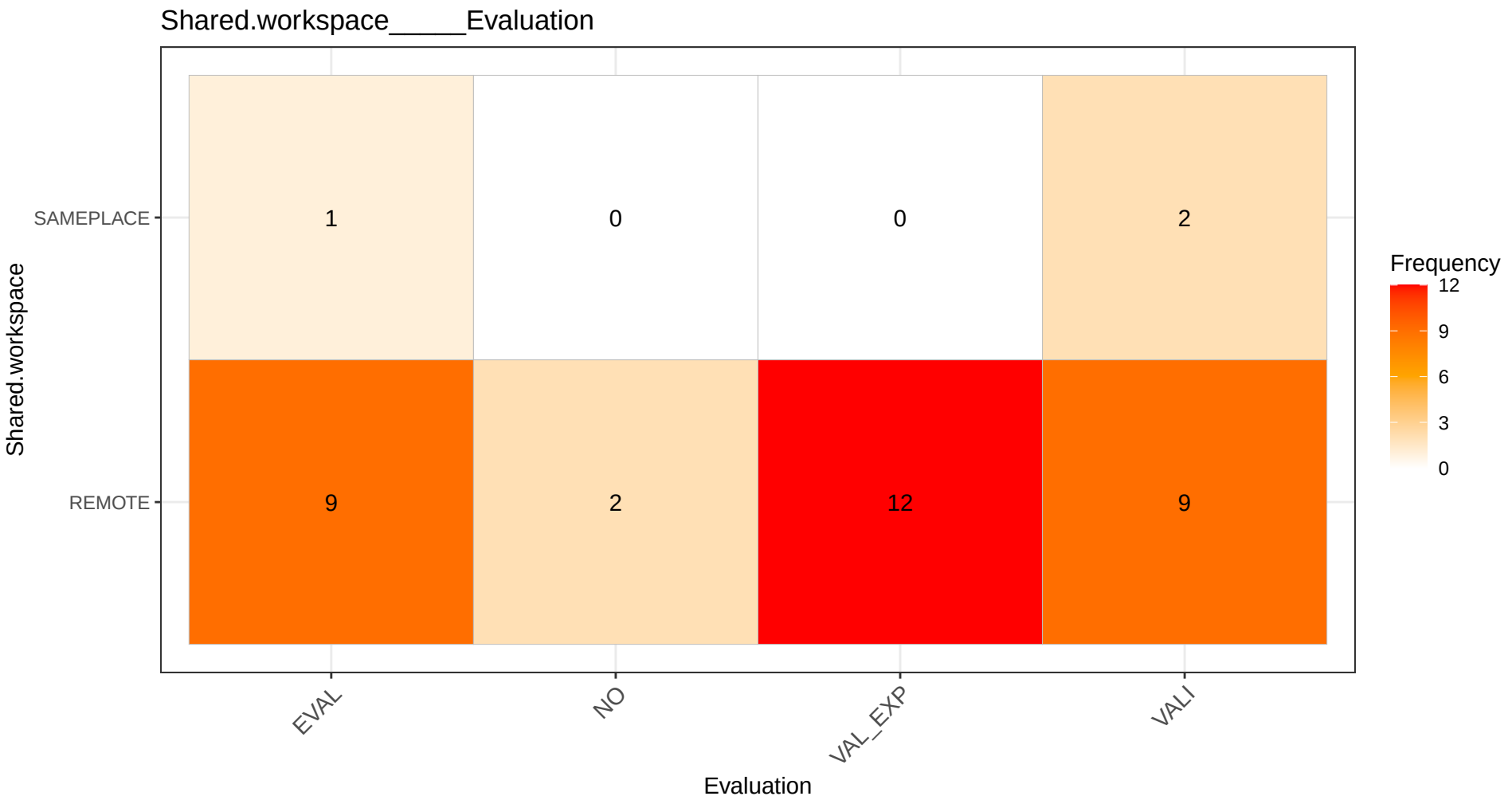

Shared.workspace_____Design.decision..discussion
Shared.workspace
SAMEPLACE
REMOTE
0 1 0 0 1 0 0 1 0 0
1 3 2 1 1 1 18 0 1 1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
15
10
5
0

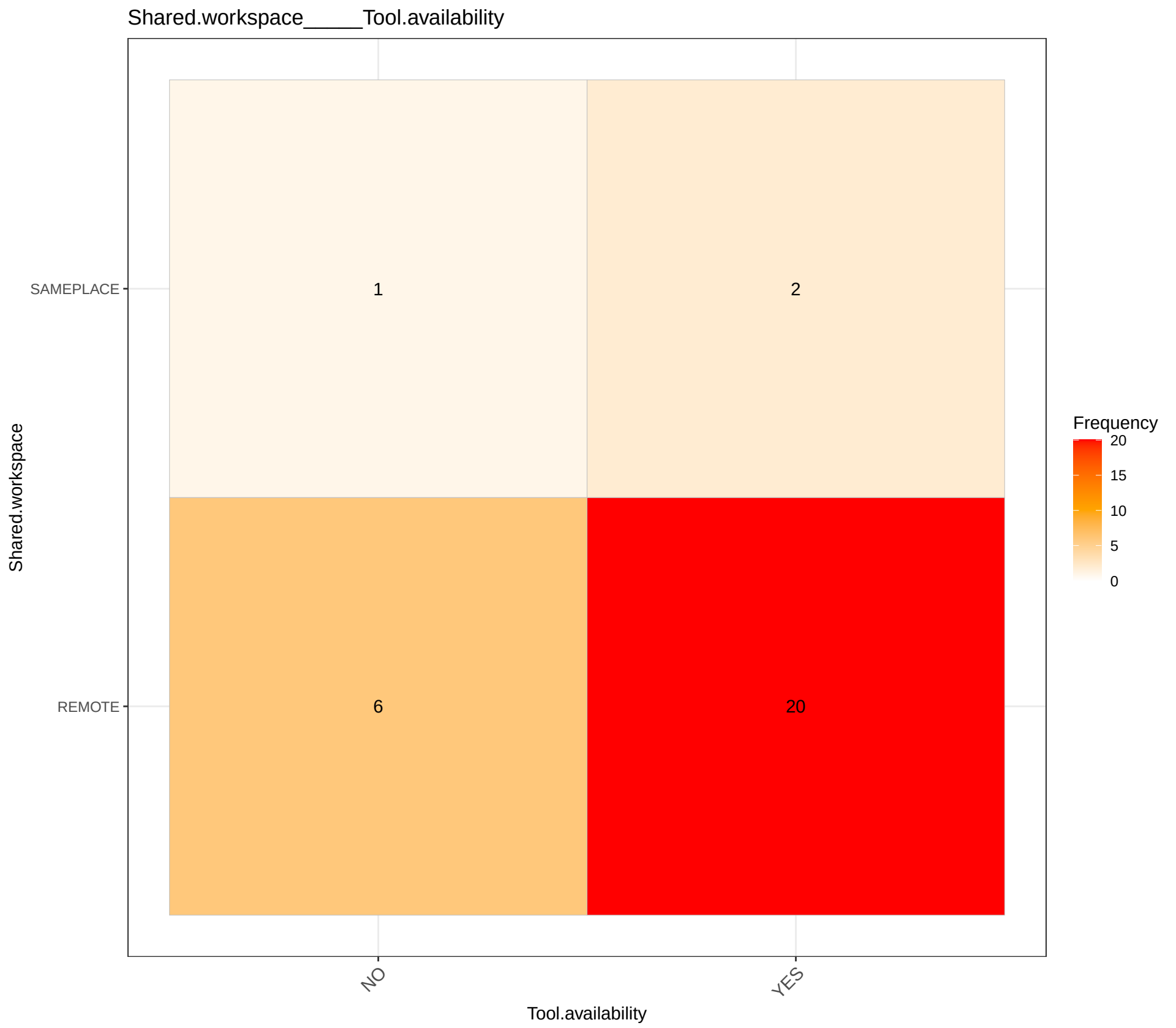

Shared.workspace_____Design.decision..session.history
Shared.workspace
SAMEPLACE
REMOTE
0
0
0
2
1
1
1
1
23
3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
20
15
10
5
0

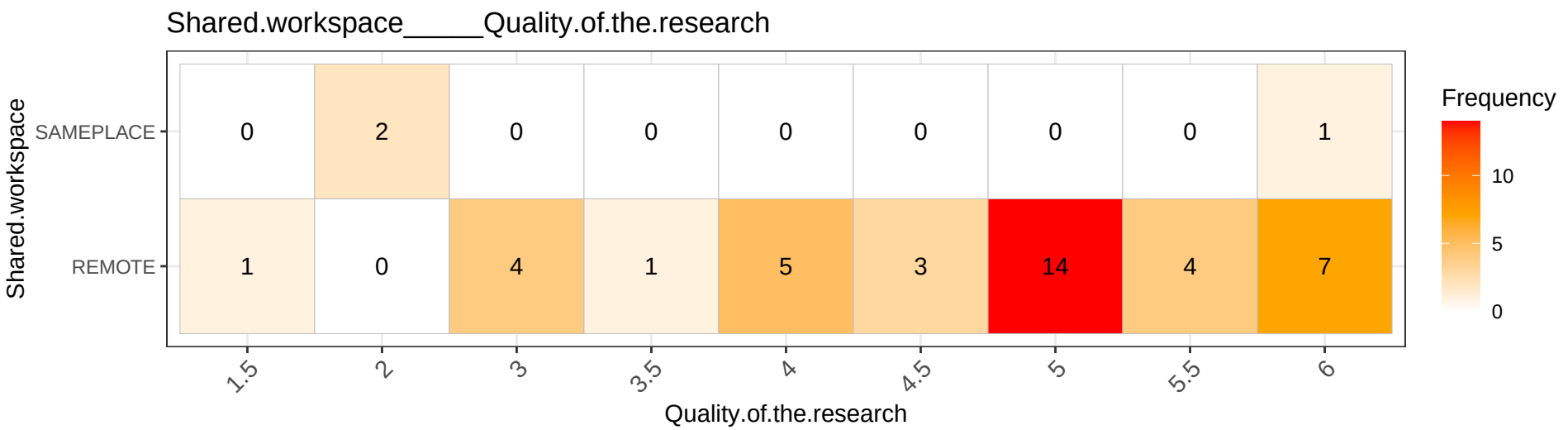

Shared.workspace_____Stakeholder.types
SAMEPLACE
REMOTE
1
3
10
26
NONTECH
TECH
Shared.workspace
Stakeholder.types
Frequency
25
20
15
10
5
0

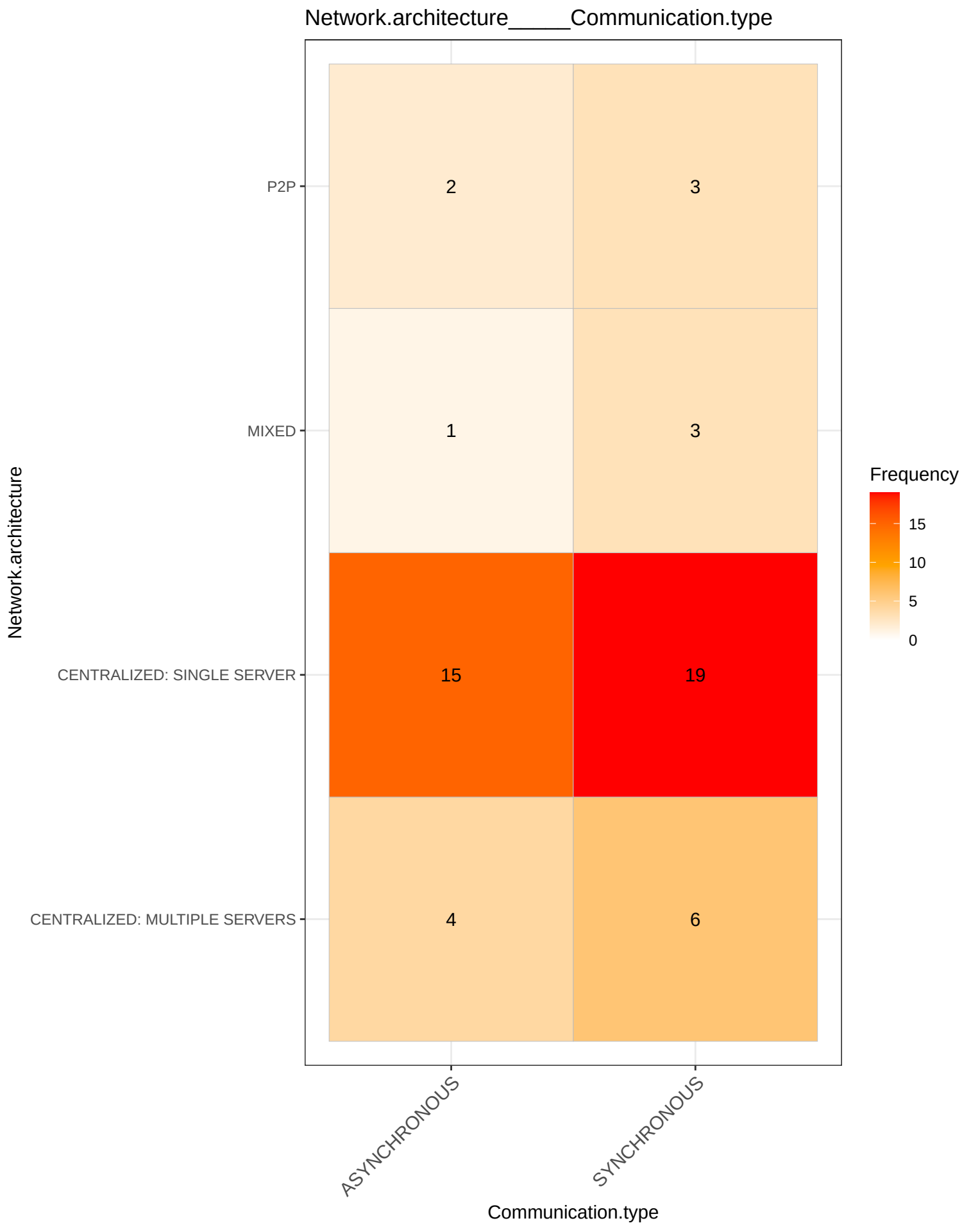

Shared.workspace_____Workspace.awareness
Shared.workspace
SAMEPLACE
REMOTE
0 1 1 0 0 0 1 0 1 1 0 0 0 0
1 2 0 1 4 2 7 4 1 1 7 2 1 7
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
4
2
0

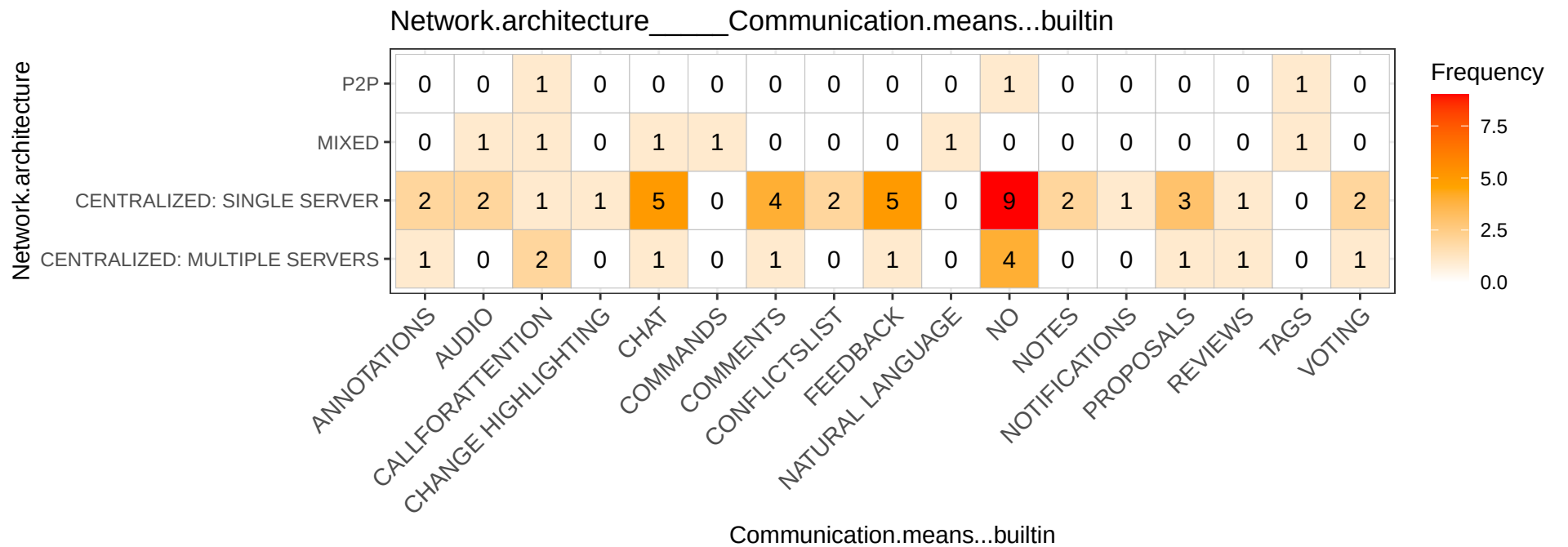
Shared.workspace_____Workspace.awareness.score
SAMEPLACE
REMOTE
Shared.workspace
2
1
0
9
12
5
HIGH
LOW
MED
Workspace.awareness.score
Frequency
12
9
6
3
0

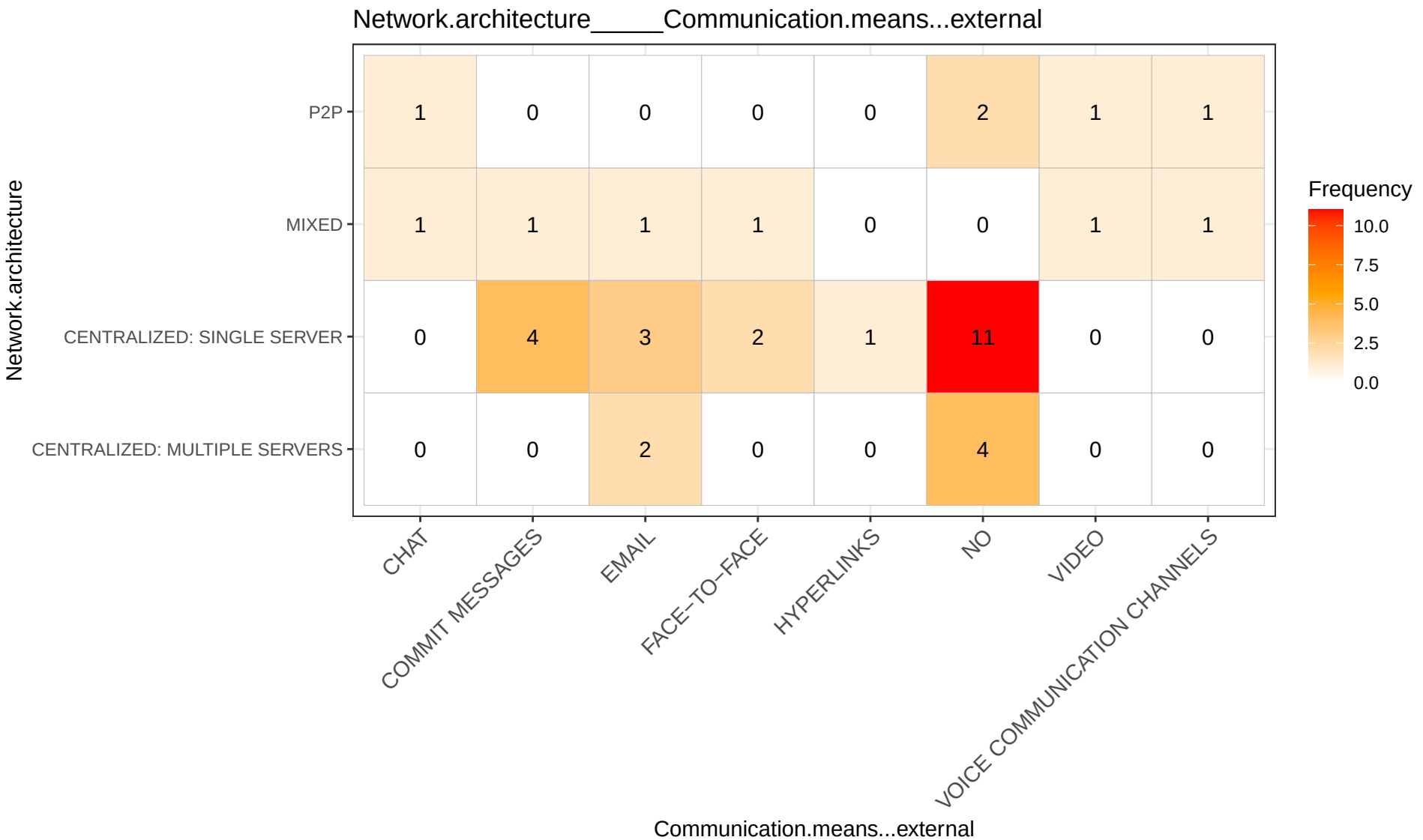

Shared.workspace_____Evaluation
SAMEPLACE
REMOTE
Shared.workspace
1
0
0
2
9
2
12
9
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
12
9
6
3
0

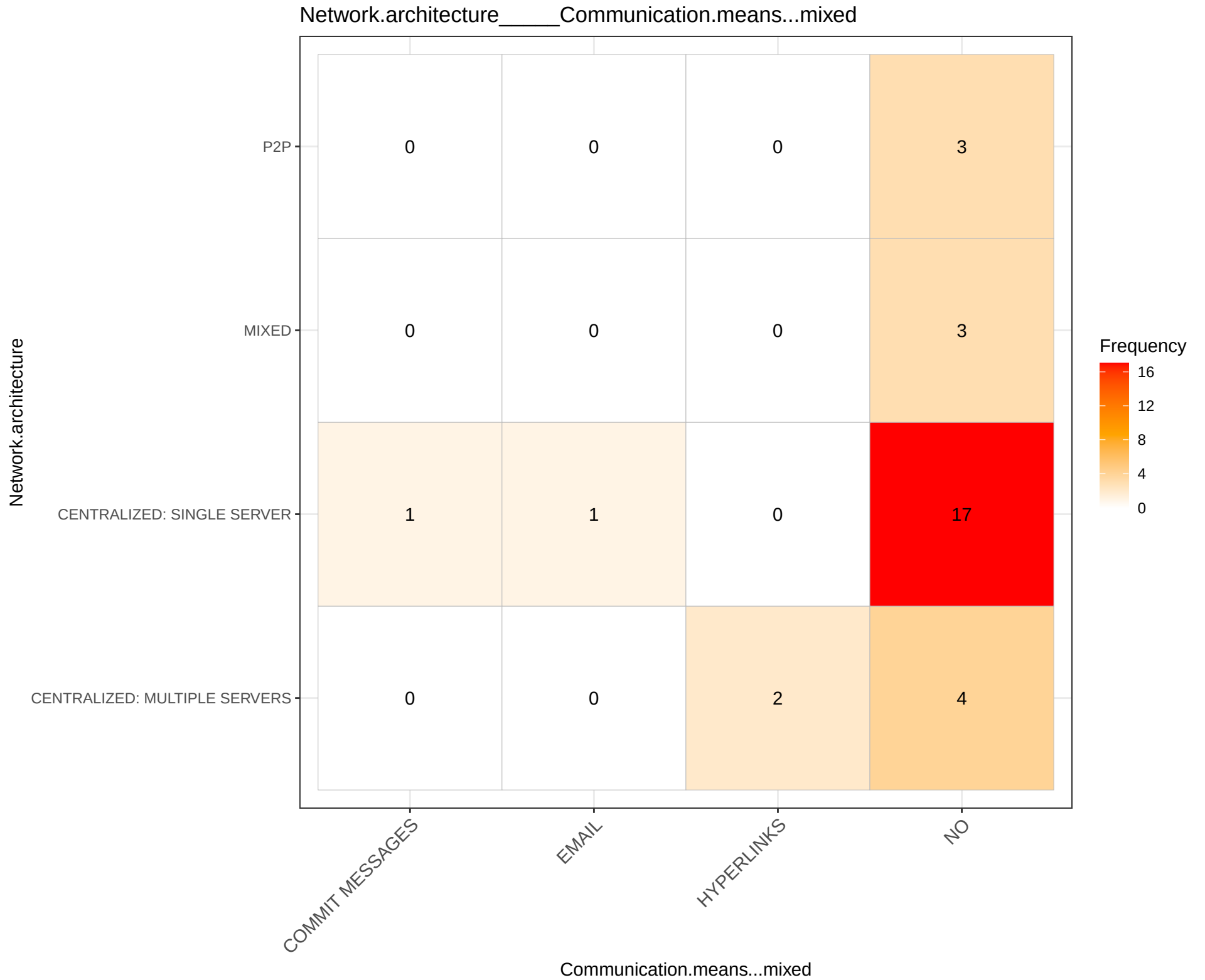

Shared.workspace_____Tool.availability
SAMEPLACE
REMOTE
Shared.workspace
1
2
6
20
NO
YES
Tool.availability
Frequency
20
15
10
5
0

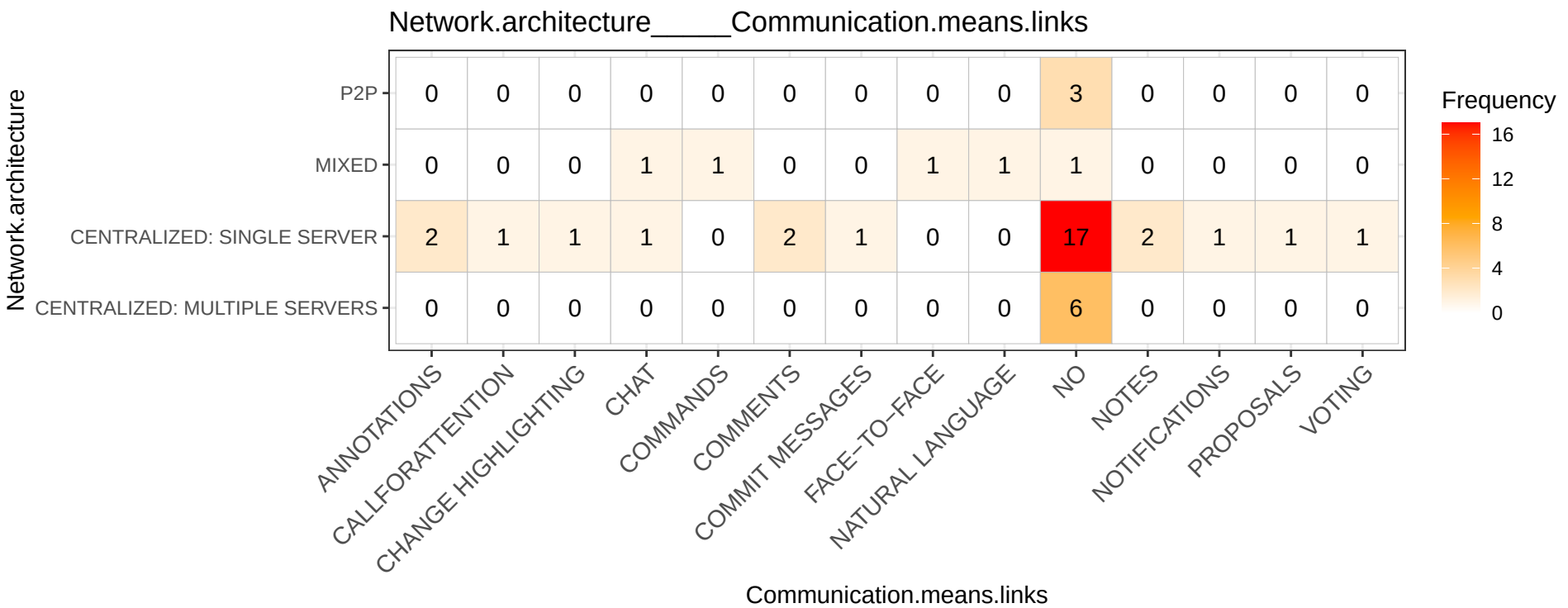

Shared.workspace_____Quality.of.the.research
Shared.workspace
SAMEPLACE
REMOTE
0
2
0
0
0
0
0
0
1
1
0
4
1
5
3
14
4
7
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10
5
0

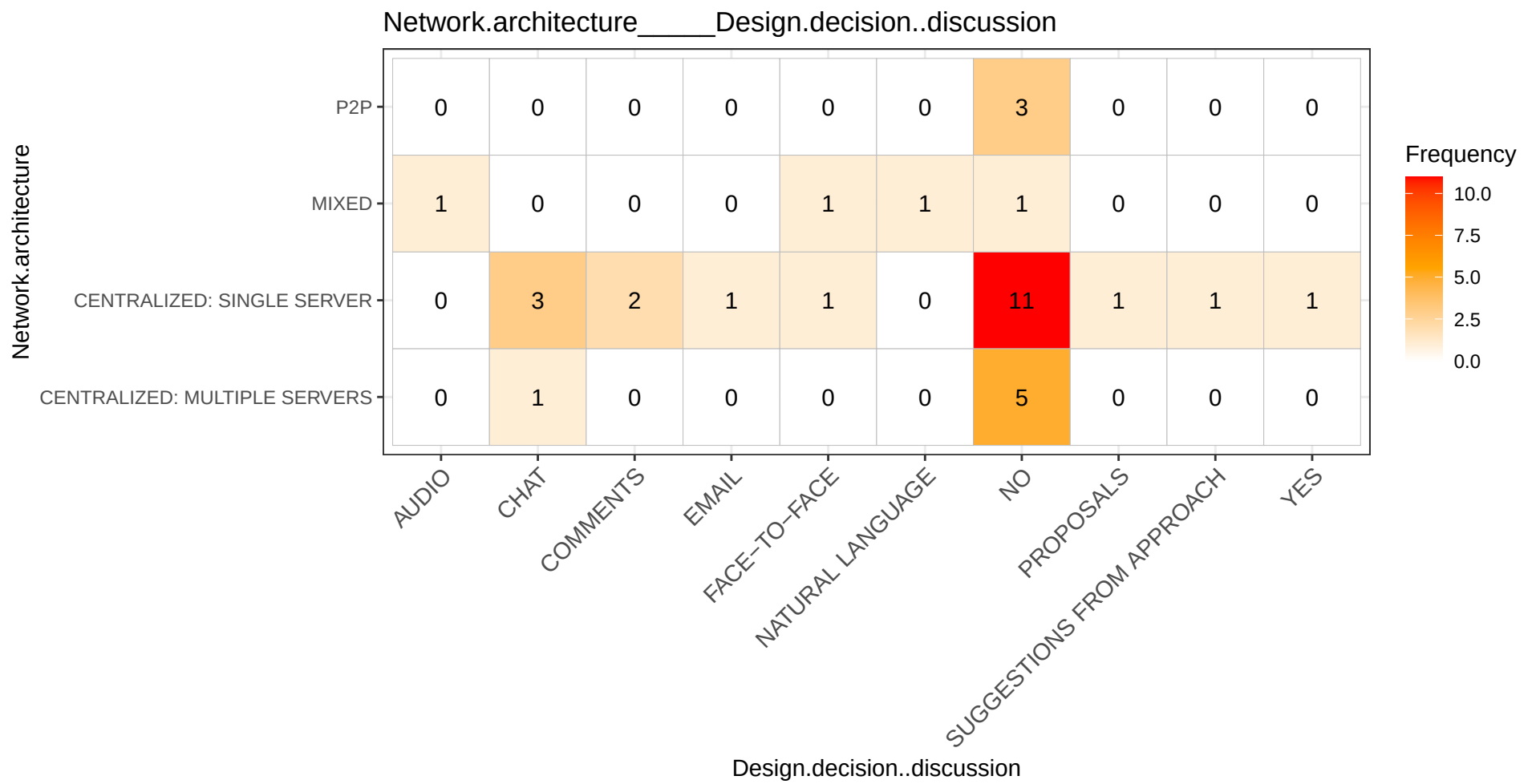

Network.architecture_____Communication.type
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
2
3
1
3
15
19
4
6
ASYNCHRONOUS
SYNCHRONOUS
Communication.type
Frequency
15
10
5
0

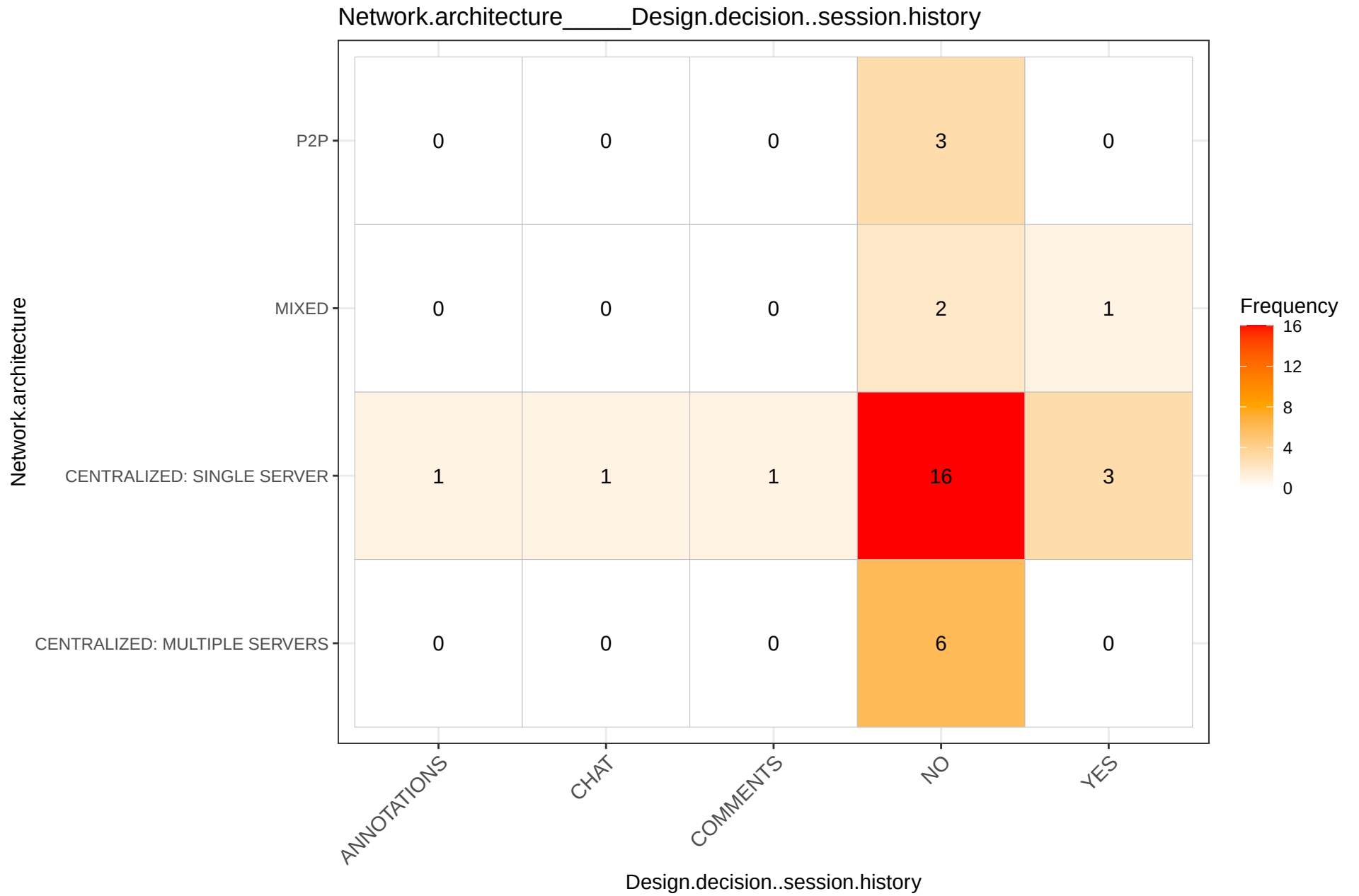

Network.architecture_____Communication.means...builtin
Network.architecture
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 1 0
0 1 1 0 1 1 0 0 0 1 0 0 0 0 0 1 0
2 2 1 1 5 0 4 2 5 0 9 2 1 3 1 0 2
1 0 2 0 1 0 1 0 1 0 4 0 0 1 1 0 1
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
7.5
5.0
2.5
0.0

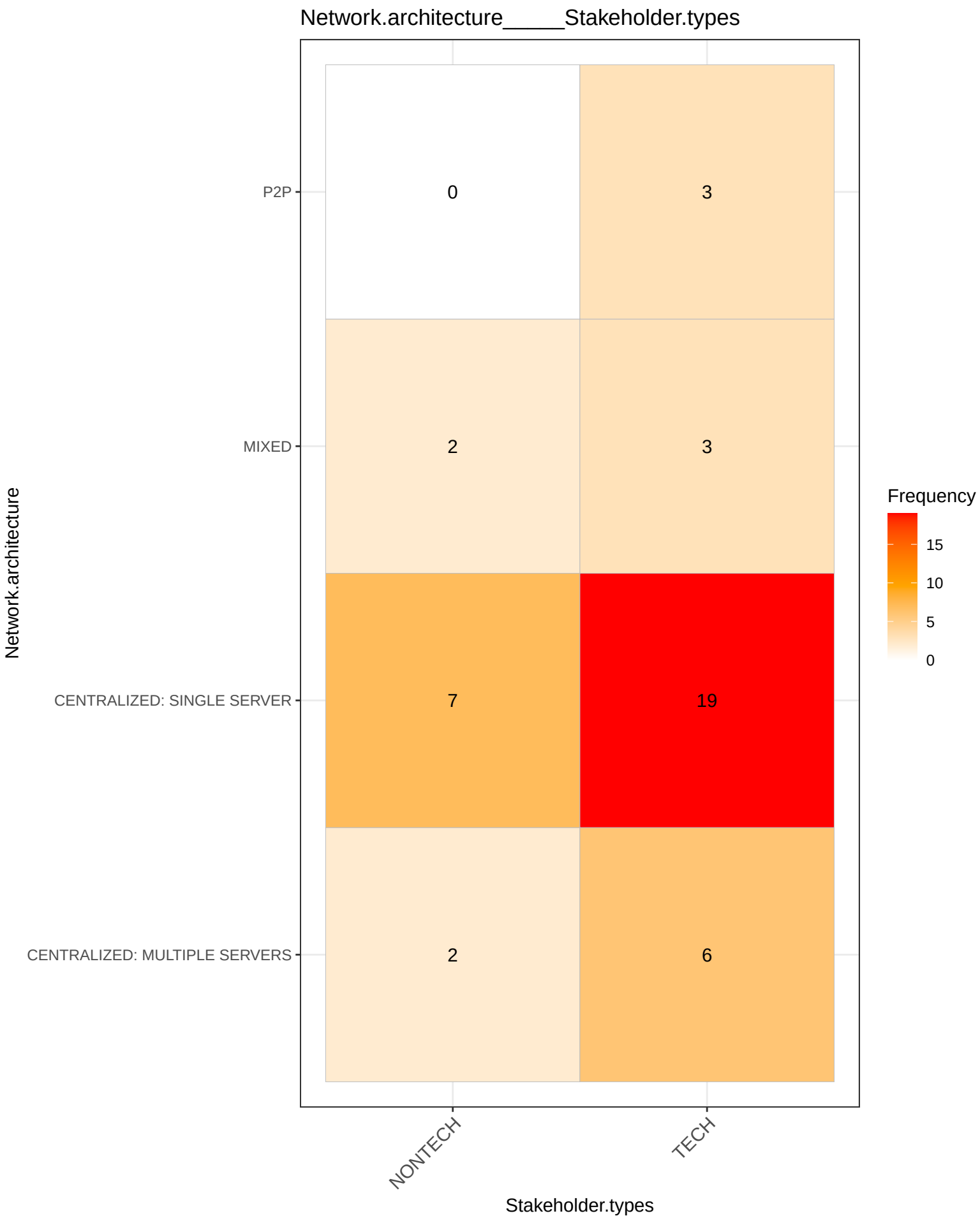

Network.architecture_____Communication.means...external
Network.architecture
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
1 0 0 0 0 2 1 1
1 1 1 1 0 0 1 1
0 4 3 2 1 11 0 0
0 0 2 0 0 4 0 0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
10.0
7.5
5.0
2.5
0.0


Network.architecture_____Communication.means...mixed
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
0
0
0
3
0
0
0
3
1
1
0
17
0
0
2
4
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
16
12
8
4
0


Network.architecture_____Communication.means.links
Network.architecture
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
0 0 0 0 0 0 0 0 0 3 0 0 0 0
0 0 0 1 1 0 0 1 1 1 0 0 0 0
2 1 1 1 0 2 1 0 0 17 2 1 1 1
0 0 0 0 0 0 0 0 0 6 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0


Network.architecture_____Design.decision..discussion
Network.architecture
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
0 0 0 0 0 0 3 0 0 0
1 0 0 0 1 1 1 0 0 0
0 3 2 1 1 0 11 1 1 1
0 1 0 0 0 0 5 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0


Network.architecture_____Design.decision..session.history
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
0 0 0 3 0
0 0 0 2 1
1 1 1 16 3
0 0 0 6 0
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
16
12
8
4
0


Network.architecture_____Stakeholder.types
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
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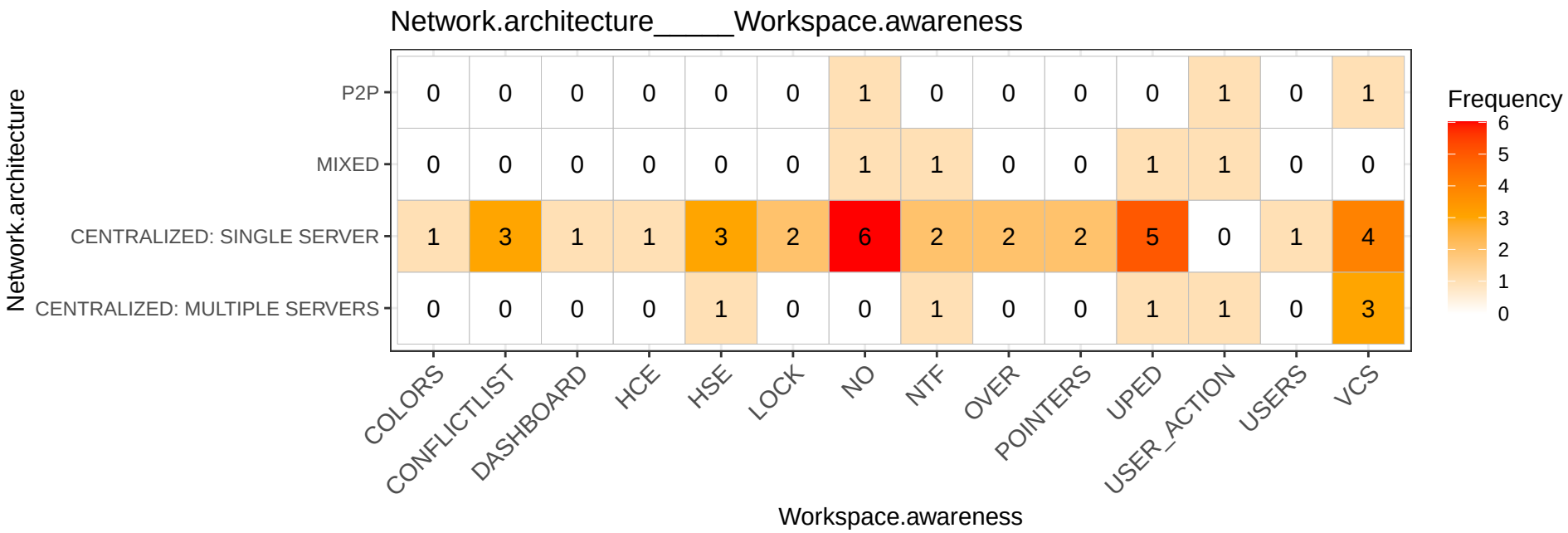
2
3
7
19
2
6
NONTECH
TECH
Stakeholder.types
Frequency
15
10
5
0


Network.architecture_____Workspace.awareness
Network.architecture
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
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0 0 0 0 0 0 1 1 0 0 1 1 0 0
1 3 1 1 3 2 6 2 2 2 5 0 1 4
0 0 0 0 1 0 0 1 0 0 1 1 0 3
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
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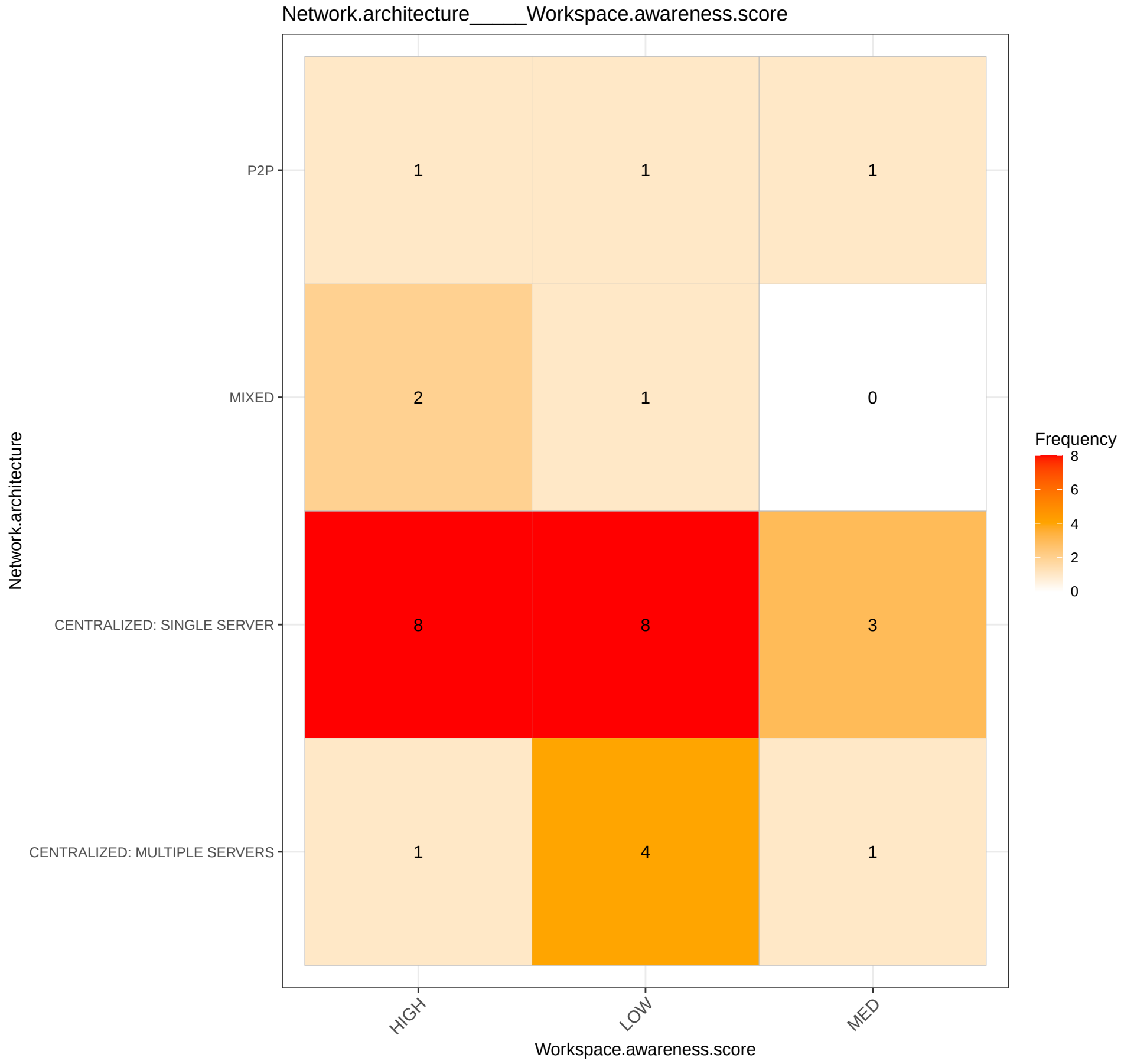
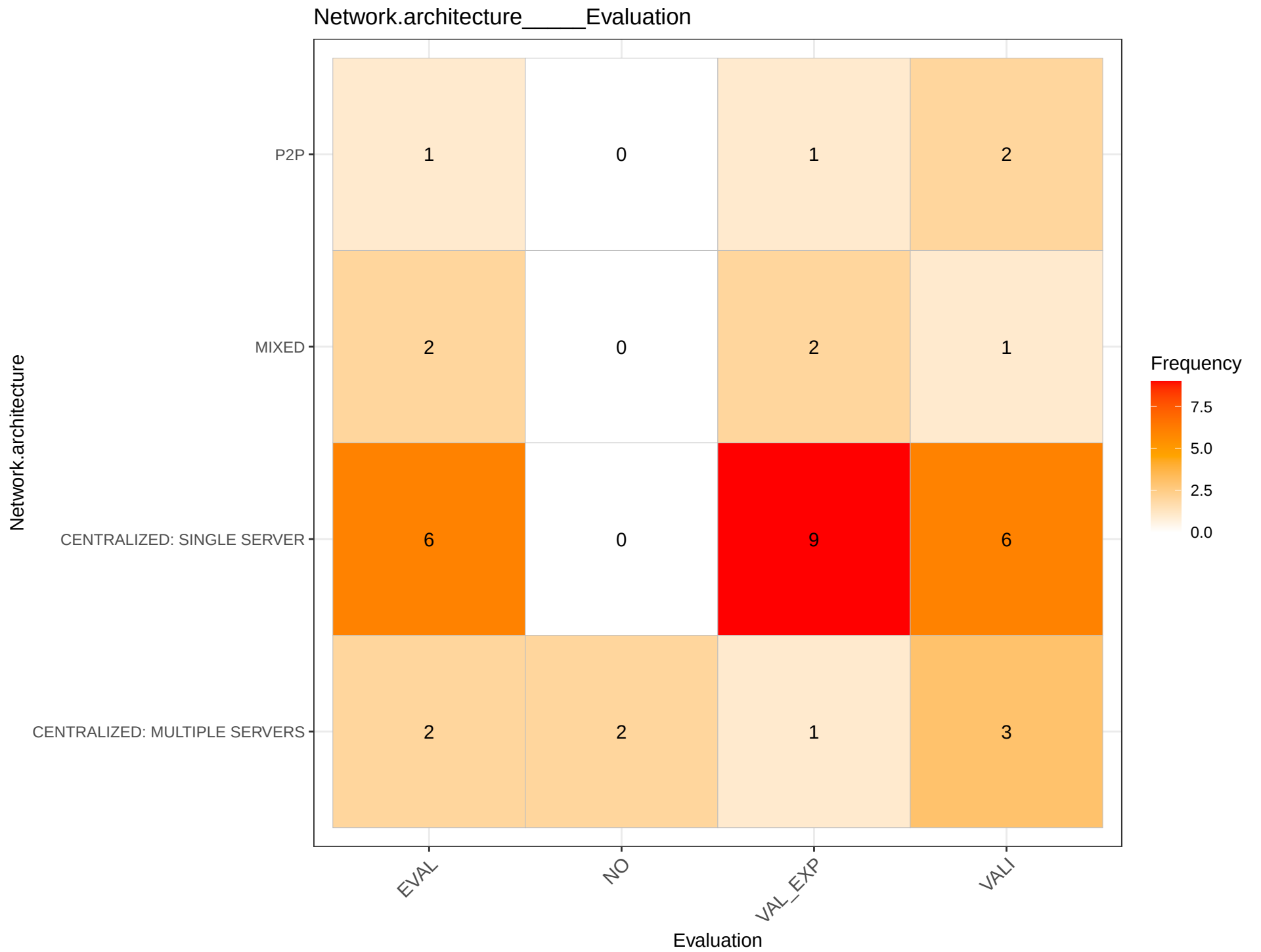
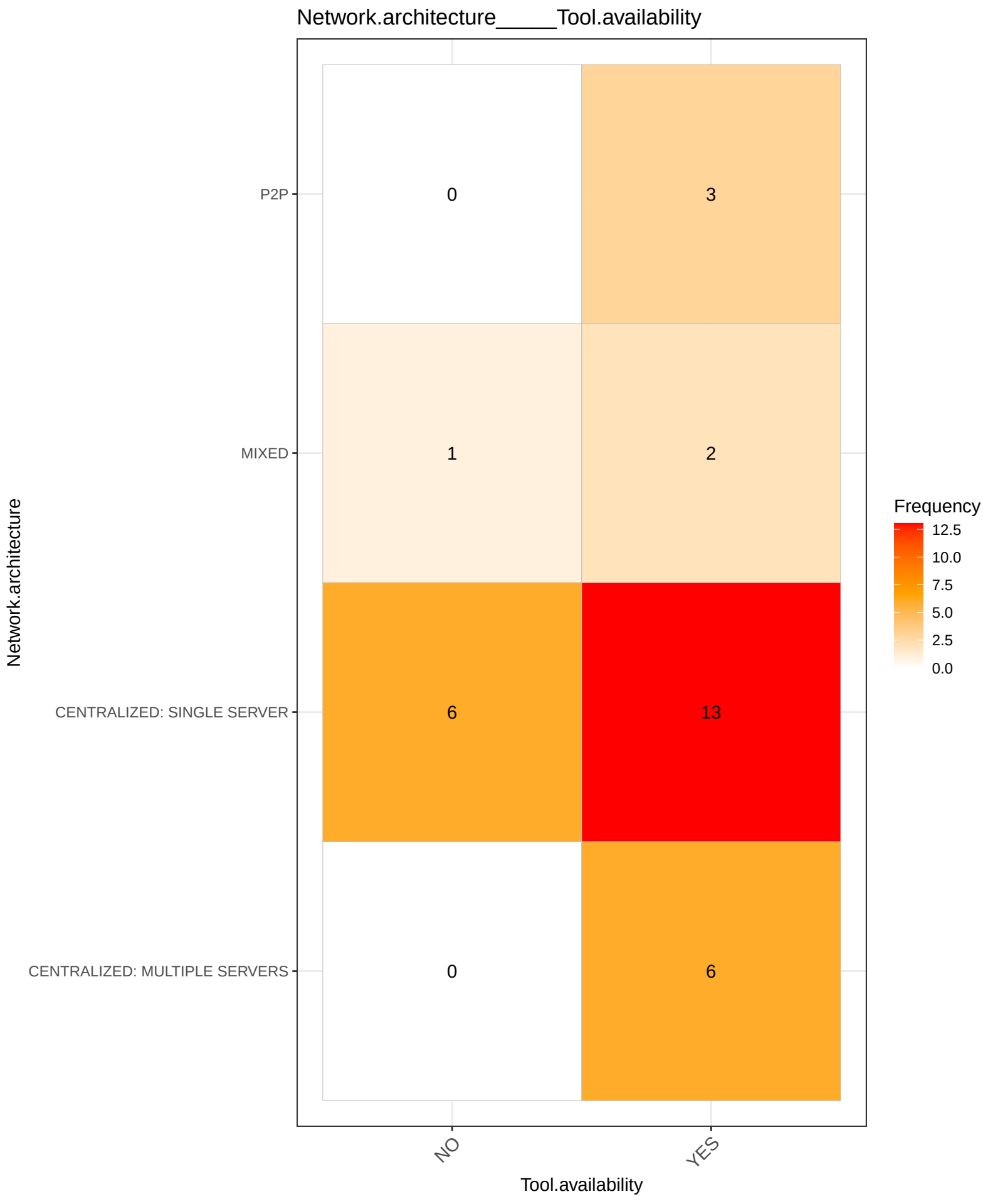
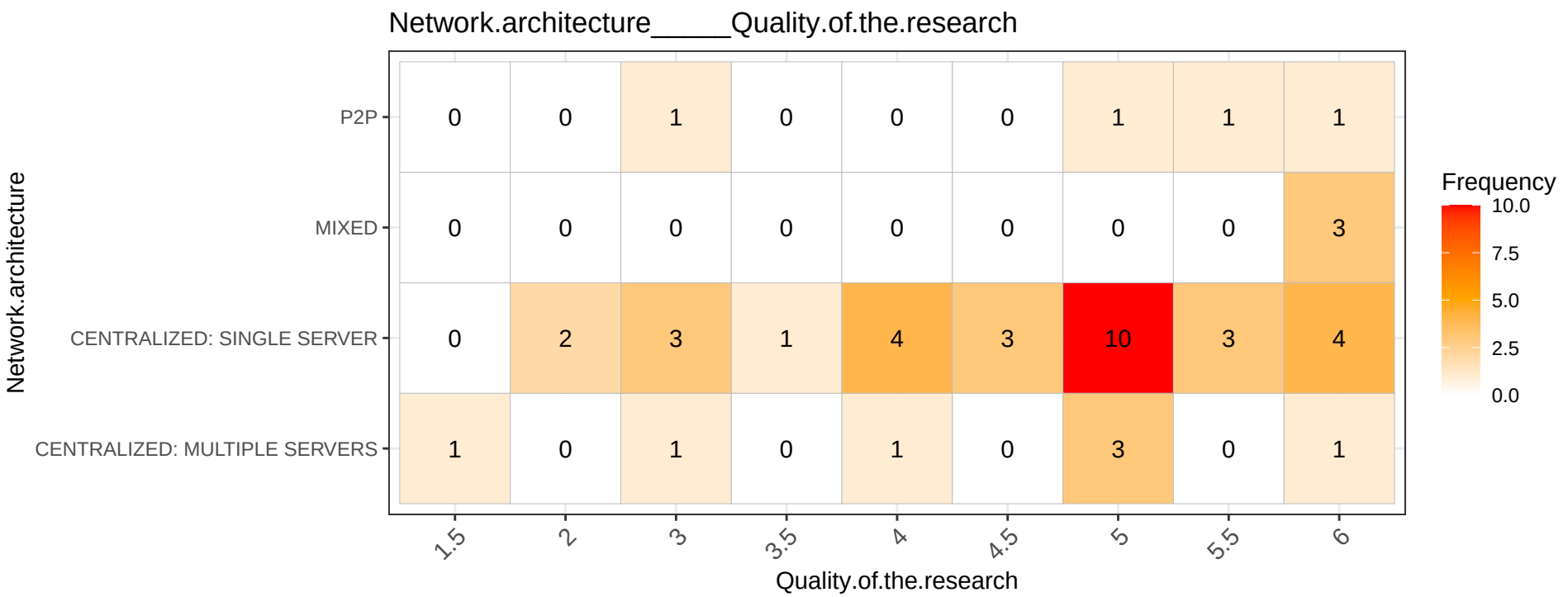
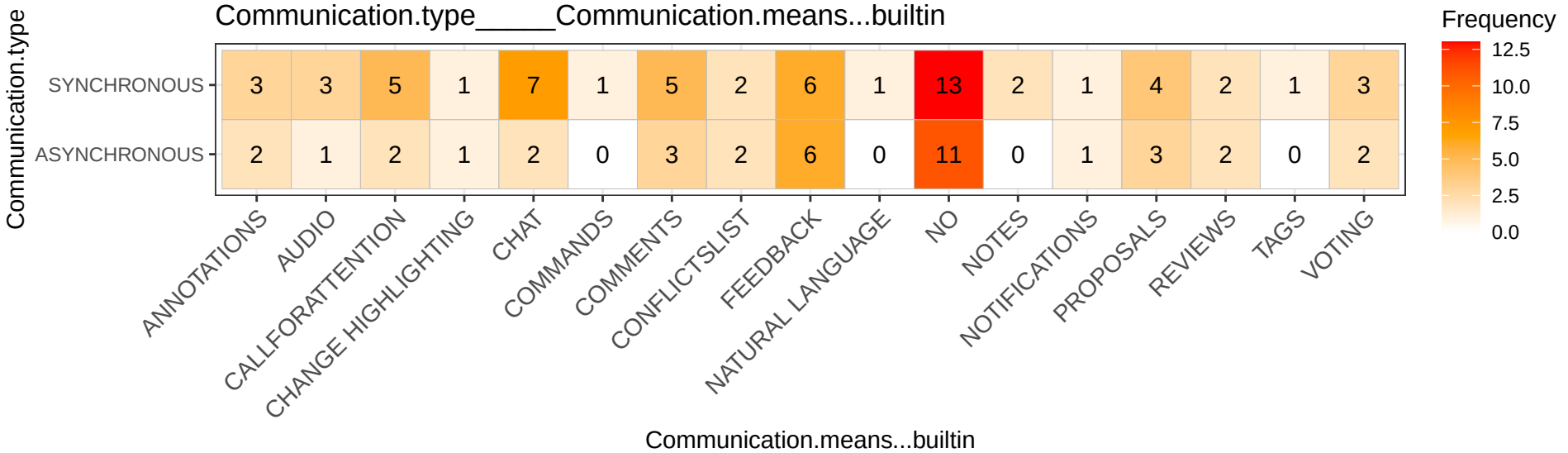
5
4
3
2
1
0

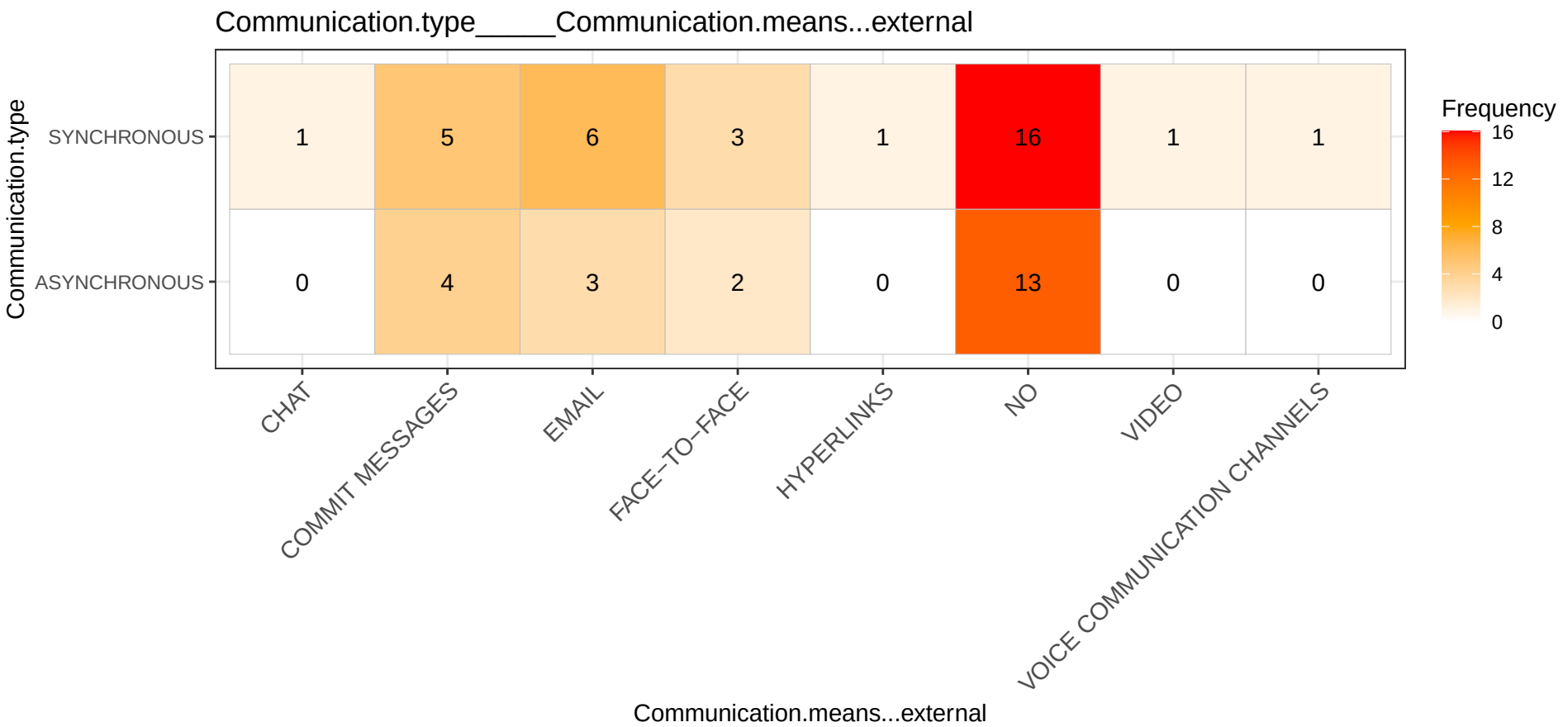

Network.architecture_____Workspace.awareness.score
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
1
1
1
2
1
0
8
8
3
1
4
1
HIGH
LOW
MED
Workspace.awareness.score
Frequency
8
6
4
2
0

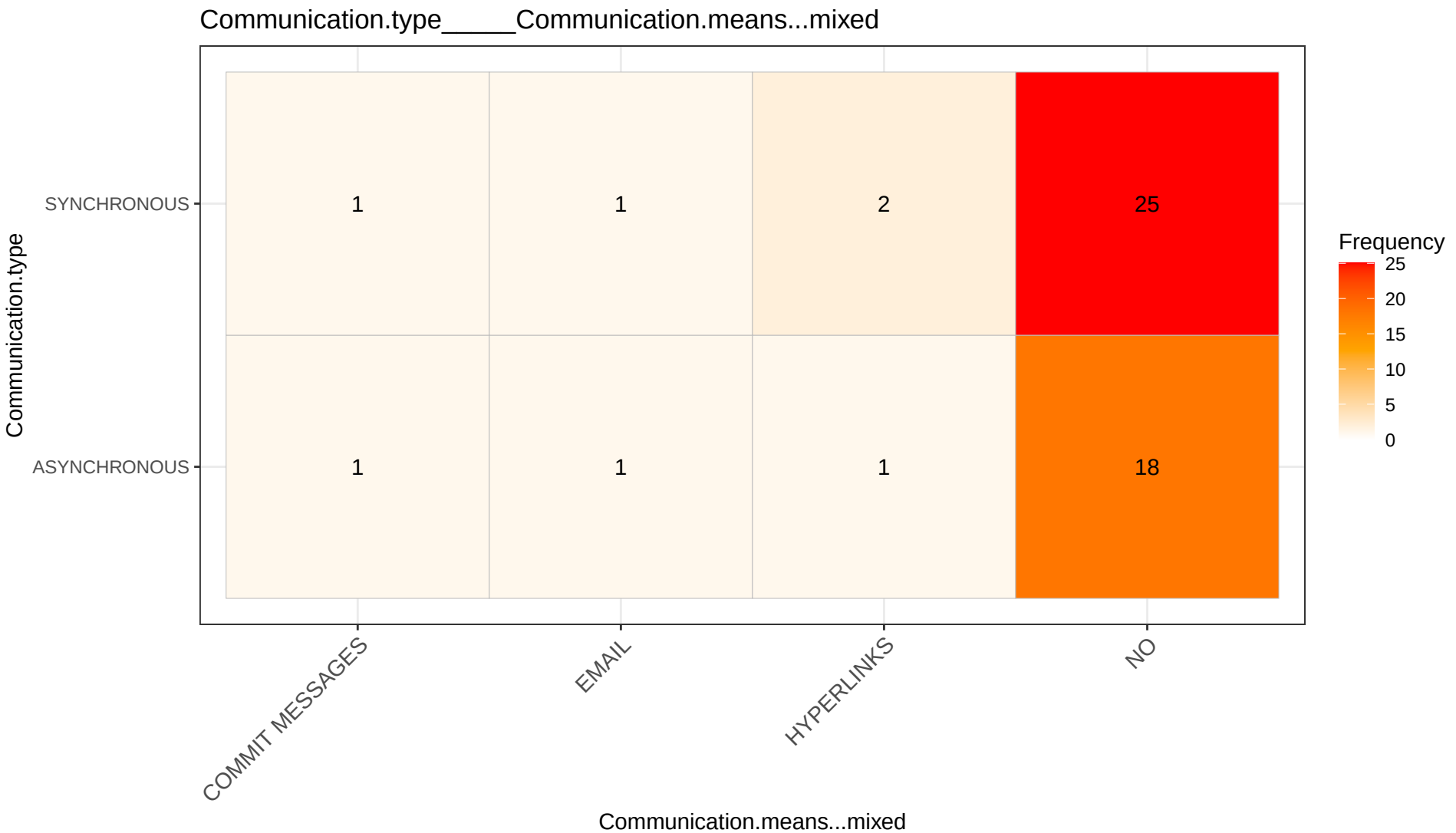

Network.architecture_____Evaluation
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
1
0
1
2
2
0
2
1
6
0
9
6
2
2
1
3
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
7.5
5.0
2.5
0.0

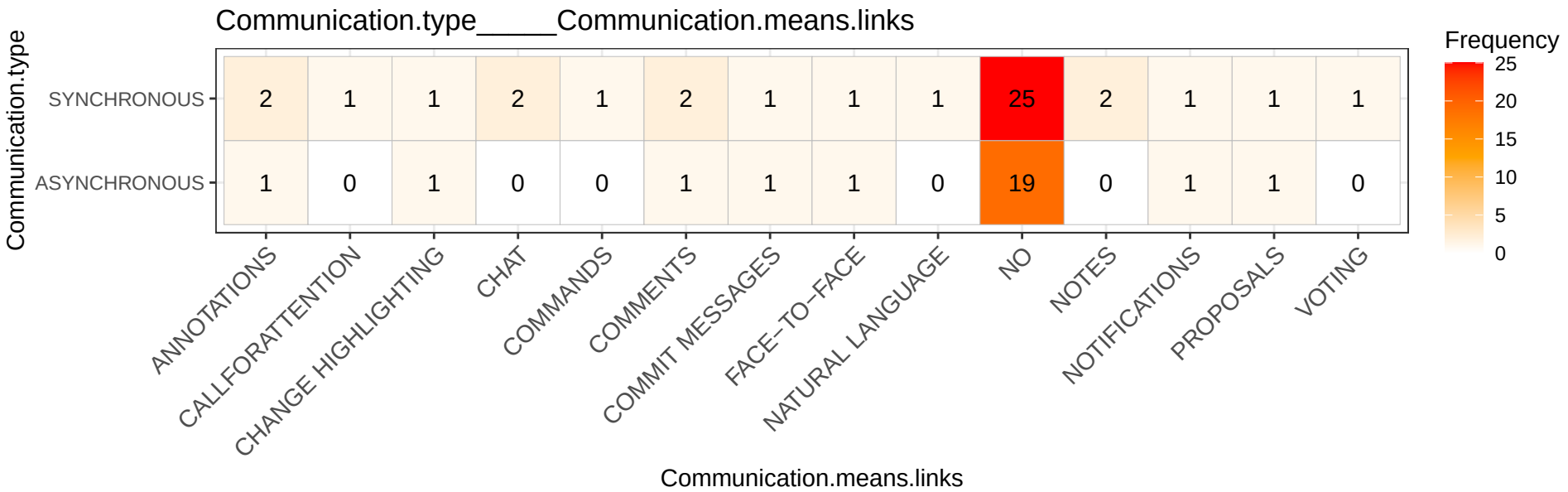

Network.architecture_____Tool.availability
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
Network.architecture
0
3
1
2
6
13
0
6
NO
YES
Tool.availability
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

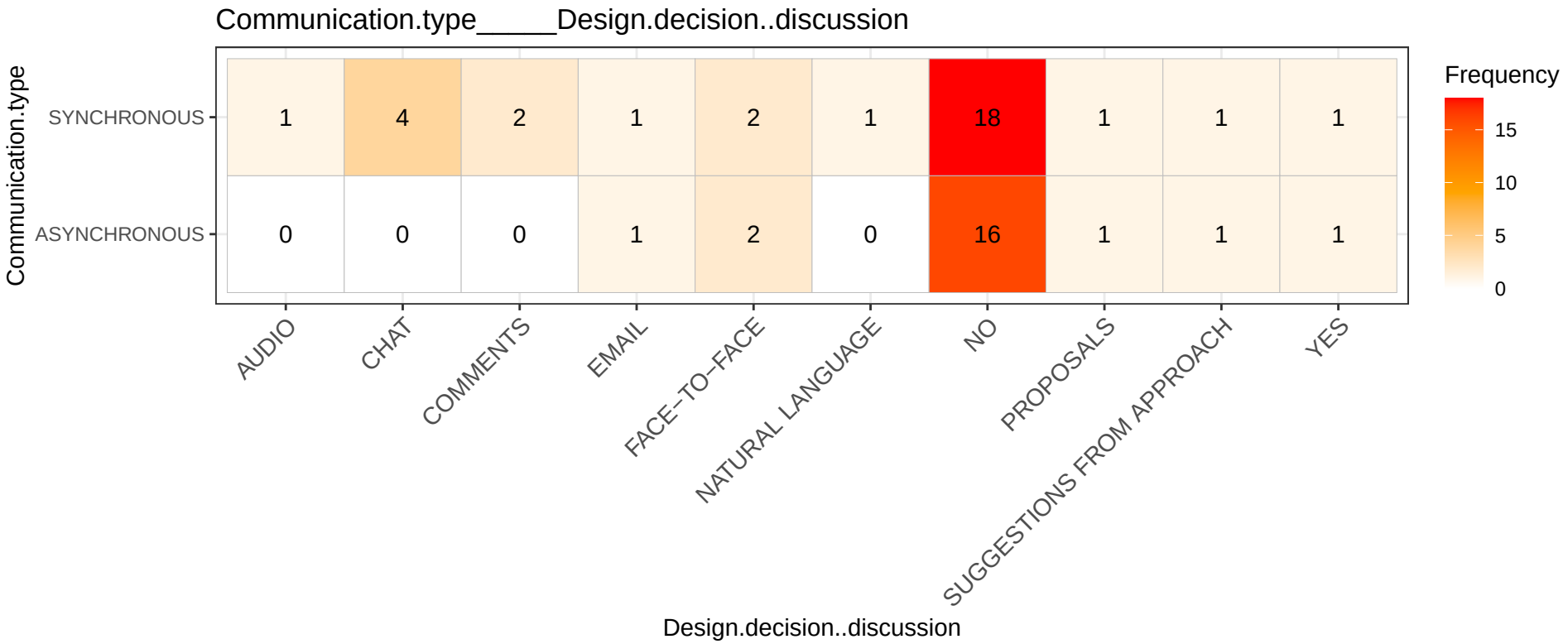

Network.architecture_____Quality.of.the.research
Network.architecture
P2P
MIXED
CENTRALIZED: SINGLE SERVER
CENTRALIZED: MULTIPLE SERVERS
0 0 1 0 0 0 1 1 1
0 0 0 0 0 0 0 0 3
0 2 3 1 4 3 10 3 4
1 0 1 0 1 0 3 0 1
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0

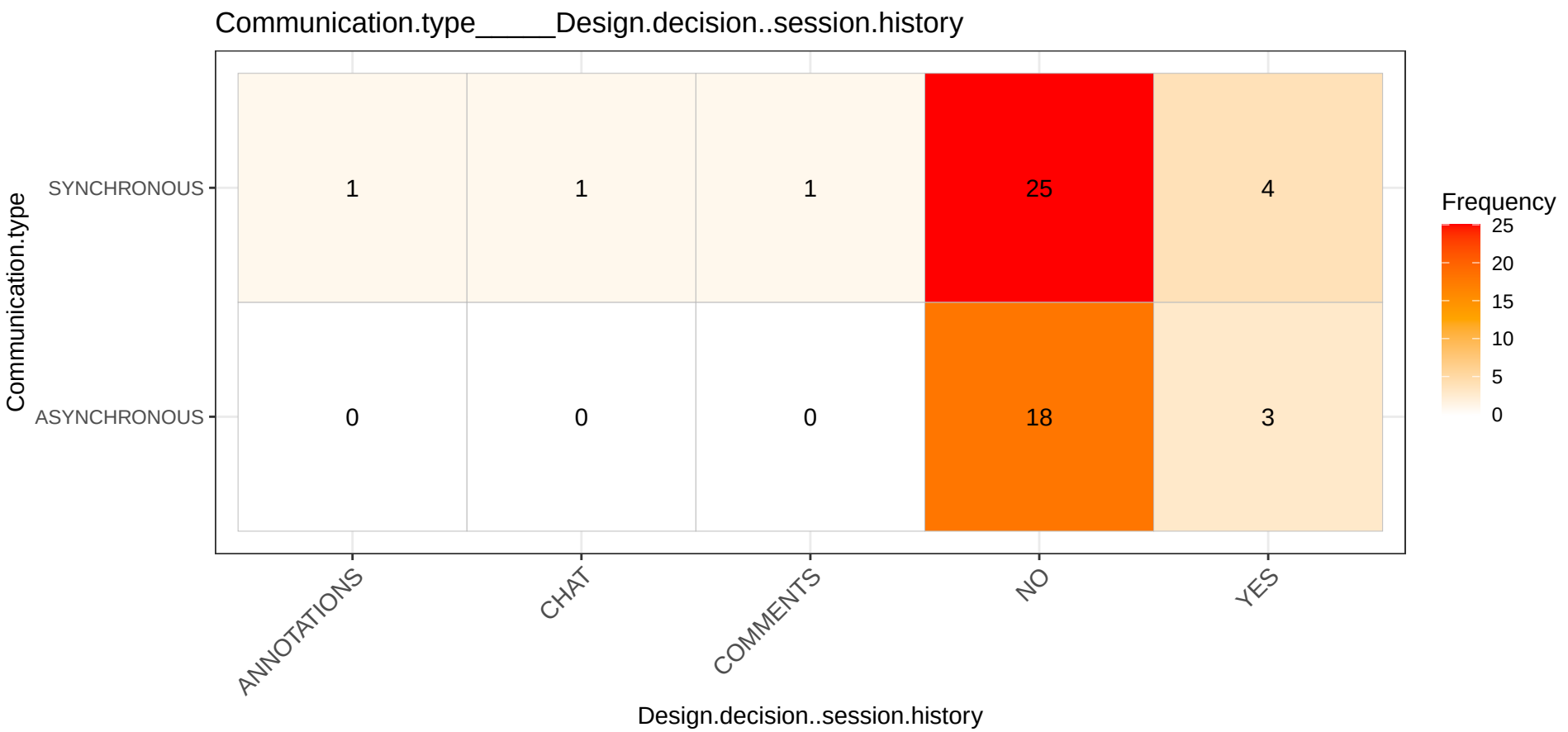

Communication.type_____Communication.means...builtin
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
3 3 5 1 7 1 5 2 6 1 13 2 1 4 2 1 3
2 1 2 1 2 0 3 2 6 0 11 0 1 3 2 0 2
ANNOTATIONS
AUDIO
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
CONFLICTSLIST
FEEDBACK
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
REVIEWS
TAGS
VOTING
Communication.means...builtin
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

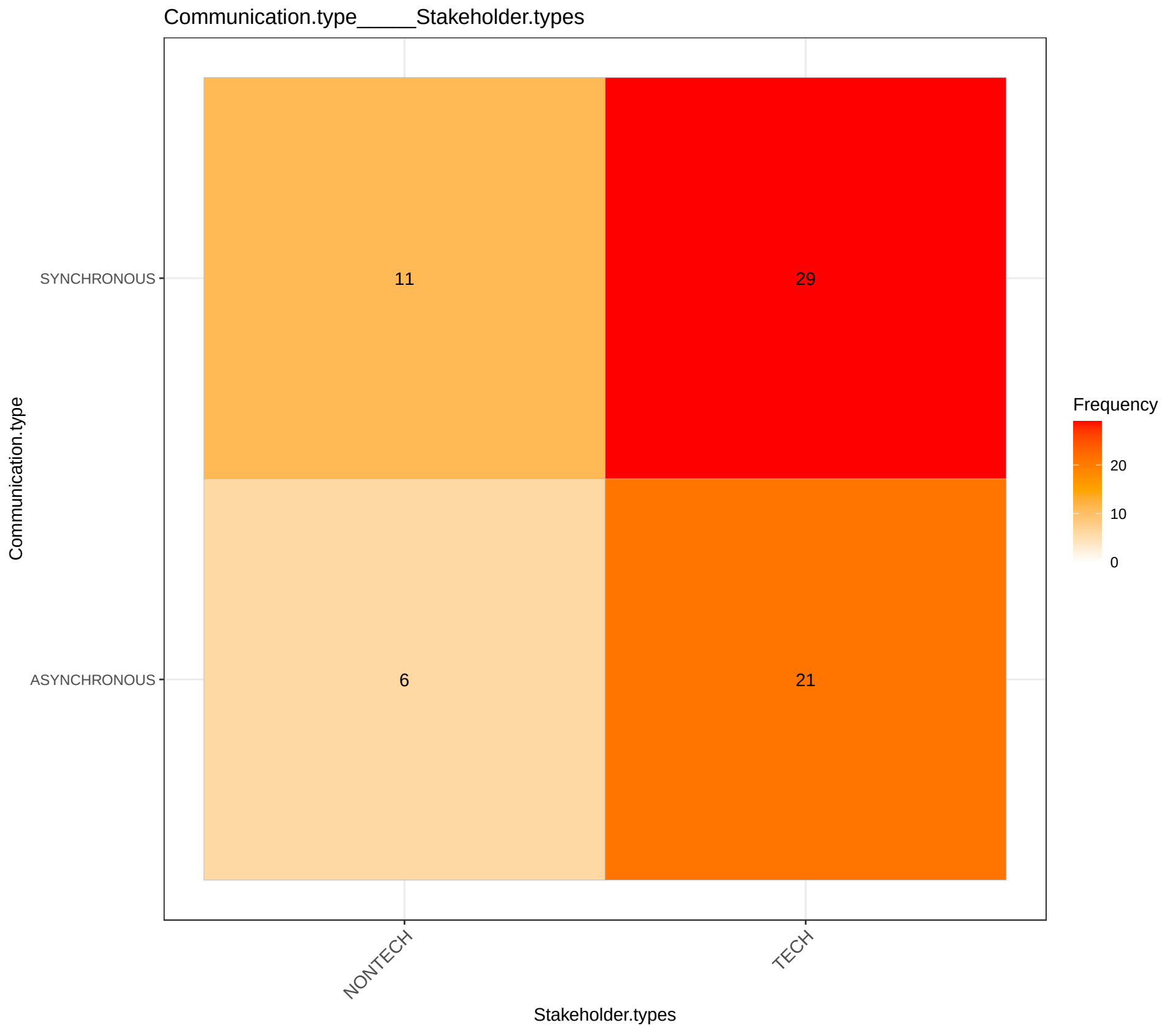

Communication.type_____Communication.means...external
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
1
5
6
3
1
16
1
1
0
4
3
2
0
13
0
0
CHAT
COMMIT MESSAGES
EMAIL
FACE−TO−FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
16
12
8
4
0

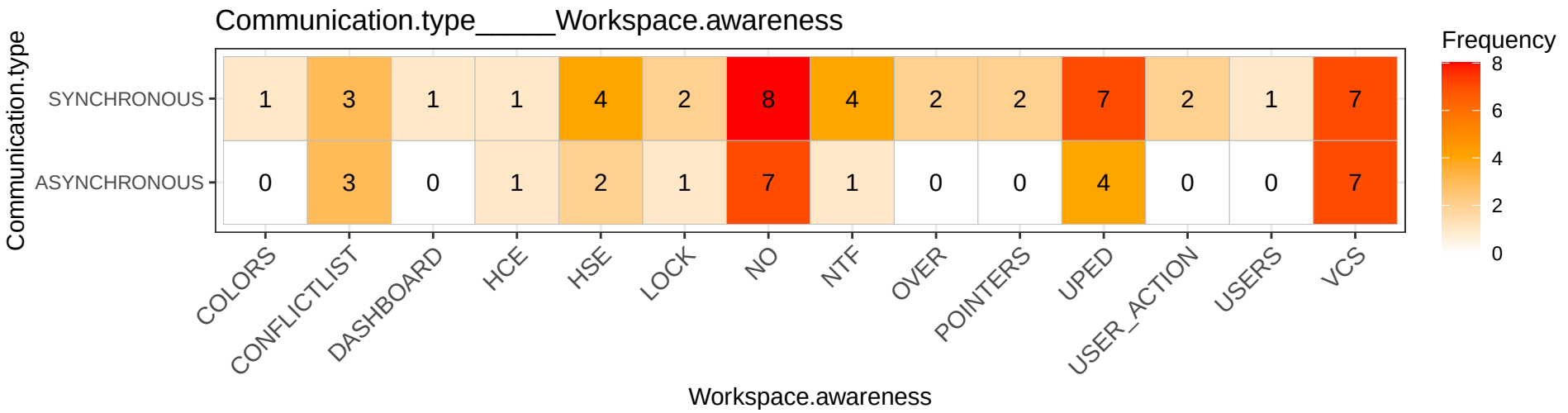

Communication.type_____Communication.means...mixed
SYNCHRONOUS
ASYNCHRONOUS
Communication.type
1
1
2
25
1
1
1
18
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
25
20
15
10
5
0

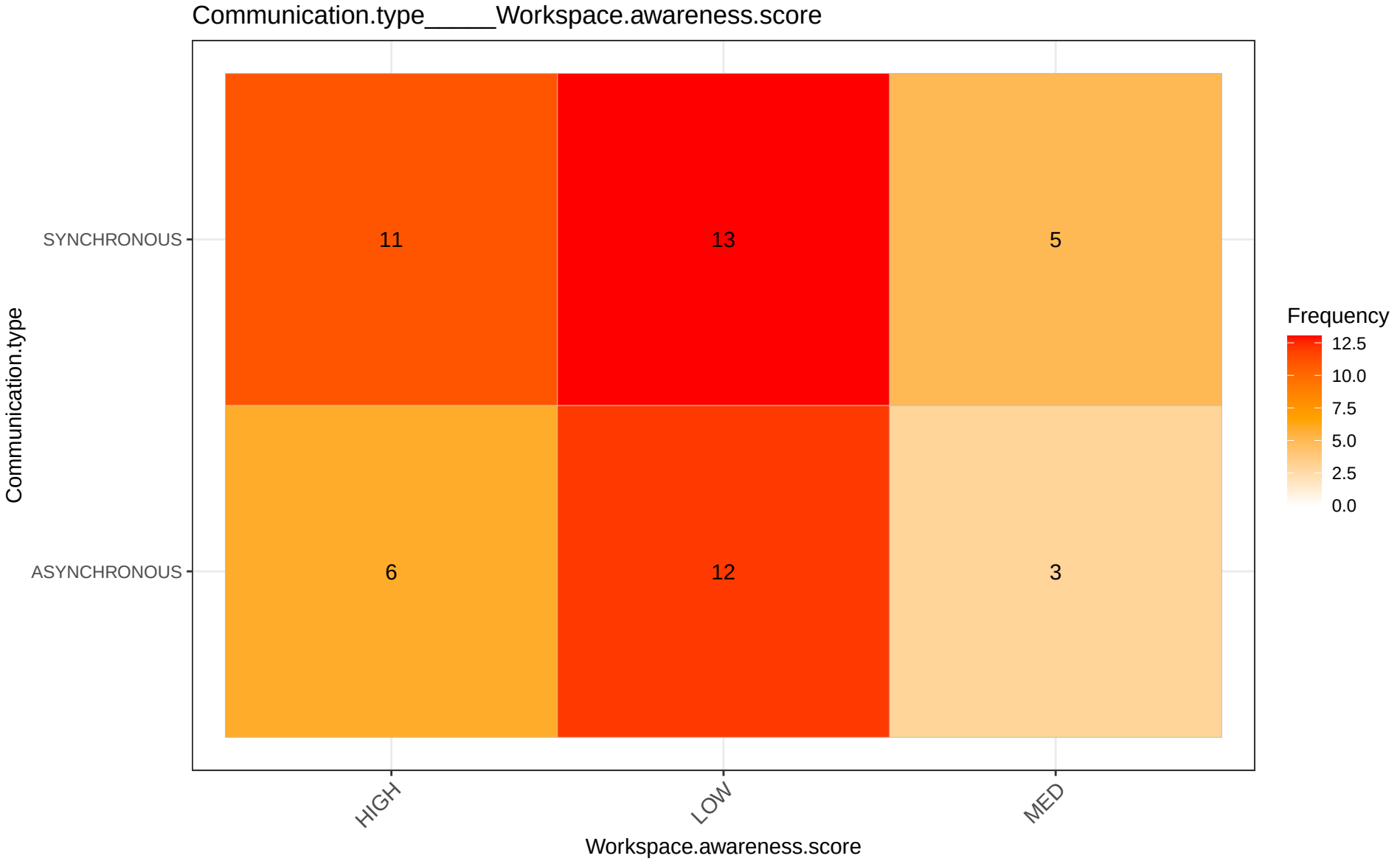

Communication.type_____Communication.means.links
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
2 1 1 2 1 2 1 1 1 25 2 1 1 1
1 0 1 0 0 1 1 1 0 19 0 1 1 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
25
20
15
10
5
0

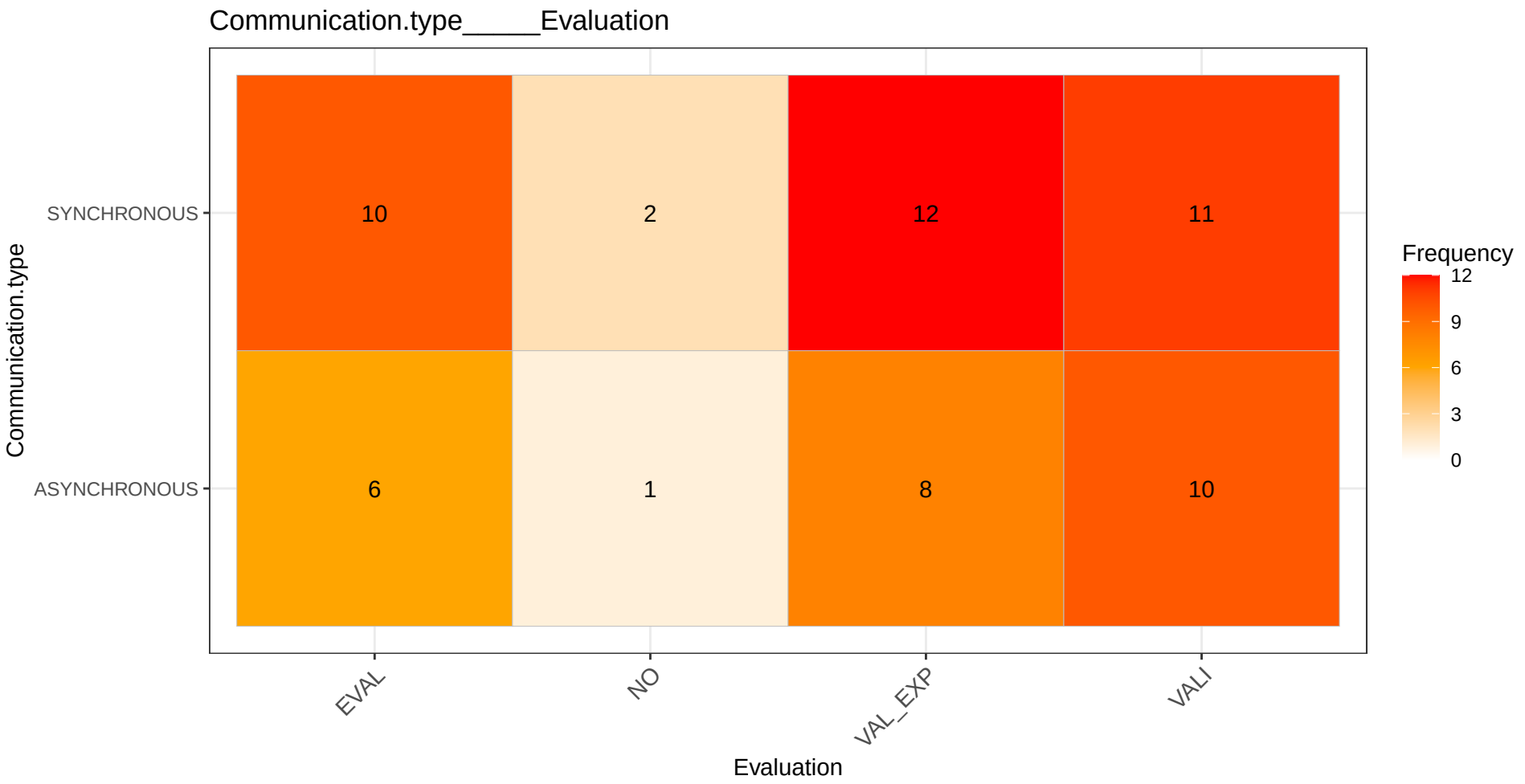

Communication.type_____Design.decision..discussion
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
1
4
2
1
2
1
18
1
1
1
0
0
0
1
2
0
16
1
1
1
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
15
10
5
0


Communication.type_____Design.decision..session.history
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
1
1
1
25
4
0
0
0
18
3
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
25
20
15
10
5
0


Communication.type_____Stakeholder.types
SYNCHRONOUS
ASYNCHRONOUS
Communication.type
11
29
6
21
NONTECH
TECH
Stakeholder.types
Frequency
20
10
0


Communication.type_____Workspace.awareness
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
1 3 1 1 4 2 8 4 2 2 7 2 1 7
0 3 0 1 2 1 7 1 0 0 4 0 0 7
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
8
6
4
2
0


Communication.type_____Workspace.awareness.score
SYNCHRONOUS
ASYNCHRONOUS
Communication.type
11
13
5
6
12
3
HIGH
LOW
MED
Workspace.awareness.score
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Communication.type_____Evaluation
Communication.type
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ASYNCHRONOUS
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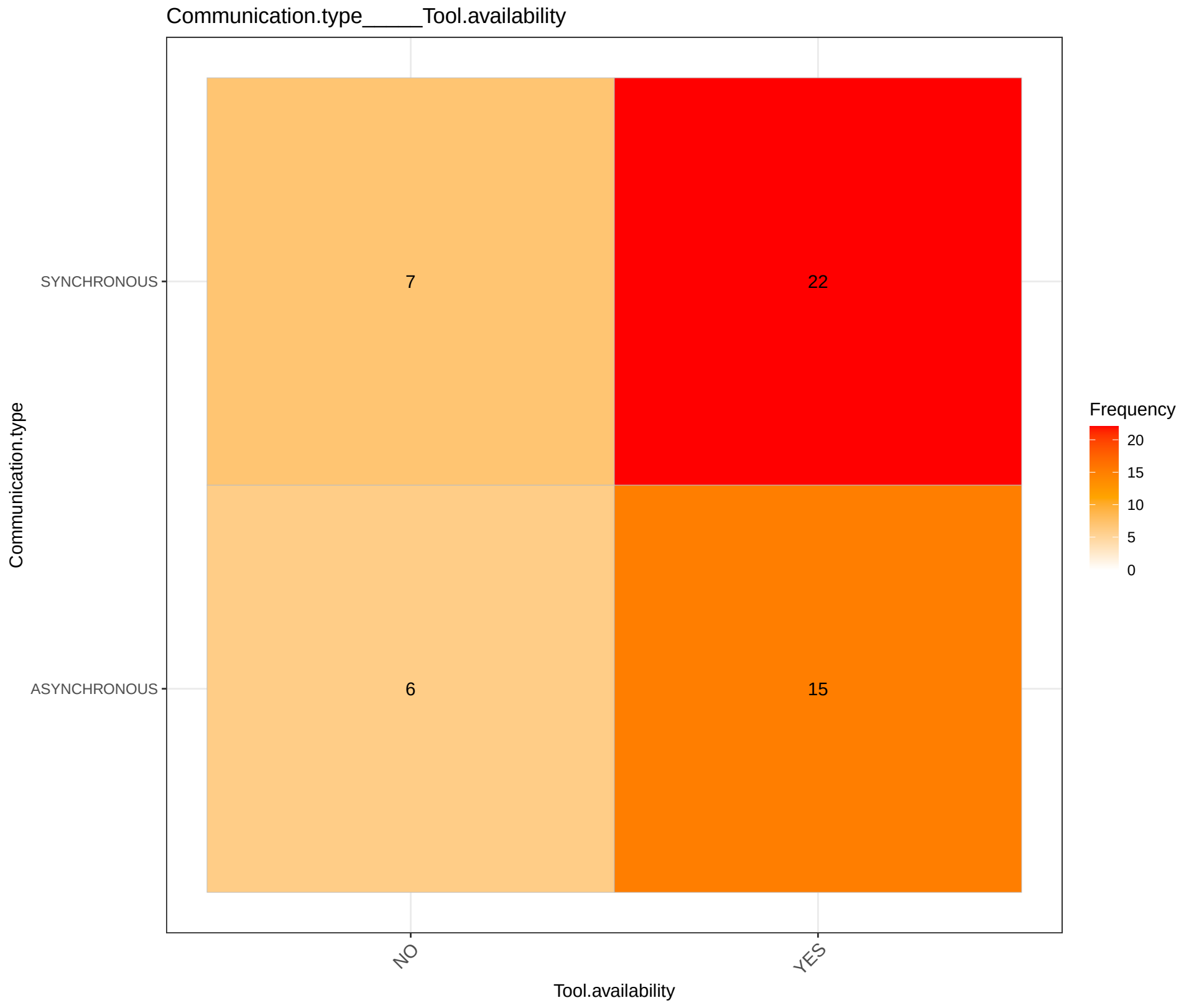
2
12
11
6
1
8
10
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
12
9
6
3
0


Communication.type_____Tool.availability
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ASYNCHRONOUS
Communication.type
7
22
6
15
NO
YES
Tool.availability
Frequency
20
15
10
5
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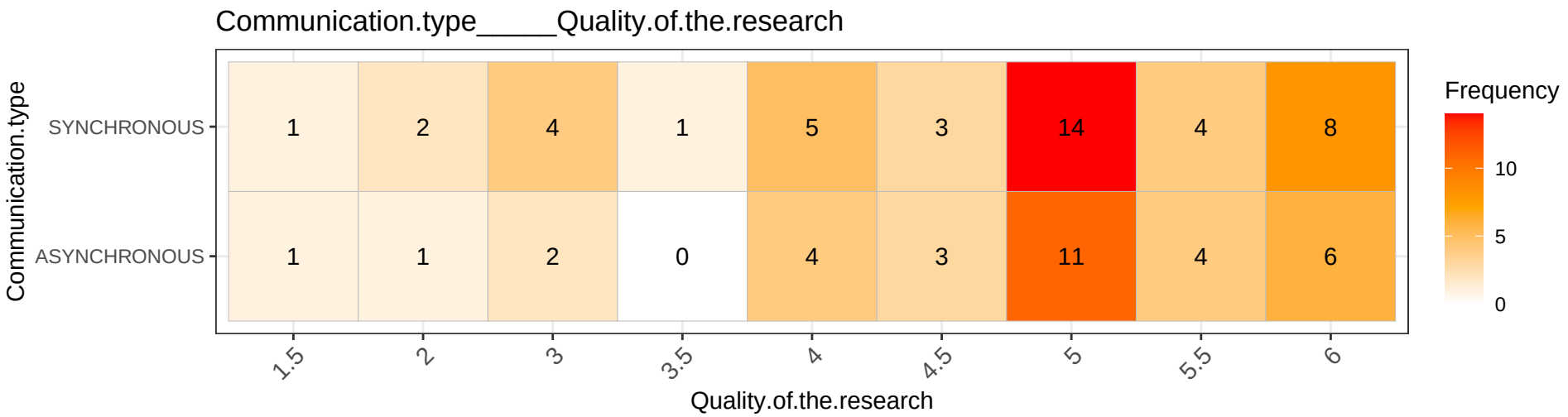
Communication.type_____Quality.of.the.research
Communication.type
SYNCHRONOUS
ASYNCHRONOUS
1
2
4
1
5
3
14
4
8
1
1
2
0
4
3
11
4
6
1.5
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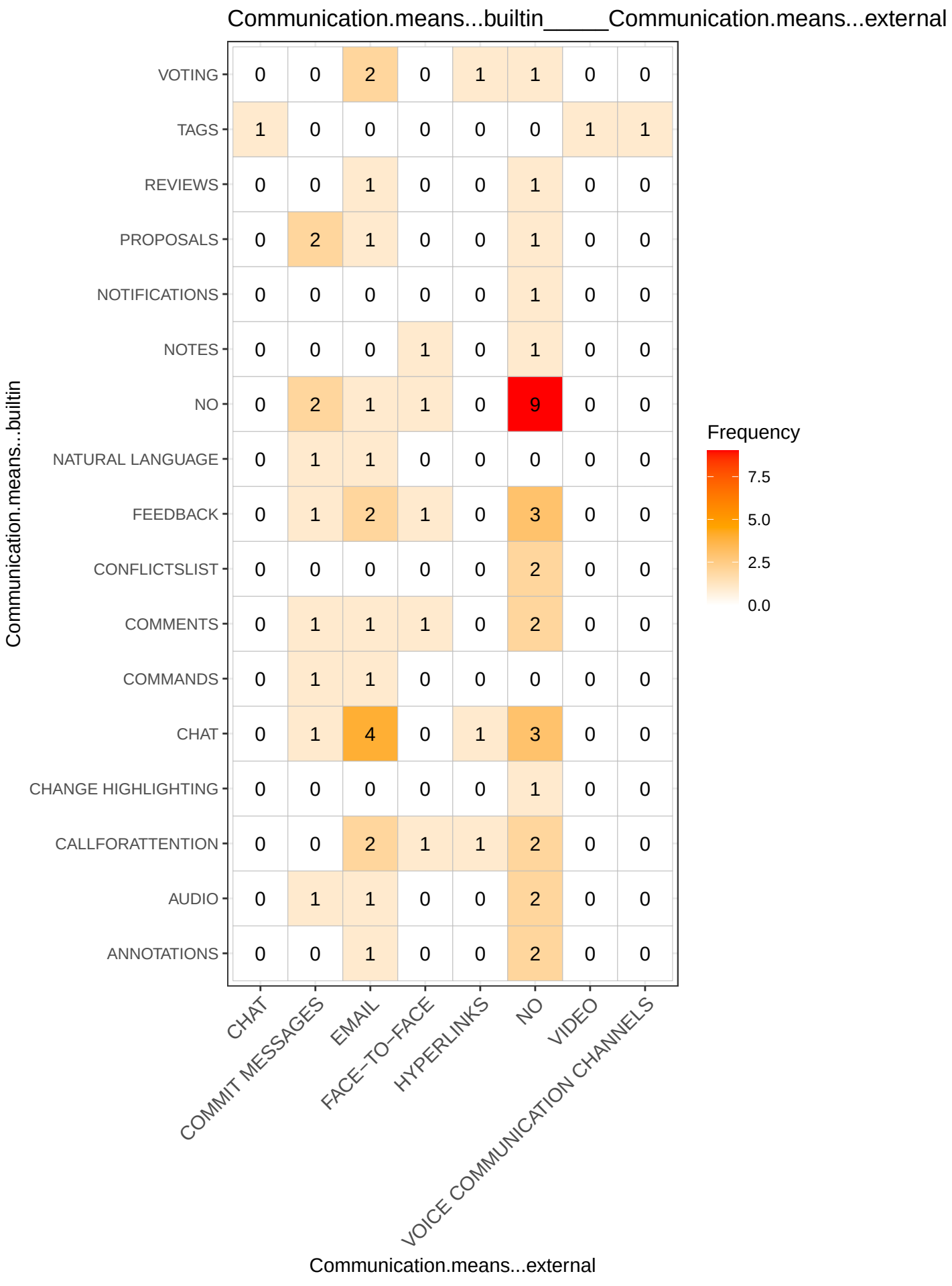
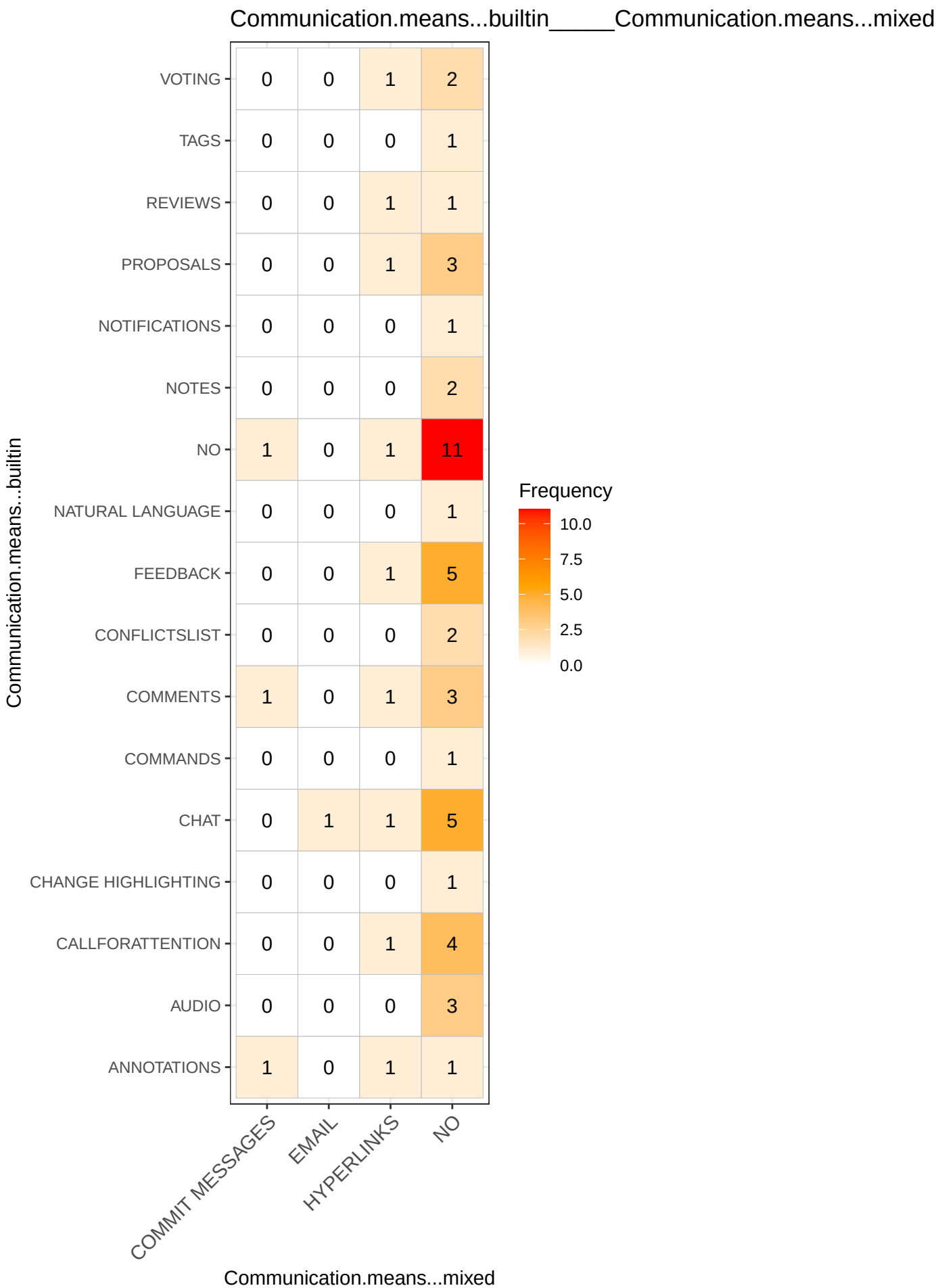
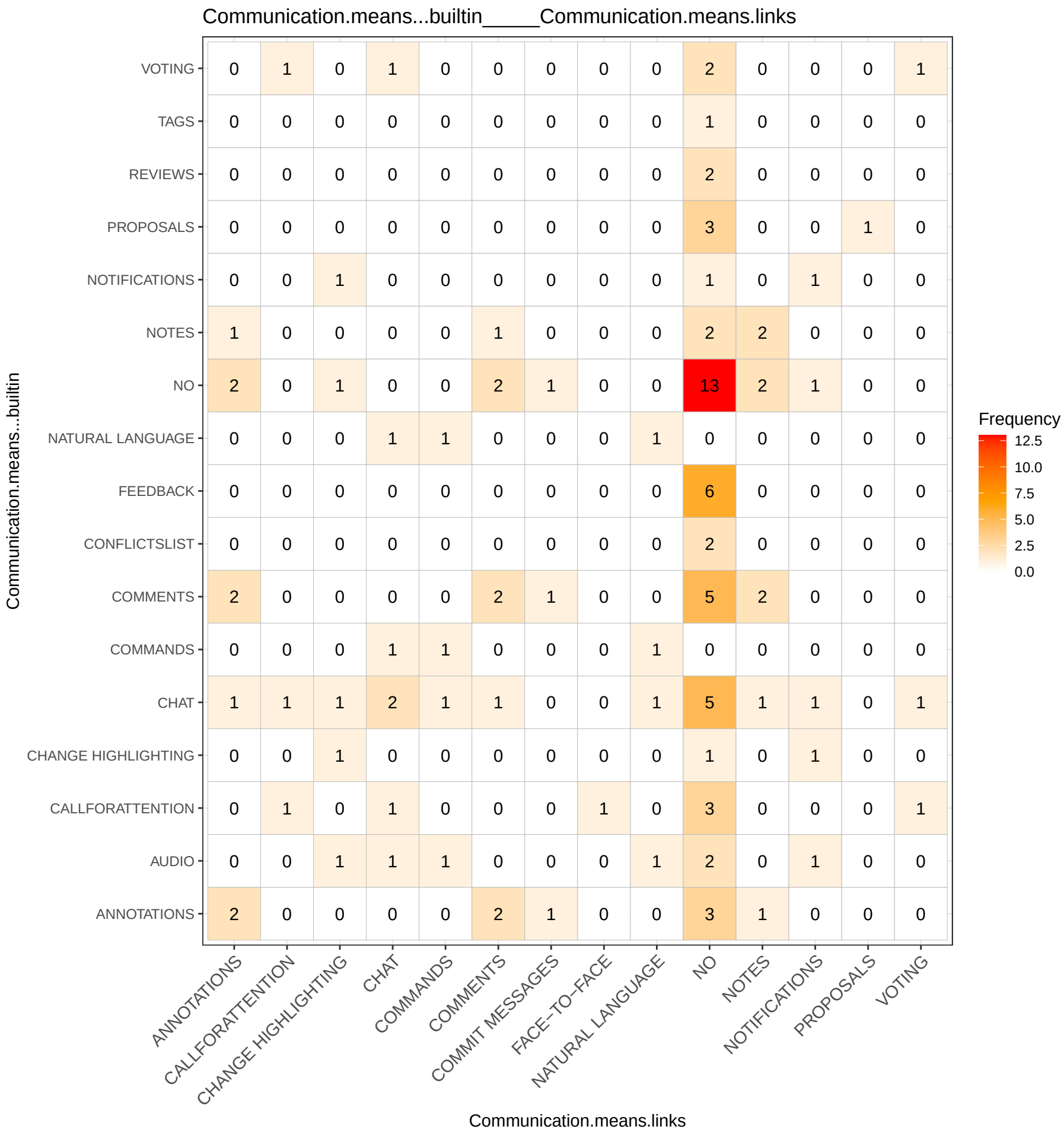
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10
5
0


Communication.means...builtin_____Communication.means...external
VOTING 0 0 2 0 1 1 0 0
TAGS 1 0 0 0 0 0 1 1
REVIEWS 0 0 1 0 0 1 0 0
PROPOSALS 0 2 1 0 0 1 0 0
NOTIFICATIONS 0 0 0 0 0 1 0 0
NOTES 0 0 0 1 0 1 0 0
NO 0 2 1 1 0 9 0 0
NATURAL LANGUAGE 0 1 1 0 0 0 0 0
FEEDBACK 0 1 2 1 0 3 0 0
CONFLICTSLIST 0 0 0 0 0 2 0 0
COMMENTS 0 1 1 1 0 2 0 0
COMMANDS 0 1 1 0 0 0 0 0
CHAT 0 1 4 0 1 3 0 0
CHANGE HIGHLIGHTING 0 0 0 0 0 1 0 0
CALLFORATTENTION 0 0 2 1 1 2 0 0
AUDIO 0 1 1 0 0 2 0 0
ANNOTATIONS 0 0 1 0 0 2 0 0
Communication.means...builtin
CHAT
COMMIT MESSAGES
EMAIL
FACE-TO-FACE
HYPERLINKS
NO
VIDEO
VOICE COMMUNICATION CHANNELS
Communication.means...external
Frequency
7.5
5.0
2.5
0.0


Communication.means...builtin_____Communication.means...mixed
VOTING
TAGS
REVIEWS
PROPOSALS
NOTIFICATIONS
NOTES
NO
NATURAL LANGUAGE
FEEDBACK
CONFLICTSLIST
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
AUDIO
ANNOTATIONS
0 0 1 2
0 0 0 1
0 0 1 1
0 0 1 3
0 0 0 1
0 0 0 2
1 0 1 11
0 0 0 1
0 0 1 5
0 0 0 2
1 0 1 3
0 0 0 1
0 1 1 5
0 0 0 1
0 0 1 4
0 0 0 3
1 0 1 1
Communication.means...builtin
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...mixed
Frequency
10.0
7.5
5.0
2.5
0.0


Communication.means...builtin_____Communication.means.links
Communication.means...builtin
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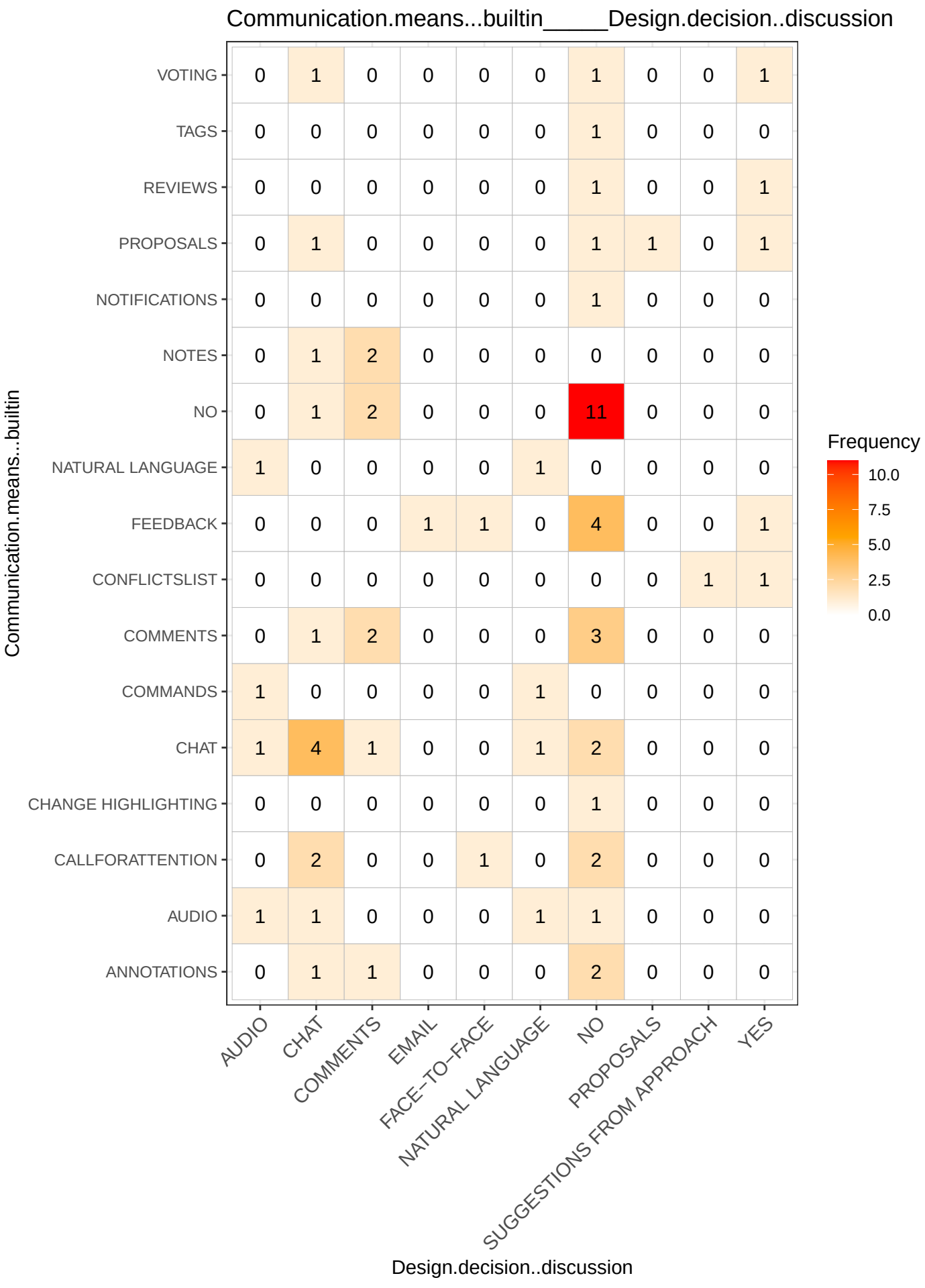
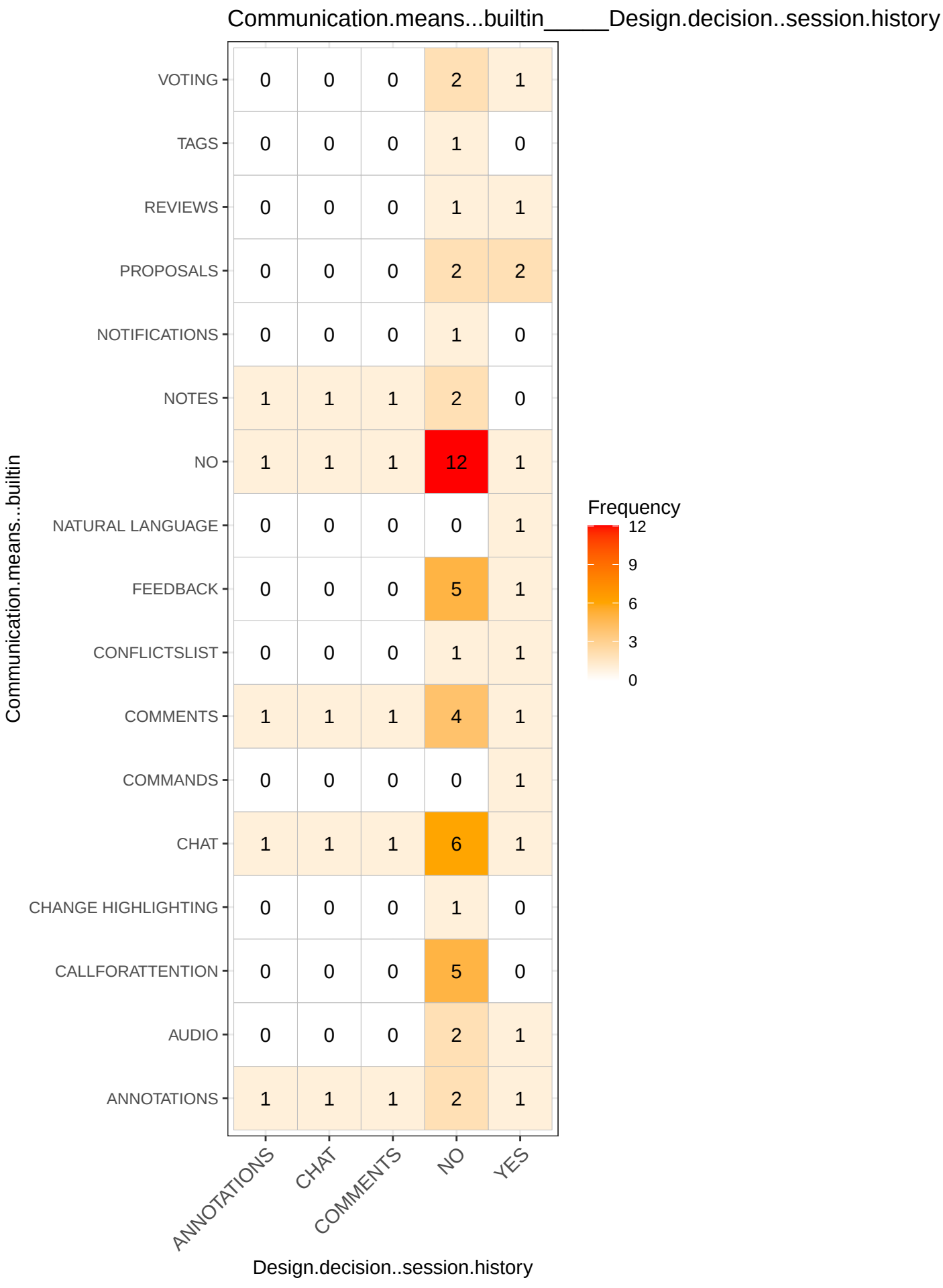
TAGS 0 0 0 0 0 0 0 0 0 1 0 0 0 0
REVIEWS 0 0 0 0 0 0 0 0 0 2 0 0 0 0
PROPOSALS 0 0 0 0 0 0 0 0 0 3 0 0 1 0
NOTIFICATIONS 0 0 1 0 0 0 0 0 0 1 0 1 0 0
NOTES 1 0 0 0 0 1 0 0 0 2 2 0 0 0
NO 2 0 1 0 0 2 1 0 0 13 2 1 0 0
NATURAL LANGUAGE 0 0 0 1 1 0 0 0 1 0 0 0 0 0
FEEDBACK 0 0 0 0 0 0 0 0 0 6 0 0 0 0
CONFLICTSLIST 0 0 0 0 0 0 0 0 0 2 0 0 0 0
COMMENTS 2 0 0 0 0 2 1 0 0 5 2 0 0 0
COMMANDS 0 0 0 1 1 0 0 0 1 0 0 0 0 0
CHAT 1 1 1 2 1 1 0 0 1 5 1 1 0 1
CHANGE HIGHLIGHTING 0 0 1 0 0 0 0 0 0 1 0 1 0 0
CALLFORATTENTION 0 1 0 1 0 0 0 1 0 3 0 0 0 1
AUDIO 0 0 1 1 1 0 0 0 1 2 0 1 0 0
ANNOTATIONS 2 0 0 0 0 2 1 0 0 3 1 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE-TO-FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
12.5
10.0
7.5
5.0
2.5
0.0


Communication.means...builtin_____Design.decision..discussion
Communication.means...builtin
VOTING 0 1 0 0 0 0 1 0 0 1
TAGS 0 0 0 0 0 0 1 0 0 0
REVIEWS 0 0 0 0 0 0 1 0 0 1
PROPOSALS 0 1 0 0 0 0 1 1 0 1
NOTIFICATIONS 0 0 0 0 0 0 1 0 0 0
NOTES 0 1 2 0 0 0 0 0 0 0
NO 0 1 2 0 0 0 11 0 0 0
NATURAL LANGUAGE 1 0 0 0 0 1 0 0 0 0
FEEDBACK 0 0 0 1 1 0 4 0 0 1
CONFLICTSLIST 0 0 0 0 0 0 0 0 1 1
COMMENTS 0 1 2 0 0 0 3 0 0 0
COMMANDS 1 0 0 0 0 1 0 0 0 0
CHAT 1 4 1 0 0 1 2 0 0 0
CHANGE HIGHLIGHTING 0 0 0 0 0 0 1 0 0 0
CALLFORATTENTION 0 2 0 0 1 0 2 0 0 0
AUDIO 1 1 0 0 0 1 1 0 0 0
ANNOTATIONS 0 1 1 0 0 0 2 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
10.0
7.5
5.0
2.5
0.0


Communication.means...builtin_____Design.decision..session.history
Communication.means...builtin
VOTING
TAGS
REVIEWS
PROPOSALS
NOTIFICATIONS
NOTES
NO
NATURAL LANGUAGE
FEEDBACK
CONFLICTSLIST
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
AUDIO
ANNOTATIONS
0 0 0 2 1
0 0 0 1 0
0 0 0 1 1
0 0 0 2 2
0 0 0 1 0
1 1 1 2 0
1 1 1 12 1
0 0 0 0 1
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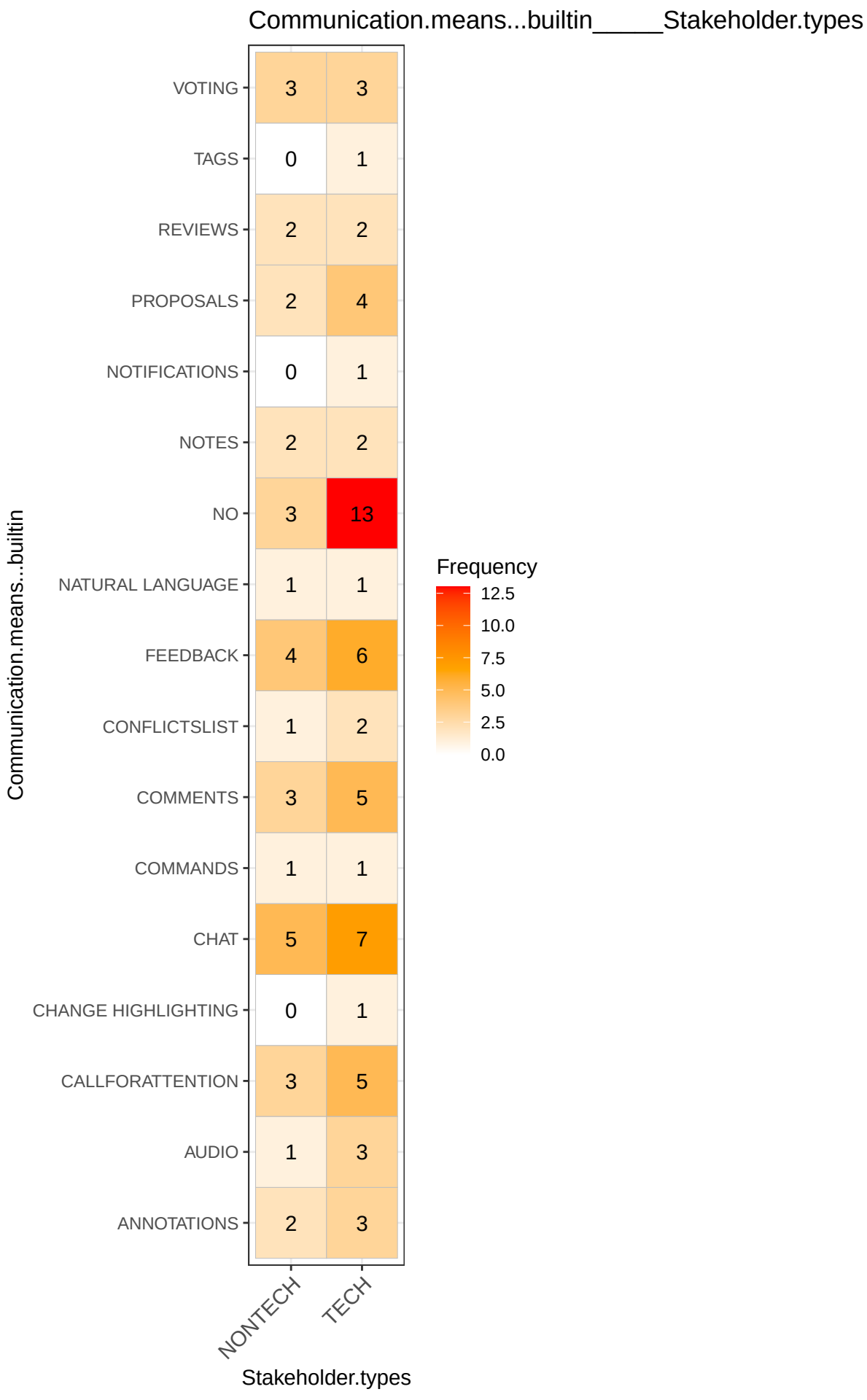
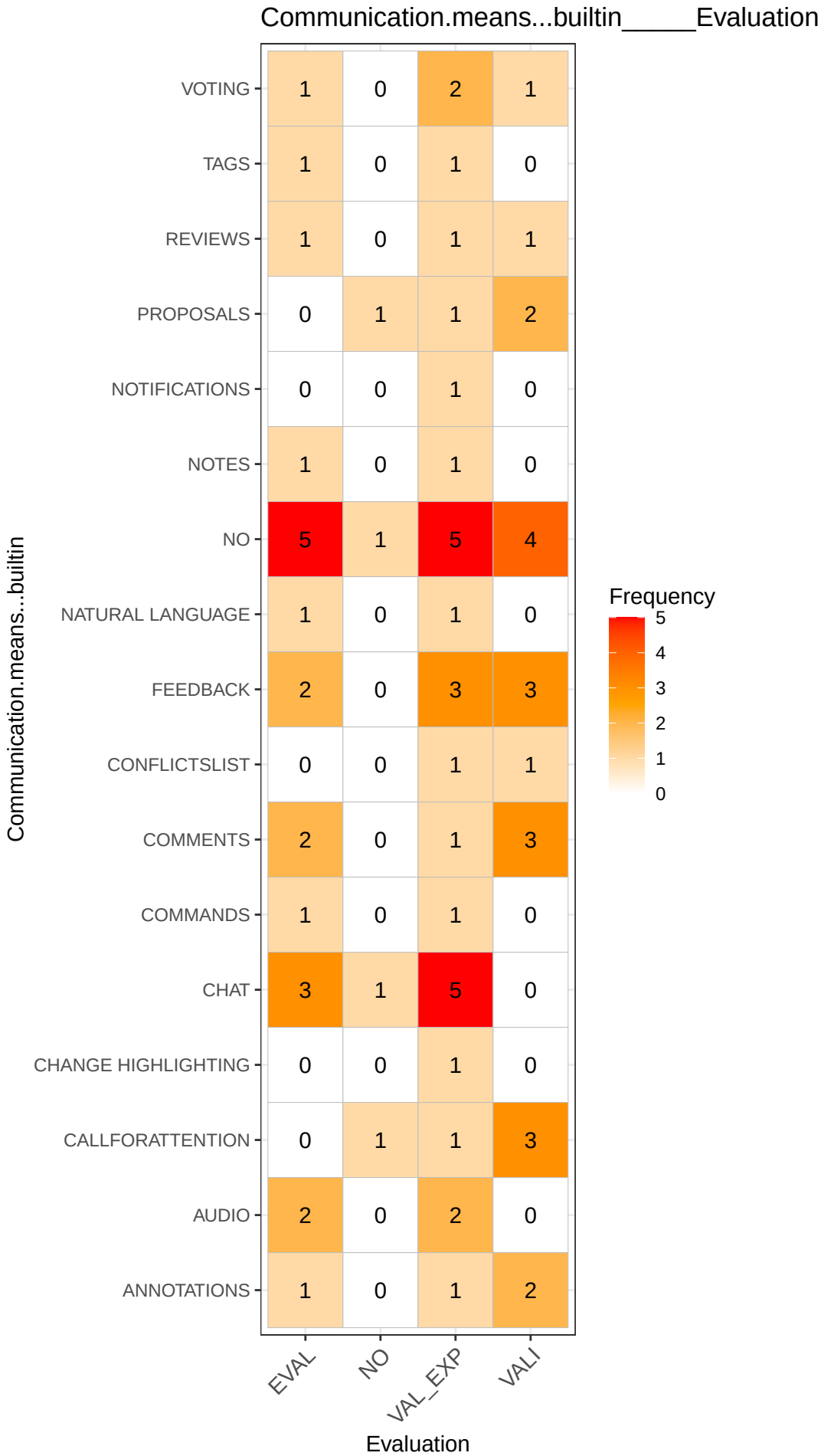
0 0 0 1 1
1 1 1 4 1
0 0 0 0 1
1 1 1 6 1
0 0 0 1 0
0 0 0 5 0
0 0 0 2 1
1 1 1 2 1
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
12
9
6
3
0


Communication.means...builtin_____Stakeholder.types
Communication.means...builtin
VOTING
TAGS
REVIEWS
PROPOSALS
NOTIFICATIONS
NOTES
NO
NATURAL LANGUAGE
FEEDBACK
CONFLICTSLIST
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
AUDIO
ANNOTATIONS
3 3
0 1
2 2
2 4
0 1
2 2
3 13
1 1
4 6
1 2
3 5
1 1
5 7
0 1
3 5
1 3
2 3
NONTECH
TECH
Stakeholder.types
Frequency
12.5
10.0
7.5
5.0
2.5
0.0

Communication.means...builtin_____Workspace.awareness
Communication.means...builtin
VOTING 0 0 0 0 2 1 0 1 1 1 0 0 0 1
TAGS 0 0 0 0 0 0 0 0 0 0 0 1 0 0
REVIEWS 0 0 0 0 1 0 0 0 0 0 0 0 0 1
PROPOSALS 0 1 0 0 0 0 1 1 0 0 0 0 0 1
NOTIFICATIONS 0 0 0 0 0 0 0 0 0 0 1 0 0 0
NOTES 1 0 0 0 1 0 1 0 0 0 1 0 1 0
NO 1 1 0 1 2 0 3 1 0 0 3 0 1 6
NATURAL LANGUAGE 0 0 0 0 0 0 0 1 0 0 1 0 0 0
FEEDBACK 0 0 0 0 2 1 3 0 0 0 1 0 0 1
CONFLICTSLIST 0 1 0 0 0 0 0 0 0 0 0 0 0 1
COMMENTS 1 0 0 1 2 0 2 0 0 0 1 0 1 1
COMMANDS 0 0 0 0 0 0 0 1 0 0 1 0 0 0
CHAT 1 0 1 0 2 1 0 3 2 2 4 0 1 0
CHANGE HIGHLIGHTING 0 0 0 0 0 0 0 0 0 0 1 0 0 0
CALLFORATTENTION 0 0 0 0 1 1 2 2 1 1 1 1 0 0
AUDIO 0 0 1 0 0 0 0 1 1 1 2 0 0 0
ANNOTATIONS 1 0 0 1 2 0 0 0 0 0 1 0 1 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0

Communication.means...builtin_____Workspace.awareness.score
VOTING
TAGS
REVIEWS
PROPOSALS
NOTIFICATIONS
NOTES
NO
NATURAL LANGUAGE
FEEDBACK
CONFLICTSLIST
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
AUDIO
ANNOTATIONS
1 1 1
1 0 0
1 1 0
2 1 1
1 0 0
1 1 0
4 8 1
1 0 0
2 4 0
1 0 1
2 3 0
1 0 0
4 1 2
1 0 0
1 1 3
3 0 0
2 1 0
HIGH
LOW
MED
Workspace.awareness.score
Communication.means...builtin
Frequency
8
6
4
2
0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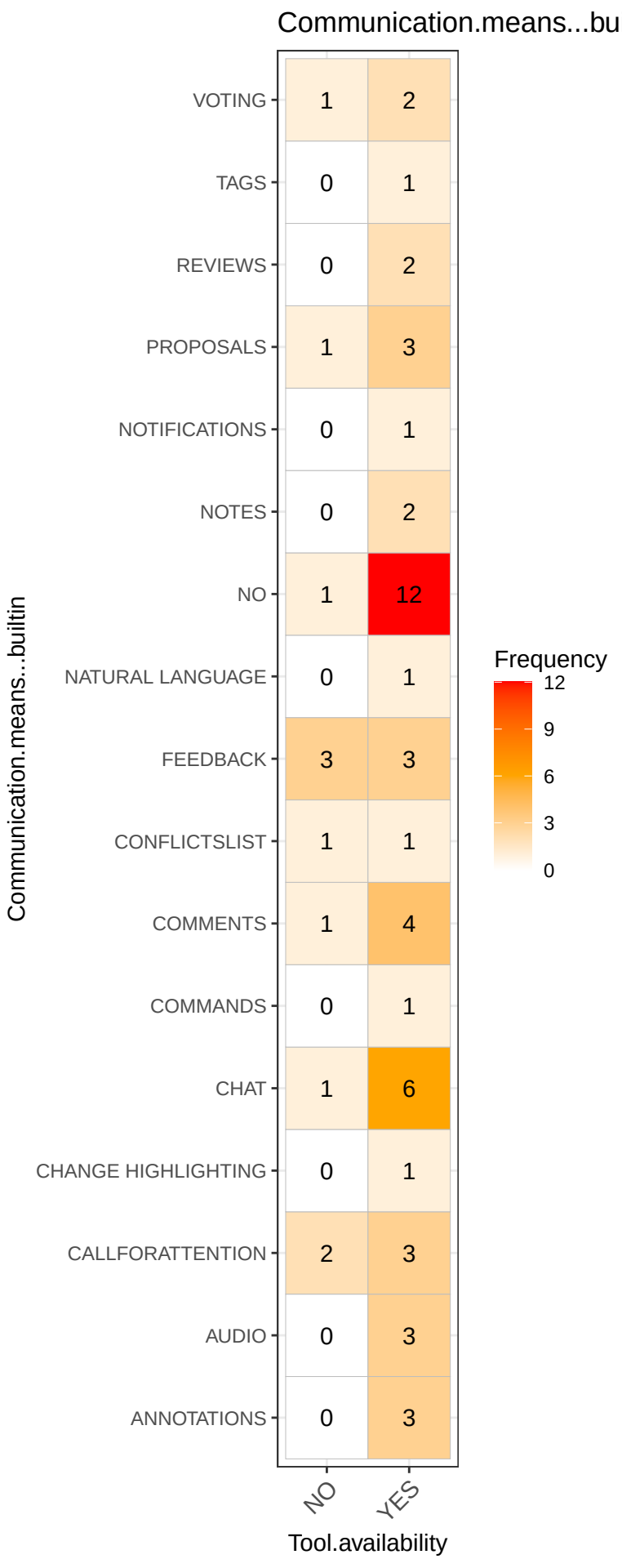
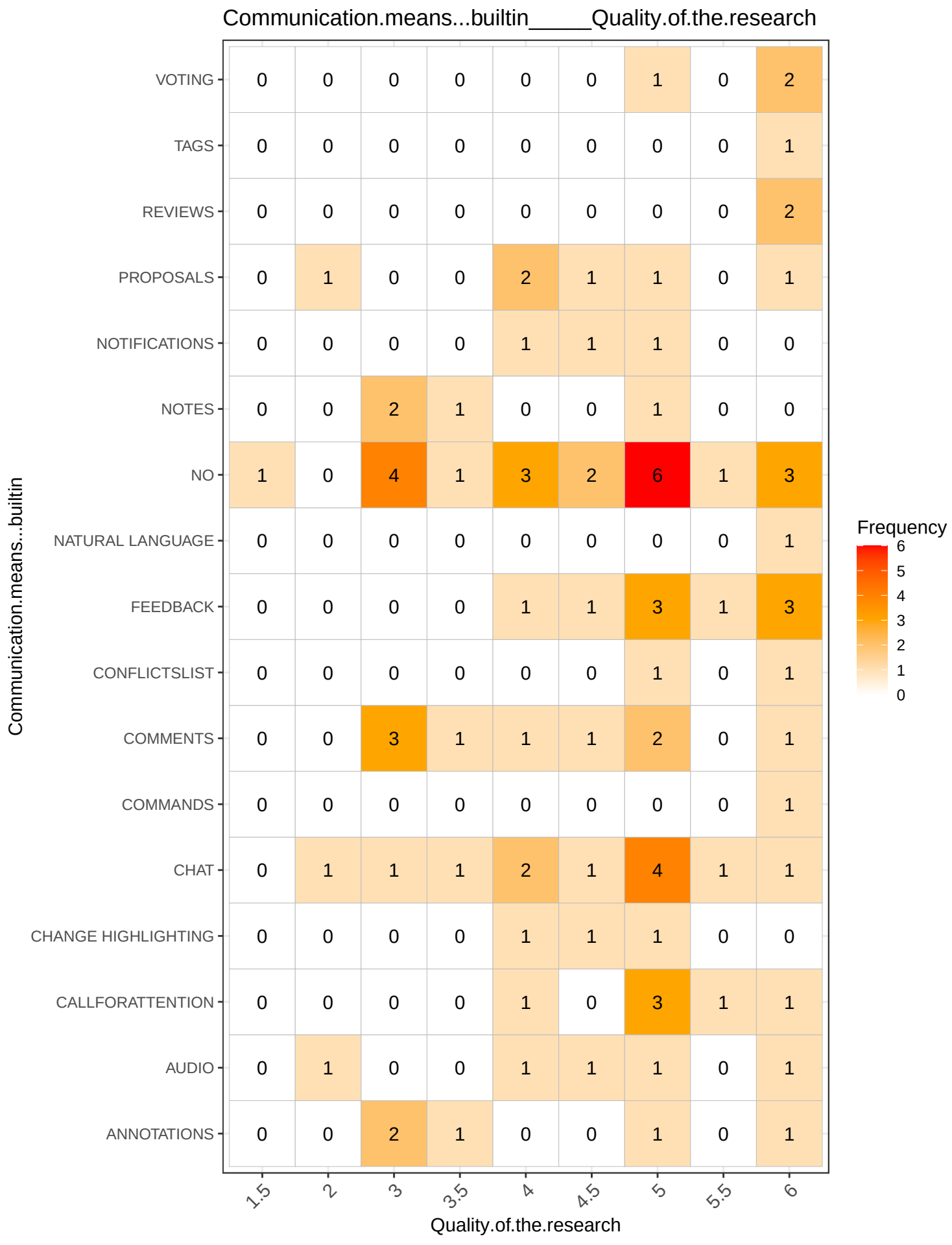
Communication.means...builtin
VOTING
TAGS
REVIEWS
PROPOSALS
NOTIFICATIONS
NOTES
NO
NATURAL LANGUAGE
FEEDBACK
CONFLICTSLIST
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
AUDIO
ANNOTATIONS
1 0 2 1
1 0 1 0
1 0 1 1
0 1 1 2
0 0 1 0
1 0 1 0
5 1 5 4
1 0 1 0
2 0 3 3
0 0 1 1
2 0 1 3
1 0 1 0
3 1 5 0
0 0 1 0
0 1 1 3
2 0 2 0
1 0 1 2
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
5
4
3
2
1
0


Communication.means...builtin_____Tool.availability
VOTING
TAGS
REVIEWS
PROPOSALS
NOTIFICATIONS
NOTES
NO
NATURAL LANGUAGE
FEEDBACK
CONFLICTSLIST
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
AUDIO
ANNOTATIONS
1 2
0 1
0 2
1 3
0 1
0 2
1 12
0 1
3 3
1 1
1 4
0 1
1 6
0 1
2 3
0 3
0 3
NO
YES
Tool.availability
Communication.means...builtin
Frequency
12
9
6
3
0


Communication.means...builtin_____Quality.of.the.research
Communication.means...builtin
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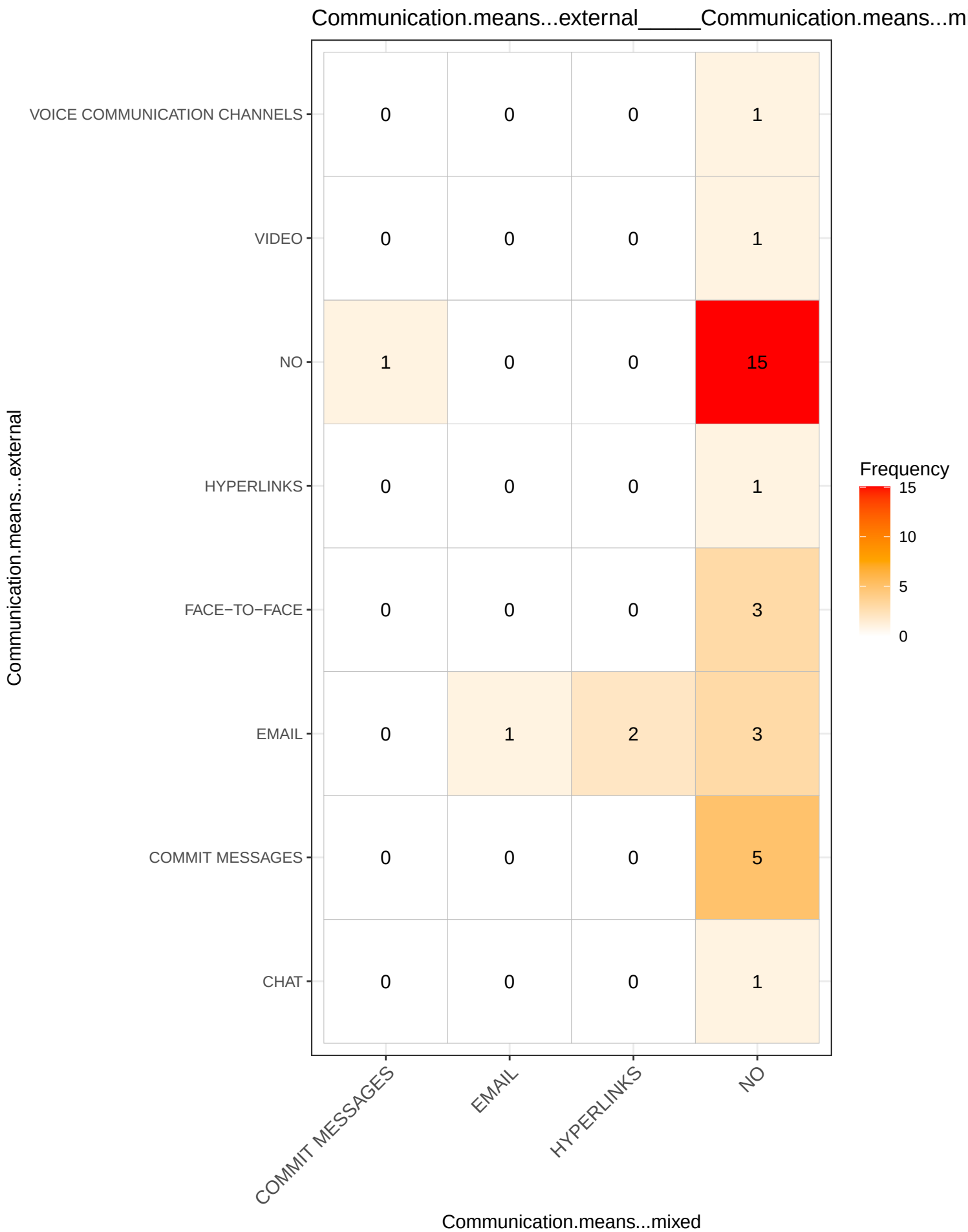
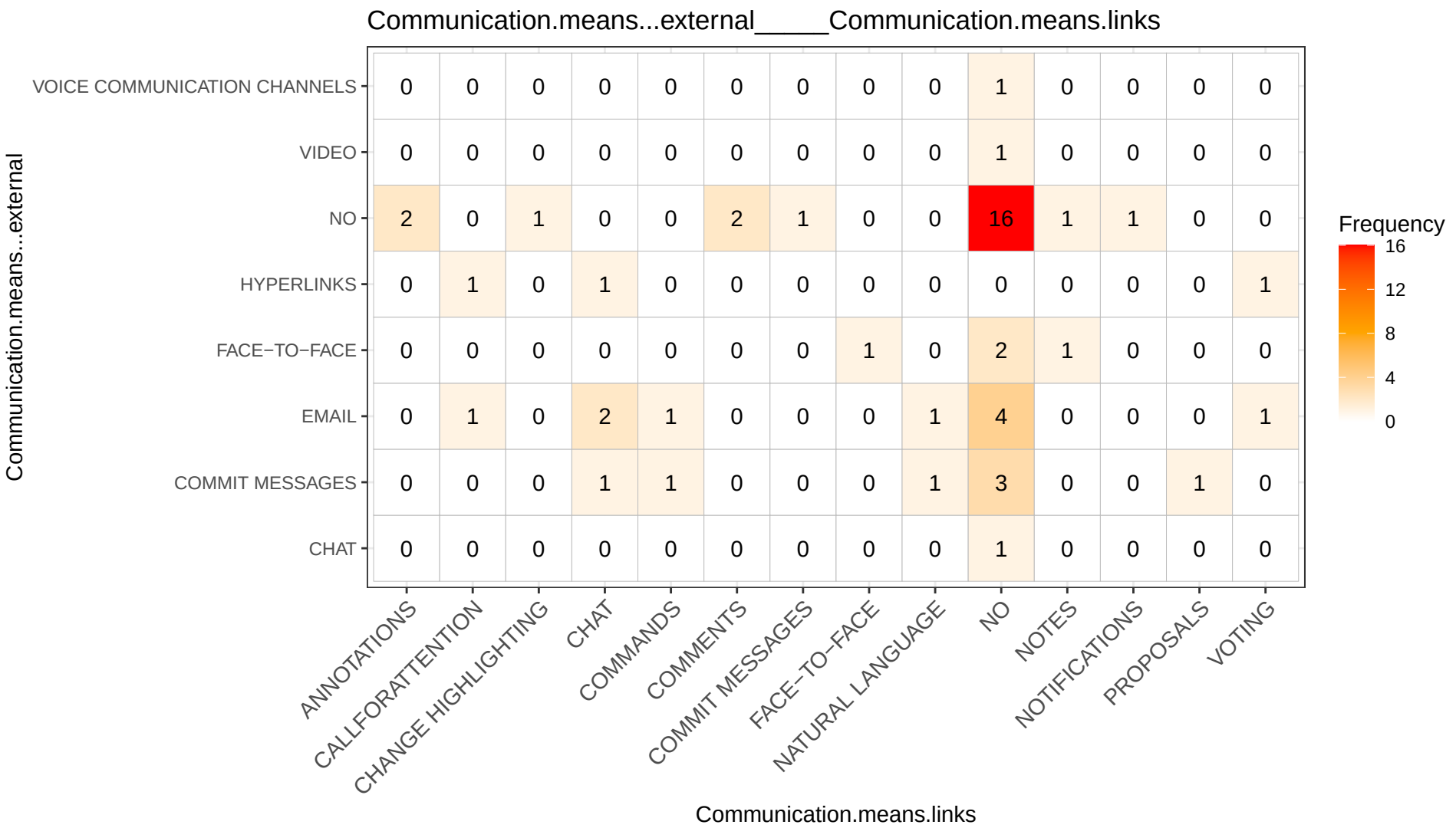
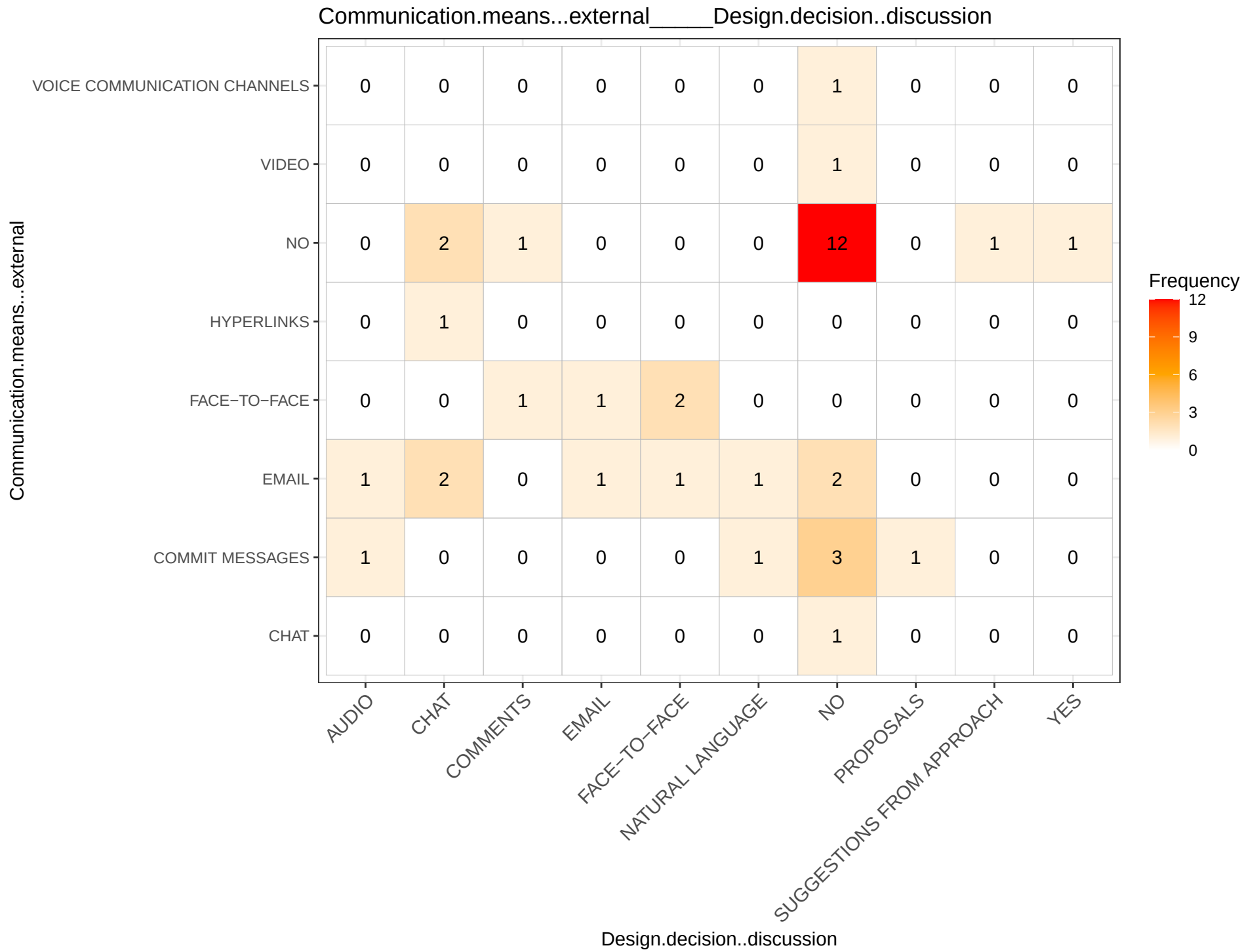
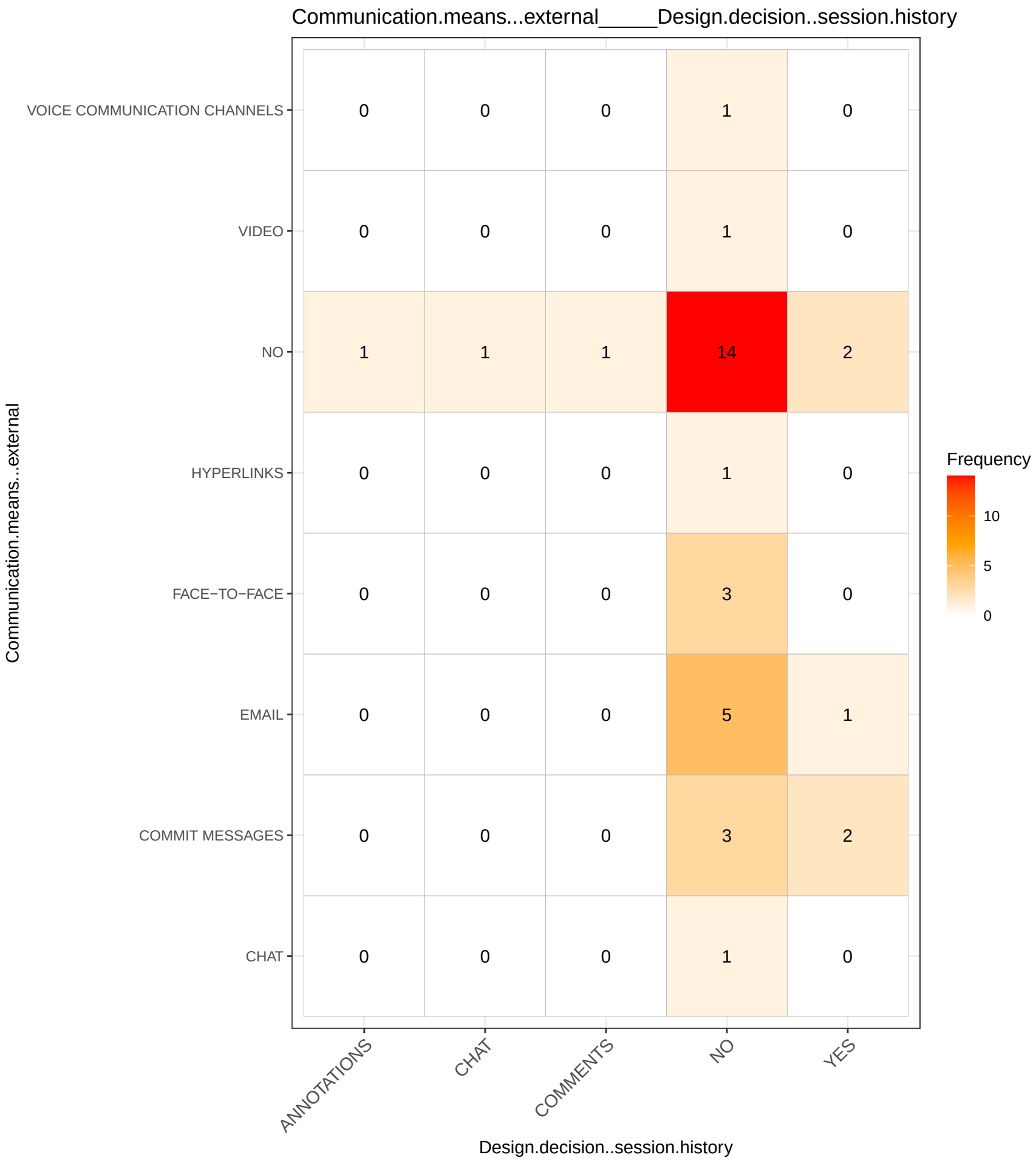
TAGS 0 0 0 0 0 0 0 0 1
REVIEWS 0 0 0 0 0 0 0 0 2
PROPOSALS 0 1 0 0 2 1 1 0 1
NOTIFICATIONS 0 0 0 0 1 1 1 0 0
NOTES 0 0 2 1 0 0 1 0 0
NO 1 0 4 1 3 2 6 1 3
NATURAL LANGUAGE 0 0 0 0 0 0 0 0 1
FEEDBACK 0 0 0 0 1 1 3 1 3
CONFLICTSLIST 0 0 0 0 0 0 1 0 1
COMMENTS 0 0 3 1 1 1 2 0 1
COMMANDS 0 0 0 0 0 0 0 0 1
CHAT 0 1 1 1 2 1 4 1 1
CHANGE HIGHLIGHTING 0 0 0 0 1 1 1 0 0
CALLFORATTENTION 0 0 0 0 1 0 3 1 1
AUDIO 0 1 0 0 1 1 1 0 1
ANNOTATIONS 0 0 2 1 0 0 1 0 1
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
6 5 4 3 2 1 0


Communication.means...external_____Communication.means...mixed
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0 0 0 1
0 0 0 1
1 0 0 15
0 0 0 1
0 0 0 3
0 1 2 3
0 0 0 5
0 0 0 1
COMMIT MESSAGES
EMAIL
HYPERLINKS
NO
Communication.means...external
Communication.means...mixed
Frequency
15
10
5
0


Communication.means...external_____Communication.means.links
Communication.means...external
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0 0 0 0 0 0 0 0 0 1 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
2 0 1 0 0 2 1 0 0 16 1 1 0 0
0 1 0 1 0 0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 1 0 2 1 0 0 0
0 1 0 2 1 0 0 0 1 4 0 0 0 1
0 0 0 1 1 0 0 0 1 3 0 0 1 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
16
12
8
4
0


Communication.means...external_____Design.decision..discussion
Communication.means...external
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0
0 2 1 0 0 0 12 0 1 1
0 1 0 0 0 0 0 0 0 0
0 0 1 1 2 0 0 0 0 0
1 2 0 1 1 1 2 0 0 0
1 0 0 0 0 1 3 1 0 0
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
12
9
6
3
0


Communication.means...external_____Design.decision..session.history
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0 0 0 1 0
0 0 0 1 0
1 1 1 14 2
0 0 0 1 0
0 0 0 3 0
0 0 0 5 1
0 0 0 3 2
0 0 0 1 0
Communication.means...external
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
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5
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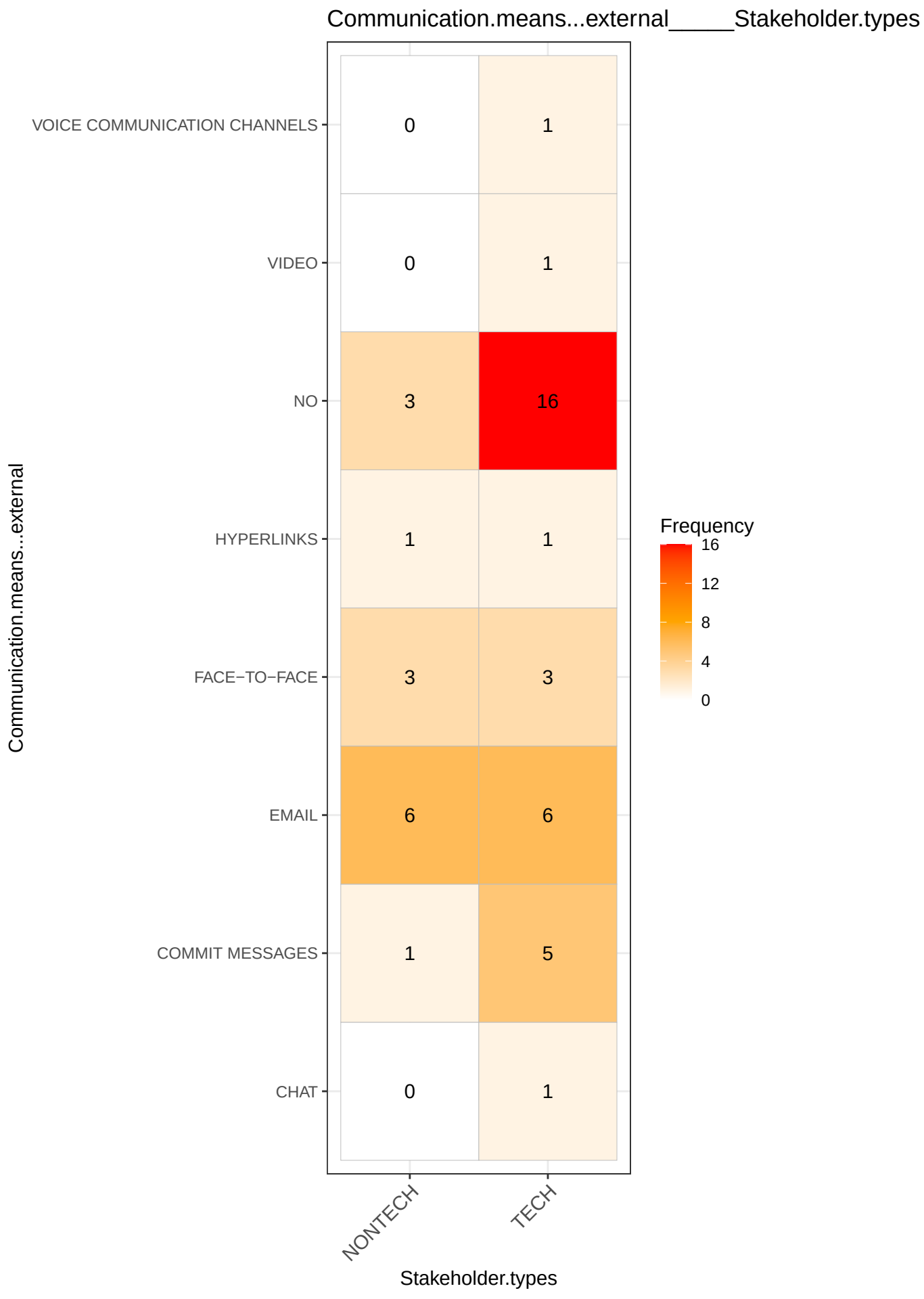
Communication.means...external_____Stakeholder.types
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0
1
0
1
3
16
1
1
3
3
6
6
1
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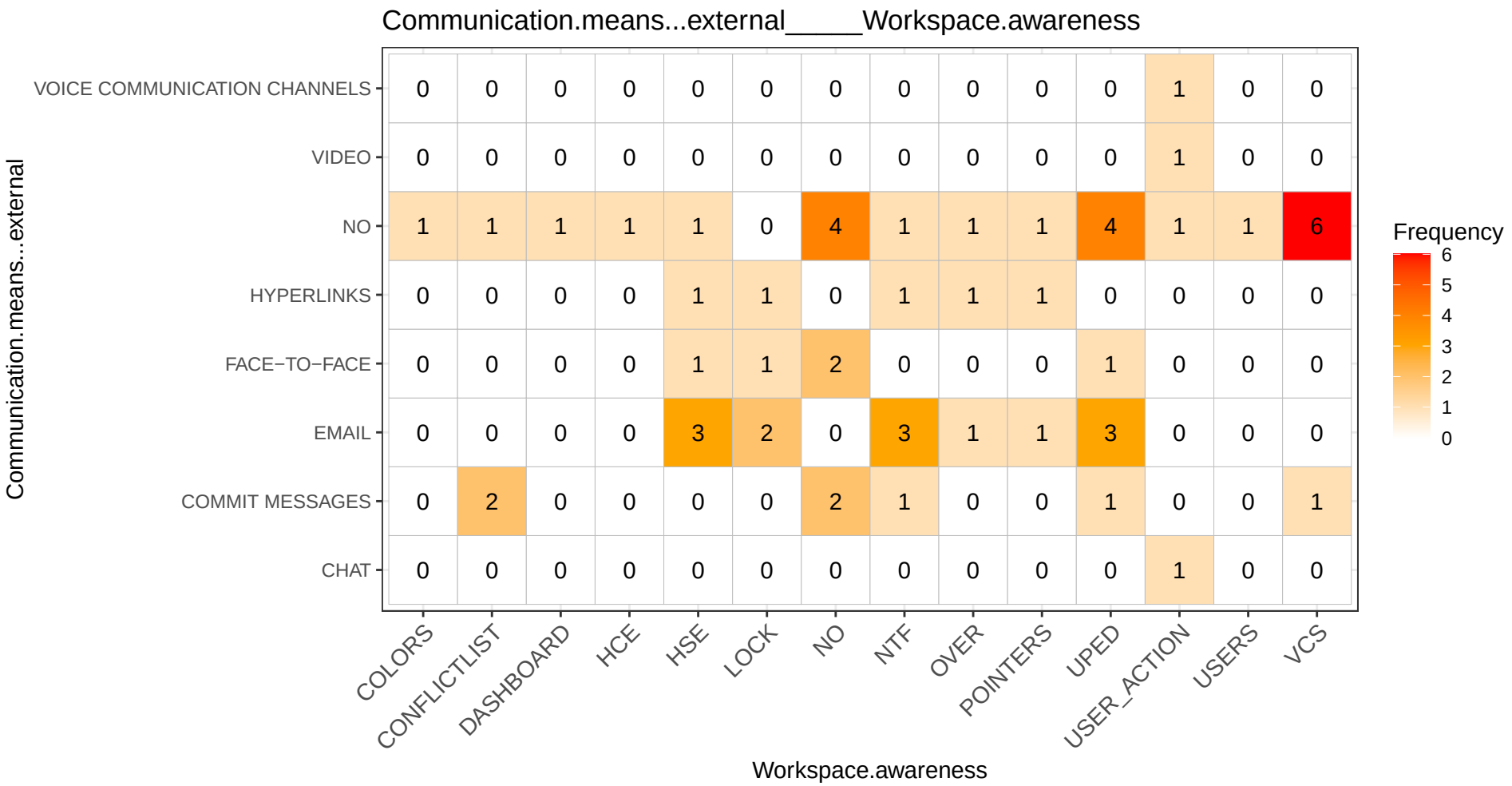
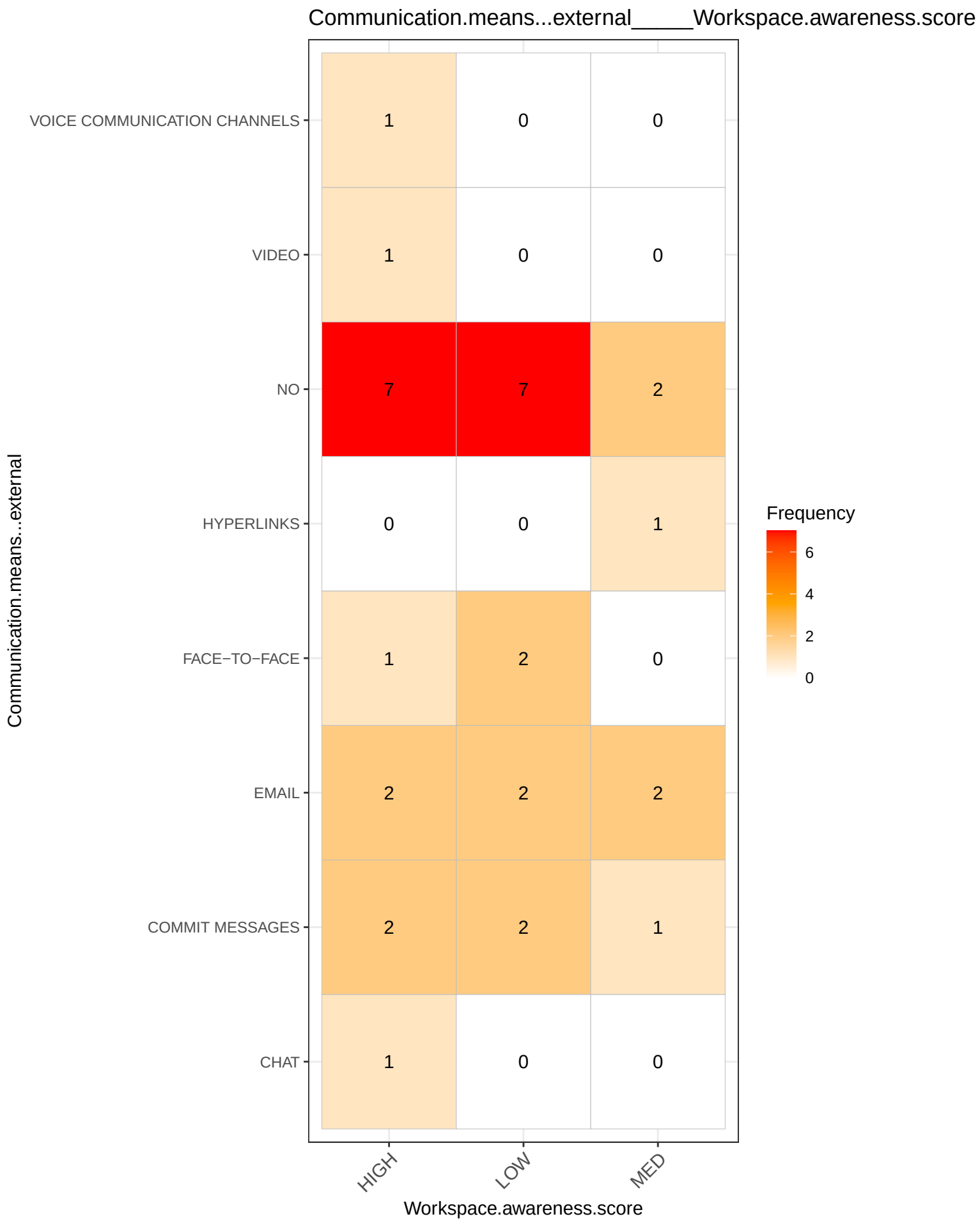
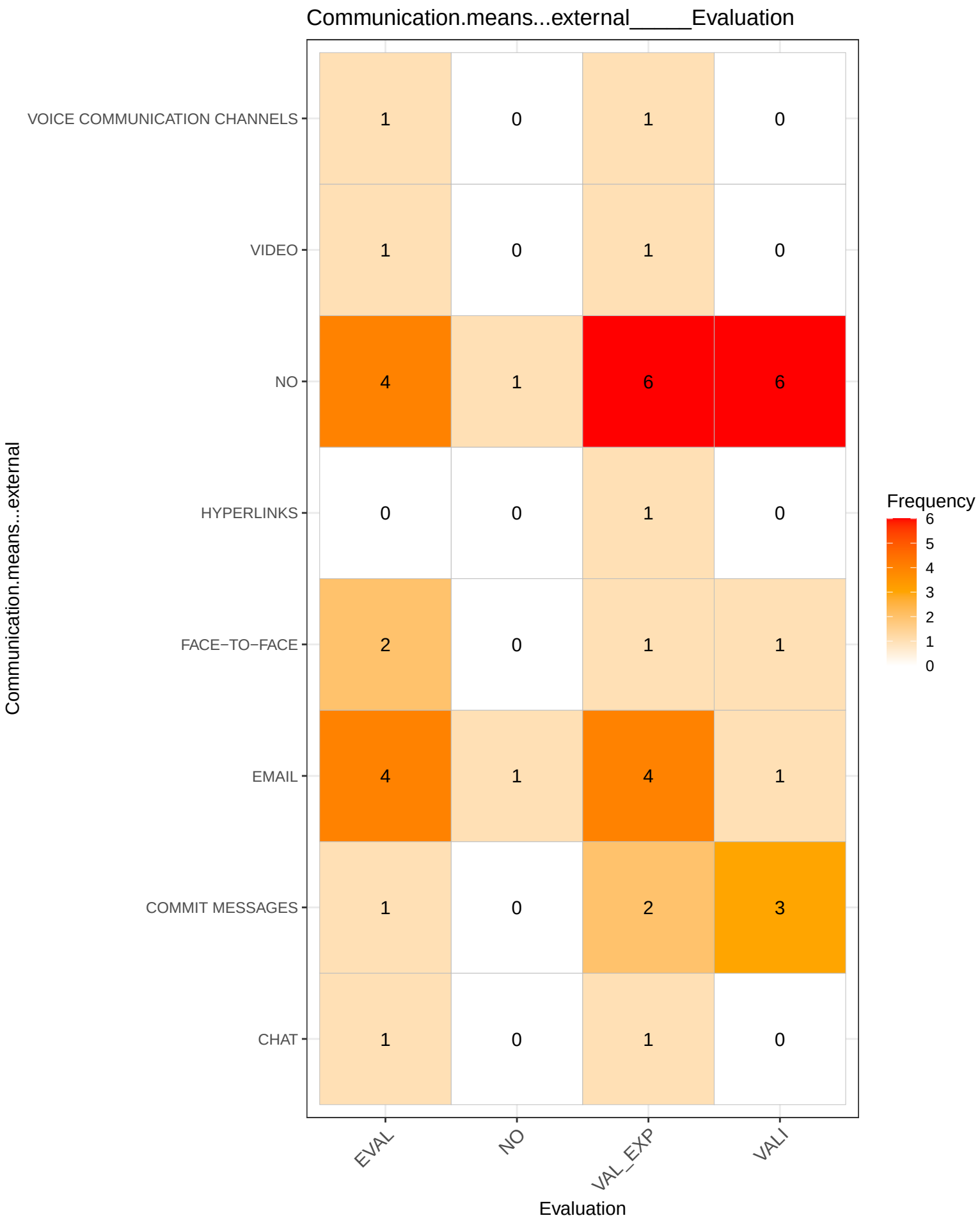
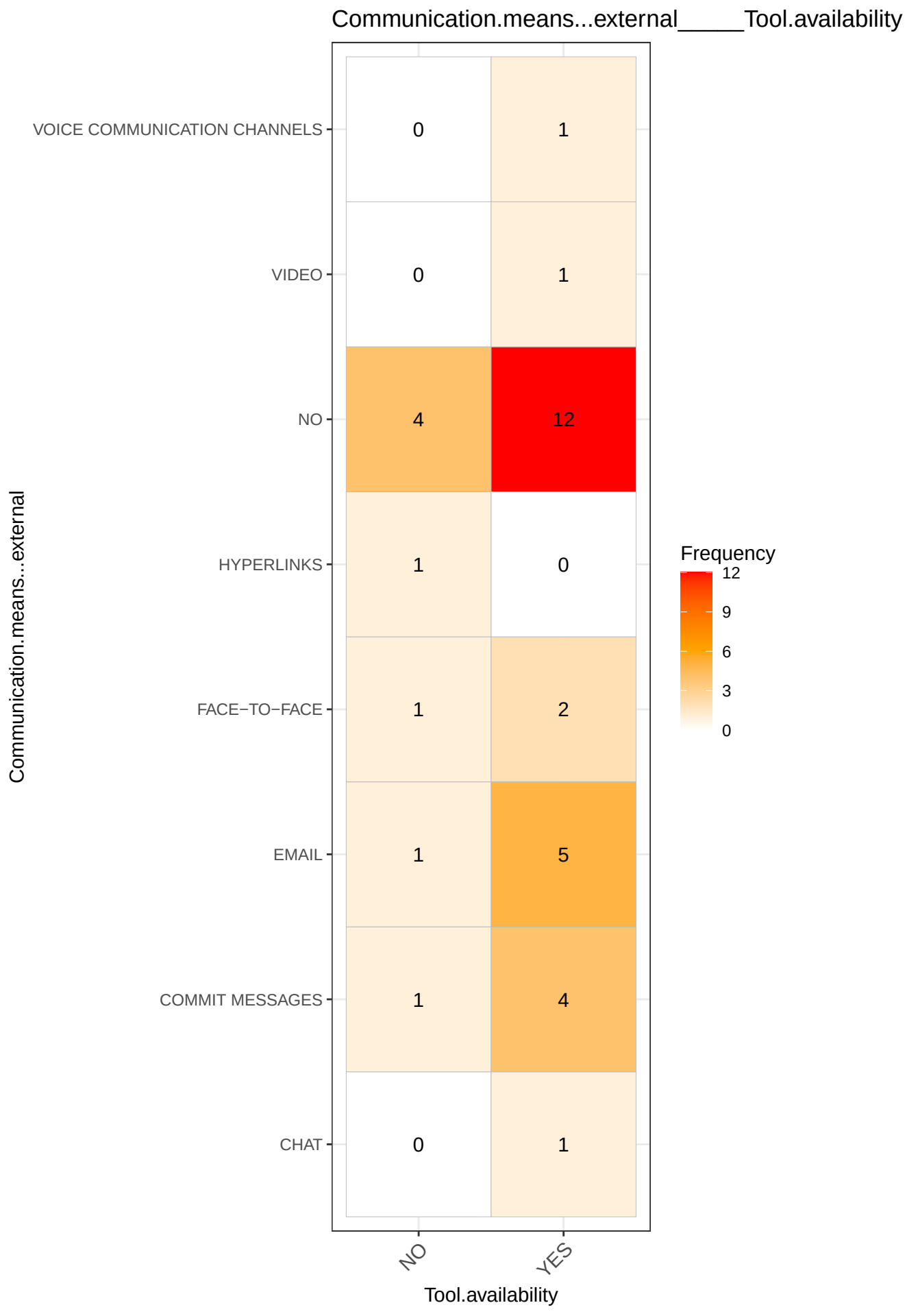
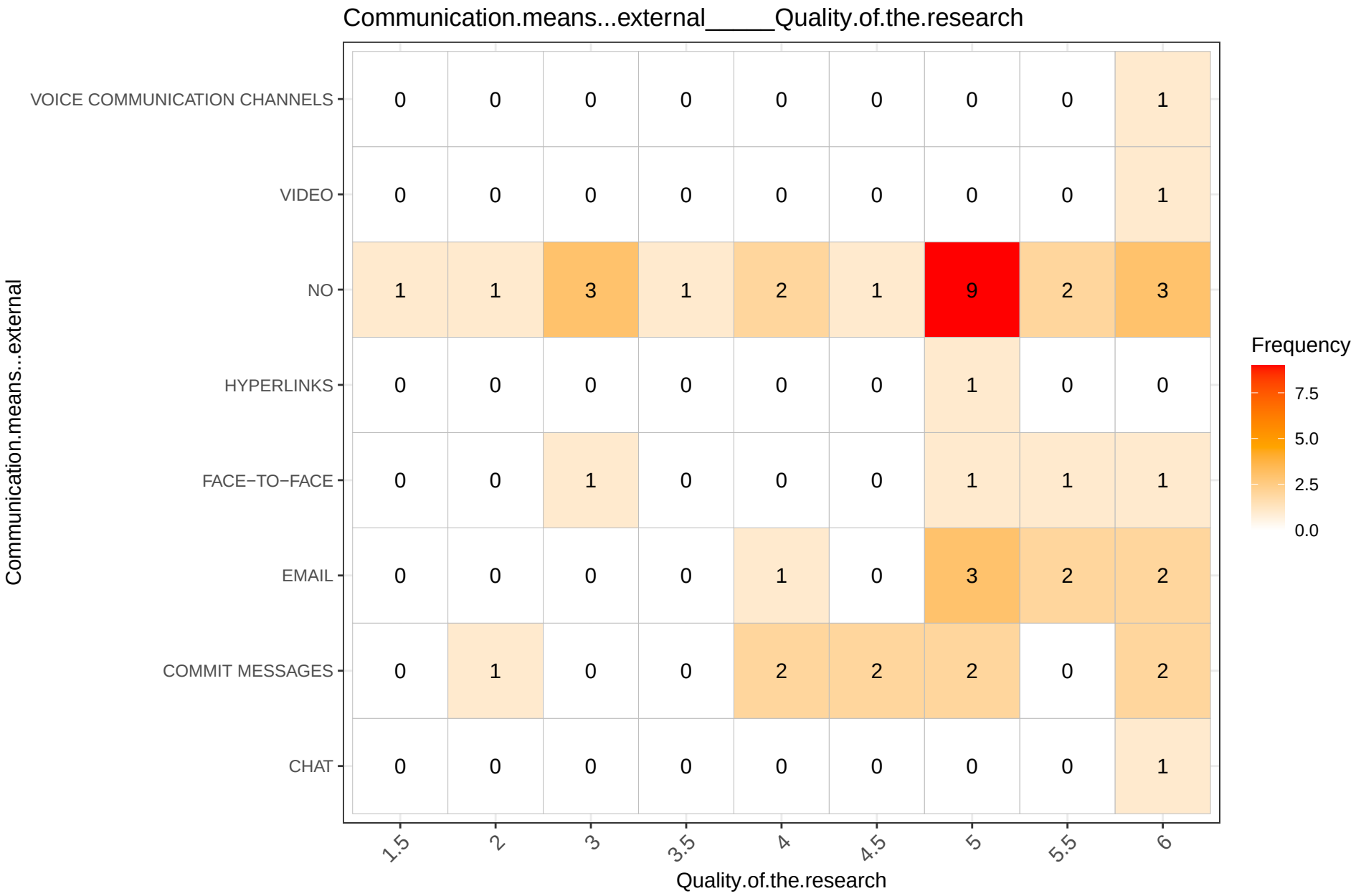
0
1
NONTECH
TECH
Stakeholder.types
Communication.means...external
Frequency
16
12
8
4
0


Communication.means...external_____Workspace.awareness
Communication.means...external
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0 0 0 0 0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0 0 0 0 1 0 0
1 1 1 1 1 0 4 1 1 1 4 1 1 6
0 0 0 0 1 1 0 1 1 1 0 0 0 0
0 0 0 0 1 1 2 0 0 0 1 0 0 0
0 0 0 0 3 2 0 3 1 1 3 0 0 0
0 2 0 0 0 0 2 1 0 0 1 0 0 1
0 0 0 0 0 0 0 0 0 0 0 1 0 0
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
6
5
4
3
2
1
0


Communication.means...external_____Workspace.awareness.score
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
Communication.means...external
1 0 0
1 0 0
7 7 2
0 0 1
1 2 0
2 2 2
2 2 1
1 0 0
HIGH
LOW
MED
Workspace.awareness.score
Frequency
6
4
2
0


Communication.means...external_____Evaluation
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
Communication.means...external
1 0 1 0
1 0 1 0
4 1 6 6
0 0 1 0
2 0 1 1
4 1 4 1
1 0 2 3
1 0 1 0
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
6
5
4
3
2
1
0


Communication.means...external_____Tool.availability
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
Communication.means...external
0
1
0
1
4
12
1
0
1
2
1
5
1
4
0
1
NO
YES
Tool.availability
Frequency
12
9
6
3
0


Communication.means...external_____Quality.of.the.research
Communication.means...external
VOICE COMMUNICATION CHANNELS
VIDEO
NO
HYPERLINKS
FACE−TO−FACE
EMAIL
COMMIT MESSAGES
CHAT
0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0 1
1 1 3 1 2 1 9 2 3
0 0 0 0 0 0 1 0 0
0 0 1 0 0 0 1 1 1
0 0 0 0 1 0 3 2 2
0 1 0 0 2 2 2 0 2
0 0 0 0 0 0 0 0 1
1.5
2
3
3.5
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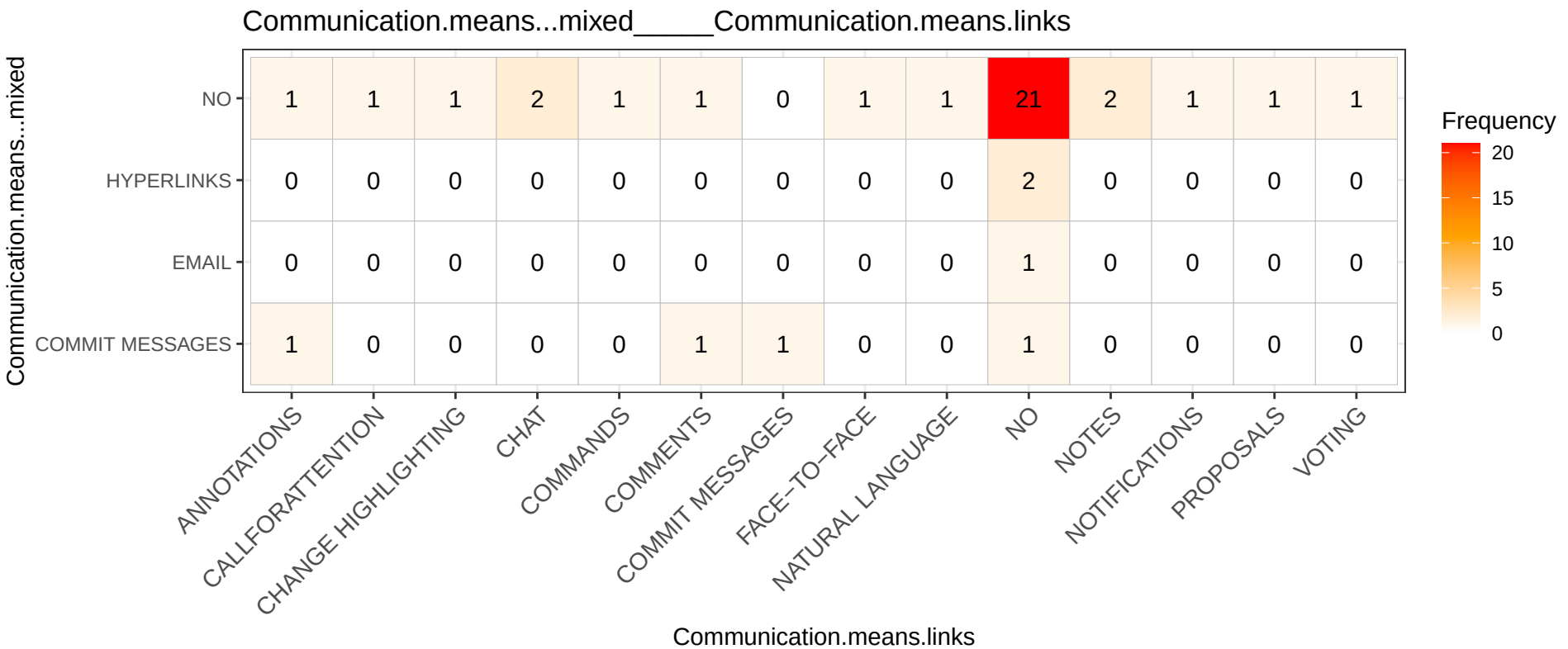
4.5
5
5.5
6
Quality.of.the.research
Frequency
7.5
5.0
2.5
0.0


Communication.means...mixed_____Communication.means.links
Communication.means...mixed
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HYPERLINKS
EMAIL
COMMIT MESSAGES
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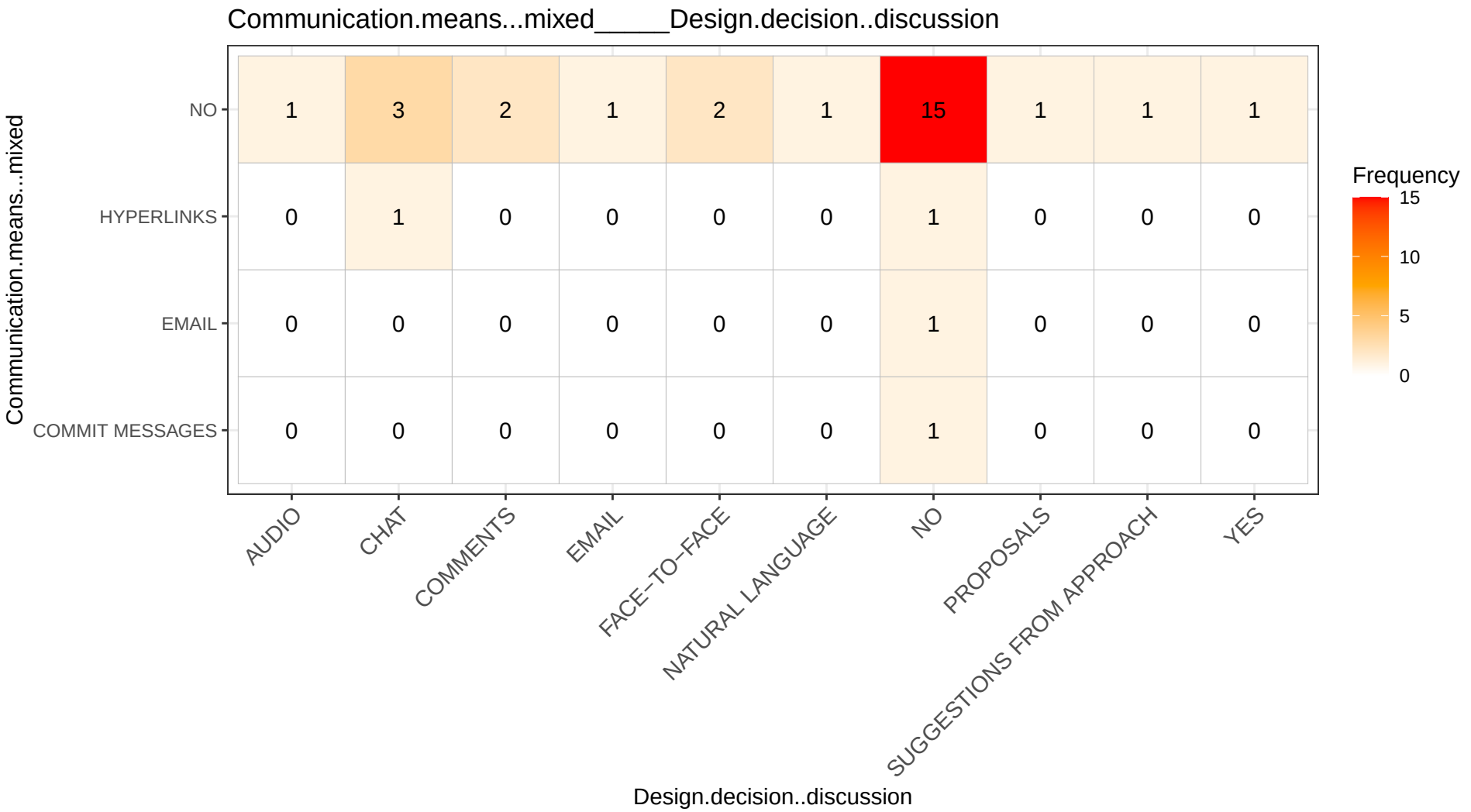
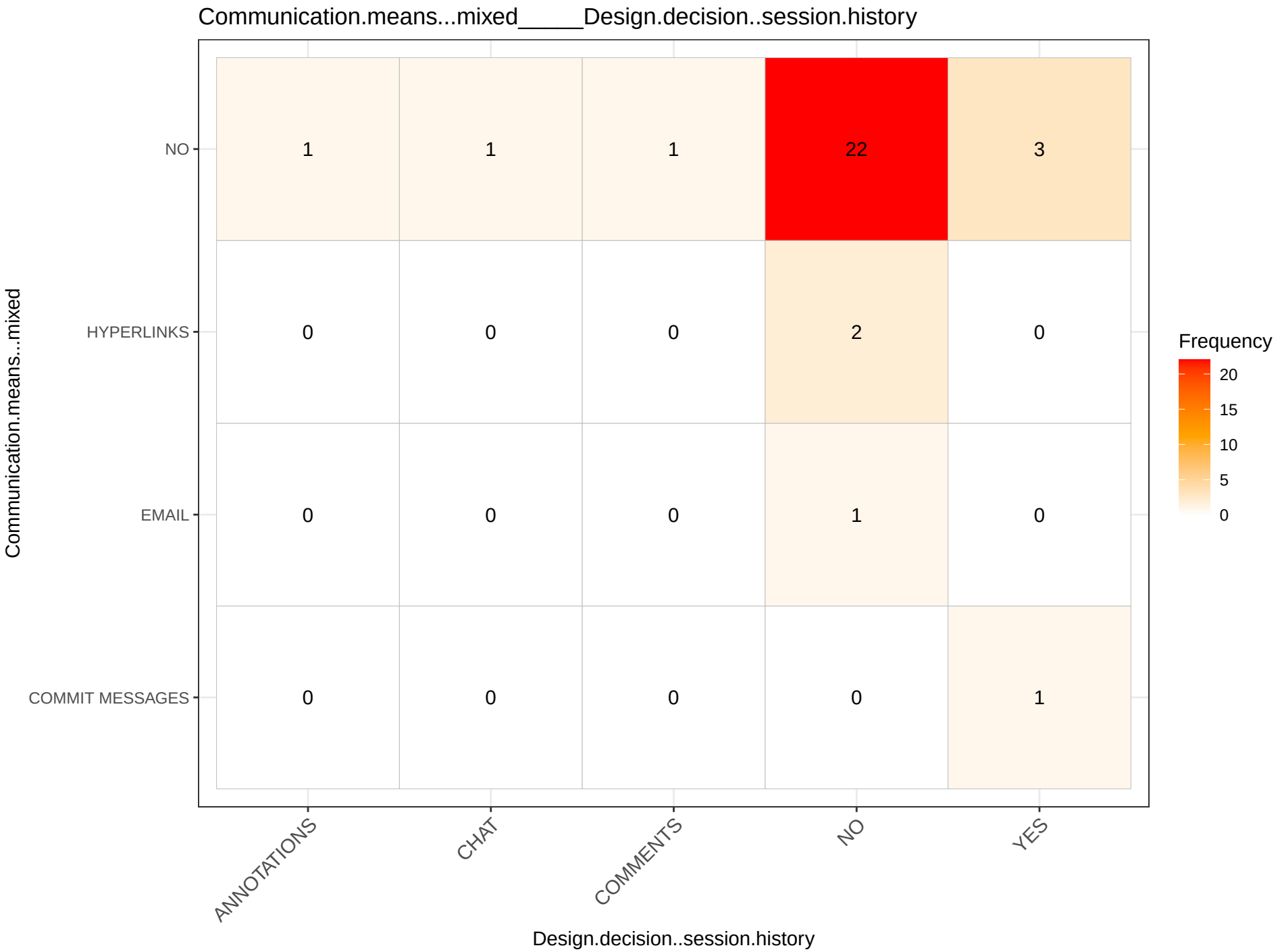
0 0 0 0 0 0 0 0 0 2 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0
1 0 0 0 0 1 1 0 0 1 0 0 0 0
ANNOTATIONS
CALLFORATTENTION
CHANGE HIGHLIGHTING
CHAT
COMMANDS
COMMENTS
COMMIT MESSAGES
FACE−TO−FACE
NATURAL LANGUAGE
NO
NOTES
NOTIFICATIONS
PROPOSALS
VOTING
Communication.means.links
Frequency
20
15
10
5
0


Communication.means...mixed_____Design.decision..discussion
Communication.means...mixed
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
1 3 2 1 2 1 15 1 1 1
0 1 0 0 0 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
NATURAL LANGUAGE
NO
PROPOSALS
SUGGESTIONS FROM APPROACH
YES
Design.decision..discussion
Frequency
15
10
5
0


Communication.means...mixed_____Design.decision..session.history
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
Communication.means...mixed
1
1
1
22
3
0
0
0
2
0
0
0
0
1
0
0
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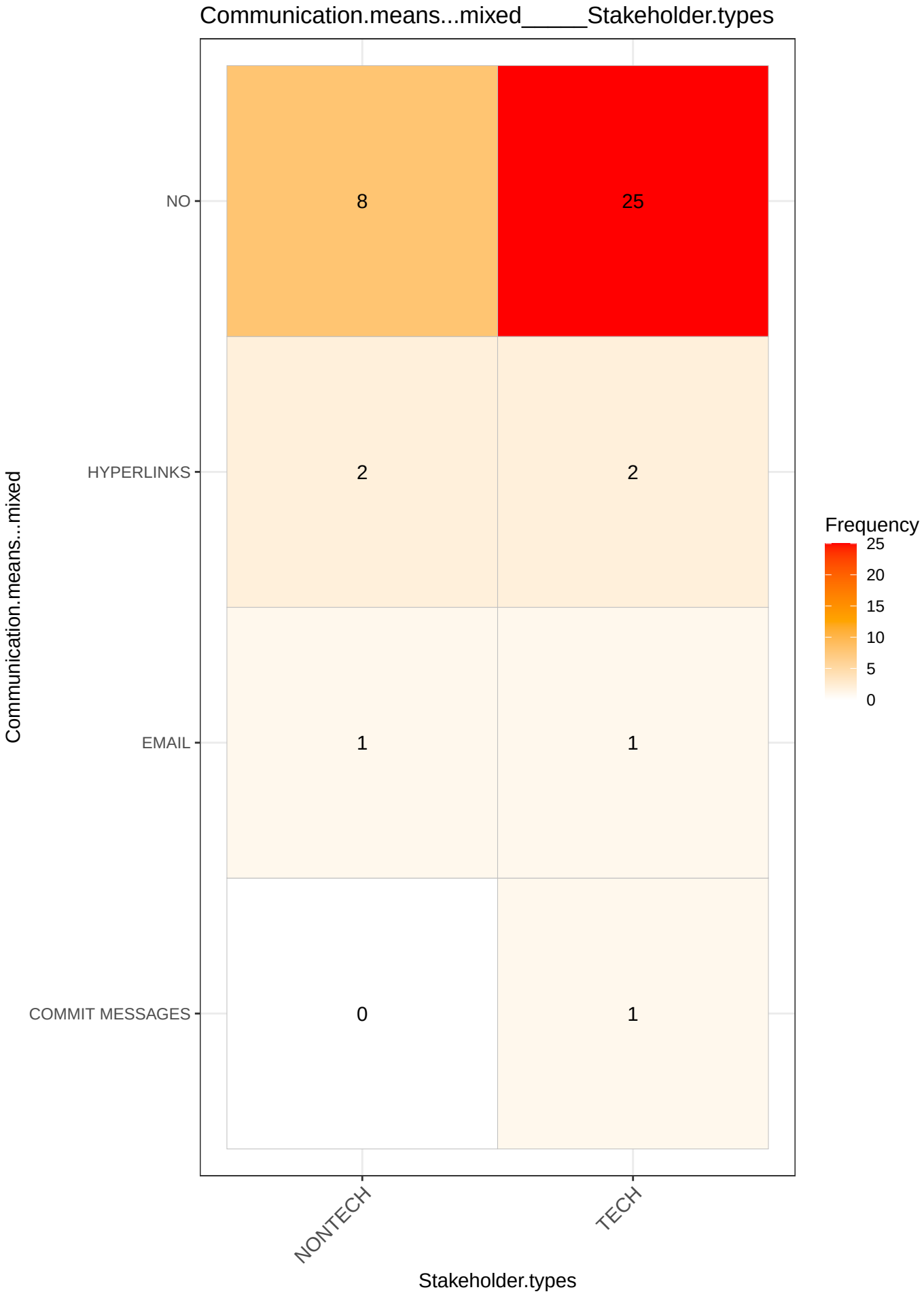
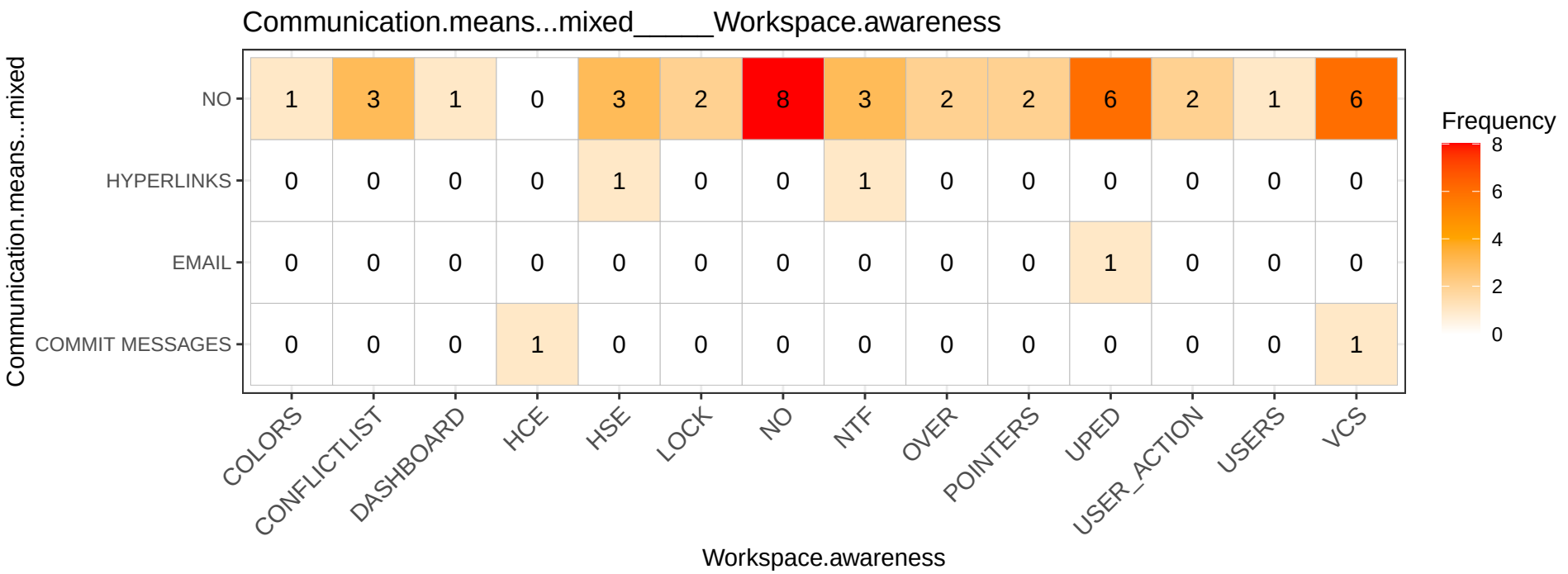
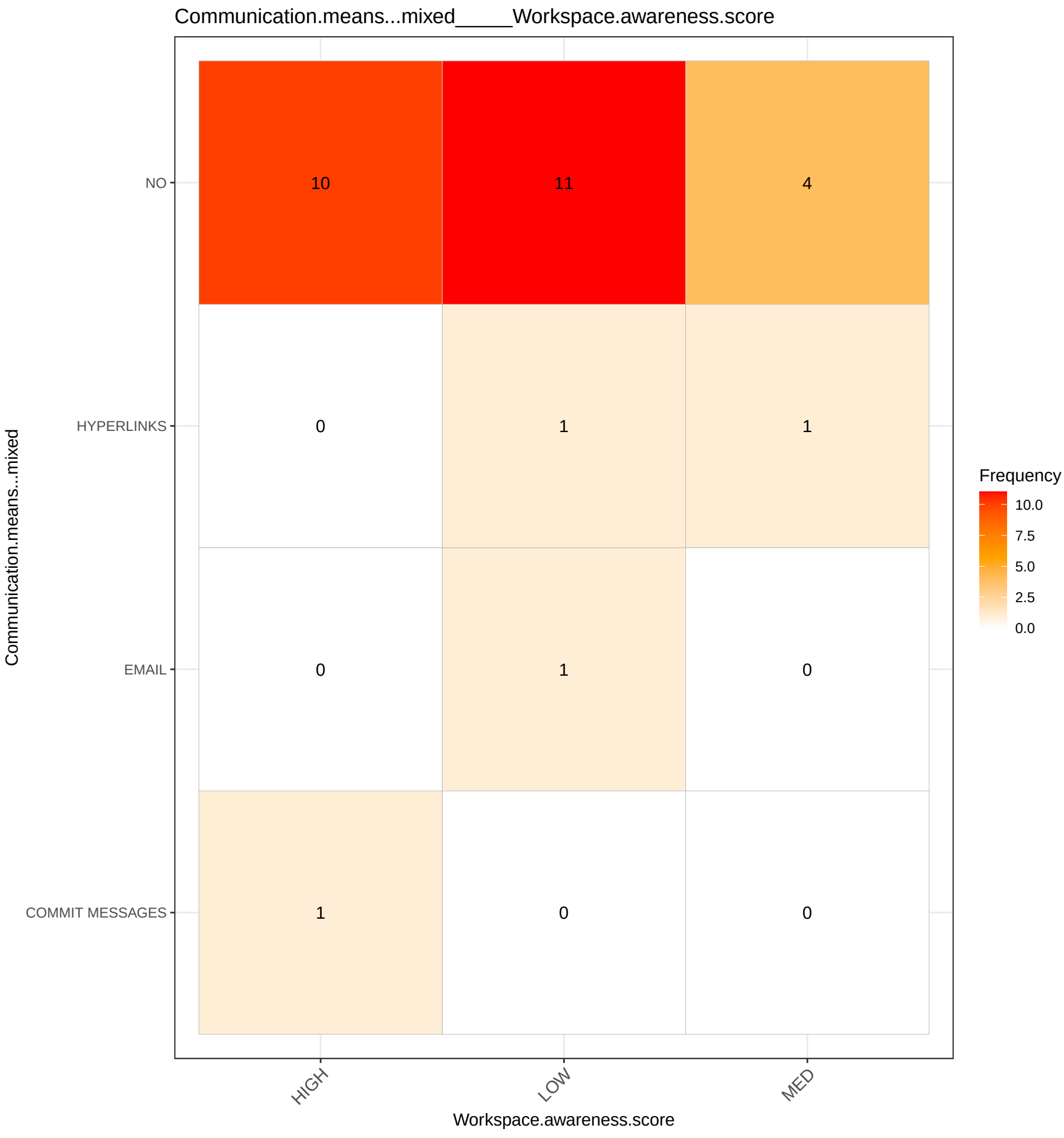
1
ANNOTATIONS
CHAT
COMMENTS
NO
YES
Design.decision..session.history
Frequency
20
15
10
5
0


Communication.means...mixed_____Stakeholder.types
Communication.means...mixed
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
8
25
2
2
1
1
0
1
NONTECH
TECH
Stakeholder.types
Frequency
25
20
15
10
5
0


Communication.means...mixed_____Workspace.awareness
Communication.means...mixed
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
1 3 1 0 3 2 8 3 2 2 6 2 1 6
0 0 0 0 1 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0
0 0 0 1 0 0 0 0 0 0 0 0 0 1
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
NO
NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
8
6
4
2
0


Communication.means...mixed_____Workspace.awareness.score
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
Communication.means...mixed
10
11
4
0
1
1
0
1
0
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0
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HIGH
LOW
MED
Workspace.awareness.score
Frequency
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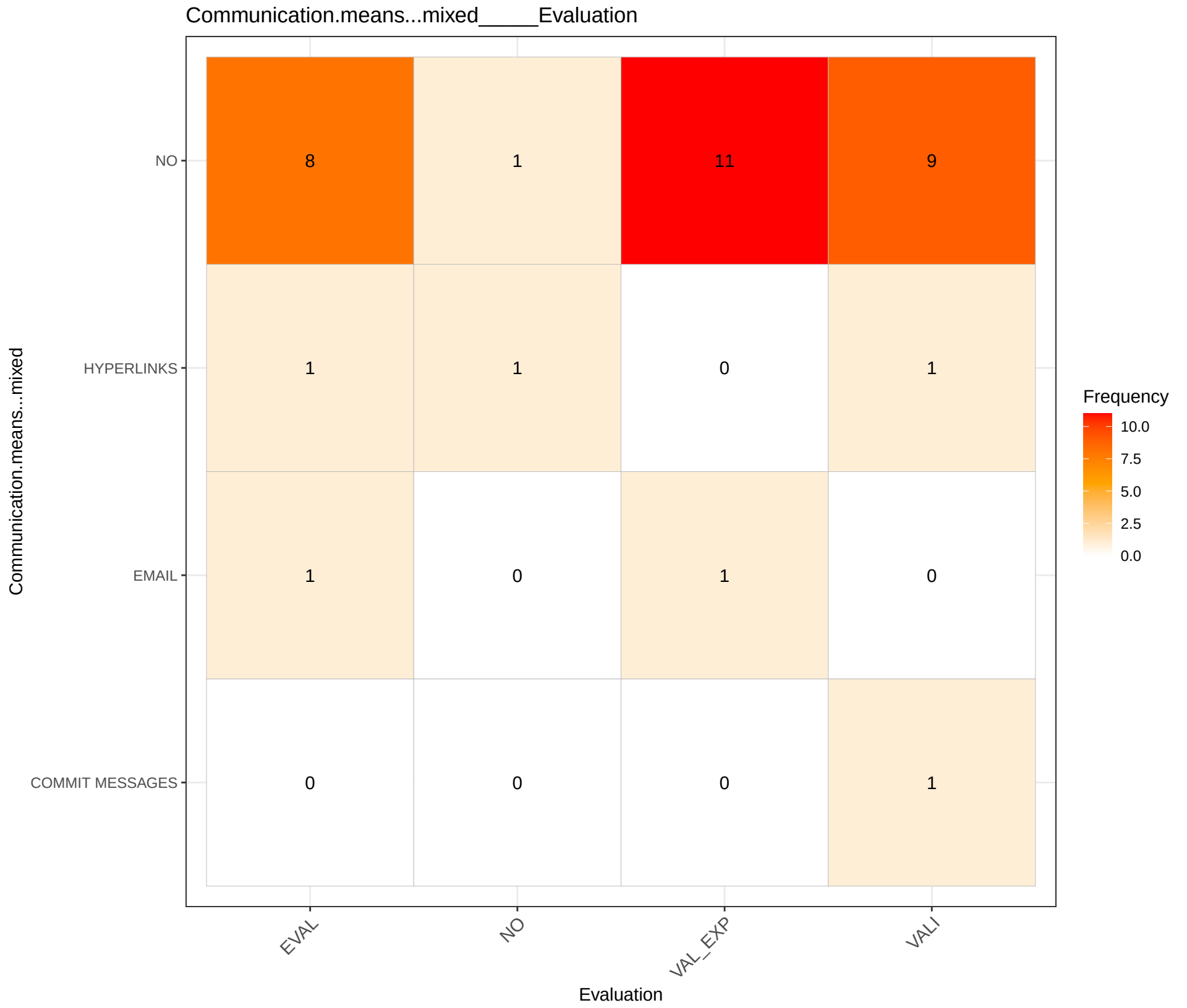
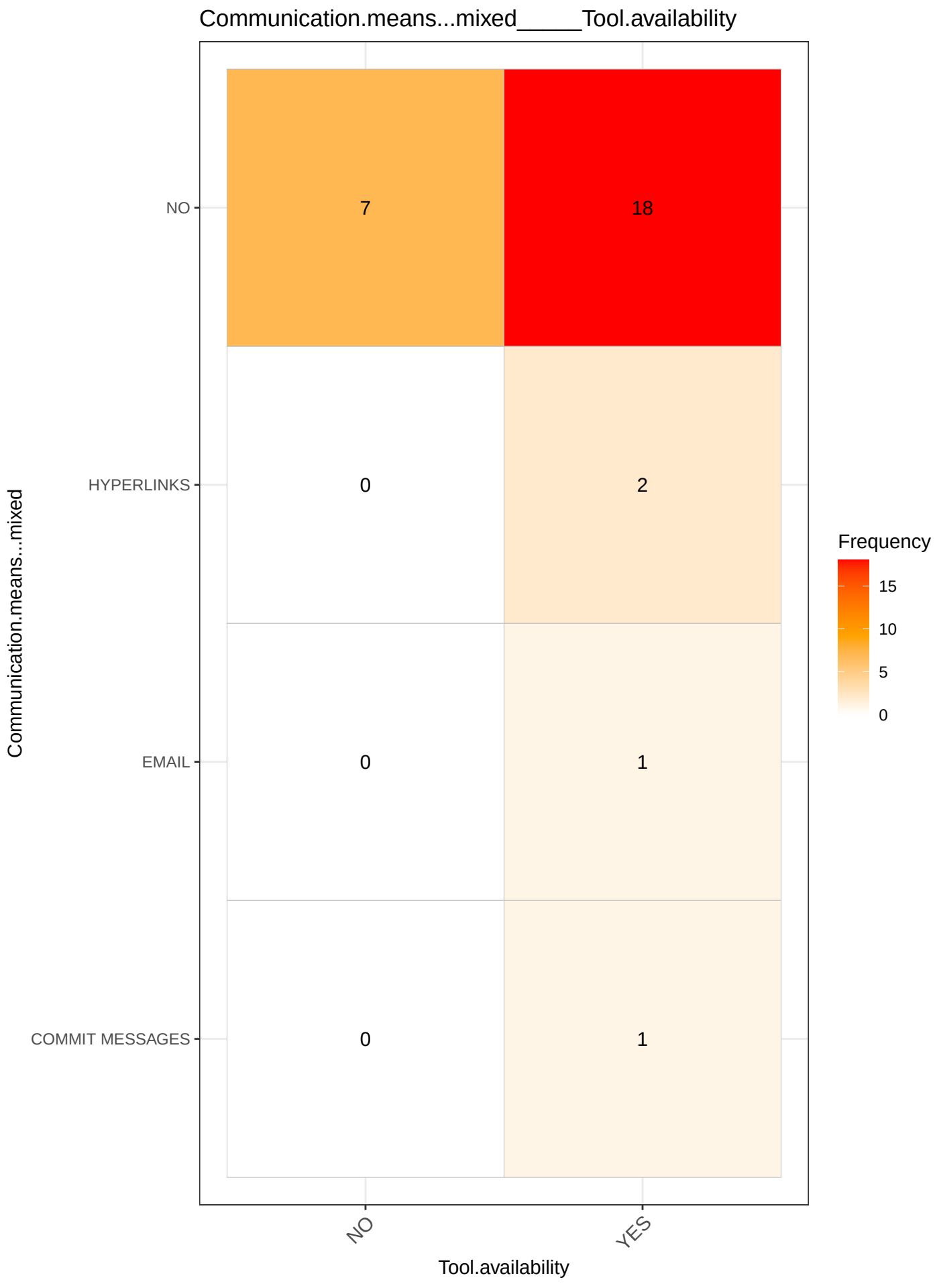
7.5
5.0
2.5
0.0


Communication.means...mixed_____Evaluation
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
Communication.means...mixed
8
1
11
9
1
1
0
1
1
0
1
0
0
0
0
1
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
10.0
7.5
5.0
2.5
0.0


Communication.means...mixed_____Tool.availability
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
Communication.means...mixed
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18
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2
0
1
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1
NO
YES
Tool.availability
Frequency
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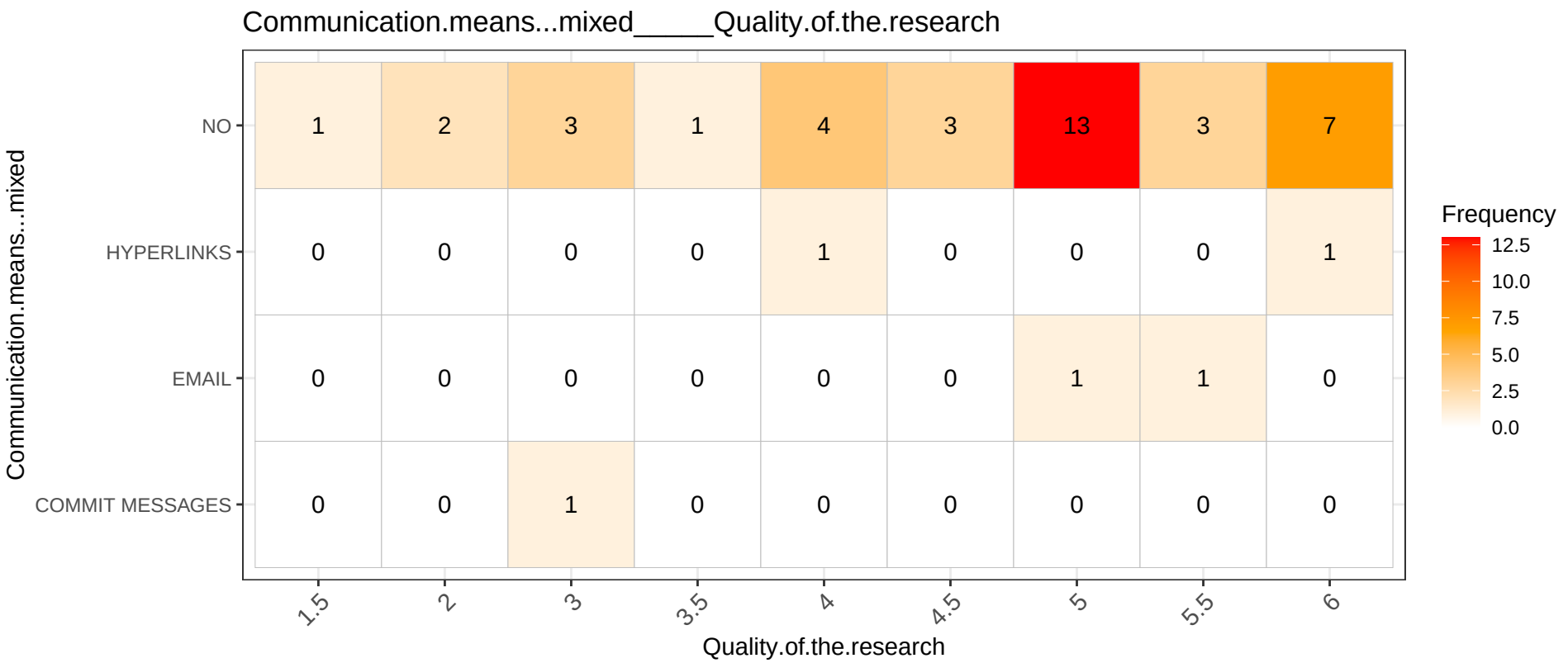
10
5
0


Communication.means...mixed_____Quality.of.the.research
Communication.means...mixed
NO
HYPERLINKS
EMAIL
COMMIT MESSAGES
1 2 3 1 4 3 13 3 7
0 0 0 0 1 0 0 0 1
0 0 0 0 0 0 1 1 0
0 0 1 0 0 0 0 0 0
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
12.5
10.0
7.5
5.0
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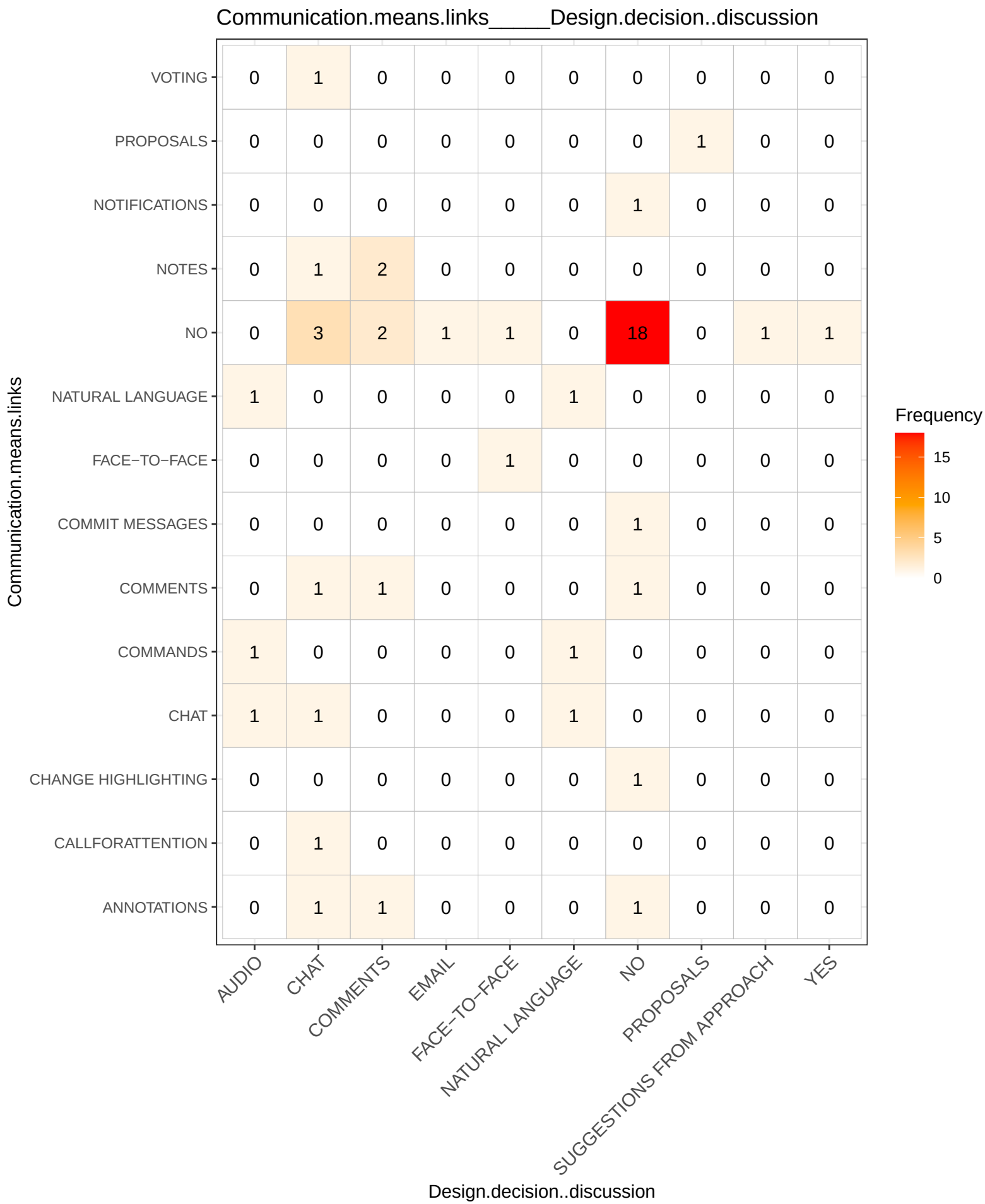
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PROPOSALS
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FACE−TO−FACE
COMMIT MESSAGES
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
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0 3 2 1 1 0 18 0 1 1
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0 1 1 0 0 0 1 0 0 0
AUDIO
CHAT
COMMENTS
EMAIL
FACE−TO−FACE
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PROPOSALS
SUGGESTIONS FROM APPROACH
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Design.decision..discussion
Frequency
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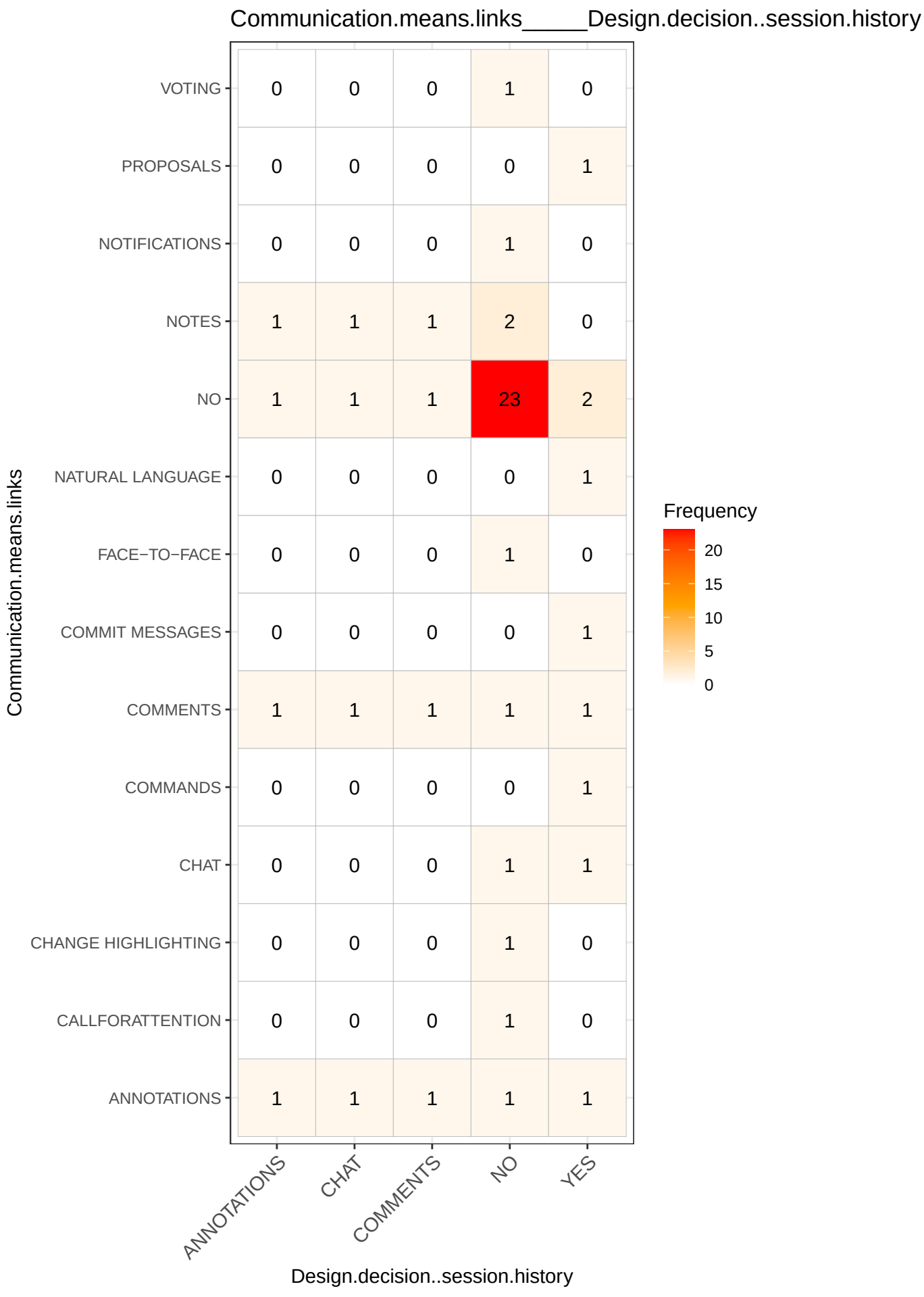
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PROPOSALS
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COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
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COMMENTS
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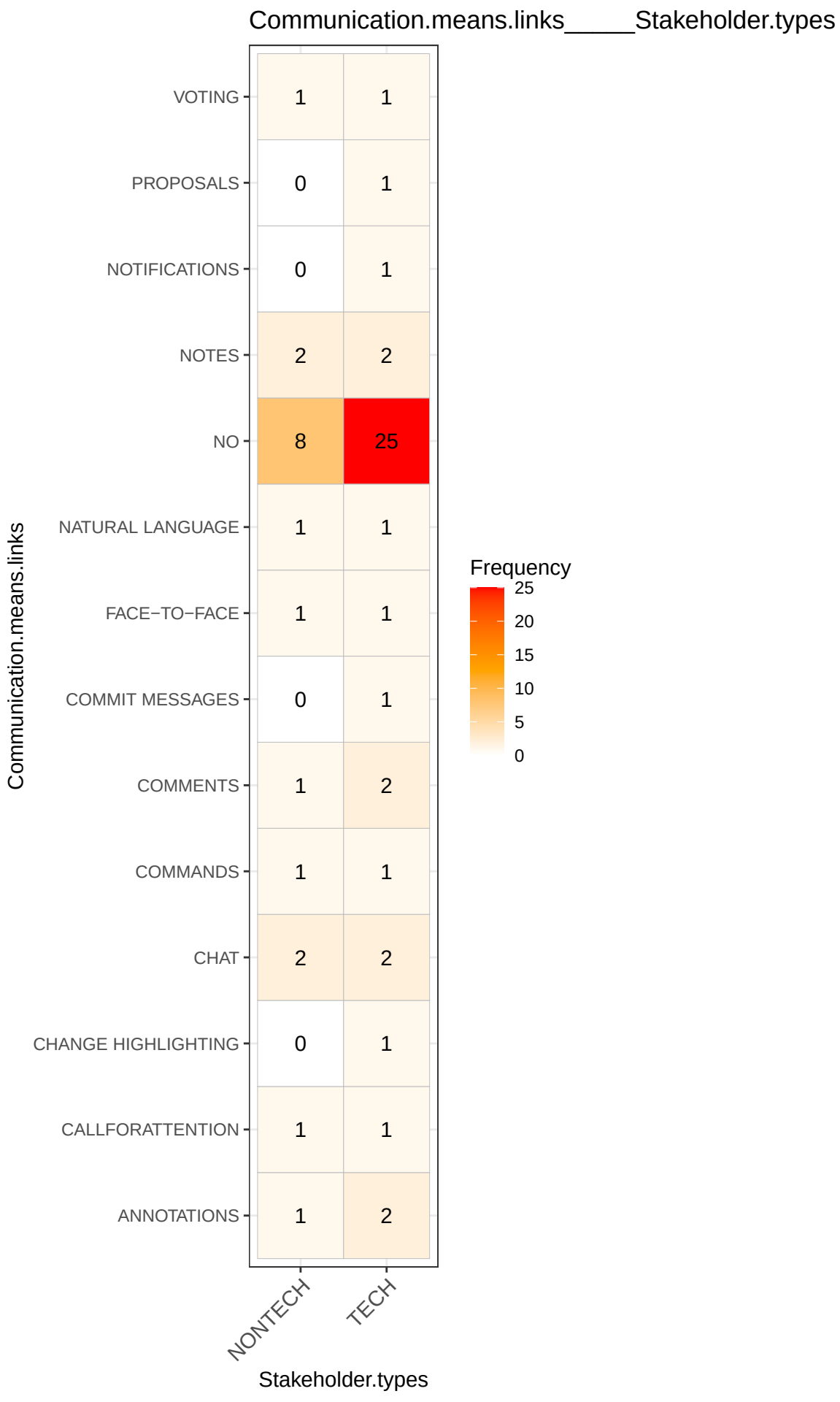
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COMMIT MESSAGES
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
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2 2
8 25
1 1
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0 1
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TECH
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Frequency
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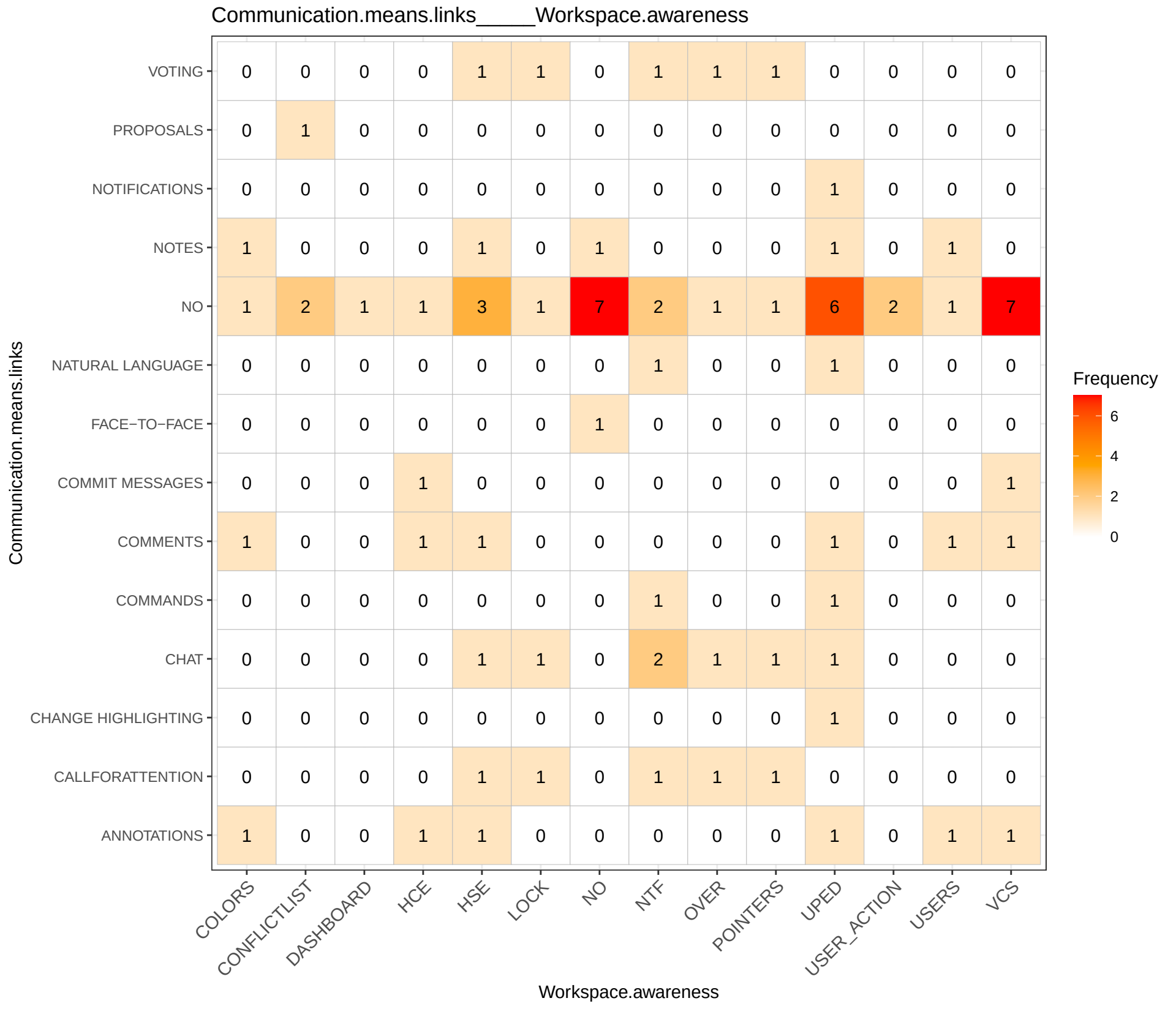
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PROPOSALS
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COMMIT MESSAGES
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
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POINTERS
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USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
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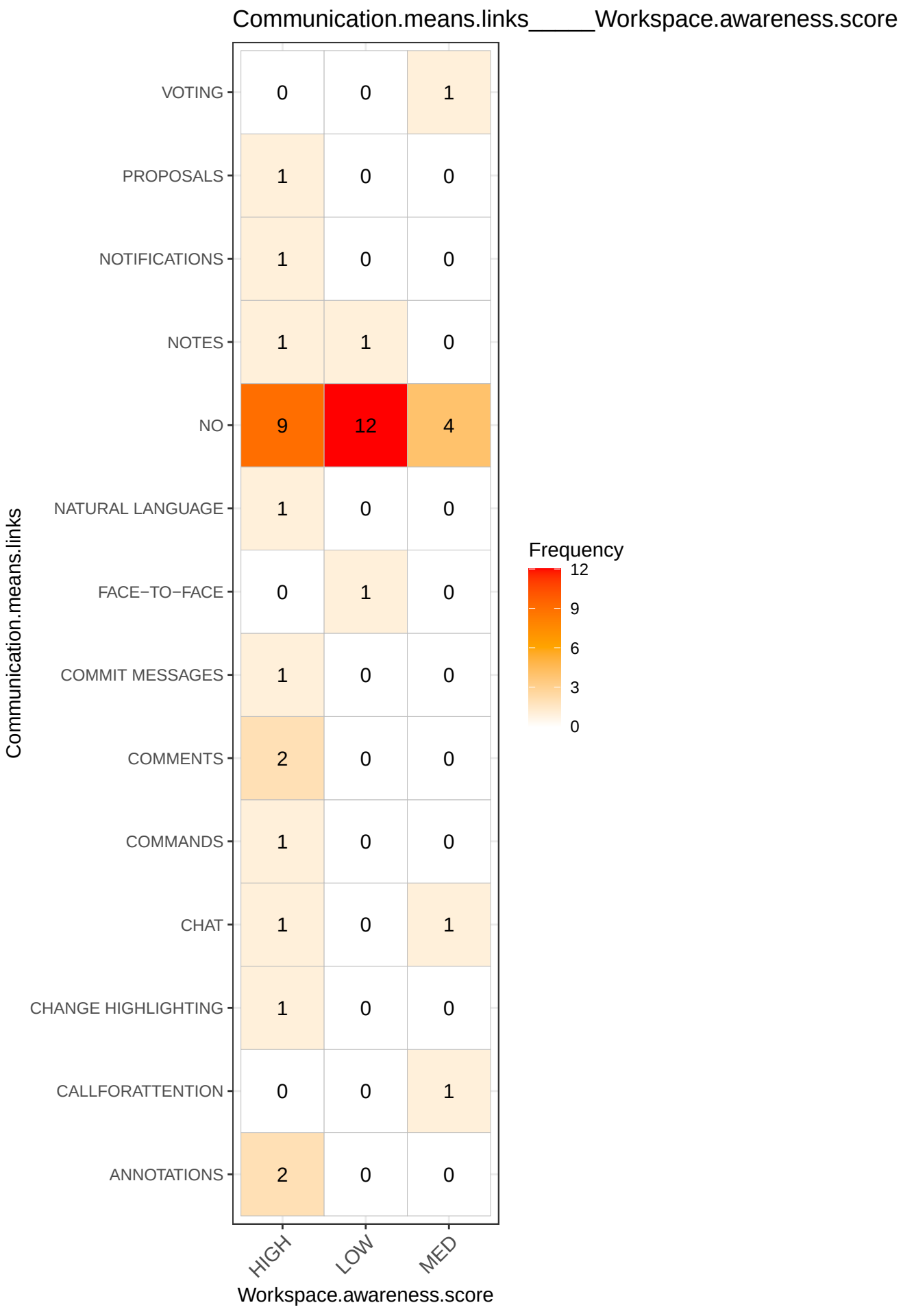
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COMMIT MESSAGES
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
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1 0 0
1 1 0
9 12 4
1 0 0
0 1 0
1 0 0
2 0 0
1 0 0
1 0 1
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LOW
MED
Workspace.awareness.score
Communication.means.links
Frequency
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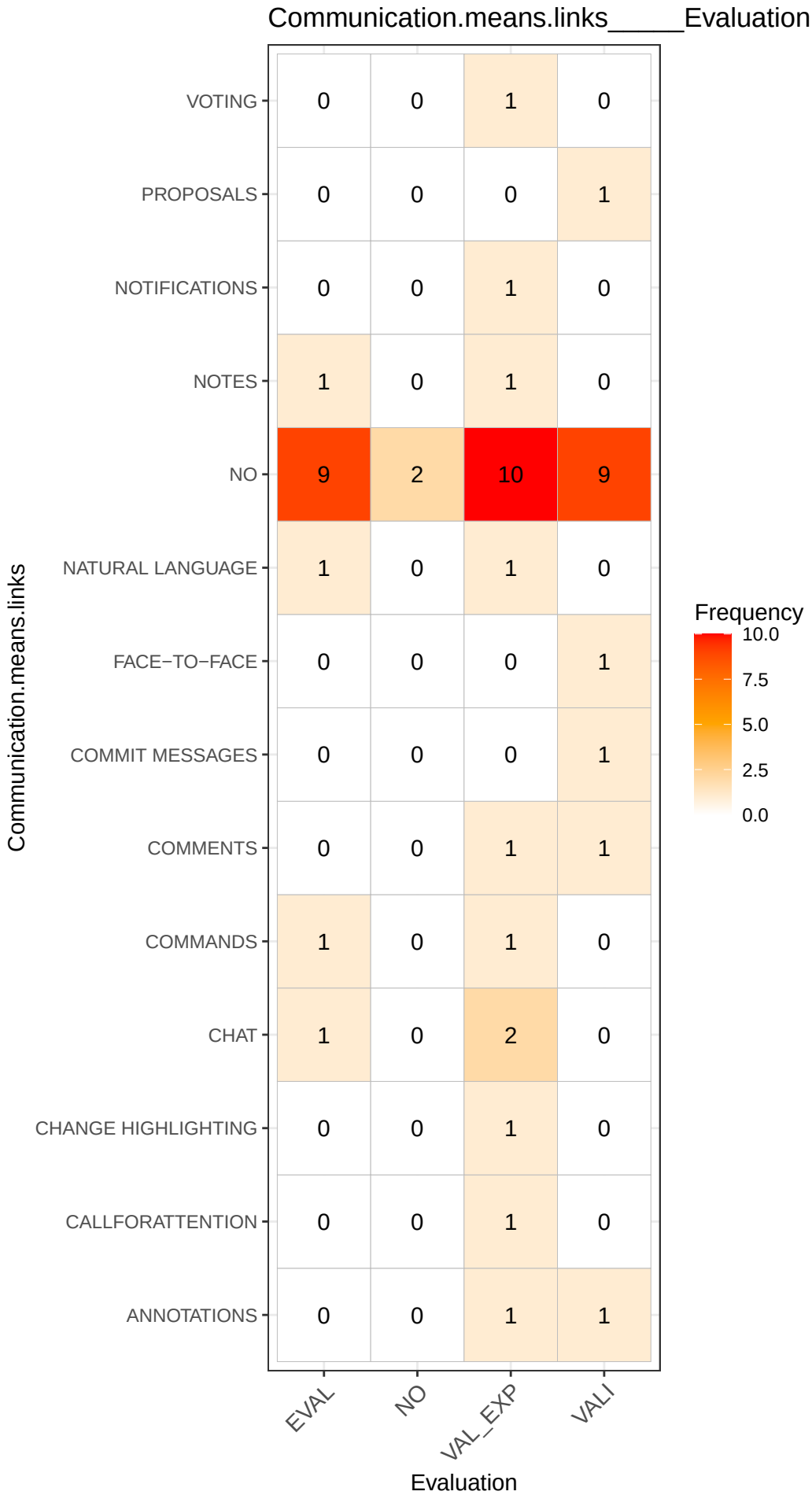
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COMMIT MESSAGES
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
Communication.means.links
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1 0 2 0
0 0 1 0
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VAL_EXP
VALI
Evaluation
Frequency
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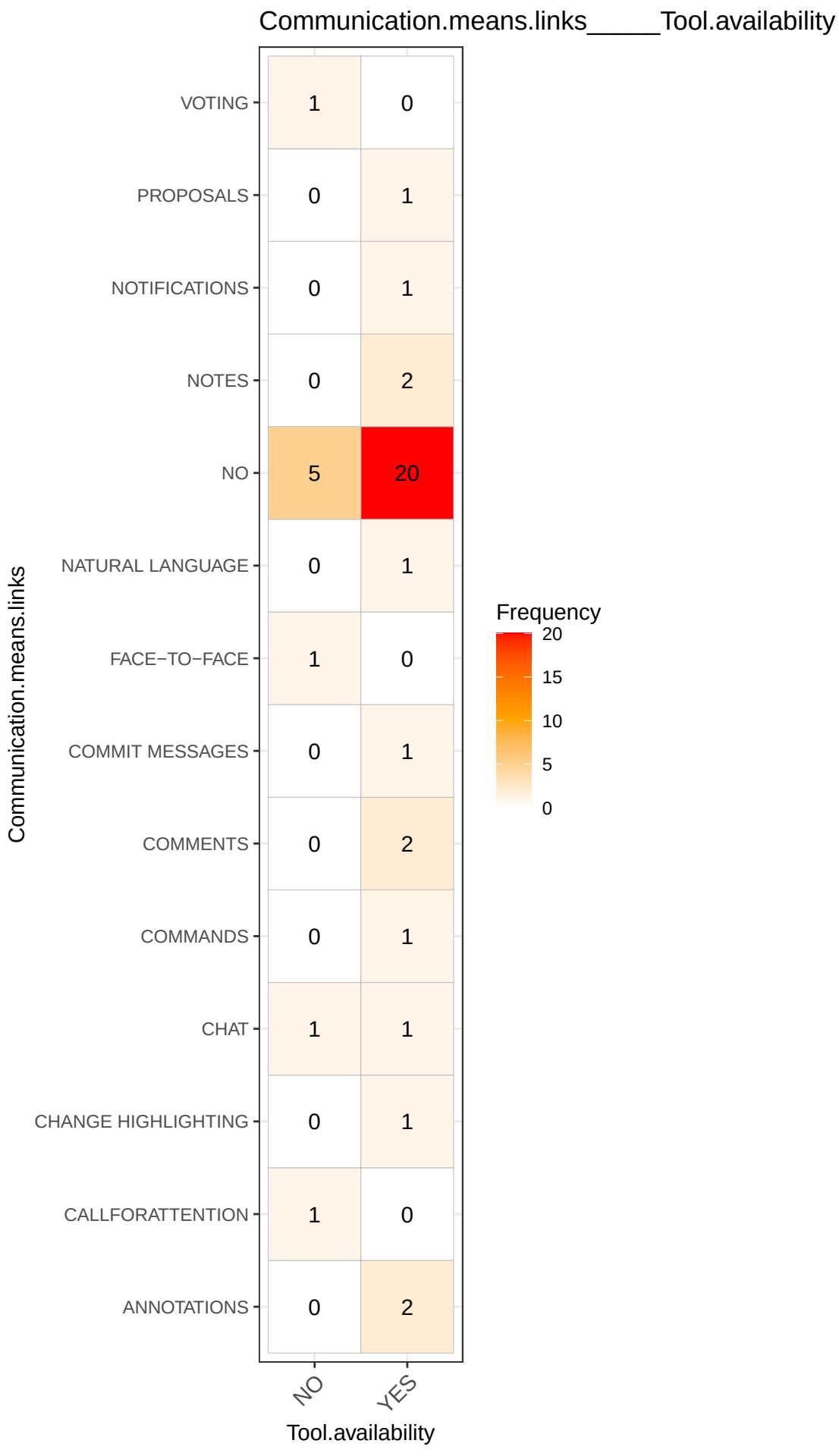
5.0
2.5
0.0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FACE−TO−FACE
COMMIT MESSAGES
COMMENTS
COMMANDS
CHAT
CHANGE HIGHLIGHTING
CALLFORATTENTION
ANNOTATIONS
Communication.means.links
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0 1
0 1
0 2
5 20
0 1
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Tool.availability
Frequency
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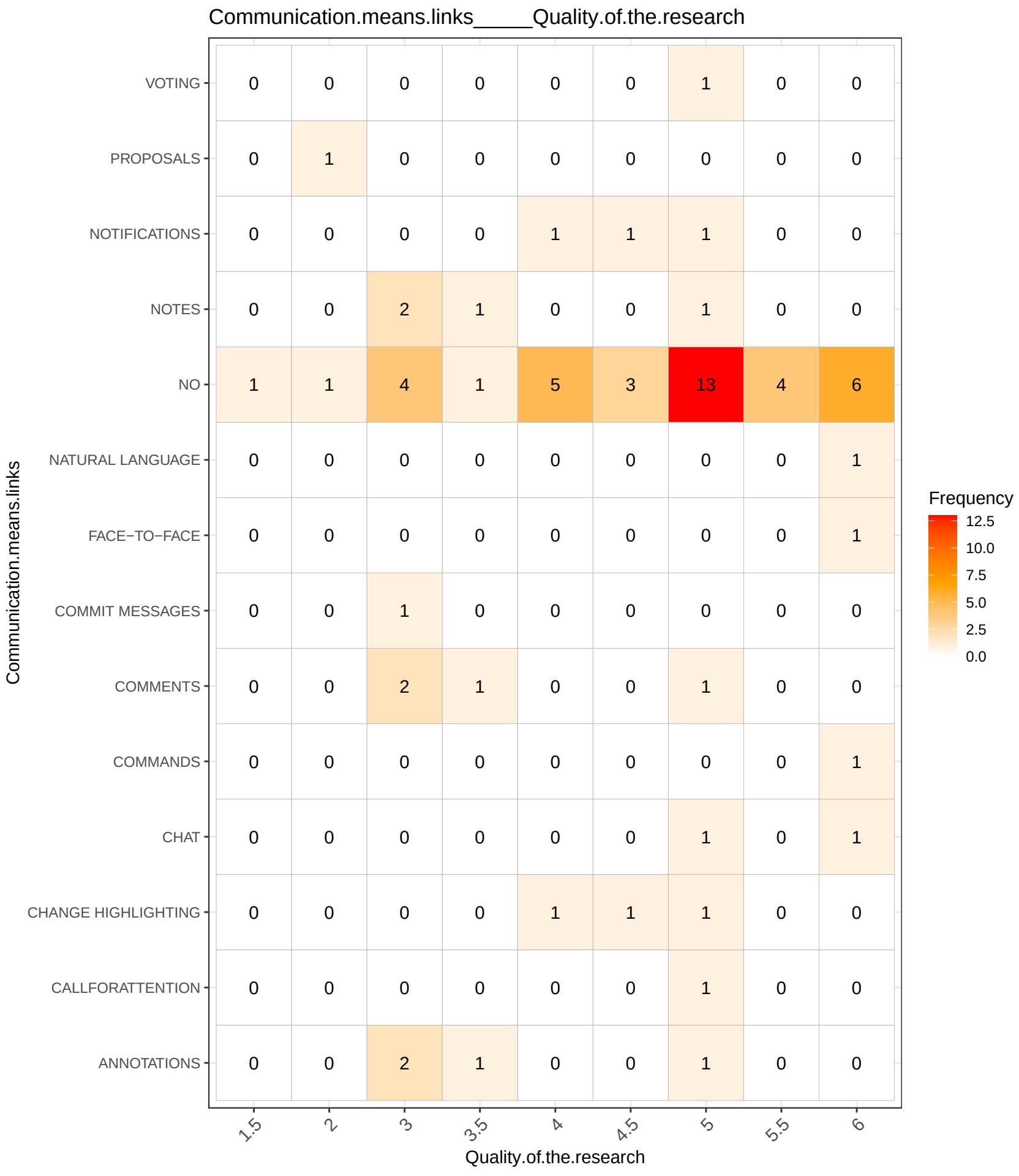
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PROPOSALS 0 1 0 0 0 0 0 0 0
NOTIFICATIONS 0 0 0 0 1 1 1 0 0
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NATURAL LANGUAGE 0 0 0 0 0 0 0 0 1
FACE−TO−FACE 0 0 0 0 0 0 0 0 1
COMMIT MESSAGES 0 0 1 0 0 0 0 0 0
COMMENTS 0 0 2 1 0 0 1 0 0
COMMANDS 0 0 0 0 0 0 0 0 1
CHAT 0 0 0 0 0 0 1 0 1
CHANGE HIGHLIGHTING 0 0 0 0 1 1 1 0 0
CALLFORATTENTION 0 0 0 0 0 0 1 0 0
ANNOTATIONS 0 0 2 1 0 0 1 0 0
Communication.means.links
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Quality.of.the.research
Frequency
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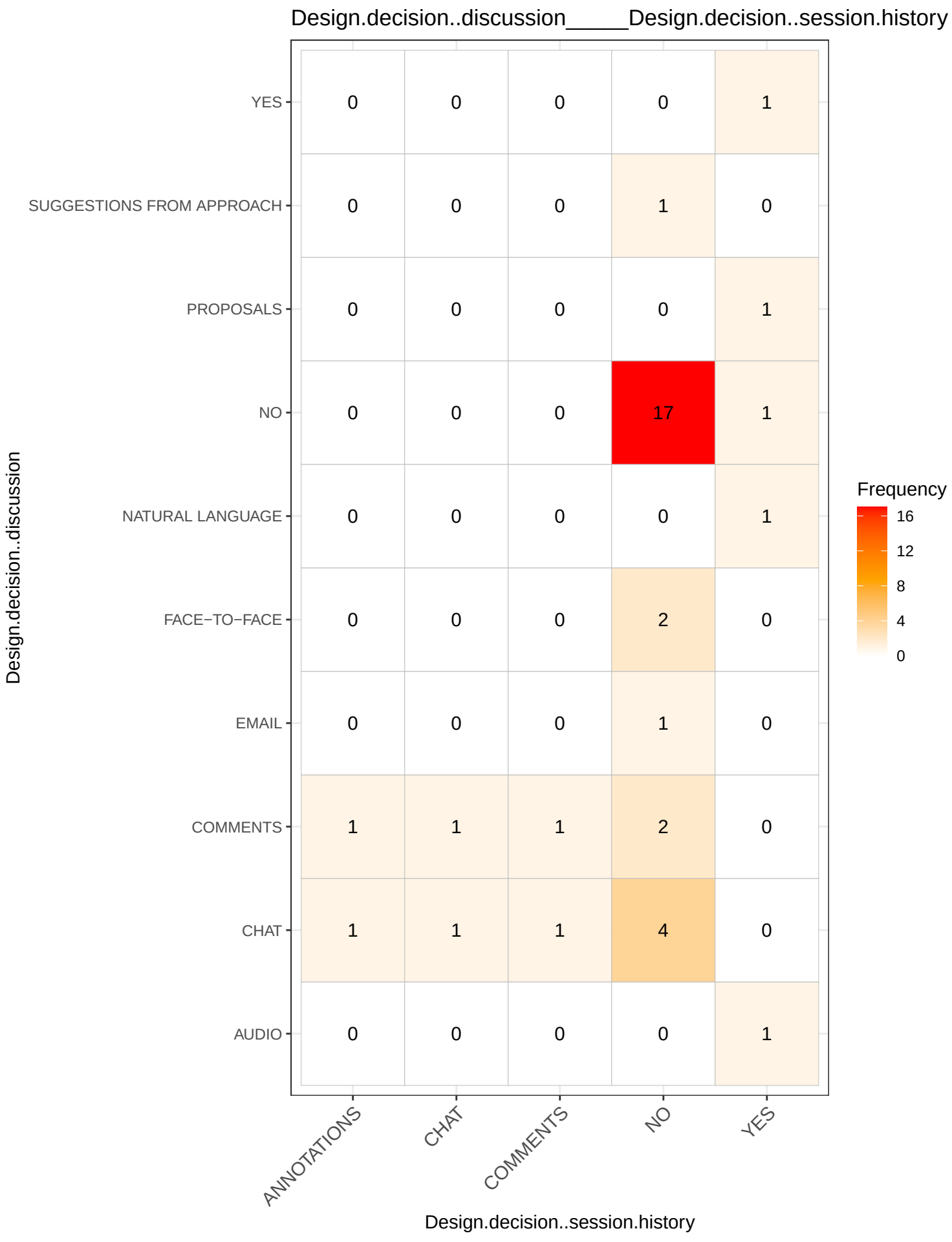
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EMAIL
COMMENTS
CHAT
AUDIO
Design.decision..discussion
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CHAT
COMMENTS
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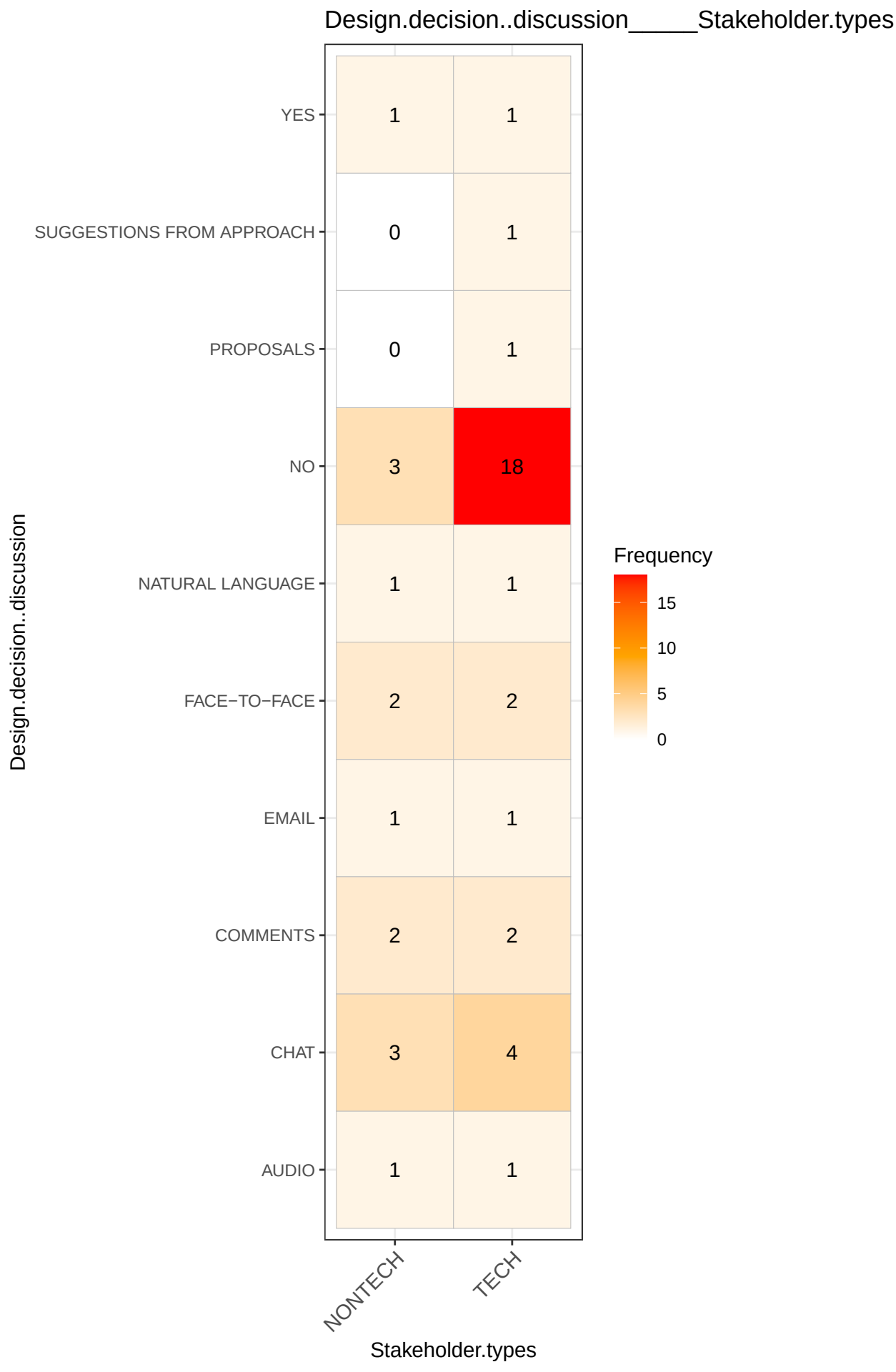
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EMAIL
COMMENTS
CHAT
AUDIO
1
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18
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TECH
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Design.decision..discussion
Frequency
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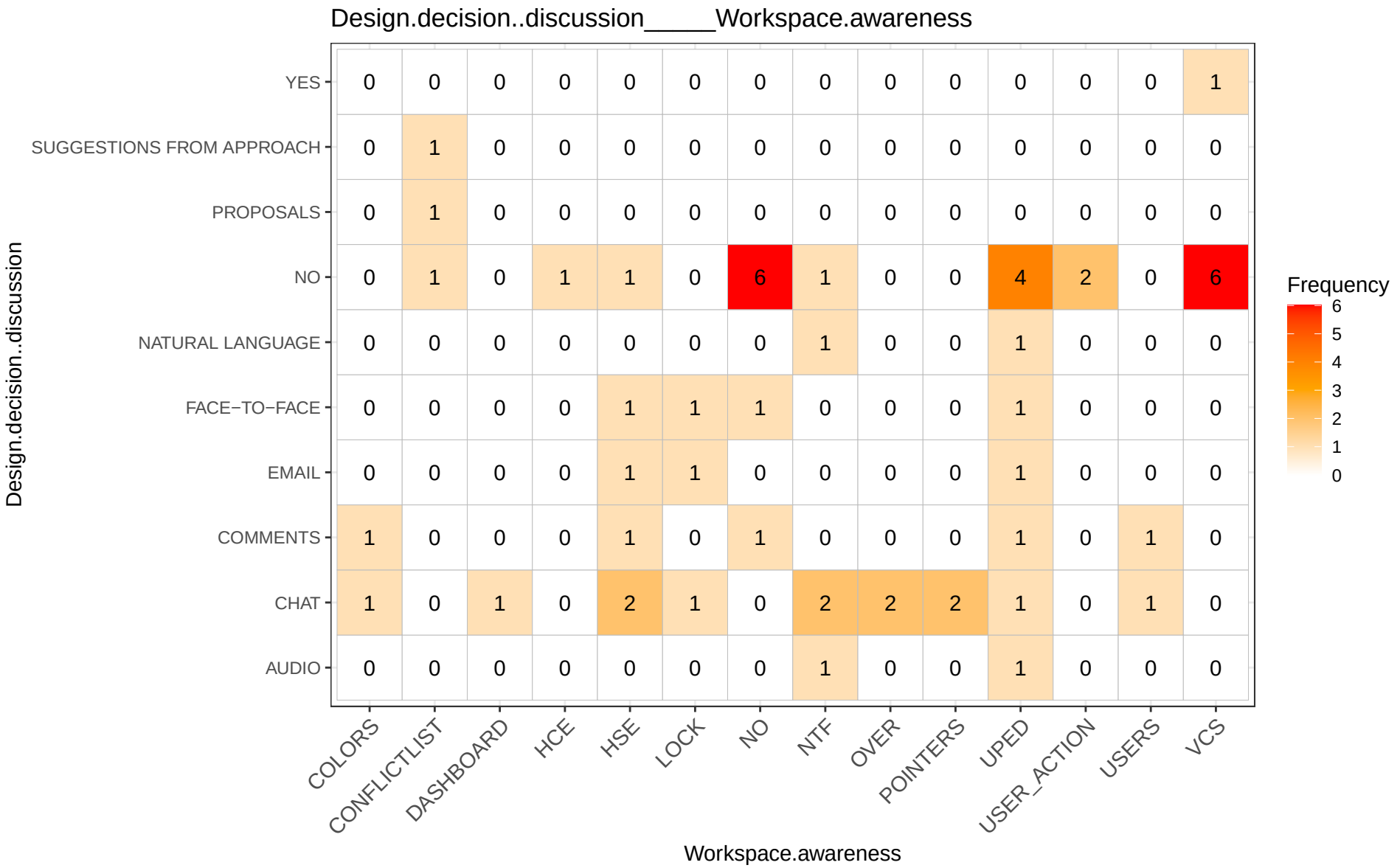
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PROPOSALS
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FACE−TO−FACE
EMAIL
COMMENTS
CHAT
AUDIO
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COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
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USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
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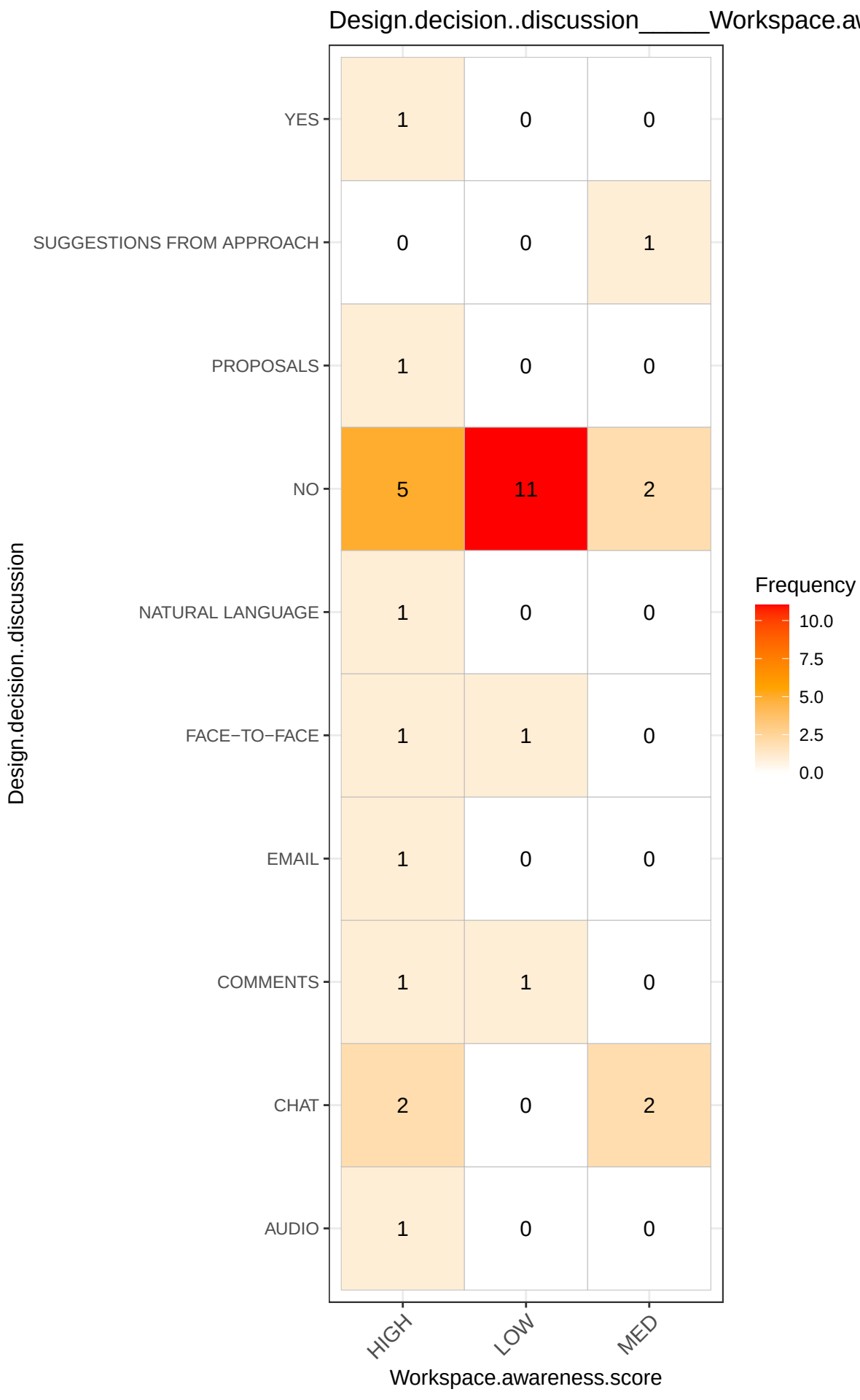
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PROPOSALS
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FACE−TO−FACE
EMAIL
COMMENTS
CHAT
AUDIO
Design.decision..discussion
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1 1 0
1 0 0
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LOW
MED
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Frequency
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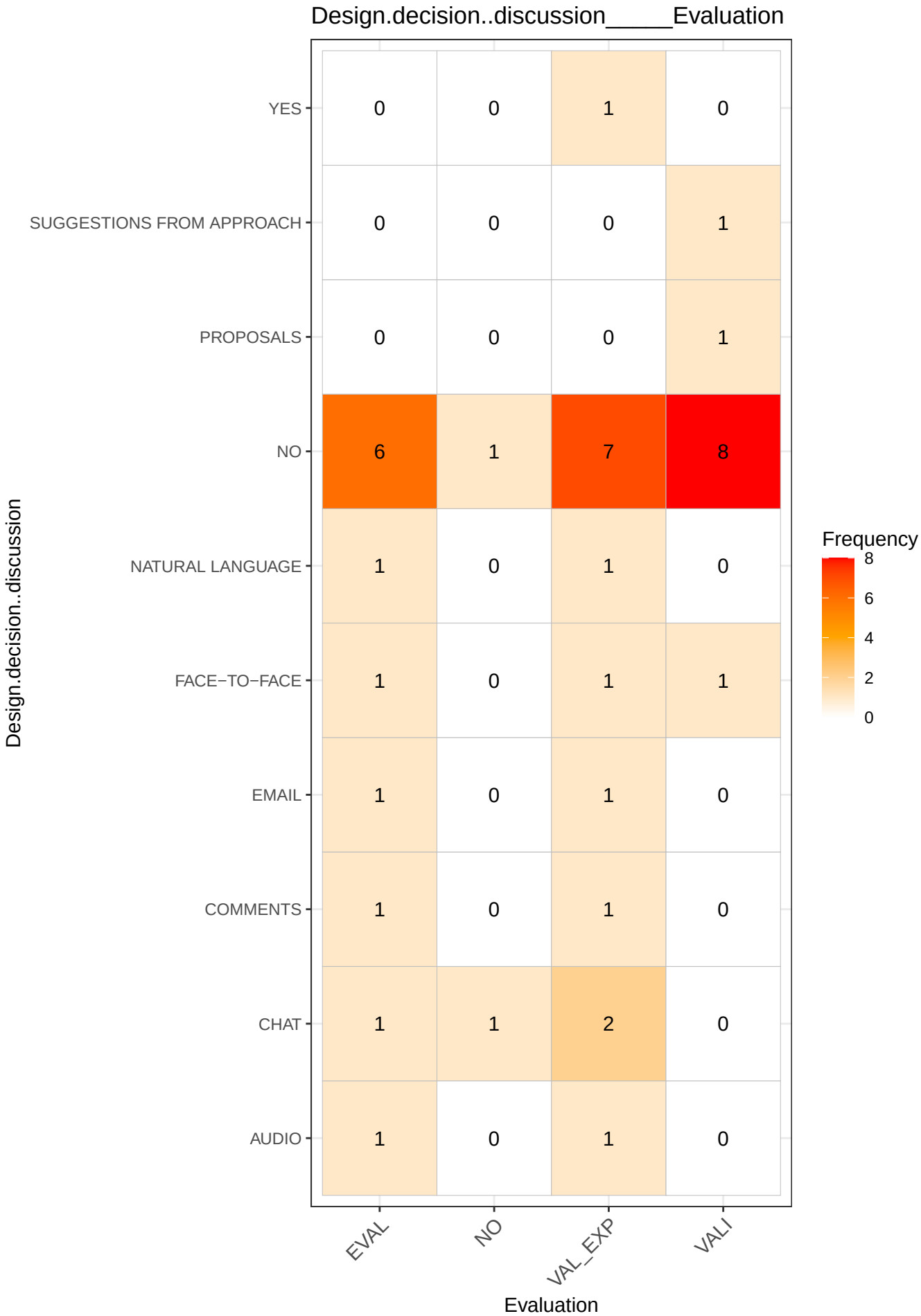
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FACE−TO−FACE
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COMMENTS
CHAT
AUDIO
Design.decision..discussion
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VAL_EXP
VALI
Evaluation
Frequency
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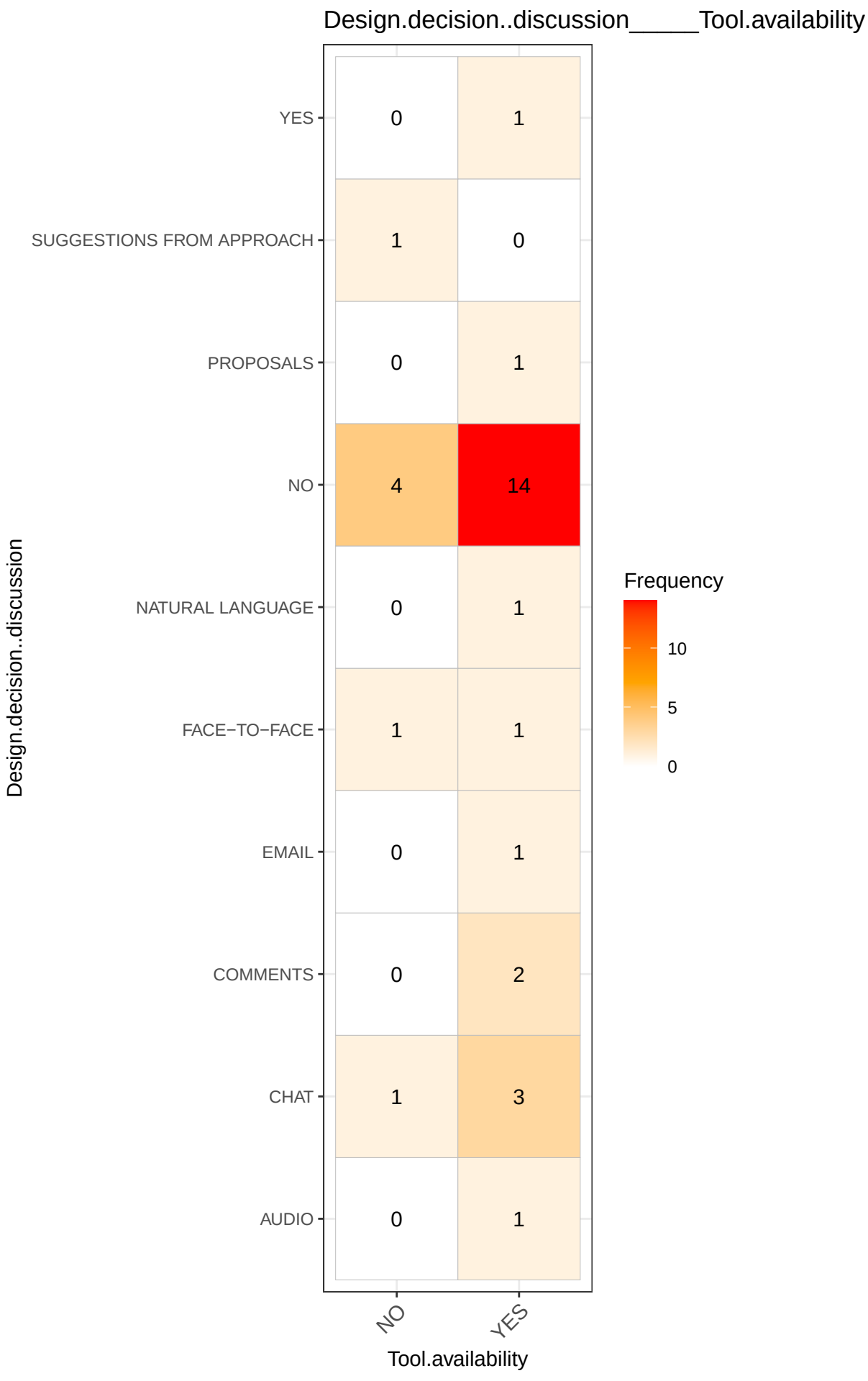
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EMAIL
COMMENTS
CHAT
AUDIO
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Frequency
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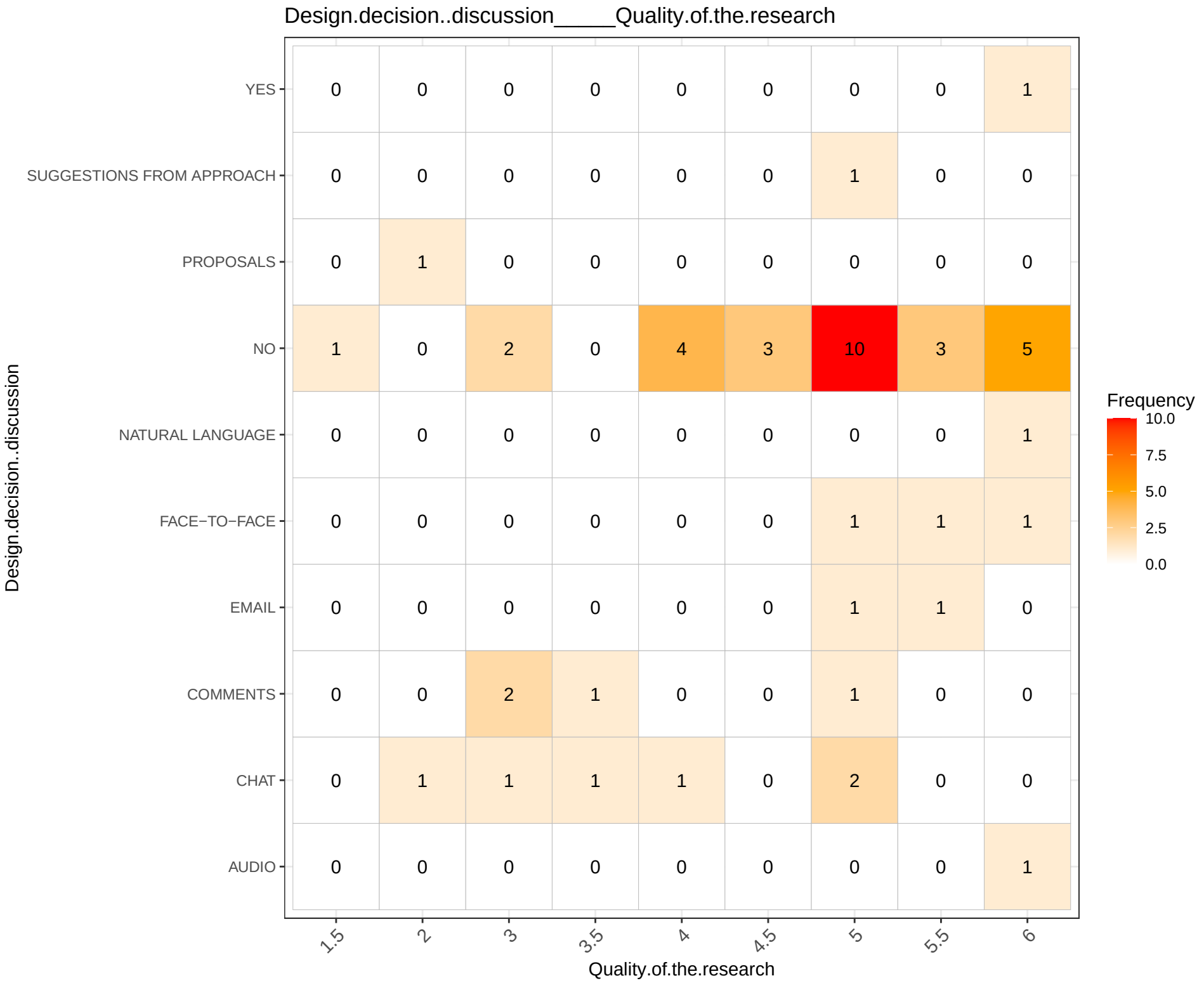
Design.decision..discussion_____Quality.of.the.research
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PROPOSALS
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NATURAL LANGUAGE
FACE−TO−FACE
EMAIL
COMMENTS
CHAT
AUDIO
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0 1 0 0 0 0 0 0 0
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2
3
3.5
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Quality.of.the.research
Design.decision..discussion
Frequency
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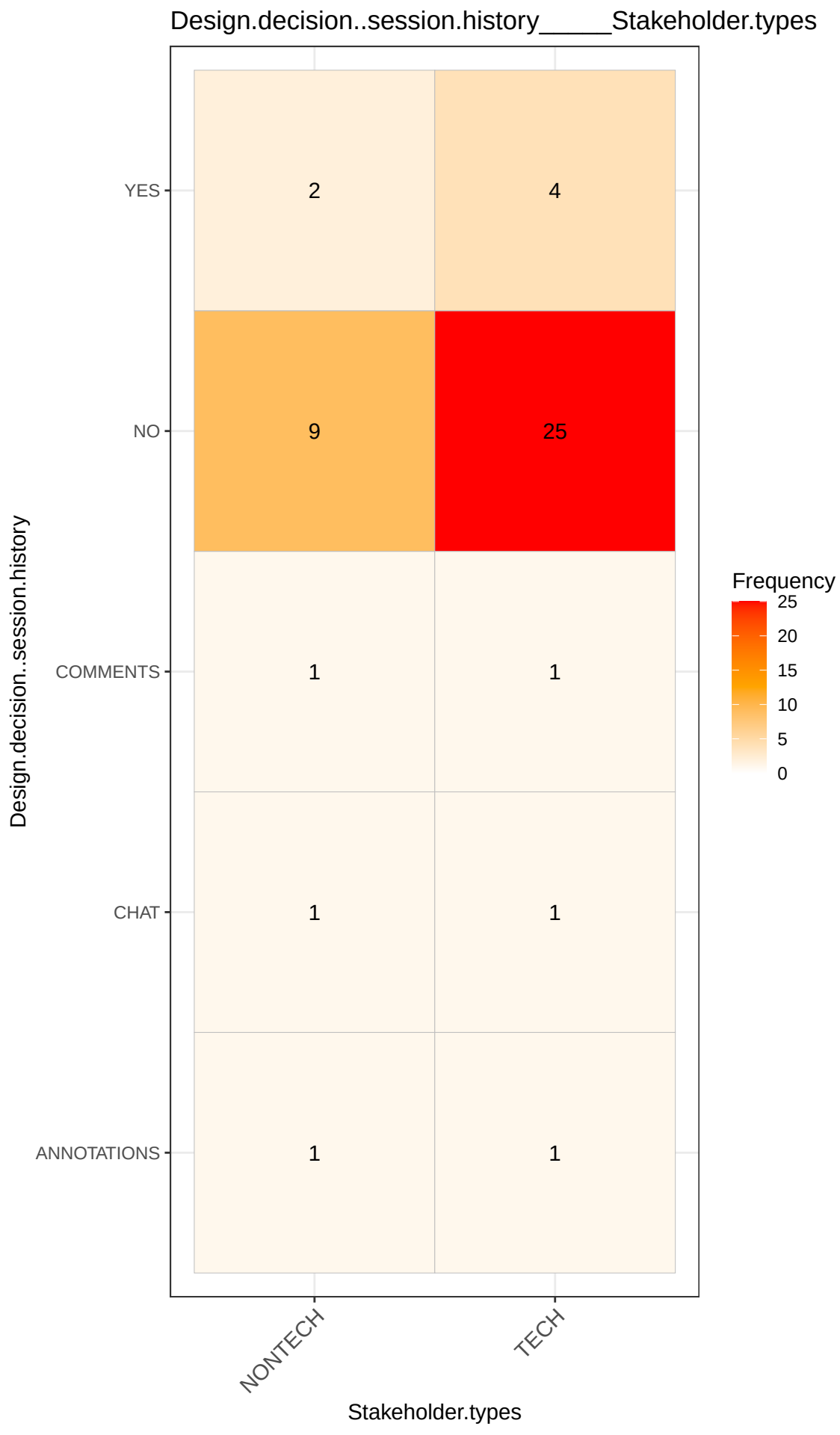
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COMMENTS
CHAT
ANNOTATIONS
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TECH
Stakeholder.types
Frequency
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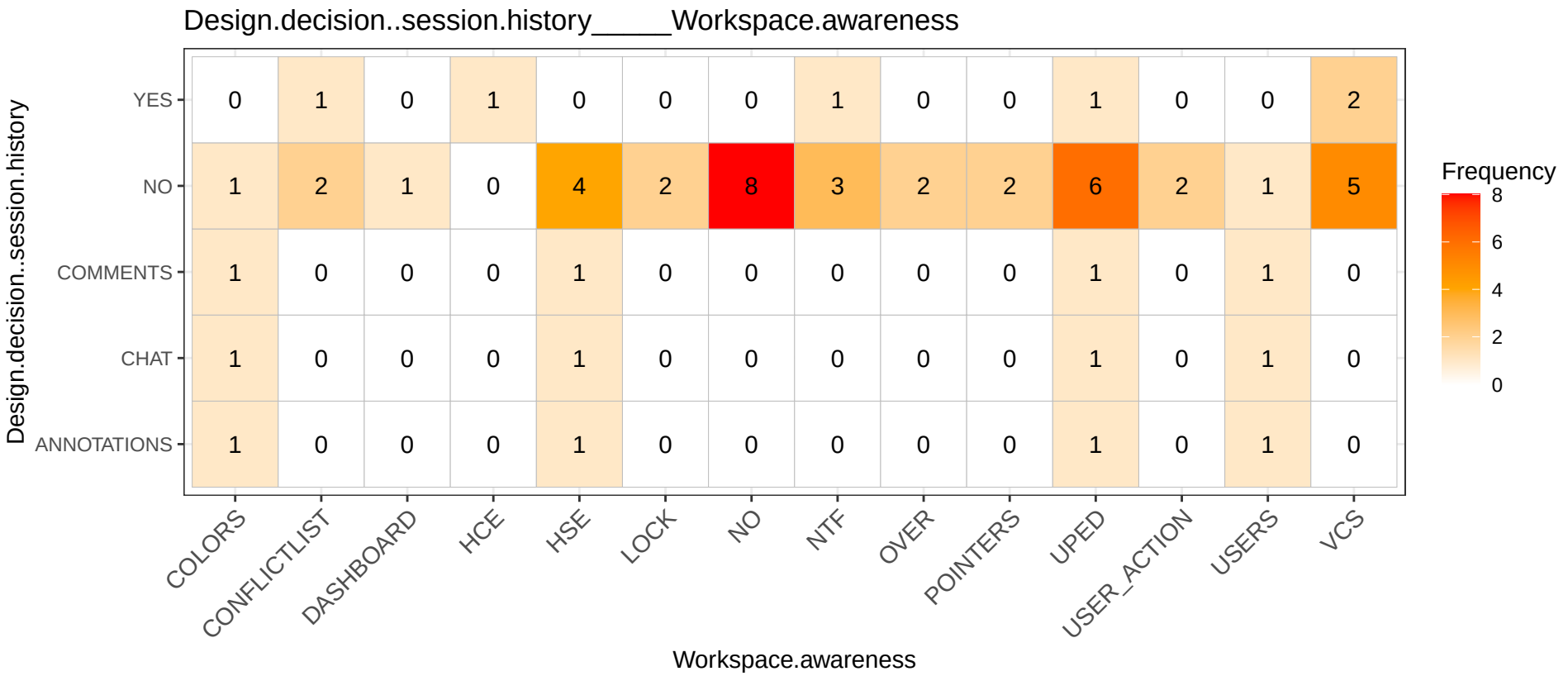
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Design.decision..session.history
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COMMENTS
CHAT
ANNOTATIONS
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1 0 0 0 1 0 0 0 0 0 1 0 1 0
COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
LOCK
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NTF
OVER
POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
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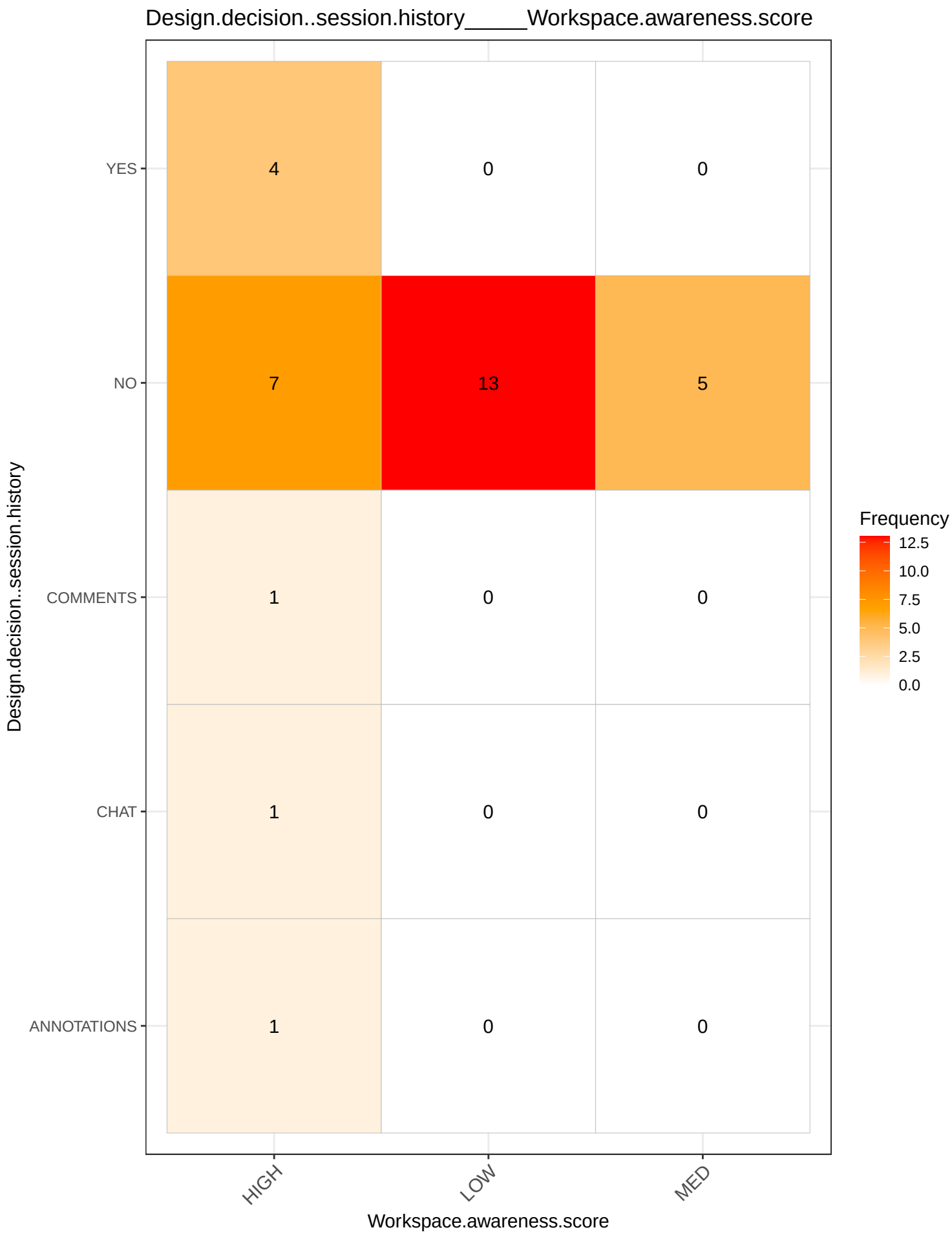
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COMMENTS
CHAT
ANNOTATIONS
Design.decision..session.history
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7
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0
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1
0
0
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LOW
MED
Workspace.awareness.score
Frequency
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10.0
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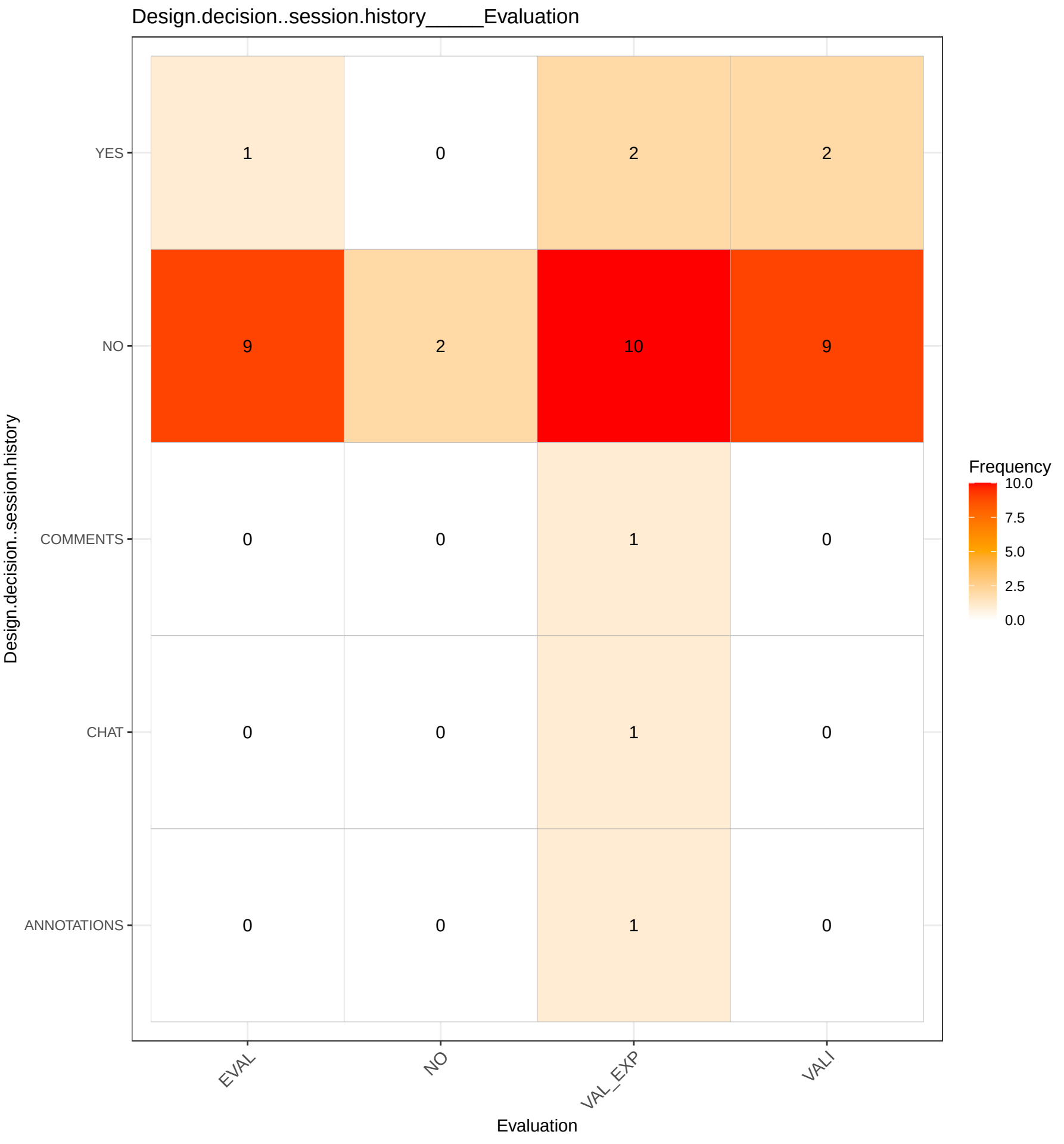
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COMMENTS
CHAT
ANNOTATIONS
Design.decision..session.history
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10
9
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0
0
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1
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VAL_EXP
VALI
Evaluation
Frequency
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2.5
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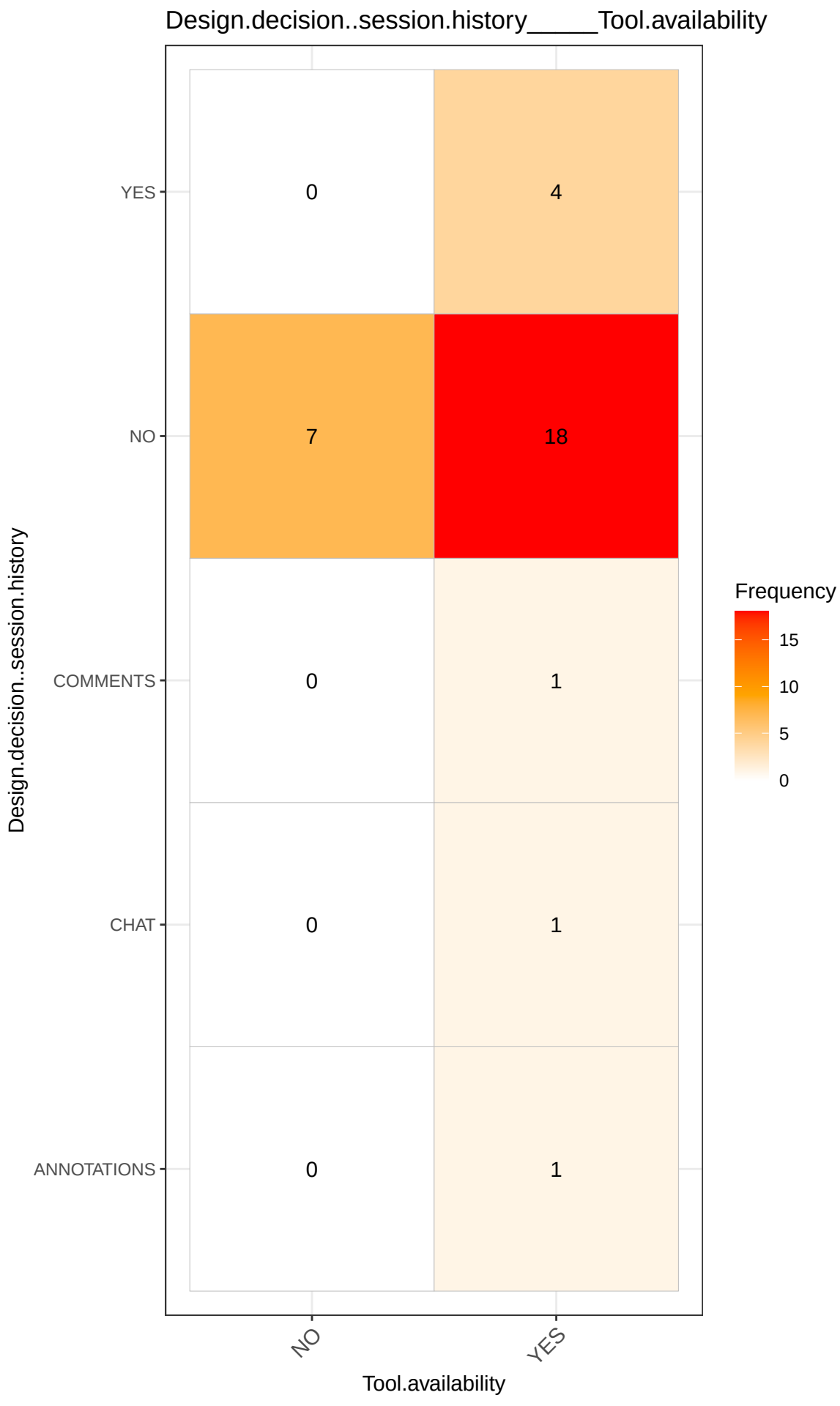
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COMMENTS
CHAT
ANNOTATIONS
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YES
Tool.availability
Frequency
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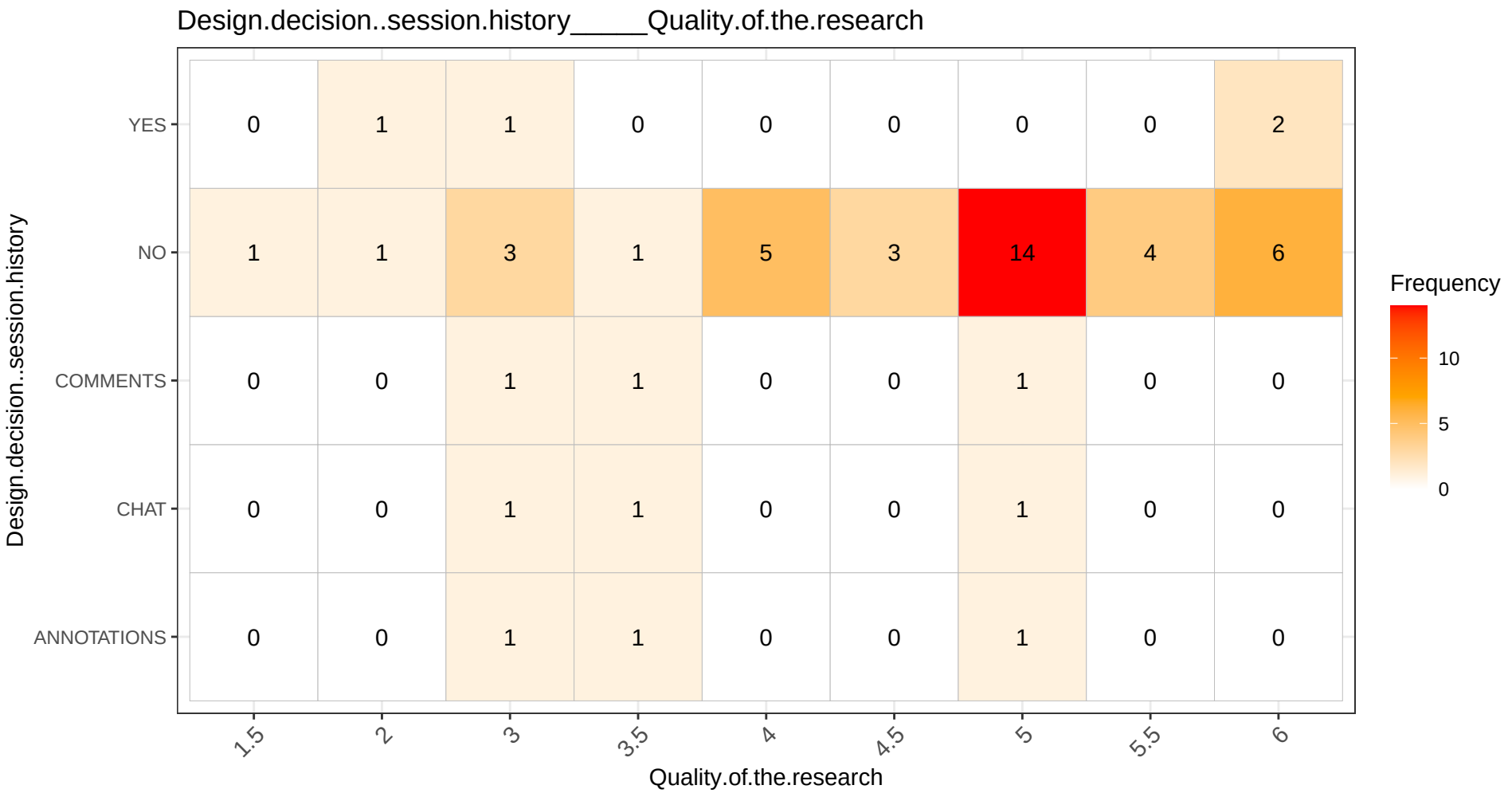
Design.decision..session.history_____Quality.of.the.research
Design.decision..session.history
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COMMENTS
CHAT
ANNOTATIONS
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Quality.of.the.research
Frequency
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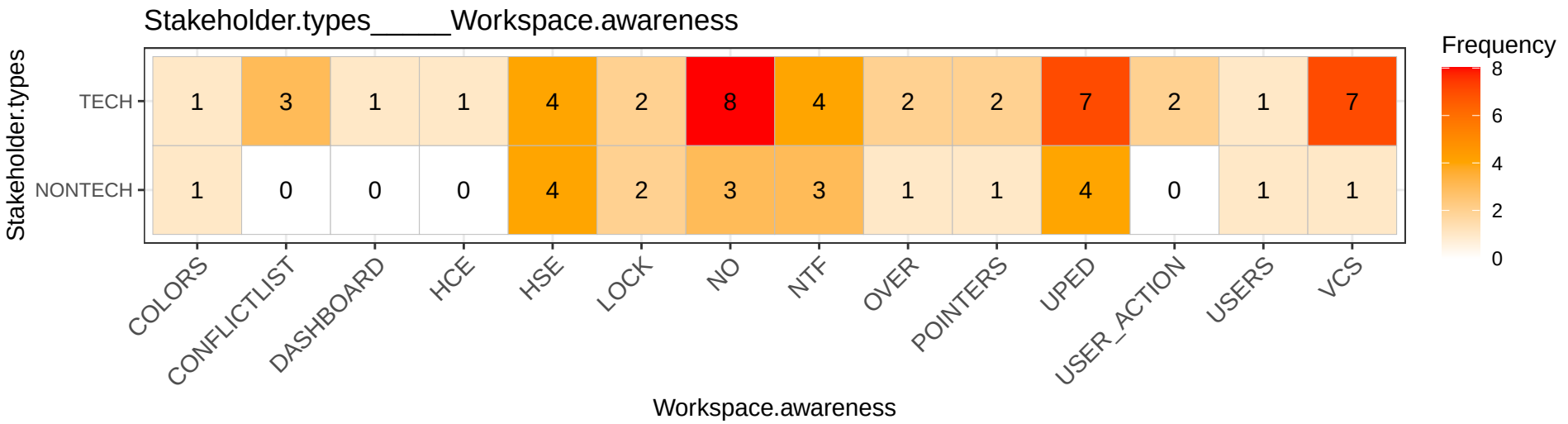
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Stakeholder.types
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NONTECH
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COLORS
CONFLICTLIST
DASHBOARD
HCE
HSE
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POINTERS
UPED
USER_ACTION
USERS
VCS
Workspace.awareness
Frequency
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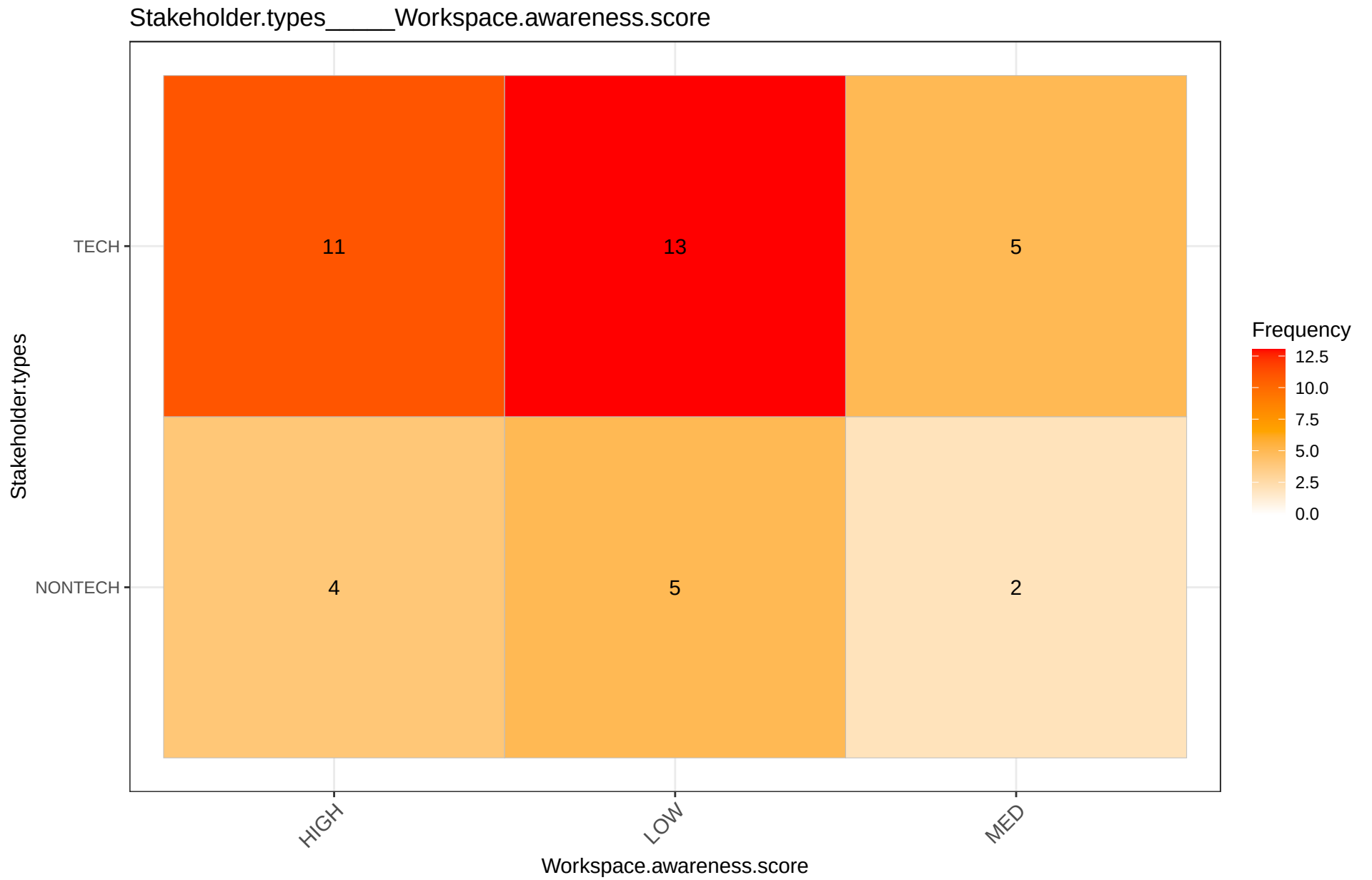
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LOW
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Workspace.awareness.score
Stakeholder.types
Frequency
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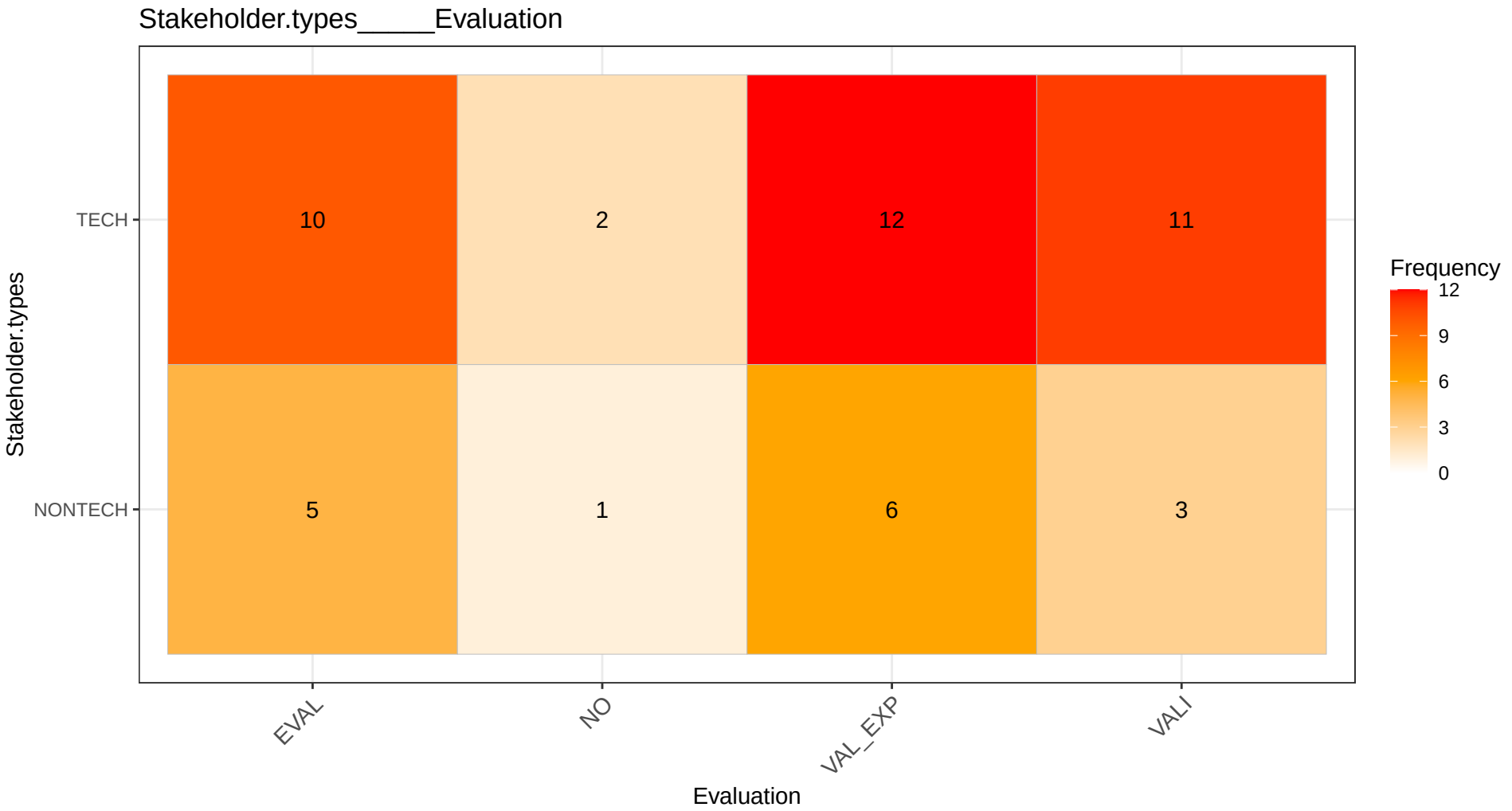
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NONTECH
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VAL_EXP
VALI
Evaluation
Frequency
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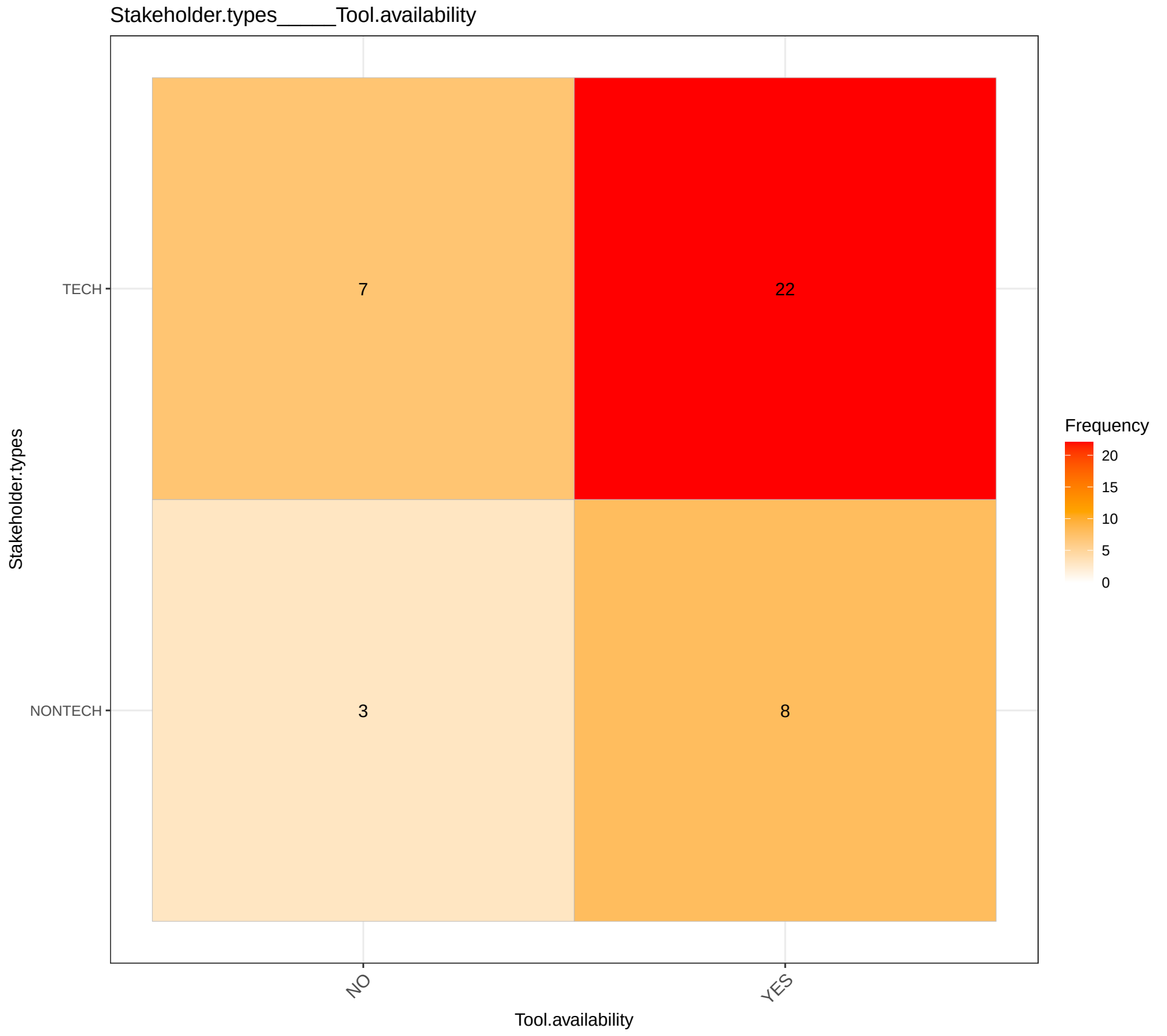
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Tool.availability
Frequency
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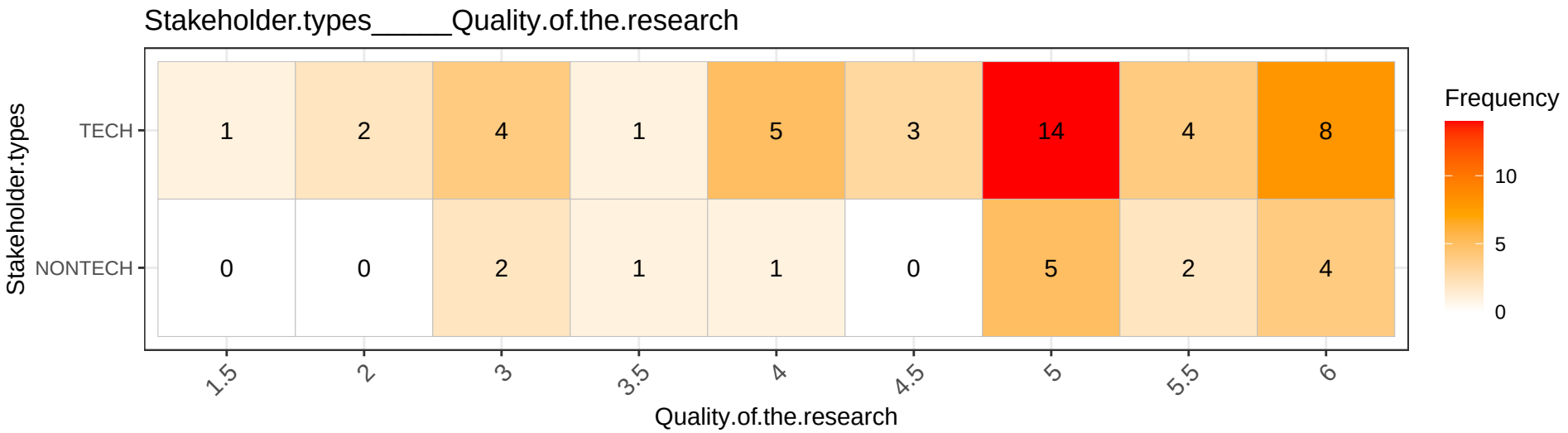
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Stakeholder.types
TECH
NONTECH
1
2
4
1
5
3
14
4
8
0
0
2
1
1
0
5
2
4
1.5
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3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10
5
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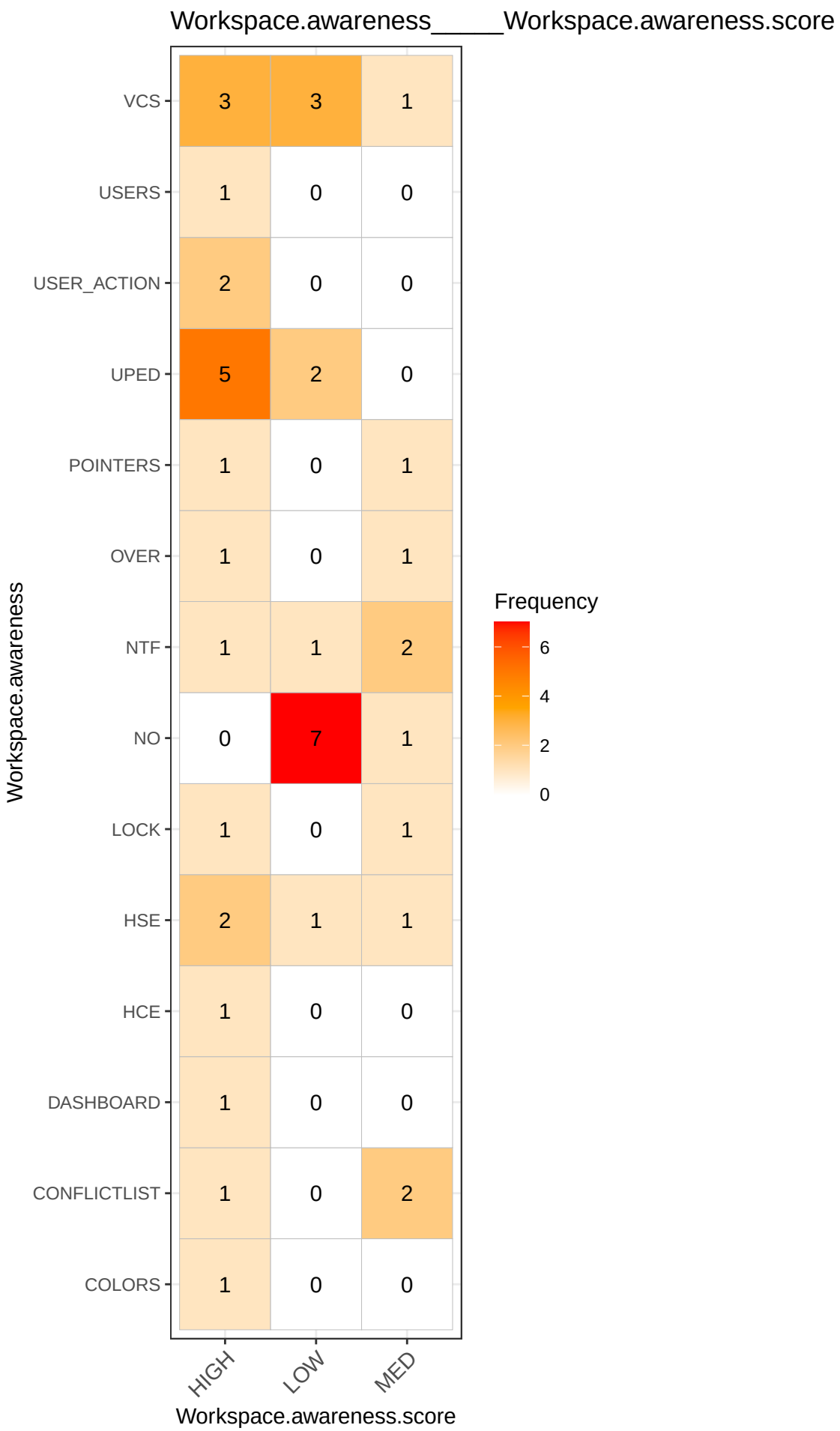
Workspace.awareness_____Workspace.awareness.score
VCS
USERS
USER_ACTION
UPED
POINTERS
OVER
NTF
NO
LOCK
HSE
HCE
DASHBOARD
CONFLICTLIST
COLORS
3 3 1
1 0 0
2 0 0
5 2 0
1 0 1
1 0 1
1 1 2
0 7 1
1 0 1
2 1 1
1 0 0
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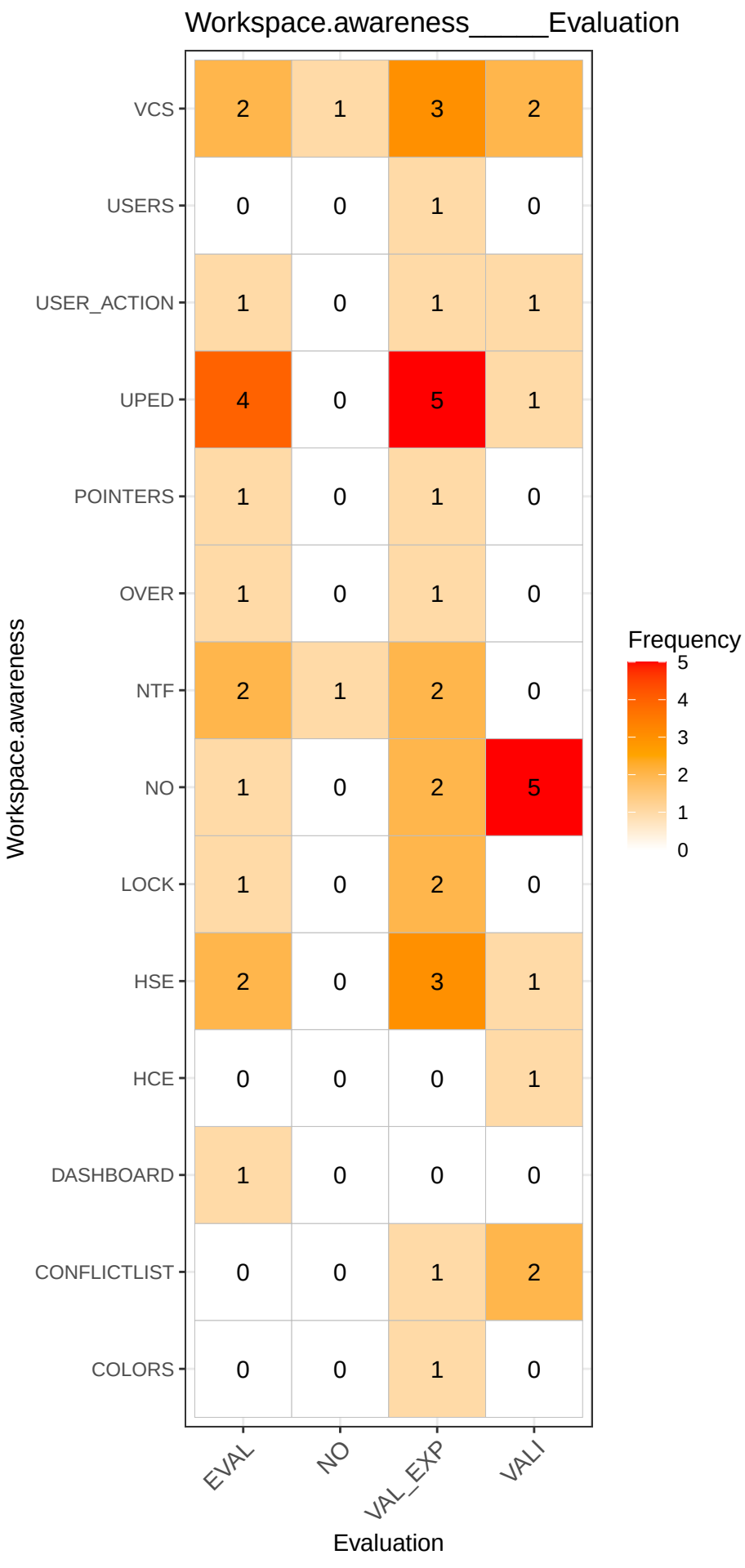
1 0 2
1 0 0
HIGH
LOW
MED
Workspace.awareness.score
Workspace.awareness
Frequency
6
4
2
0


Workspace.awareness_____Evaluation
Workspace.awareness
VCS
USERS
USER_ACTION
UPED
POINTERS
OVER
NTF
NO
LOCK
HSE
HCE
DASHBOARD
CONFLICTLIST
COLORS
2 1 3 2
0 0 1 0
1 0 1 1
4 0 5 1
1 0 1 0
1 0 1 0
2 1 2 0
1 0 2 5
1 0 2 0
2 0 3 1
0 0 0 1
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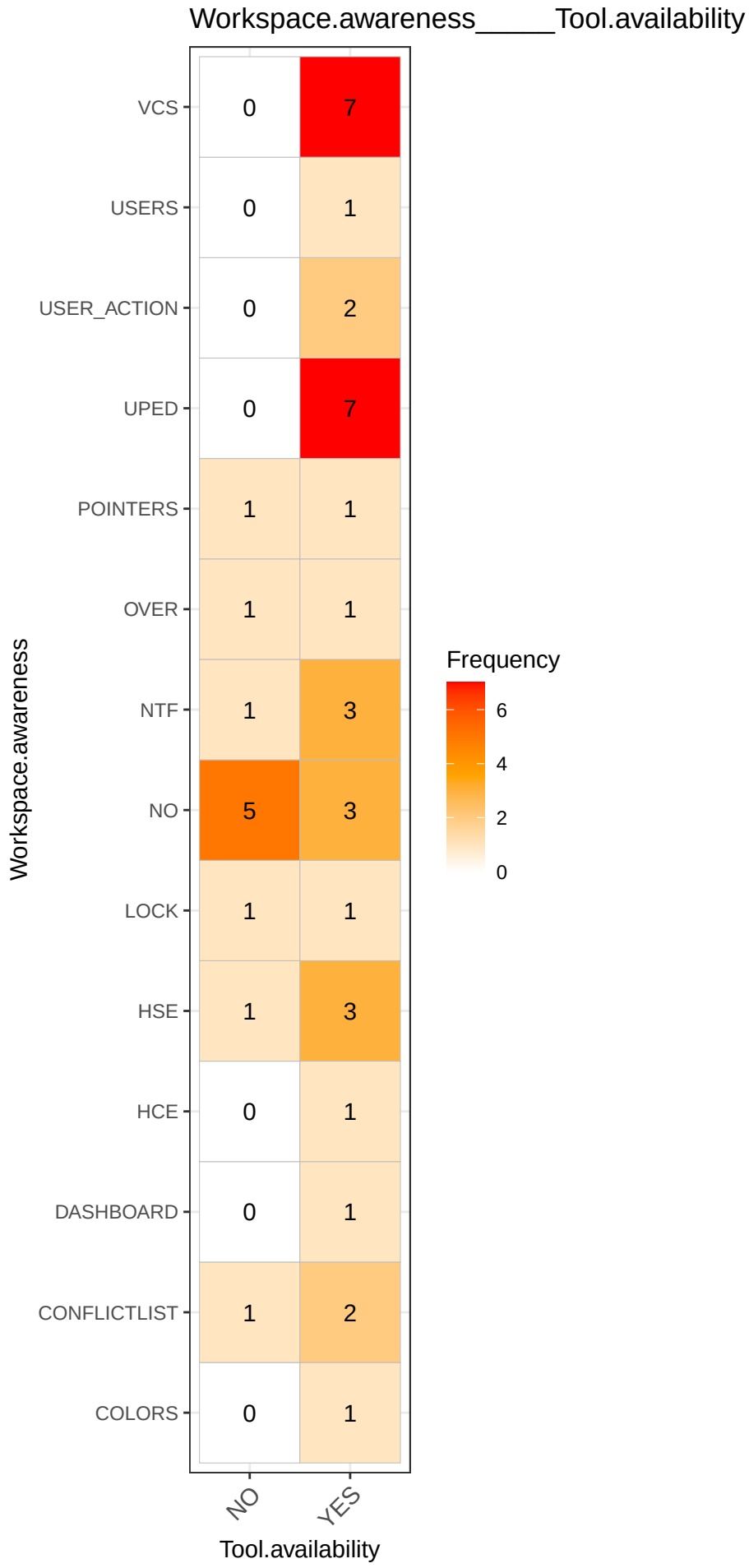
0 0 1 0
EVAL
NO
VAL_EXP
VALI
Evaluation
Frequency
5
4
3
2
1
0


Workspace.awareness_____Tool.availability
VCS
USERS
USER_ACTION
UPED
POINTERS
OVER
NTF
NO
LOCK
HSE
HCE
DASHBOARD
CONFLICTLIST
COLORS
0
7
0
1
0
2
0
7
1
1
1
1
1
3
5
3
1
1
1
3
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1
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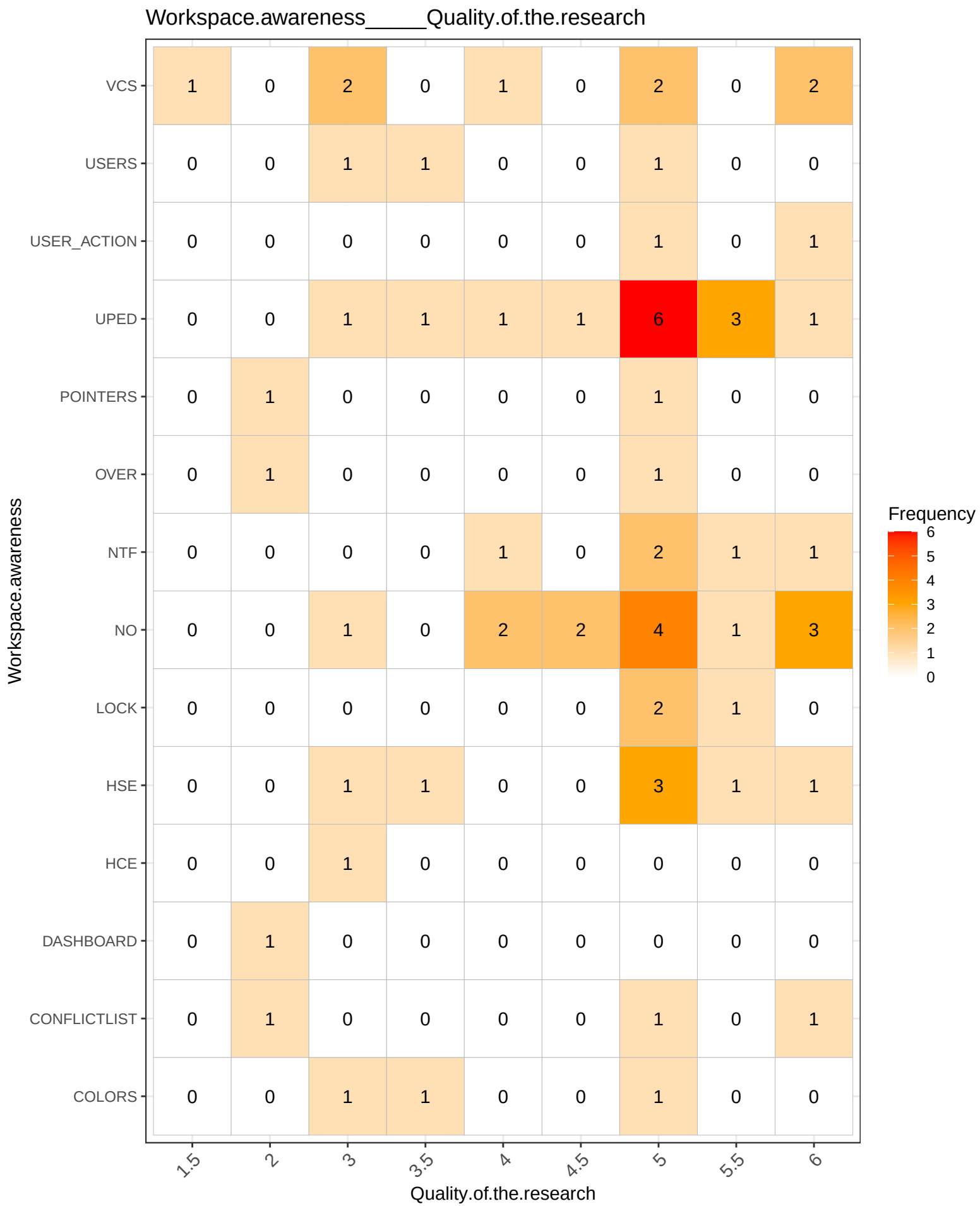
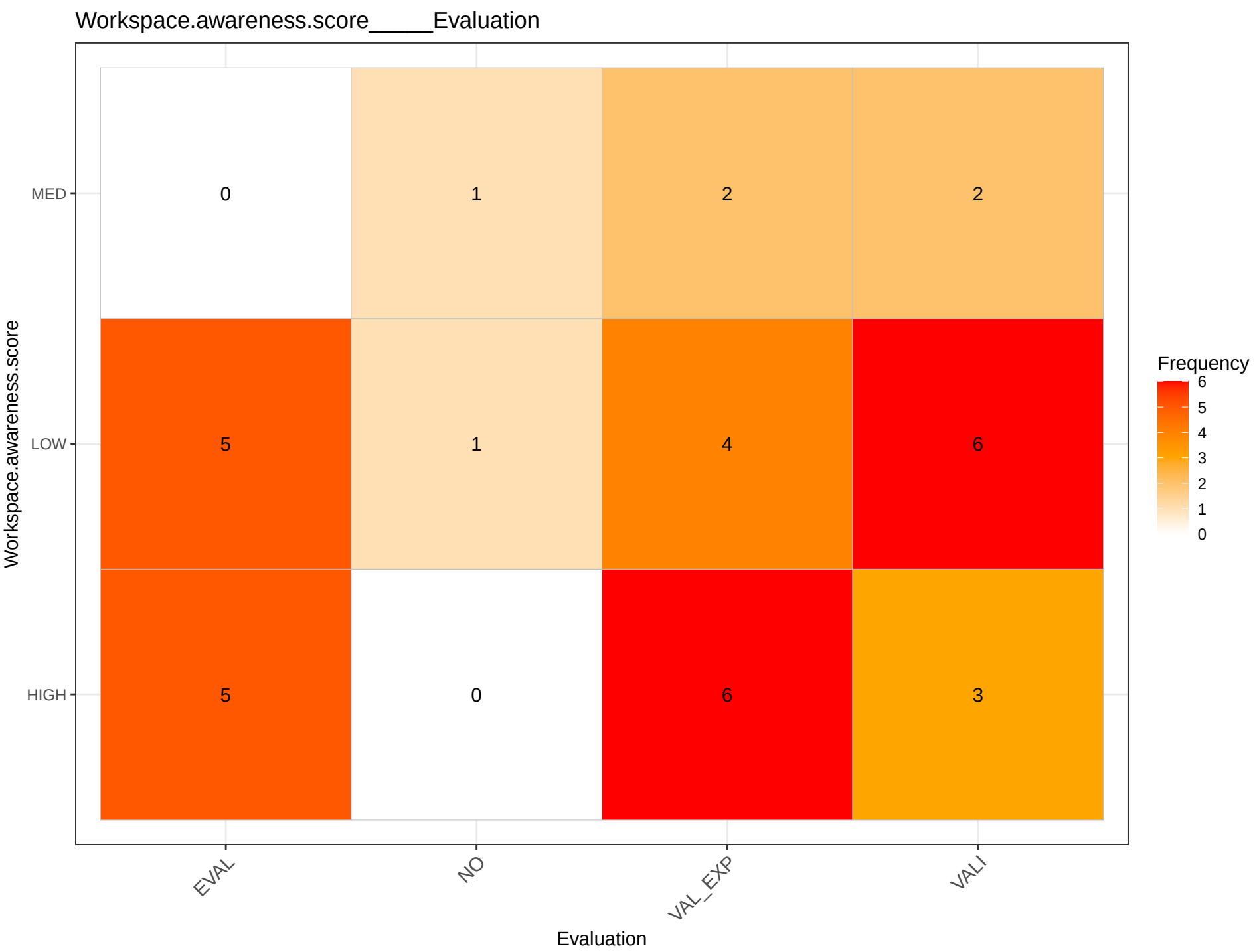
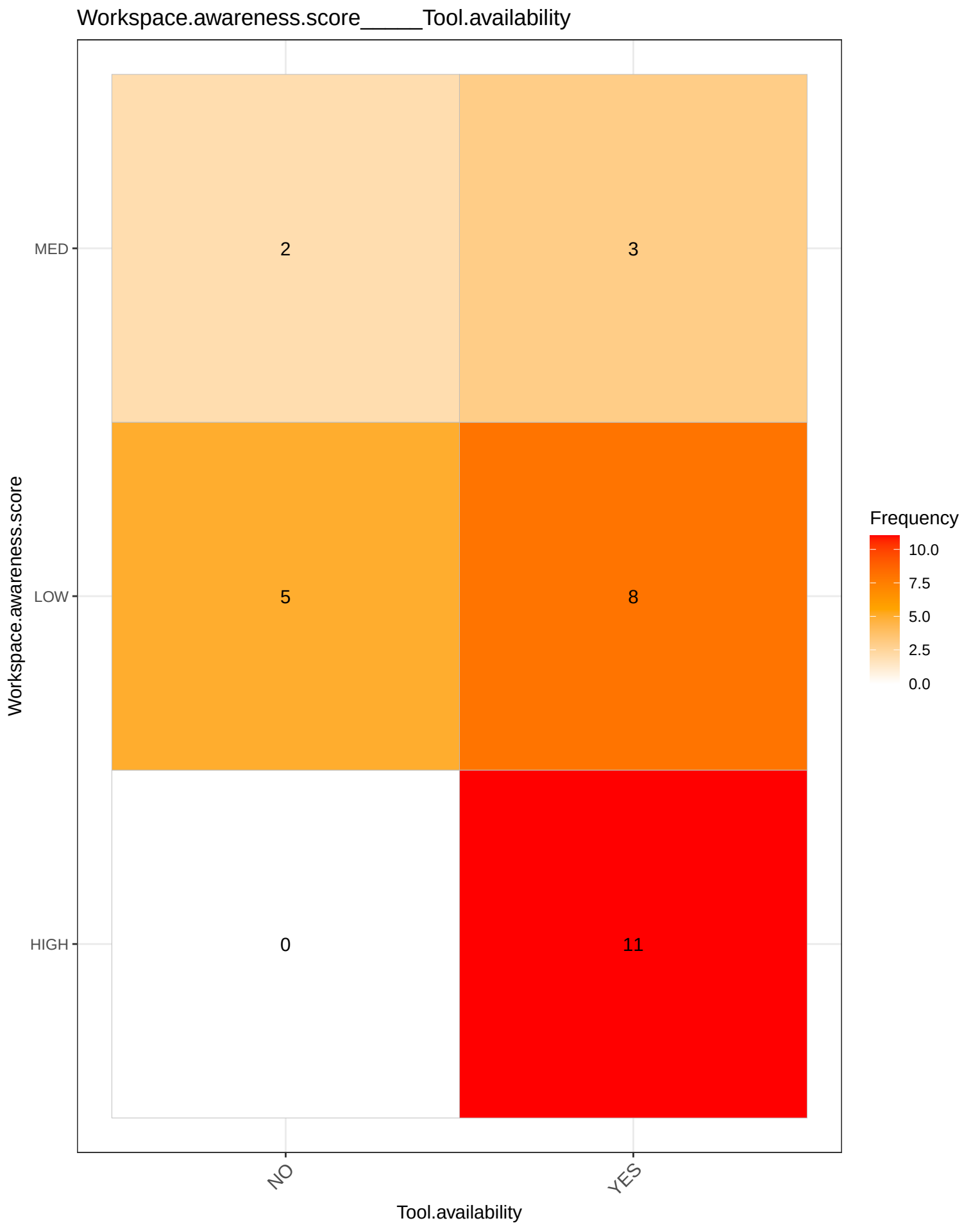
1
1
2
0
1
Workspace.awareness
NO
YES
Tool.availability
Frequency
6
4
2
0


Workspace.awareness_____Quality.of.the.research
VCS 1 0 2 0 1 0 2 0 2
USERS 0 0 1 1 0 0 1 0 0
USER_ACTION 0 0 0 0 0 0 1 0 1
UPED 0 0 1 1 1 1 6 3 1
POINTERS 0 1 0 0 0 0 1 0 0
OVER 0 1 0 0 0 0 1 0 0
NTF 0 0 0 0 1 0 2 1 1
NO 0 0 1 0 2 2 4 1 3
LOCK 0 0 0 0 0 0 2 1 0
HSE 0 0 1 1 0 0 3 1 1
HCE 0 0 1 0 0 0 0 0 0
DASHBOARD 0 1 0 0 0 0 0 0 0
CONFLICTLIST 0 1 0 0 0 0 1 0 1
COLORS 0 0 1 1 0 0 1 0 0
Workspace.awareness
1.5 2 3 3.5 4 4.5 5 5.5 6
Quality.of.the.research
Frequency
6 5 4 3 2 1 0


Workspace.awareness.score_____Evaluation
MED
LOW
HIGH
0
1
2
2
5
1
4
6
5
0
6
3
EVAL
NO
VAL_EXP
VALI
Evaluation
Workspace.awareness.score
Frequency
6
5
4
3
2
1
0


Workspace.awareness.score_____Tool.availability
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LOW
HIGH
2
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8
0
11
NO
YES
Workspace.awareness.score
Tool.availability
Frequency
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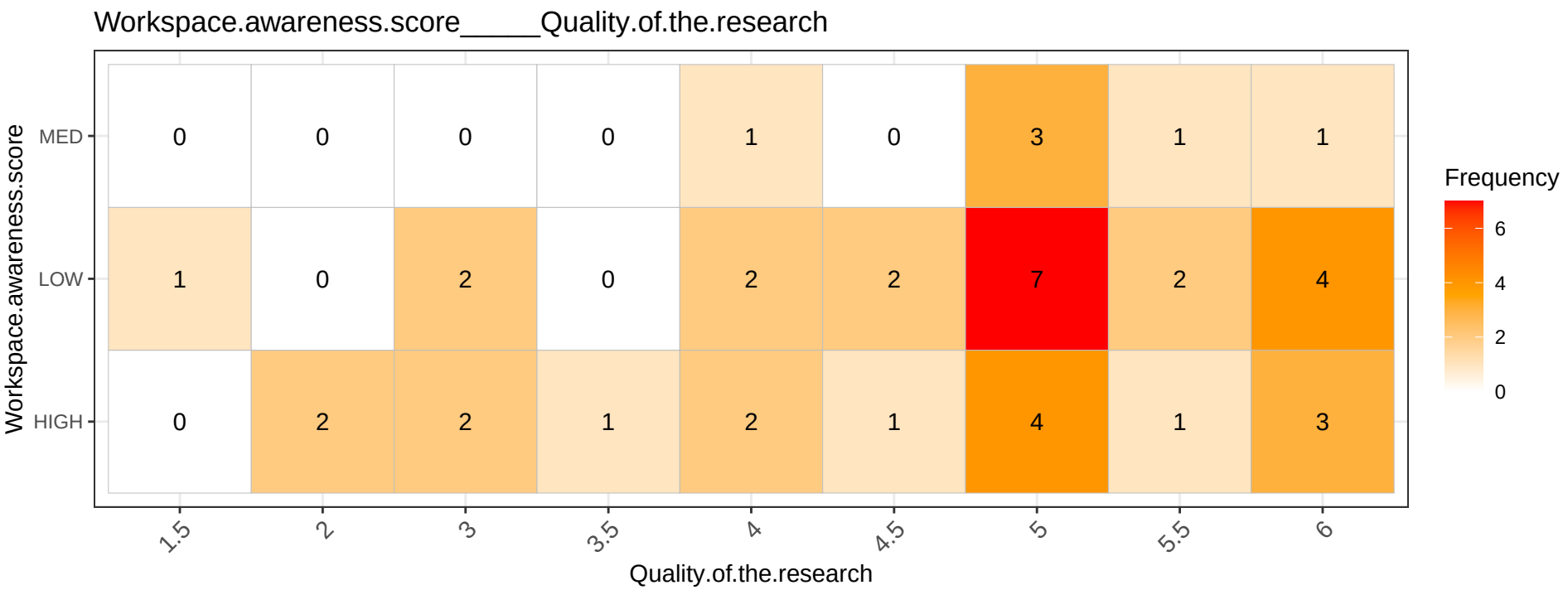
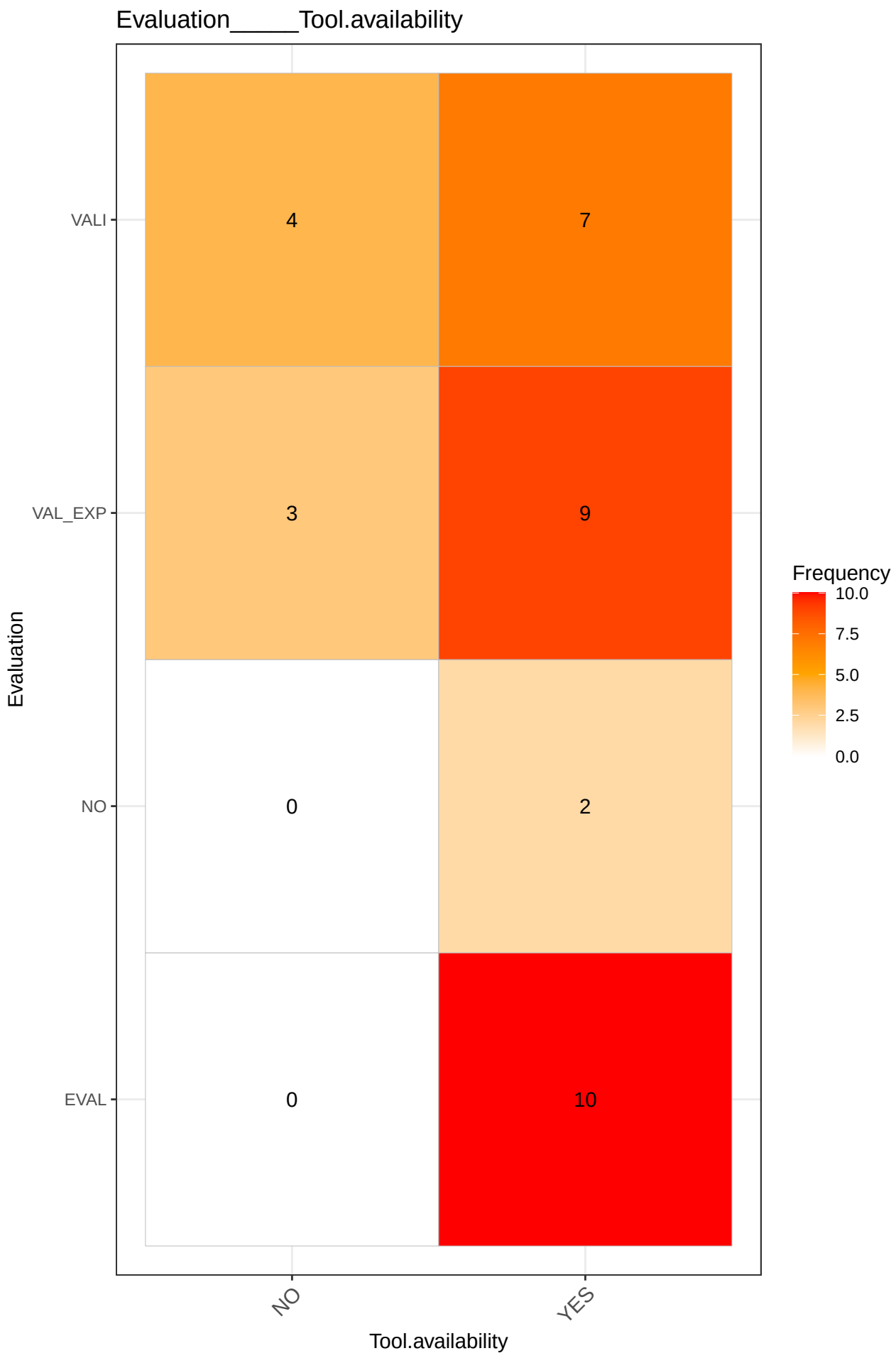
7.5
5.0
2.5
0.0


Workspace.awareness.score_____Quality.of.the.research
Workspace.awareness.score
MED
LOW
HIGH
0 0 0 0 1 0 3 1 1
1 0 2 0 2 2 7 2 4
0 2 2 1 2 1 4 1 3
1.5
2
3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
6
4
2
0


Evaluation_____Tool.availability
VALI
VAL_EXP
NO
EVAL
4
7
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2
0
10
Evaluation
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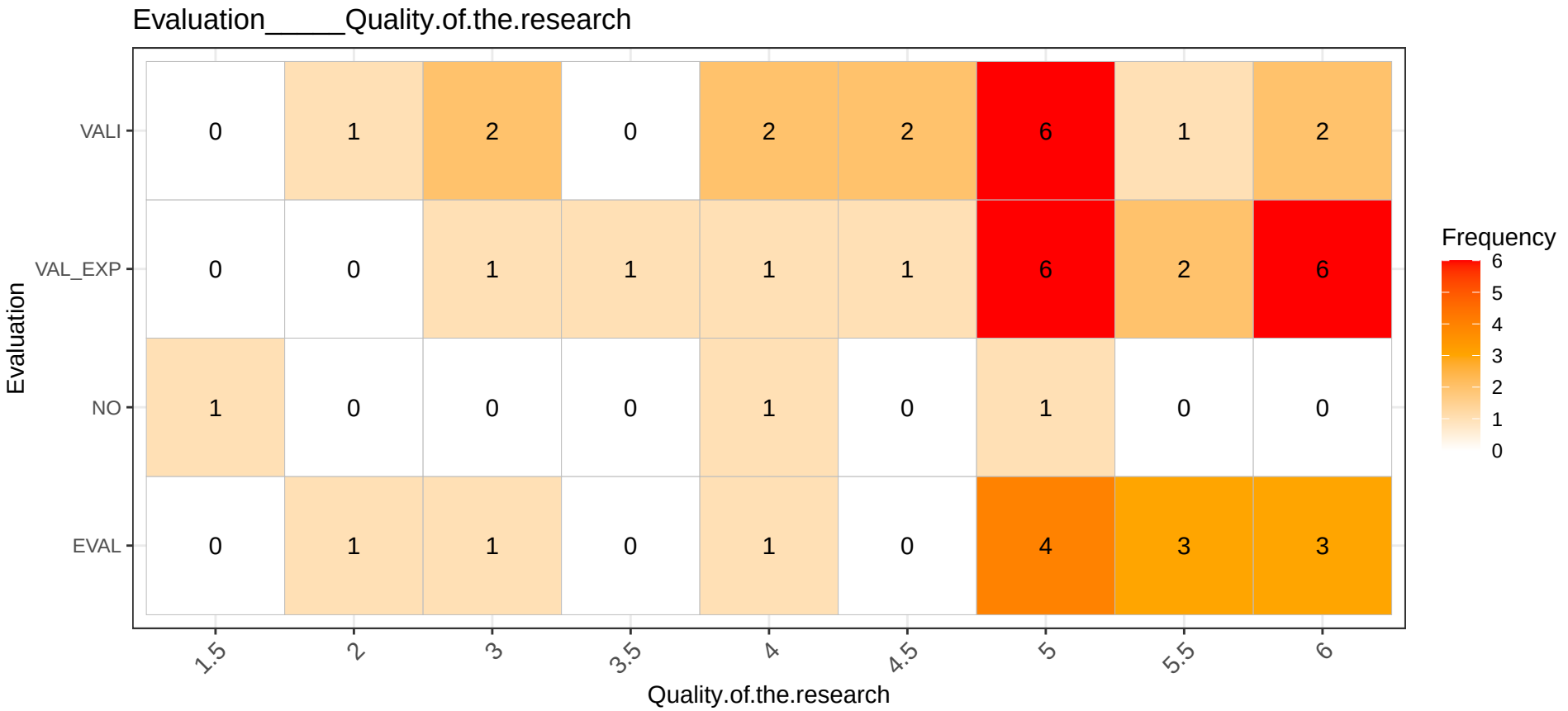
YES
Tool.availability
Frequency
10.0
7.5
5.0
2.5
0.0


Evaluation_____Quality.of.the.research
VALI
VAL_EXP
NO
EVAL
Evaluation
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0 0 1 1 1 1 6 2 6
1 0 0 0 1 0 1 0 0
0 1 1 0 1 0 4 3 3
1.5
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3
3.5
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4.5
5
5.5
6
Quality.of.the.research
Frequency
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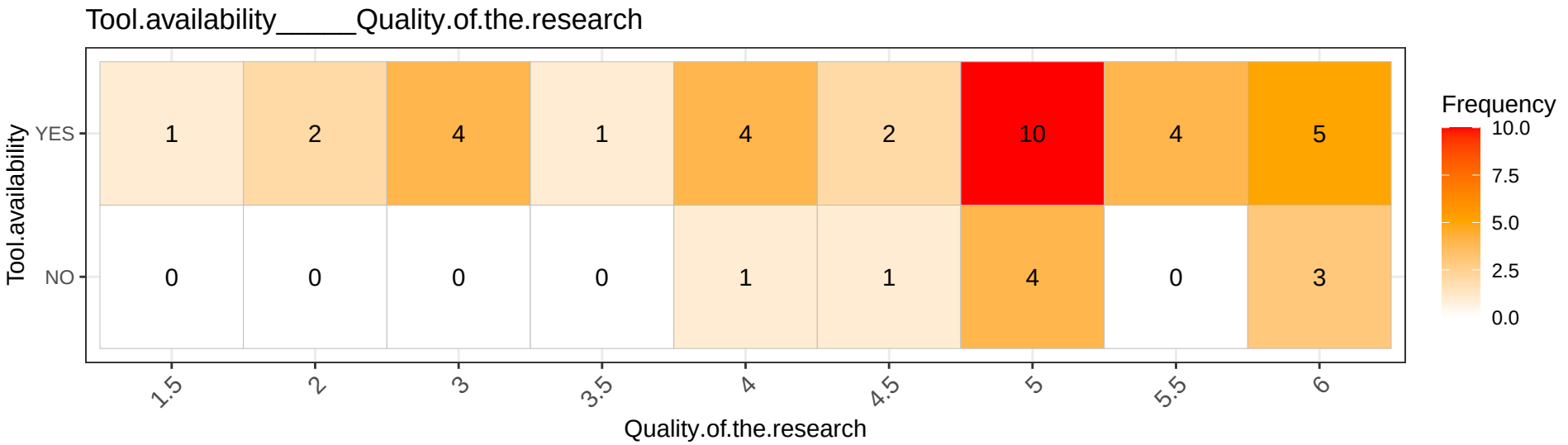
Tool.availability_____Quality.of.the.research
Tool.availability
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4
5
0
0
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1
1
4
0
3
1.5
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3
3.5
4
4.5
5
5.5
6
Quality.of.the.research
Frequency
10.0
7.5
5.0
2.5
0.0