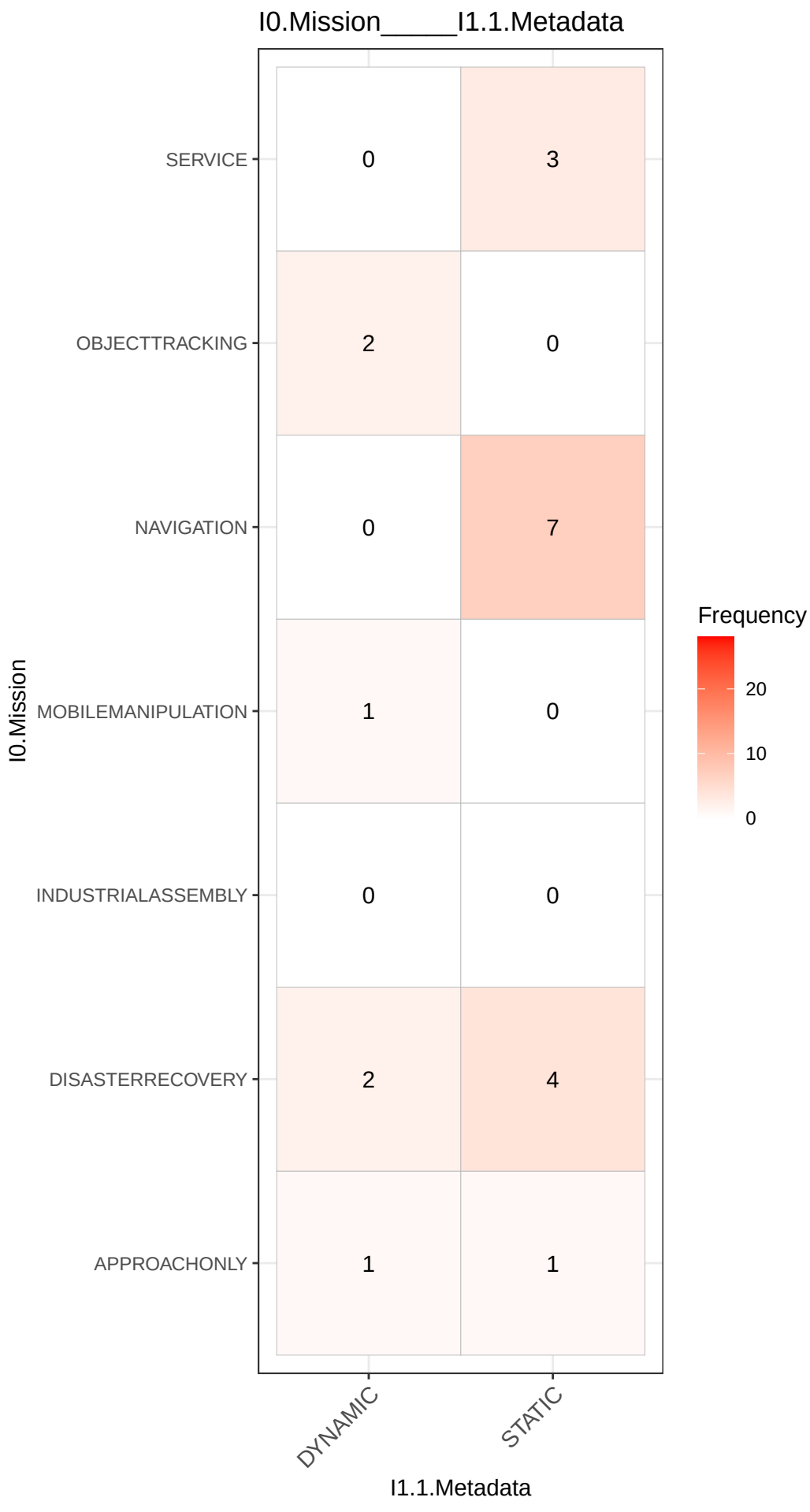
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SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
0
3
2
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DYNAMIC
STATIC
I1.1.Metadata
Frequency
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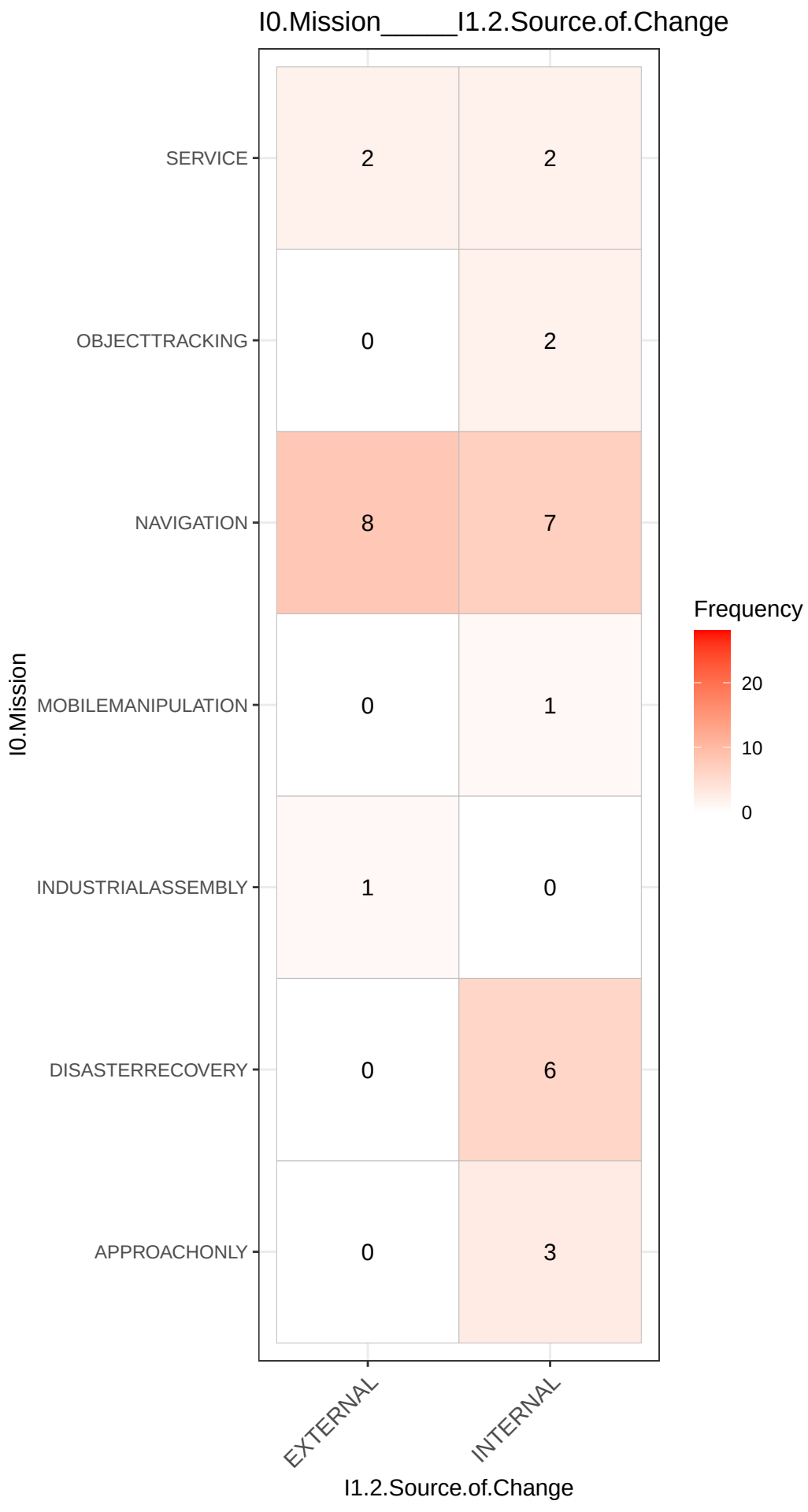
I0.Mission_____I1.2.Source.of.Change
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
2
0
2
8
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3
EXTERNAL
INTERNAL
I1.2.Source.of.Change
Frequency
20
10
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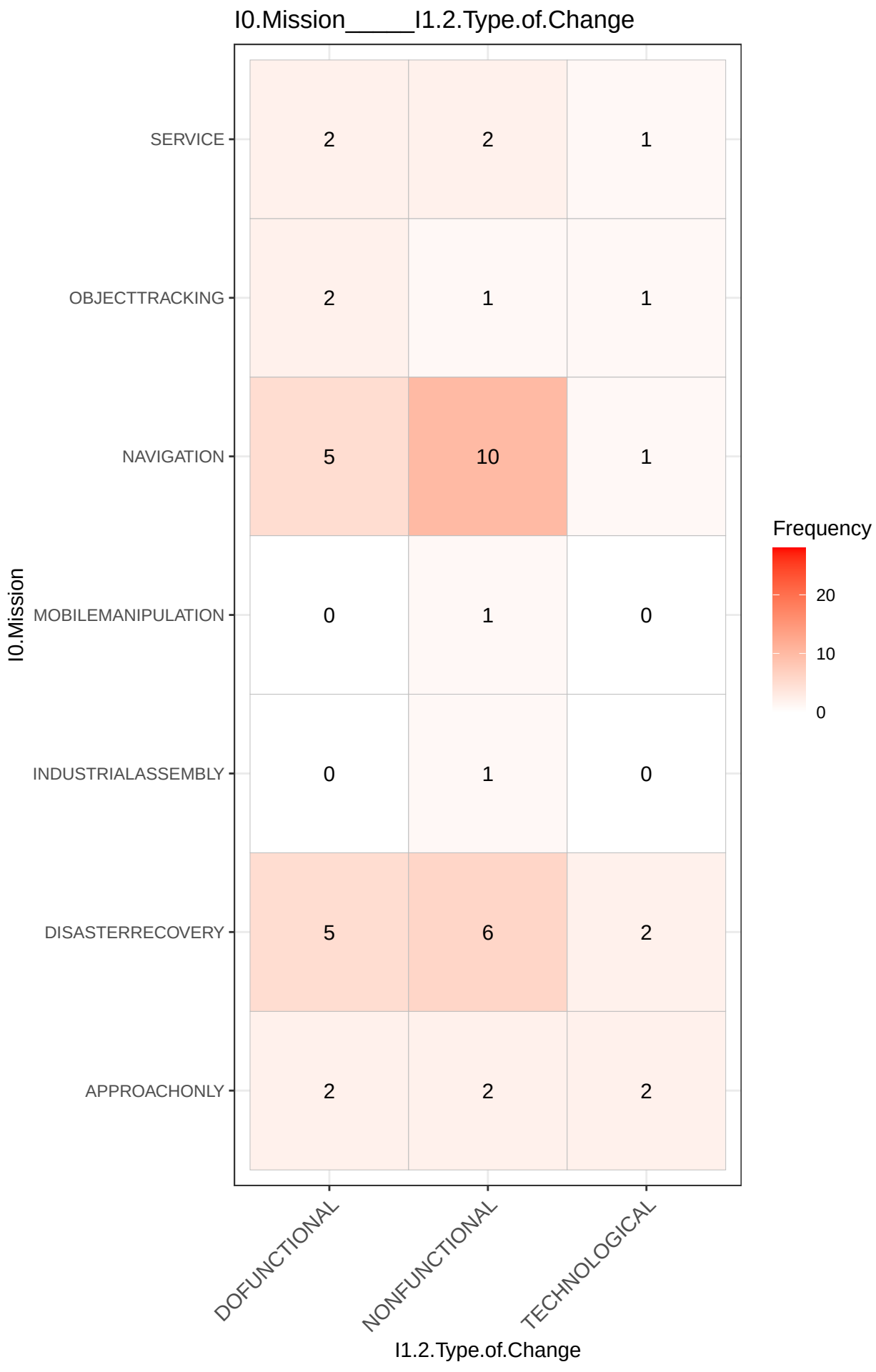
I0.Mission_____I1.2.Type.of.Change
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
2
1
2
1
1
5
10
1
0
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1
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6
2
2
2
2
DOFUNCTIONAL
NONFUNCTIONAL
TECHNOLOGICAL
I1.2.Type.of.Change
Frequency
20
10
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I0.Mission_____I1.2.Anticipation.of.Change
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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0 1 1
1 8 3
0 1 0
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DOFORESEEN
FORESEEABLE
UNFORESEEN
I1.2.Anticipation.of.Change
Frequency
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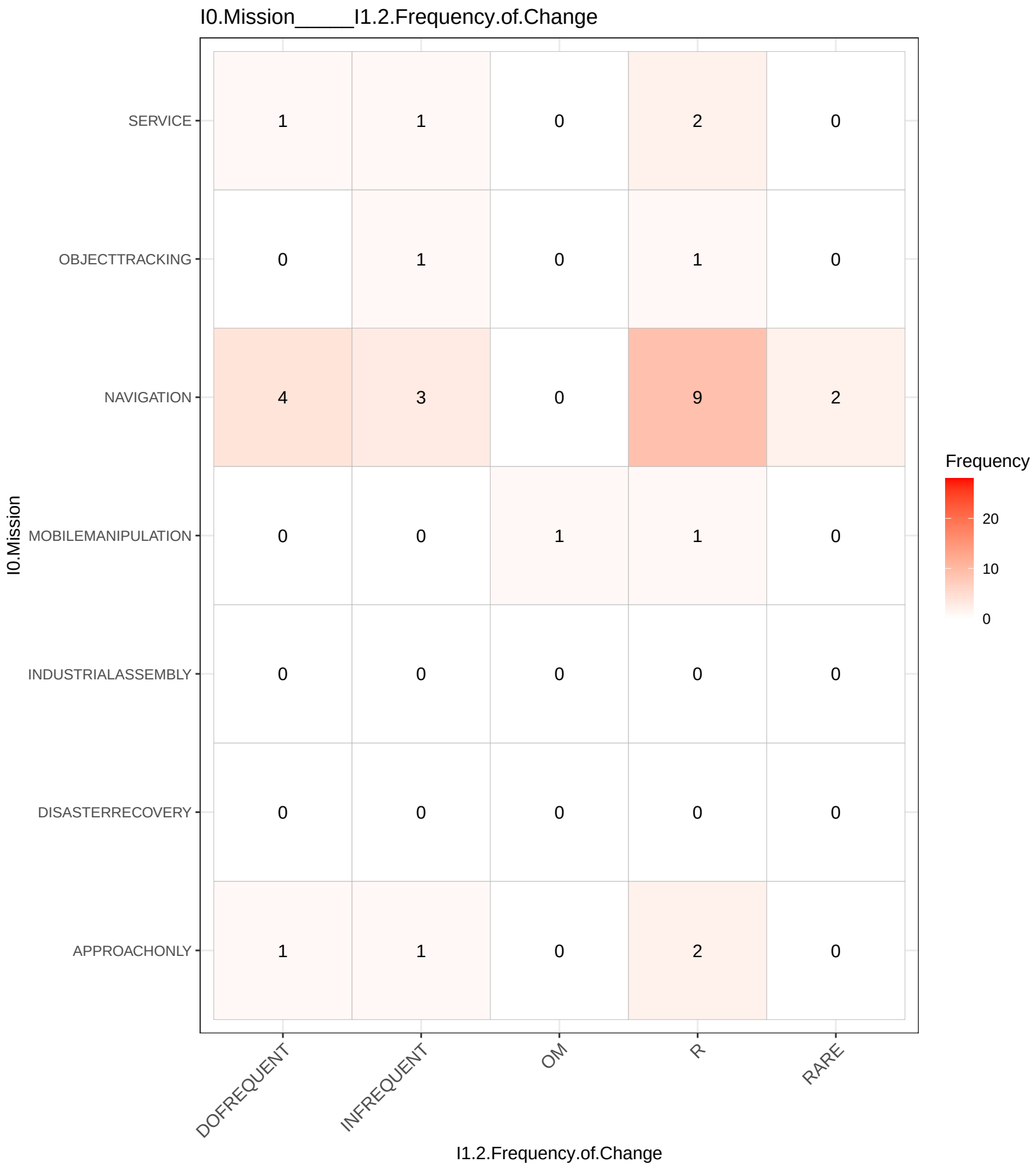
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SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
1 1 0 2 0
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4 3 0 9 2
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0 0 0 0 0
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DOFREQUENT
INFREQUENT
OM
R
RARE
I1.2.Frequency.of.Change
Frequency
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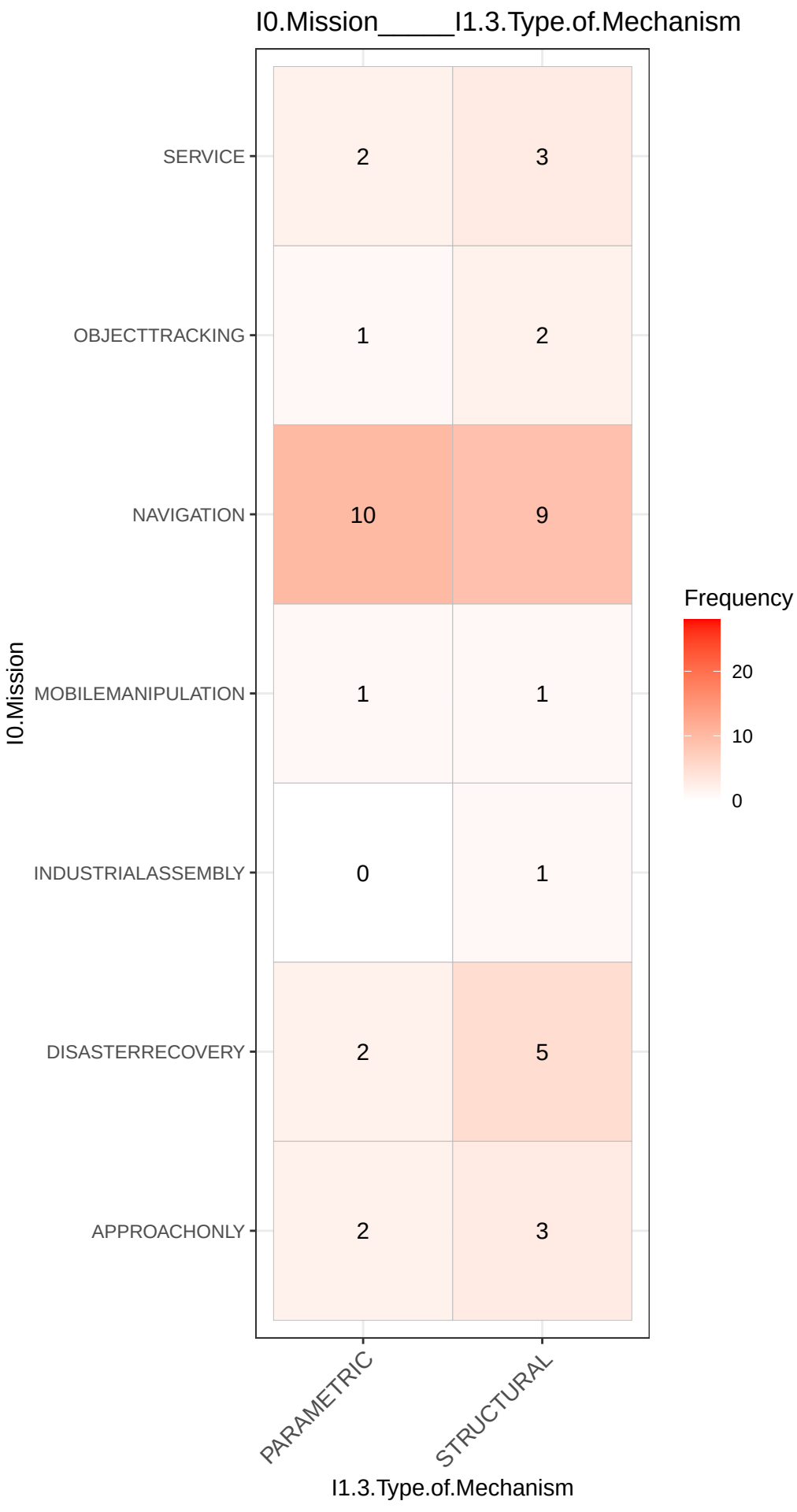
I0.Mission_____I1.3.Type.of.Mechanism
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
3
1
2
10
9
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PARAMETRIC
STRUCTURAL
I1.3.Type.of.Mechanism
Frequency
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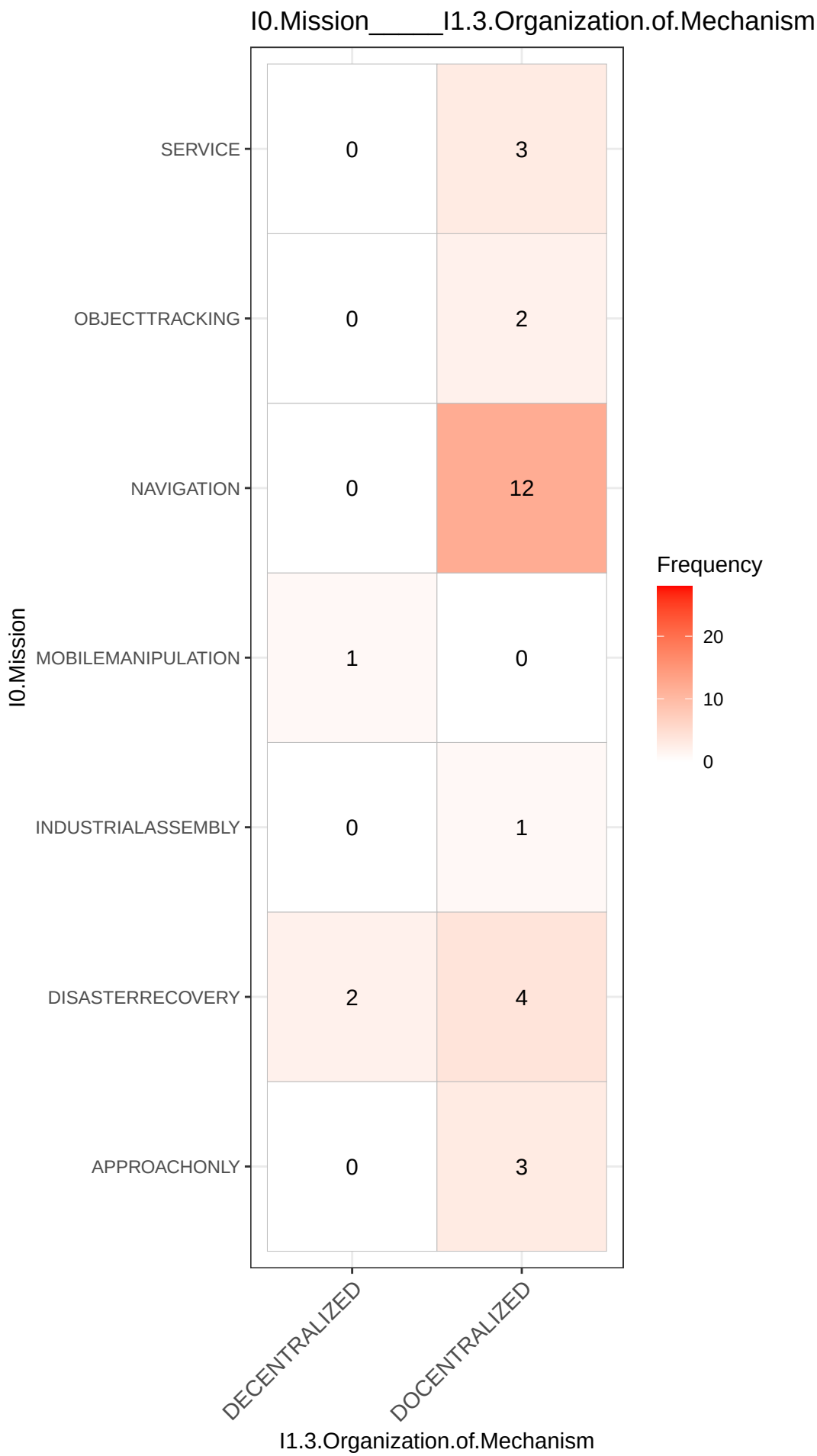
I0.Mission_____I1.3.Organization.of.Mechanism
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
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I0.Mission
0
3
0
2
0
12
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0
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Frequency
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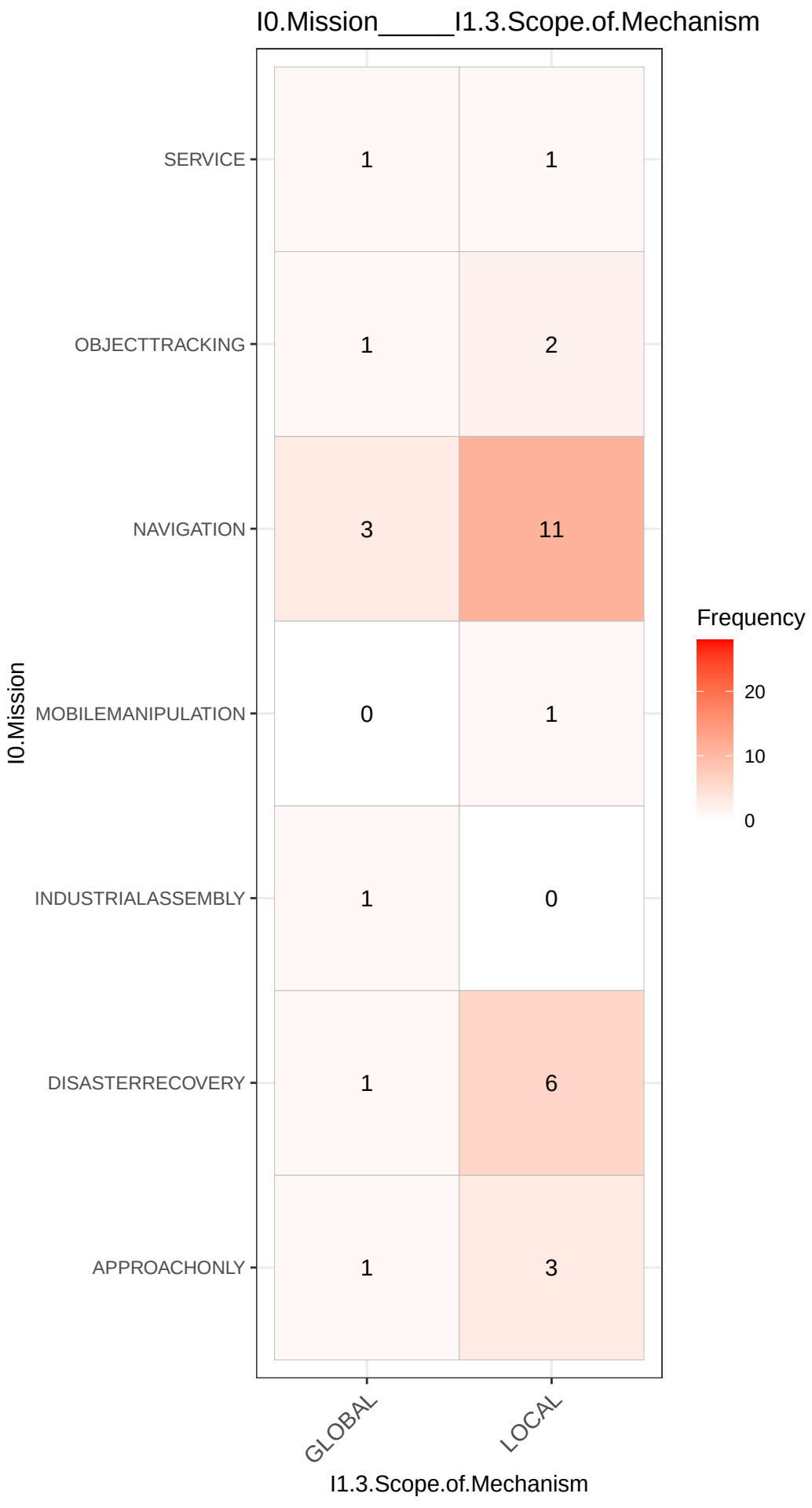
DOCENTRALIZED
I1.3.Organization.of.Mechanism


I0.Mission_____I1.3.Scope.of.Mechanism
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
1
1
1
2
3
11
0
1
1
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1
6
1
3
GLOBAL
LOCAL
I1.3.Scope.of.Mechanism
Frequency
20
10
0

I0.Mission_____I1.3.Duration.of.Mechanism
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
1
0
0
2
0
0
7
1
4
0
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0
1
0
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6
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DOSHORT
MEDIUM
VERYSHORT
I1.3.Duration.of.Mechanism
Frequency
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10
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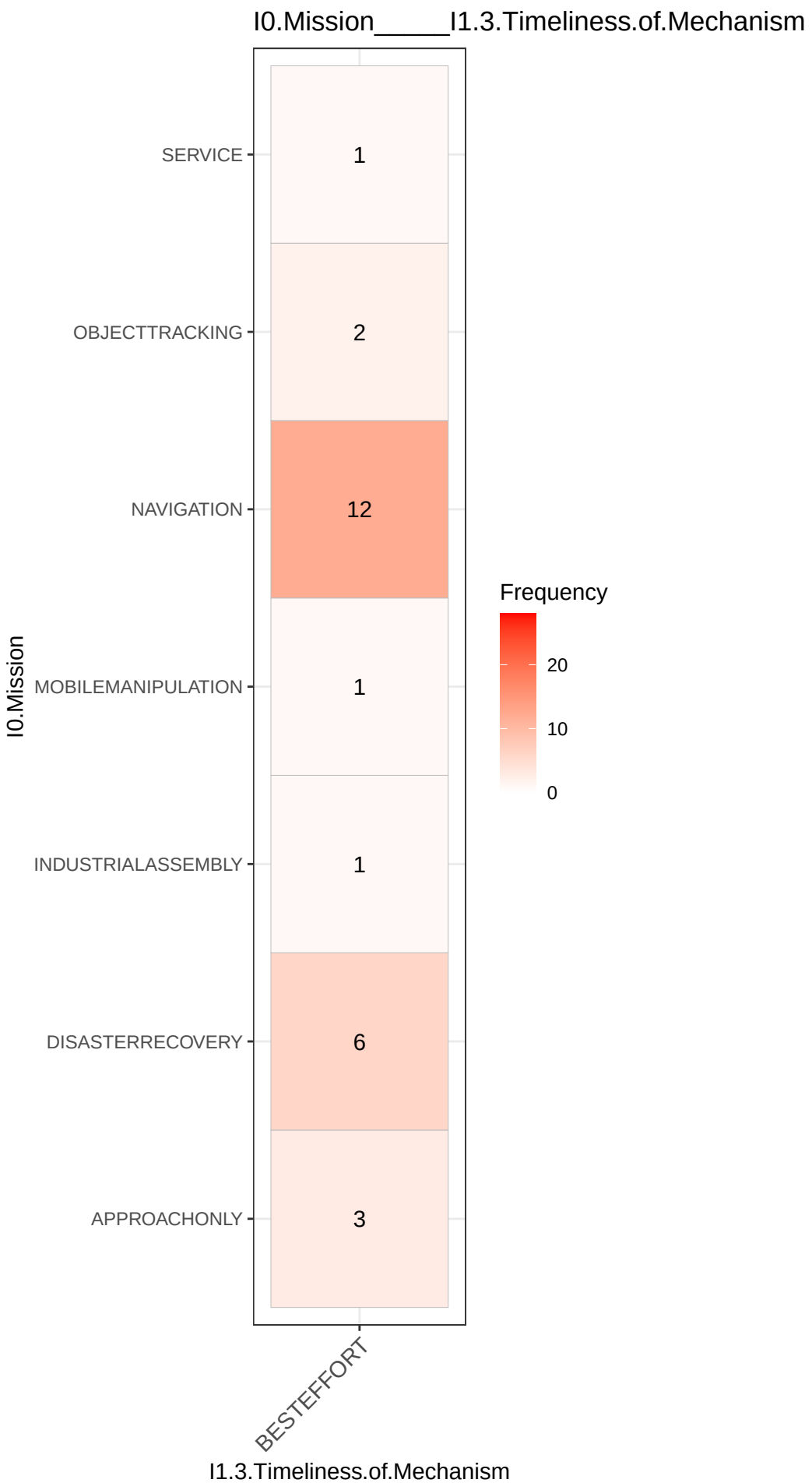
I0.Mission_____I1.3.Timeliness.of.Mechanism
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OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
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2
12
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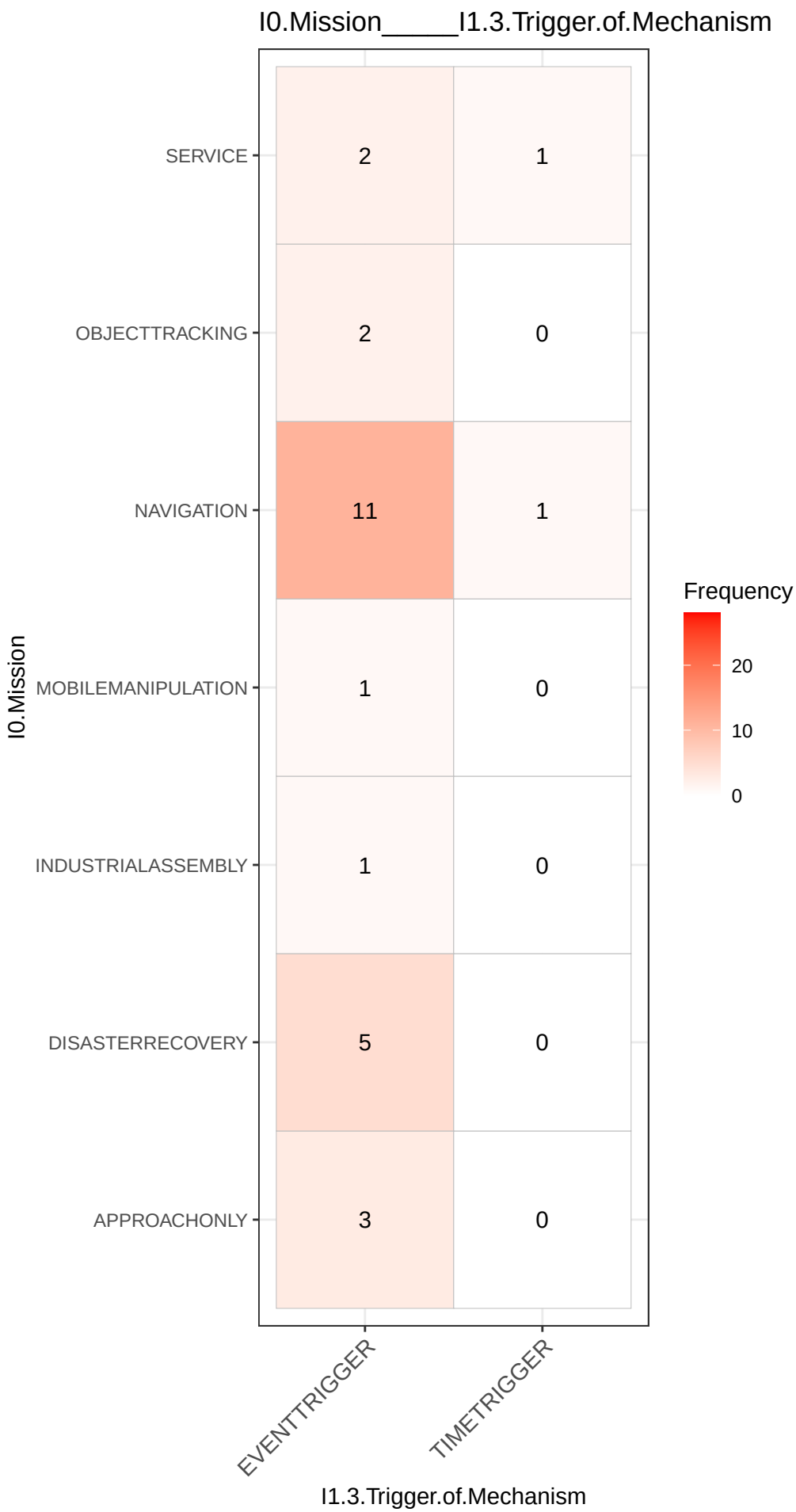
1
6
3
I0.Mission
Frequency
20
10
0
BESTEFFORT
I1.3.Timeliness.of.Mechanism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SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
1
2
0
11
1
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Frequency
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10
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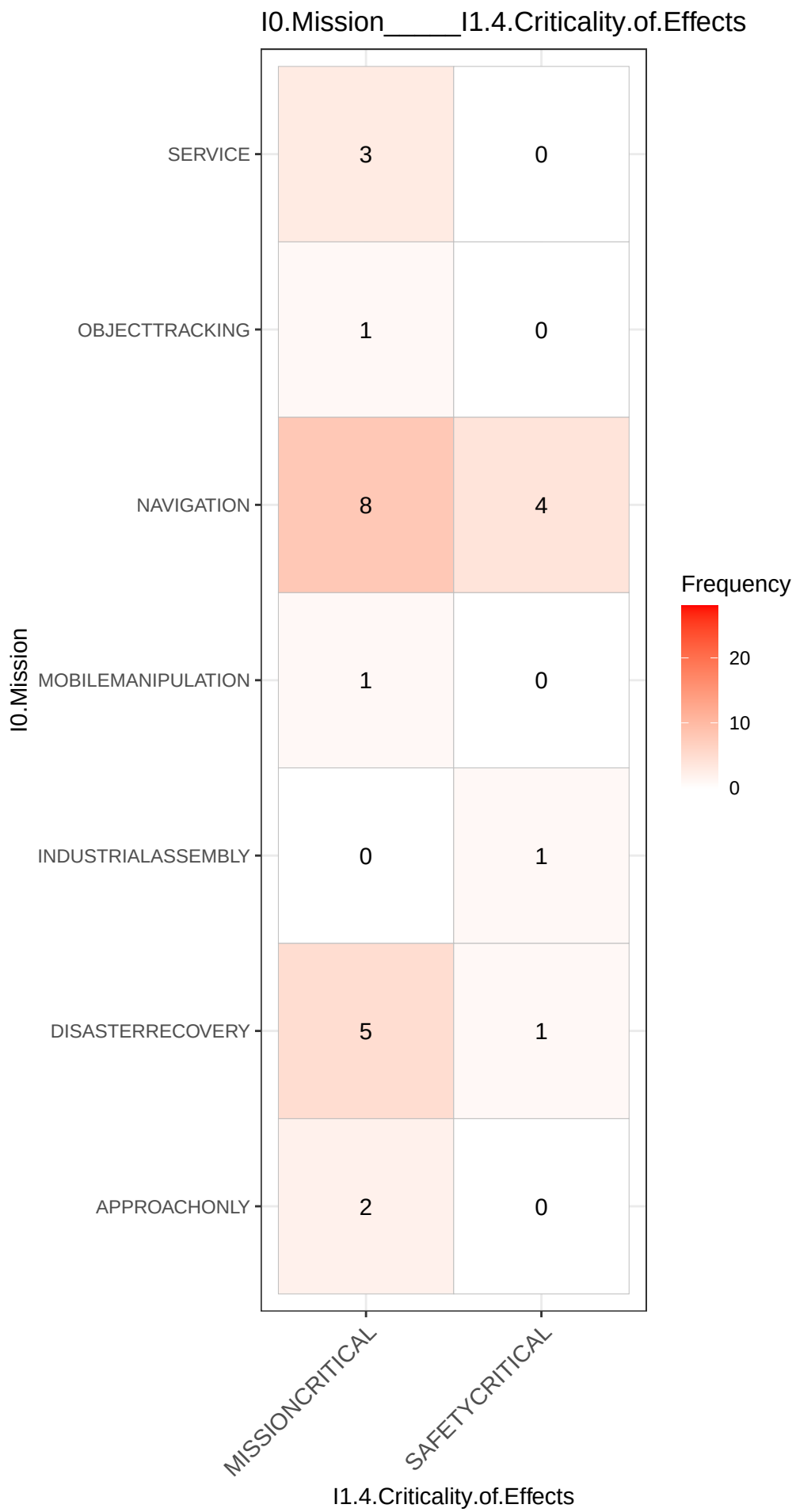
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism


I0.Mission_____I1.4.Criticality.of.Effects
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
3
0
1
0
8
4
1
0
0
1
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1
2
0
Frequency
20
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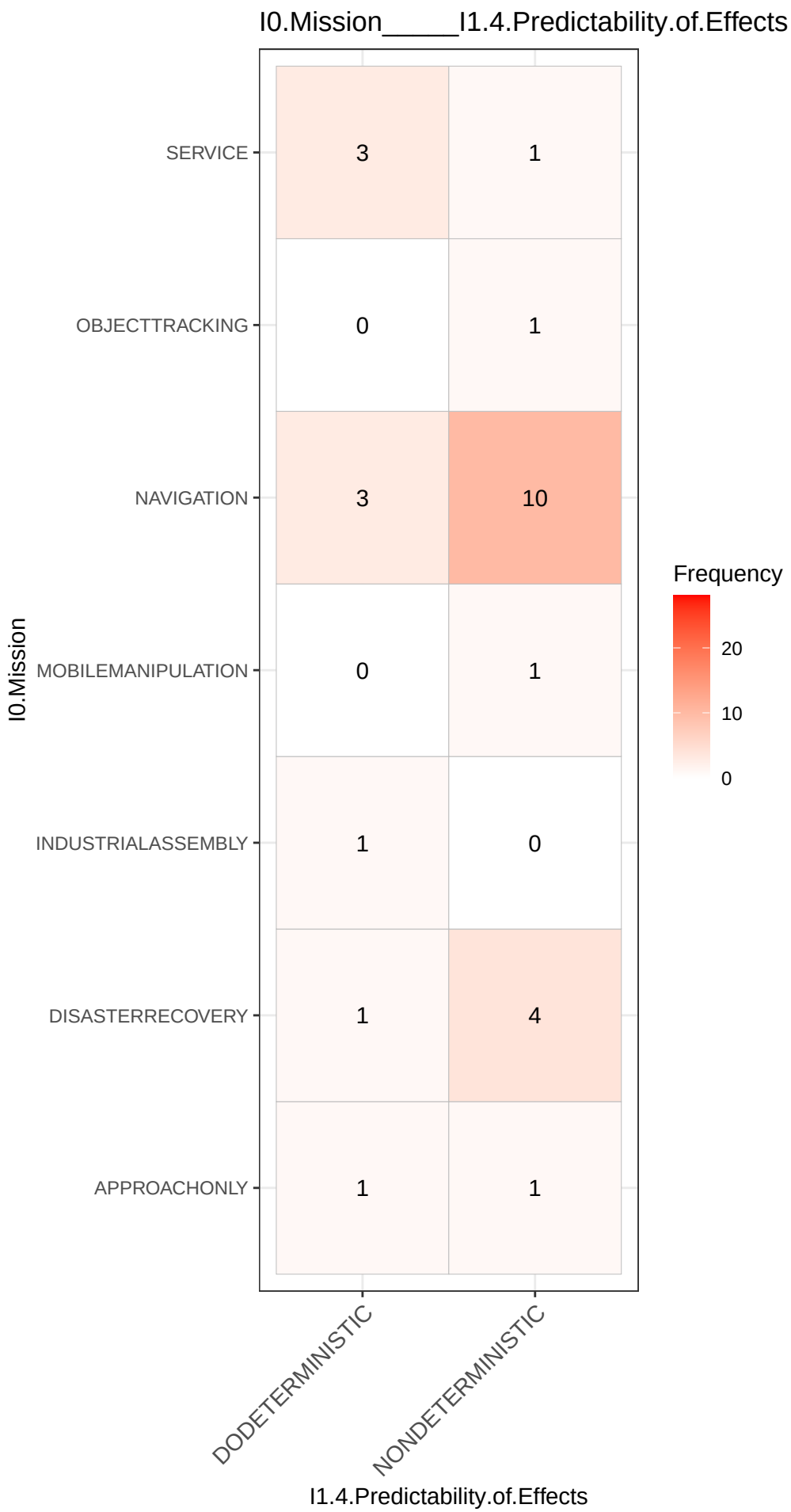
SAFETYCRITICAL
I1.4.Criticality.of.Effects


I0.Mission_____I1.4.Predictability.of.Effects
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
3
1
0
1
3
10
0
1
1
0
1
4
1
1
Frequency
20
10
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DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects

I0.Mission_____I1.4.Overhead.of.Effects
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2 0 0
2 0 0
5 2 3
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3 0 0
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
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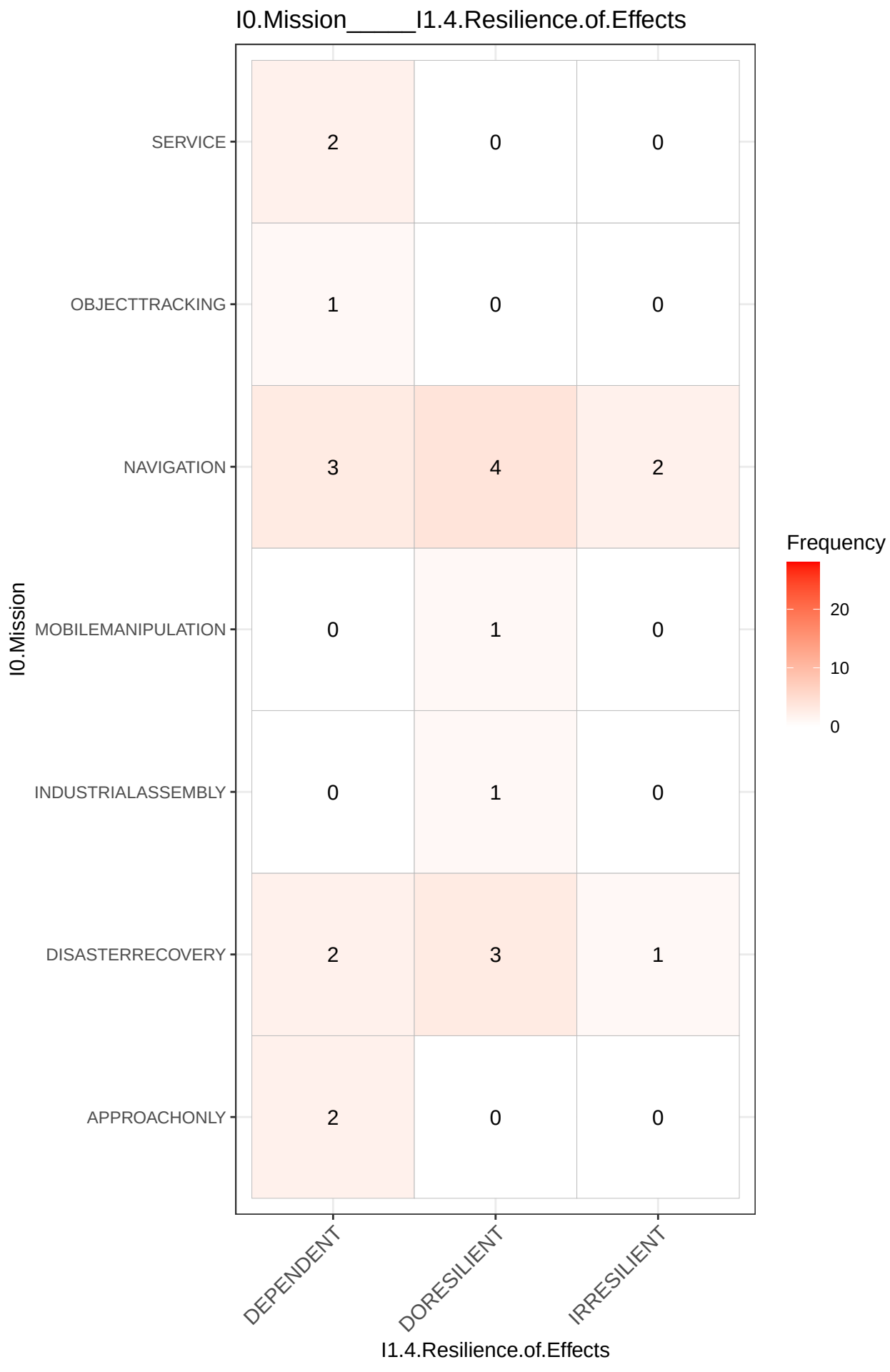
I0.Mission_____I1.4.Resilience.of.Effects
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
0
0
1
0
0
3
4
2
0
1
0
0
1
0
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DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
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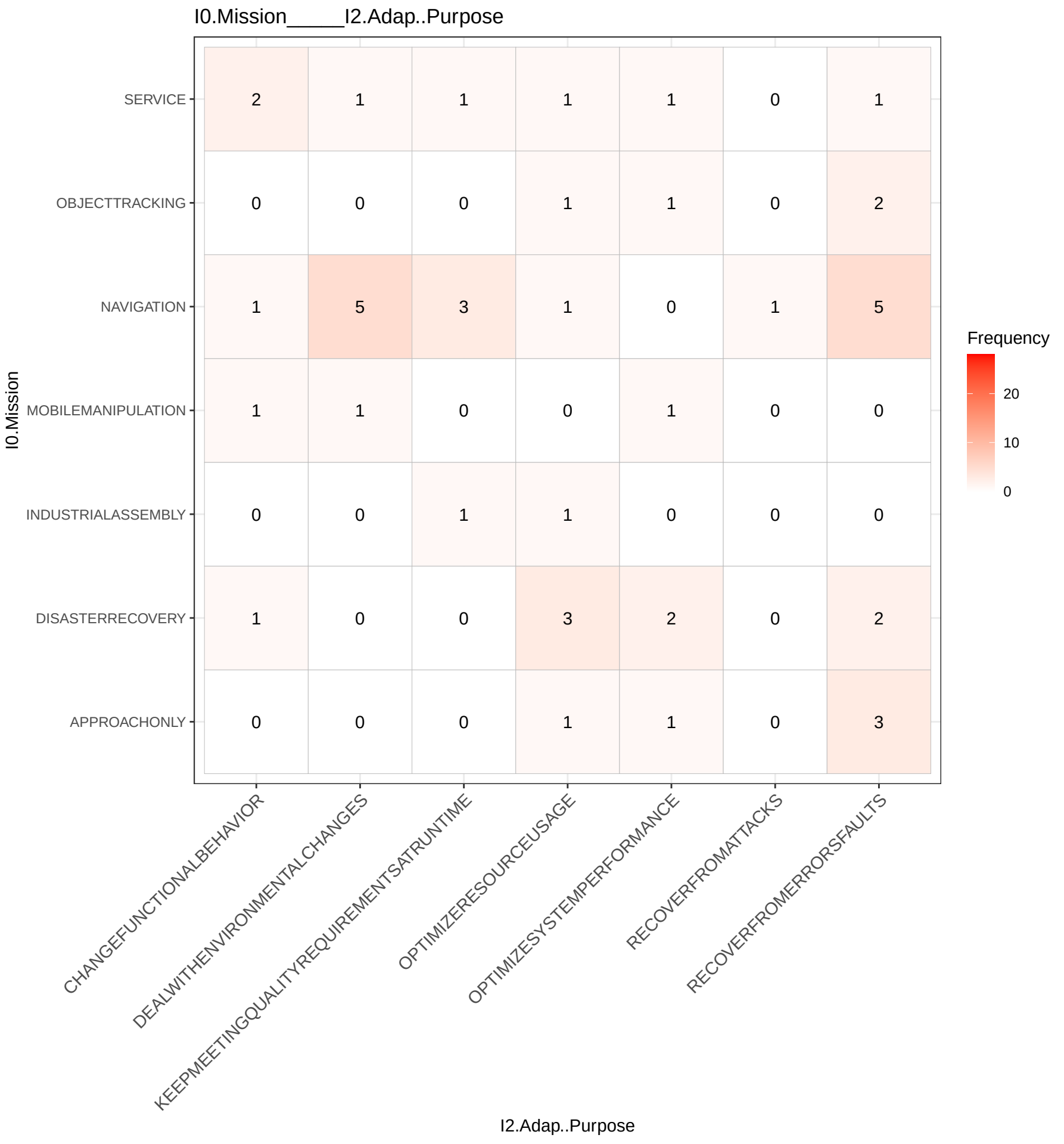
I0.Mission_____I2.Adap..Purpose
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2 1 1 1 1 0 1
0 0 0 1 1 0 2
1 5 3 1 0 1 5
1 1 0 0 1 0 0
0 0 1 1 0 0 0
1 0 0 3 2 0 2
0 0 0 1 1 0 3
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
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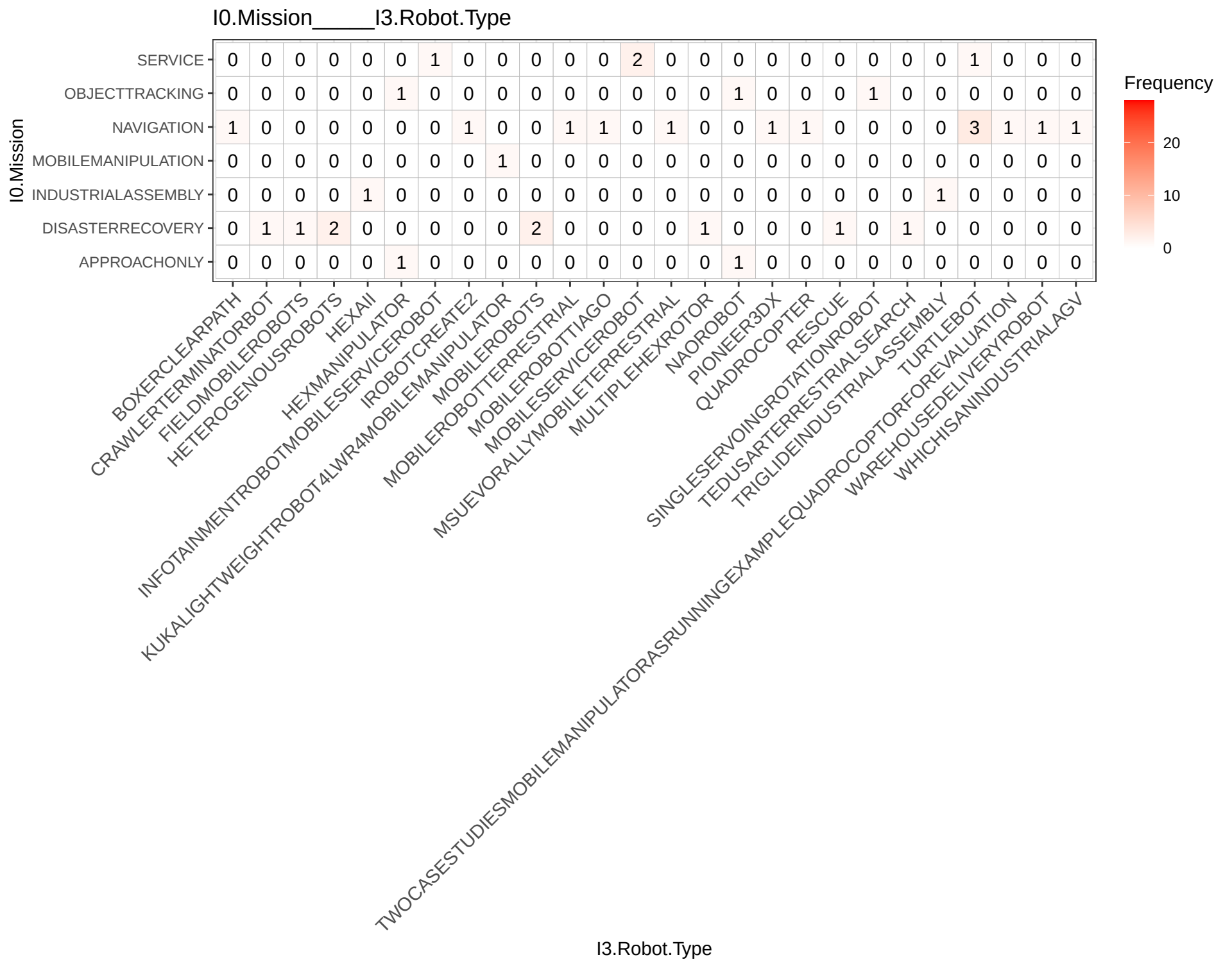
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I0.Mission
SERVICE 0 0 0 0 0 0 1 0 0 0 0 0 2 0 0 0 0 0 0 0 0 0 1 0 0 0
OBJECTTRACKING 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0
NAVIGATION 1 0 0 0 0 0 0 1 0 0 1 1 0 1 0 0 1 1 0 0 0 0 3 1 1 1
MOBILEMANIPULATION 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
INDUSTRIALASSEMBLY 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
DISASTERRECOVERY 0 1 1 2 0 0 0 0 0 2 0 0 0 0 1 0 0 0 1 0 1 0 0 0 0 0
APPROACHONLY 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
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
IROBOTCREATE2
INFOTAINMENTROBOTMOBILESERVICEROBOT
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
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WHICHISANINDUSTRIALAGV
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Frequency
20
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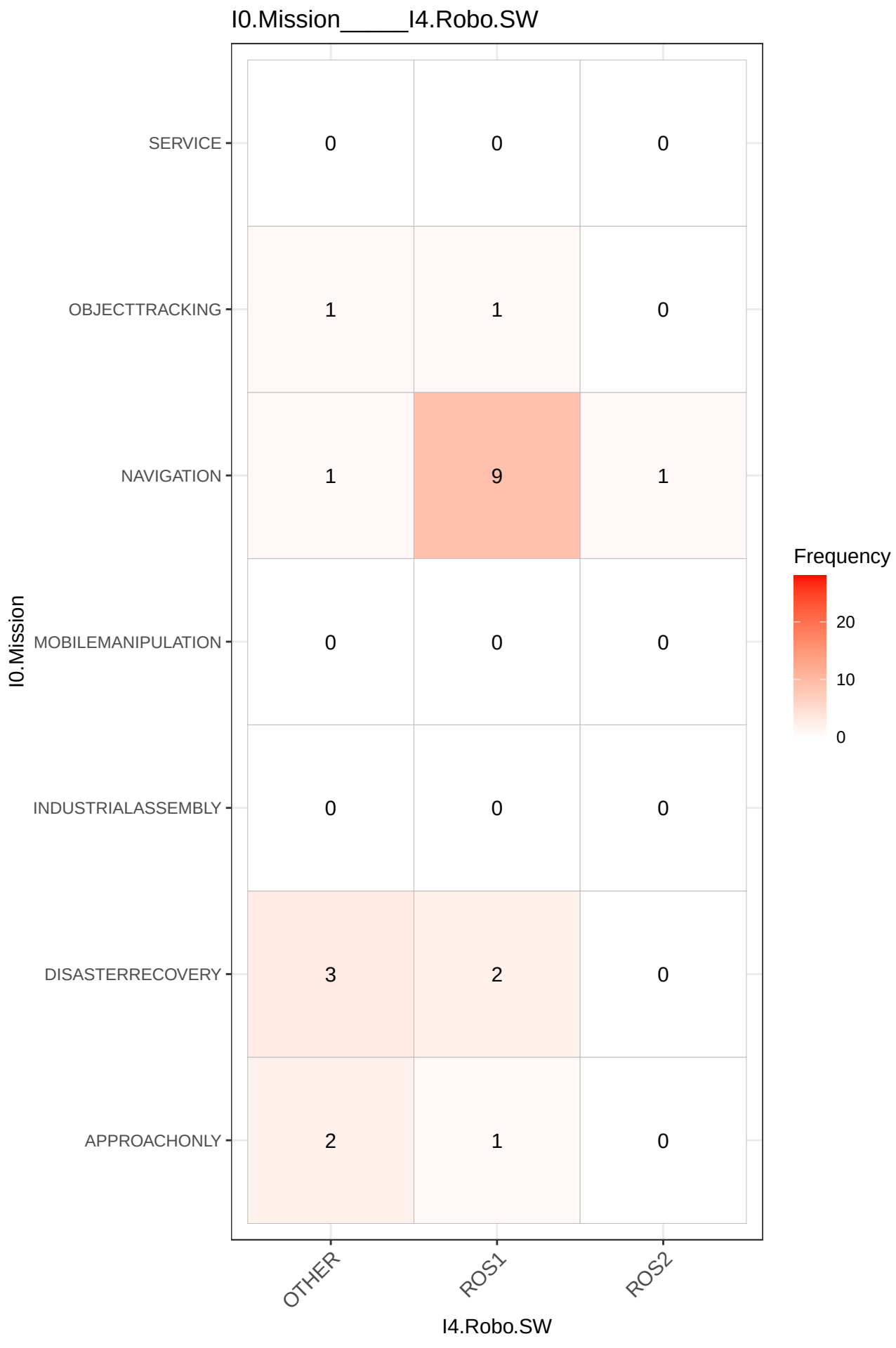
I0.Mission_____I4.Robo.SW
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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ROS1
ROS2
I4.Robo.SW
Frequency
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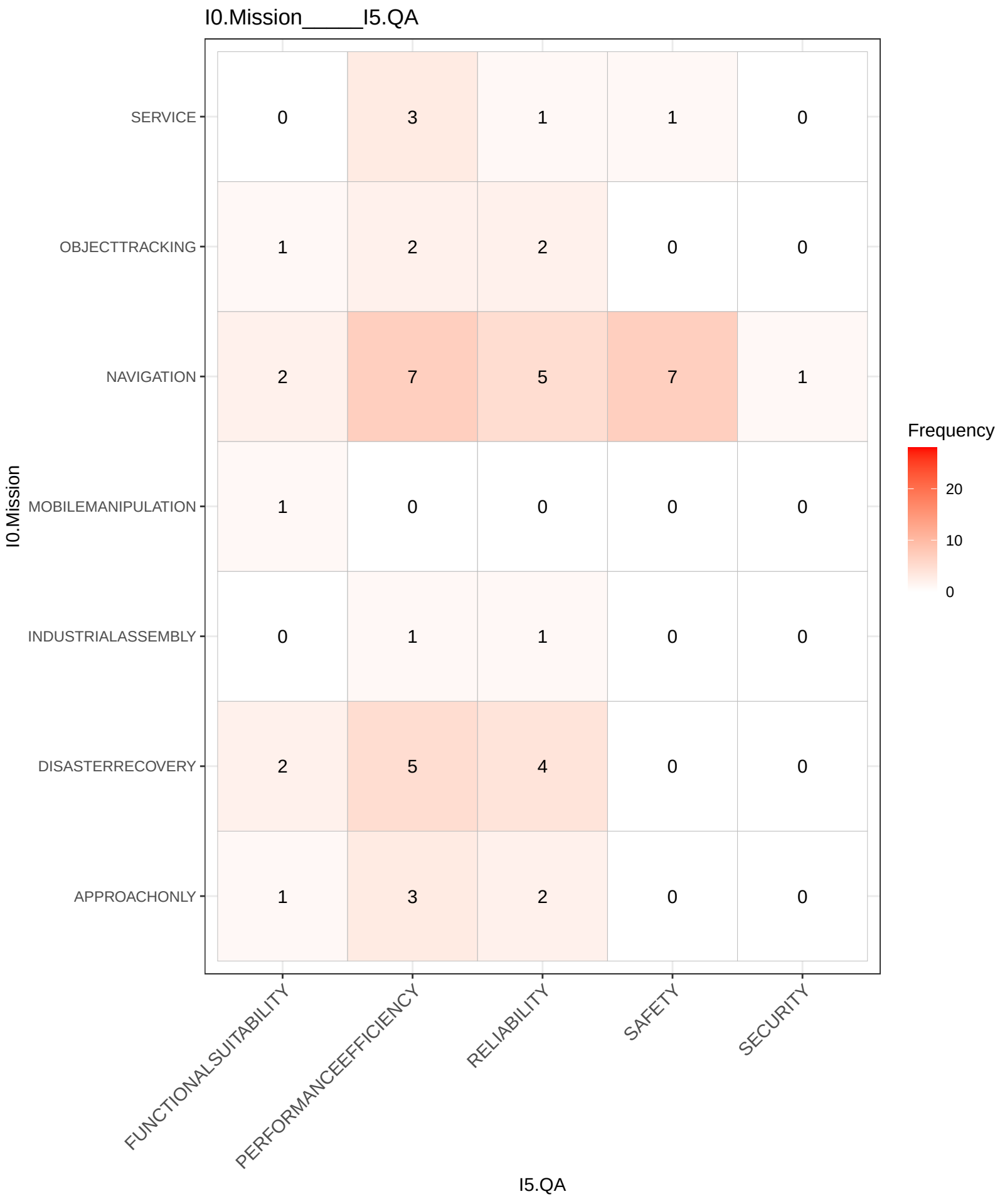
I0.Mission_____I5.QA
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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1 2 2 0 0
2 7 5 7 1
1 0 0 0 0
0 1 1 0 0
2 5 4 0 0
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PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
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10
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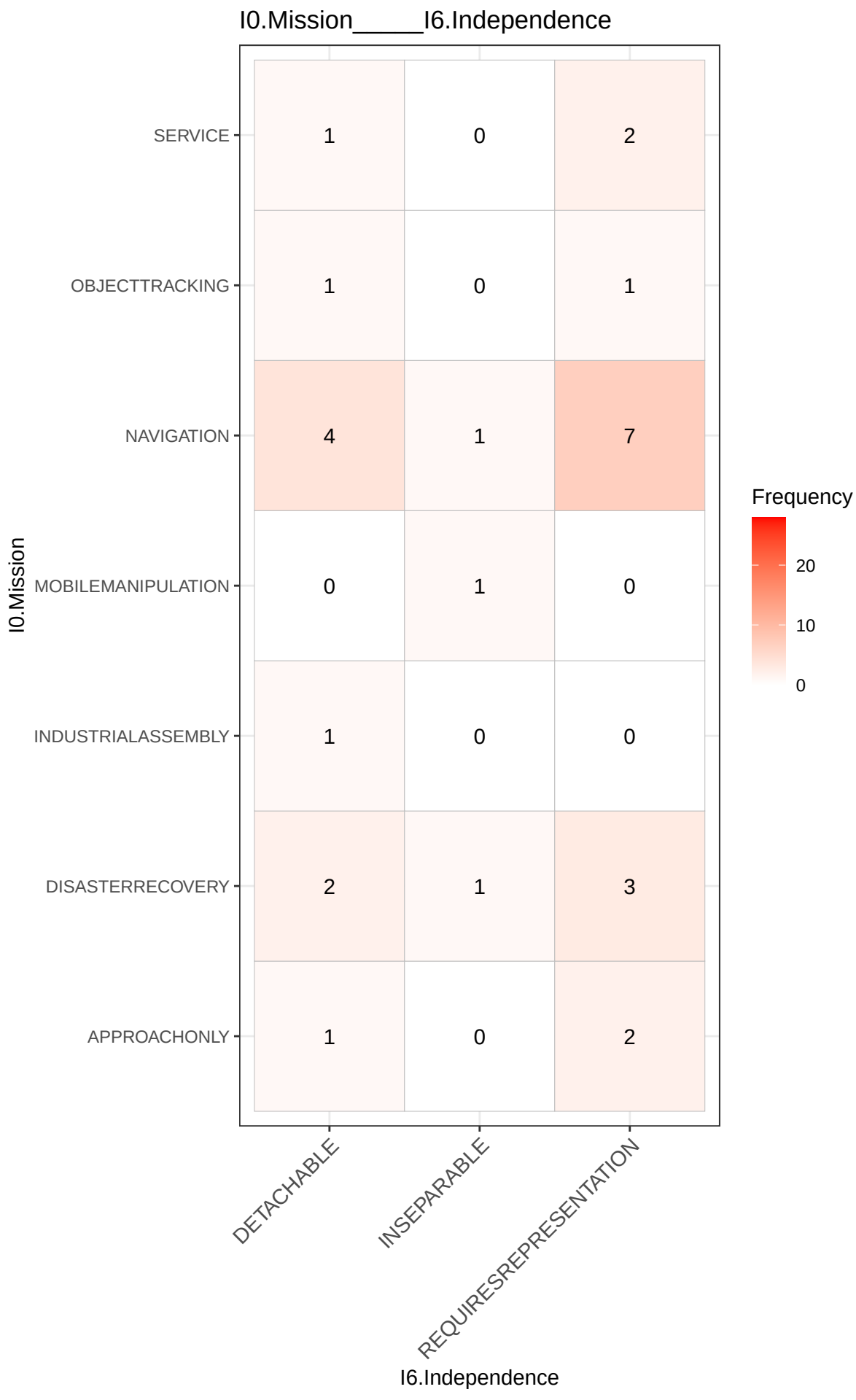
I0.Mission_____I6.Independence
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
1 0 2
1 0 1
4 1 7
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1 0 2
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
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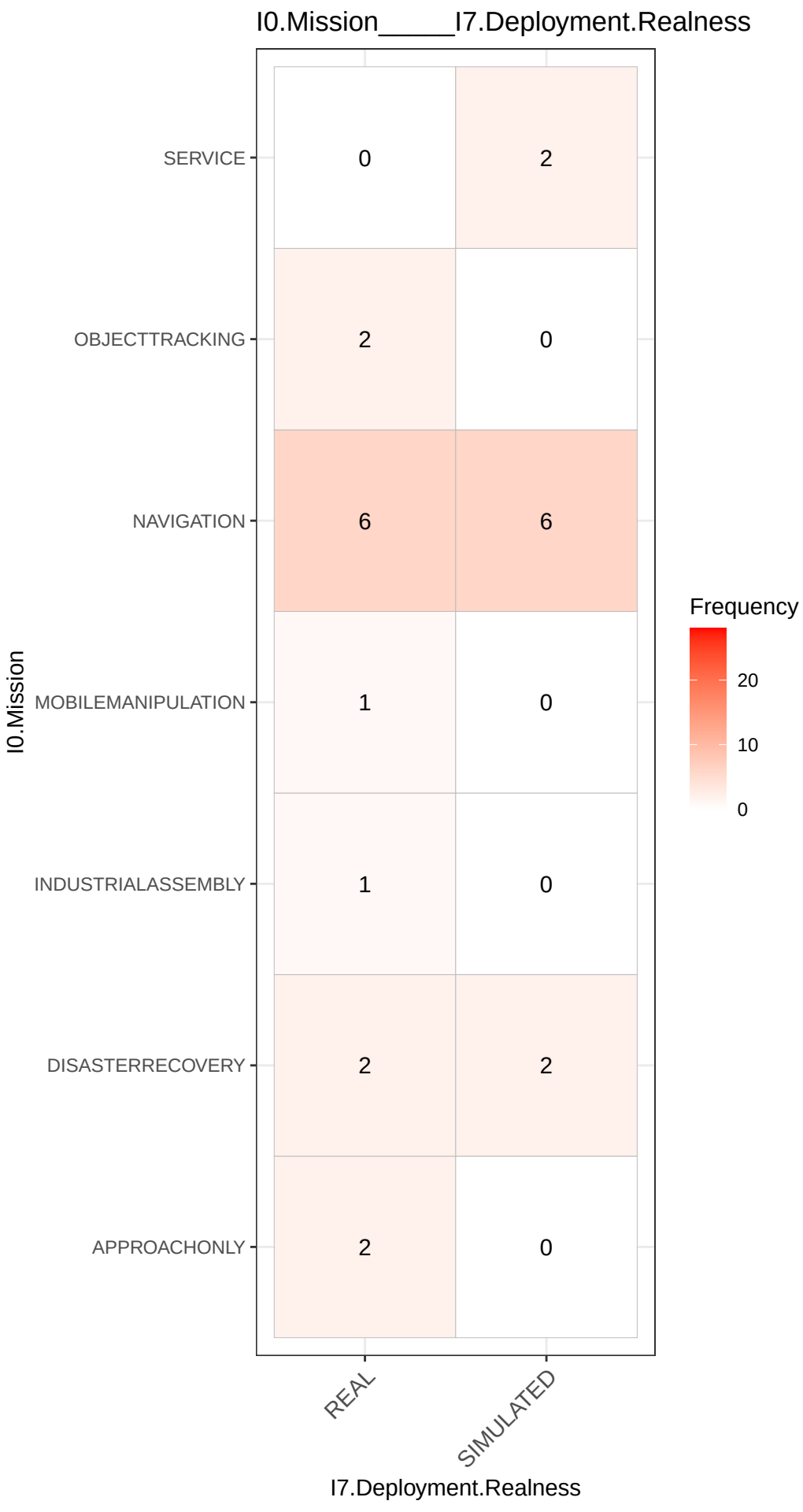
I0.Mission_____I7.Deployment.Realness
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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SIMULATED
I7.Deployment.Realness
Frequency
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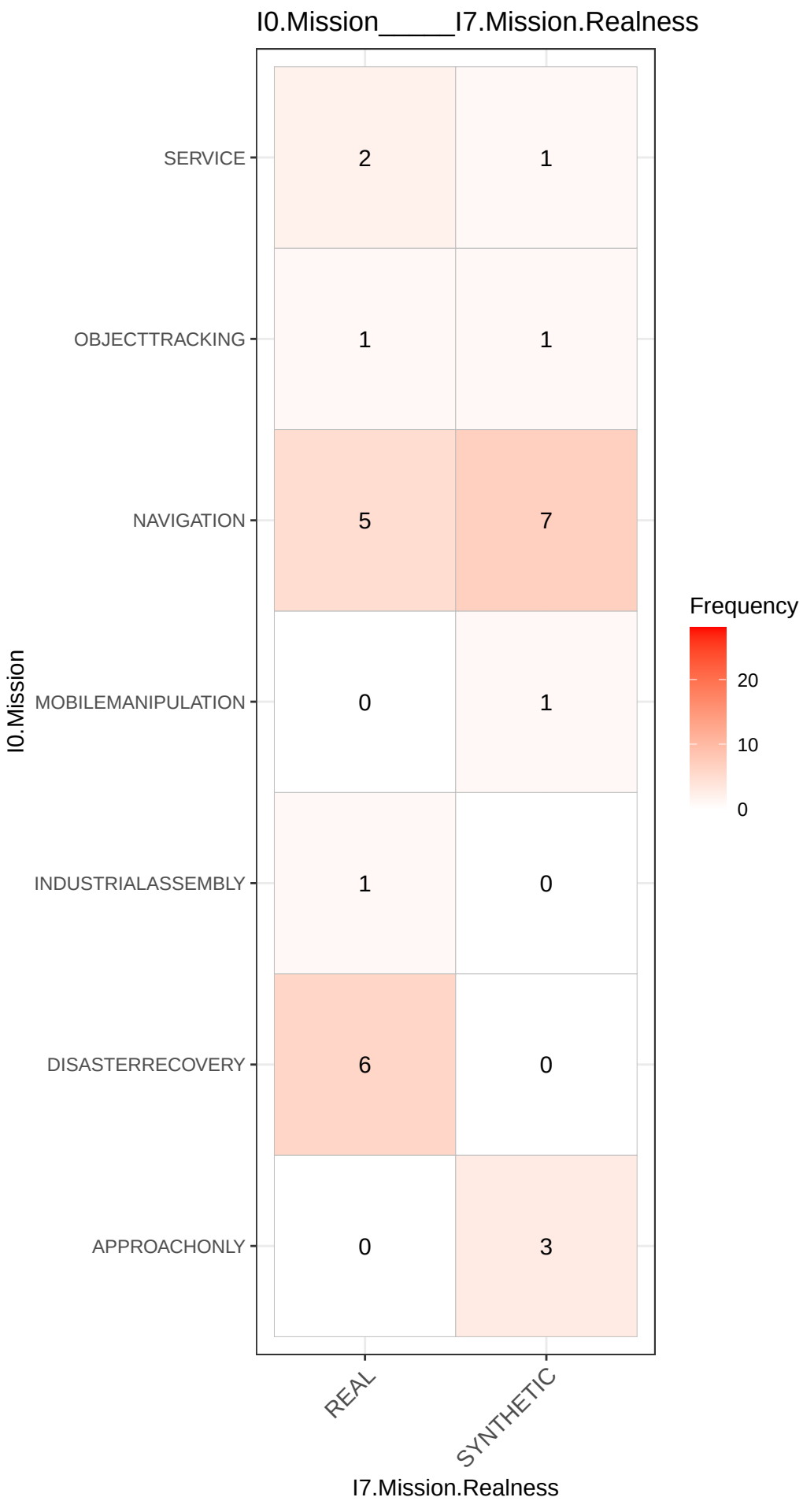
I0.Mission_____I7.Mission.Realness
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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SYNTHETIC
I7.Mission.Realness
Frequency
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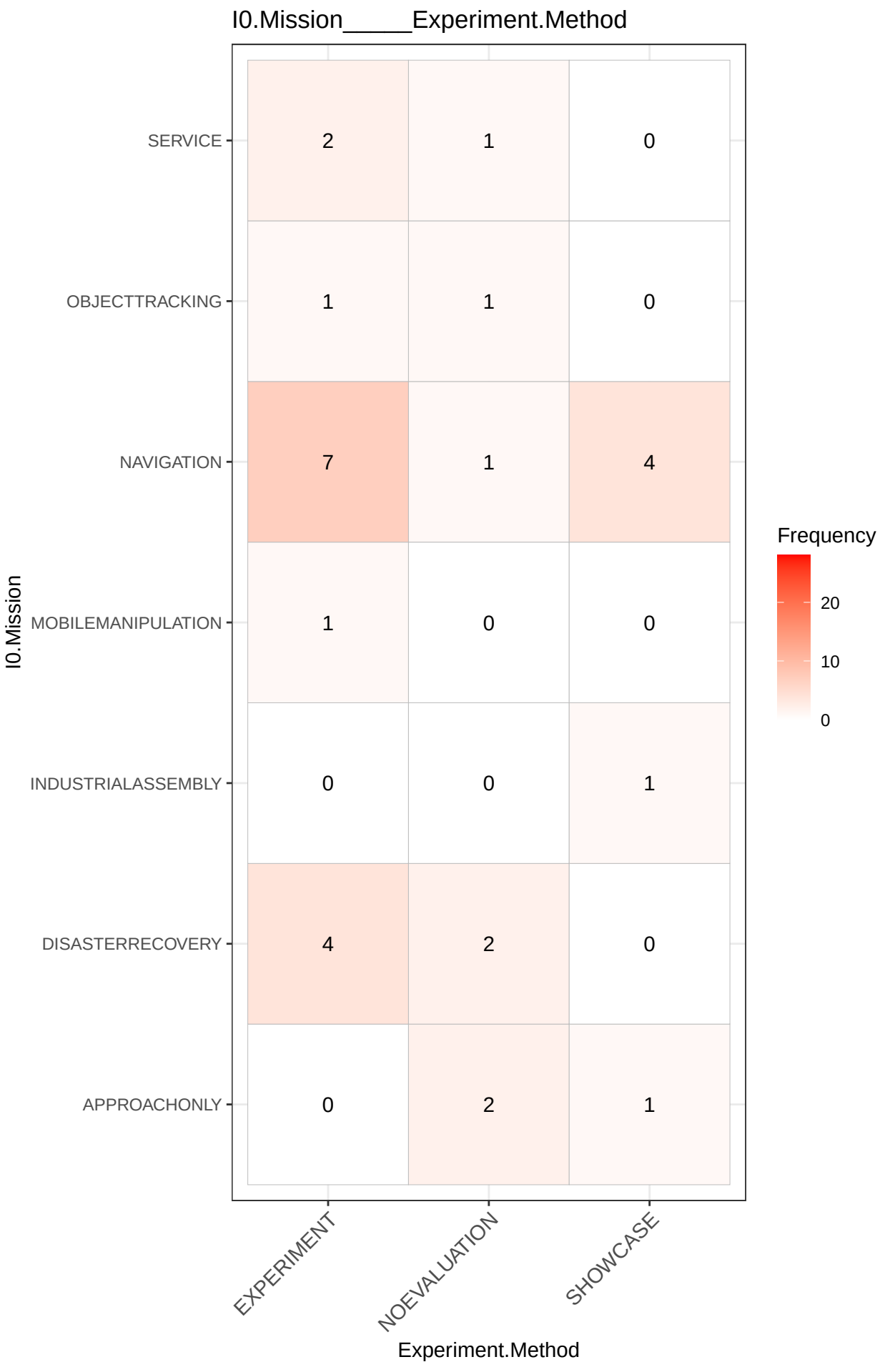
I0.Mission_____Experiment.Method
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
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1
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7
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SHOWCASE
Experiment.Method
Frequency
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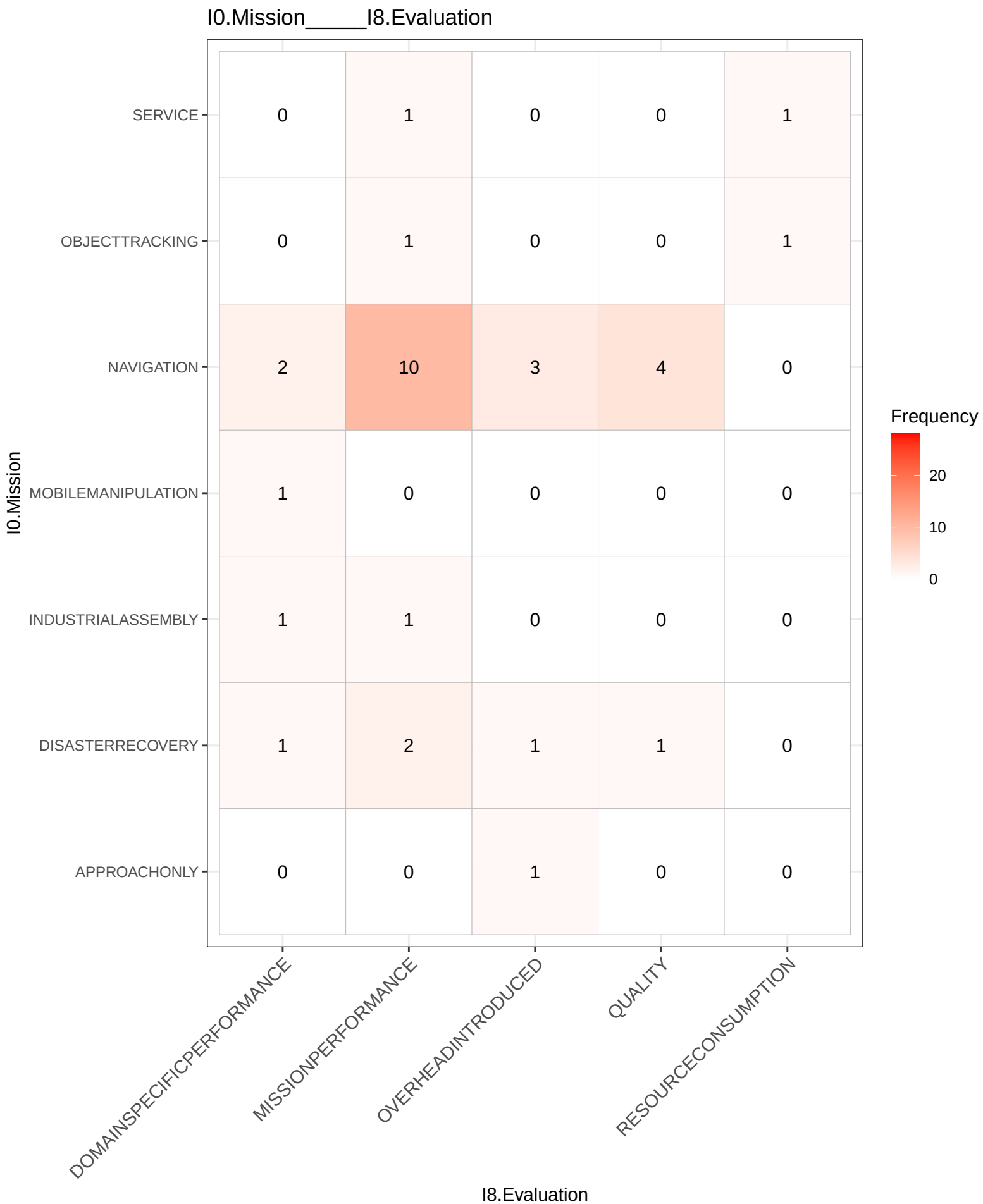
I0.Mission_____I8.Evaluation
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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0 1 0 0 1
2 10 3 4 0
1 0 0 0 0
1 1 0 0 0
1 2 1 1 0
0 0 1 0 0
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MISSIONPERFORMANCE
OVERHEADINTRODUCED
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RESOURCECONSUMPTION
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Frequency
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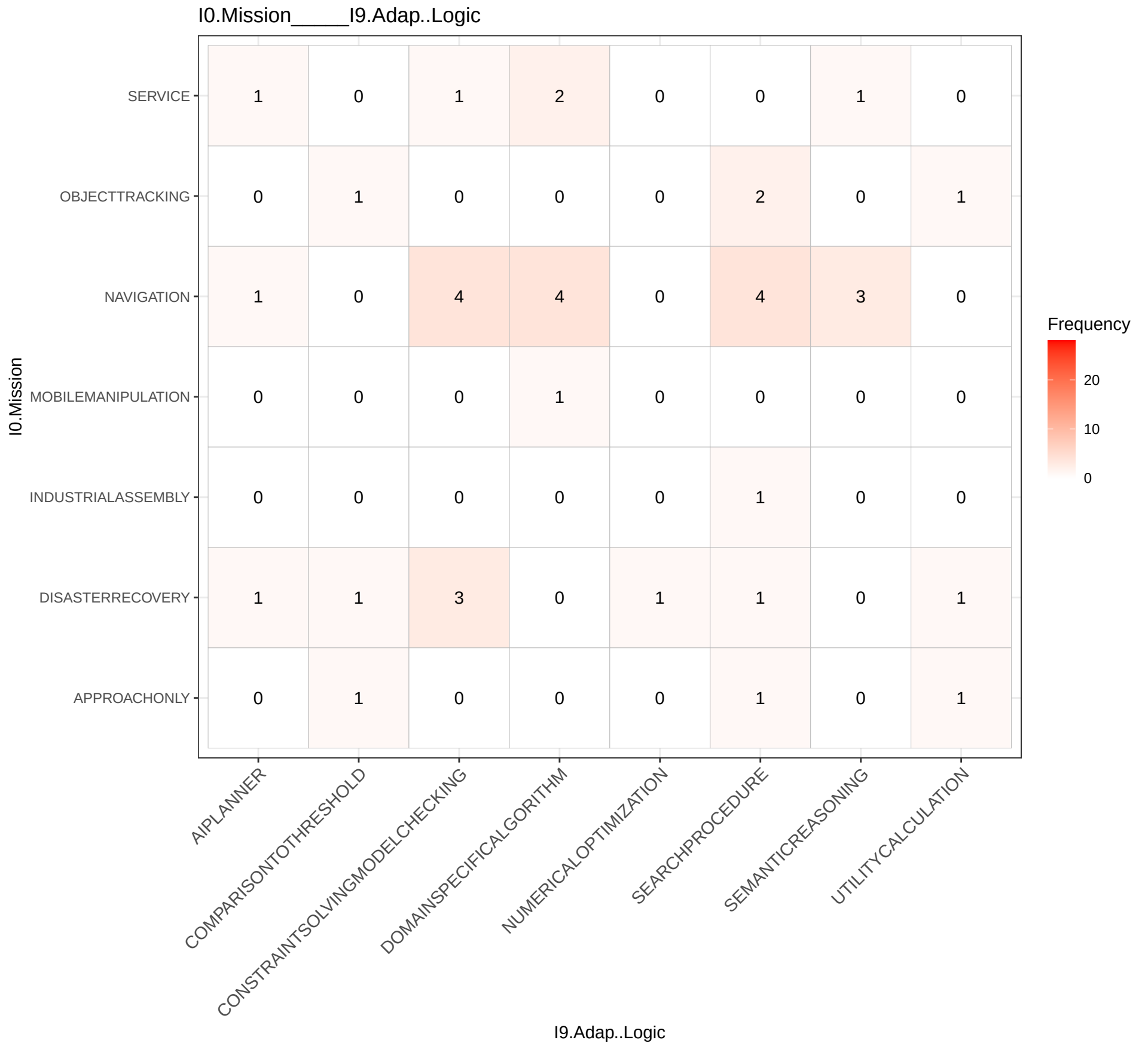
I0.Mission_____I9.Adap..Logic
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
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0 1 0 0 0 2 0 1
1 0 4 4 0 4 3 0
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1 1 3 0 1 1 0 1
0 1 0 0 0 1 0 1
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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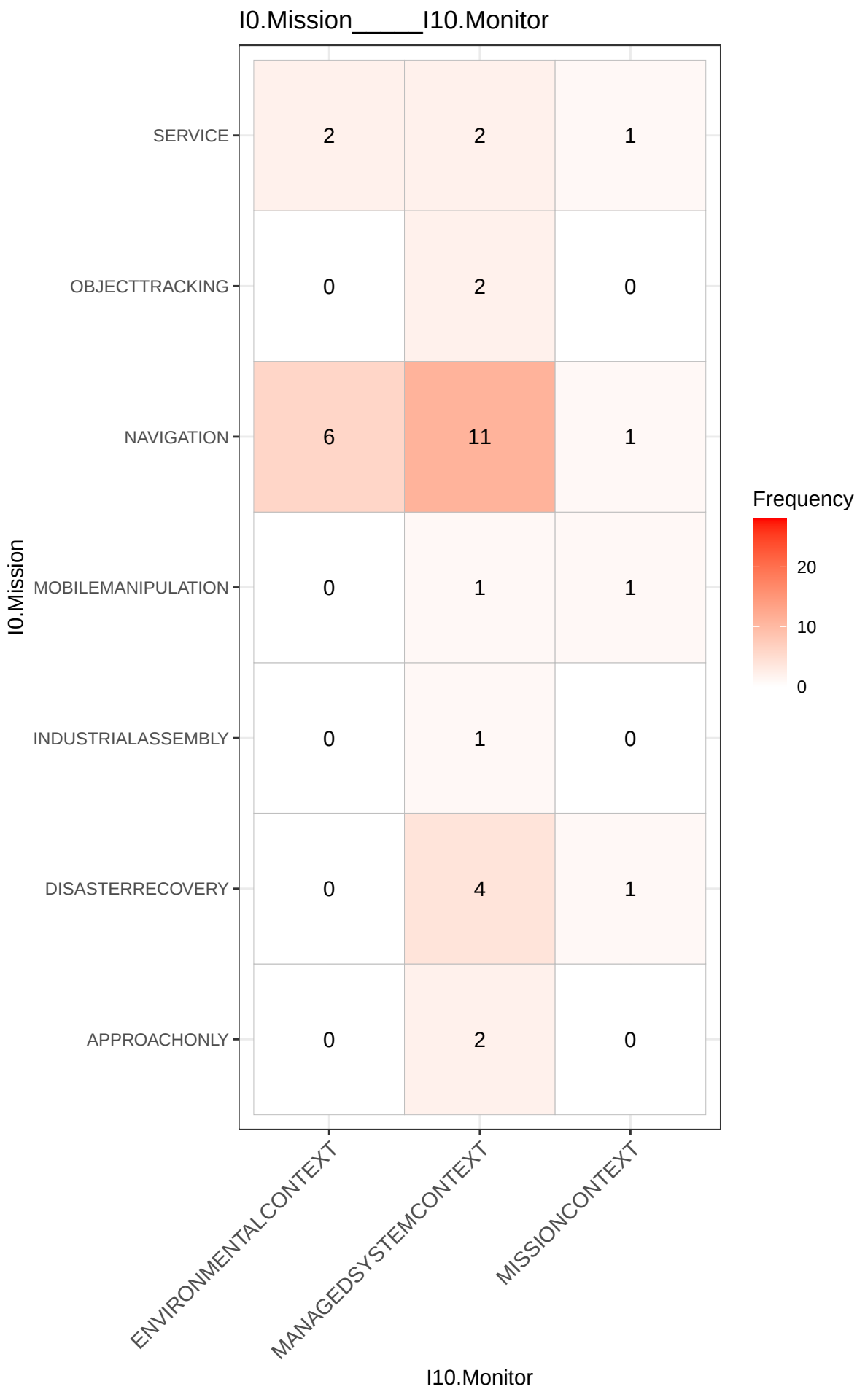
I0.Mission_____I10.Monitor
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
2
1
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2
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6
11
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MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
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Frequency
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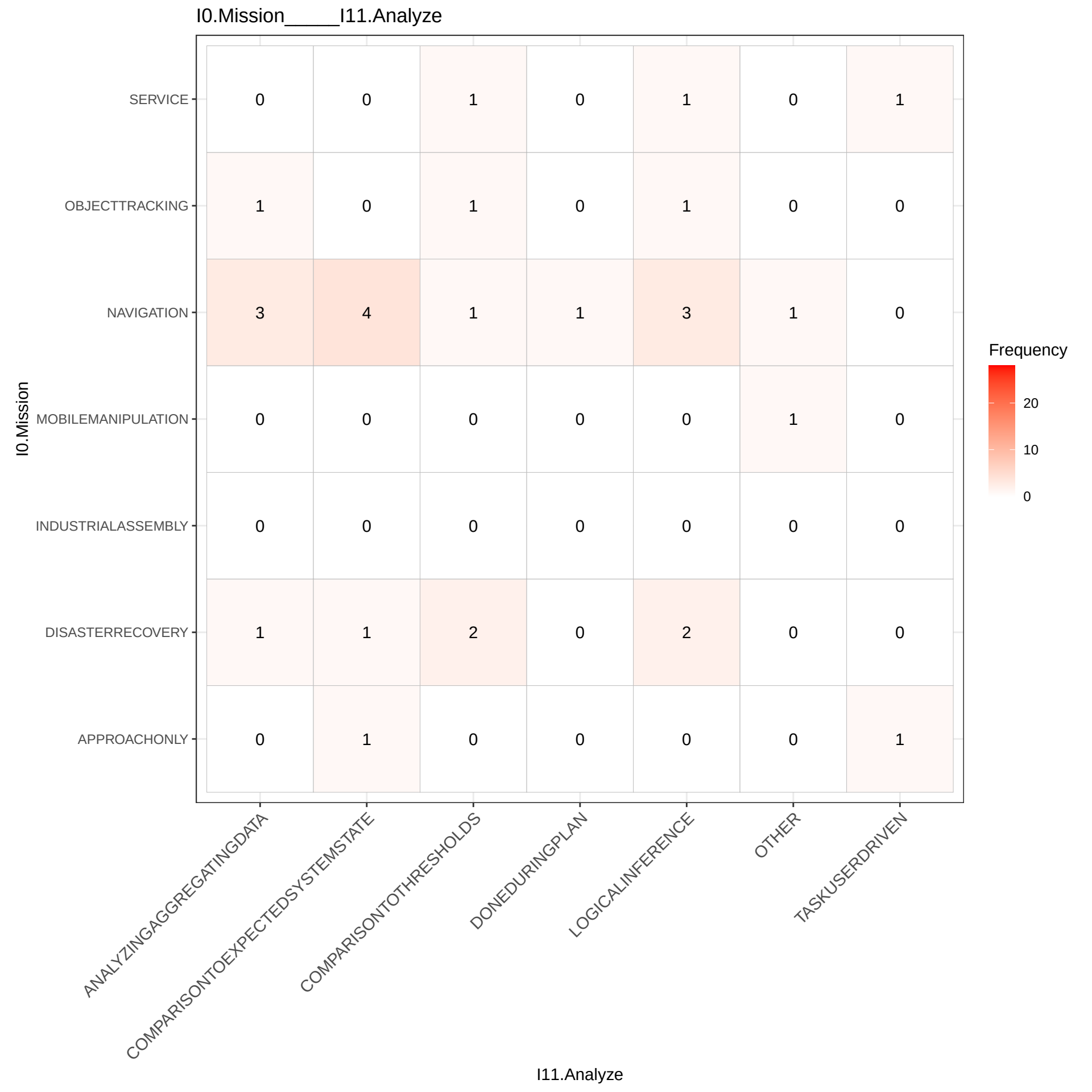
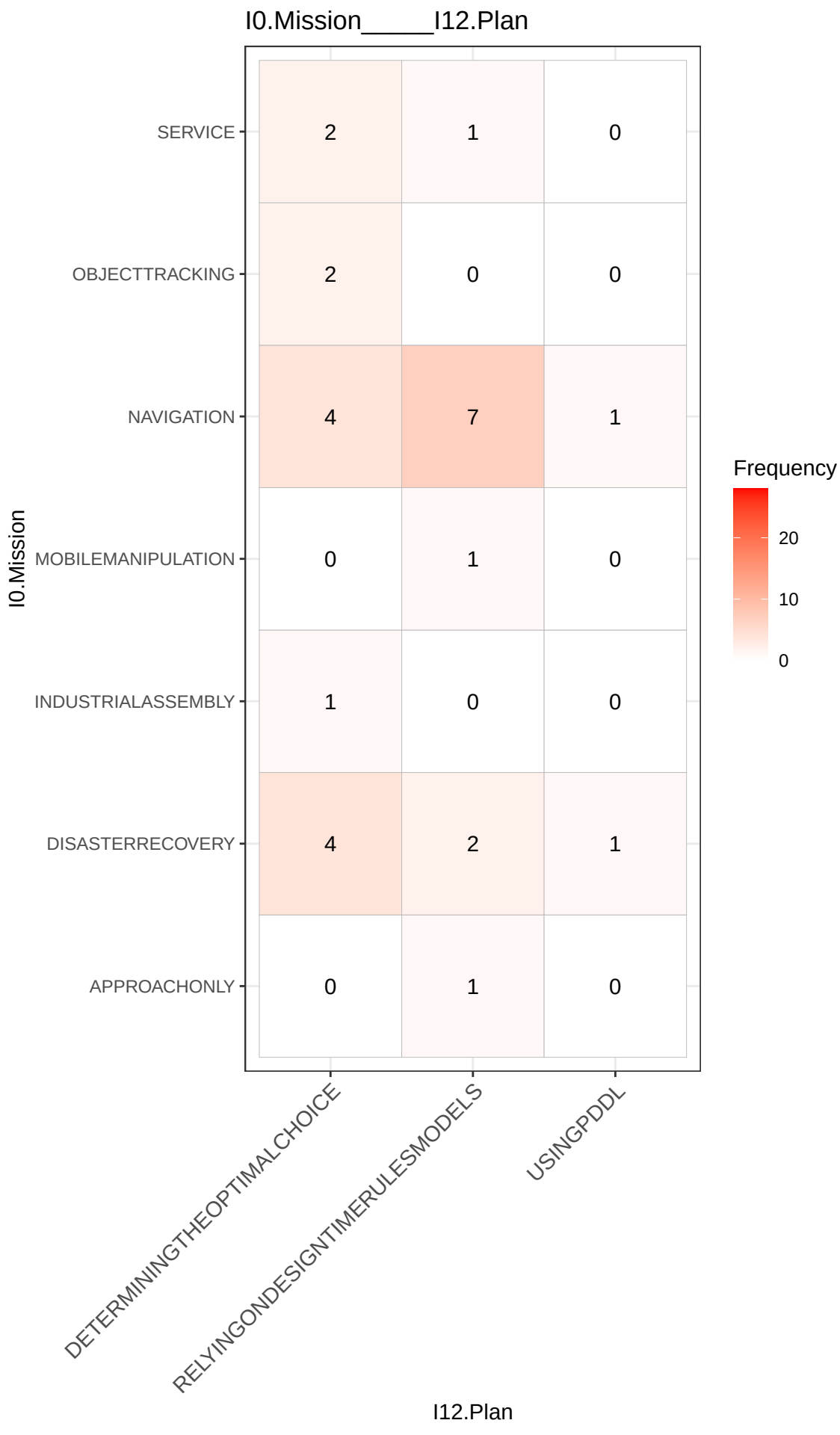
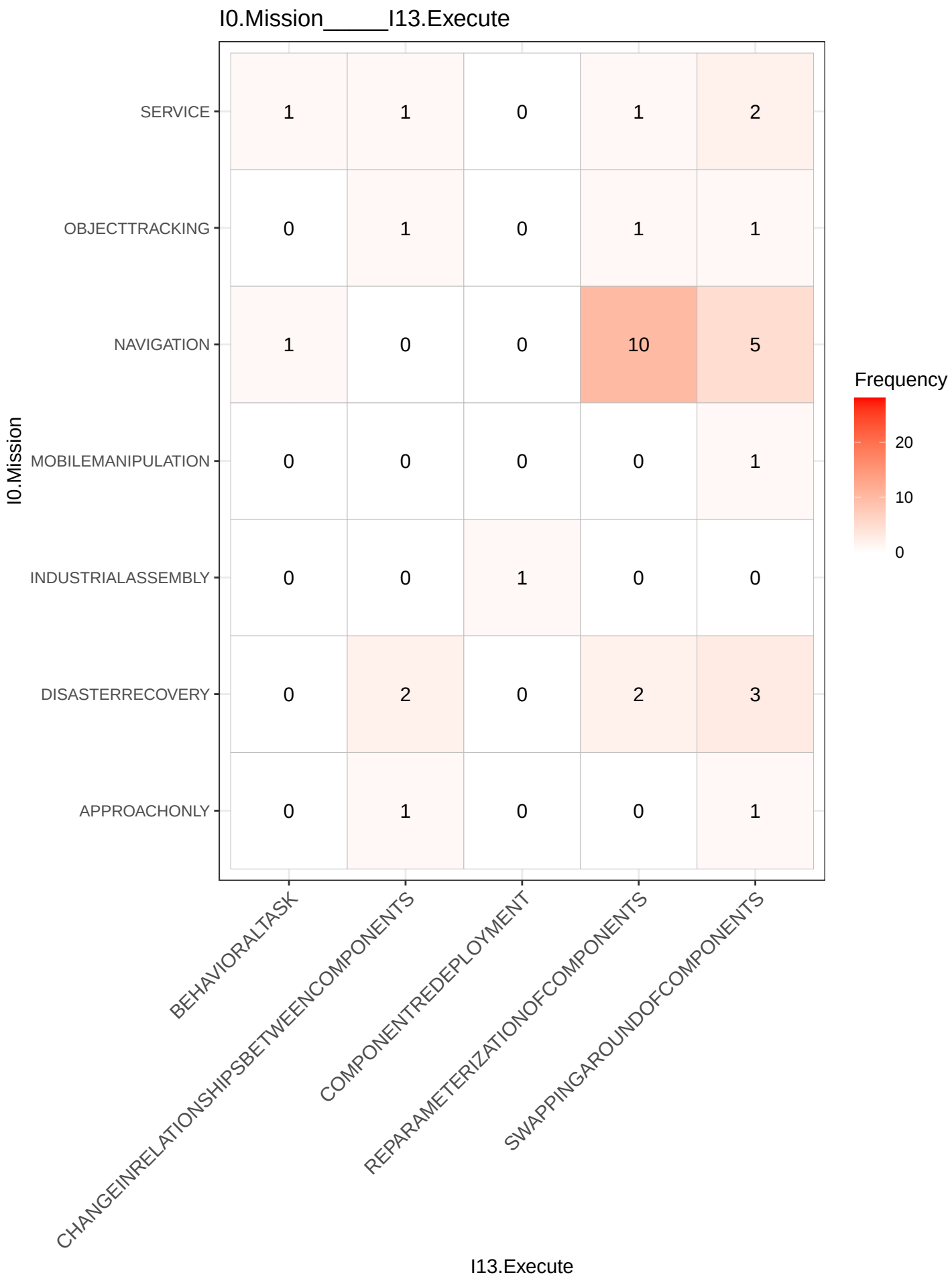
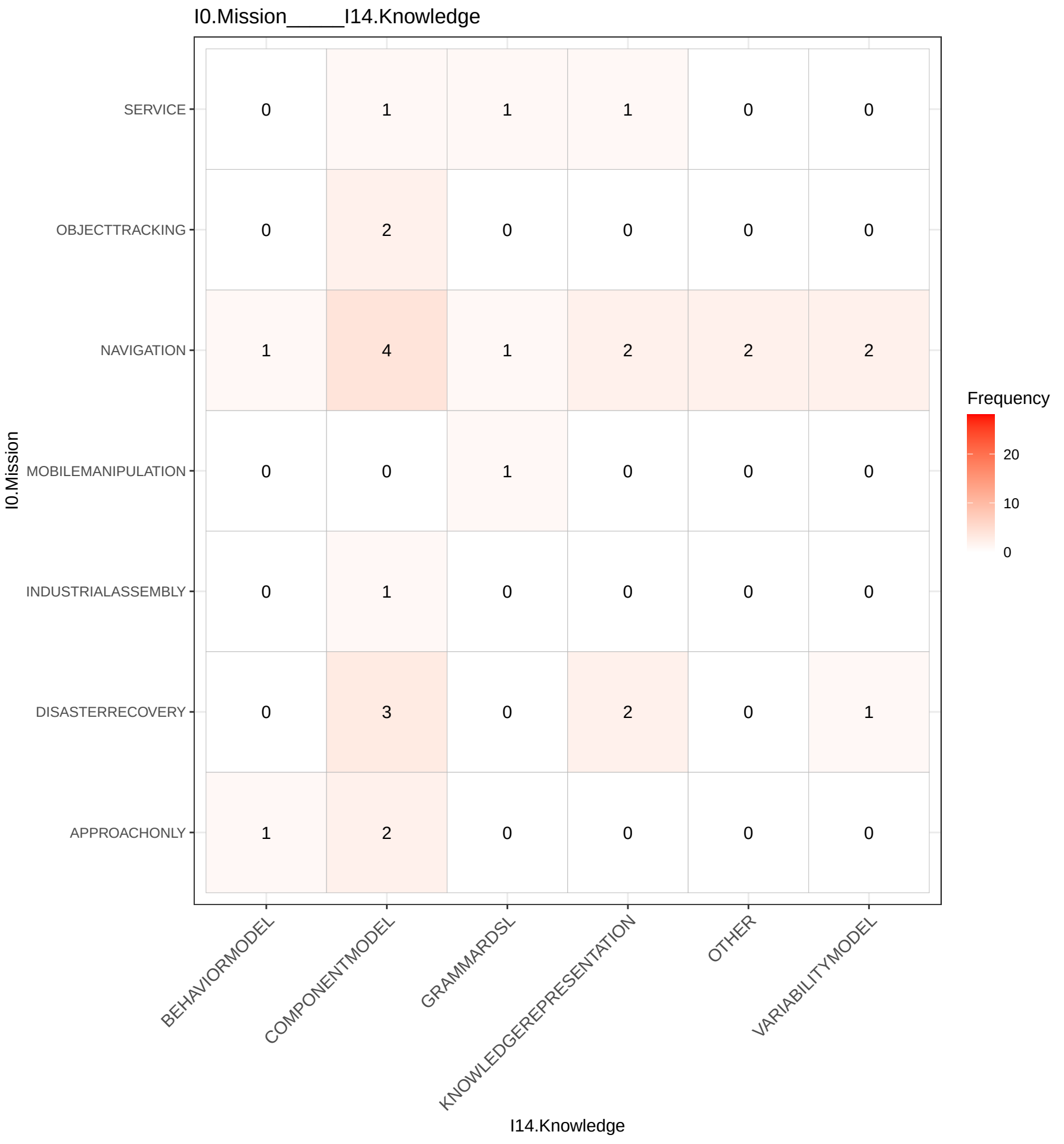
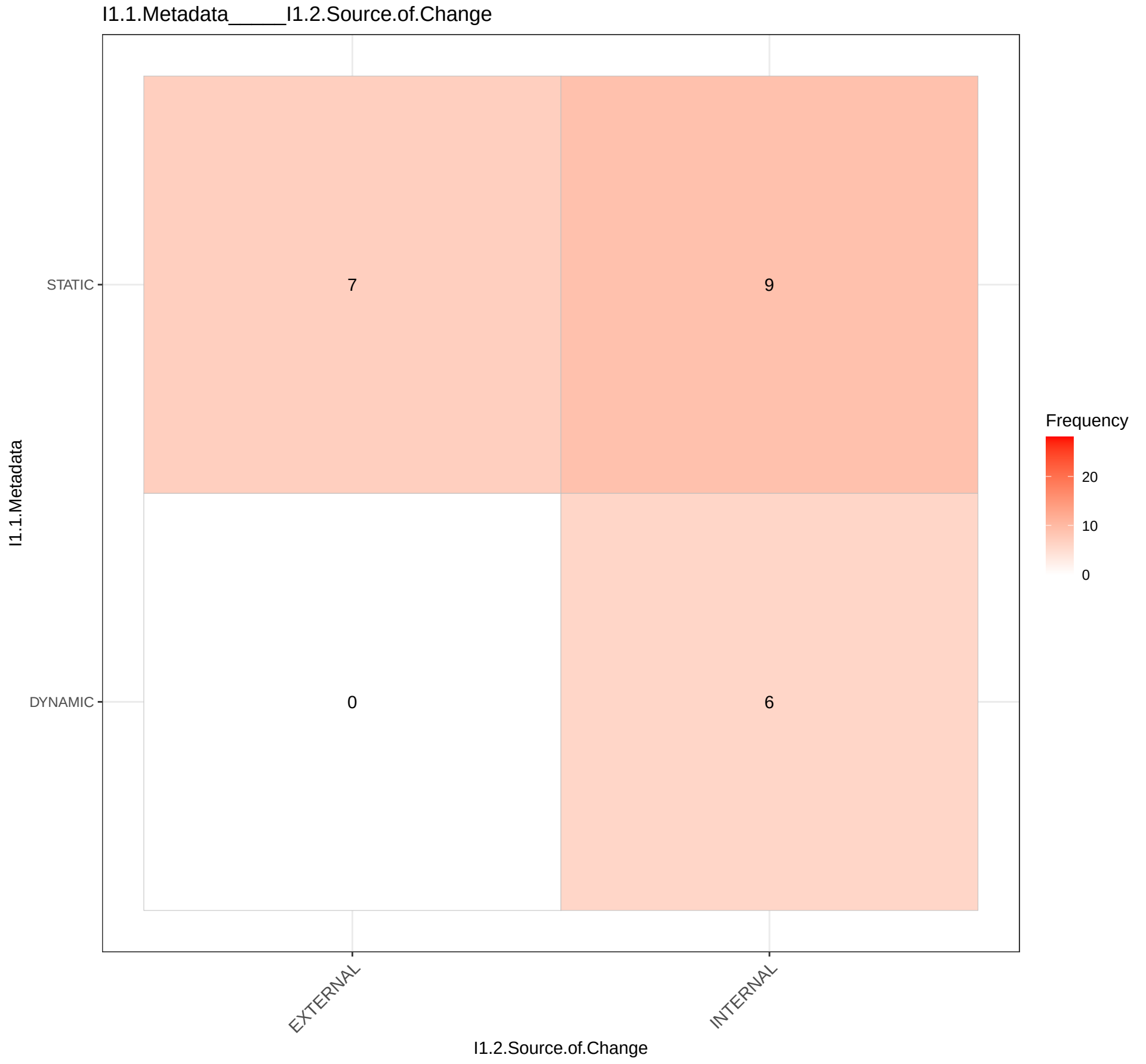
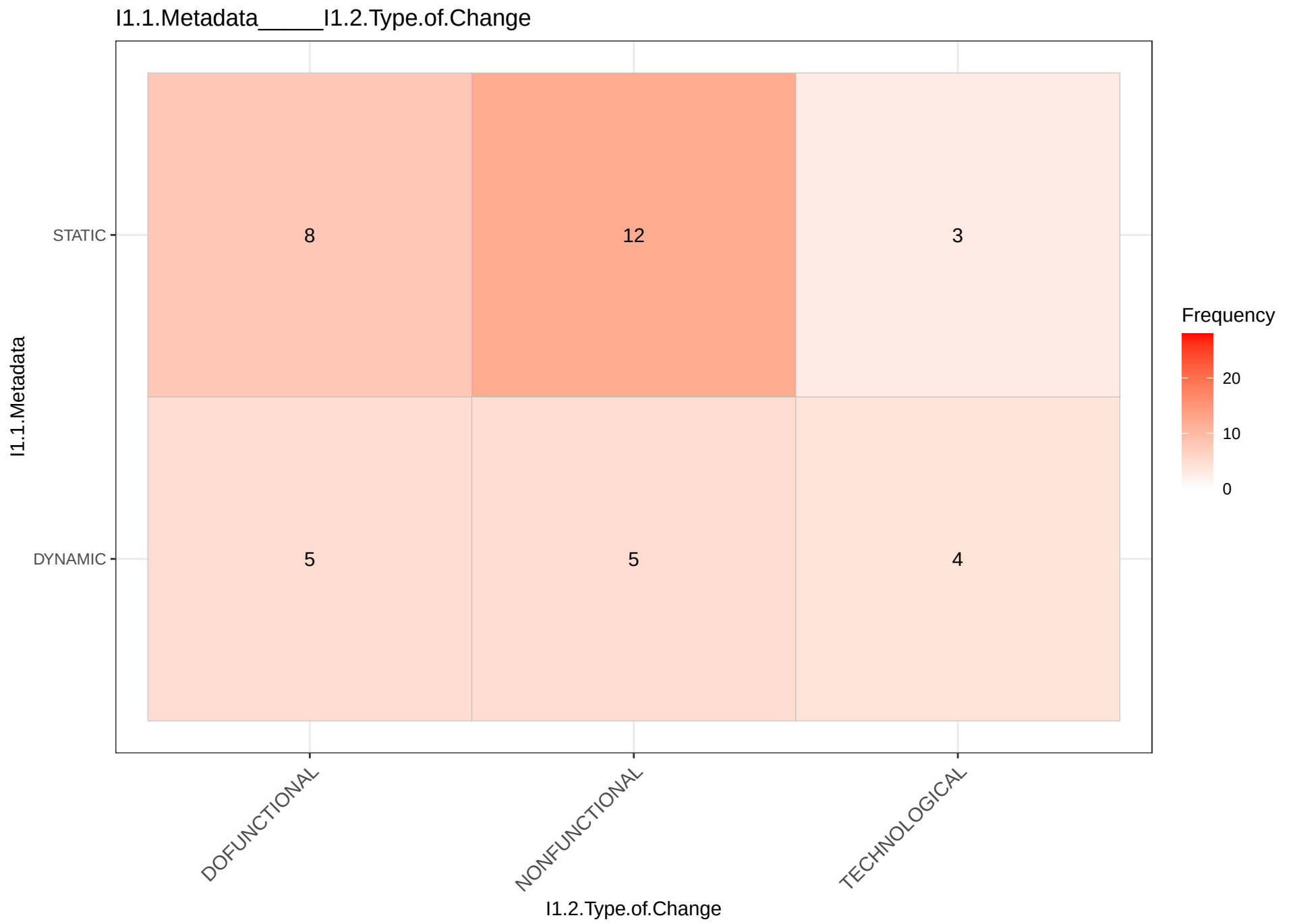

I0.Mission_____I11.Analyze
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
0 0 1 0 1 0 1
1 0 1 0 1 0 0
3 4 1 1 3 1 0
0 0 0 0 0 1 0
0 0 0 0 0 0 0
1 1 2 0 2 0 0
0 1 0 0 0 0 1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
0

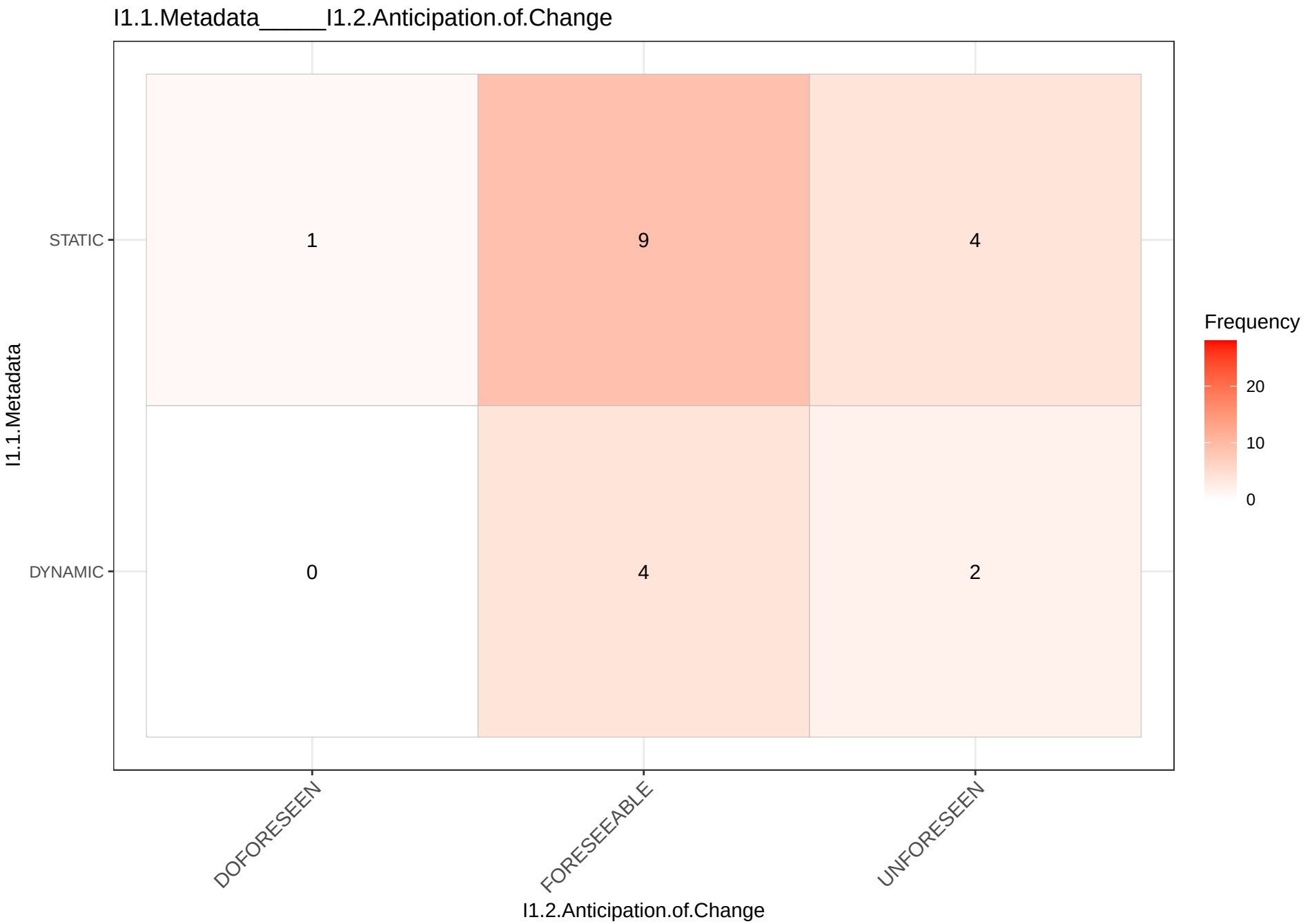

I0.Mission_____I12.Plan
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
2
1
0
2
0
0
4
7
1
0
1
0
1
0
0
4
2
1
0
1
0
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0

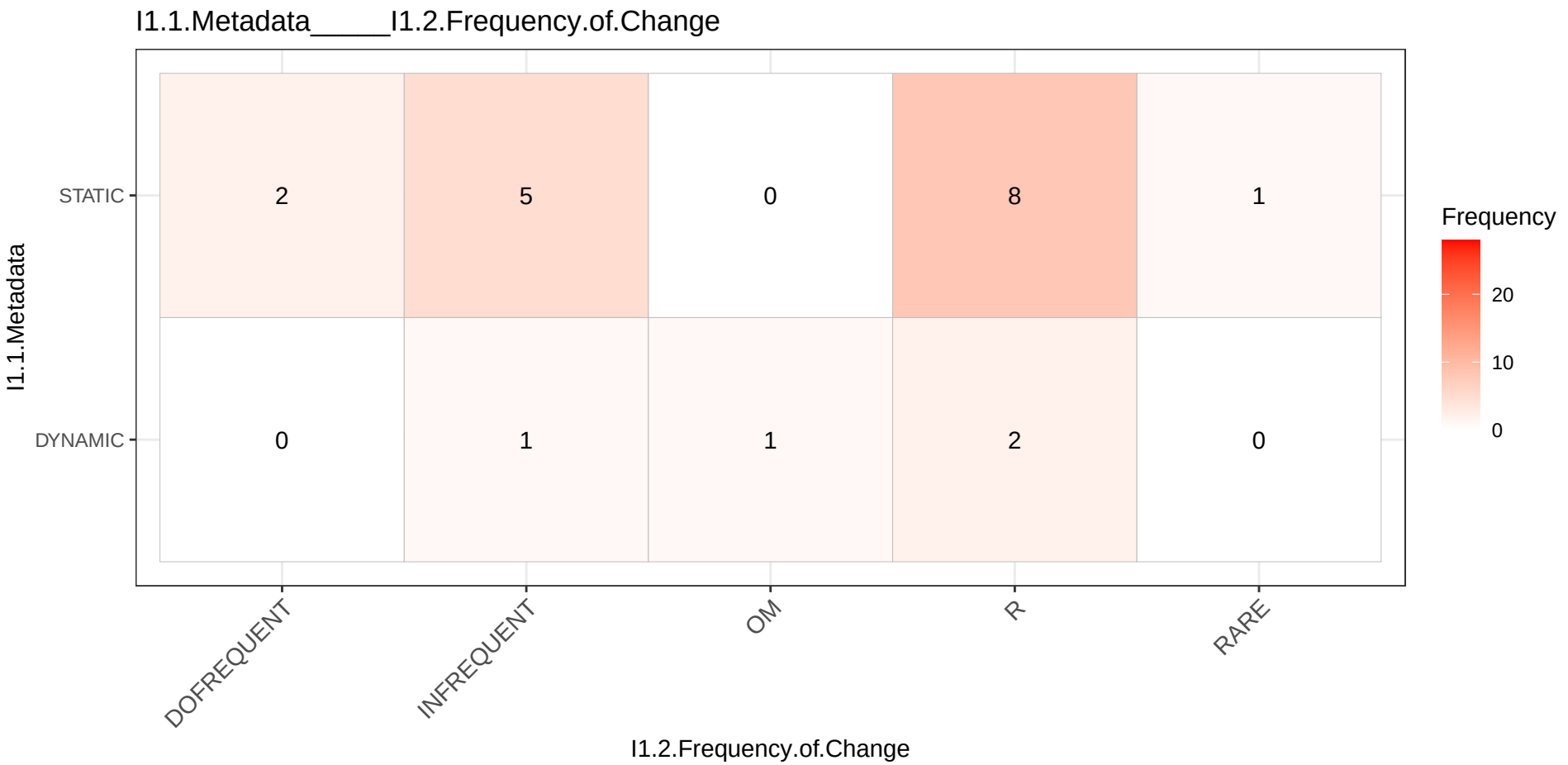

I0.Mission_____I13.Execute
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
1 1 0 1 2
0 1 0 1 1
1 0 0 10 5
0 0 0 0 1
0 0 1 0 0
0 2 0 2 3
0 1 0 0 1
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0

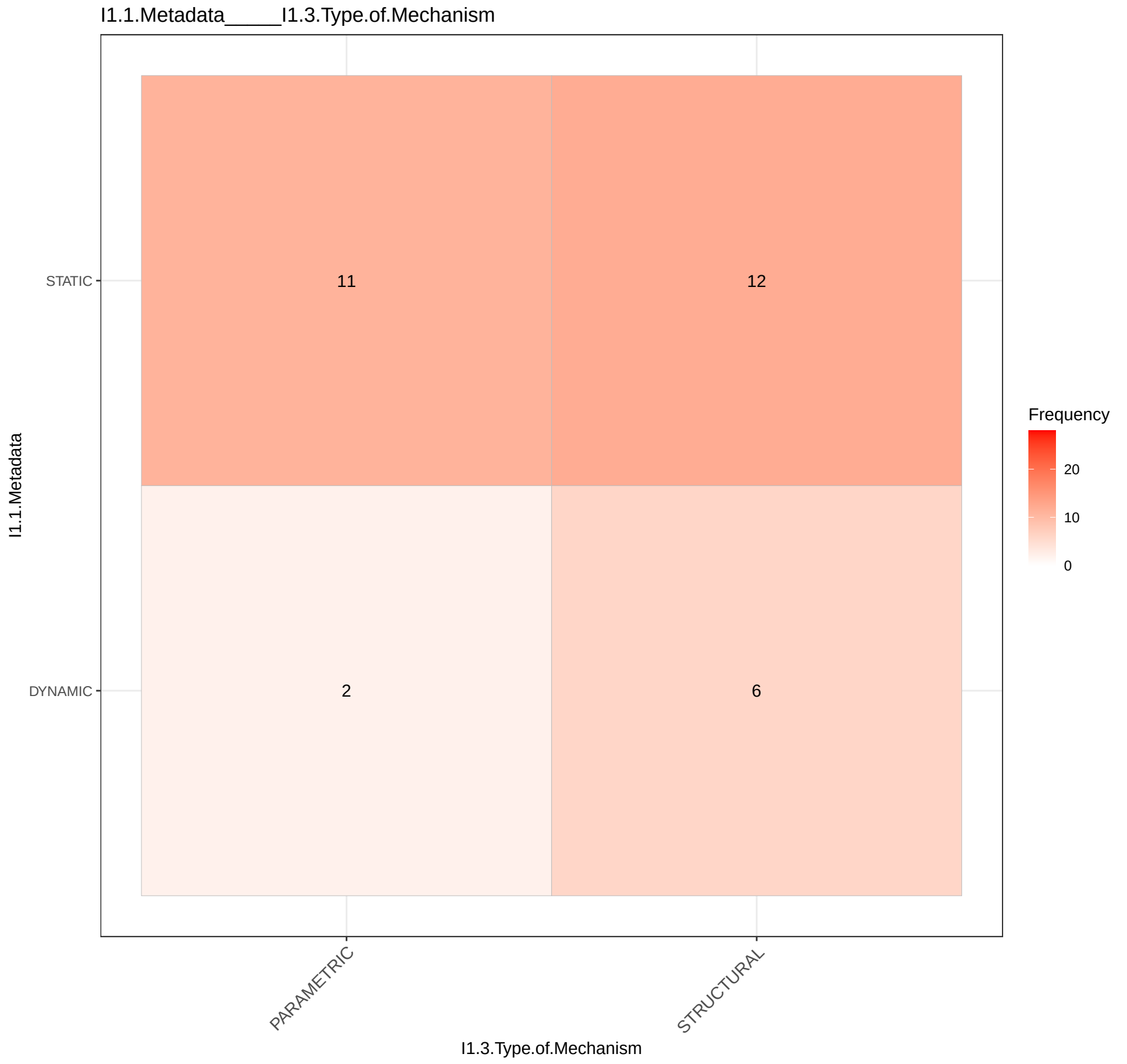

I0.Mission_____I14.Knowledge
SERVICE
OBJECTTRACKING
NAVIGATION
MOBILEMANIPULATION
INDUSTRIALASSEMBLY
DISASTERRECOVERY
APPROACHONLY
I0.Mission
0 1 1 1 0 0
0 2 0 0 0 0
1 4 1 2 2 2
0 0 1 0 0 0
0 1 0 0 0 0
0 3 0 2 0 1
1 2 0 0 0 0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

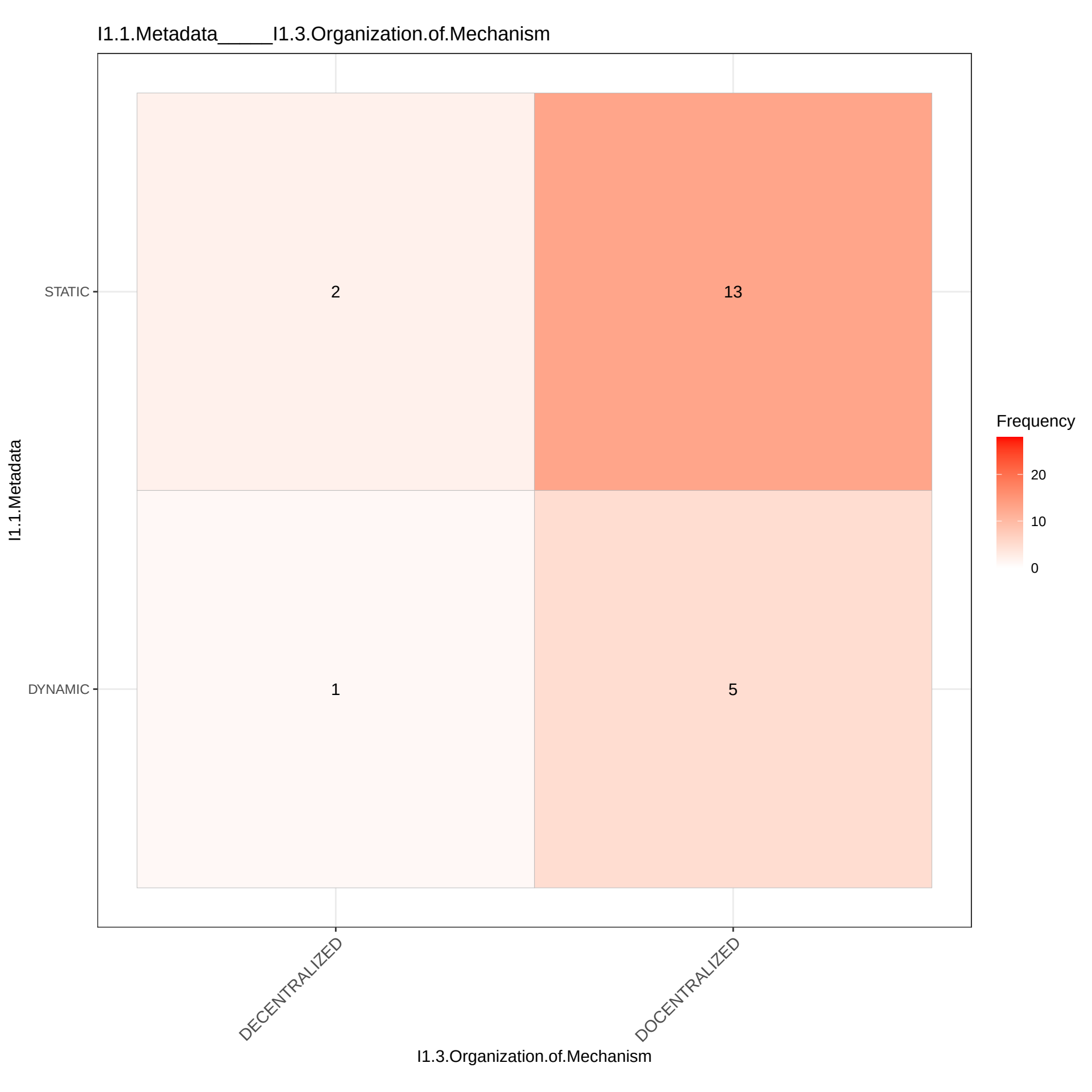

I1.1.Metadata_____I1.2.Source.of.Change
STATIC
DYNAMIC
7
9
0
6
EXTERNAL
INTERNAL
I1.1.Metadata
I1.2.Source.of.Change
Frequency
20
10
0

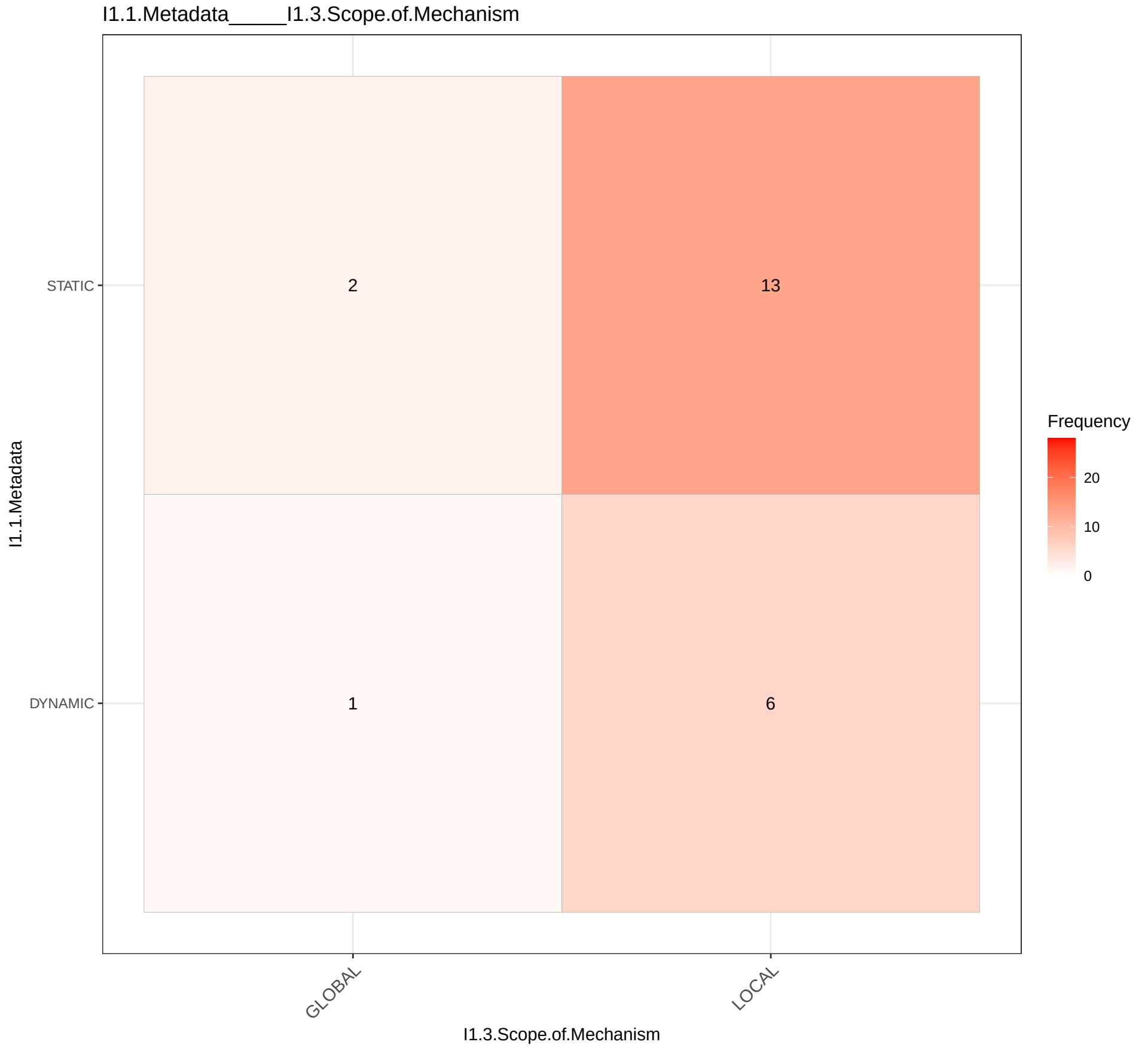

I1.1.Metadata_____I1.2.Type.of.Change
STATIC
DYNAMIC
I1.1.Metadata
8
12
3
5
5
4
Frequency
20
10
0
DOFUNCTIONAL
NONFUNCTIONAL
TECHNOLOGICAL
I1.2.Type.of.Change

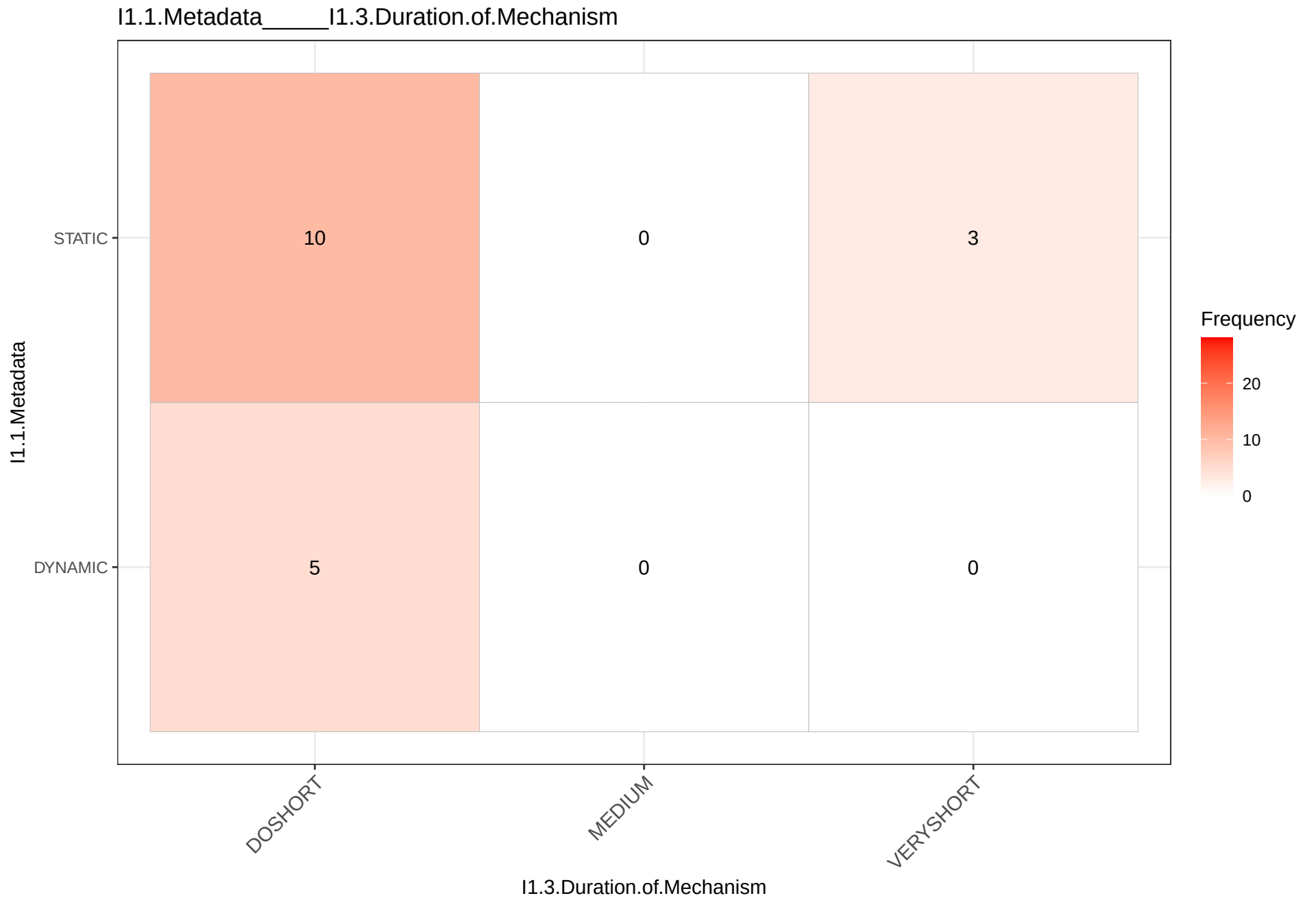

I1.1.Metadata_____I1.2.Anticipation.of.Change
STATIC
DYNAMIC
1
9
4
0
4
2
I1.1.Metadata
DOFORESEEN
FORESEEABLE
UNFORESEEN
I1.2.Anticipation.of.Change
Frequency
20
10
0

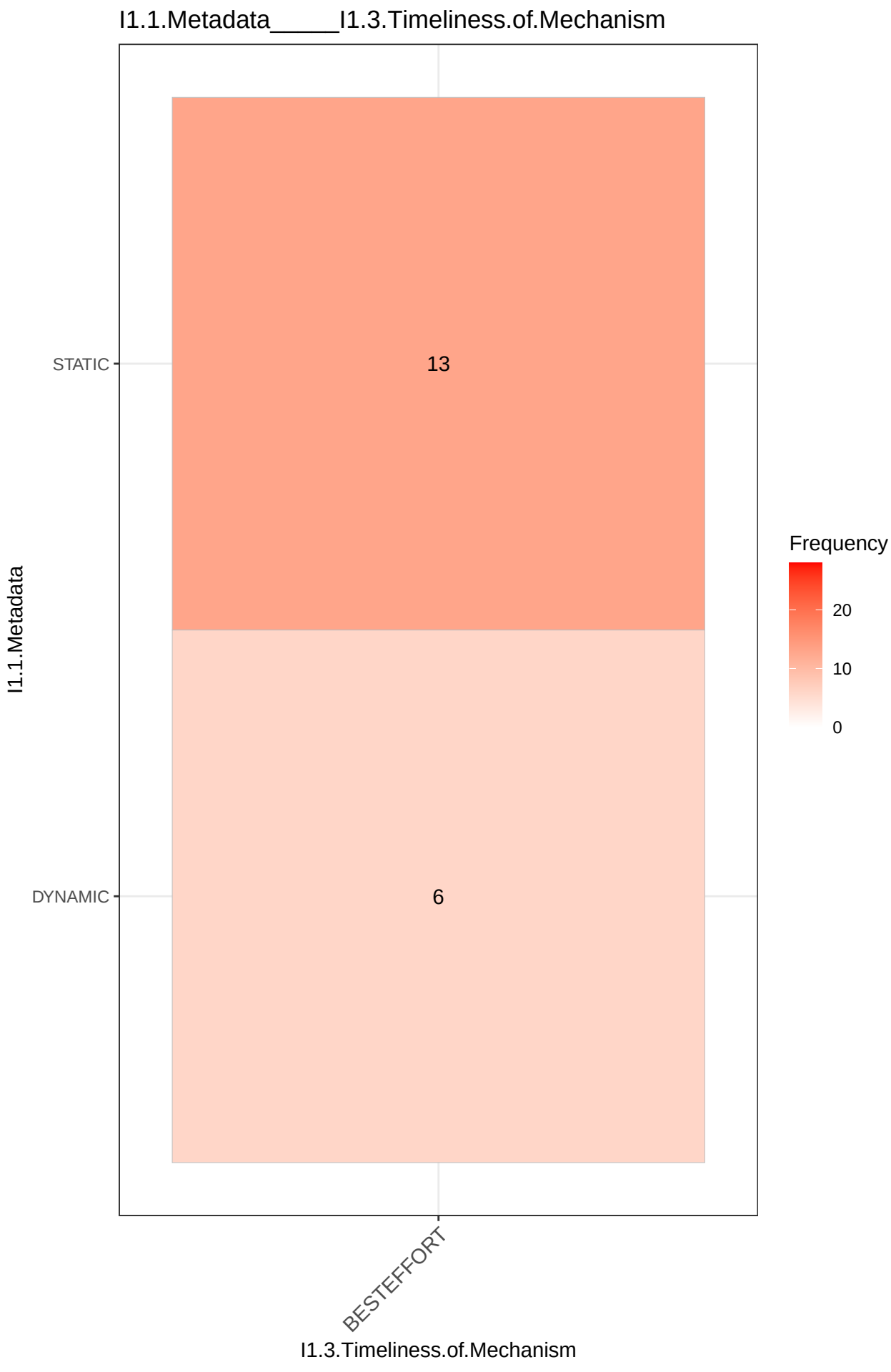

I1.1.Metadata_____I1.2.Frequency.of.Change
STATIC
DYNAMIC
I1.1.Metadata
2
5
0
8
1
0
1
1
2
0
DOFREQUENT
INFREQUENT
OM
R
RARE
I1.2.Frequency.of.Change
Frequency
20
10
0

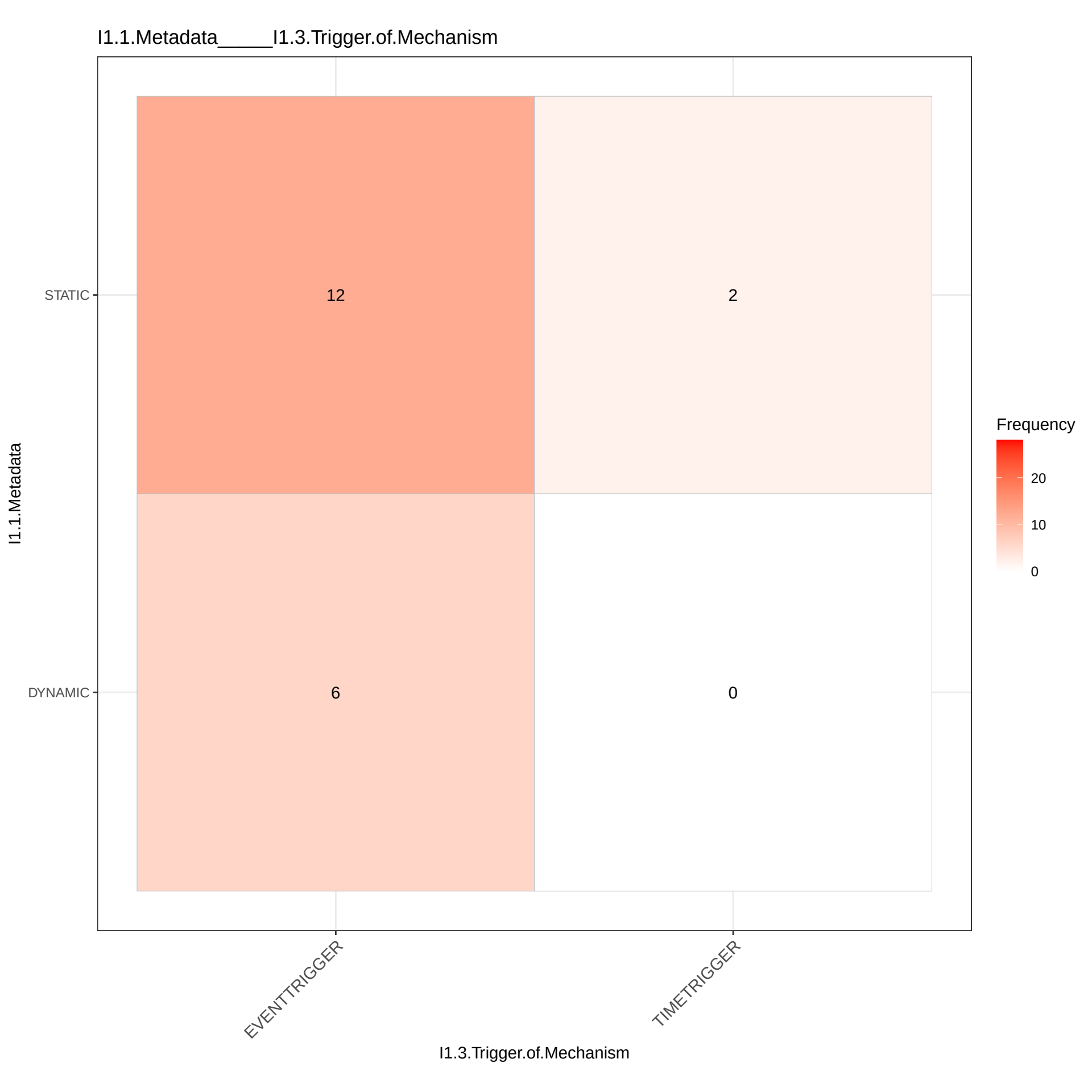

I1.1.Metadata_____I1.3.Type.of.Mechanism
STATIC
DYNAMIC
11
12
2
6
I1.1.Metadata
PARAMETRIC
STRUCTURAL
I1.3.Type.of.Mechanism
Frequency
20
10
0

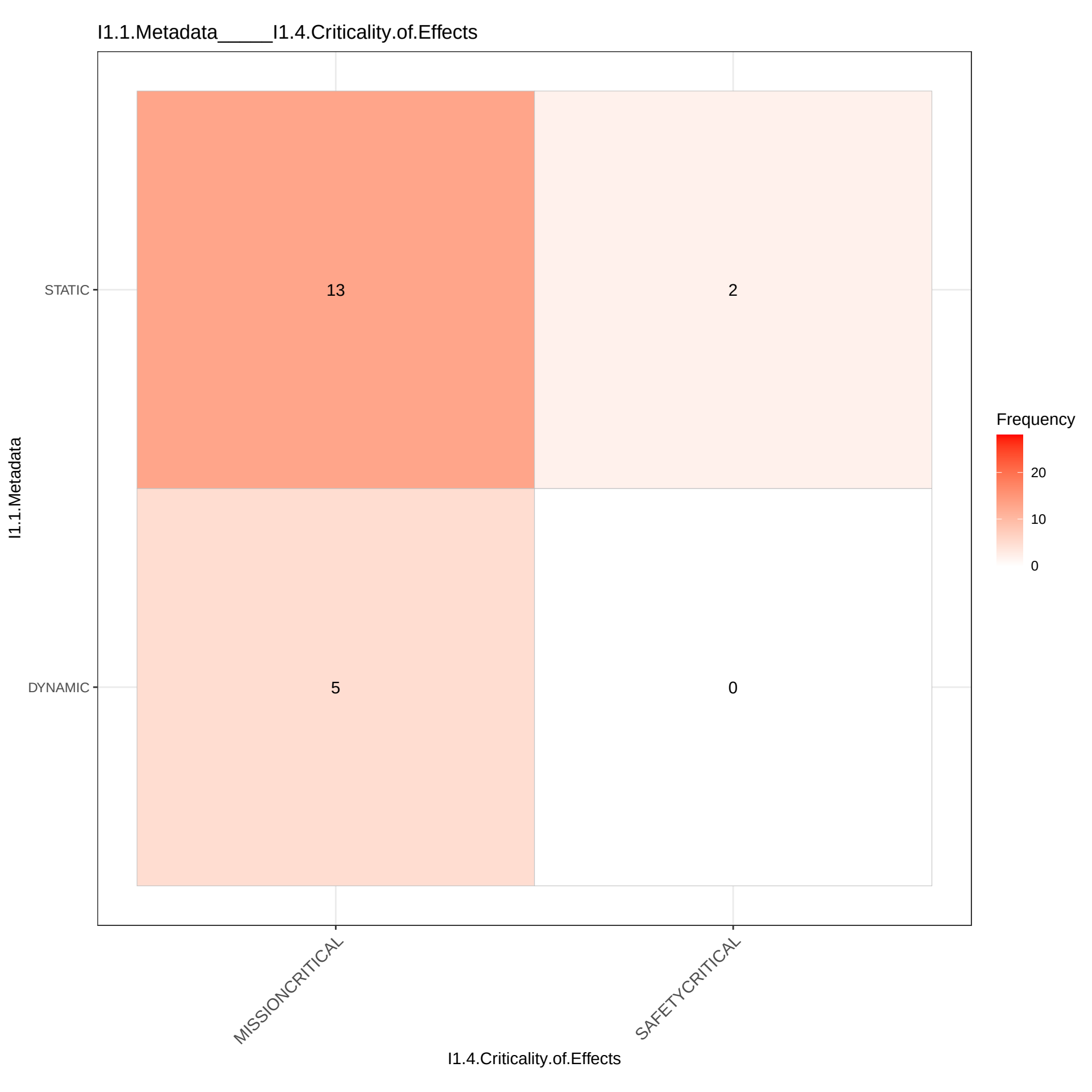

I1.1.Metadata_____I1.3.Organization.of.Mechanism
STATIC
DYNAMIC
2
13
1
5
I1.1.Metadata
DECENTRALIZED
DOCENTRALIZED
I1.3.Organization.of.Mechanism
Frequency
20
10
0

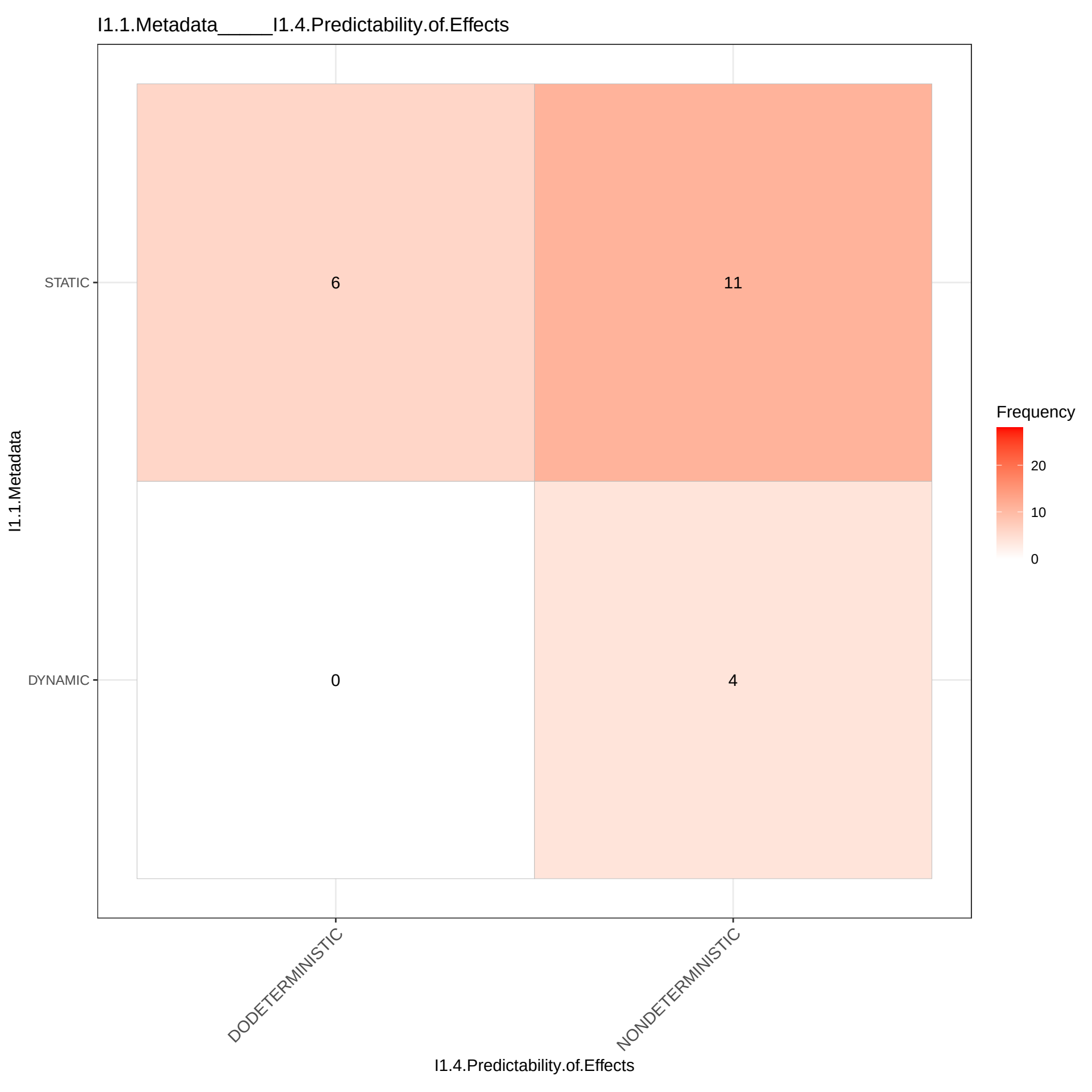

I1.1.Metadata_____I1.3.Scope.of.Mechanism
STATIC
DYNAMIC
2
13
1
6
I1.1.Metadata
GLOBAL
LOCAL
I1.3.Scope.of.Mechanism
Frequency
20
10
0

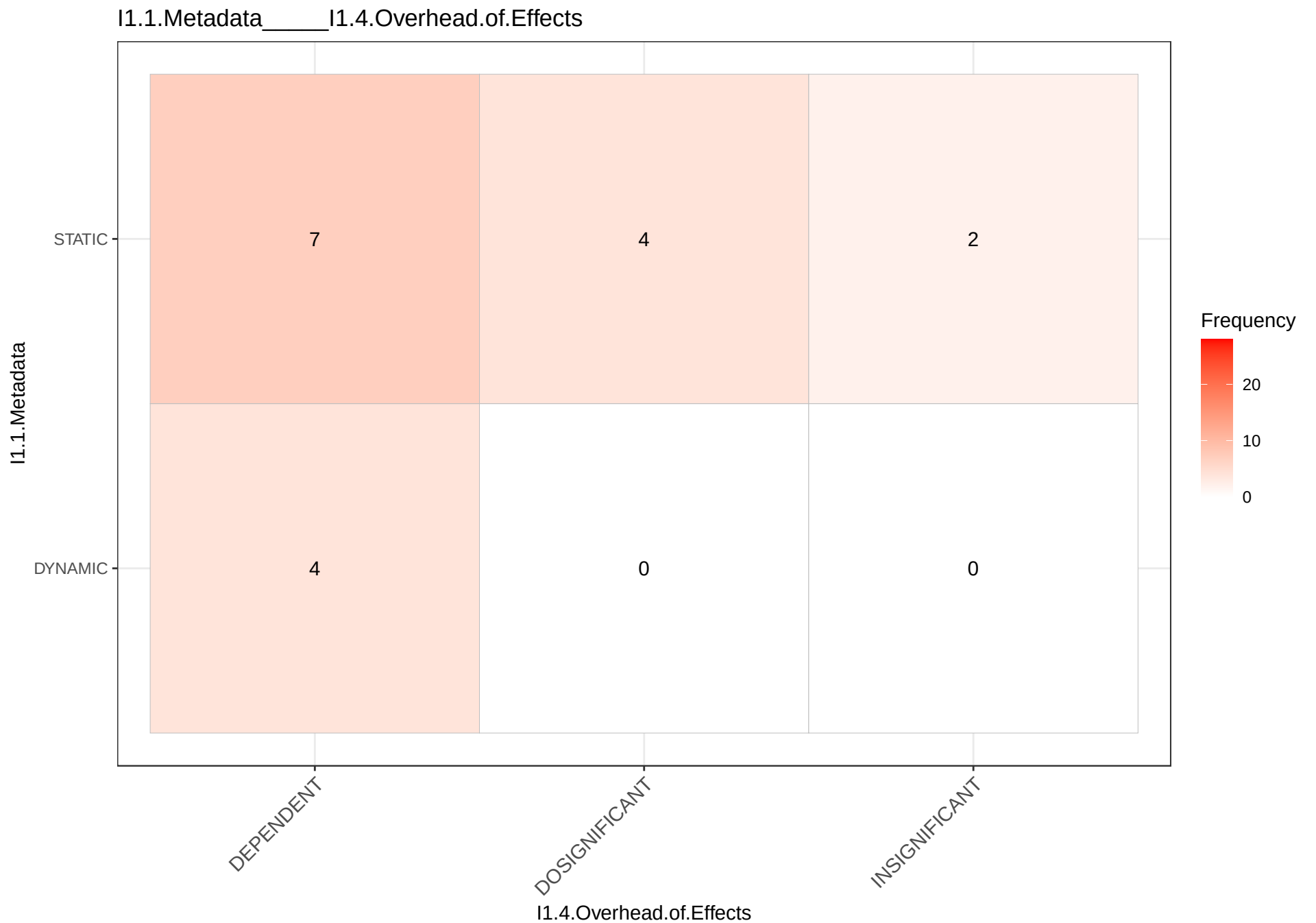

I1.1.Metadata_____I1.3.Duration.of.Mechanism
STATIC
DYNAMIC
10
0
3
5
0
0
I1.1.Metadata
DOSHORT
MEDIUM
VERYSHORT
I1.3.Duration.of.Mechanism
Frequency
20
10
0

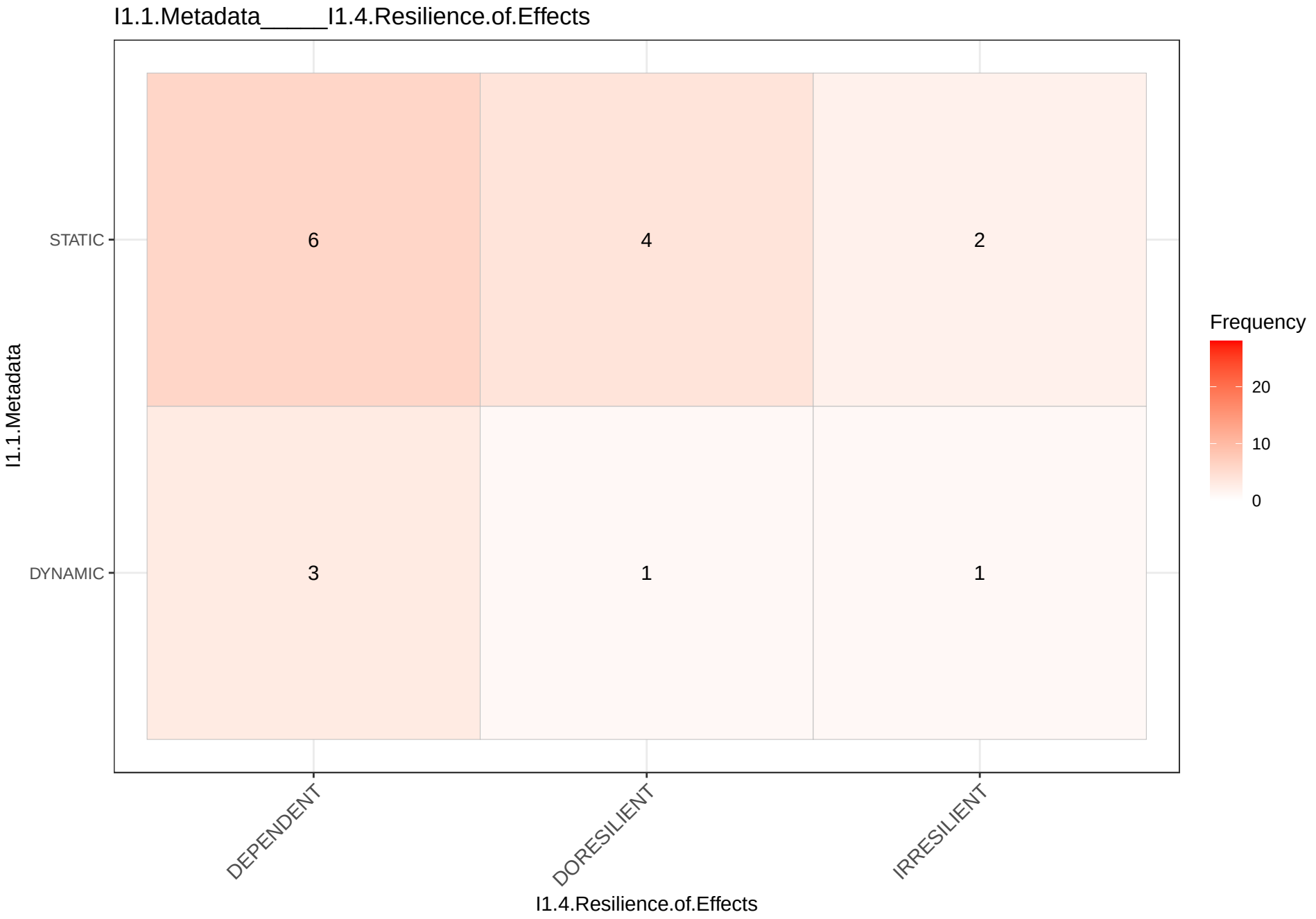

I1.1.Metadata_____I1.3.Timeliness.of.Mechanism
STATIC
DYNAMIC
13
6
I1.1.Metadata
BESTEFFORT
I1.3.Timeliness.of.Mechanism
Frequency
20
10
0

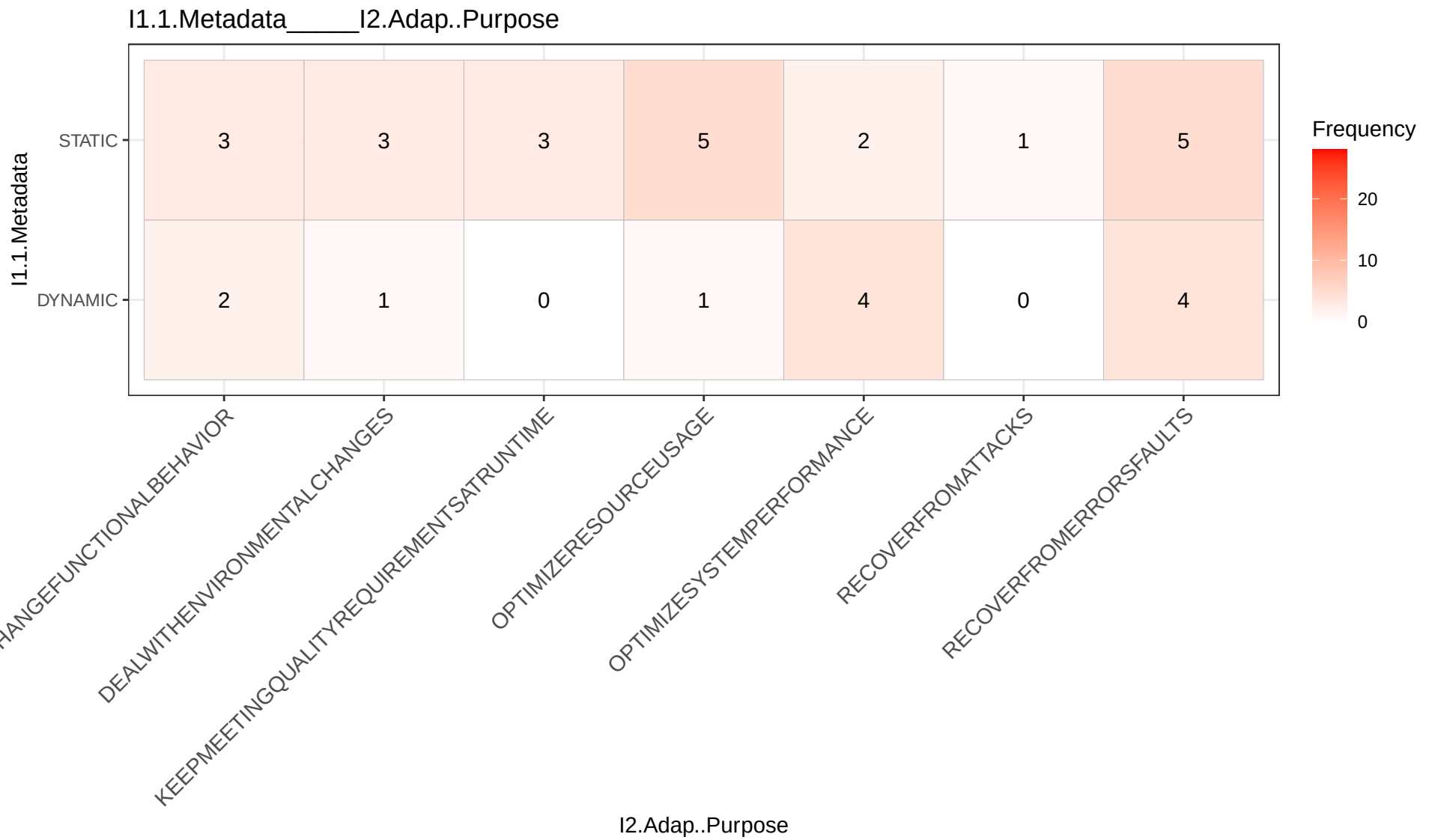

I1.1.Metadata_____I1.3.Trigger.of.Mechanism
STATIC
DYNAMIC
12
2
6
0
I1.1.Metadata
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
0

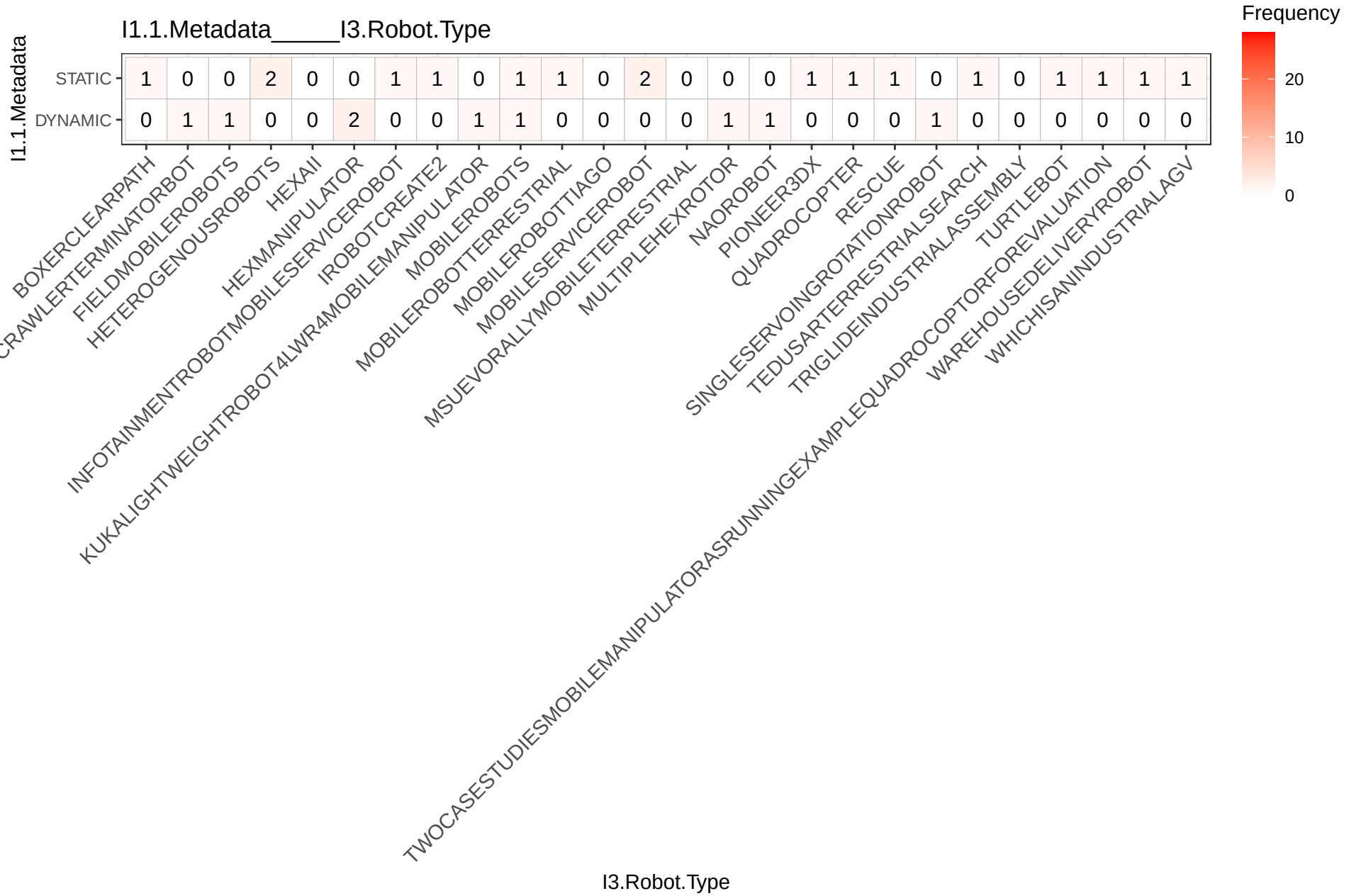

I1.1.Metadata_____I1.4.Criticality.of.Effects
STATIC
DYNAMIC
13
2
5
0
I1.1.Metadata
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
0

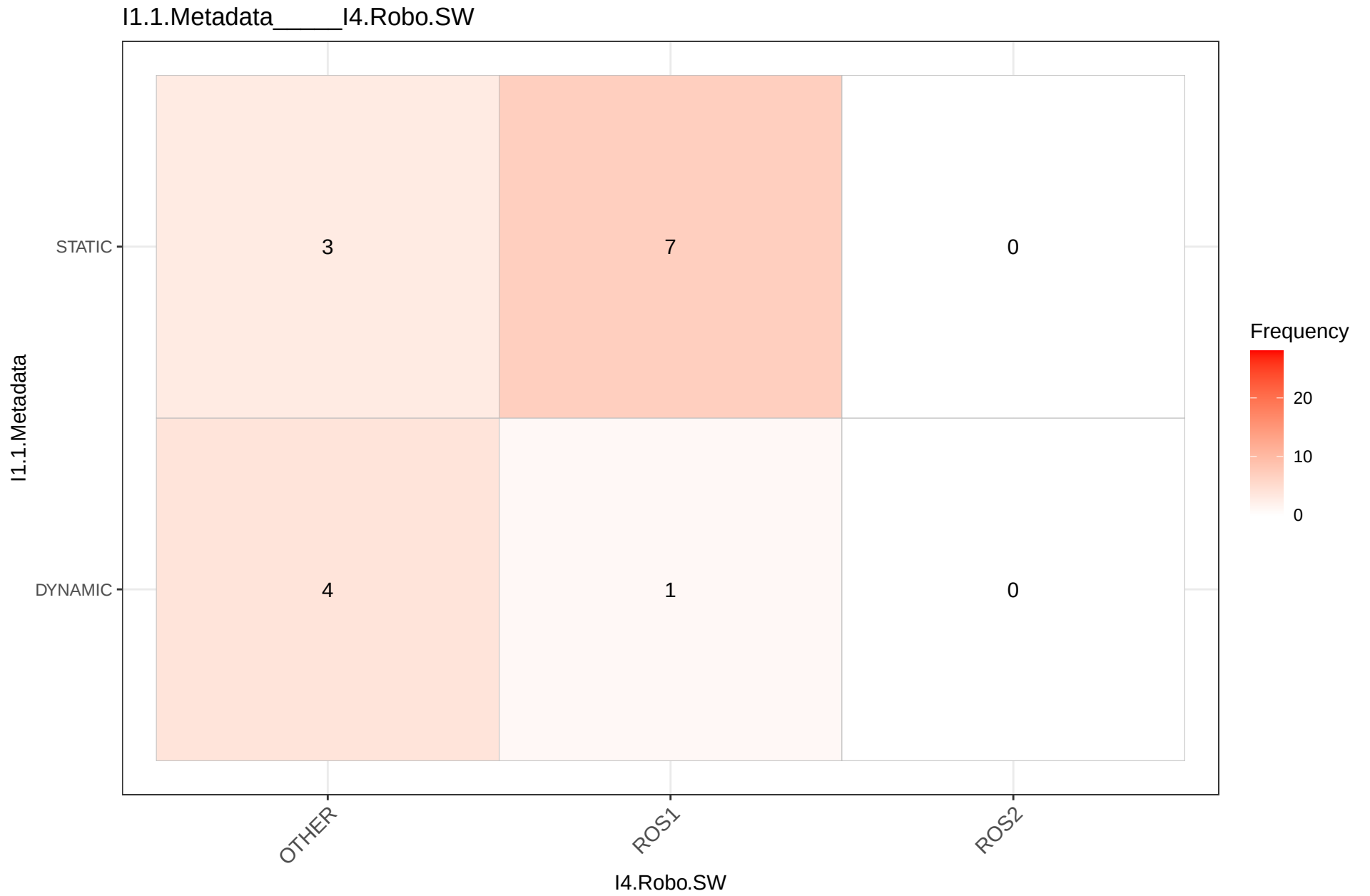

I1.1.Metadata_____I1.4.Predictability.of.Effects
STATIC
DYNAMIC
6
11
0
4
I1.1.Metadata
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0

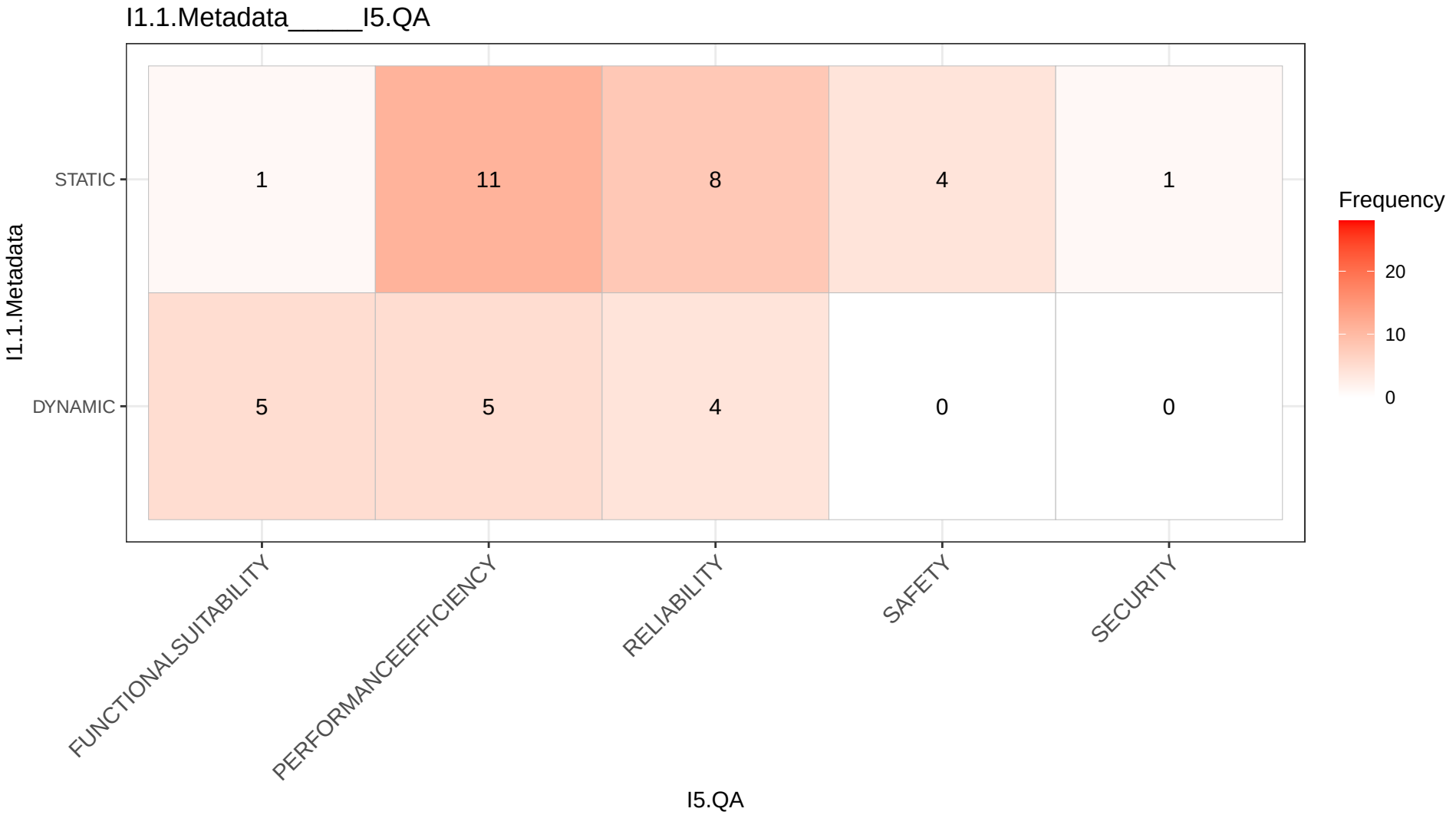

I1.1.Metadata_____I1.4.Overhead.of.Effects
STATIC
DYNAMIC
I1.1.Metadata
7
4
2
4
0
0
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
0

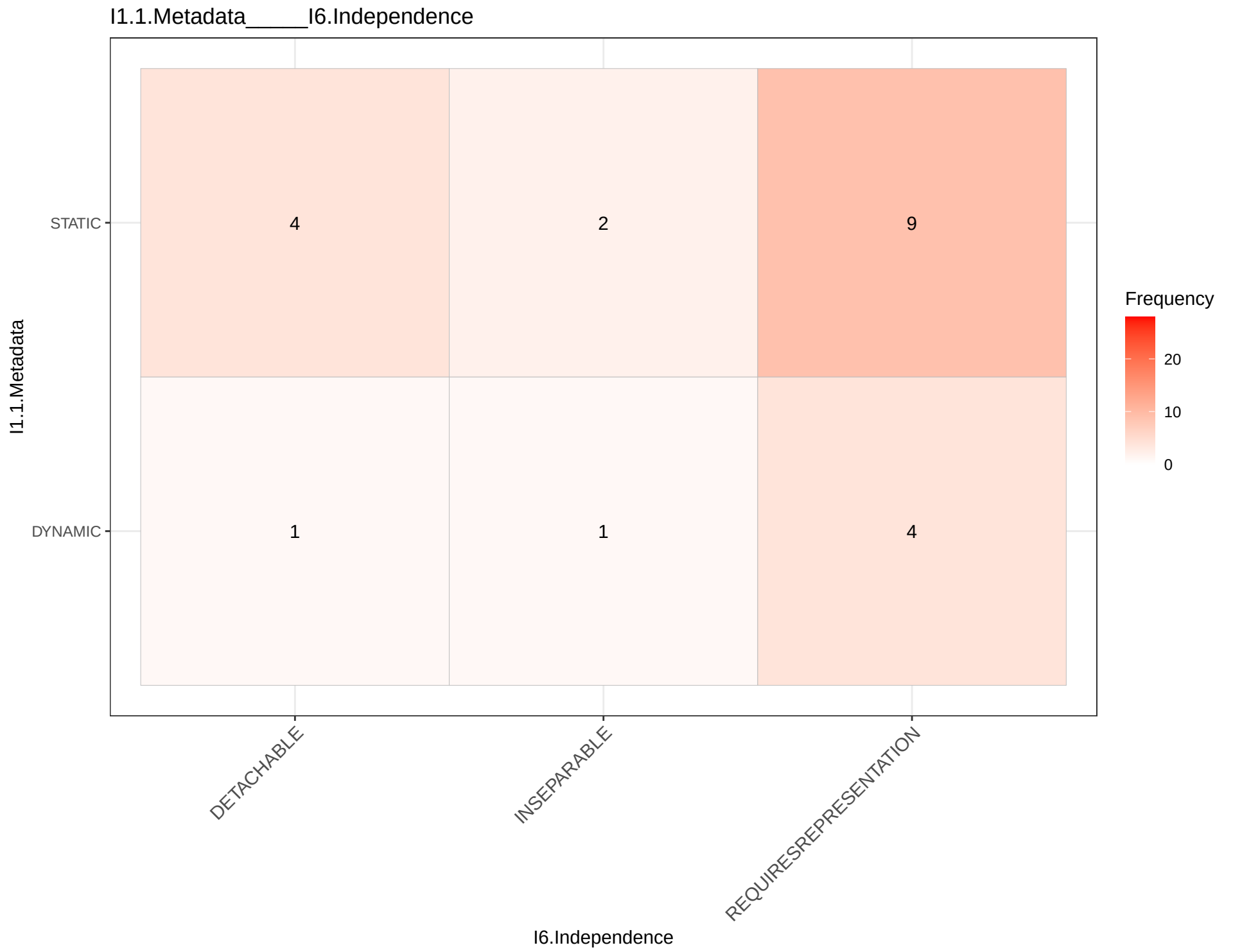

I1.1.Metadata_____I1.4.Resilience.of.Effects
STATIC
DYNAMIC
I1.1.Metadata
6
4
2
3
1
1
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0

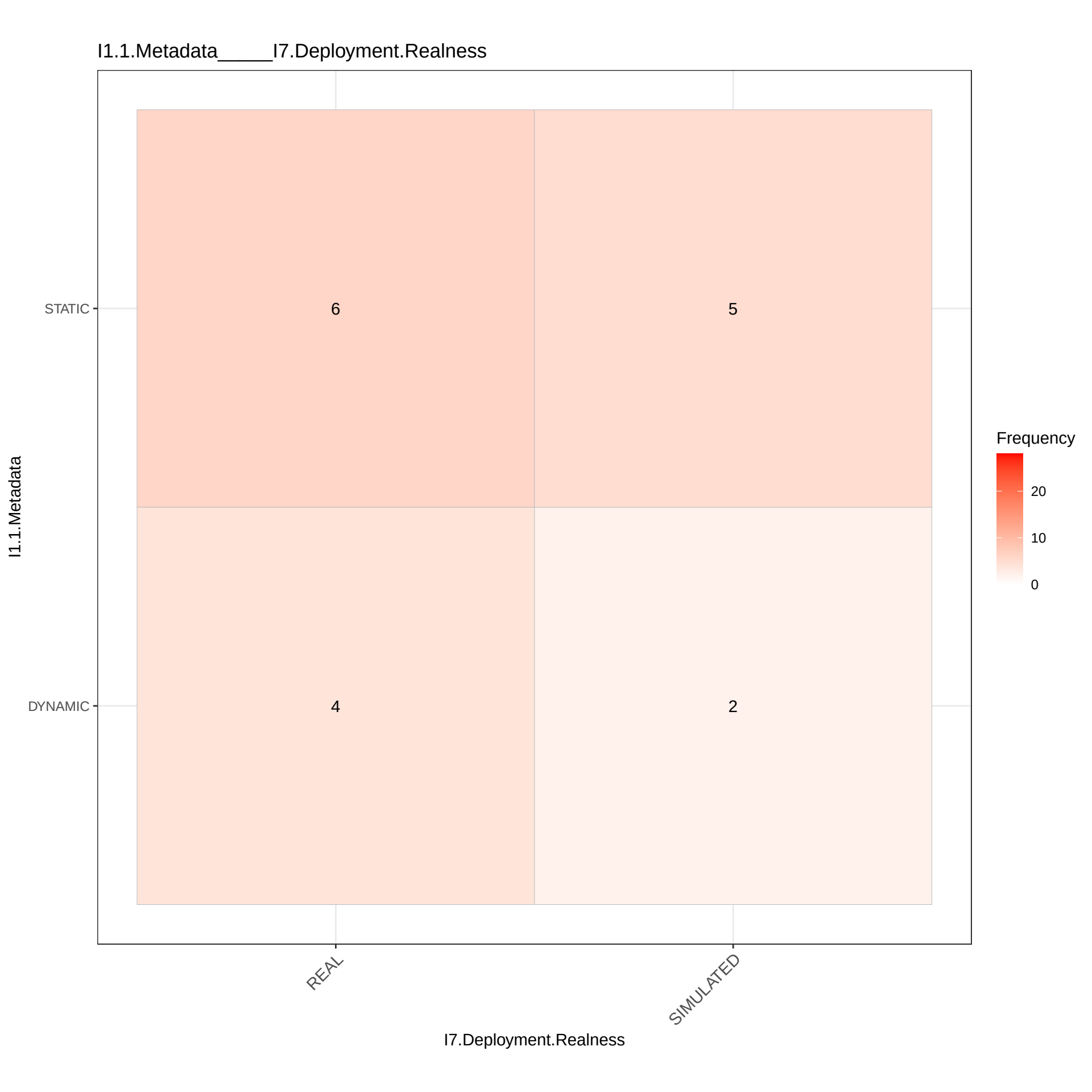

I1.1.Metadata_____I2.Adap..Purpose
I1.1.Metadata
STATIC
DYNAMIC
3
3
3
5
2
1
5
2
1
0
1
4
0
4
Frequency
20
10
0
HANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose

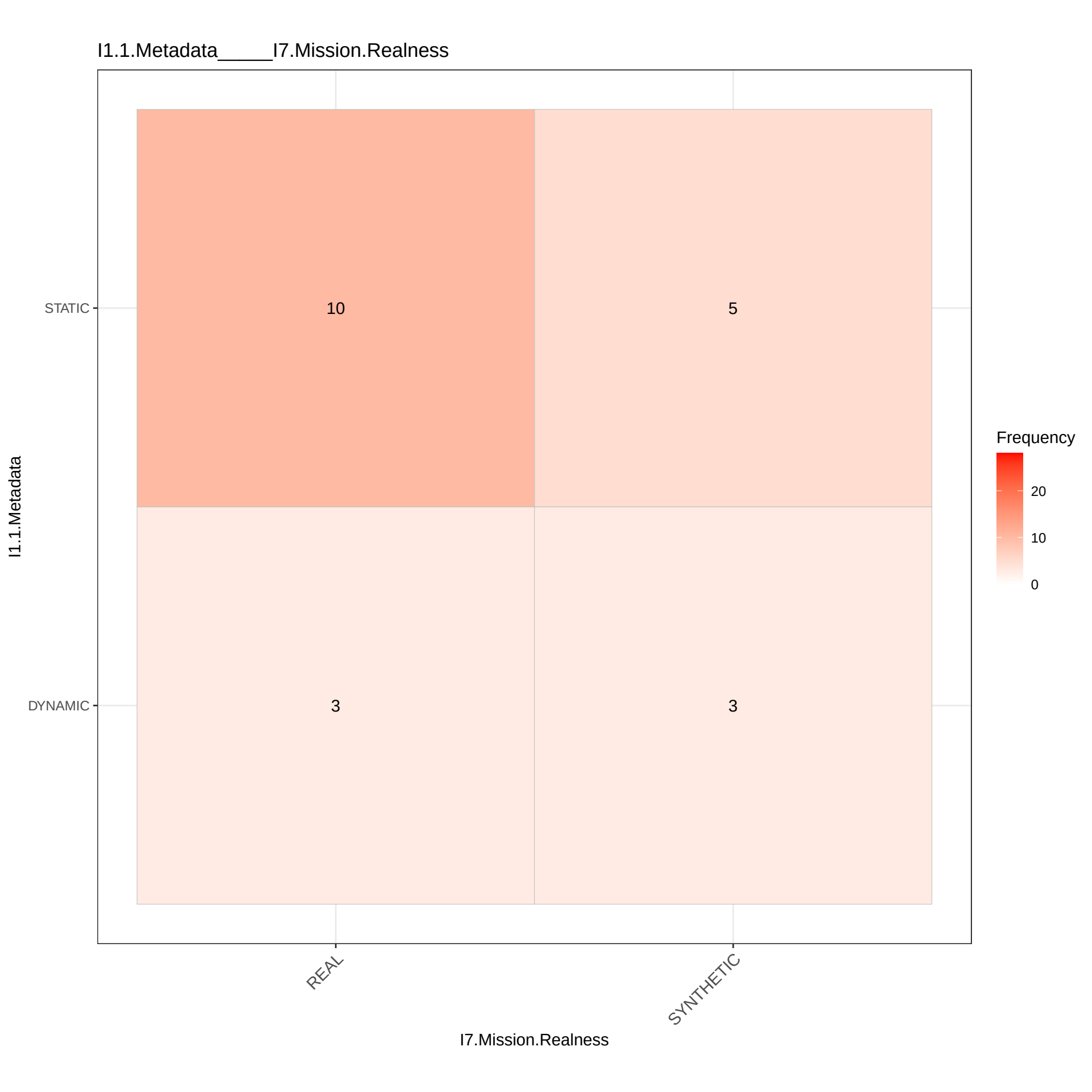

I1.1.Metadata_____I3.Robot.Type
I1.1.Metadata
STATIC
DYNAMIC
1 0 0 2 0 0 1 1 0 1 1 0 2 0 0 0 1 1 1 0 1 0 1 1 1 1
0 1 1 0 0 2 0 0 1 1 0 0 0 0 1 1 0 0 0 1 0 0 0 0 0 0
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0

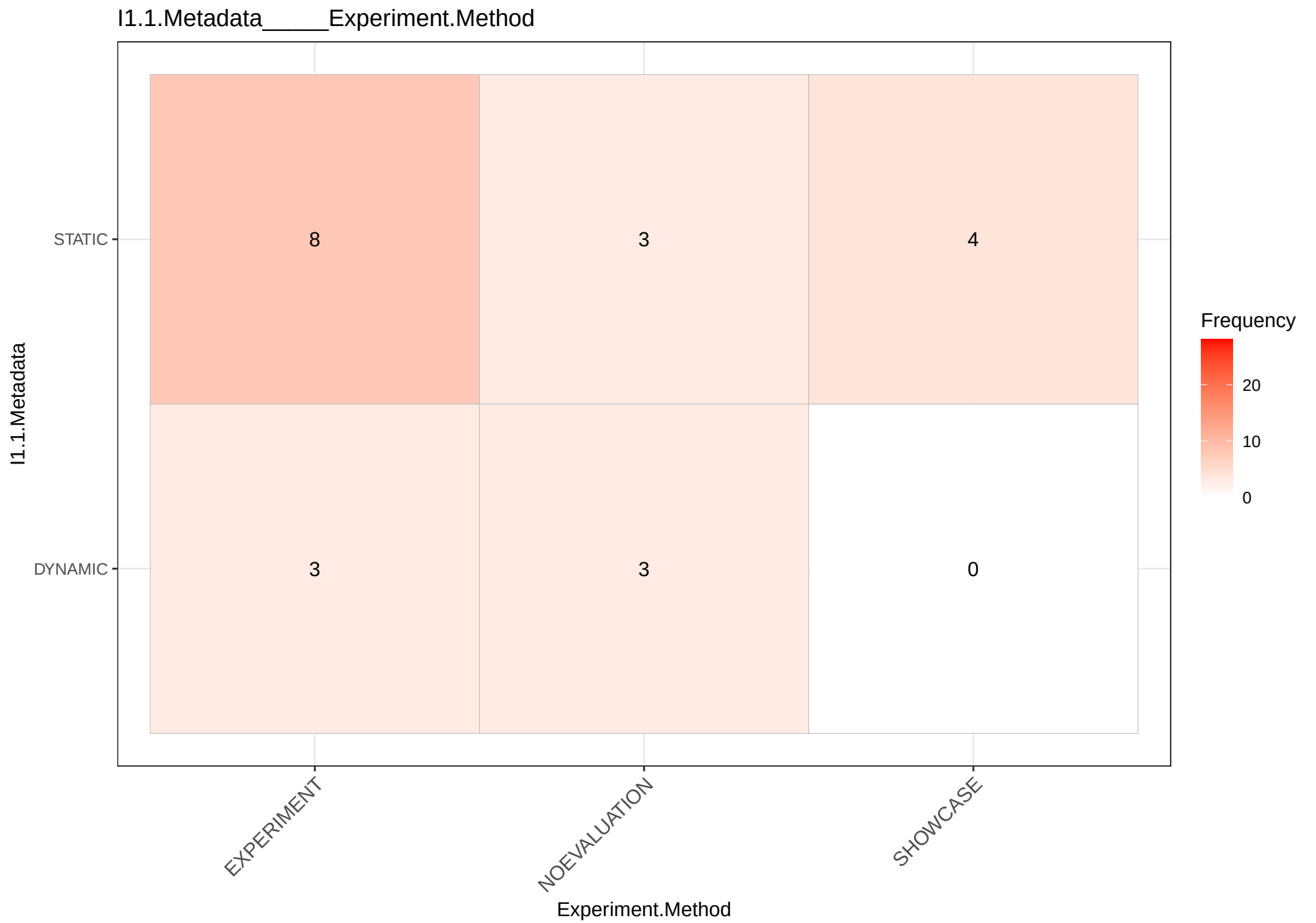

I1.1.Metadata_____I4.Robo.SW
STATIC
DYNAMIC
I1.1.Metadata
3
7
0
4
1
0
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0

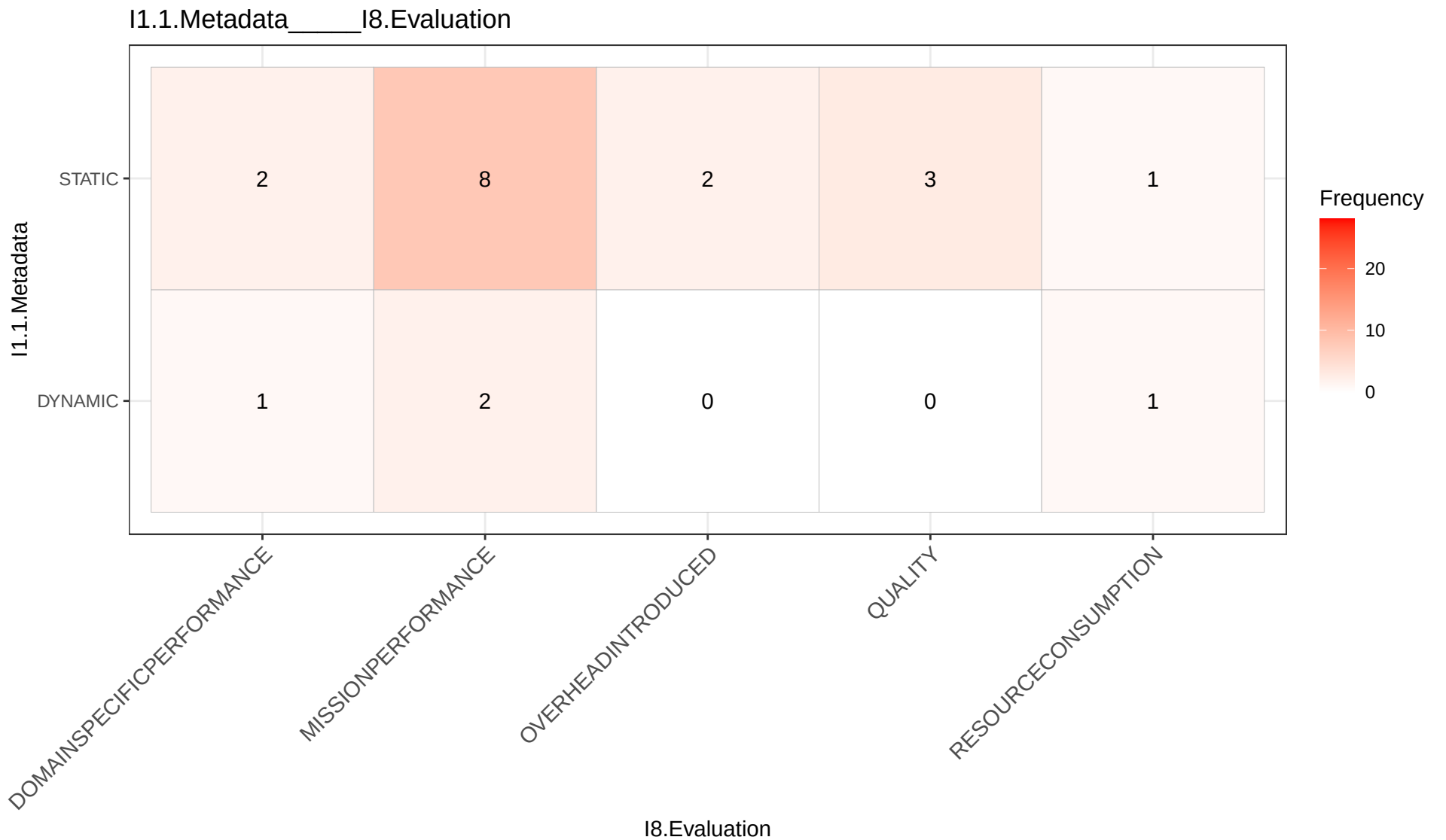

I1.1.Metadata_____I5.QA
STATIC
DYNAMIC
1
11
8
4
1
5
5
4
0
0
I1.1.Metadata
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I1.1.Metadata_____I6.Independence
STATIC
DYNAMIC
I1.1.Metadata
4
2
9
1
1
4
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I1.1.Metadata_____I7.Deployment.Realness
STATIC
DYNAMIC
6
5
4
2
REAL
SIMULATED
I1.1.Metadata
I7.Deployment.Realness
Frequency
20
10
0


I1.1.Metadata_____I7.Mission.Realness
STATIC
DYNAMIC
10
5
3
3
I1.1.Metadata
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0


I1.1.Metadata_____Experiment.Method
STATIC
DYNAMIC
I1.1.Metadata
8
3
4
3
3
0
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I1.1.Metadata_____I8.Evaluation
STATIC
DYNAMIC
I1.1.Metadata
2
8
2
3
1
1
2
0
0
1
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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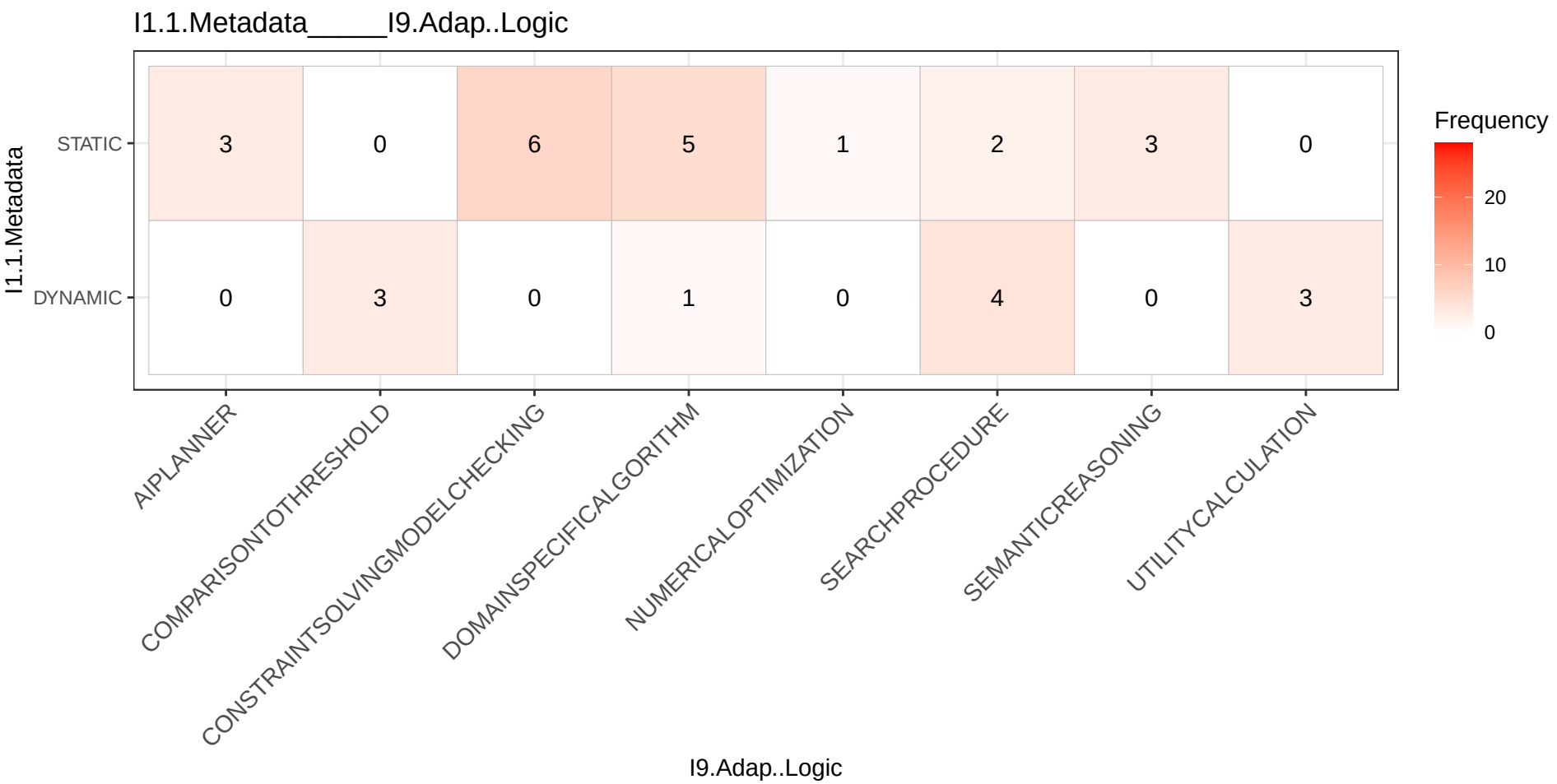
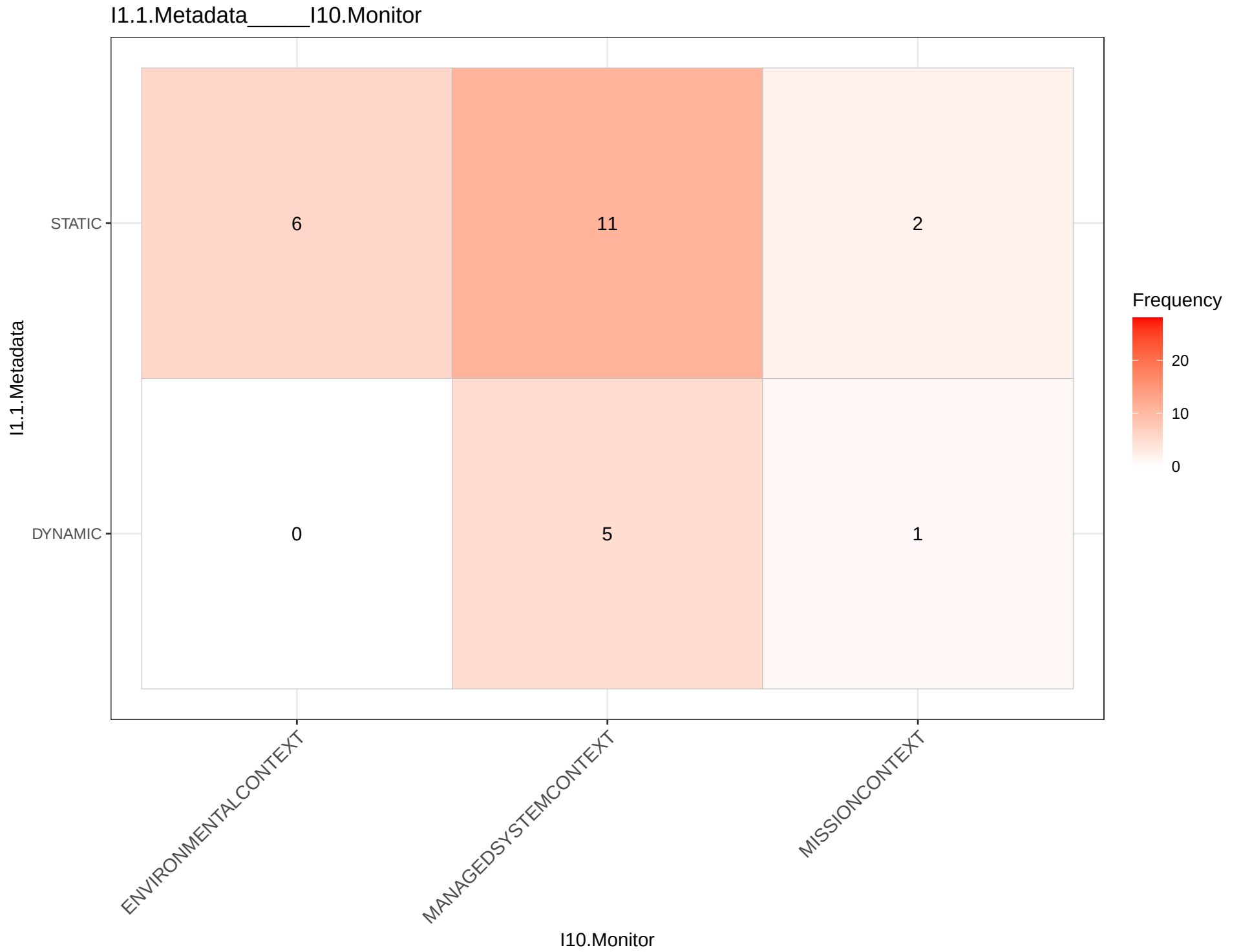
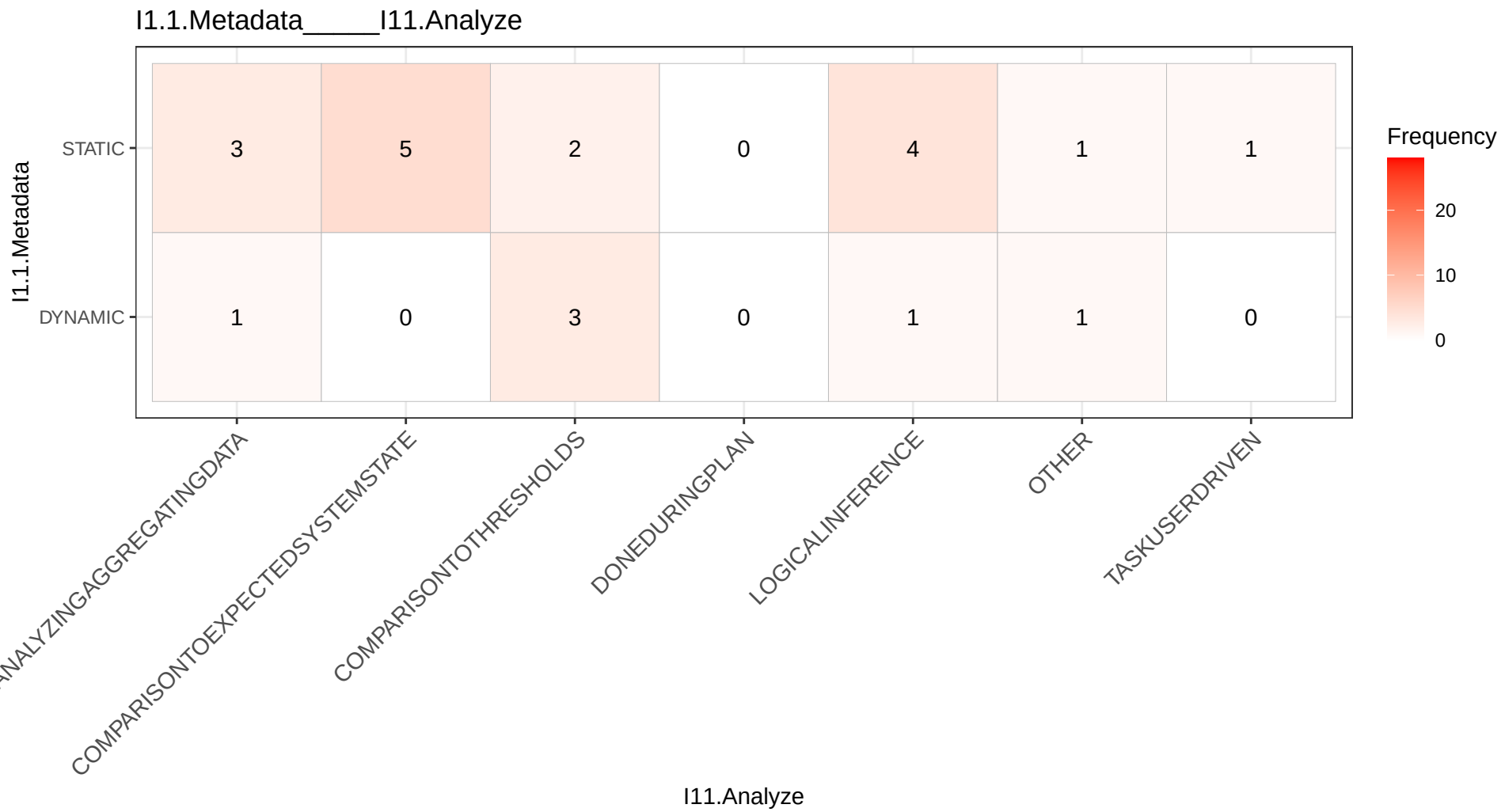
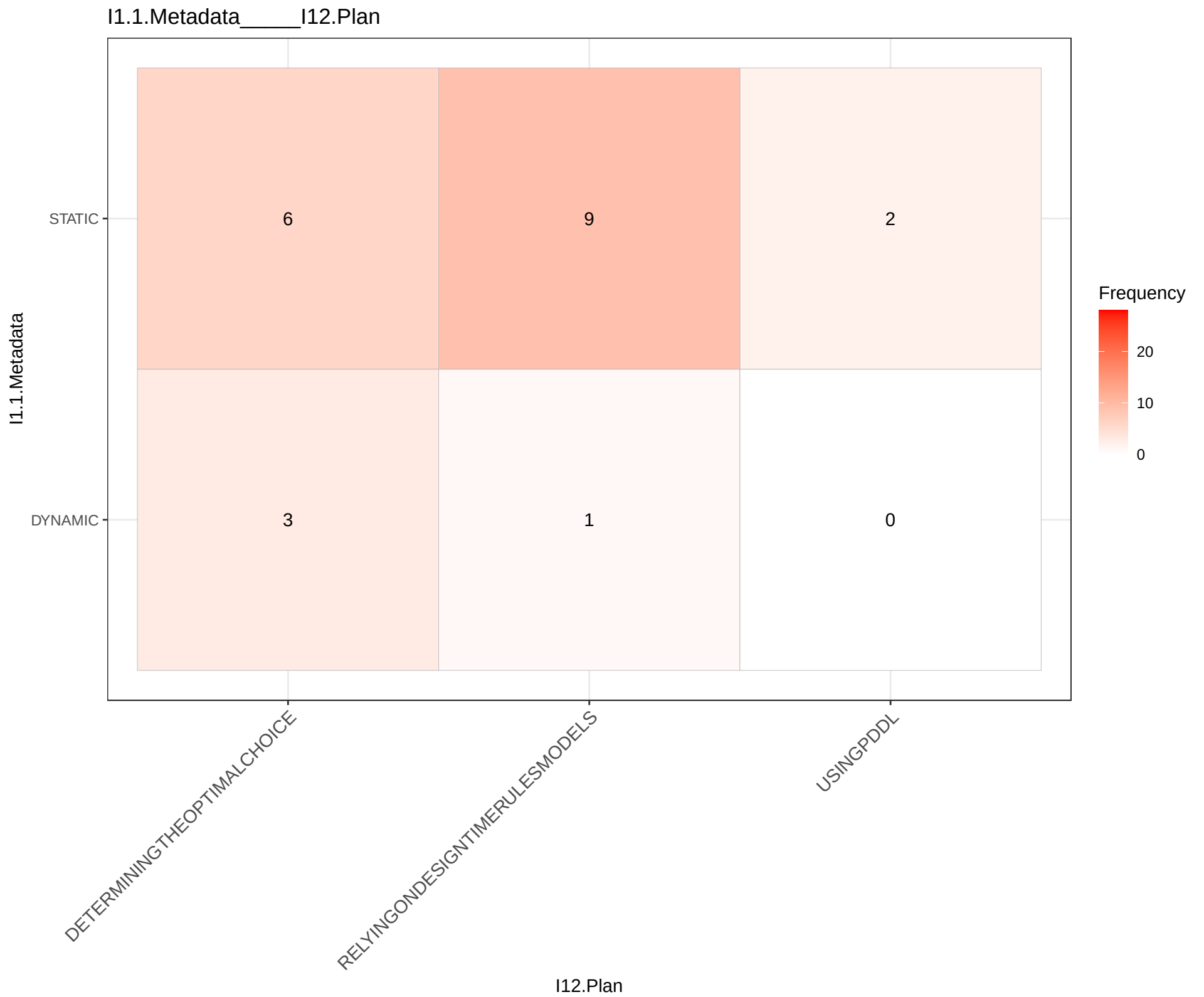
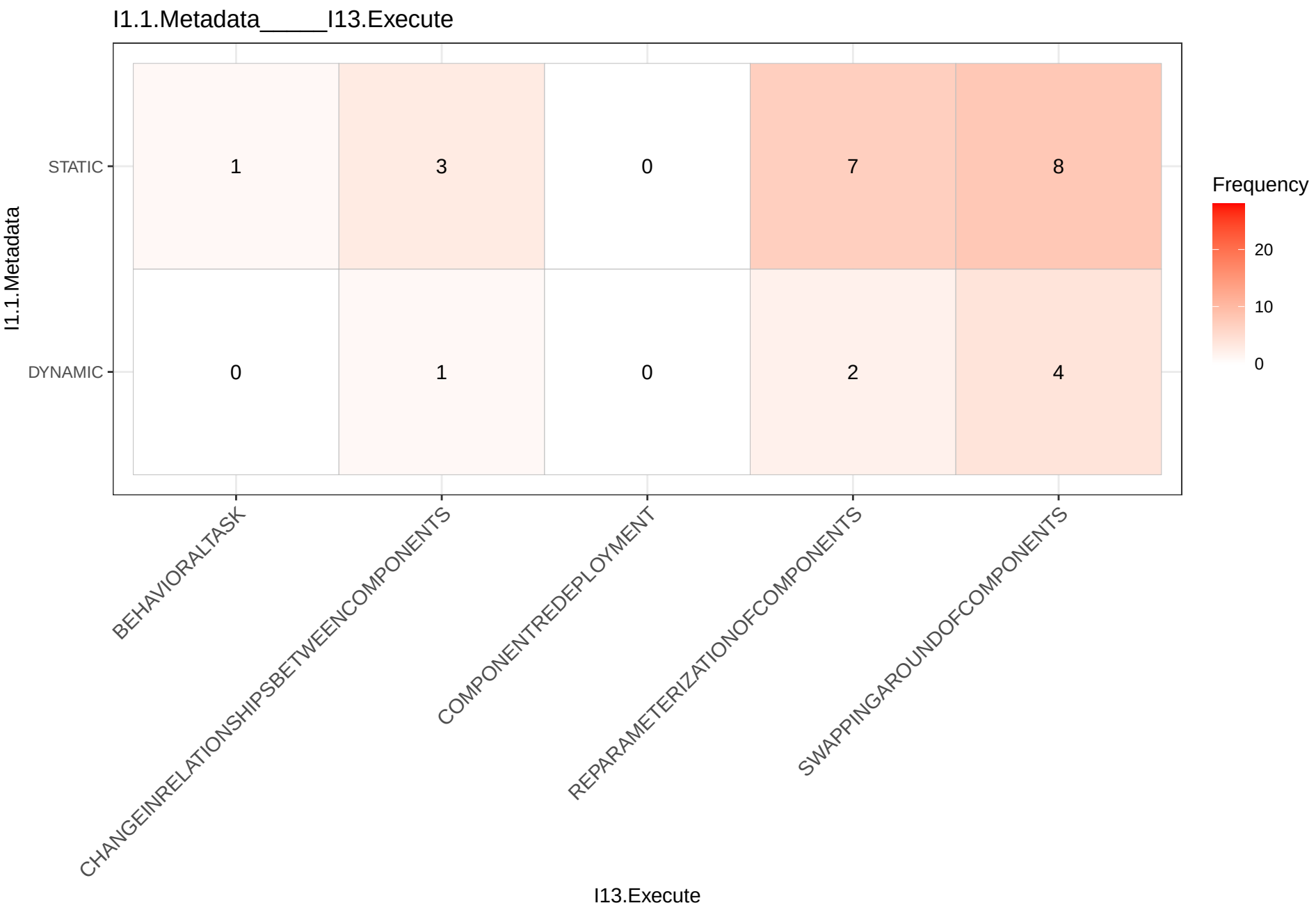
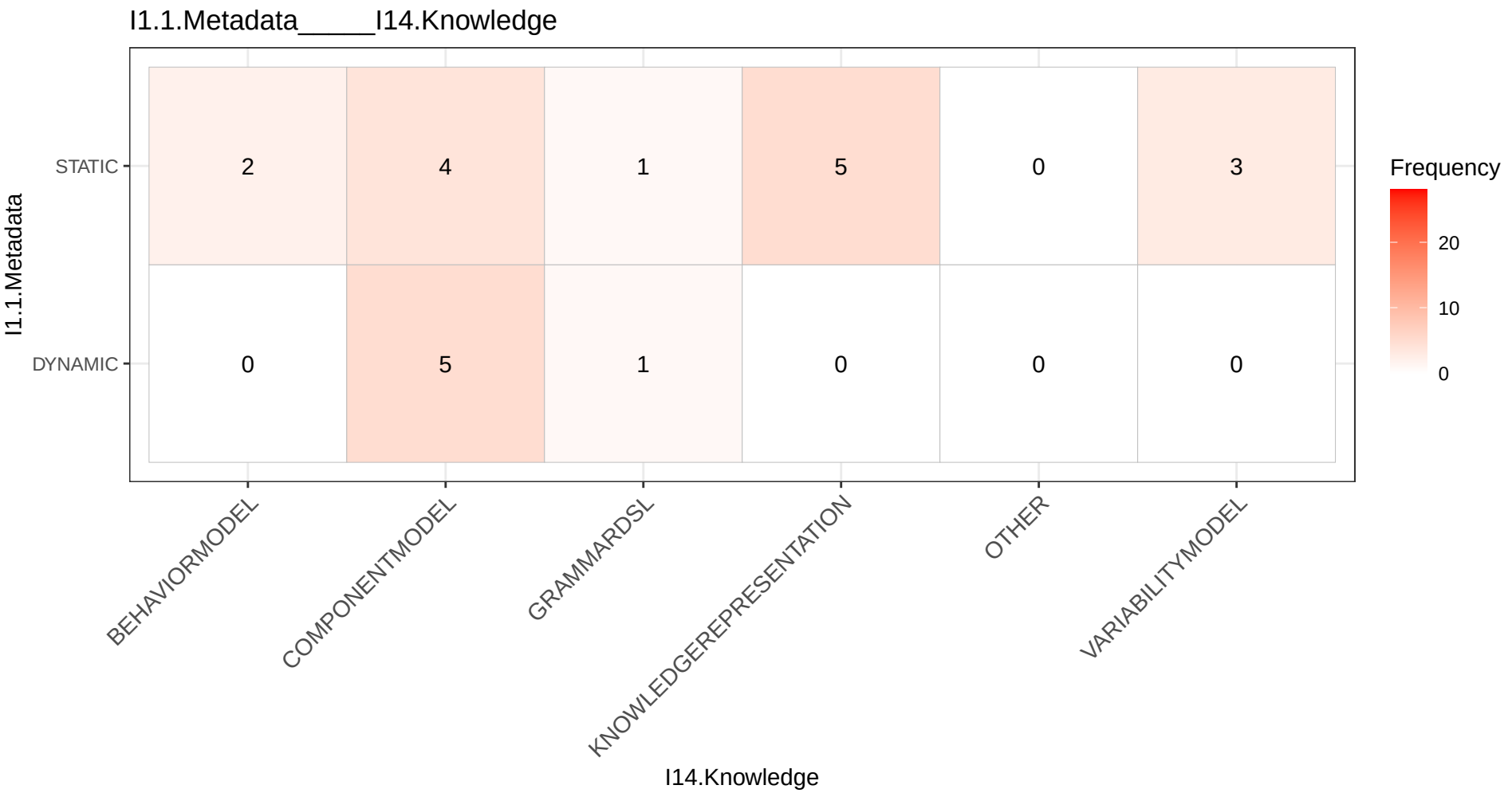

I1.1.Metadata_____I9.Adap..Logic
I1.1.Metadata
STATIC
DYNAMIC
3
0
6
5
1
2
3
0
0
3
0
1
0
4
0
3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
0


I1.1.Metadata_____I10.Monitor
STATIC
DYNAMIC
6
11
2
0
5
1
I1.1.Metadata
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0


I1.1.Metadata_____I11.Analyze
I1.1.Metadata
STATIC
DYNAMIC
3
5
2
0
4
1
1
1
0
3
0
1
1
0
Frequency
20
10
0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze


I1.1.Metadata_____I12.Plan
STATIC
DYNAMIC
6
9
2
3
1
0
I1.1.Metadata
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0


I1.1.Metadata_____I13.Execute
STATIC
DYNAMIC
1
3
0
7
8
0
1
0
2
4
I1.1.Metadata
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0


I1.1.Metadata_____I14.Knowledge
STATIC
DYNAMIC
I1.1.Metadata
2
4
1
5
0
3
0
5
1
0
0
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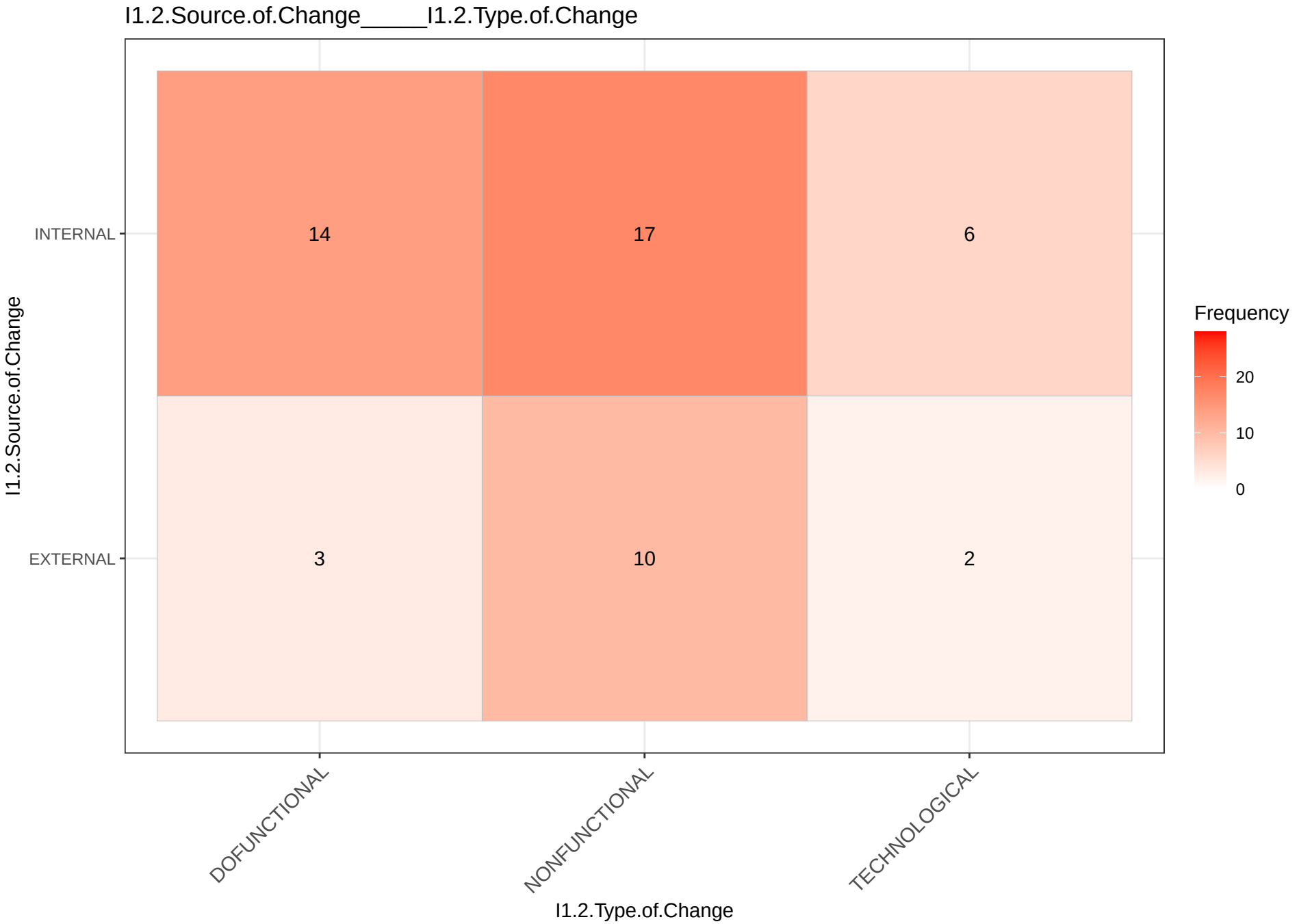
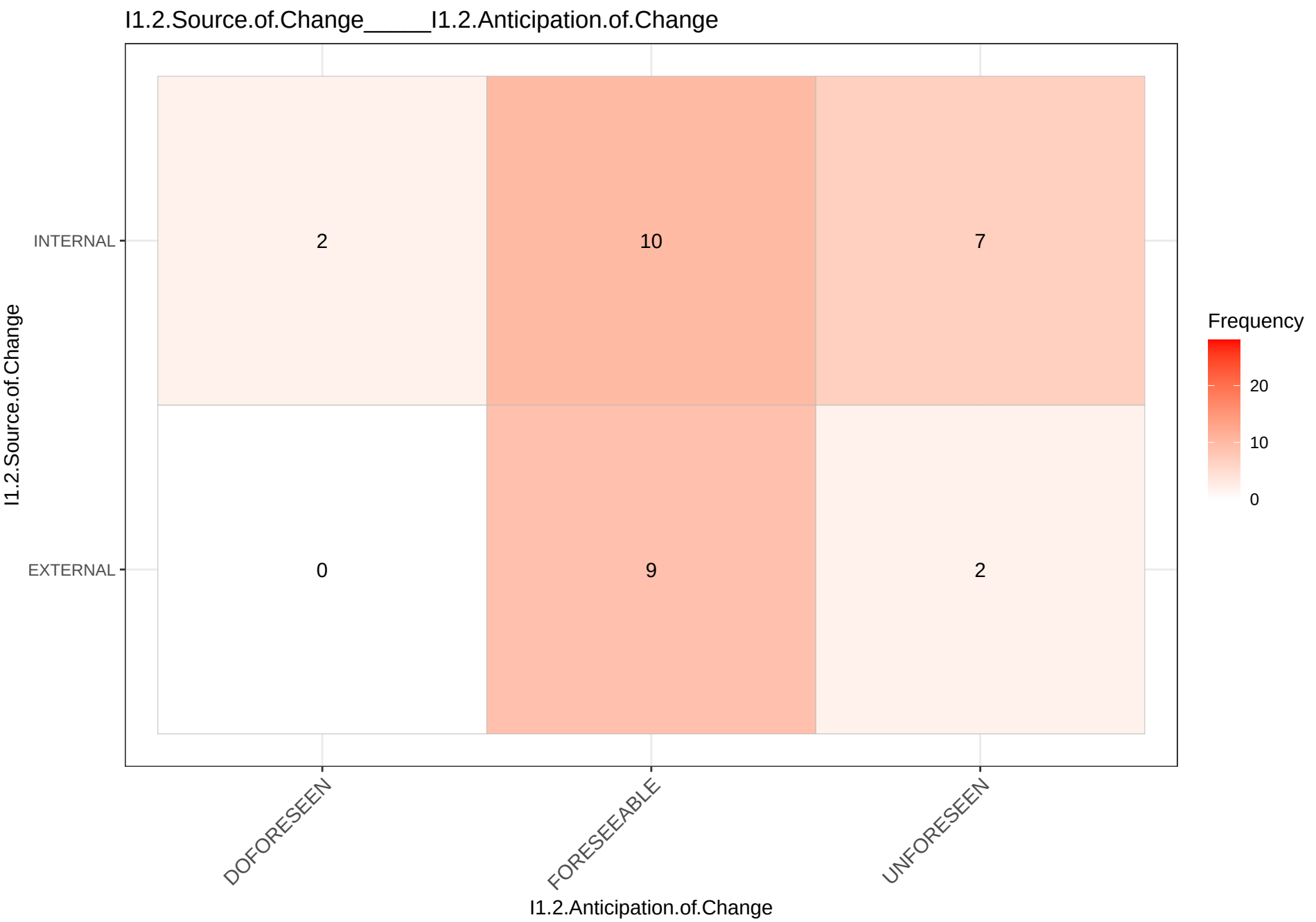
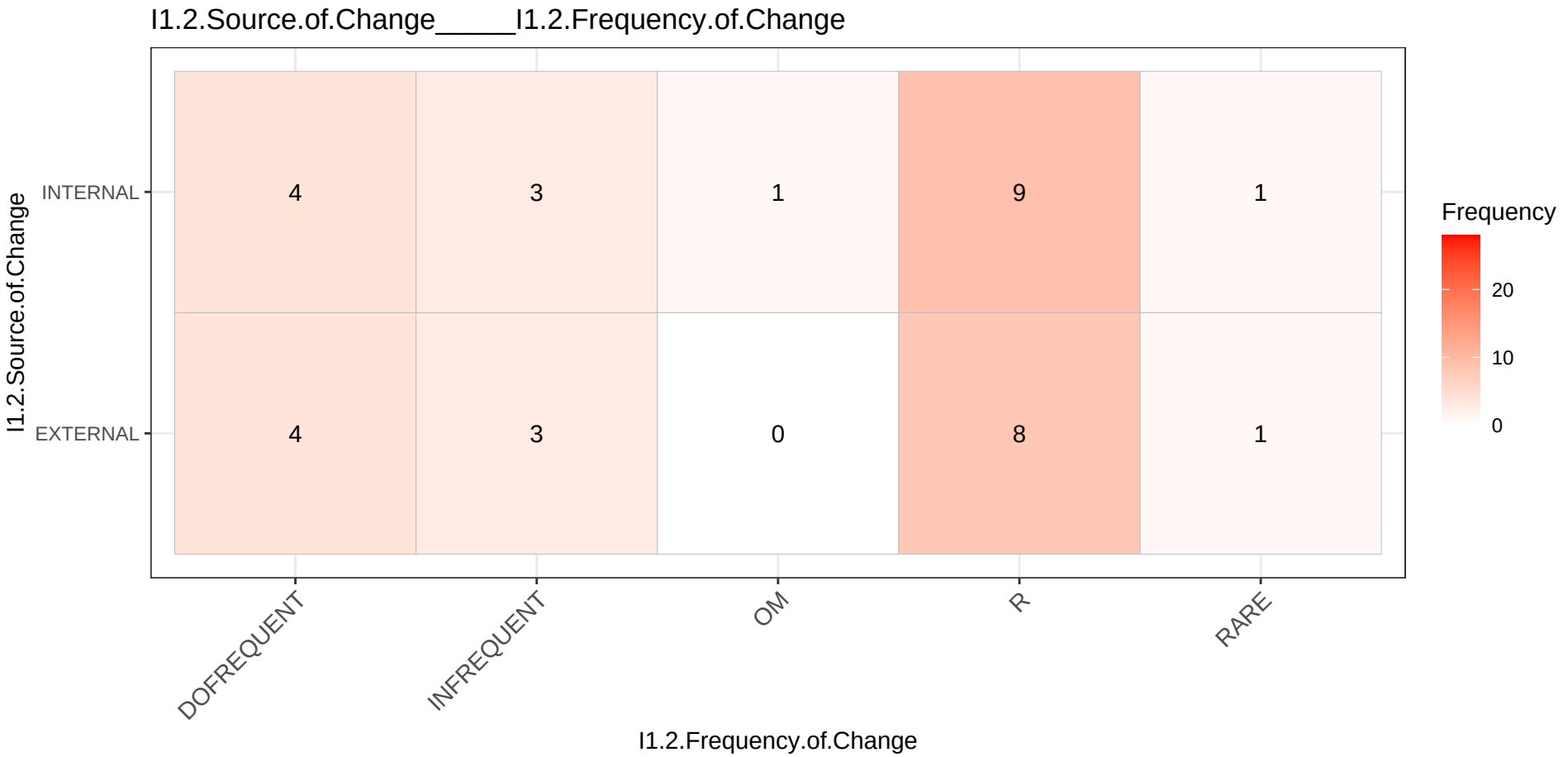
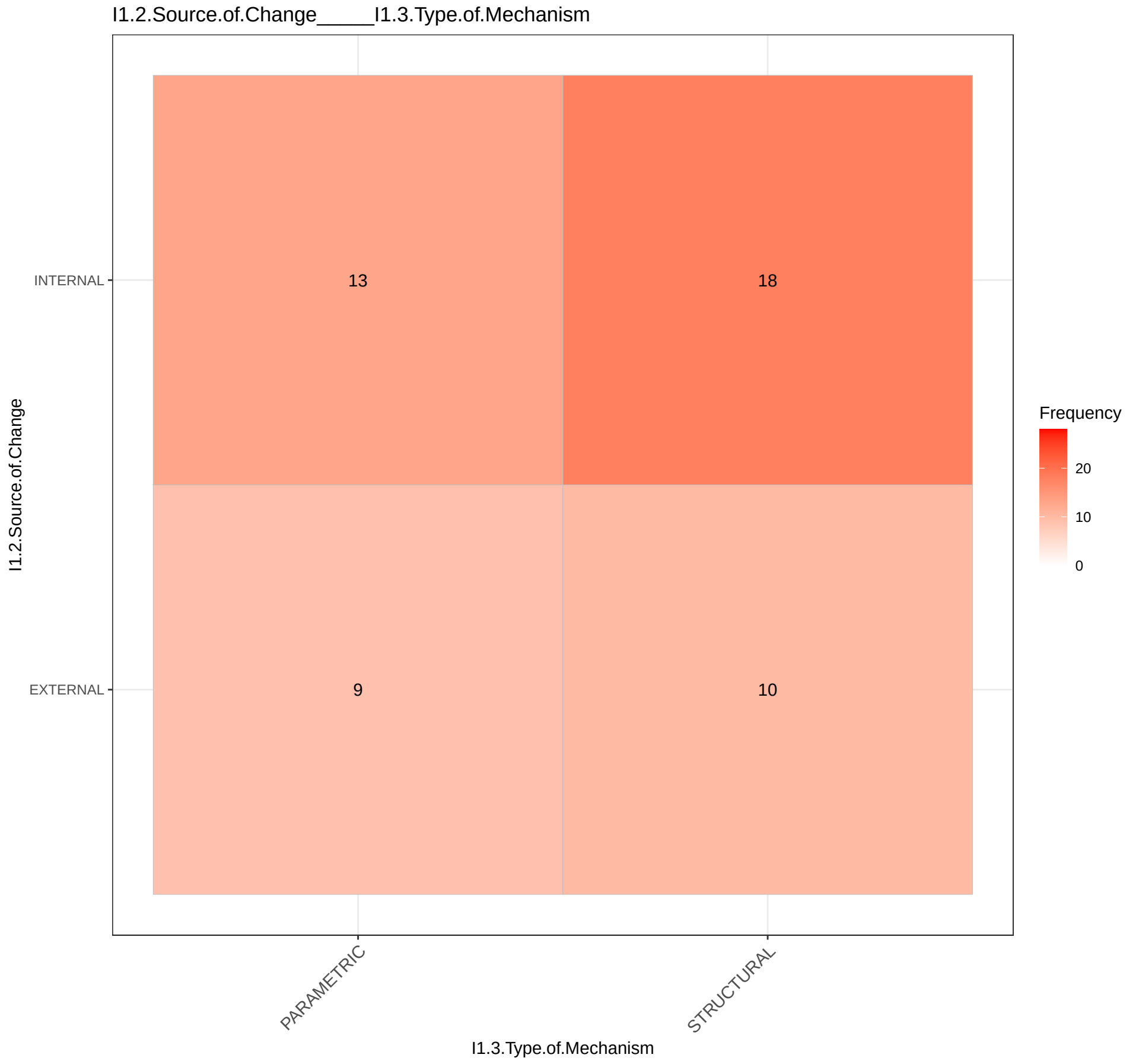
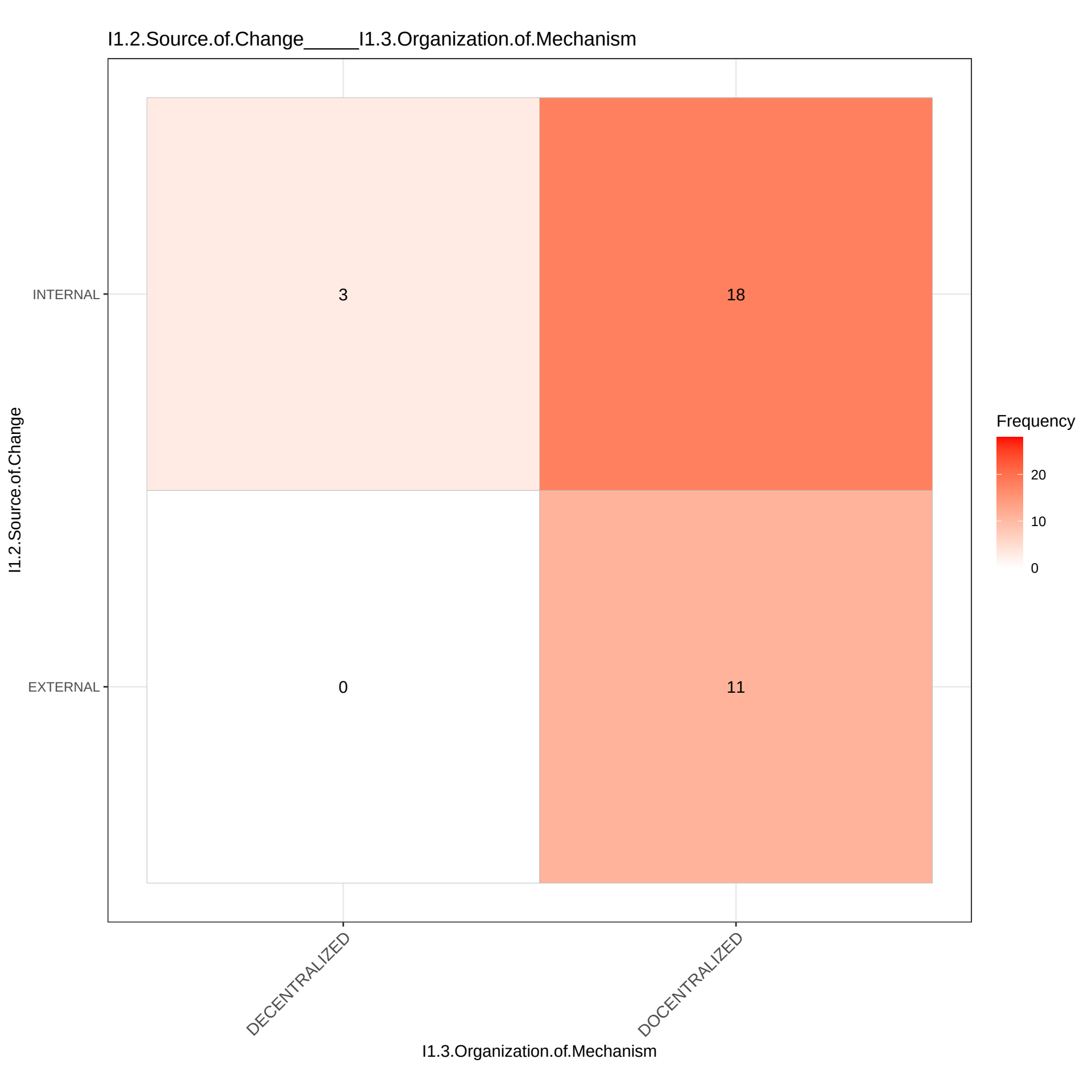
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

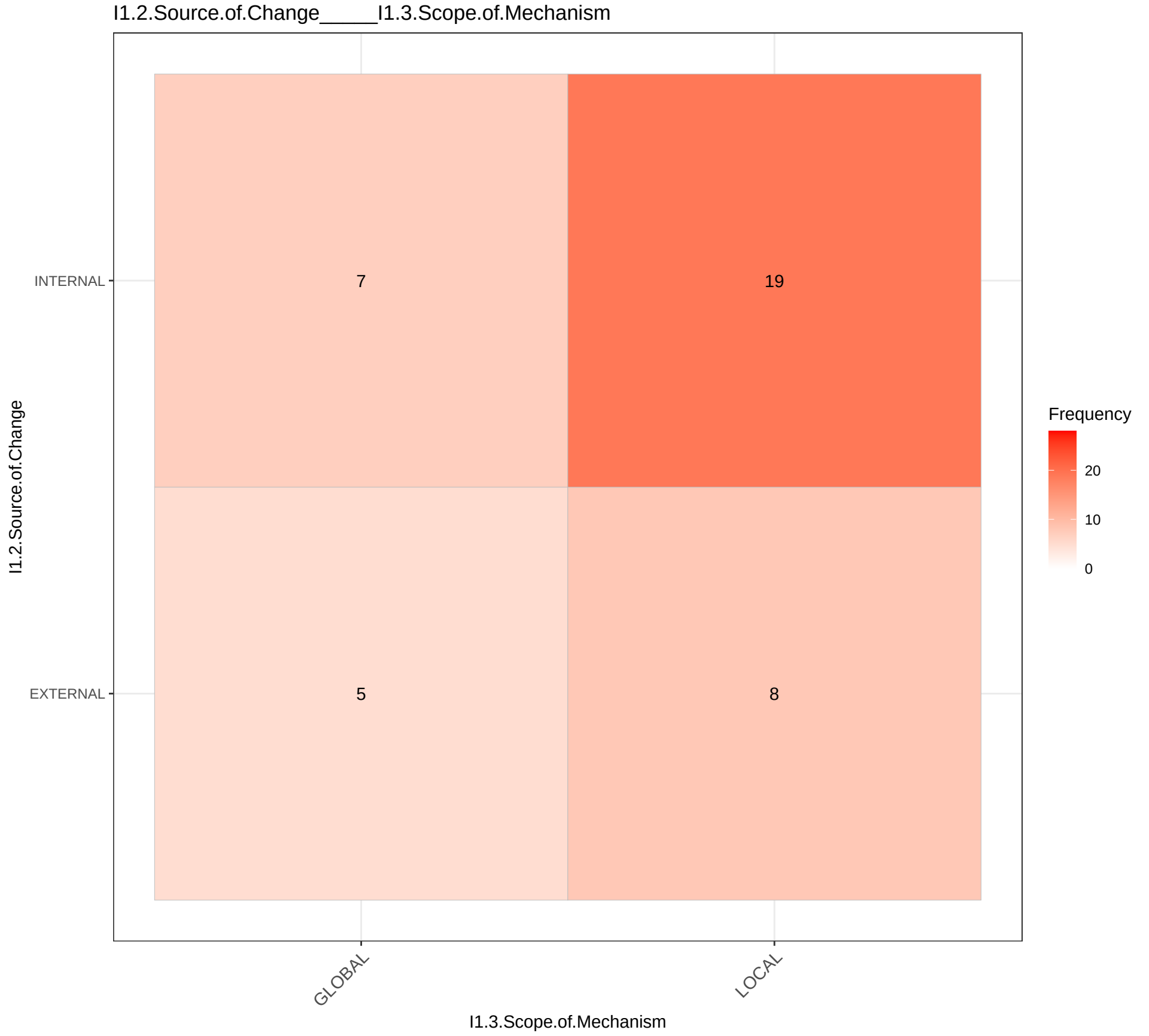

I1.2.Source.of.Change_____I1.2.Type.of.Change
INTERNAL
EXTERNAL
I1.2.Source.of.Change
14
17
6
3
10
2
Frequency
20
10
0
DOFUNCTIONAL
NONFUNCTIONAL
TECHNOLOGICAL
I1.2.Type.of.Change


I1.2.Source.of.Change_____I1.2.Anticipation.of.Change
INTERNAL
EXTERNAL
I1.2.Source.of.Change
2
10
7
0
9
2
DOFORESEEN
FORESEEABLE
UNFORESEEN
I1.2.Anticipation.of.Change
Frequency
20
10
0


I1.2.Source.of.Change_____I1.2.Frequency.of.Change
I1.2.Source.of.Change
INTERNAL
EXTERNAL
4
3
1
9
1
4
3
0
8
1
DOFREQUENT
INFREQUENT
OM
R
RARE
I1.2.Frequency.of.Change
Frequency
20
10
0


I1.2.Source.of.Change_____I1.3.Type.of.Mechanism
INTERNAL
EXTERNAL
13
18
9
10
I1.2.Source.of.Change
PARAMETRIC
STRUCTURAL
I1.3.Type.of.Mechanism
Frequency
20
10
0


I1.2.Source.of.Change_____I1.3.Organization.of.Mechanism
INTERNAL
EXTERNAL
I1.2.Source.of.Change
3
18
0
11
DECENTRALIZED
DOCENTRALIZED
I1.3.Organization.of.Mechanism
Frequency
20
10
0


I1.2.Source.of.Change_____I1.3.Scope.of.Mechanism
INTERNAL
EXTERNAL
7
19
5
8
GLOBAL
LOCAL
I1.2.Source.of.Change
I1.3.Scope.of.Mechanism
Frequency
20
10
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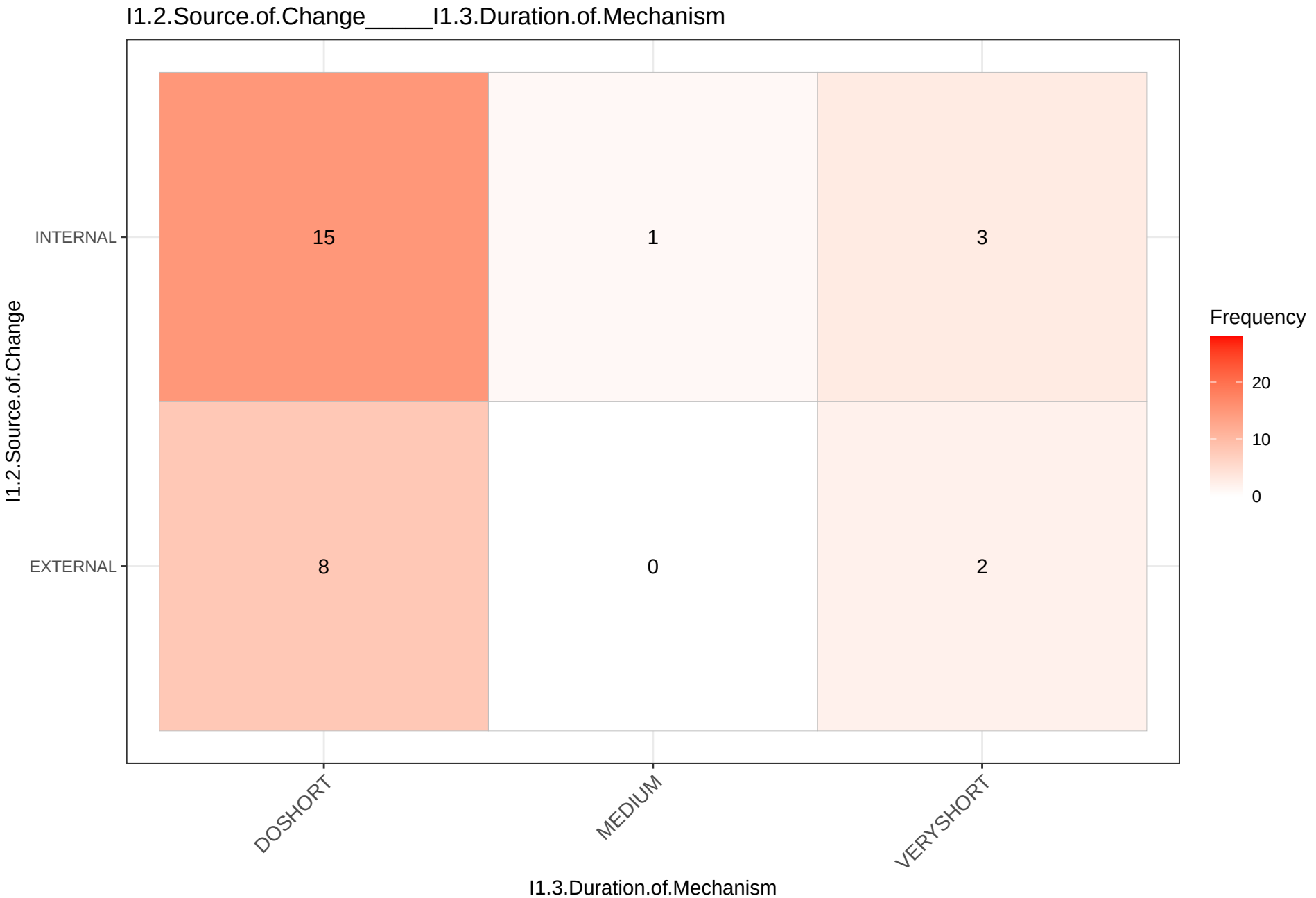
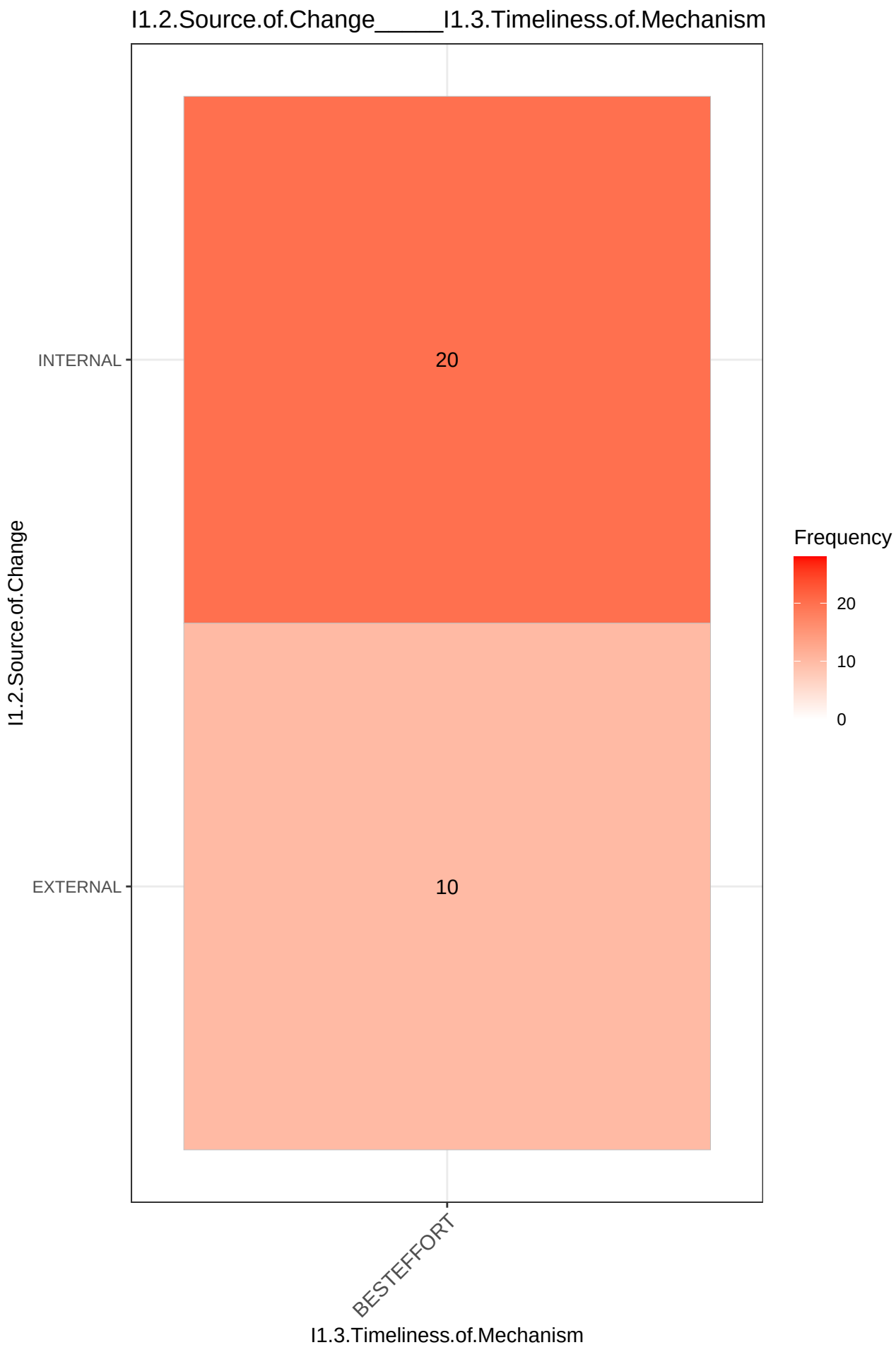
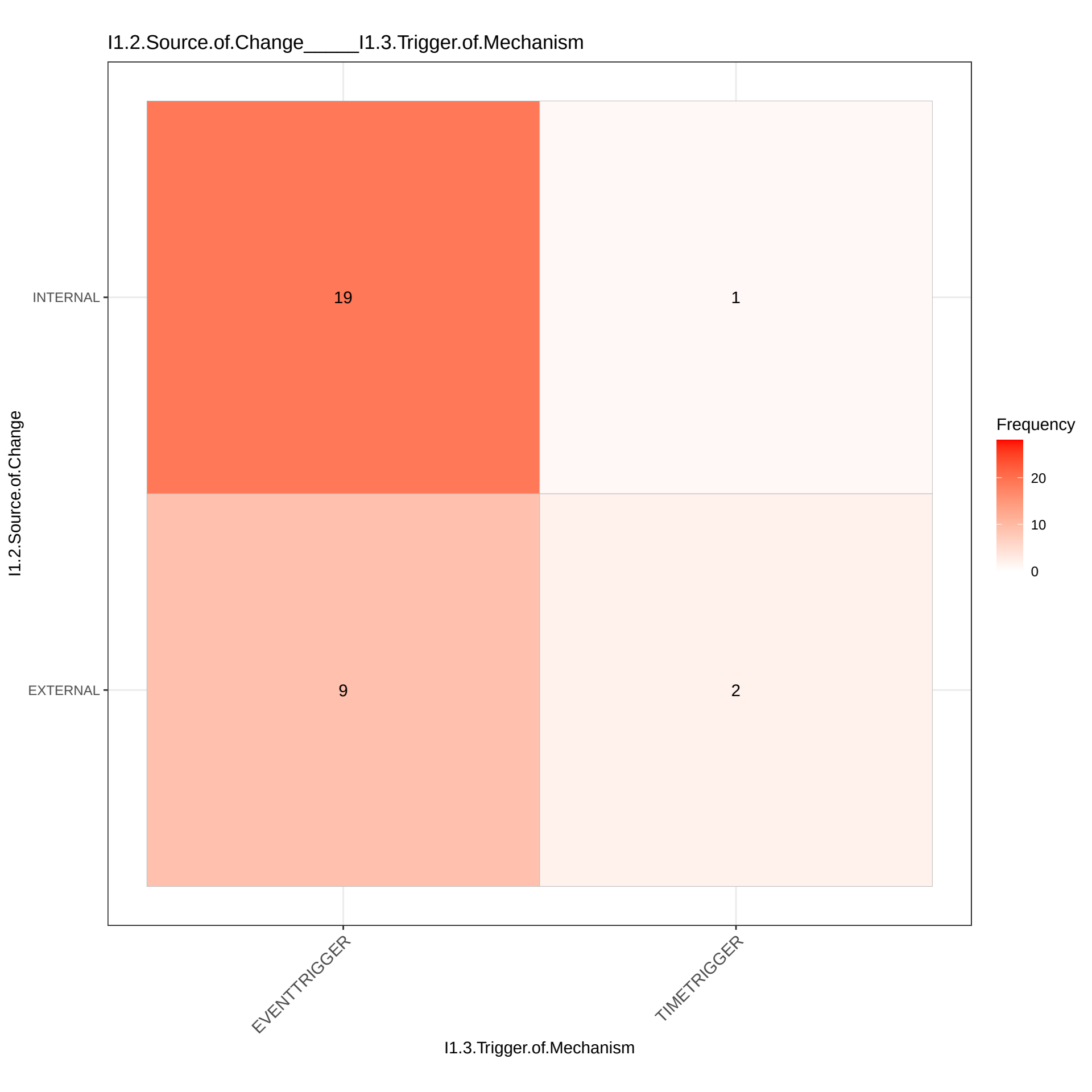
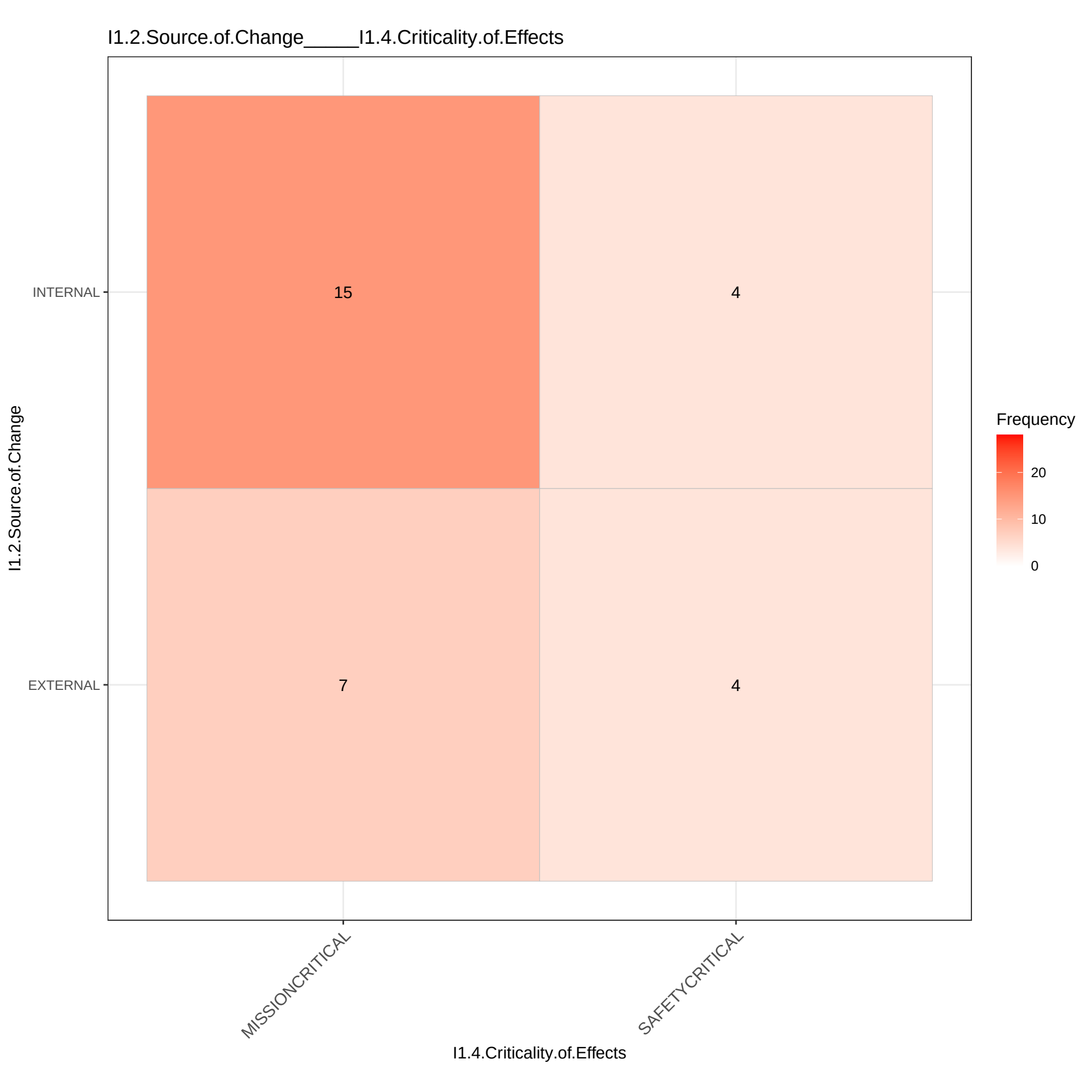
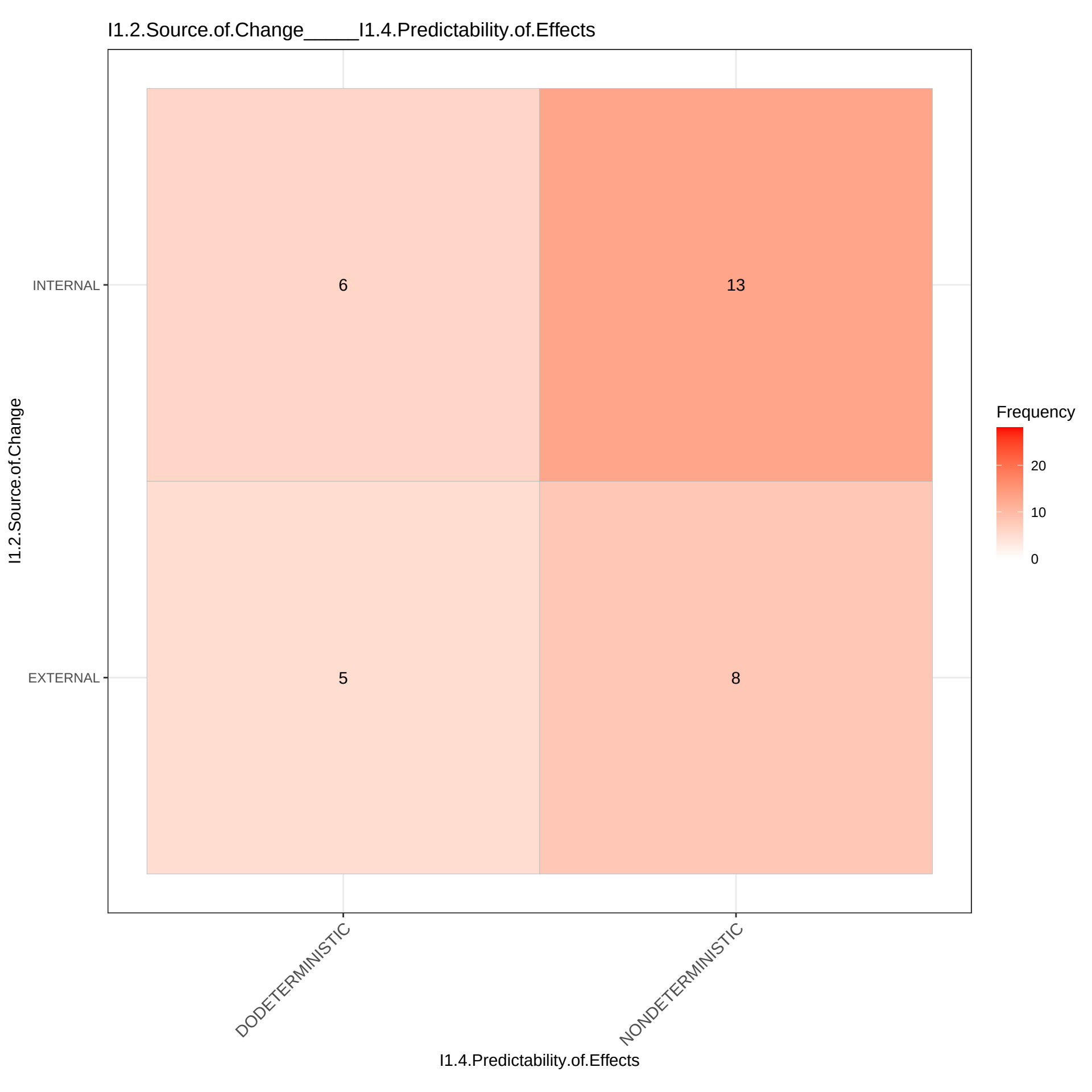
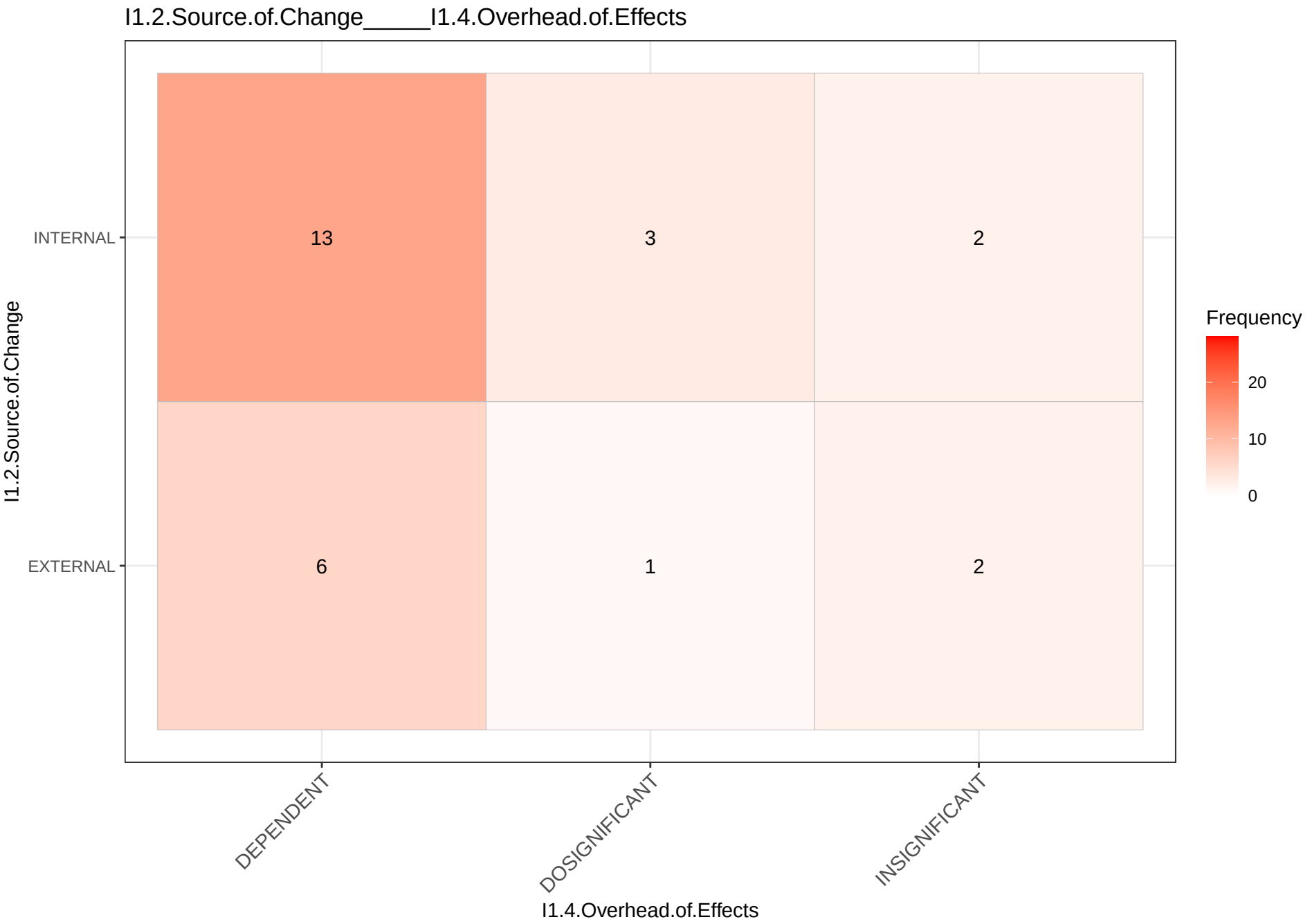

I1.2.Source.of.Change_____I1.3.Duration.of.Mechanism
INTERNAL
EXTERNAL
I1.2.Source.of.Change
15
1
3
8
0
2
DOSHORT
MEDIUM
VERYSHORT
I1.3.Duration.of.Mechanism
Frequency
20
10
0

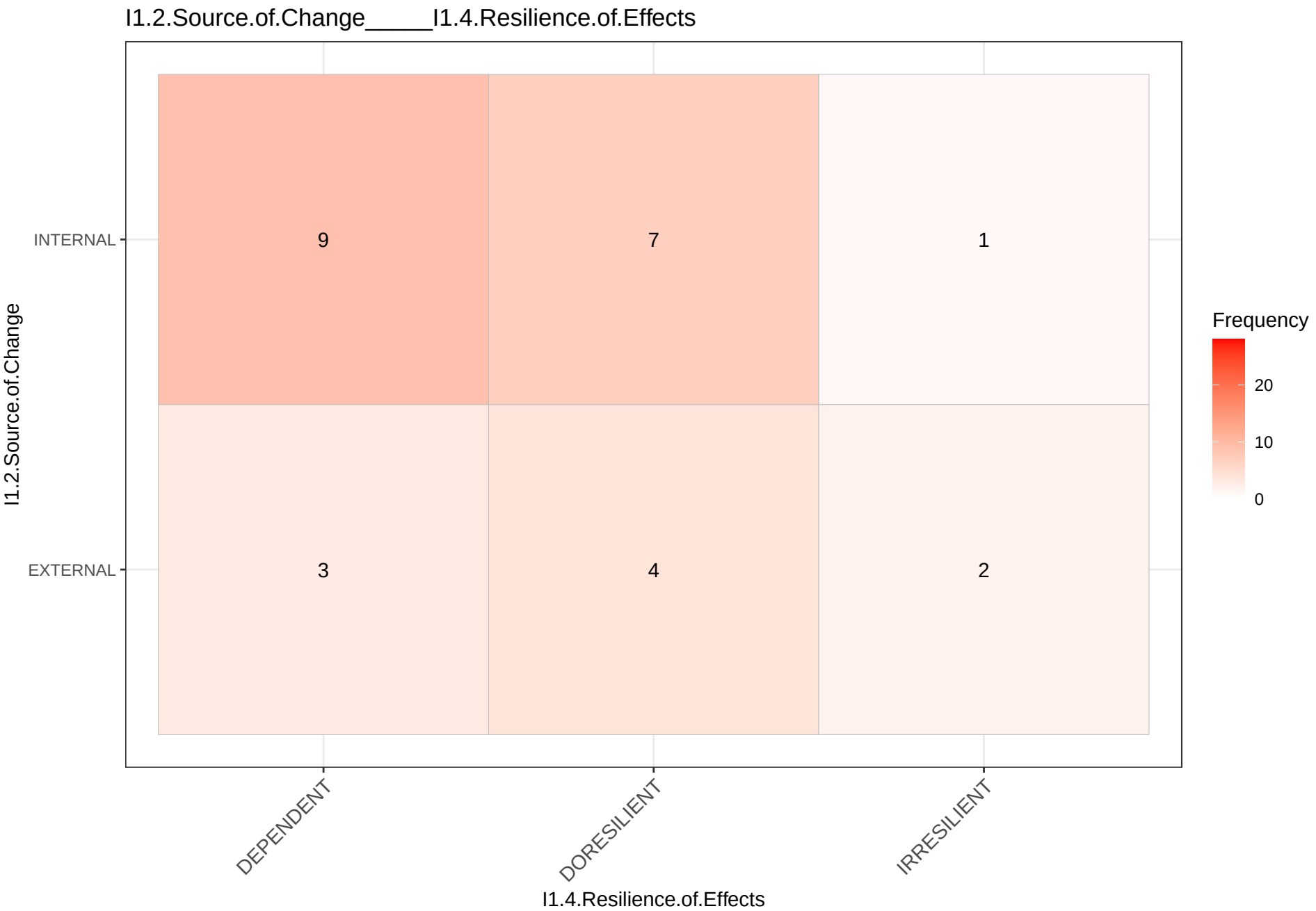

I1.2.Source.of.Change_____I1.3.Timeliness.of.Mechanism
INTERNAL
EXTERNAL
20
10
I1.2.Source.of.Change
Frequency
20
10
0
BESTEFFORT
I1.3.Timeliness.of.Mechanism

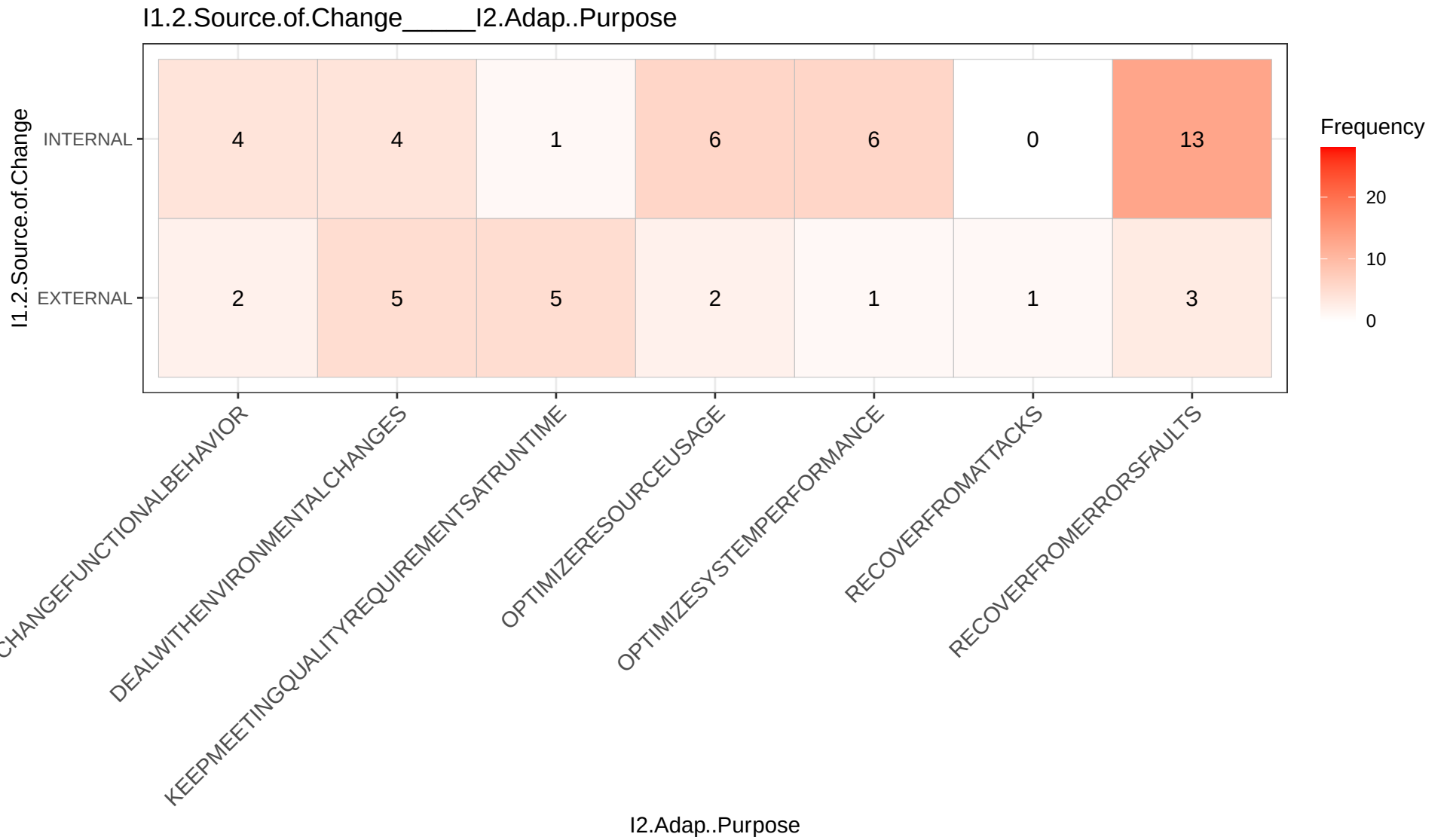

I1.2.Source.of.Change_____I1.3.Trigger.of.Mechanism
INTERNAL
EXTERNAL
I1.2.Source.of.Change
19
1
9
2
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
0

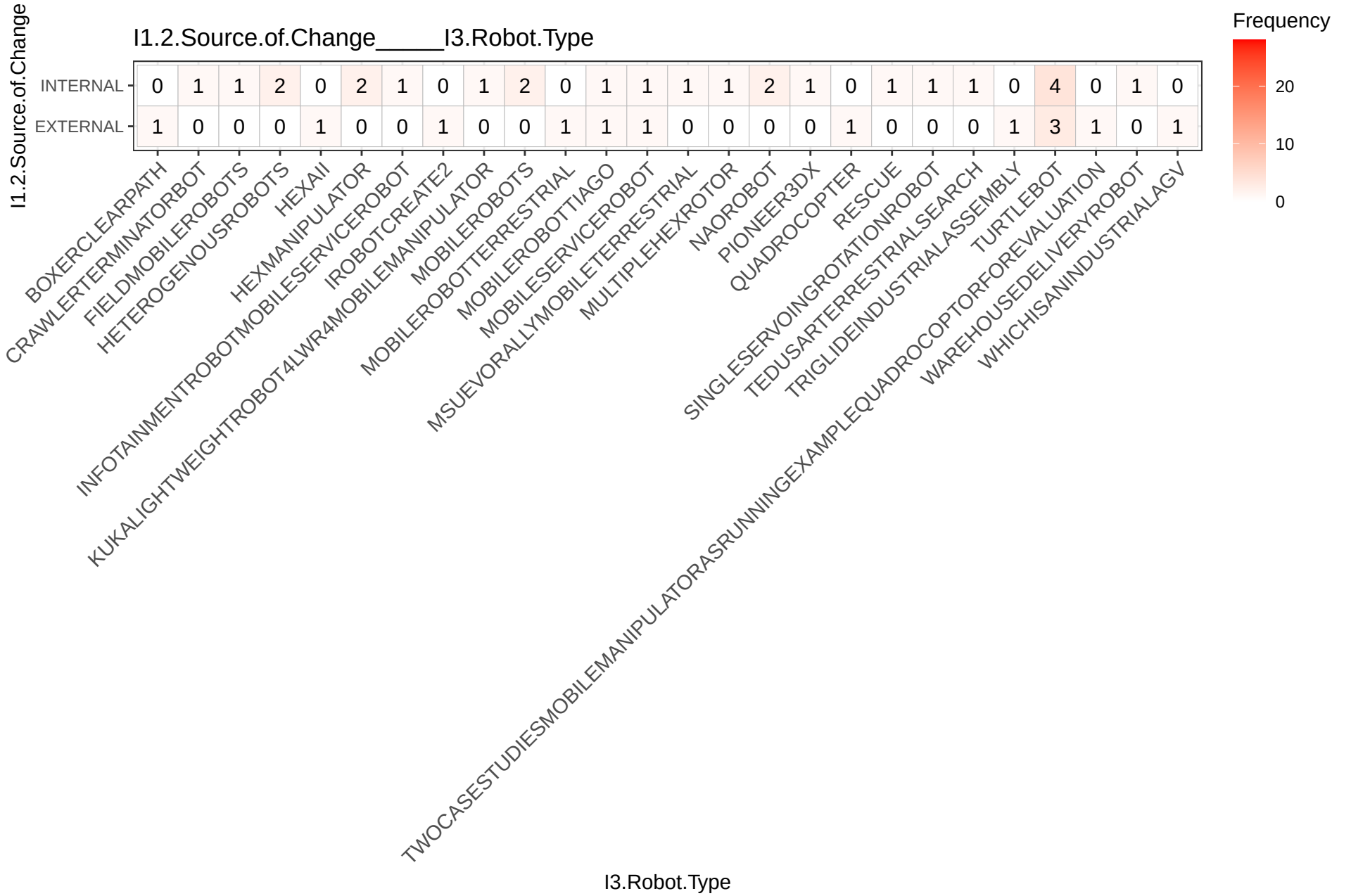

I1.2.Source.of.Change_____I1.4.Criticality.of.Effects
INTERNAL
EXTERNAL
15
4
7
4
I1.2.Source.of.Change
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
0

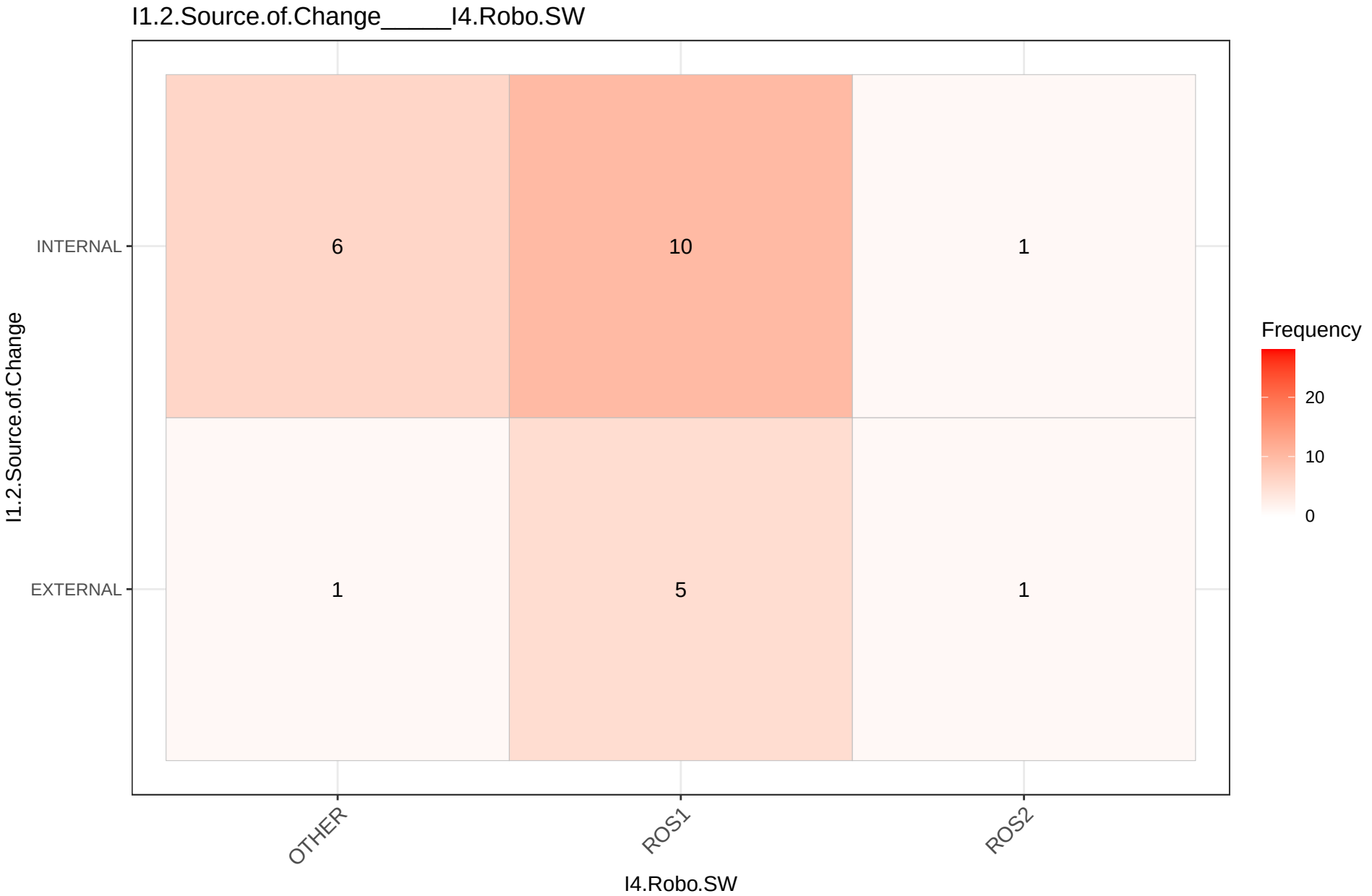

I1.2.Source.of.Change_____I1.4.Predictability.of.Effects
INTERNAL
EXTERNAL
6
13
5
8
I1.2.Source.of.Change
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0

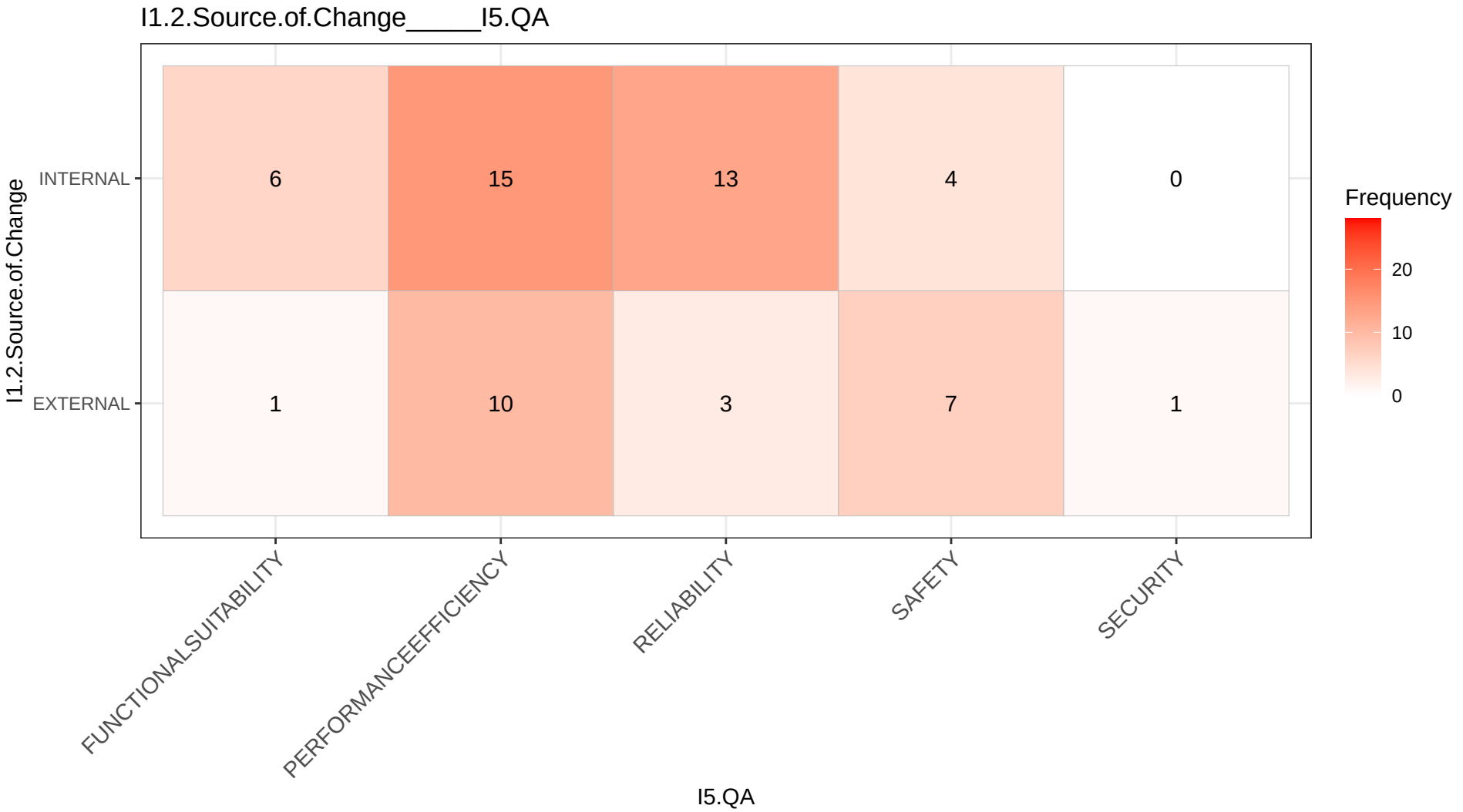

I1.2.Source.of.Change_____I1.4.Overhead.of.Effects
INTERNAL
EXTERNAL
13
3
2
6
1
2
I1.2.Source.of.Change
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
0

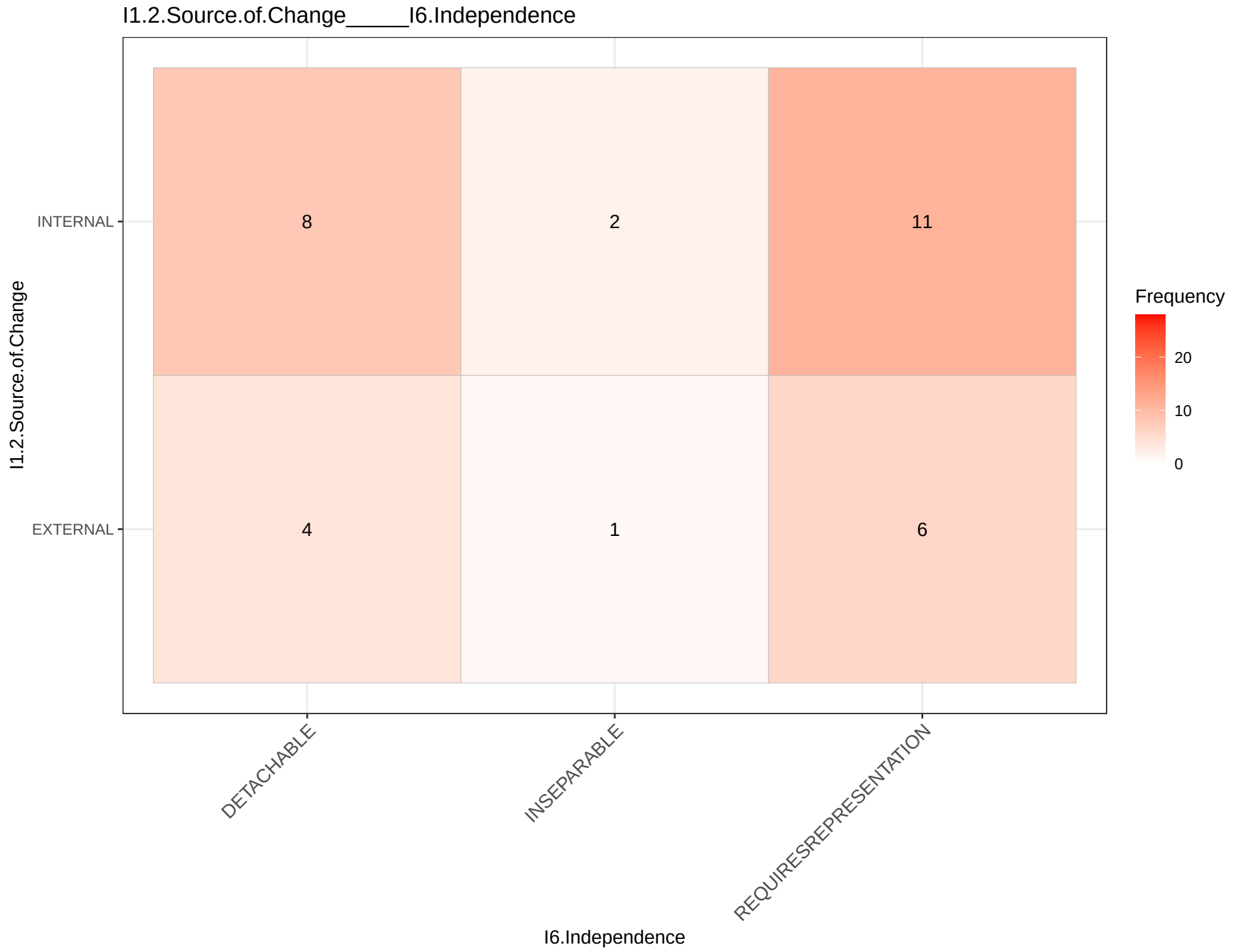

I1.2.Source.of.Change_____I1.4.Resilience.of.Effects
INTERNAL
EXTERNAL
I1.2.Source.of.Change
9
7
1
3
4
2
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0

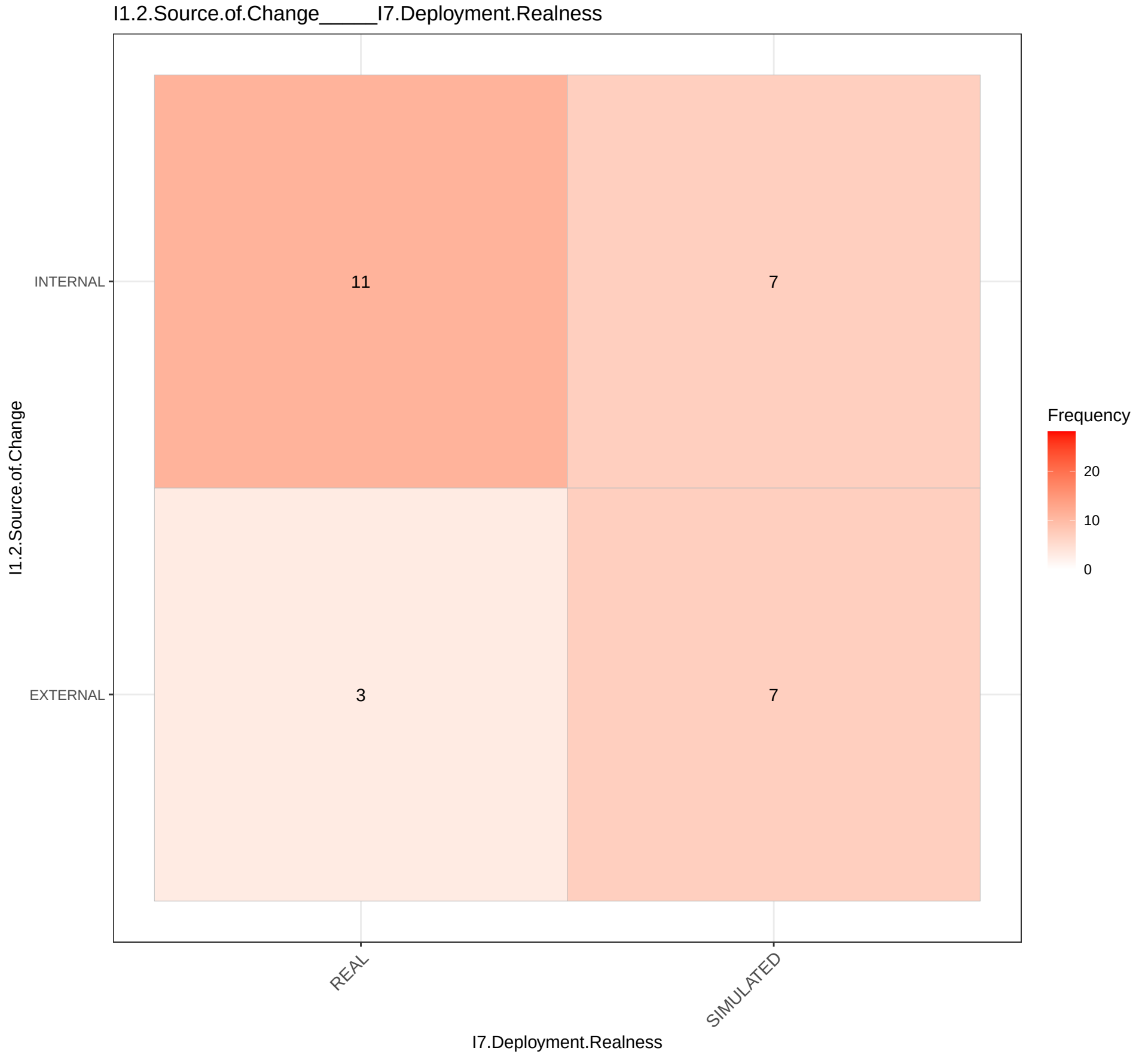

I1.2.Source.of.Change_____I2.Adap..Purpose
I1.2.Source.of.Change
INTERNAL
EXTERNAL
4
4
1
6
6
0
13
2
5
5
2
1
1
3
Frequency
20
10
0
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose

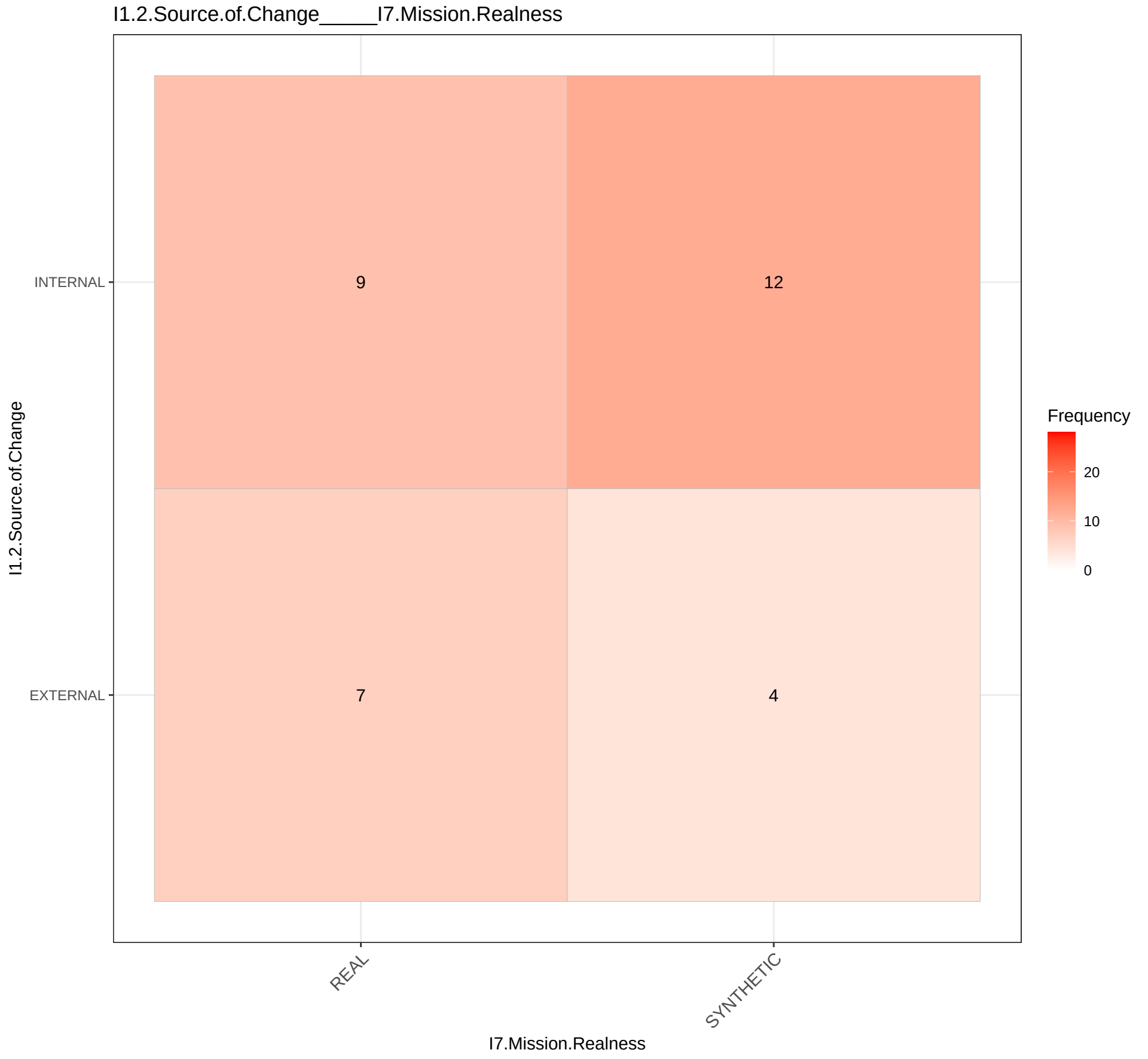

I1.2.Source.of.Change_____I3.Robot.Type
I1.2.Source.of.Change
INTERNAL
EXTERNAL
0 1 1 2 0 2 1 0 1 2 0 1 1 1 1 2 1 0 1 1 1 0 4 0 1 0
1 0 0 0 1 0 0 1 0 0 1 1 1 0 0 0 0 1 0 0 0 1 3 1 0 1
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0

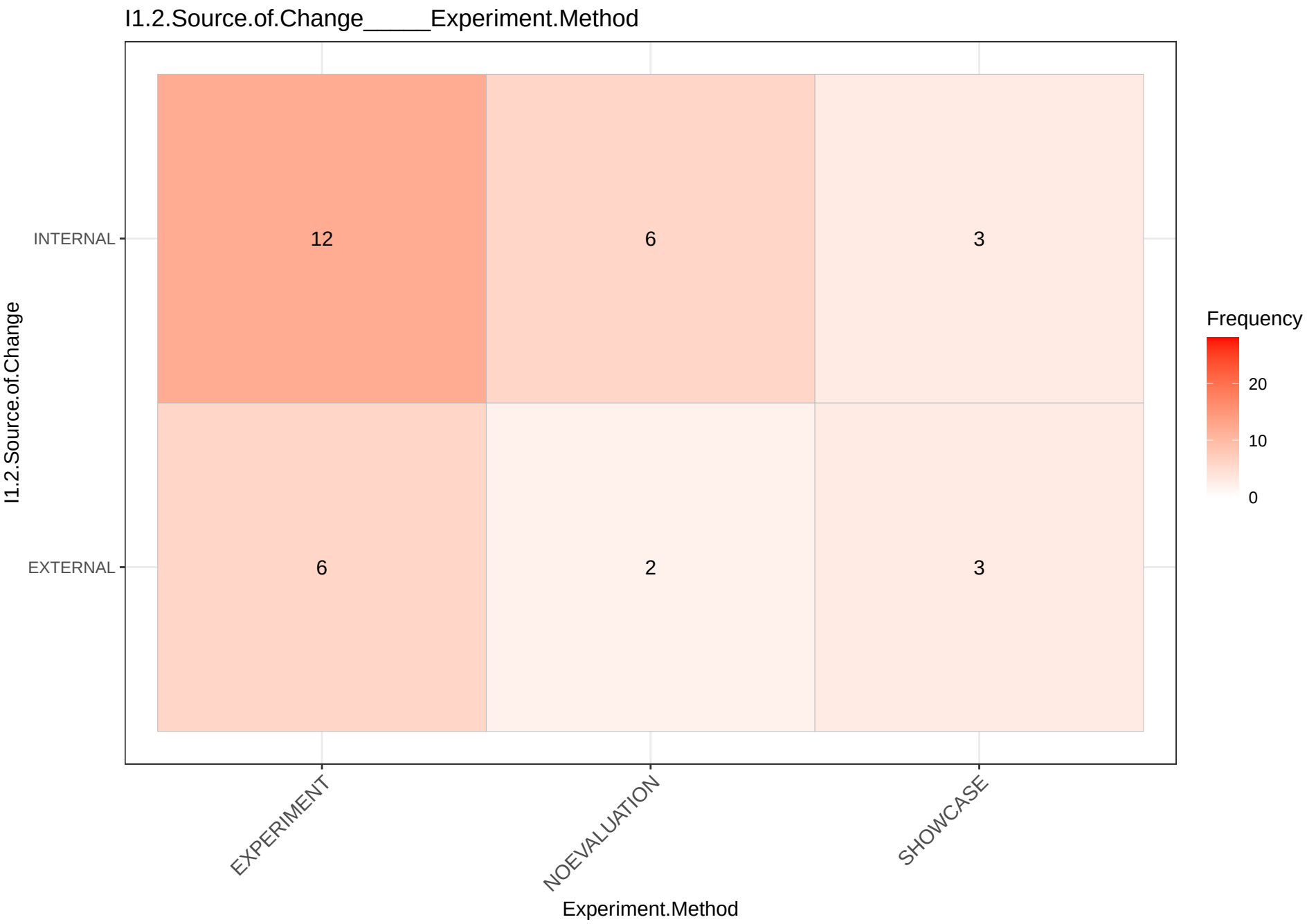

I1.2.Source.of.Change_____I4.Robo.SW
INTERNAL
EXTERNAL
I1.2.Source.of.Change
6
10
1
1
5
1
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0

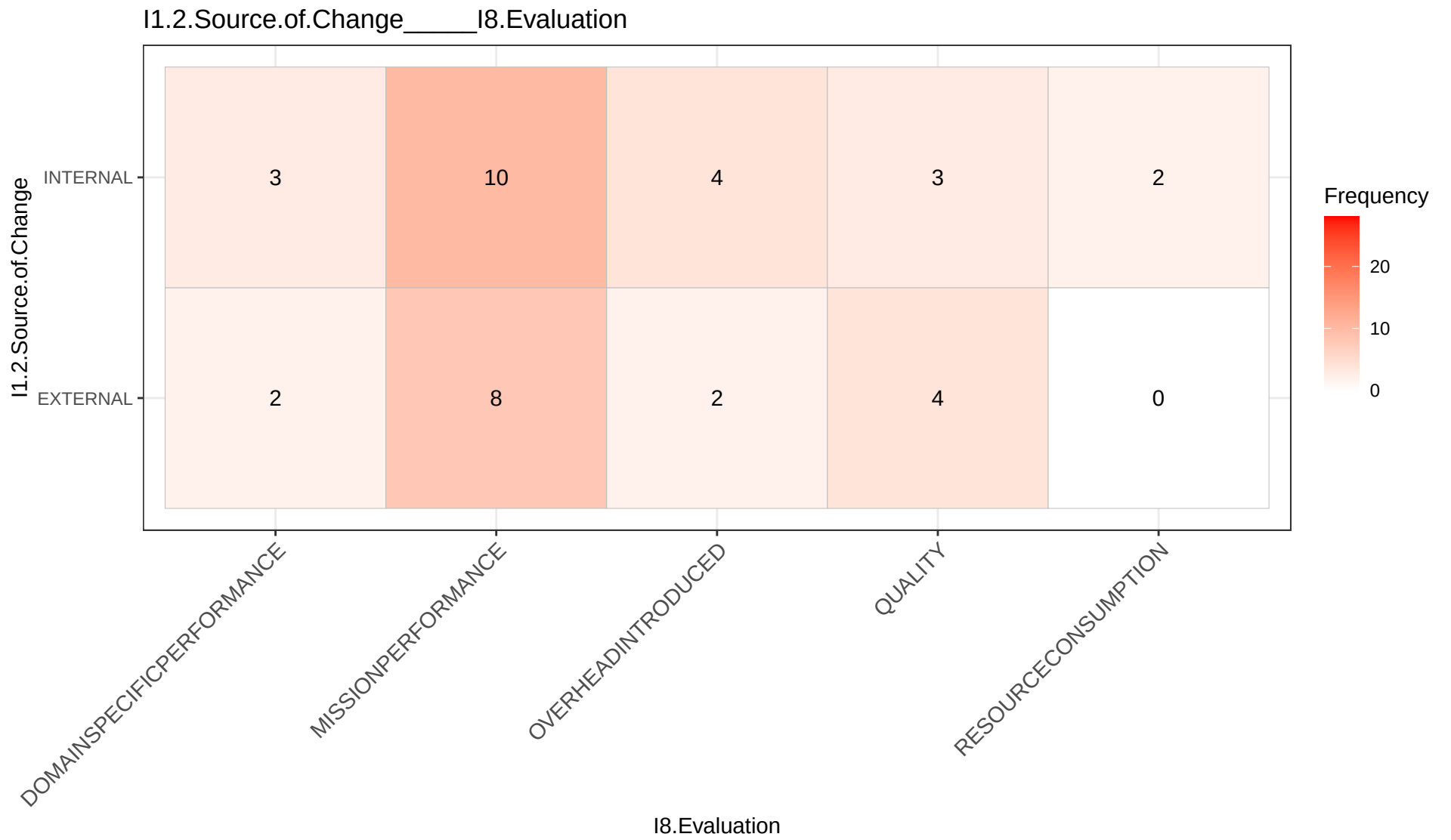

I1.2.Source.of.Change_____I5.QA
I1.2.Source.of.Change
INTERNAL
EXTERNAL
6
15
13
4
0
1
10
3
7
1
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I1.2.Source.of.Change_____I6.Independence
INTERNAL
EXTERNAL
I1.2.Source.of.Change
8
2
11
4
1
6
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I1.2.Source.of.Change_____I7.Deployment.Realness
INTERNAL
EXTERNAL
11
7
3
7
I1.2.Source.of.Change
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0


I1.2.Source.of.Change_____I7.Mission.Realness
INTERNAL
EXTERNAL
9
12
7
4
REAL
SYNTHETIC
I1.2.Source.of.Change
I7.Mission.Realness
Frequency
20
10
0


I1.2.Source.of.Change_____Experiment.Method
I1.2.Source.of.Change
INTERNAL
EXTERNAL
12
6
3
6
2
3
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I1.2.Source.of.Change_____I8.Evaluation
I1.2.Source.of.Change
INTERNAL
EXTERNAL
3
10
4
3
2
2
8
2
4
0
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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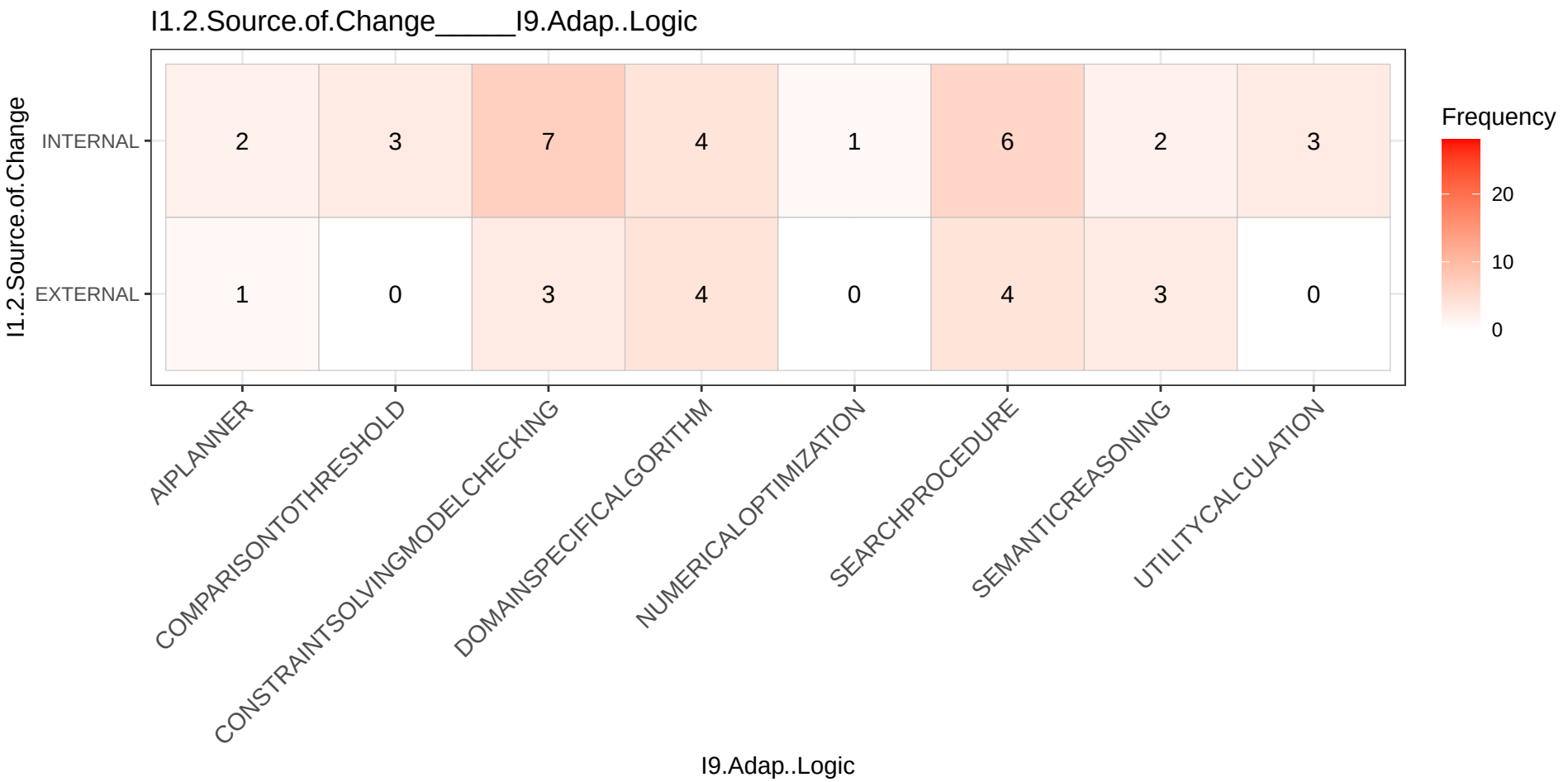
I1.2.Source.of.Change_____I9.Adap..Logic
I1.2.Source.of.Change
INTERNAL
EXTERNAL
2
3
7
4
1
6
2
3
1
0
3
4
0
4
3
0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
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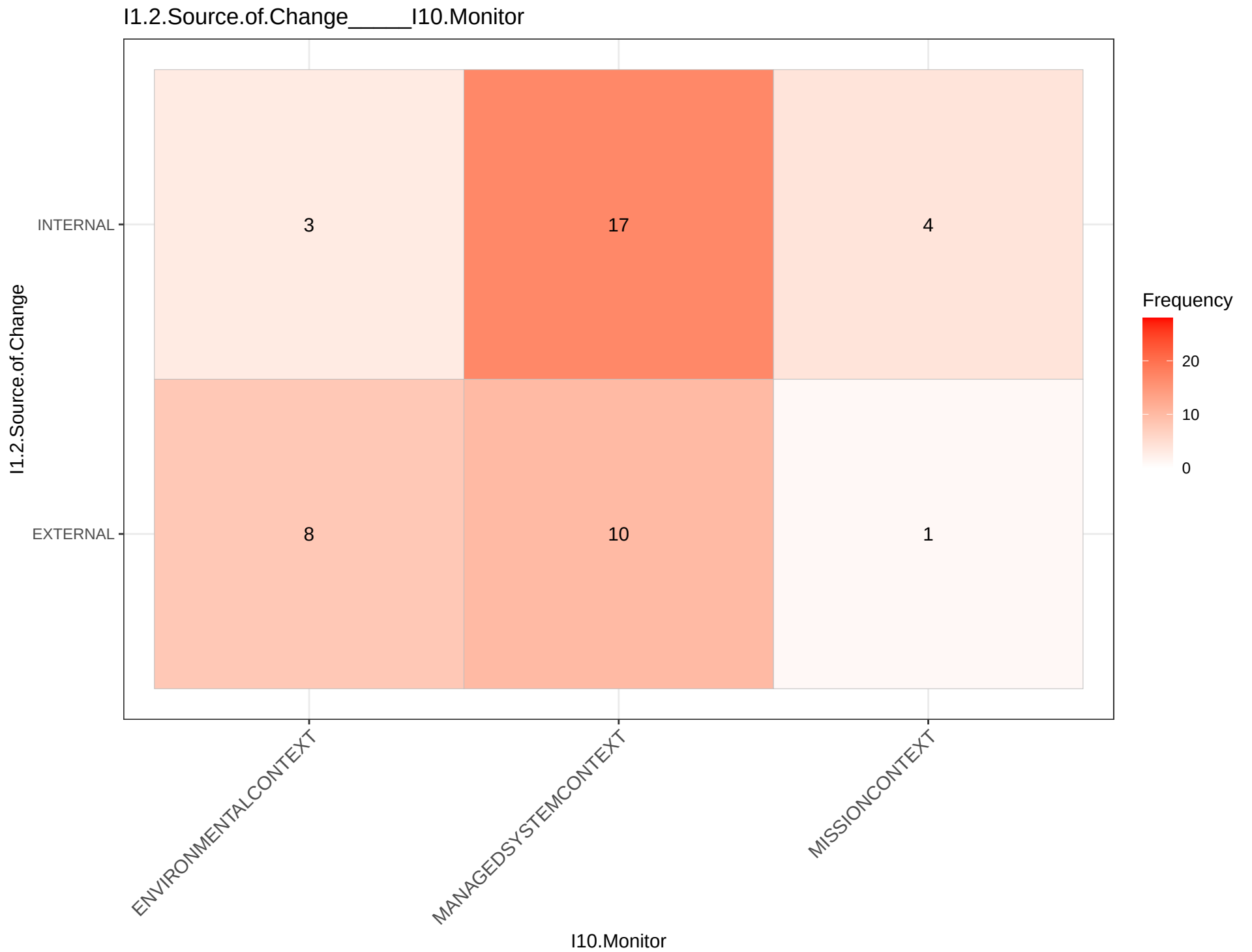
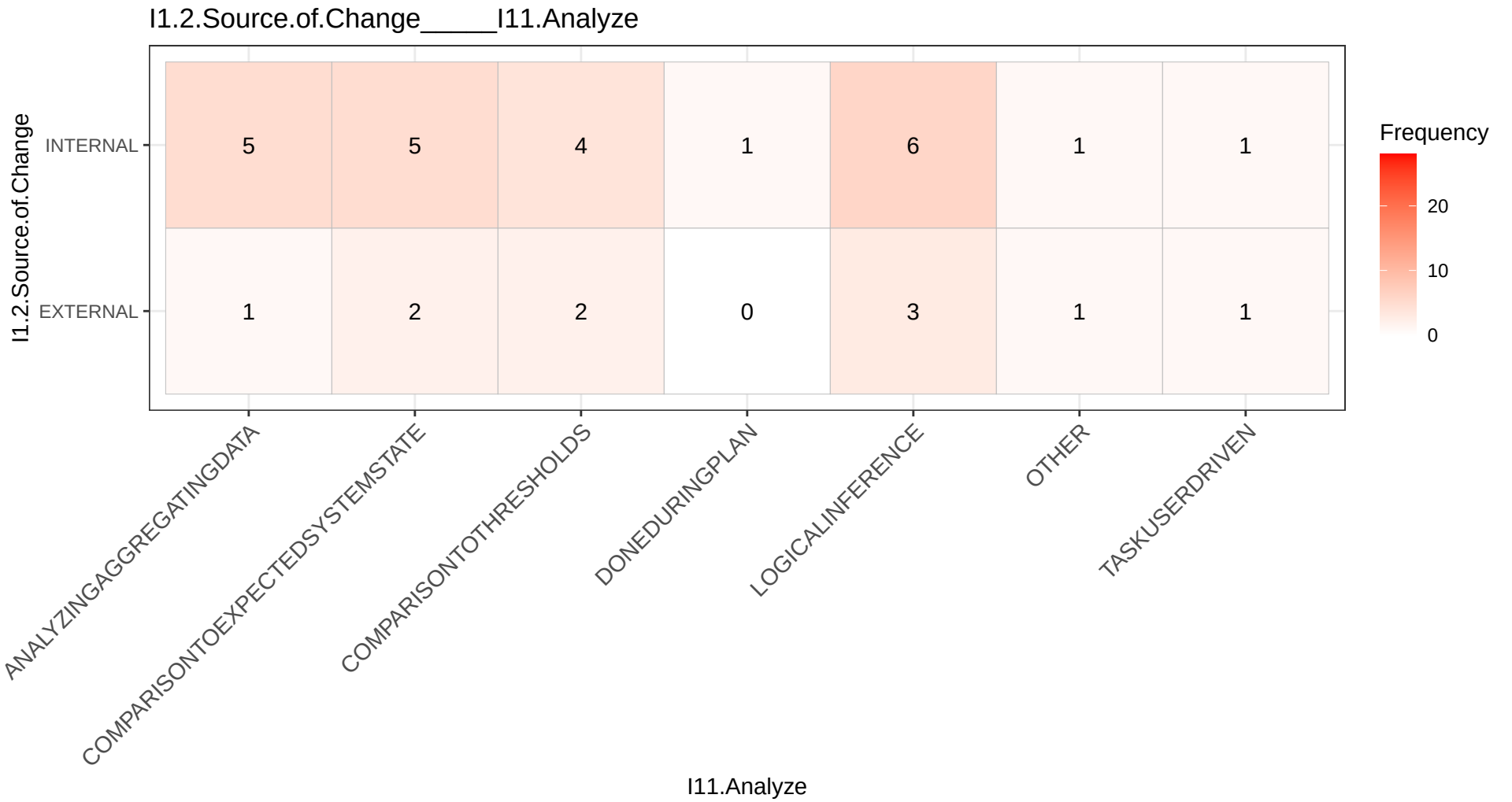
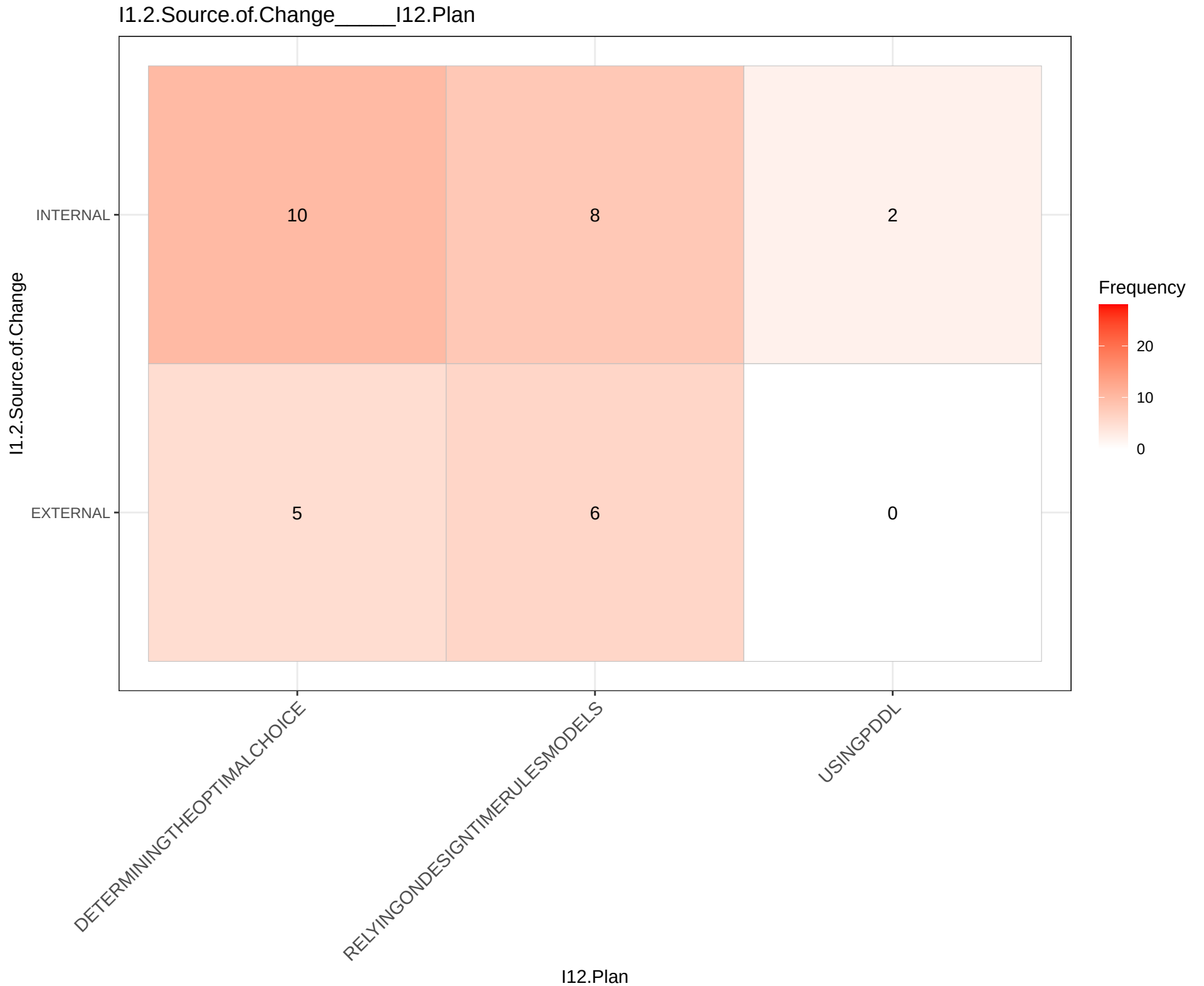

I1.2.Source.of.Change_____I10.Monitor
INTERNAL
EXTERNAL
I1.2.Source.of.Change
3
17
4
8
10
1
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0


I1.2.Source.of.Change_____I11.Analyze
I1.2.Source.of.Change
INTERNAL
EXTERNAL
5
5
4
1
6
1
1
1
2
2
0
3
1
1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
0


I1.2.Source.of.Change_____I12.Plan
INTERNAL
EXTERNAL
I1.2.Source.of.Change
10
8
2
5
6
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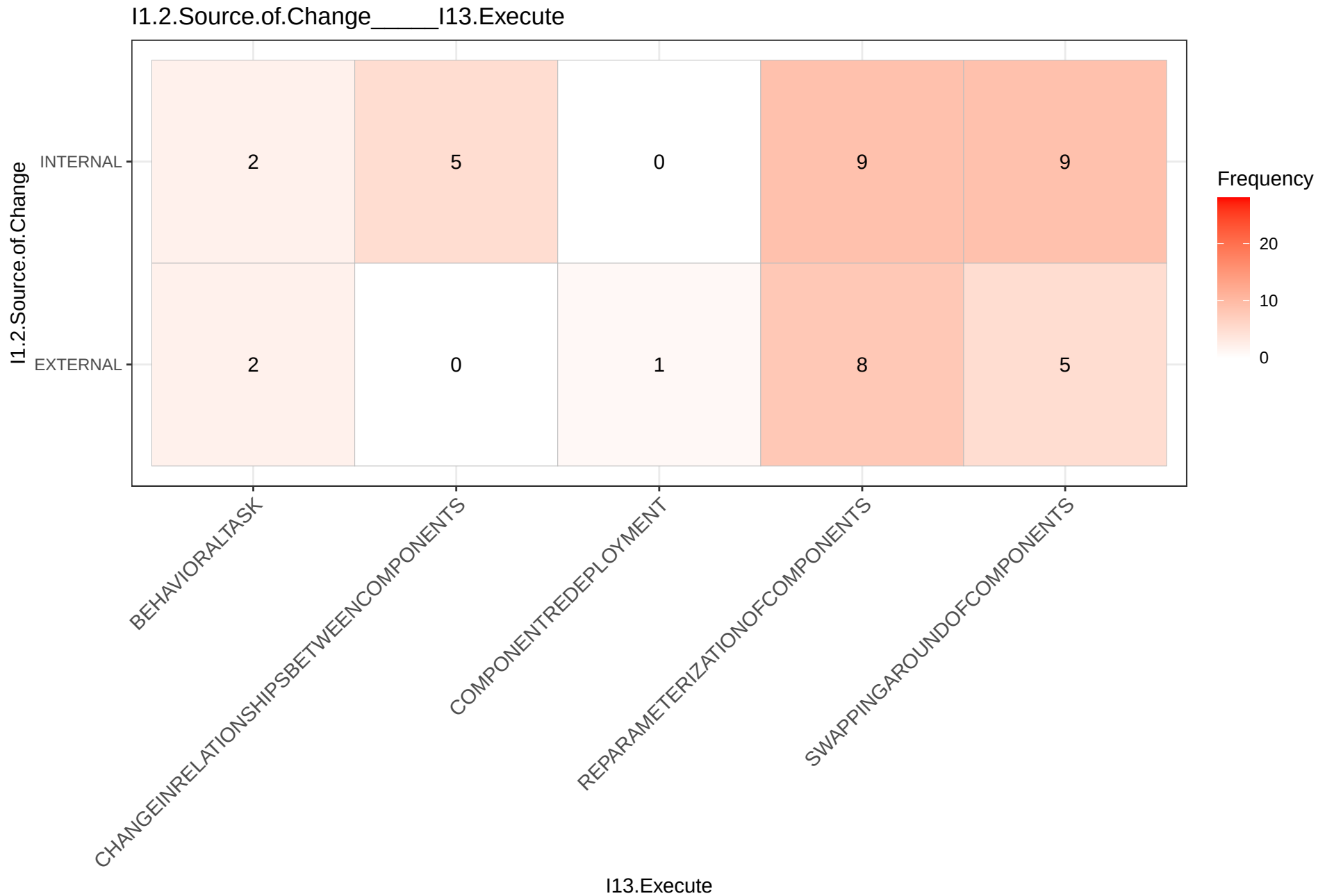
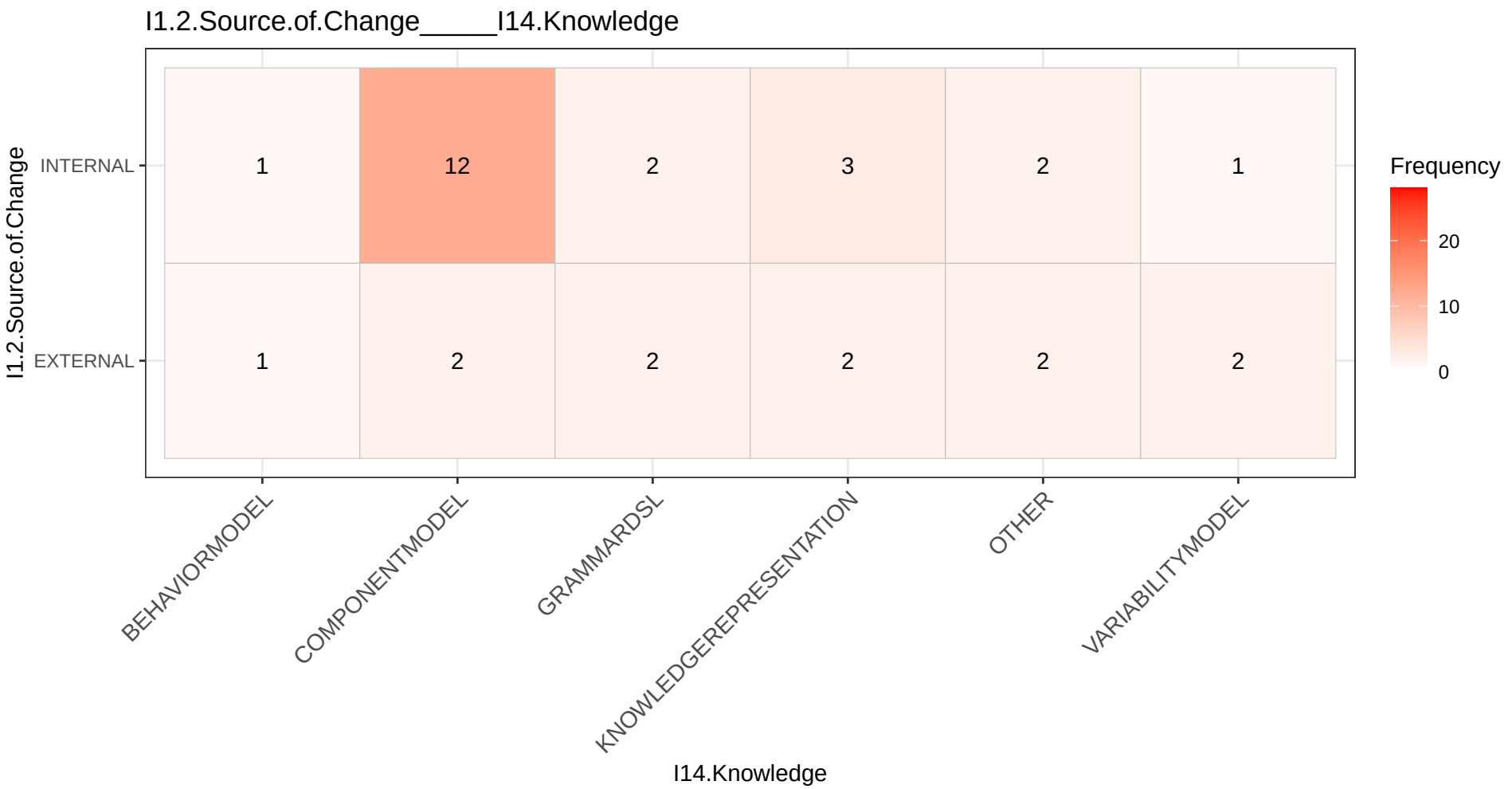
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0


I1.2.Source.of.Change_____I13.Execute
I1.2.Source.of.Change
INTERNAL
EXTERNAL
2
5
0
9
9
2
0
1
8
5
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0


I1.2.Source.of.Change_____I14.Knowledge
I1.2.Source.of.Change
INTERNAL
EXTERNAL
1
12
2
3
2
1
1
2
2
2
2
2
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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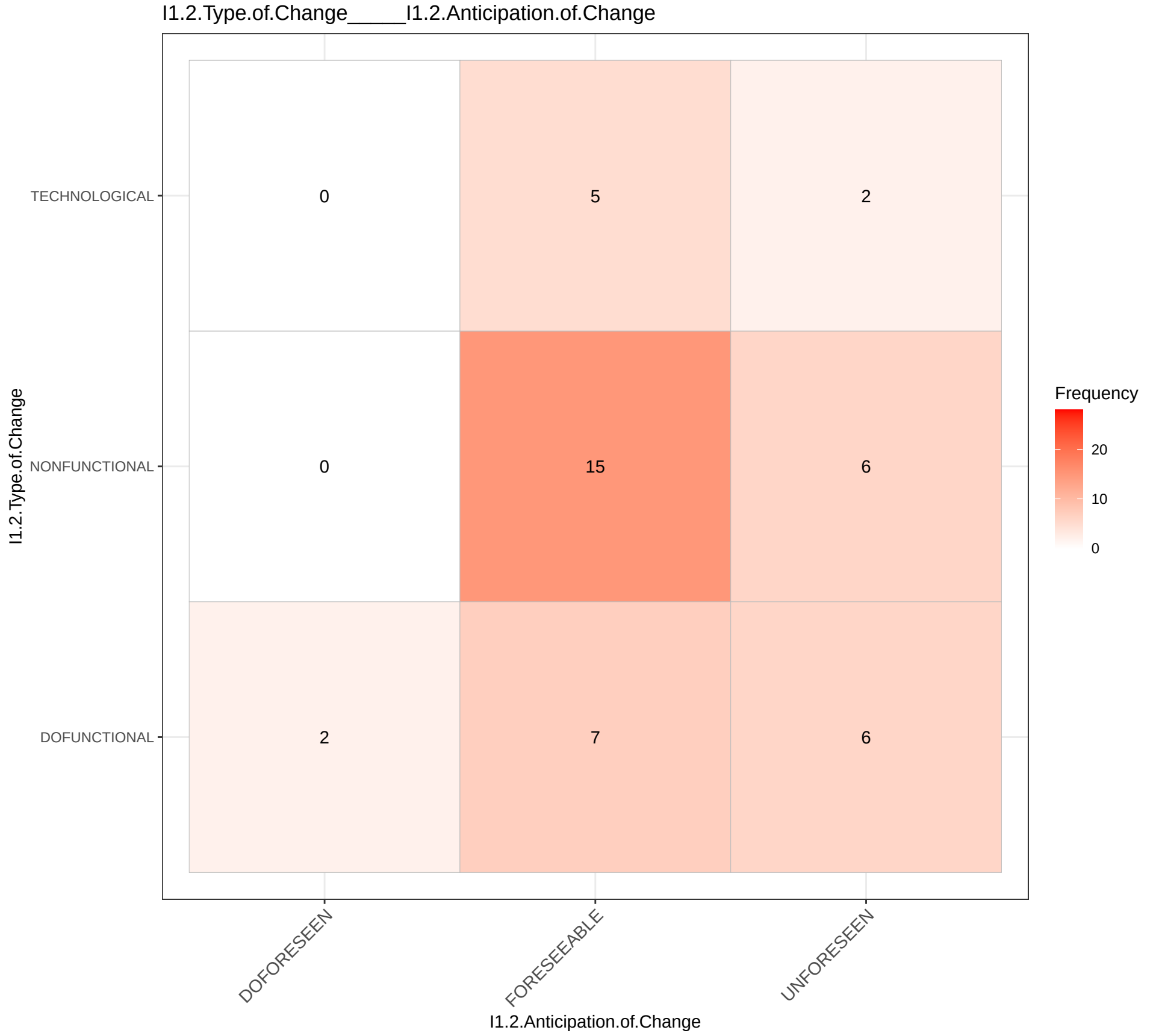
I1.2.Type.of.Change_____I1.2.Anticipation.of.Change
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
0
5
2
0
15
6
2
7
6
DOFORESEEN
FORESEEABLE
UNFORESEEN
I1.2.Anticipation.of.Change
Frequency
20
10
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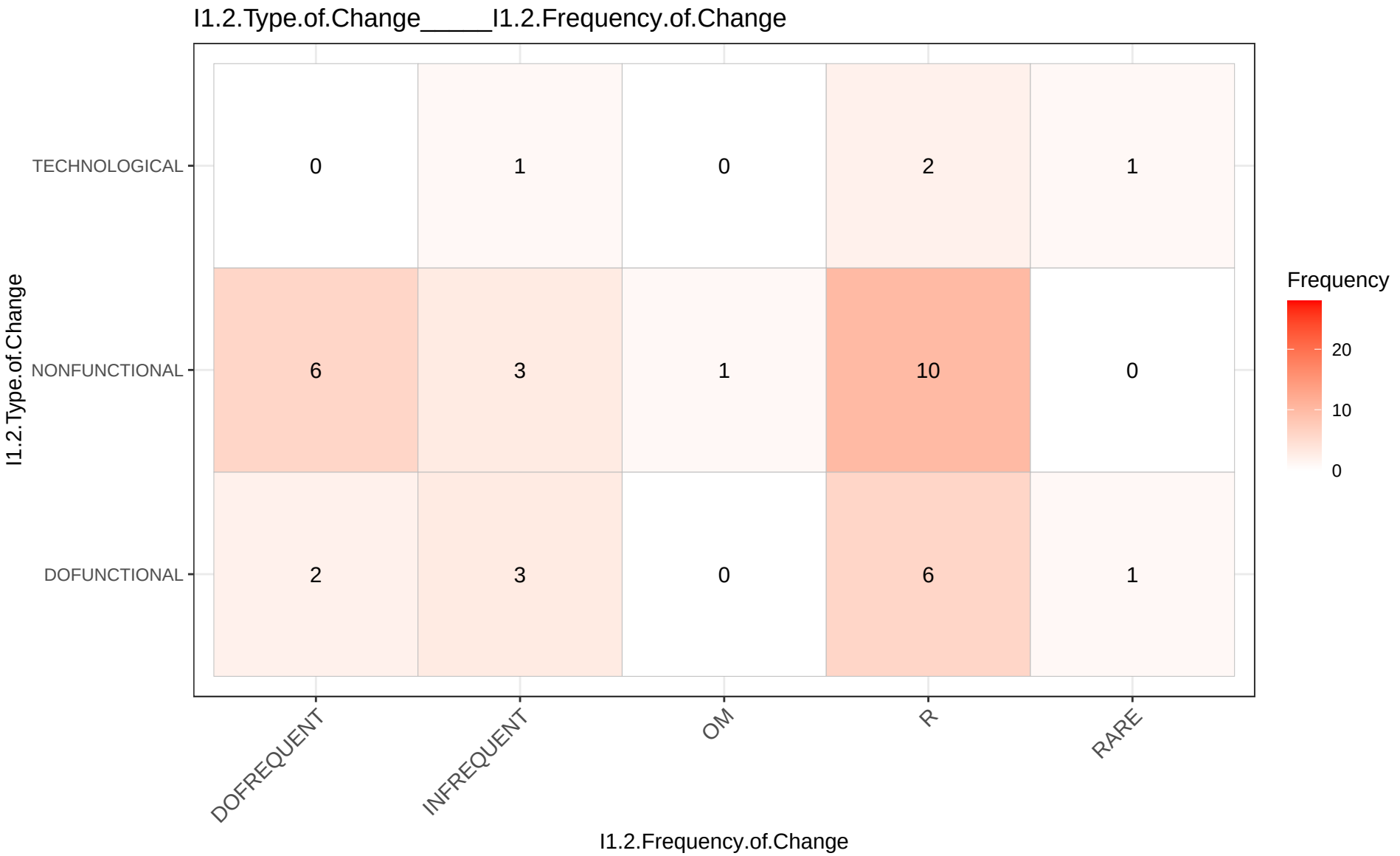
I1.2.Type.of.Change_____I1.2.Frequency.of.Change
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
0
1
0
2
1
6
3
1
10
0
2
3
0
6
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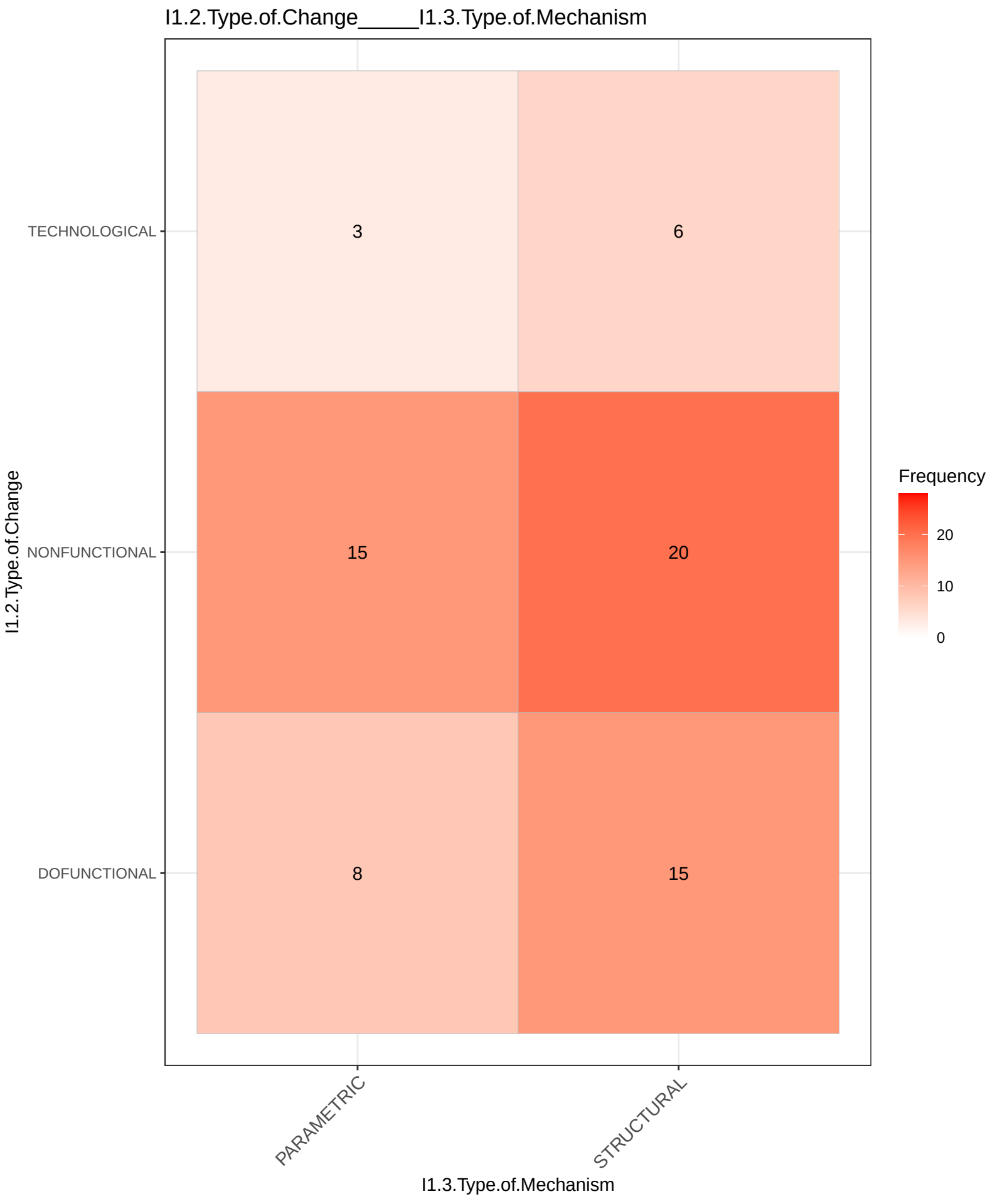
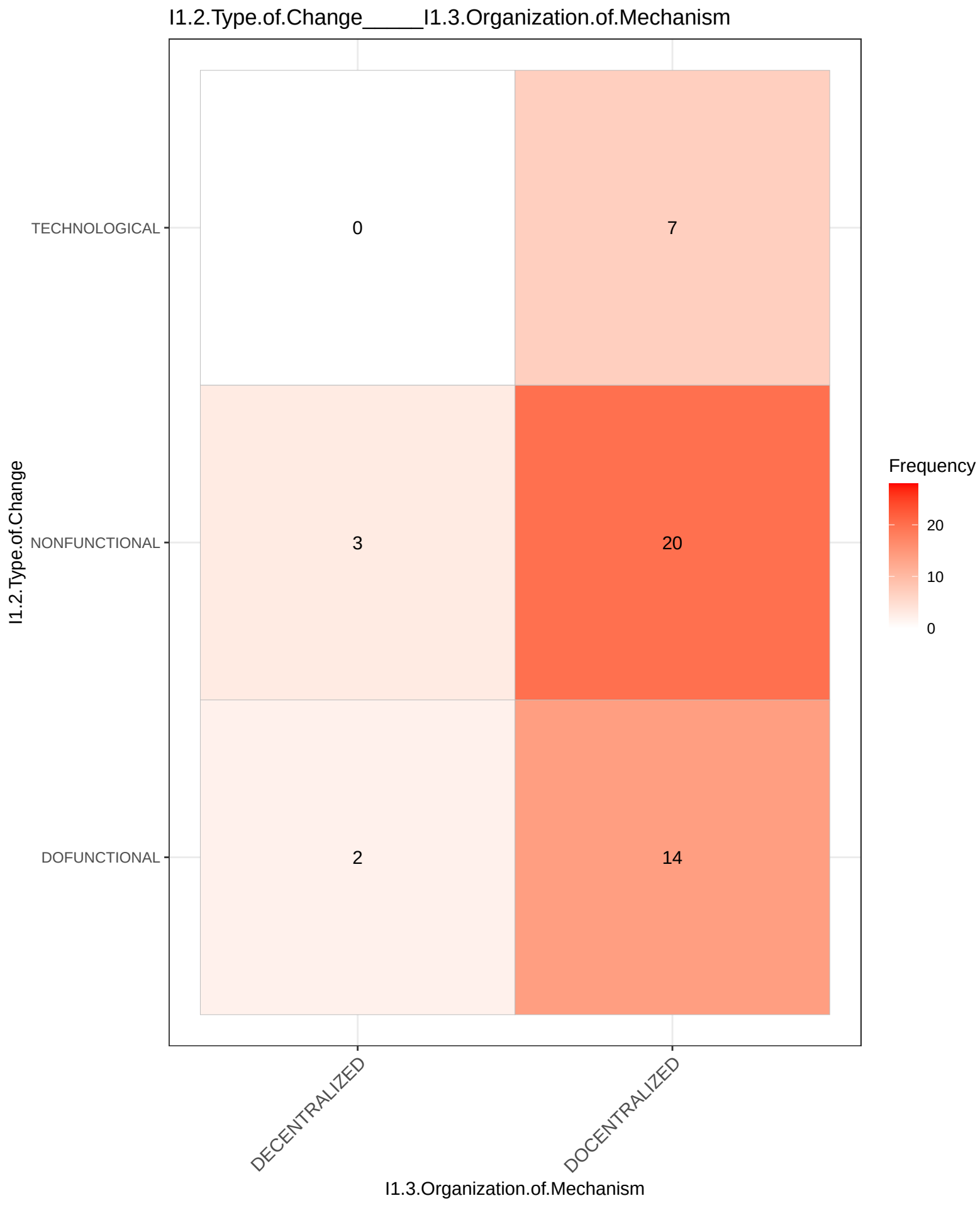
DOFREQUENT
INFREQUENT
OM
R
RARE
I1.2.Frequency.of.Change
Frequency
20
10
0


I1.2.Type.of.Change_____I1.3.Type.of.Mechanism
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
3
6
15
20
8
15
PARAMETRIC
STRUCTURAL
I1.3.Type.of.Mechanism
Frequency
20
10
0


I1.2.Type.of.Change_____I1.3.Organization.of.Mechanism
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
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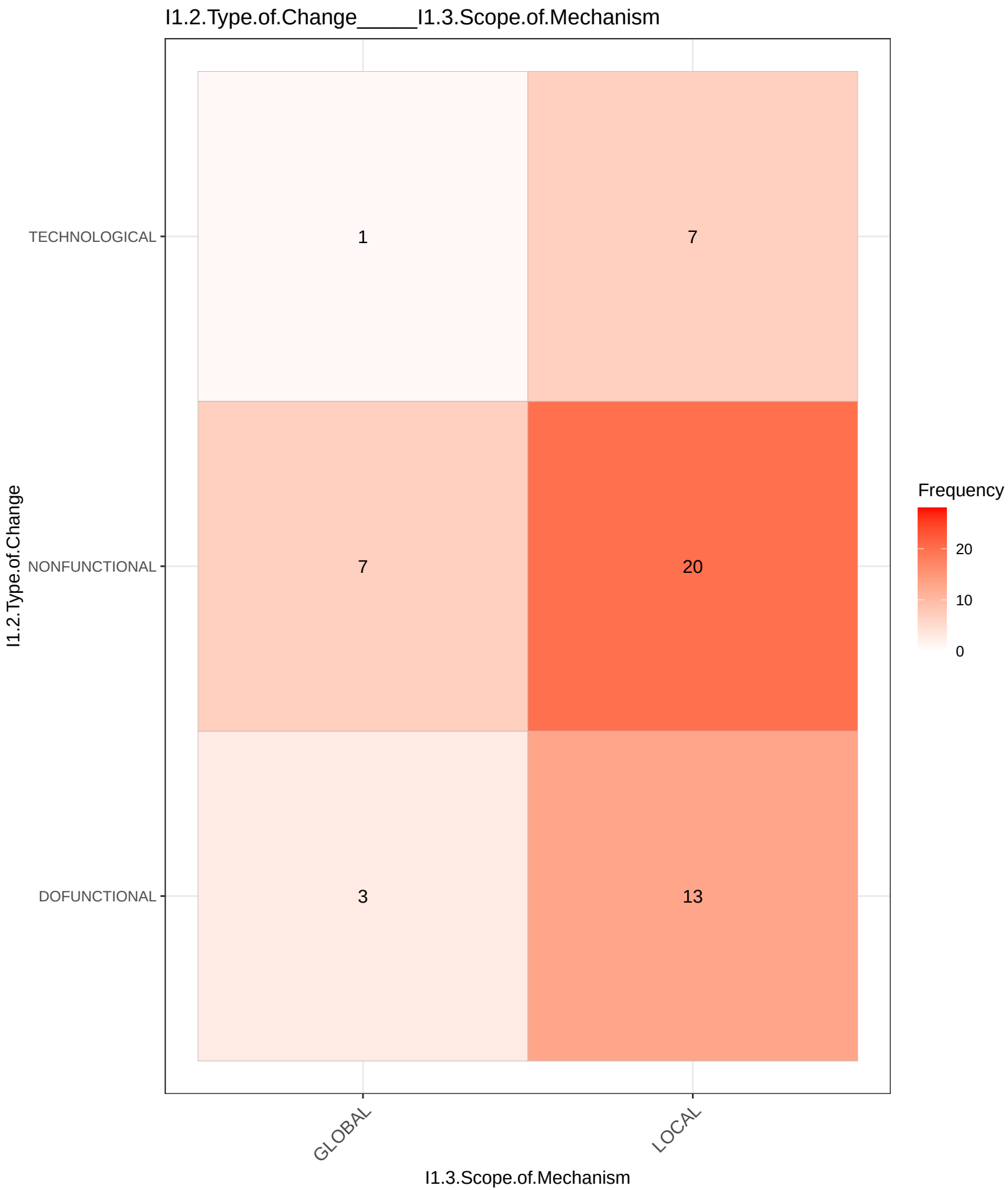
7
3
20
2
14
DECENTRALIZED
DOCENTRALIZED
I1.3.Organization.of.Mechanism
Frequency
20
10
0


I1.2.Type.of.Change_____I1.3.Scope.of.Mechanism
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
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7
7
20
3
13
GLOBAL
LOCAL
I1.2.Type.of.Change
I1.3.Scope.of.Mechanism
Frequency
20
10
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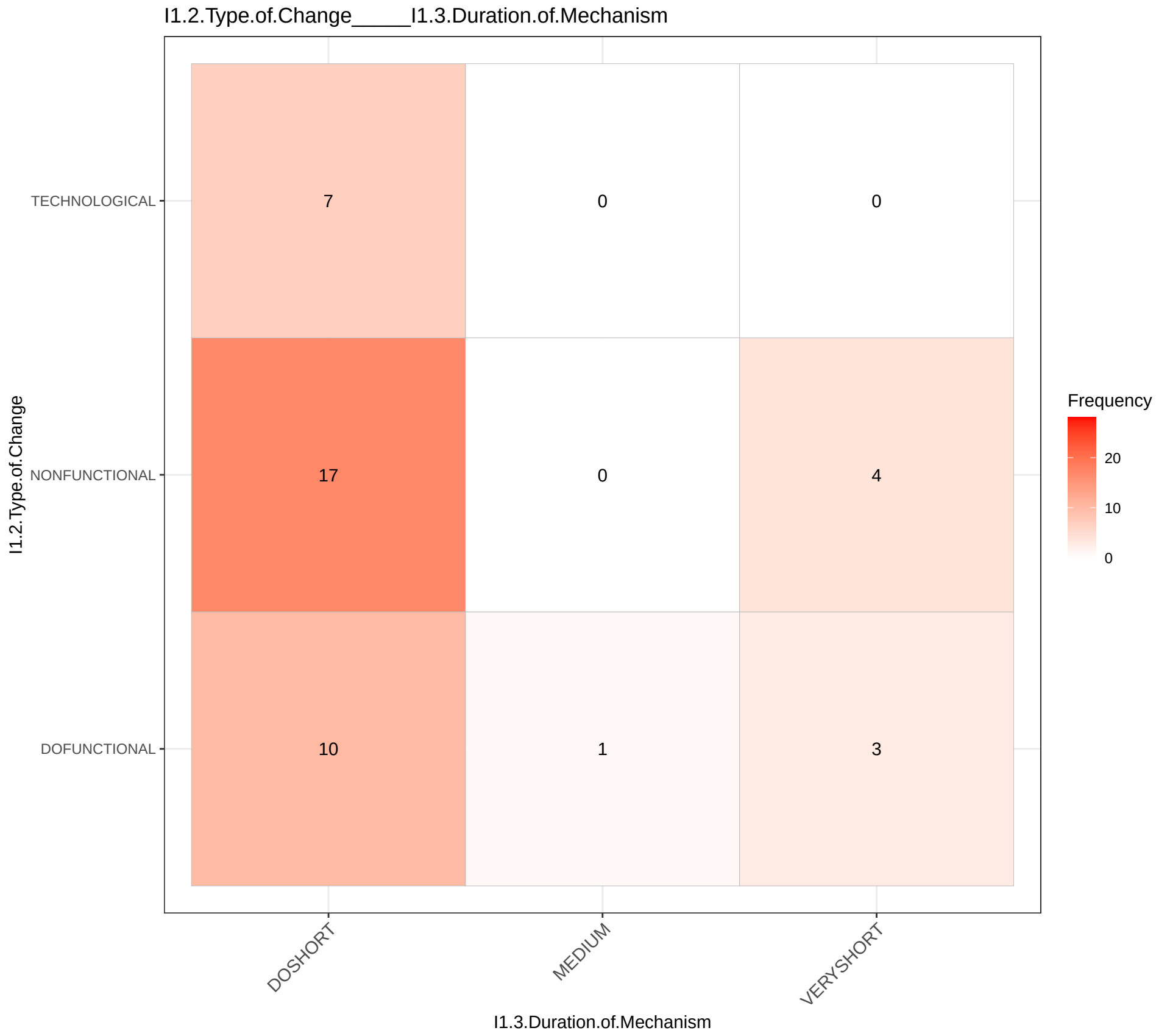
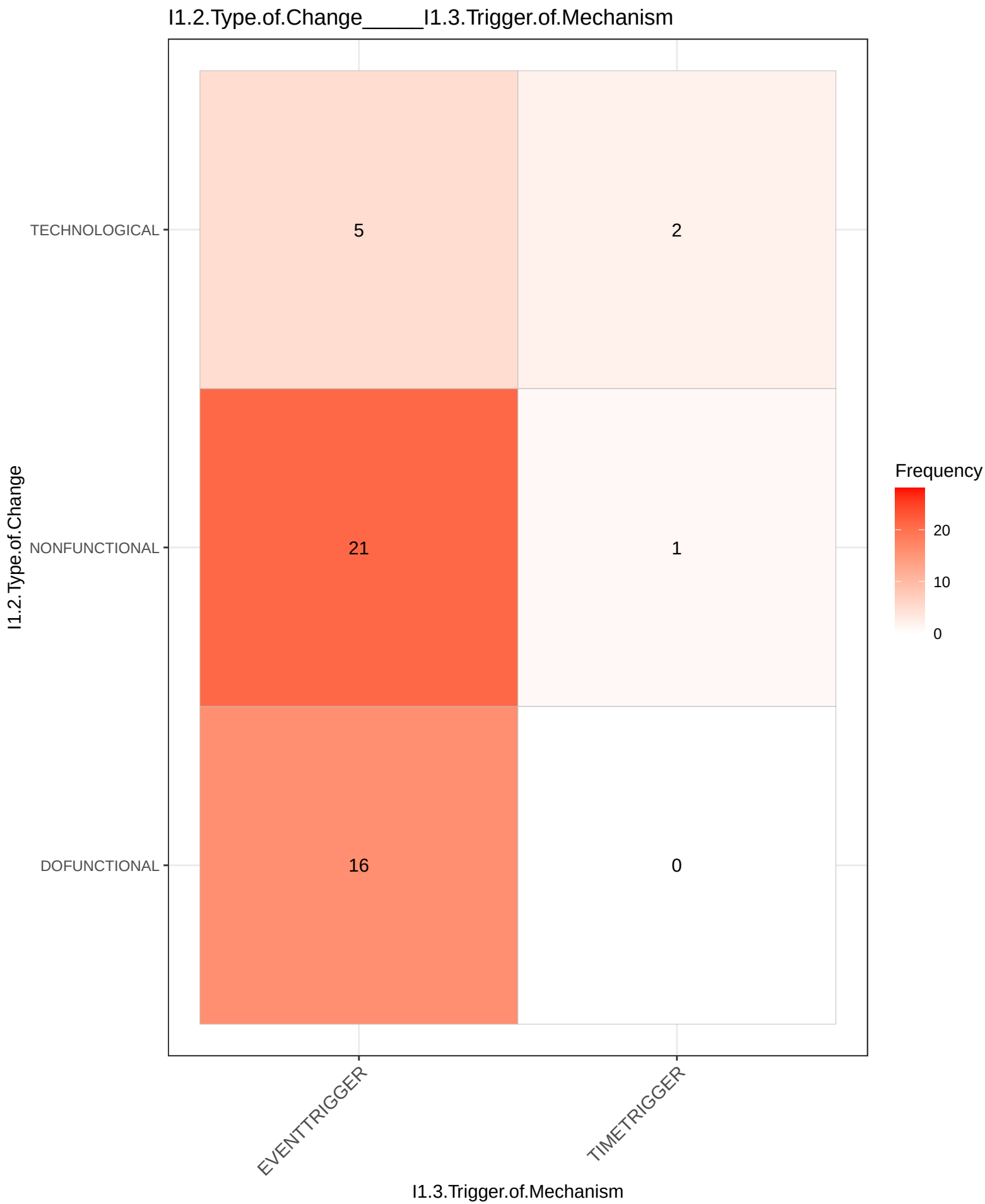

I1.2.Type.of.Change_____I1.3.Duration.of.Mechanism
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
7
0
0
17
0
4
10
1
3
DOSHORT
MEDIUM
VERYSHORT
I1.3.Duration.of.Mechanism
Frequency
20
10
0


I1.2.Type.of.Change_____I1.3.Trigger.of.Mechanism
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
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2
21
1
16
0
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
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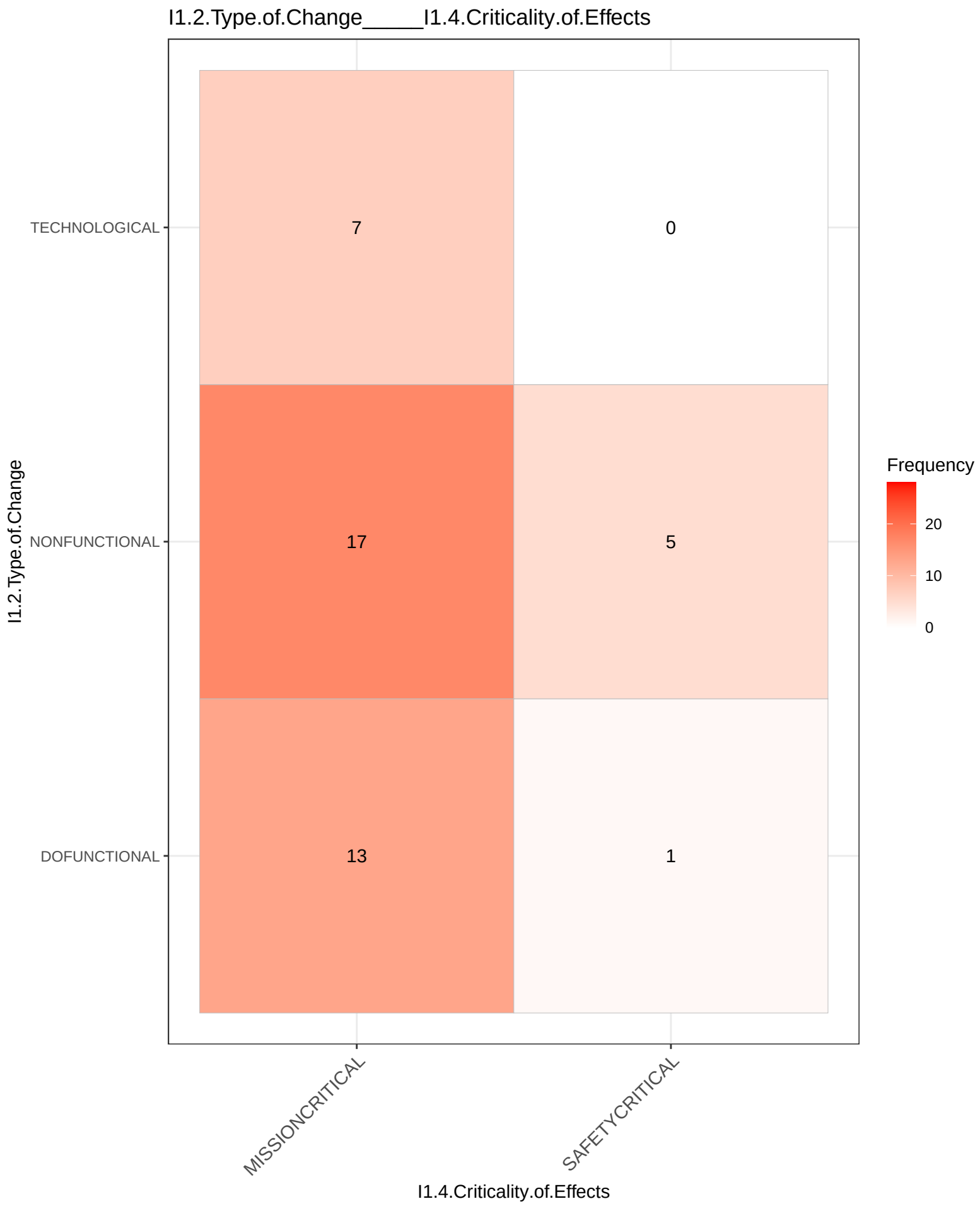
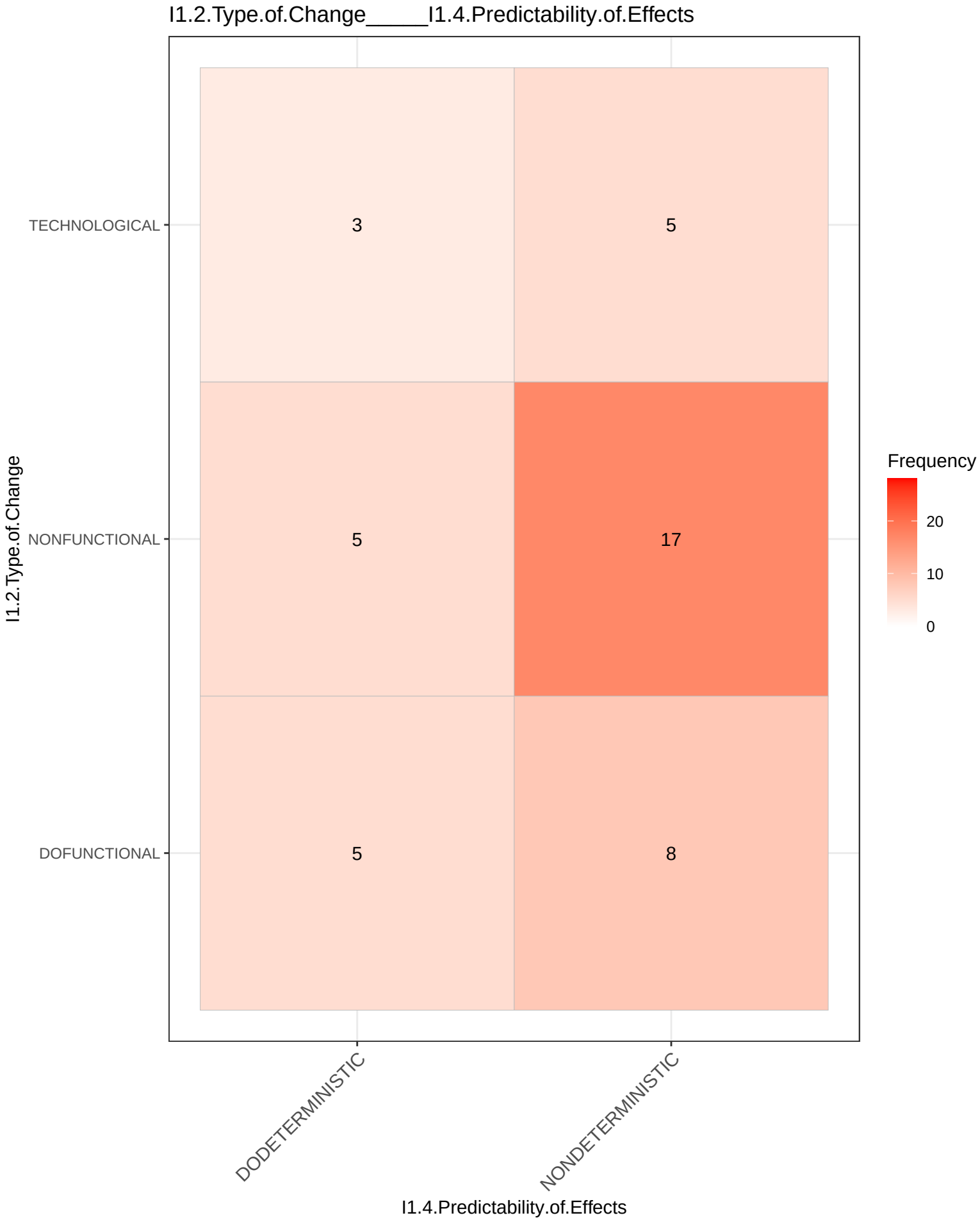
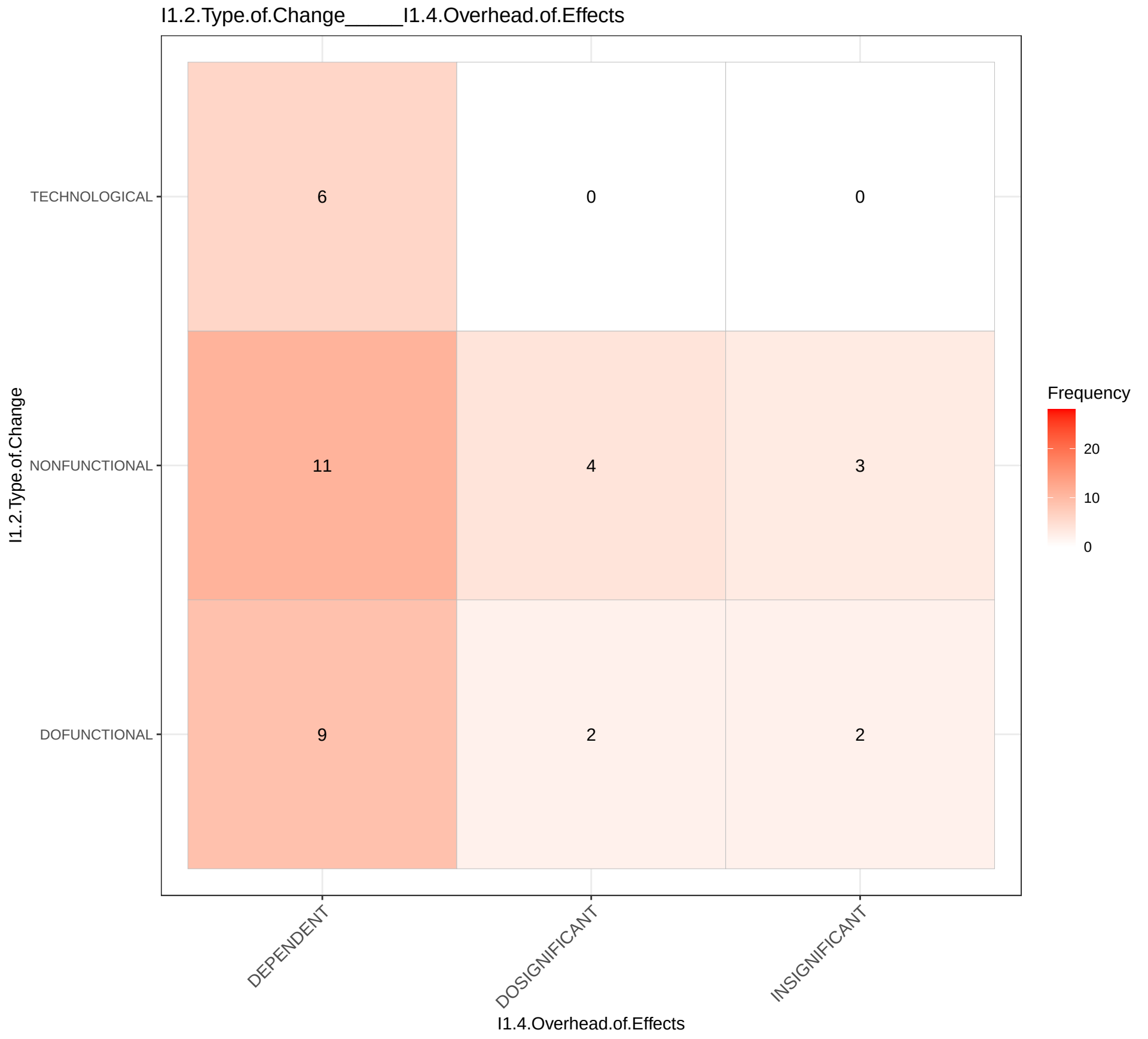
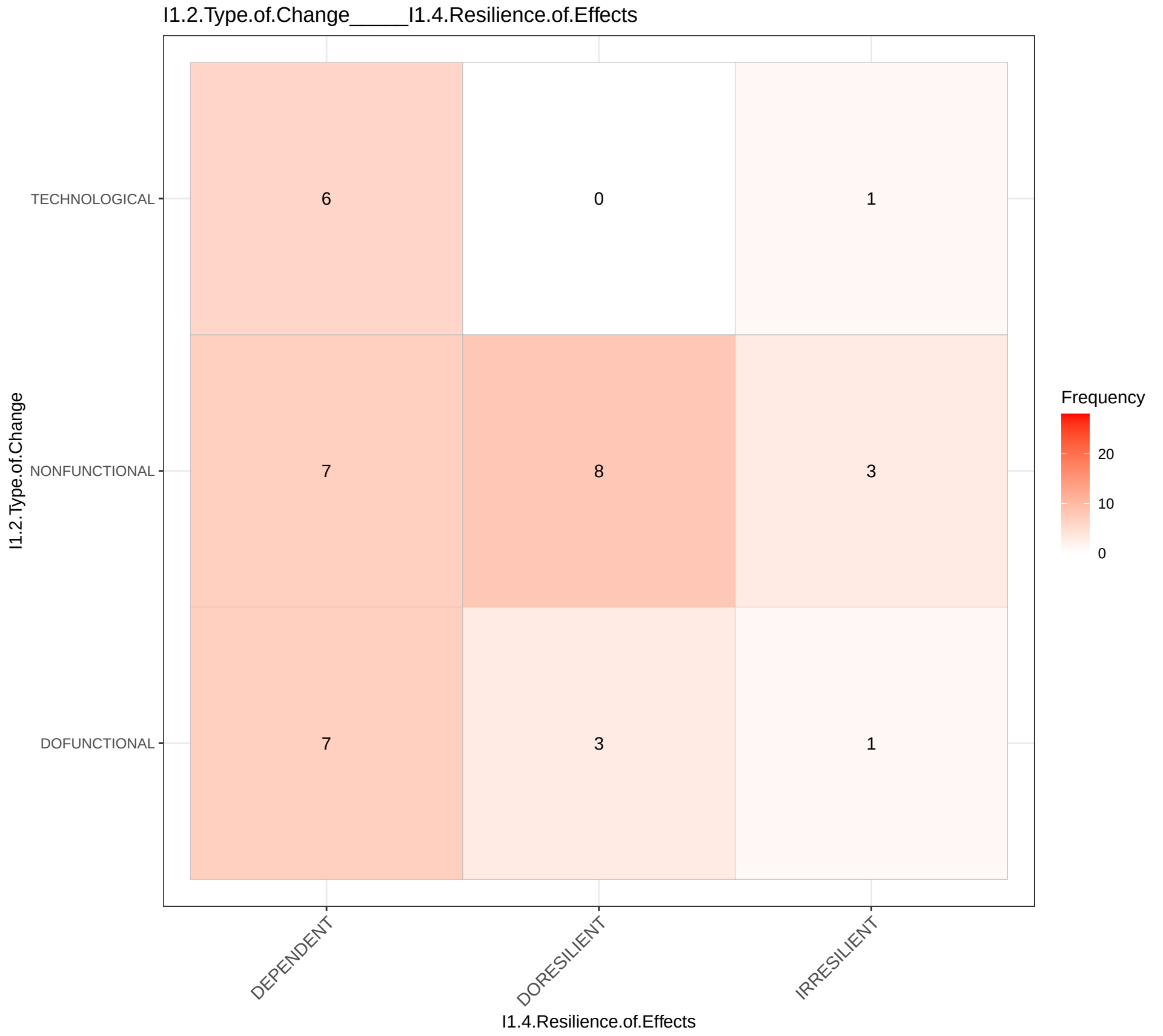
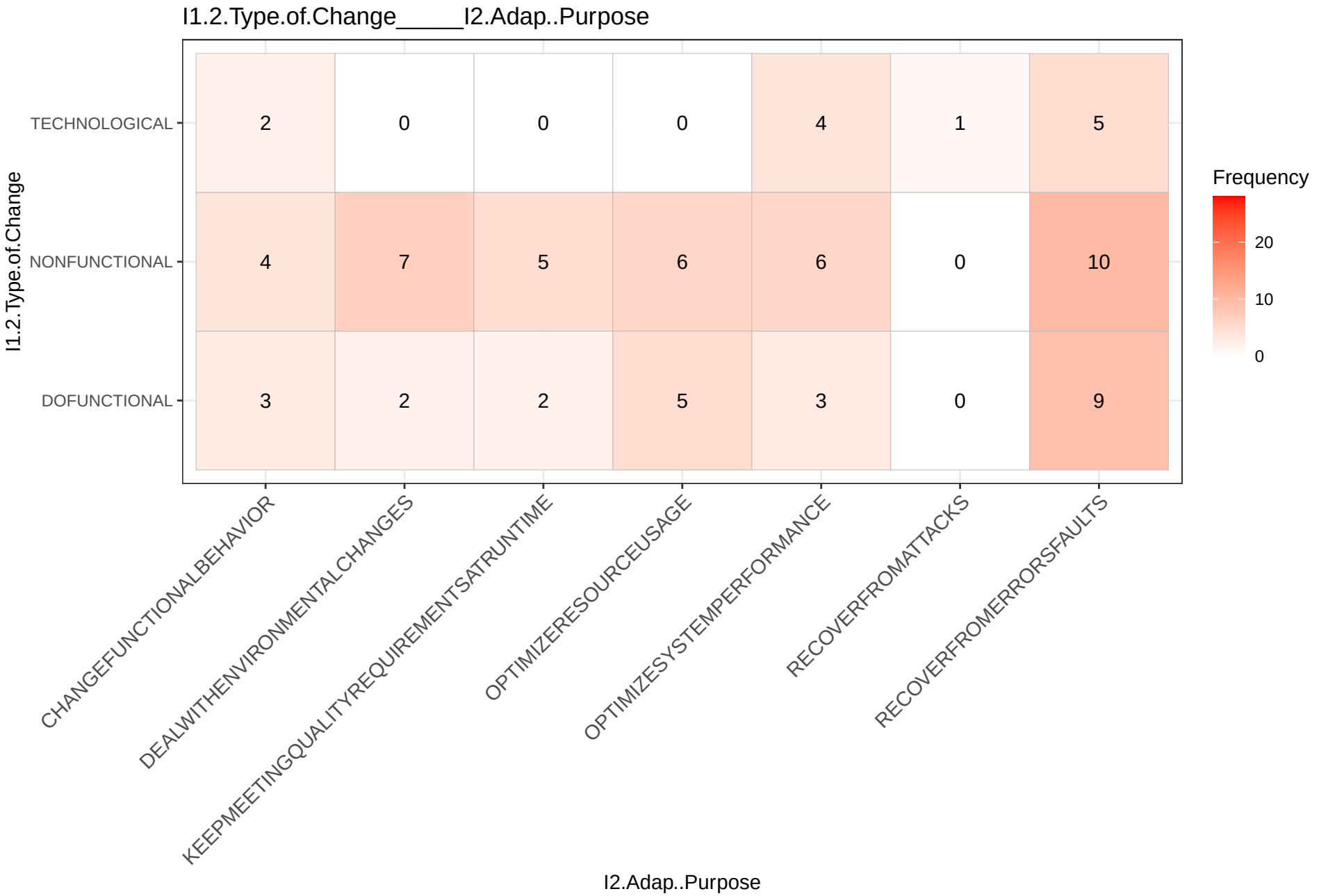
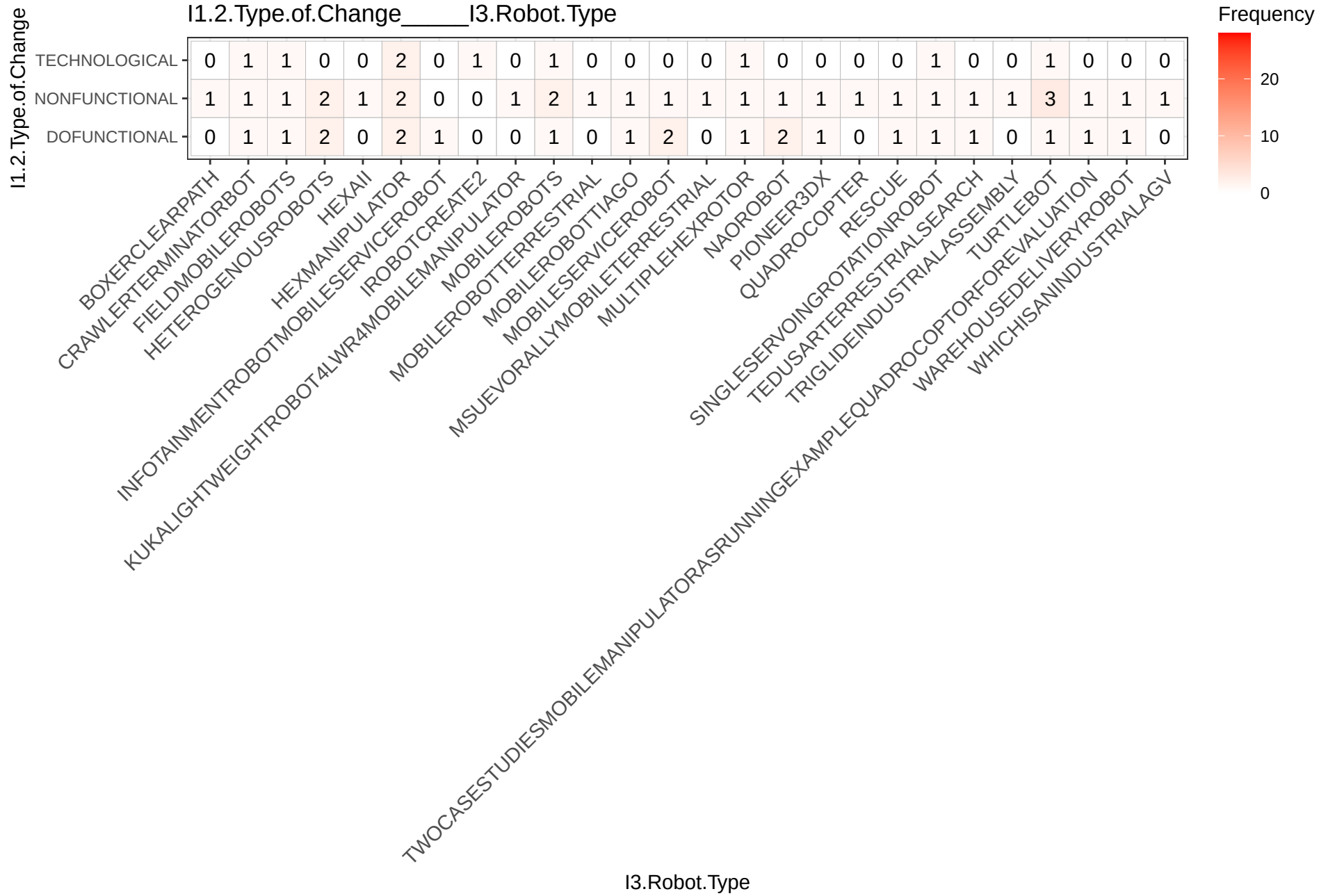

I1.2.Type.of.Change_____I1.4.Criticality.of.Effects
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
7
0
17
5
13
1
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
0

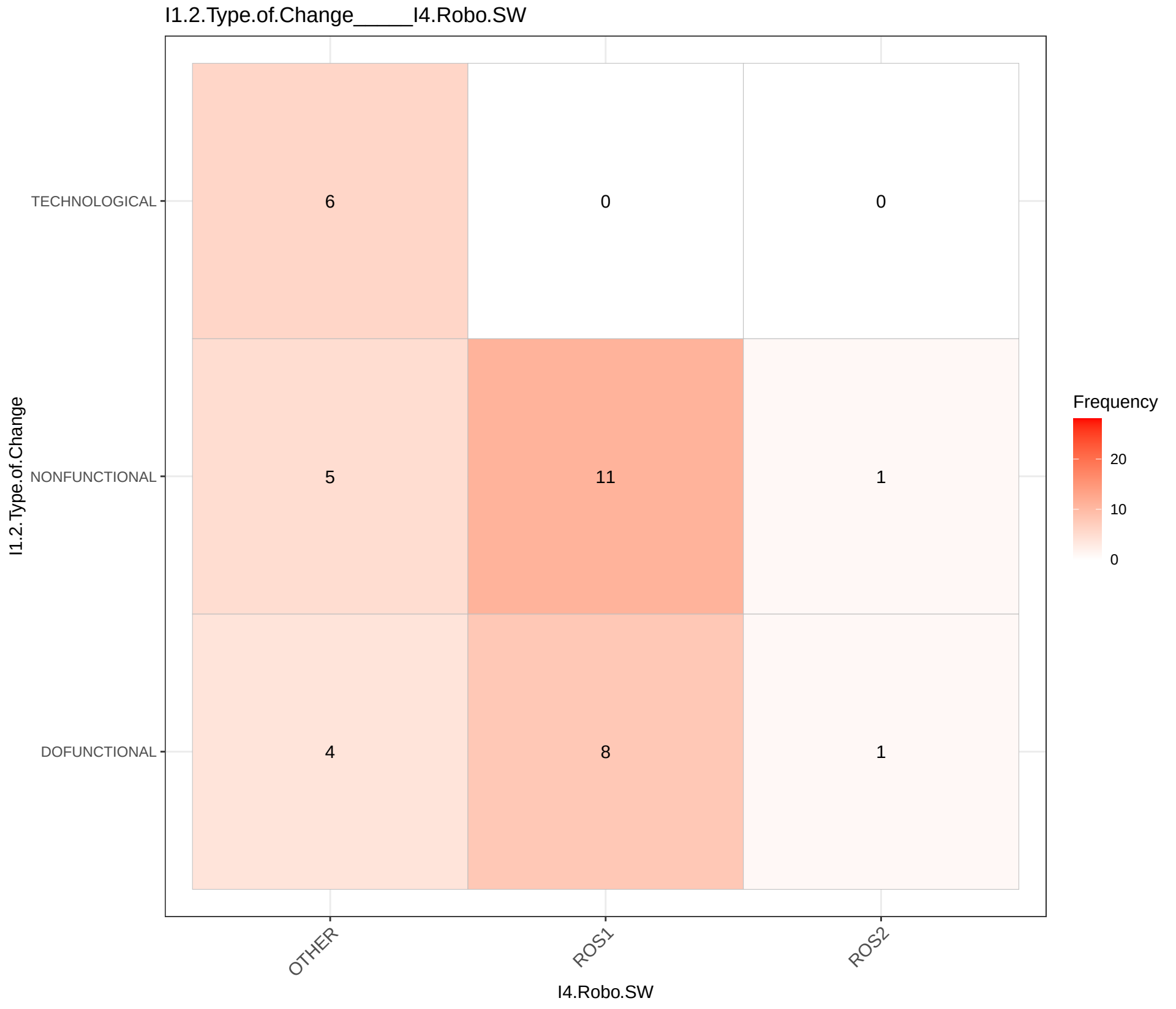

I1.2.Type.of.Change_____I1.4.Predictability.of.Effects
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
3
5
5
17
5
8
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0


I1.2.Type.of.Change_____I1.4.Overhead.of.Effects
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
6
0
0
11
4
3
9
2
2
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
0


I1.2.Type.of.Change_____I1.4.Resilience.of.Effects
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
6
0
1
7
8
3
7
3
1
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0


I1.2.Type.of.Change_____I2.Adap..Purpose
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
2 0 0 0 4 1 5
4 7 5 6 6 0 10
3 2 2 5 3 0 9
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
0


I1.2.Type.of.Change_____I3.Robot.Type
I1.2.Type.of.Change
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
0 1 1 0 0 2 0 1 0 1 0 0 0 0 1 0 0 0 0 1 0 0 1 0 0 0
1 1 1 2 1 2 0 0 1 2 1 1 1 1 1 1 1 1 1 1 1 1 3 1 1 1
0 1 1 2 0 2 1 0 0 1 0 1 2 0 1 2 1 0 1 1 1 0 1 1 1 0
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MSUEVORALLYMOBILEROBOTTIAGO
MOBILESERVICEROBOT
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0


I1.2.Type.of.Change_____I4.Robo.SW
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
6
0
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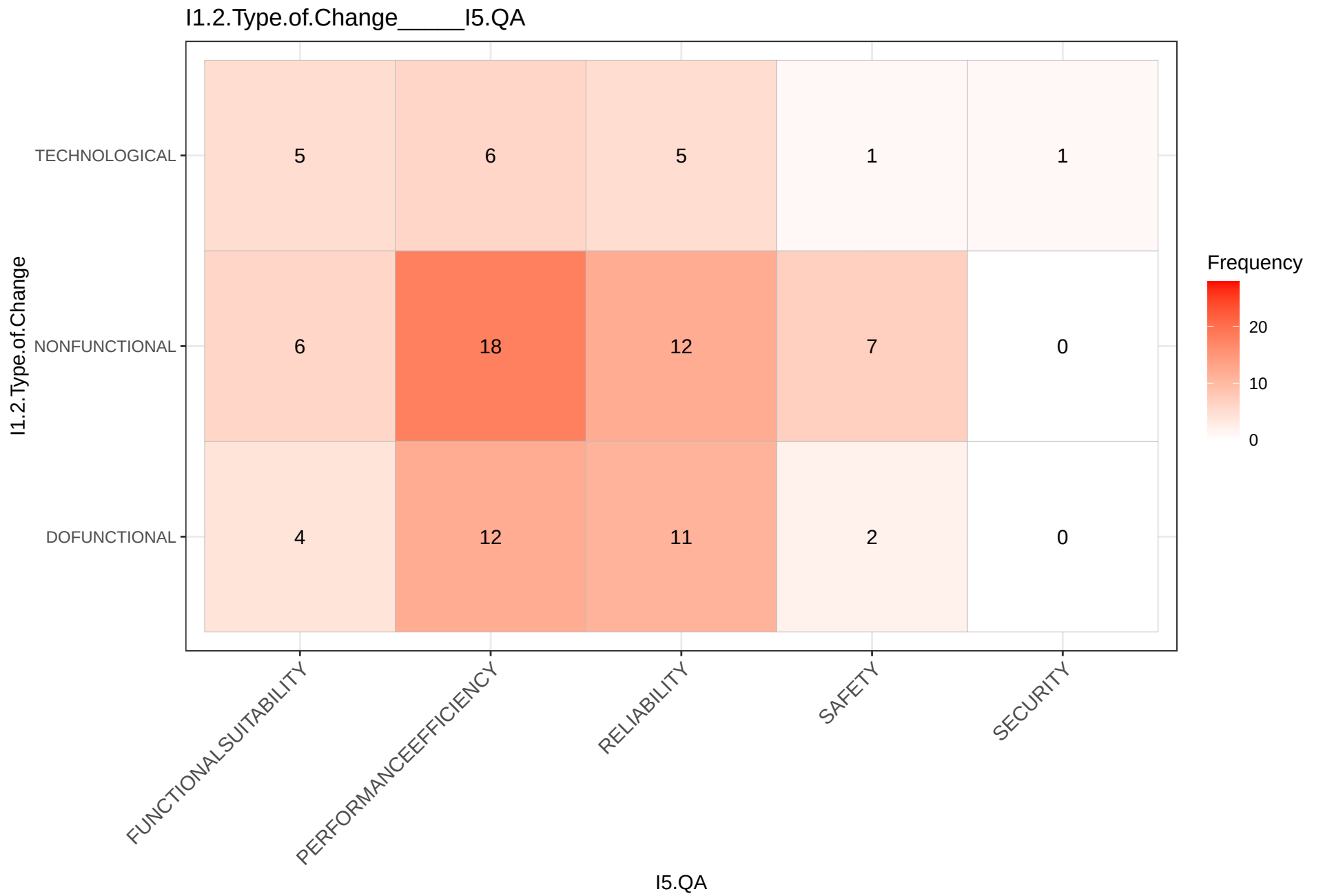
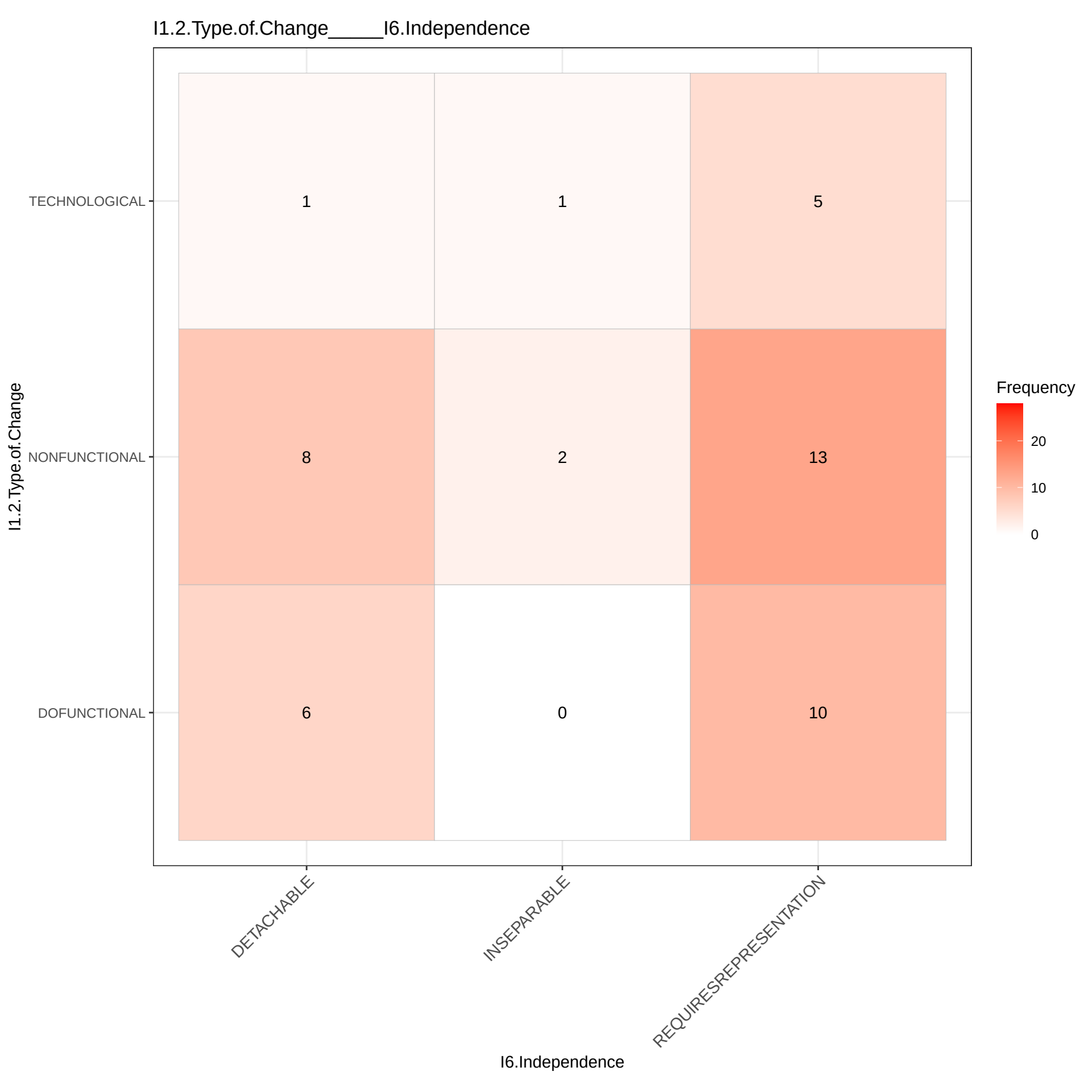
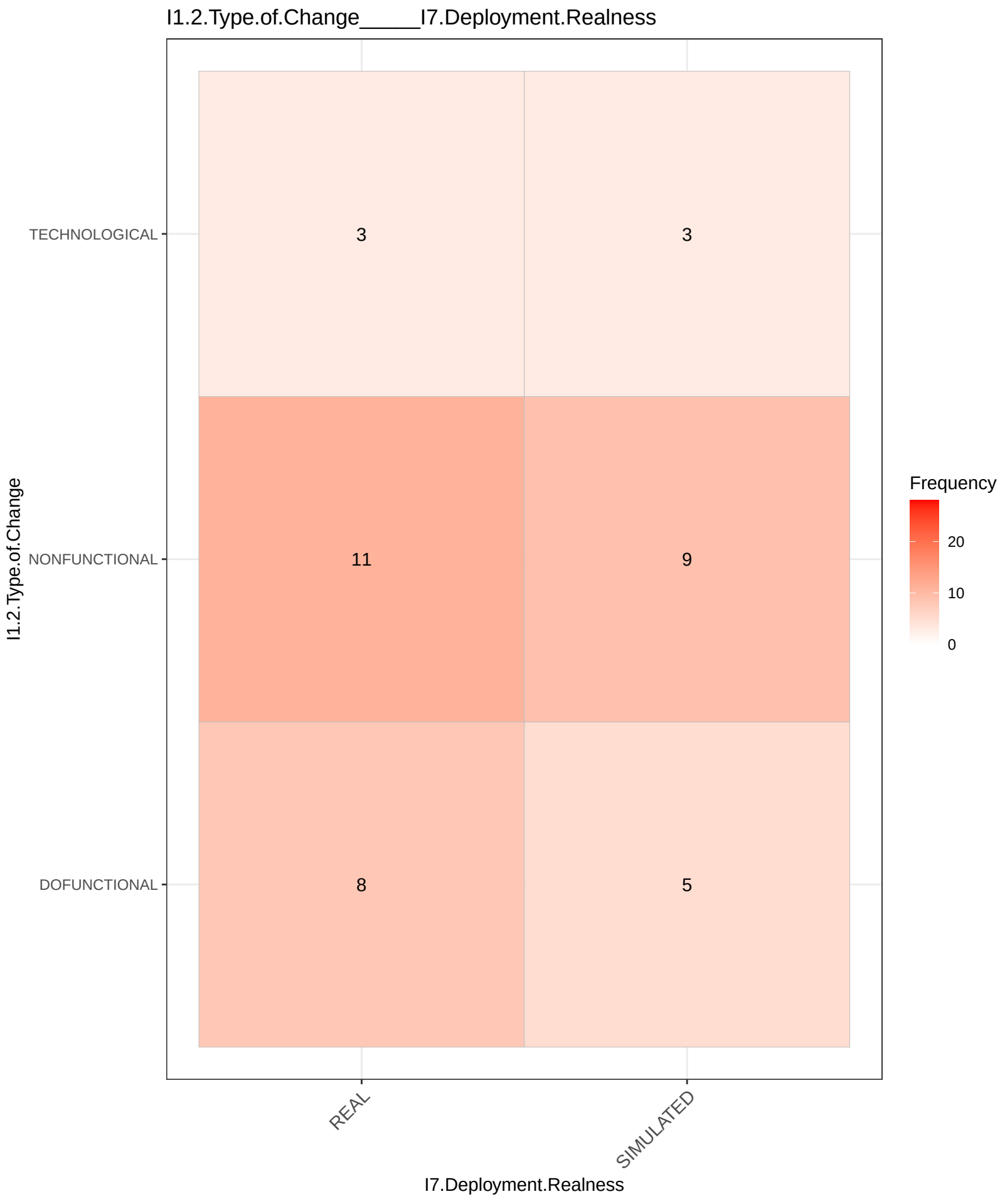
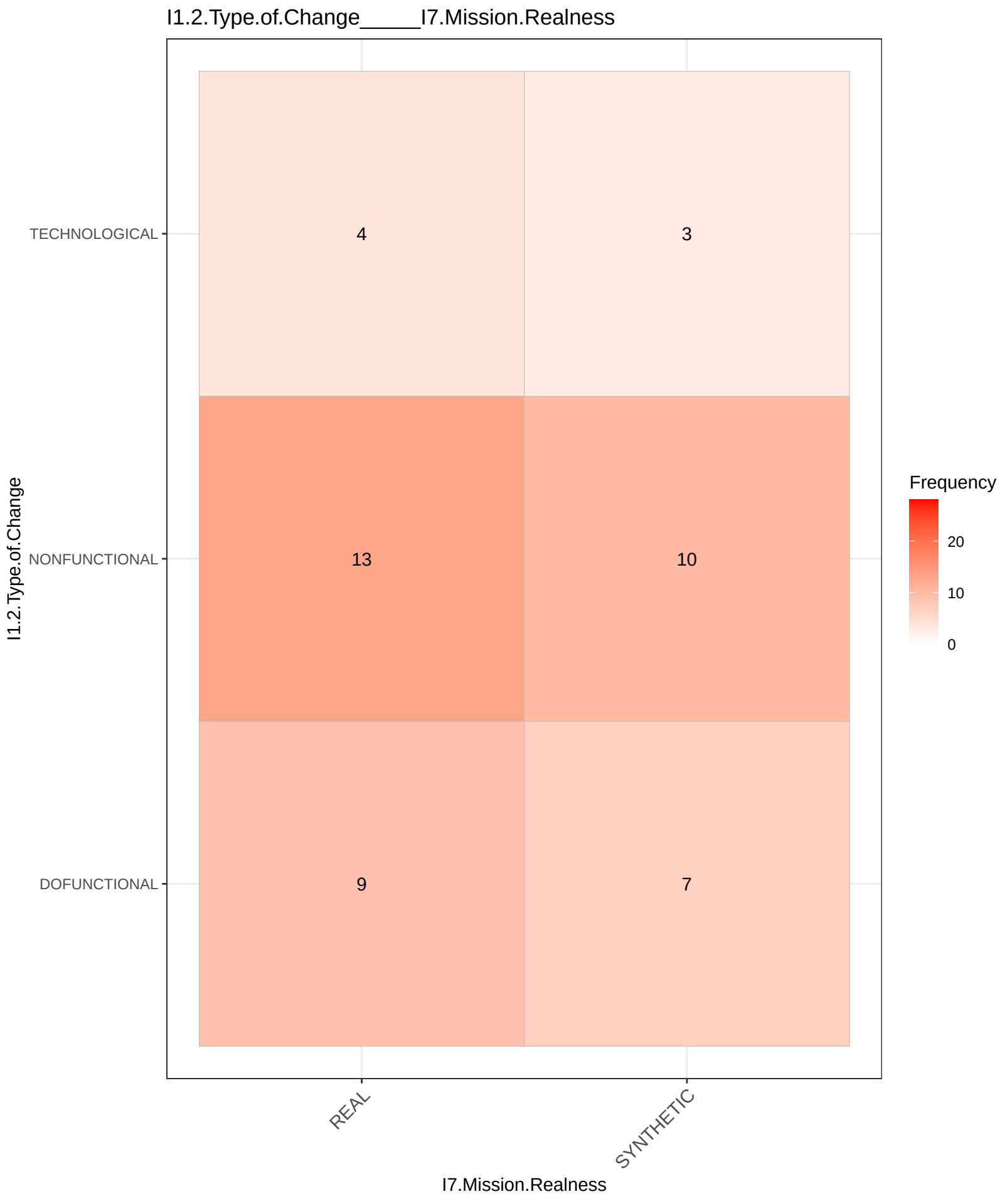
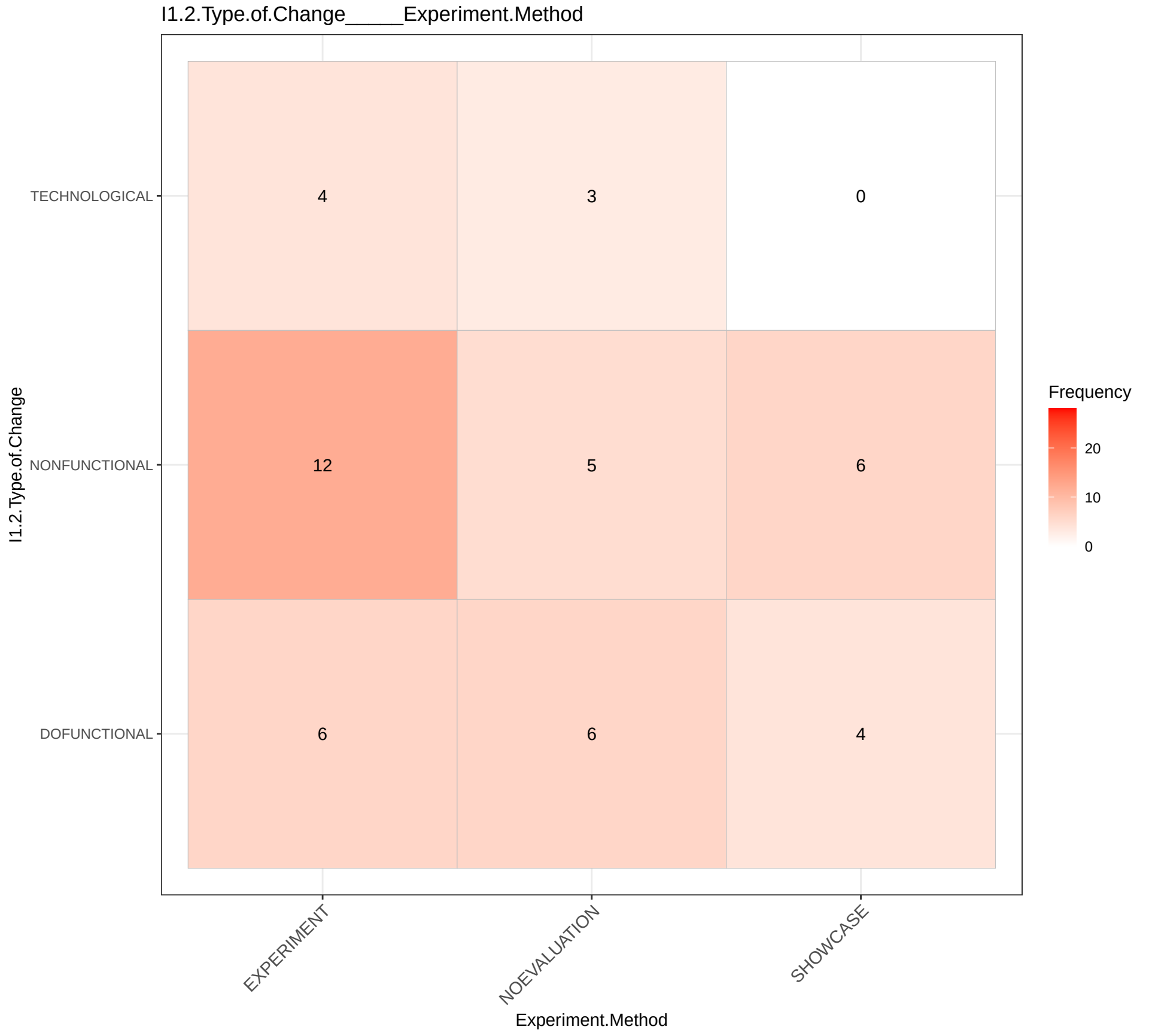
5
11
1
4
8
1
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0


I1.2.Type.of.Change_____I5.QA
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
5
6
5
1
1
6
18
12
7
0
4
12
11
2
0
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I1.2.Type.of.Change_____I6.Independence
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
1
1
5
8
2
13
6
0
10
I1.2.Type.of.Change
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I1.2.Type.of.Change_____I7.Deployment.Realness
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
3
3
11
9
8
5
REAL
SIMULATED
I1.2.Type.of.Change
I7.Deployment.Realness
Frequency
20
10
0


I1.2.Type.of.Change_____I7.Mission.Realness
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
4
3
13
10
9
7
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0


I1.2.Type.of.Change_____Experiment.Method
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
4
3
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6
6
6
4
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
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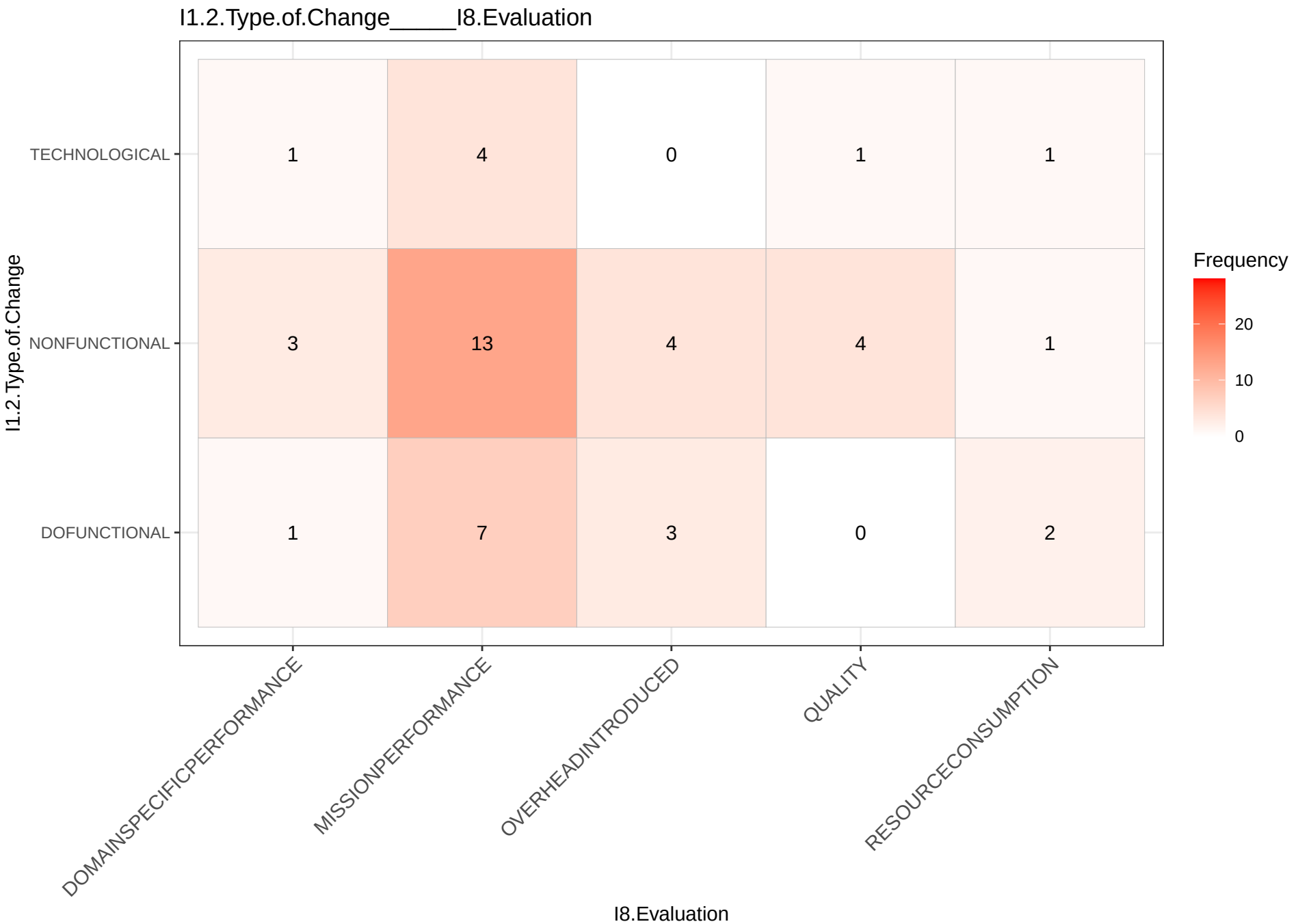
I1.2.Type.of.Change_____I8.Evaluation
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
1
4
0
1
1
3
13
4
4
1
1
7
3
0
2
I1.2.Type.of.Change
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
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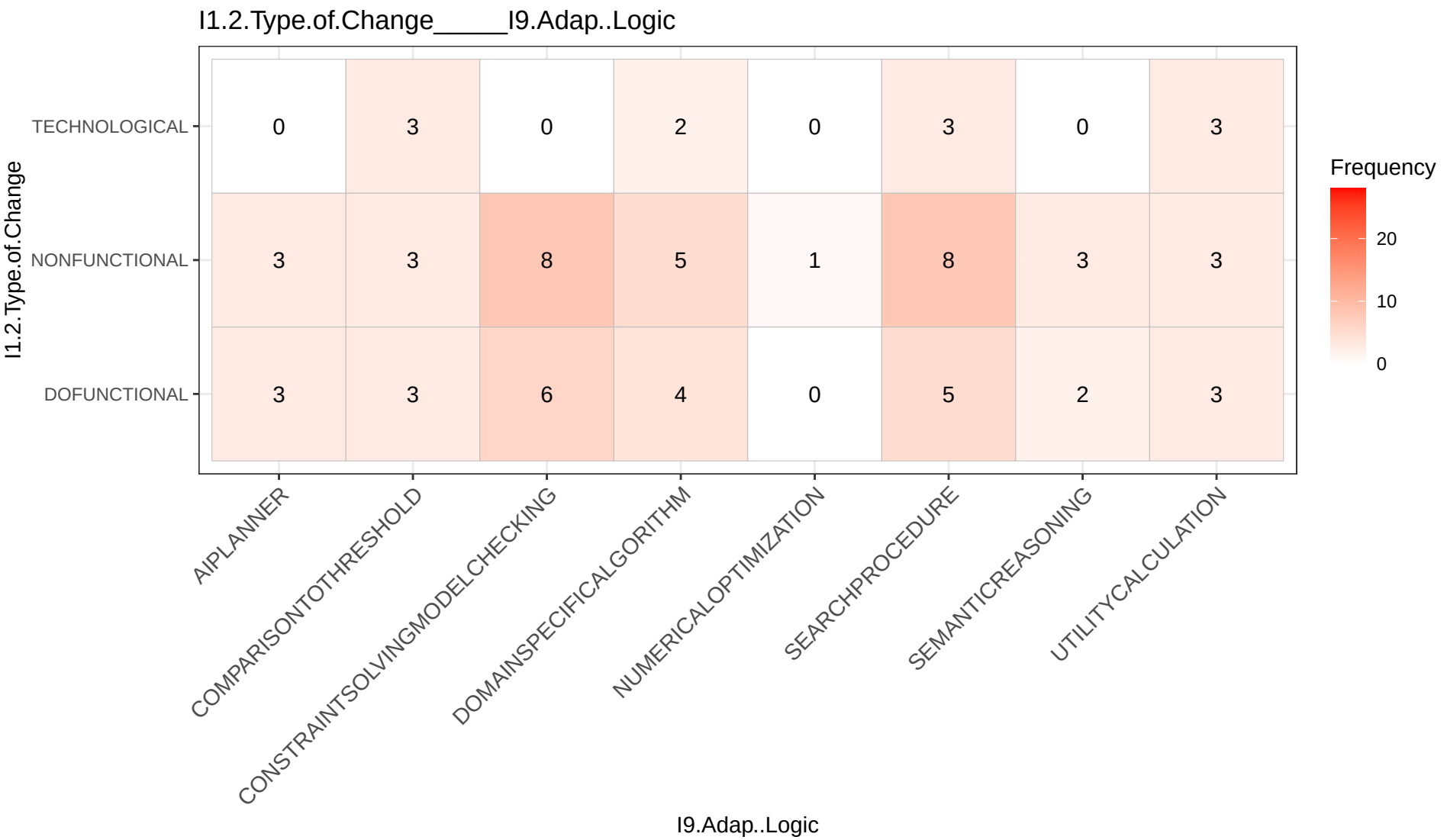
I1.2.Type.of.Change_____I9.Adap..Logic
I1.2.Type.of.Change
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
0
3
0
2
0
3
0
3
3
3
8
5
1
8
3
3
3
3
6
4
0
5
2
3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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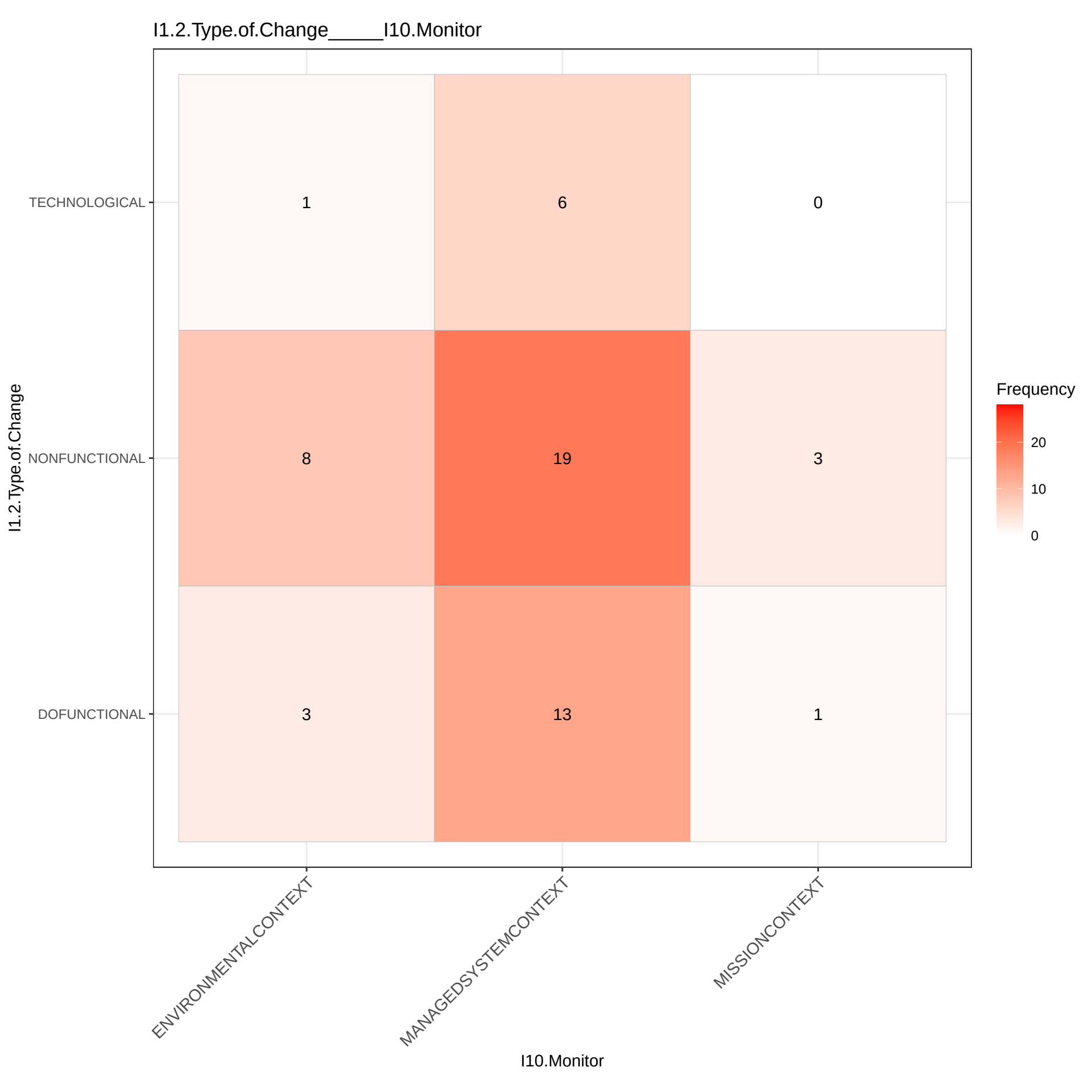
I1.2.Type.of.Change_____I10.Monitor
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
1
6
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8
19
3
3
13
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ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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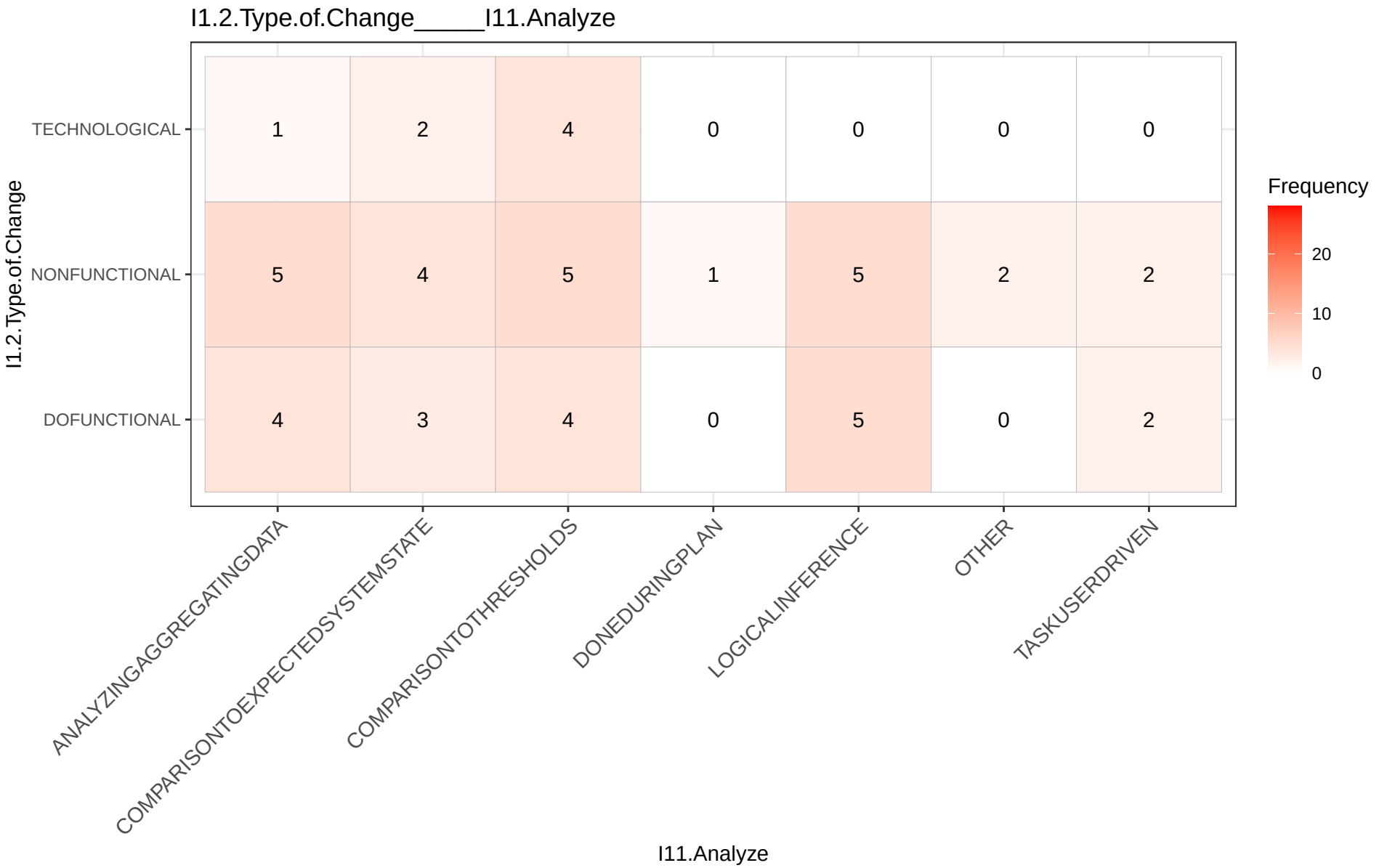
I1.2.Type.of.Change_____I11.Analyze
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
1
2
4
0
0
0
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5
4
5
1
5
2
2
4
3
4
0
5
0
2
I1.2.Type.of.Change
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
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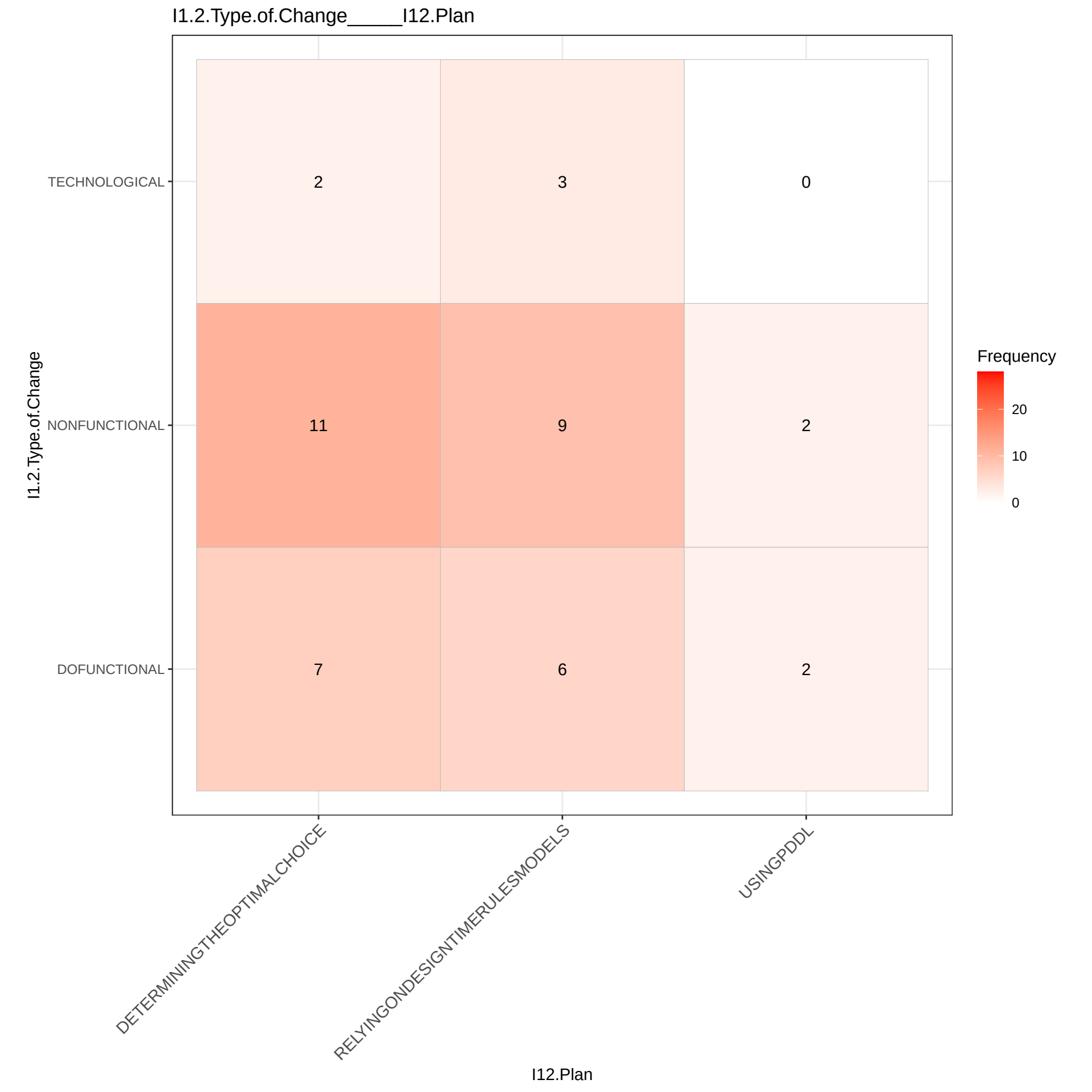
I1.2.Type.of.Change_____I12.Plan
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
2
3
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11
9
2
7
6
2
I1.2.Type.of.Change
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
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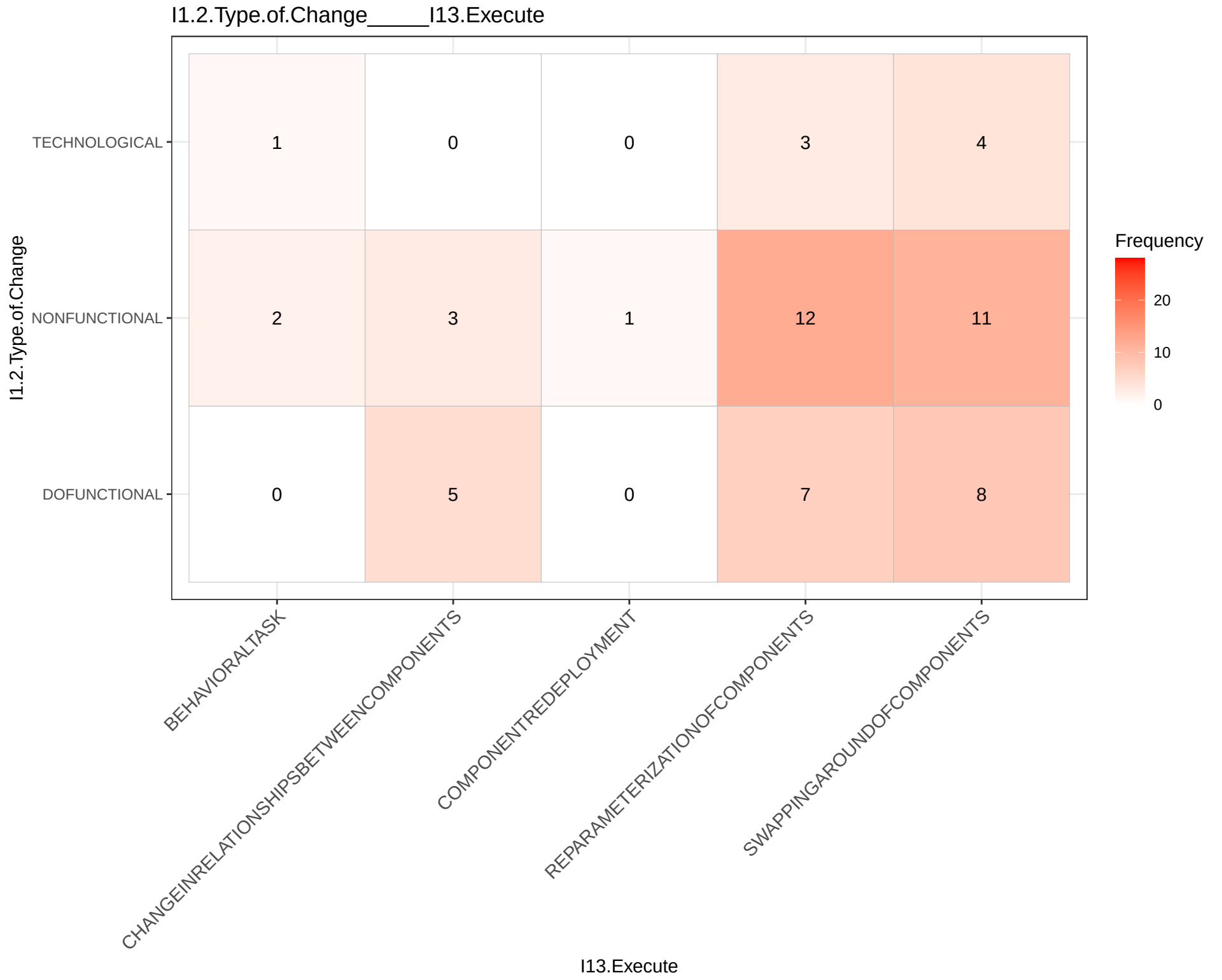
I1.2.Type.of.Change_____I13.Execute
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
1
0
0
3
4
2
3
1
12
11
0
5
0
7
8
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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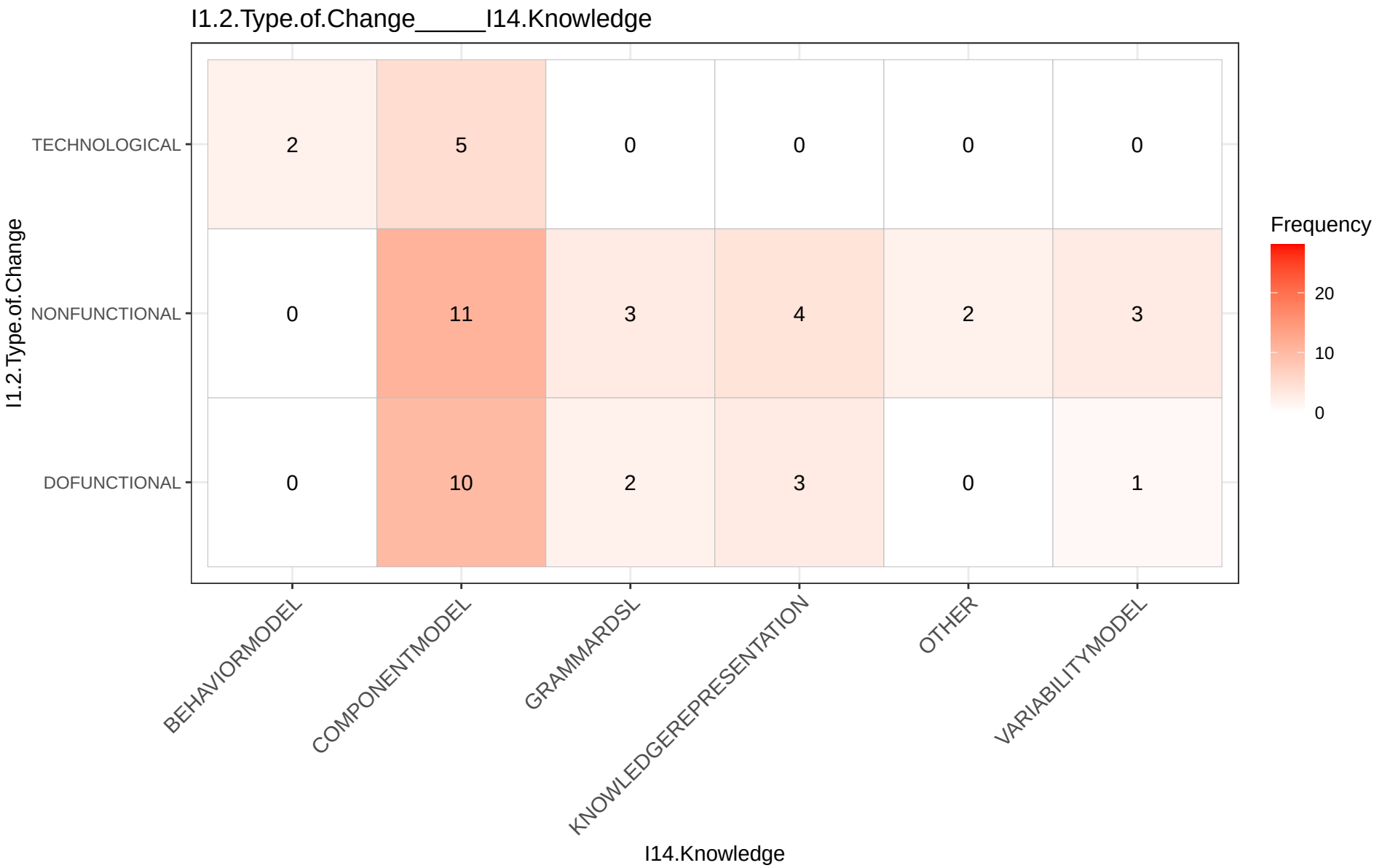
I1.2.Type.of.Change_____I14.Knowledge
TECHNOLOGICAL
NONFUNCTIONAL
DOFUNCTIONAL
I1.2.Type.of.Change
2
5
0
0
0
0
0
11
3
4
2
3
0
10
2
3
0
1
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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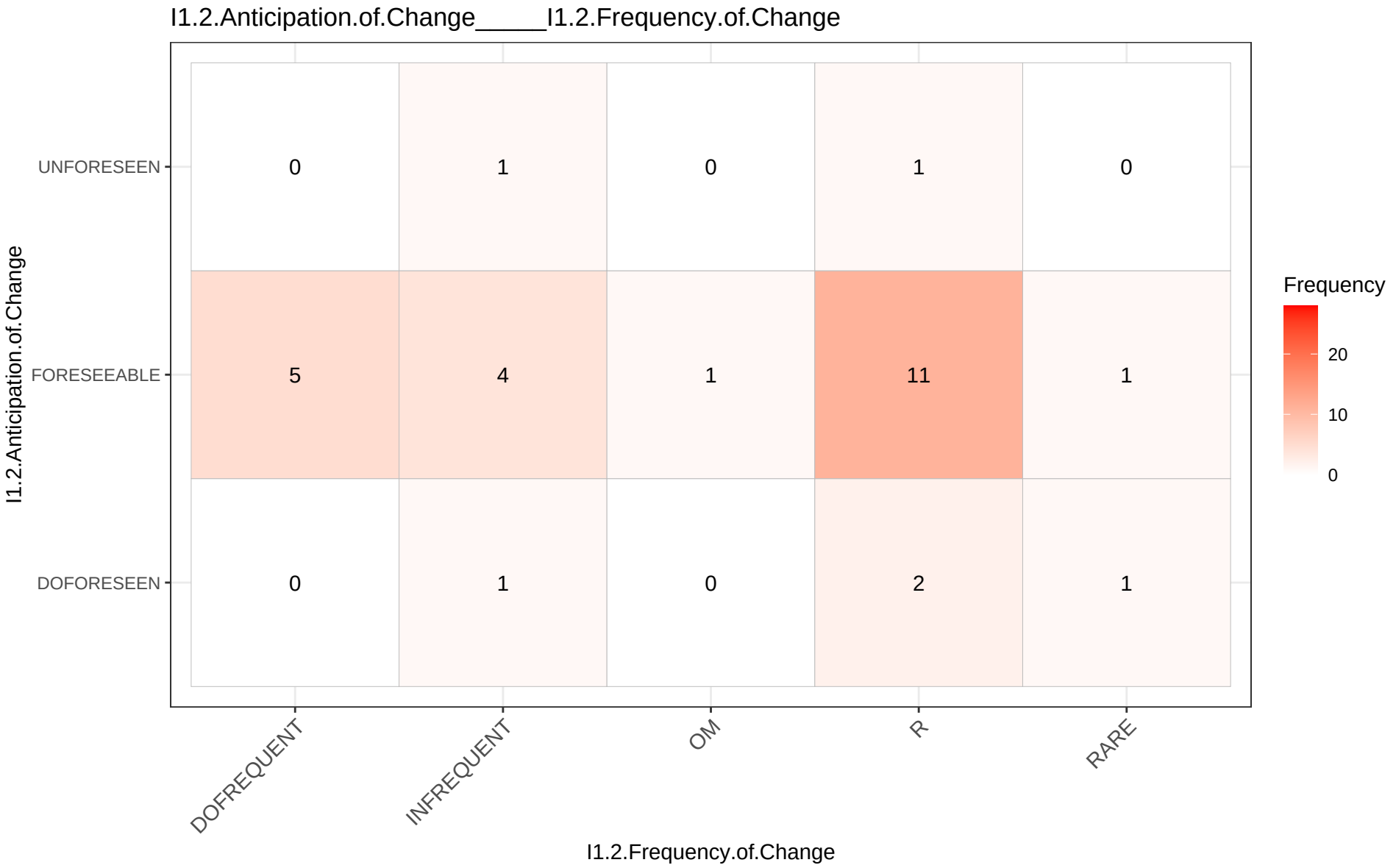
I1.2.Anticipation.of.Change_____I1.2.Frequency.of.Change
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
0
1
0
1
0
5
4
1
11
1
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INFREQUENT
OM
R
RARE
I1.2.Frequency.of.Change
Frequency
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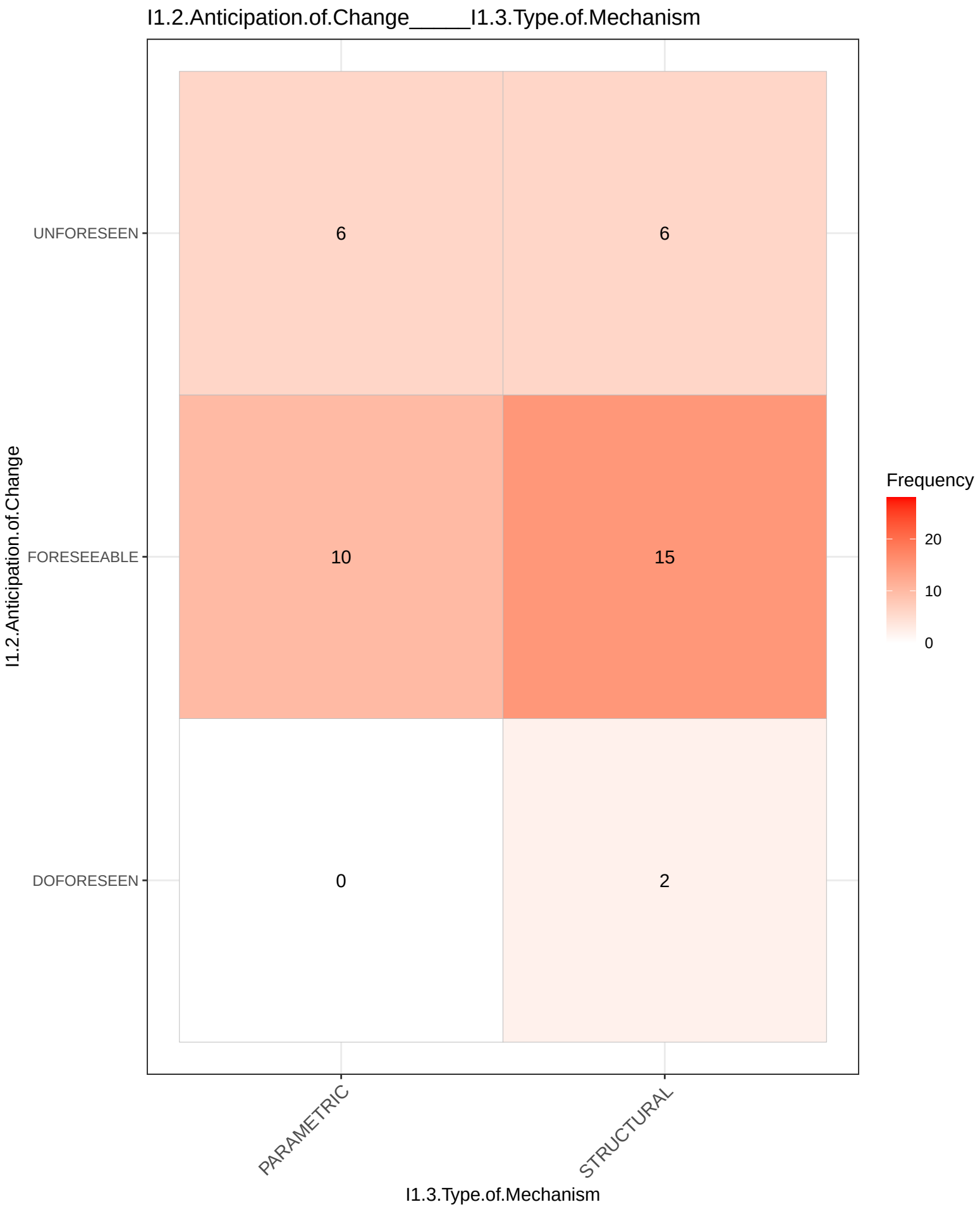
I1.2.Anticipation.of.Change_____I1.3.Type.of.Mechanism
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
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15
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2
PARAMETRIC
STRUCTURAL
I1.3.Type.of.Mechanism
Frequency
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10
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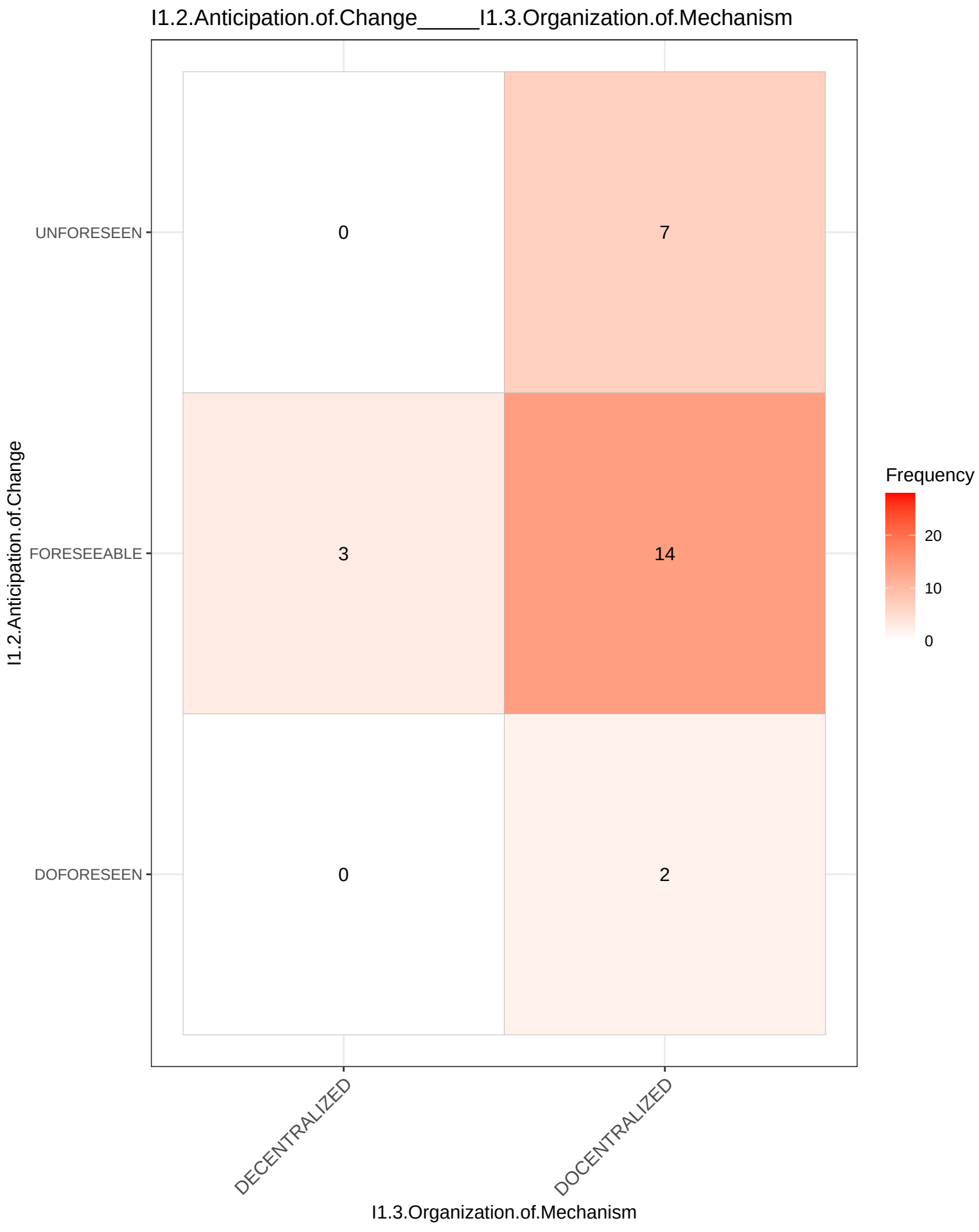
I1.2.Anticipation.of.Change_____I1.3.Organization.of.Mechanism
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
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7
3
14
0
2
Frequency
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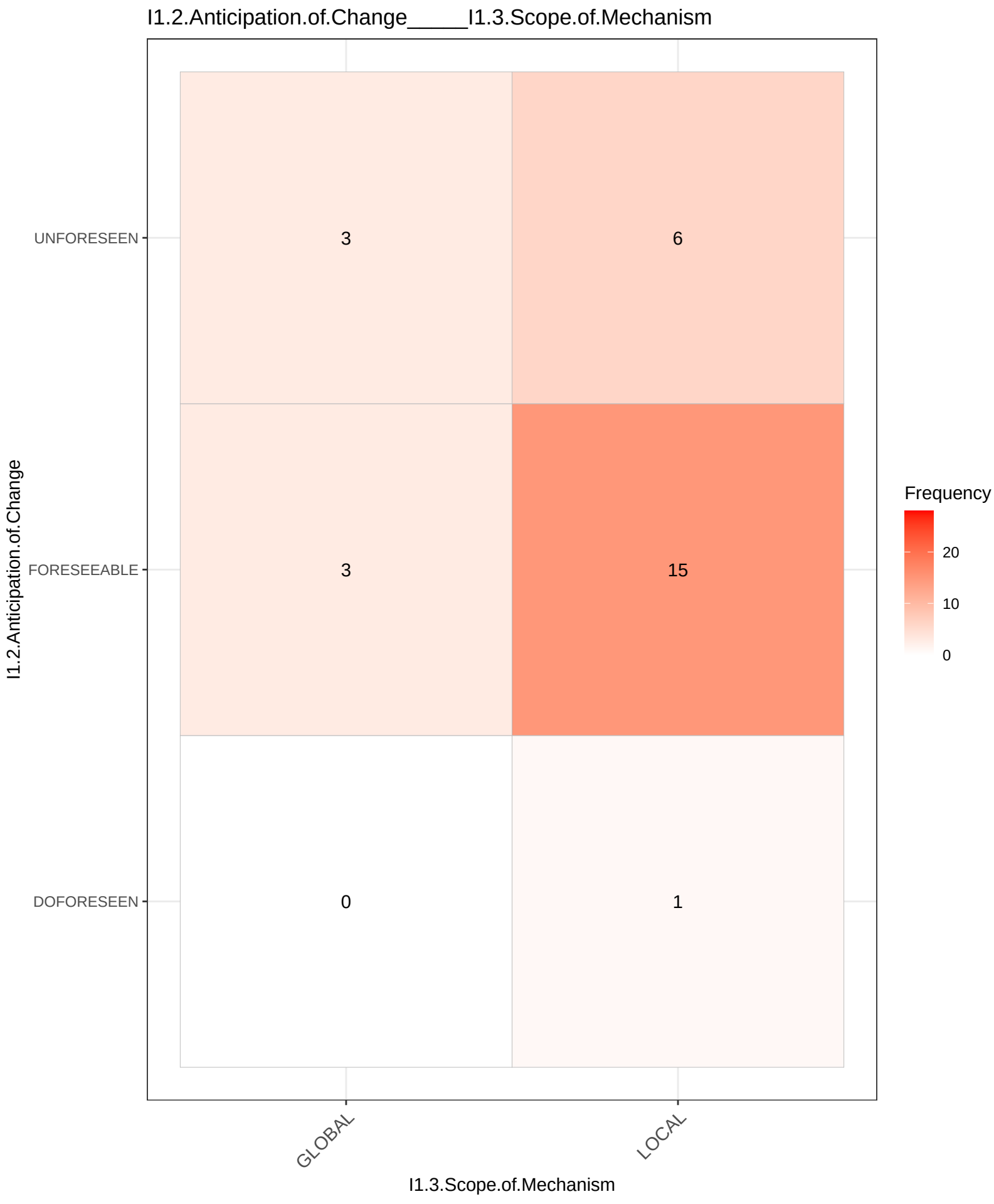
DECENTRALIZED
DOCENTRALIZED
I1.3.Organization.of.Mechanism


I1.2.Anticipation.of.Change_____I1.3.Scope.of.Mechanism
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
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6
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1
GLOBAL
LOCAL
I1.3.Scope.of.Mechanism
Frequency
20
10
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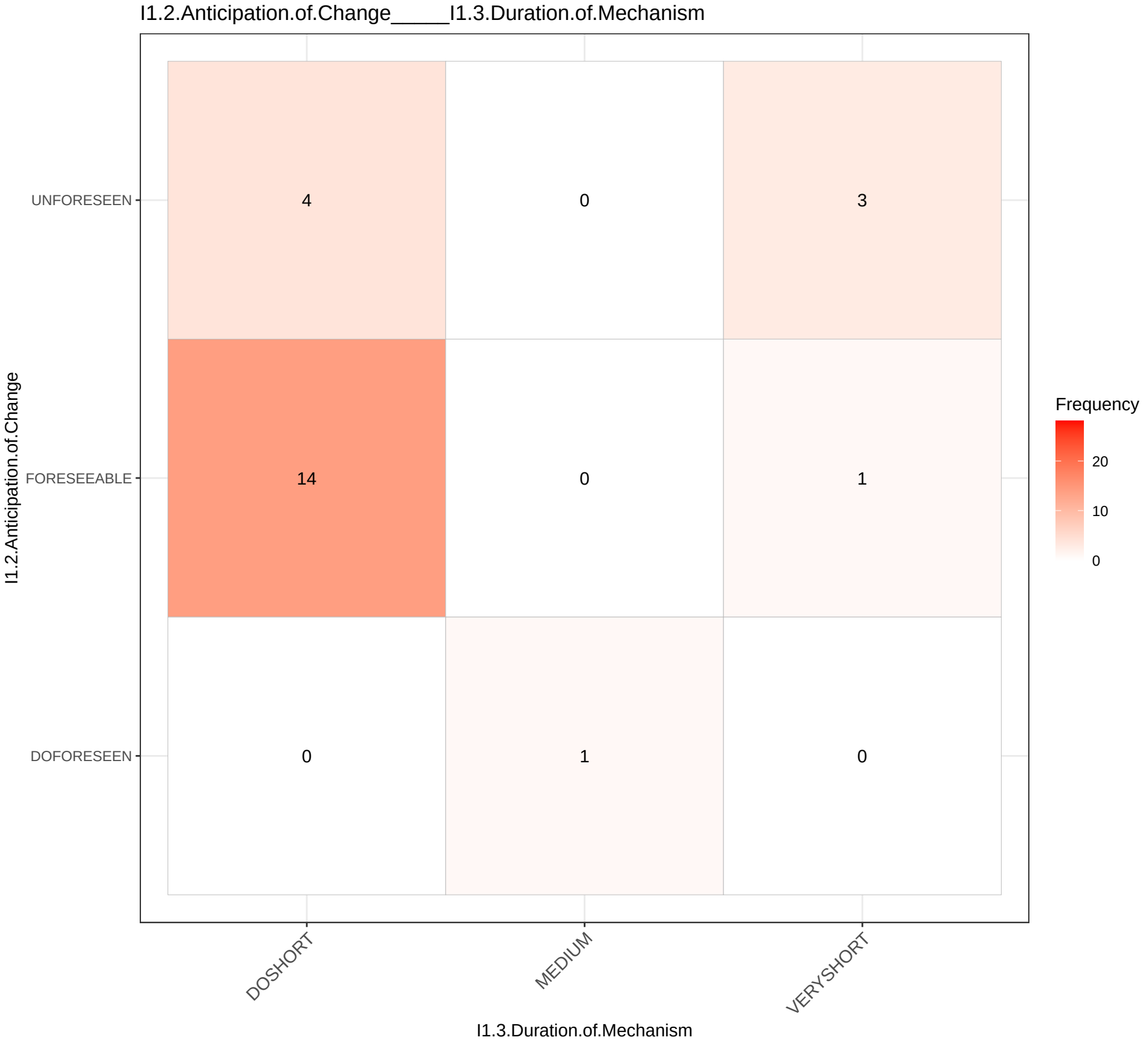
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UNFORESEEN
FORESEEABLE
DOFORESEEN
4
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1
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MEDIUM
VERYSHORT
I1.2.Anticipation.of.Change
I1.3.Duration.of.Mechanism
Frequency
20
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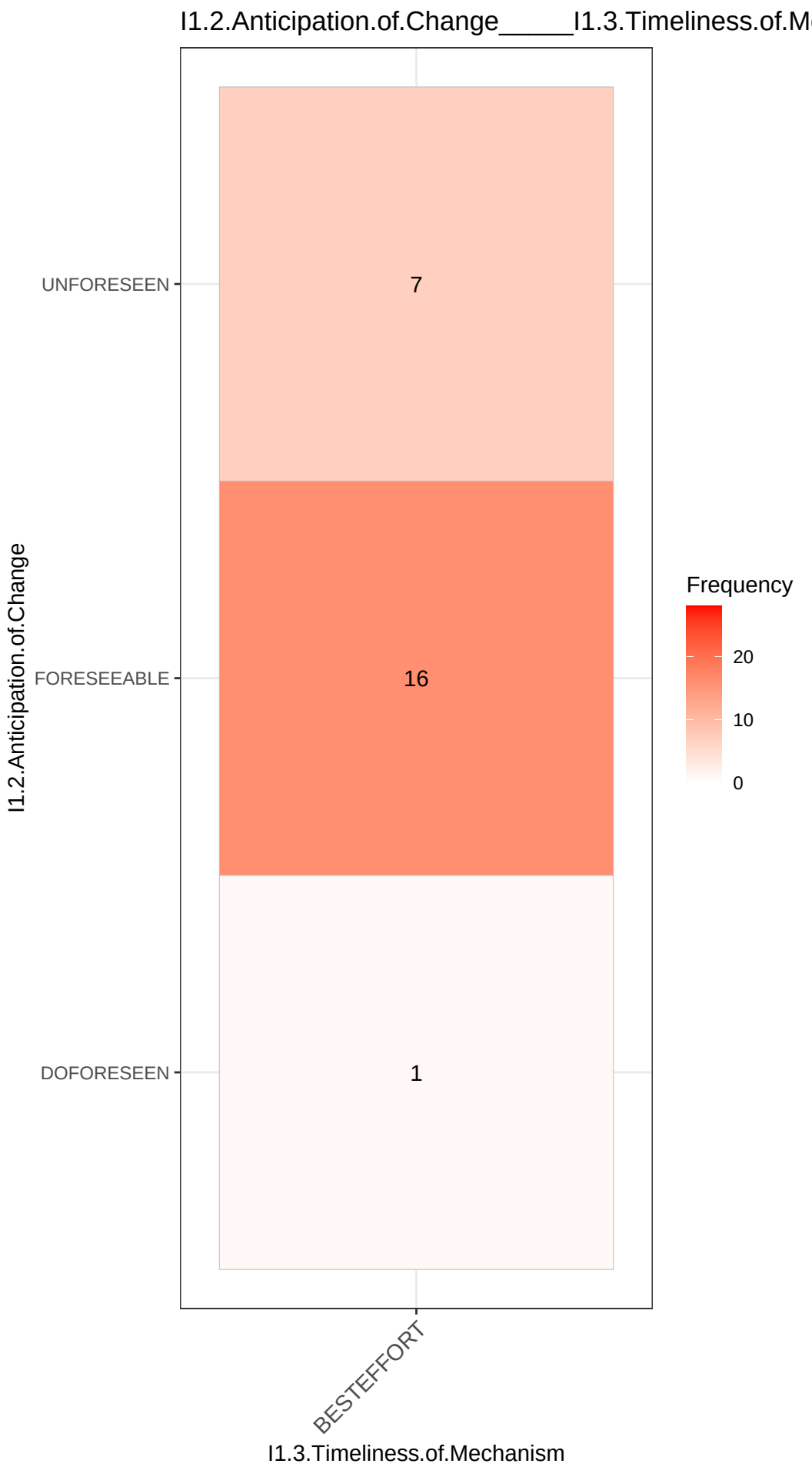
I1.2.Anticipation.of.Change_____I1.3.Timeliness.of.Mechanism
UNFORESEEN
FORESEEABLE
DOFORESEEN
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BESTEFFORT
I1.3.Timeliness.of.Mechanism
Frequency
20
10
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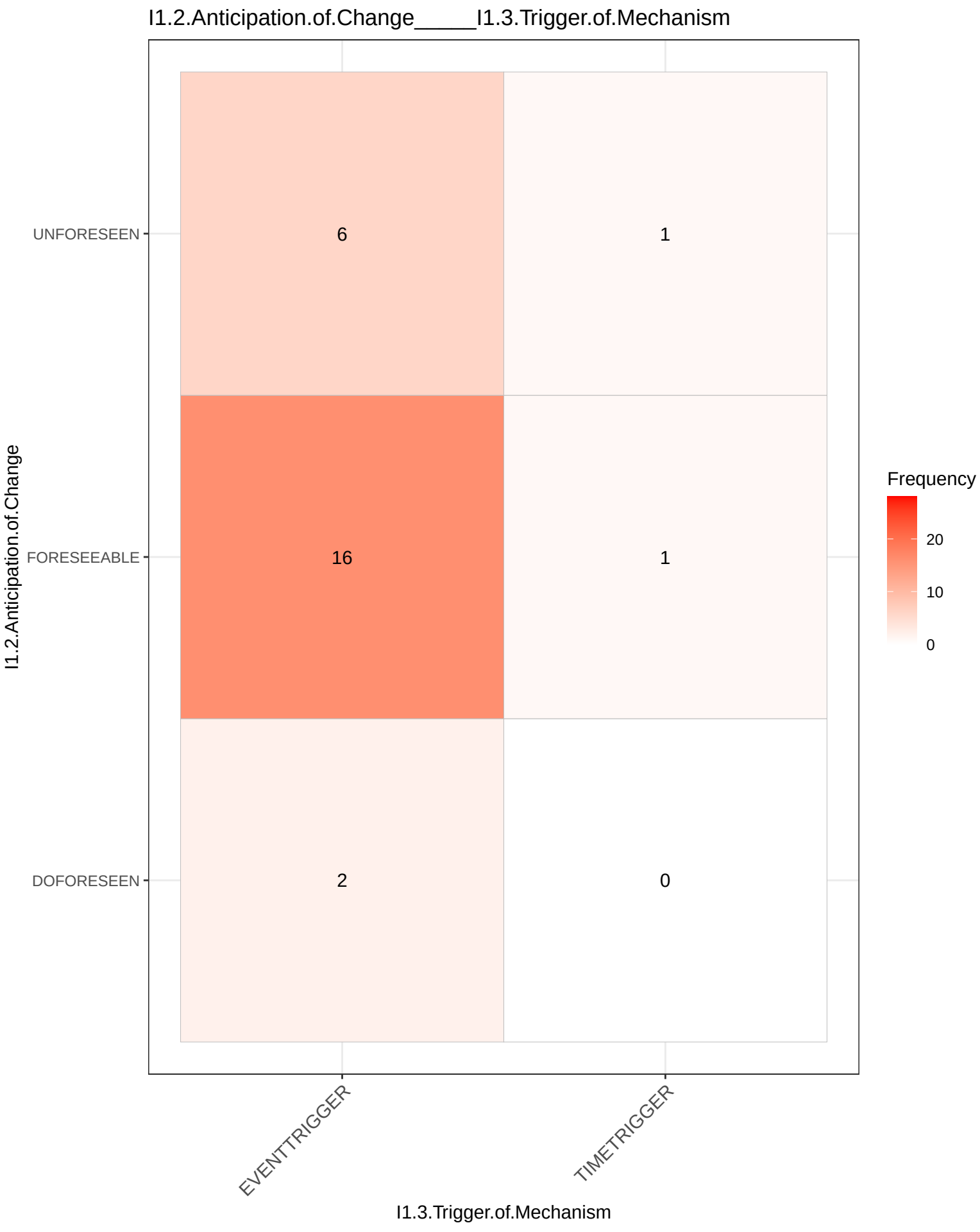
I1.2.Anticipation.of.Change_____I1.3.Trigger.of.Mechanism
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
6
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1
2
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EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
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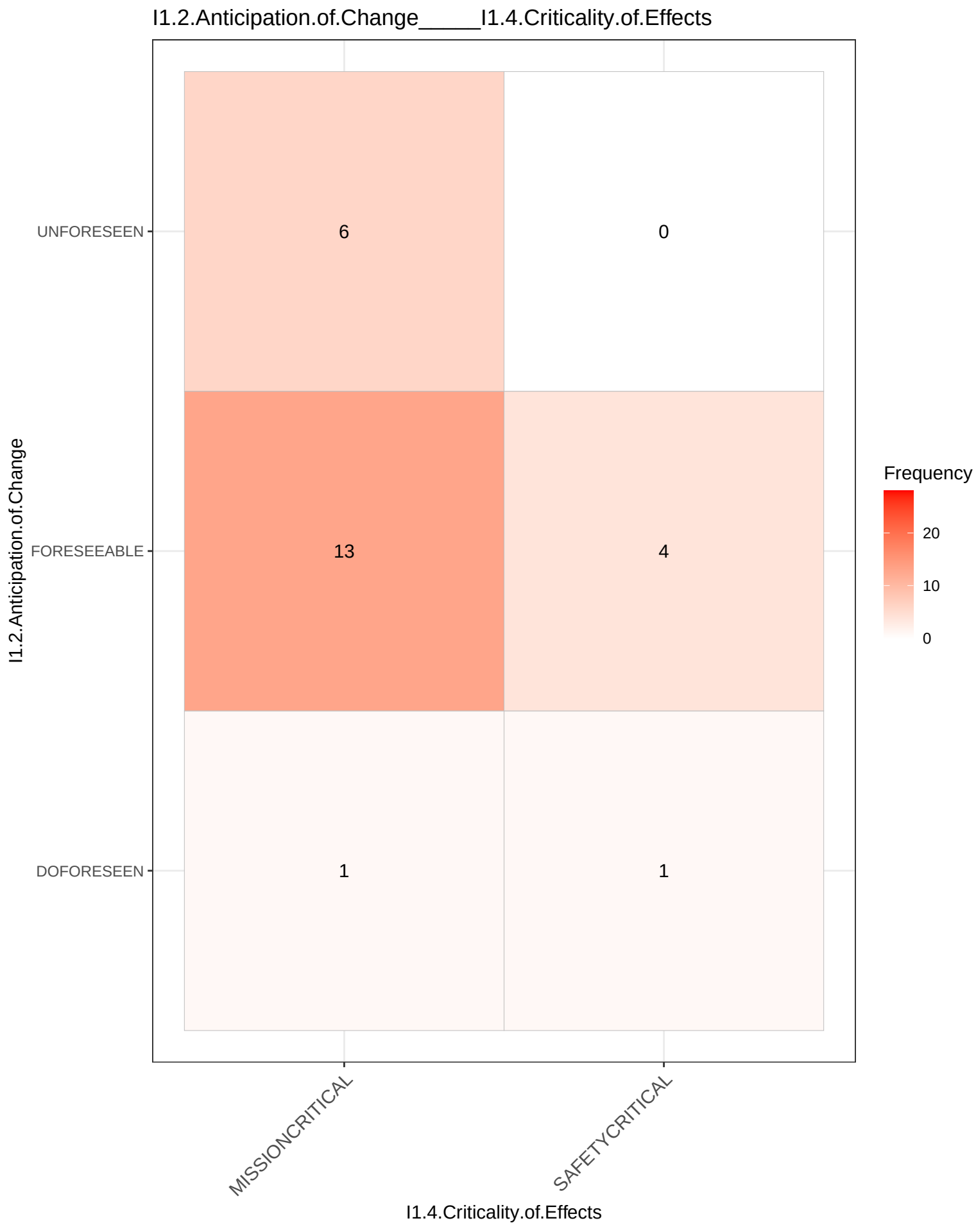
I1.2.Anticipation.of.Change_____I1.4.Criticality.of.Effects
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
6
0
13
4
1
1
Frequency
20
10
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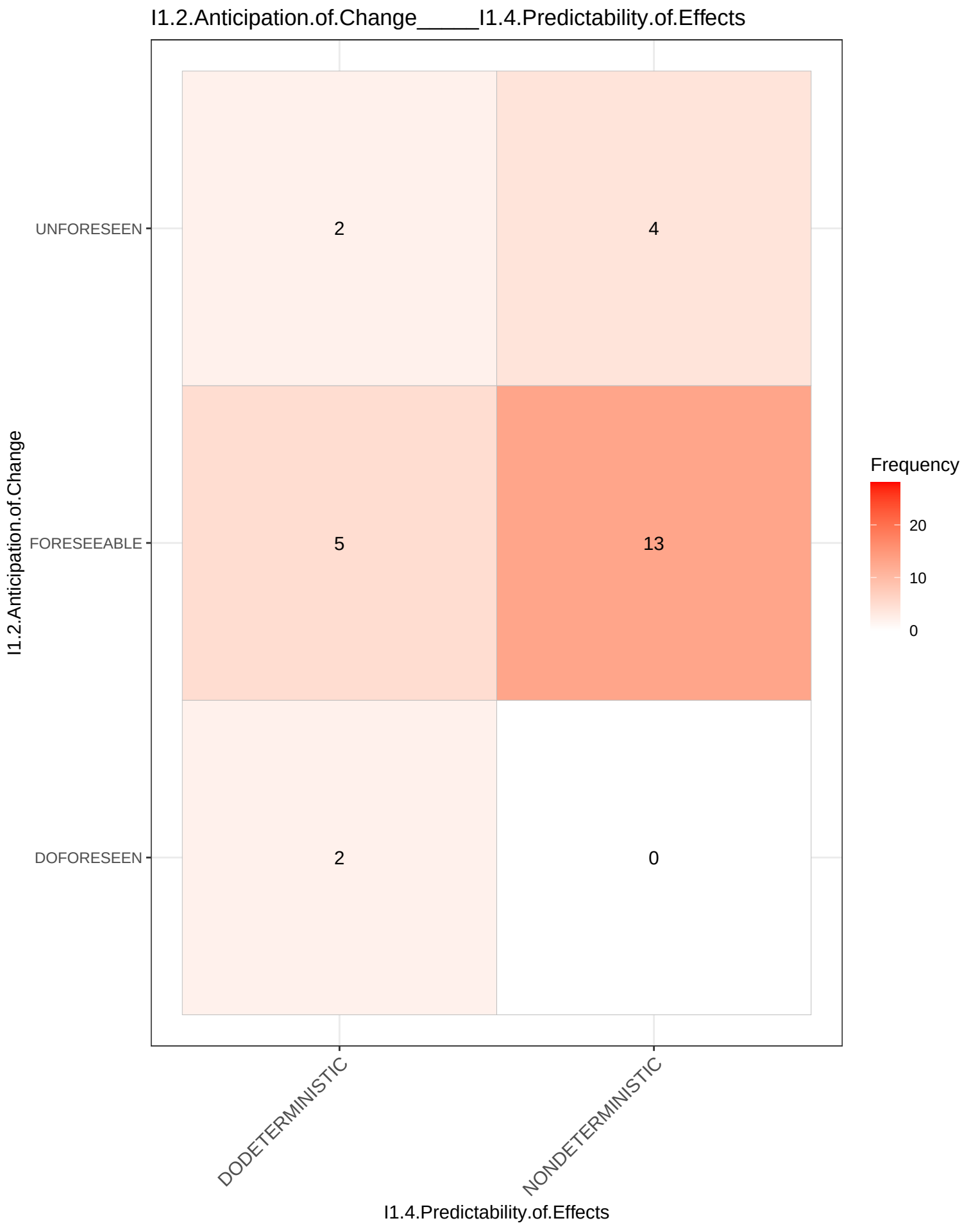
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects


I1.2.Anticipation.of.Change_____I1.4.Predictability.of.Effects
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
2
4
5
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2
0
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
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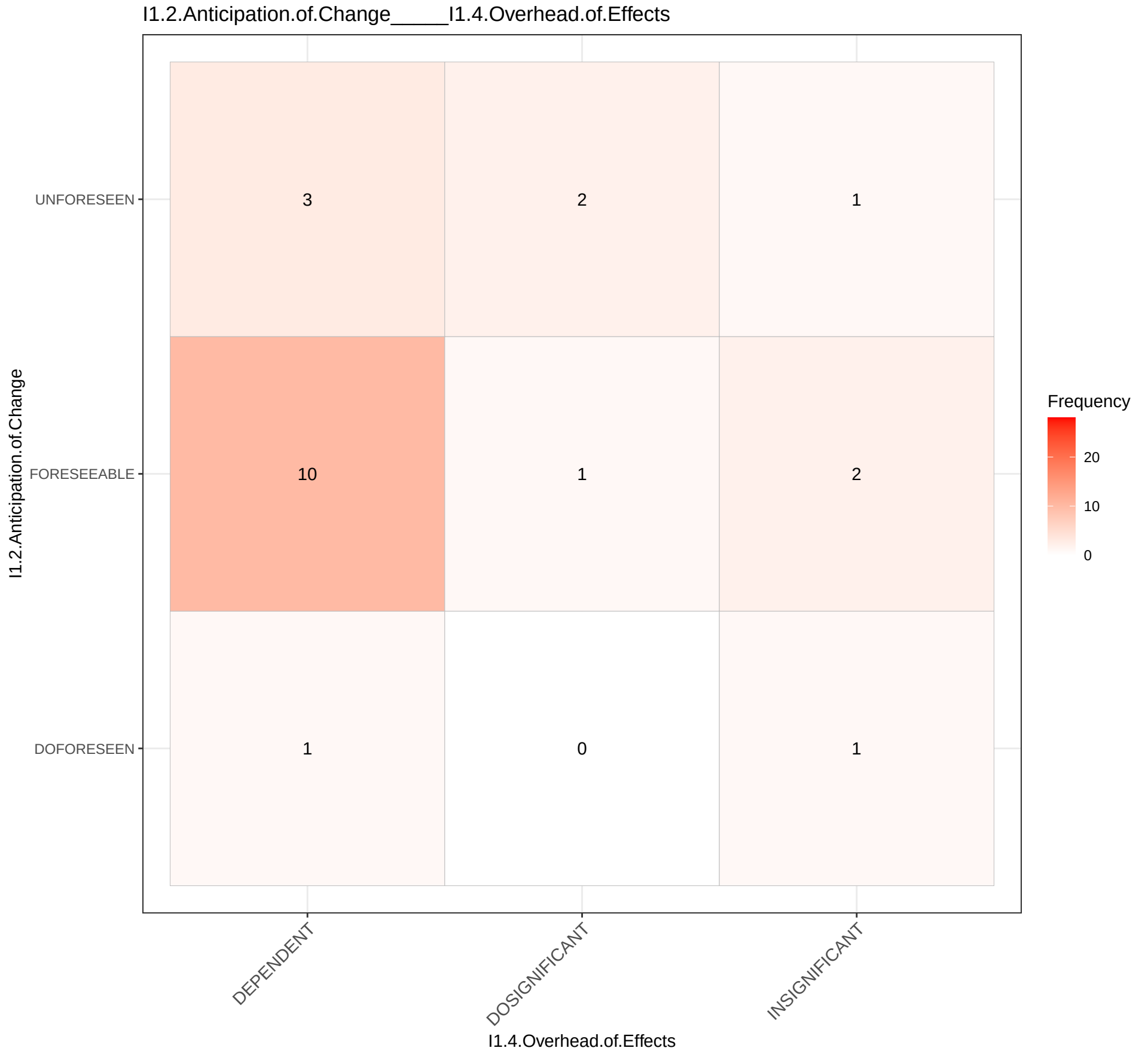
I1.2.Anticipation.of.Change_____I1.4.Overhead.of.Effects
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
3
2
1
10
1
2
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0
1
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
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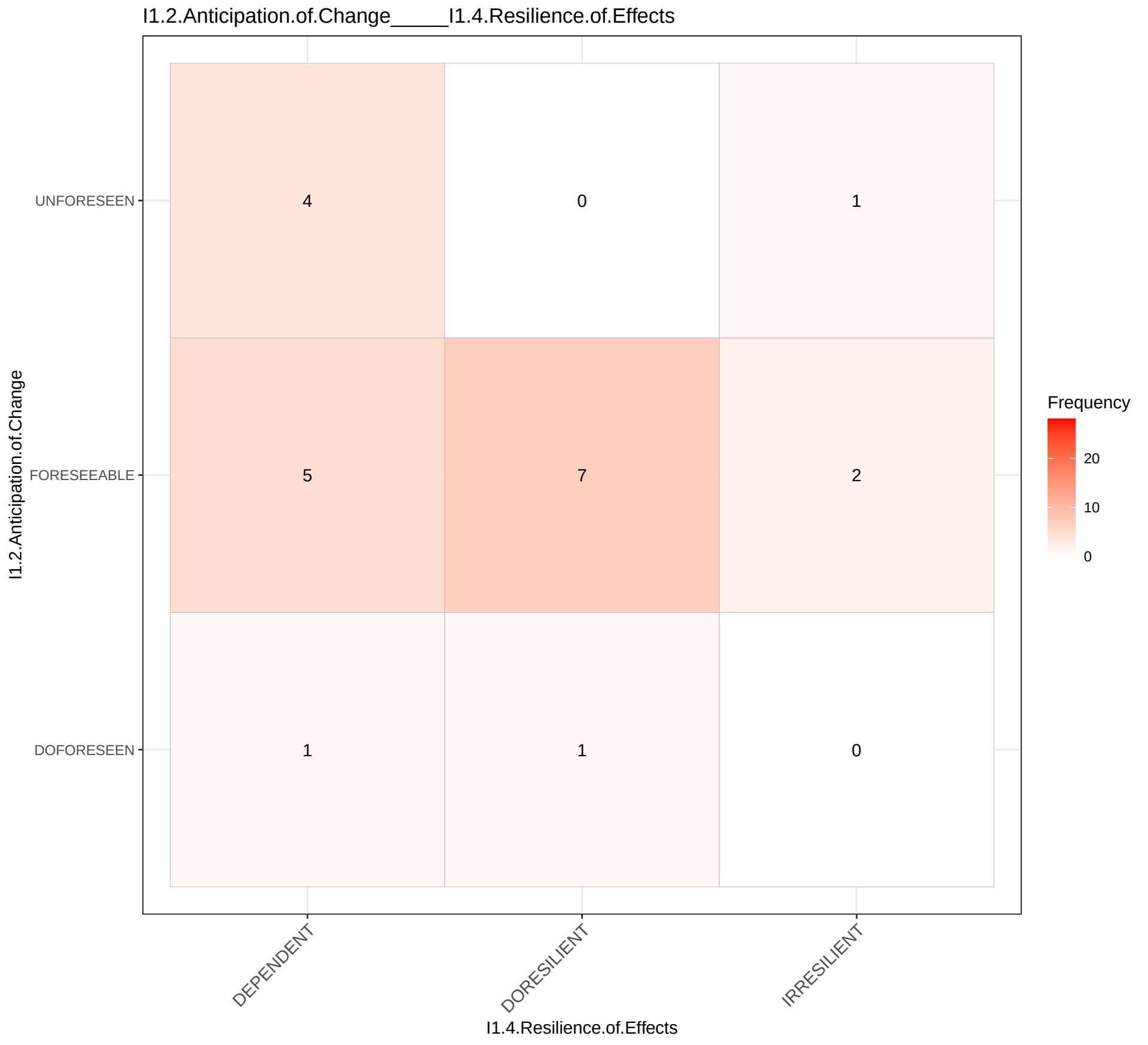
I1.2.Anticipation.of.Change_____I1.4.Resilience.of.Effects
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
4
0
1
5
7
2
1
1
0
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0

I1.2.Anticipation.of.Change_____I2.Adap..Purpose
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
2
0
1
1
1
0
5
2
7
4
4
4
1
6
1
0
0
1
0
0
1
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
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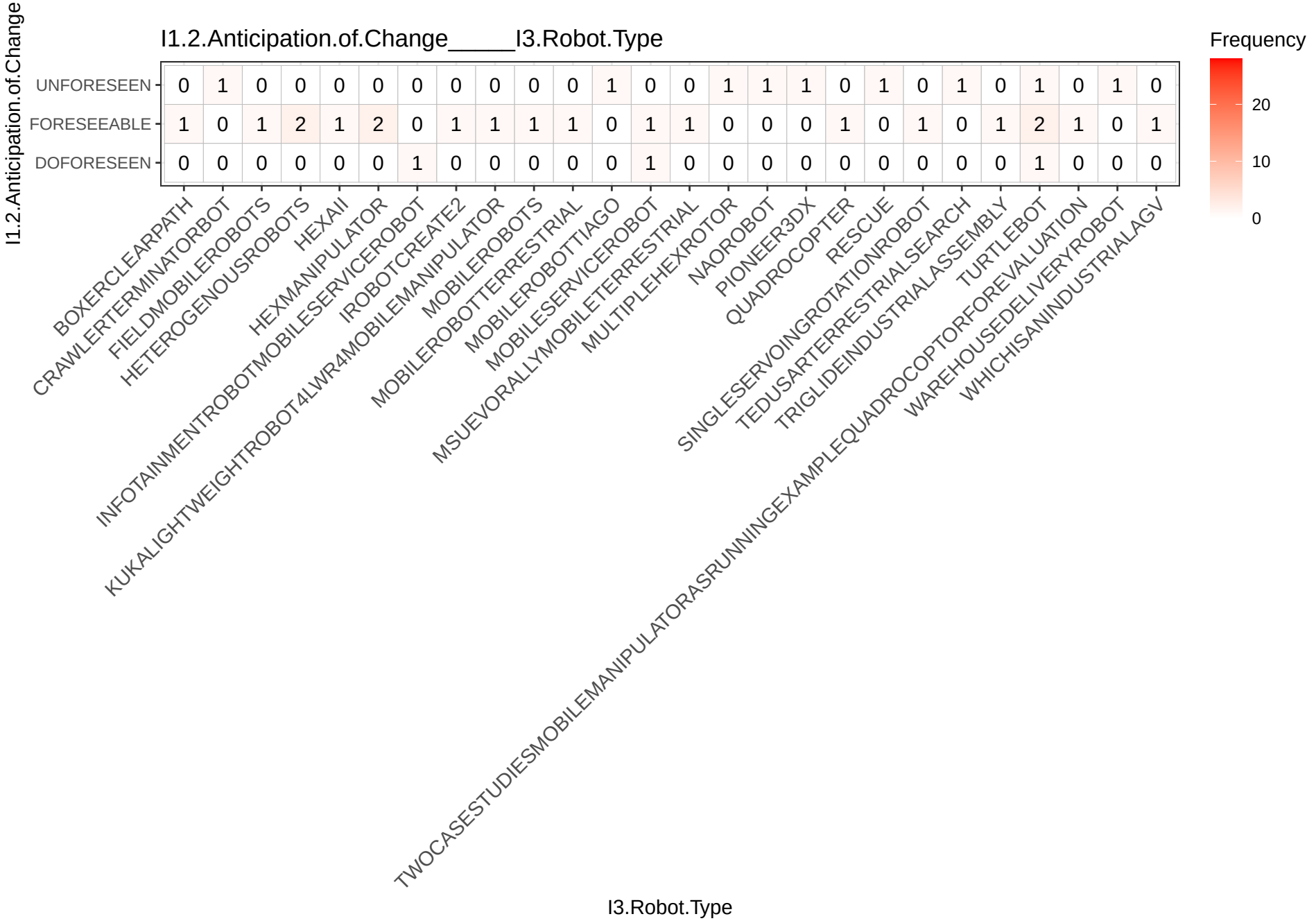
I1.2.Anticipation.of.Change_____I3.Robot.Type
I1.2.Anticipation.of.Change
UNFORESEEN
FORESEEABLE
DOFORESEEN
0 1 0 0 0 0 0 0 0 0 0 1 0 0 1 1 1 0 1 0 1 0 1 0 1 0
1 0 1 2 1 2 0 1 1 1 1 0 1 1 0 0 0 1 0 1 0 1 2 1 0 1
0 0 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
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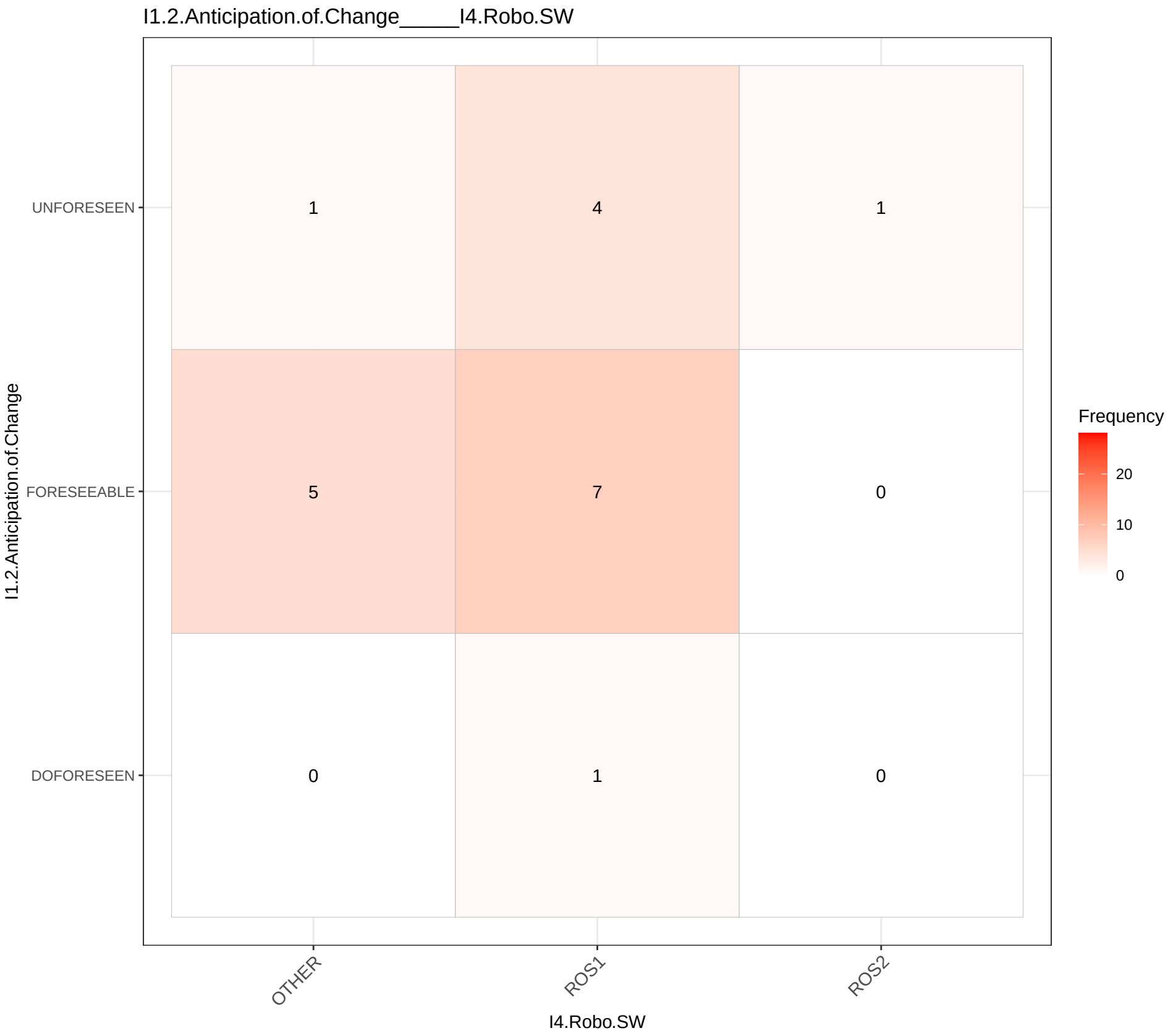
I1.2.Anticipation.of.Change_____I4.Robo.SW
UNFORESEEN
FORESEEABLE
DOFORESEEN
1
4
1
5
7
0
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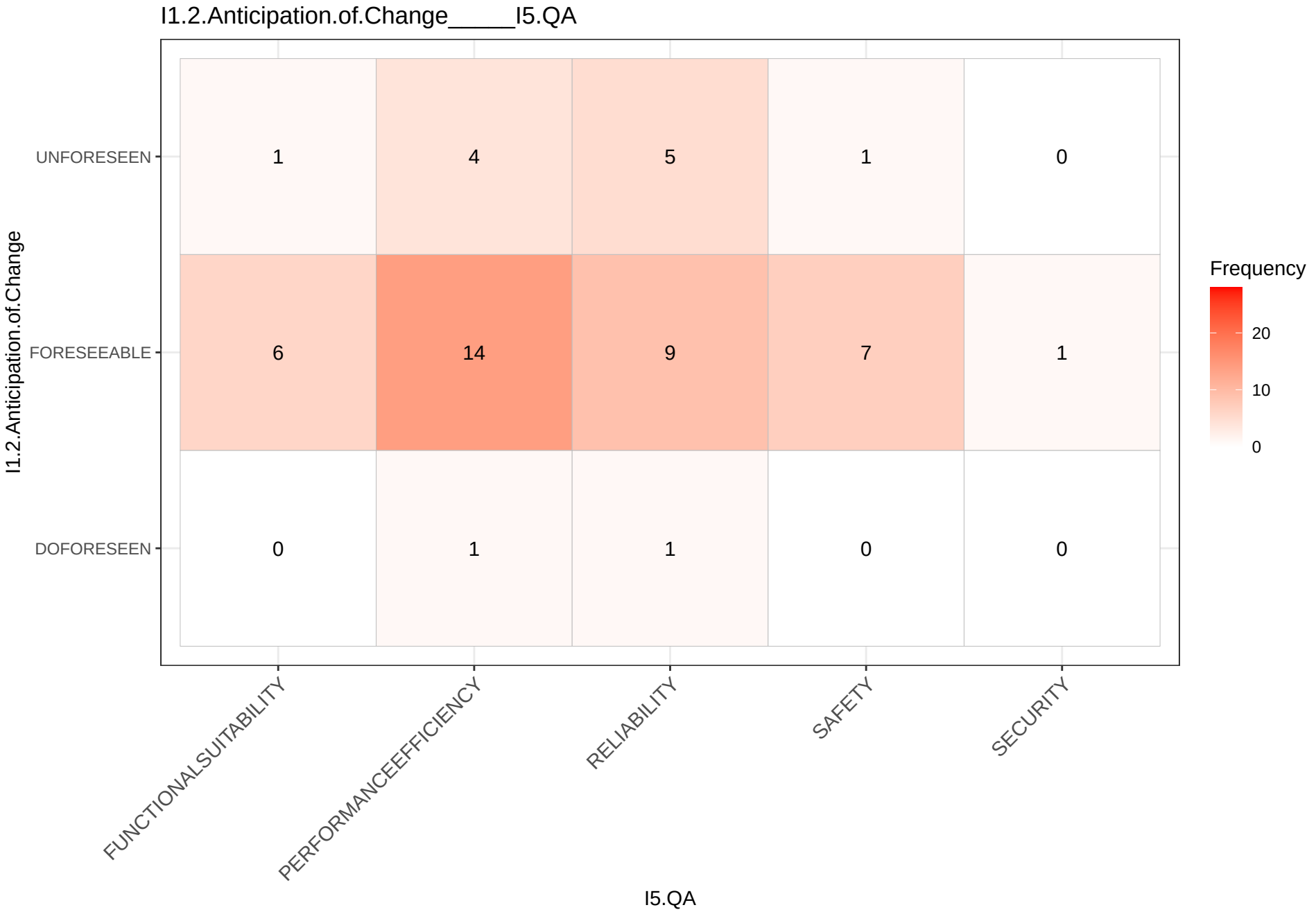
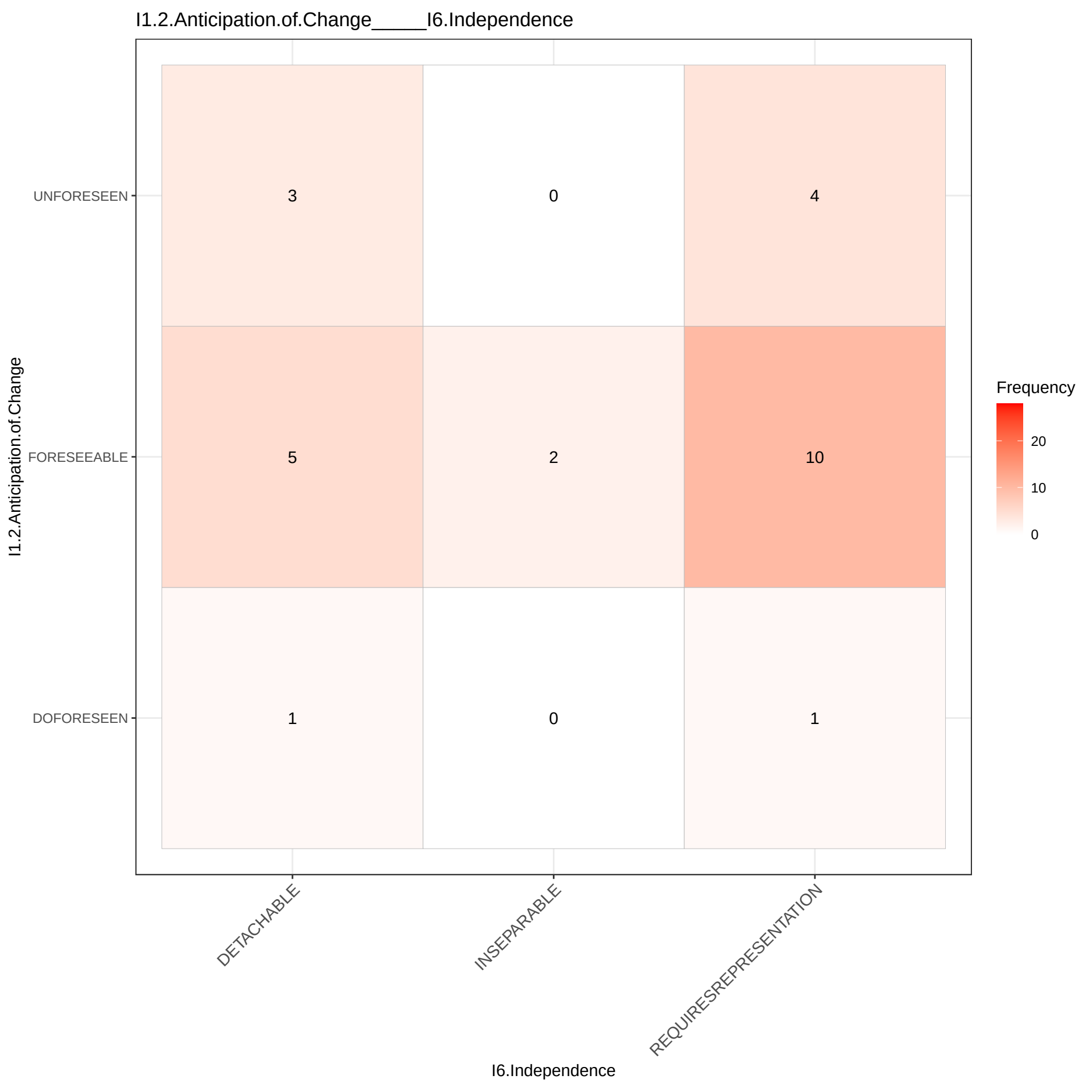
0
OTHER
ROS1
ROS2
I4.Robo.SW
I1.2.Anticipation.of.Change
Frequency
20
10
0


I1.2.Anticipation.of.Change_____I5.QA
UNFORESEEN
FORESEEABLE
DOFORESEEN
1
4
5
1
0
6
14
9
7
1
0
1
1
0
0
I1.2.Anticipation.of.Change
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I1.2.Anticipation.of.Change_____I6.Independence
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
3
0
4
5
2
10
1
0
1
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
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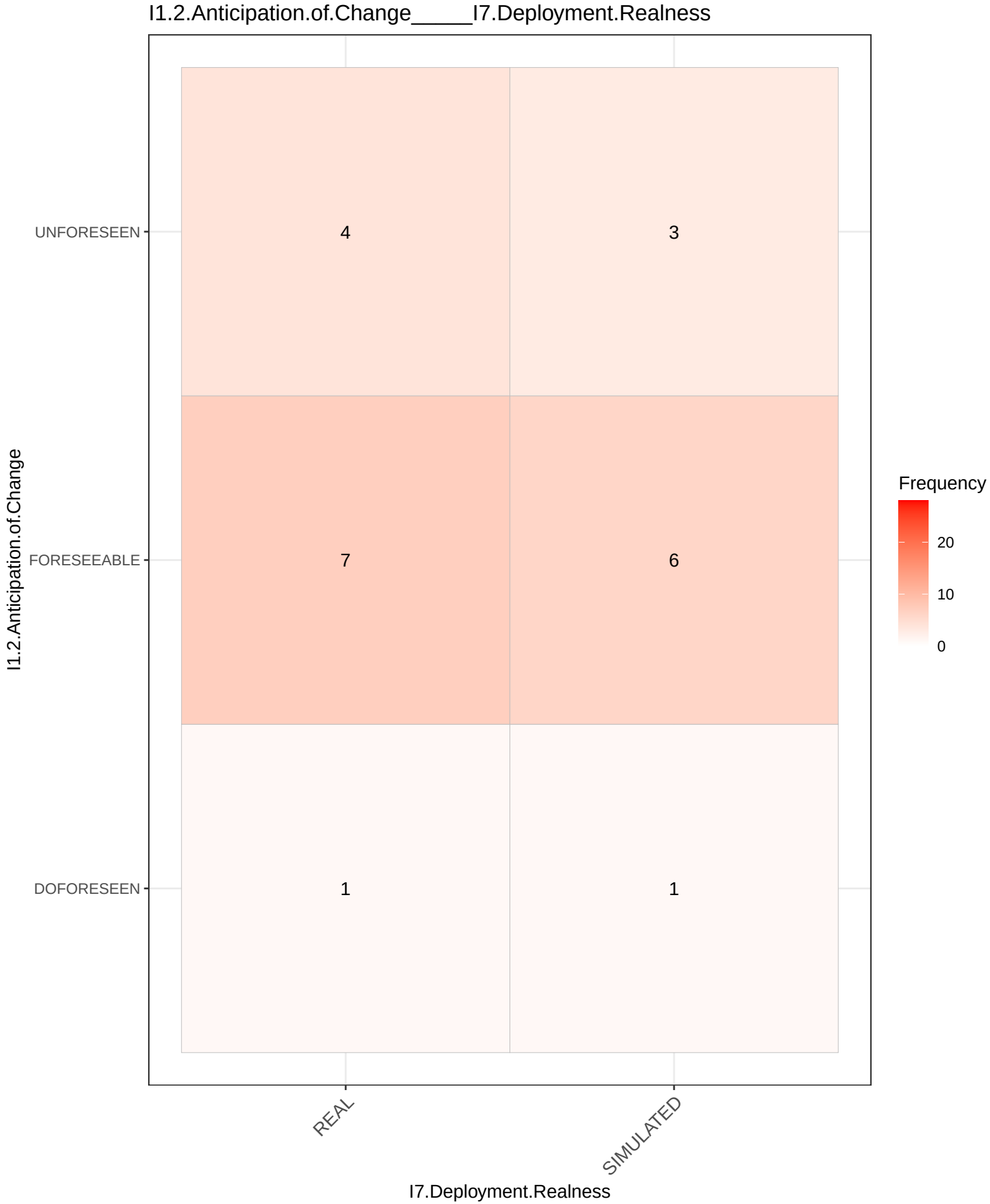
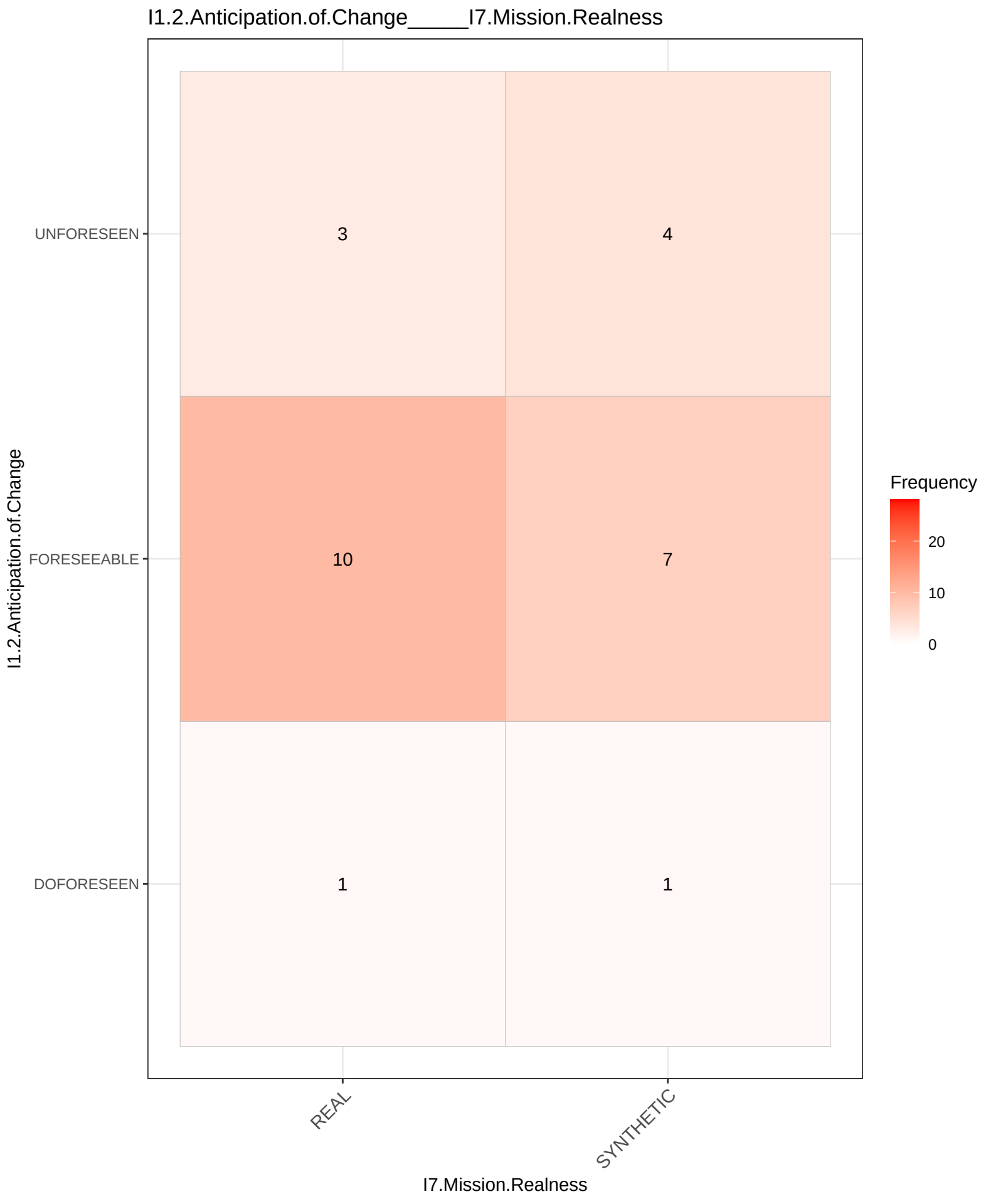
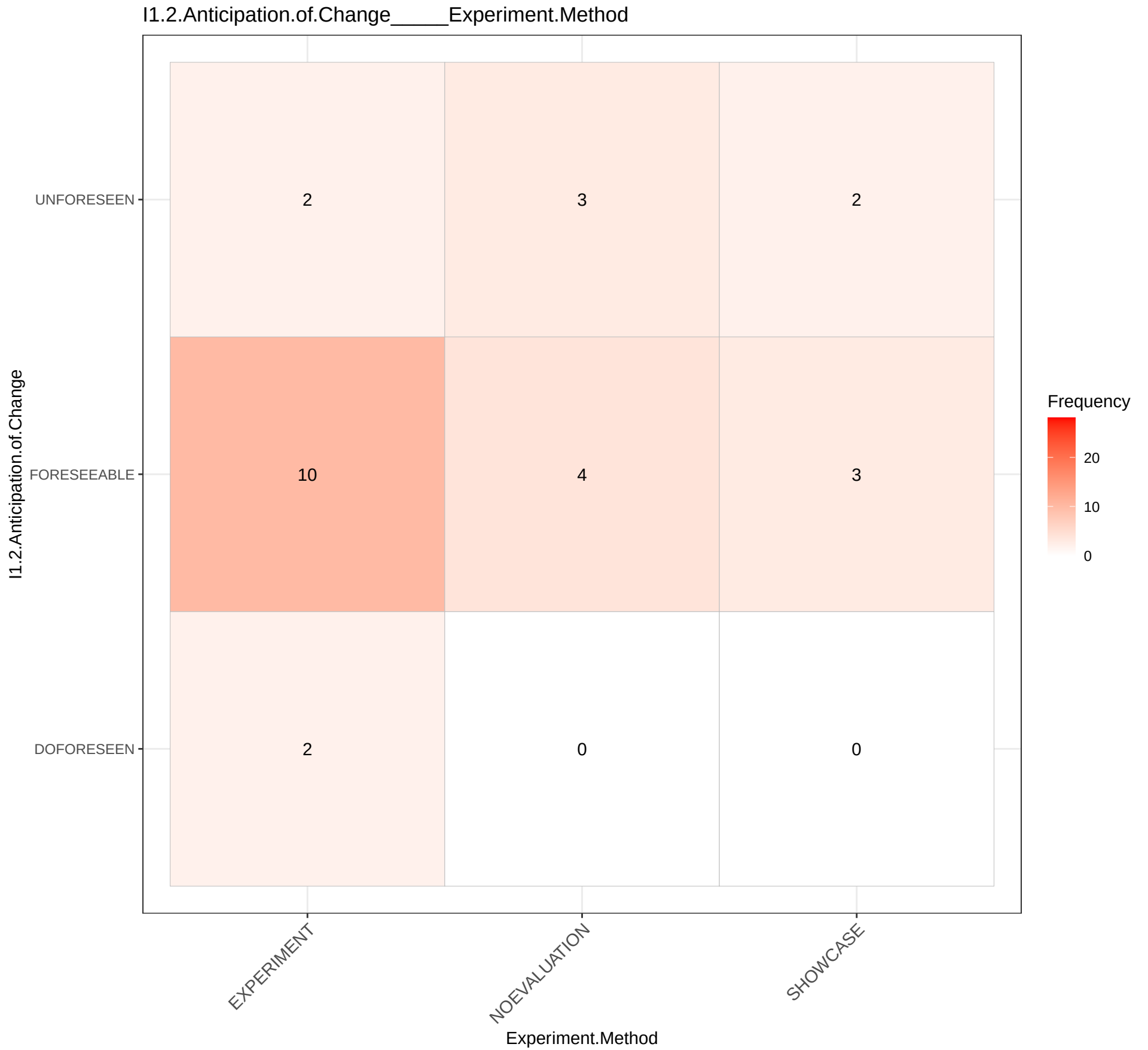
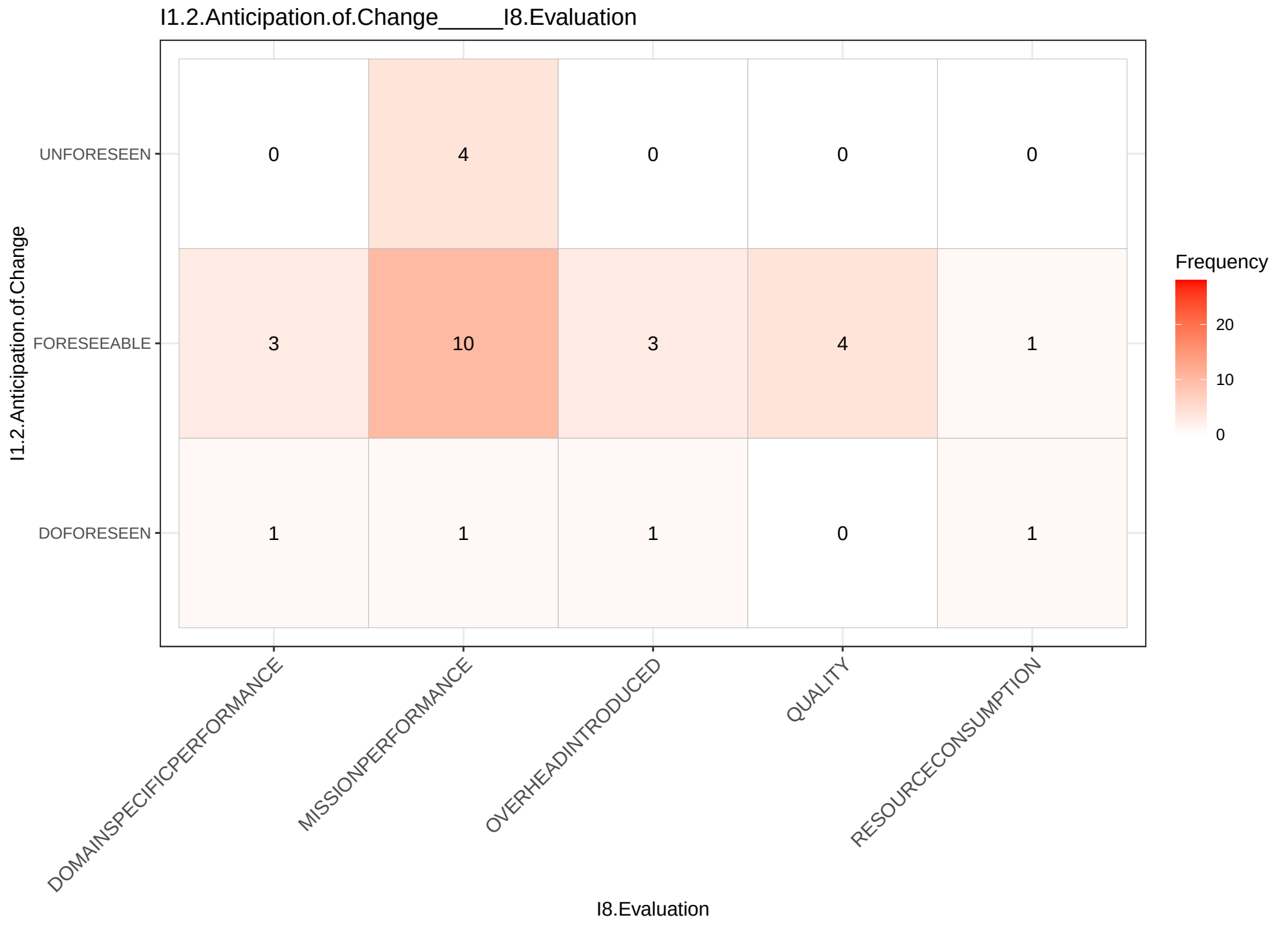
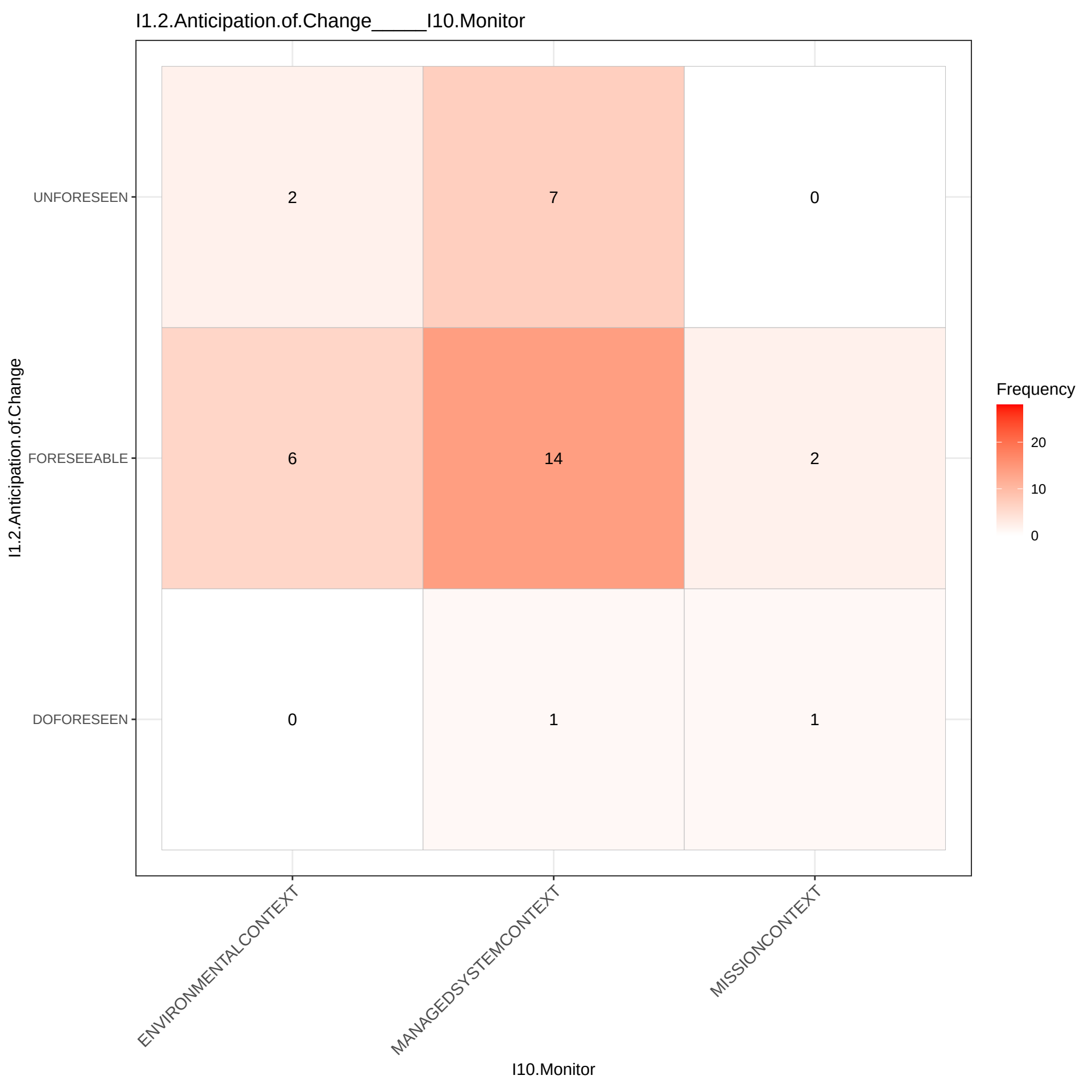

I1.2.Anticipation.of.Change_____I7.Deployment.Realness
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
4
3
7
6
1
1
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0


I1.2.Anticipation.of.Change_____I7.Mission.Realness
UNFORESEEN
FORESEEABLE
DOFORESEEN
3
4
10
7
1
1
I1.2.Anticipation.of.Change
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0


I1.2.Anticipation.of.Change_____Experiment.Method
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
2
3
2
10
4
3
2
0
0
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I1.2.Anticipation.of.Change_____I8.Evaluation
UNFORESEEN
FORESEEABLE
DOFORESEEN
0
4
0
0
0
3
10
3
4
1
1
1
1
0
1
I1.2.Anticipation.of.Change
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
0

I1.2.Anticipation.of.Change_____I9.Adap..Logic
I1.2.Anticipation.of.Change
UNFORESEEN
FORESEEABLE
DOFORESEEN
2 0 3 2 0 2 1 0
1 3 5 4 0 7 2 3
0 0 0 1 0 0 1 0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
0


I1.2.Anticipation.of.Change_____I10.Monitor
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
2
7
0
6
14
2
0
1
1
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
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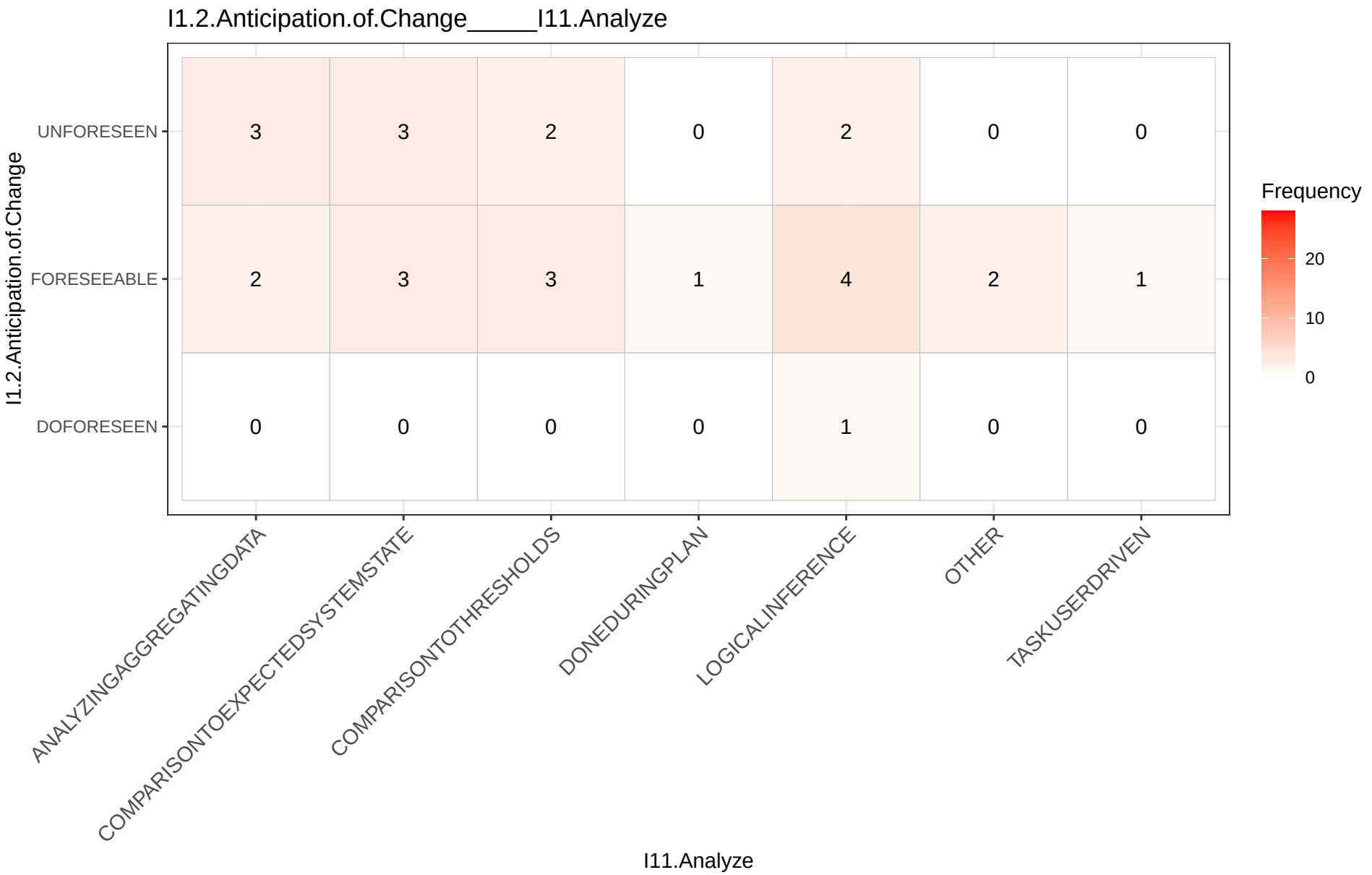
I1.2.Anticipation.of.Change_____I11.Analyze
I1.2.Anticipation.of.Change
UNFORESEEN
FORESEEABLE
DOFORESEEN
3
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2
0
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2
3
3
1
4
2
1
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1
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0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
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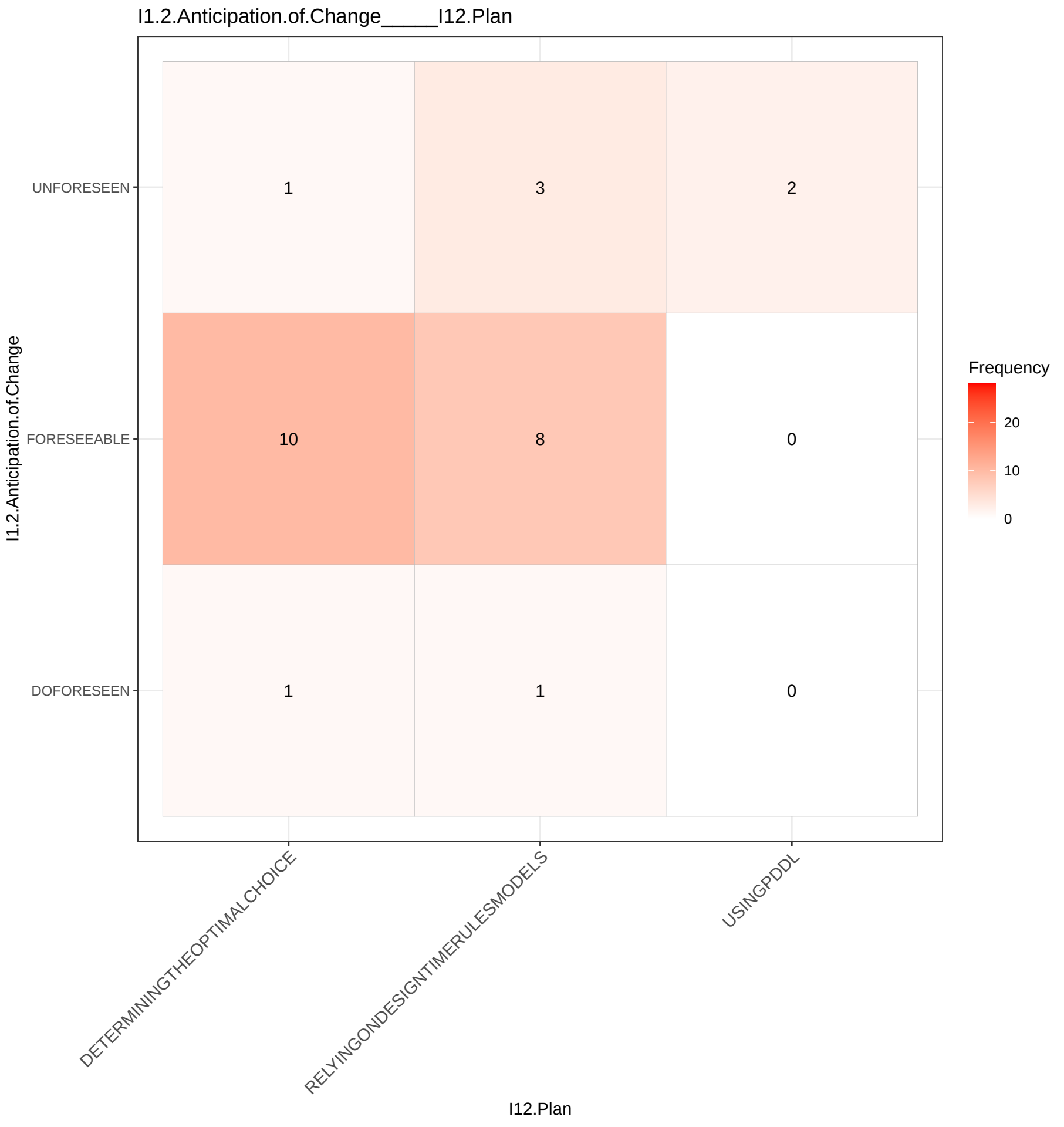
I1.2.Anticipation.of.Change_____I12.Plan
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
1
3
2
10
8
0
1
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Frequency
20
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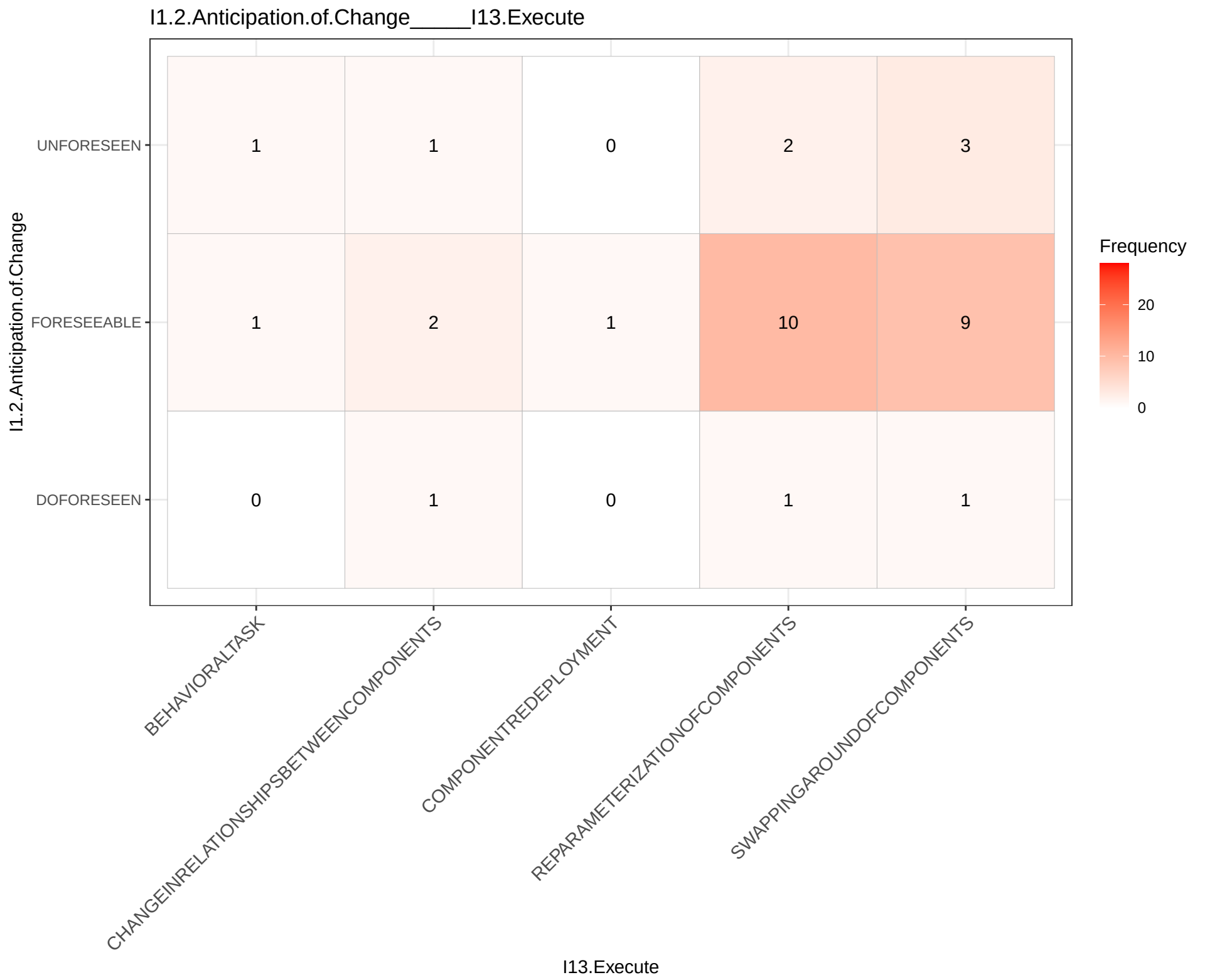
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan


I1.2.Anticipation.of.Change_____I13.Execute
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
1
1
0
2
3
1
2
1
10
9
0
1
0
1
1
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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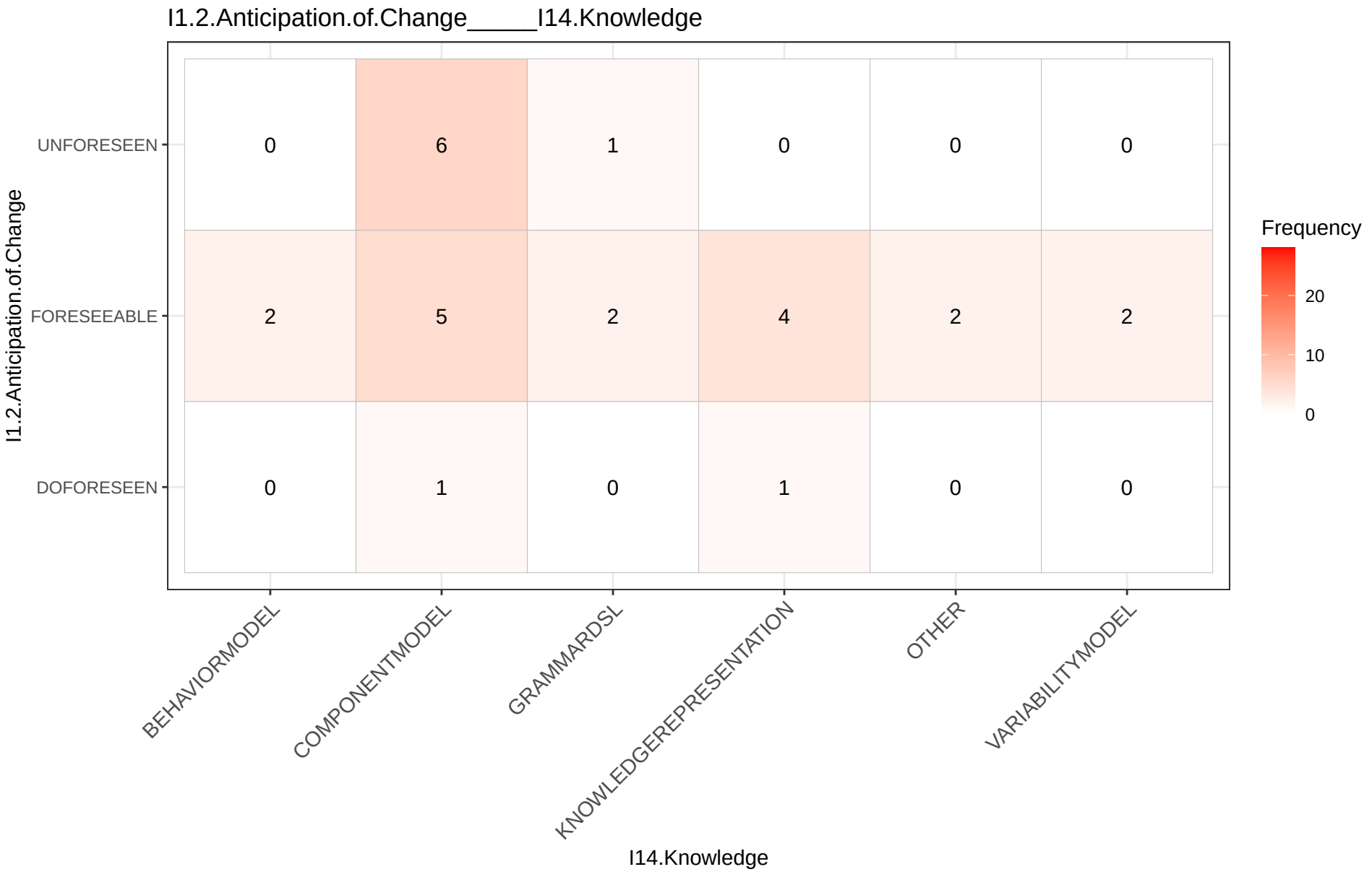
I1.2.Anticipation.of.Change_____I14.Knowledge
UNFORESEEN
FORESEEABLE
DOFORESEEN
I1.2.Anticipation.of.Change
0
6
1
0
0
0
2
5
2
4
2
2
0
1
0
1
0
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BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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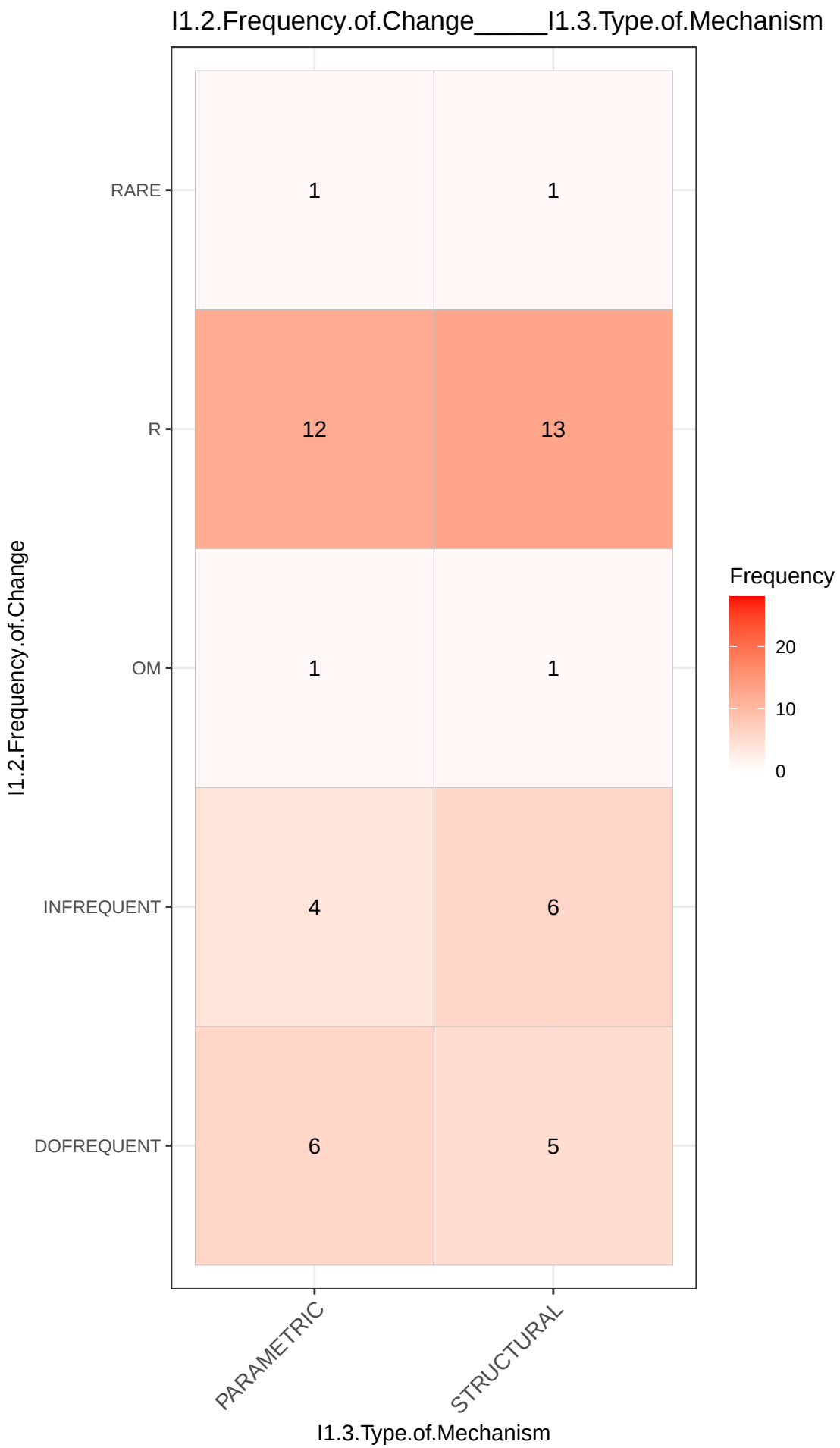
I1.2.Frequency.of.Change_____I1.3.Type.of.Mechanism
RARE
R
OM
INFREQUENT
DOFREQUENT
1
1
12
13
1
1
4
6
6
5
I1.2.Frequency.of.Change
PARAMETRIC
STRUCTURAL
I1.3.Type.of.Mechanism
Frequency
20
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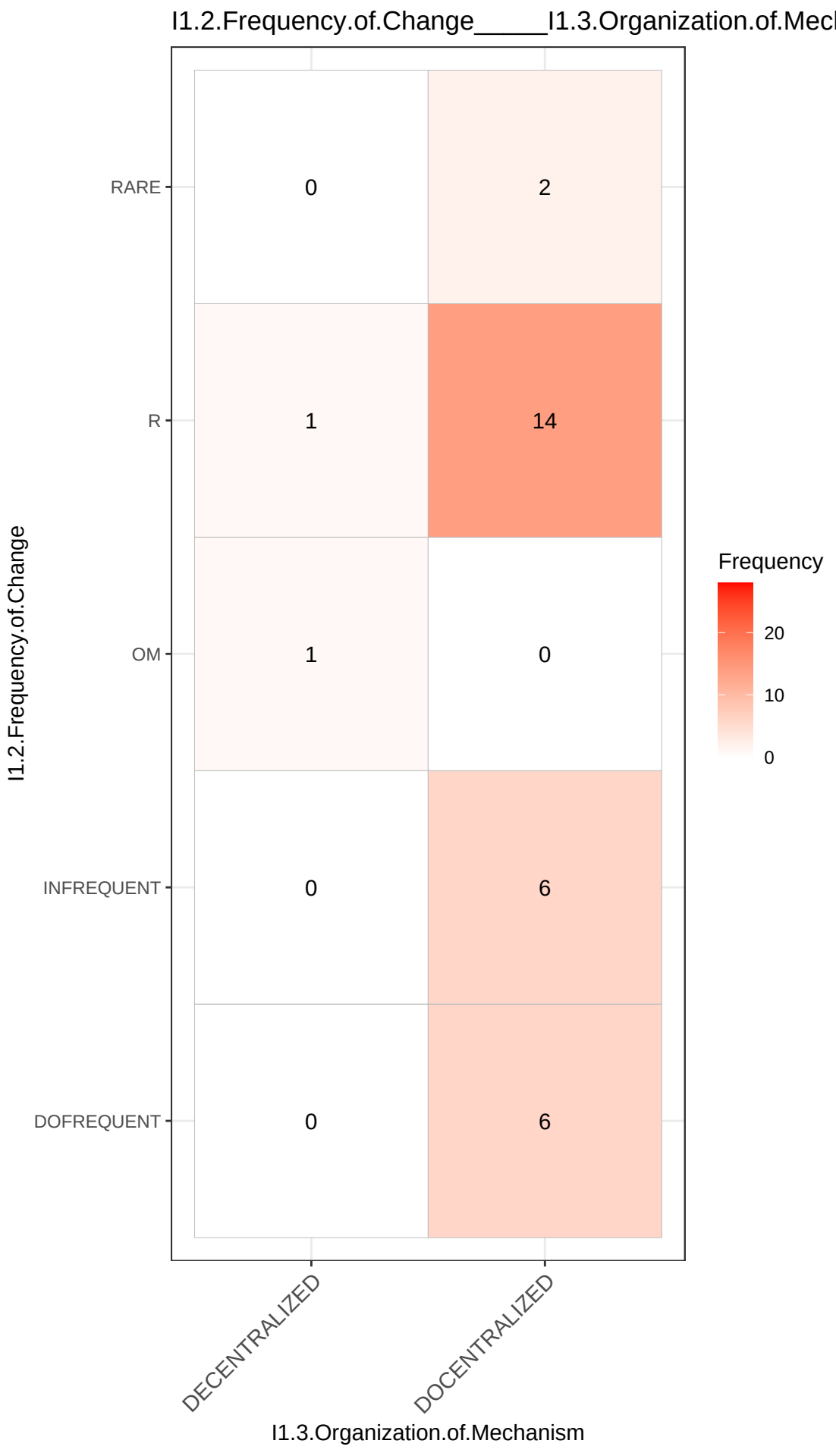
I1.2.Frequency.of.Change_____I1.3.Organization.of.Mechanism
RARE
R
OM
INFREQUENT
DOFREQUENT
0
2
1
14
1
0
0
6
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6
I1.2.Frequency.of.Change
DECENTRALIZED
DOCENTRALIZED
I1.3.Organization.of.Mechanism
Frequency
20
10
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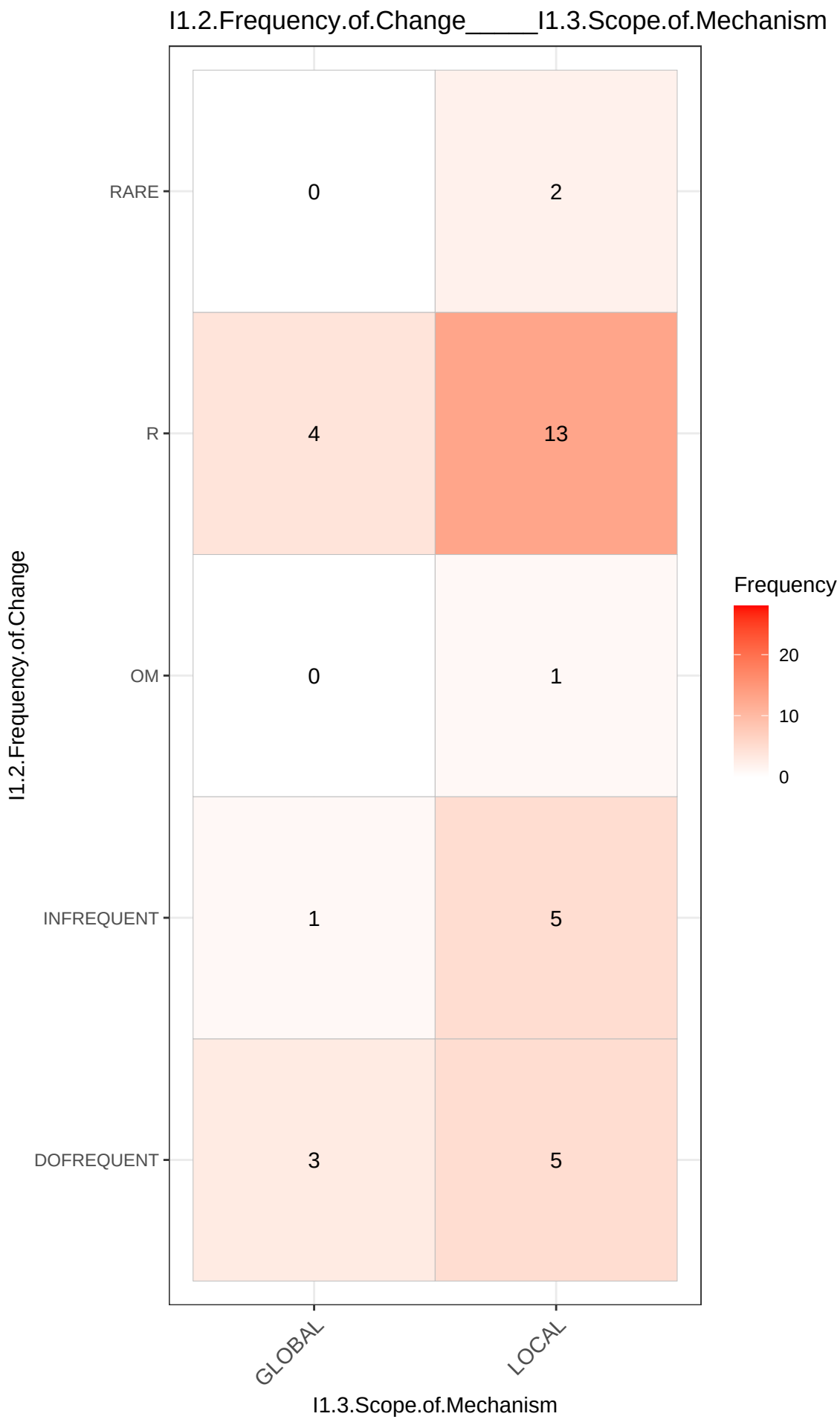
I1.2.Frequency.of.Change_____I1.3.Scope.of.Mechanism
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
0
2
4
13
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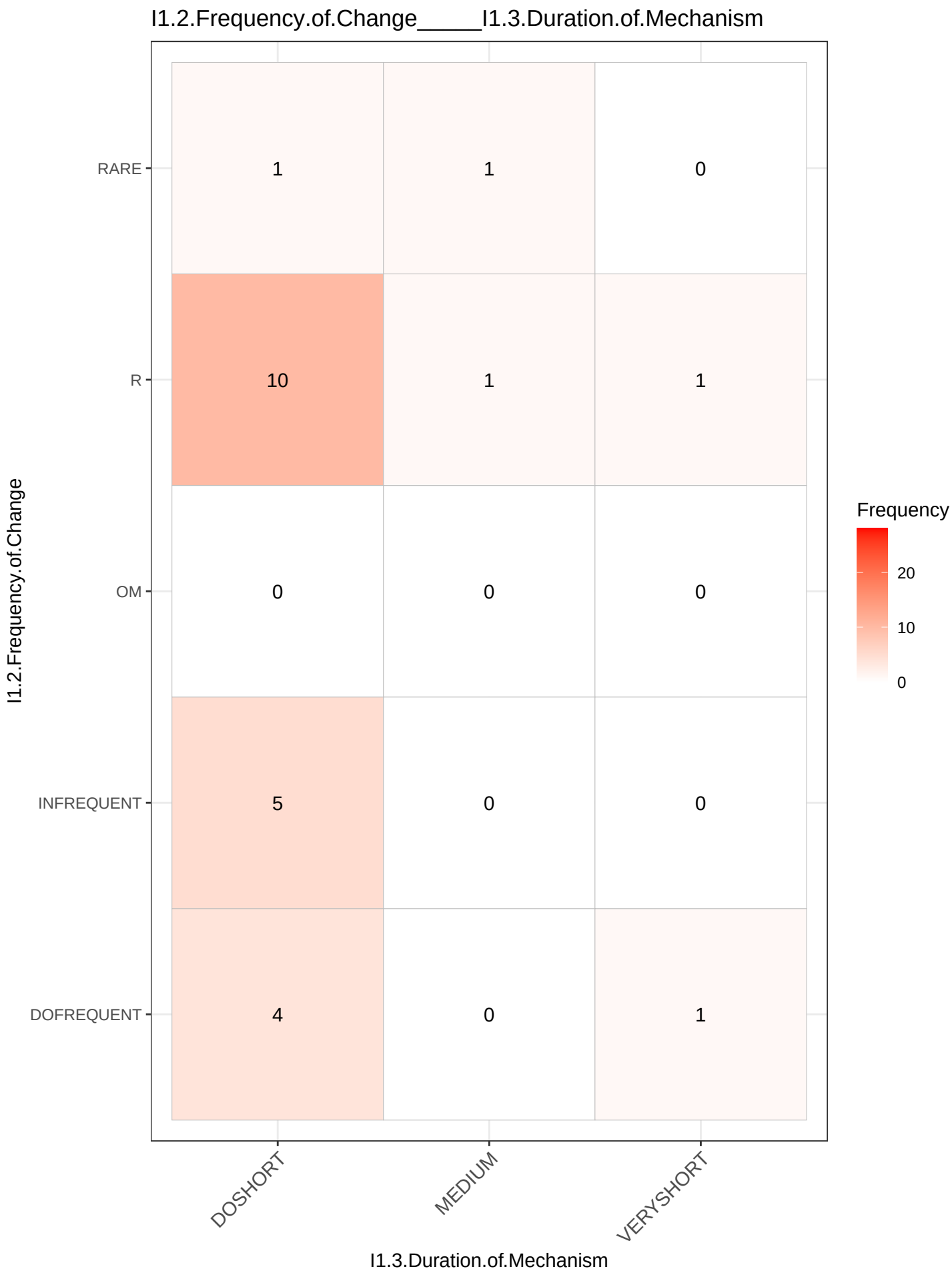
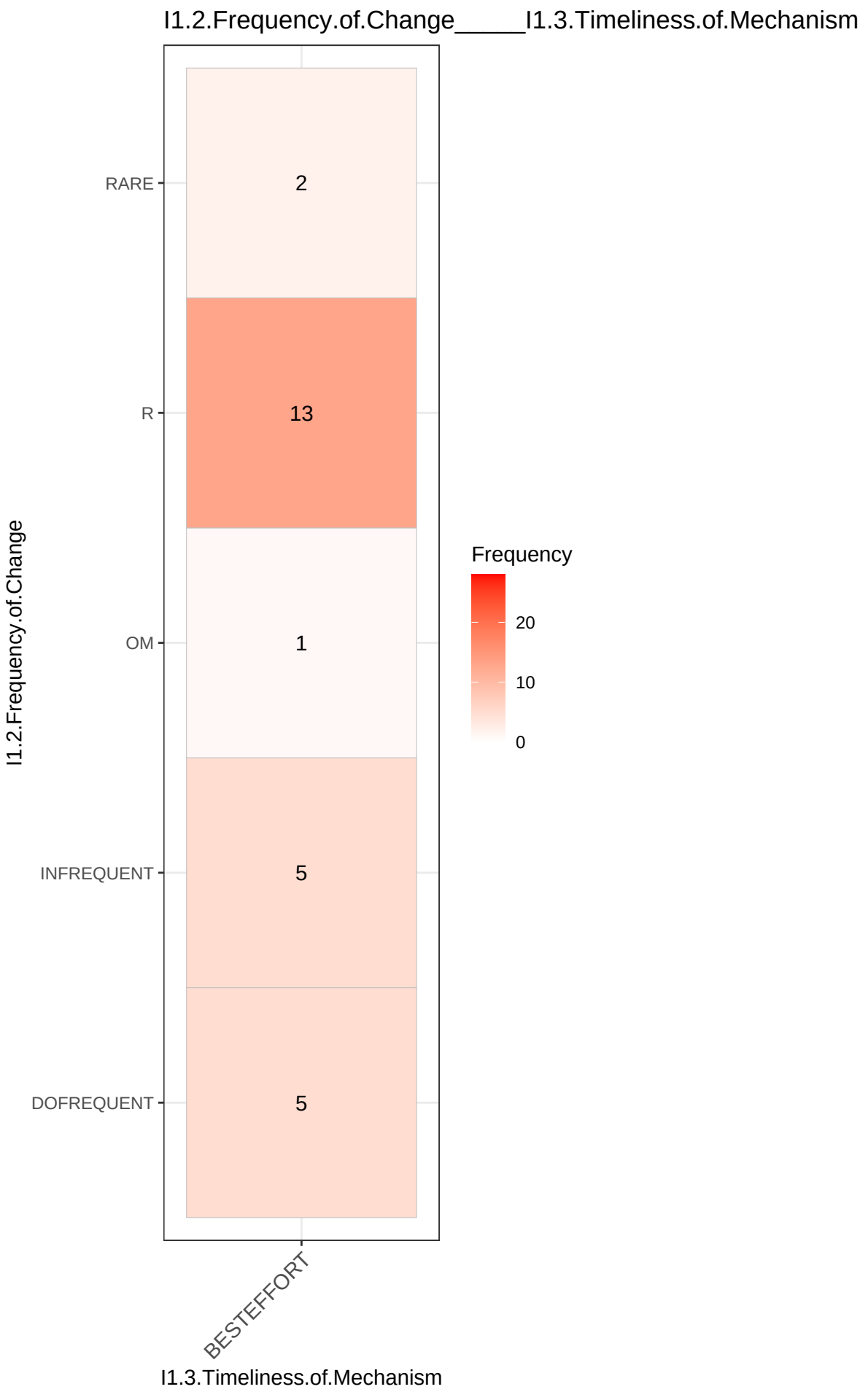
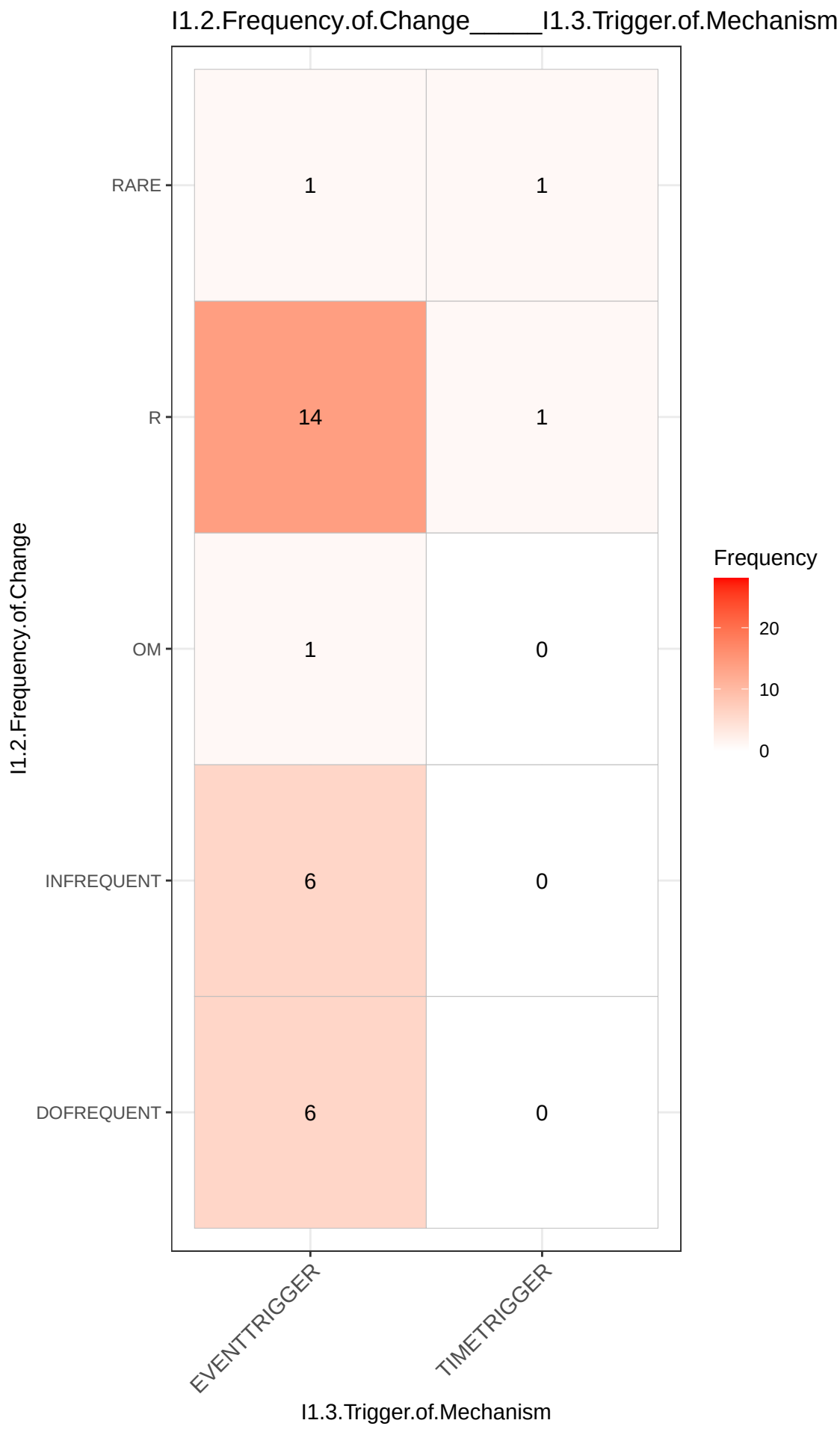
1
1
5
3
5
GLOBAL
LOCAL
I1.3.Scope.of.Mechanism
Frequency
20
10
0


I1.2.Frequency.of.Change_____I1.3.Duration.of.Mechanism
RARE
R
OM
INFREQUENT
DOFREQUENT
1
1
0
10
1
1
0
0
0
5
0
0
4
0
1
DOSHORT
MEDIUM
VERYSHORT
I1.2.Frequency.of.Change
I1.3.Duration.of.Mechanism
Frequency
20
10
0


I1.2.Frequency.of.Change_____I1.3.Timeliness.of.Mechanism
RARE
R
OM
INFREQUENT
DOFREQUENT
2
13
1
5
5
I1.2.Frequency.of.Change
Frequency
20
10
0
BESTEFFORT
I1.3.Timeliness.of.Mechanism


I1.2.Frequency.of.Change_____I1.3.Trigger.of.Mechanism
RARE
R
OM
INFREQUENT
DOFREQUENT
1
1
14
1
1
0
6
0
6
0
I1.2.Frequency.of.Change
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
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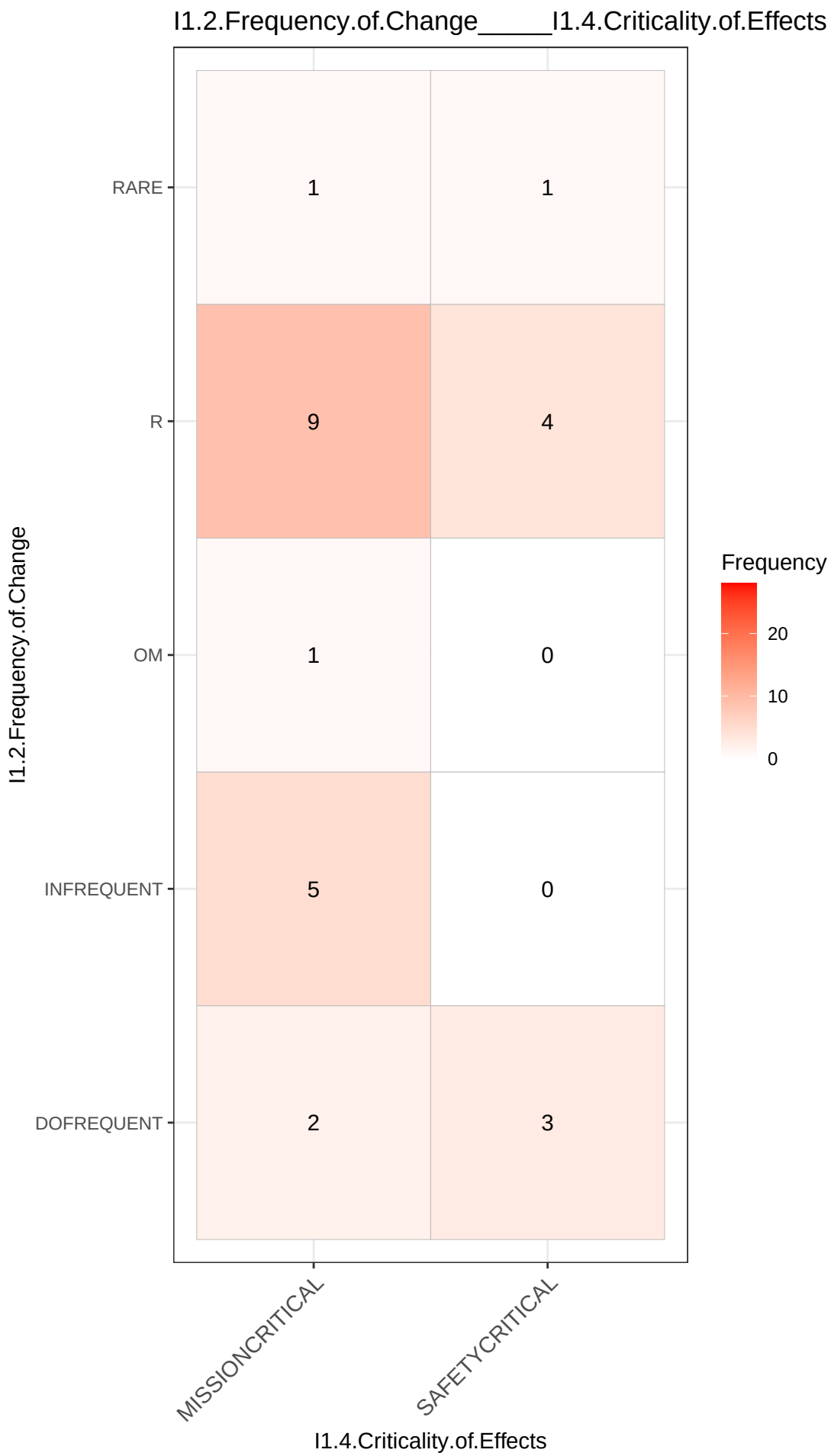
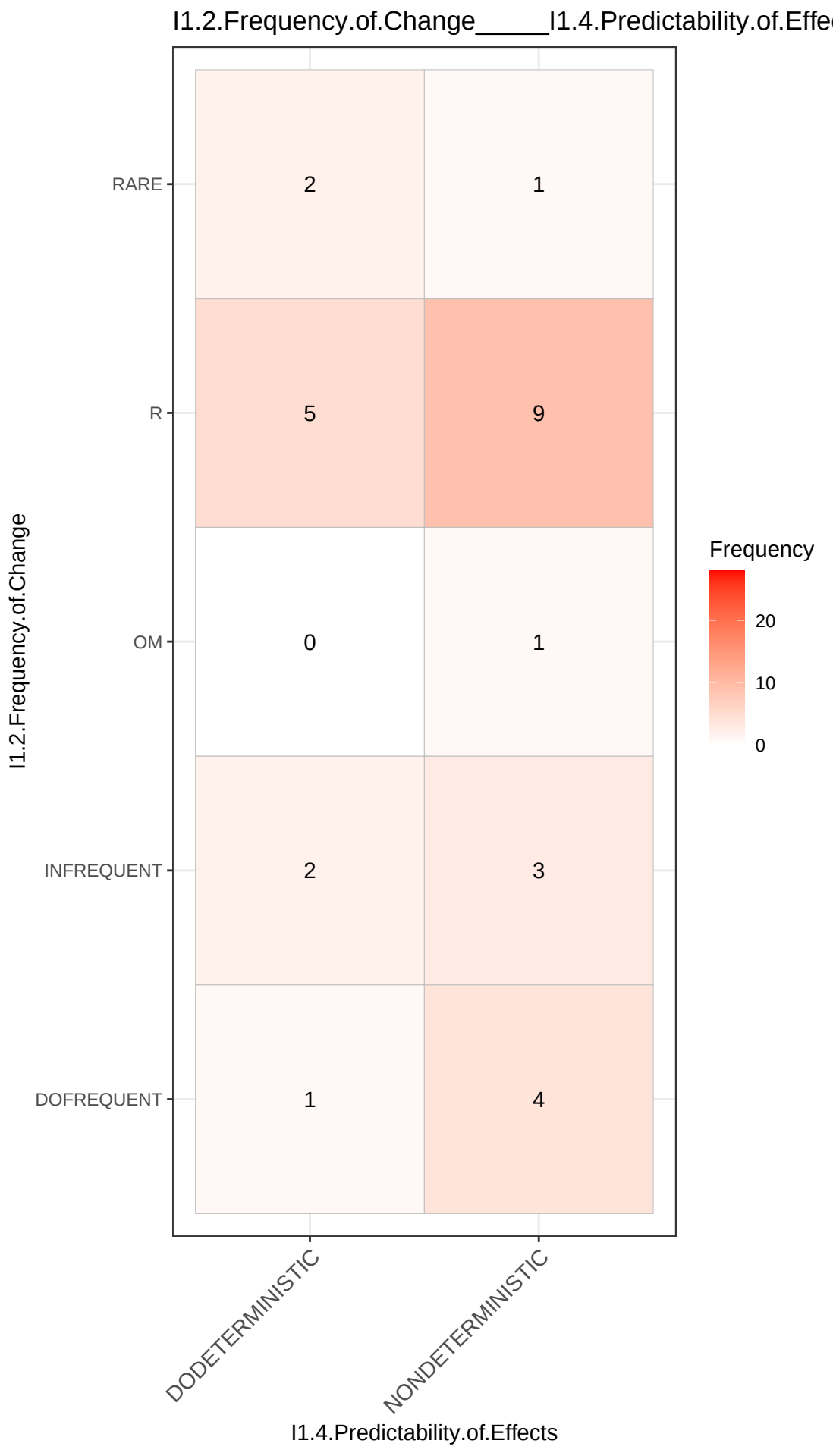
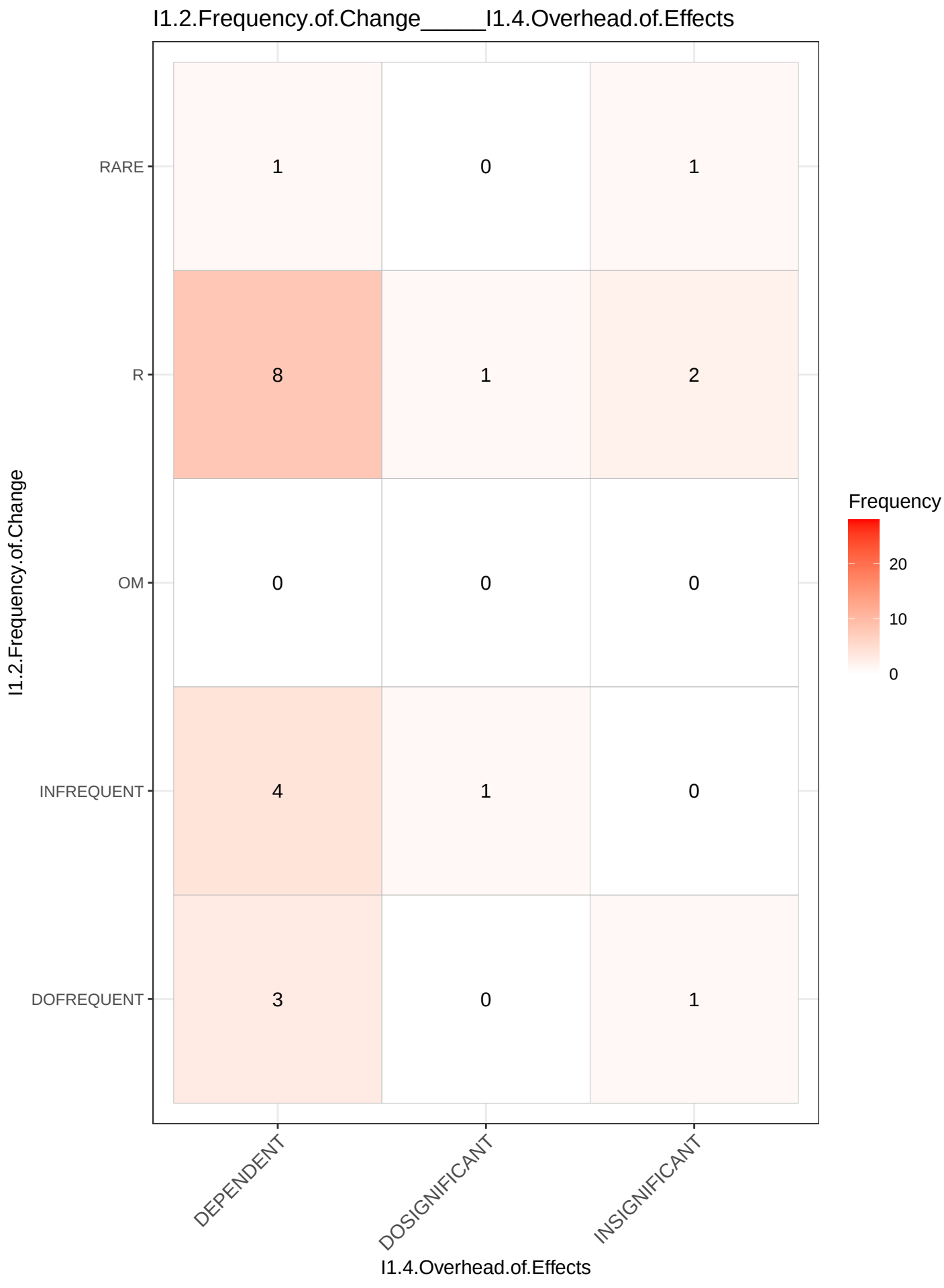
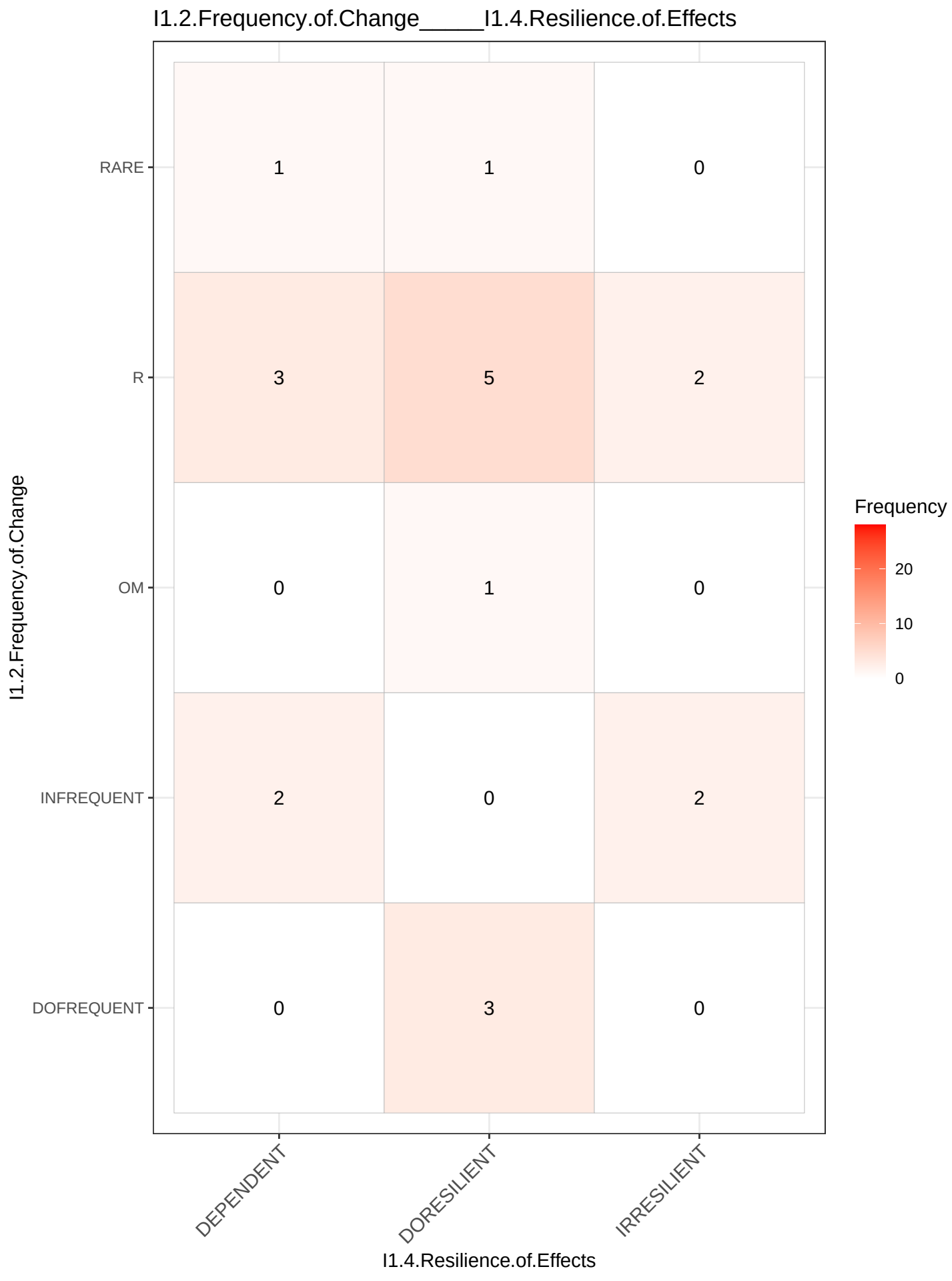
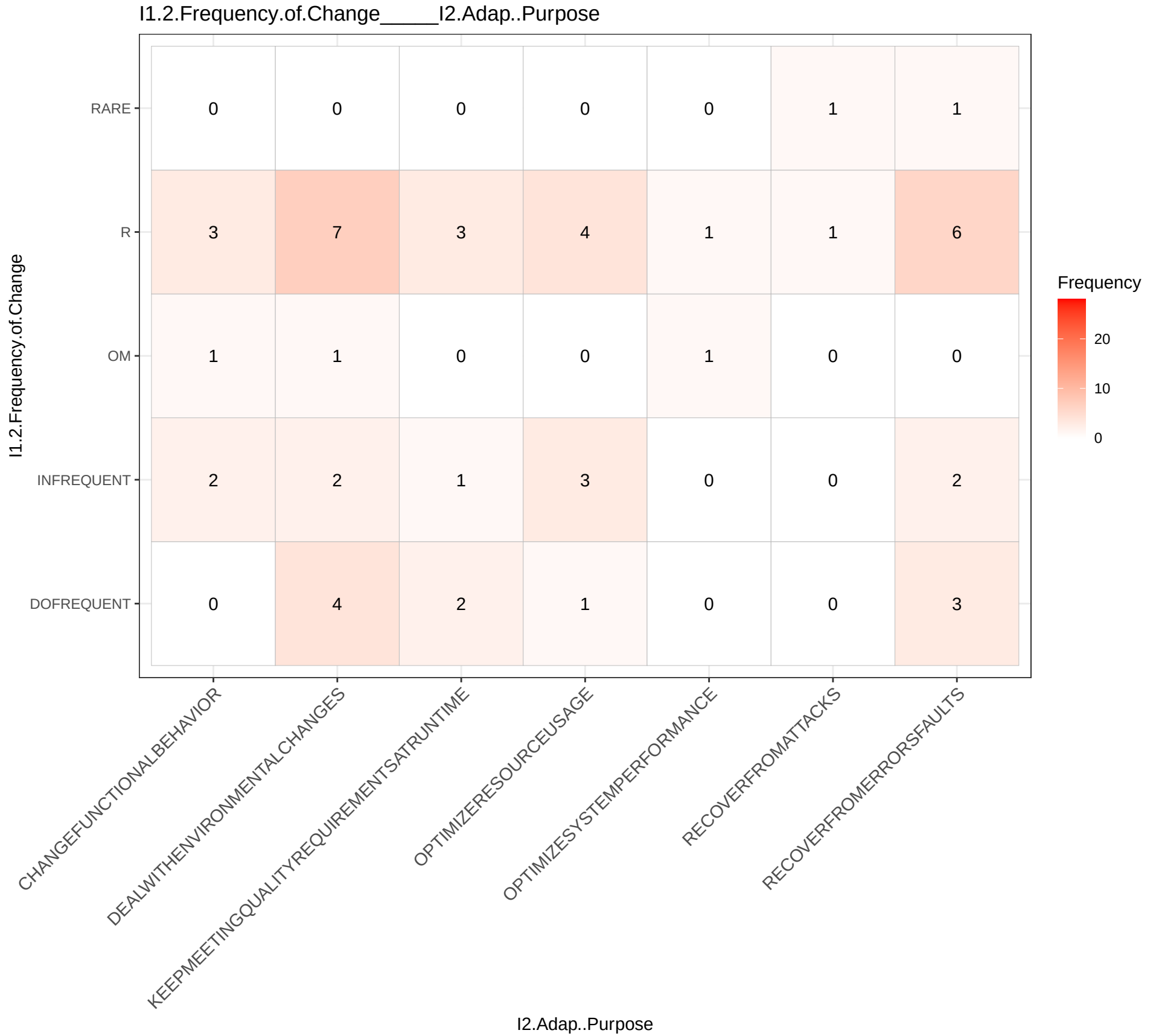
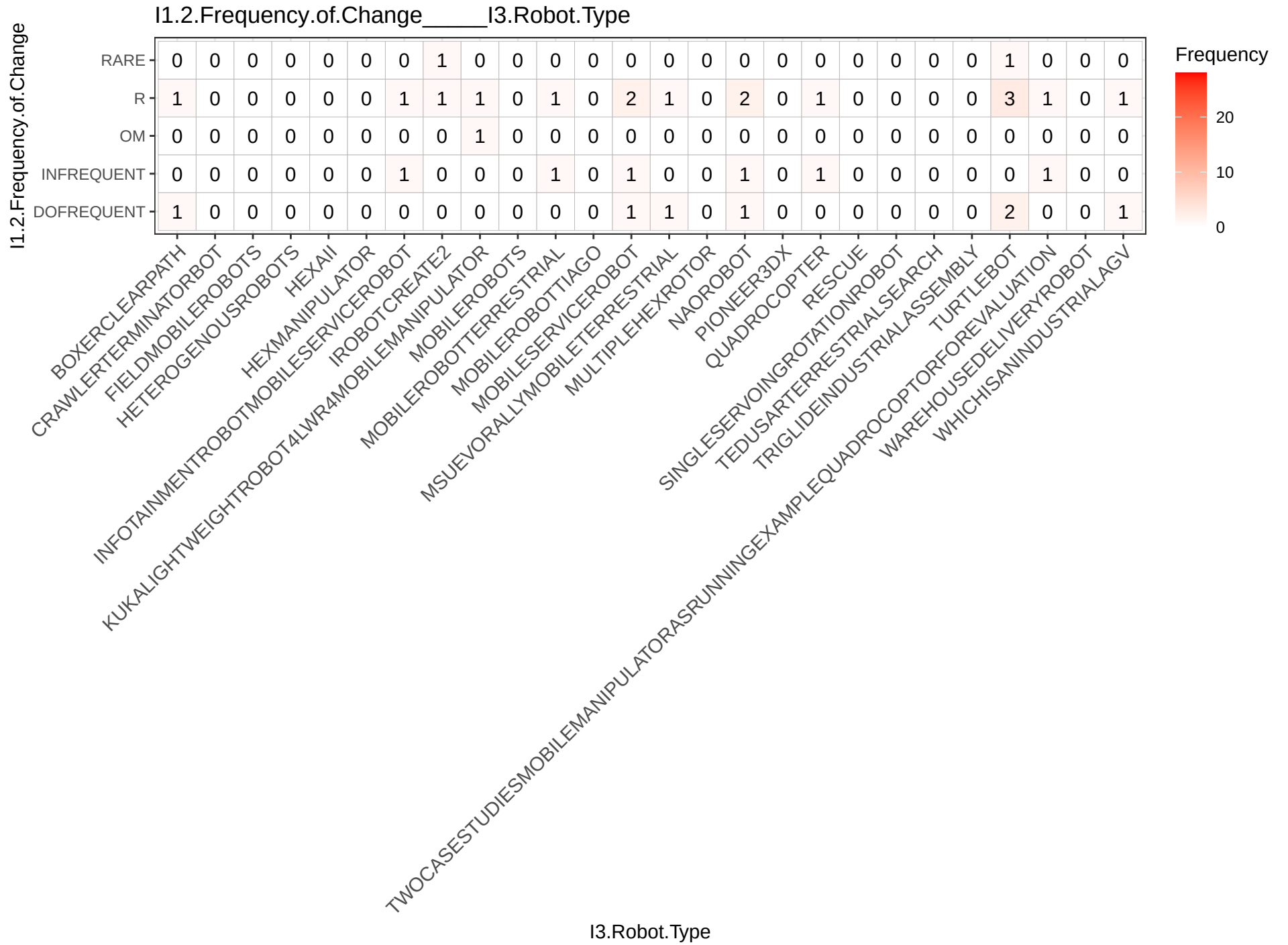

I1.2.Frequency.of.Change_____I1.4.Criticality.of.Effects
RARE
R
OM
INFREQUENT
DOFREQUENT
1
1
9
4
1
0
5
0
2
3
I1.2.Frequency.of.Change
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
0

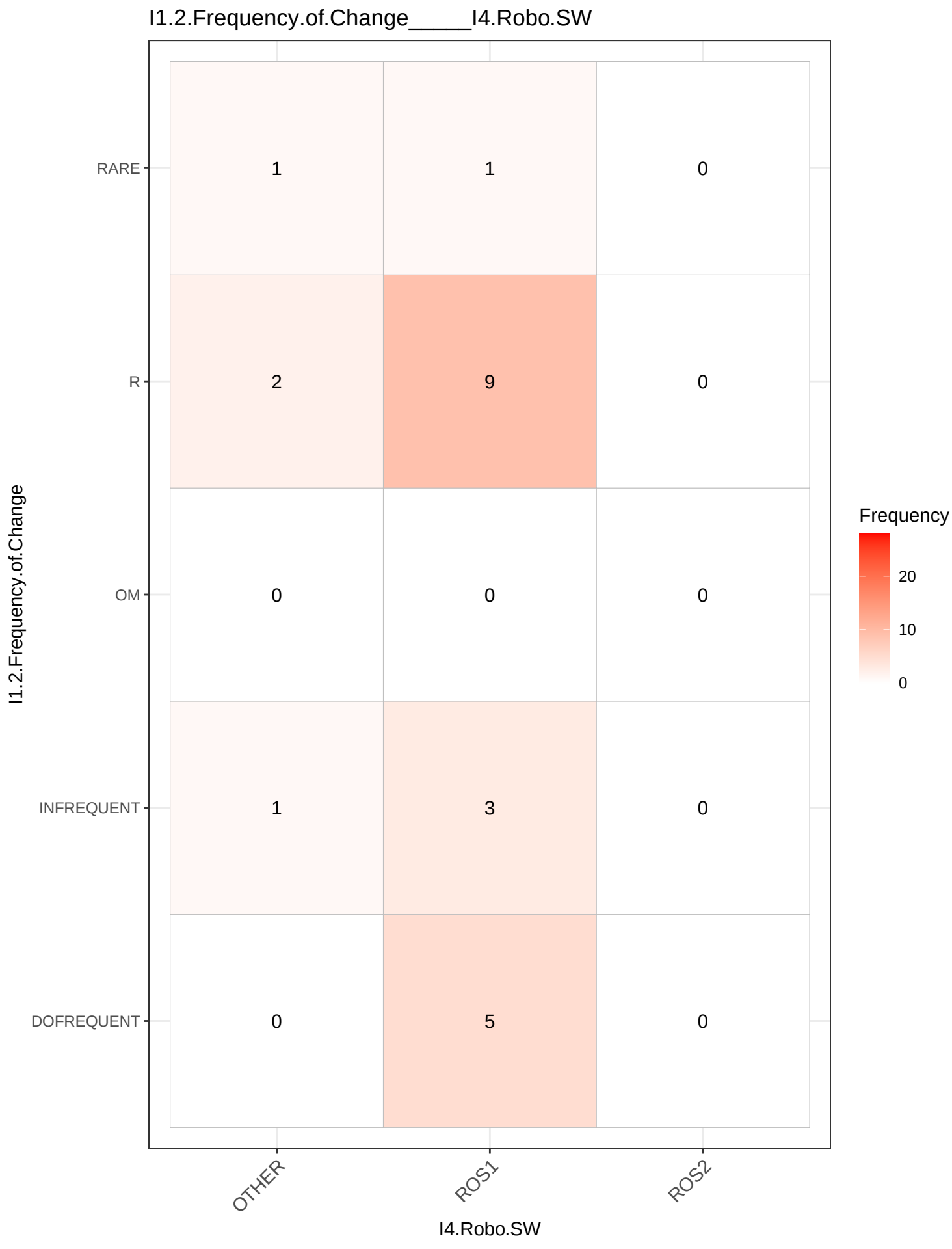

I1.2.Frequency.of.Change_____I1.4.Predictability.of.Effects
RARE
R
OM
INFREQUENT
DOFREQUENT
2
1
5
9
0
1
2
3
1
4
I1.2.Frequency.of.Change
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0

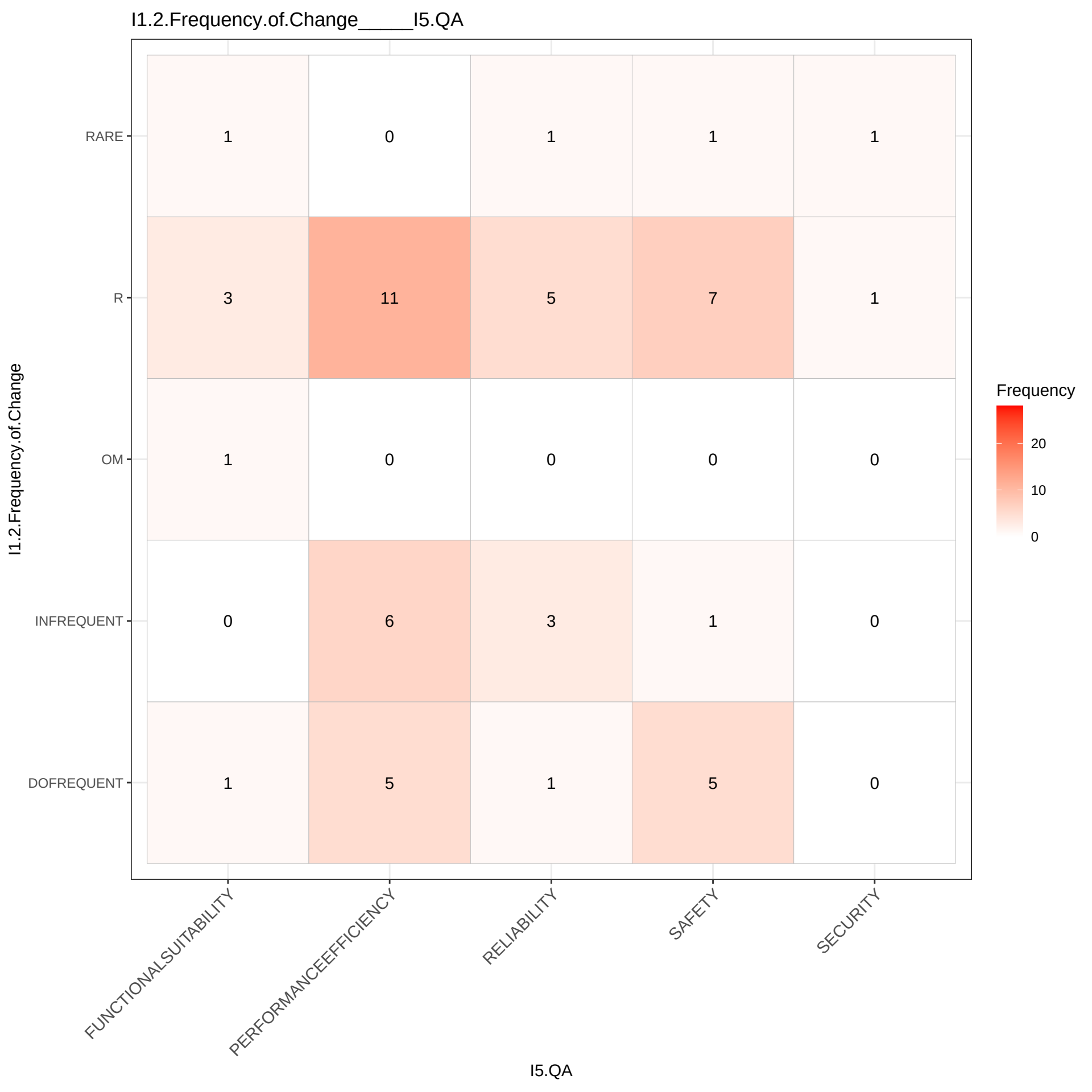

I1.2.Frequency.of.Change_____I1.4.Overhead.of.Effects
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
1
0
1
8
1
2
0
0
0
4
1
0
3
0
1
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
0

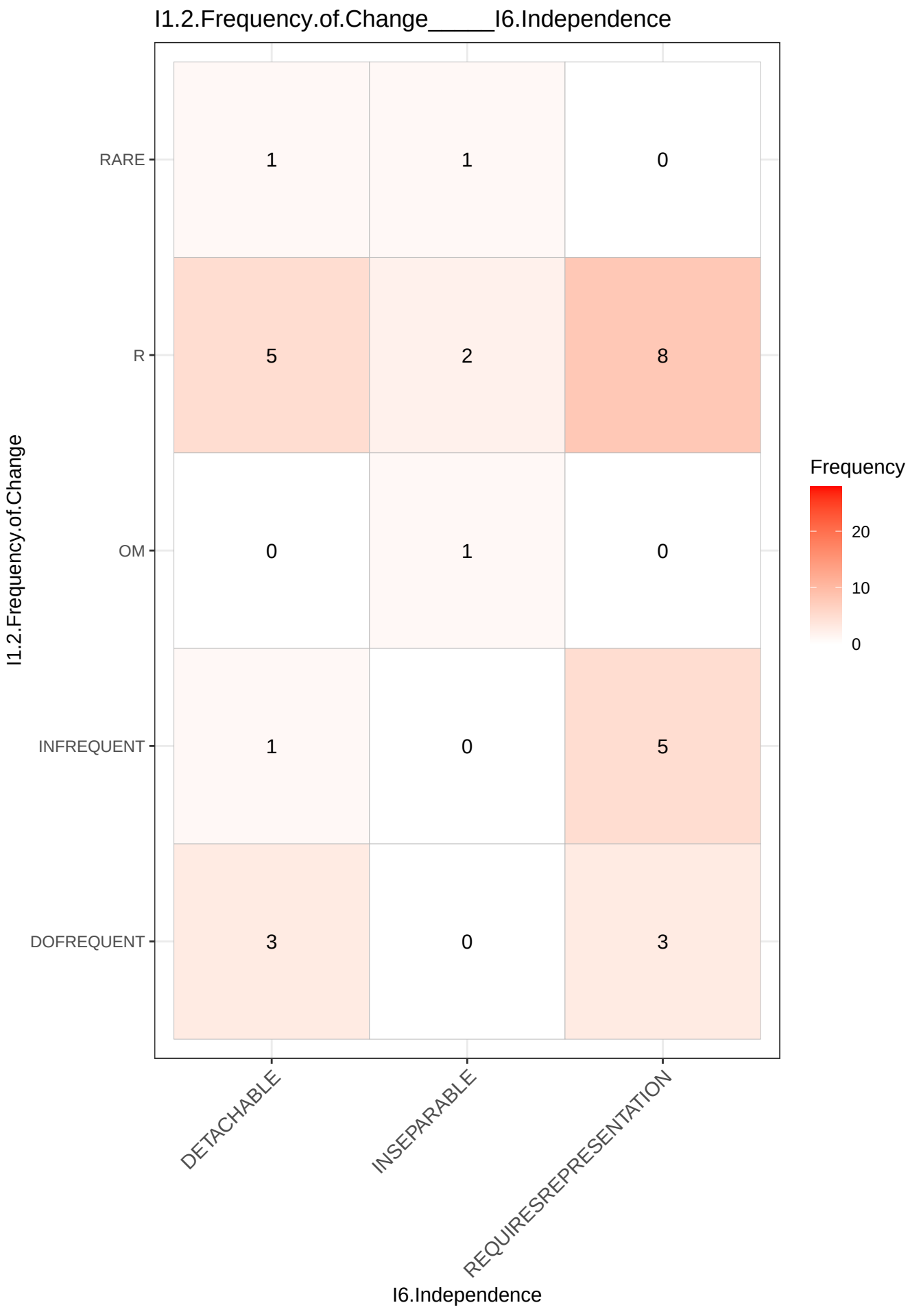

I1.2.Frequency.of.Change_____I1.4.Resilience.of.Effects
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
1
1
0
3
5
2
0
1
0
2
0
2
0
3
0
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0

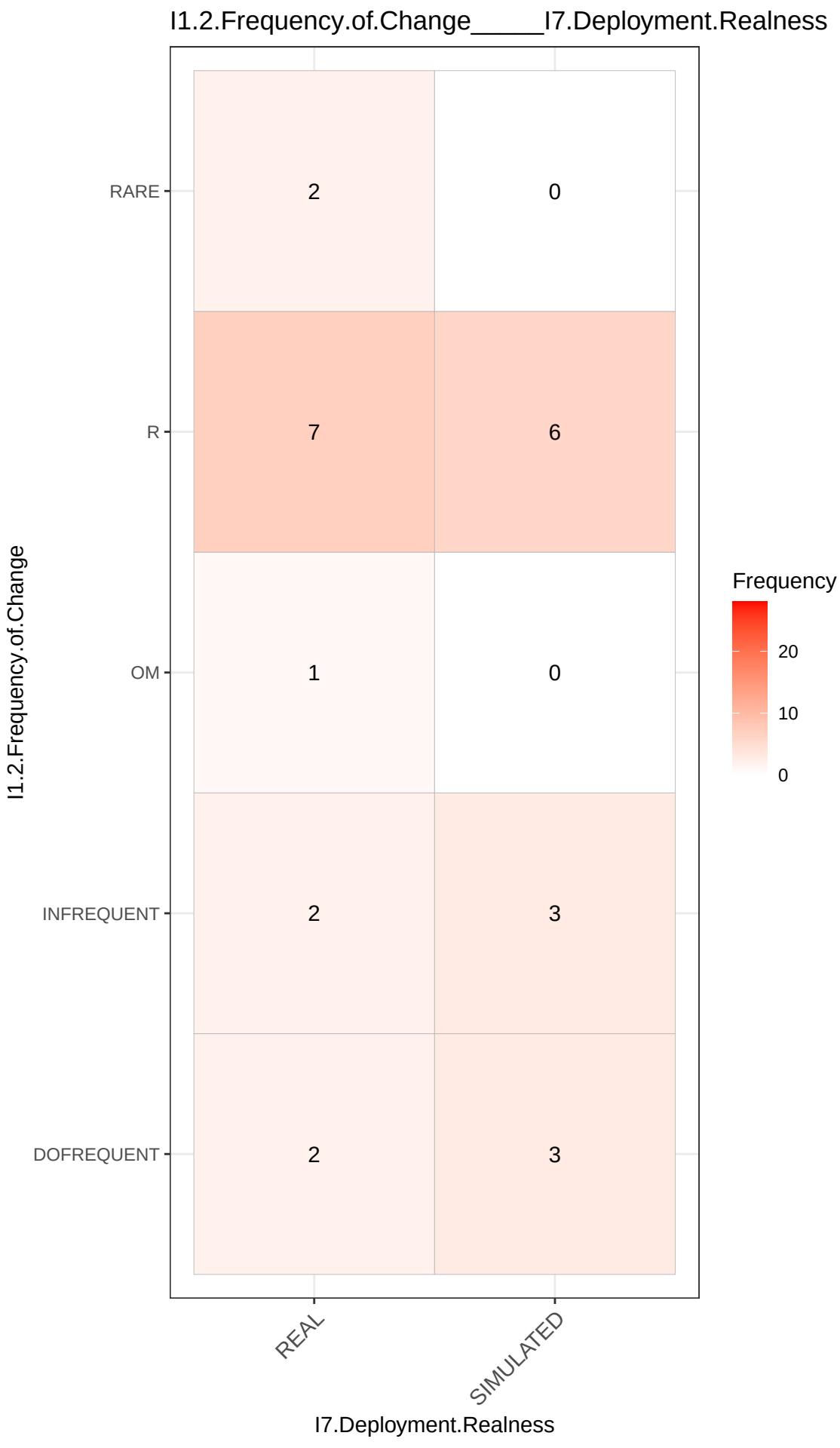

I1.2.Frequency.of.Change_____I2.Adap..Purpose
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
0 0 0 0 0 1 1
3 7 3 4 1 1 6
1 1 0 0 1 0 0
2 2 1 3 0 0 2
0 4 2 1 0 0 3
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
0

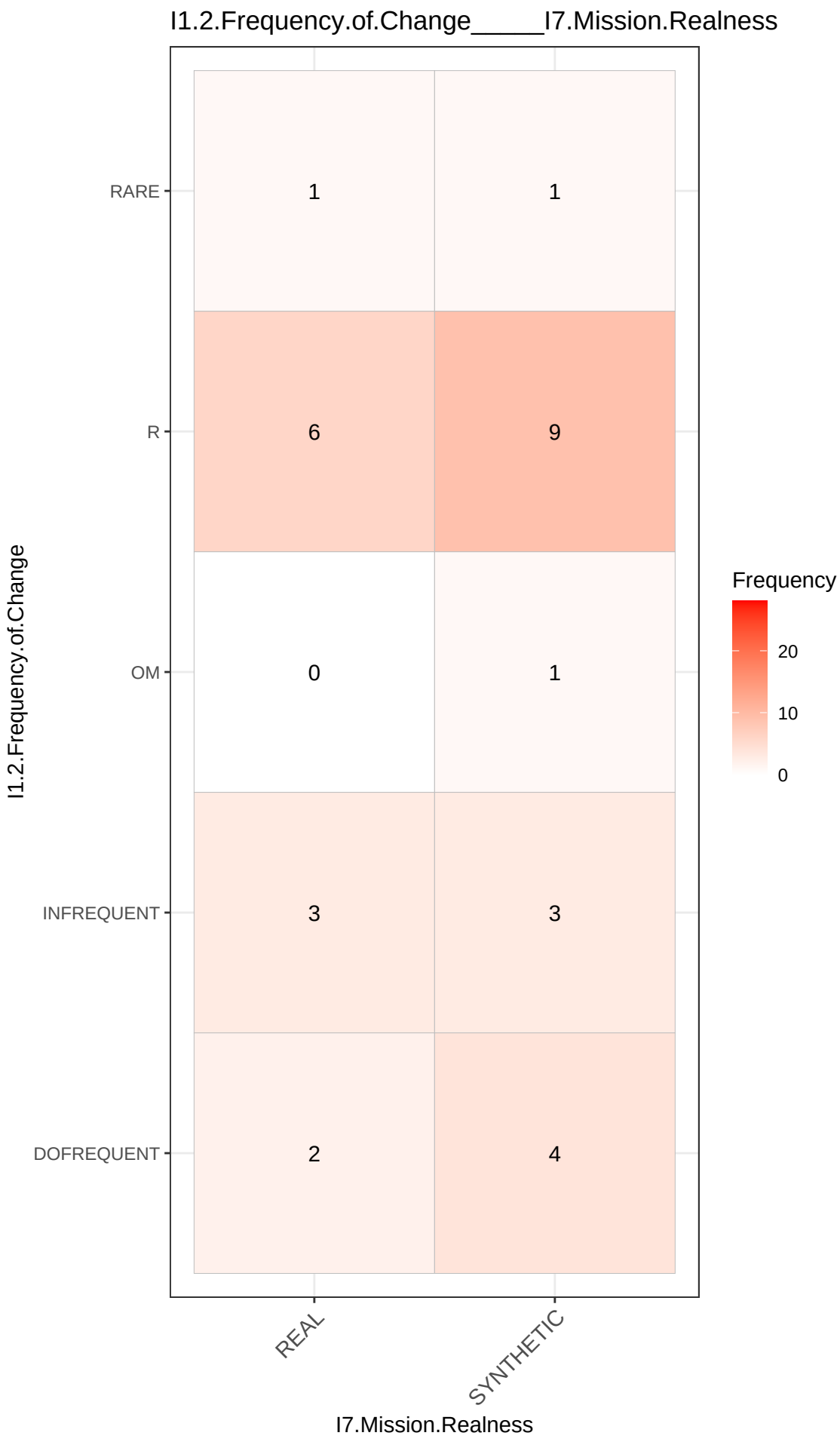

I1.2.Frequency.of.Change_____I3.Robot.Type
I1.2.Frequency.of.Change
RARE 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
R 1 0 0 0 0 0 1 1 1 0 1 0 2 1 0 2 0 1 0 0 0 0 3 1 0 1
OM 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
INFREQUENT 0 0 0 0 0 0 1 0 0 0 1 0 1 0 0 1 0 1 0 0 0 0 0 1 0 0
DOFREQUENT 1 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 0 0 0 0 0 0 2 0 0 1
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0

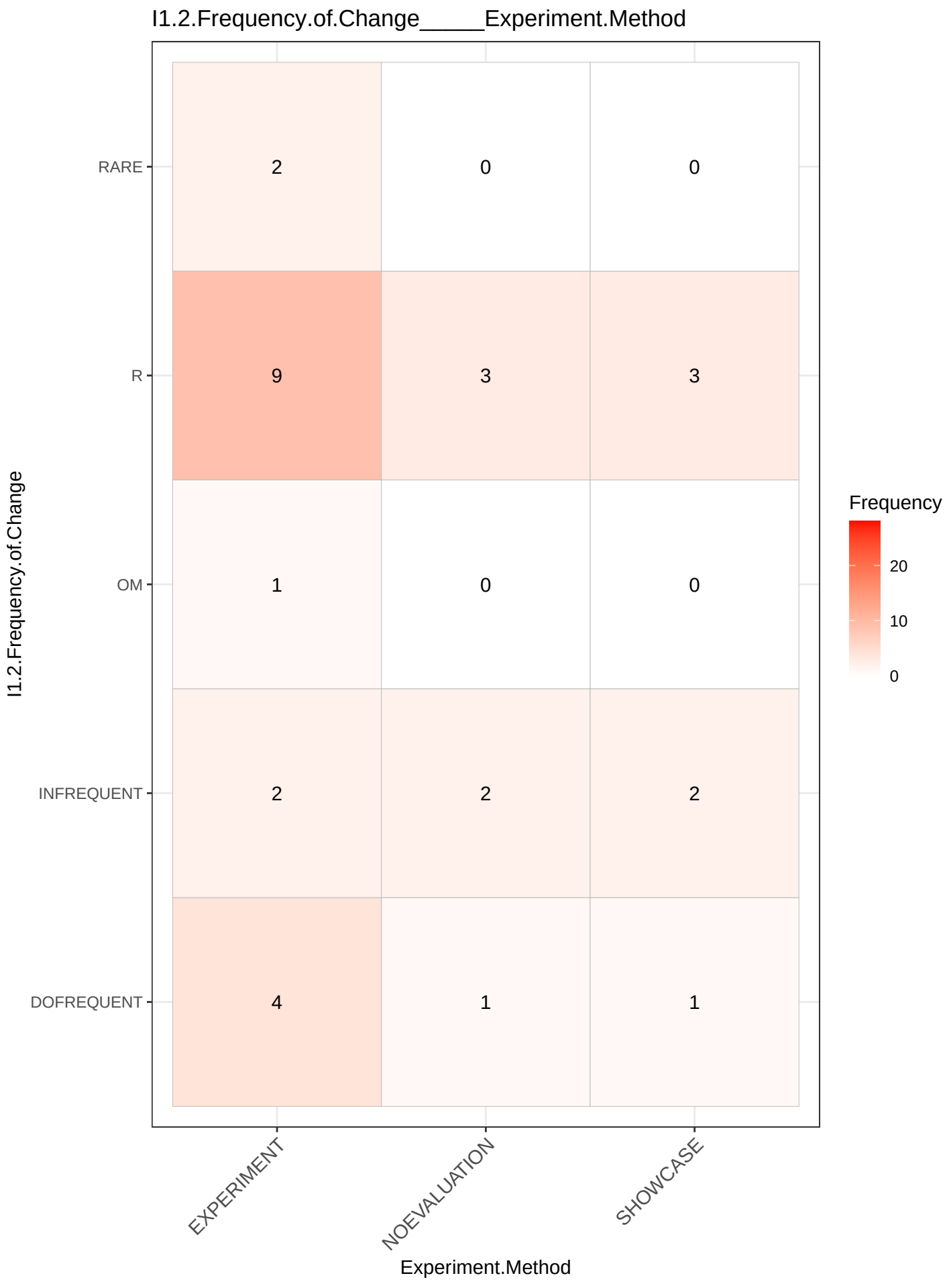

I1.2.Frequency.of.Change_____I4.Robo.SW
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
1
1
0
2
9
0
0
0
0
1
3
0
0
5
0
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0

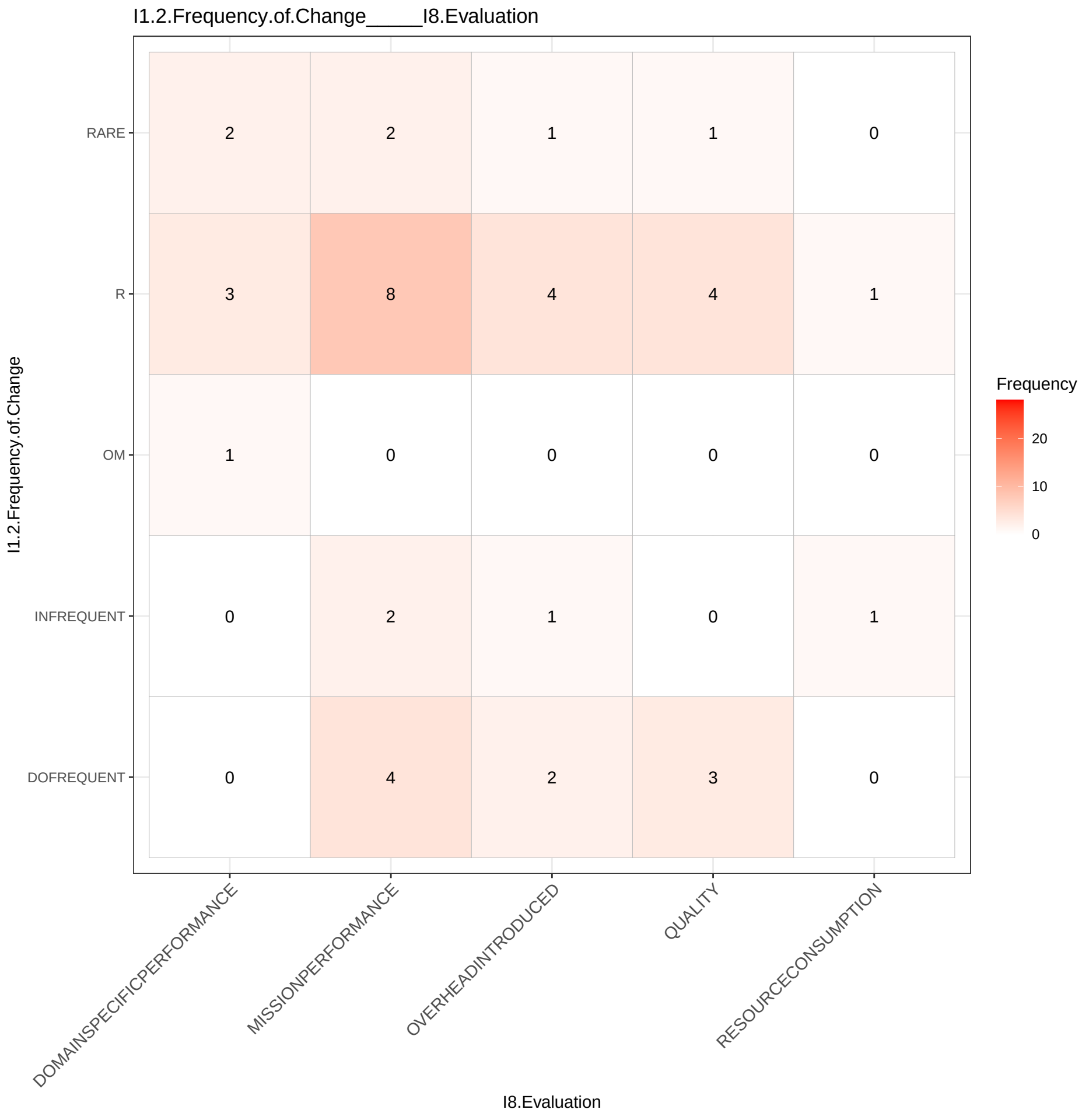

I1.2.Frequency.of.Change_____I5.QA
RARE
R
OM
INFREQUENT
DOFREQUENT
1 0 1 1 1
3 11 5 7 1
1 0 0 0 0
0 6 3 1 0
1 5 1 5 0
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I1.2.Frequency.of.Change
I5.QA
Frequency
20
10
0

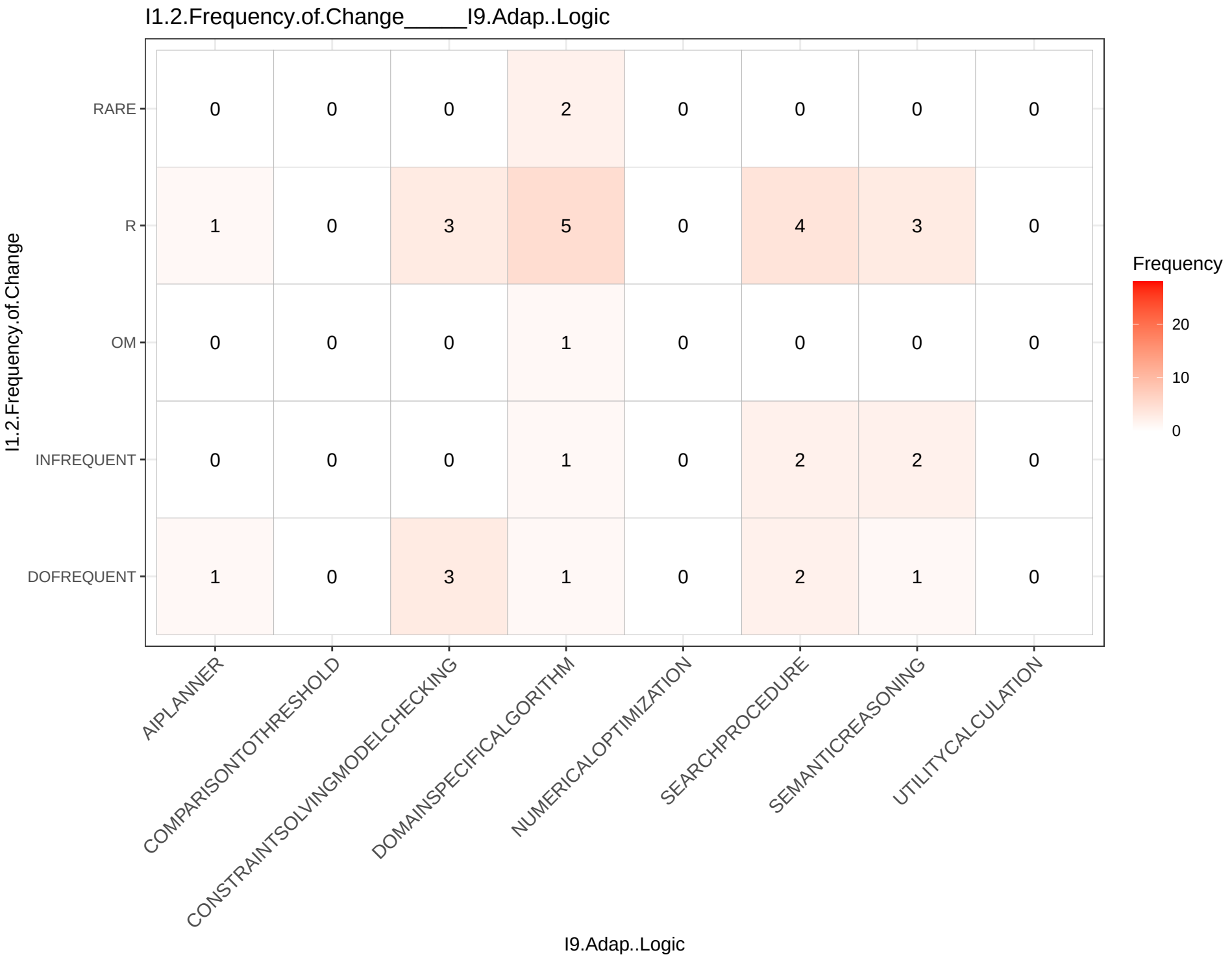

I1.2.Frequency.of.Change_____I6.Independence
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
1
1
0
5
2
8
0
1
0
1
0
5
3
0
3
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0

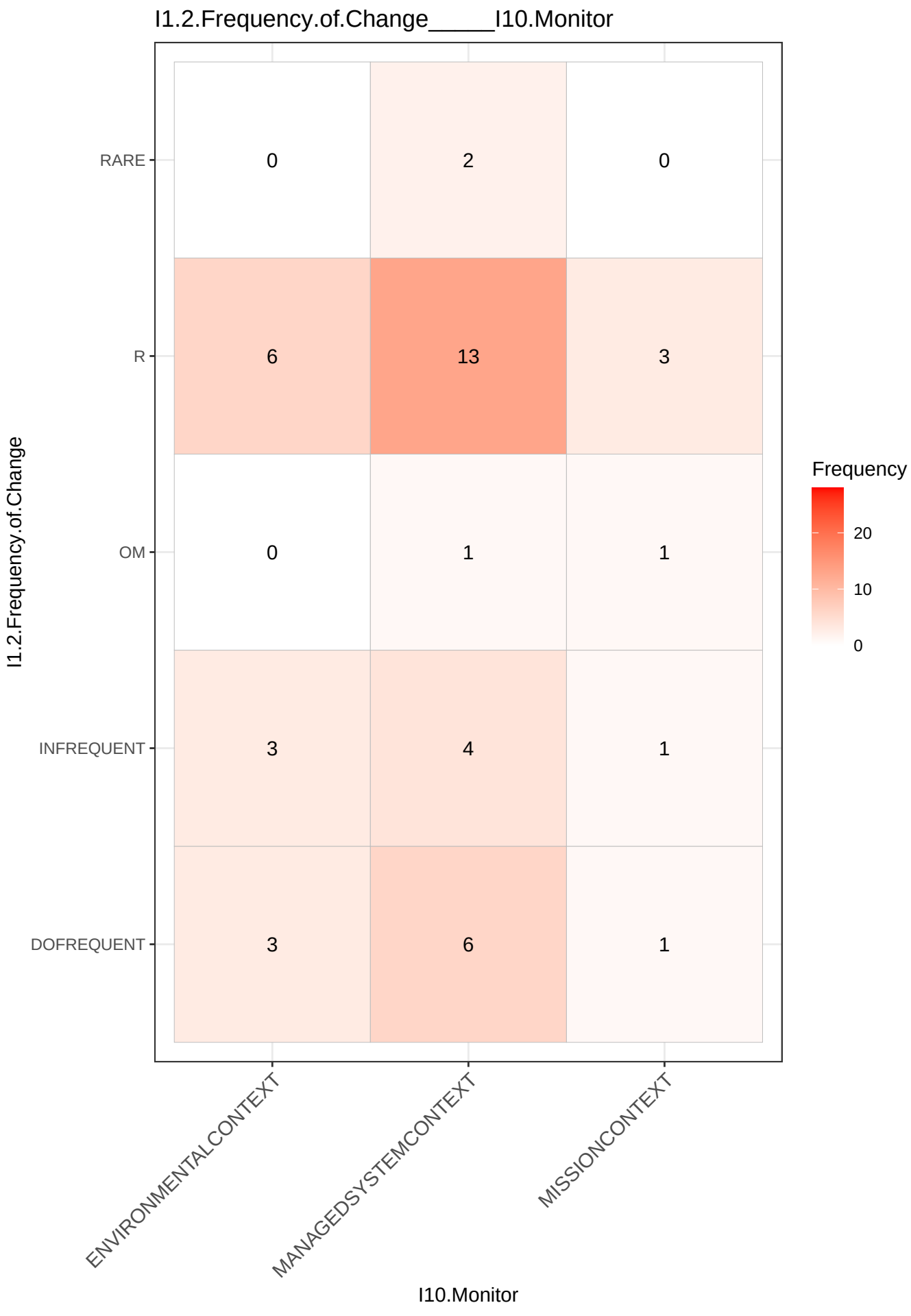

I1.2.Frequency.of.Change_____I7.Deployment.Realness
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
2
0
7
6
1
0
2
3
2
3
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0

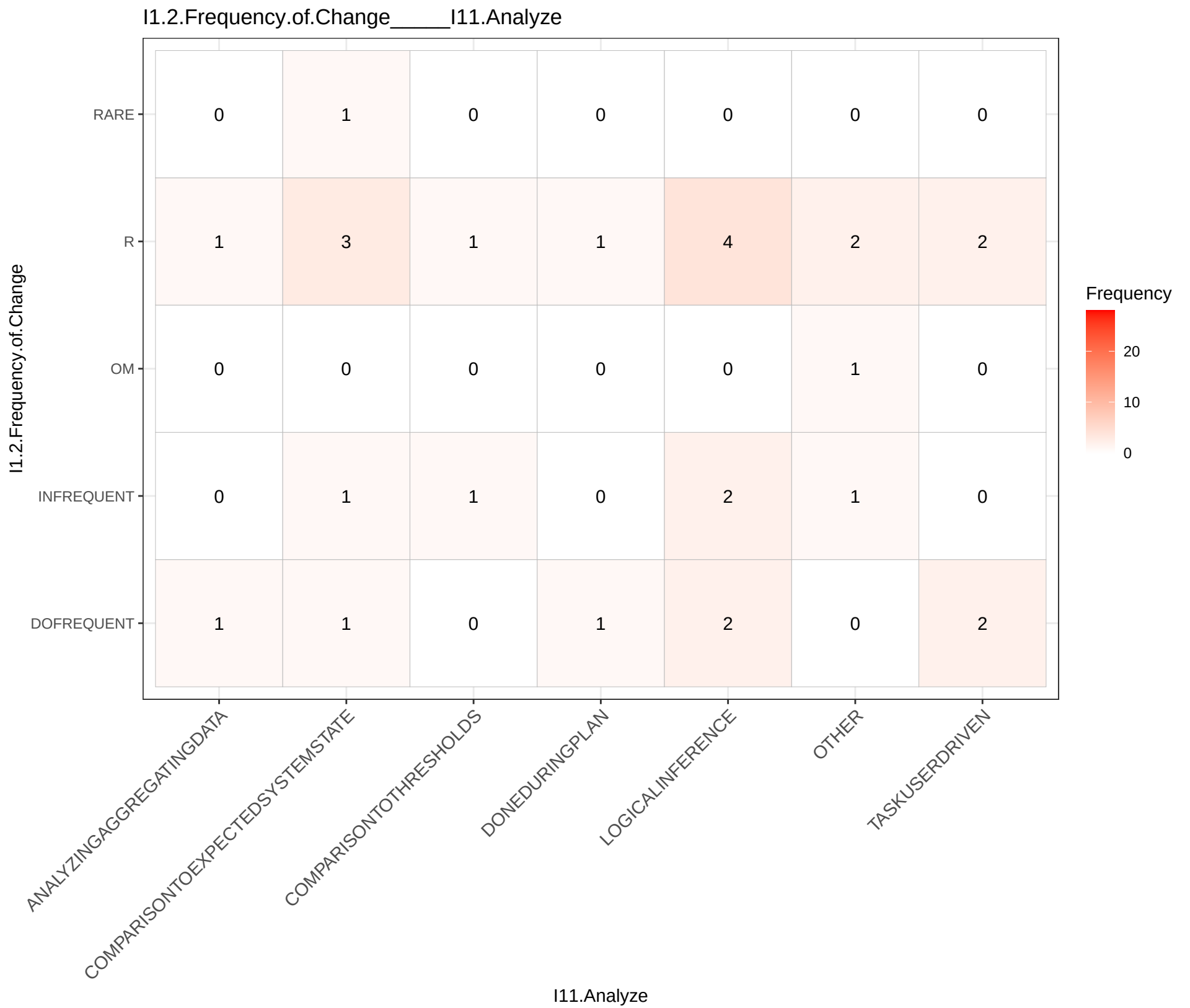

I1.2.Frequency.of.Change_____I7.Mission.Realness
RARE
R
OM
INFREQUENT
DOFREQUENT
1
1
6
9
0
1
3
3
2
4
I1.2.Frequency.of.Change
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0

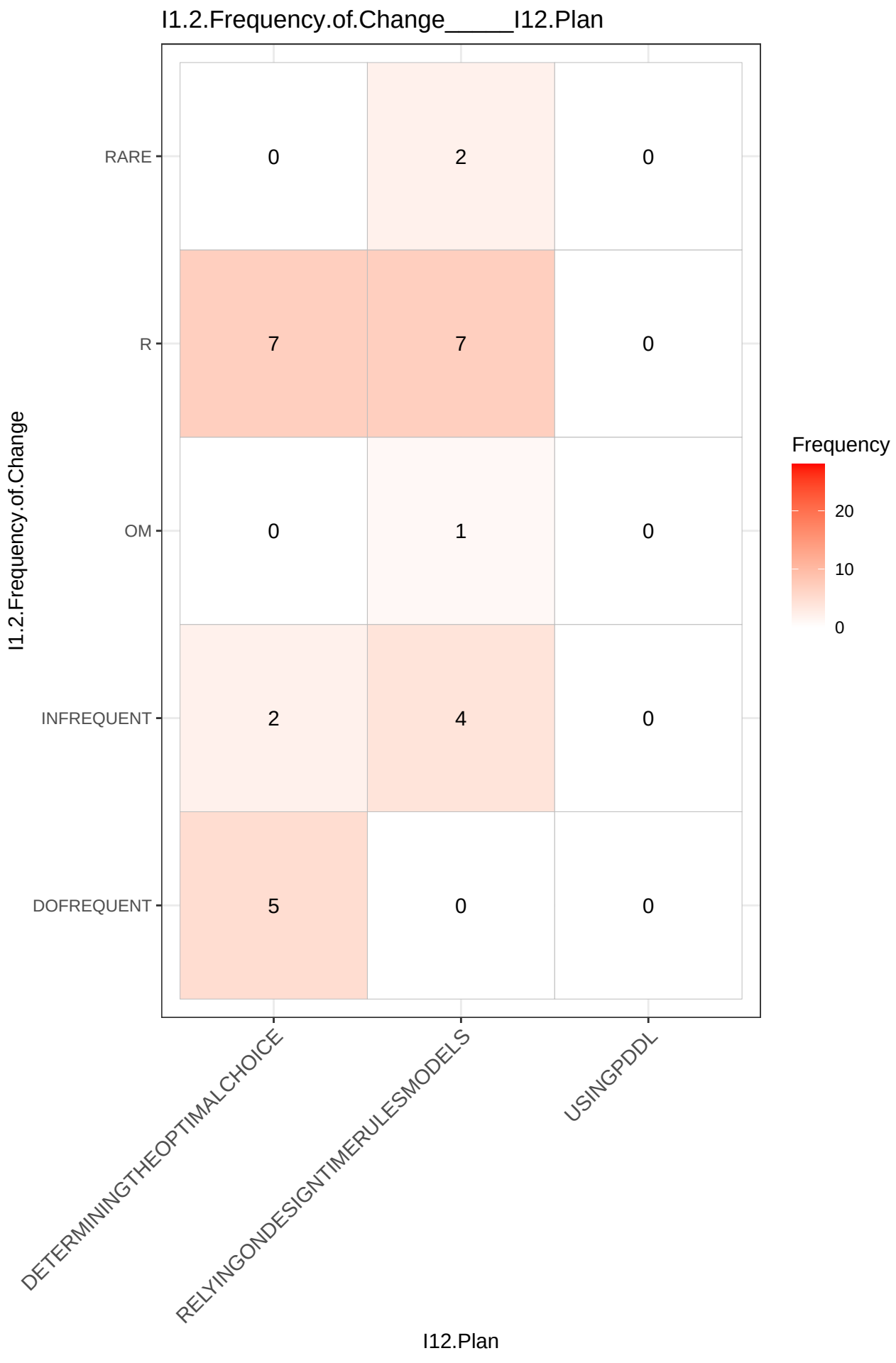

I1.2.Frequency.of.Change_____Experiment.Method
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
2
0
0
9
3
3
1
0
0
2
2
2
4
1
1
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0

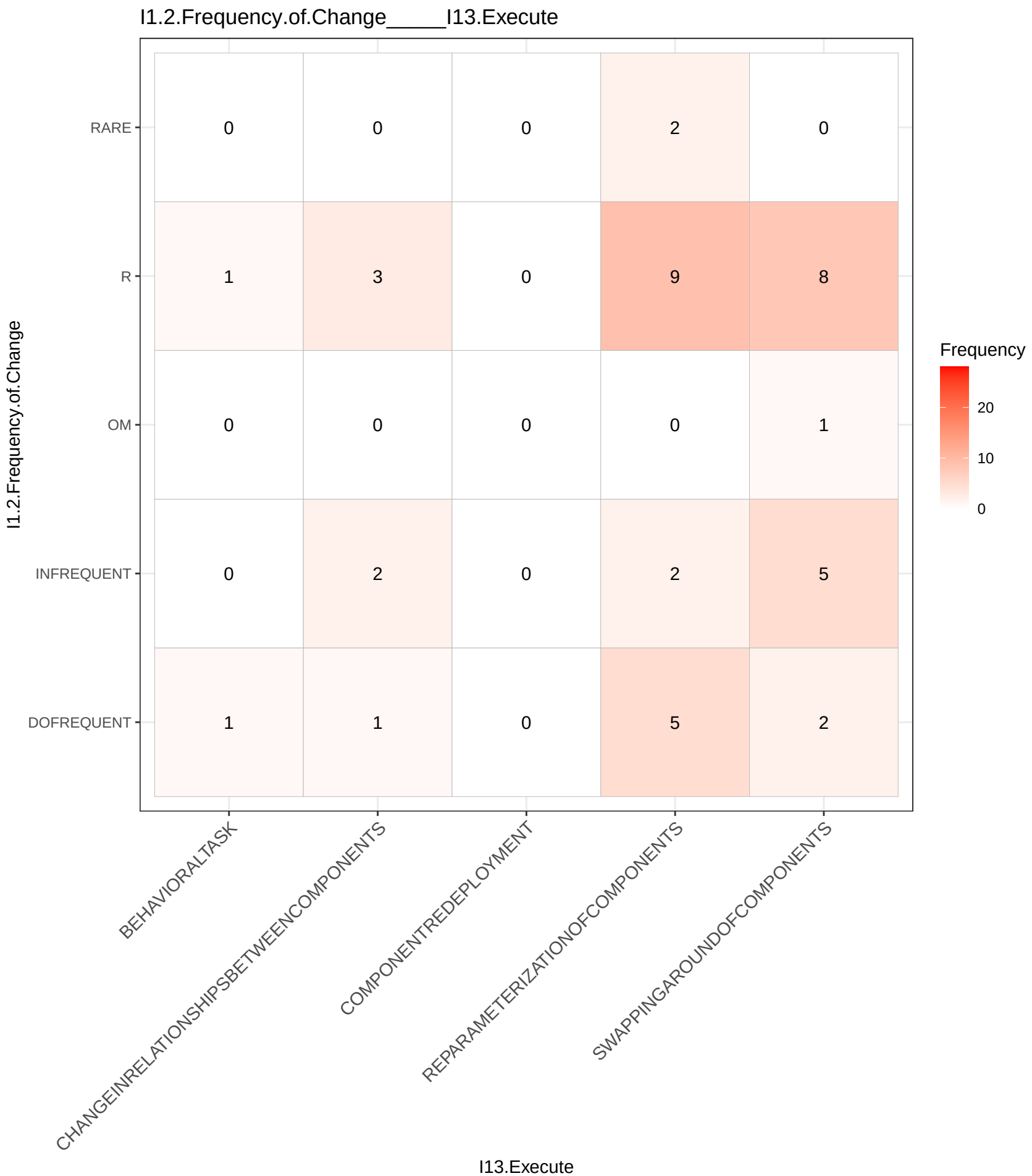

I1.2.Frequency.of.Change_____I8.Evaluation
RARE
R
OM
INFREQUENT
DOFREQUENT
2
2
1
1
0
3
8
4
4
1
1
0
0
0
0
0
2
1
0
1
0
4
2
3
0
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I1.2.Frequency.of.Change
I8.Evaluation
Frequency
20
10
0


I1.2.Frequency.of.Change_____I9.Adap..Logic
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
0 0 0 2 0 0 0 0
1 0 3 5 0 4 3 0
0 0 0 1 0 0 0 0
0 0 0 1 0 2 2 0
1 0 3 1 0 2 1 0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
0


I1.2.Frequency.of.Change_____I10.Monitor
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
0
2
0
6
13
3
0
1
1
3
4
1
3
6
1
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0


I1.2.Frequency.of.Change_____I11.Analyze
RARE
R
OM
INFREQUENT
DOFREQUENT
0 1 0 0 0 0 0
1 3 1 1 4 2 2
0 0 0 0 0 1 0
0 1 1 0 2 1 0
1 1 0 1 2 0 2
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I1.2.Frequency.of.Change
I11.Analyze
Frequency
20
10
0


I1.2.Frequency.of.Change_____I12.Plan
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
0
2
0
7
7
0
0
1
0
2
4
0
5
0
0
Frequency
20
10
0
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan


I1.2.Frequency.of.Change_____I13.Execute
RARE
R
OM
INFREQUENT
DOFREQUENT
I1.2.Frequency.of.Change
0 0 0 2 0
1 3 0 9 8
0 0 0 0 1
0 2 0 2 5
1 1 0 5 2
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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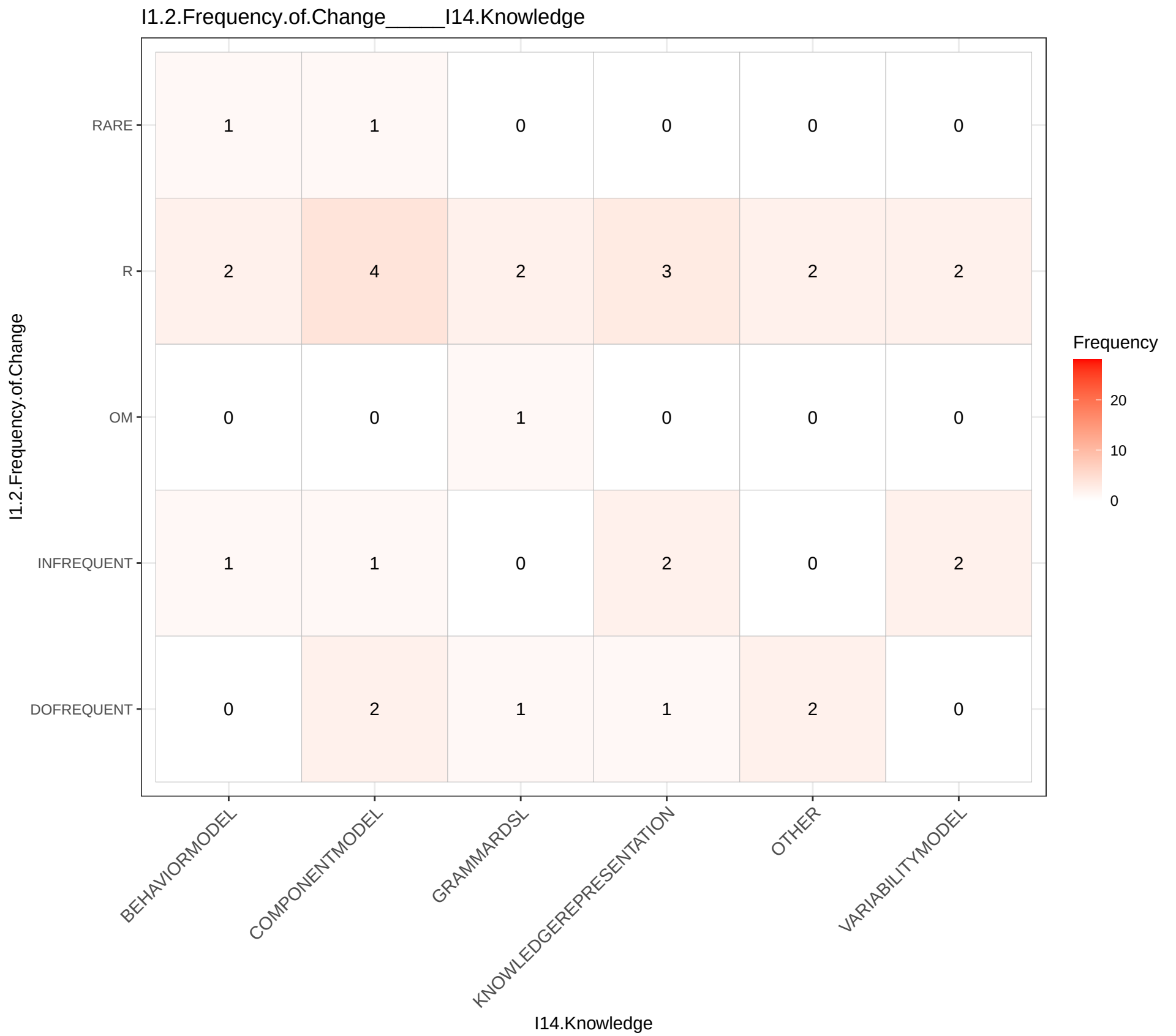
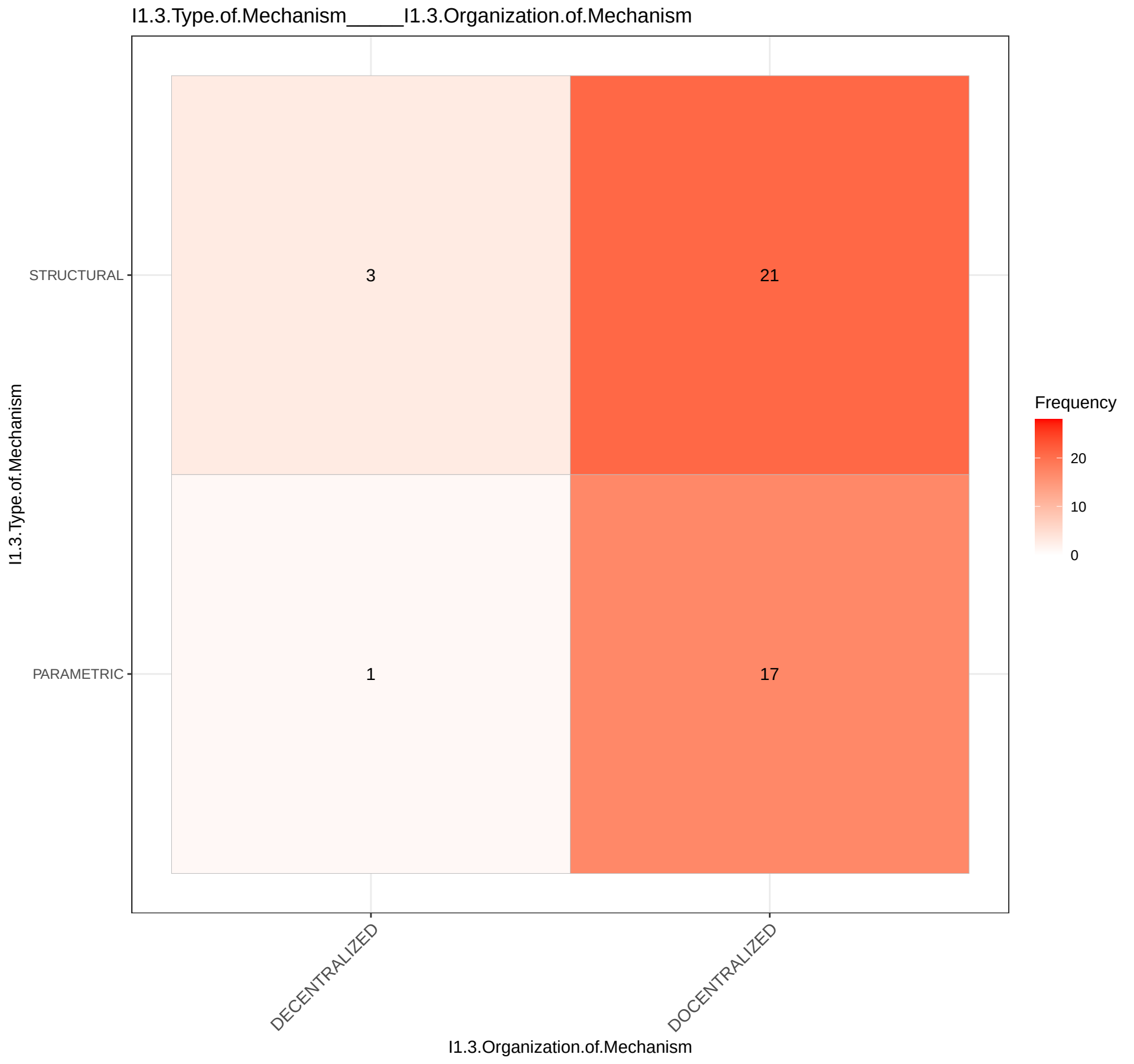

I1.2.Frequency.of.Change_____I14.Knowledge
RARE
R
OM
INFREQUENT
DOFREQUENT
1 1 0 0 0 0
2 4 2 3 2 2
0 0 1 0 0 0
1 1 0 2 0 2
0 2 1 1 2 0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I1.2.Frequency.of.Change
I14.Knowledge
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I1.3.Organization.of.Mechanism
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
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21
1
17
DECENTRALIZED
DOCENTRALIZED
I1.3.Organization.of.Mechanism
Frequency
20
10
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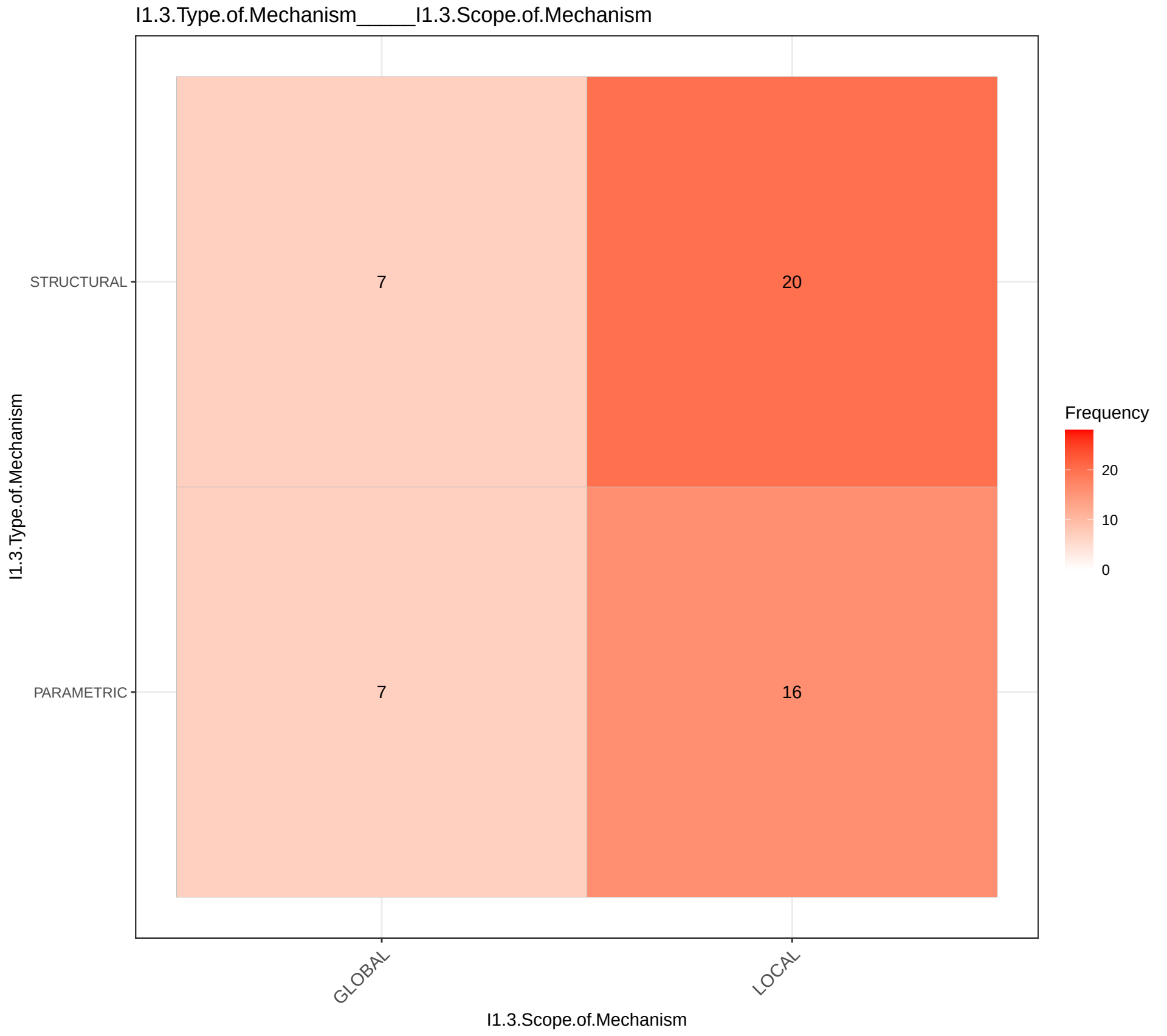
I1.3.Type.of.Mechanism_____I1.3.Scope.of.Mechanism
STRUCTURAL
PARAMETRIC
7
20
7
16
I1.3.Type.of.Mechanism
GLOBAL
LOCAL
I1.3.Scope.of.Mechanism
Frequency
20
10
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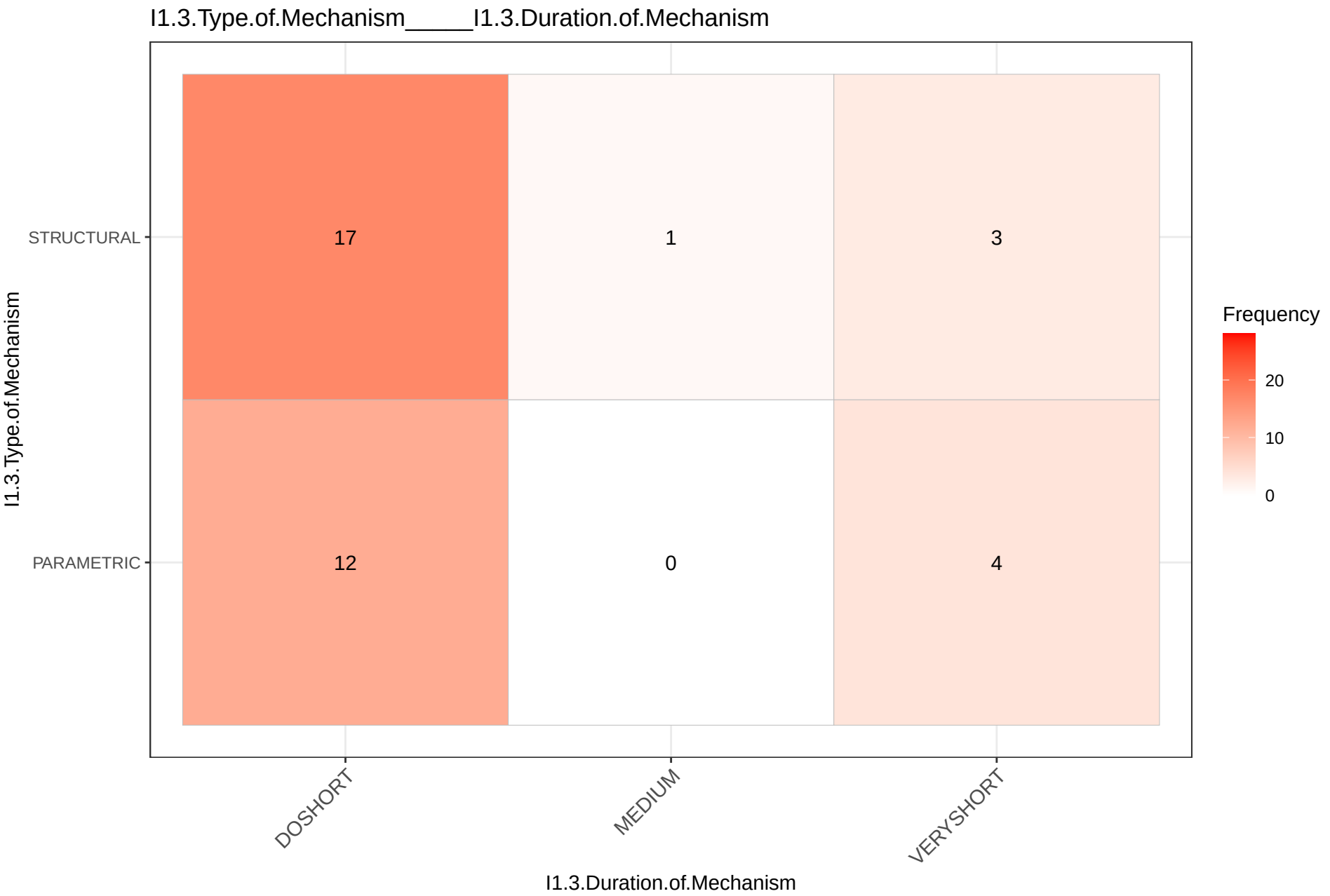
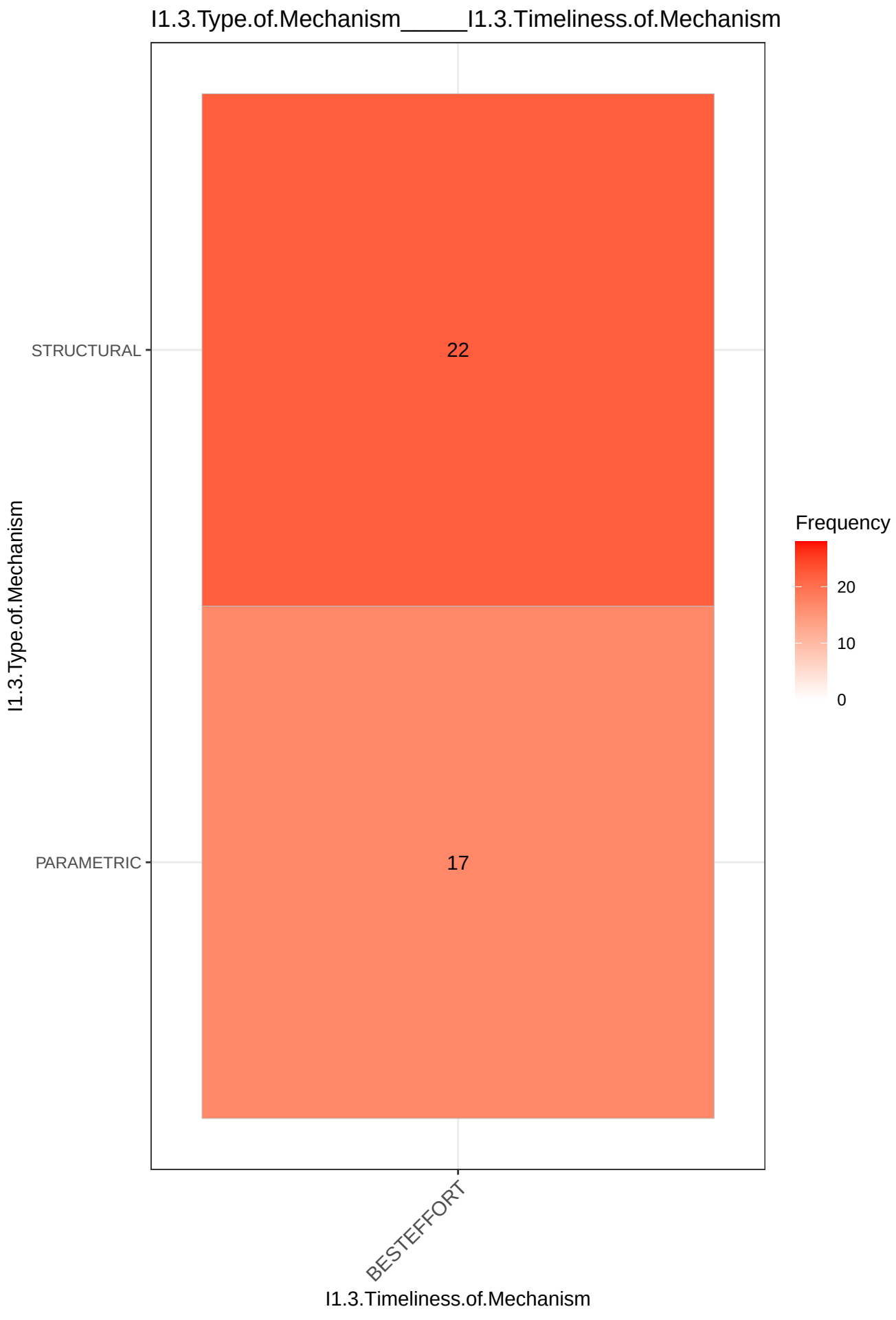
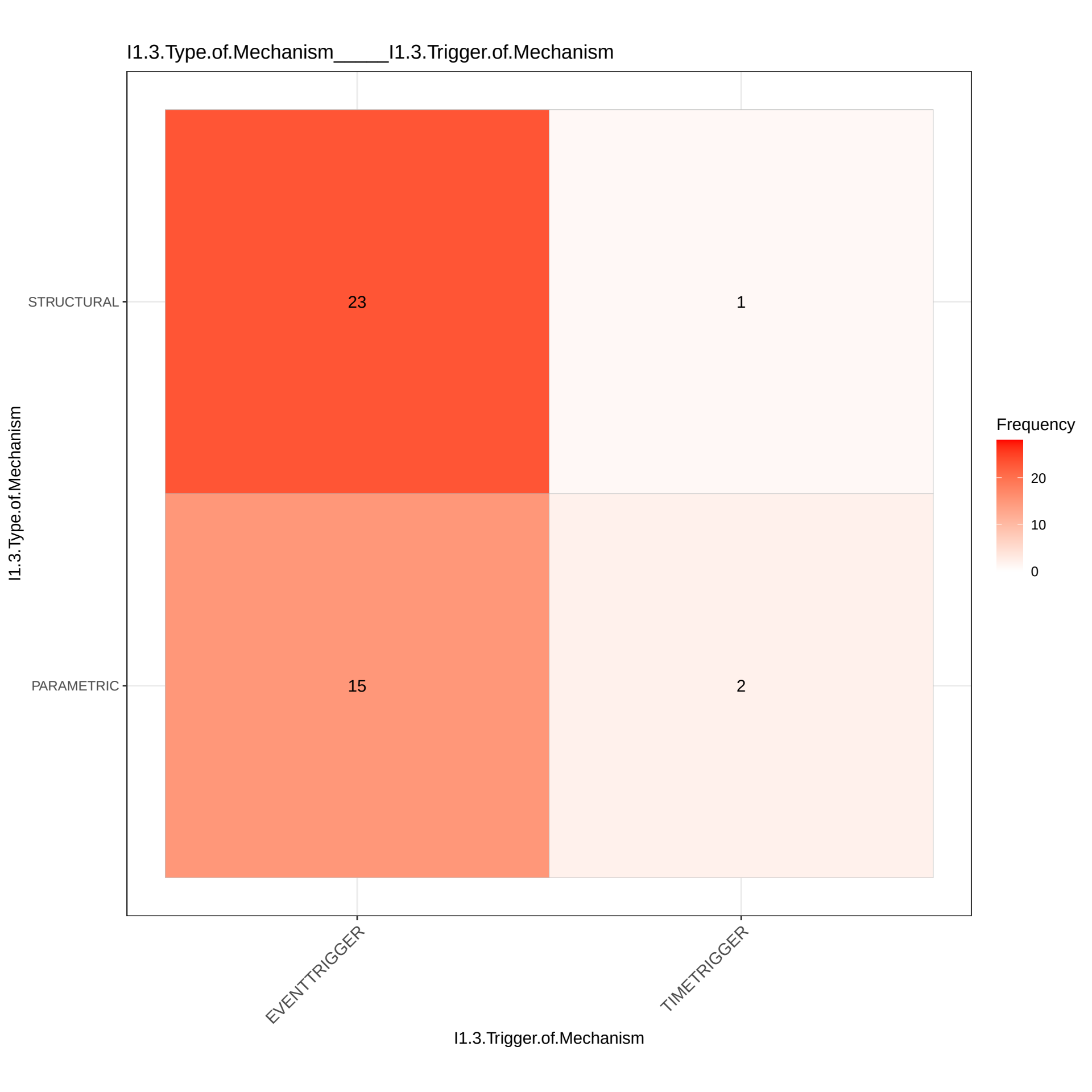

I1.3.Type.of.Mechanism_____I1.3.Duration.of.Mechanism
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
17
1
3
12
0
4
DOSHORT
MEDIUM
VERYSHORT
I1.3.Duration.of.Mechanism
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I1.3.Timeliness.of.Mechanism
STRUCTURAL
PARAMETRIC
22
17
I1.3.Type.of.Mechanism
BESTEFFORT
I1.3.Timeliness.of.Mechanism
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I1.3.Trigger.of.Mechanism
STRUCTURAL
PARAMETRIC
23
1
15
2
EVENTTRIGGER
TIMETRIGGER
I1.3.Type.of.Mechanism
I1.3.Trigger.of.Mechanism
Frequency
20
10
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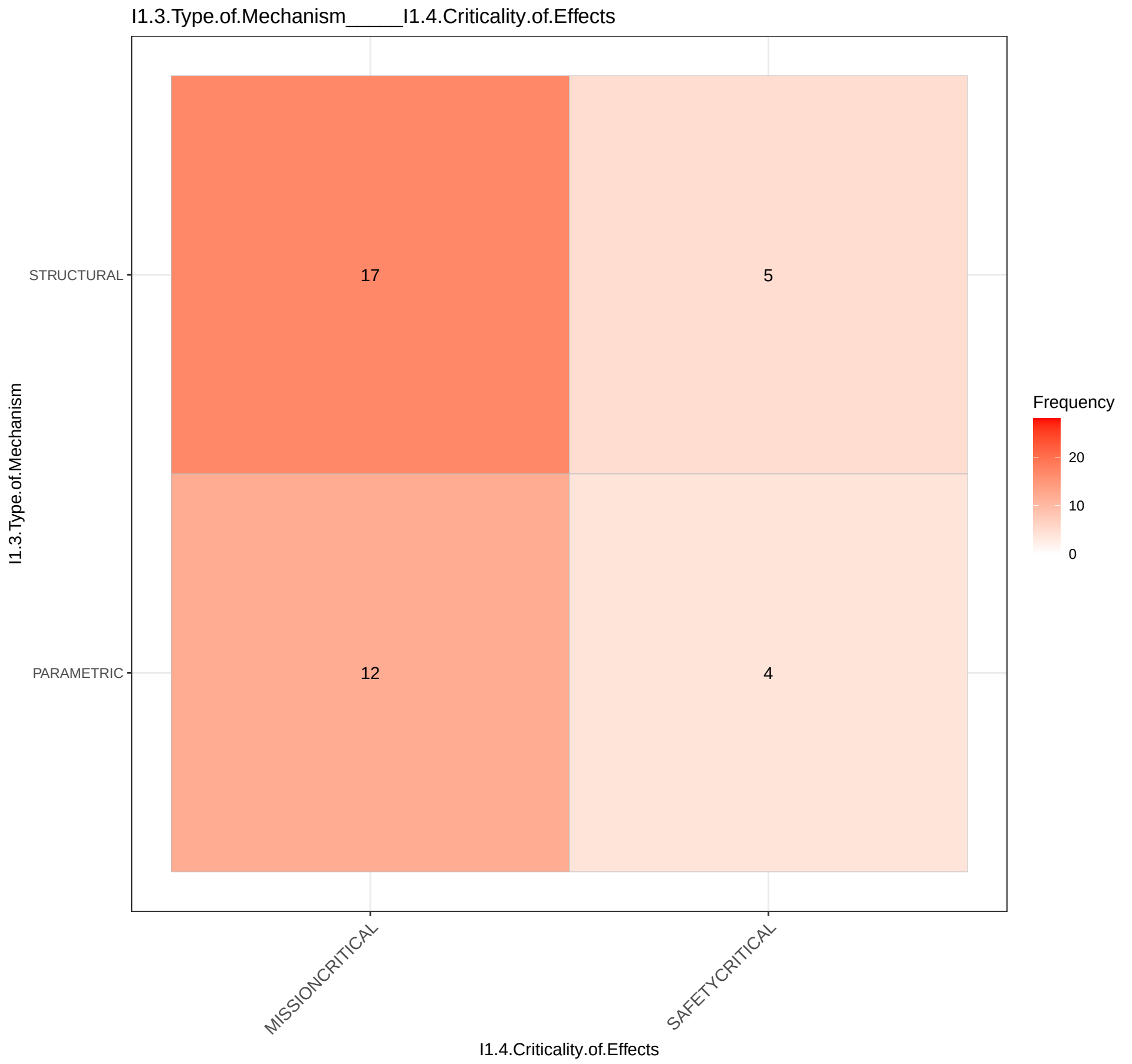
I1.3.Type.of.Mechanism_____I1.4.Criticality.of.Effects
STRUCTURAL
PARAMETRIC
17
5
12
4
I1.3.Type.of.Mechanism
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
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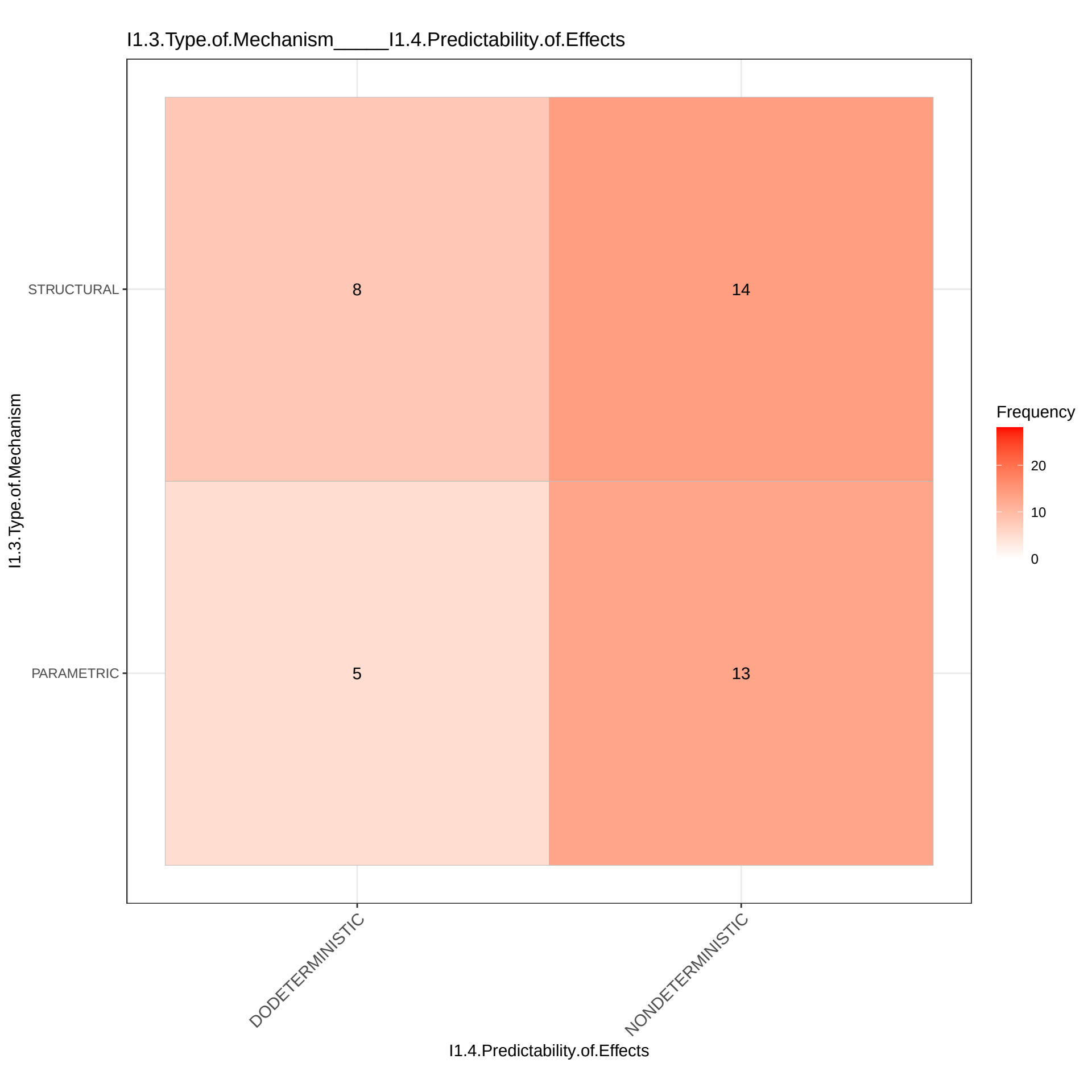
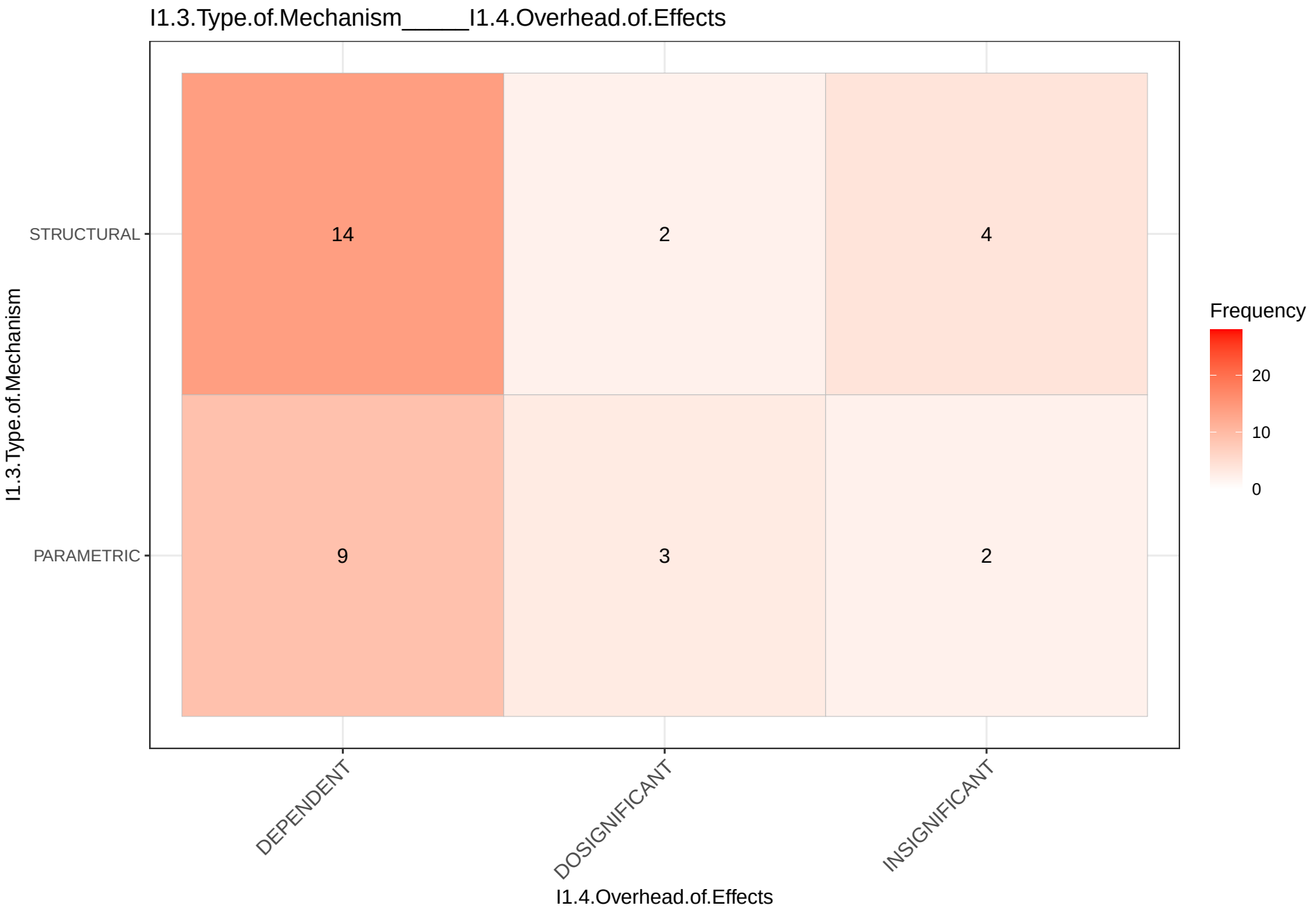

I1.3.Type.of.Mechanism_____I1.4.Predictability.of.Effects
STRUCTURAL
PARAMETRIC
8
14
5
13
I1.3.Type.of.Mechanism
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I1.4.Overhead.of.Effects
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
14
2
4
9
3
2
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
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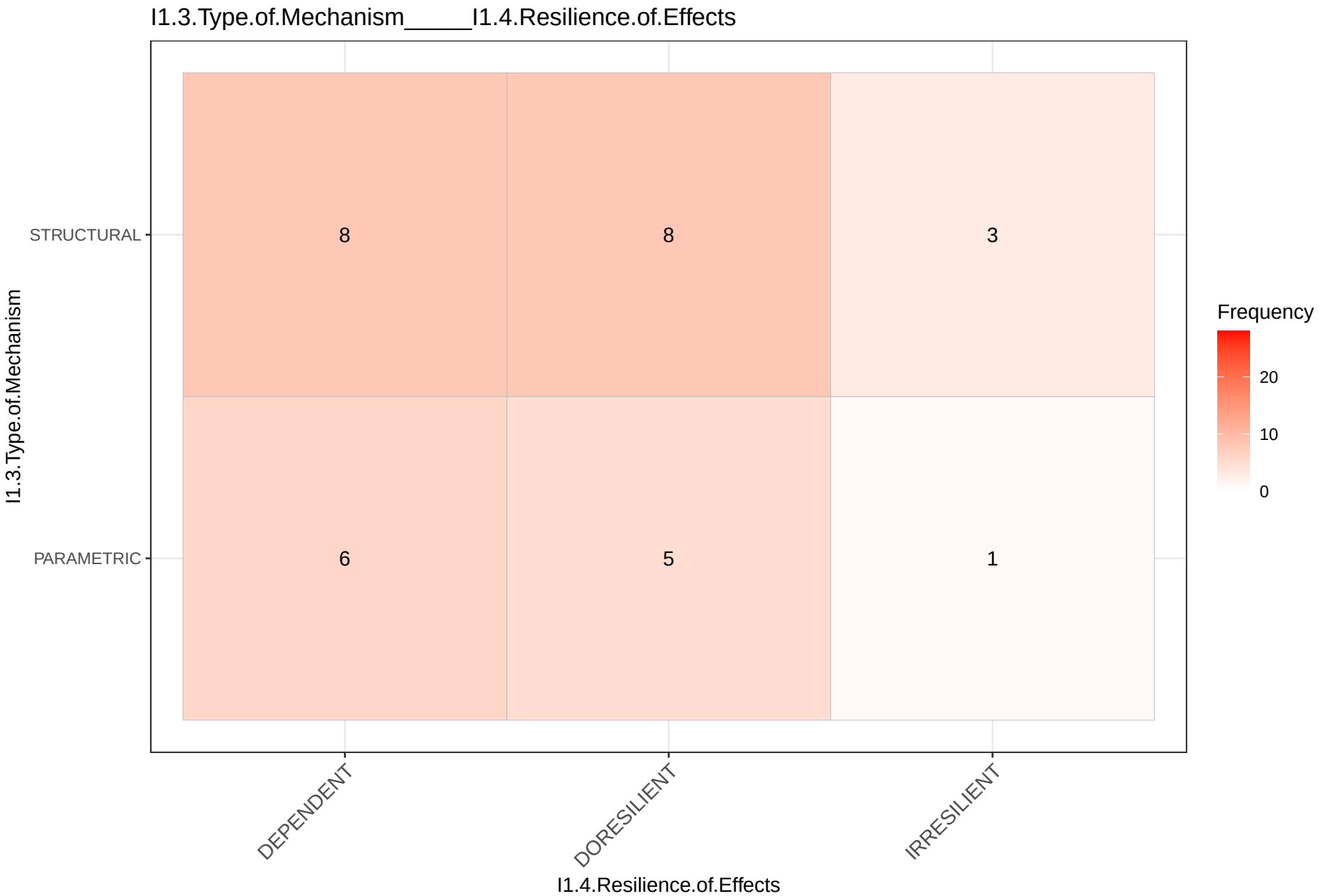
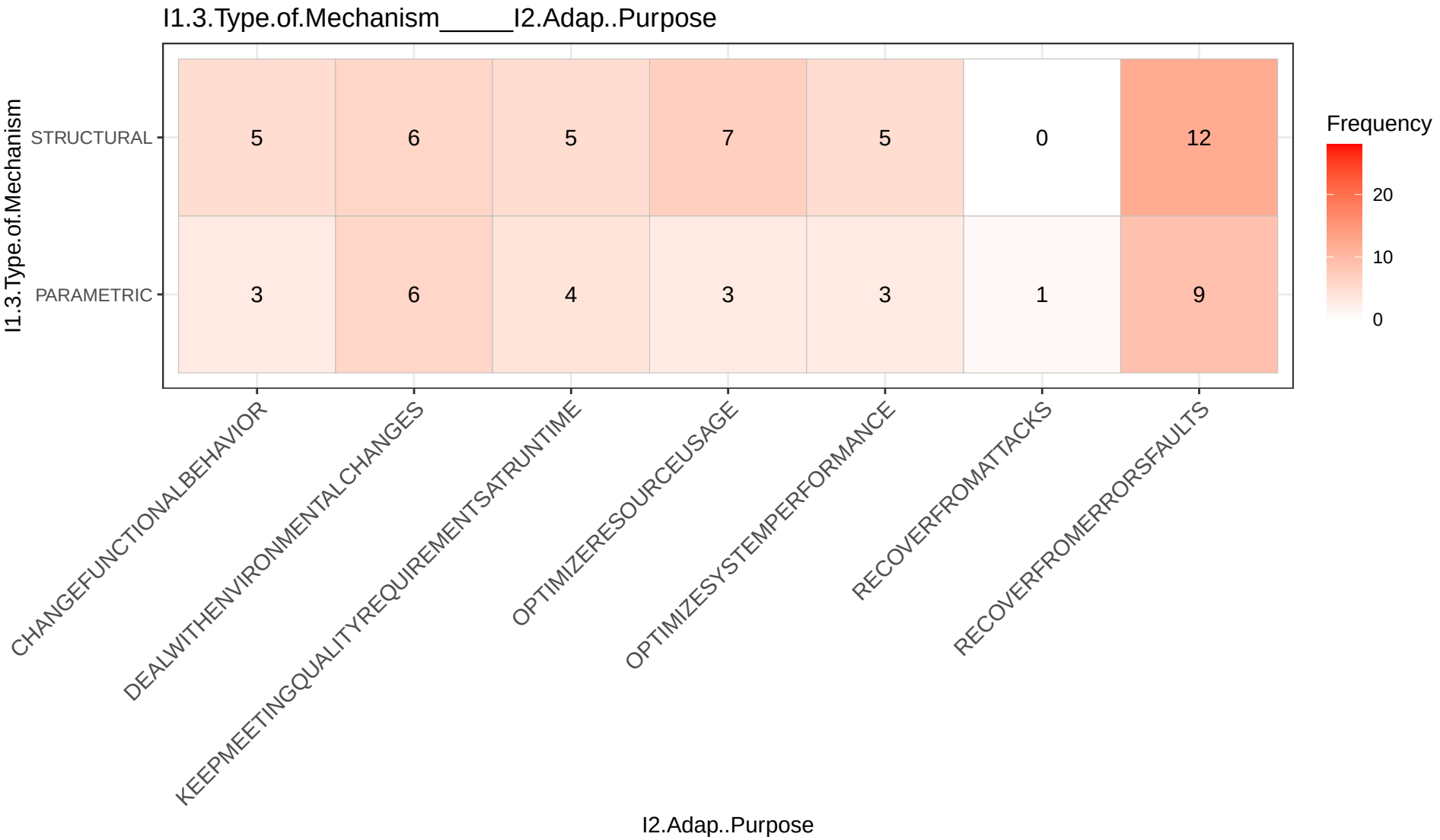
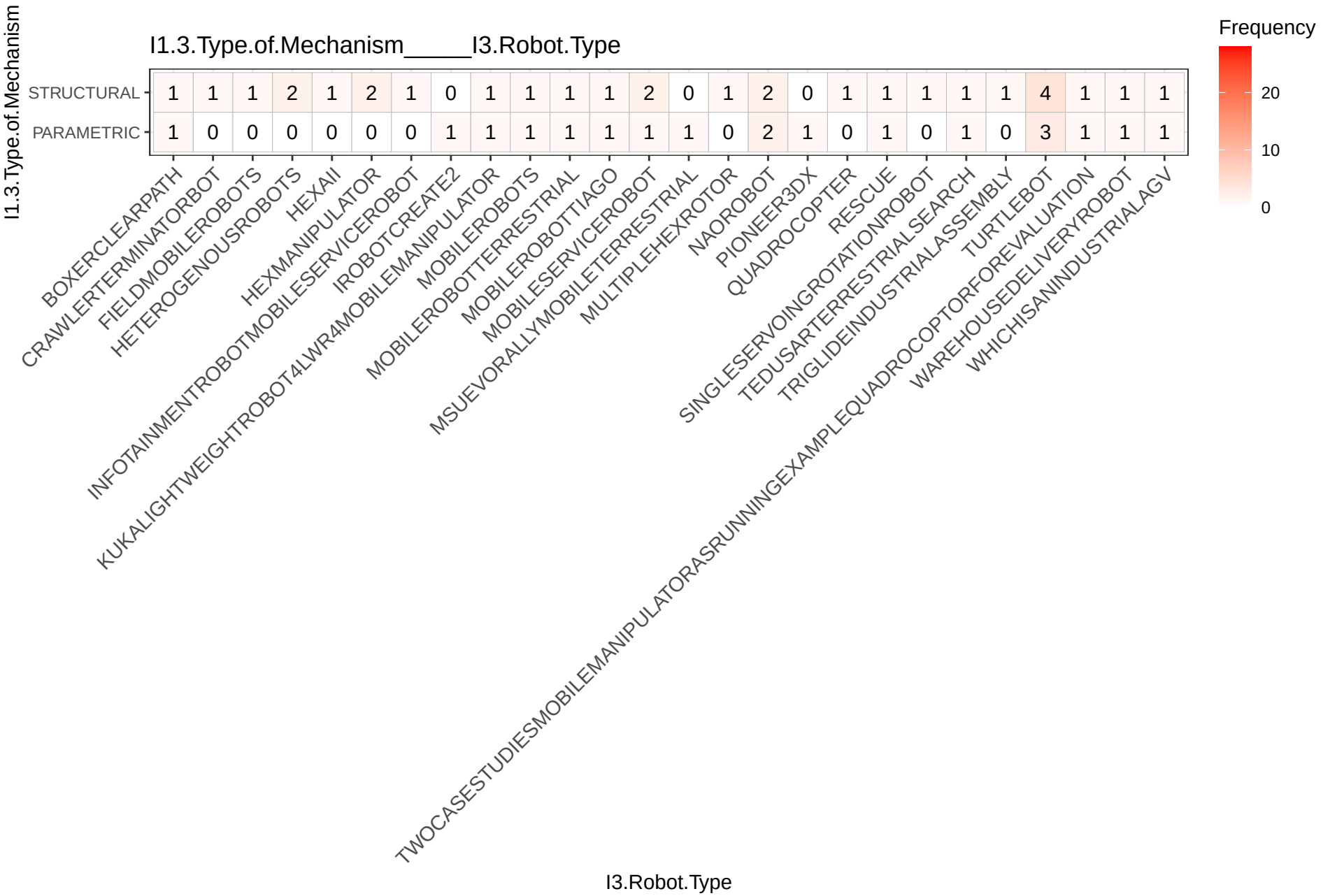
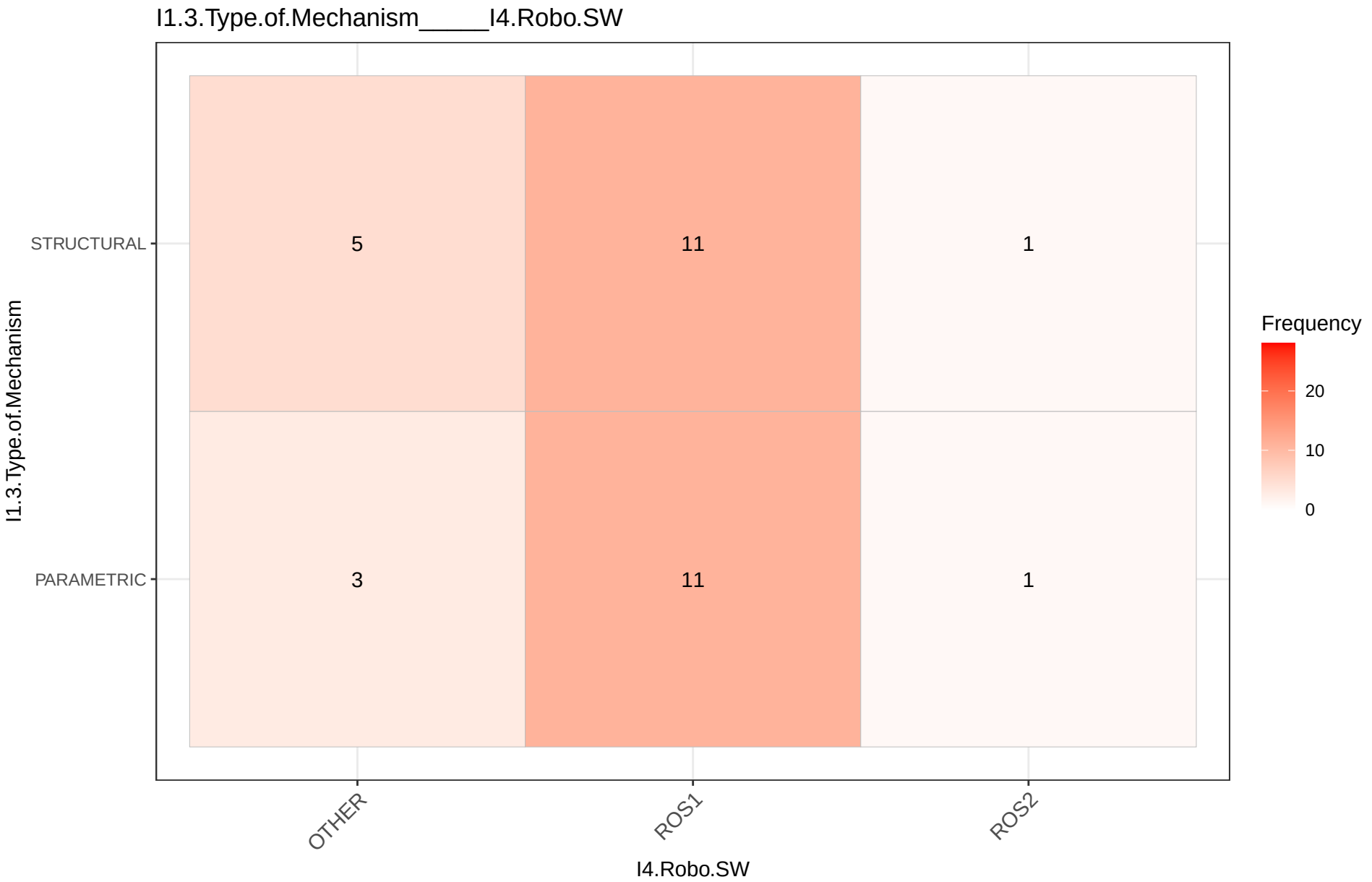
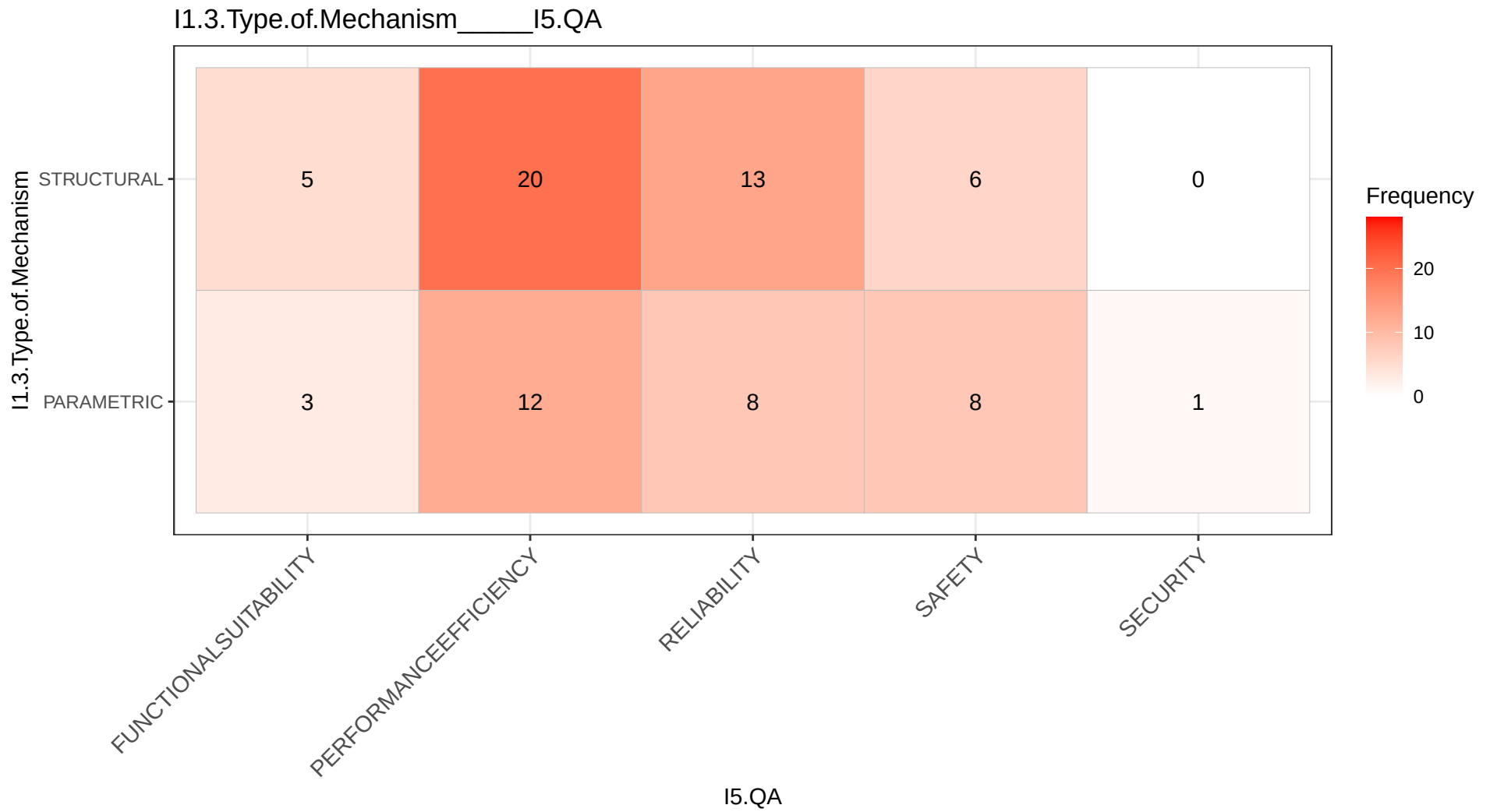

I1.3.Type.of.Mechanism_____I1.4.Resilience.of.Effects
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
8
8
3
6
5
1
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I2.Adap..Purpose
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
5
6
5
7
5
0
12
3
6
4
3
3
1
9
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I3.Robot.Type
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
1 1 1 2 1 2 1 0 1 1 1 1 2 0 1 2 0 1 1 1 1 1 4 1 1 1
1 0 0 0 0 0 0 1 1 1 1 1 1 1 0 2 1 0 1 0 1 0 3 1 1 1
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I4.Robo.SW
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
5
11
1
3
11
1
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I5.QA
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
5
20
13
6
0
3
12
8
8
1
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
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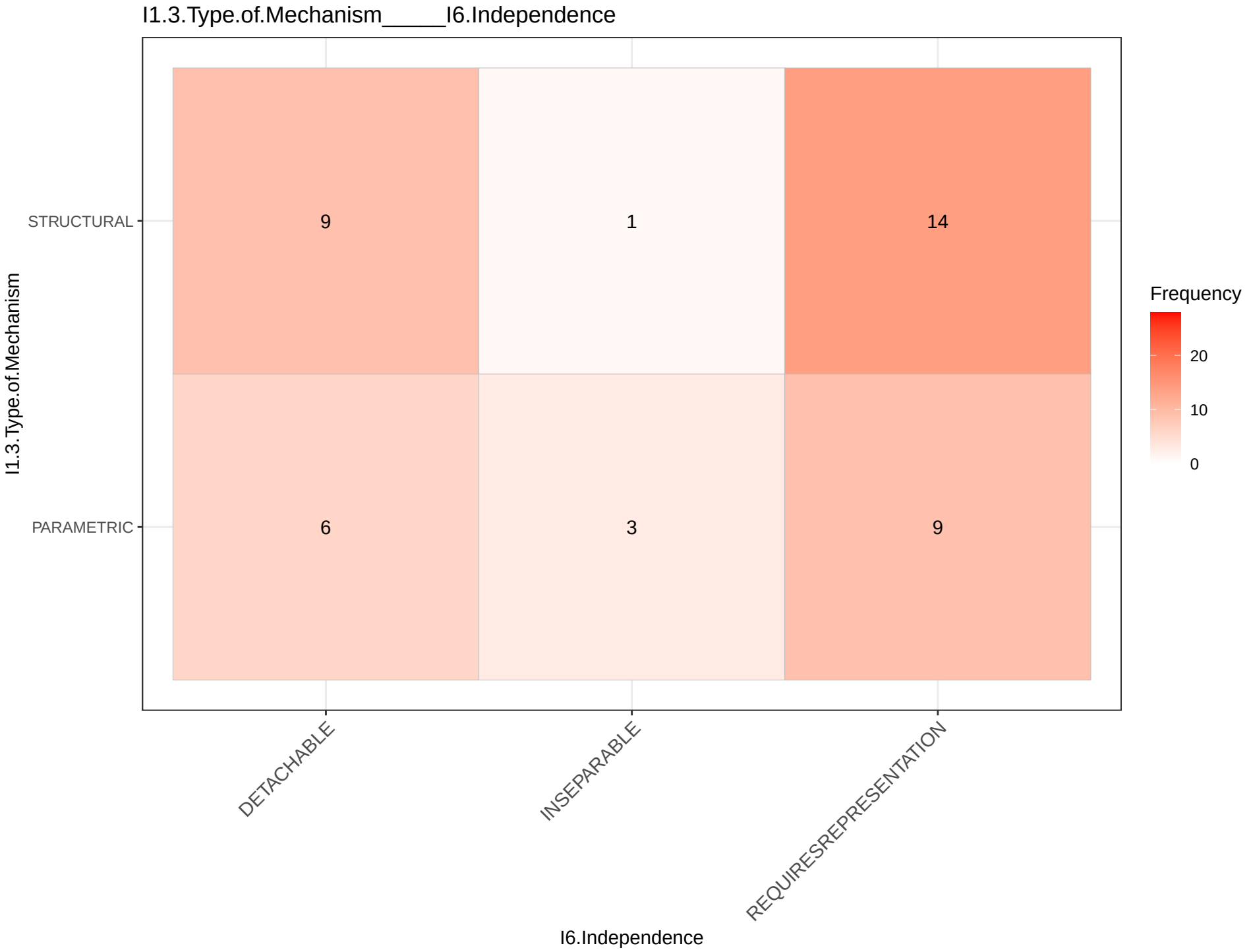
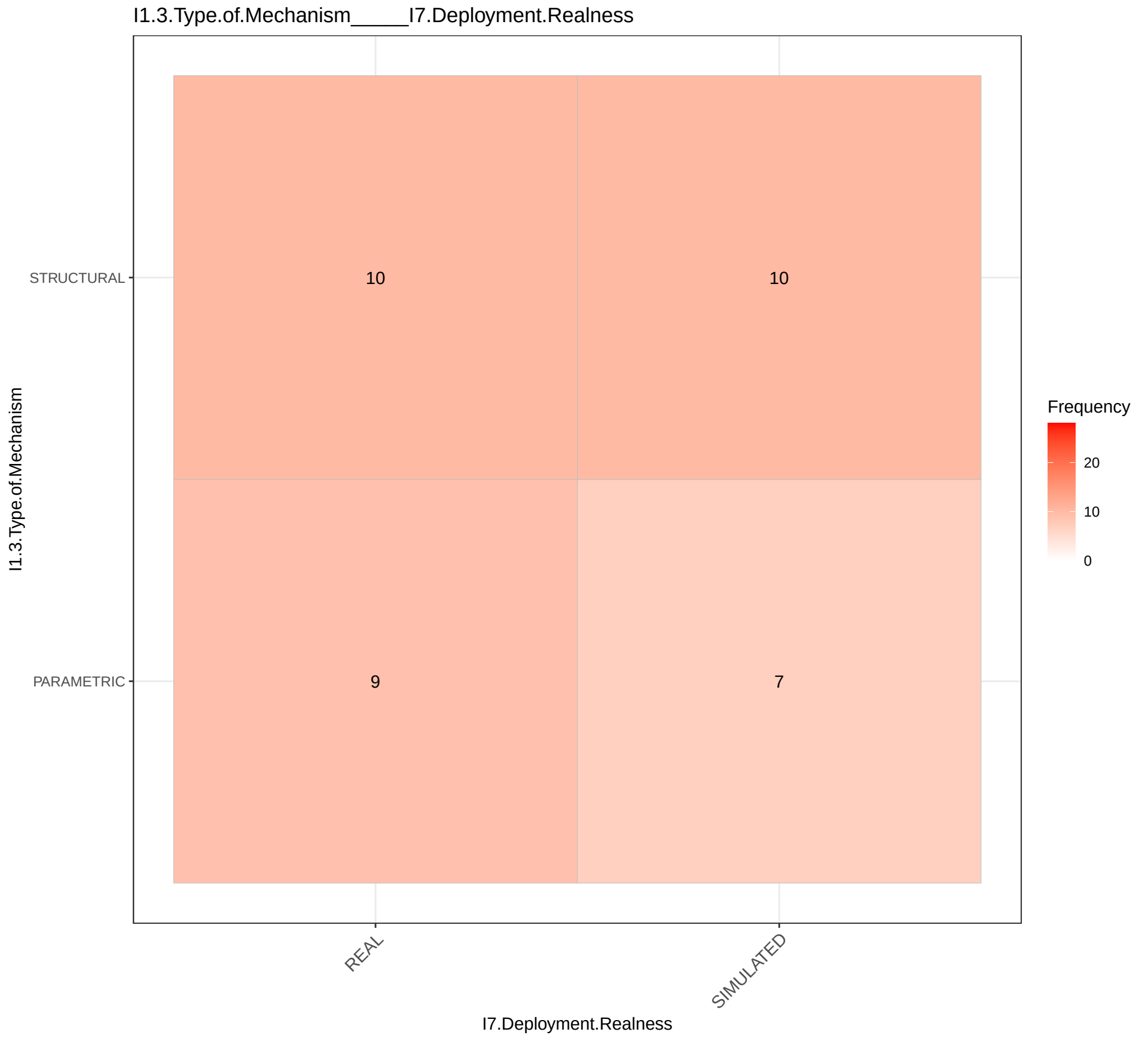
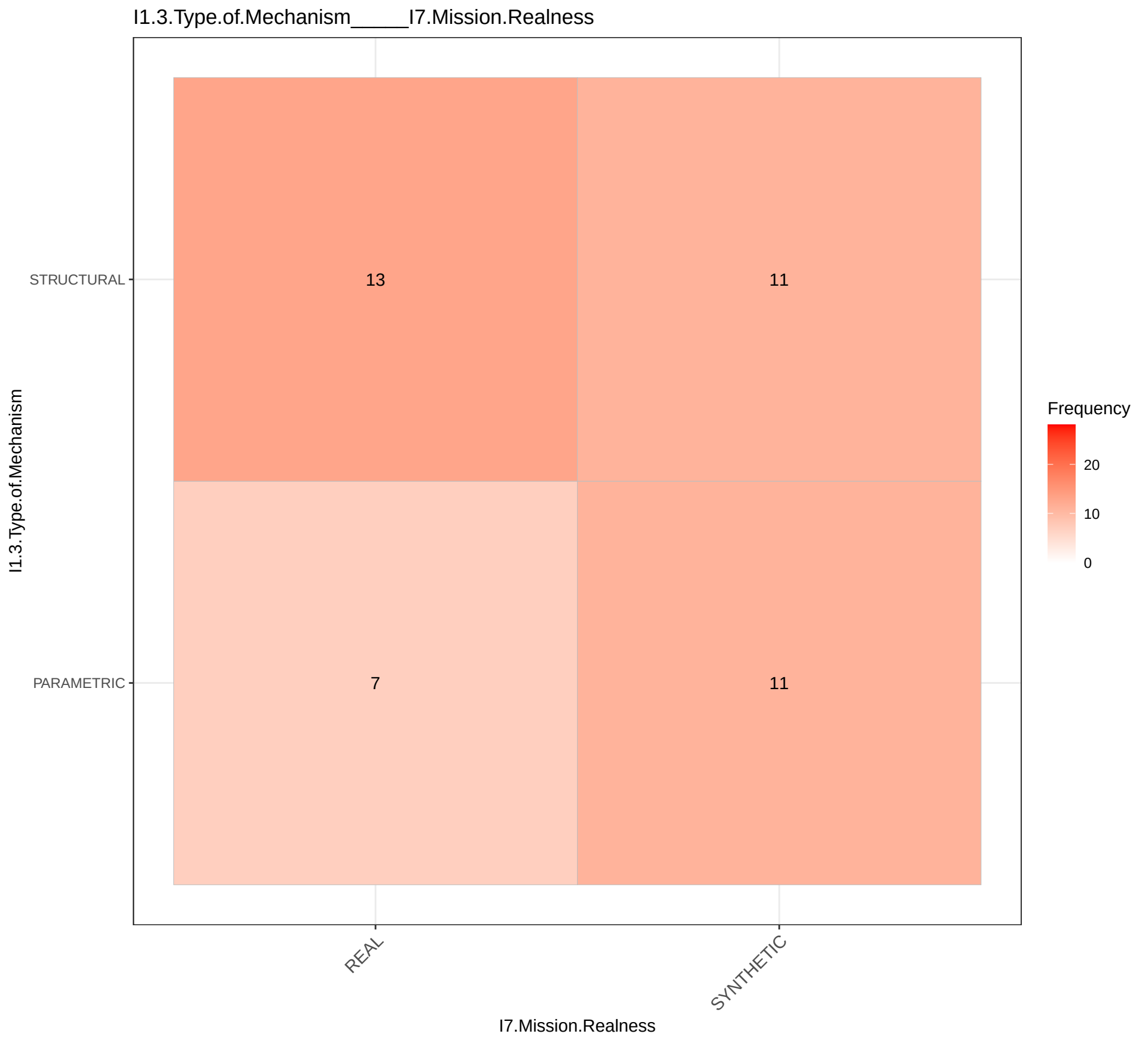

I1.3.Type.of.Mechanism_____I6.Independence
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
9
1
14
6
3
9
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I7.Deployment.Realness
STRUCTURAL
PARAMETRIC
10
10
9
7
I1.3.Type.of.Mechanism
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I7.Mission.Realness
STRUCTURAL
PARAMETRIC
13
11
7
11
REAL
SYNTHETIC
I7.Mission.Realness
I1.3.Type.of.Mechanism
Frequency
20
10
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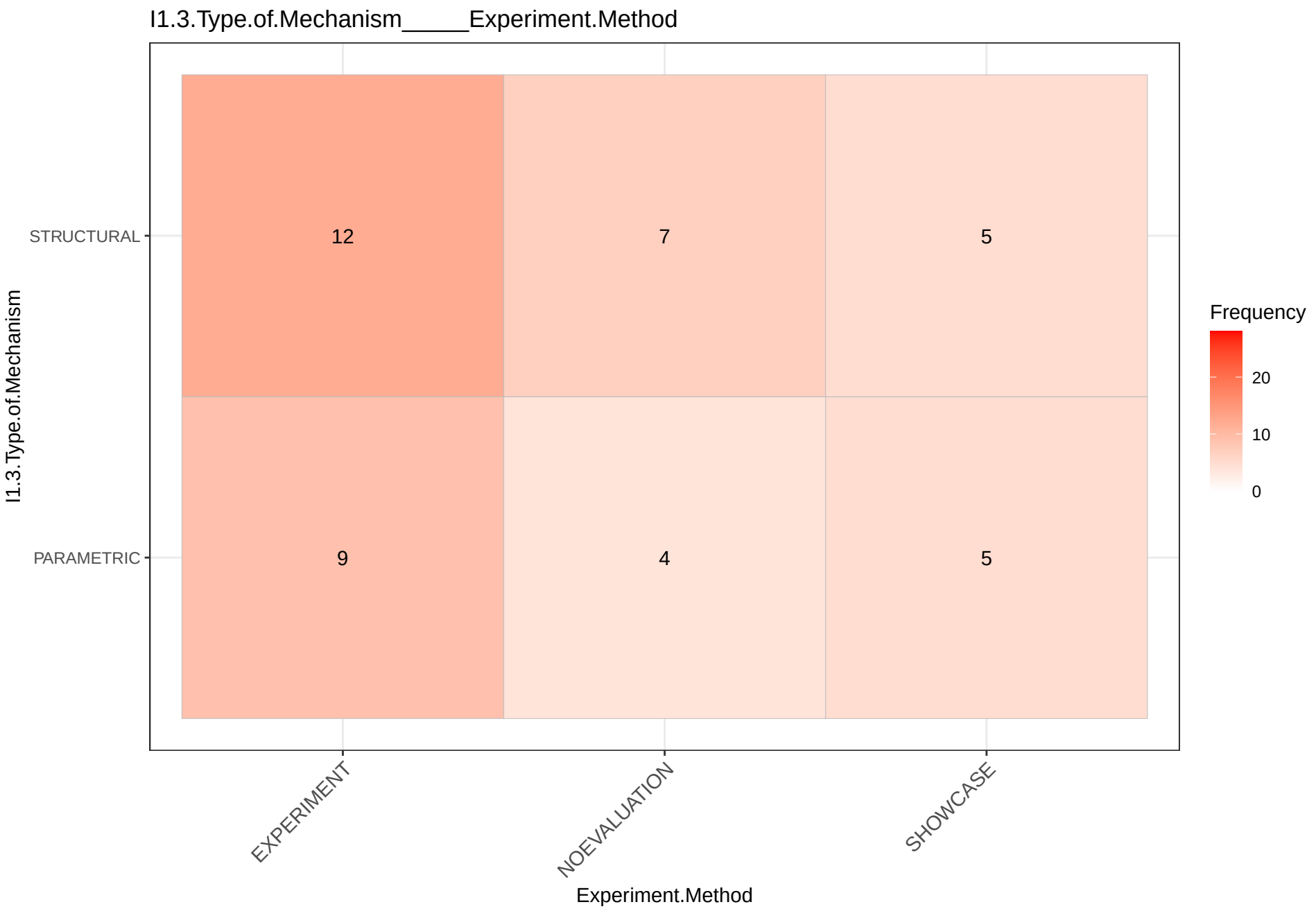
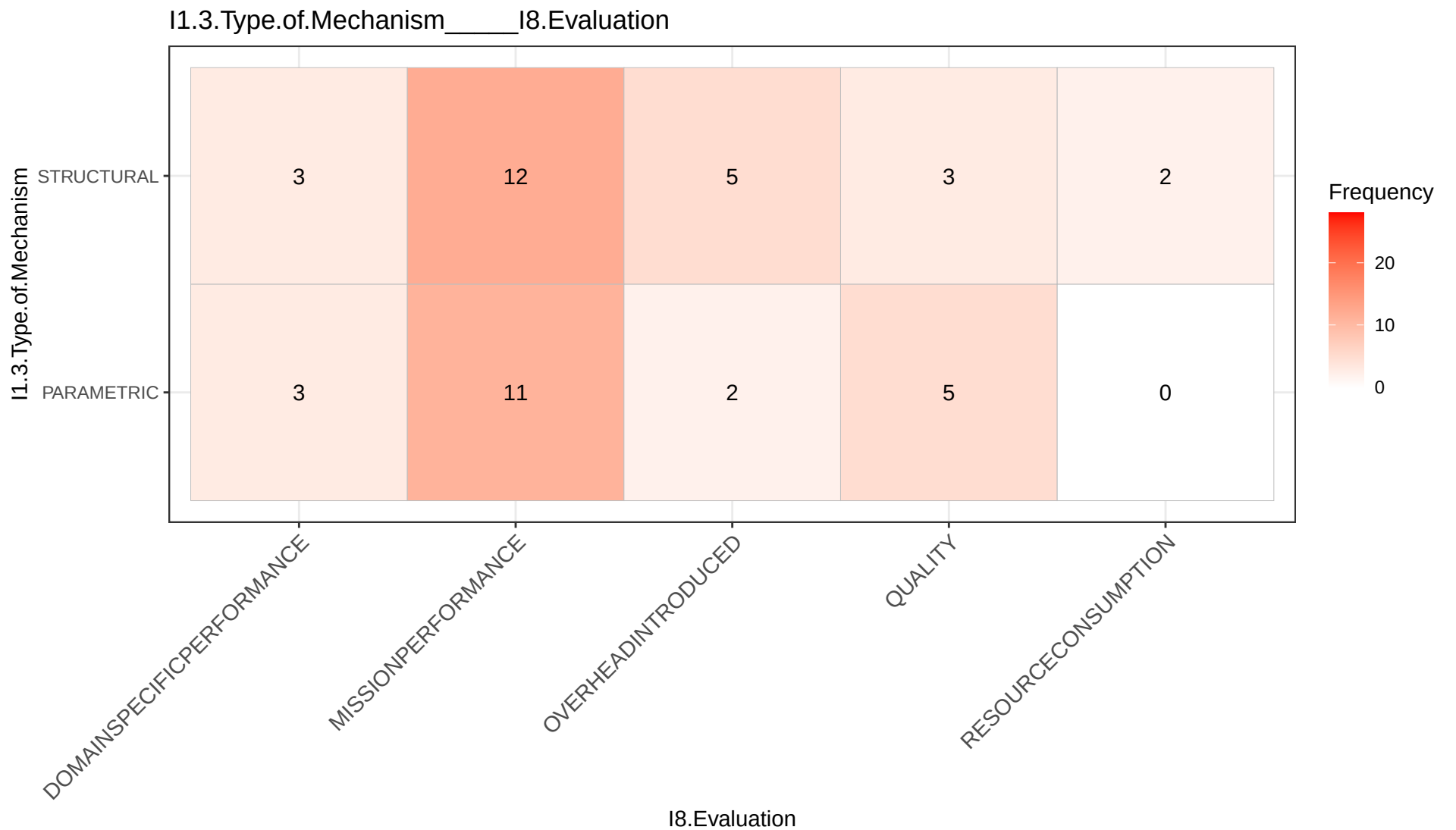

I1.3.Type.of.Mechanism_____Experiment.Method
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
12
7
5
9
4
5
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I1.3.Type.of.Mechanism_____I8.Evaluation
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
3
12
5
3
2
3
11
2
5
0
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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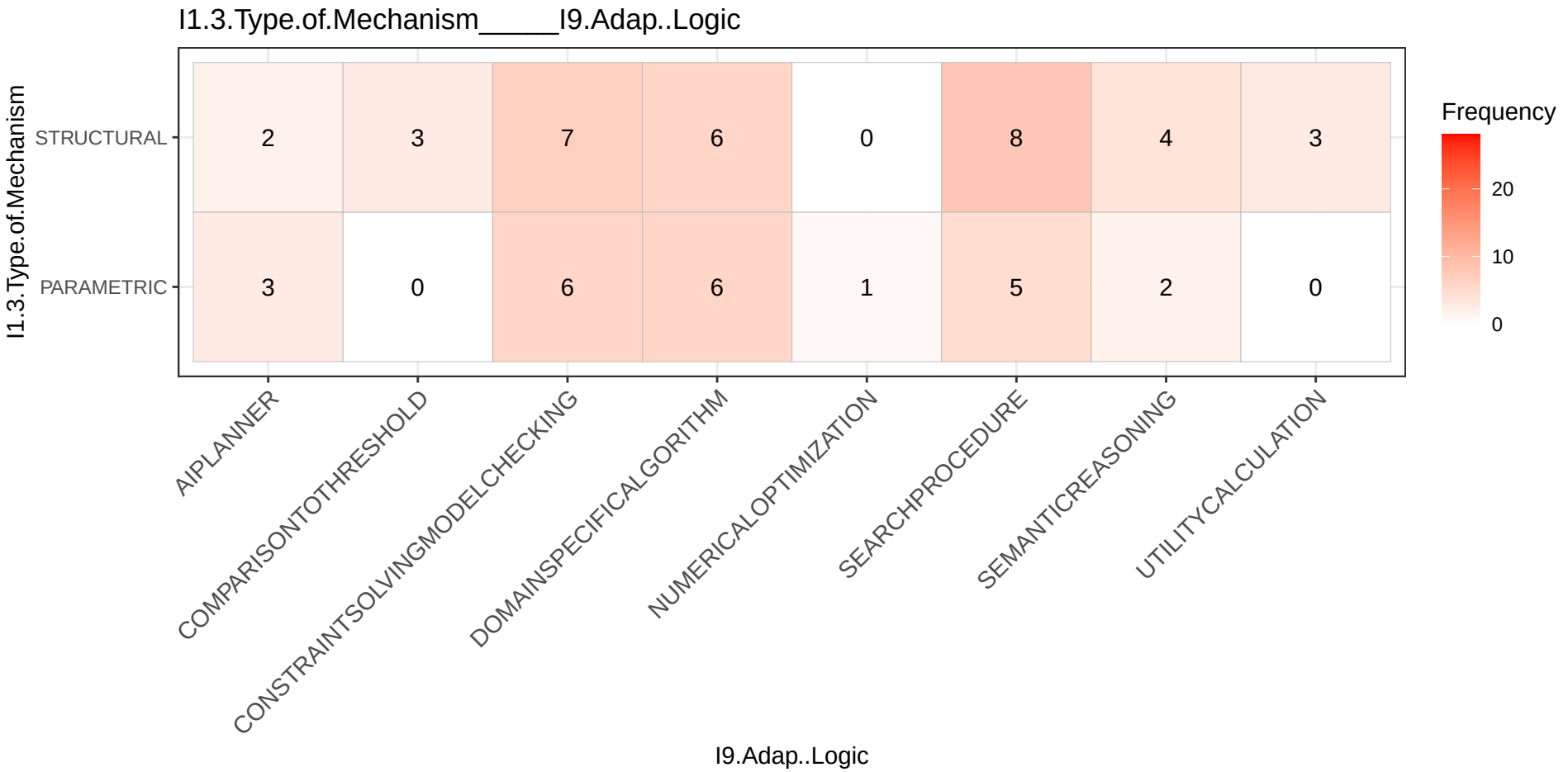
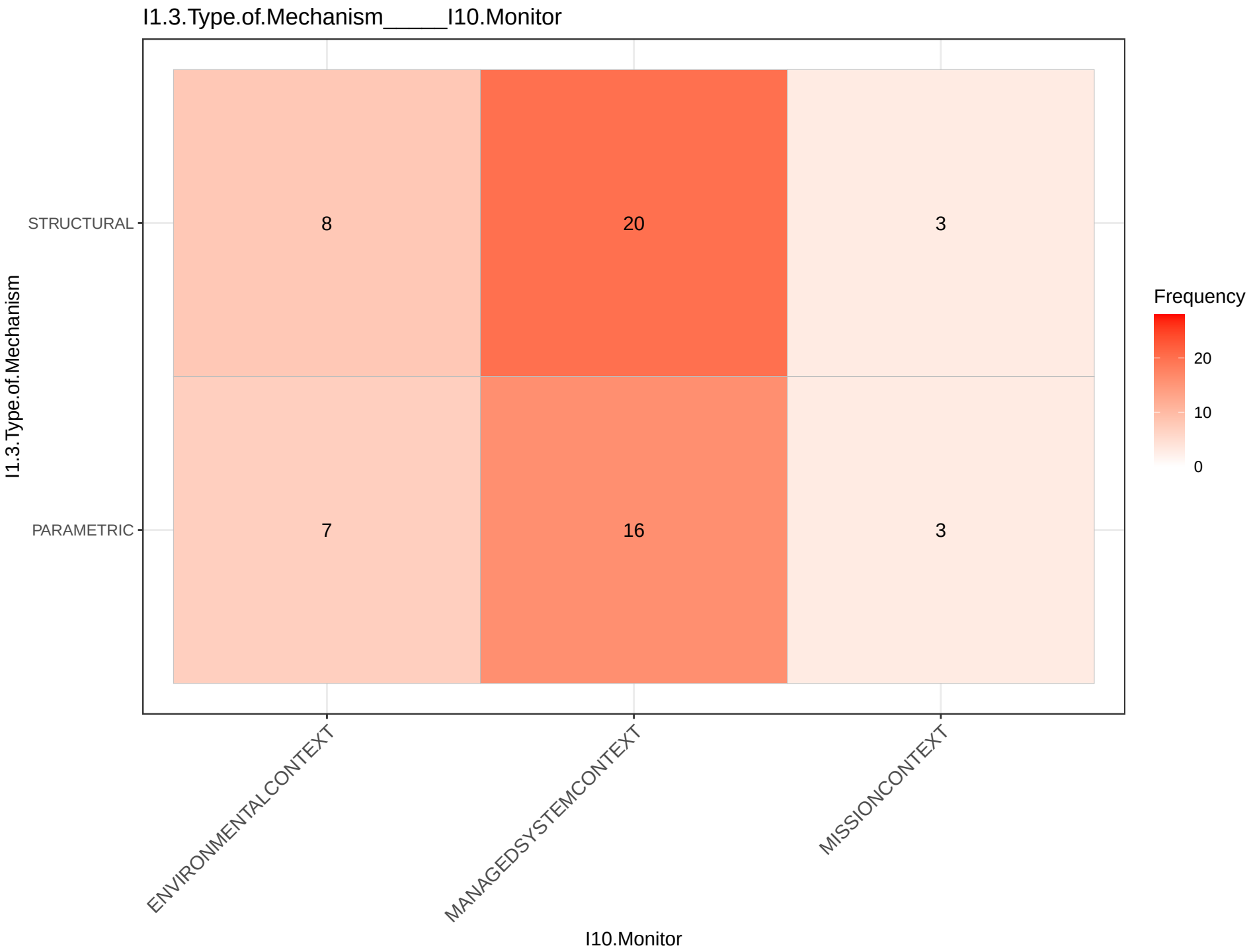
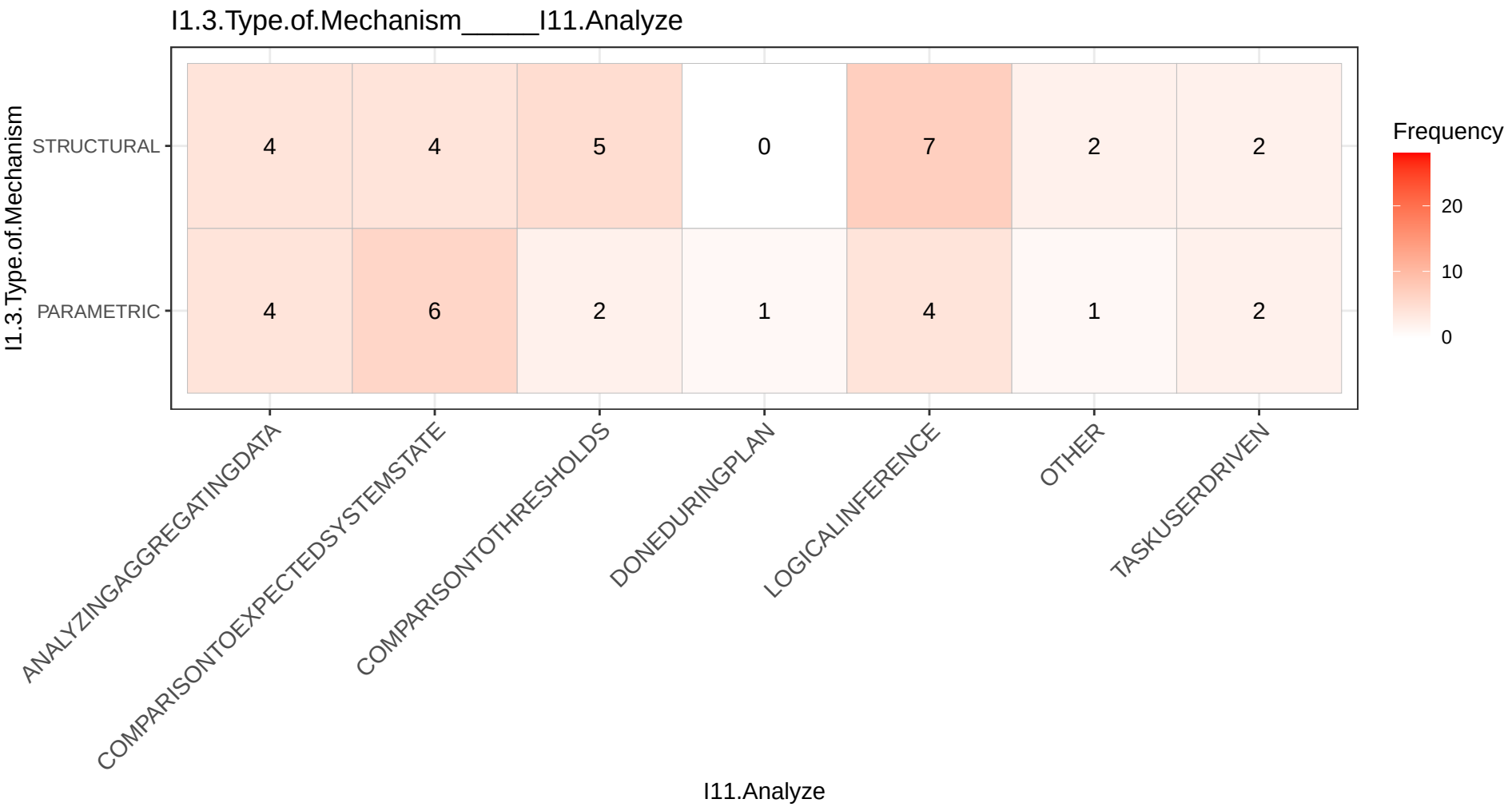
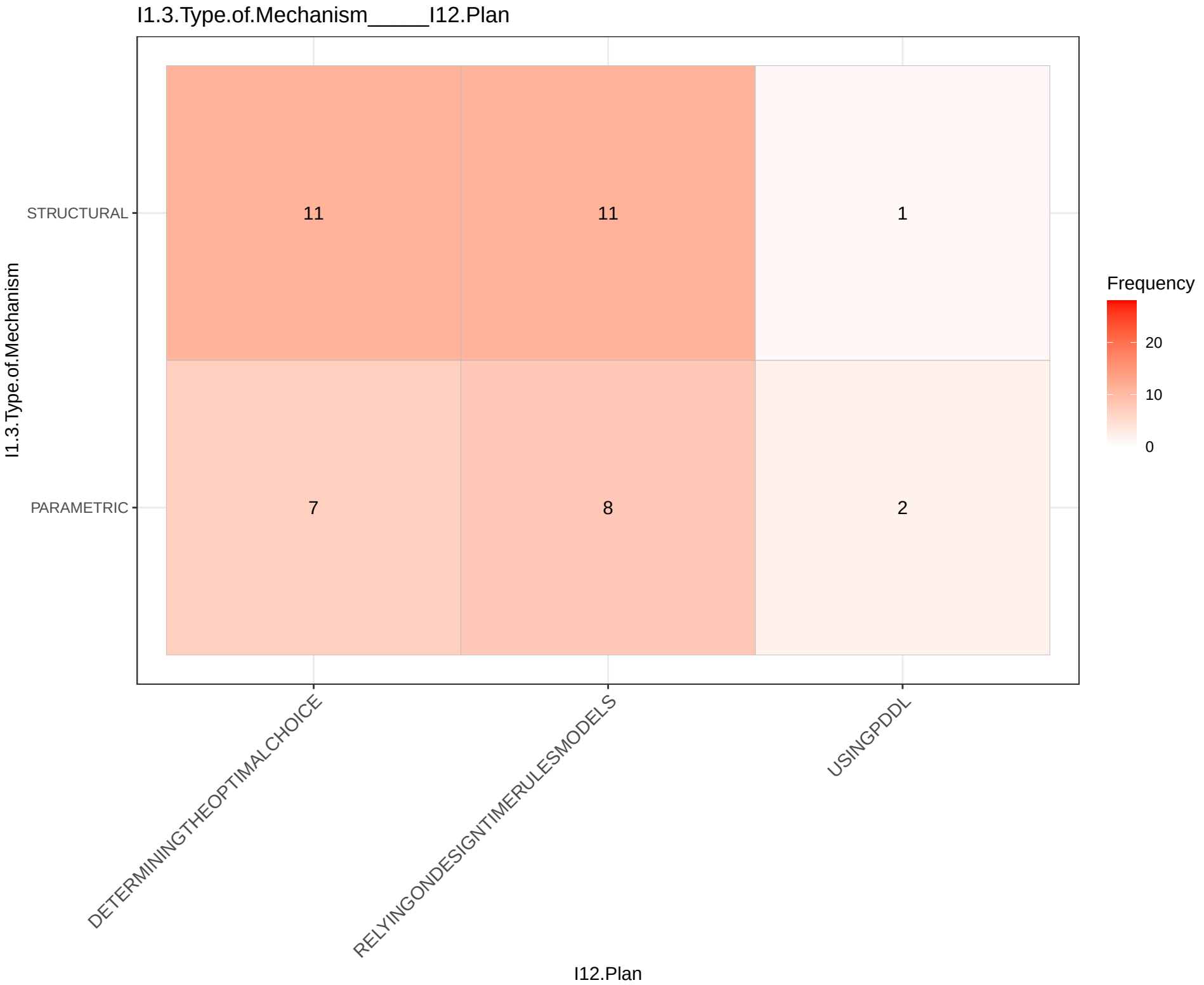
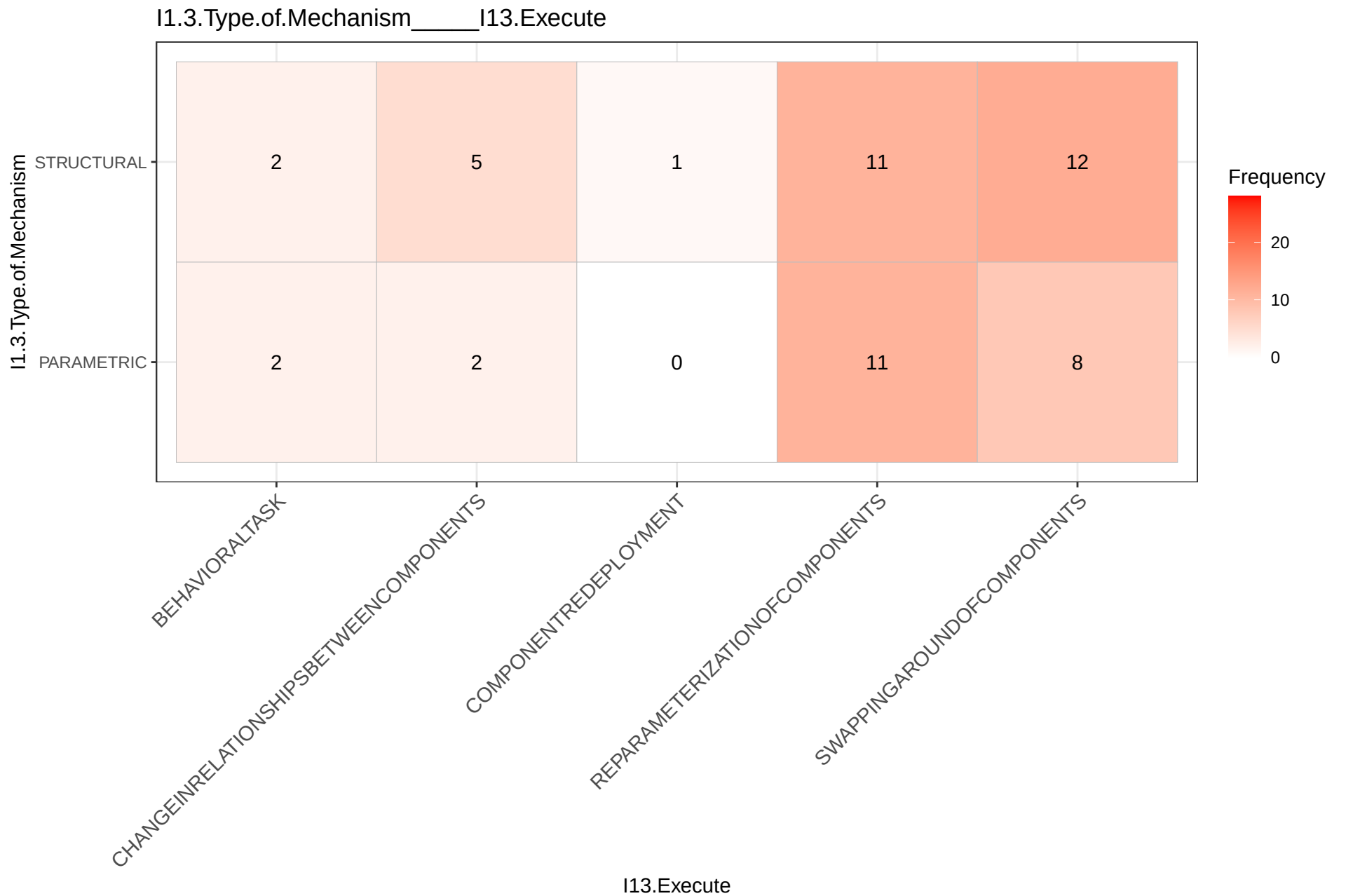
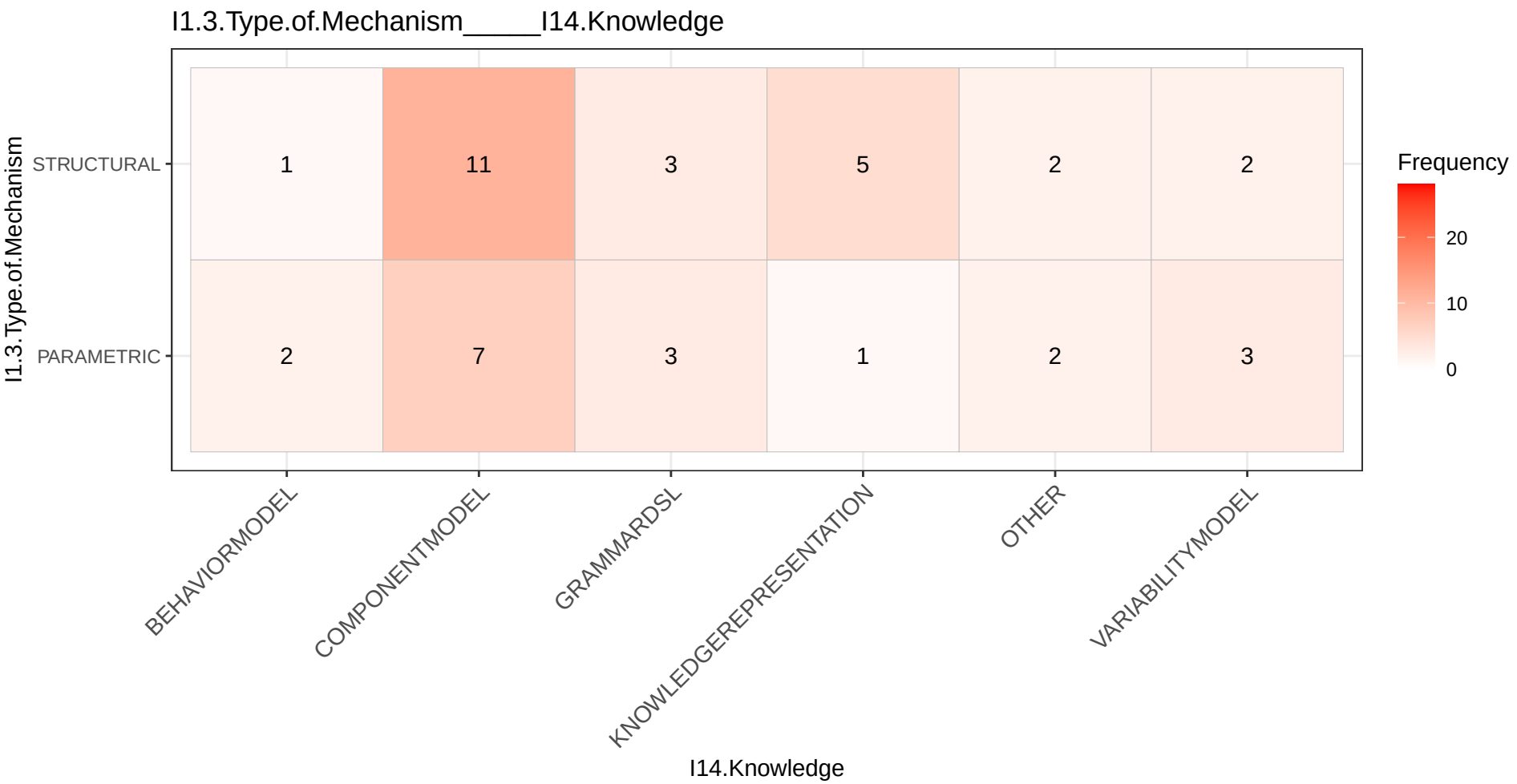

I1.3.Type.of.Mechanism_____I9.Adap..Logic
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
2
3
7
6
0
8
4
3
3
0
6
6
1
5
2
0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
0

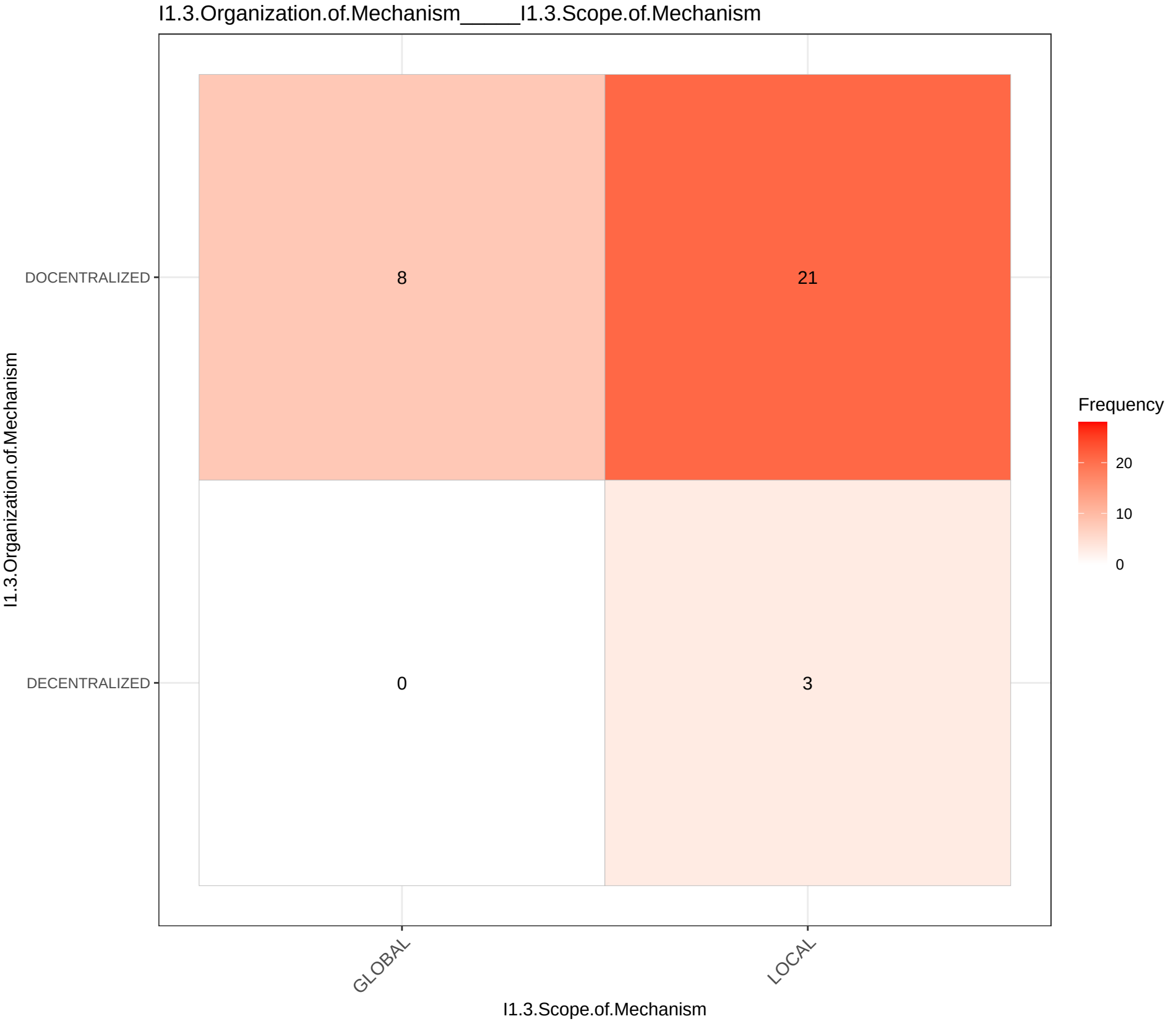

I1.3.Type.of.Mechanism_____I10.Monitor
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
8
20
3
7
16
3
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0

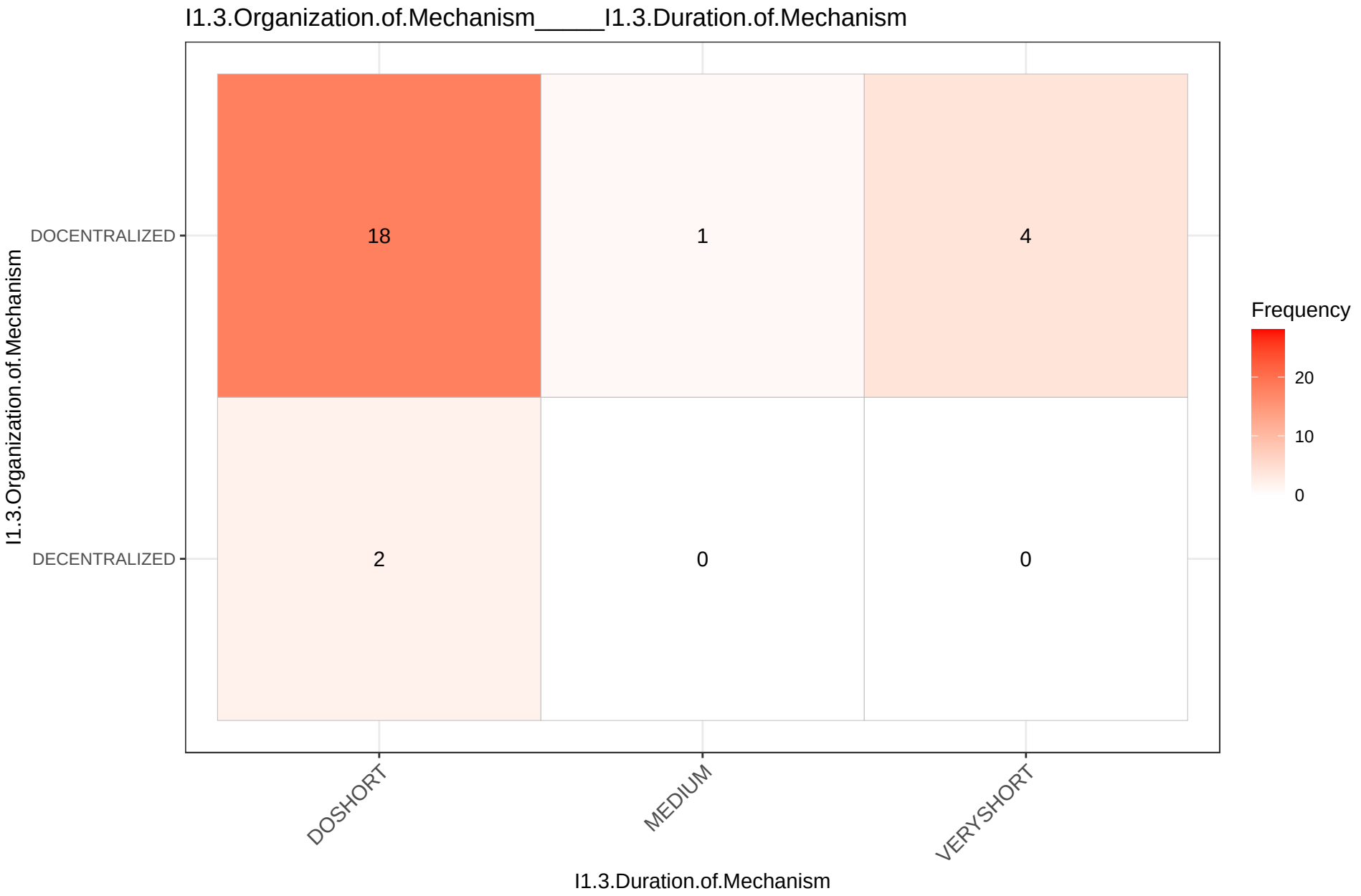

I1.3.Type.of.Mechanism_____I11.Analyze
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
4
4
5
0
7
2
2
4
6
2
1
4
1
2
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
0

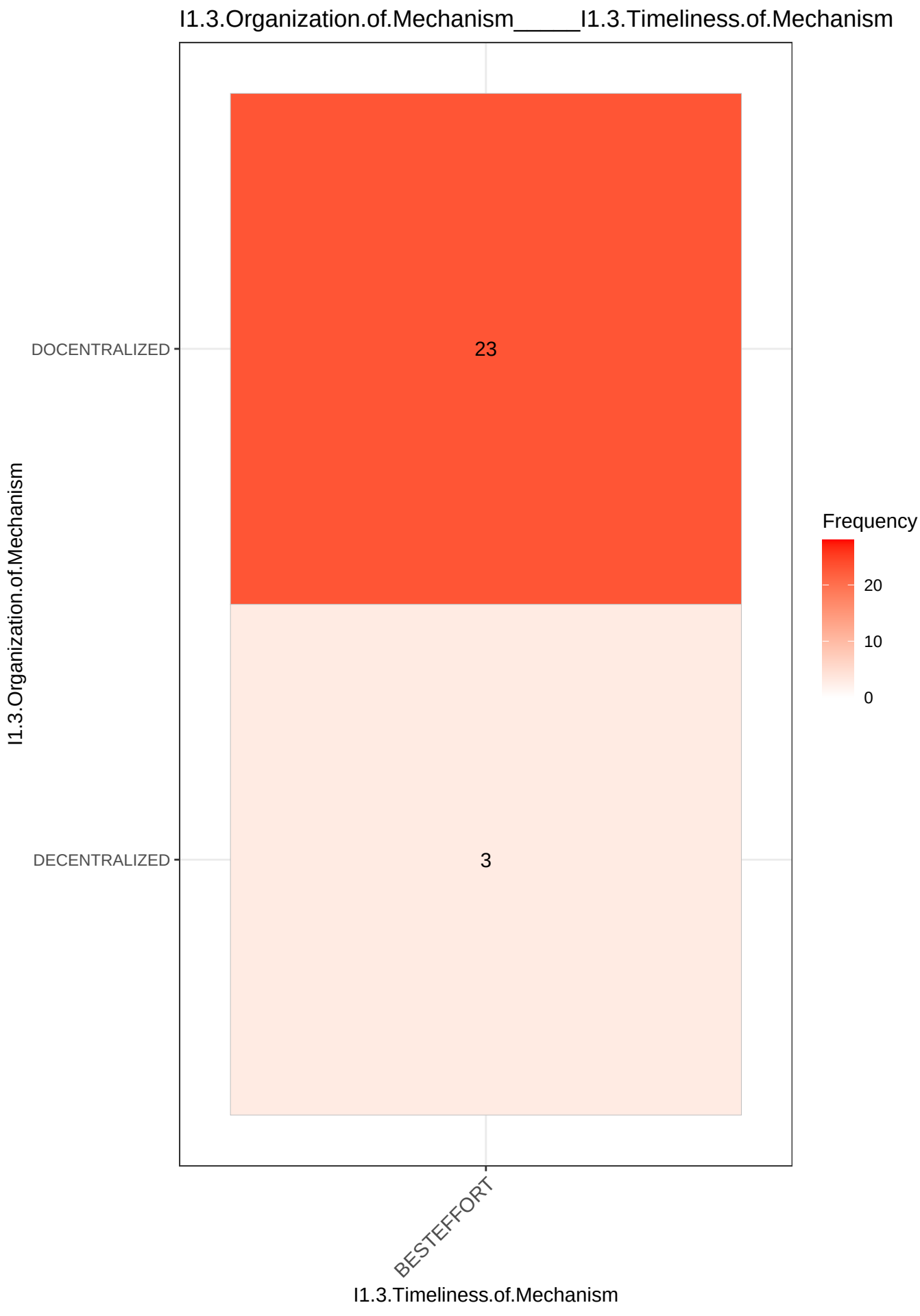

I1.3.Type.of.Mechanism_____I12.Plan
STRUCTURAL
PARAMETRIC
I1.3.Type.of.Mechanism
11
11
1
7
8
2
Frequency
20
10
0
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan


I1.3.Type.of.Mechanism_____I13.Execute
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
2
5
1
11
12
2
2
0
11
8
Frequency
20
10
0
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute


I1.3.Type.of.Mechanism_____I14.Knowledge
I1.3.Type.of.Mechanism
STRUCTURAL
PARAMETRIC
1
11
3
5
2
2
2
7
3
1
2
3
Frequency
20
10
0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge


I1.3.Organization.of.Mechanism_____I1.3.Scope.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
8
21
0
3
GLOBAL
LOCAL
I1.3.Scope.of.Mechanism
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I1.3.Duration.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
18
1
4
2
0
0
DOSHORT
MEDIUM
VERYSHORT
I1.3.Duration.of.Mechanism
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I1.3.Timeliness.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
23
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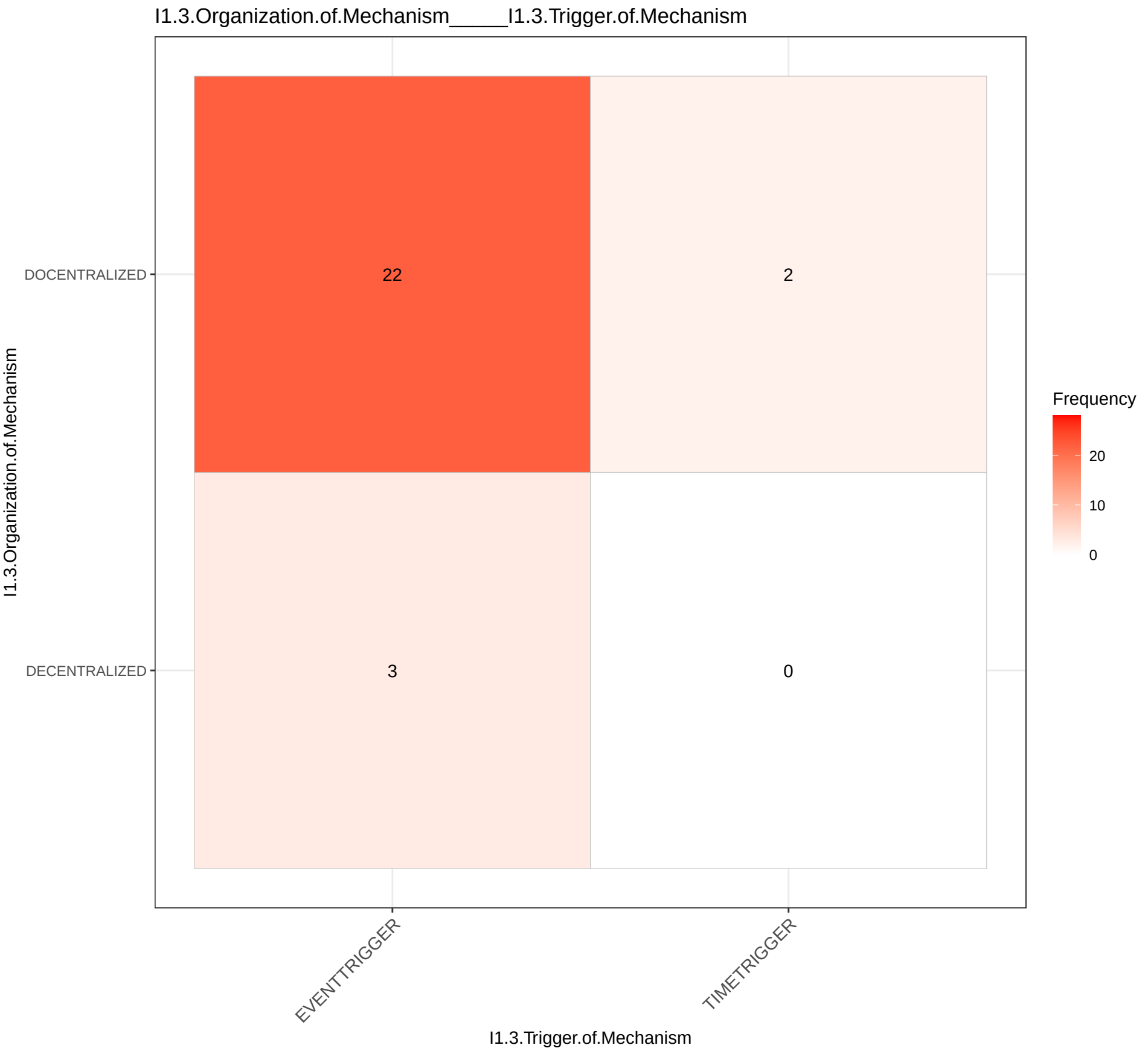
I1.3.Organization.of.Mechanism
BESTEFFORT
I1.3.Timeliness.of.Mechanism
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I1.3.Trigger.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
22
2
3
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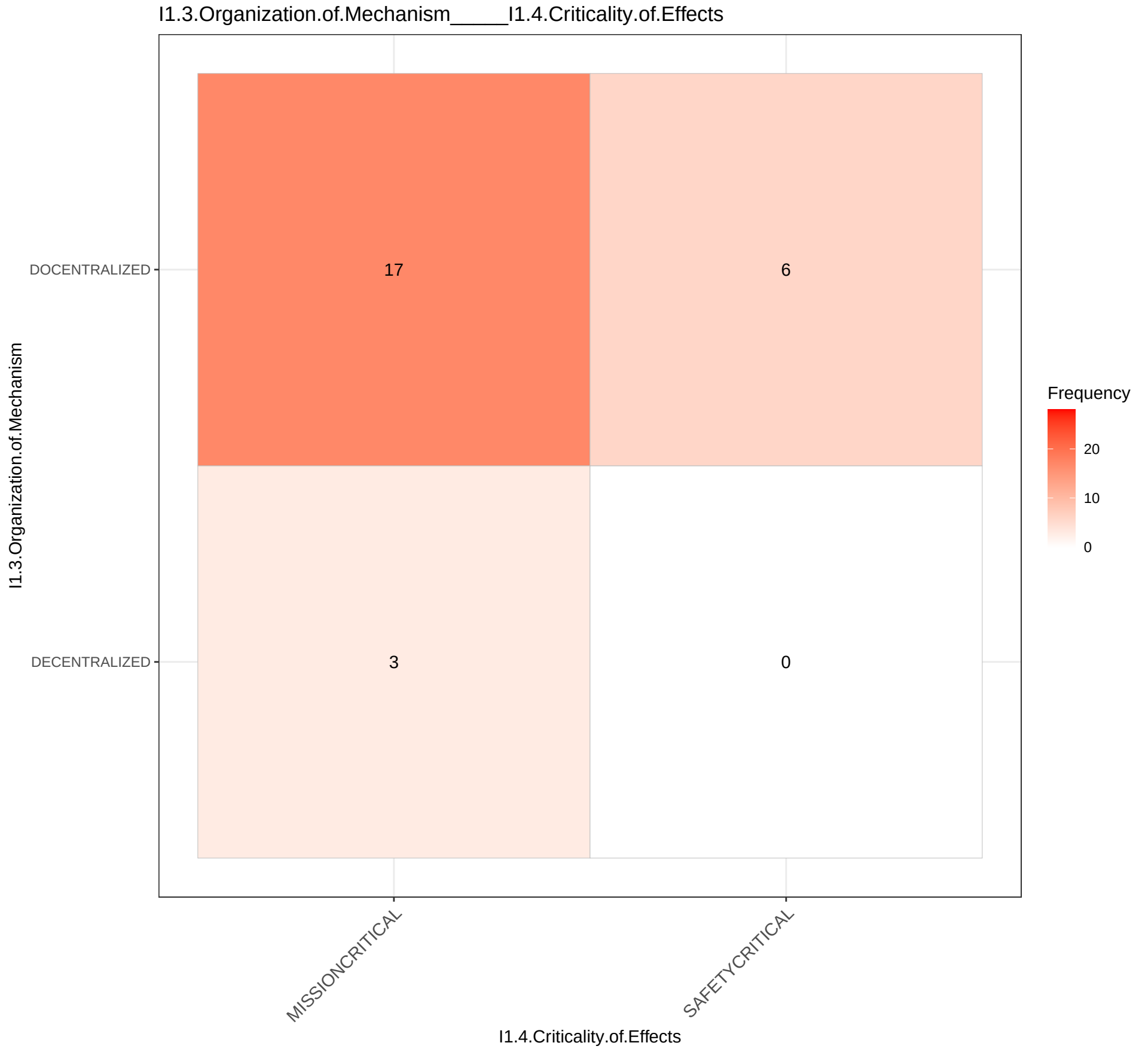
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I1.4.Criticality.of.Effects
DOCENTRALIZED
DECENTRALIZED
17
6
3
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I1.3.Organization.of.Mechanism
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
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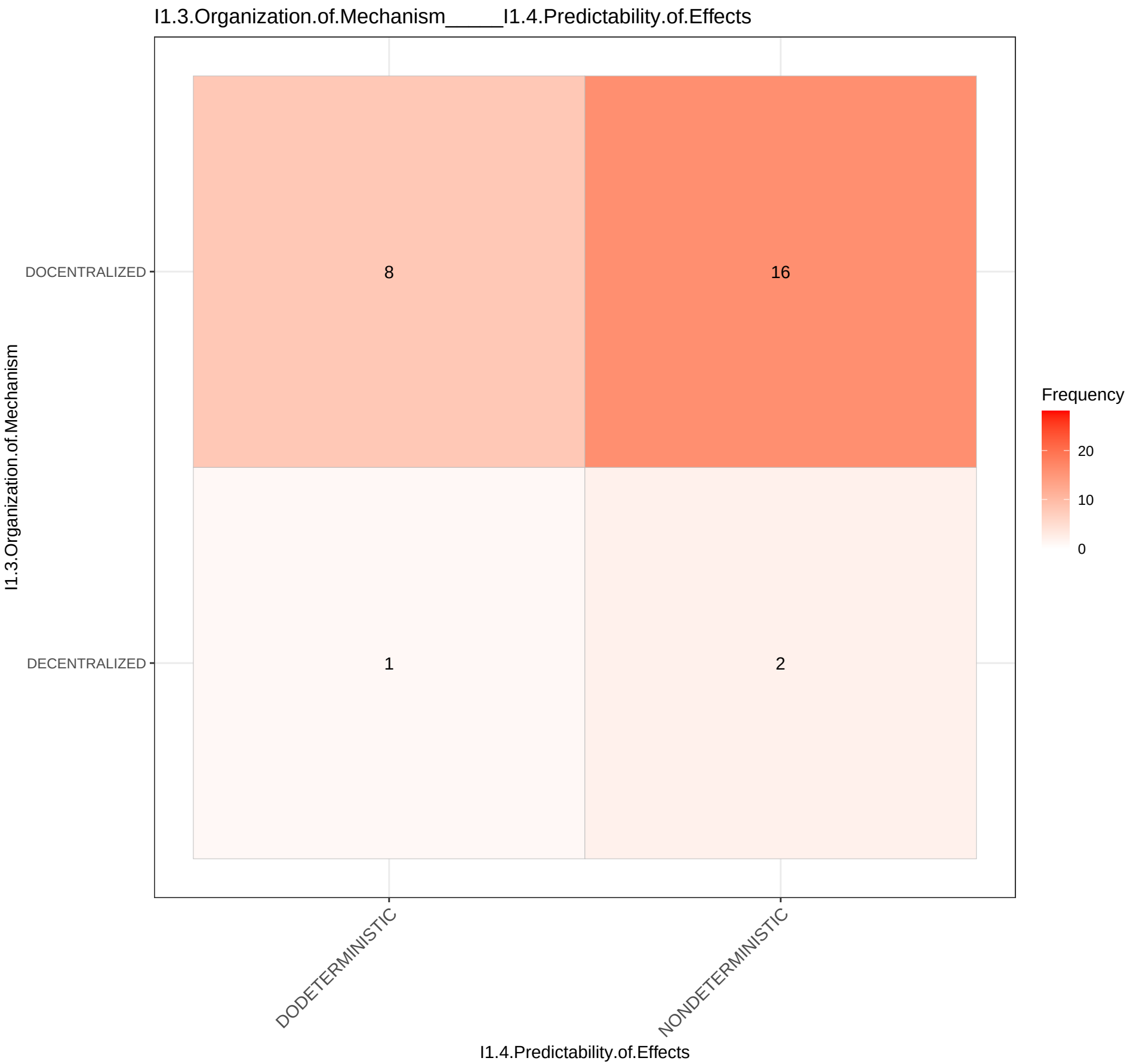
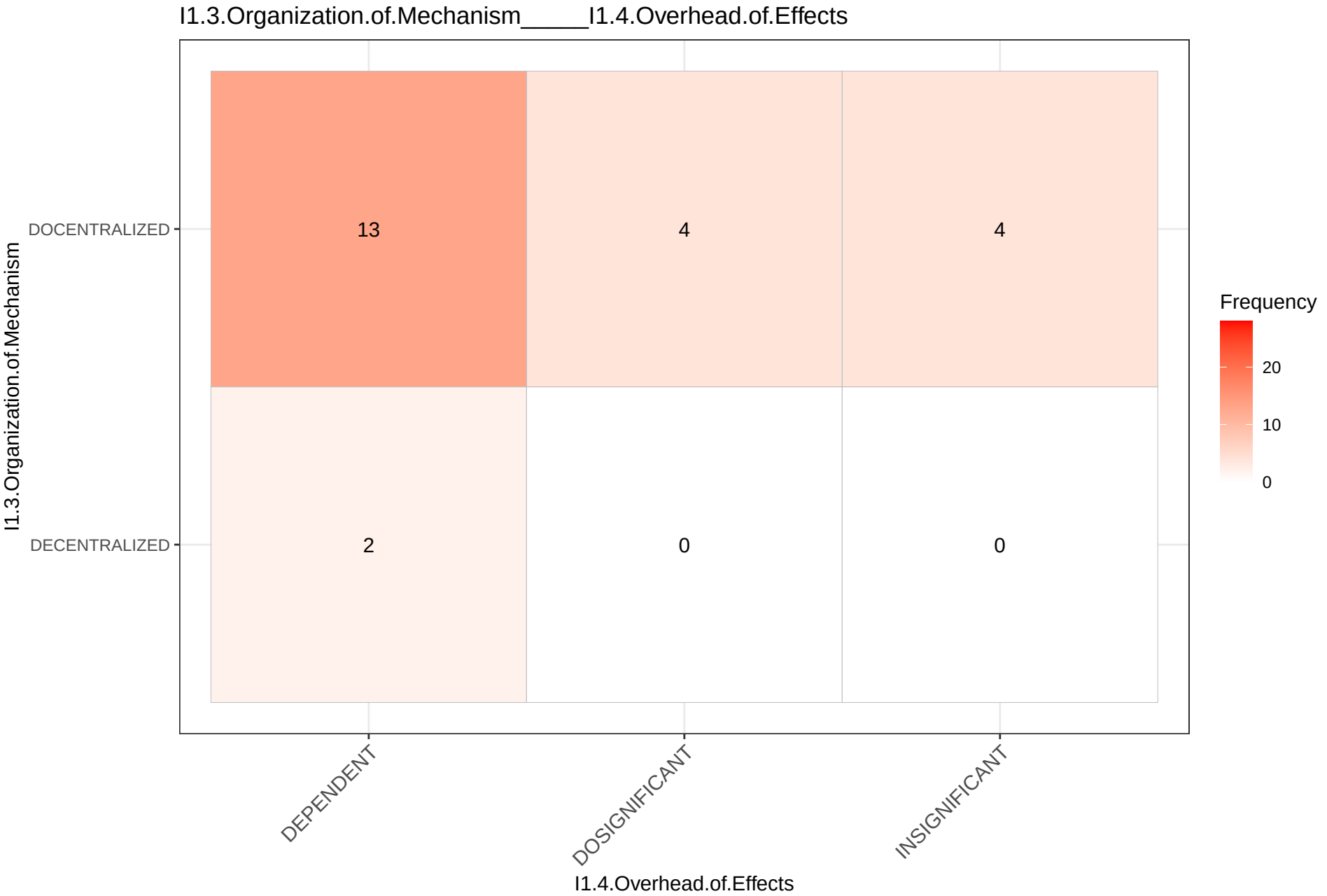
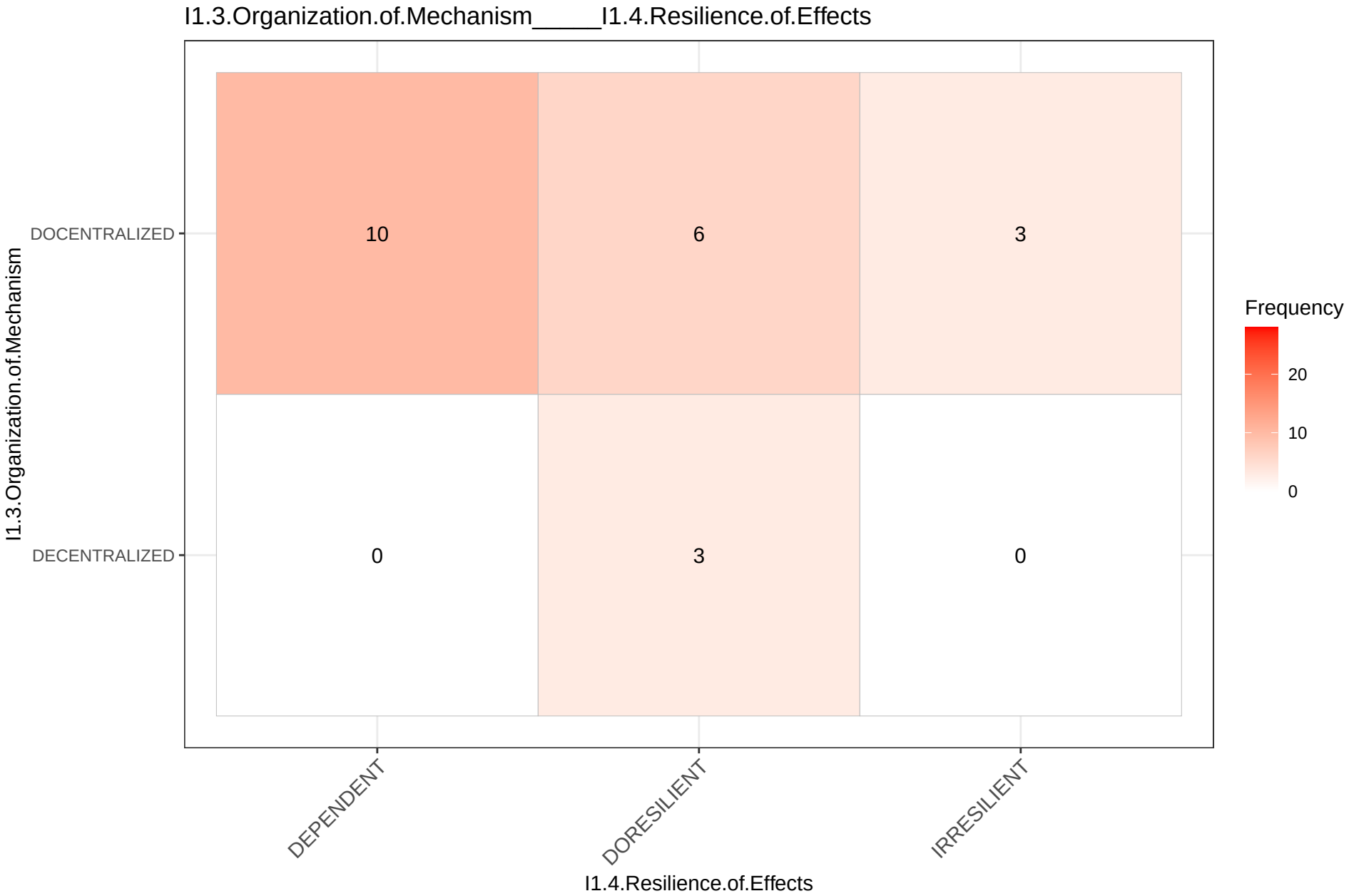

I1.3.Organization.of.Mechanism_____I1.4.Predictability.of.Effects
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
8
16
1
2
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I1.4.Overhead.of.Effects
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
13
4
4
2
0
0
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I1.4.Resilience.of.Effects
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
10
6
3
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3
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DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
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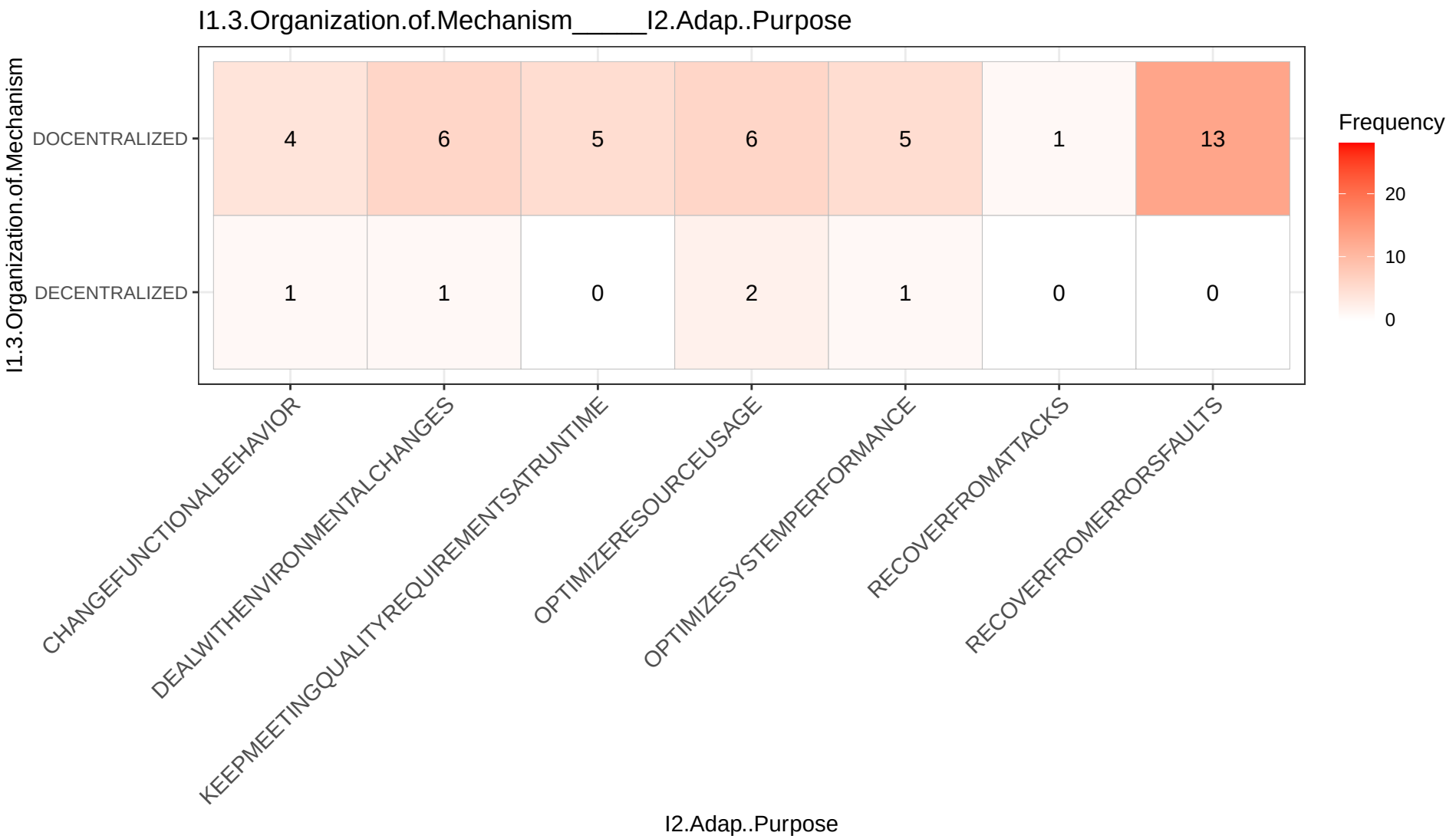
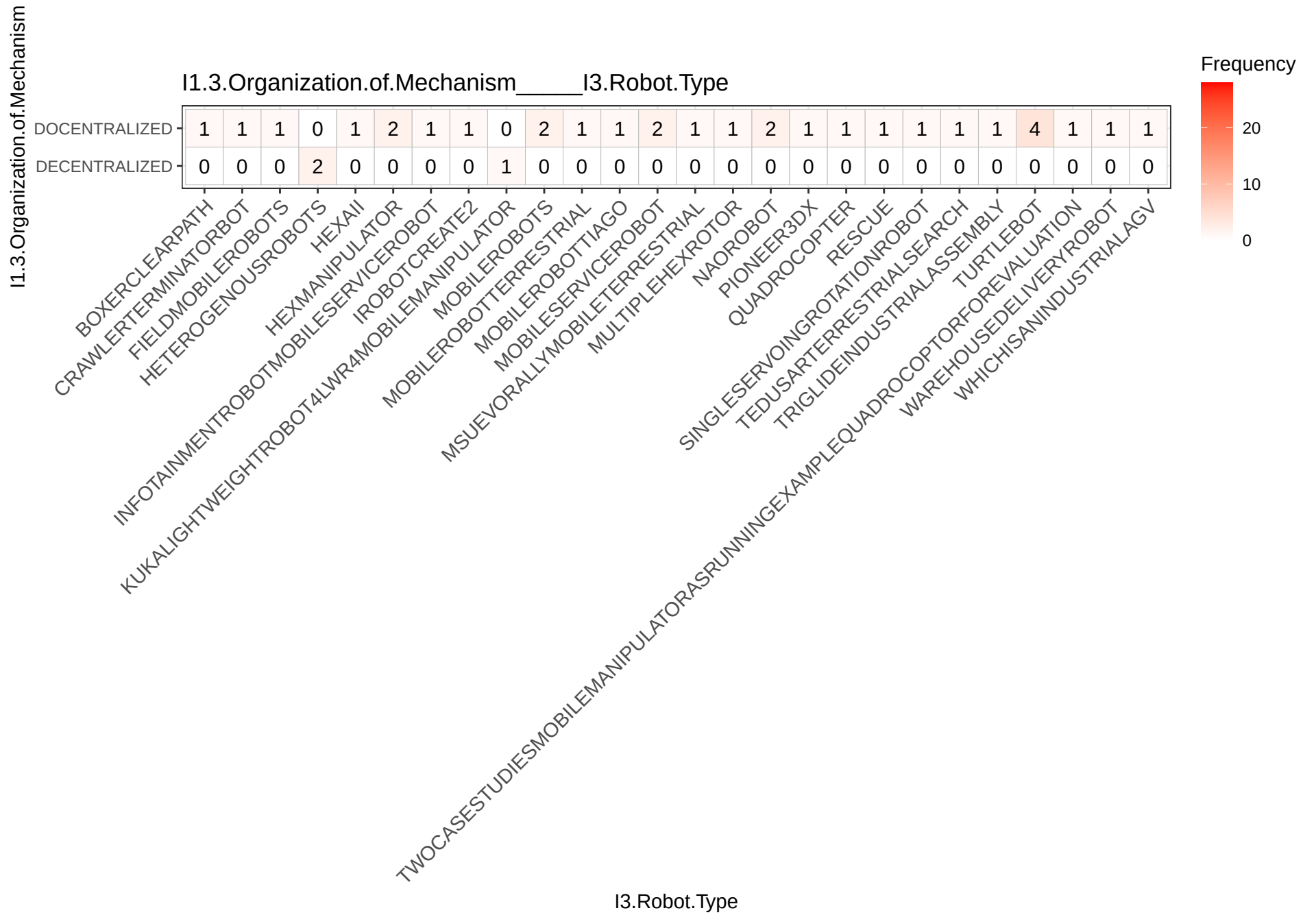
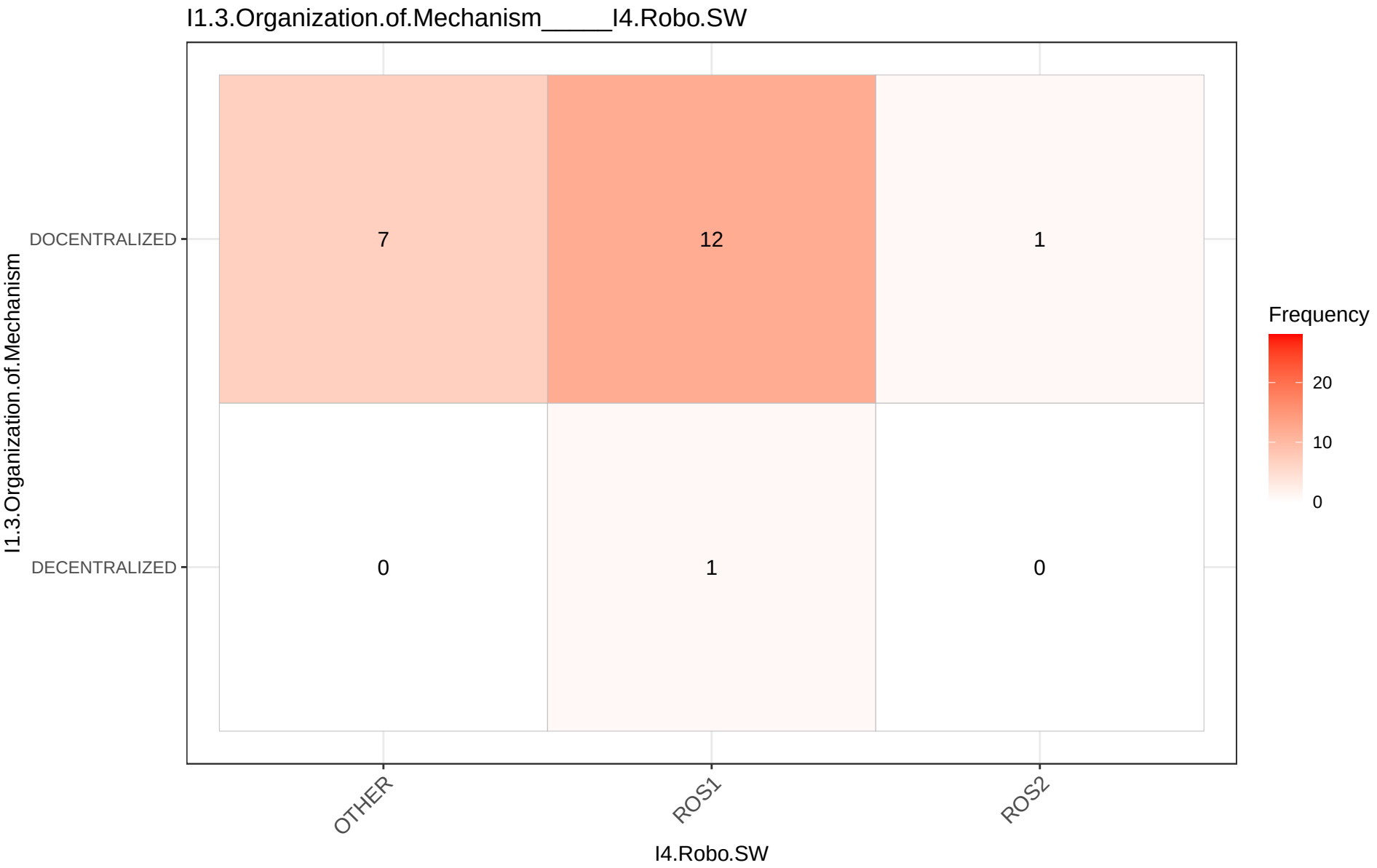

I1.3.Organization.of.Mechanism_____I2.Adap..Purpose
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
4
6
5
6
5
1
13
1
1
0
2
1
0
0
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I3.Robot.Type
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
1 1 1 0 1 2 1 1 0 2 1 1 2 1 1 2 1 1 1 1 1 1 4 1 1 1
0 0 0 2 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILESERVICEROBOT
MSUEVORALLYMOBILEROBOTTIAGO
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I4.Robo.SW
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
7
12
1
0
1
0
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
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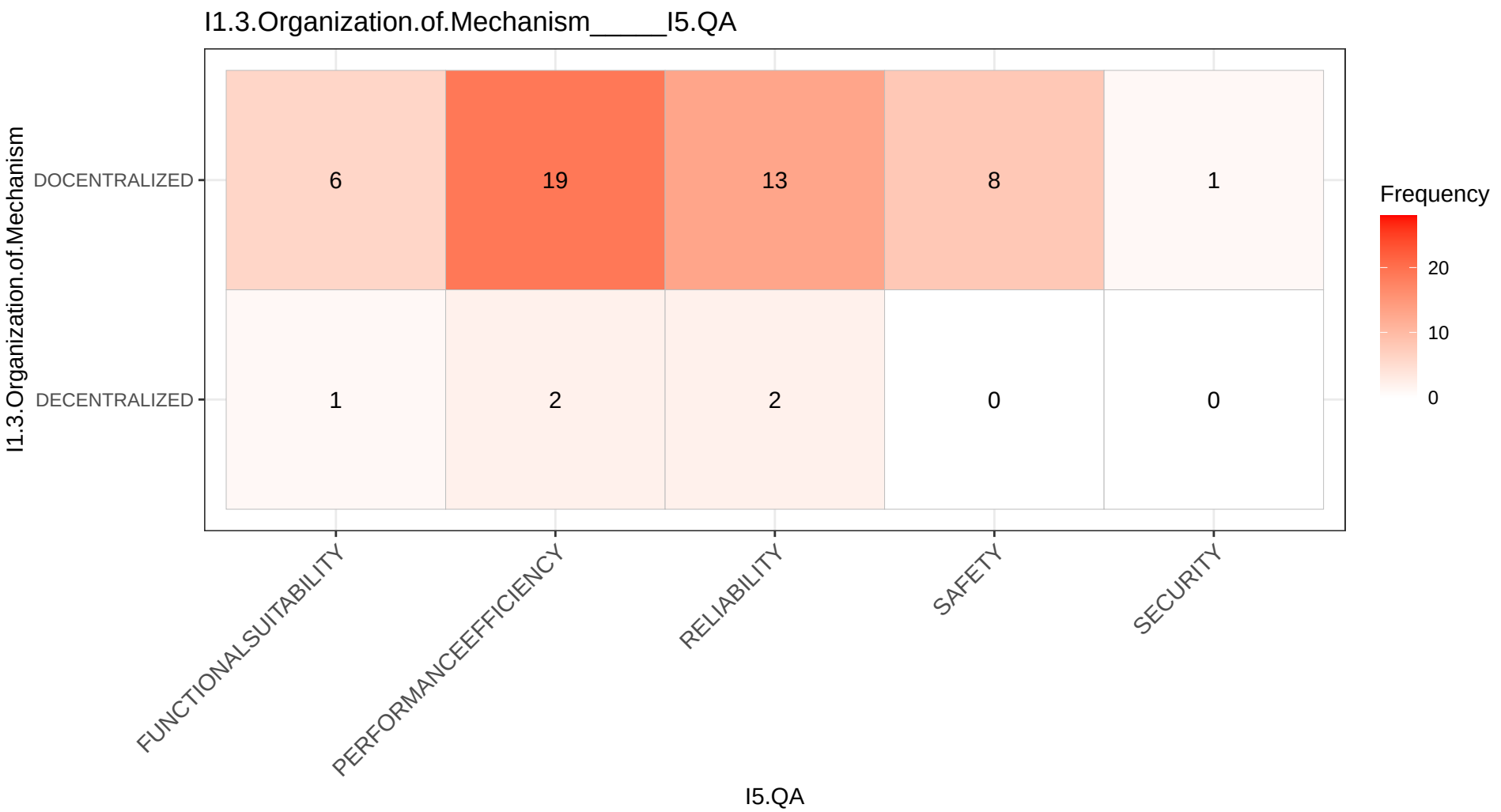
I1.3.Organization.of.Mechanism_____I5.QA
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
6
19
13
8
1
1
2
2
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FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
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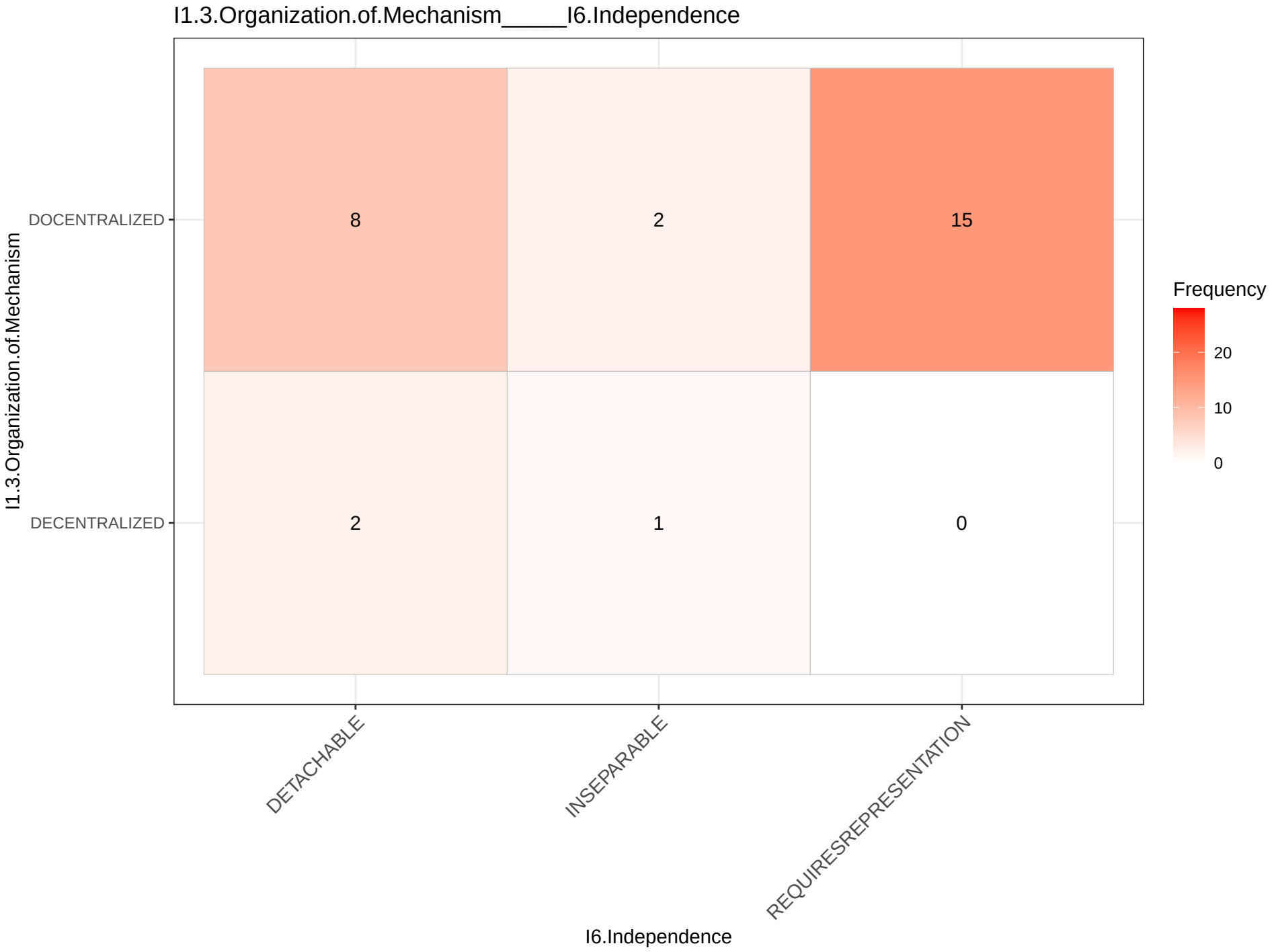
I1.3.Organization.of.Mechanism_____I6.Independence
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
8
2
15
2
1
0
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
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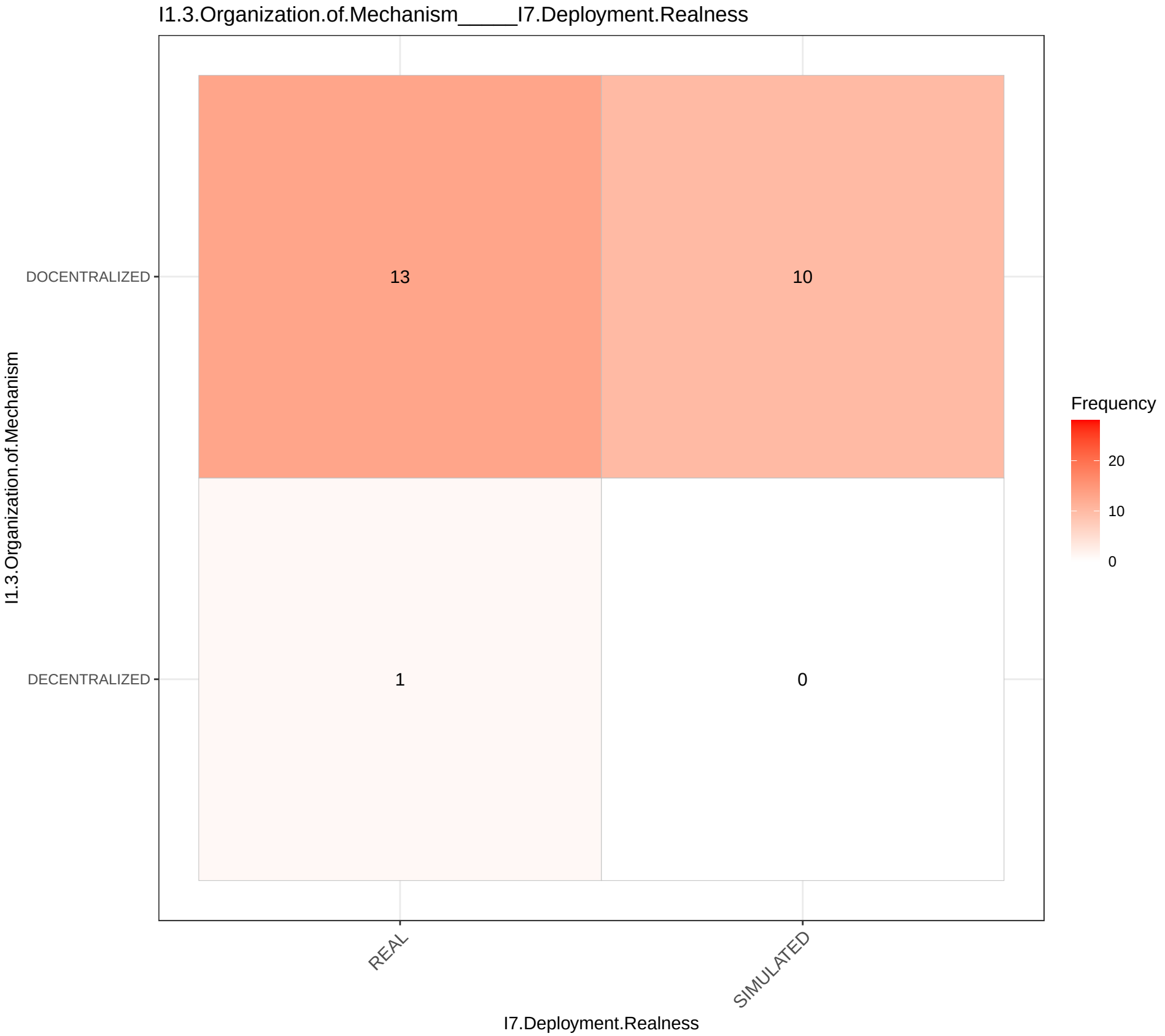
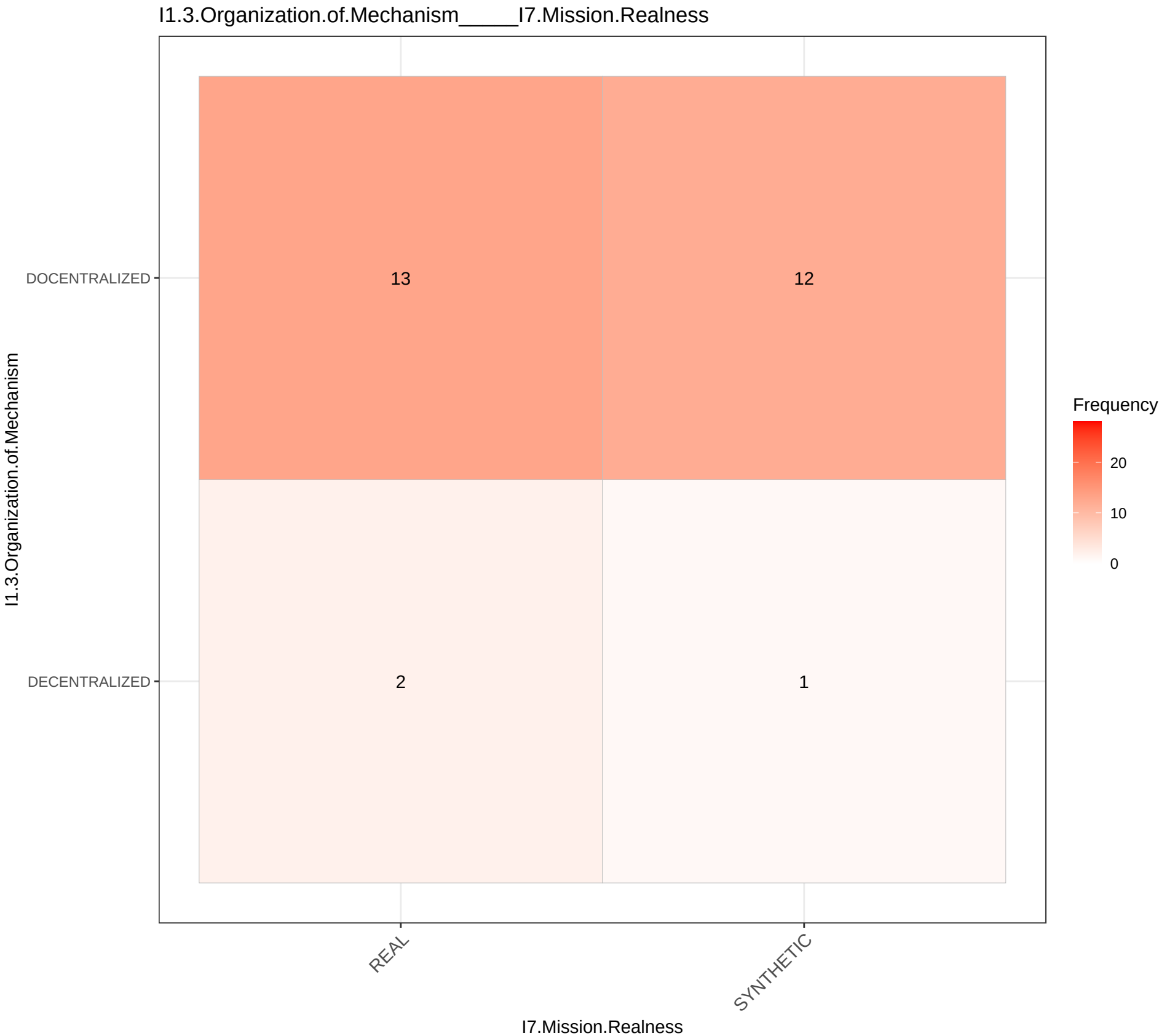
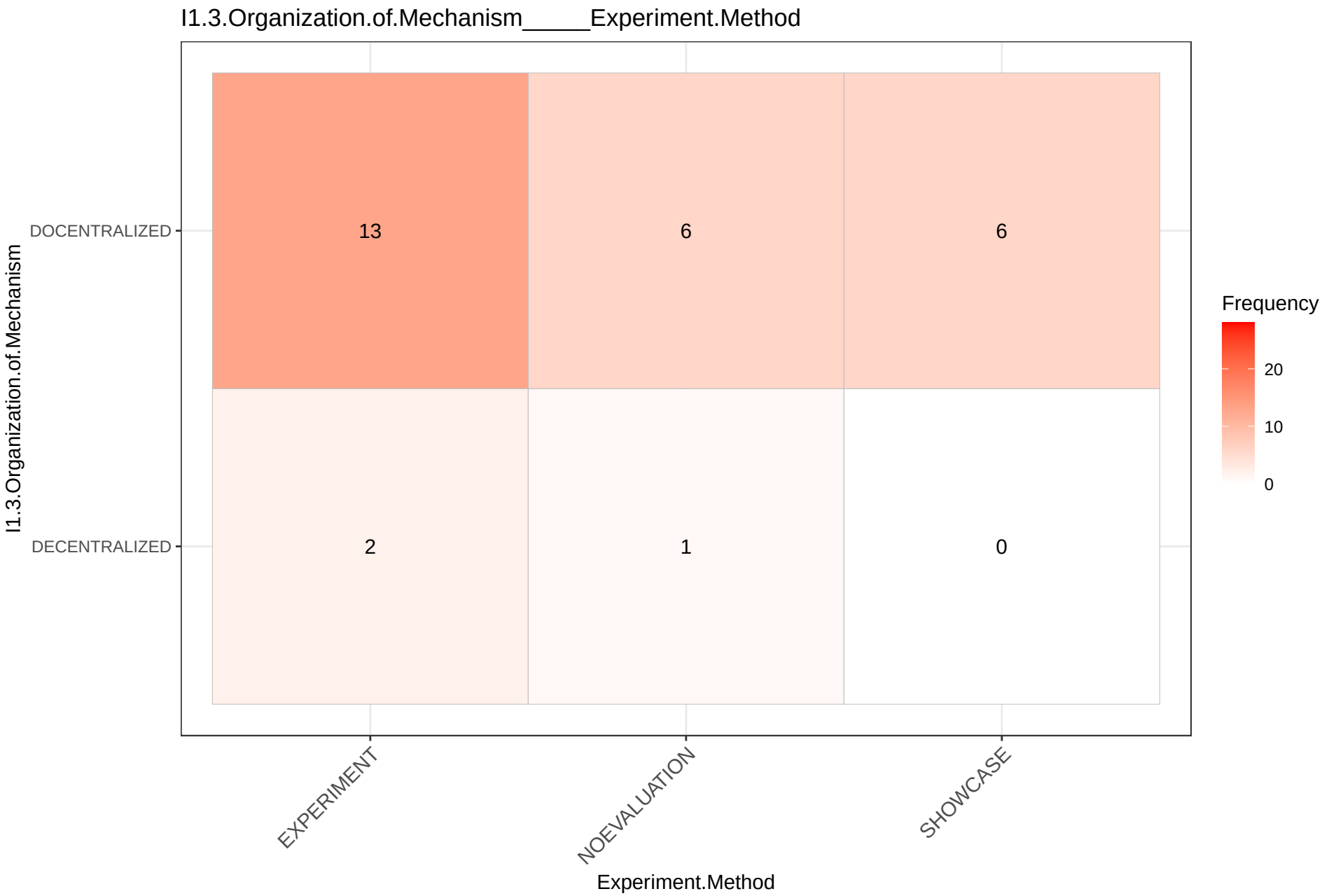

I1.3.Organization.of.Mechanism_____I7.Deployment.Realness
DOCENTRALIZED
DECENTRALIZED
13
10
1
0
I1.3.Organization.of.Mechanism
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____I7.Mission.Realness
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
13
12
2
1
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0


I1.3.Organization.of.Mechanism_____Experiment.Method
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
13
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6
2
1
0
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
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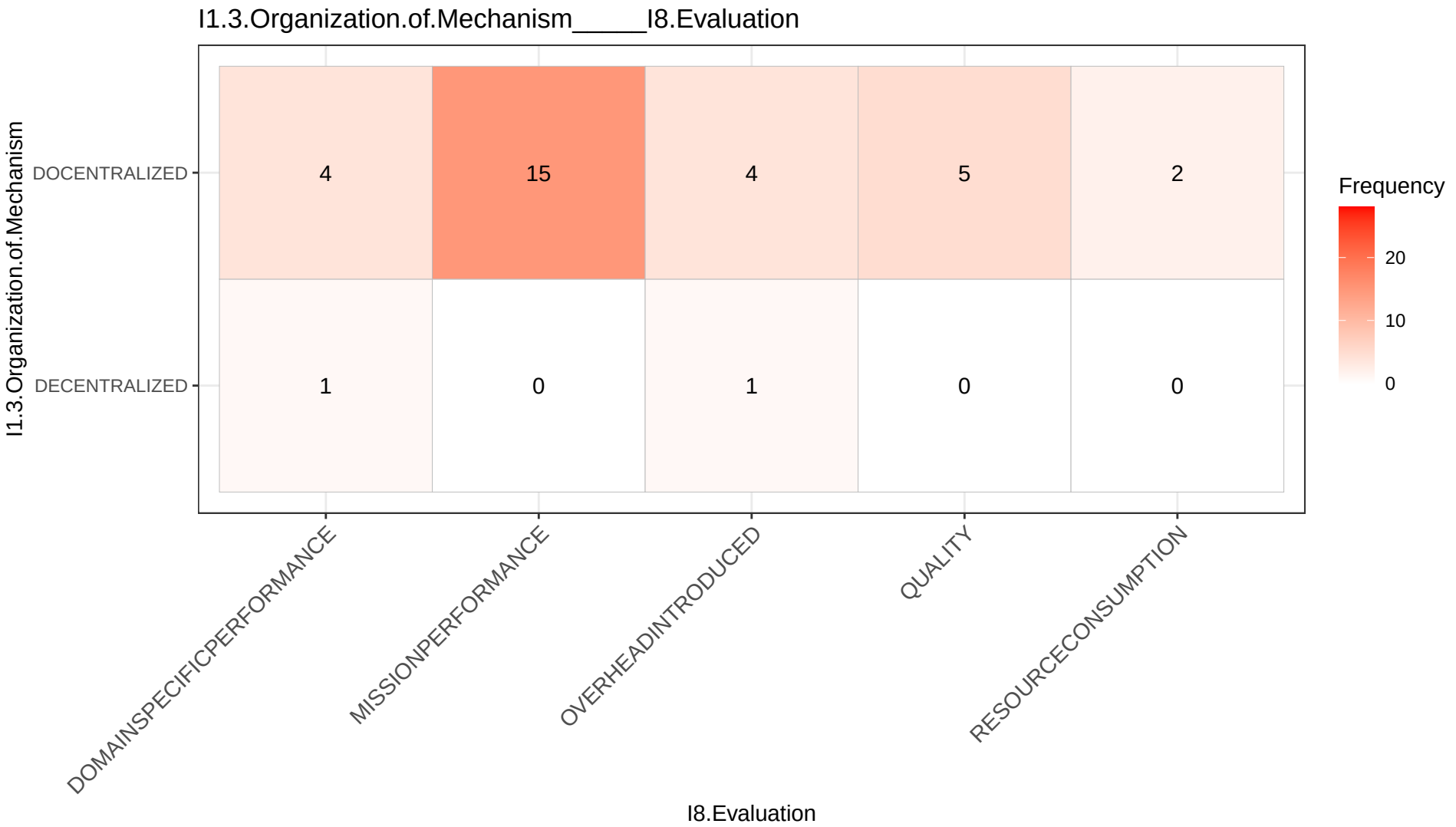
I1.3.Organization.of.Mechanism_____I8.Evaluation
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
4
15
4
5
2
1
0
1
0
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DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
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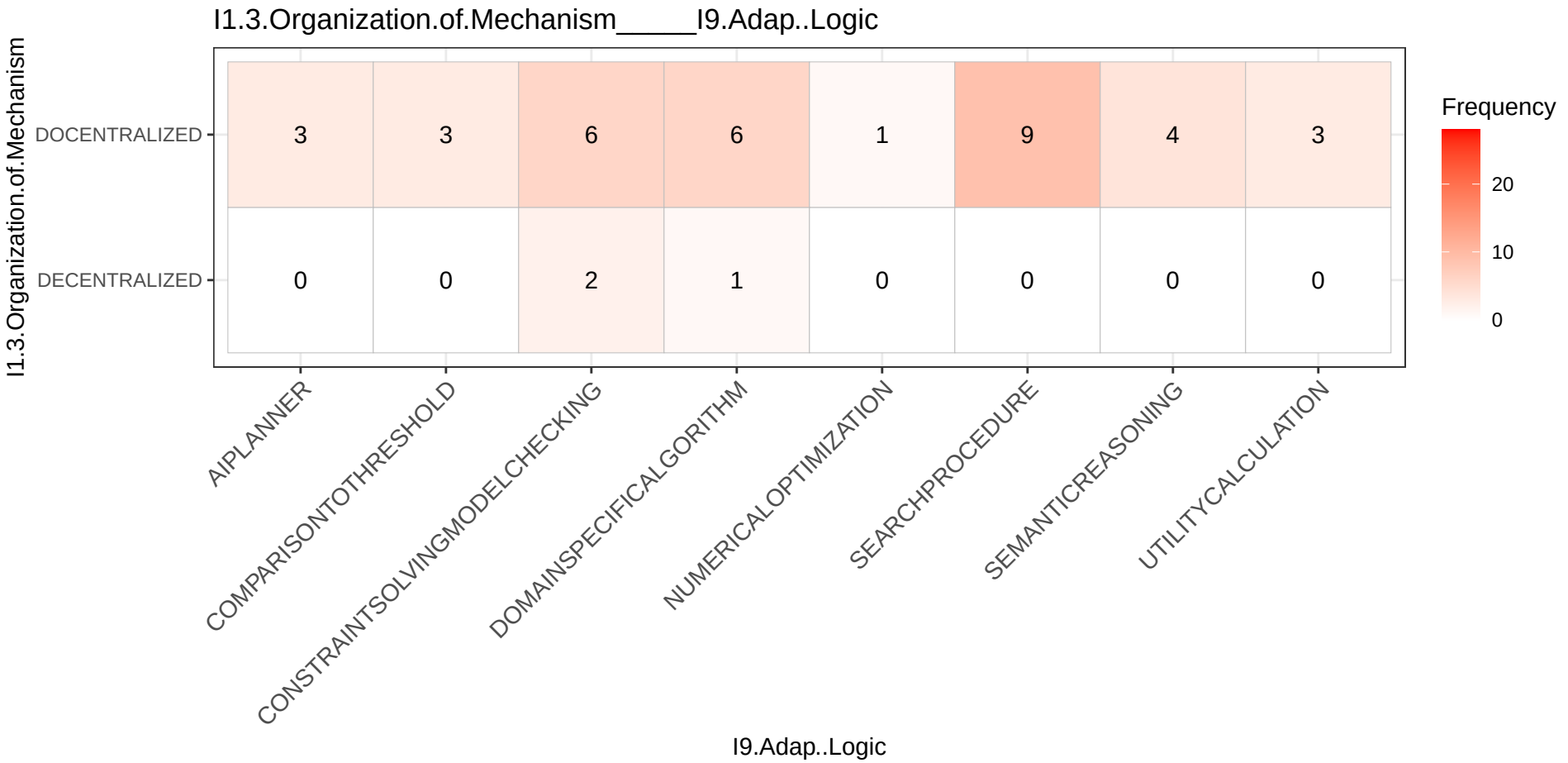
I1.3.Organization.of.Mechanism_____I9.Adap..Logic
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
3
3
6
6
1
9
4
3
0
0
2
1
0
0
0
0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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10
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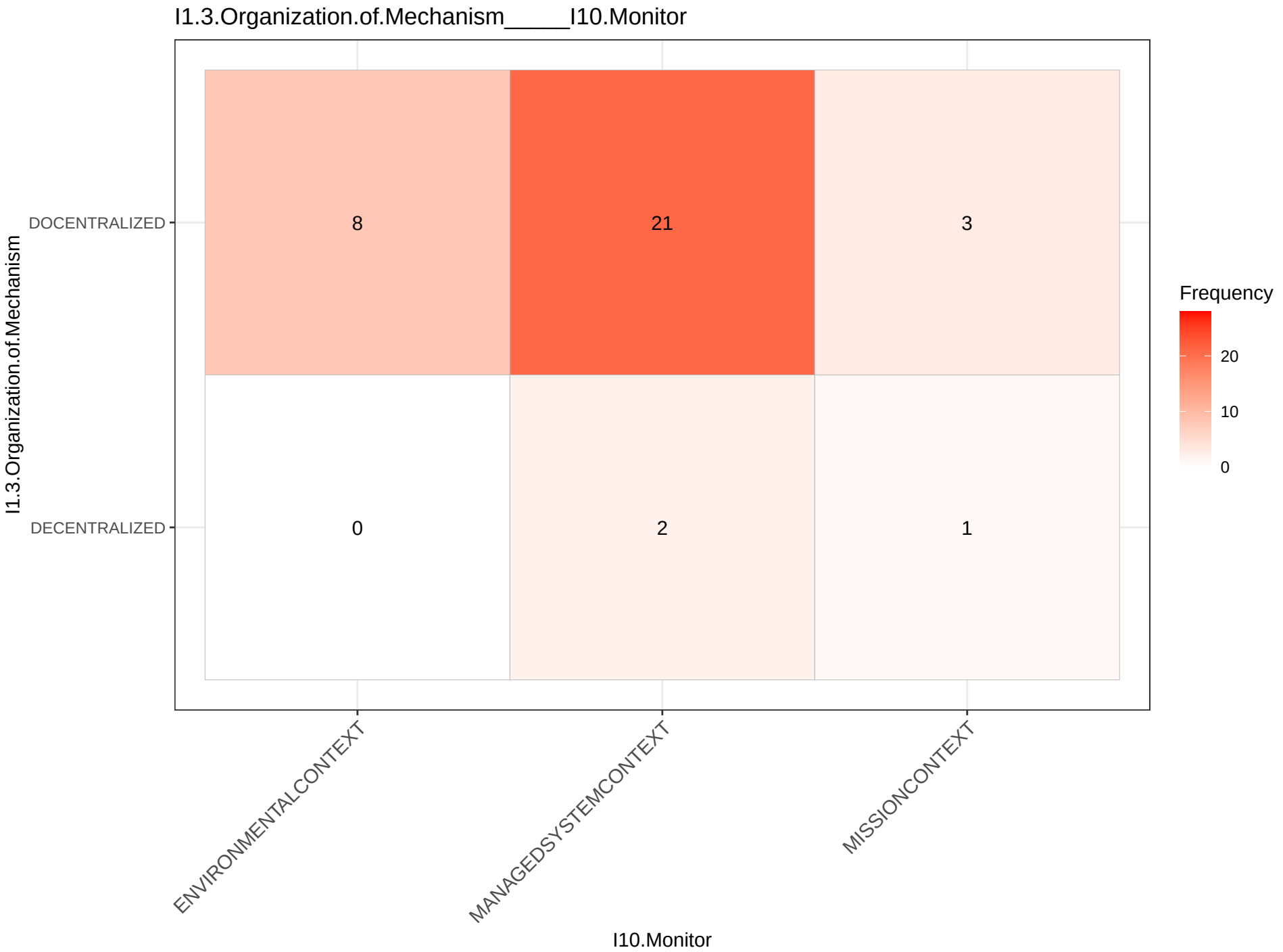
I1.3.Organization.of.Mechanism_____I10.Monitor
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
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21
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2
1
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
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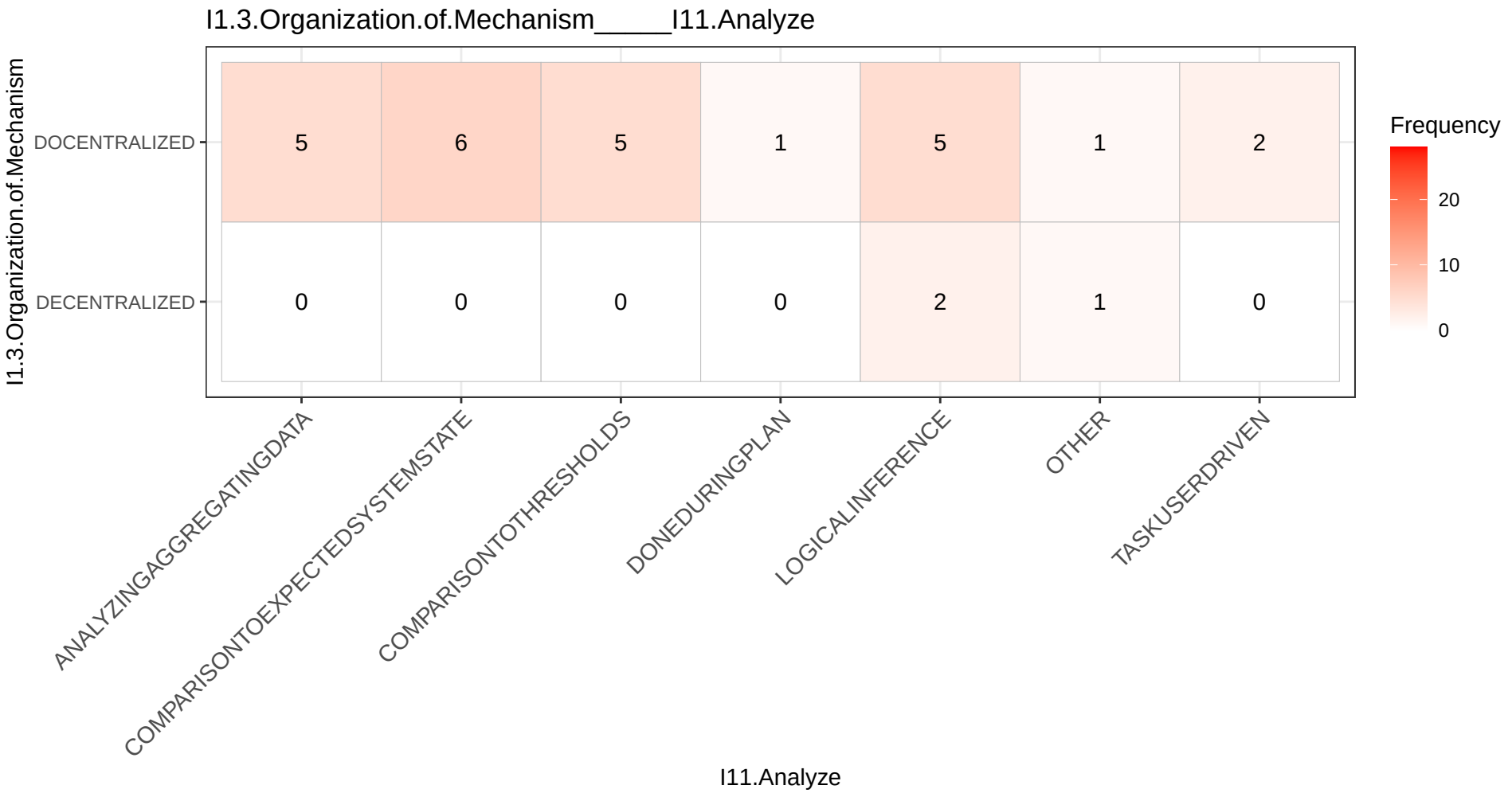
I1.3.Organization.of.Mechanism_____I11.Analyze
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
5
6
5
1
5
1
2
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0
0
0
2
1
0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
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LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
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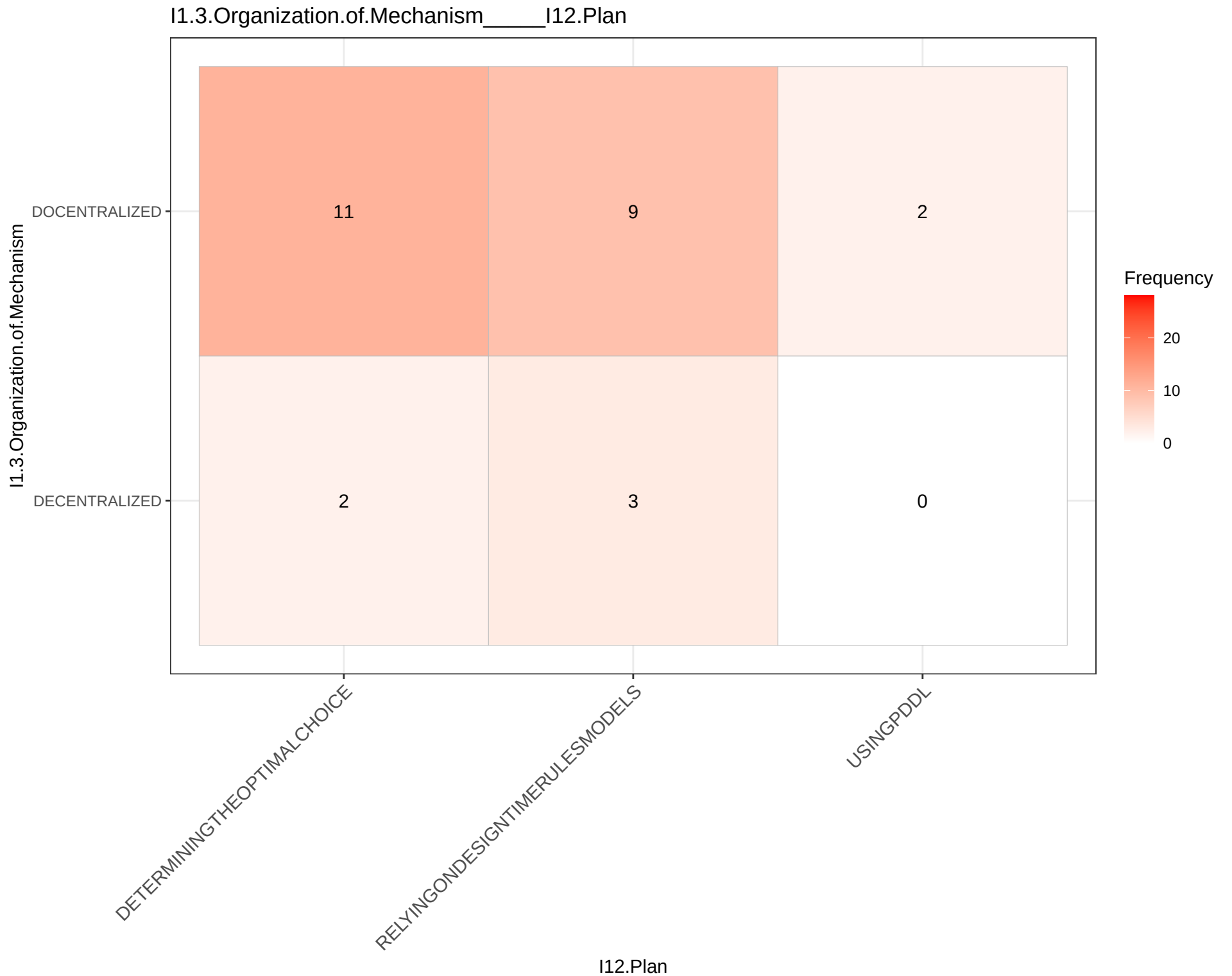
I1.3.Organization.of.Mechanism_____I12.Plan
DOCENTRALIZED
DECENTRALIZED
I1.3.Organization.of.Mechanism
11
9
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2
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DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
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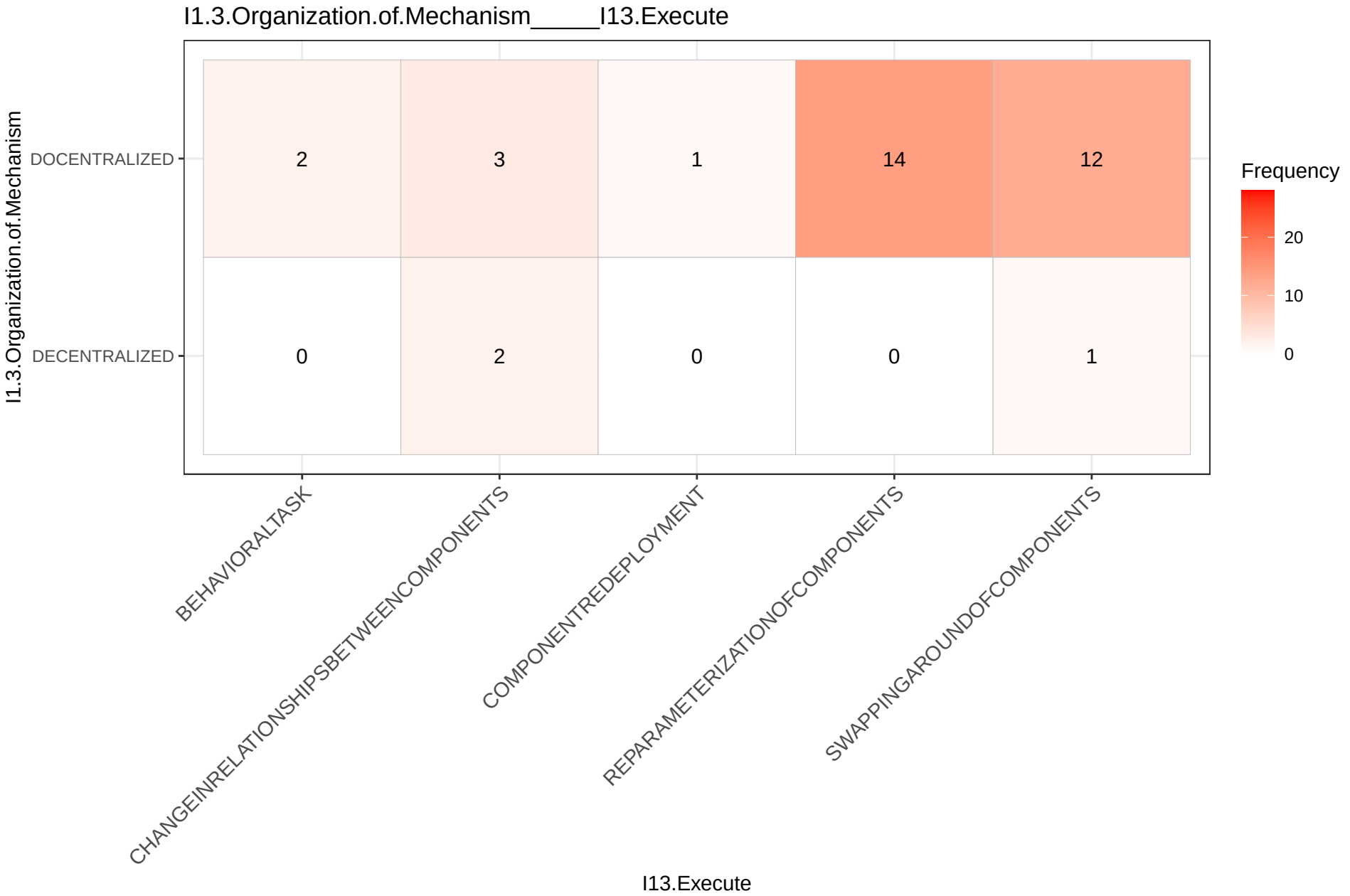
I1.3.Organization.of.Mechanism_____I13.Execute
I1.3.Organization.of.Mechanism
DOCENTRALIZED
DECENTRALIZED
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3
1
14
12
0
2
0
0
1
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
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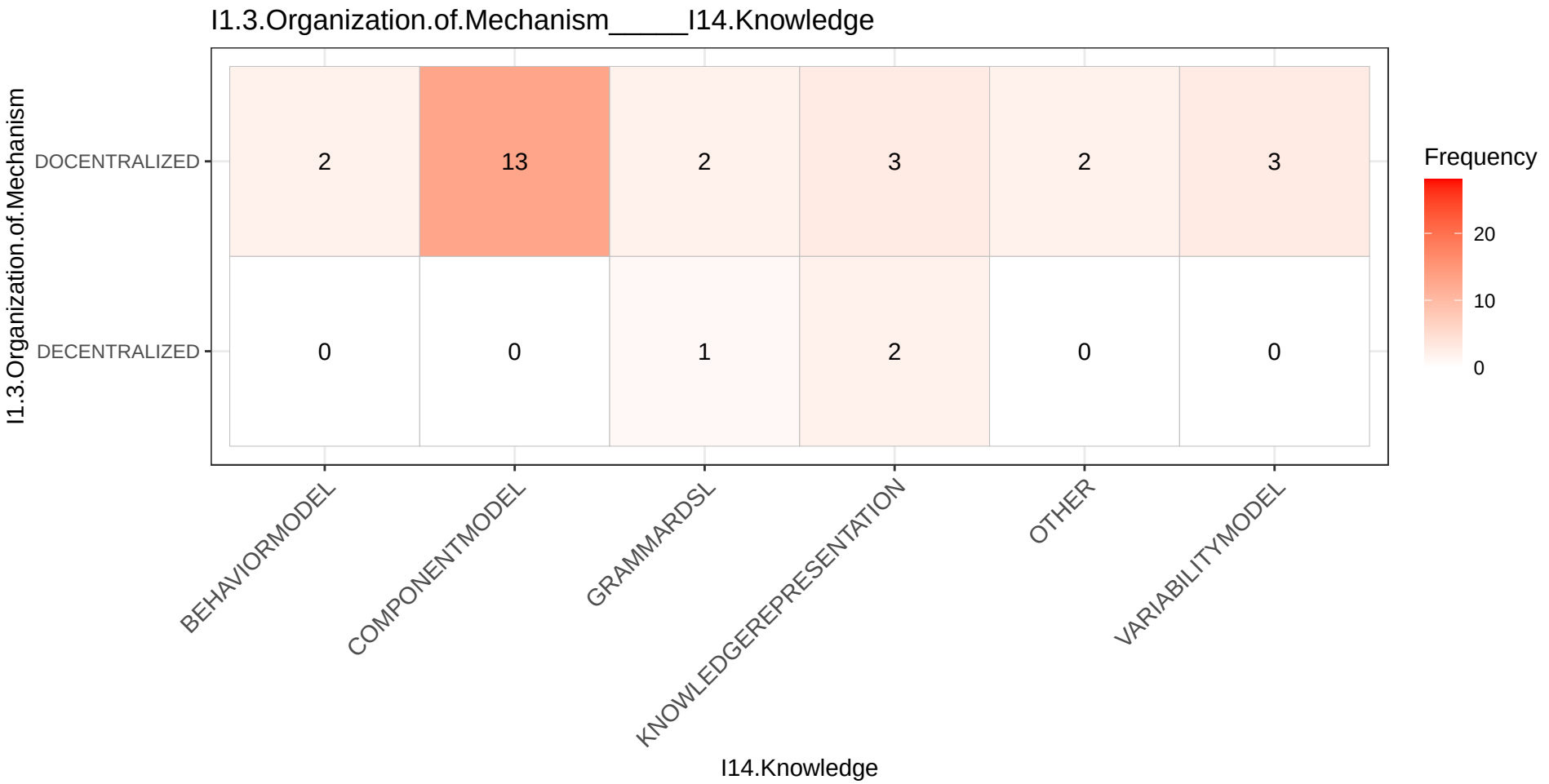
I1.3.Organization.of.Mechanism_____I14.Knowledge
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DOCENTRALIZED
DECENTRALIZED
2
13
2
3
2
3
0
0
1
2
0
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BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
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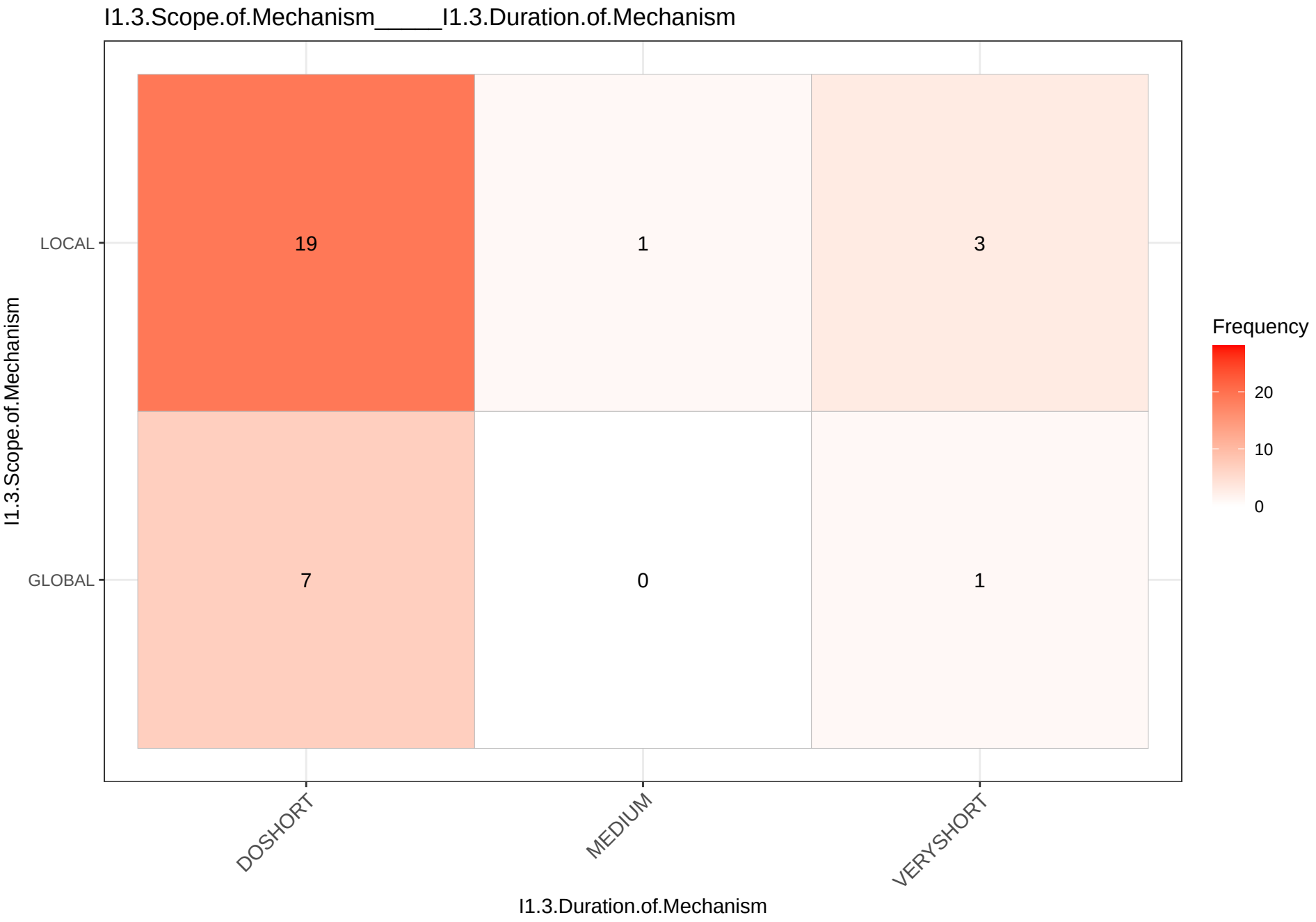
I1.3.Scope.of.Mechanism_____I1.3.Duration.of.Mechanism
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
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0
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DOSHORT
MEDIUM
VERYSHORT
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Frequency
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10
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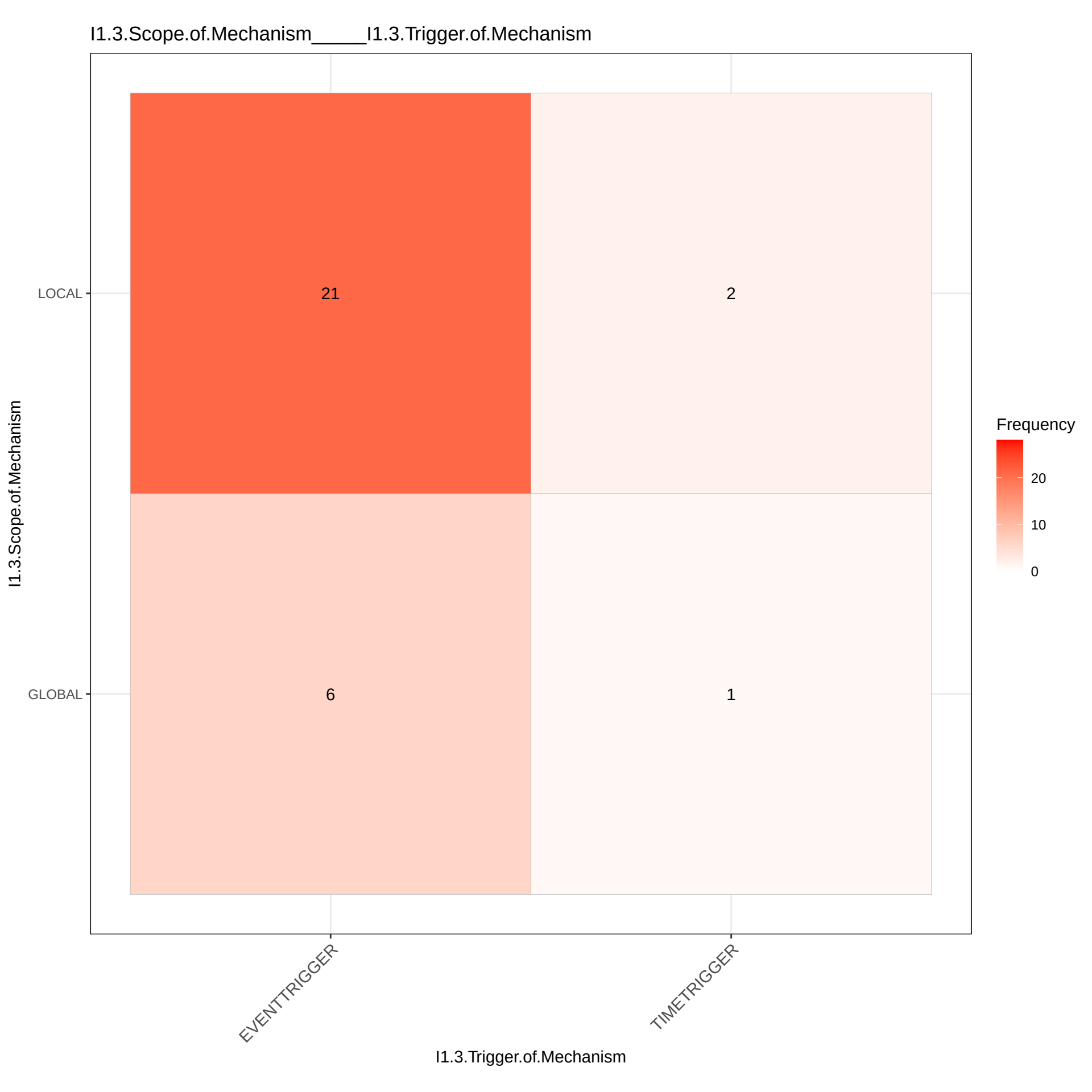
I1.3.Scope.of.Mechanism_____I1.3.Trigger.of.Mechanism
LOCAL
GLOBAL
21
2
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1
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EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
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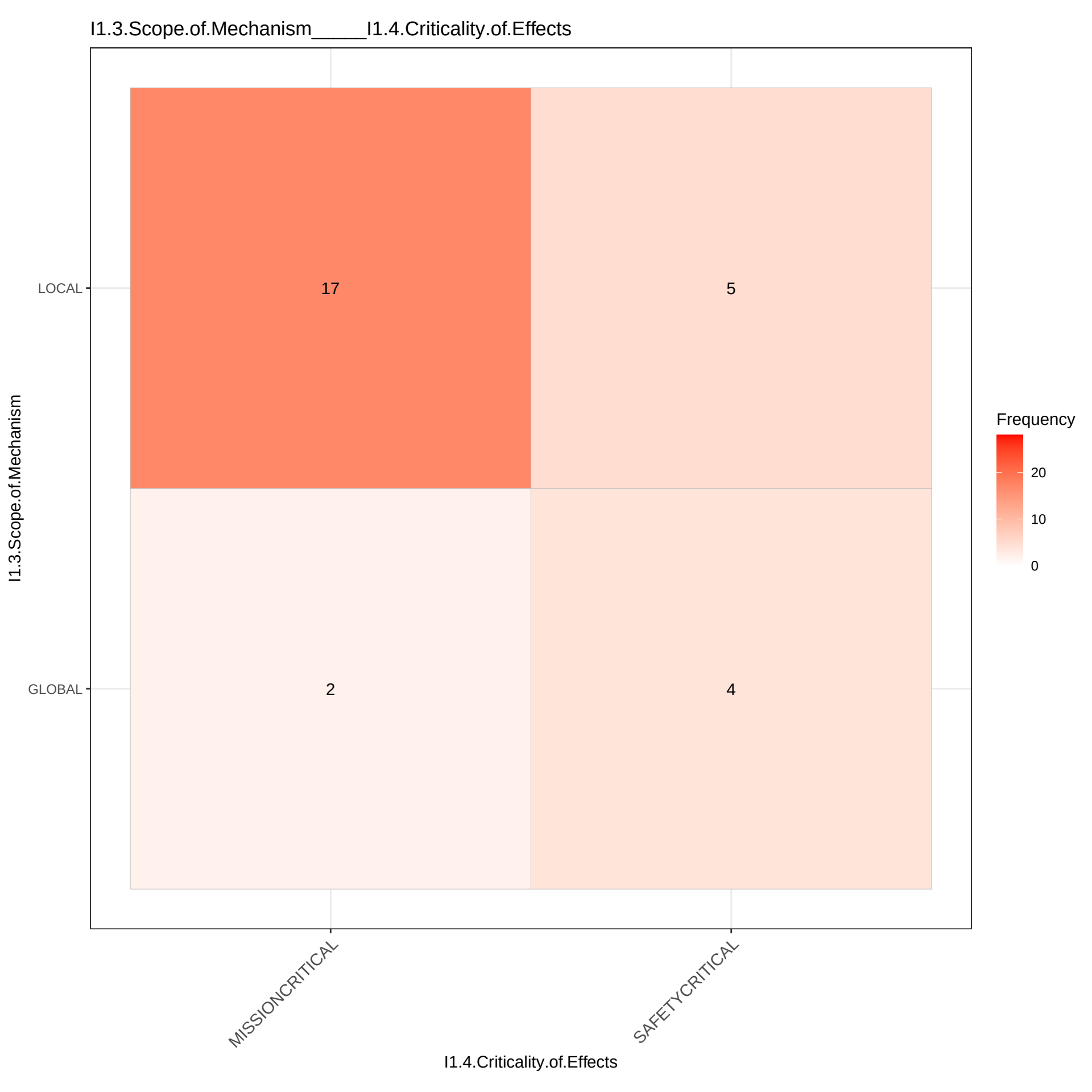
I1.3.Scope.of.Mechanism_____I1.4.Criticality.of.Effects
LOCAL
GLOBAL
17
5
2
4
I1.3.Scope.of.Mechanism
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
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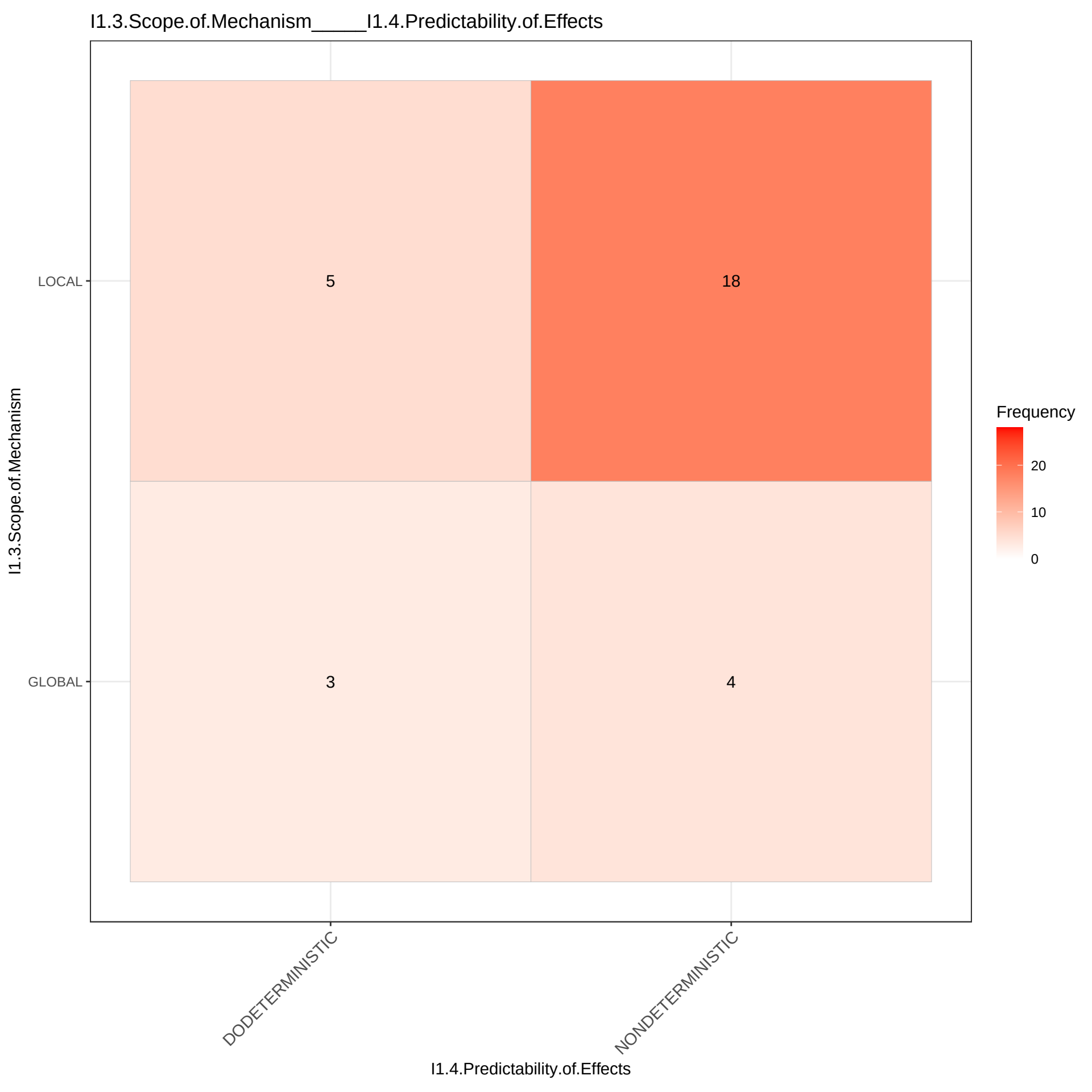
I1.3.Scope.of.Mechanism_____I1.4.Predictability.of.Effects
LOCAL
GLOBAL
5
18
3
4
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DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
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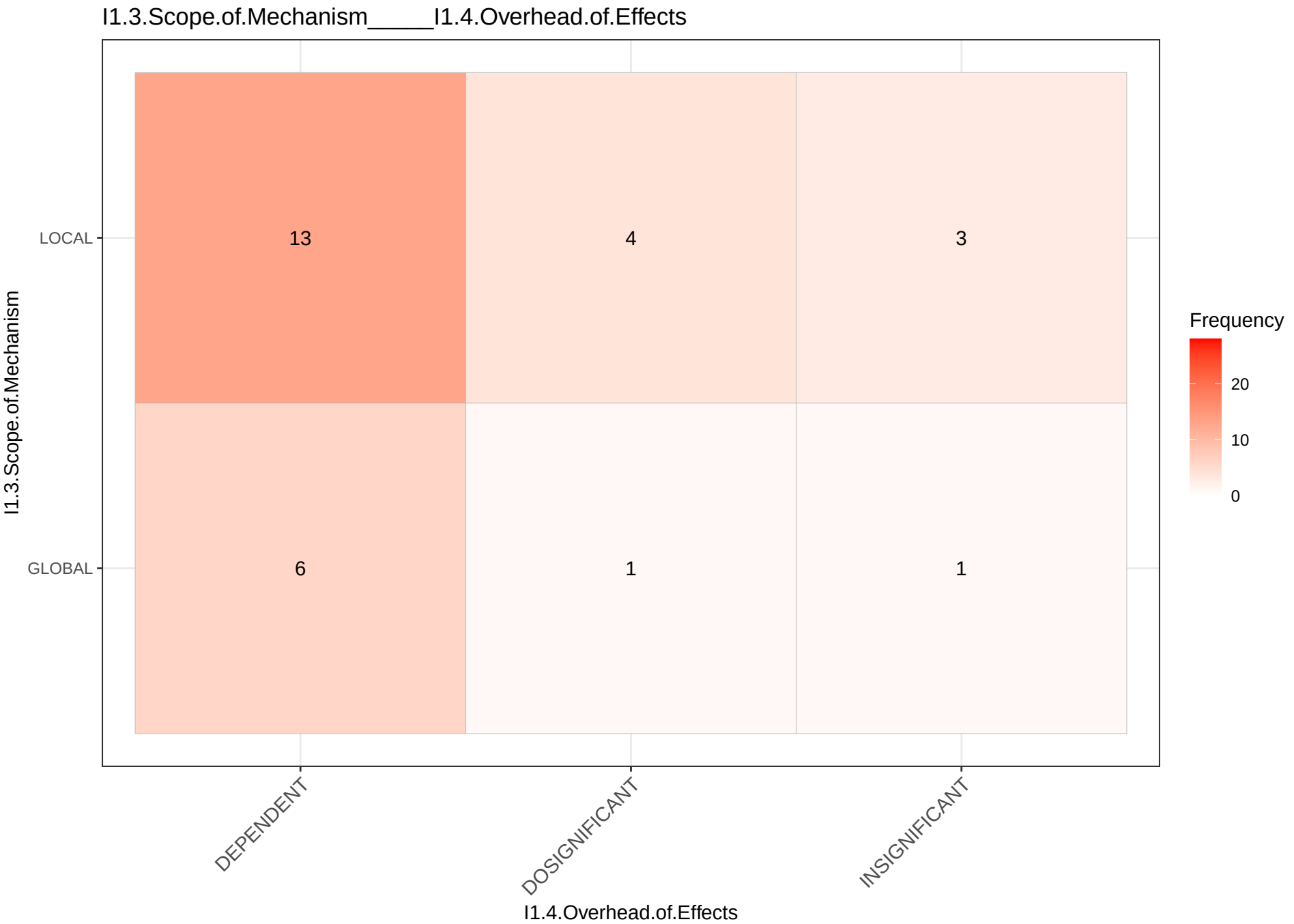
I1.3.Scope.of.Mechanism_____I1.4.Overhead.of.Effects
LOCAL
GLOBAL
13
4
3
6
1
1
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DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
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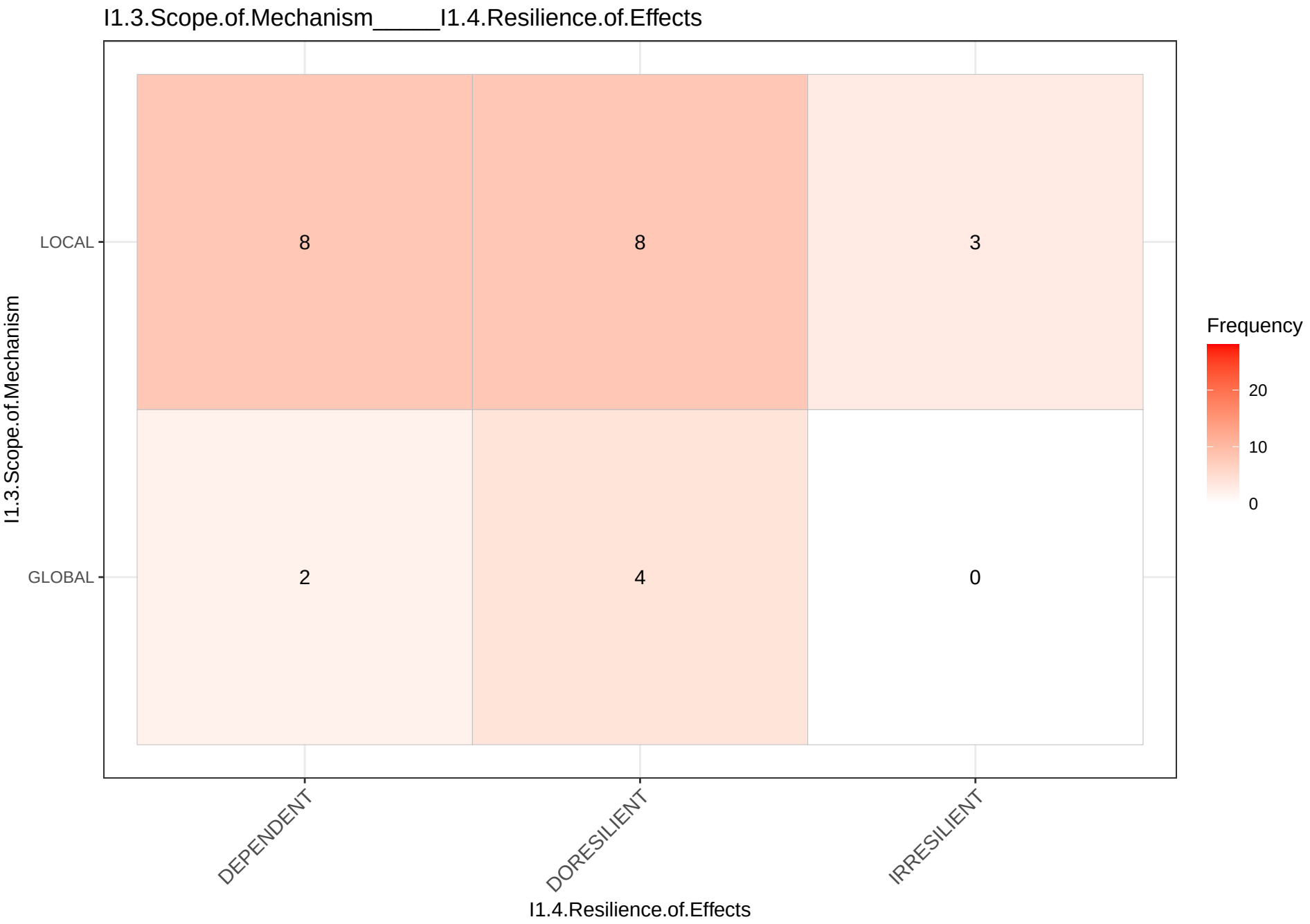
I1.3.Scope.of.Mechanism_____I1.4.Resilience.of.Effects
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
8
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DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
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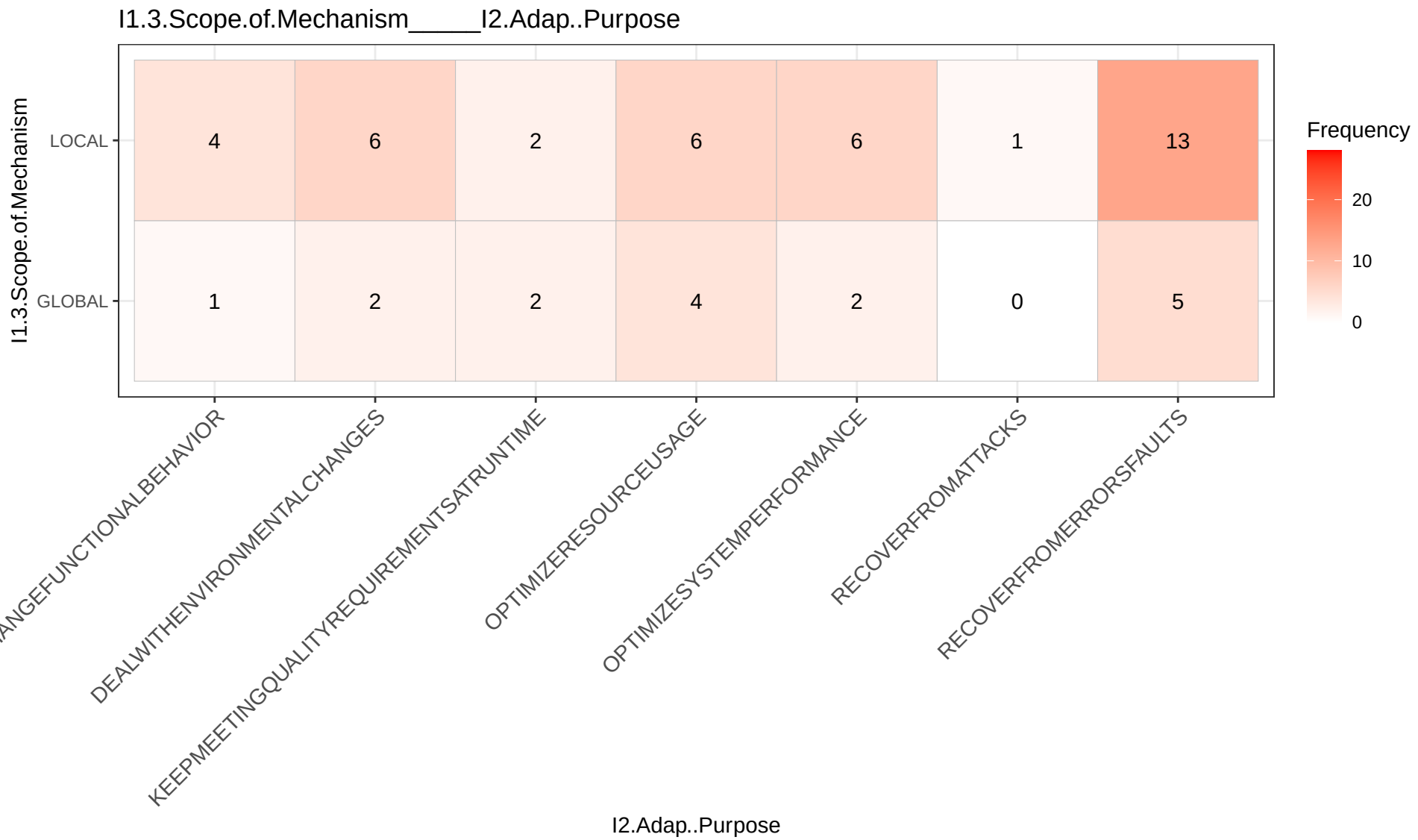
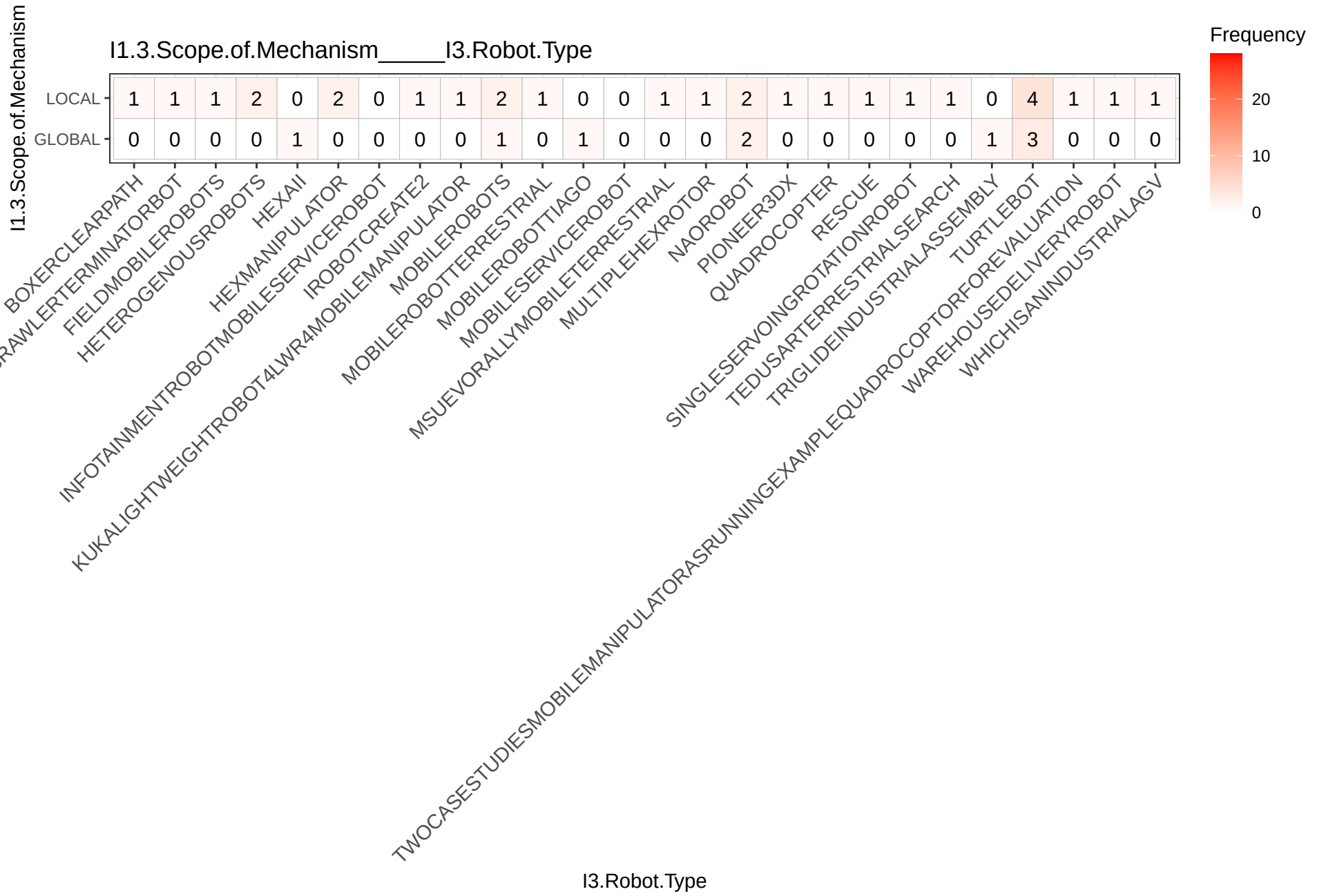

I1.3.Scope.of.Mechanism_____I2.Adap..Purpose
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
4
6
2
6
6
1
13
1
2
2
4
2
0
5
Frequency
20
10
0
ANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose


I1.3.Scope.of.Mechanism_____I3.Robot.Type
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
1 1 1 2 0 2 0 1 1 2 1 0 0 1 1 2 1 1 1 1 1 0 4 1 1 1
0 0 0 0 1 0 0 0 0 1 0 1 0 0 0 2 0 0 0 0 0 1 3 0 0 0
BOXERCLEARPATH
RAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
IROBOTCREATE2
INFOTAINMENTROBOTMOBILESERVICEROBOT
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
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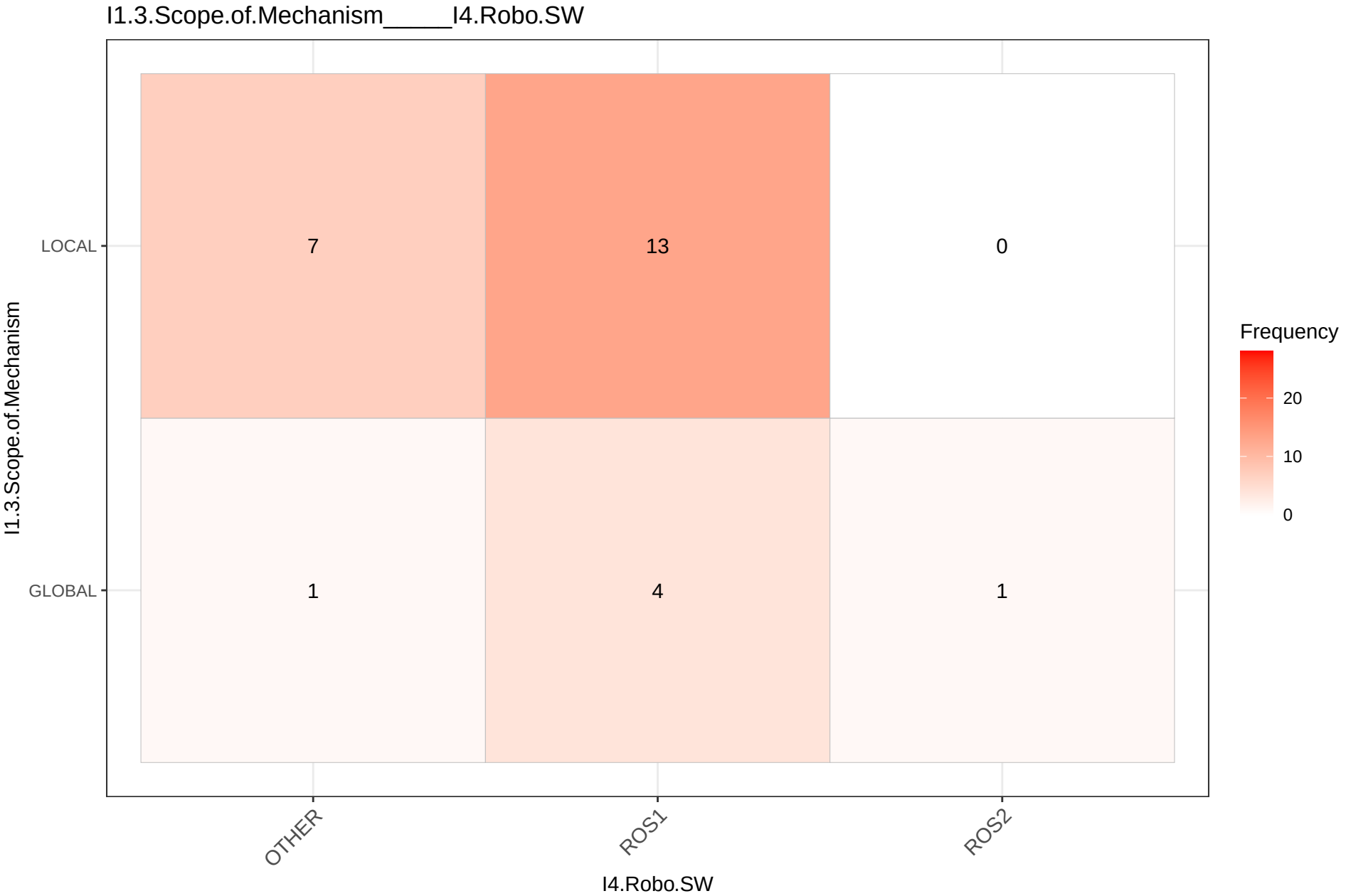
I1.3.Scope.of.Mechanism_____I4.Robo.SW
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
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13
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4
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OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
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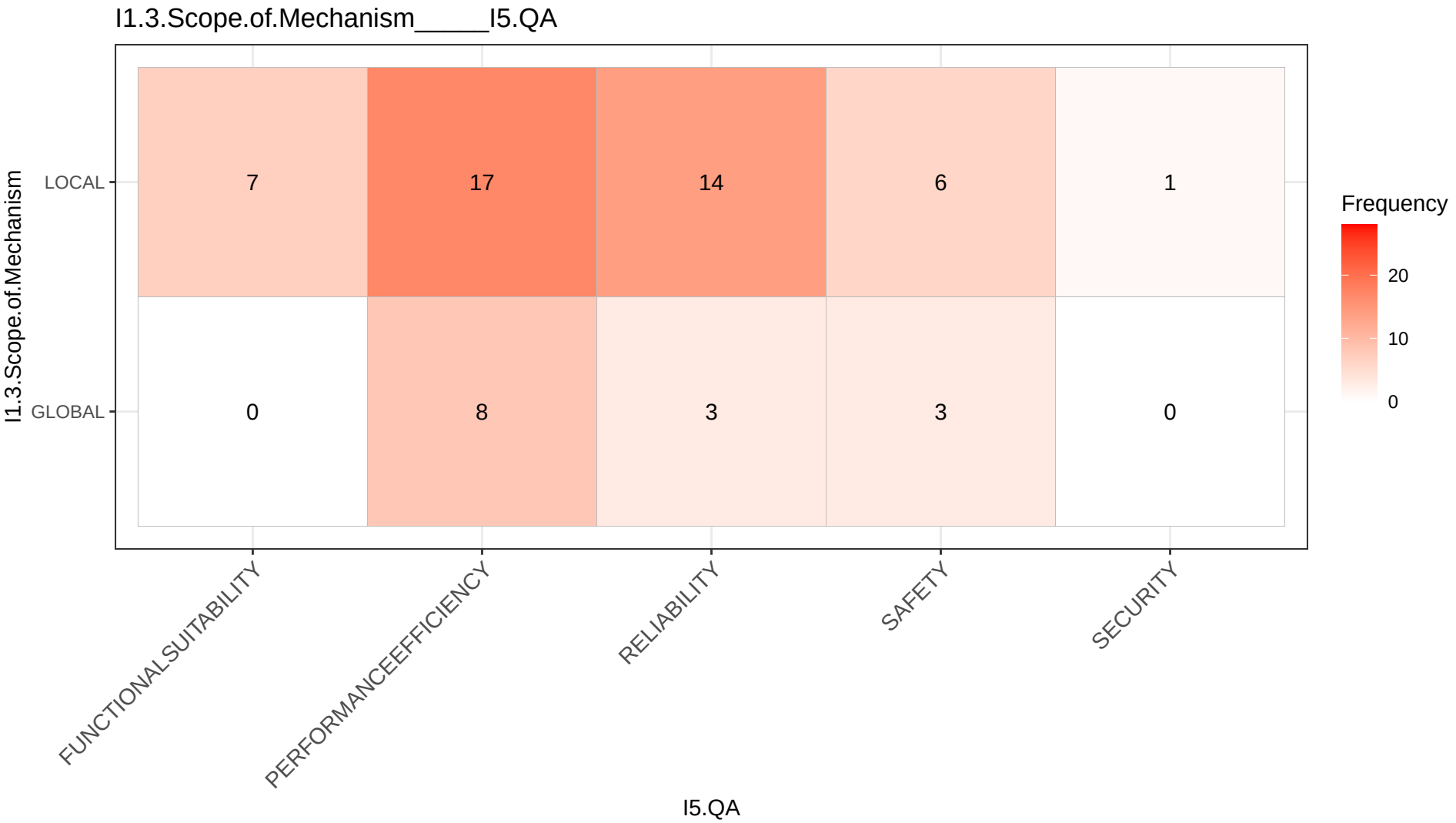
I1.3.Scope.of.Mechanism_____I5.QA
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
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17
14
6
1
0
8
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3
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PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
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10
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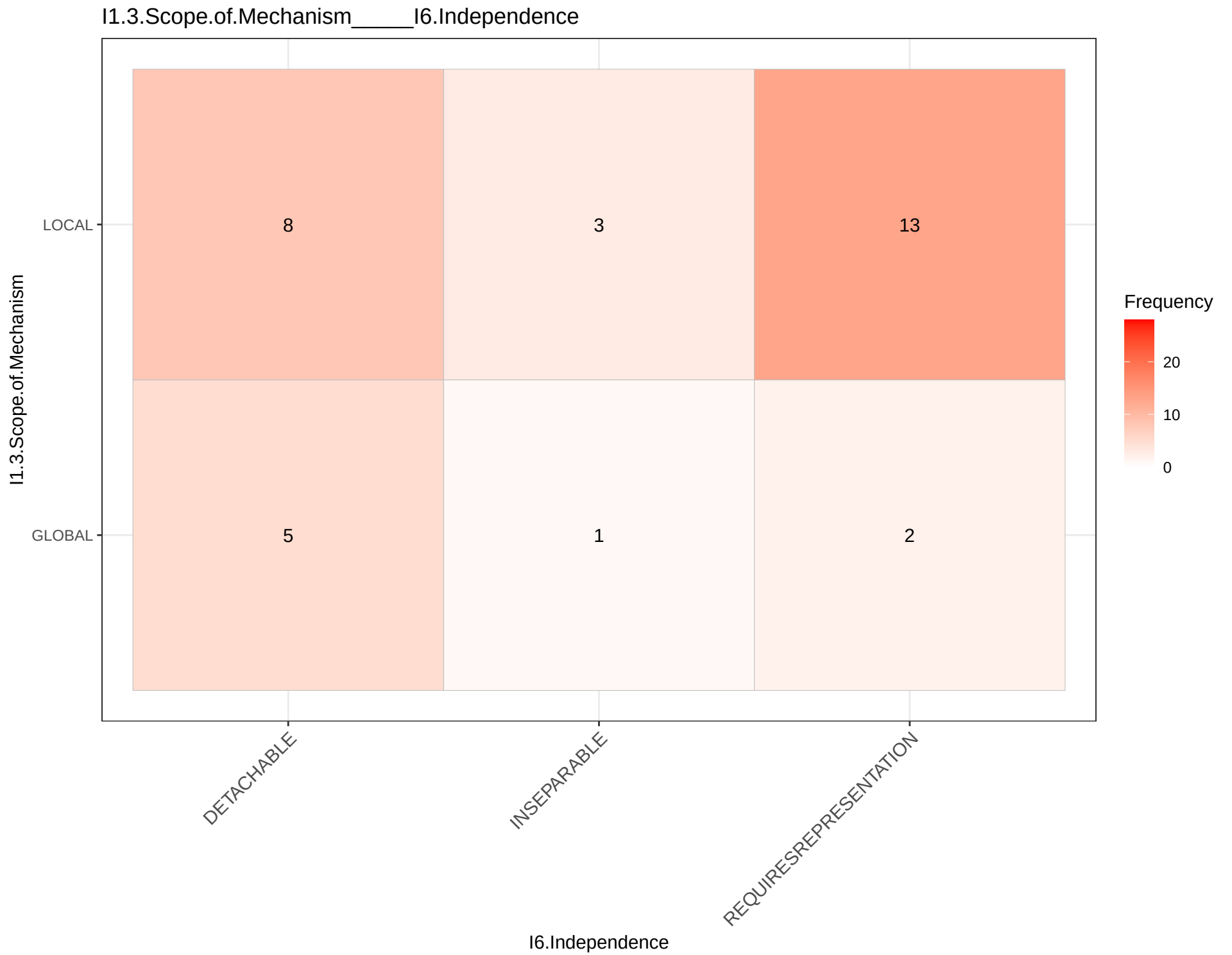
I1.3.Scope.of.Mechanism_____I6.Independence
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
8
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5
1
2
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
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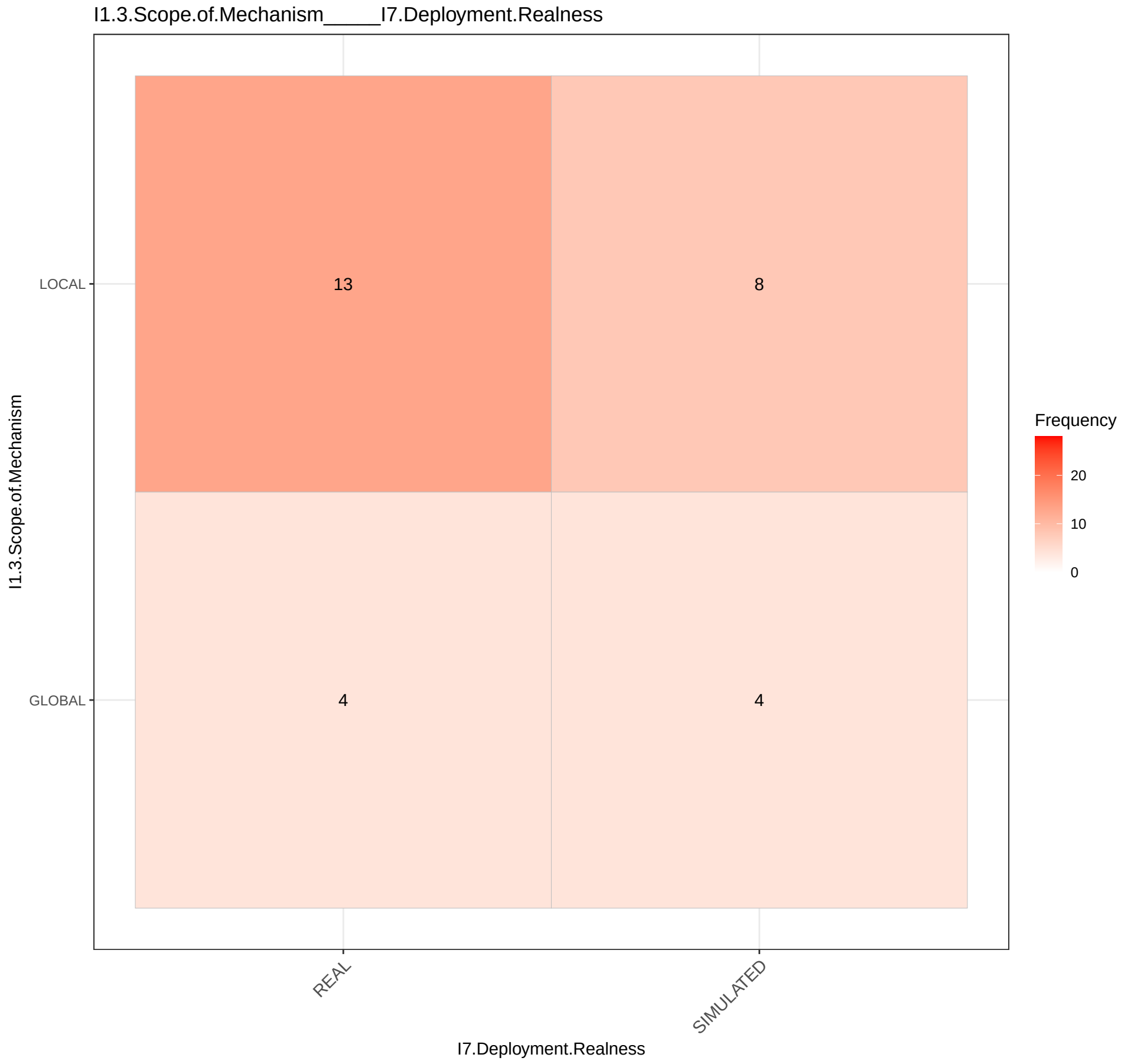
I1.3.Scope.of.Mechanism_____I7.Deployment.Realness
LOCAL
GLOBAL
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4
REAL
SIMULATED
I1.3.Scope.of.Mechanism
I7.Deployment.Realness
Frequency
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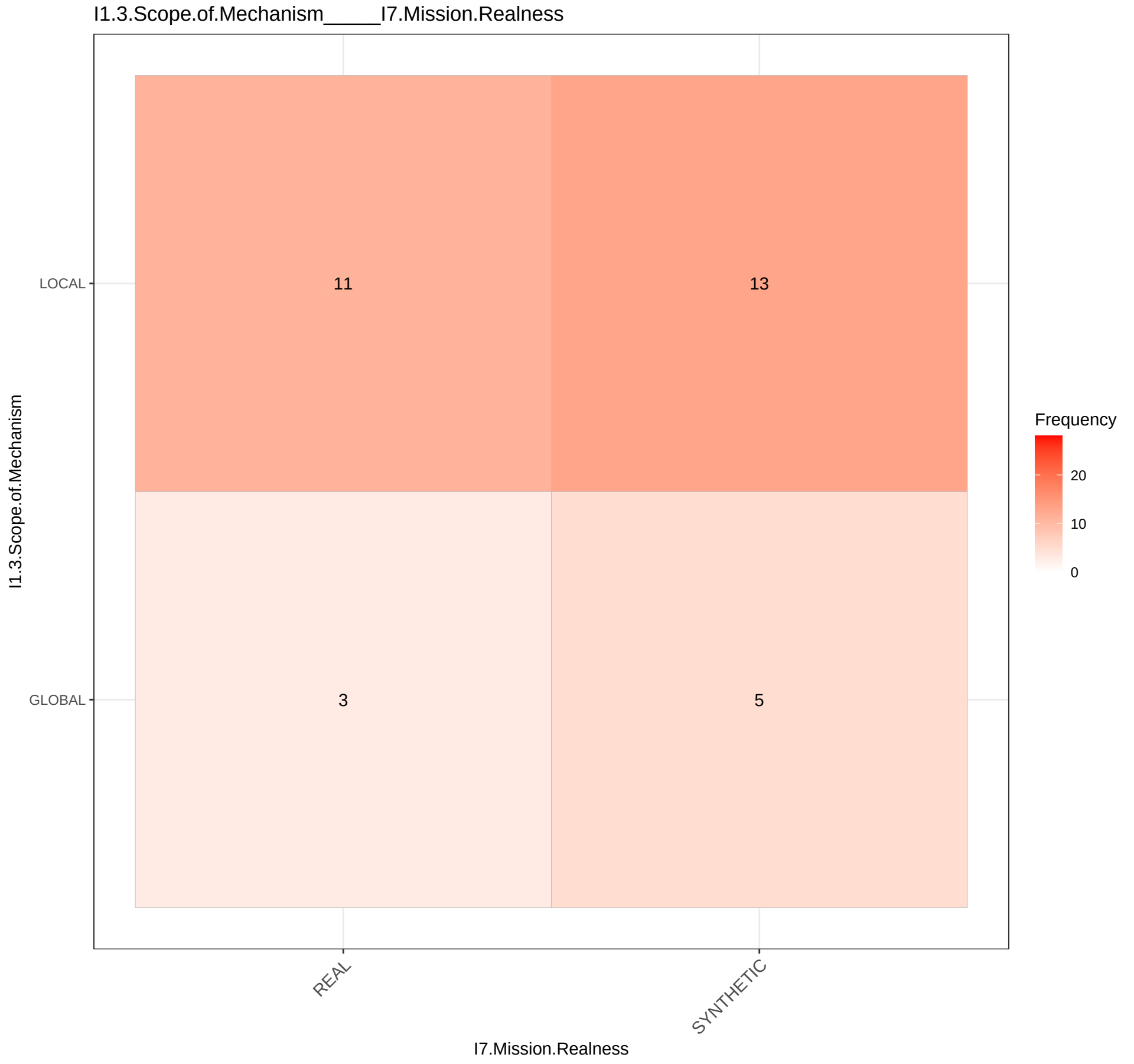
I1.3.Scope.of.Mechanism_____I7.Mission.Realness
LOCAL
GLOBAL
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13
3
5
REAL
SYNTHETIC
I7.Mission.Realness
I1.3.Scope.of.Mechanism
Frequency
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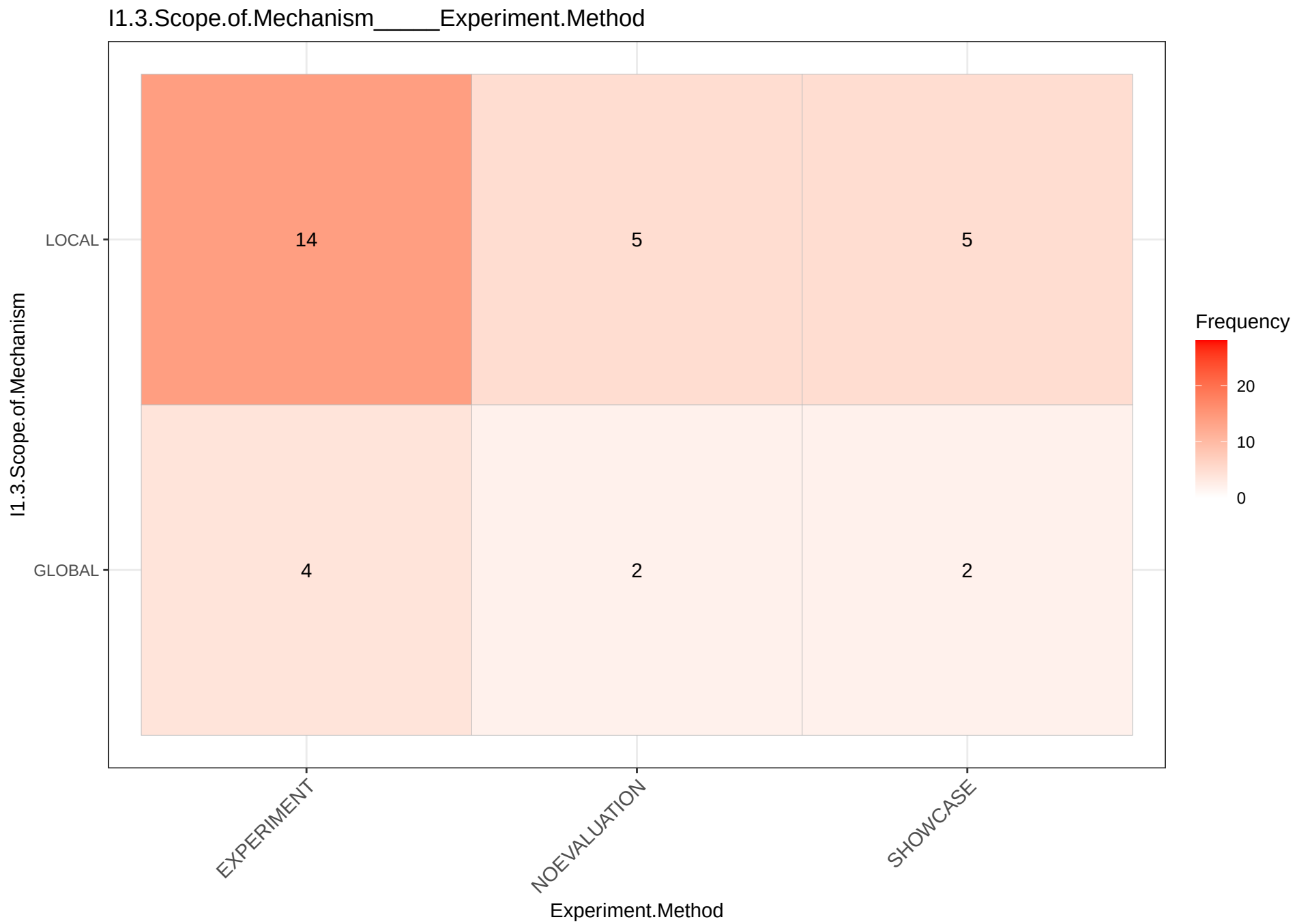
I1.3.Scope.of.Mechanism_____Experiment.Method
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
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SHOWCASE
Experiment.Method
Frequency
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10
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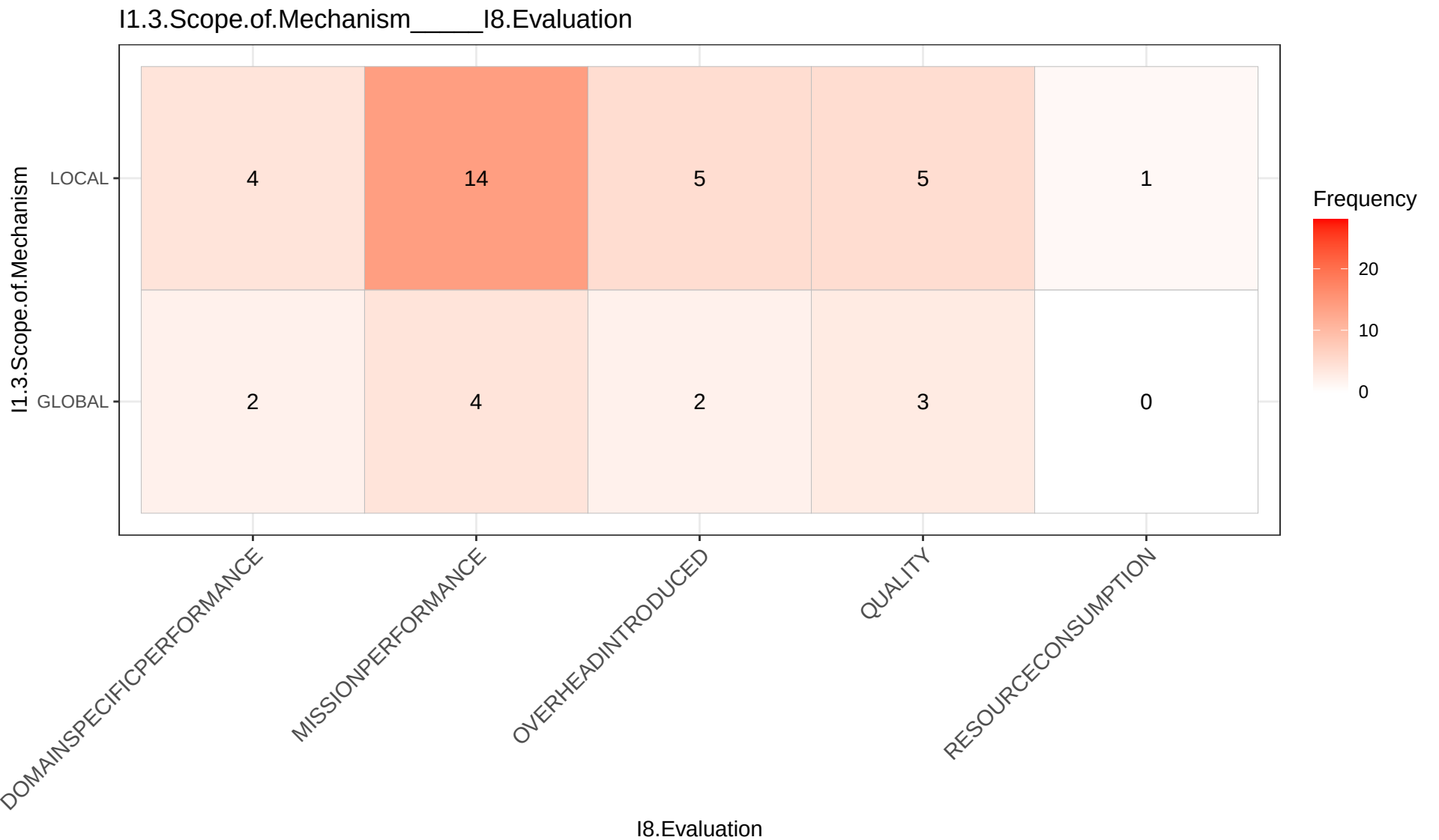
I1.3.Scope.of.Mechanism_____I8.Evaluation
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
4
14
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1
2
4
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DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
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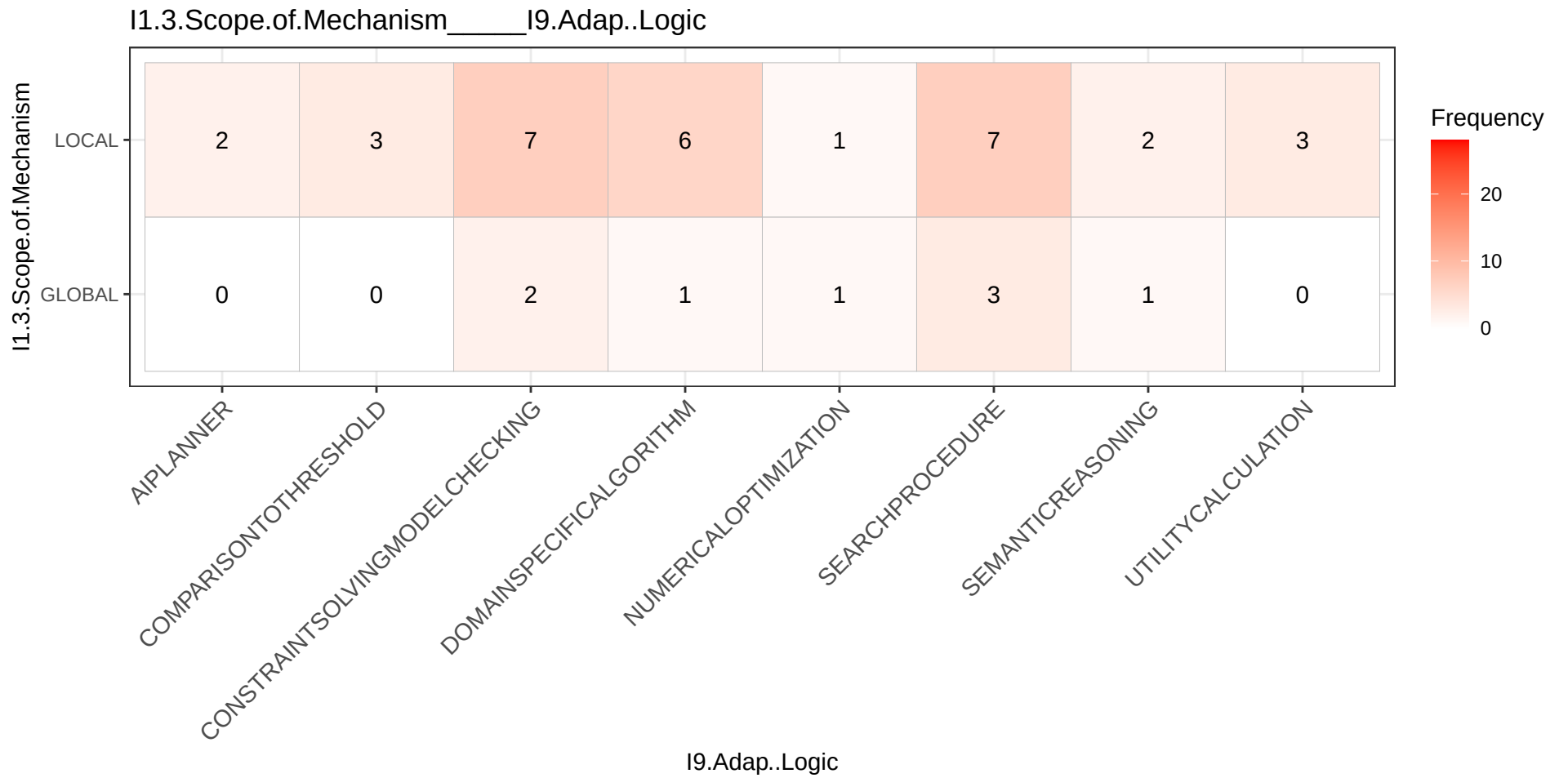
I1.3.Scope.of.Mechanism_____I9.Adap..Logic
I1.3.Scope.of.Mechanism
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GLOBAL
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AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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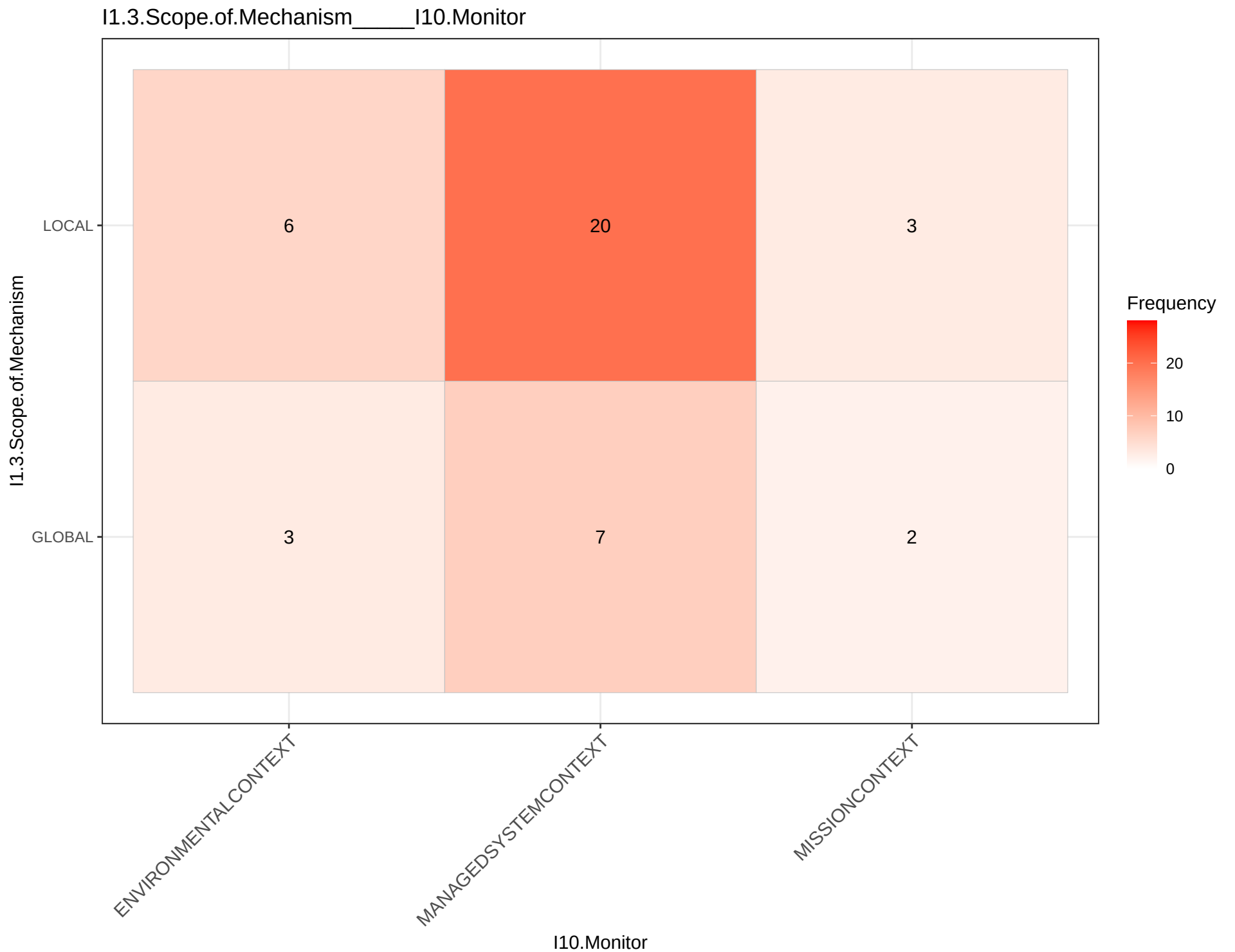
I1.3.Scope.of.Mechanism_____I10.Monitor
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
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ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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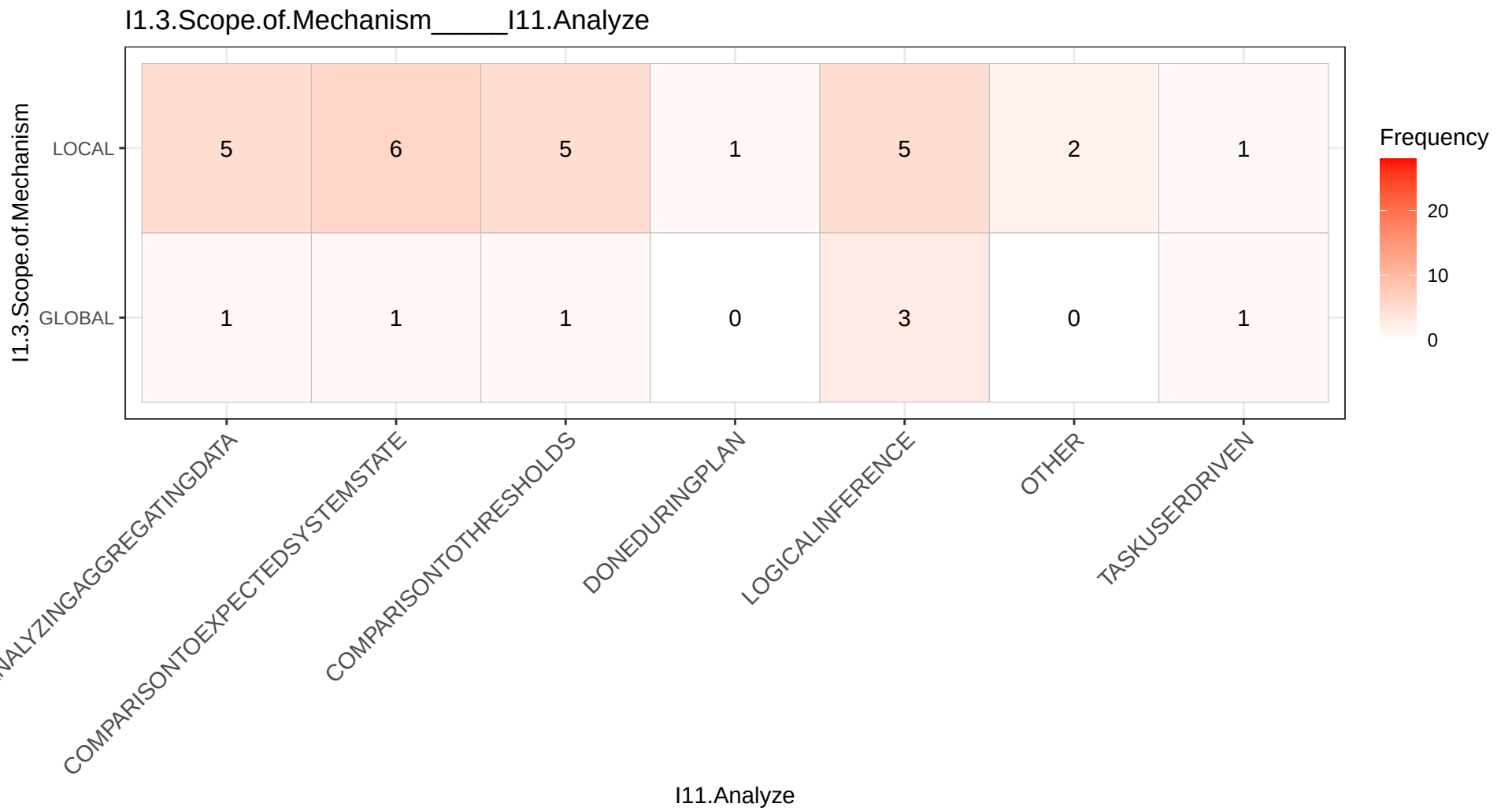
I1.3.Scope.of.Mechanism_____I11.Analyze
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
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6
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1
5
2
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1
1
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3
0
1
Frequency
20
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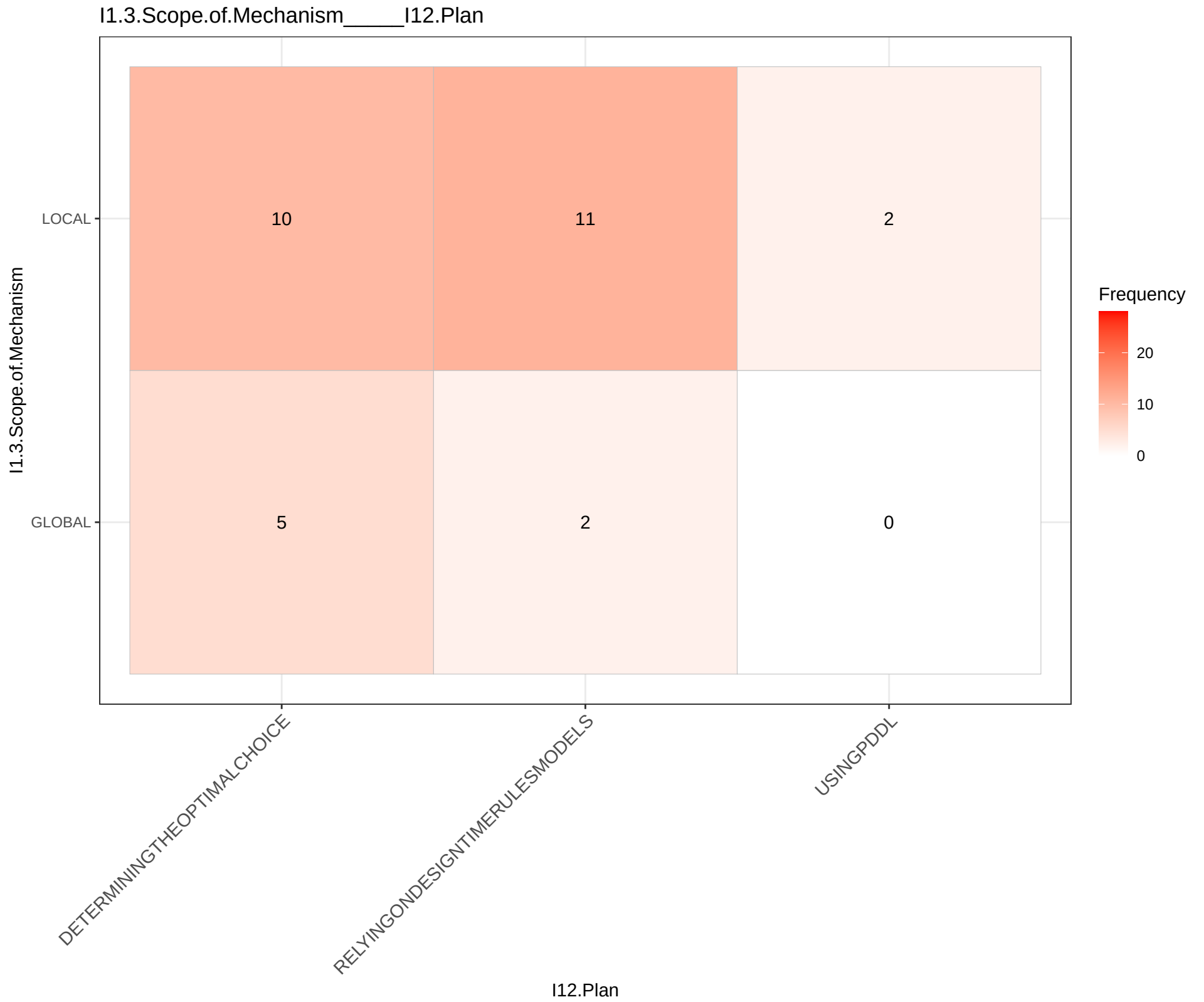
NALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze


I1.3.Scope.of.Mechanism_____I12.Plan
LOCAL
GLOBAL
I1.3.Scope.of.Mechanism
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DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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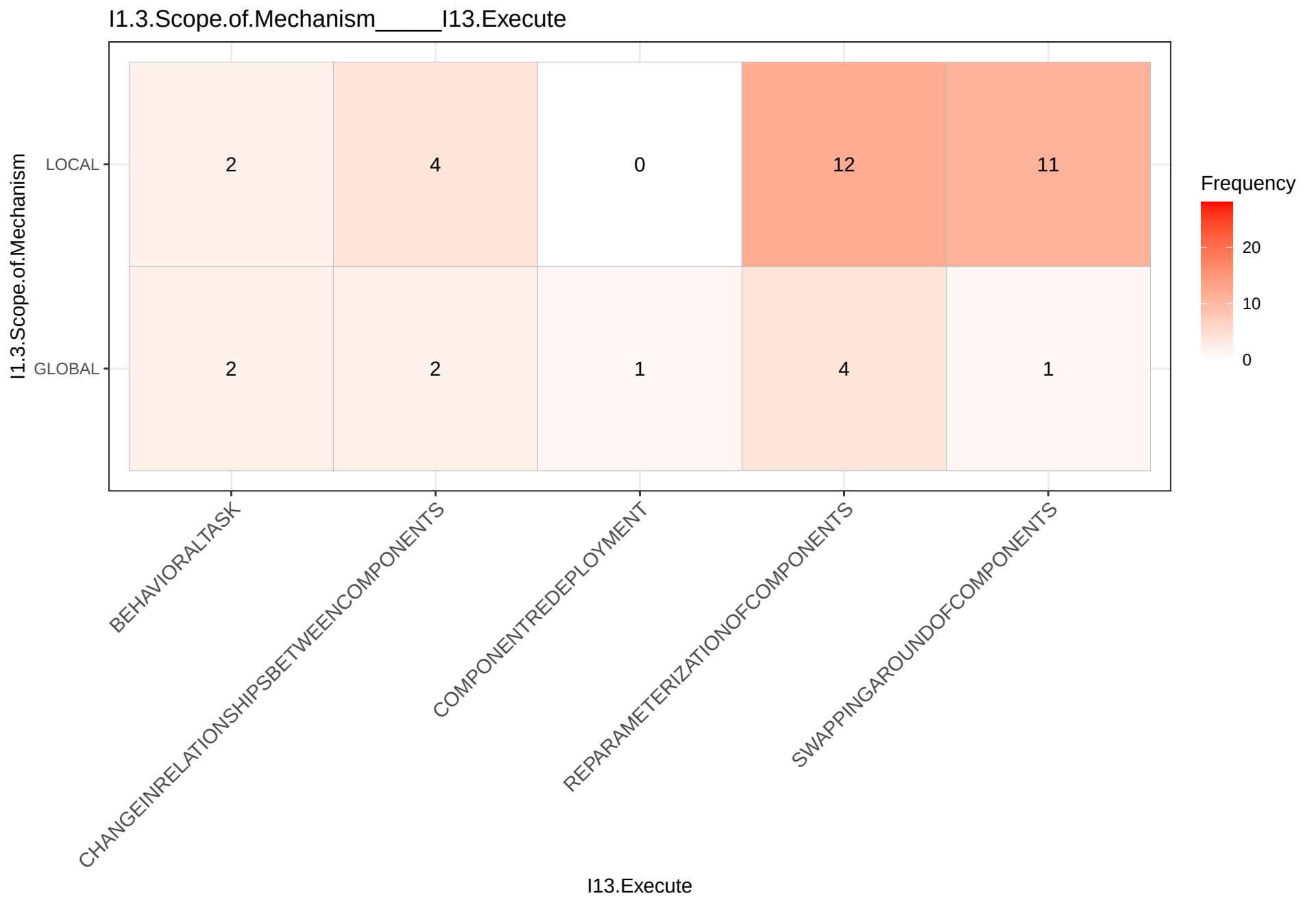
I1.3.Scope.of.Mechanism_____I13.Execute
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
2
4
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12
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2
2
1
4
1
Frequency
20
10
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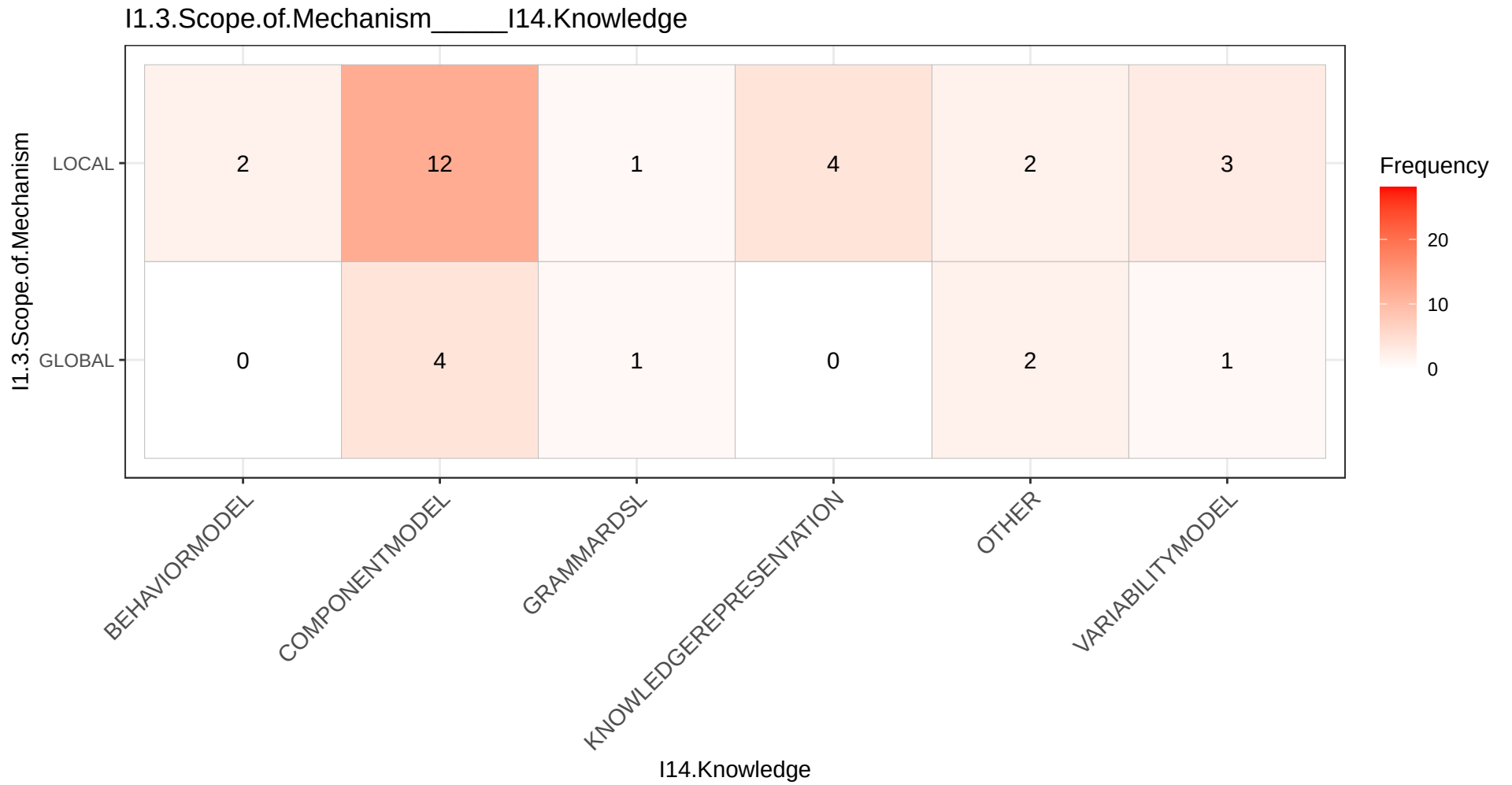
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute


I1.3.Scope.of.Mechanism_____I14.Knowledge
I1.3.Scope.of.Mechanism
LOCAL
GLOBAL
2
12
1
4
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3
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4
1
0
2
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BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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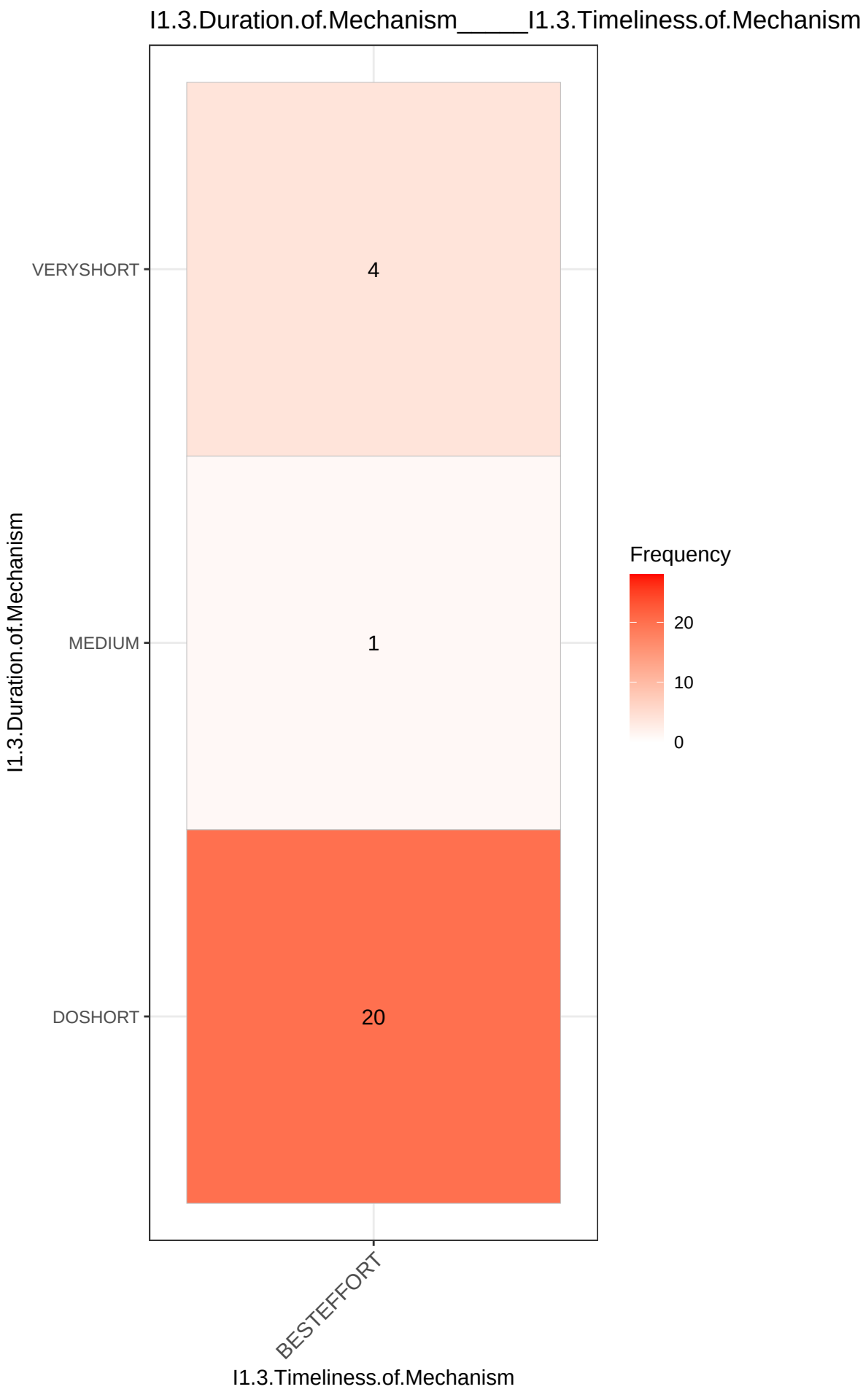
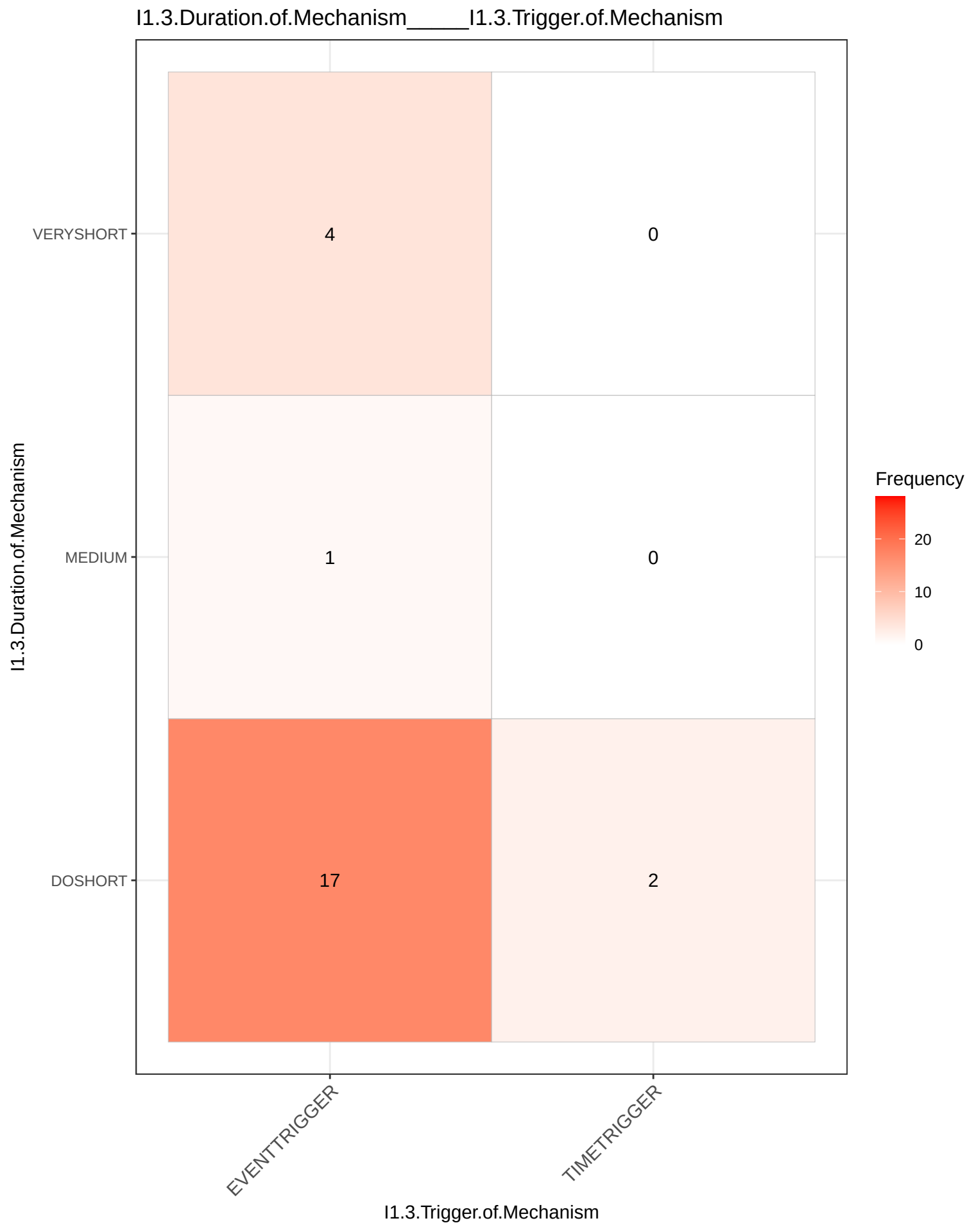

I1.3.Duration.of.Mechanism_____I1.3.Timeliness.of.Mechanism
VERYSHORT
MEDIUM
DOSHORT
4
1
20
I1.3.Duration.of.Mechanism
Frequency
20
10
0
BESTEFFORT
I1.3.Timeliness.of.Mechanism


I1.3.Duration.of.Mechanism_____I1.3.Trigger.of.Mechanism
VERYSHORT
MEDIUM
DOSHORT
4
0
1
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17
2
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EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
20
10
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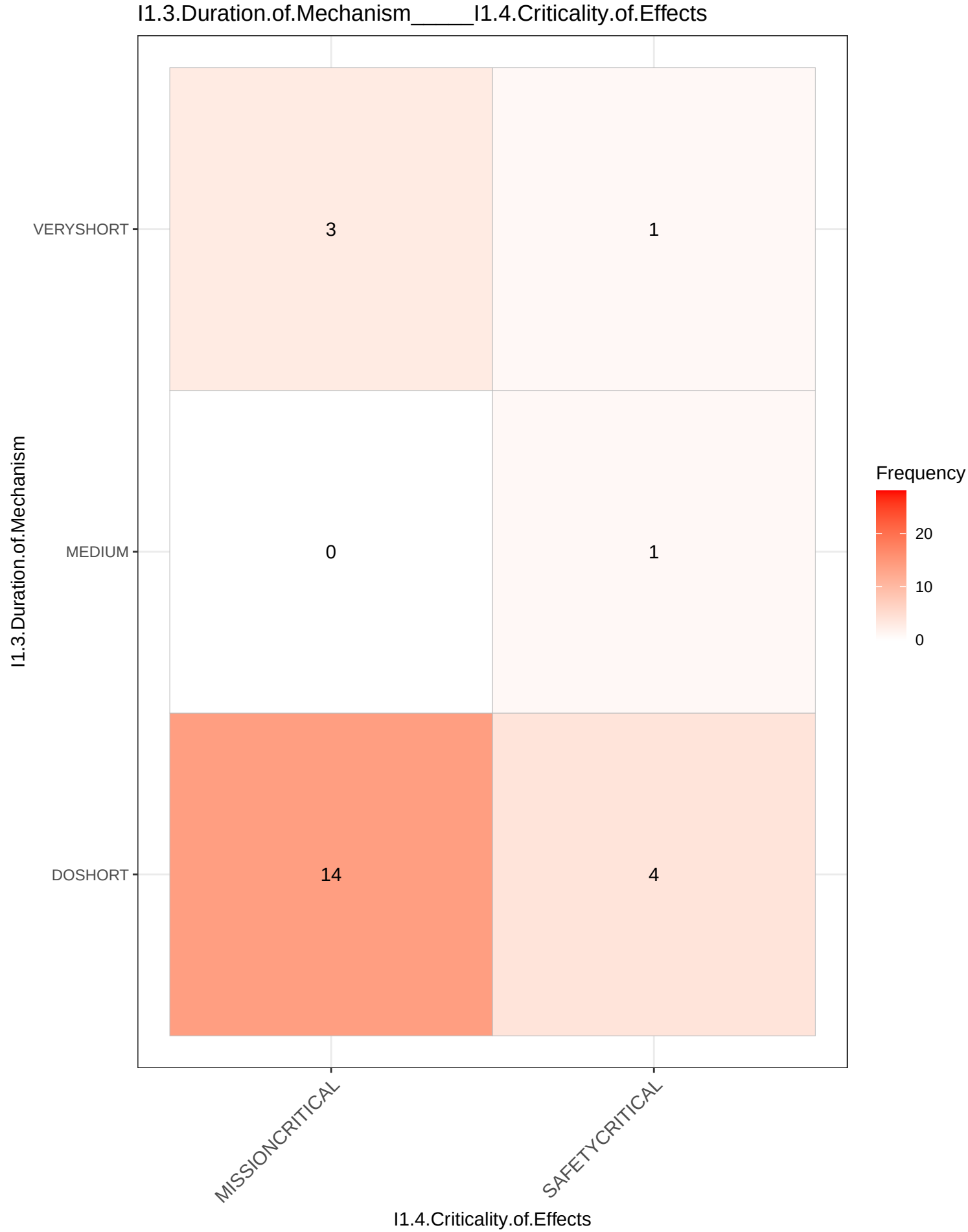
I1.3.Duration.of.Mechanism_____I1.4.Criticality.of.Effects
VERYSHORT
MEDIUM
DOSHORT
3
1
0
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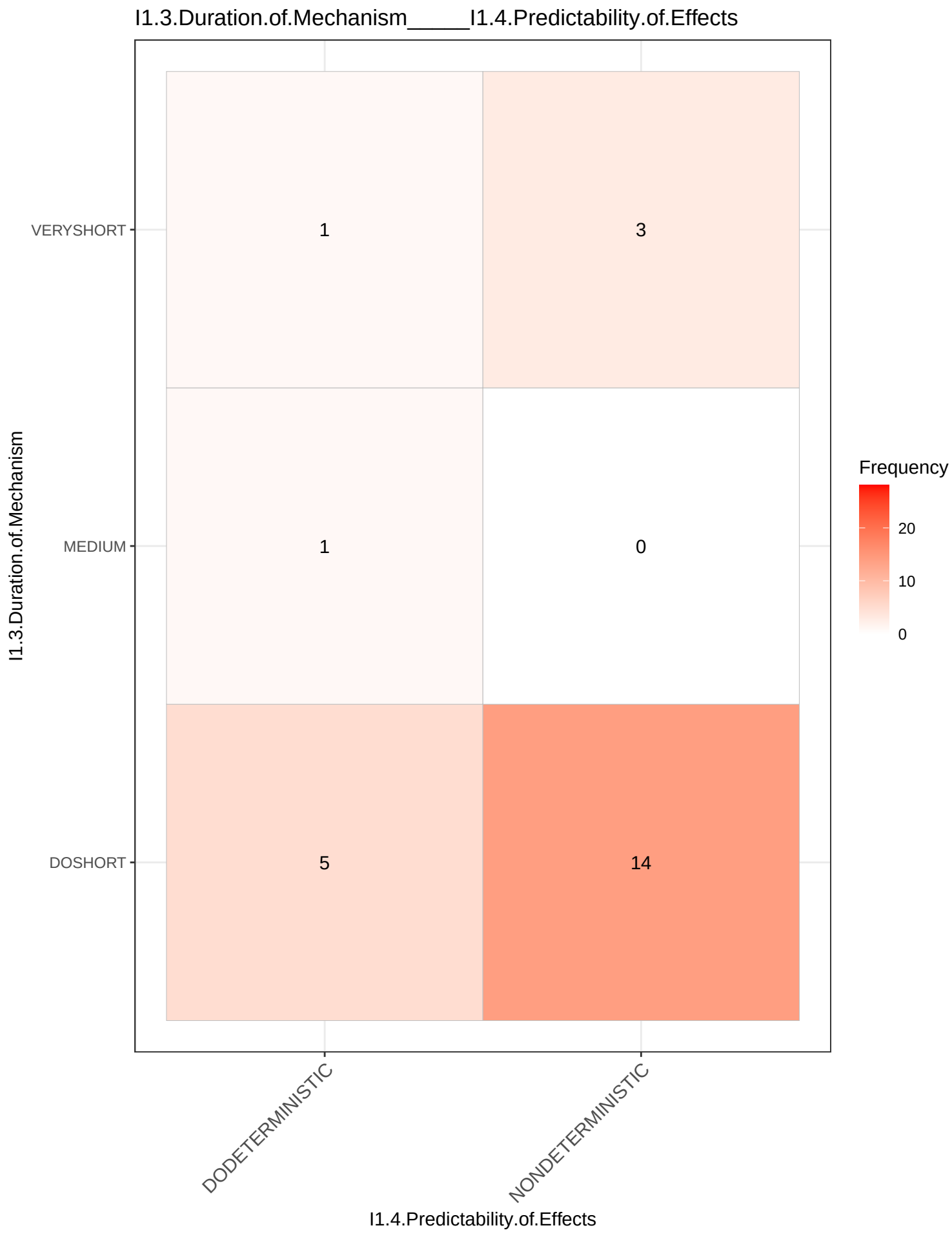
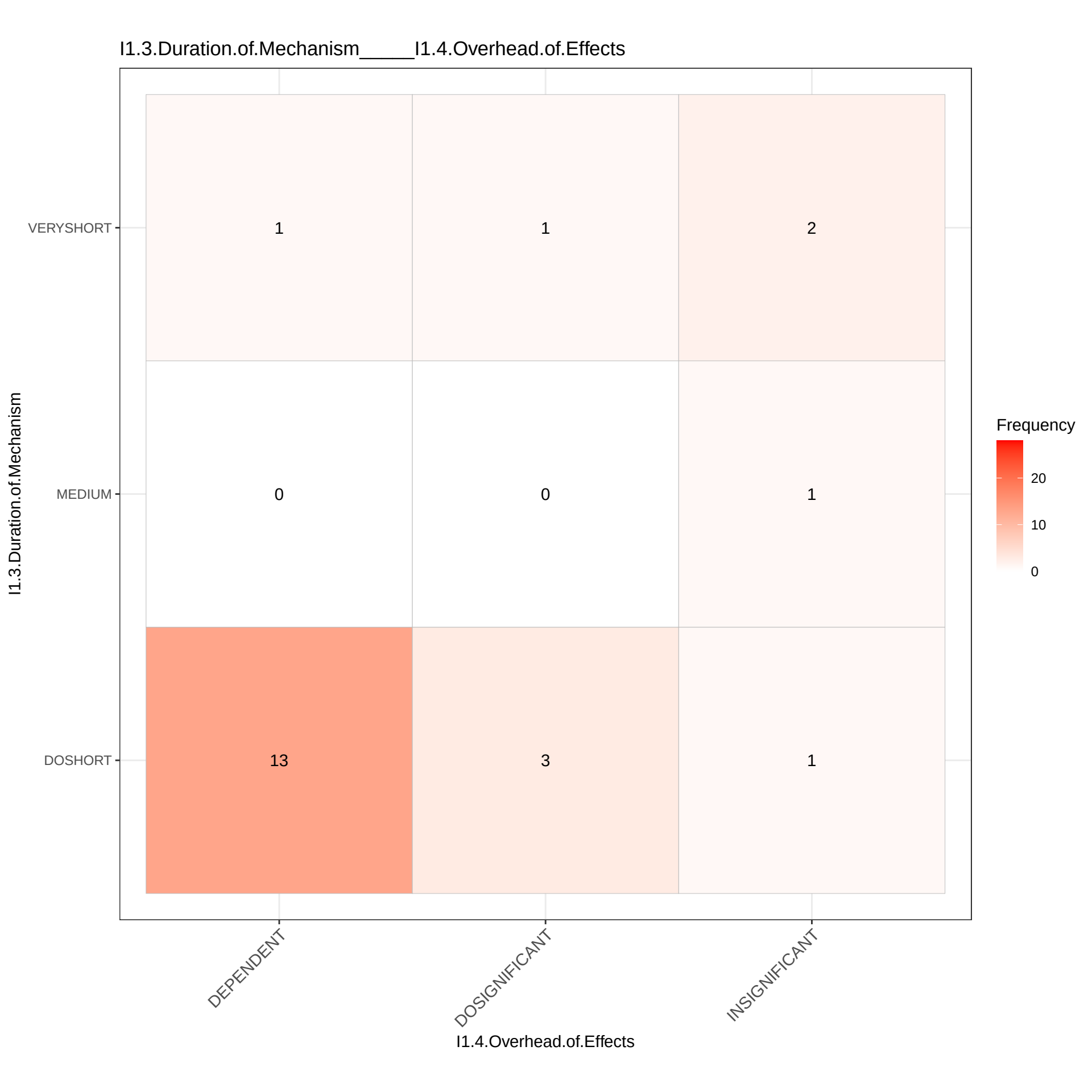
14
4
I1.3.Duration.of.Mechanism
MISSIONCRITICAL
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I1.4.Predictability.of.Effects
VERYSHORT
MEDIUM
DOSHORT
1
3
1
0
5
14
I1.3.Duration.of.Mechanism
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I1.4.Overhead.of.Effects
VERYSHORT
MEDIUM
DOSHORT
1
1
2
0
0
1
13
3
1
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.3.Duration.of.Mechanism
I1.4.Overhead.of.Effects
Frequency
20
10
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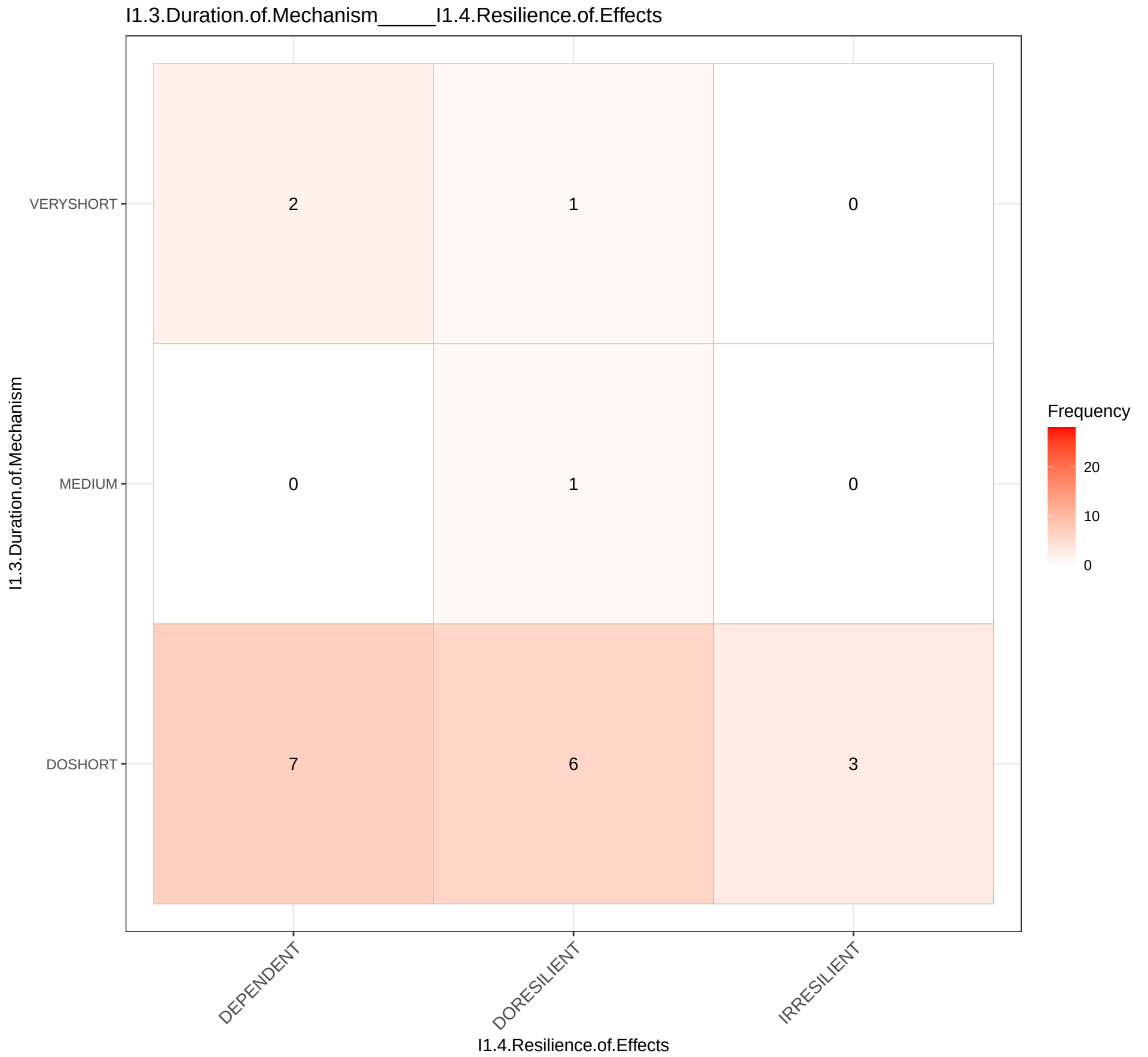
I1.3.Duration.of.Mechanism_____I1.4.Resilience.of.Effects
VERYSHORT
MEDIUM
DOSHORT
2
1
0
0
1
0
7
6
3
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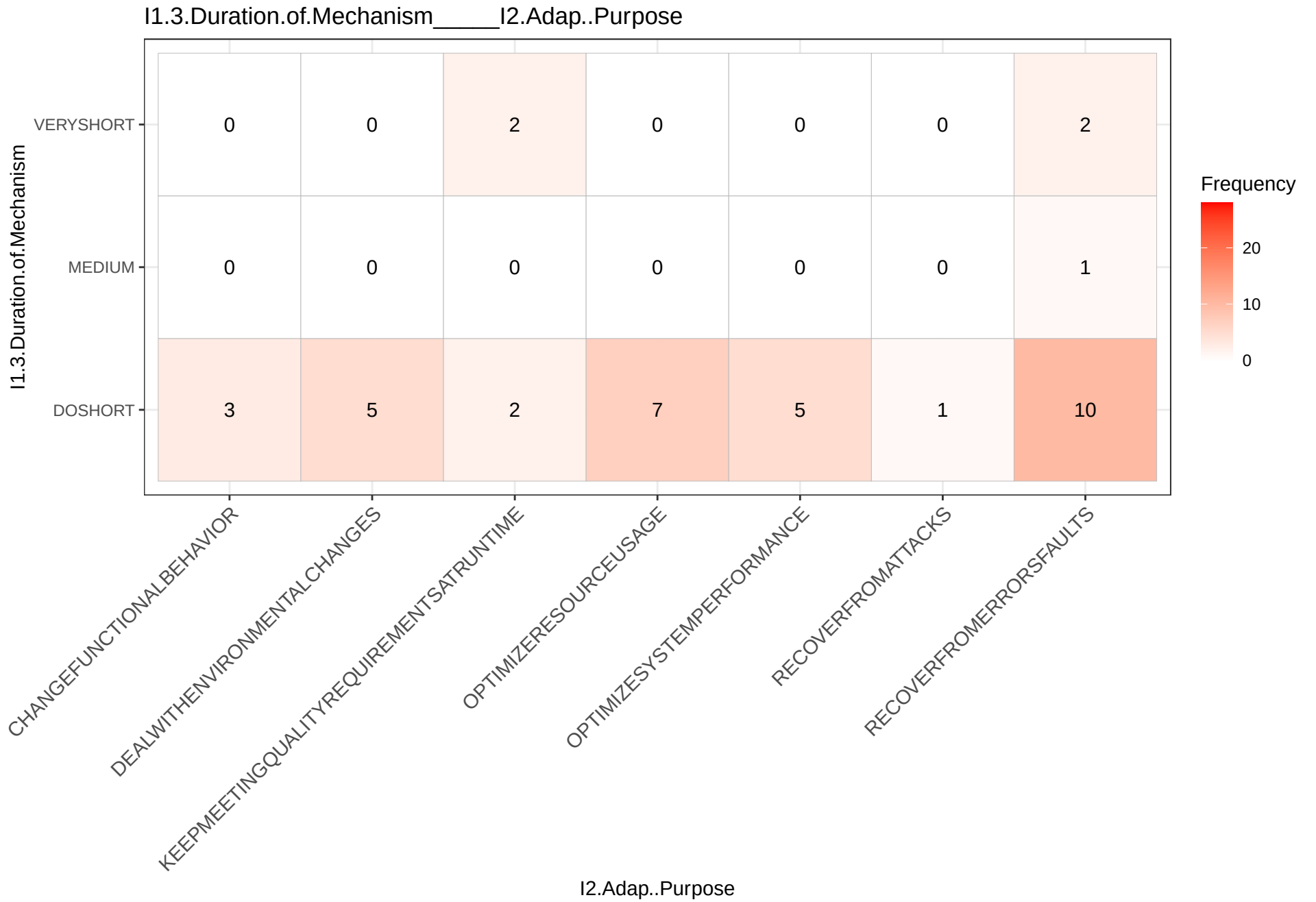
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I2.Adap..Purpose
I1.3.Duration.of.Mechanism
VERYSHORT
MEDIUM
DOSHORT
0 0 2 0 0 0 2
0 0 0 0 0 0 1
3 5 2 7 5 1 10
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
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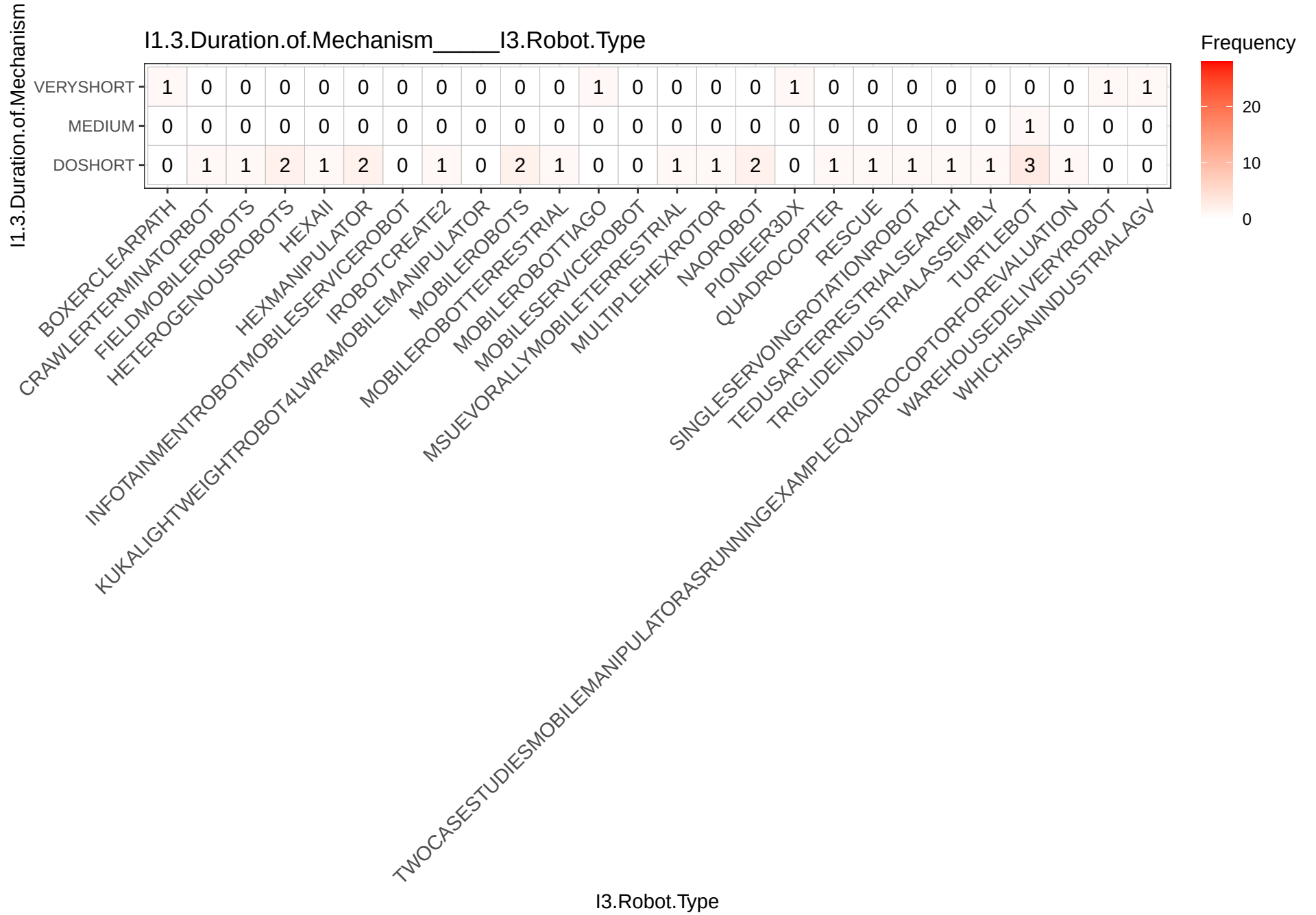
I1.3.Duration.of.Mechanism_____I3.Robot.Type
I1.3.Duration.of.Mechanism
VERYSHORT
MEDIUM
DOSHORT
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0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
0 1 1 2 1 2 0 1 0 2 1 0 0 1 1 2 0 1 1 1 1 1 3 1 0 0
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
IROBOTCREATE2
INFOTAINMENTROBOTMOBILESERVICEROBOT
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILESERVICEROBOT
MSUEVORALLYMOBILEROBOTTIAGO
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
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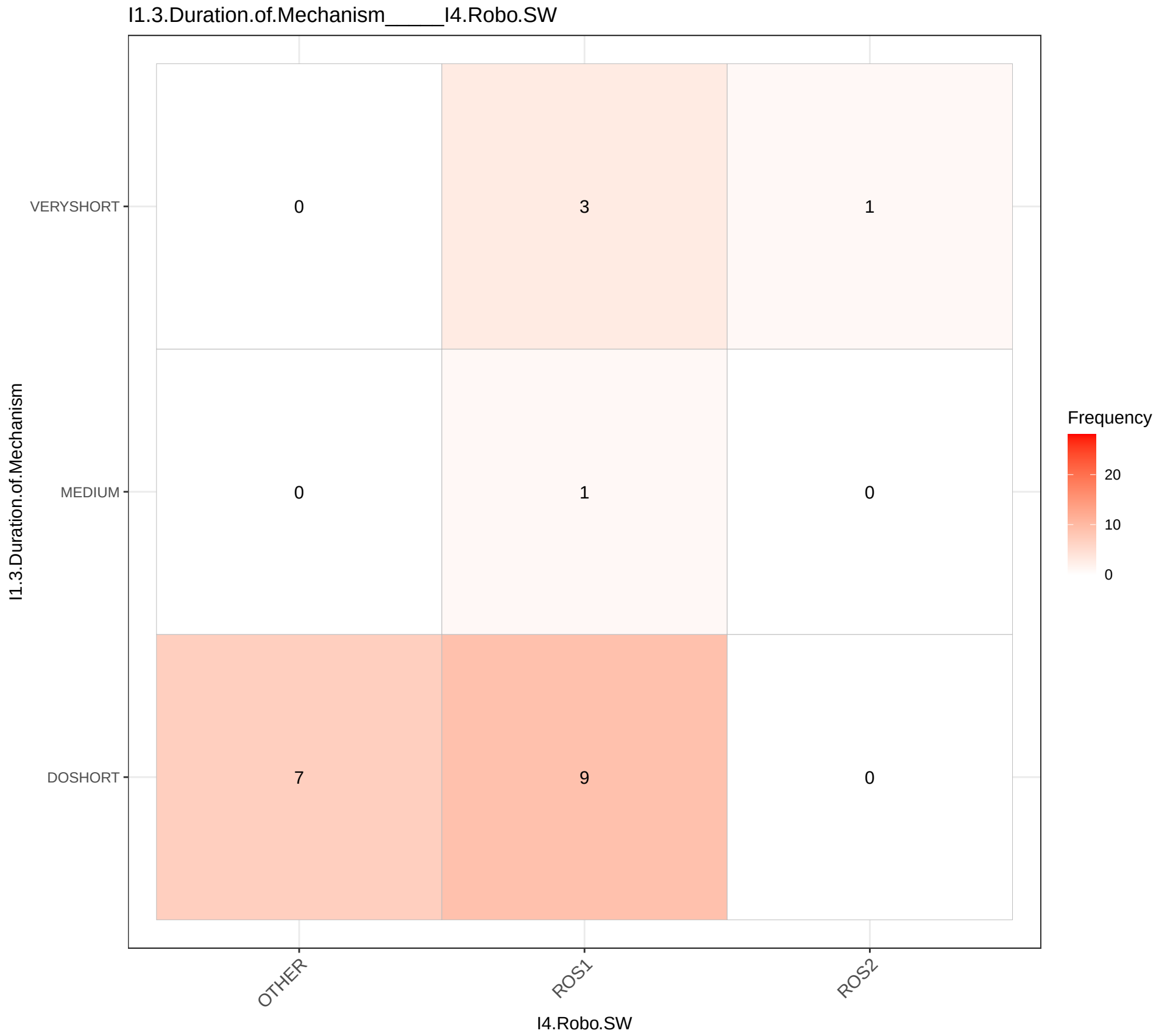
I1.3.Duration.of.Mechanism_____I4.Robo.SW
VERYSHORT
MEDIUM
DOSHORT
0
3
1
0
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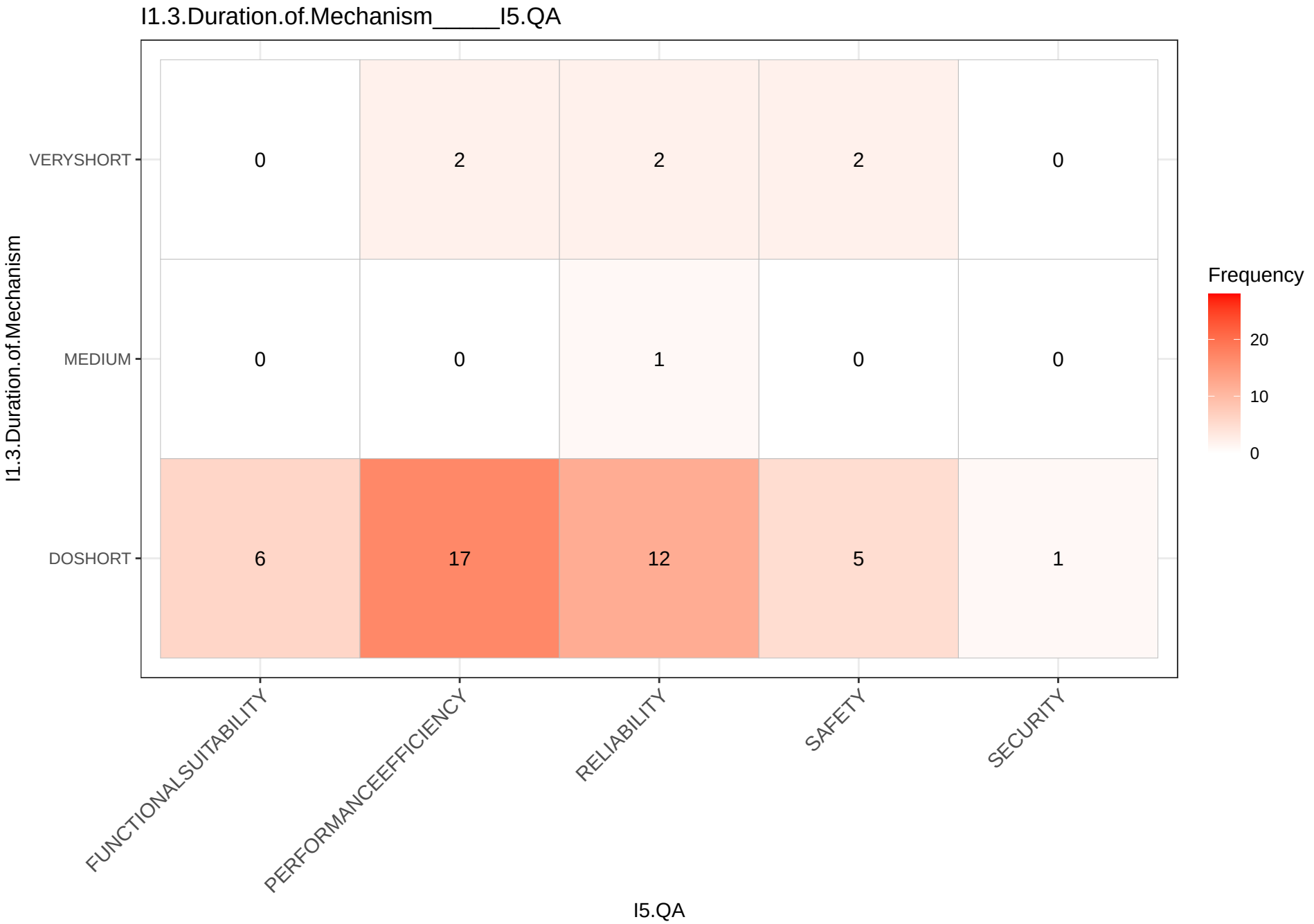
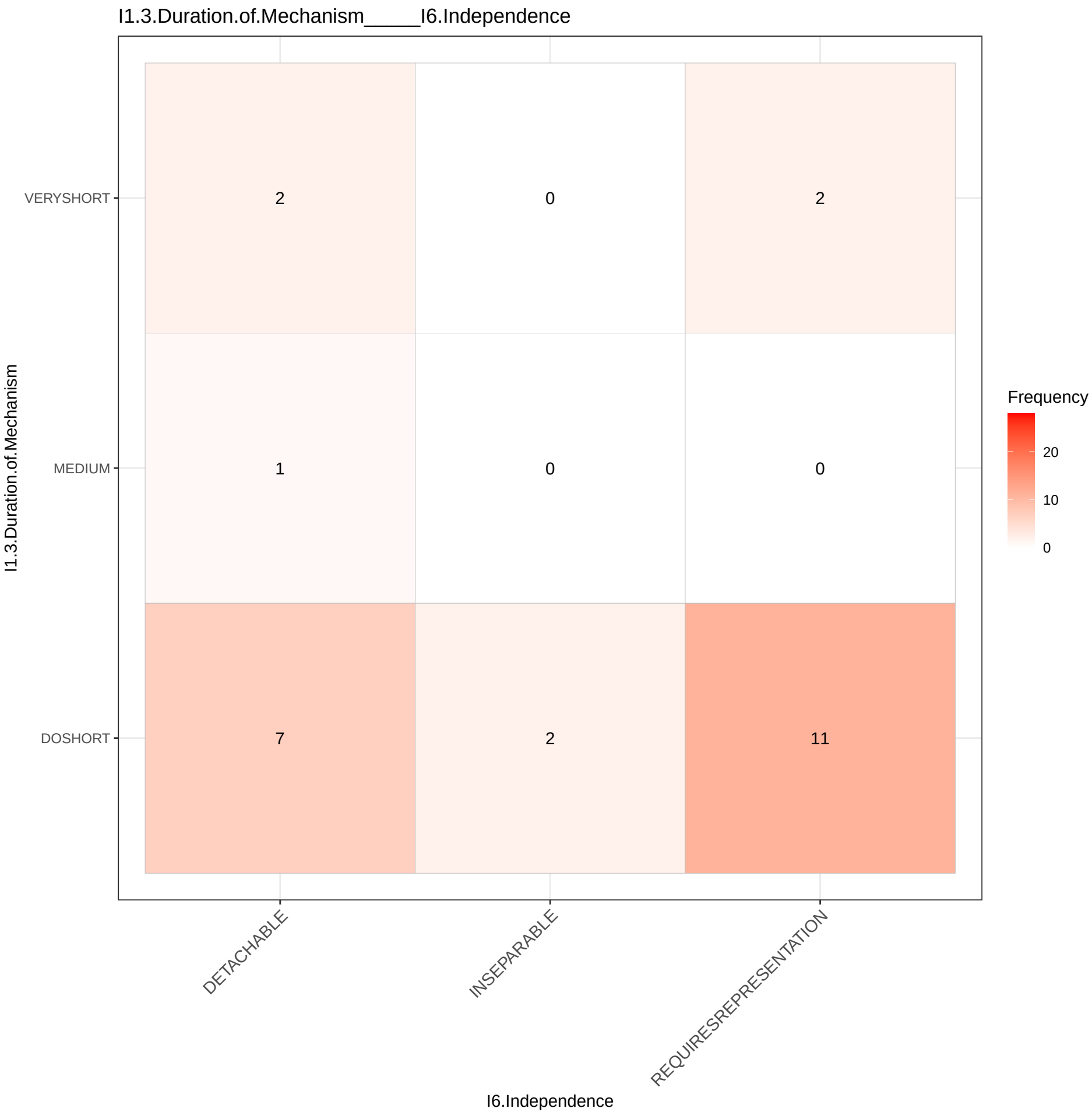
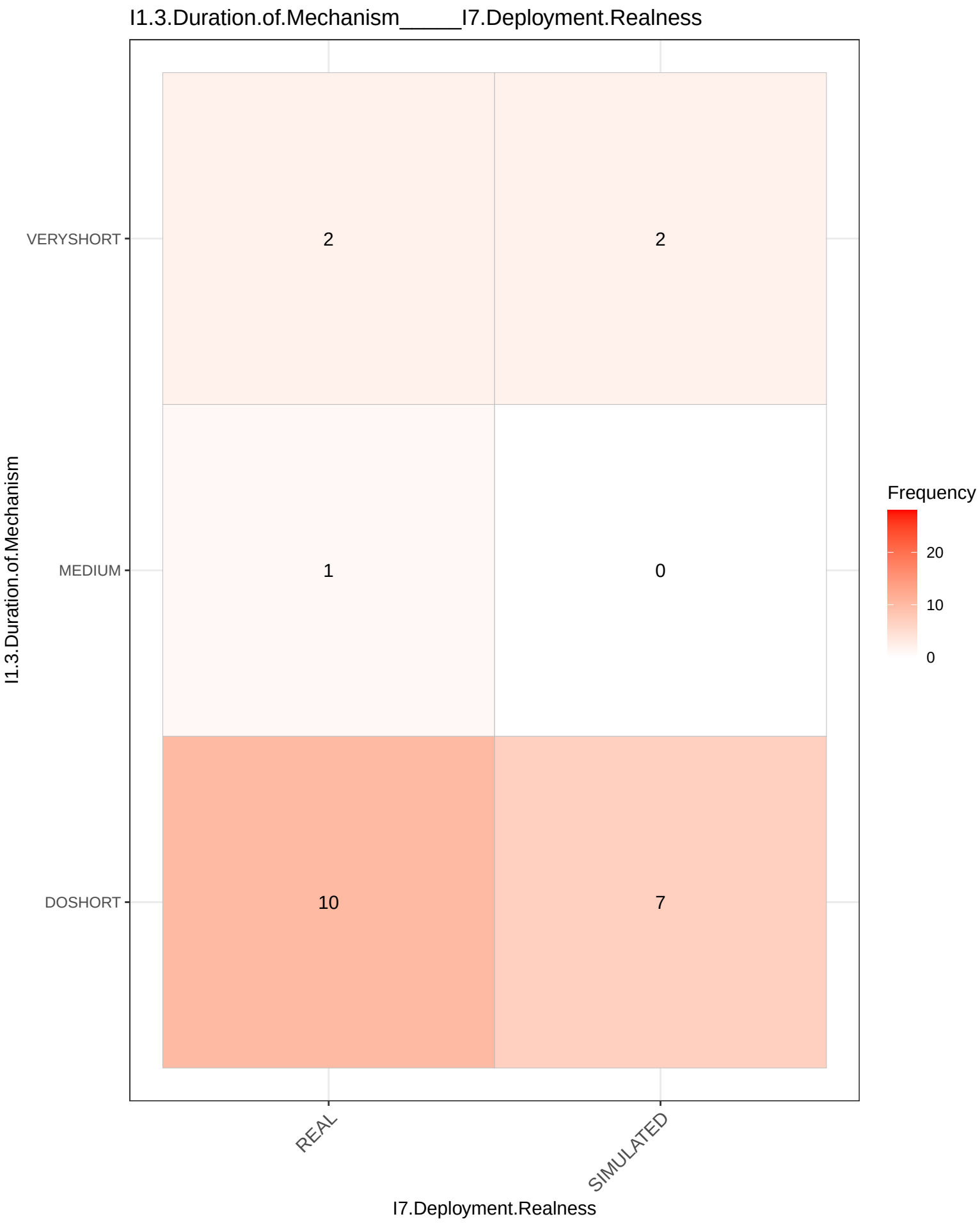
9
0
OTHER
ROS1
ROS2
I4.Robo.SW
I1.3.Duration.of.Mechanism
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I5.QA
VERYSHORT
MEDIUM
DOSHORT
0
2
2
2
0
0
0
1
0
0
6
17
12
5
1
I1.3.Duration.of.Mechanism
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I6.Independence
VERYSHORT
MEDIUM
DOSHORT
2
0
2
1
0
0
7
2
11
I1.3.Duration.of.Mechanism
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I7.Deployment.Realness
VERYSHORT
MEDIUM
DOSHORT
2
2
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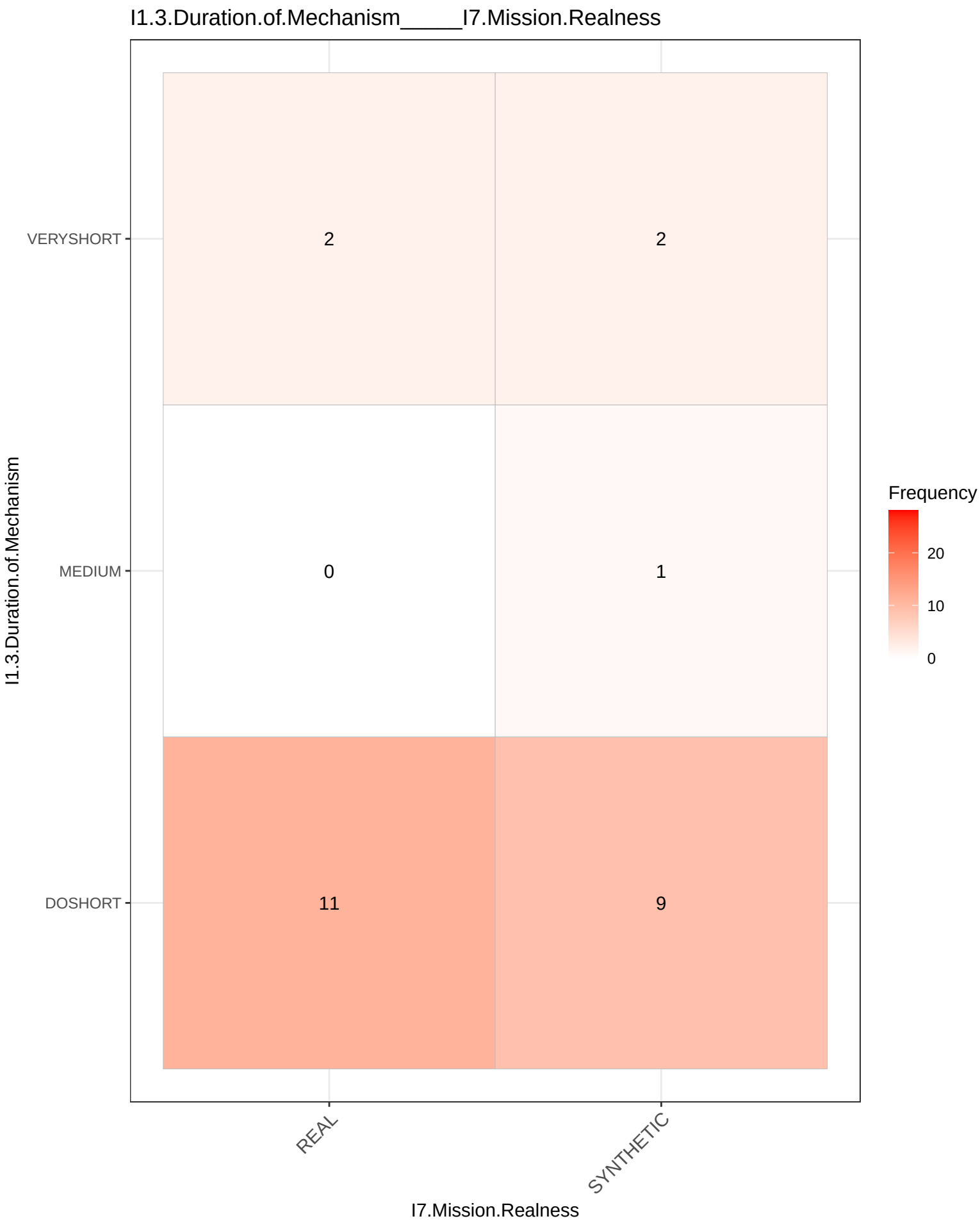
7
I1.3.Duration.of.Mechanism
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I7.Mission.Realness
VERYSHORT
MEDIUM
DOSHORT
2
2
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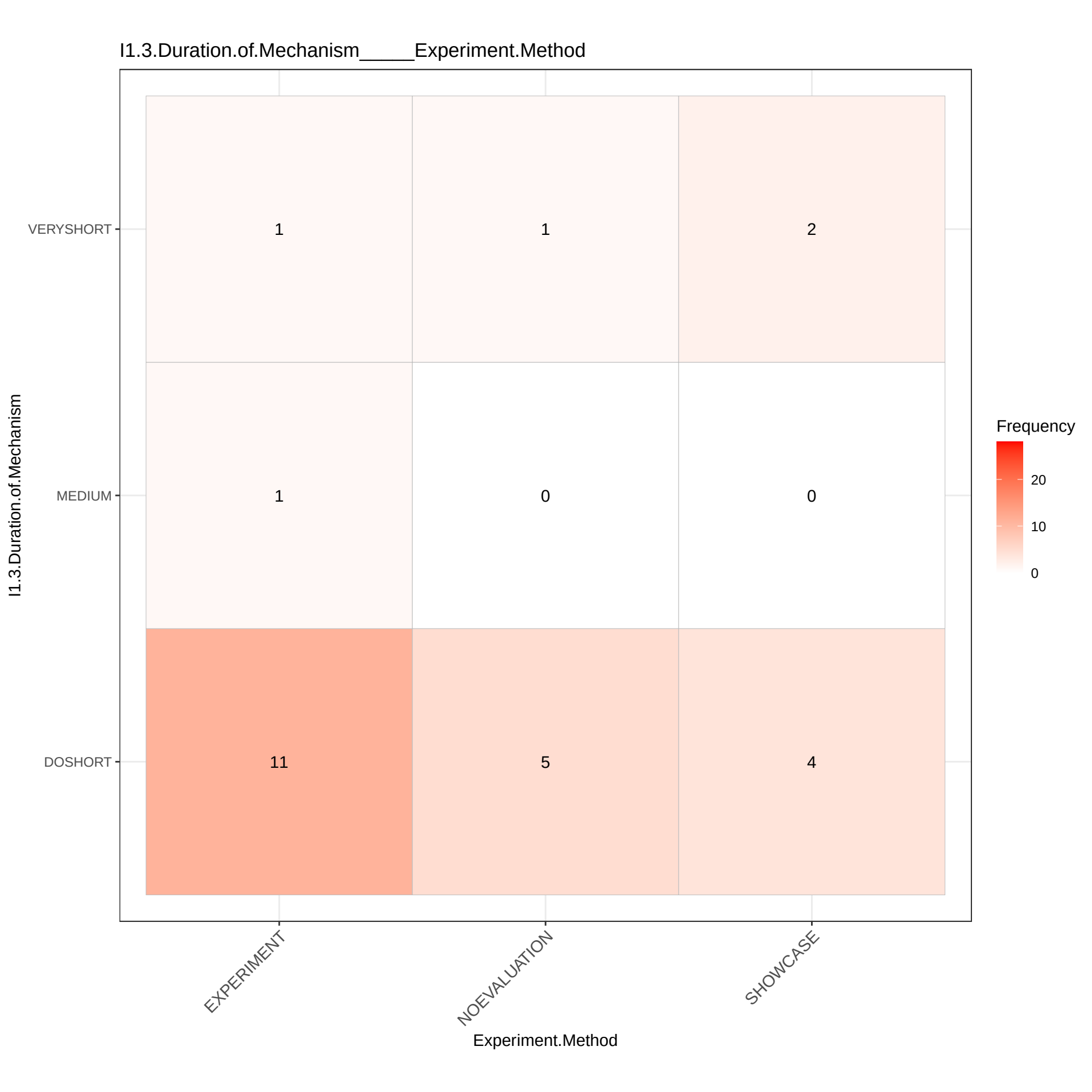
9
I1.3.Duration.of.Mechanism
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____Experiment.Method
VERYSHORT
MEDIUM
DOSHORT
1
1
2
1
0
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11
5
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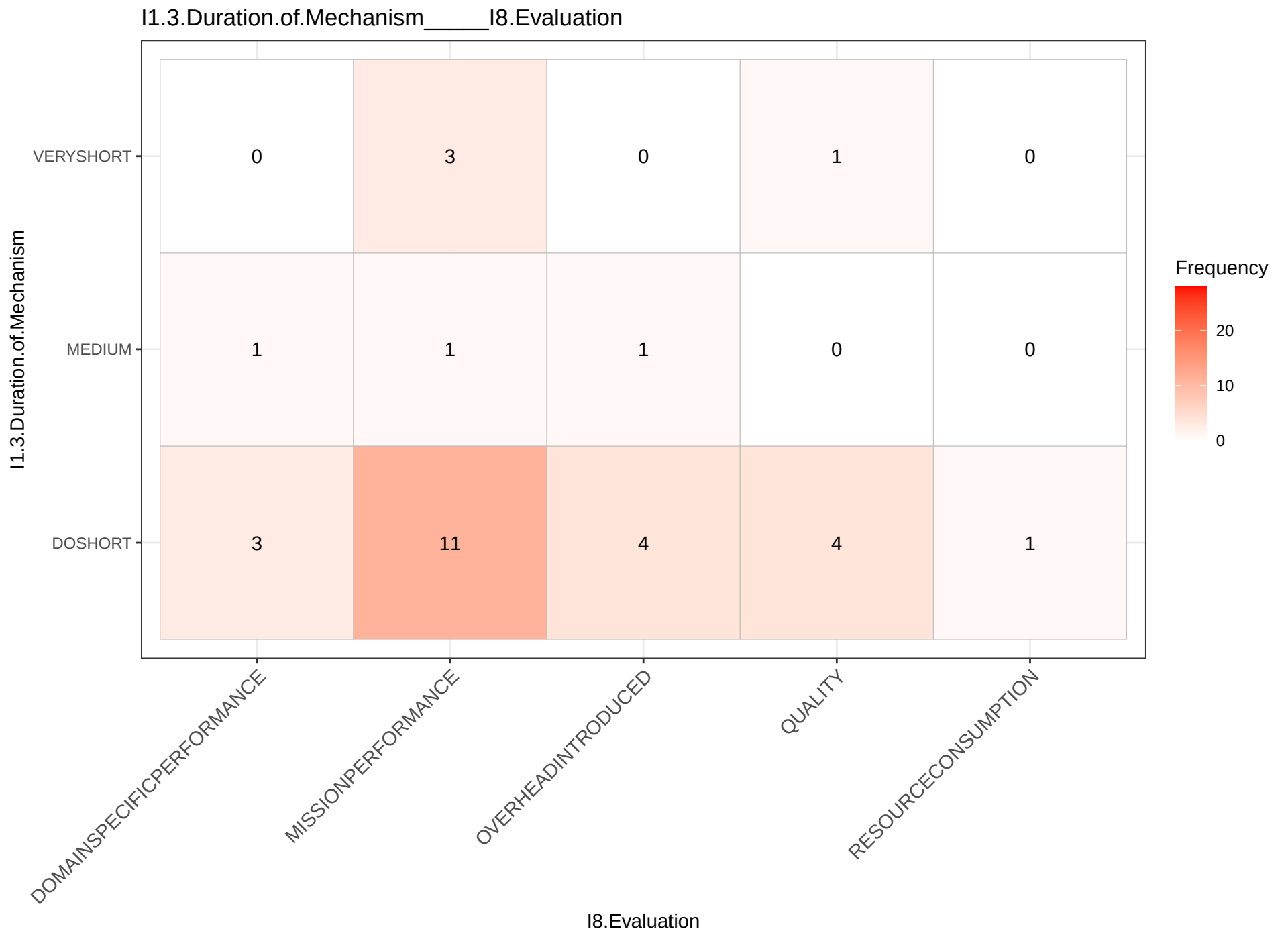
I1.3.Duration.of.Mechanism
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I8.Evaluation
VERYSHORT
MEDIUM
DOSHORT
I1.3.Duration.of.Mechanism
0
3
0
1
0
1
1
1
0
0
3
11
4
4
1
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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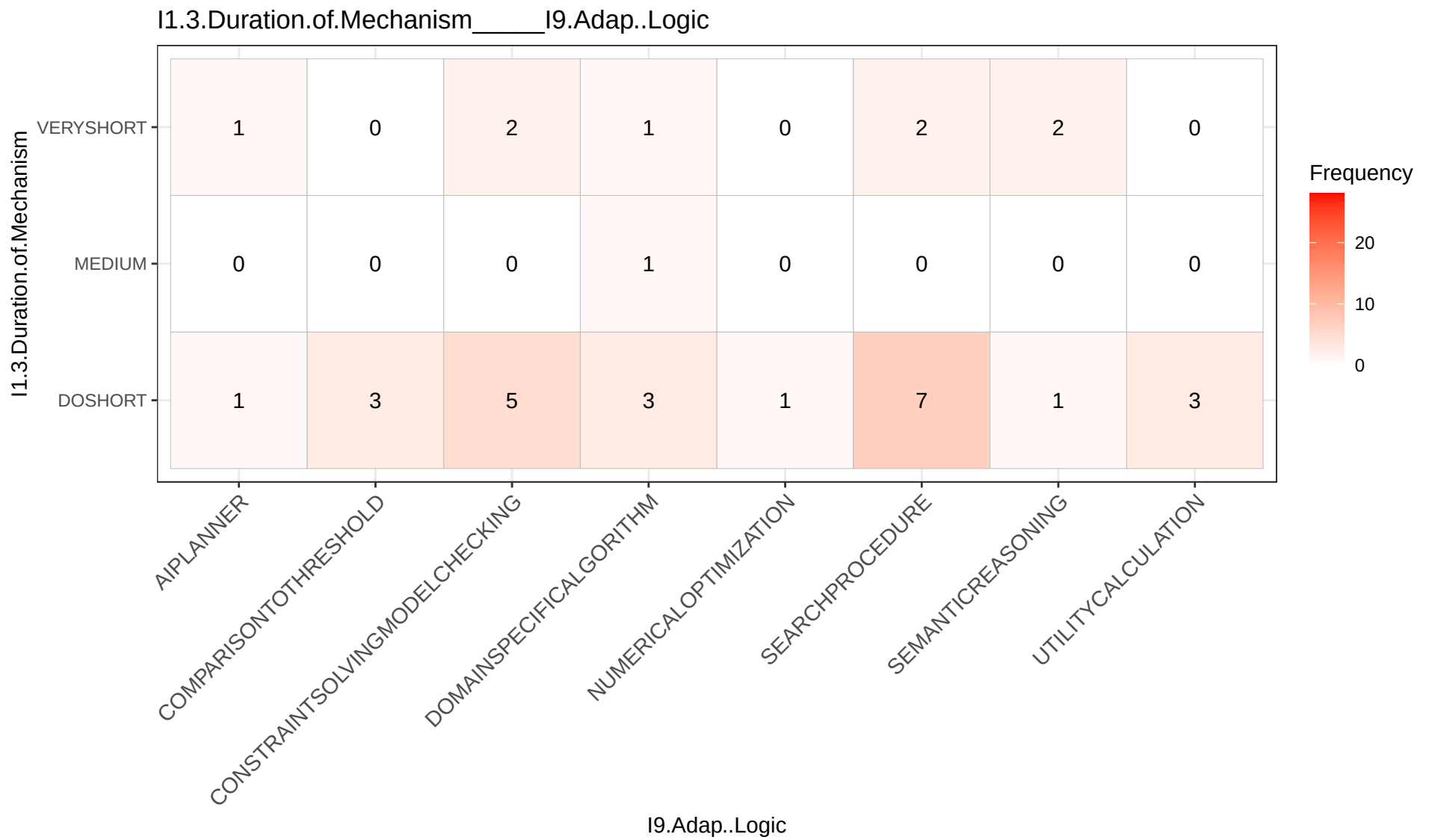
I1.3.Duration.of.Mechanism_____I9.Adap..Logic
I1.3.Duration.of.Mechanism
VERYSHORT
MEDIUM
DOSHORT
1 0 2 1 0 2 2 0
0 0 0 1 0 0 0 0
1 3 5 3 1 7 1 3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
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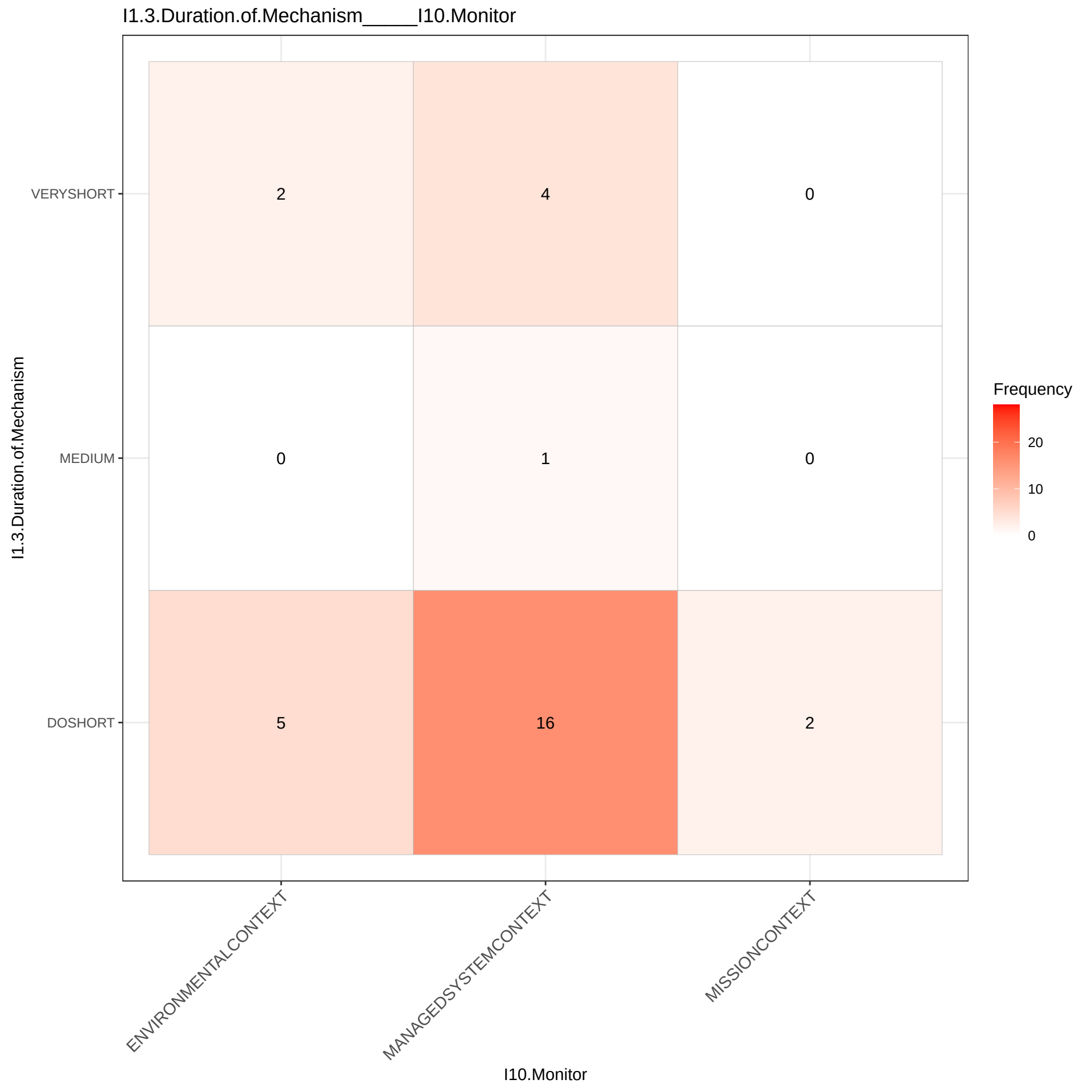
I1.3.Duration.of.Mechanism_____I10.Monitor
VERYSHORT
MEDIUM
DOSHORT
2
4
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0
1
0
5
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I1.3.Duration.of.Mechanism
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
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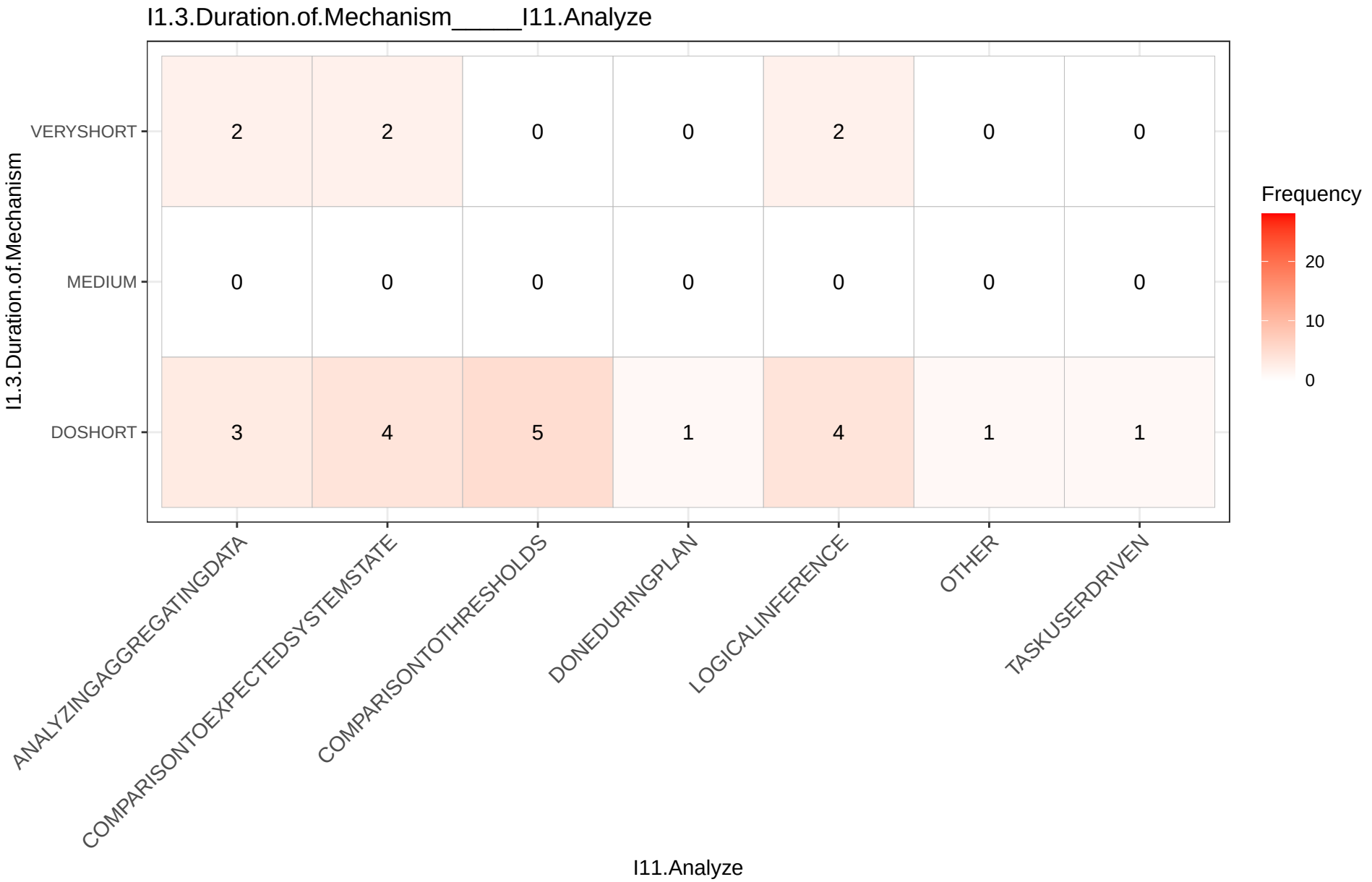
I1.3.Duration.of.Mechanism_____I11.Analyze
I1.3.Duration.of.Mechanism
VERYSHORT
MEDIUM
DOSHORT
2
2
0
0
2
0
0
0
0
0
0
0
0
0
3
4
5
1
4
1
1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
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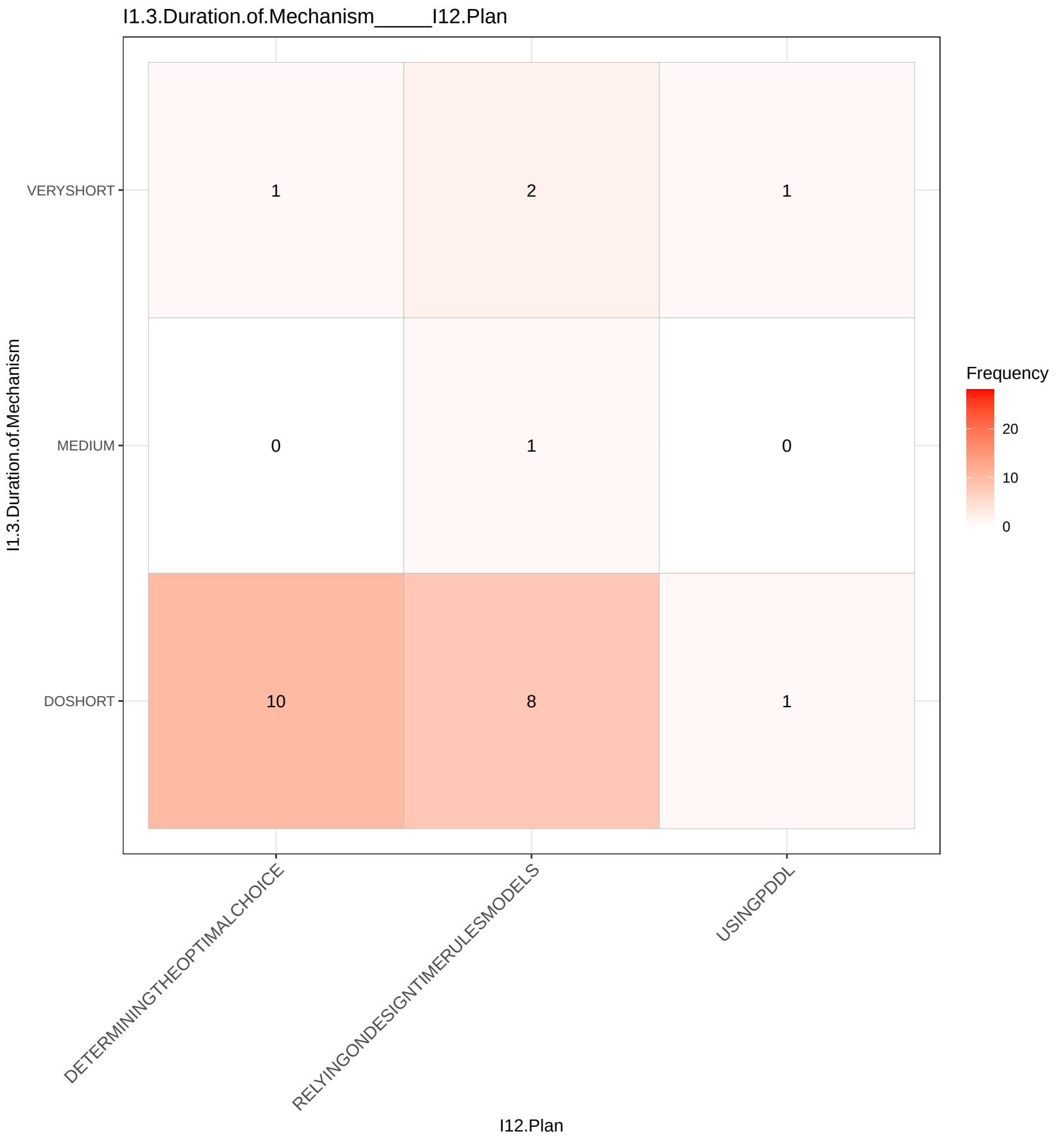
I1.3.Duration.of.Mechanism_____I12.Plan
VERYSHORT
MEDIUM
DOSHORT
1
2
1
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1
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10
8
1
I1.3.Duration.of.Mechanism
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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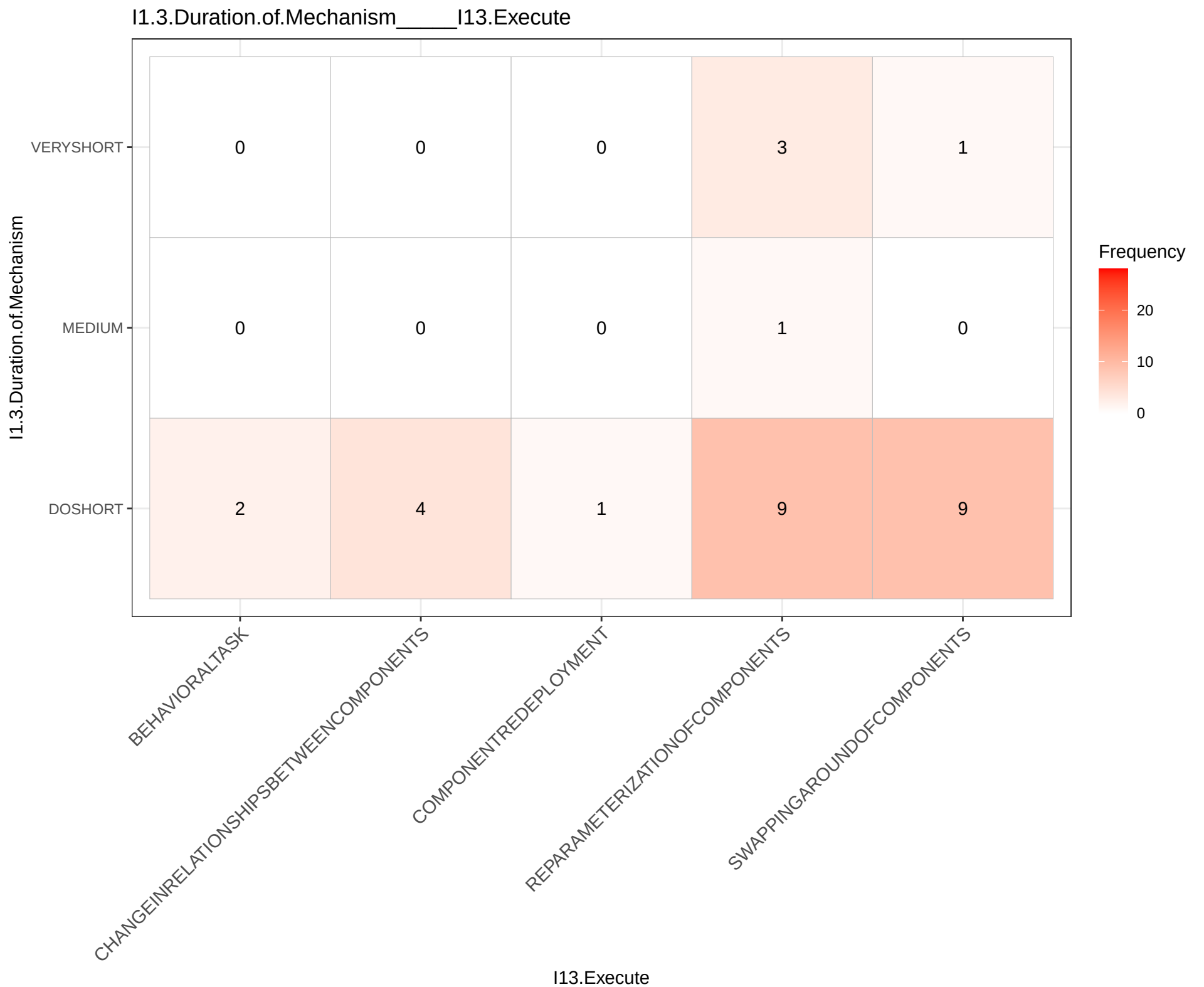
10
0


I1.3.Duration.of.Mechanism_____I13.Execute
VERYSHORT
MEDIUM
DOSHORT
0
0
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3
1
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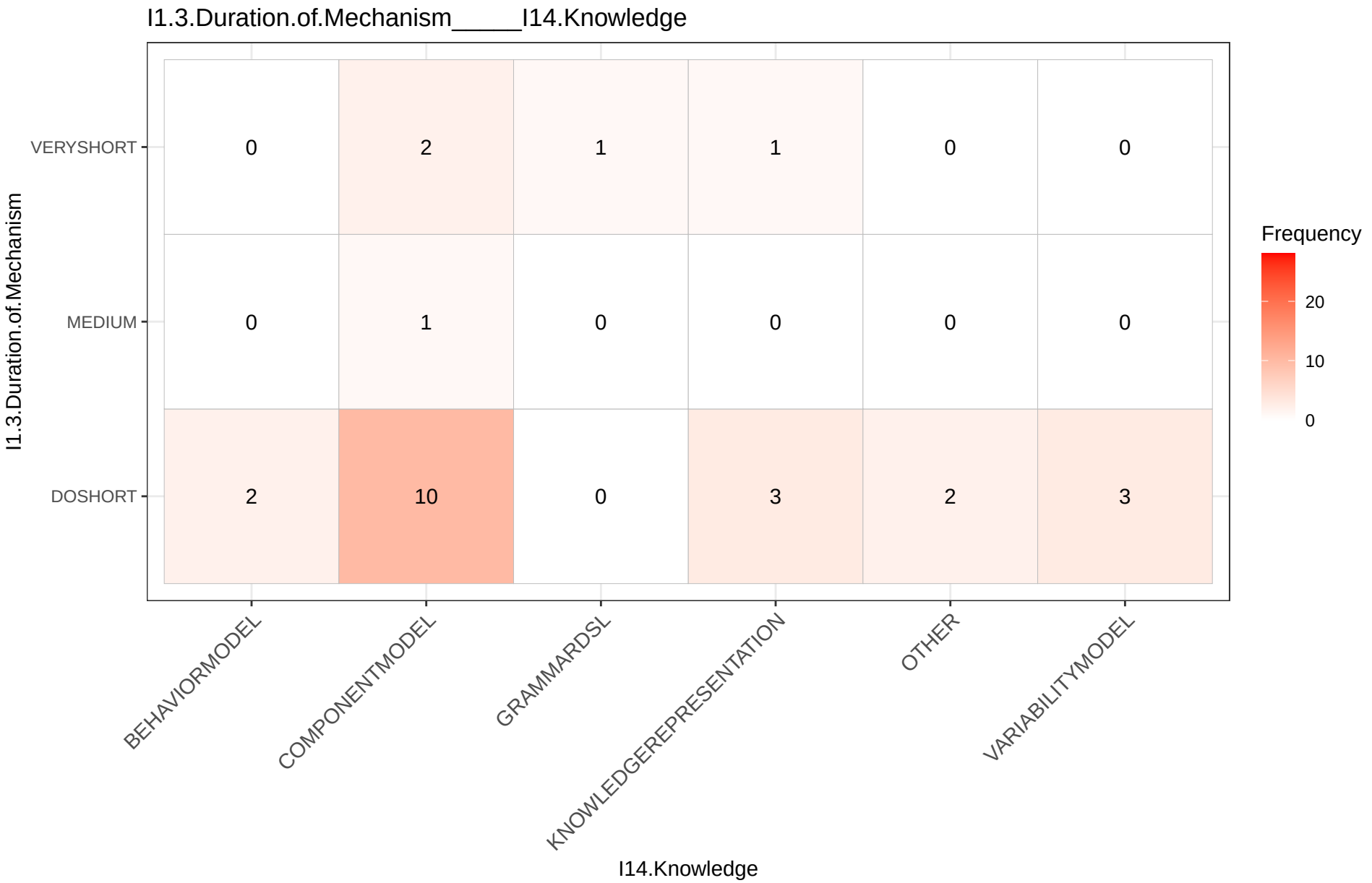
0
1
0
2
4
1
9
9
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I1.3.Duration.of.Mechanism
I13.Execute
Frequency
20
10
0


I1.3.Duration.of.Mechanism_____I14.Knowledge
VERYSHORT
MEDIUM
DOSHORT
I1.3.Duration.of.Mechanism
0
2
1
1
0
0
0
1
0
0
0
0
2
10
0
3
2
3
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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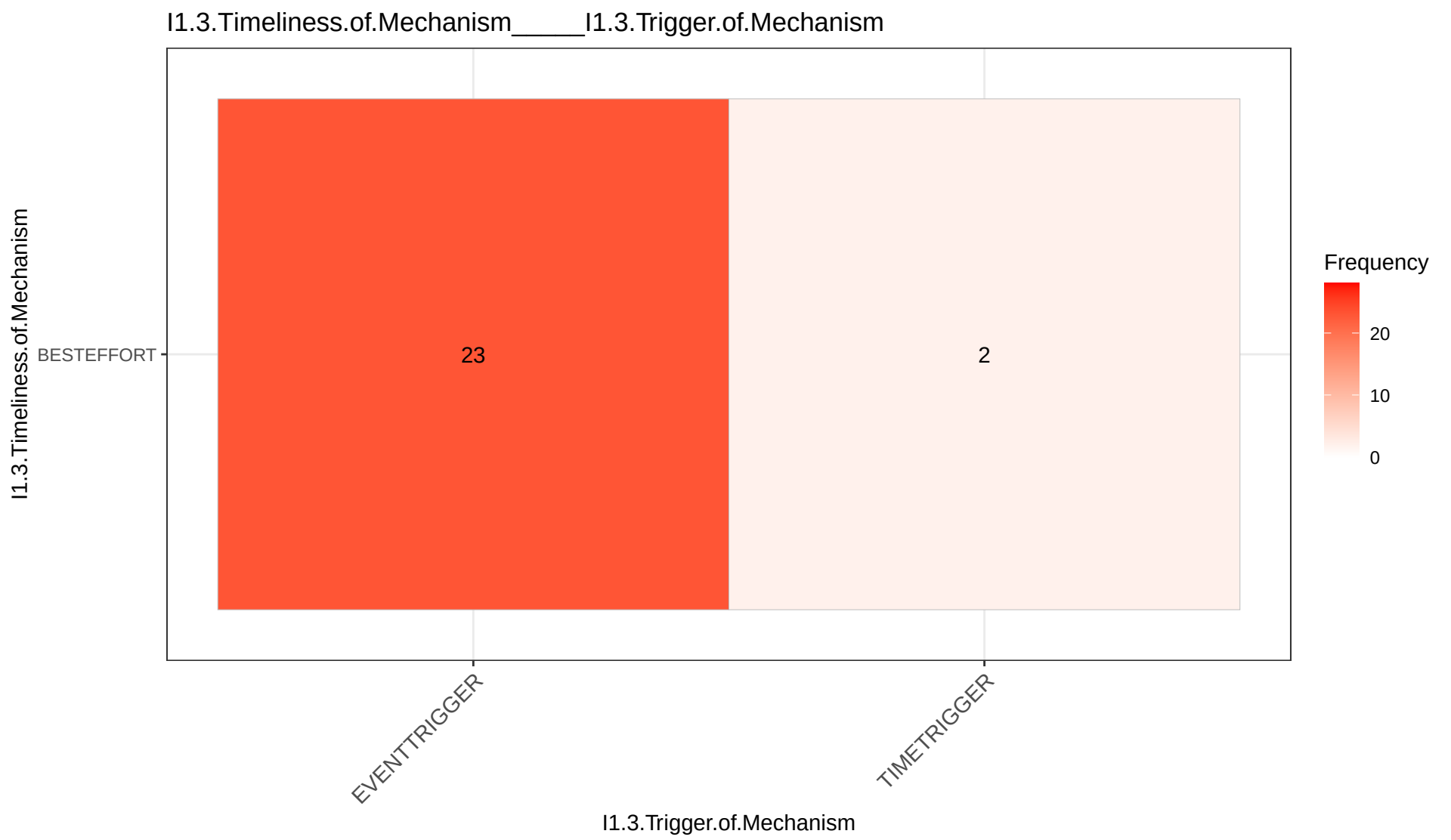
I1.3.Timeliness.of.Mechanism_____I1.3.Trigger.of.Mechanism
I1.3.Timeliness.of.Mechanism
BESTEFFORT
23
2
EVENTTRIGGER
TIMETRIGGER
I1.3.Trigger.of.Mechanism
Frequency
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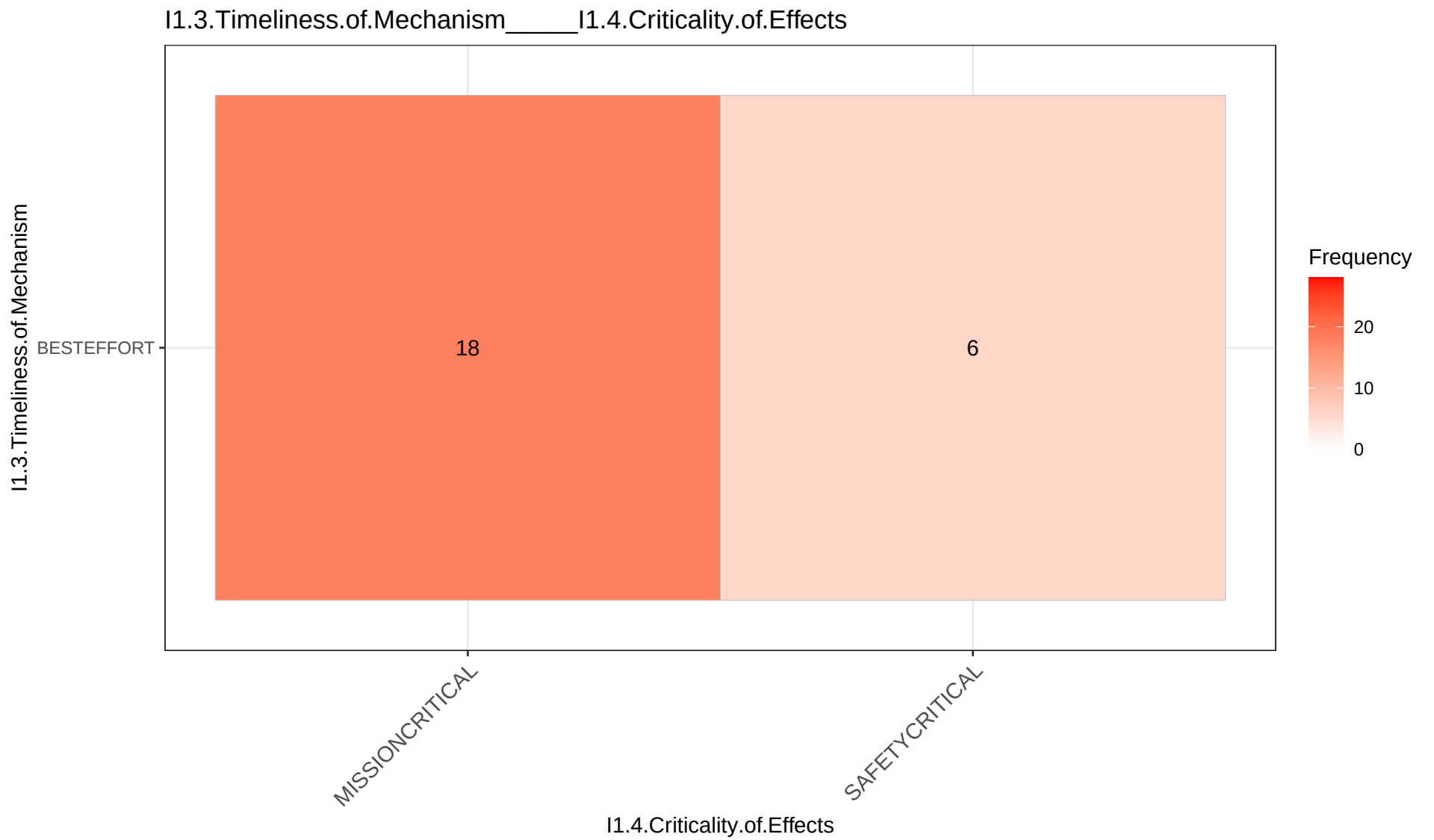
I1.3.Timeliness.of.Mechanism_____I1.4.Criticality.of.Effects
I1.3.Timeliness.of.Mechanism
BESTEFFORT
18
6
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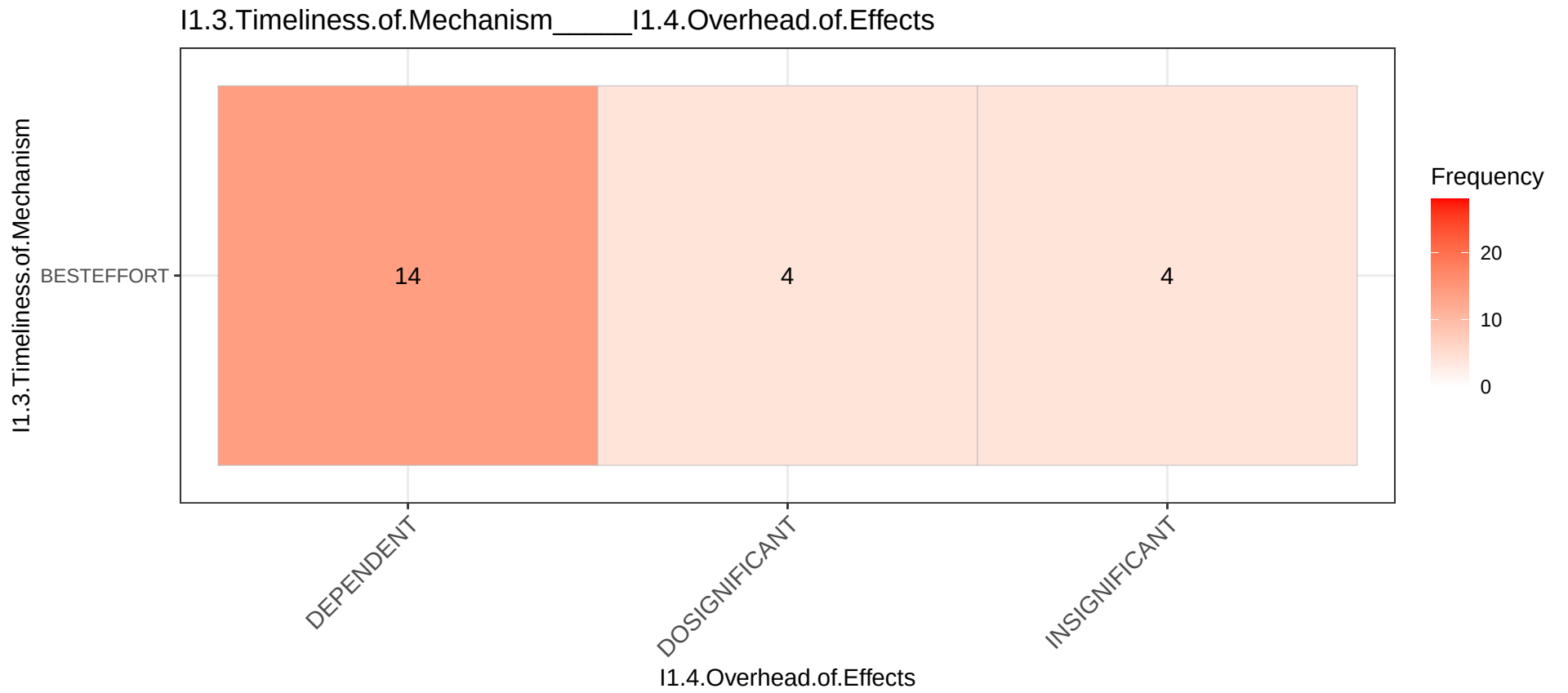
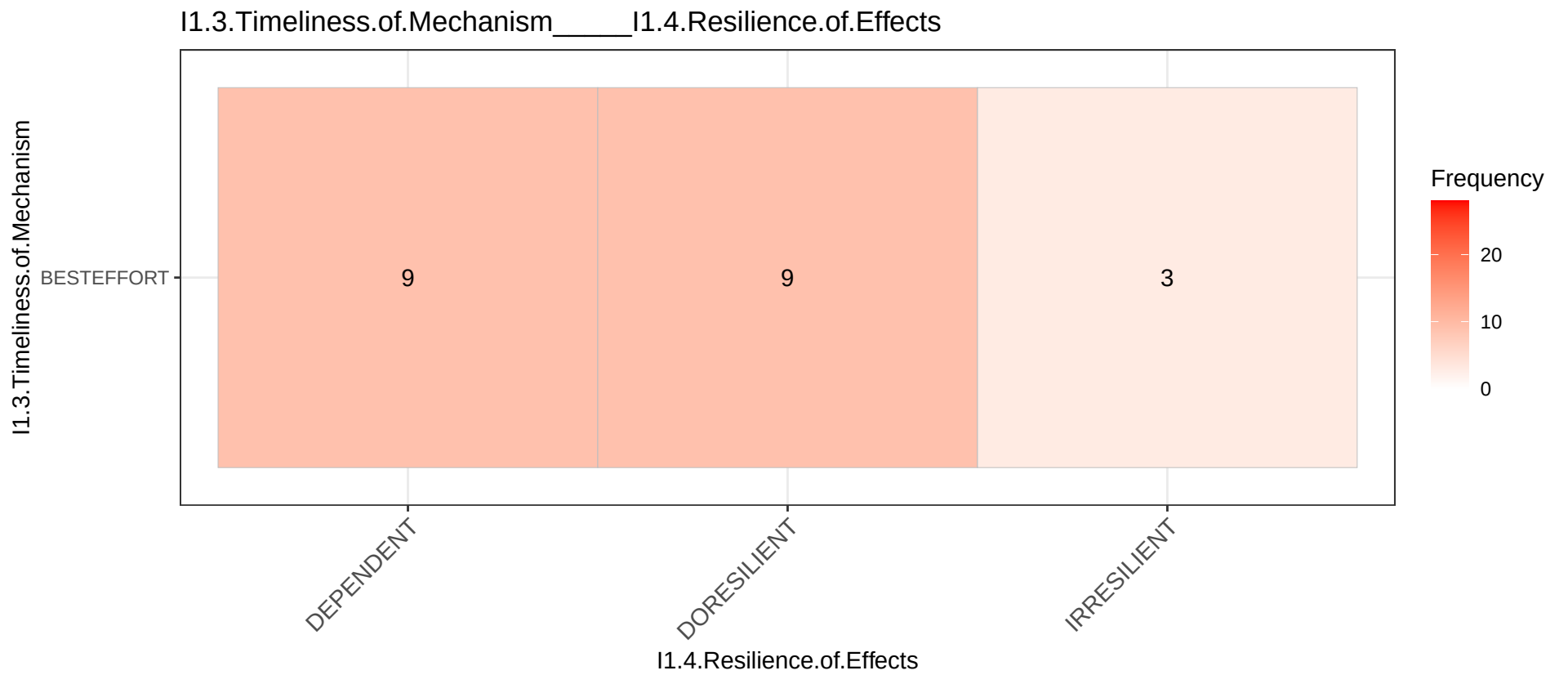
SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
0


I1.3.Timeliness.of.Mechanism_____I1.4.Overhead.of.Effects
I1.3.Timeliness.of.Mechanism
BESTEFFORT
14
4
4
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
0


I1.3.Timeliness.of.Mechanism_____I1.4.Resilience.of.Effects
I1.3.Timeliness.of.Mechanism
BESTEFFORT
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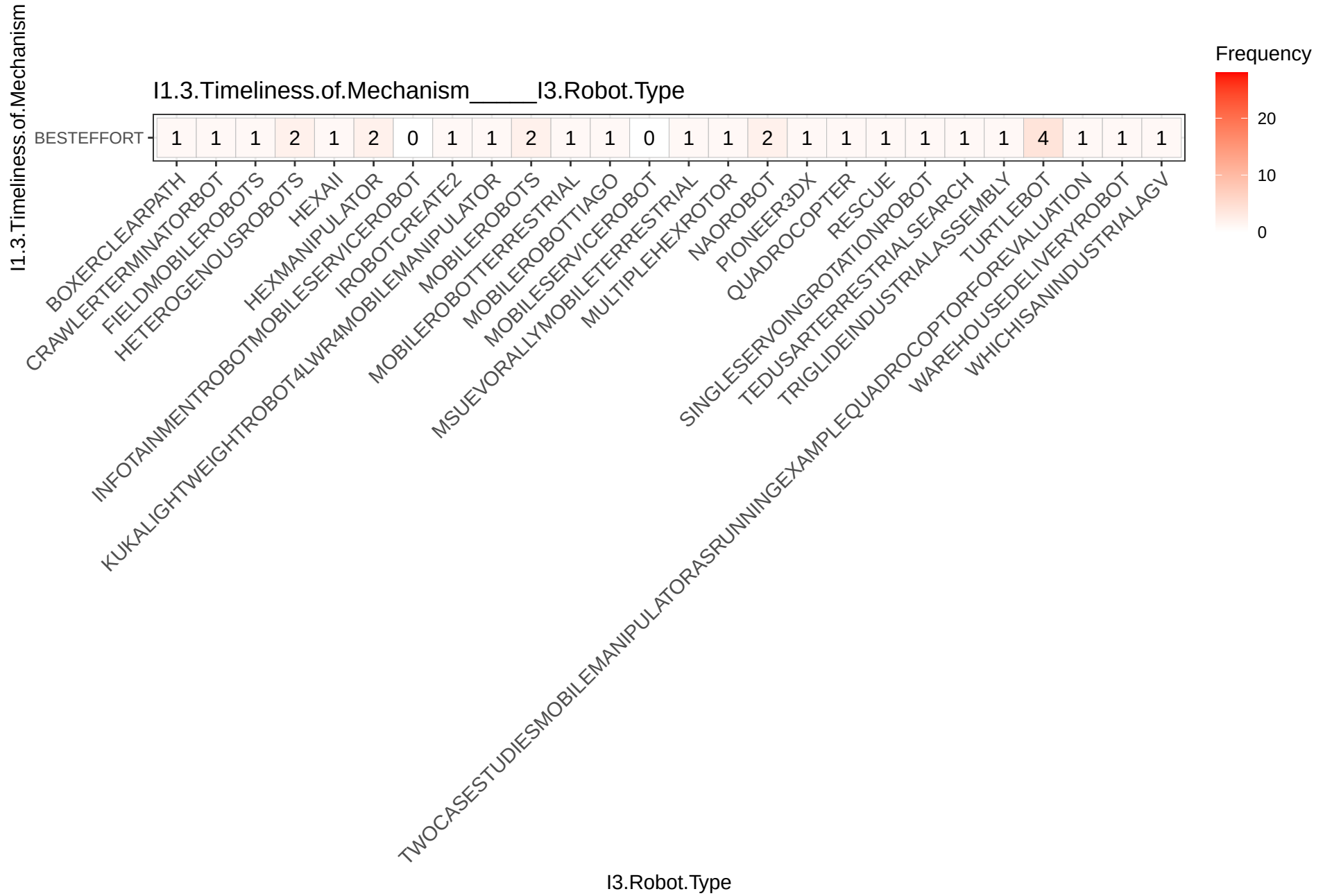
9
3
DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
20
10
0


I1.3.Timeliness.of.Mechanism_____I3.Robot.Type
I1.3.Timeliness.of.Mechanism
BESTEFFORT
1 1 1 2 1 2 0 1 1 2 1 1 0 1 1 2 1 1 1 1 1 1 4 1 1 1
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
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10
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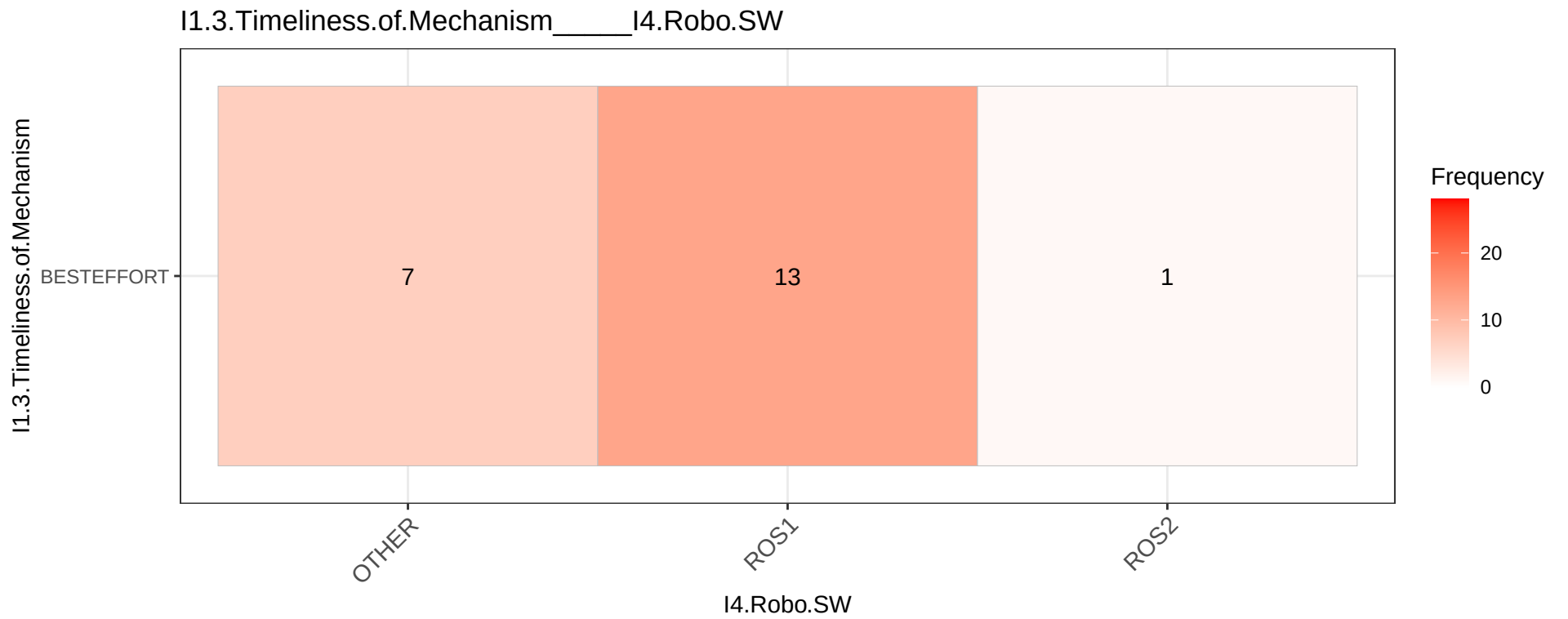
I1.3.Timeliness.of.Mechanism_____I4.Robo.SW
I1.3.Timeliness.of.Mechanism
BESTEFFORT
7
13
1
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
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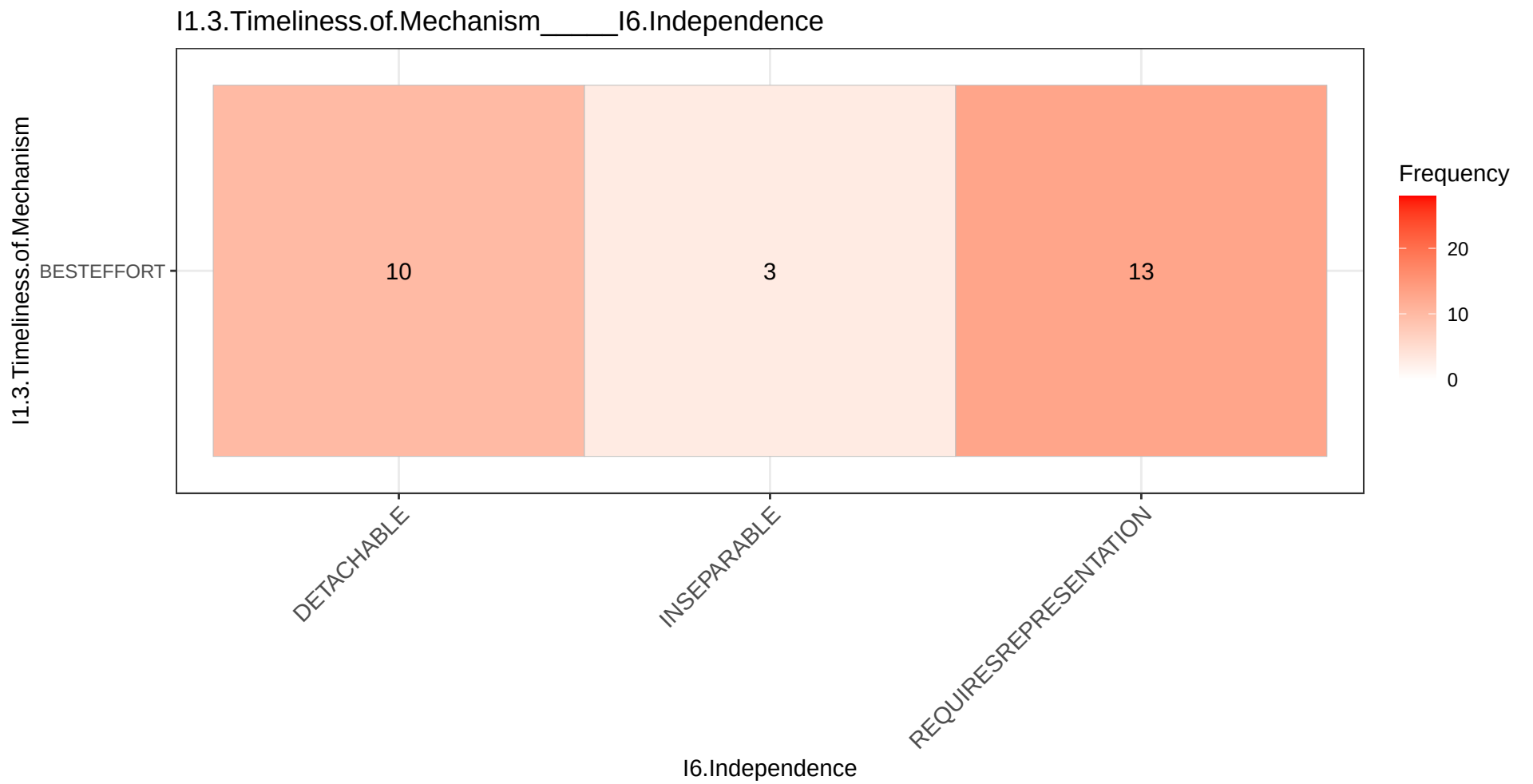
I1.3.Timeliness.of.Mechanism_____I6.Independence
I1.3.Timeliness.of.Mechanism
BESTEFFORT
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3
13
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
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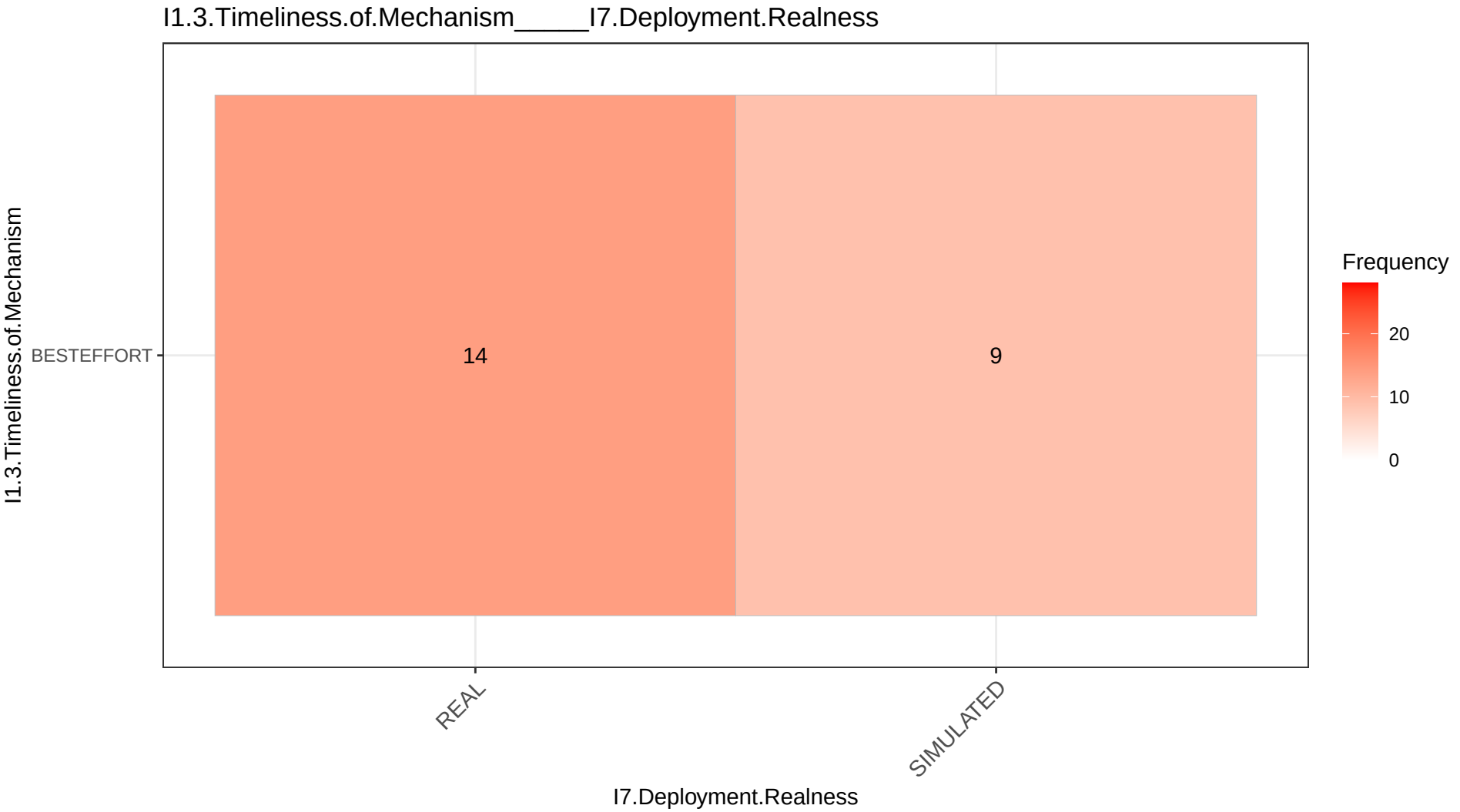
I1.3.Timeliness.of.Mechanism_____I7.Deployment.Realness
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BESTEFFORT
14
9
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
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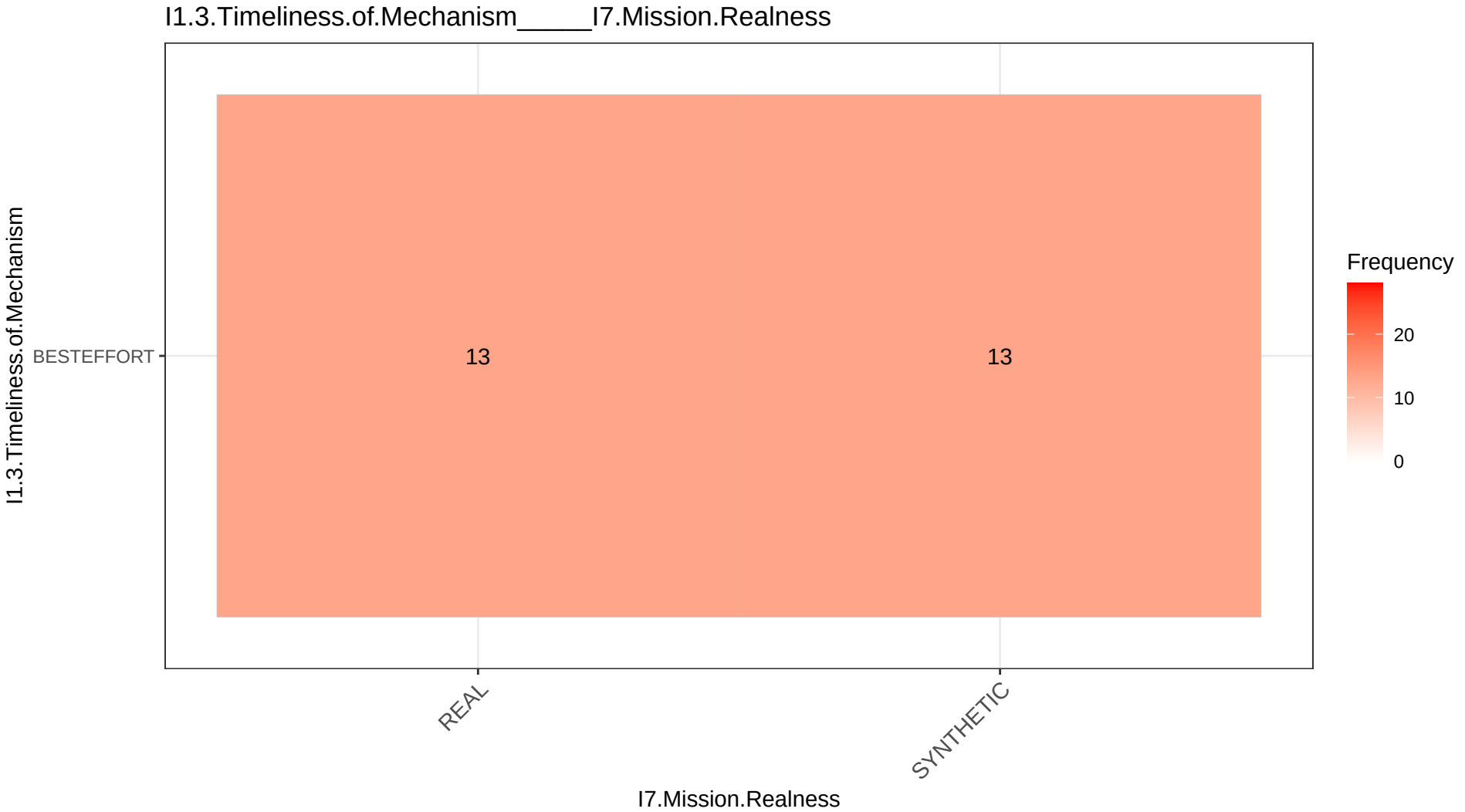
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BESTEFFORT
13
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REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
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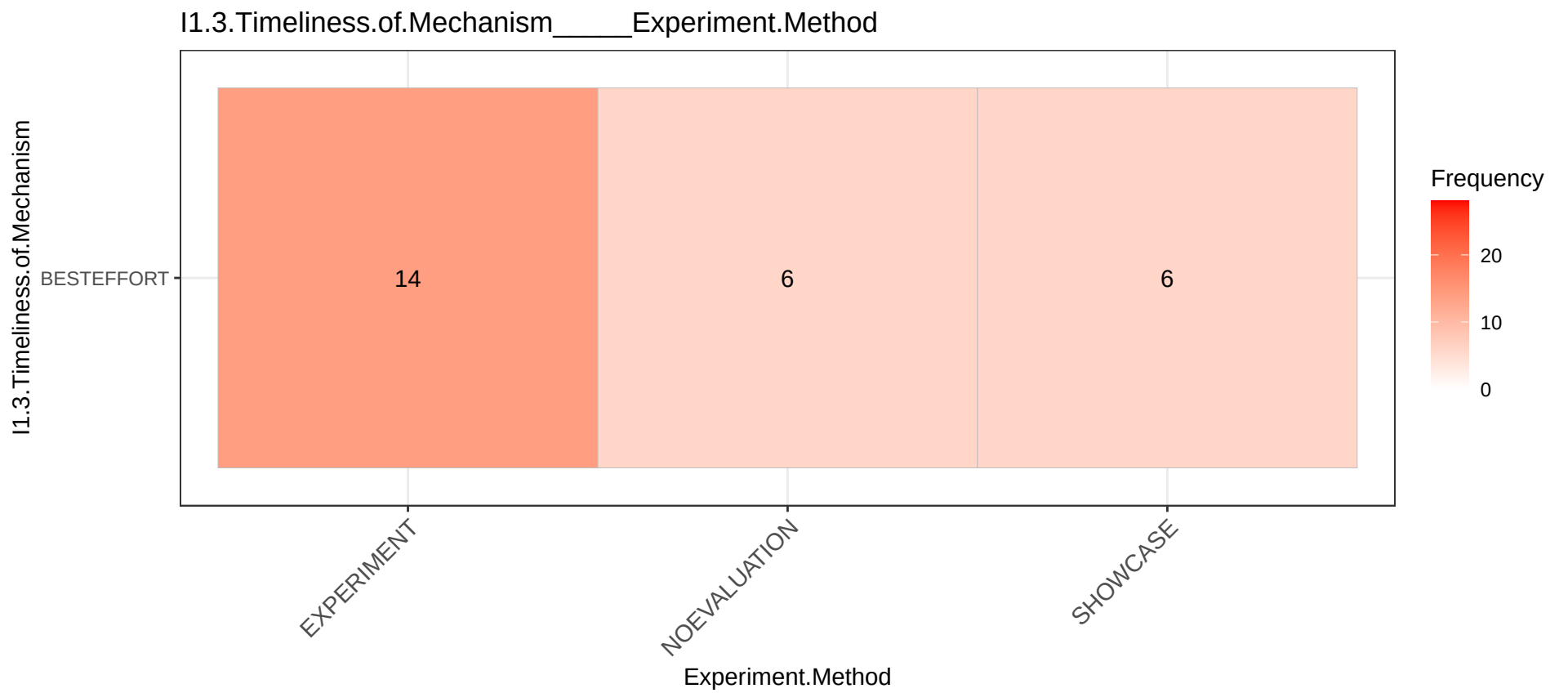
I1.3.Timeliness.of.Mechanism_____Experiment.Method
I1.3.Timeliness.of.Mechanism
BESTEFFORT
14
6
6
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
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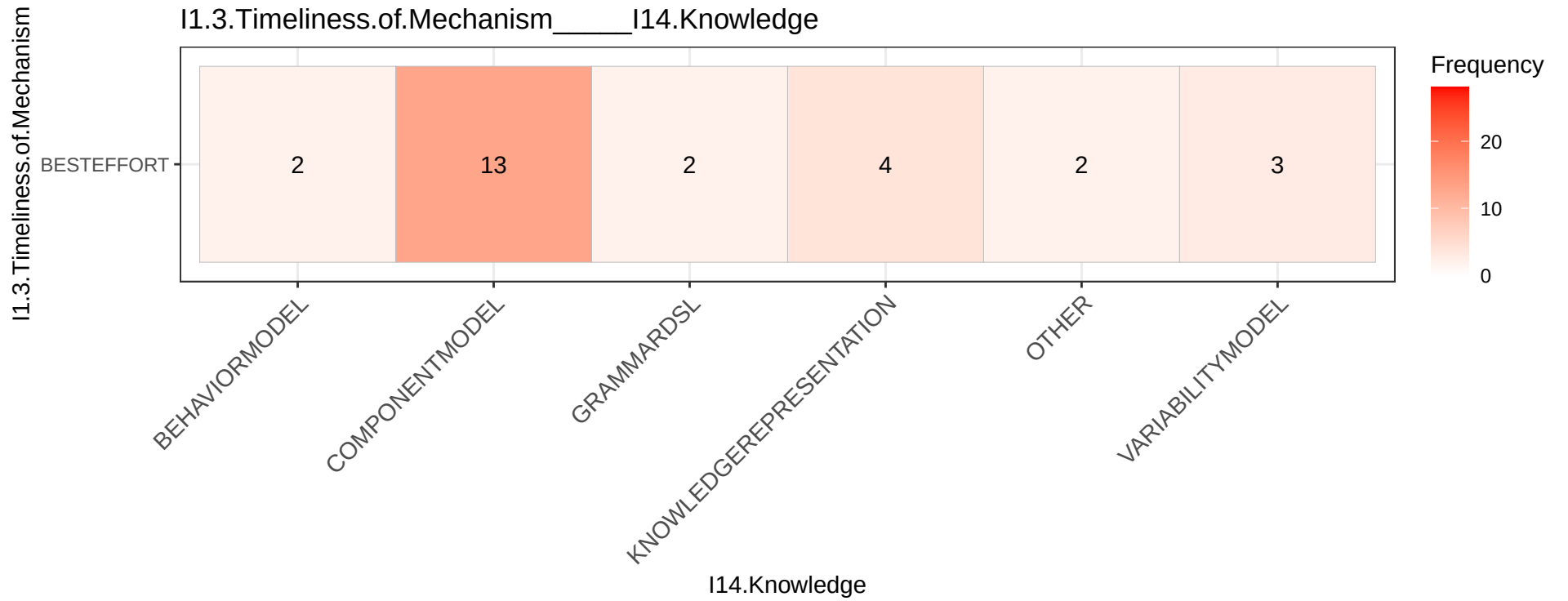
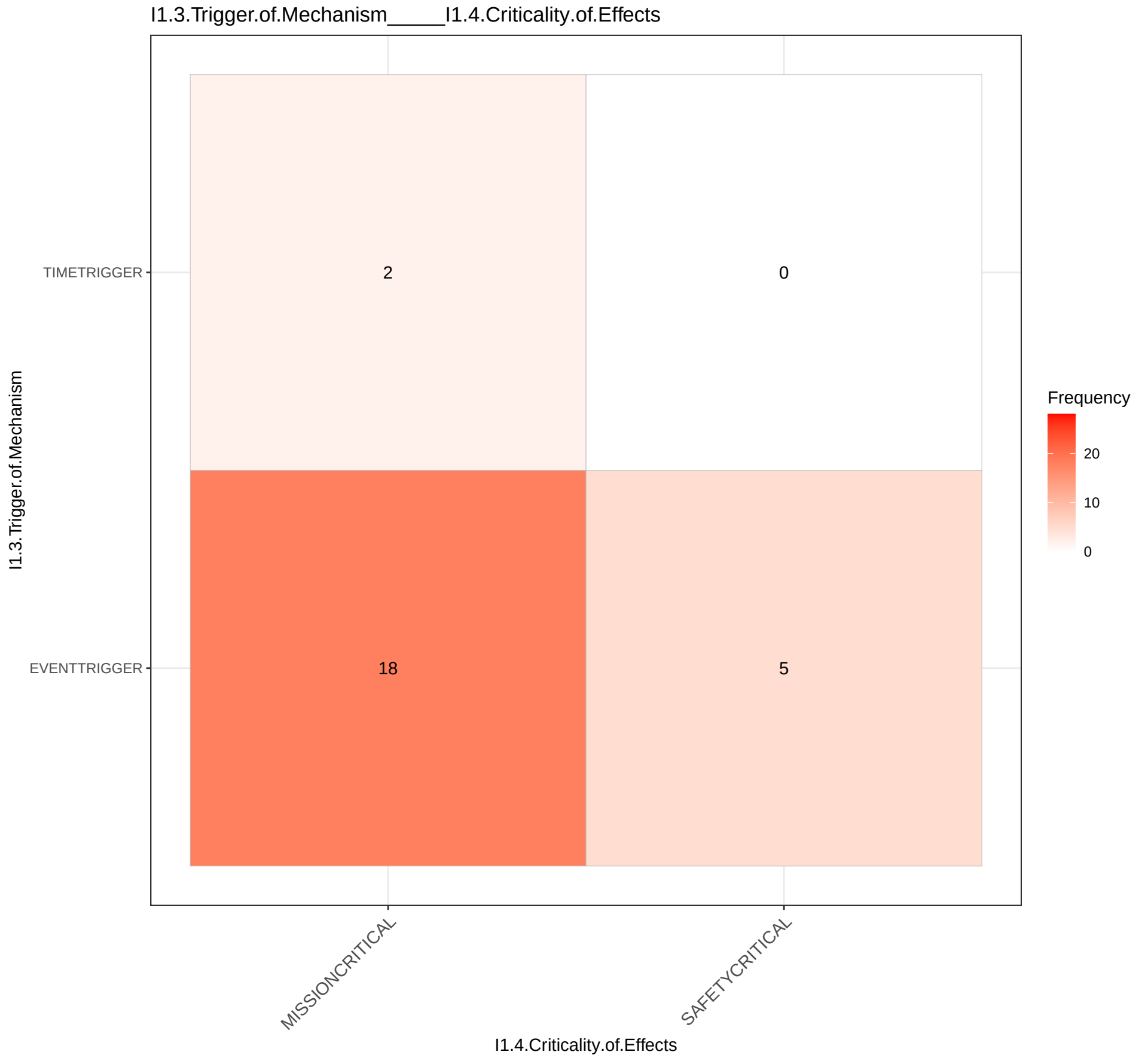

I1.3.Timeliness.of.Mechanism_____I14.Knowledge
I1.3.Timeliness.of.Mechanism
BESTEFFORT
2
13
2
4
2
3
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0


I1.3.Trigger.of.Mechanism_____I1.4.Criticality.of.Effects
TIMETRIGGER
EVENTTRIGGER
I1.3.Trigger.of.Mechanism
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18
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SAFETYCRITICAL
I1.4.Criticality.of.Effects
Frequency
20
10
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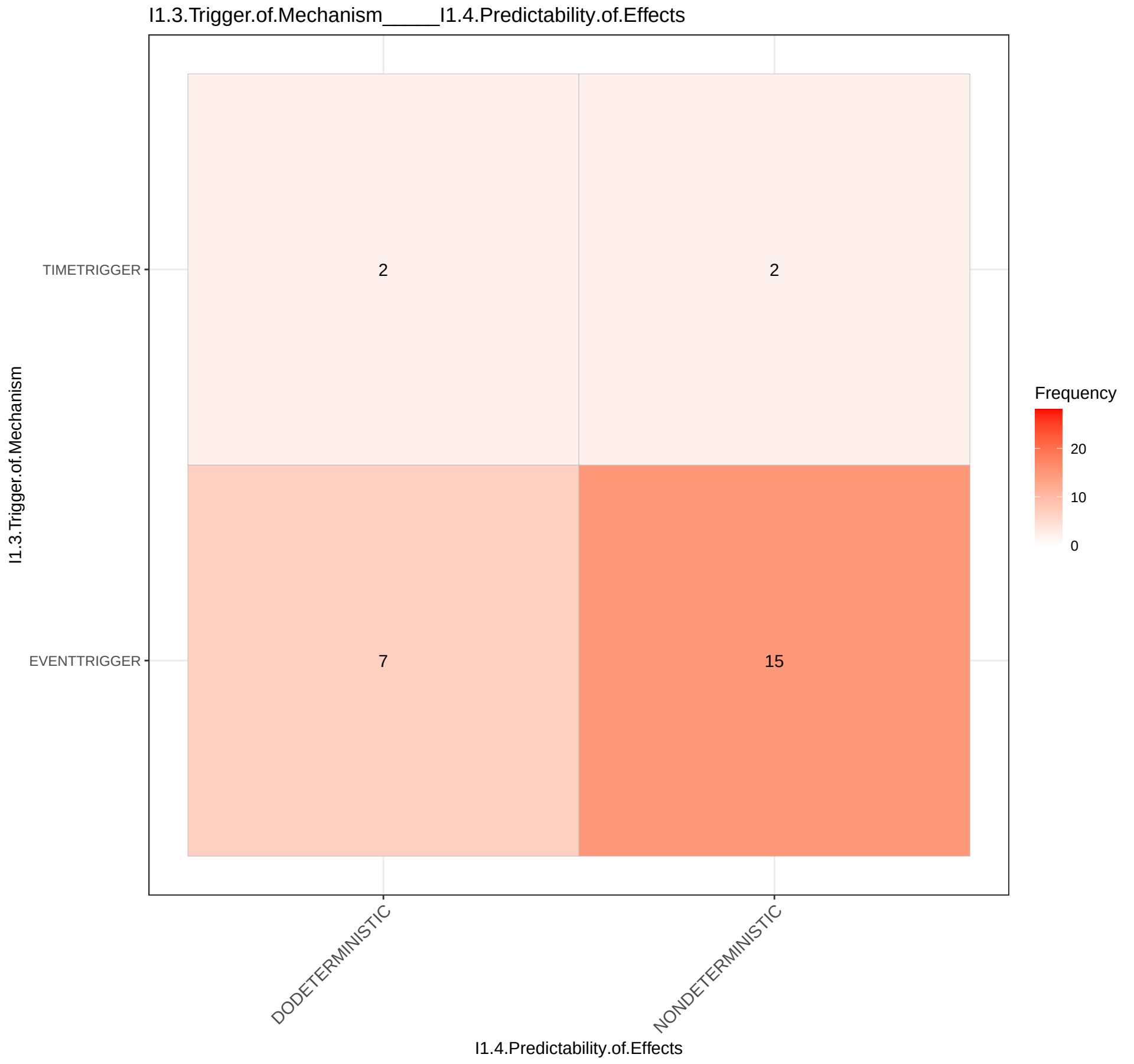
I1.3.Trigger.of.Mechanism_____I1.4.Predictability.of.Effects
TIMETRIGGER
EVENTTRIGGER
2
2
7
15
I1.3.Trigger.of.Mechanism
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
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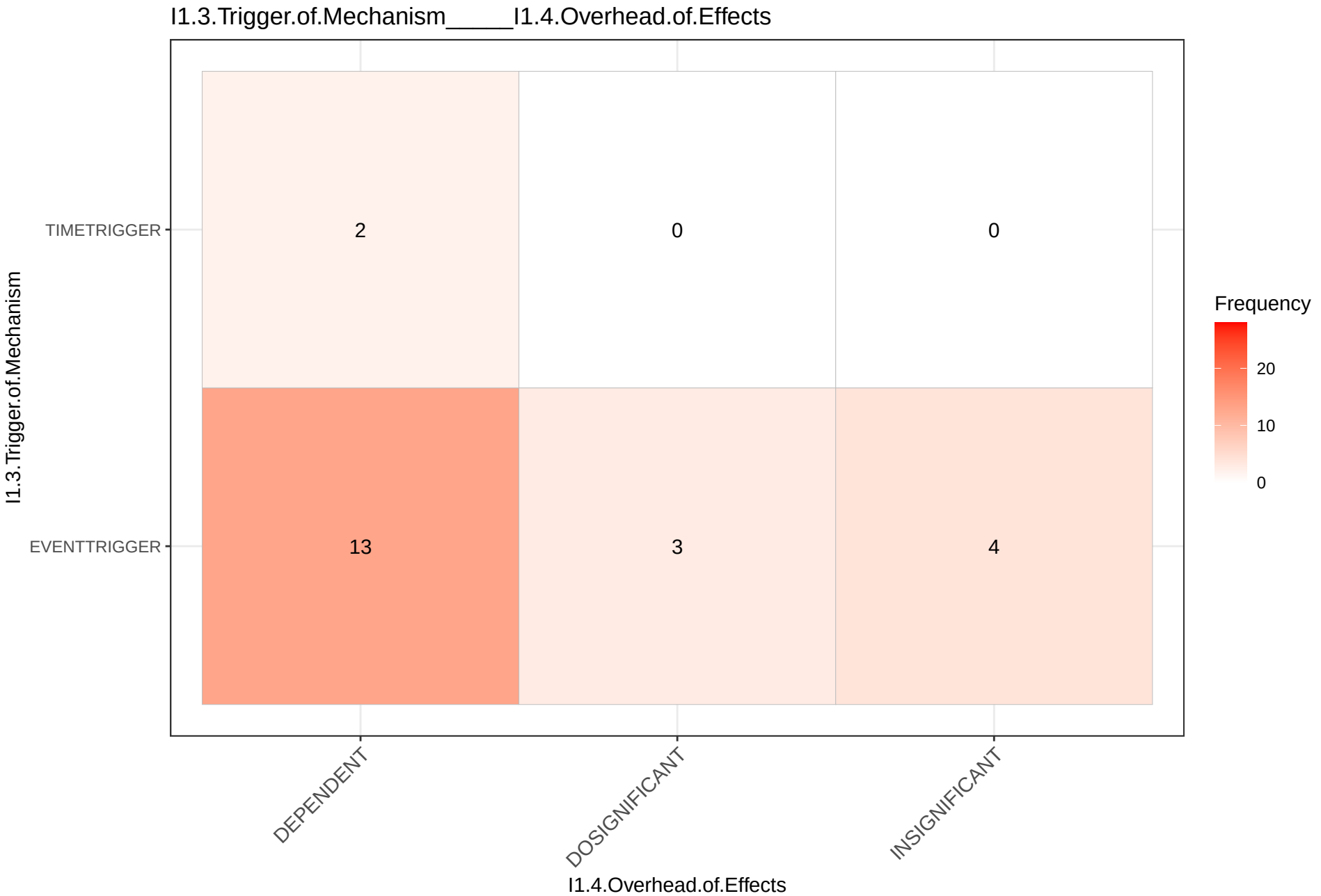
I1.3.Trigger.of.Mechanism_____I1.4.Overhead.of.Effects
TIMETRIGGER
EVENTTRIGGER
I1.3.Trigger.of.Mechanism
2
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INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
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10
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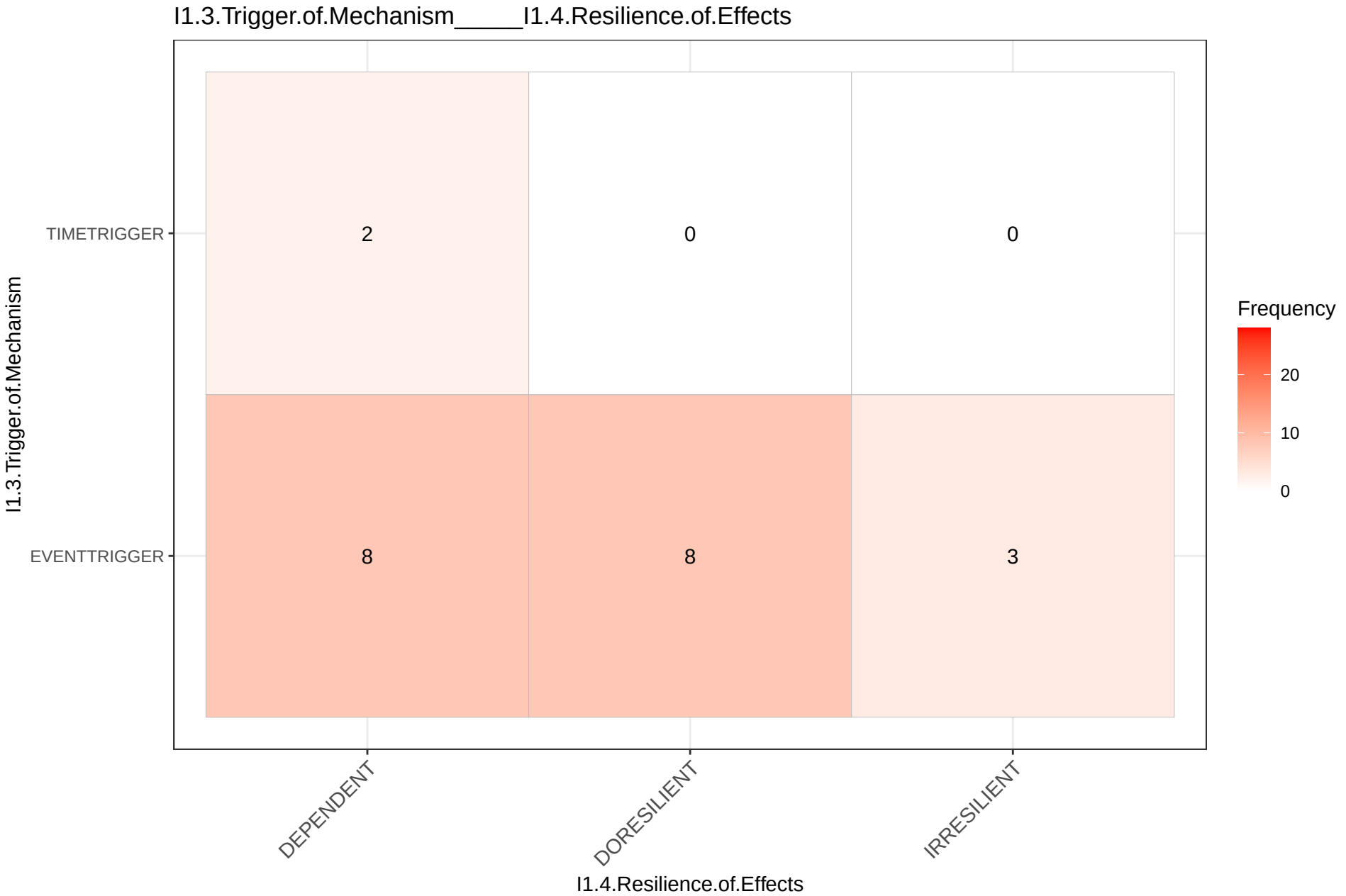
I1.3.Trigger.of.Mechanism_____I1.4.Resilience.of.Effects
TIMETRIGGER
EVENTTRIGGER
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0
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3
DEPENDENT
DORESILIENT
IRRESILIENT
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Frequency
20
10
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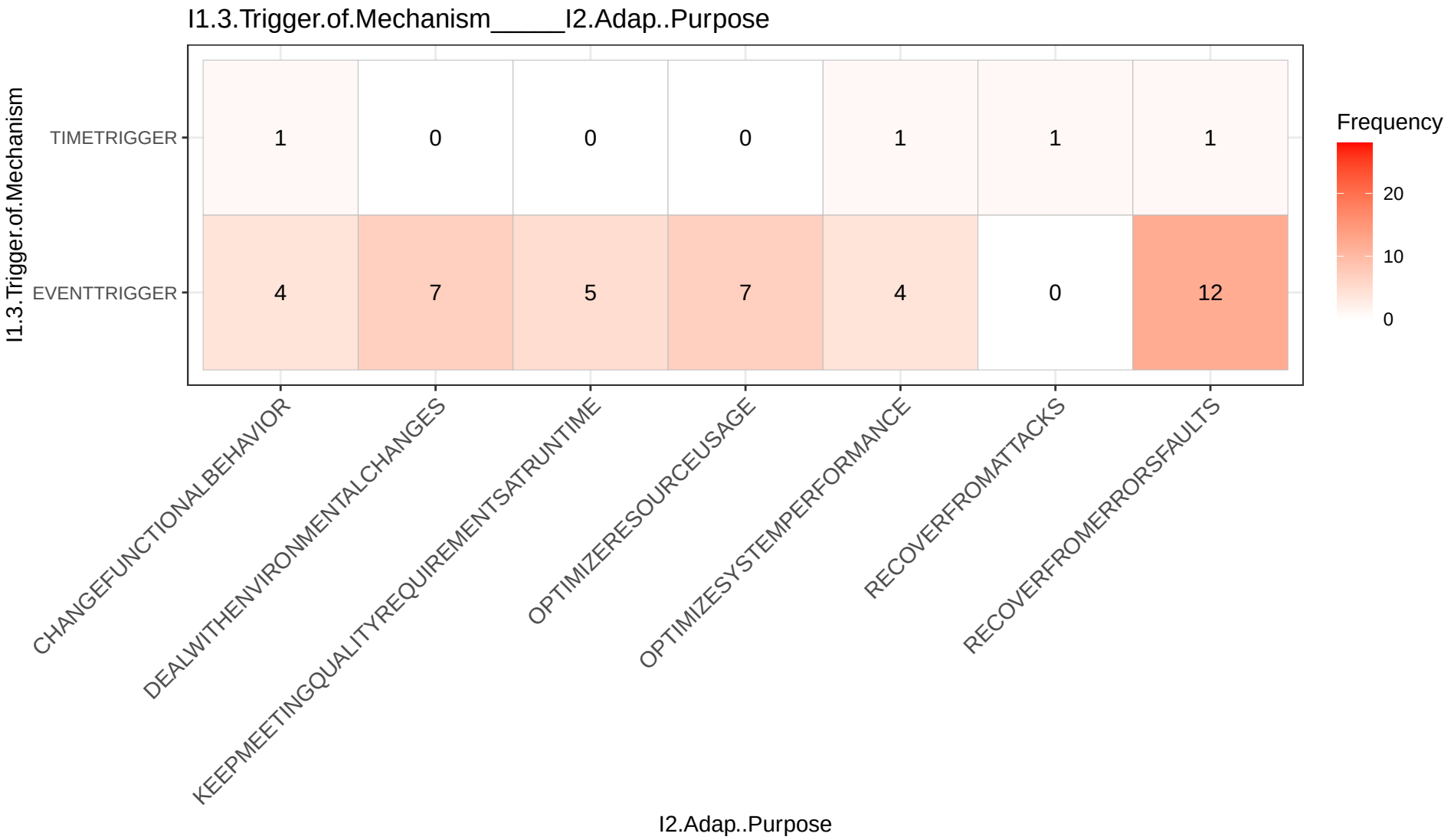
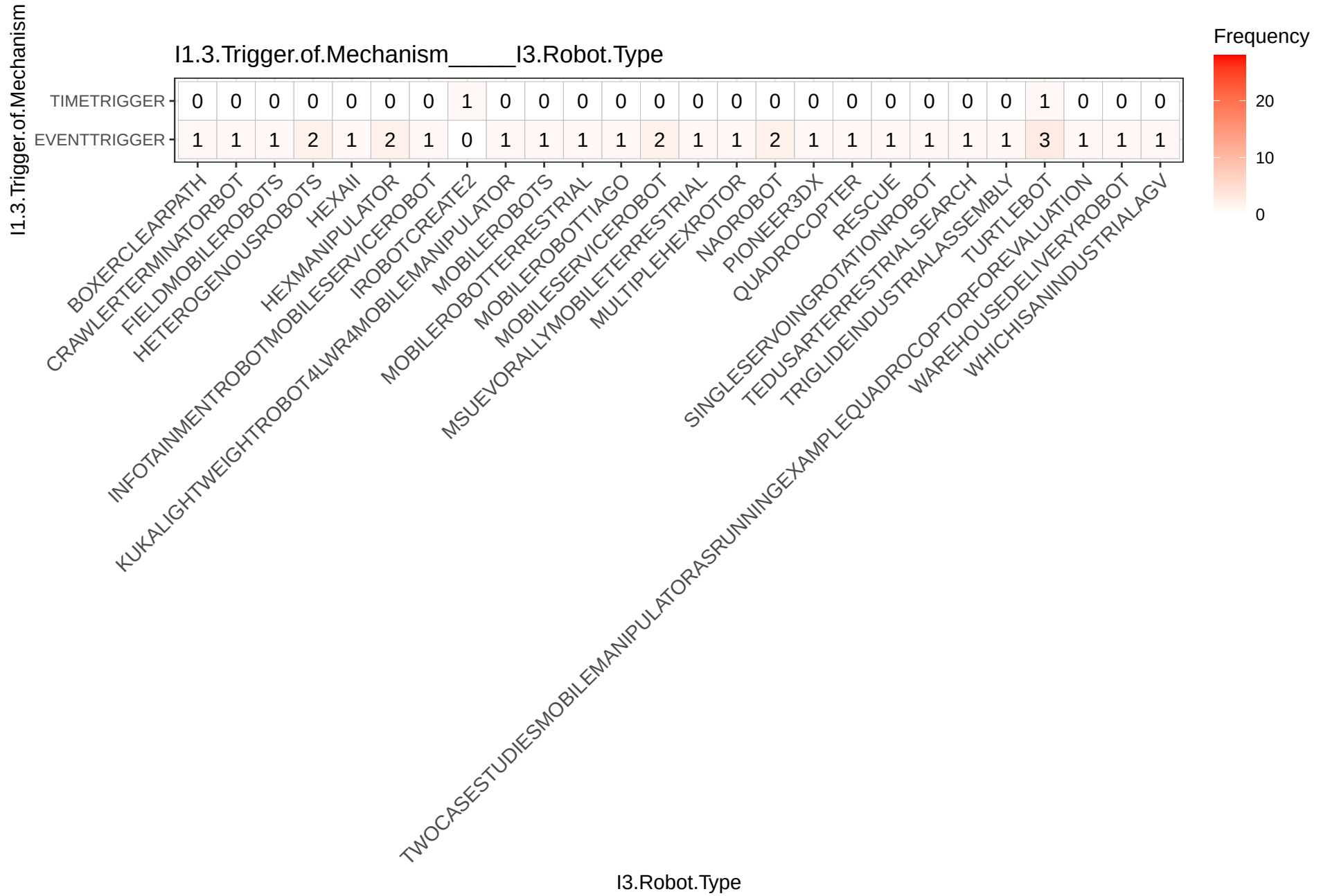

I1.3.Trigger.of.Mechanism_____I2.Adap..Purpose
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
1
0
0
0
1
1
1
4
7
5
7
4
0
12
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
10
0


I1.3.Trigger.of.Mechanism_____I3.Robot.Type
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
1 1 1 2 1 2 1 0 1 1 1 1 2 1 1 2 1 1 1 1 1 1 3 1 1 1
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
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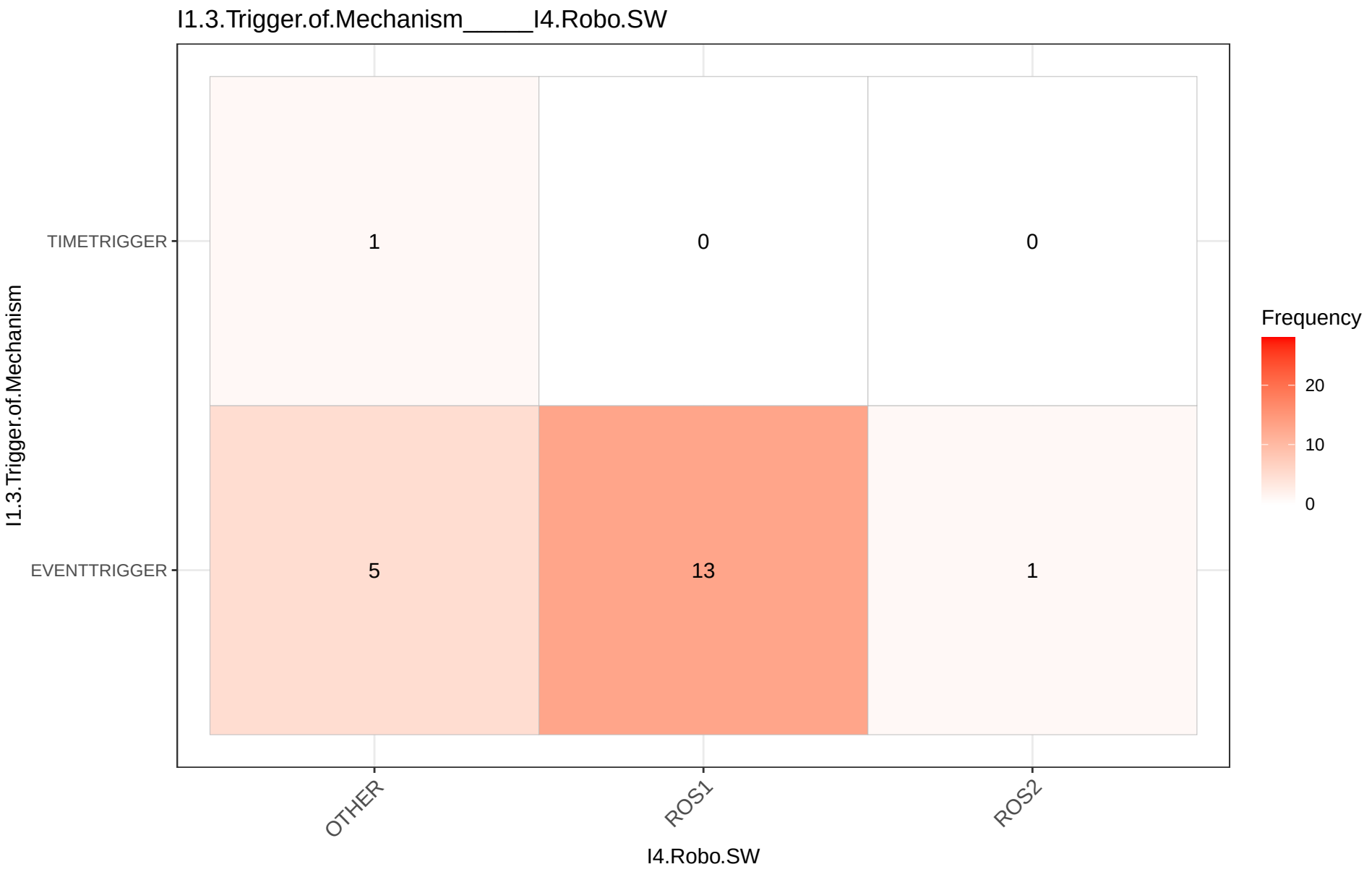
I1.3.Trigger.of.Mechanism_____I4.Robo.SW
TIMETRIGGER
EVENTTRIGGER
I1.3.Trigger.of.Mechanism
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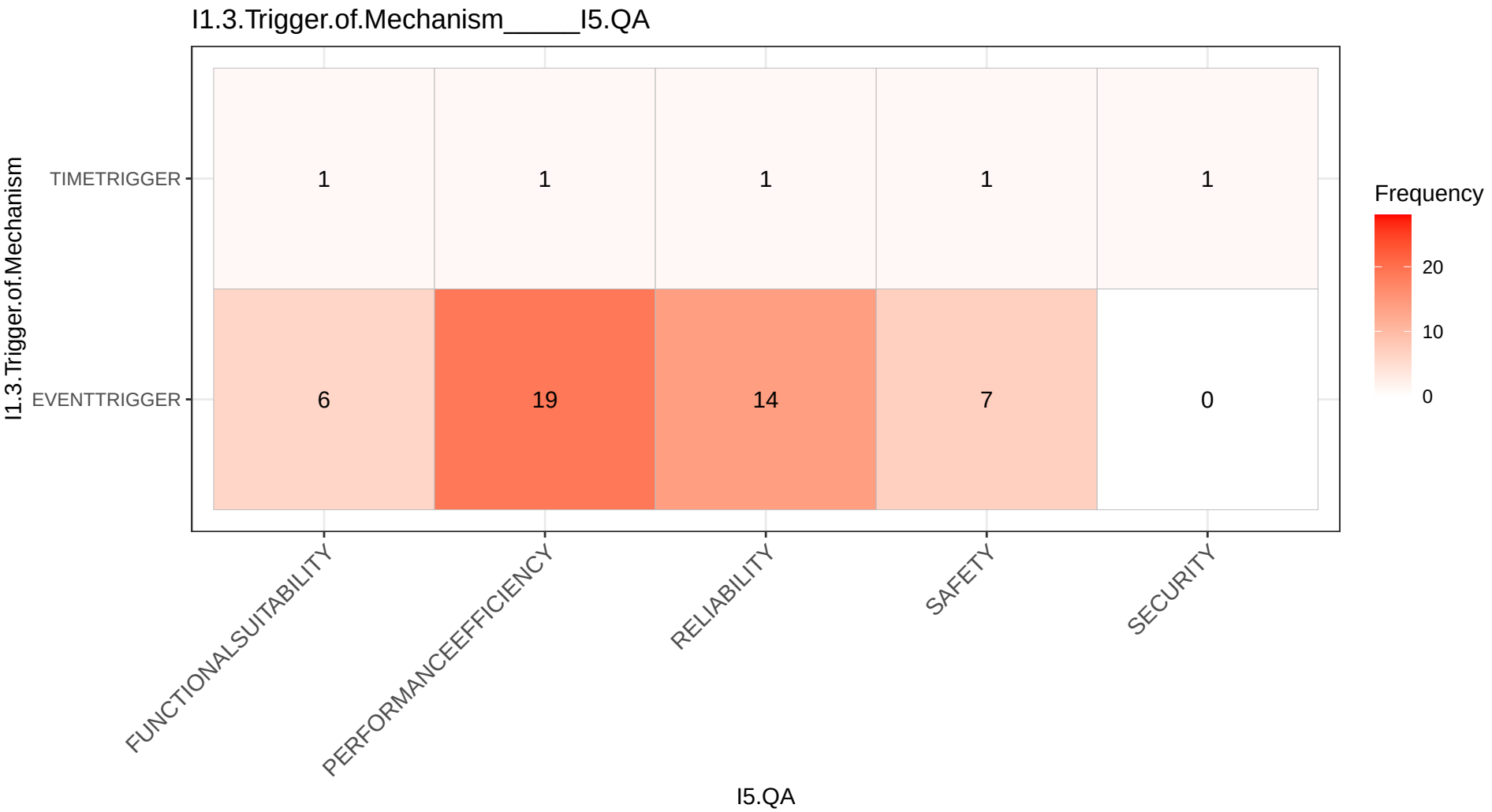
0
5
13
1
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0


I1.3.Trigger.of.Mechanism_____I5.QA
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
1
1
1
1
1
6
19
14
7
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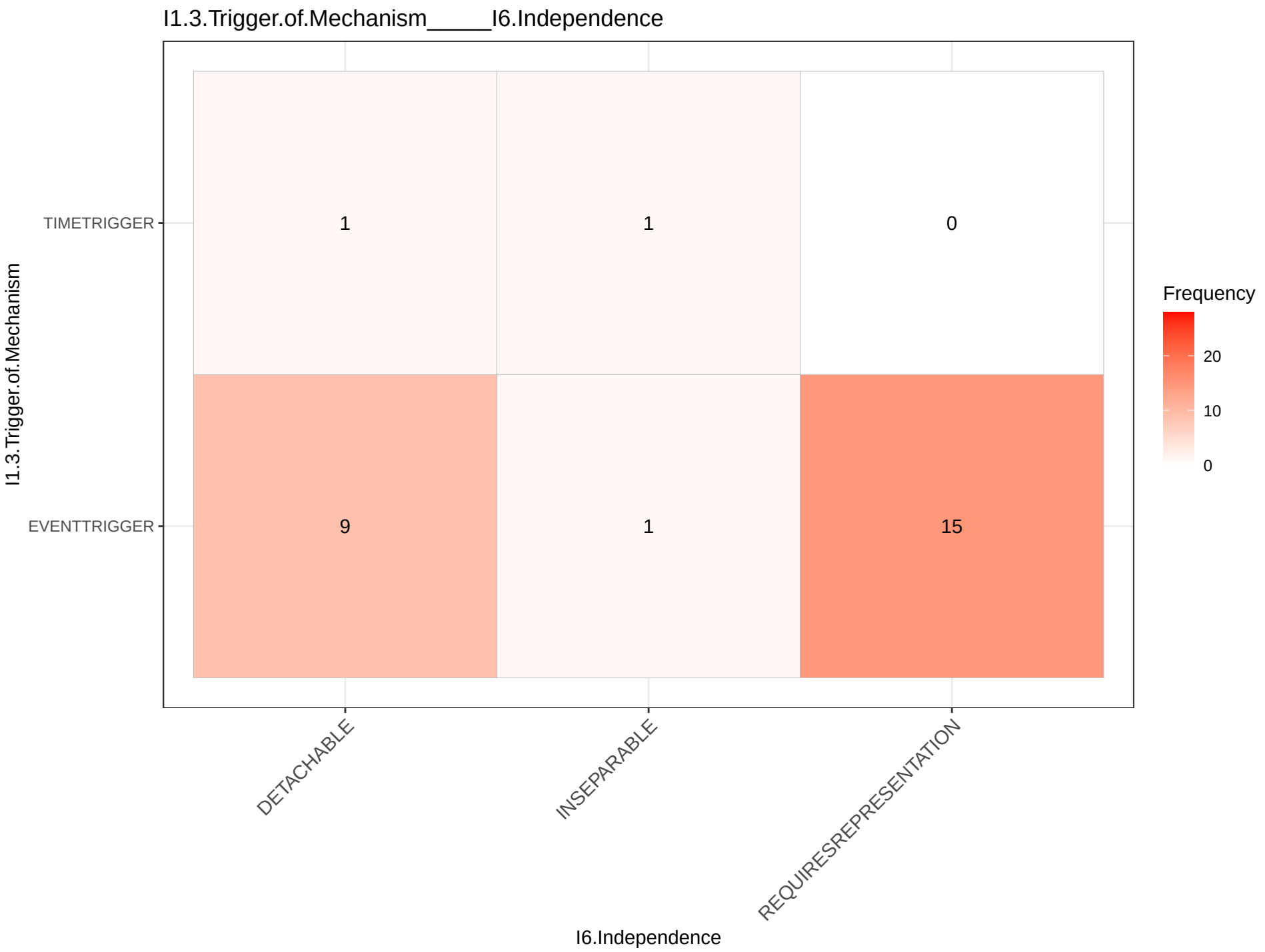
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I1.3.Trigger.of.Mechanism_____I6.Independence
TIMETRIGGER
EVENTTRIGGER
1
1
0
9
1
15
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I1.3.Trigger.of.Mechanism
I6.Independence
Frequency
20
10
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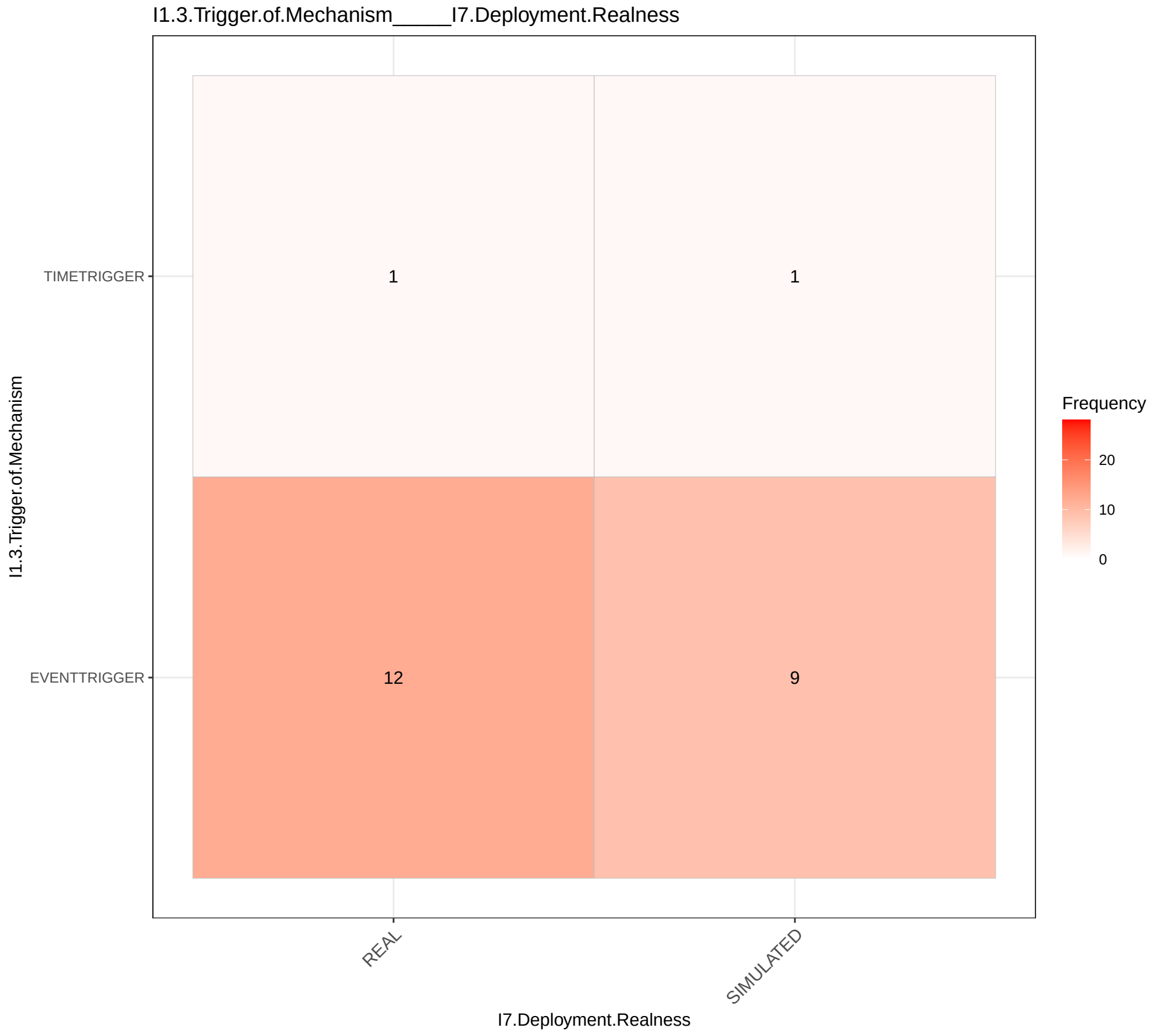
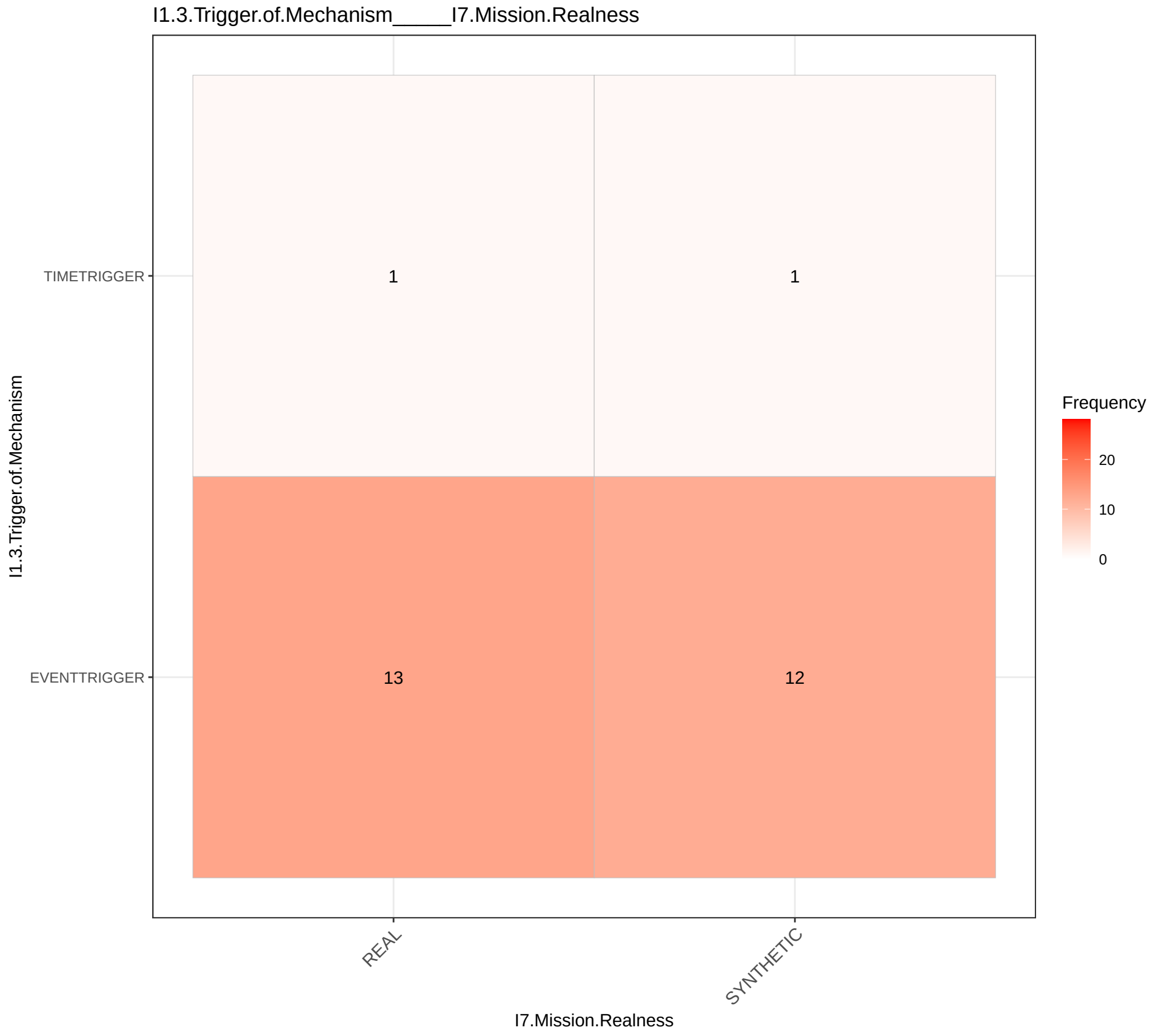

I1.3.Trigger.of.Mechanism_____I7.Deployment.Realness
TIMETRIGGER
EVENTTRIGGER
1
1
12
9
REAL
SIMULATED
I1.3.Trigger.of.Mechanism
I7.Deployment.Realness
Frequency
20
10
0


I1.3.Trigger.of.Mechanism_____I7.Mission.Realness
TIMETRIGGER
EVENTTRIGGER
1
1
13
12
REAL
SYNTHETIC
I1.3.Trigger.of.Mechanism
I7.Mission.Realness
Frequency
20
10
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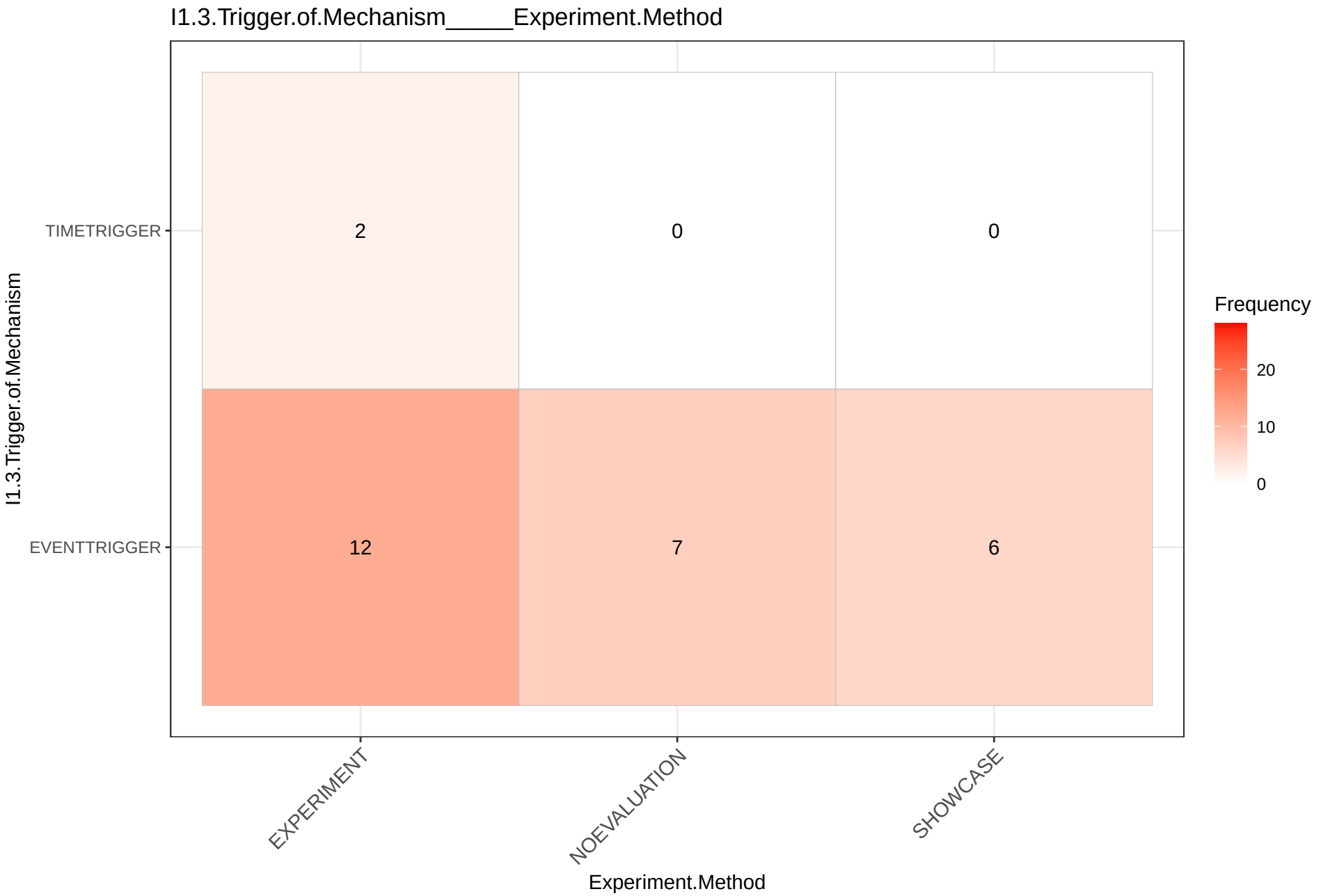
I1.3.Trigger.of.Mechanism_____Experiment.Method
TIMETRIGGER
EVENTTRIGGER
I1.3.Trigger.of.Mechanism
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12
7
6
Frequency
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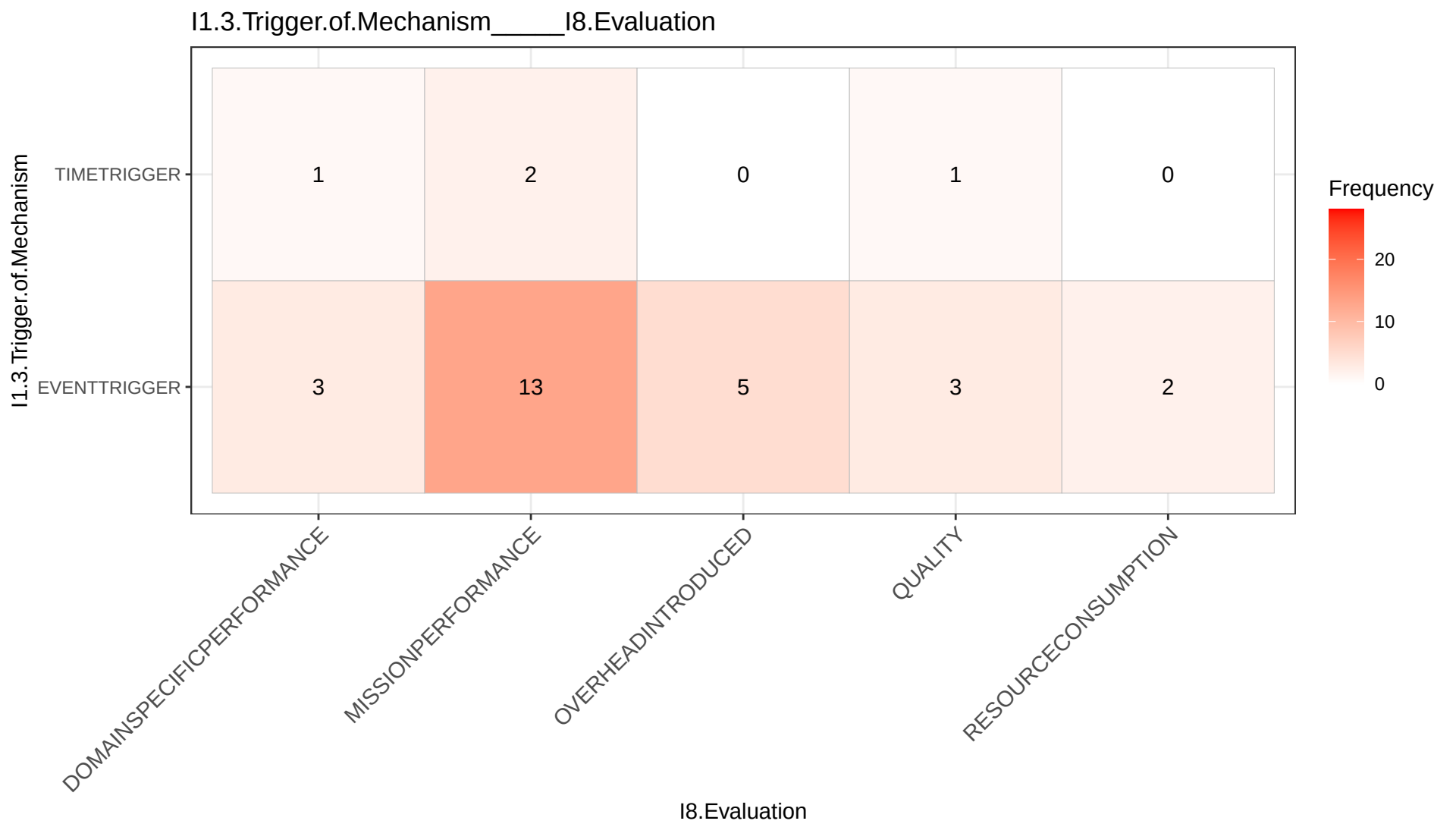
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method


I1.3.Trigger.of.Mechanism_____I8.Evaluation
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
1
2
0
1
0
3
13
5
3
2
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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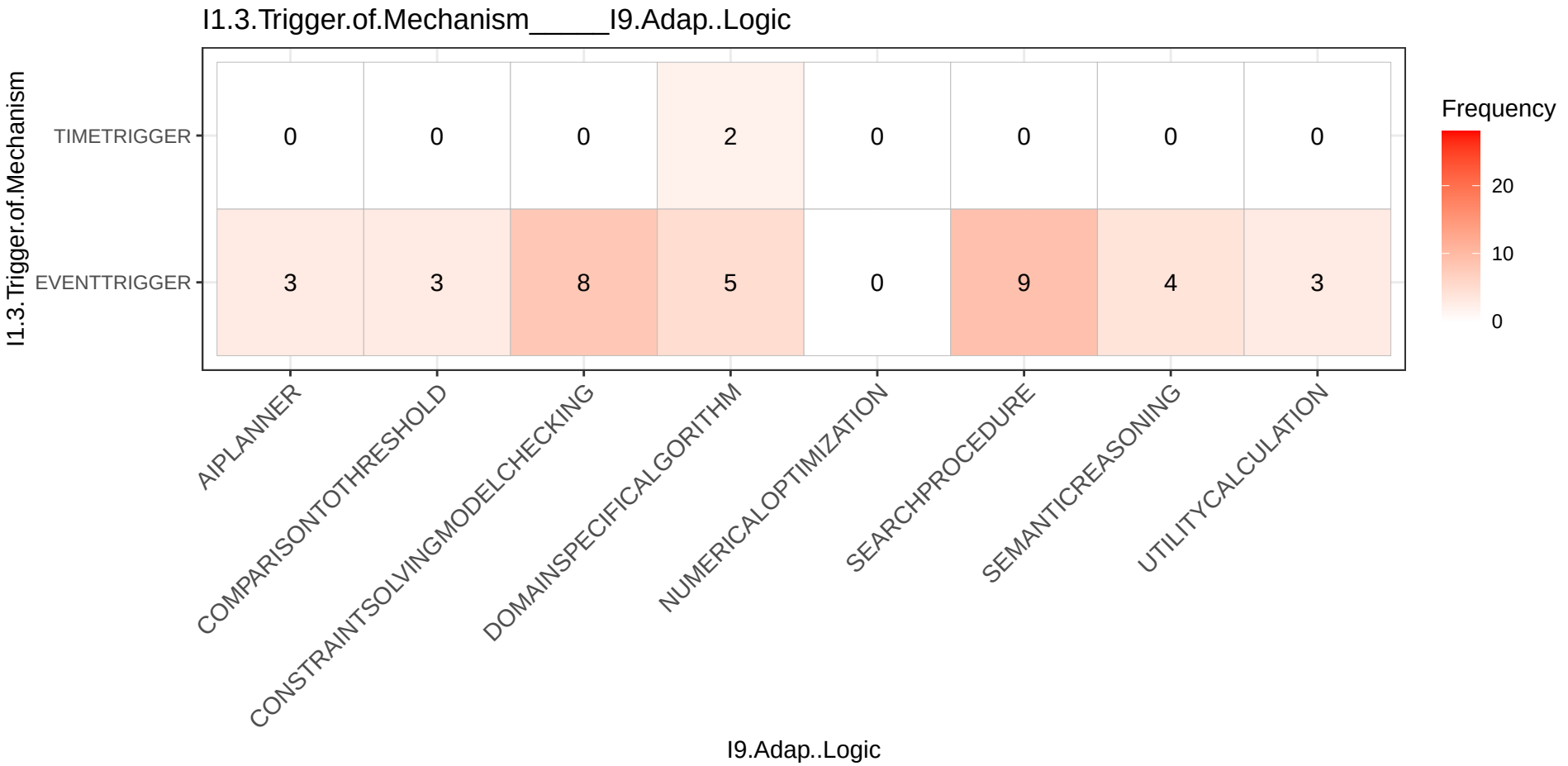
I1.3.Trigger.of.Mechanism_____I9.Adap..Logic
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
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3 3 8 5 0 9 4 3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
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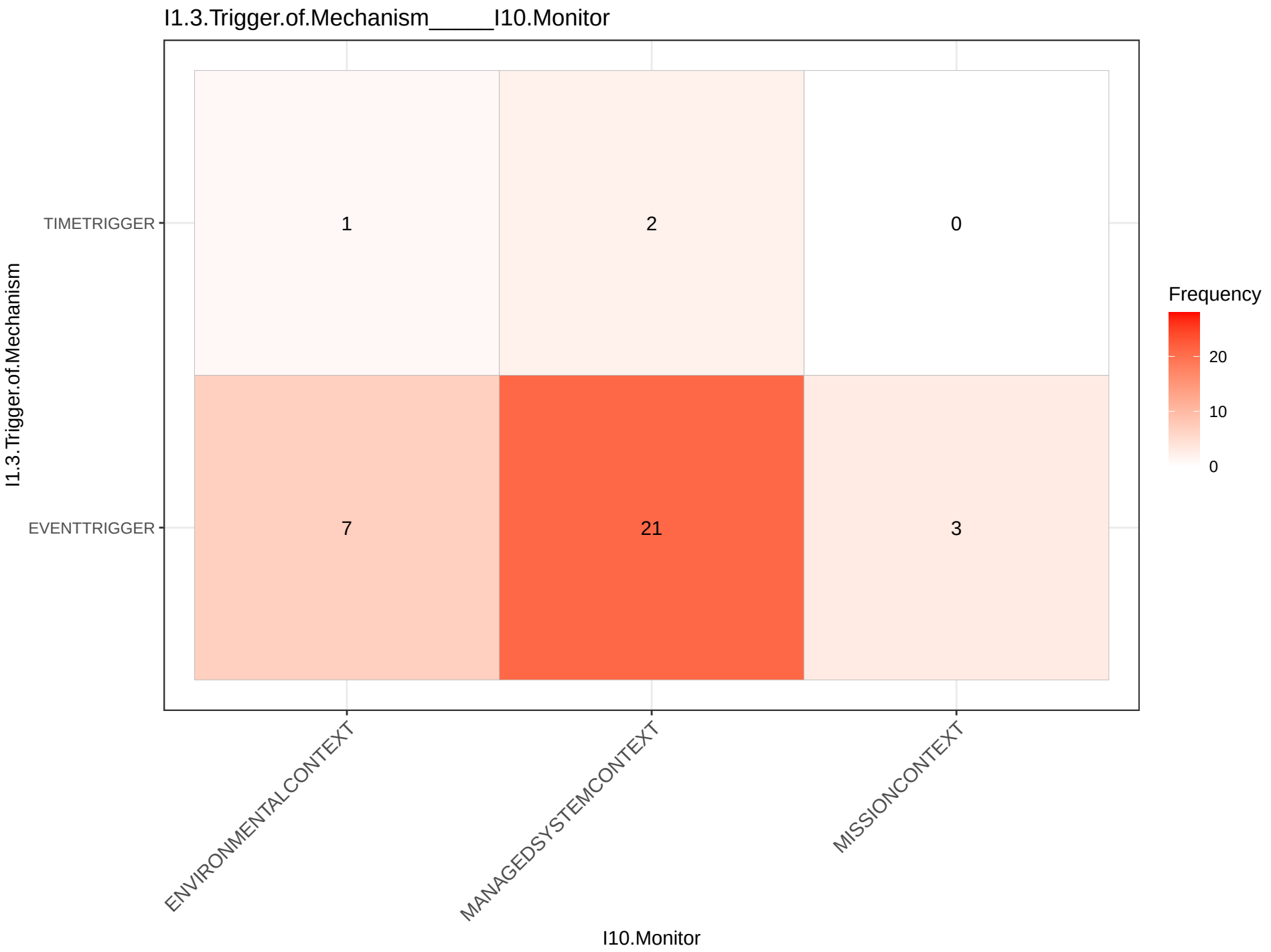
I1.3.Trigger.of.Mechanism_____I10.Monitor
TIMETRIGGER
EVENTTRIGGER
I1.3.Trigger.of.Mechanism
1
2
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7
21
3
Frequency
20
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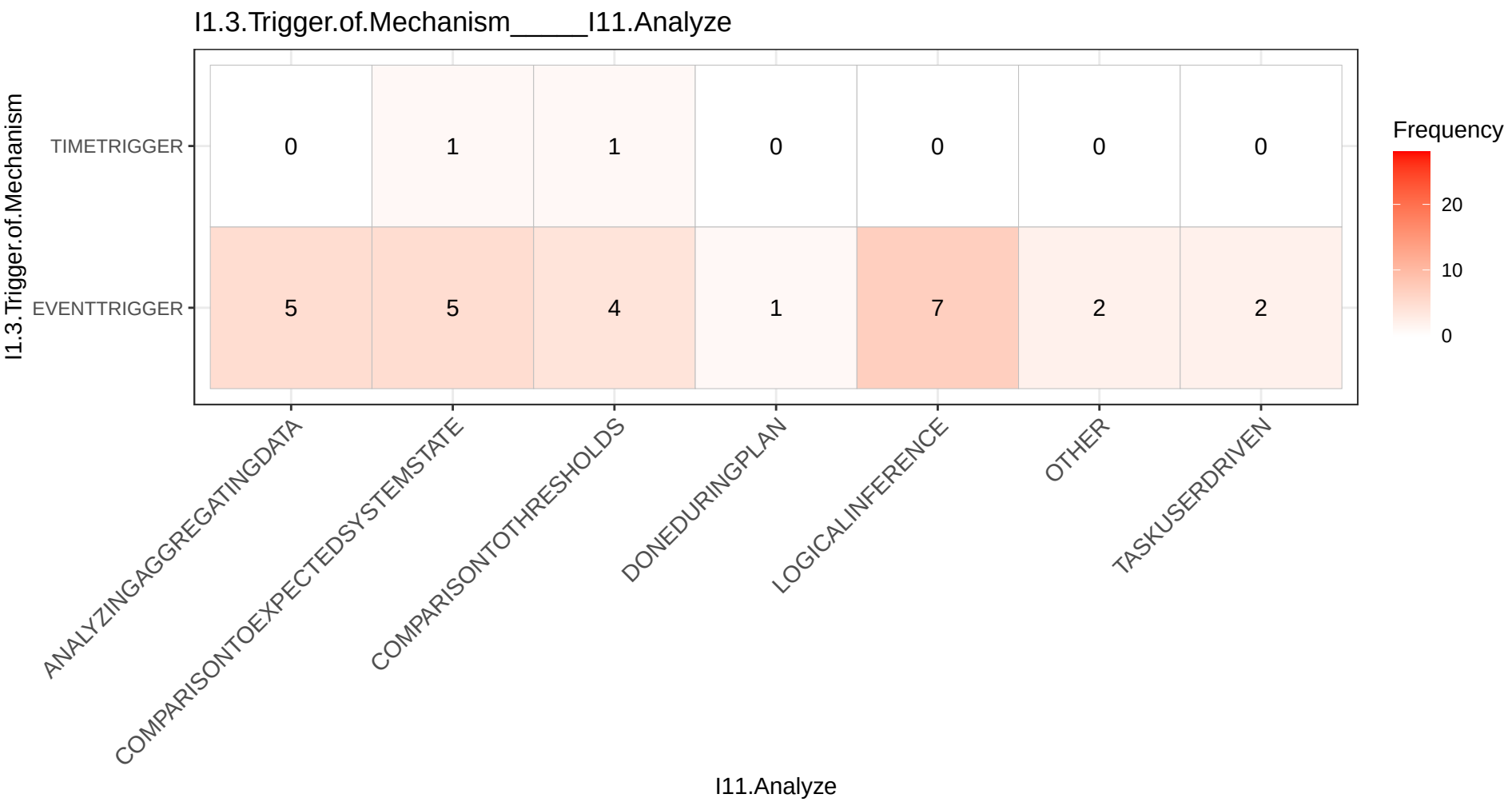
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor


I1.3.Trigger.of.Mechanism_____I11.Analyze
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
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1
1
0
0
0
0
5
5
4
1
7
2
2
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
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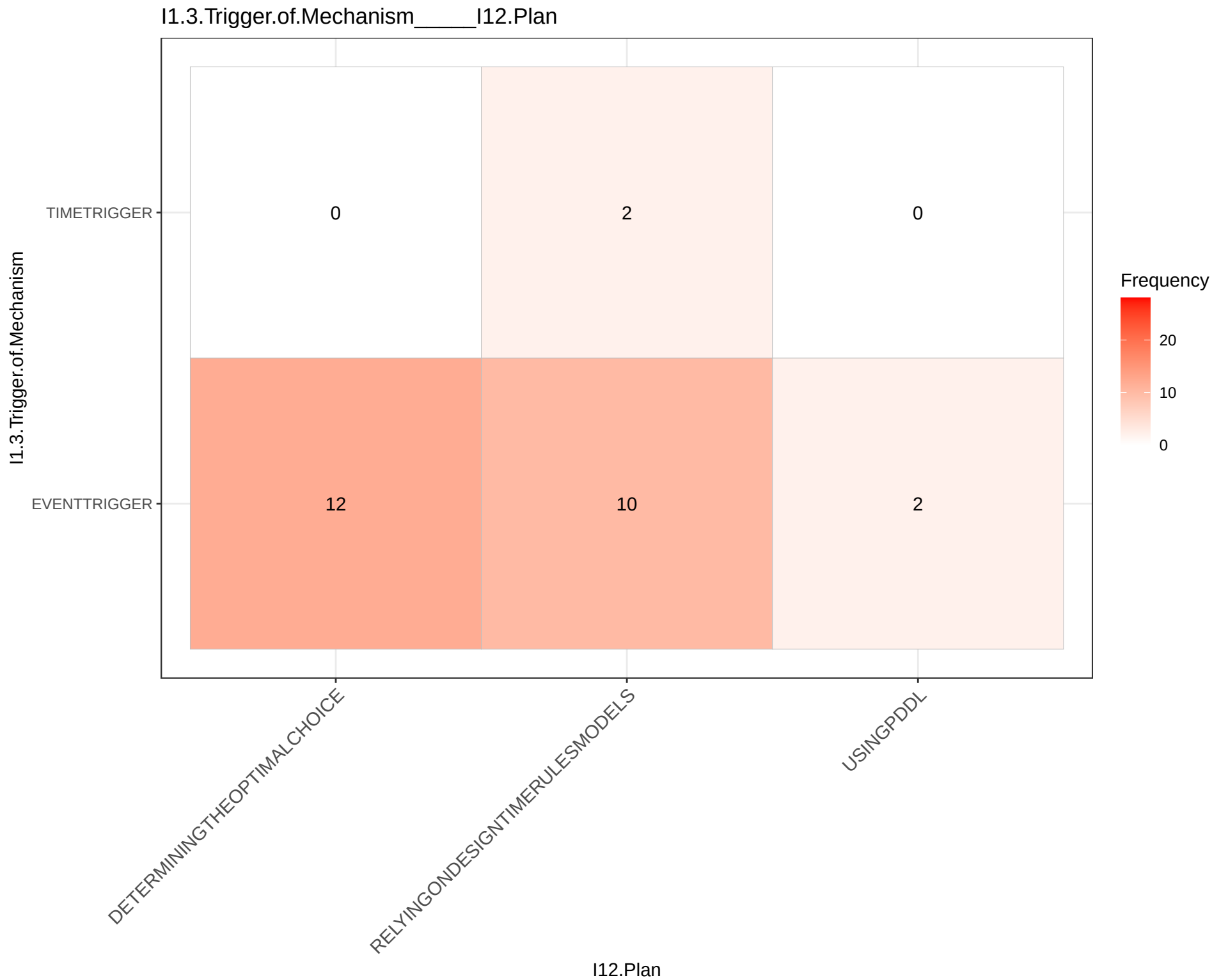
I1.3.Trigger.of.Mechanism_____I12.Plan
TIMETRIGGER
EVENTTRIGGER
I1.3.Trigger.of.Mechanism
0
2
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12
10
2
Frequency
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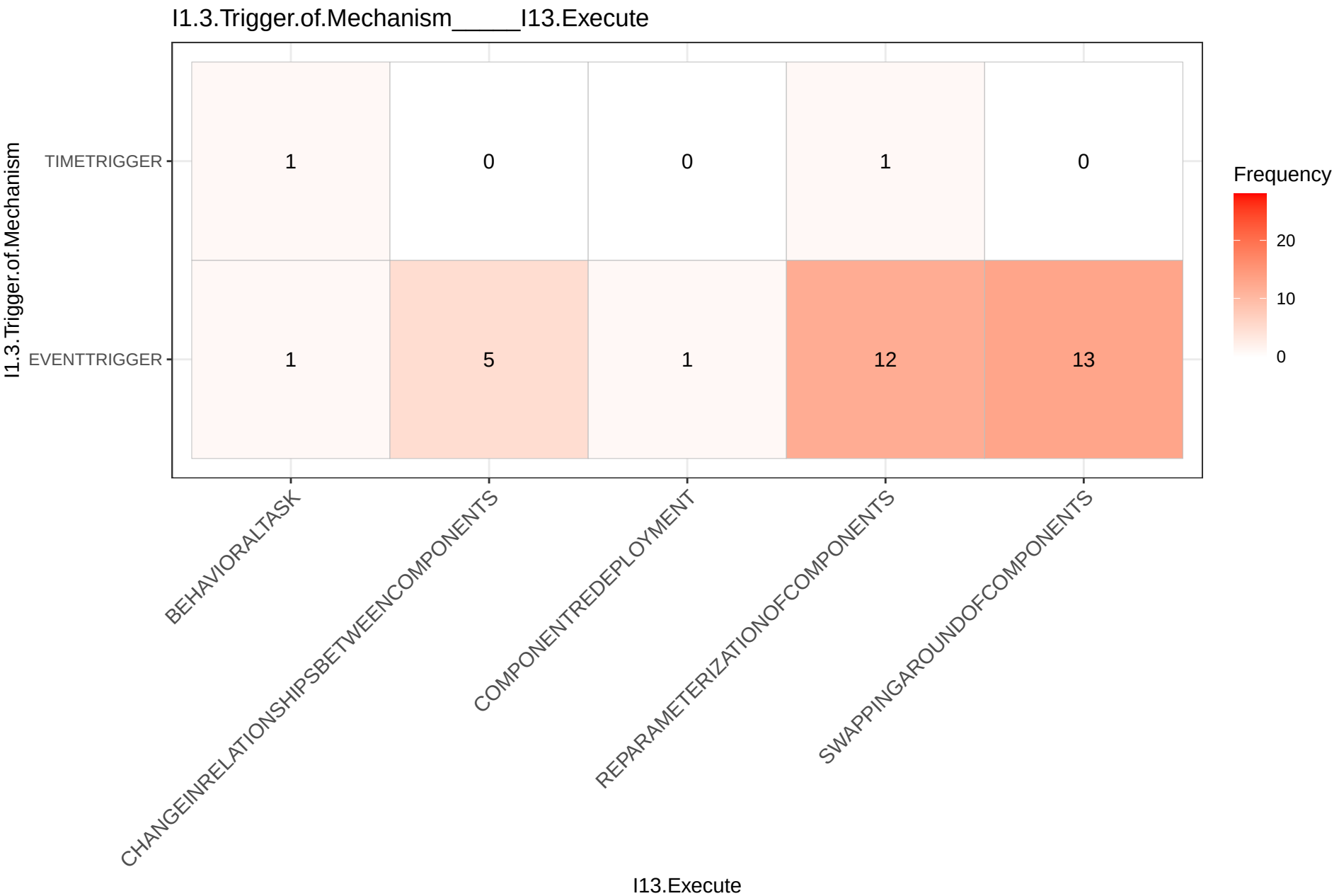
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan


I1.3.Trigger.of.Mechanism_____I13.Execute
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
1
0
0
1
0
1
5
1
12
13
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
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REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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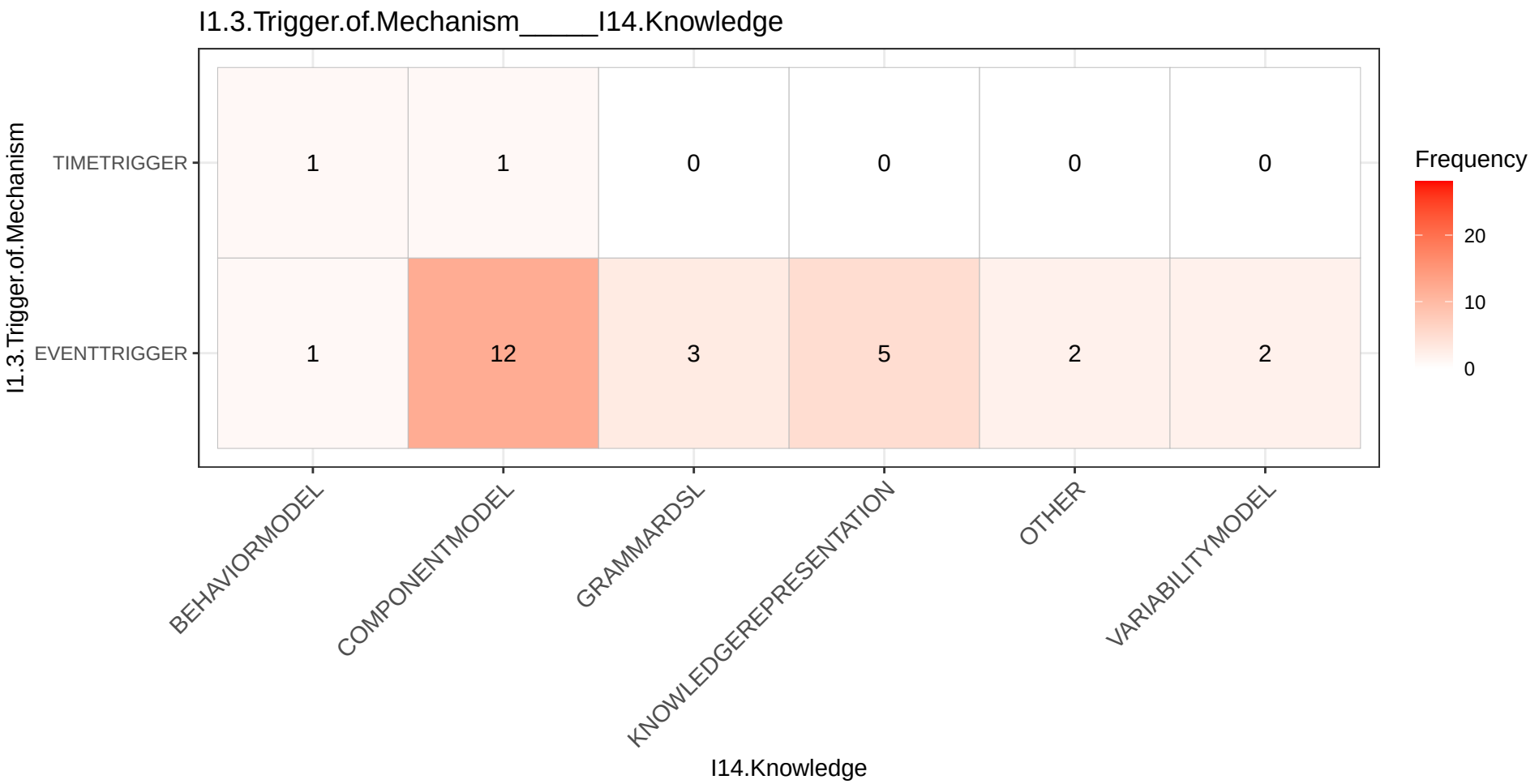
I1.3.Trigger.of.Mechanism_____I14.Knowledge
I1.3.Trigger.of.Mechanism
TIMETRIGGER
EVENTTRIGGER
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1
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1
12
3
5
2
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COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
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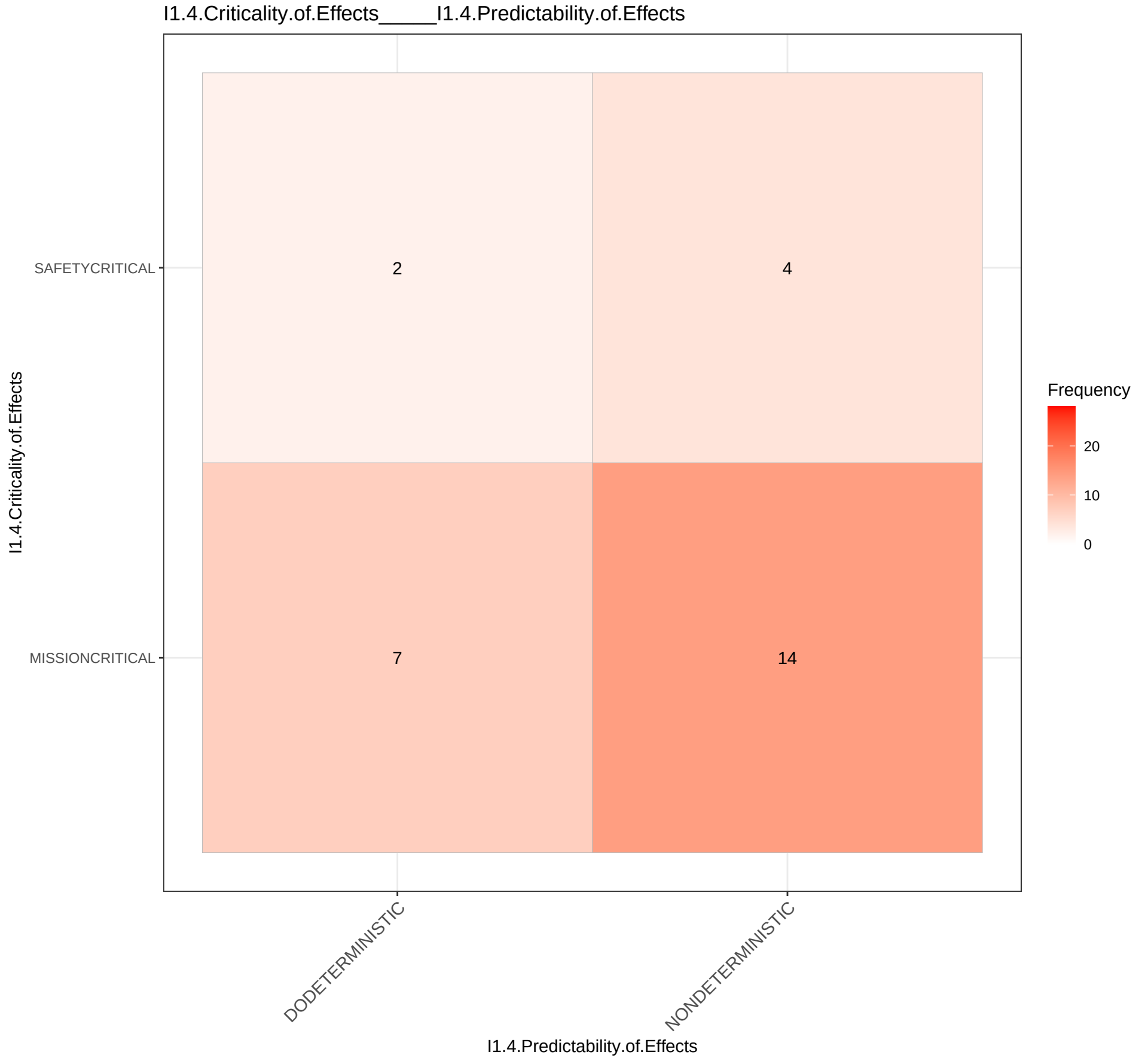
I1.4.Criticality.of.Effects_____I1.4.Predictability.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
I1.4.Criticality.of.Effects
2
4
7
14
DODETERMINISTIC
NONDETERMINISTIC
I1.4.Predictability.of.Effects
Frequency
20
10
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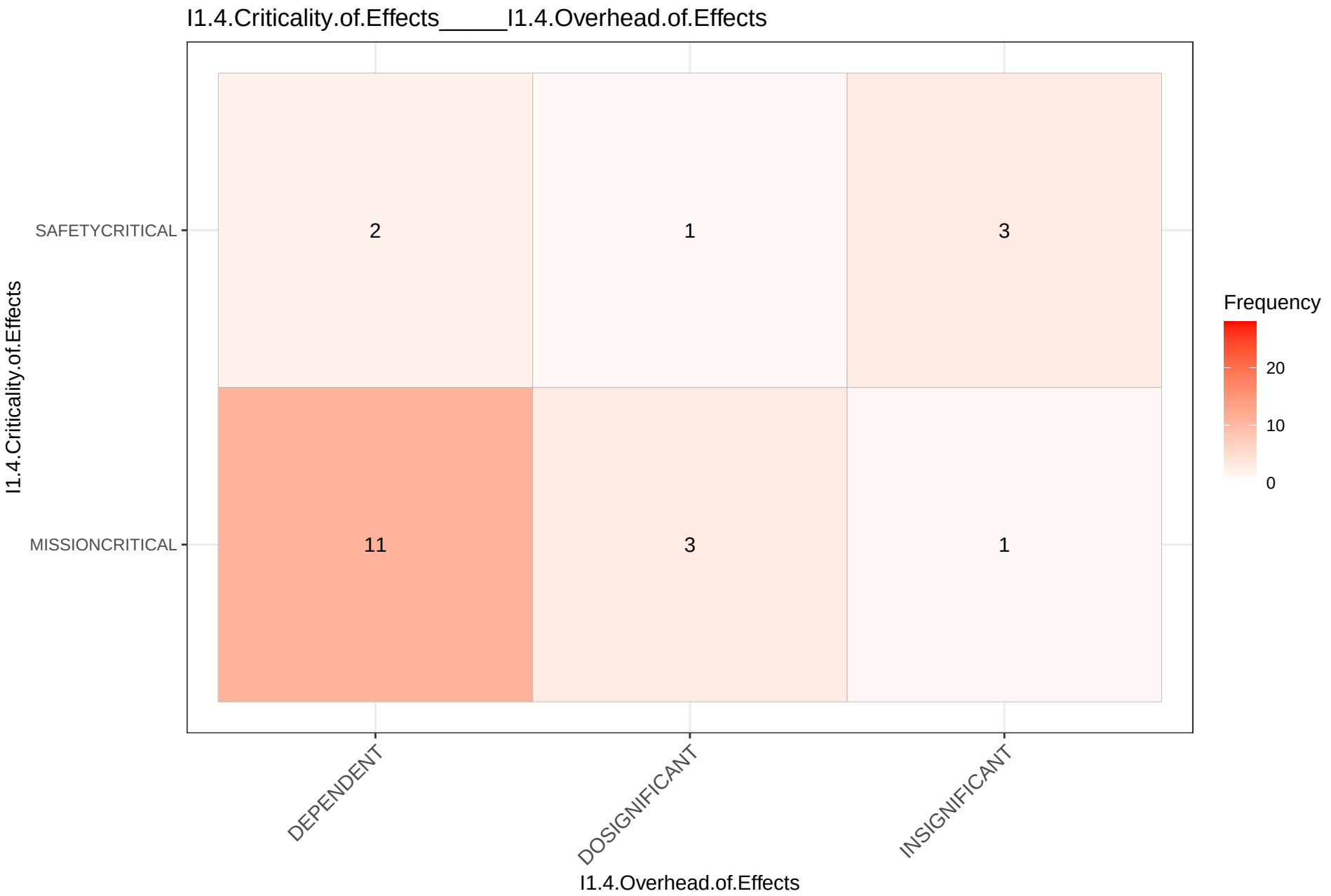
I1.4.Criticality.of.Effects_____I1.4.Overhead.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
I1.4.Criticality.of.Effects
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DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
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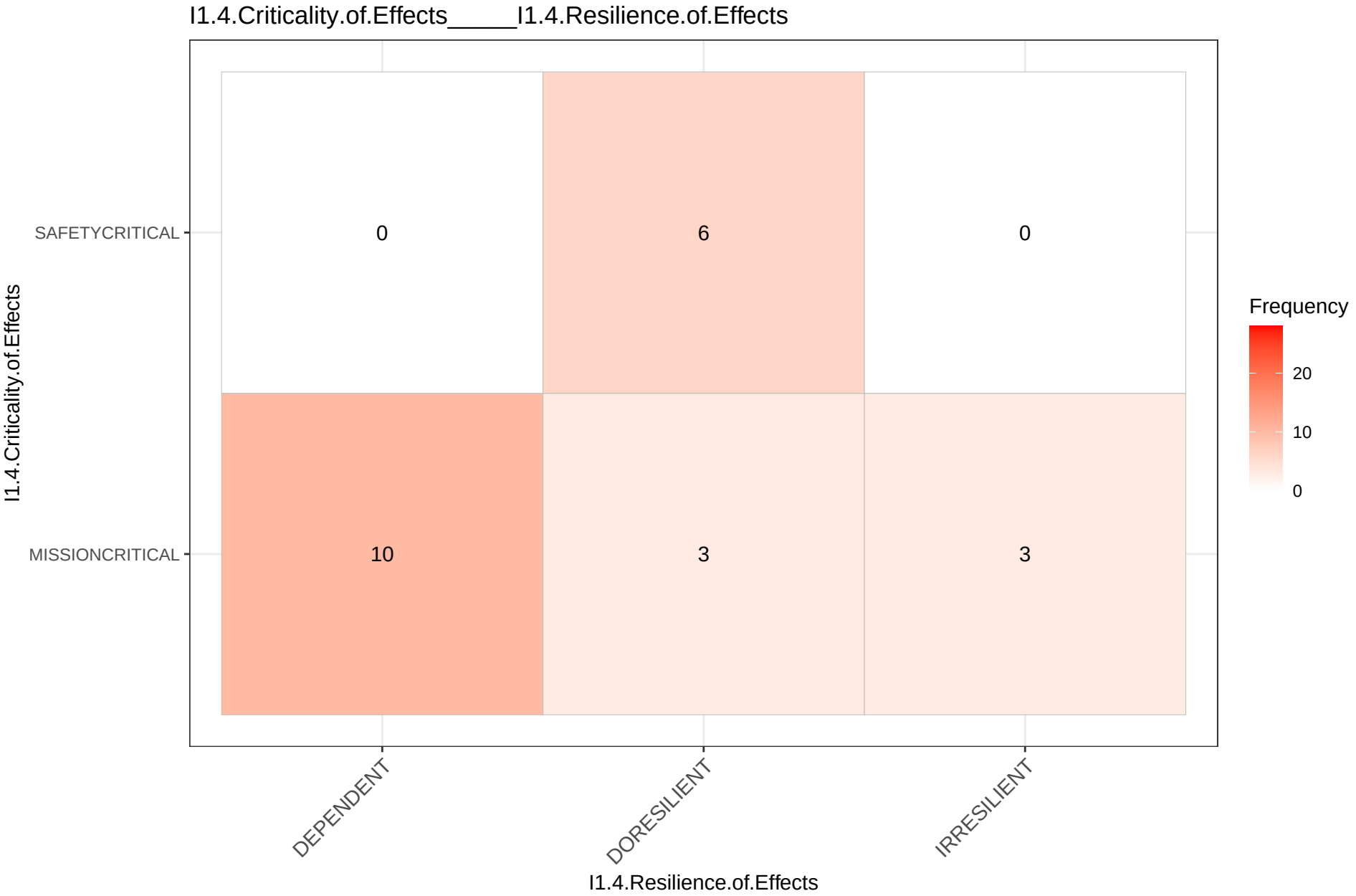
I1.4.Criticality.of.Effects_____I1.4.Resilience.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
I1.4.Criticality.of.Effects
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DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
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10
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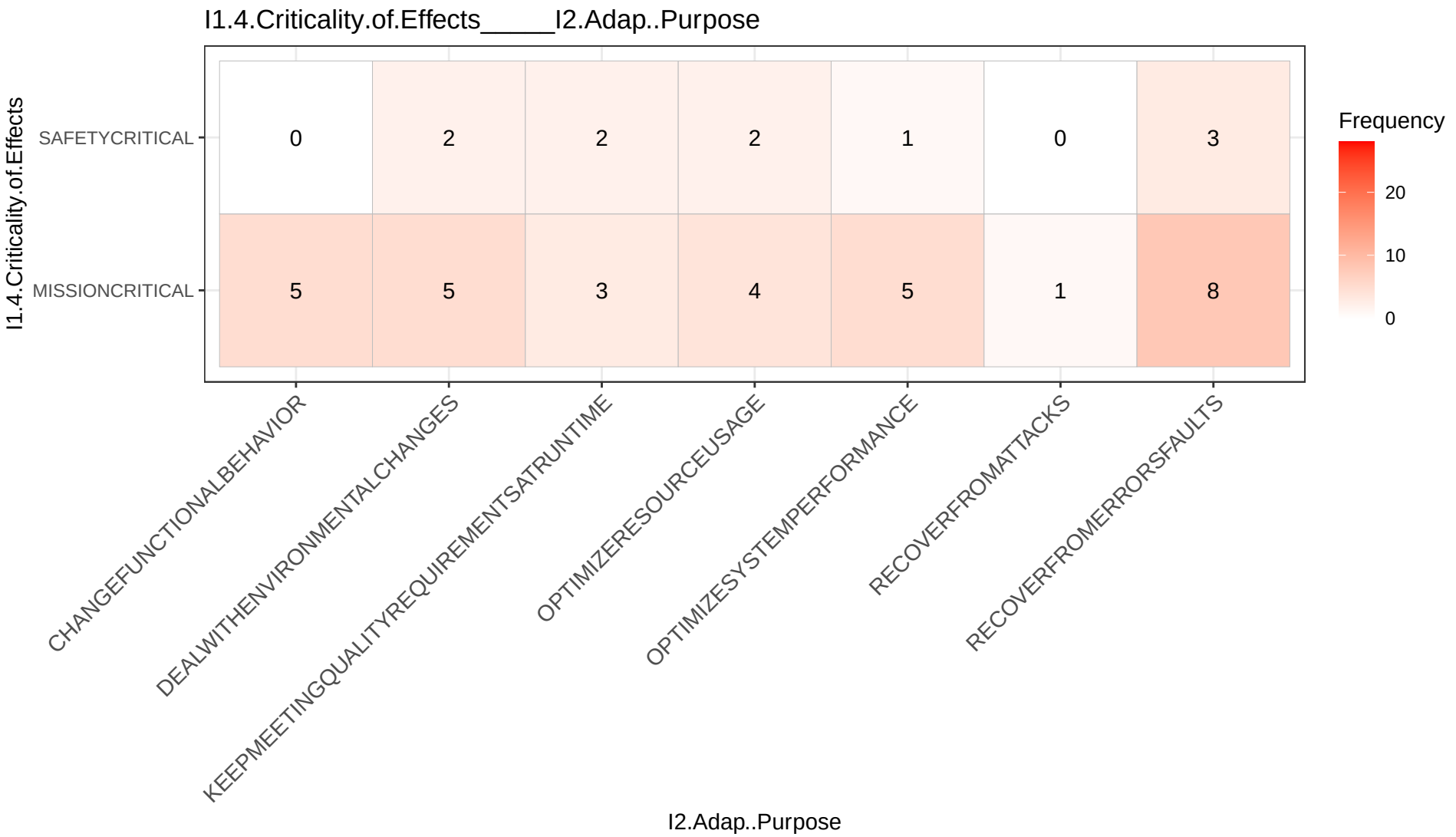
I1.4.Criticality.of.Effects_____I2.Adap..Purpose
I1.4.Criticality.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
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2
2
2
1
0
3
5
5
3
4
5
1
8
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
20
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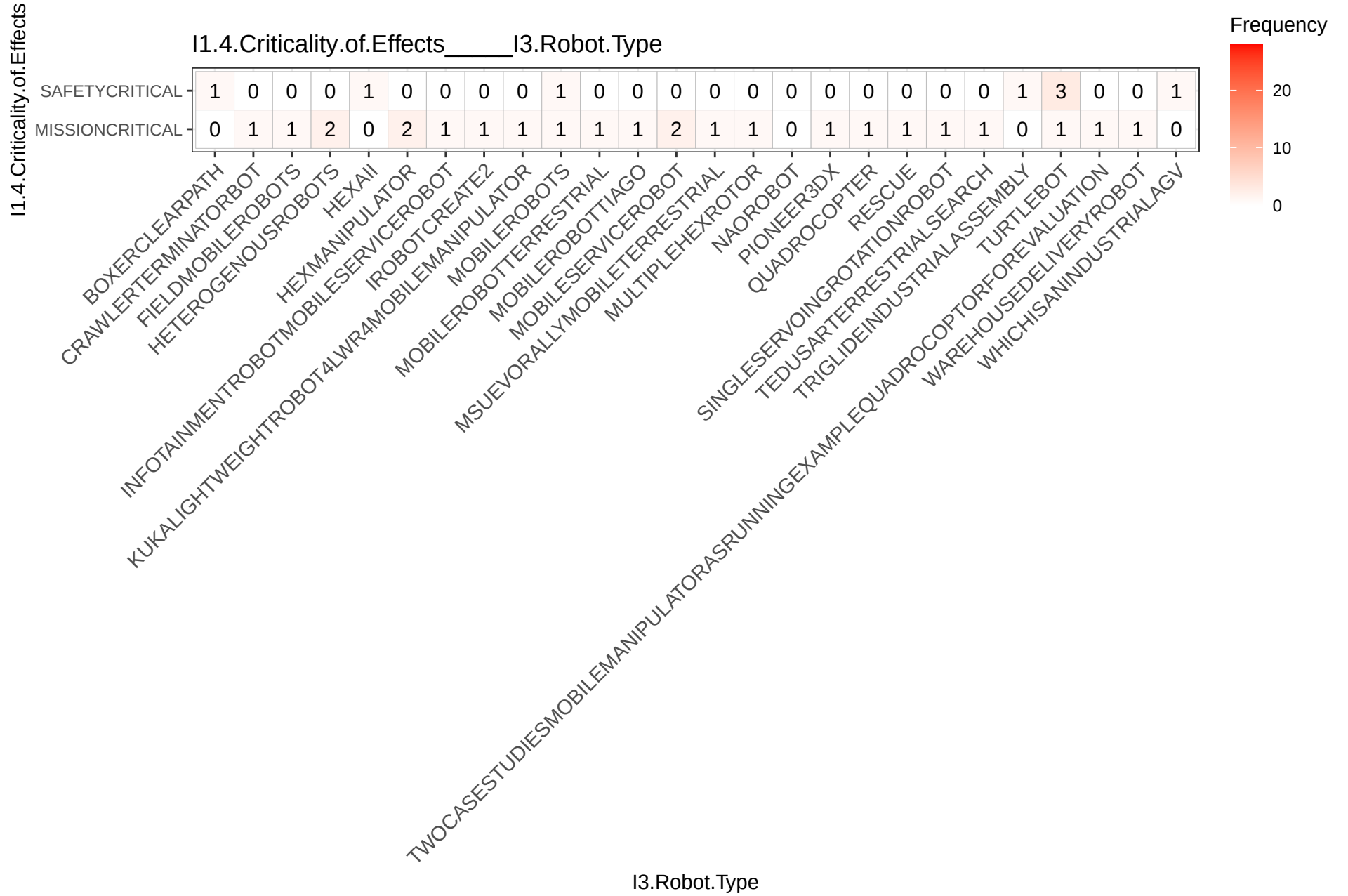
I1.4.Criticality.of.Effects_____I3.Robot.Type
I1.4.Criticality.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
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BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
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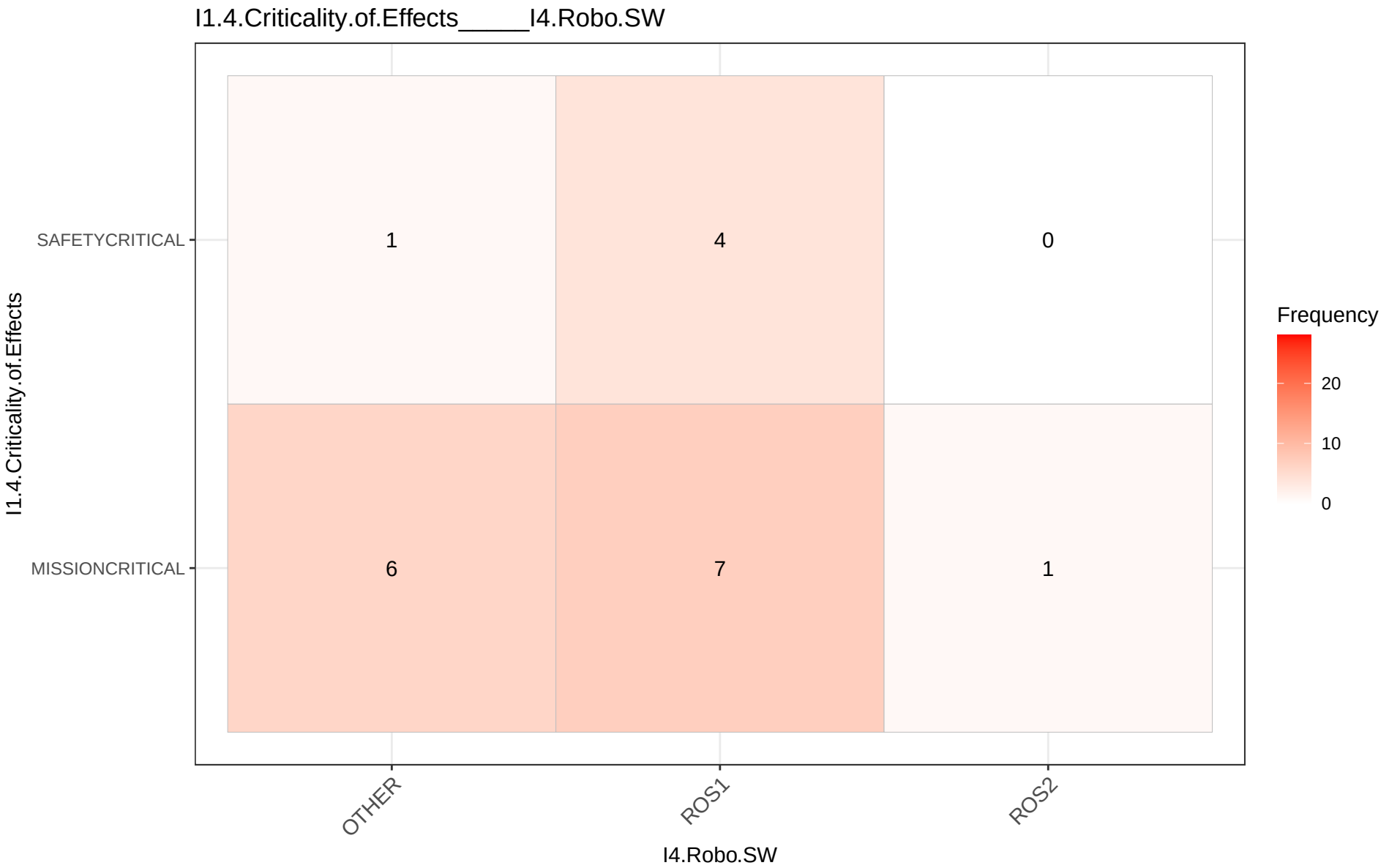
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MISSIONCRITICAL
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OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
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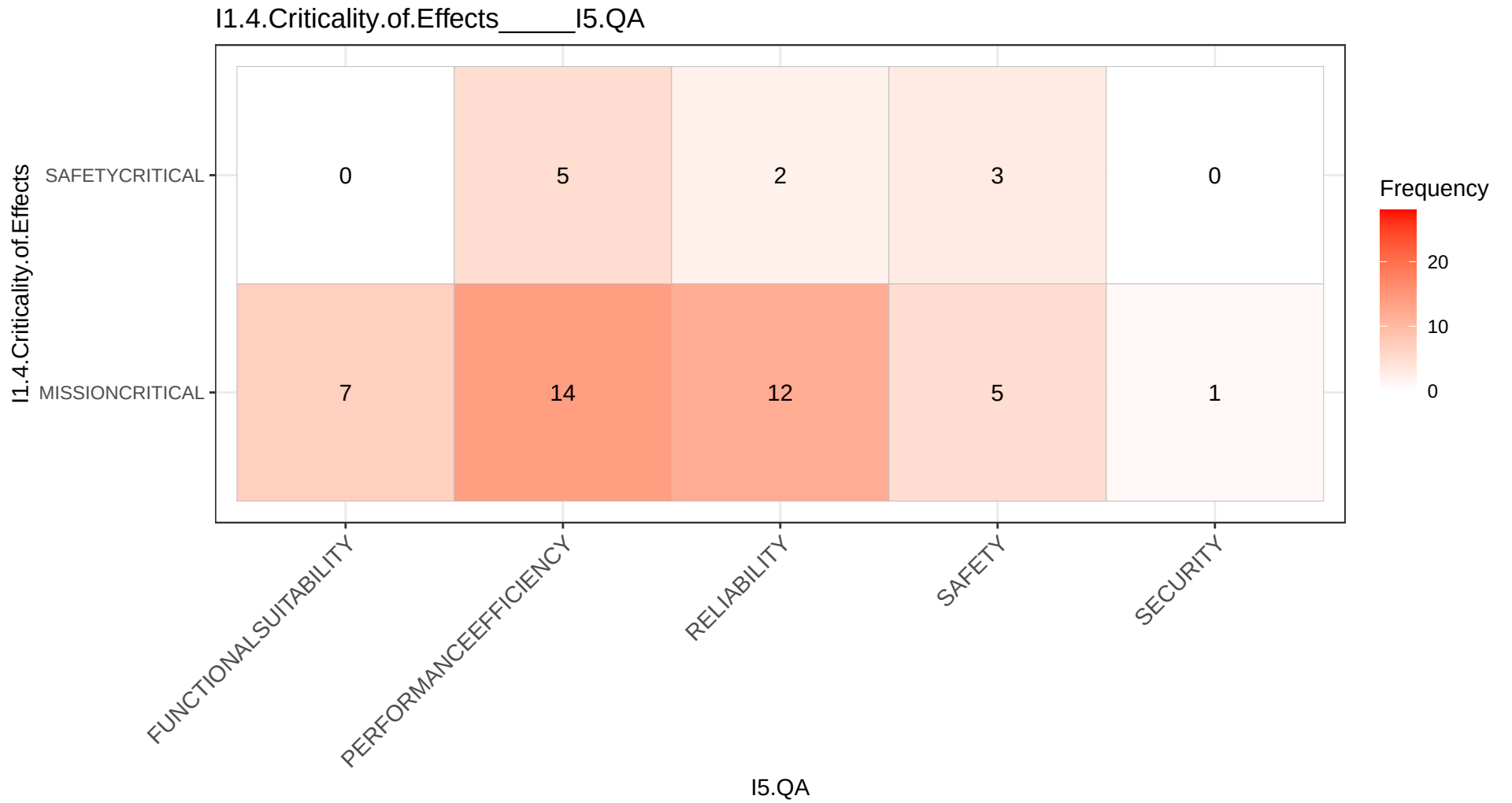
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PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
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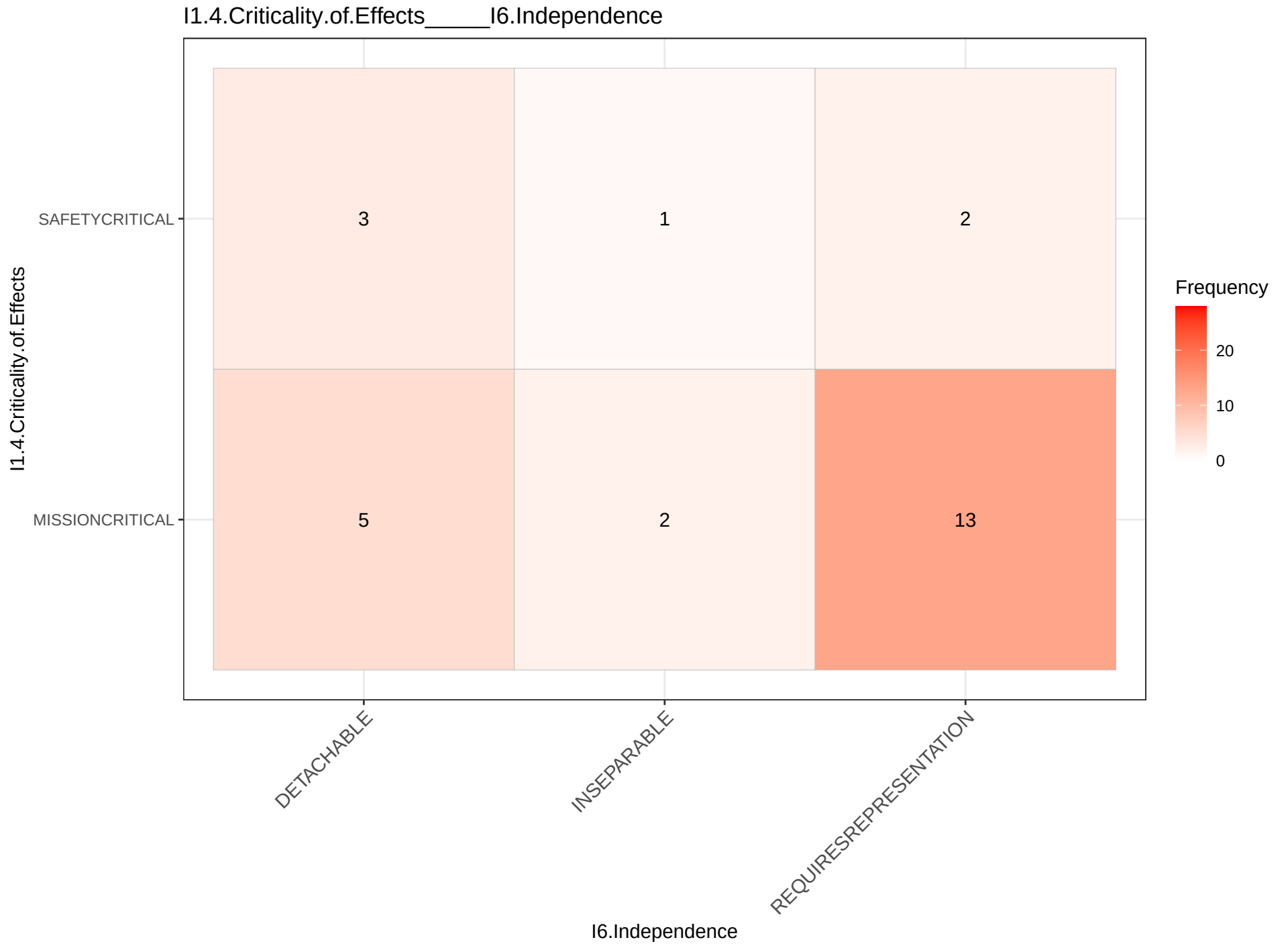
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MISSIONCRITICAL
I1.4.Criticality.of.Effects
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2
13
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
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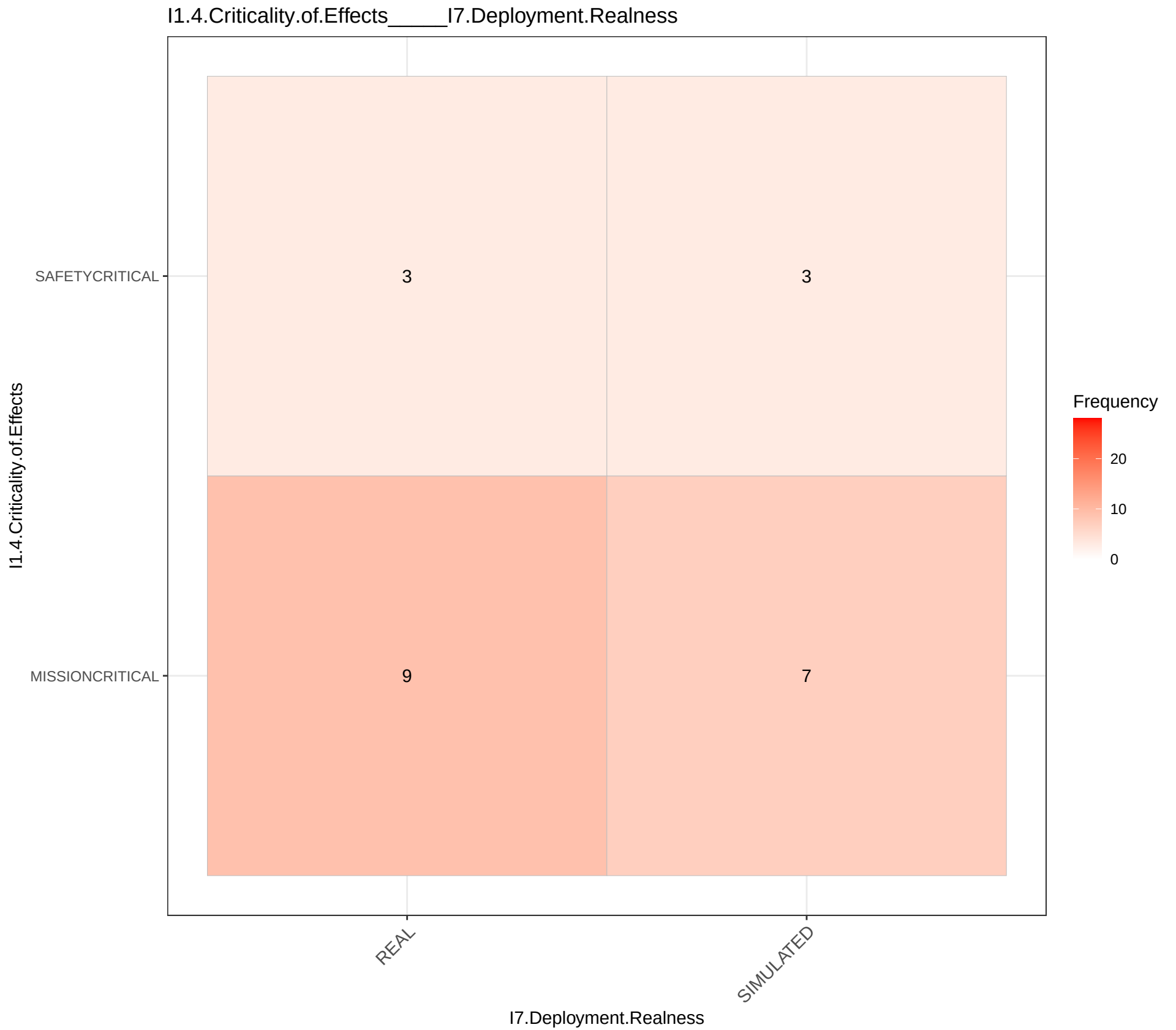
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MISSIONCRITICAL
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3
9
7
REAL
SIMULATED
I7.Deployment.Realness
Frequency
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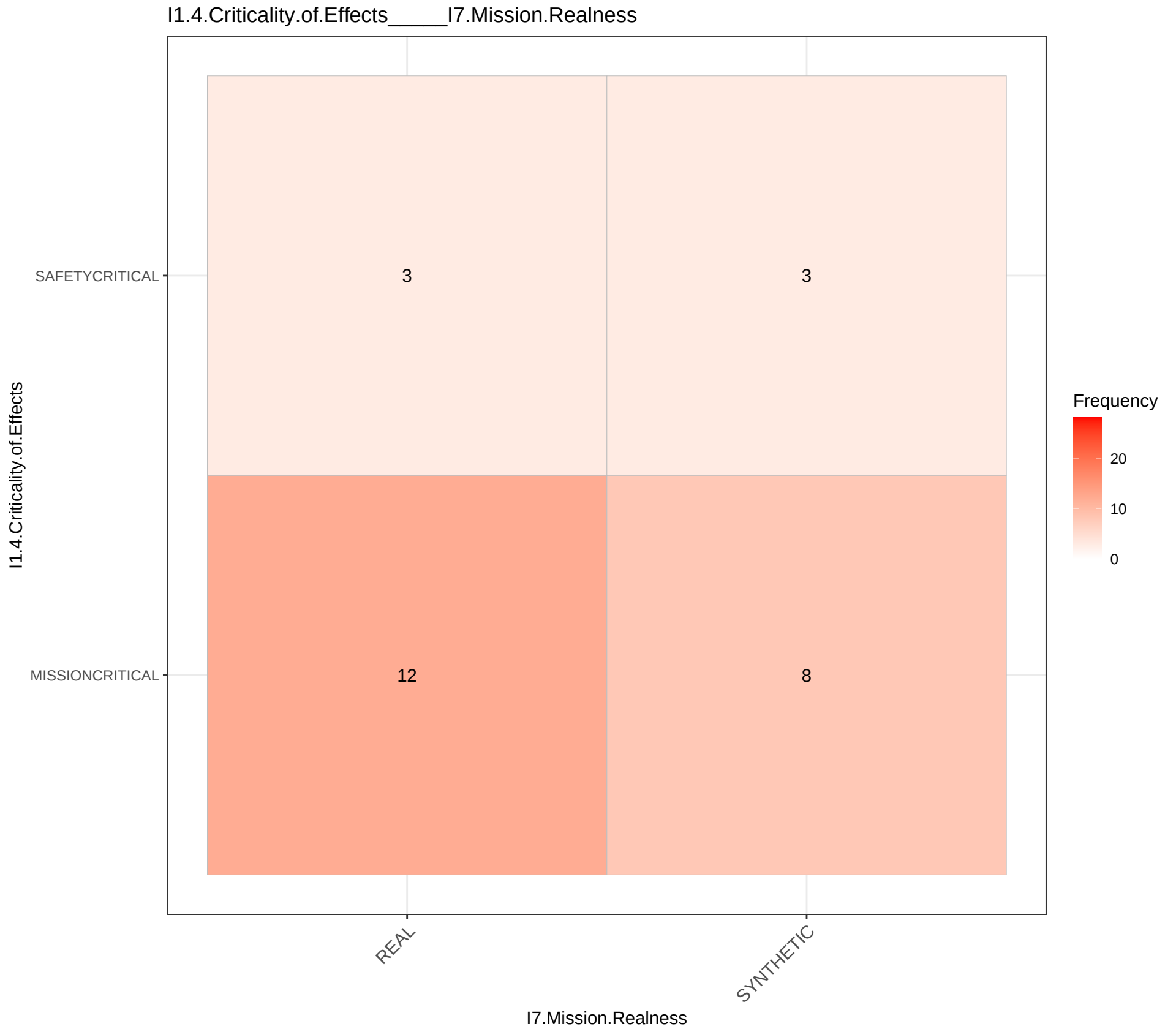
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SAFETYCRITICAL
MISSIONCRITICAL
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SYNTHETIC
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I7.Mission.Realness
Frequency
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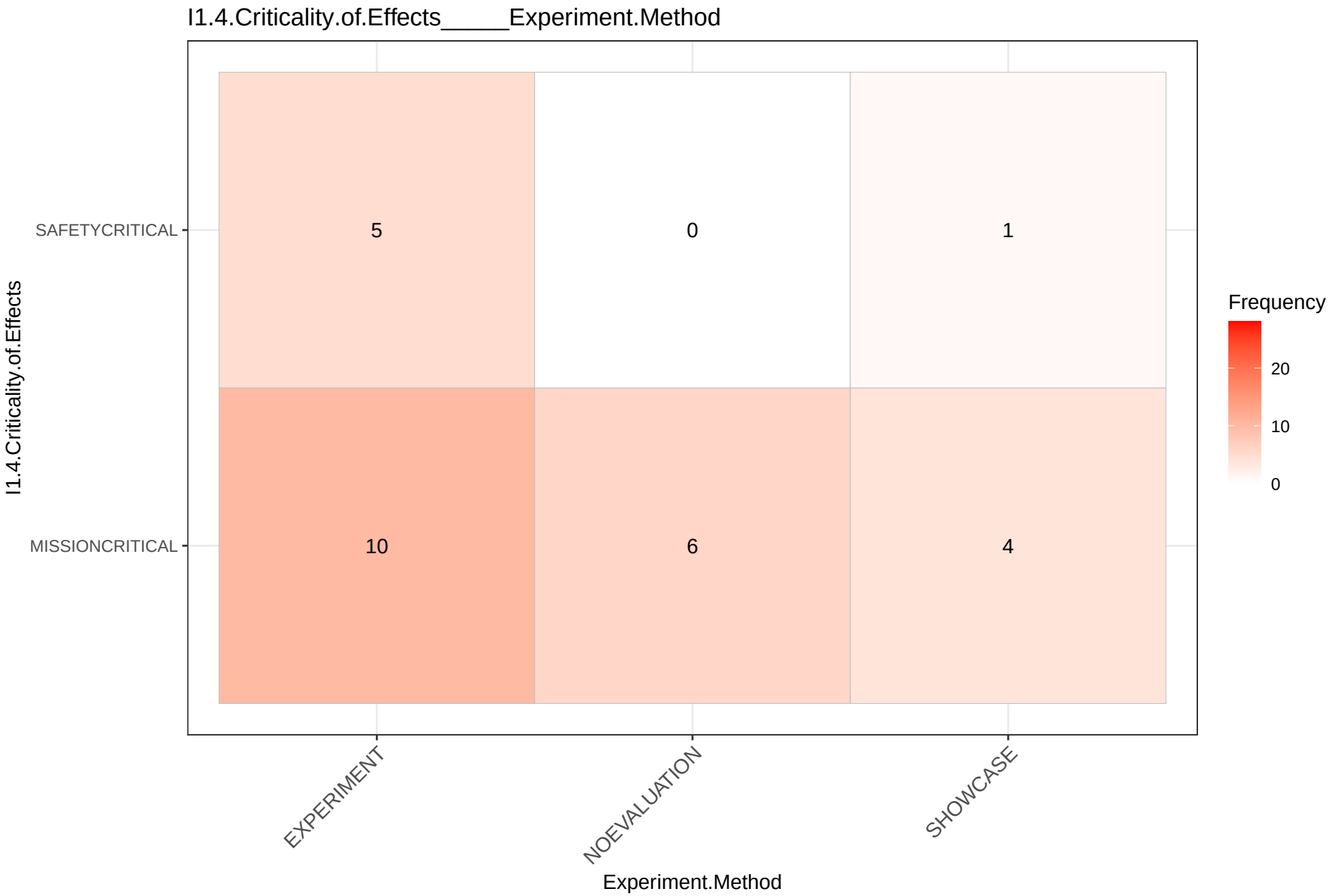
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MISSIONCRITICAL
I1.4.Criticality.of.Effects
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NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
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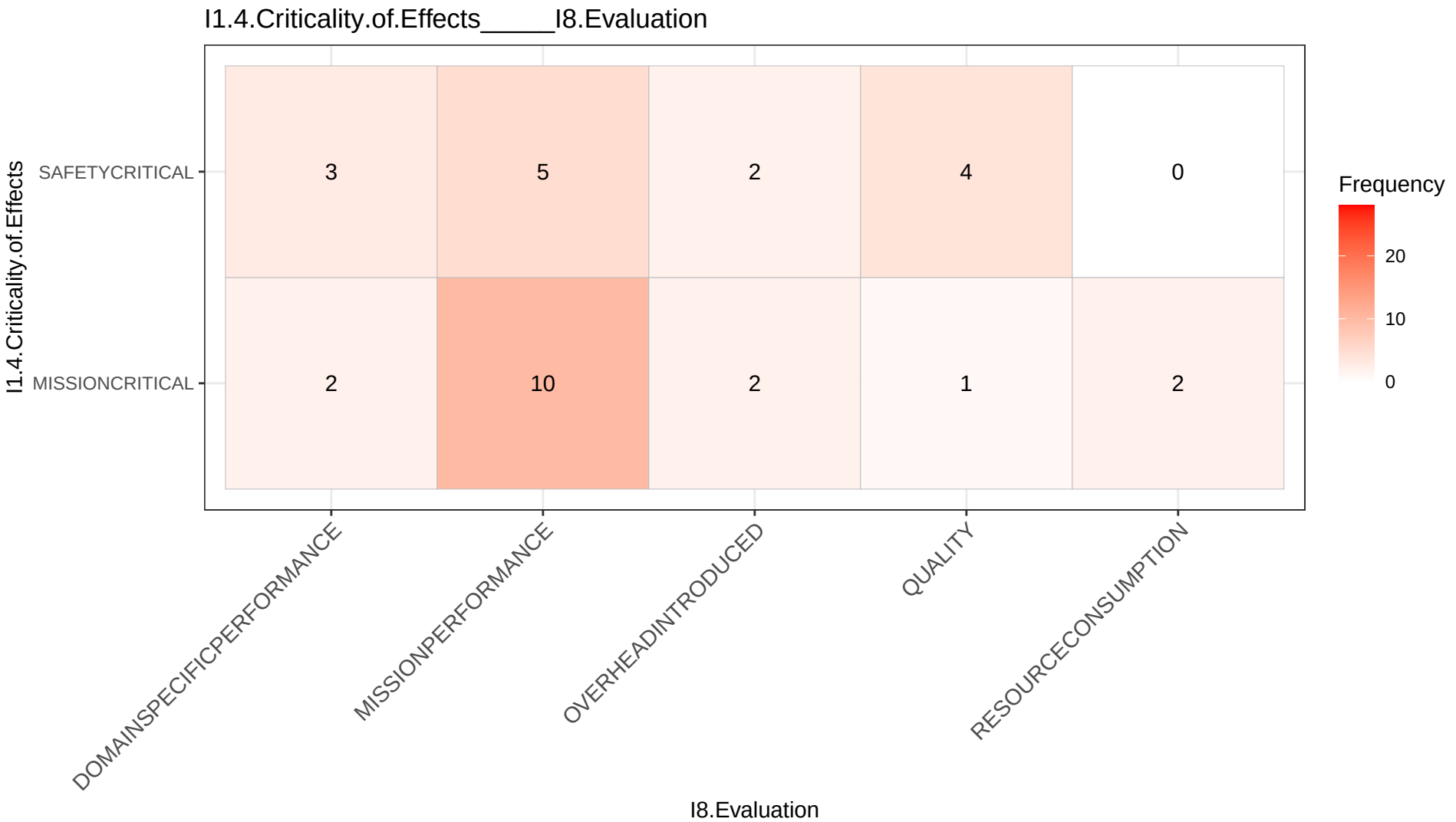
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MISSIONCRITICAL
3
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2
4
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2
10
2
1
2
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MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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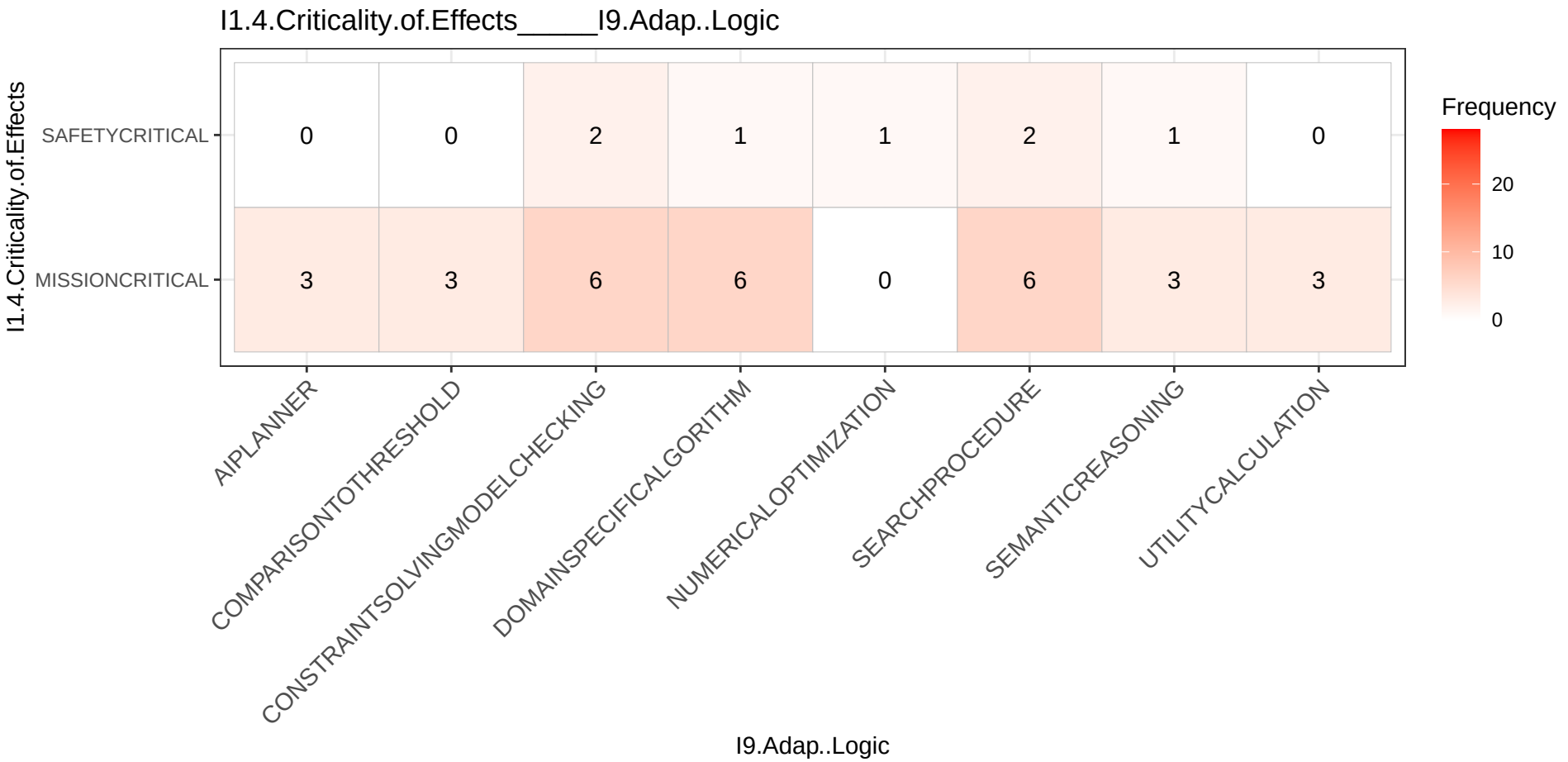
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MISSIONCRITICAL
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1
1
2
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3
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3
3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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10
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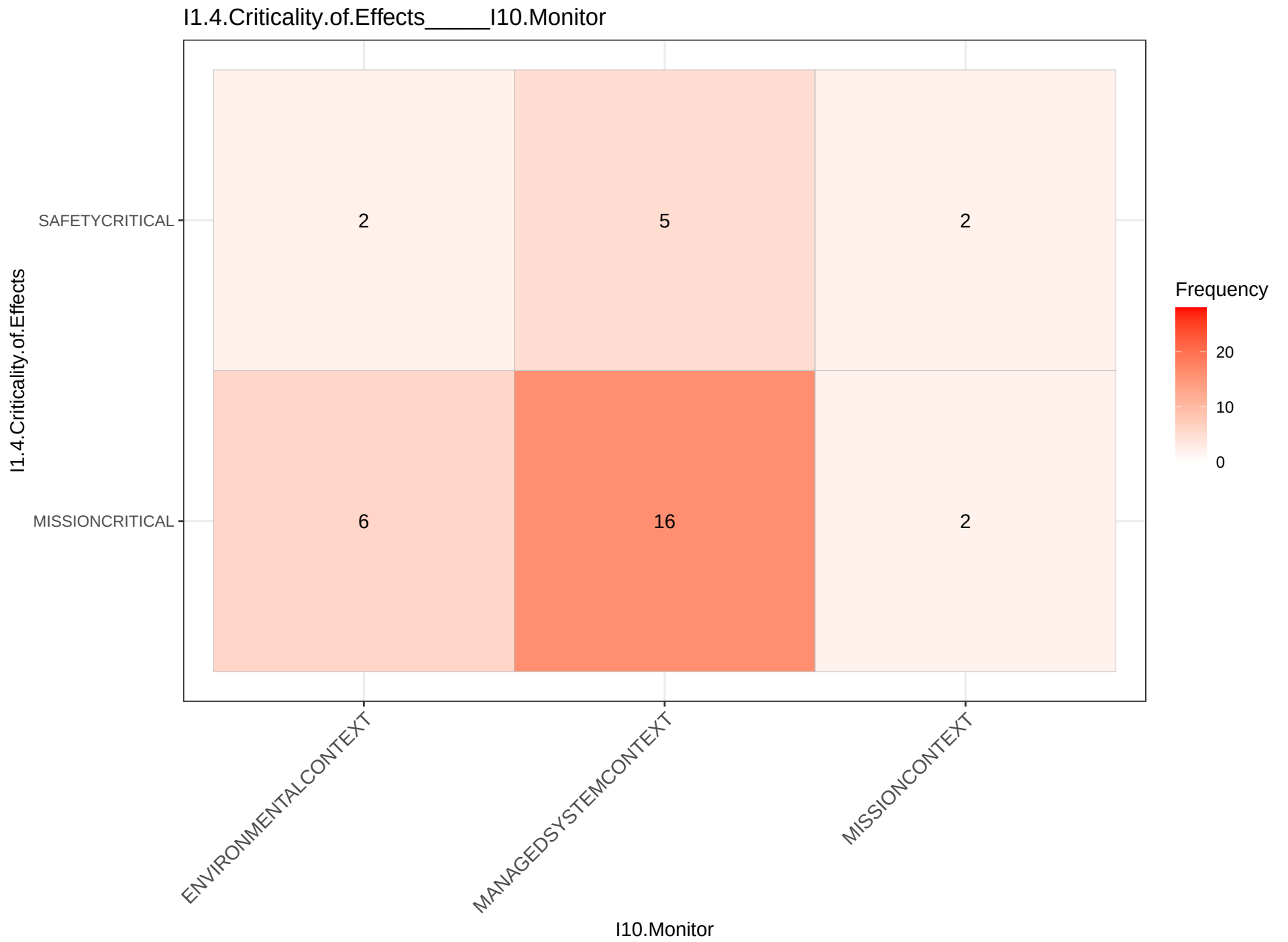
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SAFETYCRITICAL
MISSIONCRITICAL
I1.4.Criticality.of.Effects
2
5
2
6
16
2
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0

I1.4.Criticality.of.Effects_____I11.Analyze
I1.4.Criticality.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
1
1
0
0
2
0
0
4
5
5
1
4
2
1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
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LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
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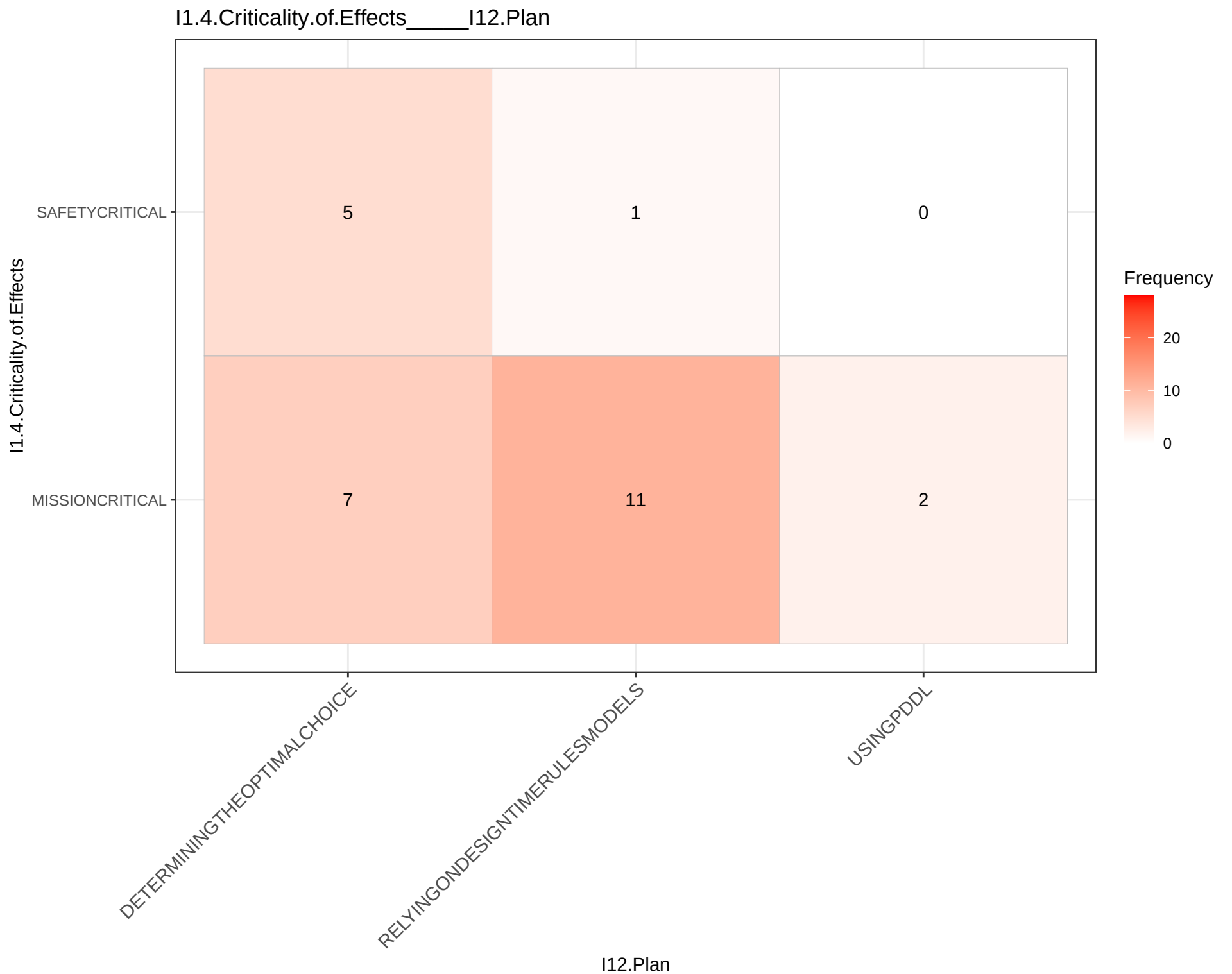
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SAFETYCRITICAL
MISSIONCRITICAL
I1.4.Criticality.of.Effects
5
1
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7
11
2
Frequency
20
10
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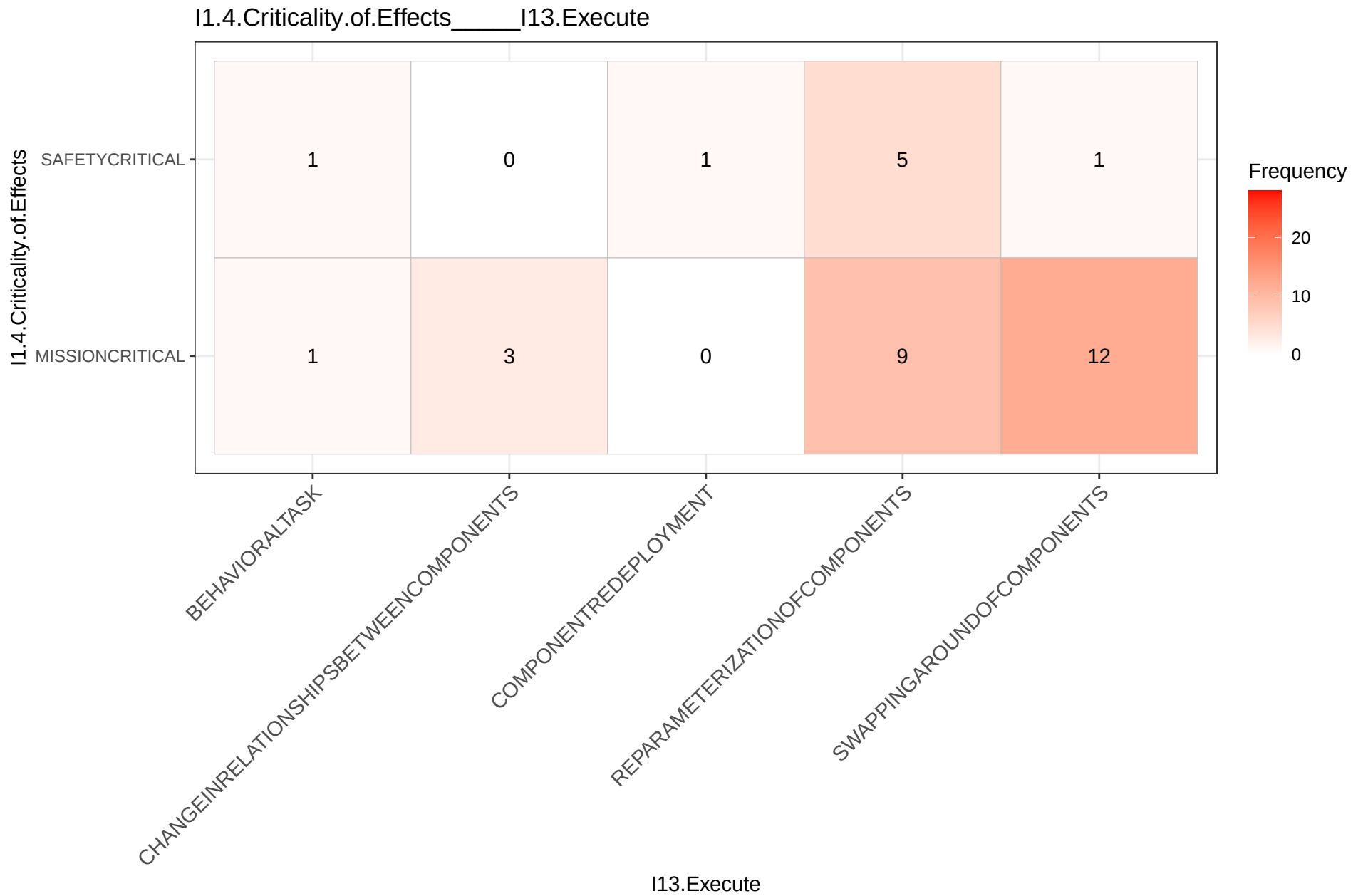
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan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SAFETYCRITICAL
MISSIONCRITICAL
1
0
1
5
1
1
3
0
9
12
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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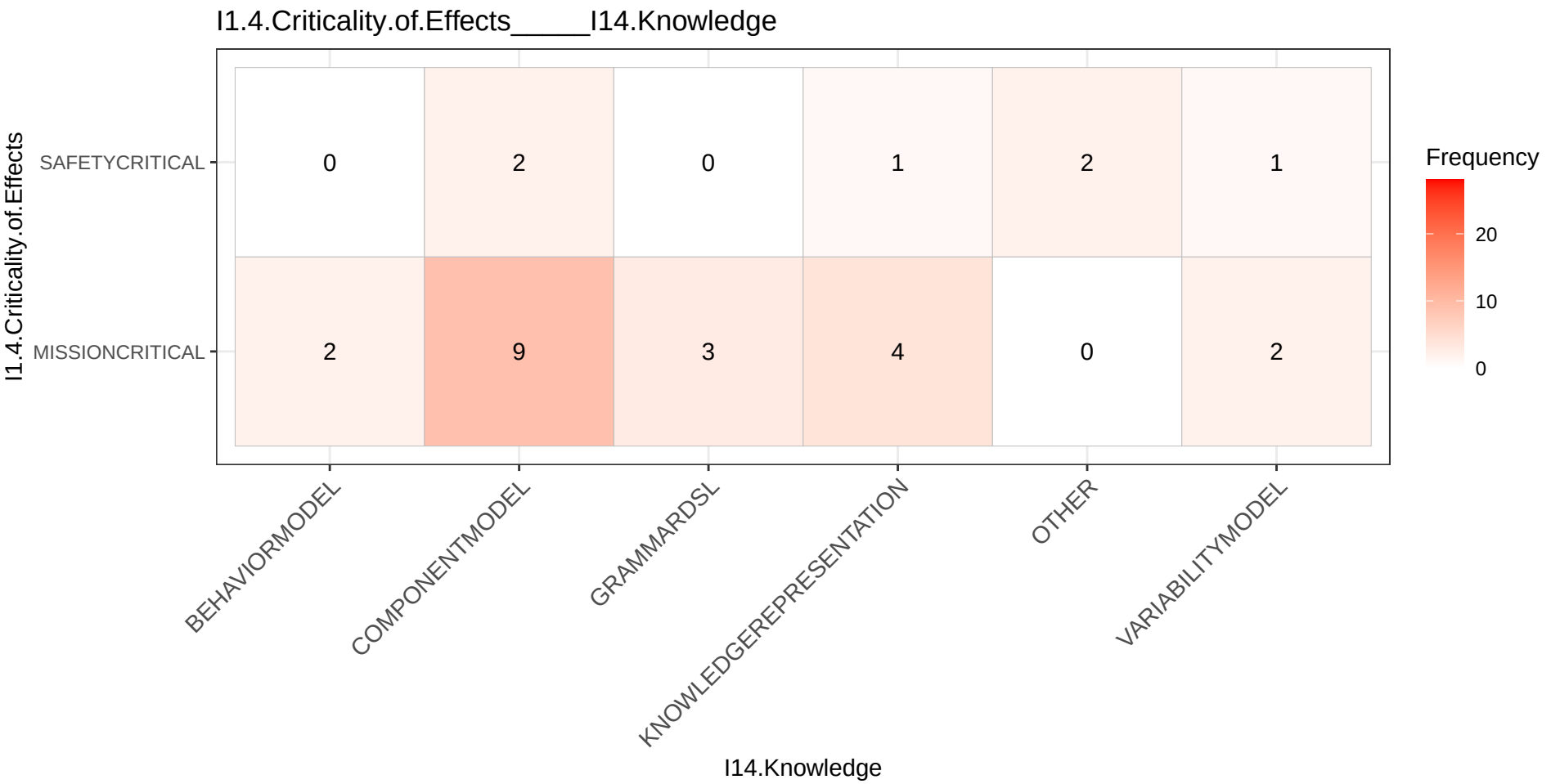
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I1.4.Criticality.of.Effects
SAFETYCRITICAL
MISSIONCRITICAL
0
2
0
1
2
1
2
9
3
4
0
2
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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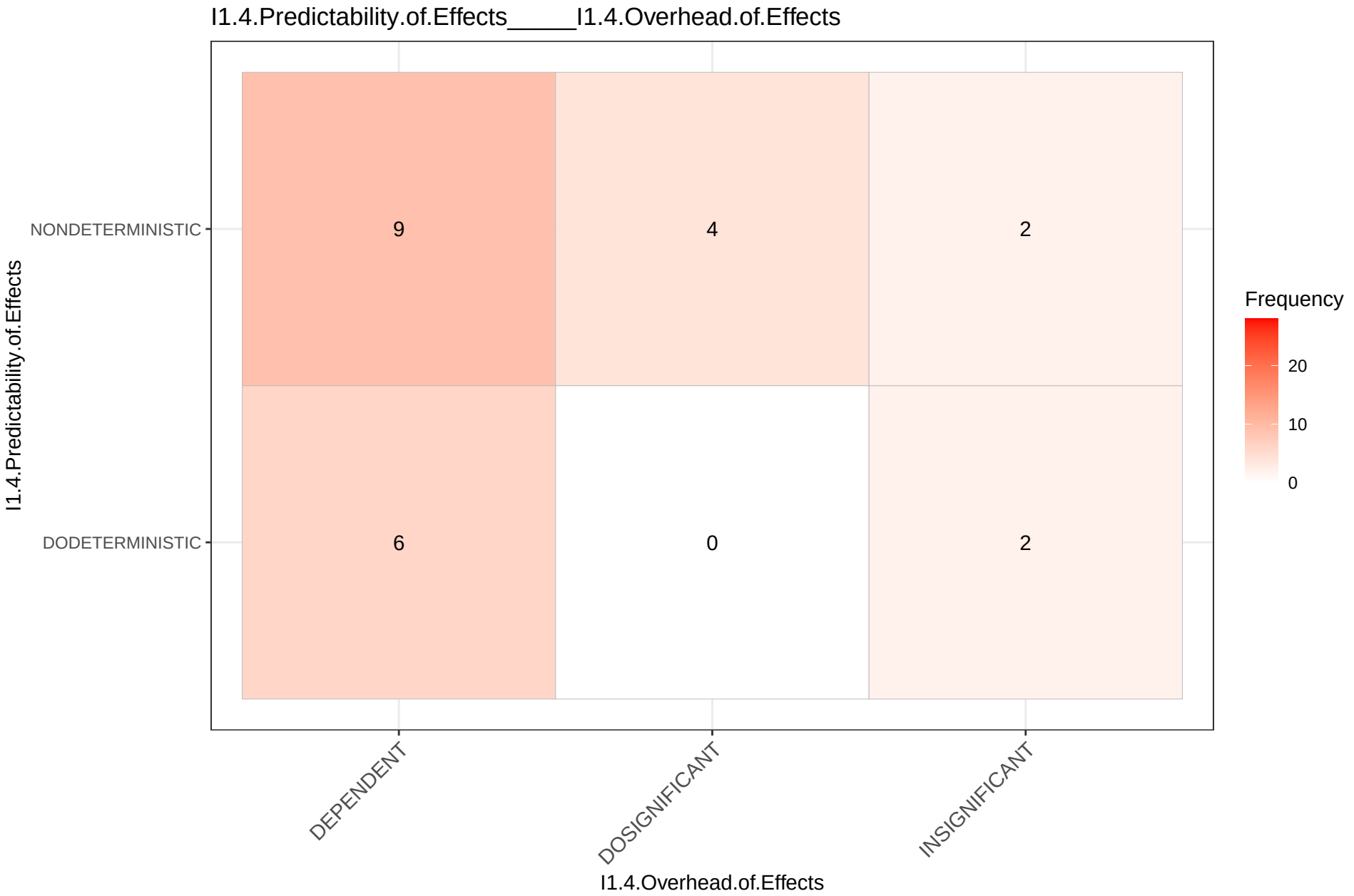
I1.4.Predictability.of.Effects_____I1.4.Overhead.of.Effects
NONDETERMINISTIC
DODETERMINISTIC
I1.4.Predictability.of.Effects
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4
2
6
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2
DEPENDENT
DOSIGNIFICANT
INSIGNIFICANT
I1.4.Overhead.of.Effects
Frequency
20
10
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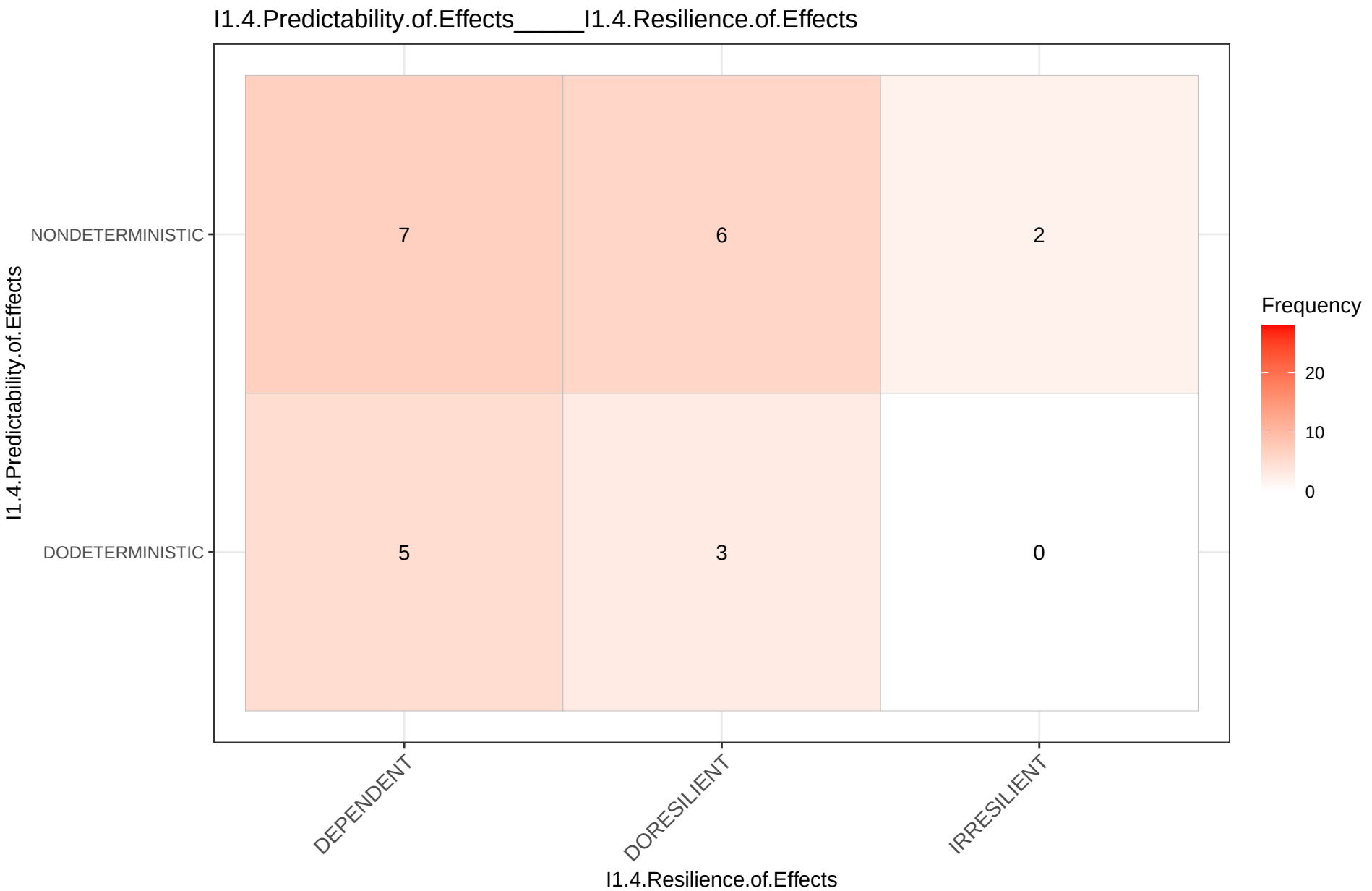
I1.4.Predictability.of.Effects_____I1.4.Resilience.of.Effects
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DODETERMINISTIC
I1.4.Predictability.of.Effects
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6
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DEPENDENT
DORESILIENT
IRRESILIENT
I1.4.Resilience.of.Effects
Frequency
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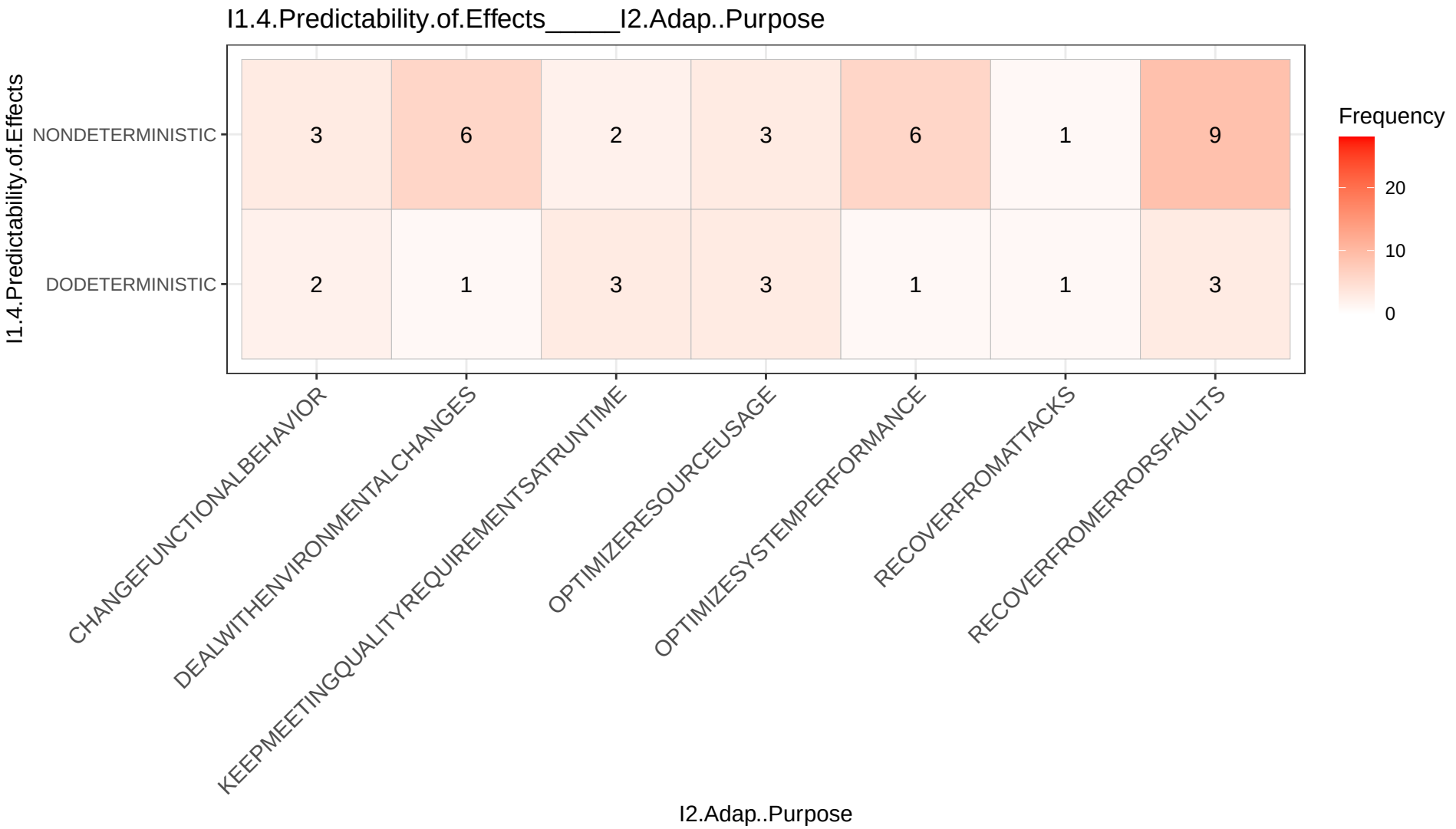
I1.4.Predictability.of.Effects_____I2.Adap..Purpose
I1.4.Predictability.of.Effects
NONDETERMINISTIC
DODETERMINISTIC
3
6
2
3
6
1
9
2
1
3
3
1
1
3
CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
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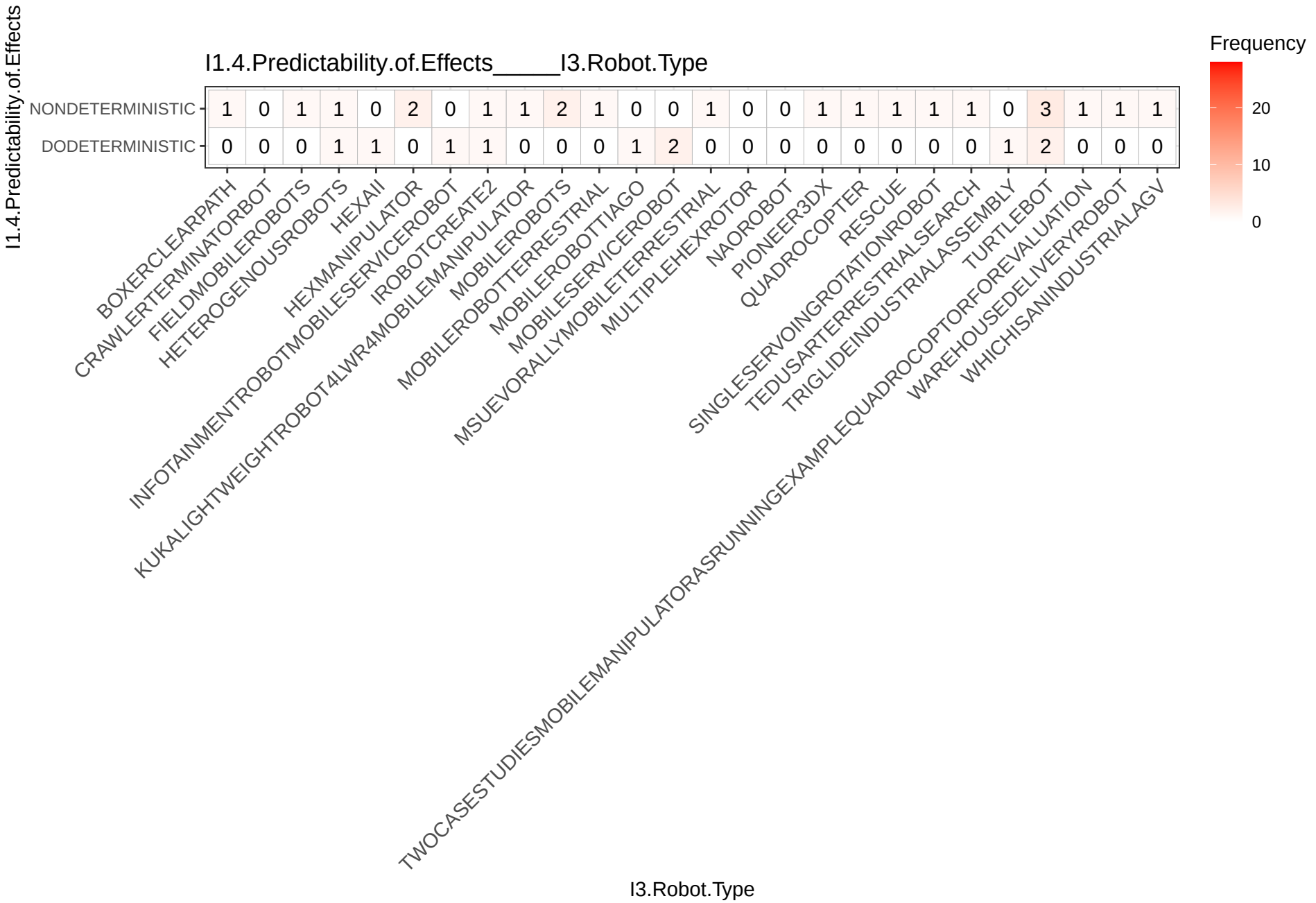
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I1.4.Predictability.of.Effects
NONDETERMINISTIC
DODETERMINISTIC
1 0 1 1 0 2 0 1 1 2 1 0 0 1 0 0 1 1 1 1 1 0 3 1 1 1
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BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
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WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
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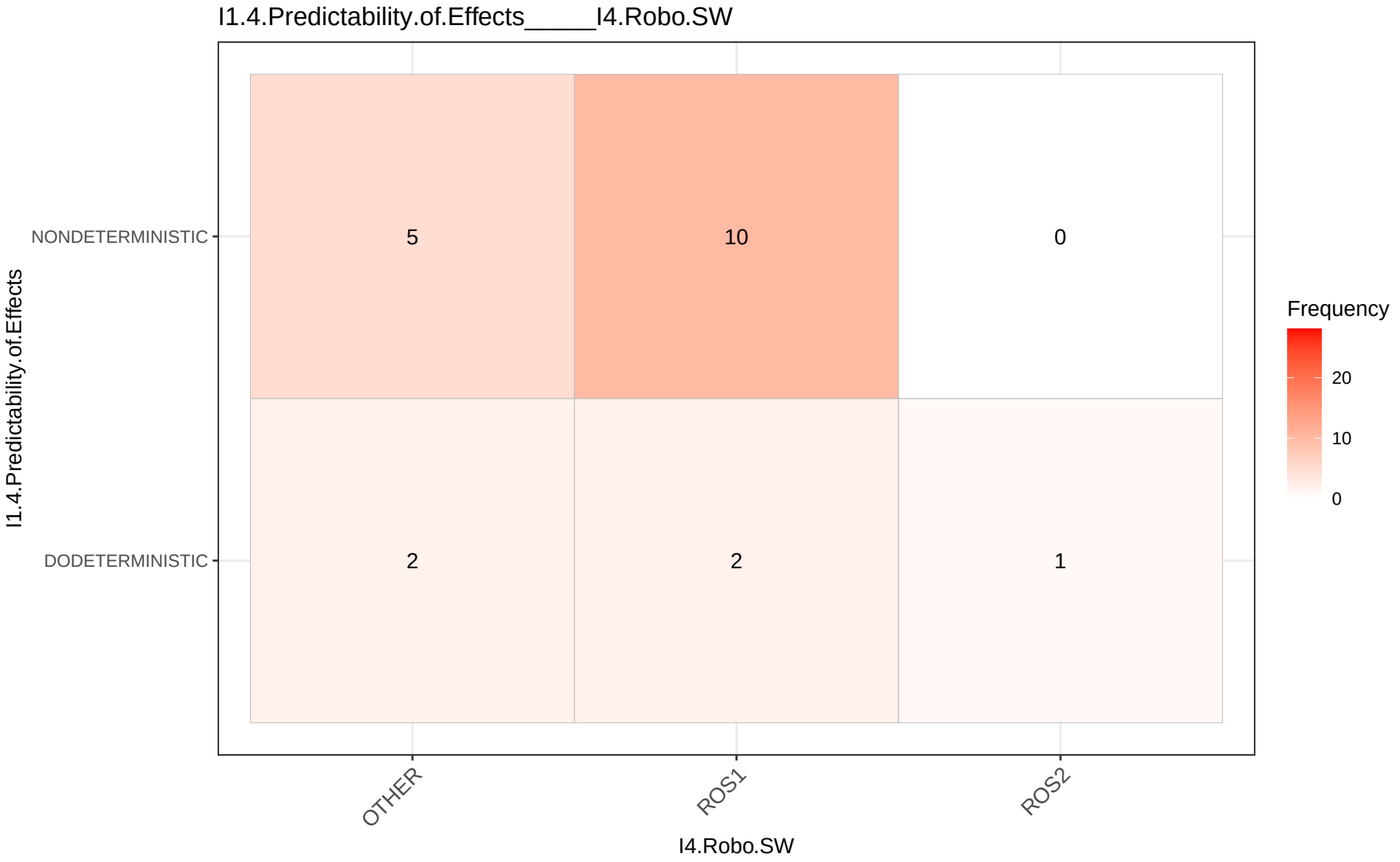
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NONDETERMINISTIC
DODETERMINISTIC
I1.4.Predictability.of.Effects
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OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
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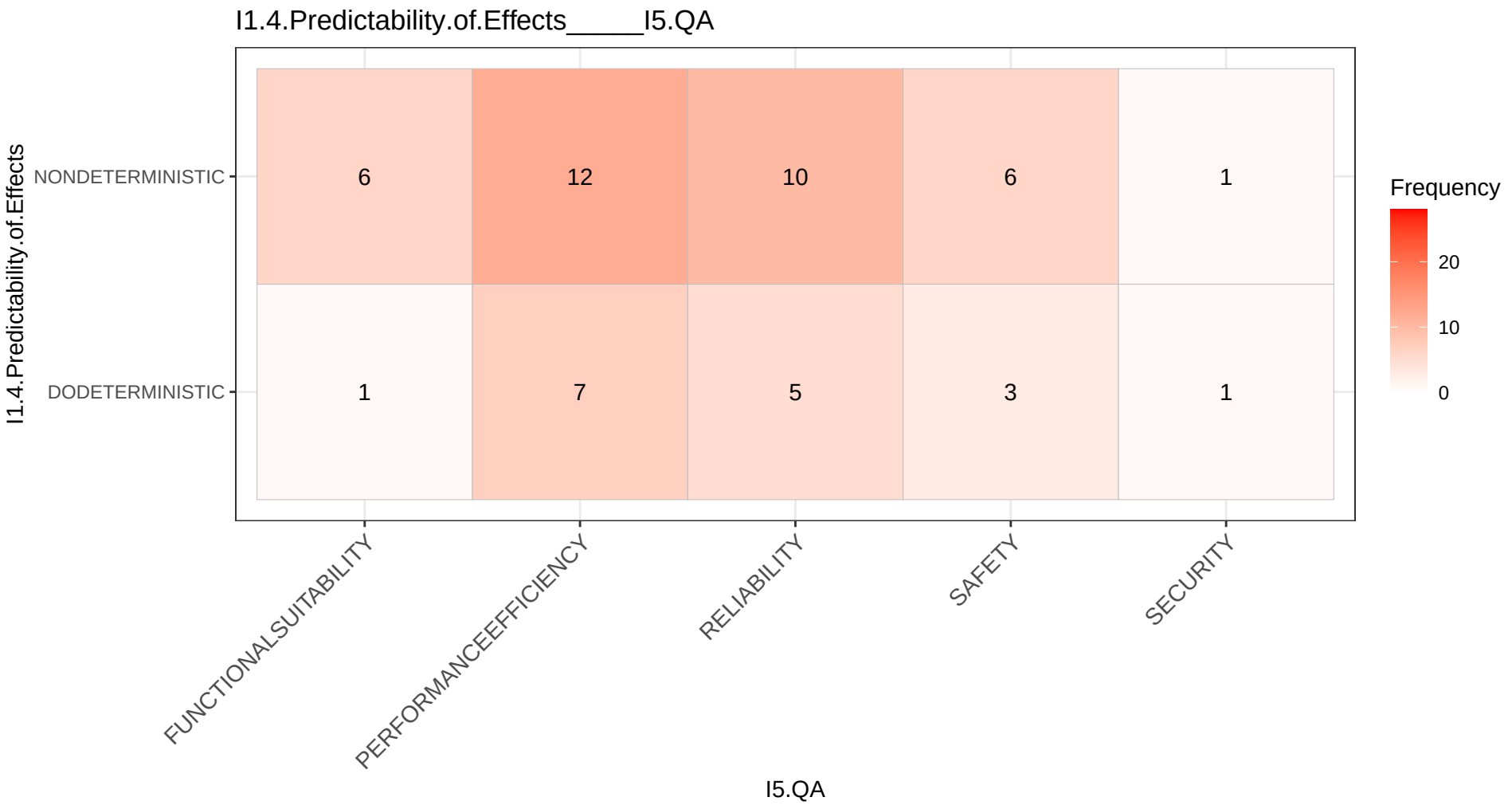
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DODETERMINISTIC
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PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
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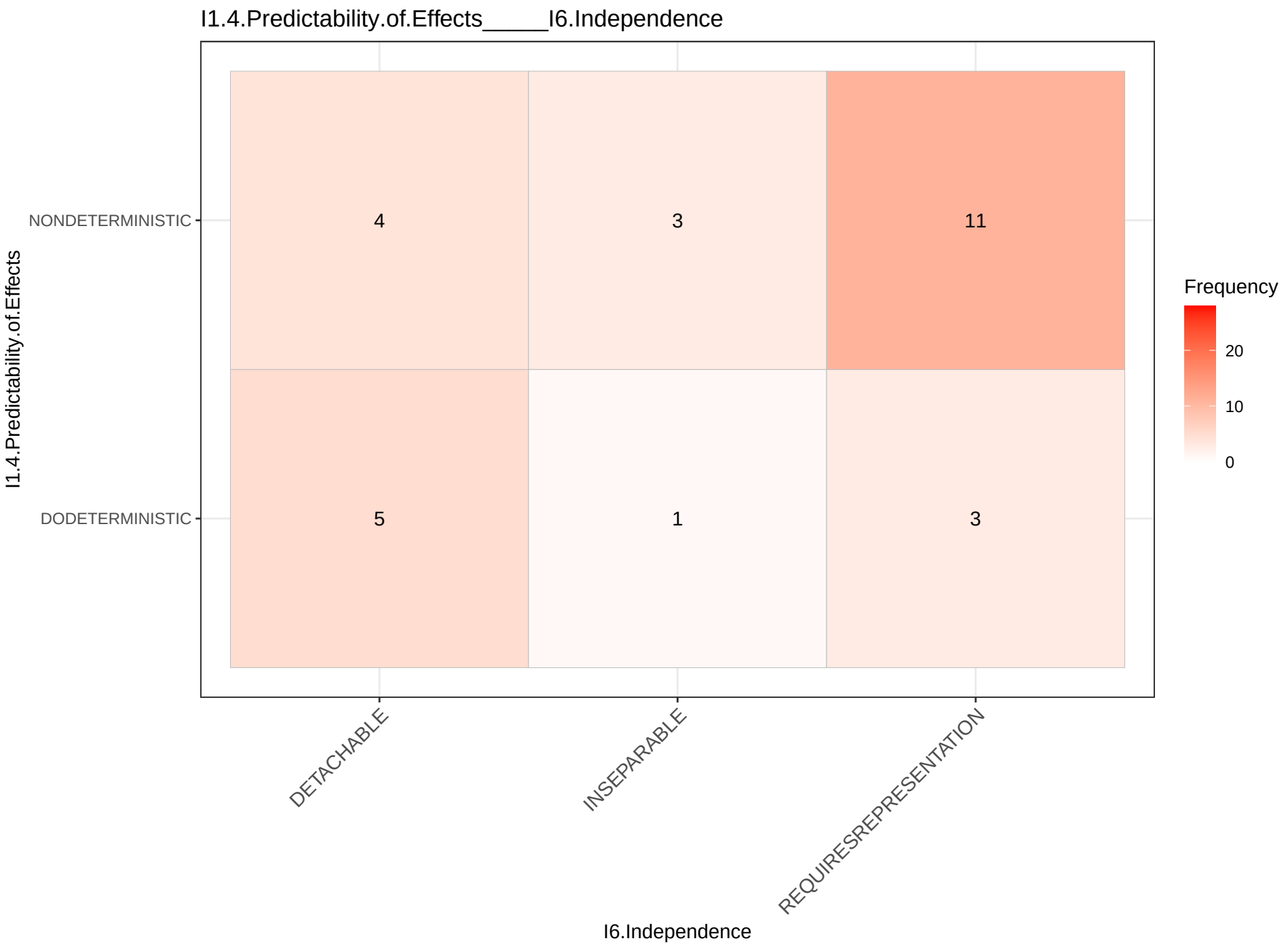
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DODETERMINISTIC
I1.4.Predictability.of.Effects
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INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
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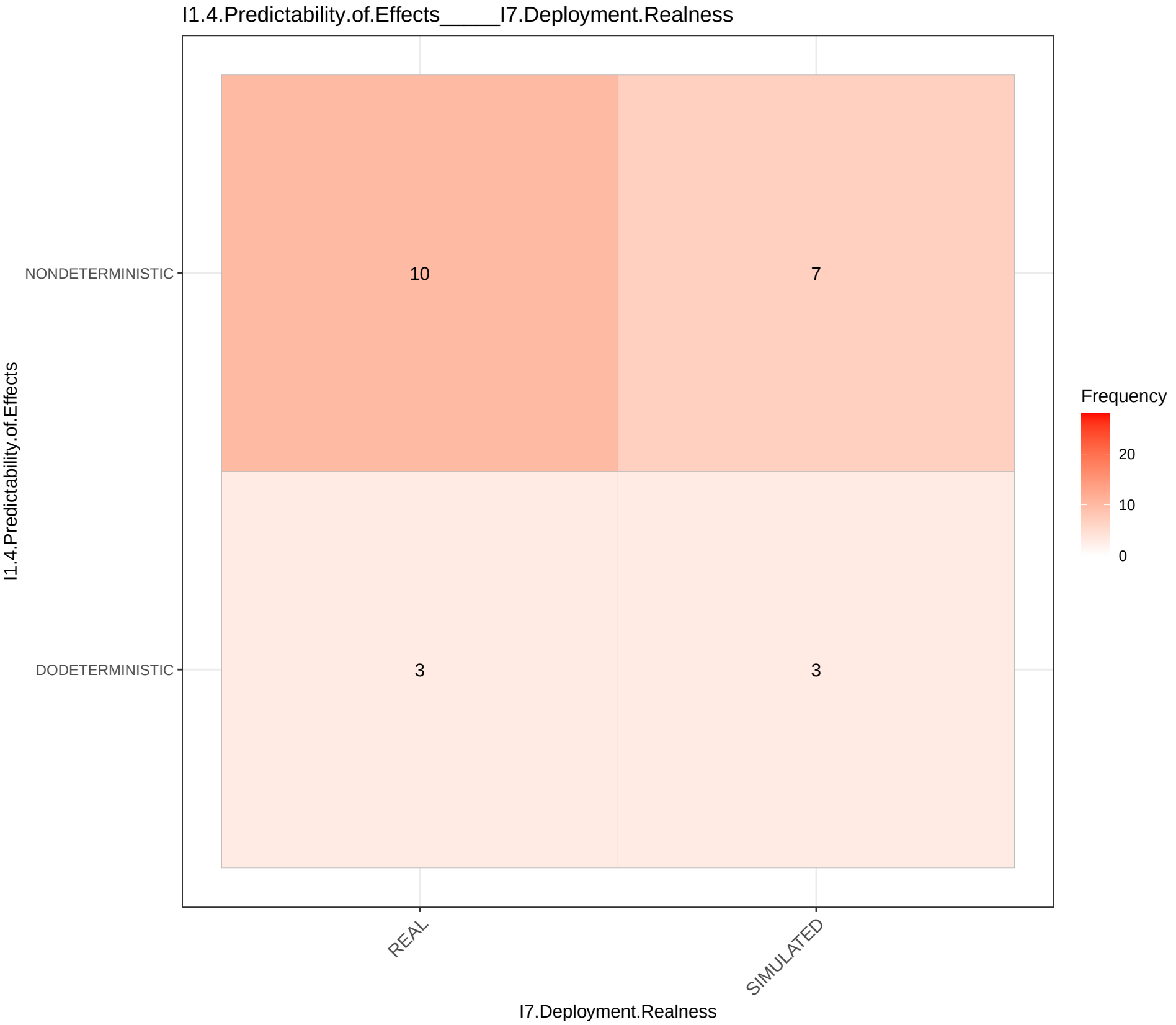
I1.4.Predictability.of.Effects_____I7.Deployment.Realness
NONDETERMINISTIC
DODETERMINISTIC
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REAL
SIMULATED
I7.Deployment.Realness
Frequency
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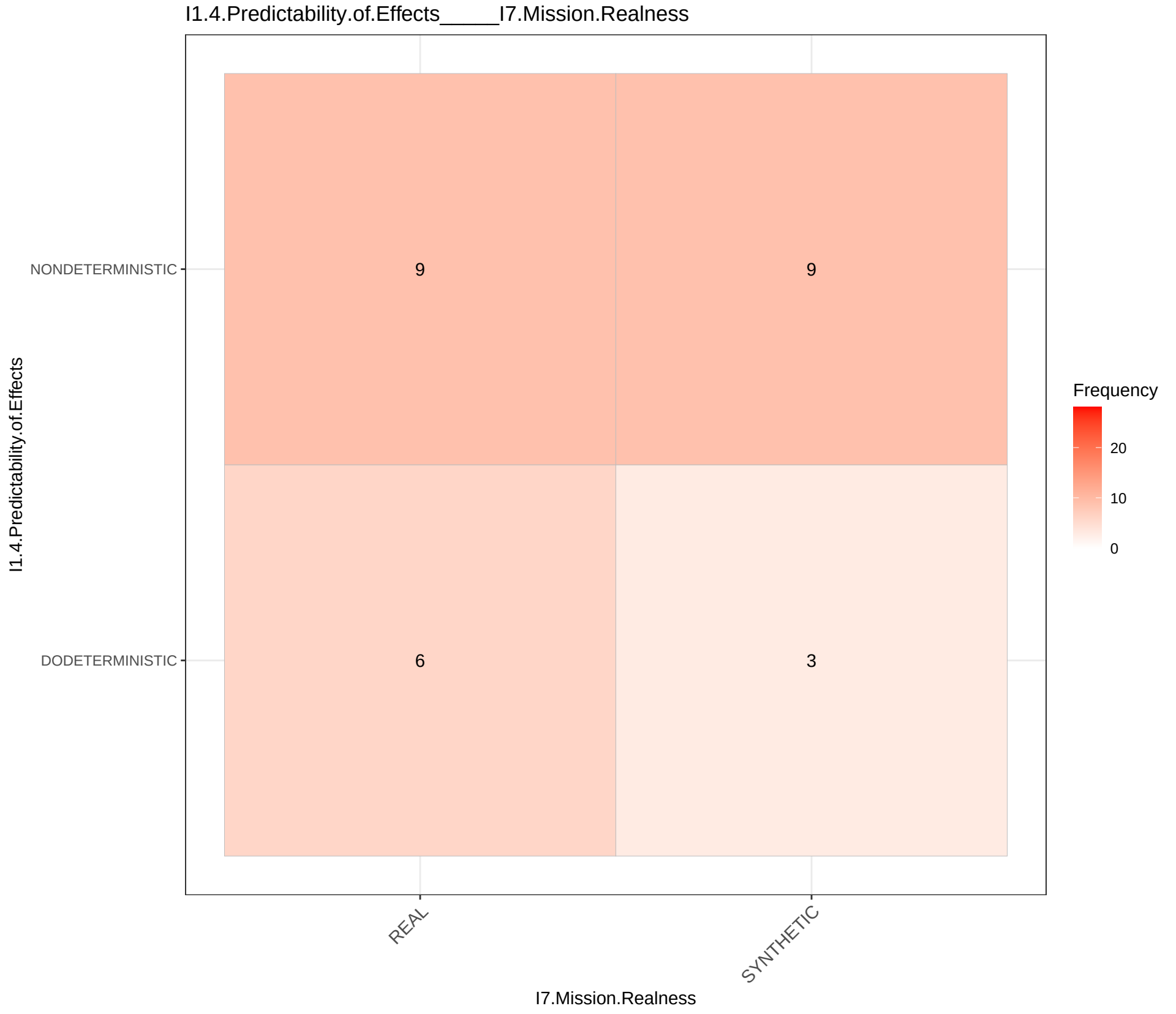
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NONDETERMINISTIC
DODETERMINISTIC
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3
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SYNTHETIC
I7.Mission.Realness
Frequency
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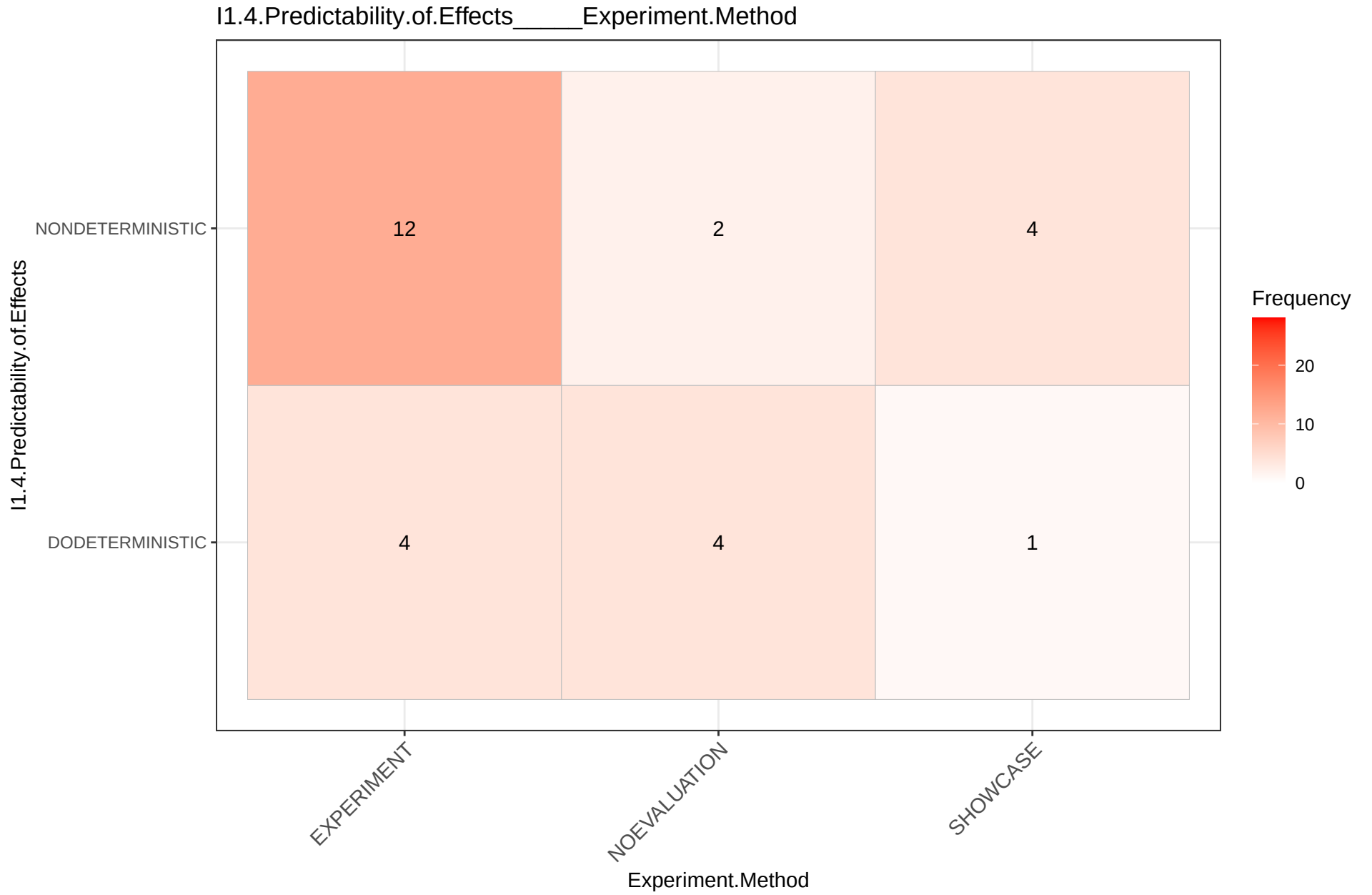
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DODETERMINISTIC
I1.4.Predictability.of.Effects
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NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
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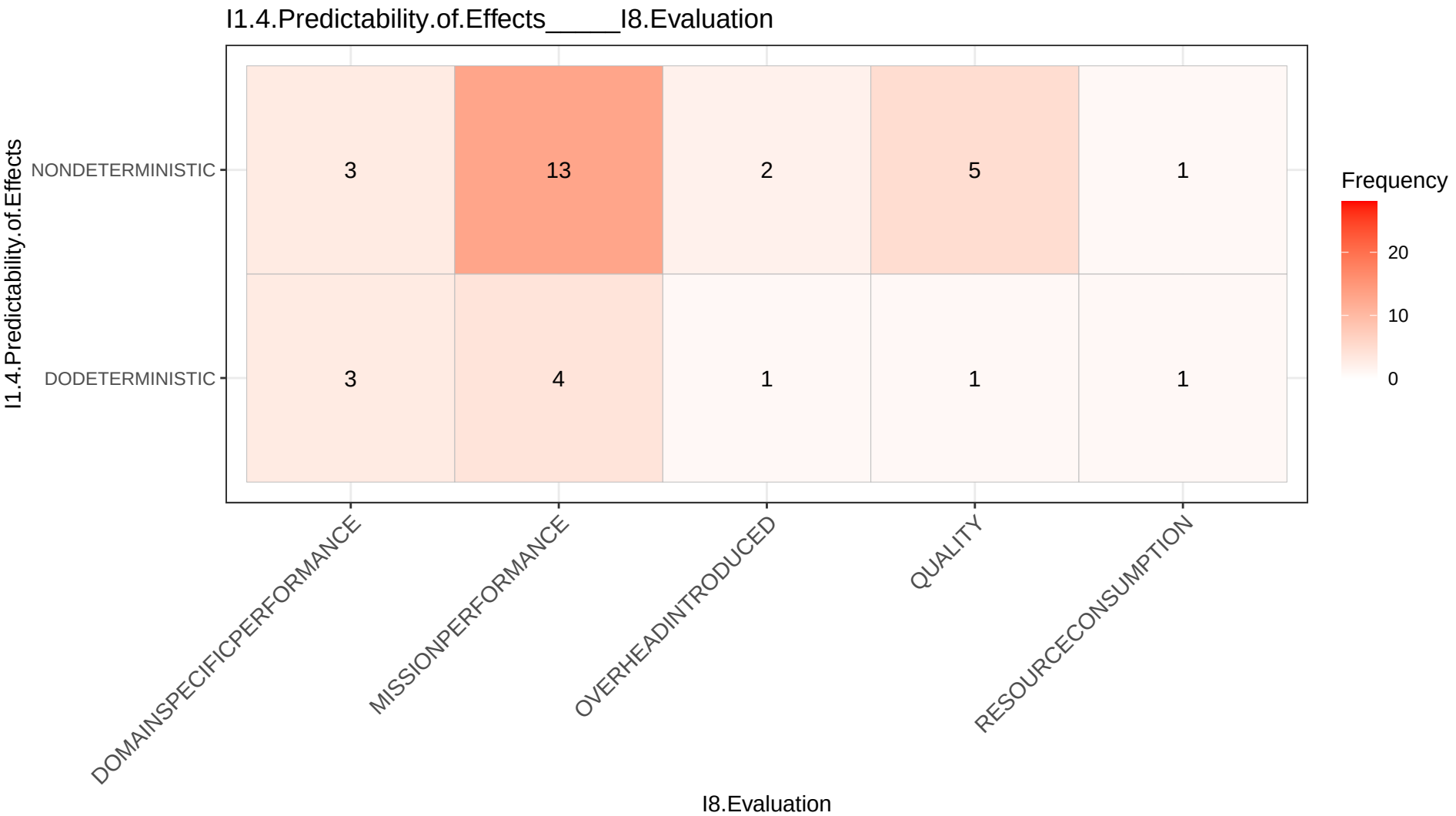
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I1.4.Predictability.of.Effects
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DODETERMINISTIC
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3
4
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1
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DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
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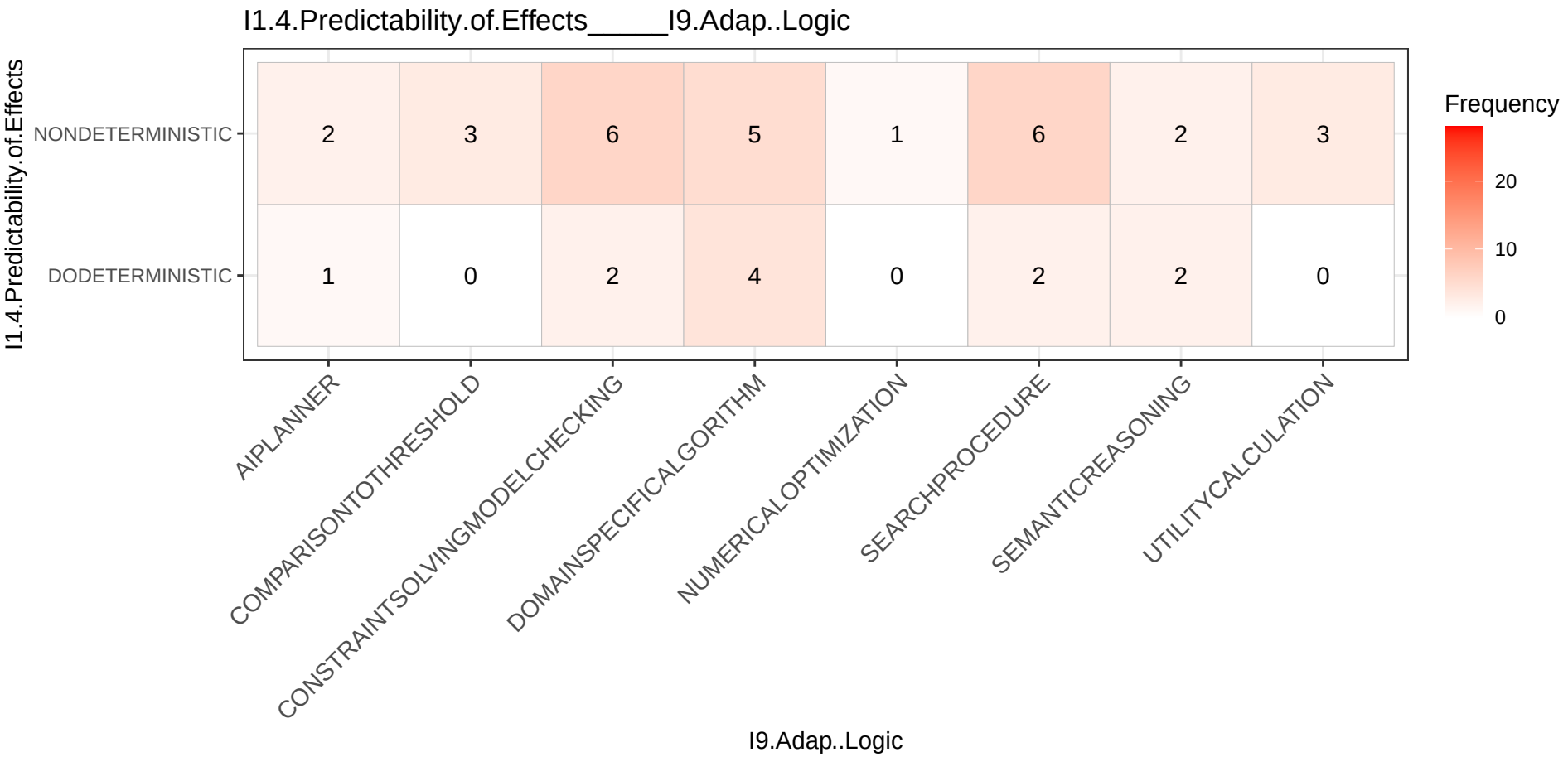
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I1.4.Predictability.of.Effects
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DODETERMINISTIC
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2
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AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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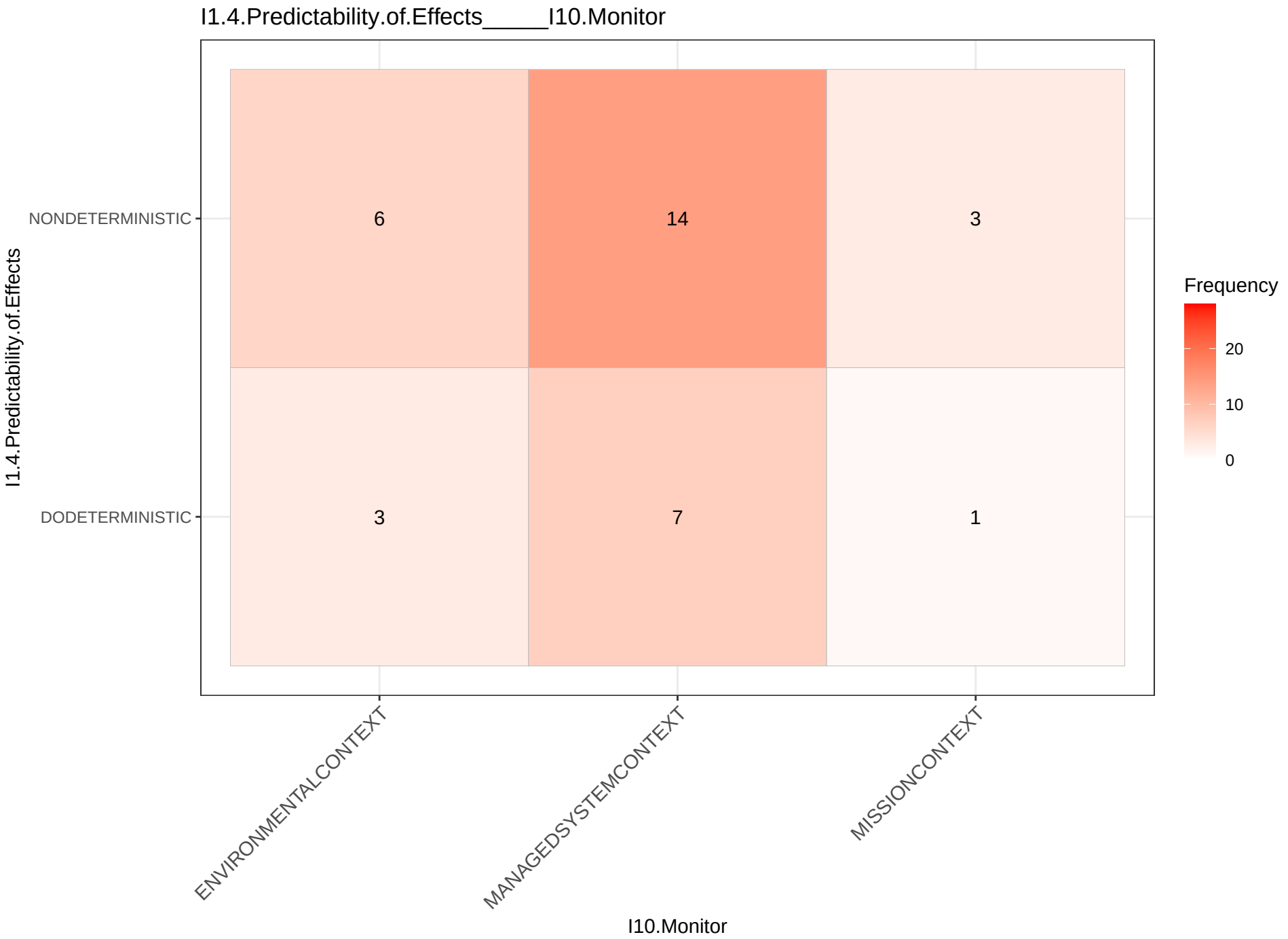
I1.4.Predictability.of.Effects_____I10.Monitor
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DODETERMINISTIC
I1.4.Predictability.of.Effects
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ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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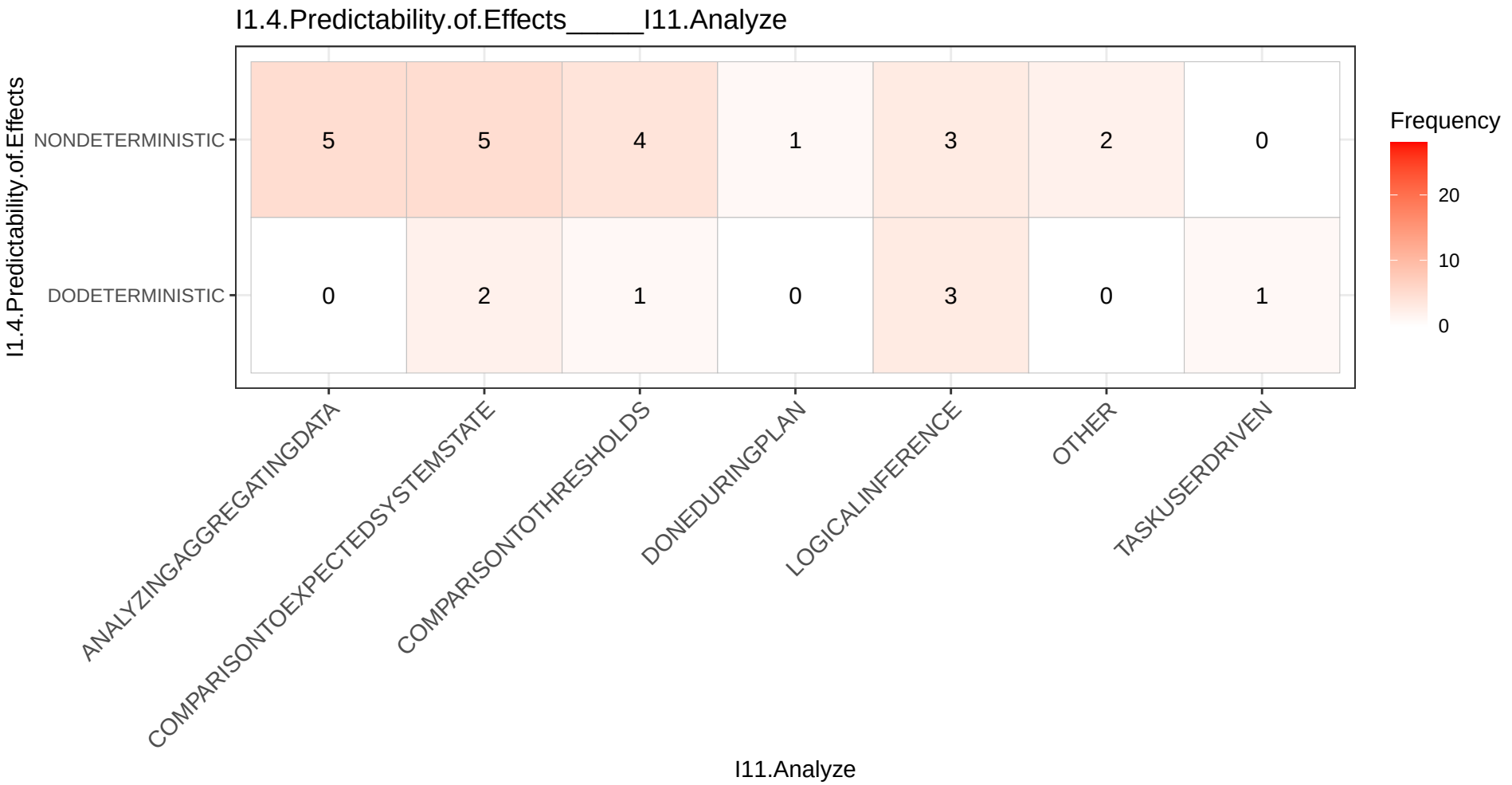
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I1.4.Predictability.of.Effects
NONDETERMINISTIC
DODETERMINISTIC
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5
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3
2
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ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
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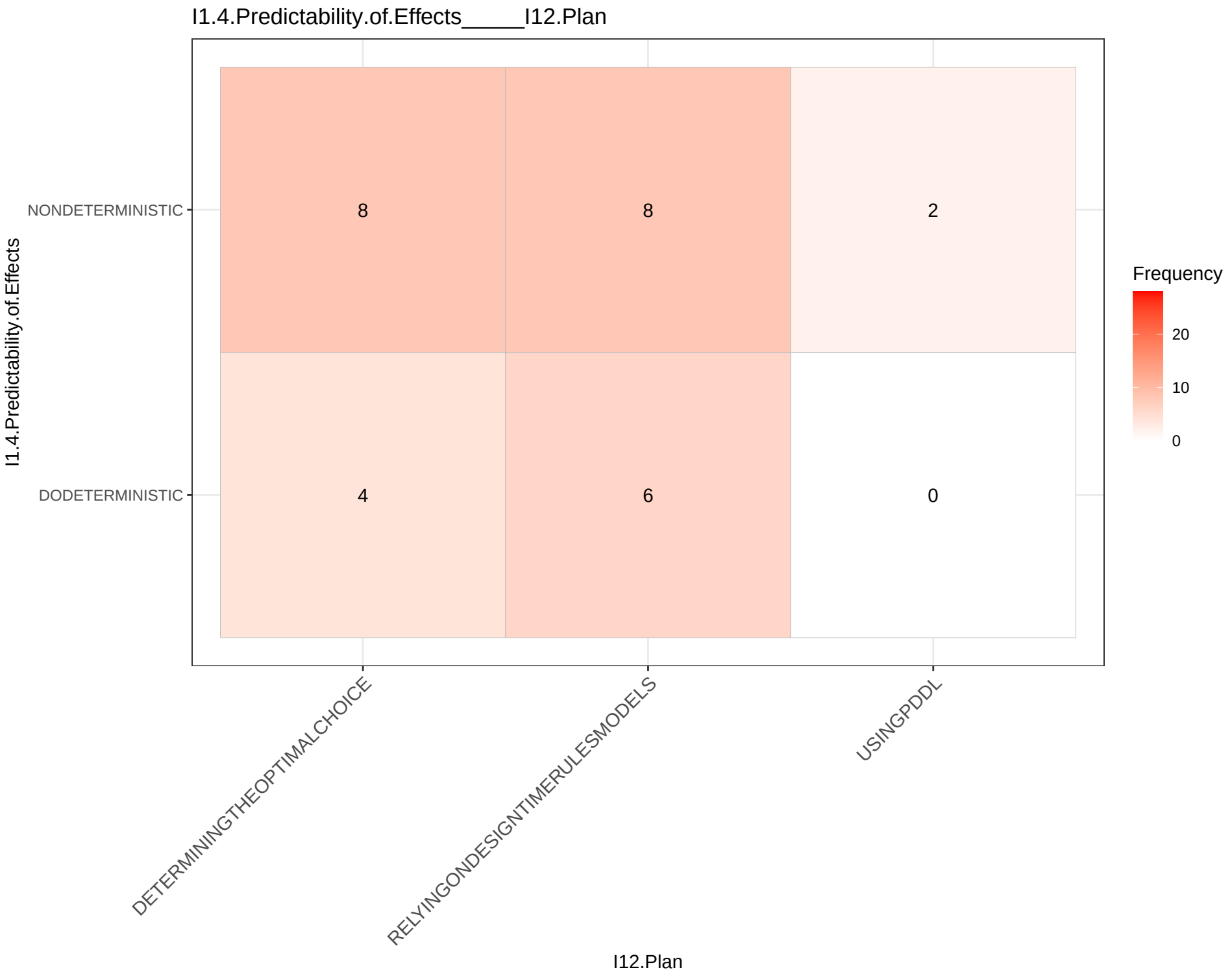
I1.4.Predictability.of.Effects_____I12.Plan
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DODETERMINISTIC
I1.4.Predictability.of.Effects
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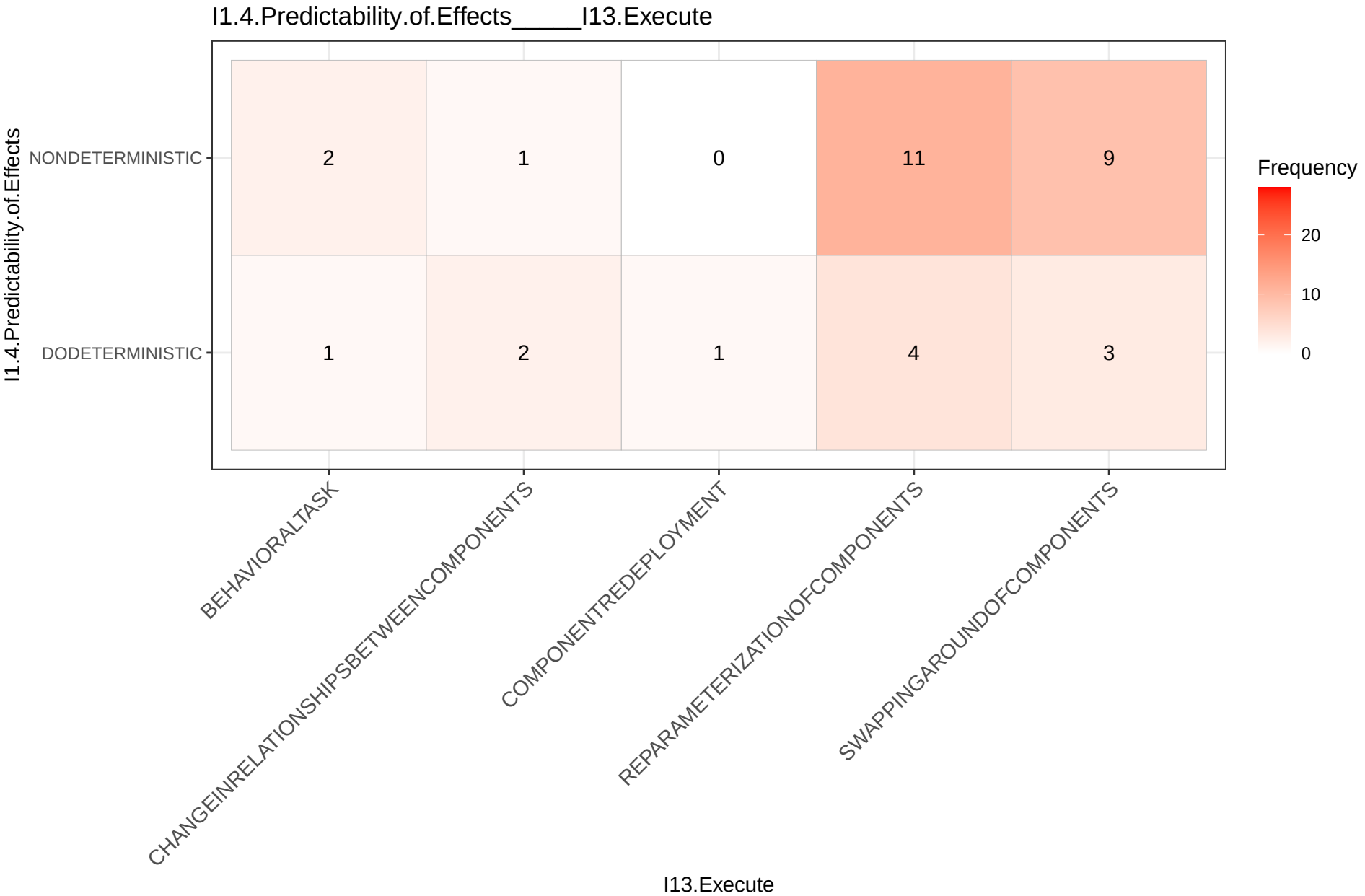
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan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DODETERMINISTIC
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1
4
3
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
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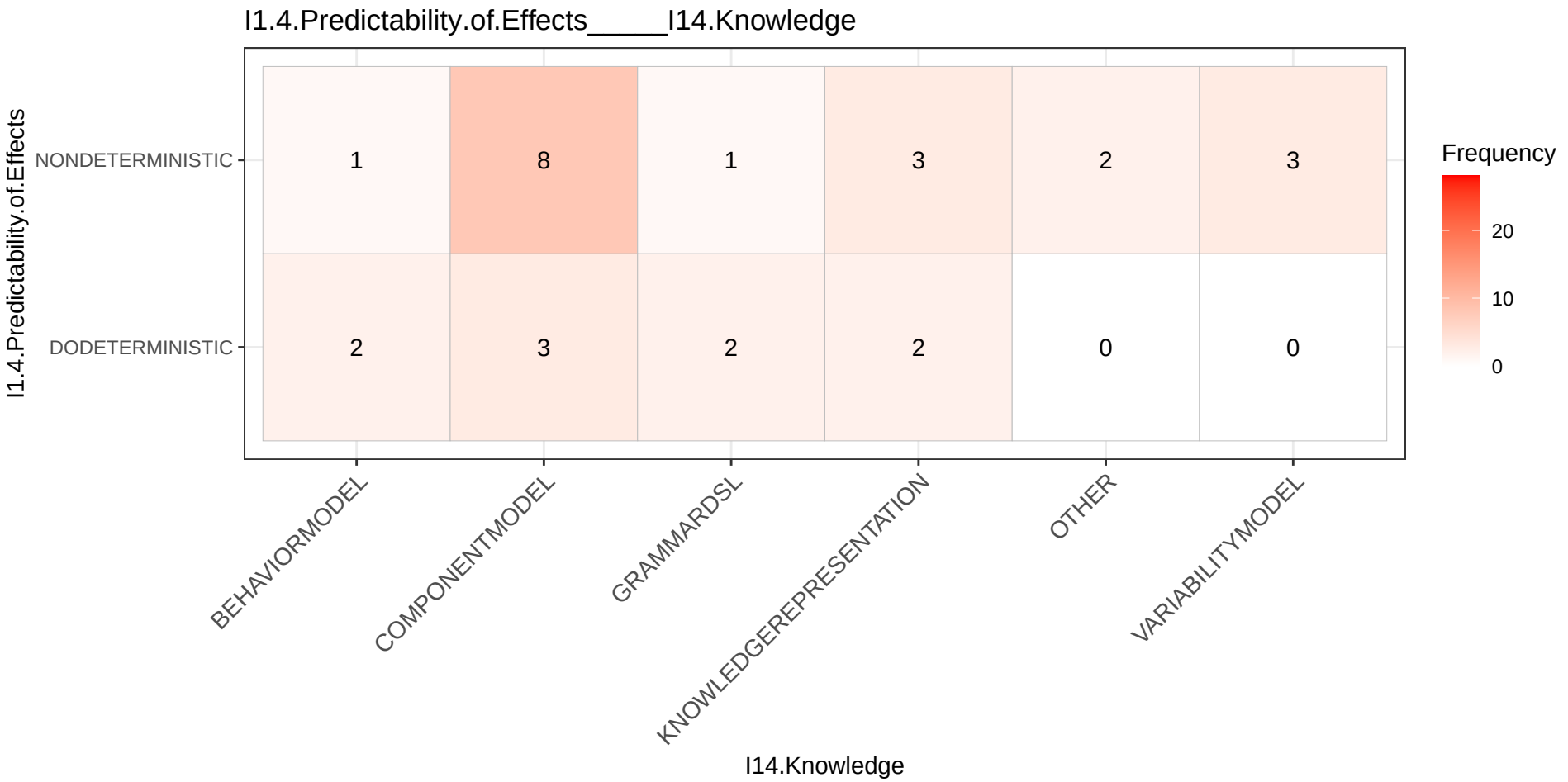
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OTHER
VARIABILITYMODEL
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Frequency
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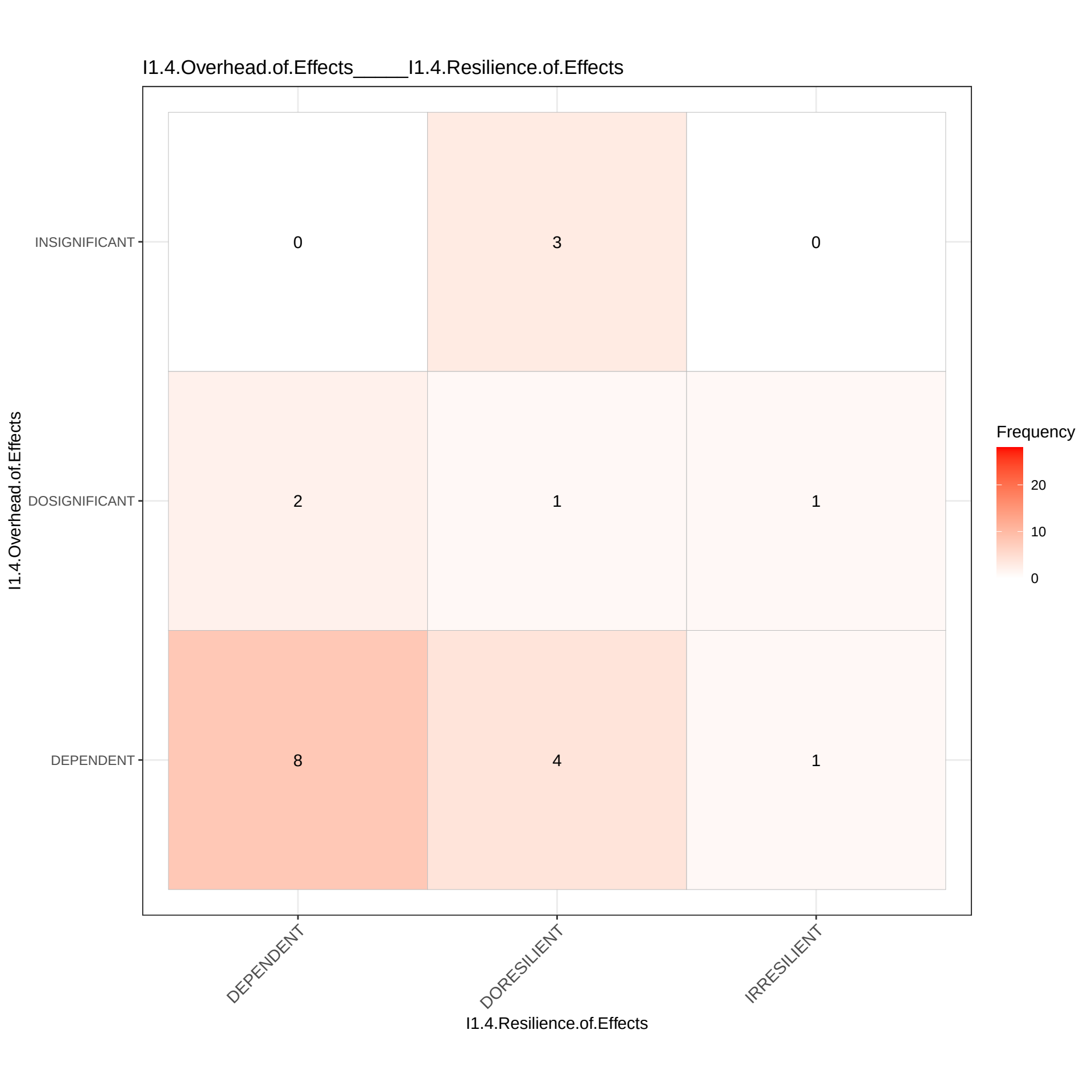
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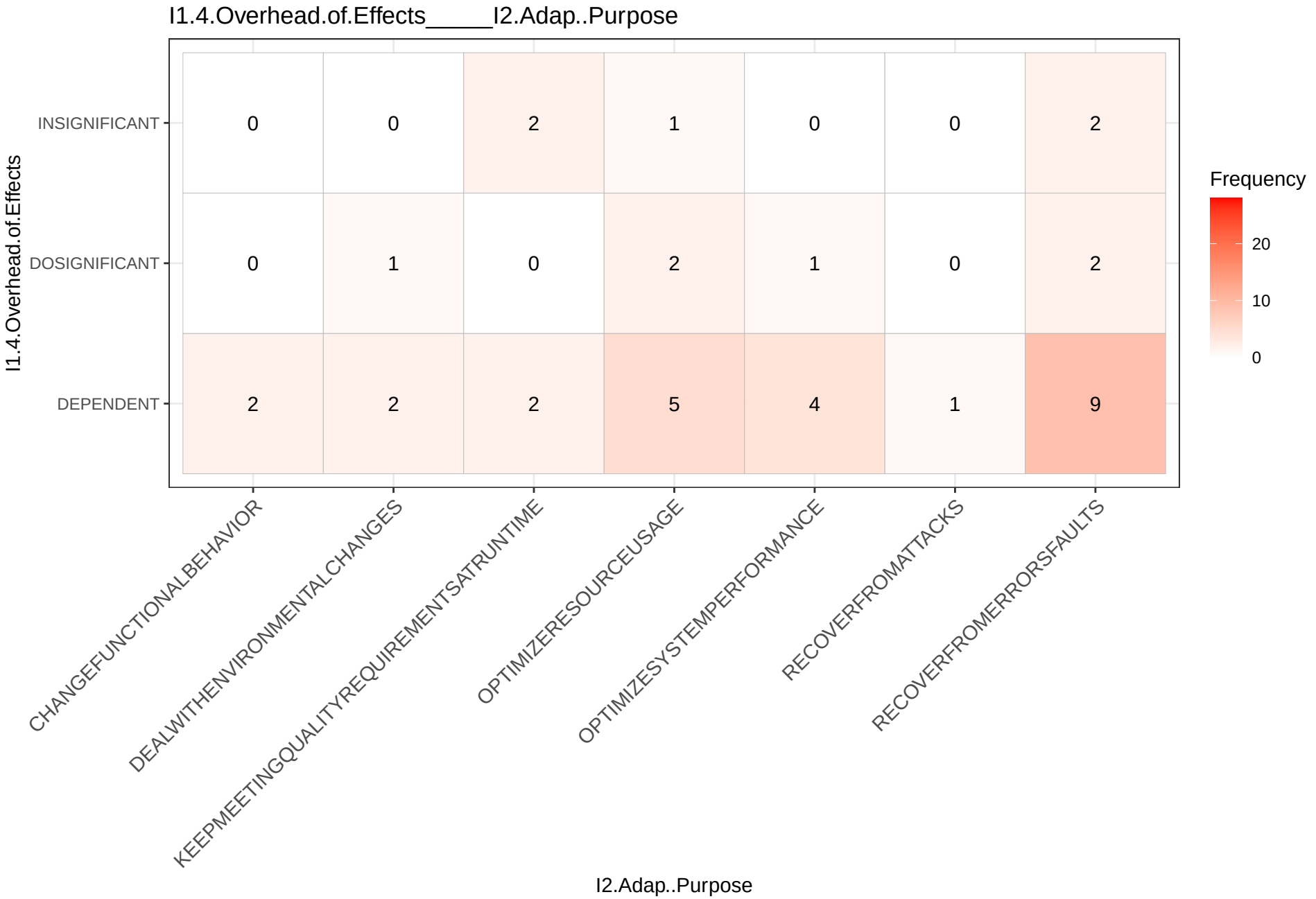
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DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
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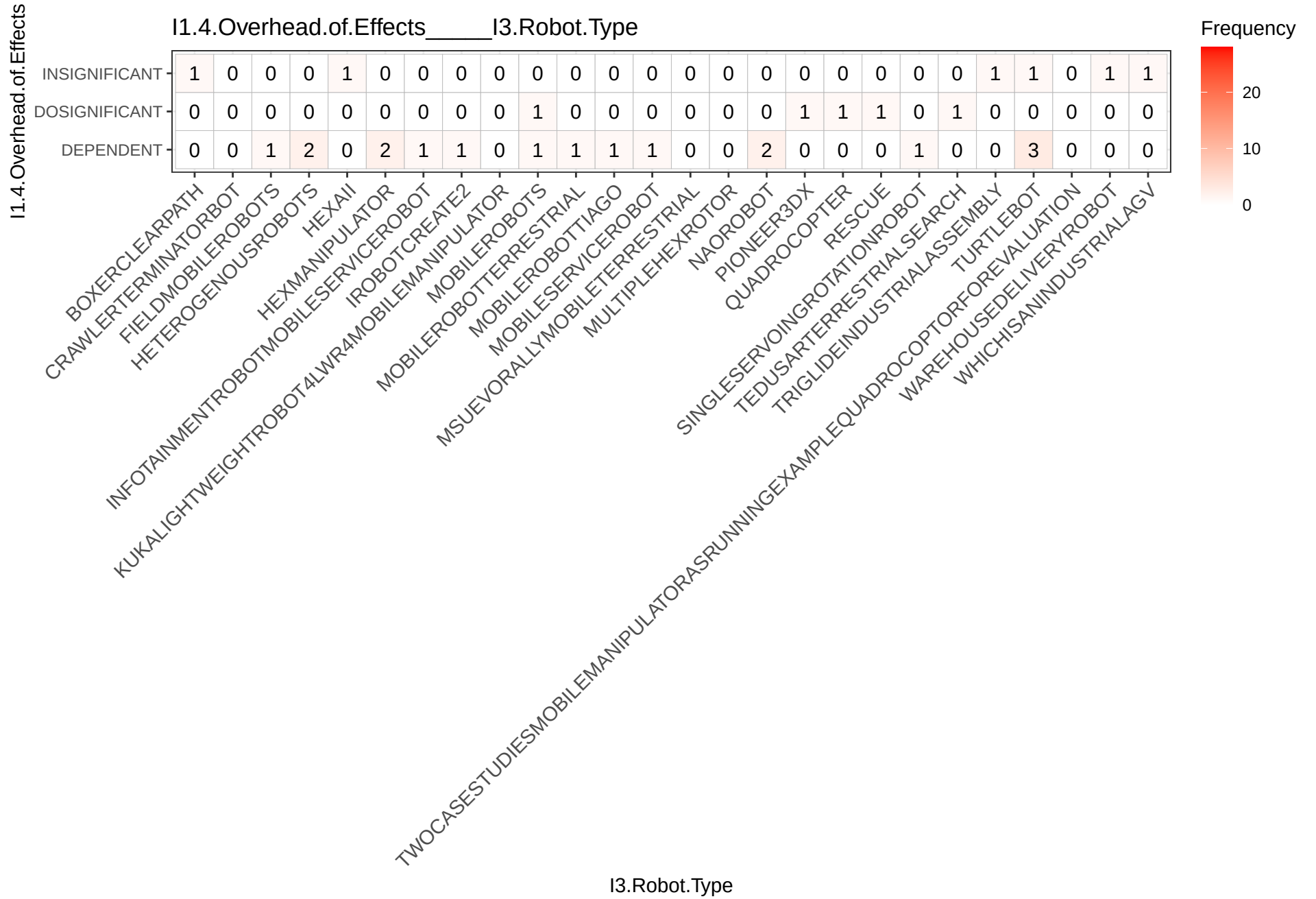
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BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
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MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
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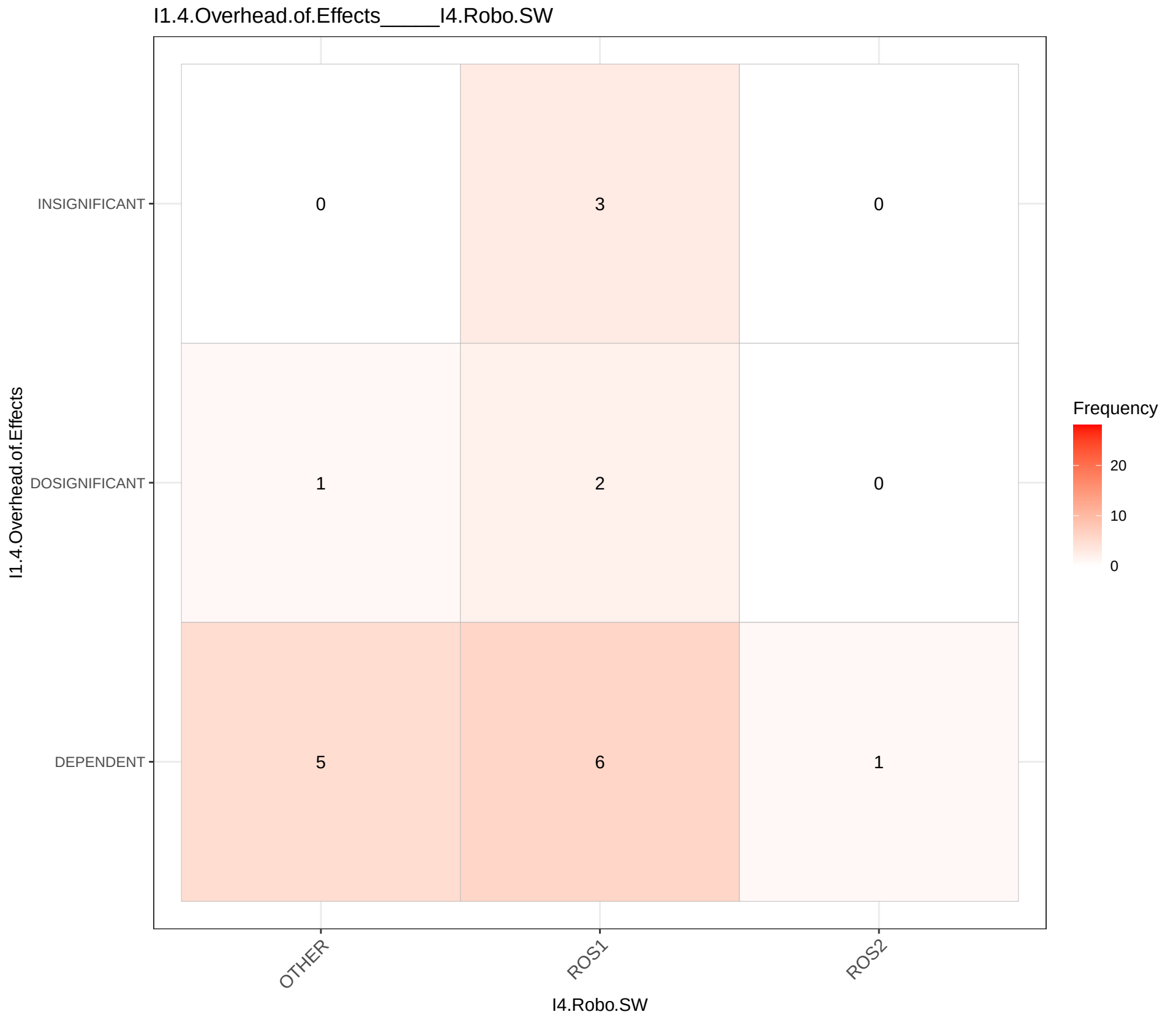
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ROS2
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Frequency
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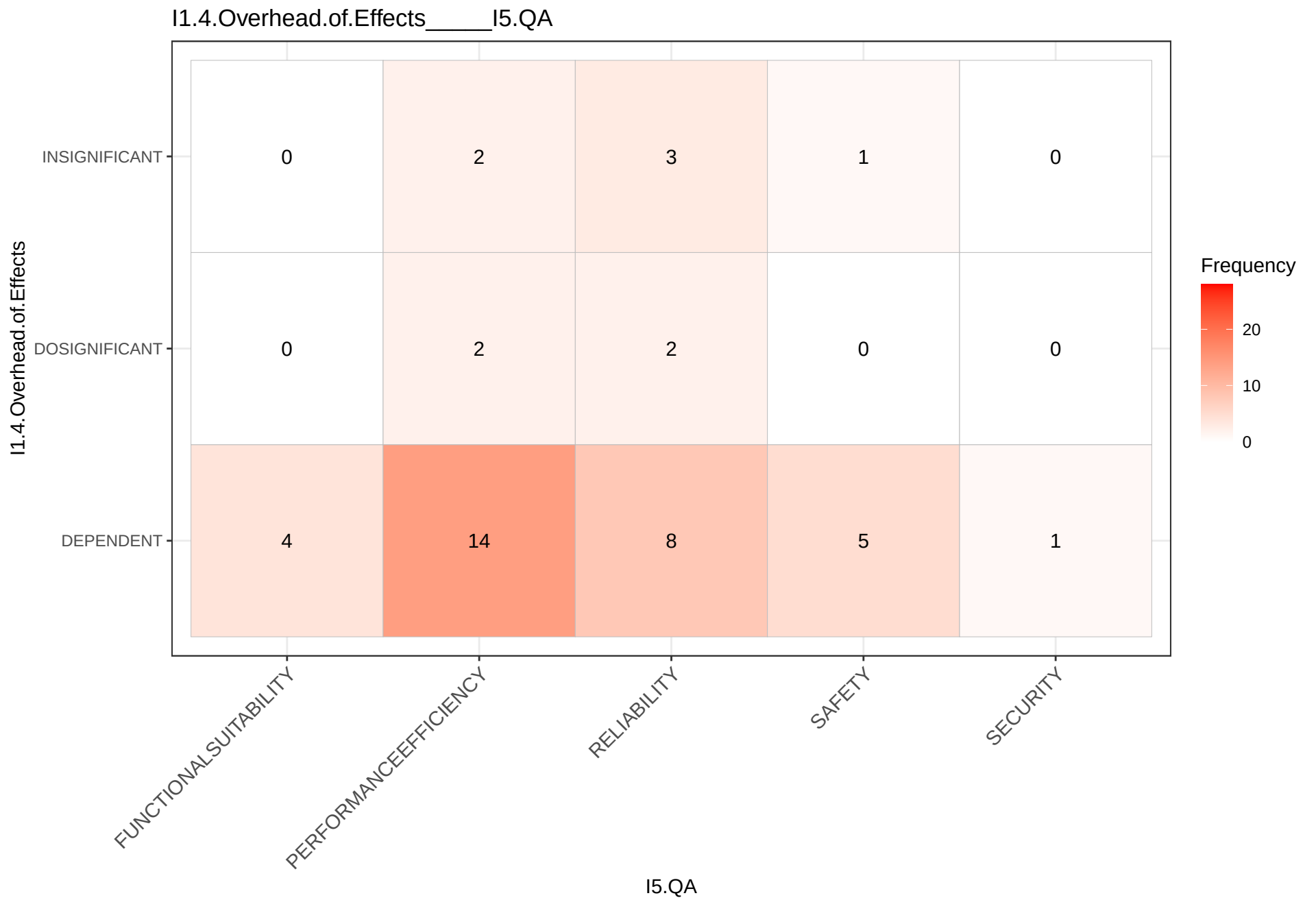
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RELIABILITY
SAFETY
SECURITY
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Frequency
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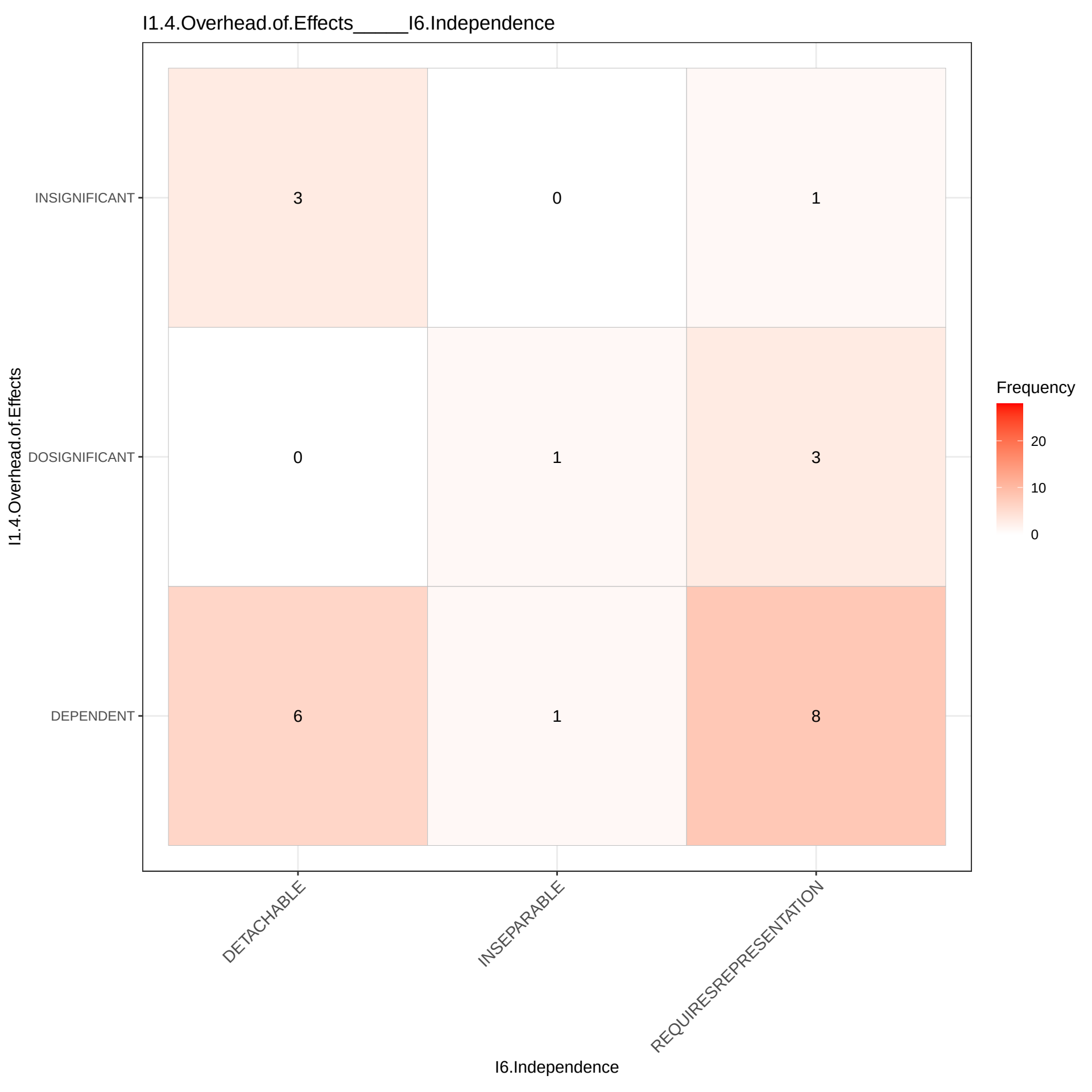
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DEPENDENT
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I6.Independence
Frequency
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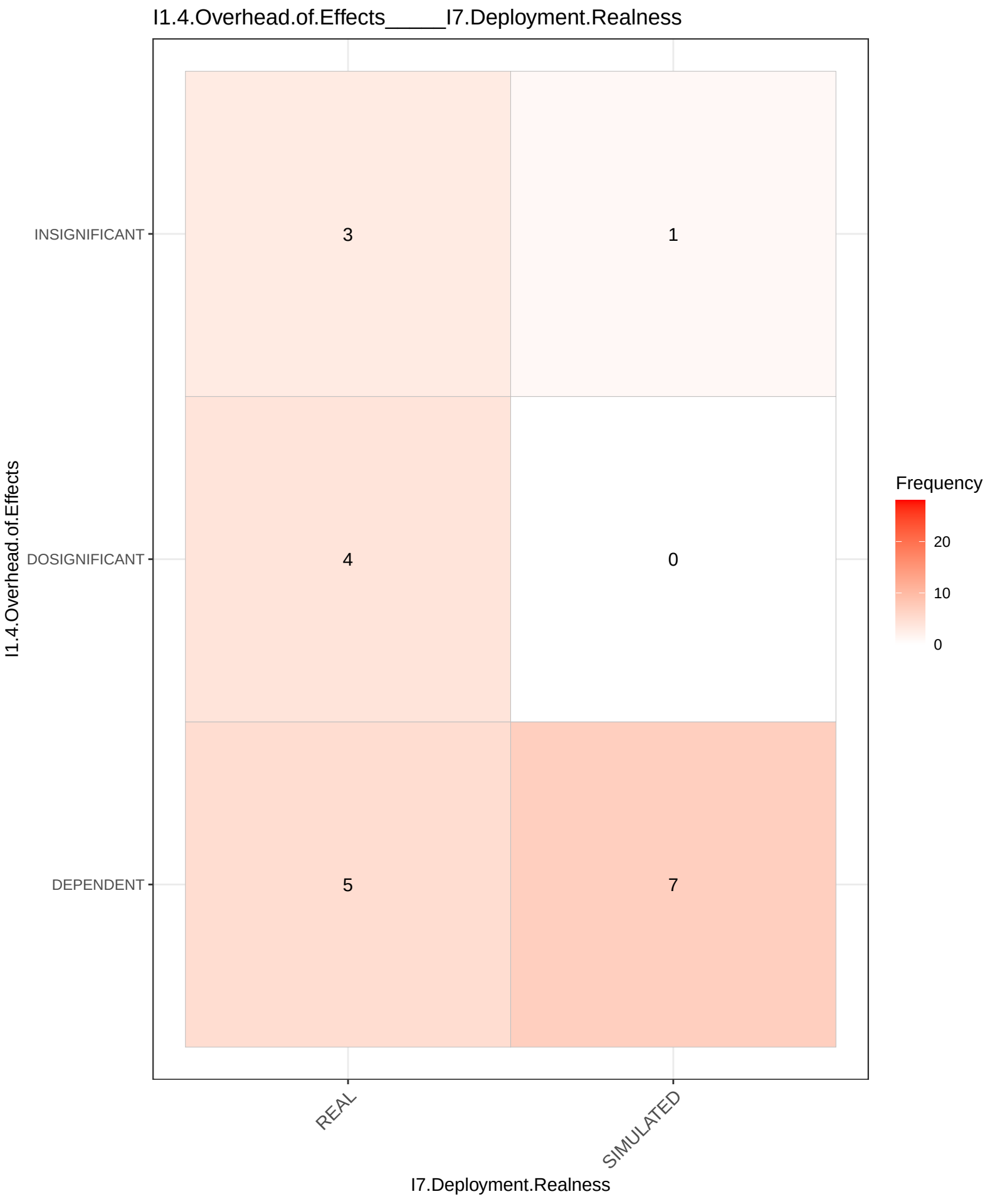
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Frequency
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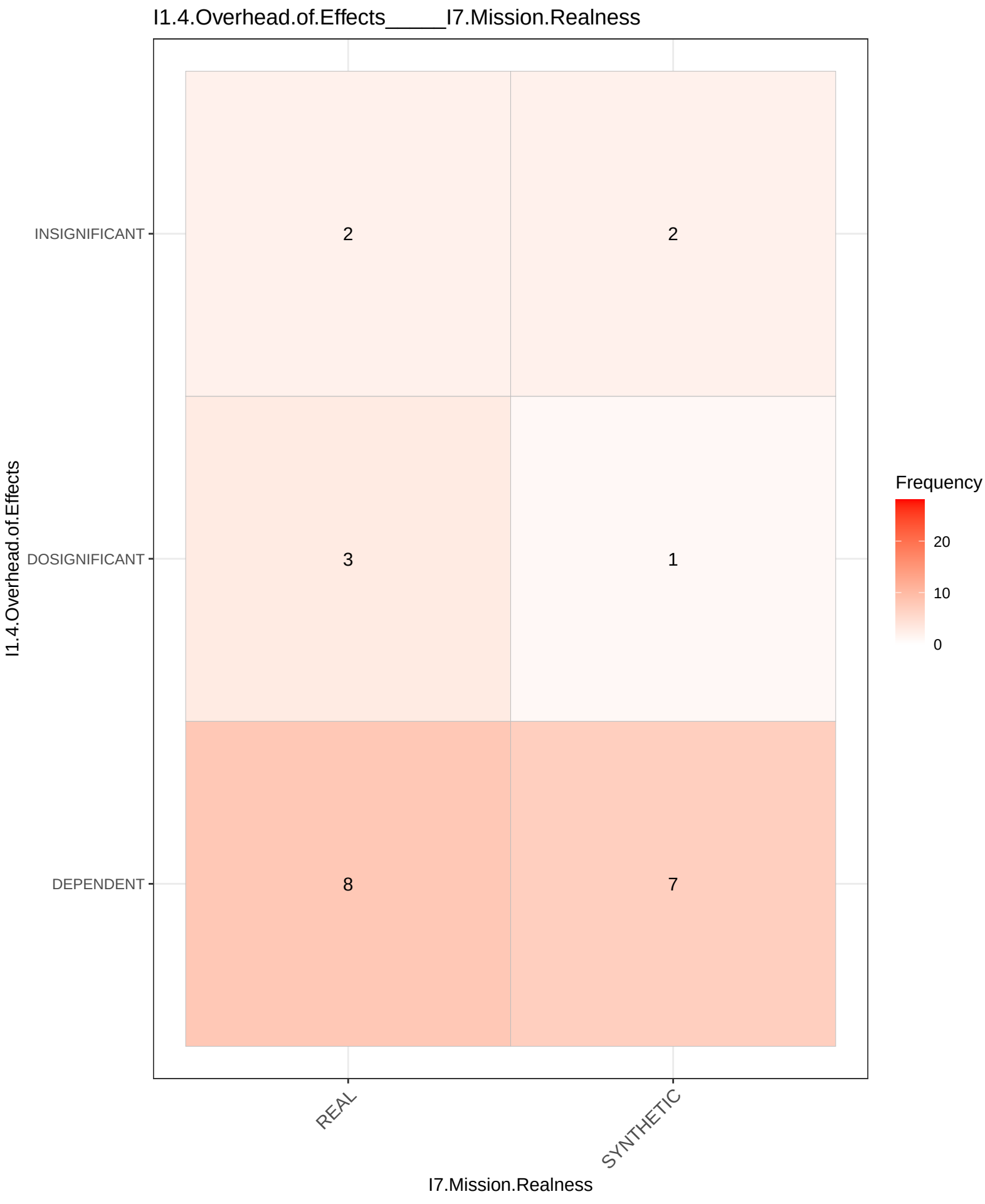
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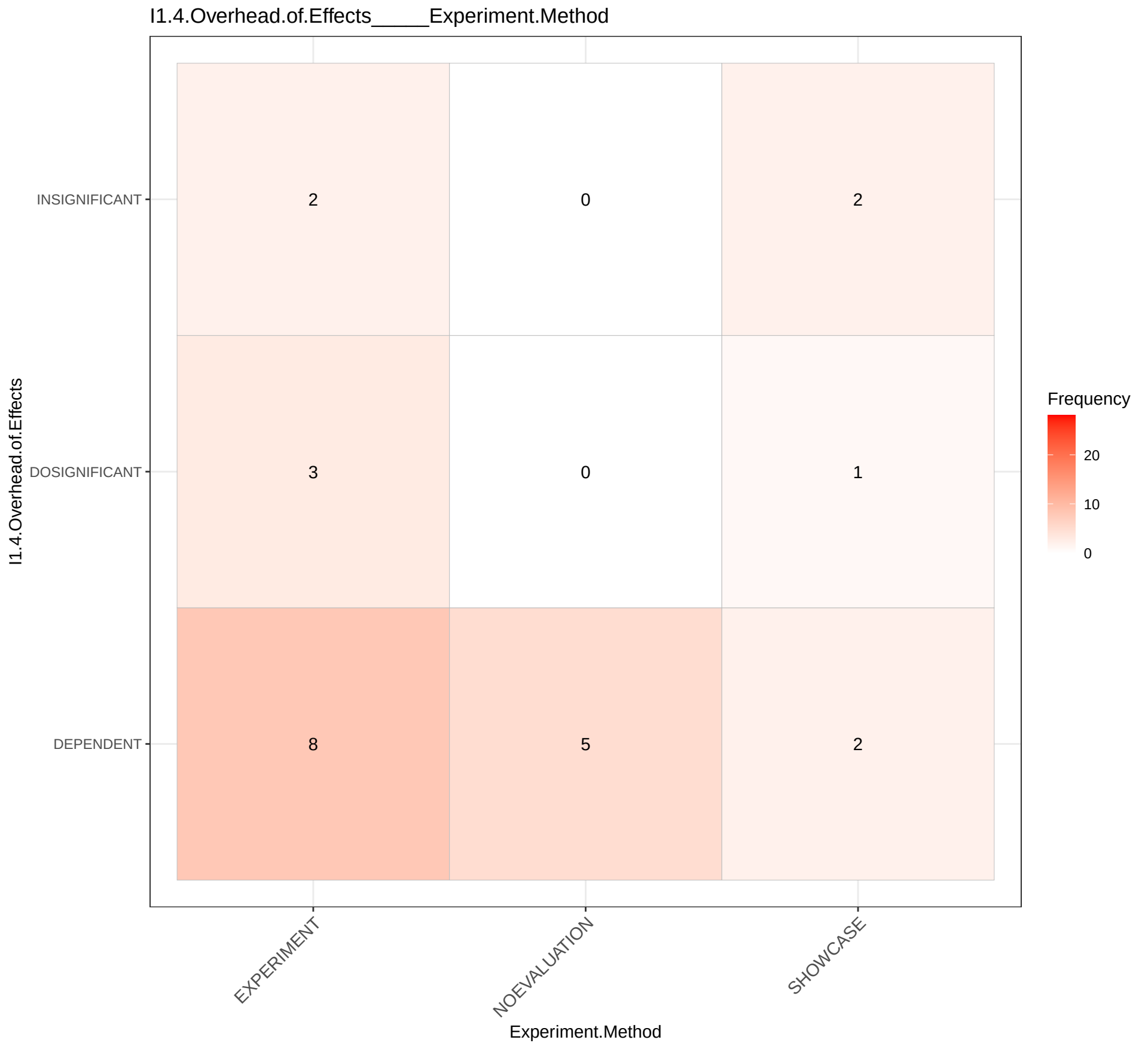
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Frequency
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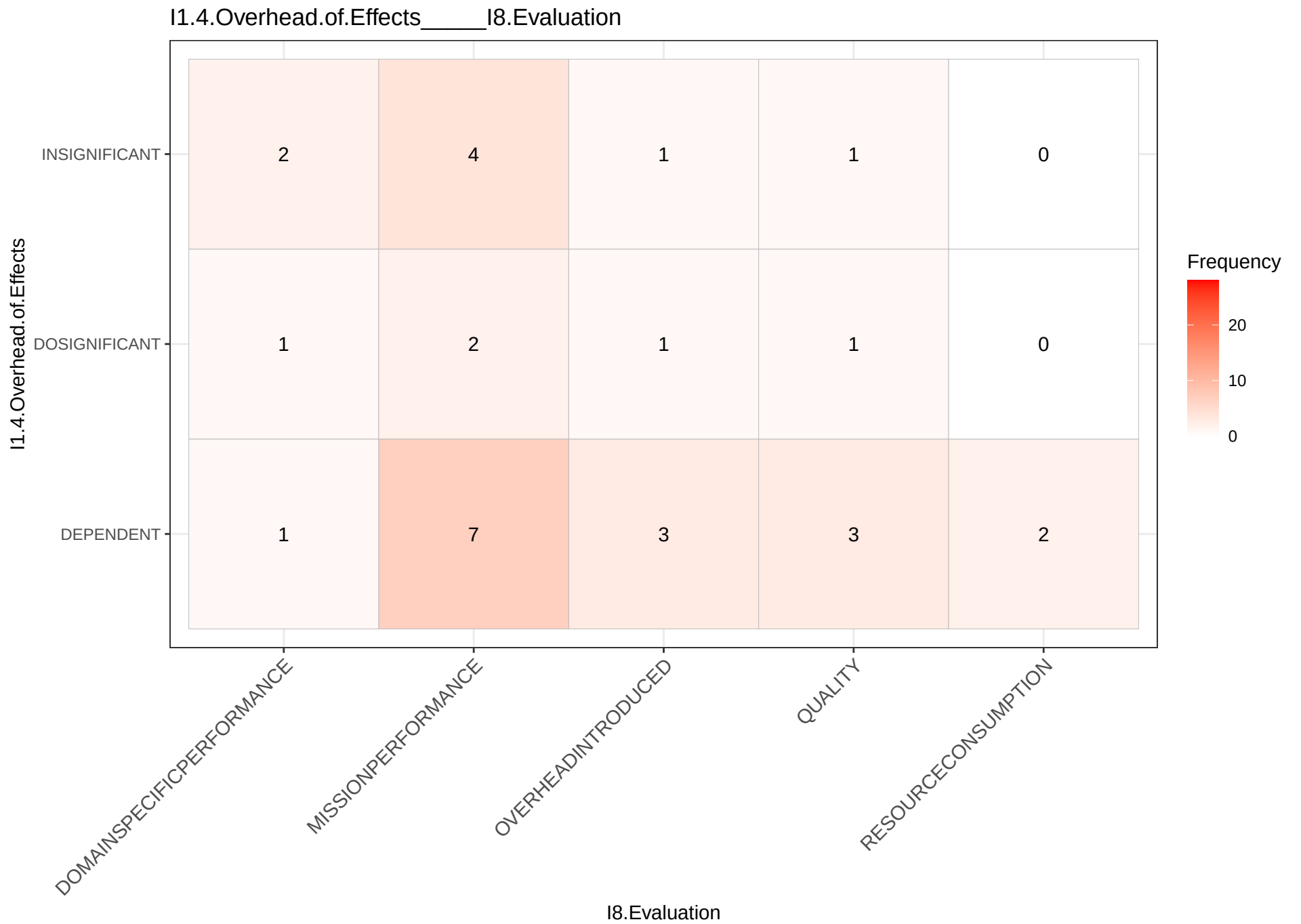
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I1.4.Overhead.of.Effects
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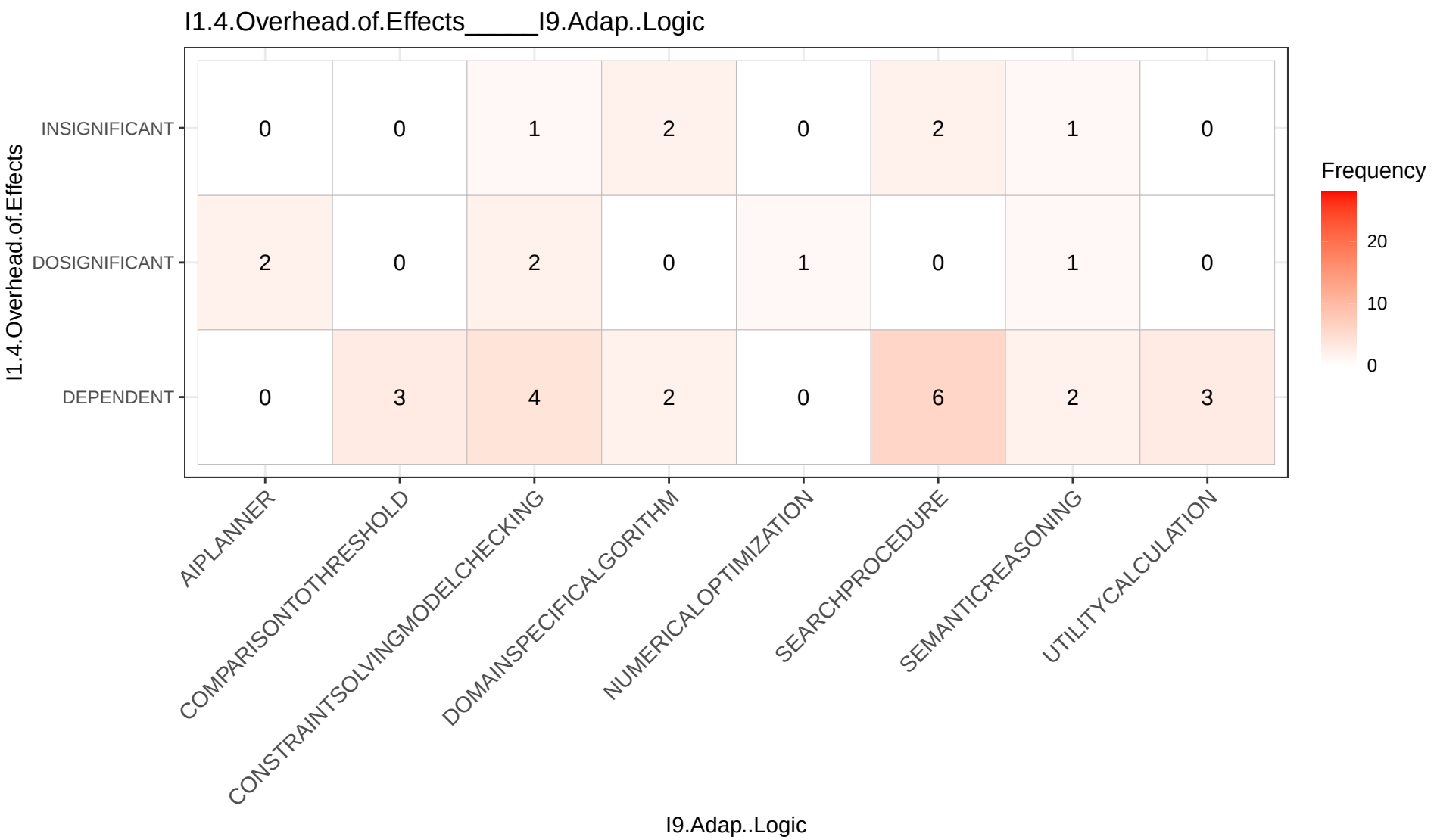
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Frequency
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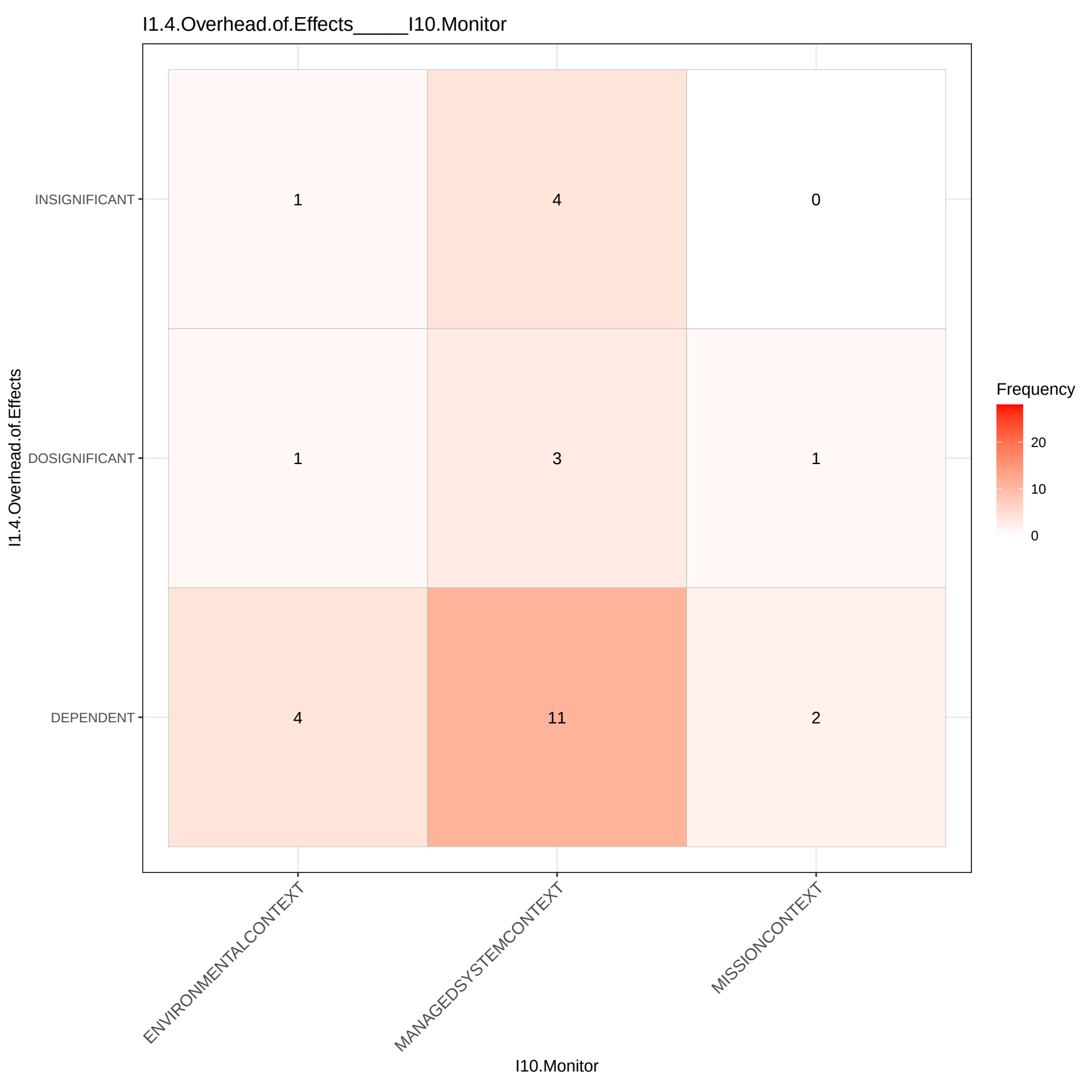
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Frequency
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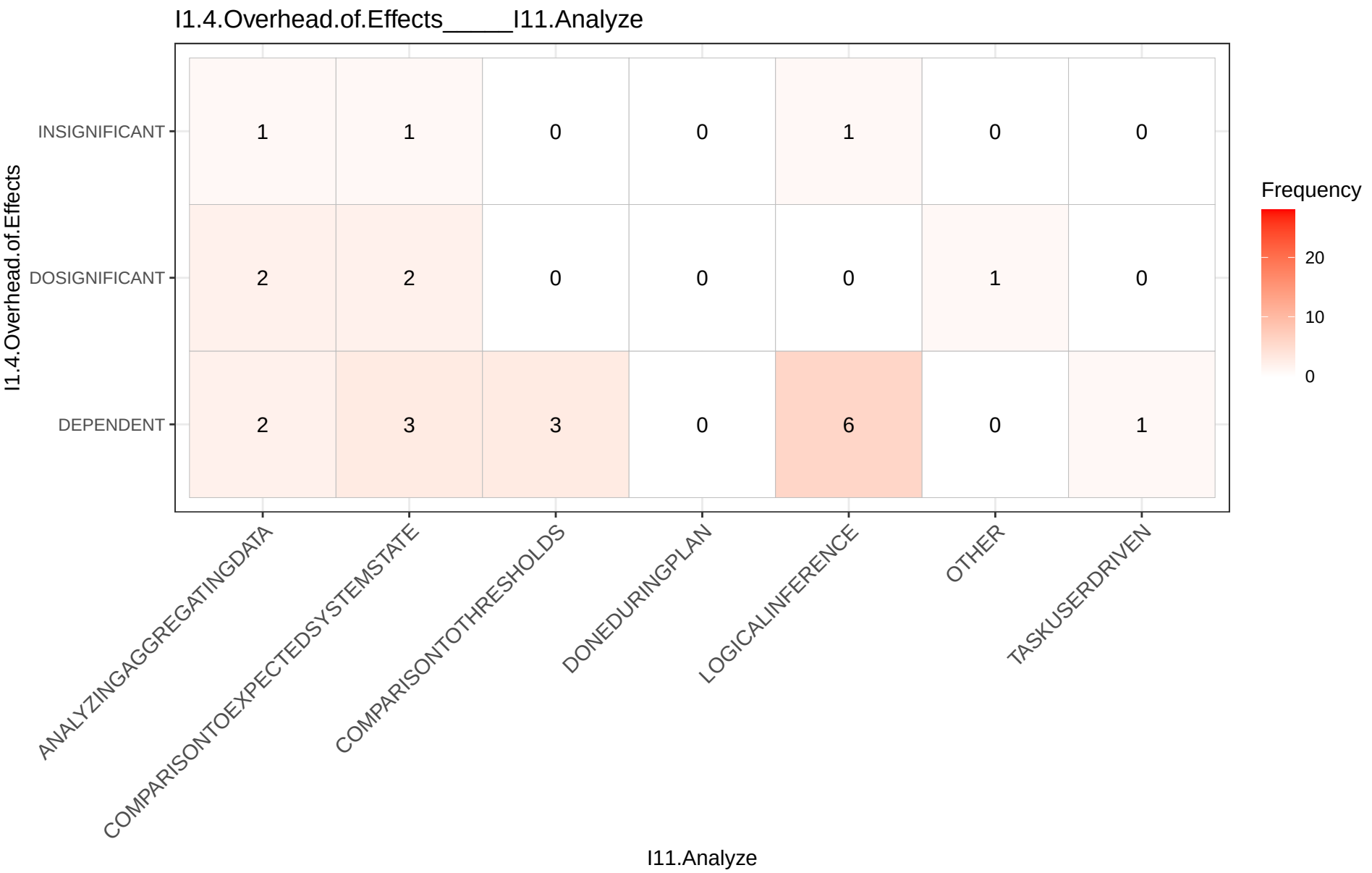
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I1.4.Overhead.of.Effects
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
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Frequency
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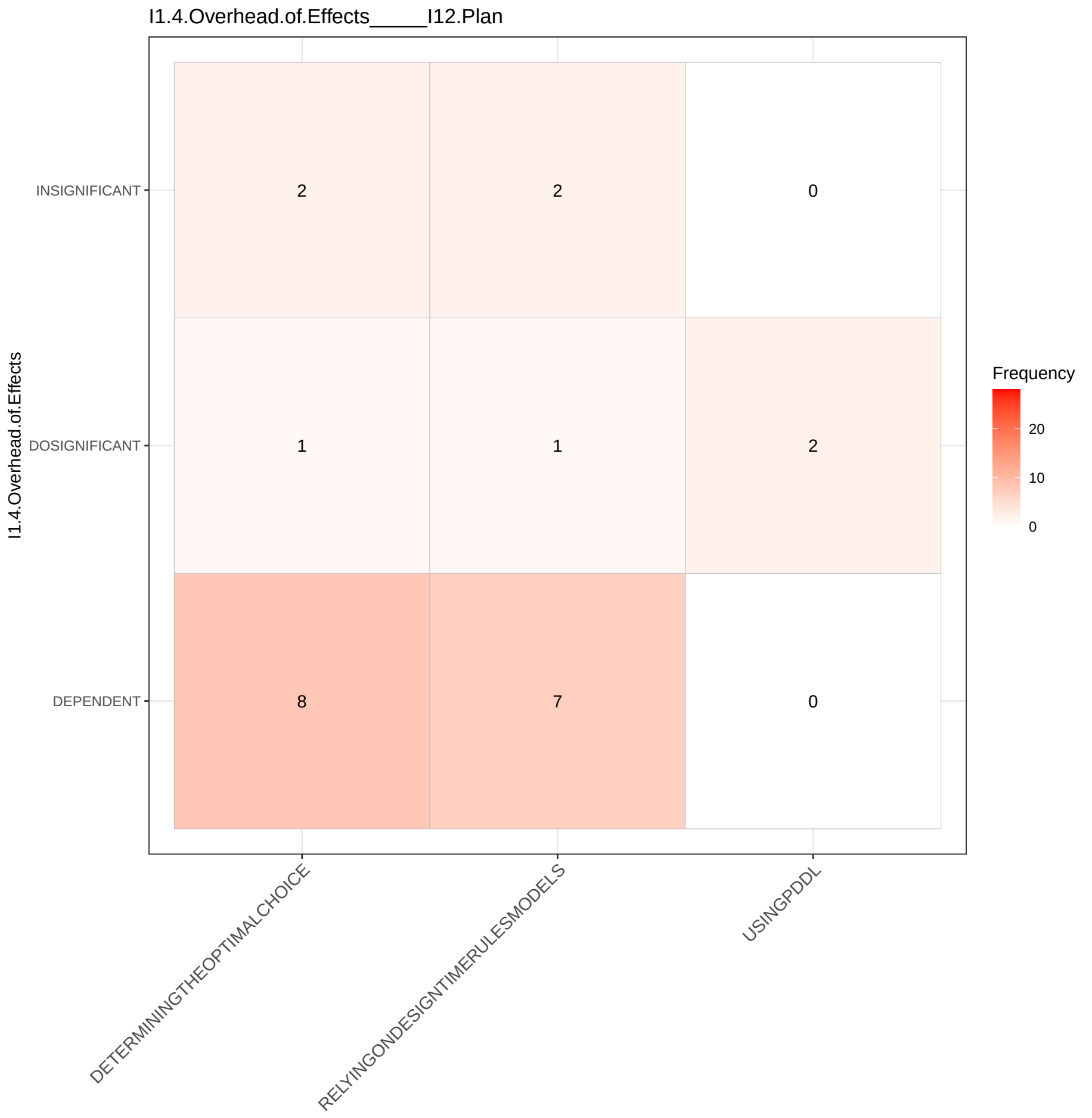
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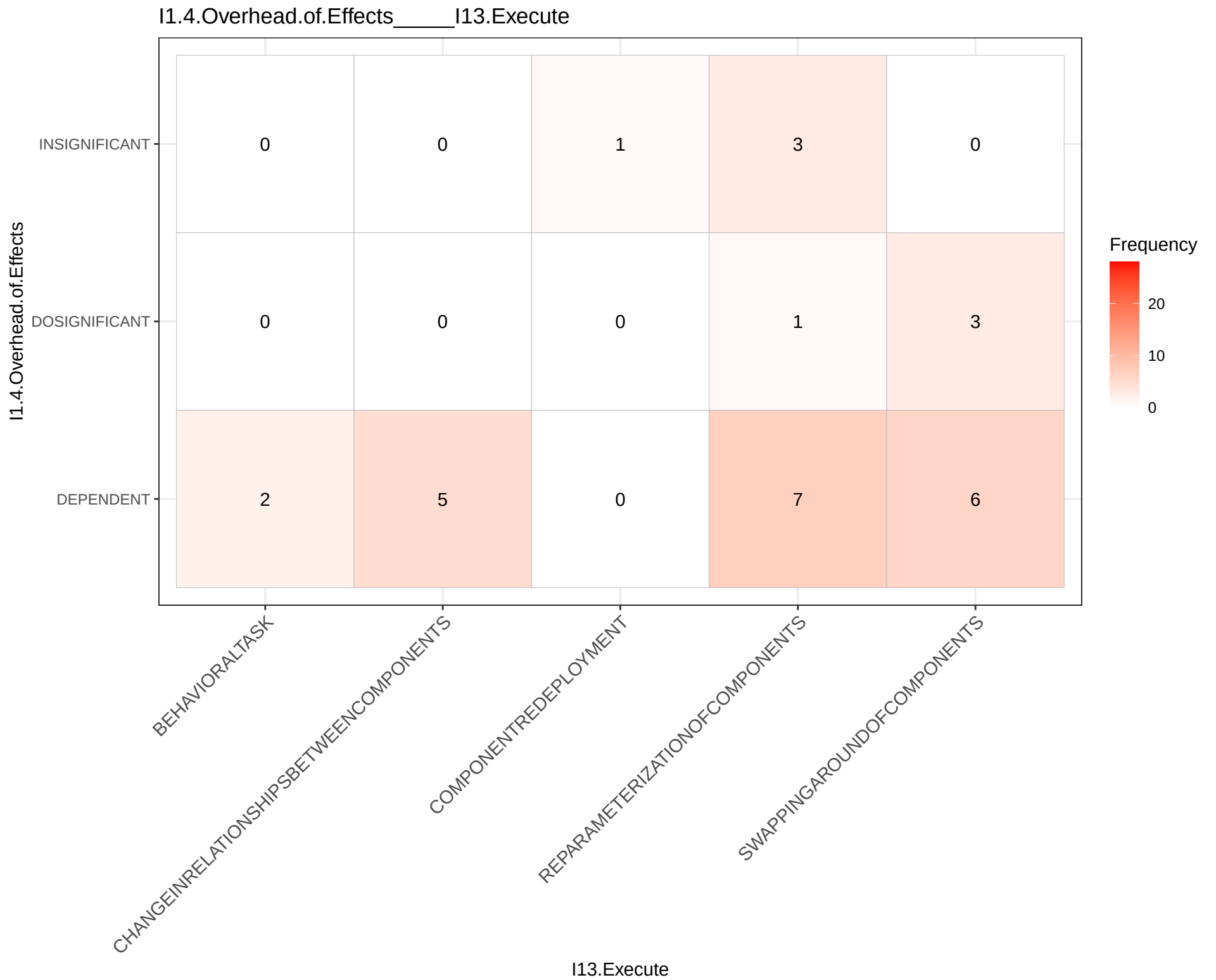
I12.Plan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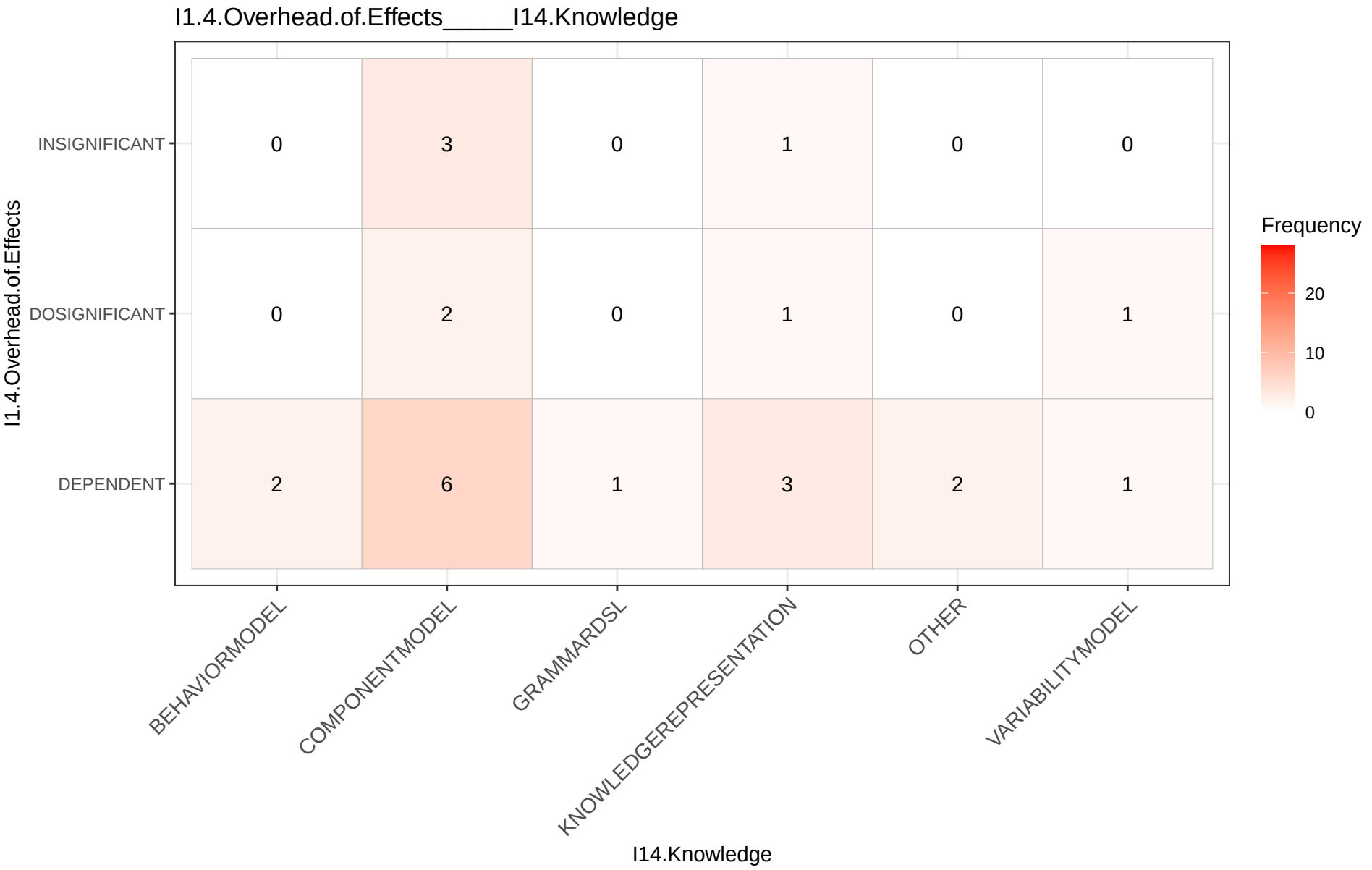
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DEPENDENT
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KNOWLEDGEREPRESENTATION
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Frequency
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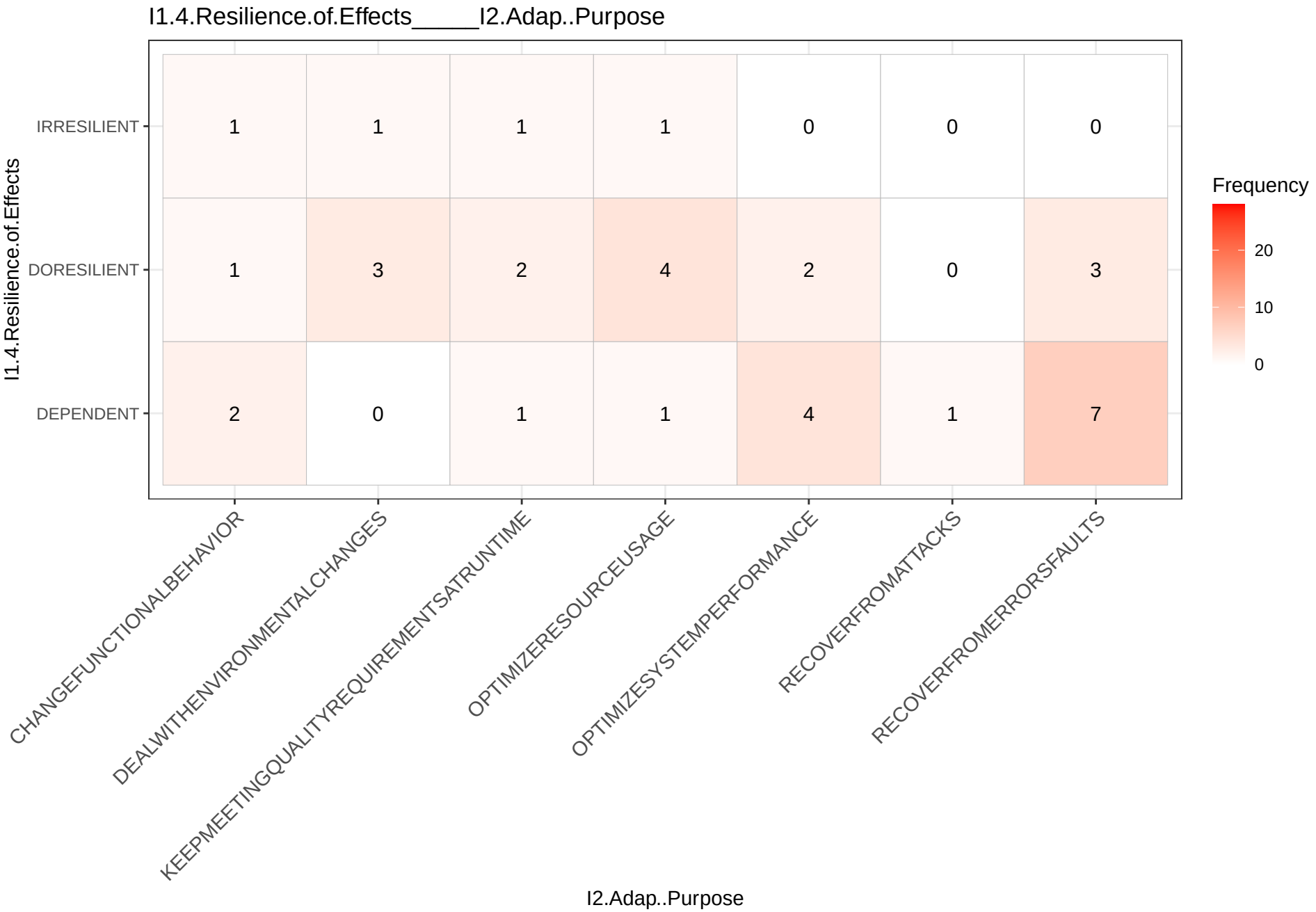
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DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
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RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS
I2.Adap..Purpose
Frequency
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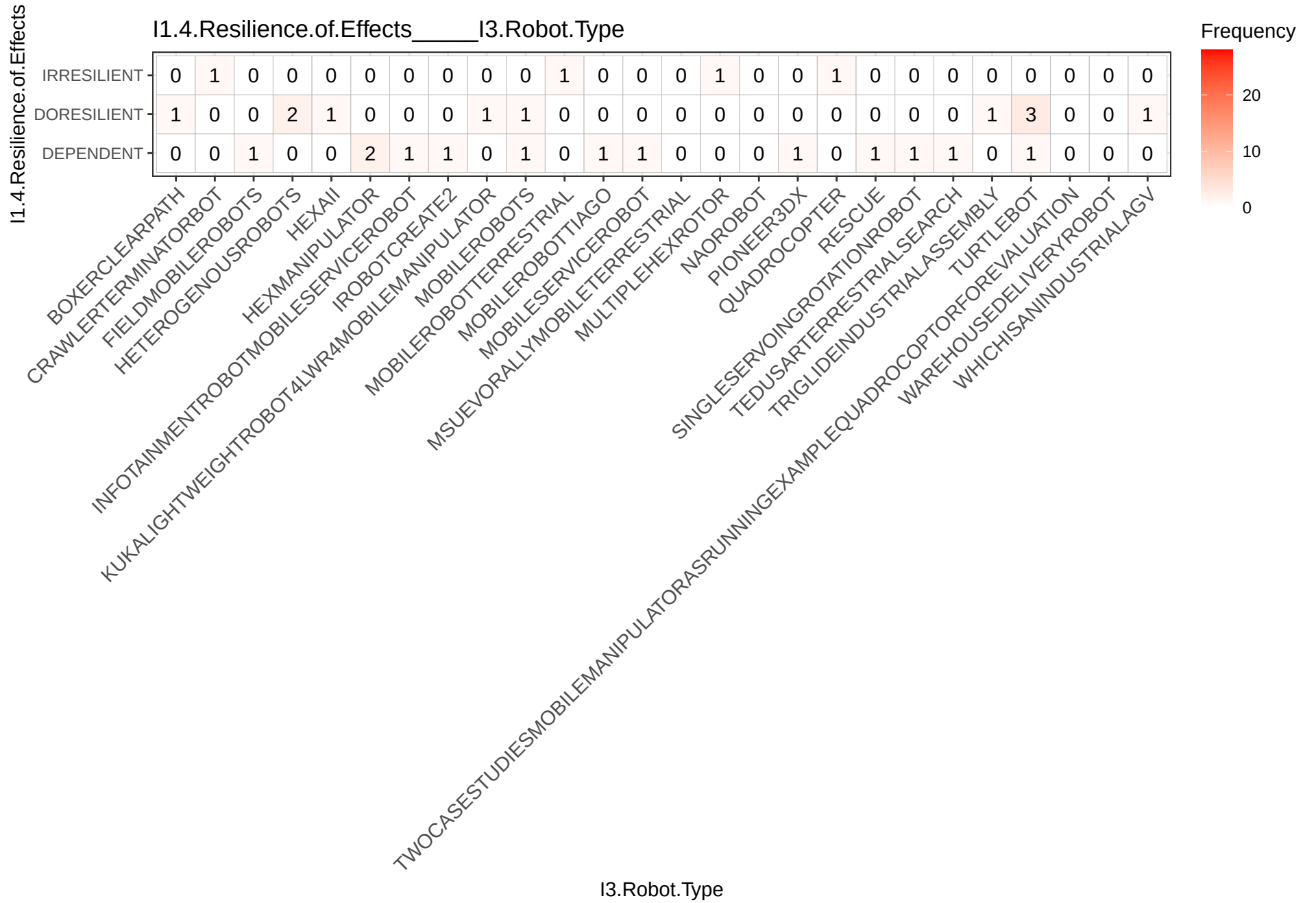
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BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
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KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
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MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
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NAOROBOT
PIONEER3DX
QUADROCOPTER
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TRIGLIDEINDUSTRIALASSEMBLY
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TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
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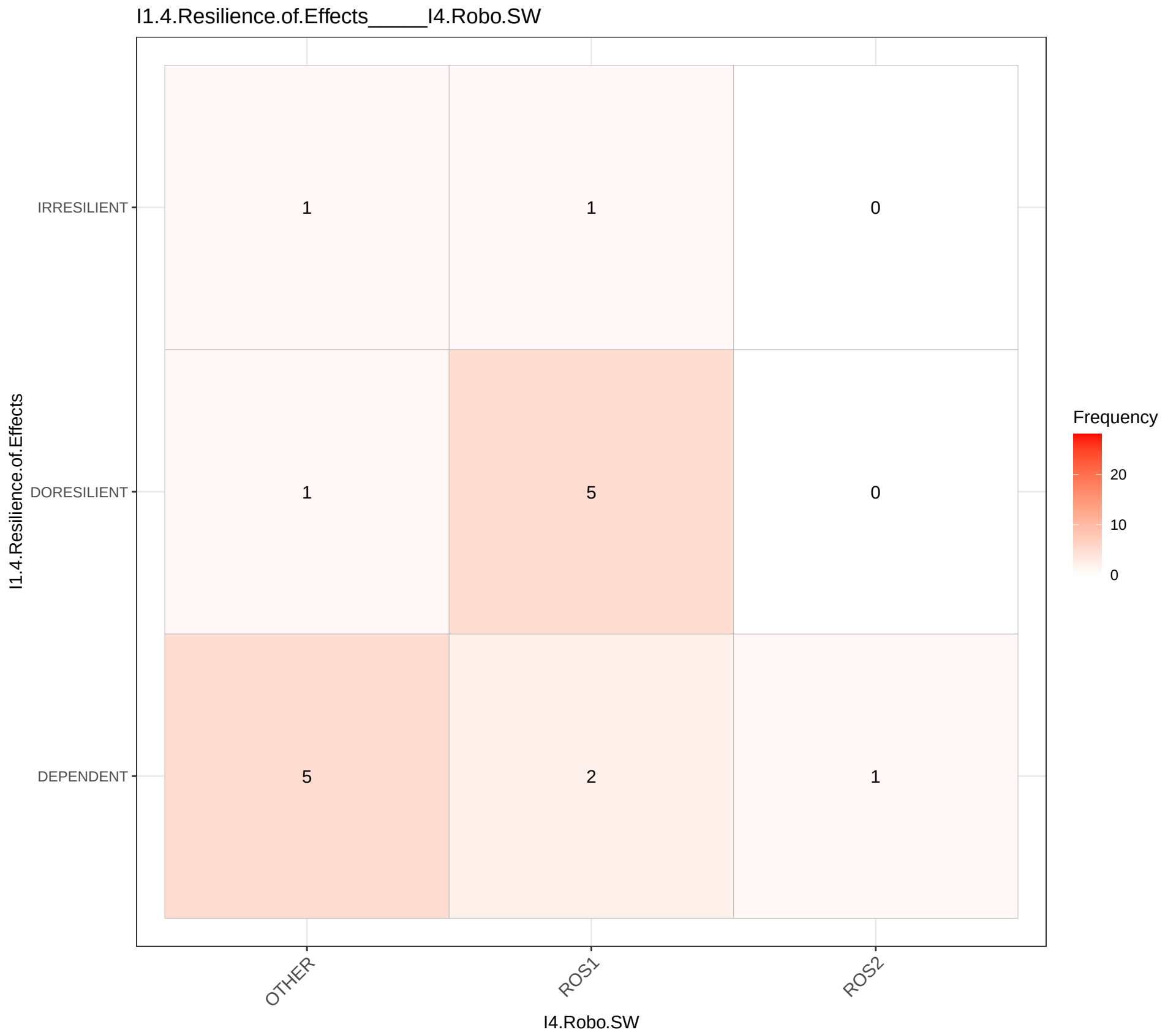
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DEPENDENT
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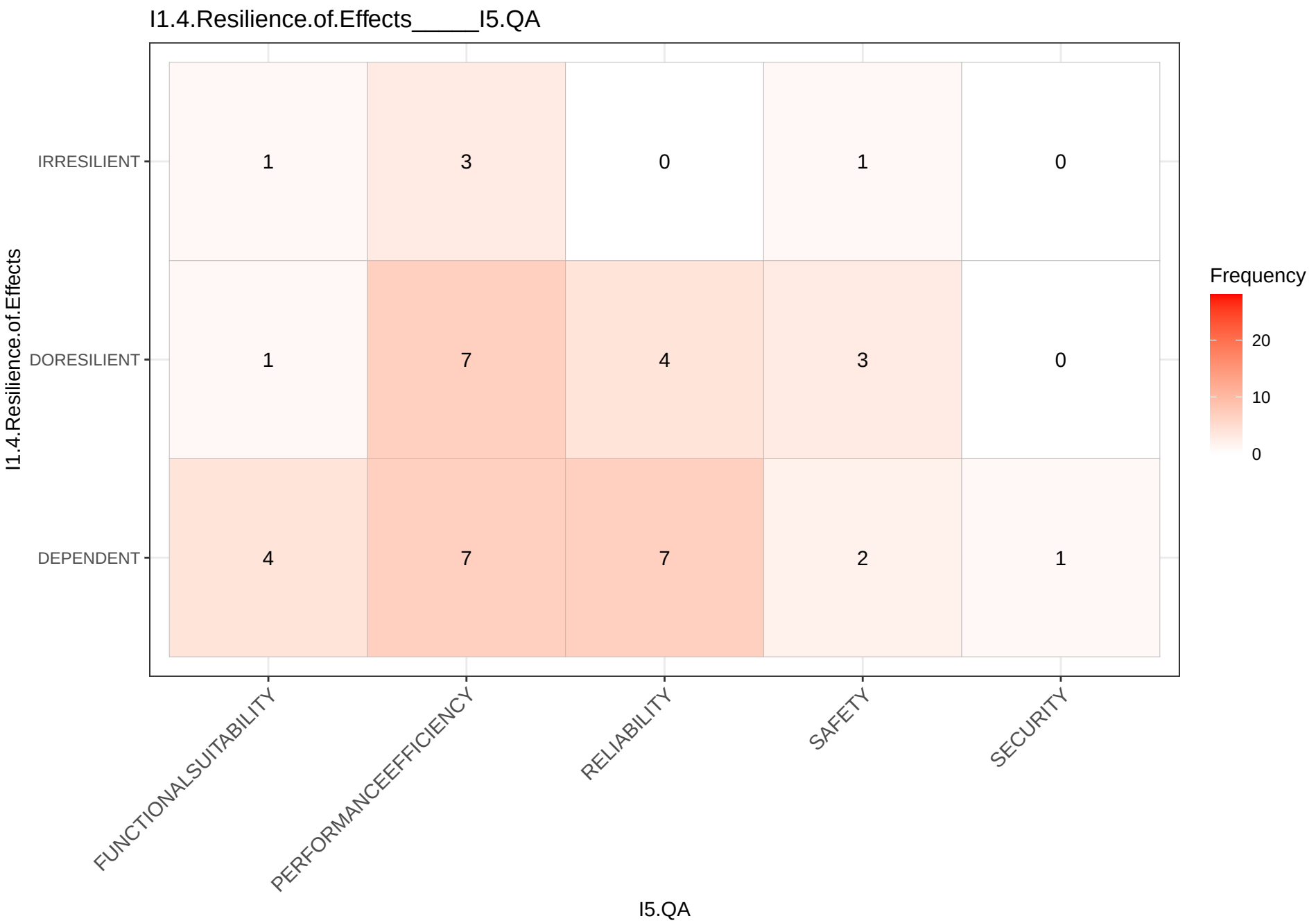
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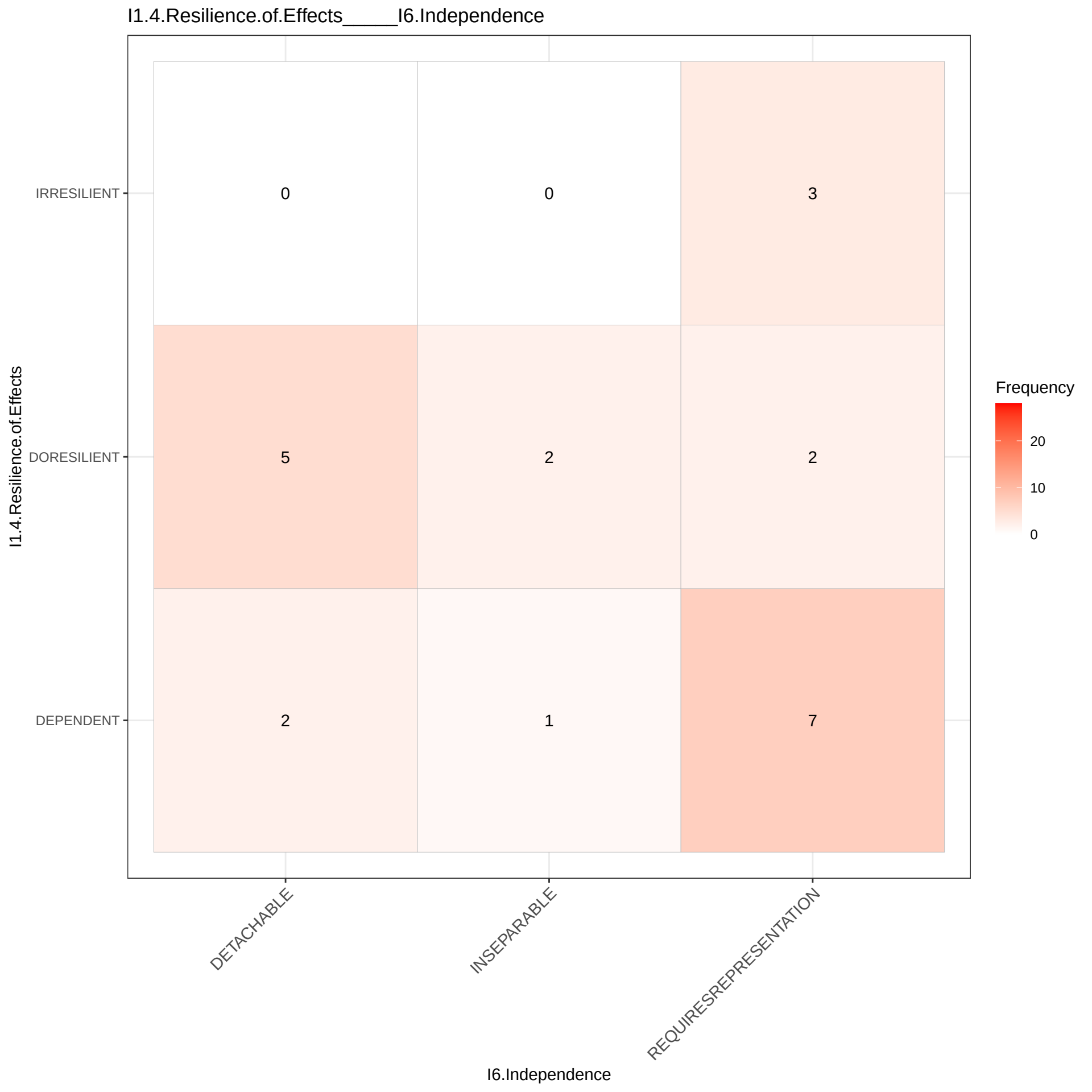
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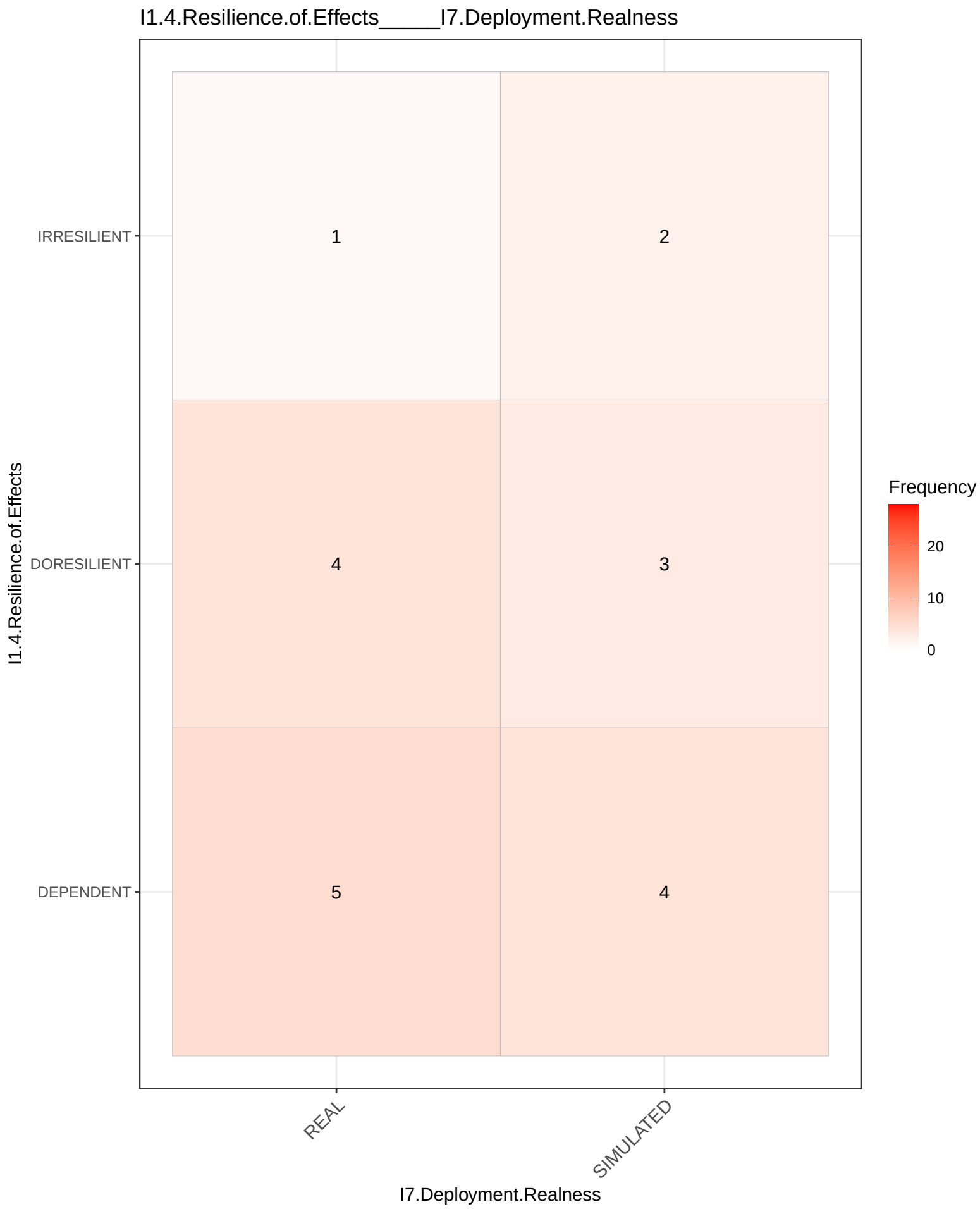
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SIMULATED
I7.Deployment.Realness
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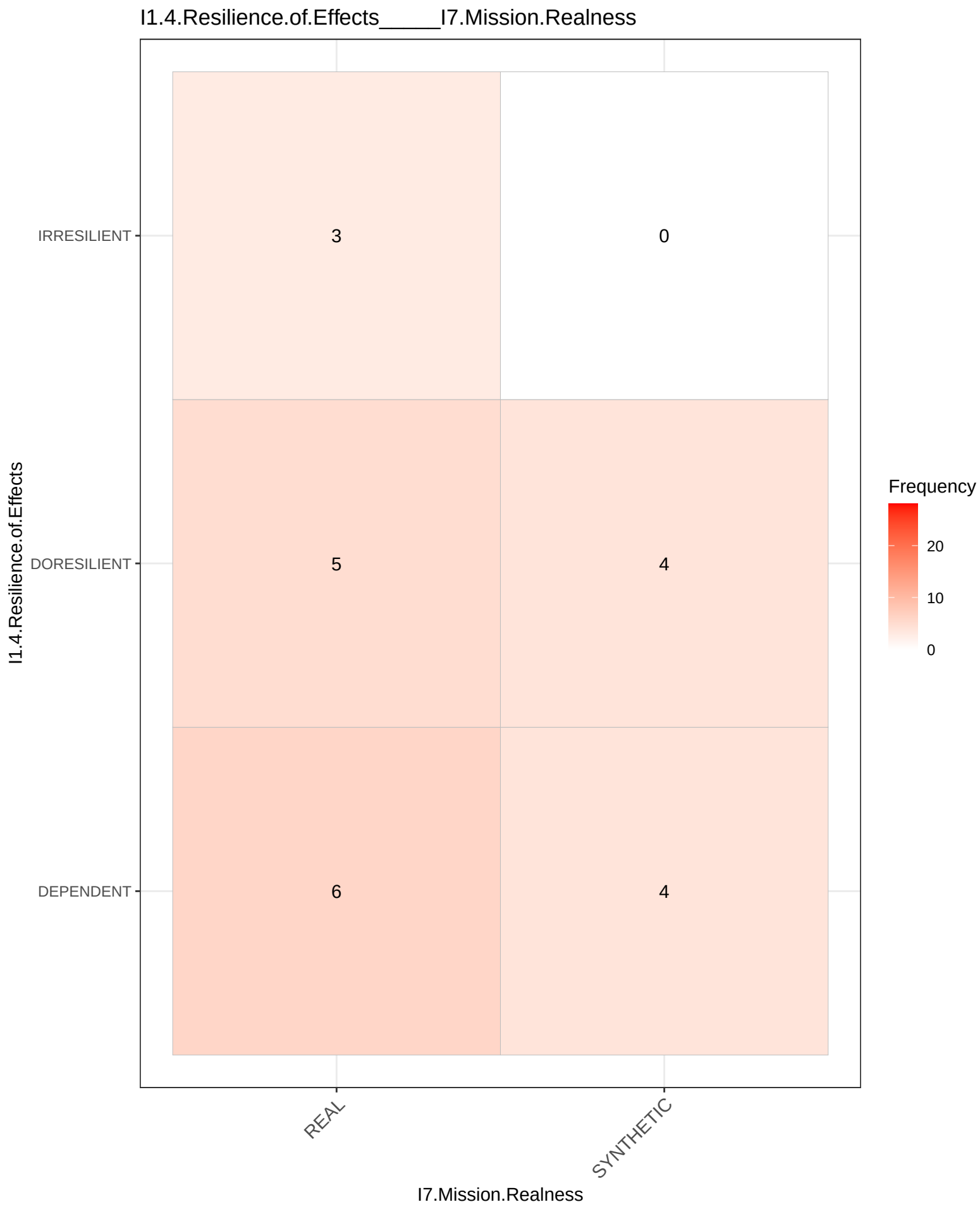
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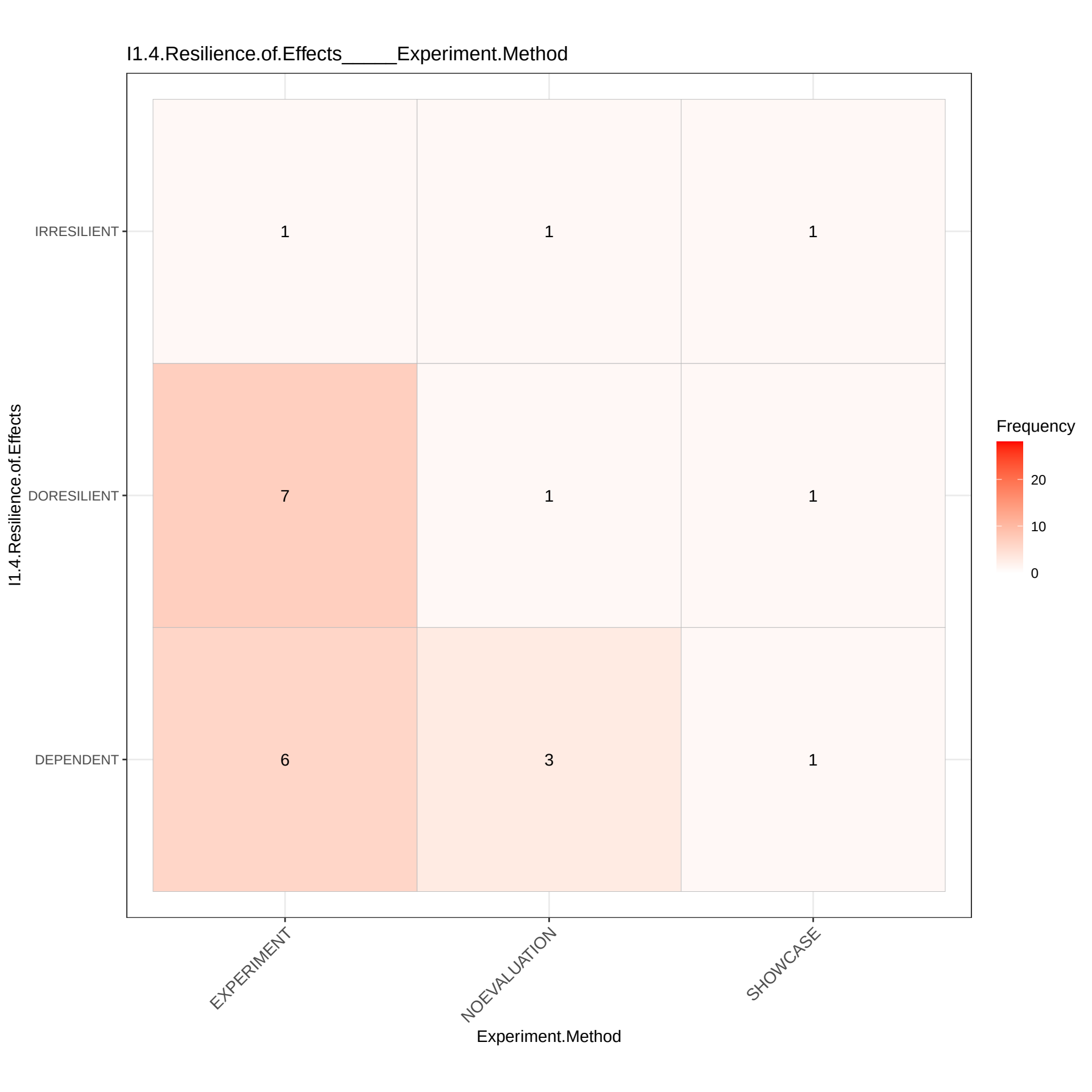
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SHOWCASE
Experiment.Method
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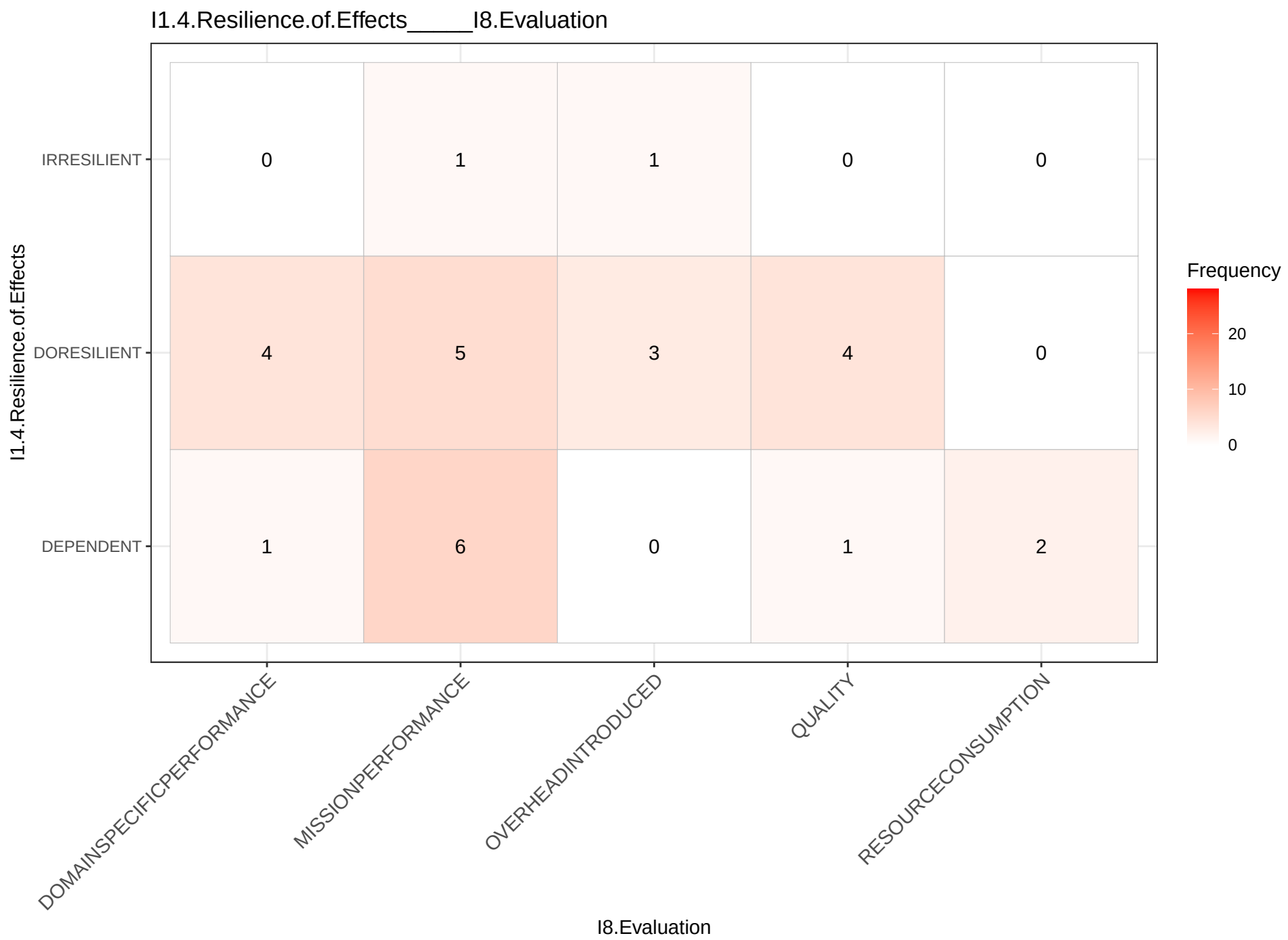
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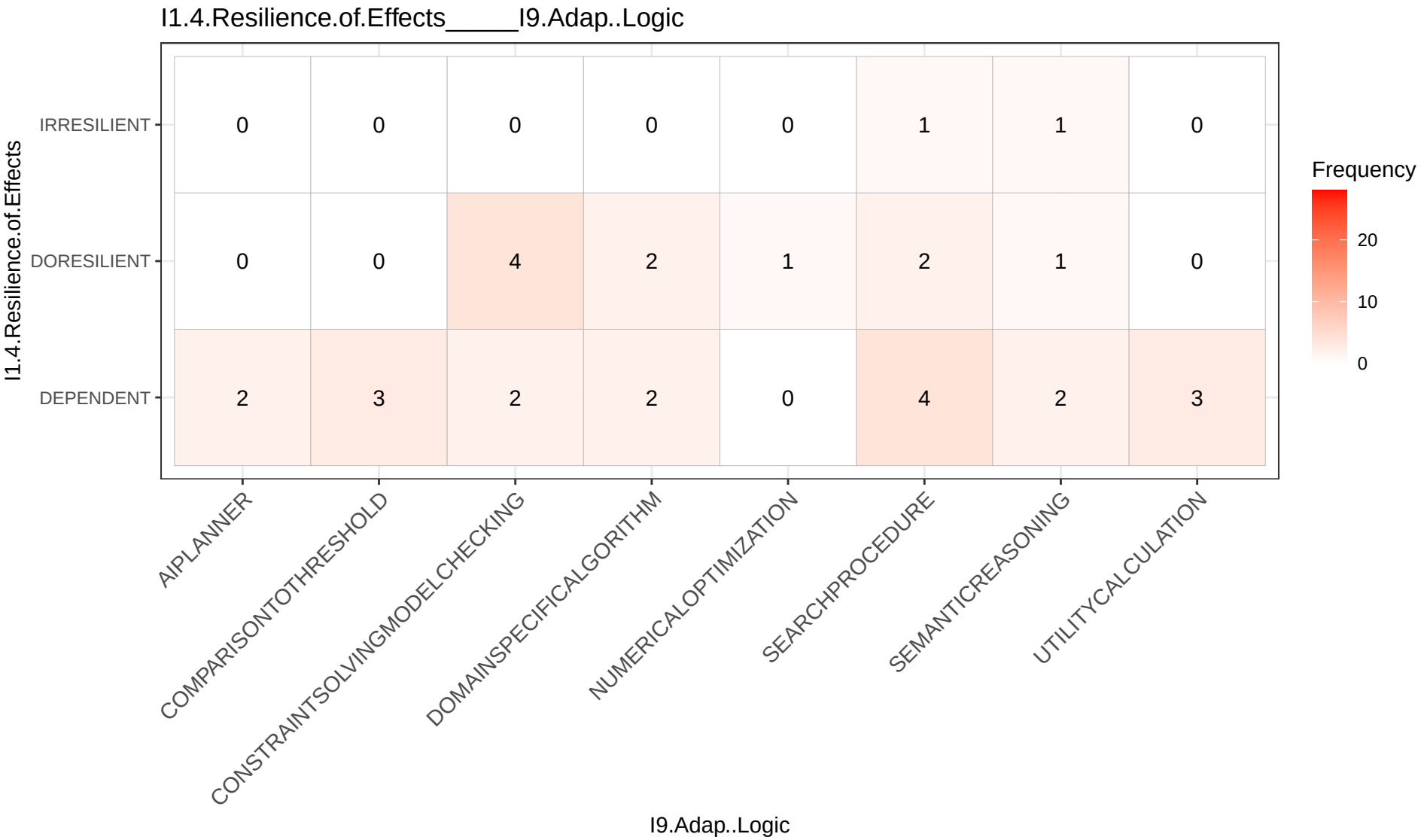
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AIPLANNER
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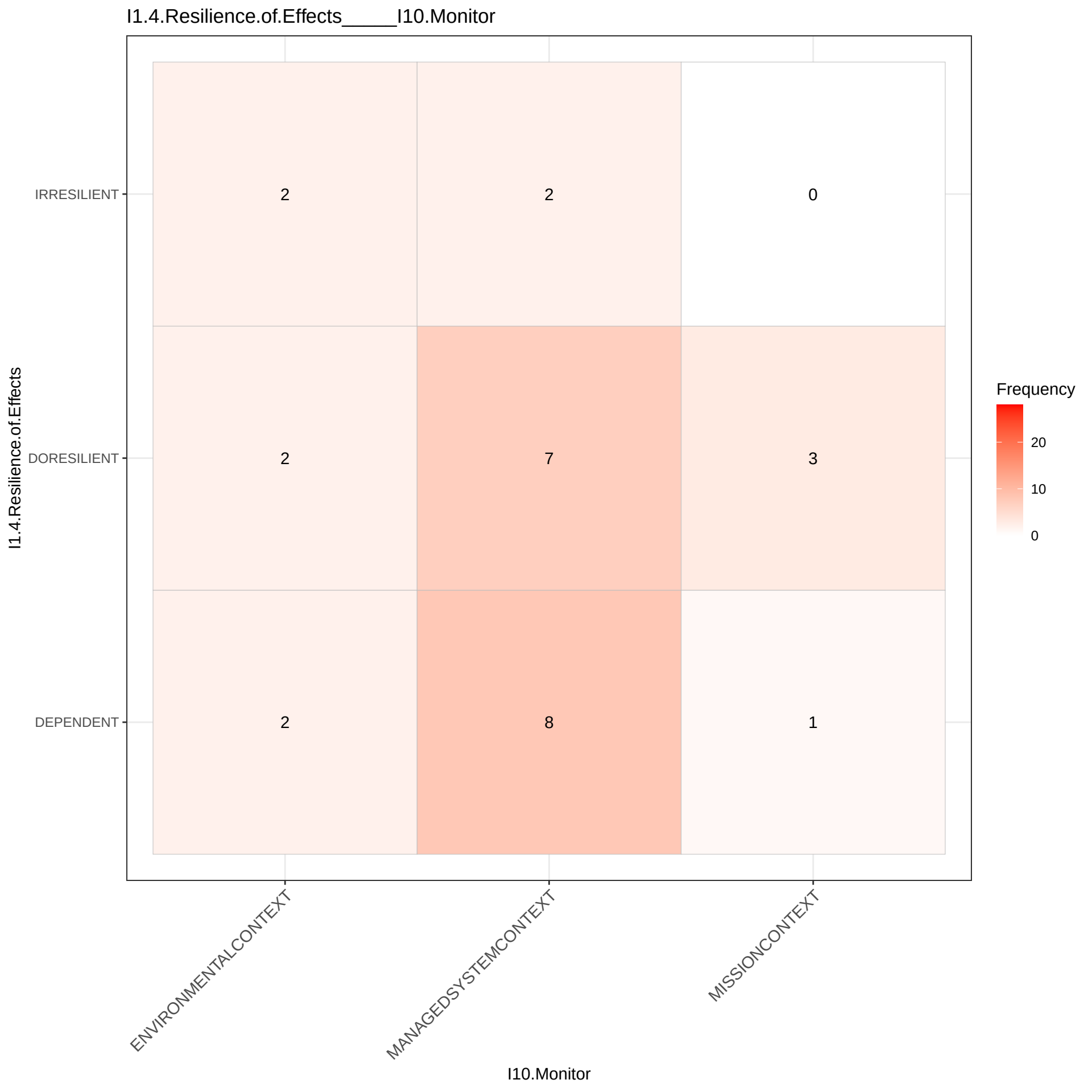
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
0


I1.4.Resilience.of.Effects_____I10.Monitor
IRRESILIENT
DORESILIENT
DEPENDENT
I1.4.Resilience.of.Effects
2
2
0
2
7
3
2
8
1
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
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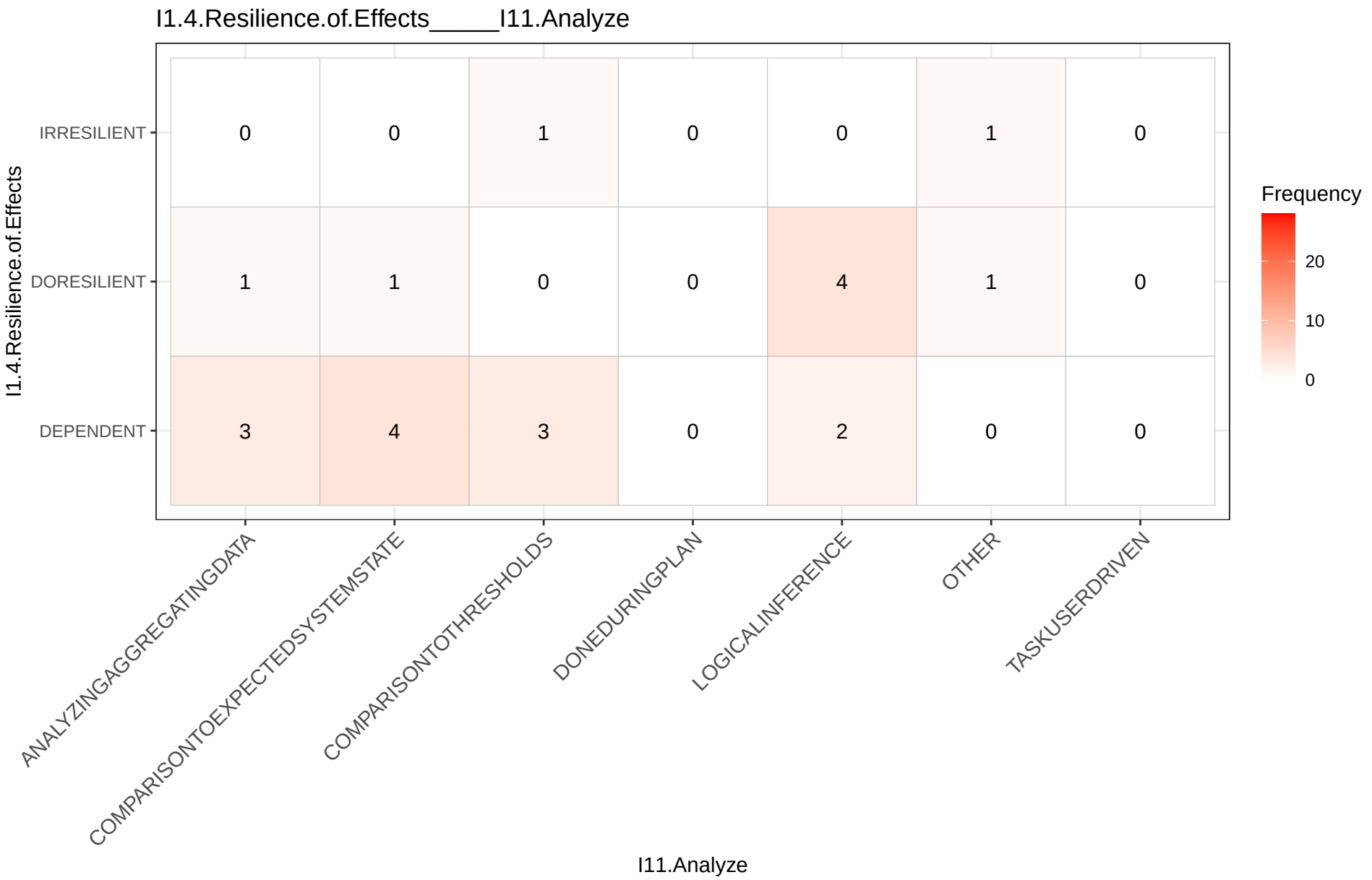
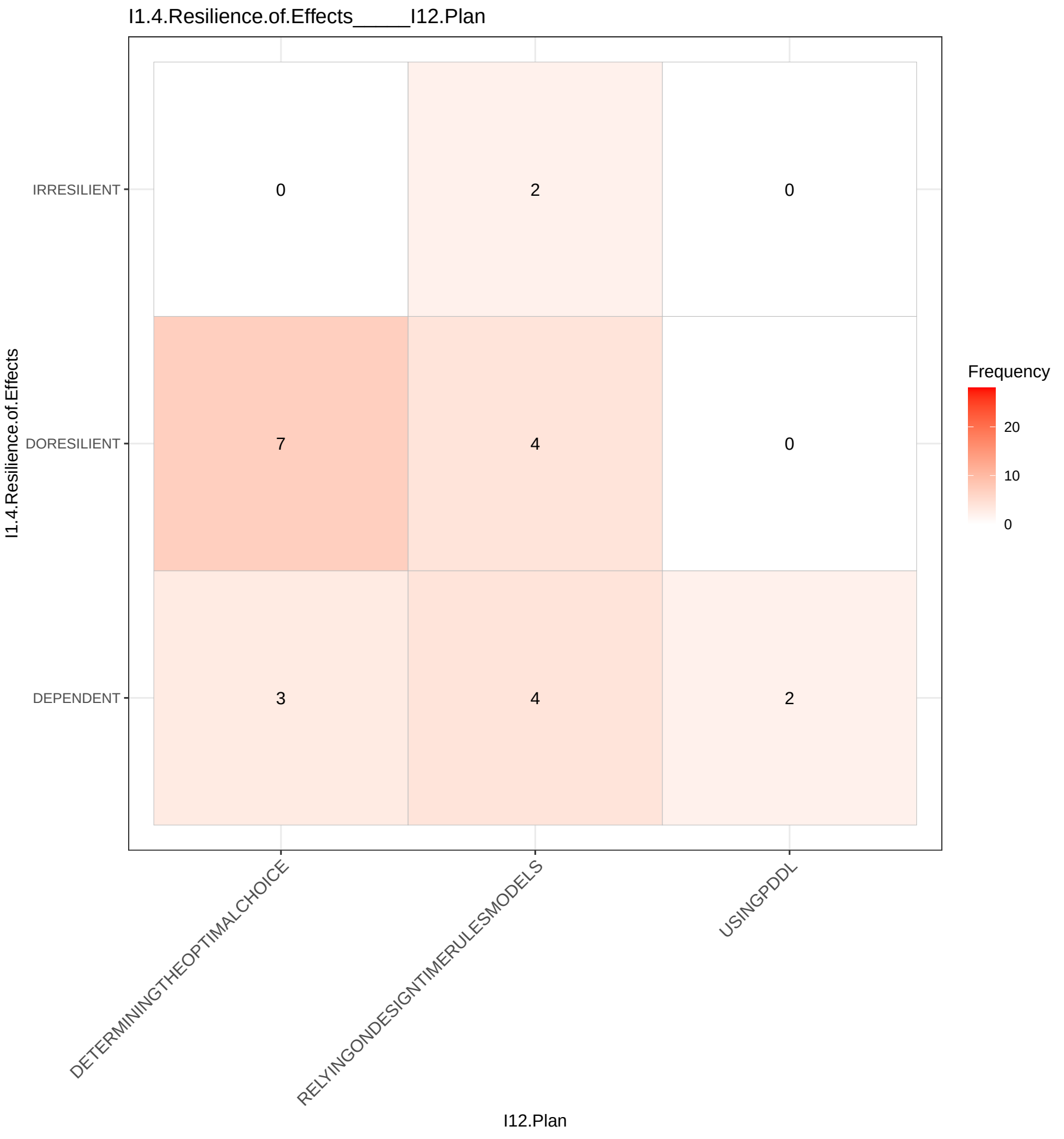
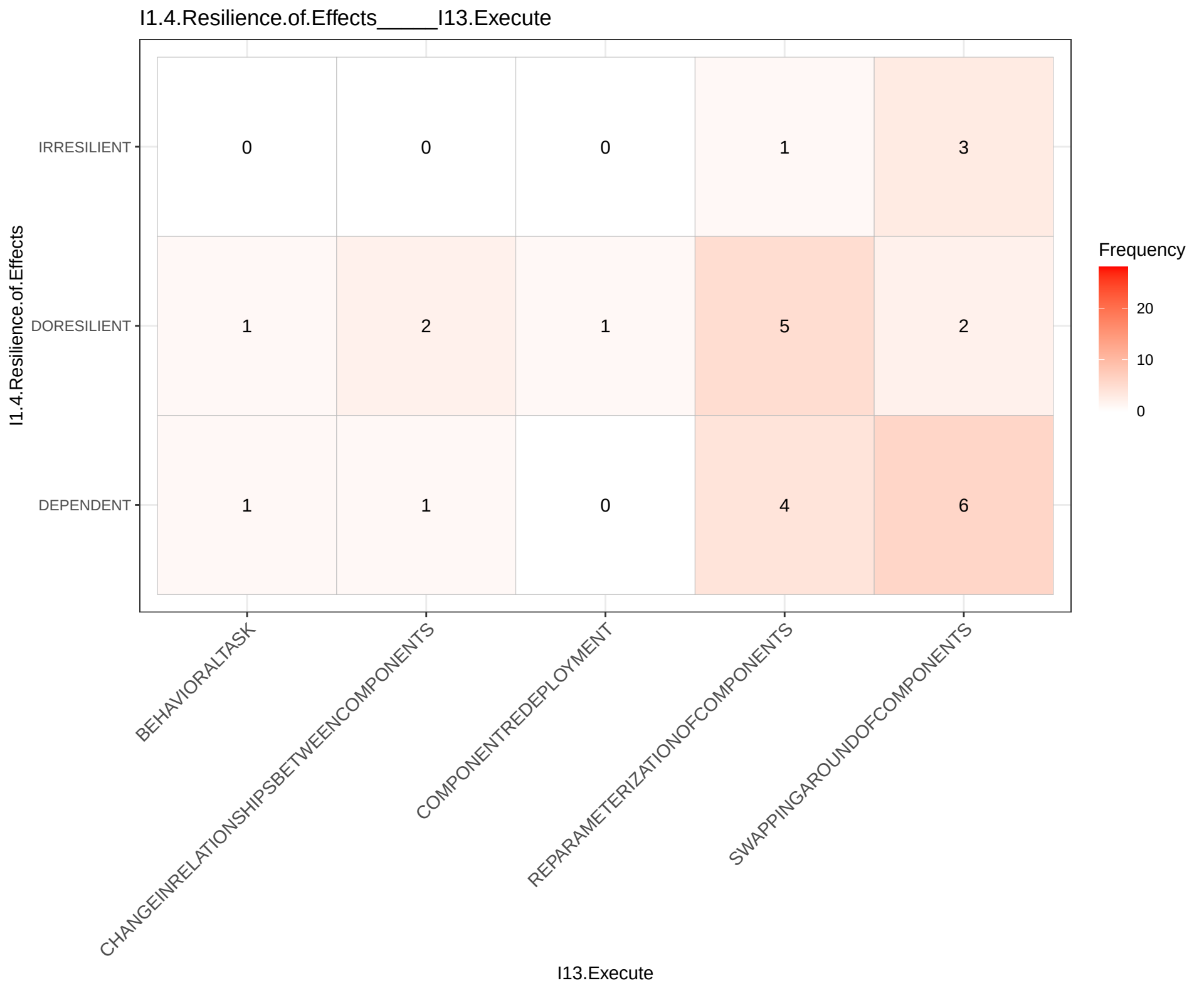

I1.4.Resilience.of.Effects_____I11.Analyze
I1.4.Resilience.of.Effects
IRRESILIENT
DORESILIENT
DEPENDENT
0 0 1 0 0 1 0
1 1 0 0 4 1 0
3 4 3 0 2 0 0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
0


I1.4.Resilience.of.Effects_____I12.Plan
IRRESILIENT
DORESILIENT
DEPENDENT
0
2
0
7
4
0
3
4
2
I1.4.Resilience.of.Effects
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0


I1.4.Resilience.of.Effects_____I13.Execute
IRRESILIENT
DORESILIENT
DEPENDENT
0
0
0
1
3
1
2
1
5
2
1
1
0
4
6
I1.4.Resilience.of.Effects
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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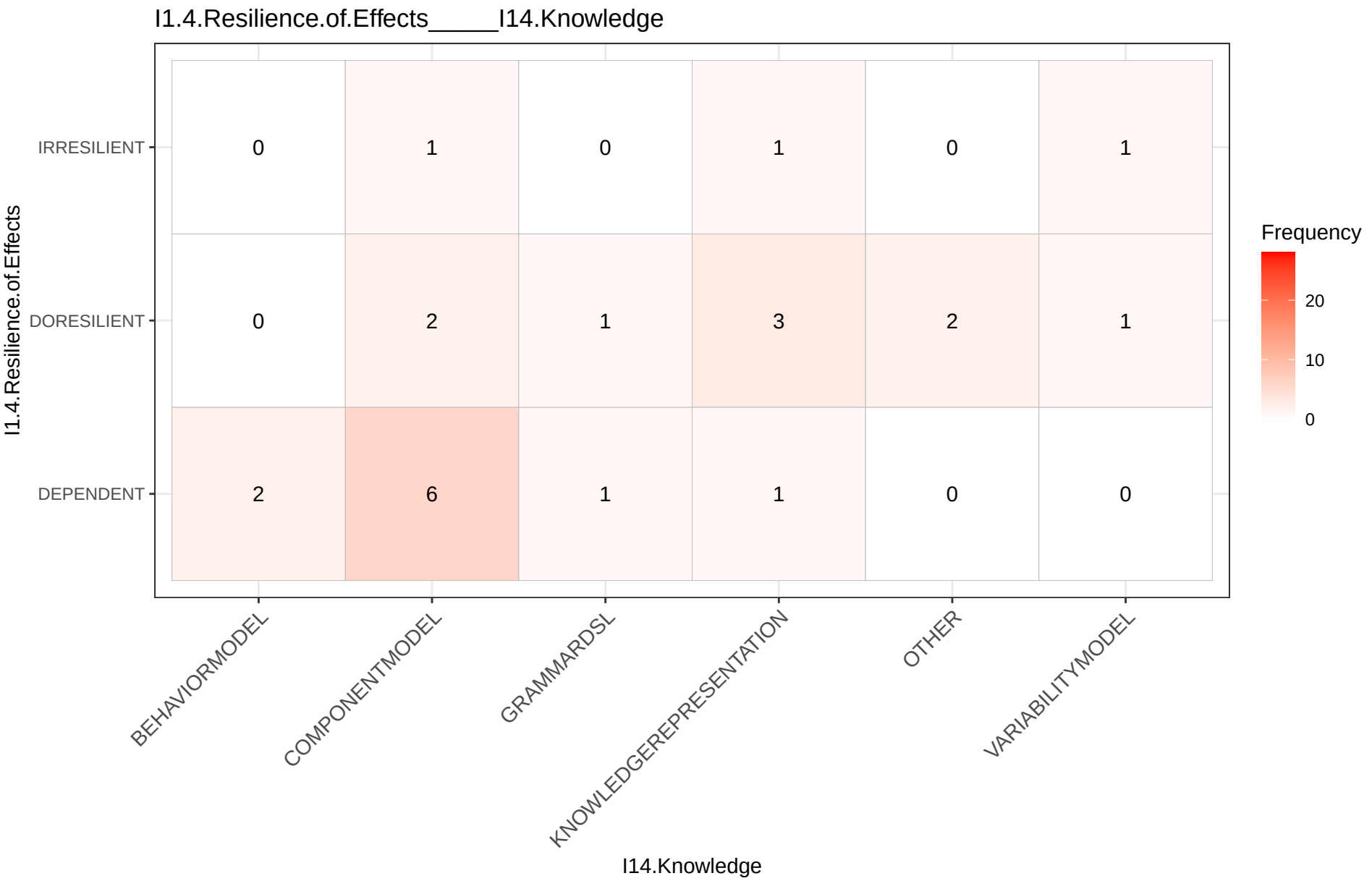
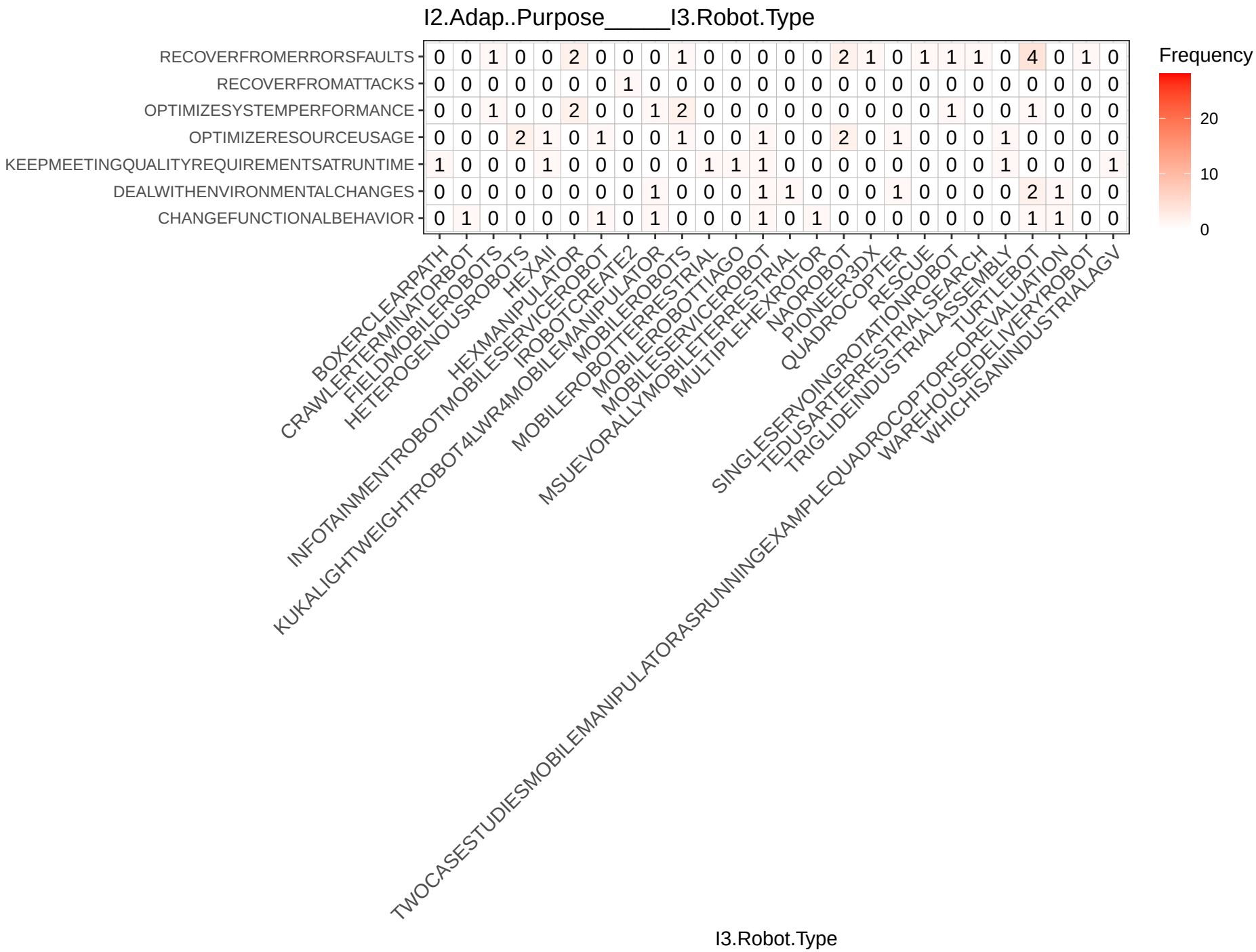
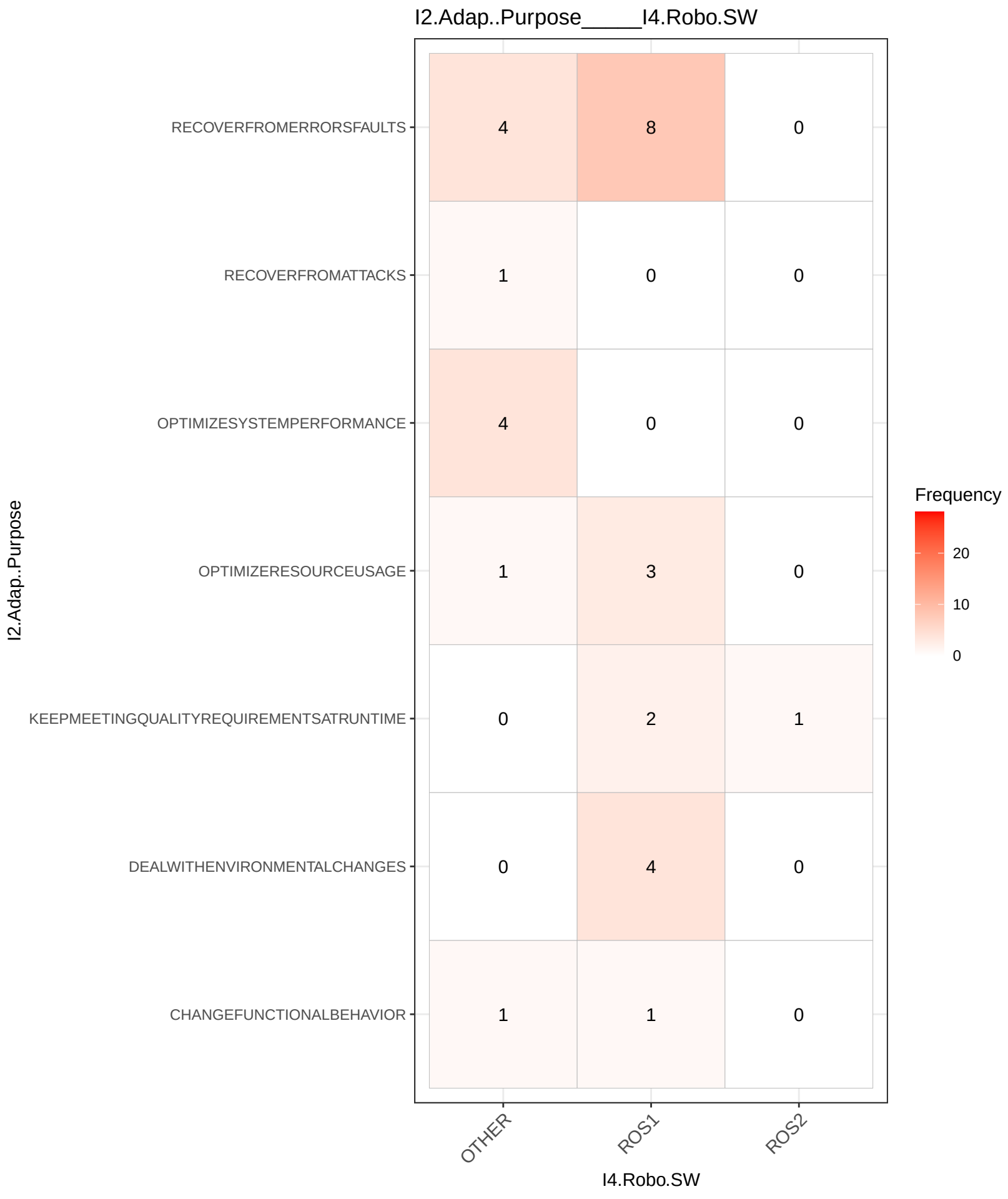
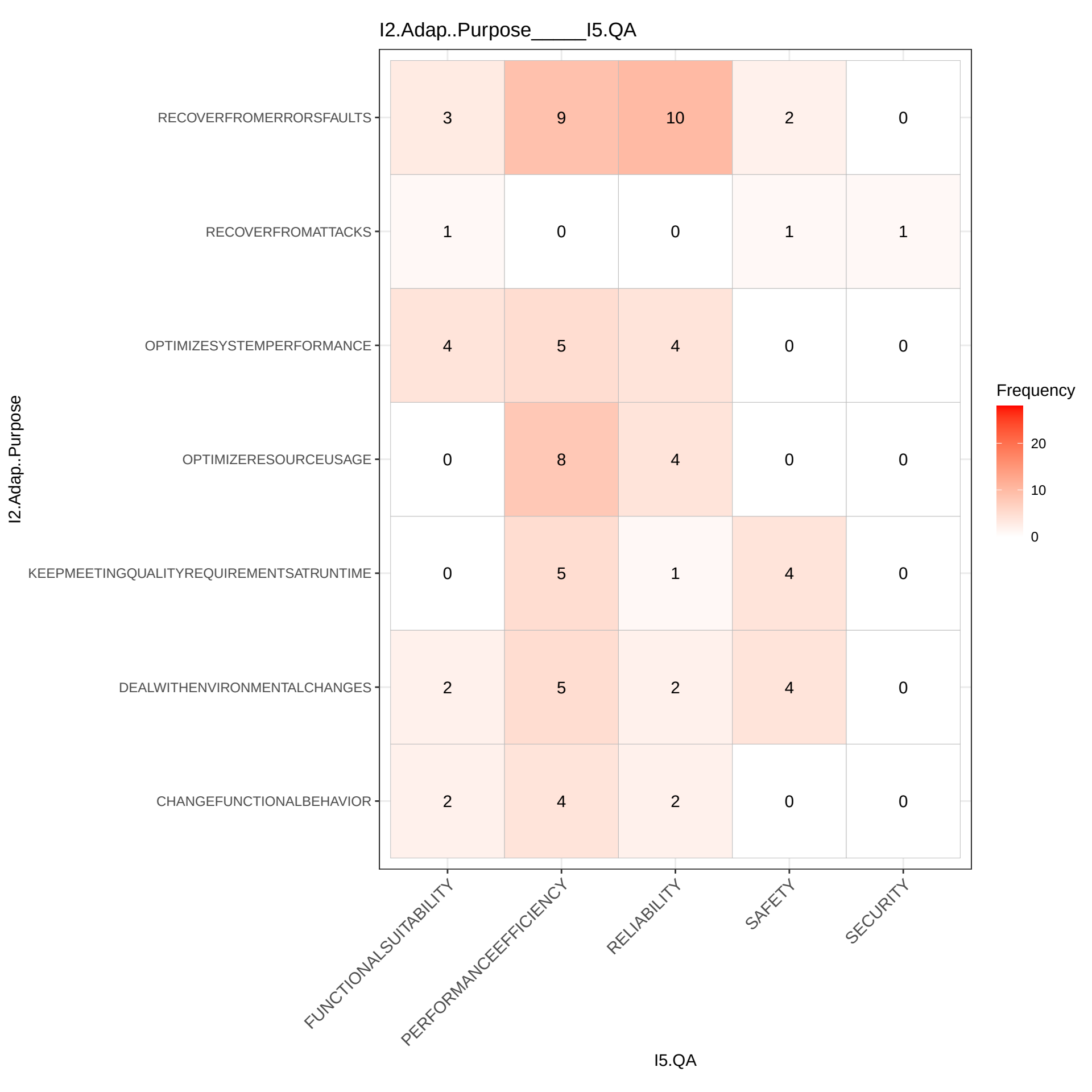
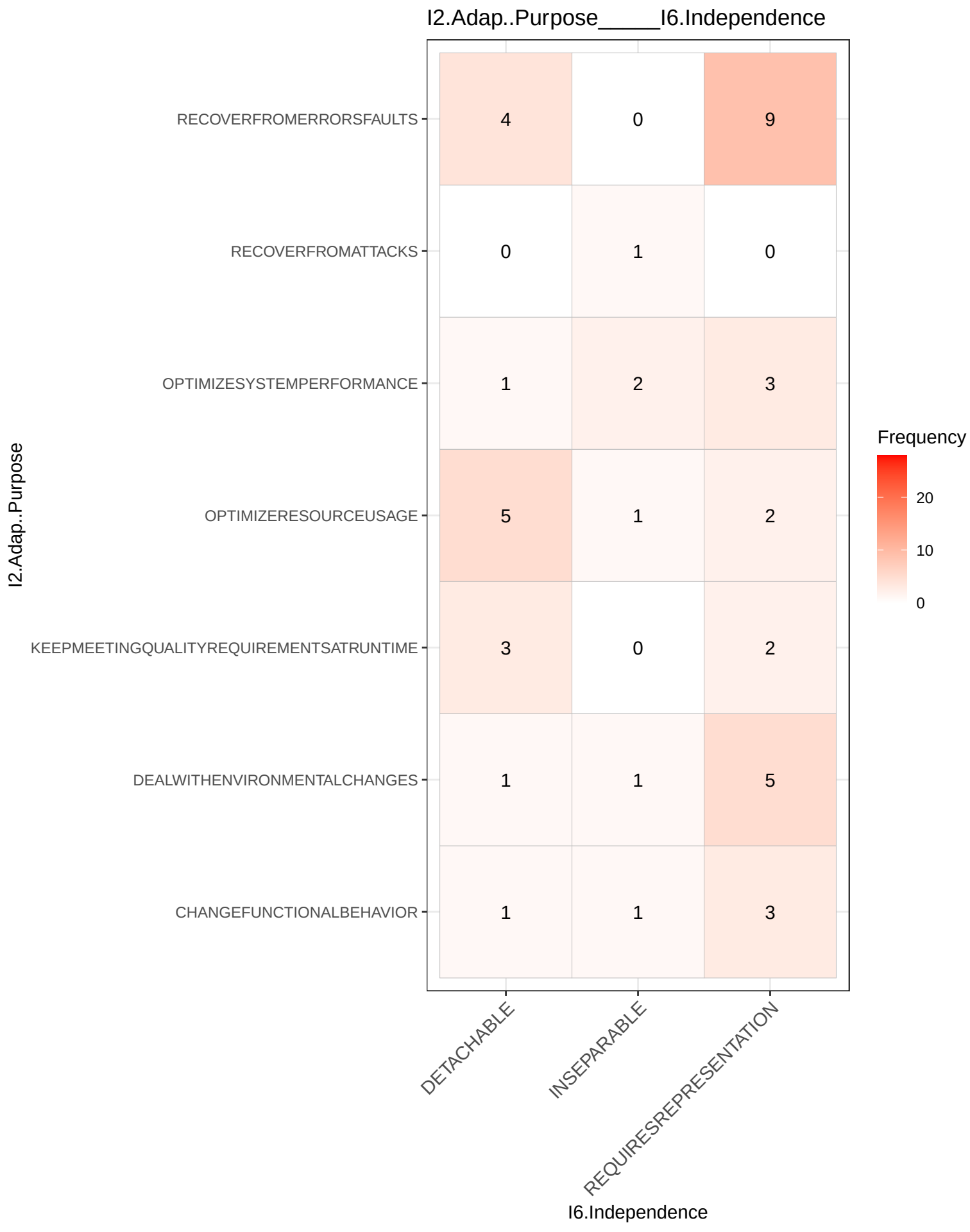
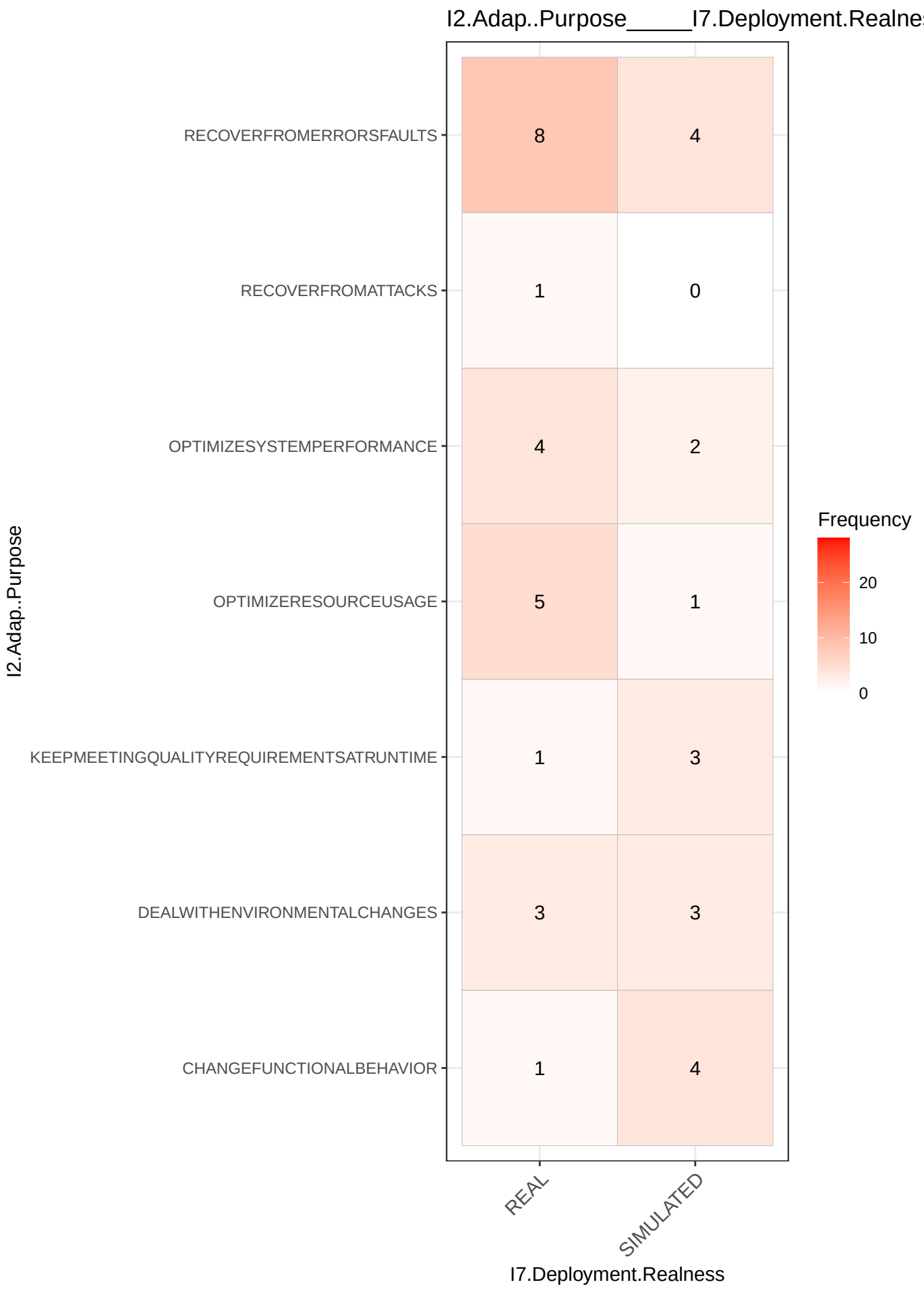

I1.4.Resilience.of.Effects_____I14.Knowledge
IRRESILIENT
DORESILIENT
DEPENDENT
I1.4.Resilience.of.Effects
0
1
0
1
0
1
0
2
1
3
2
1
2
6
1
1
0
0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

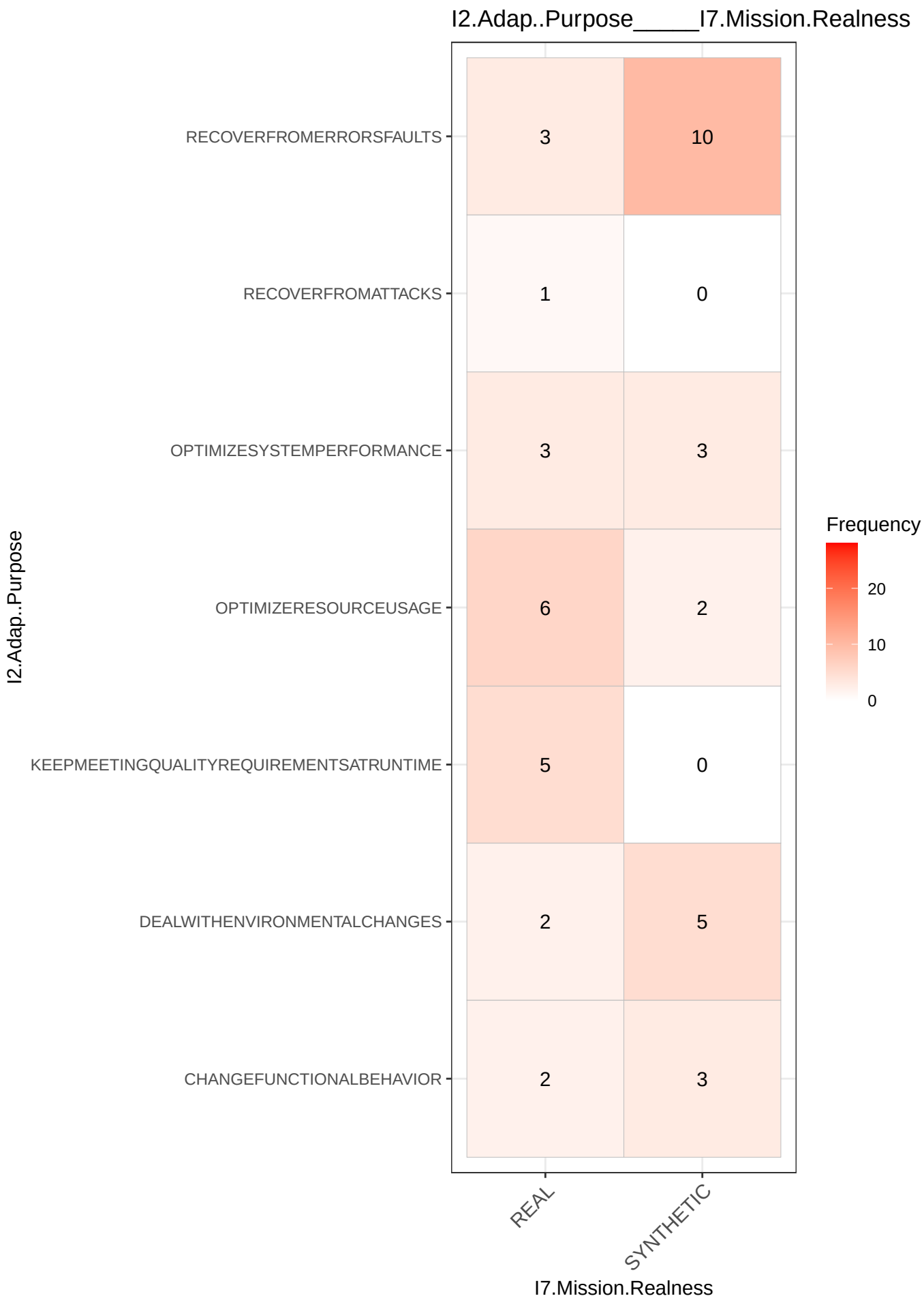

I2.Adap..Purpose_____I3.Robot.Type
I2.Adap..Purpose
RECOVERFROMERRORSFAULTS 0 0 1 0 0 2 0 0 0 1 0 0 0 0 0 2 1 0 1 1 1 0 4 0 1 0
RECOVERFROMATTACKS 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
OPTIMIZESYSTEMPERFORMANCE 0 0 1 0 0 2 0 0 1 2 0 0 0 0 0 0 0 0 0 1 0 0 1 0 0 0
OPTIMIZERESOURCEUSAGE 0 0 0 2 1 0 1 0 0 1 0 0 1 0 0 2 0 1 0 0 0 1 0 0 0 0
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME 1 0 0 0 1 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 1 0 0 0 1
DEALWITHENVIRONMENTALCHANGES 0 0 0 0 0 0 0 0 1 0 0 0 1 1 0 0 0 1 0 0 0 0 2 1 0 0
CHANGEFUNCTIONALBEHAVIOR 0 1 0 0 0 0 1 0 1 0 0 0 1 0 1 0 0 0 0 0 0 0 1 1 0 0
BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOTS
HETEROGENOUSROBOTS
HEXAII
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTS
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVOINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
I3.Robot.Type
Frequency
20
10
0

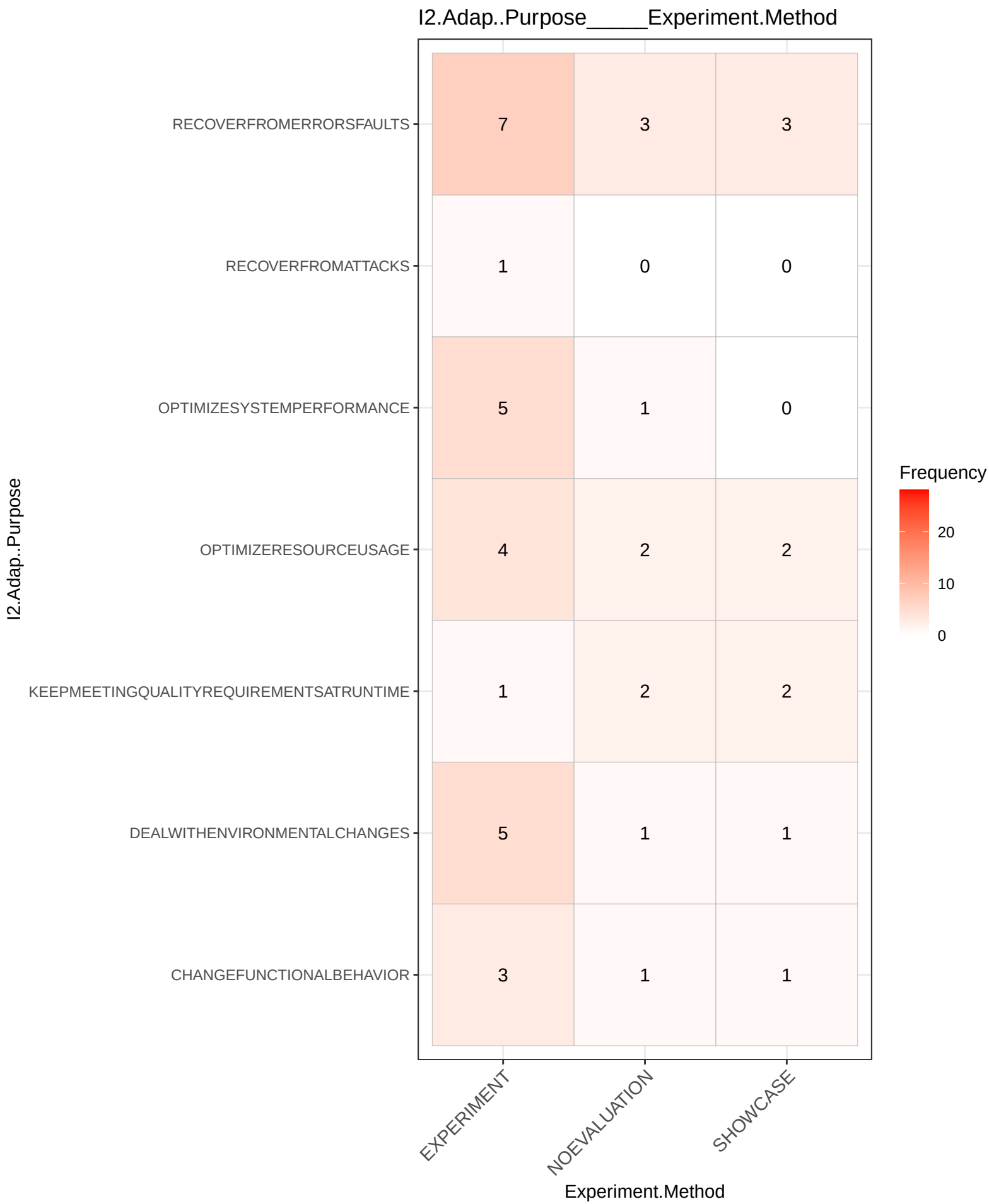

I2.Adap..Purpose_____I4.Robo.SW
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
I2.Adap..Purpose
4 8 0
1 0 0
4 0 0
1 3 0
0 2 1
0 4 0
1 1 0
OTHER
ROS1
ROS2
I4.Robo.SW
Frequency
20
10
0

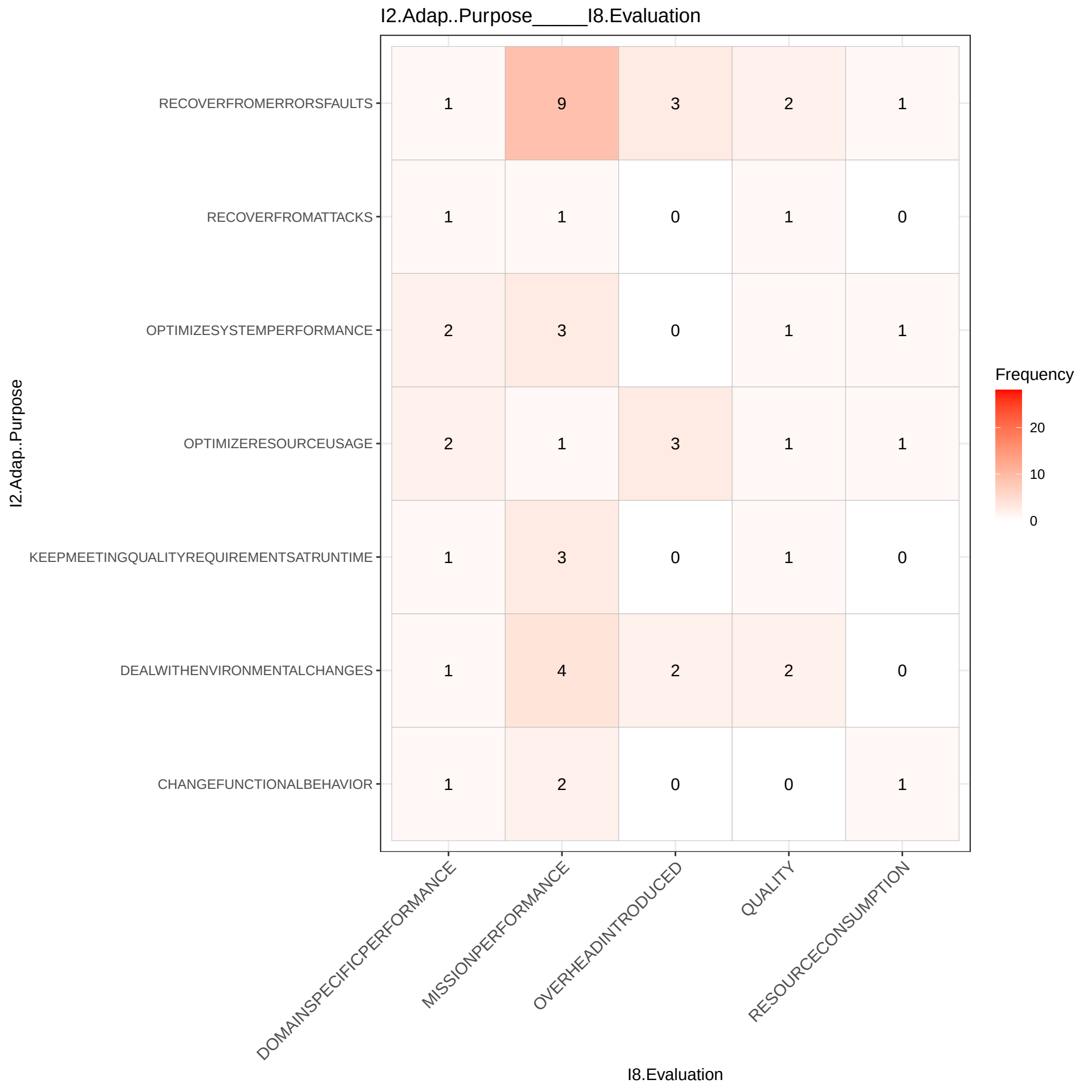

I2.Adap..Purpose_____I5.QA
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
3 9 10 2 0
1 0 0 1 1
4 5 4 0 0
0 8 4 0 0
0 5 1 4 0
2 5 2 4 0
2 4 2 0 0
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
I2.Adap..Purpose
Frequency
20
10
0

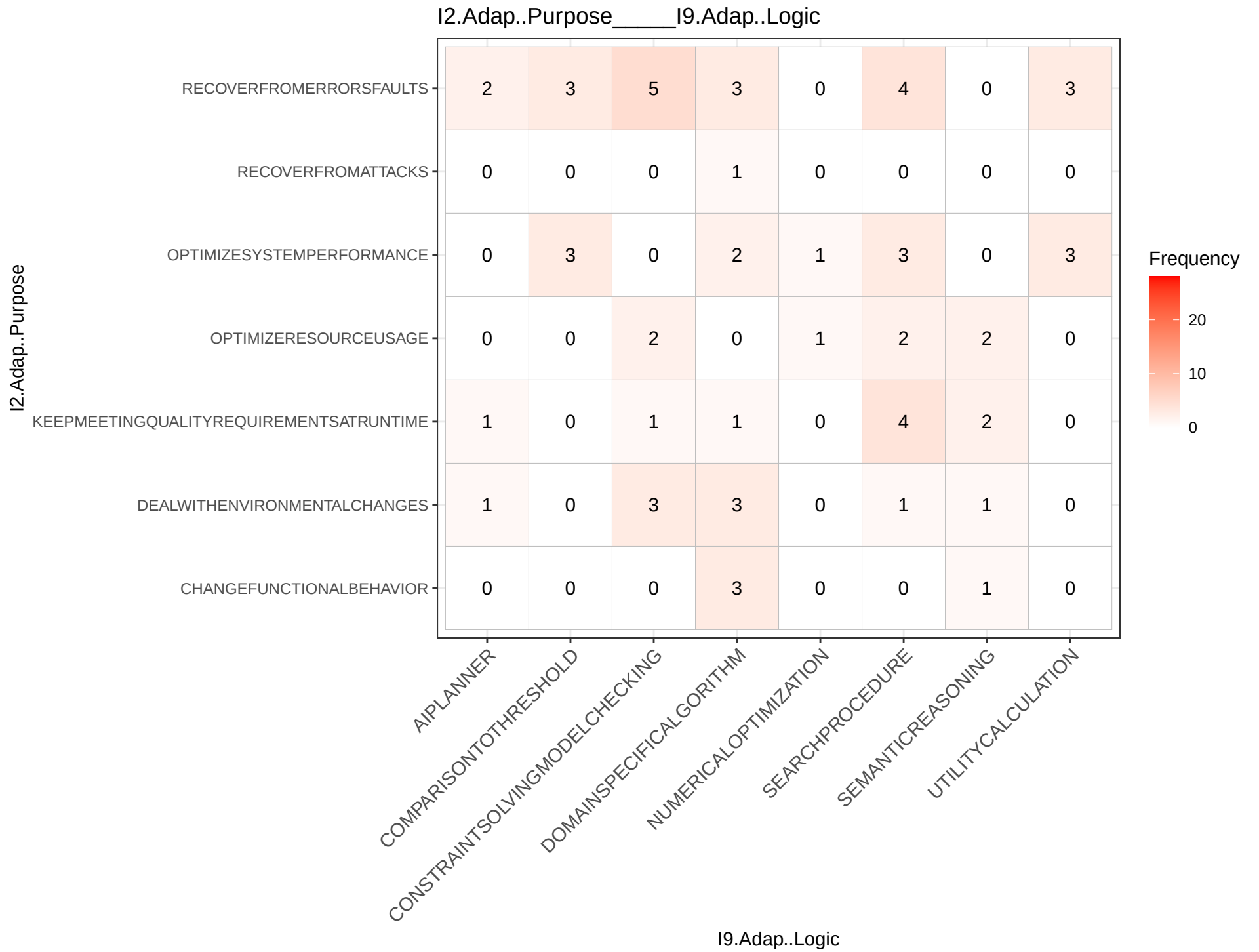

I2.Adap..Purpose_____I6.Independence
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
I2.Adap..Purpose
4 0 9
0 1 0
1 2 3
5 1 2
3 0 2
1 1 5
1 1 3
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0

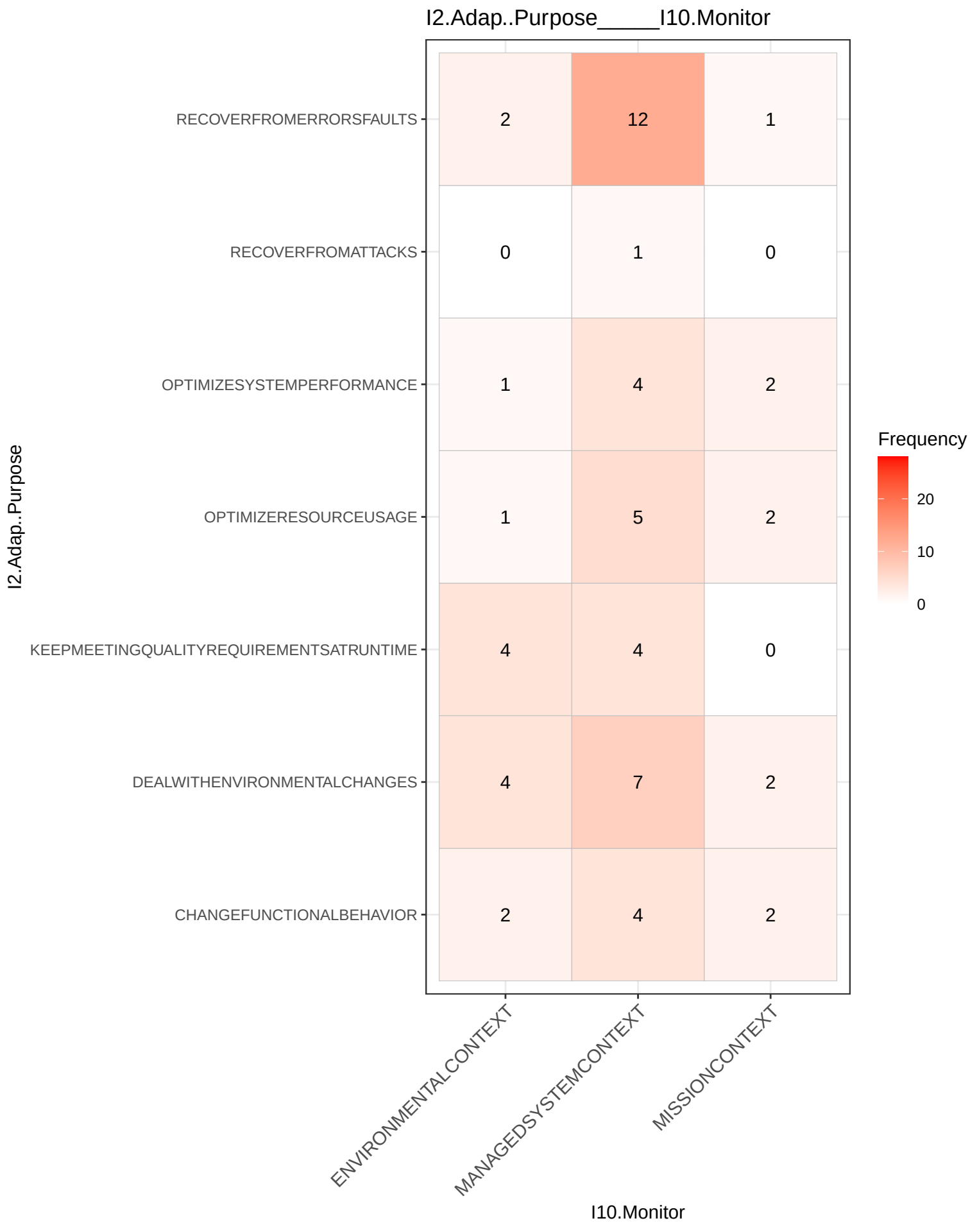

I2.Adap..Purpose_____I7.Deployment.Realness
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
I2.Adap..Purpose
8
4
1
0
4
2
5
1
1
3
3
3
1
4
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0

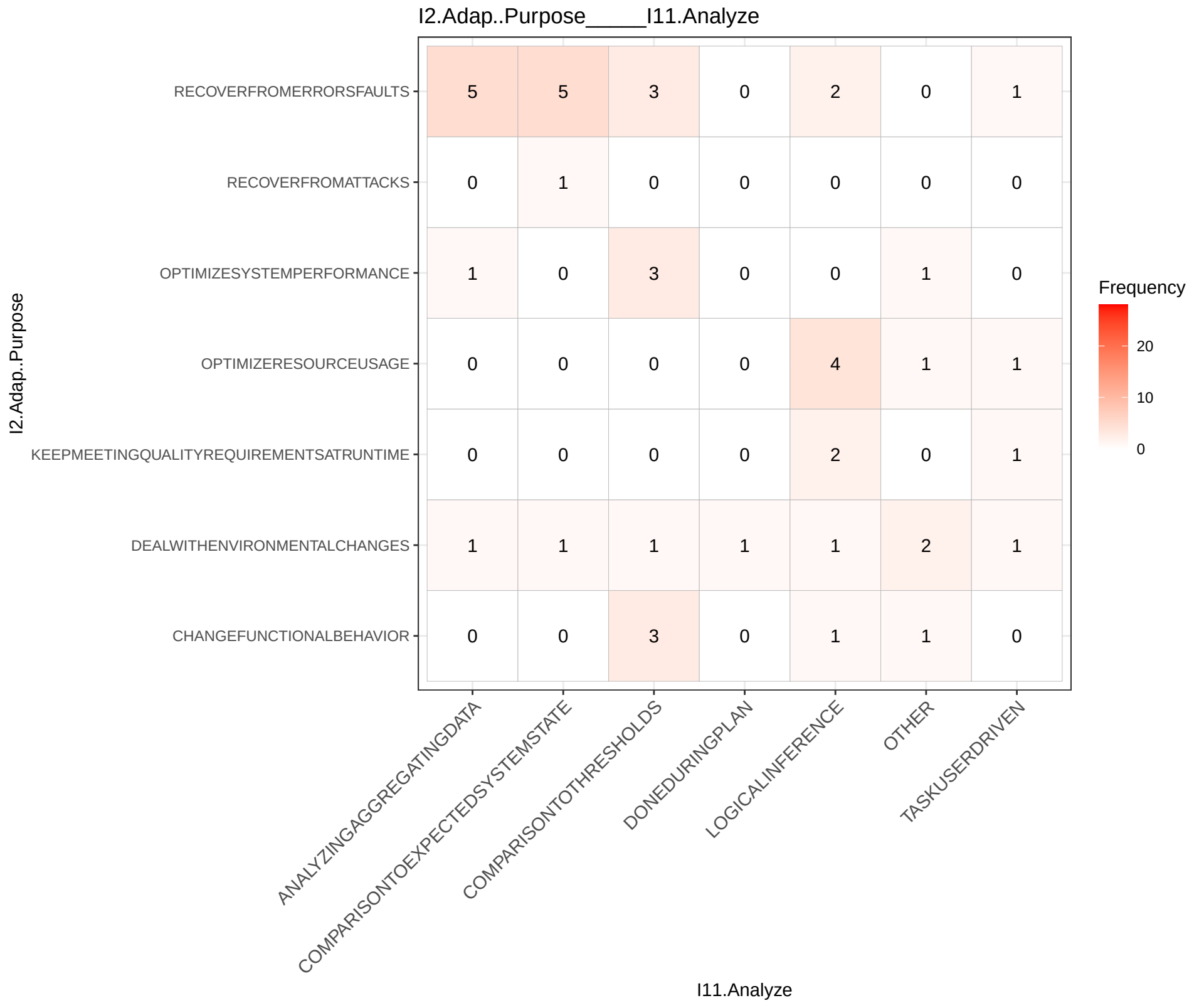

I2.Adap..Purpose_____I7.Mission.Realness
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
3
10
1
0
3
3
6
2
5
0
2
5
2
3
REAL
SYNTHETIC
I7.Mission.Realness
I2.Adap..Purpose
Frequency
20
10
0

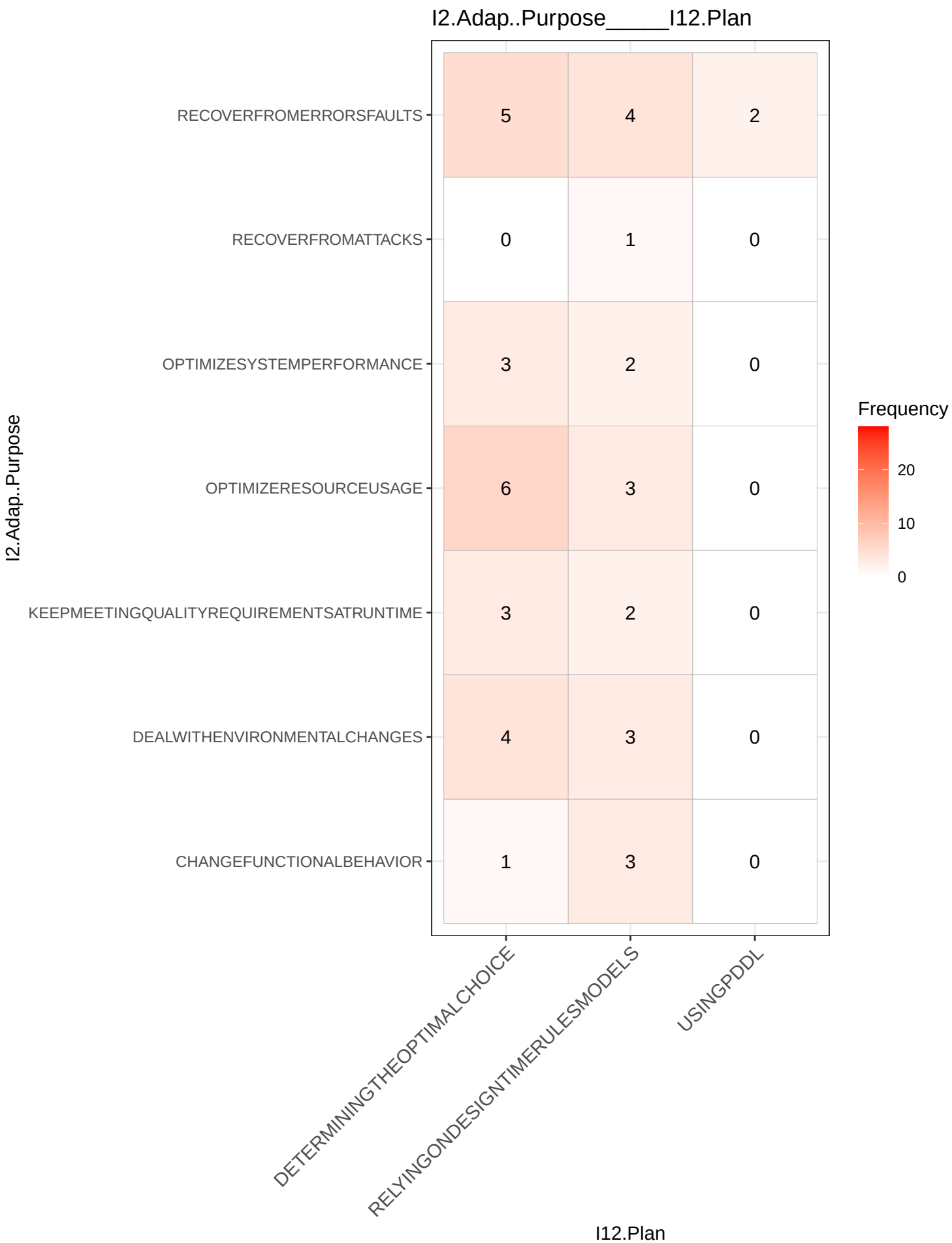

I2.Adap..Purpose_____Experiment.Method
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
7
3
3
1
0
0
5
1
0
4
2
2
1
2
2
5
1
1
3
1
1
EXPERIMENT
NOEVALUATION
SHOWCASE
I2.Adap..Purpose
Experiment.Method
Frequency
20
10
0

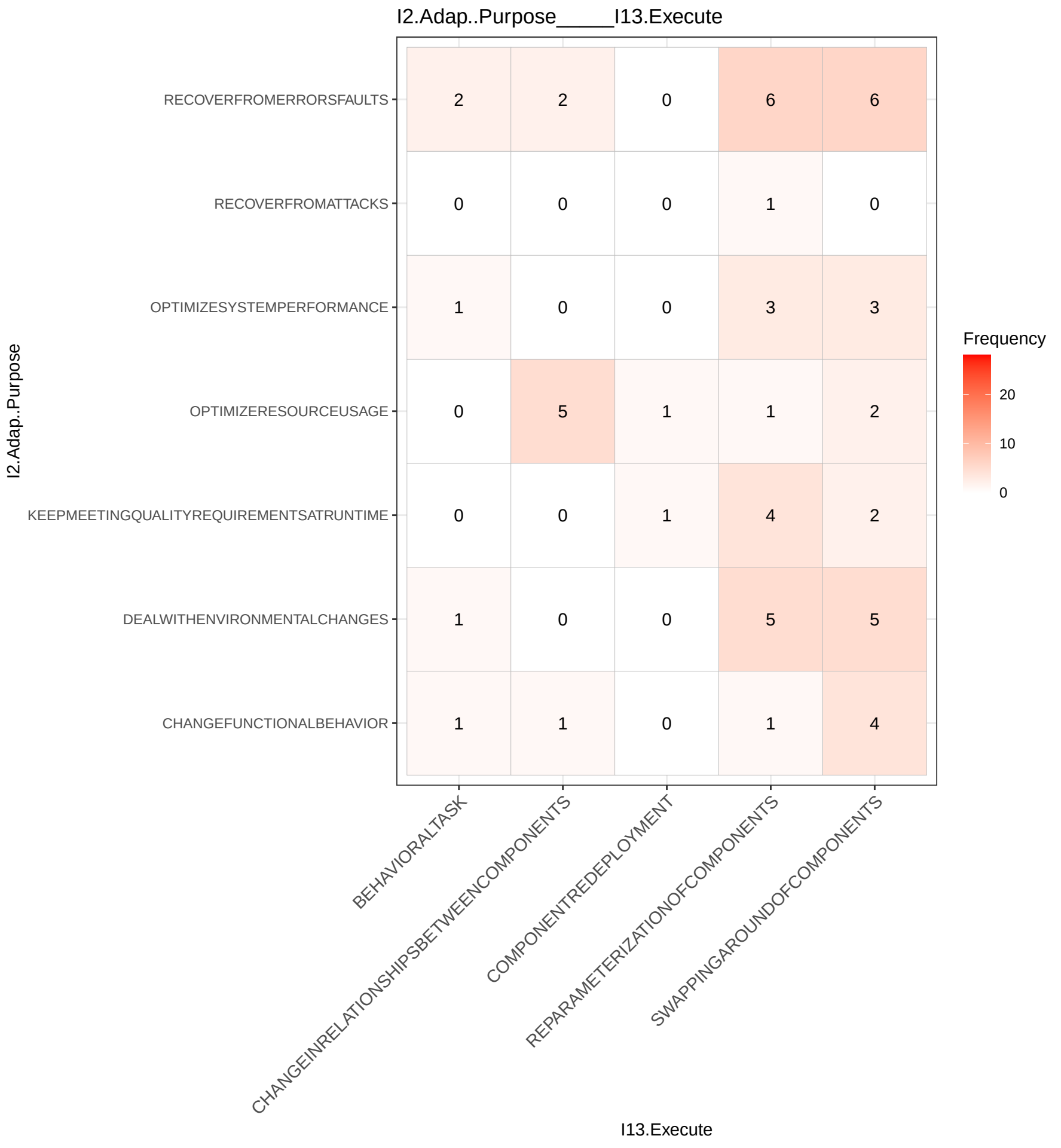

I2.Adap..Purpose_____I8.Evaluation
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
1 9 3 2 1
1 1 0 1 0
2 3 0 1 1
2 1 3 1 1
1 3 0 1 0
1 4 2 2 0
1 2 0 0 1
I2.Adap..Purpose
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
0

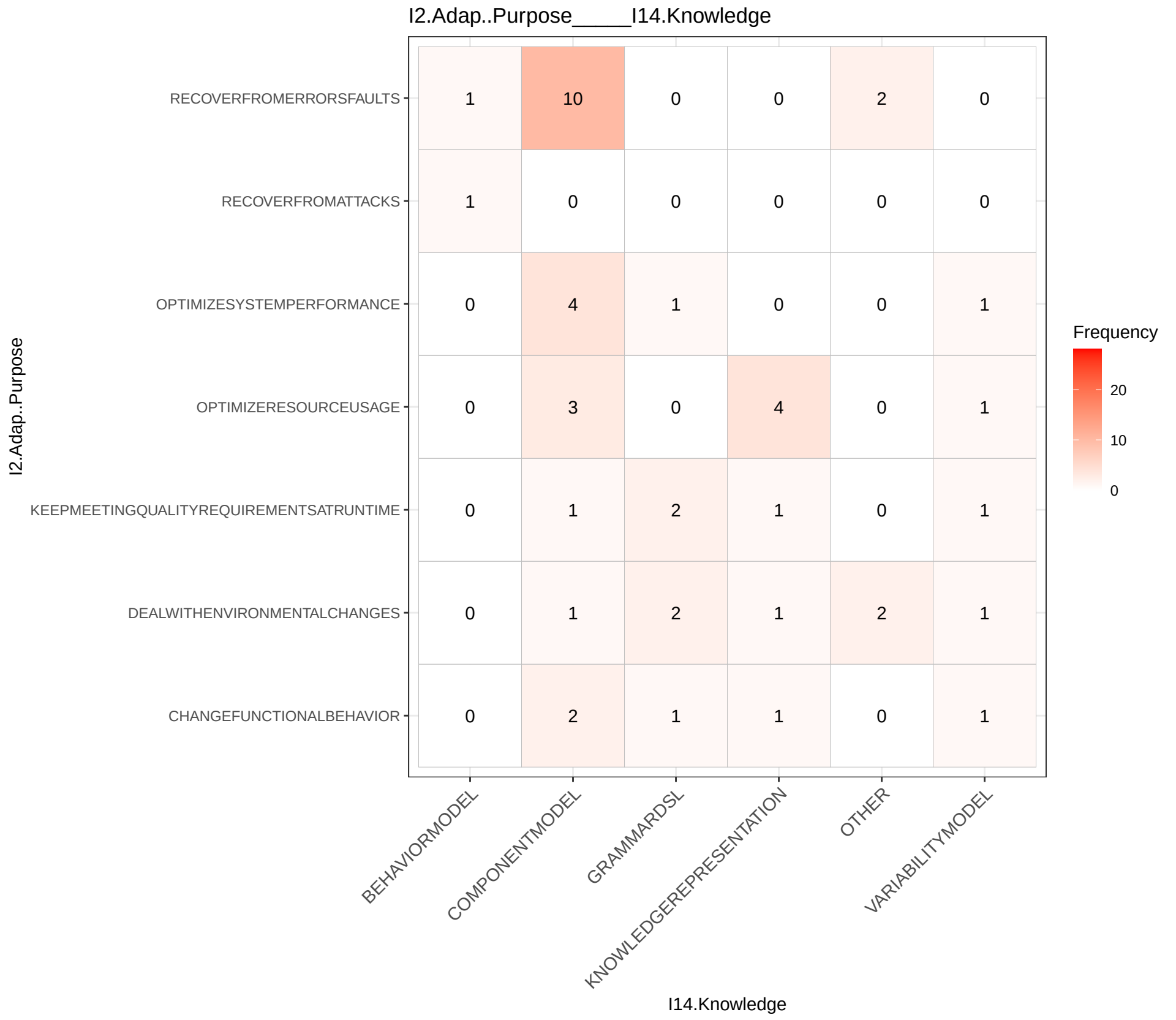

I2.Adap..Purpose_____I9.Adap..Logic
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
2 3 5 3 0 4 0 3
0 0 0 1 0 0 0 0
0 3 0 2 1 3 0 3
0 0 2 0 1 2 2 0
1 0 1 1 0 4 2 0
1 0 3 3 0 1 1 0
0 0 0 3 0 0 1 0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I2.Adap..Purpose
I9.Adap..Logic
Frequency
20
10
0

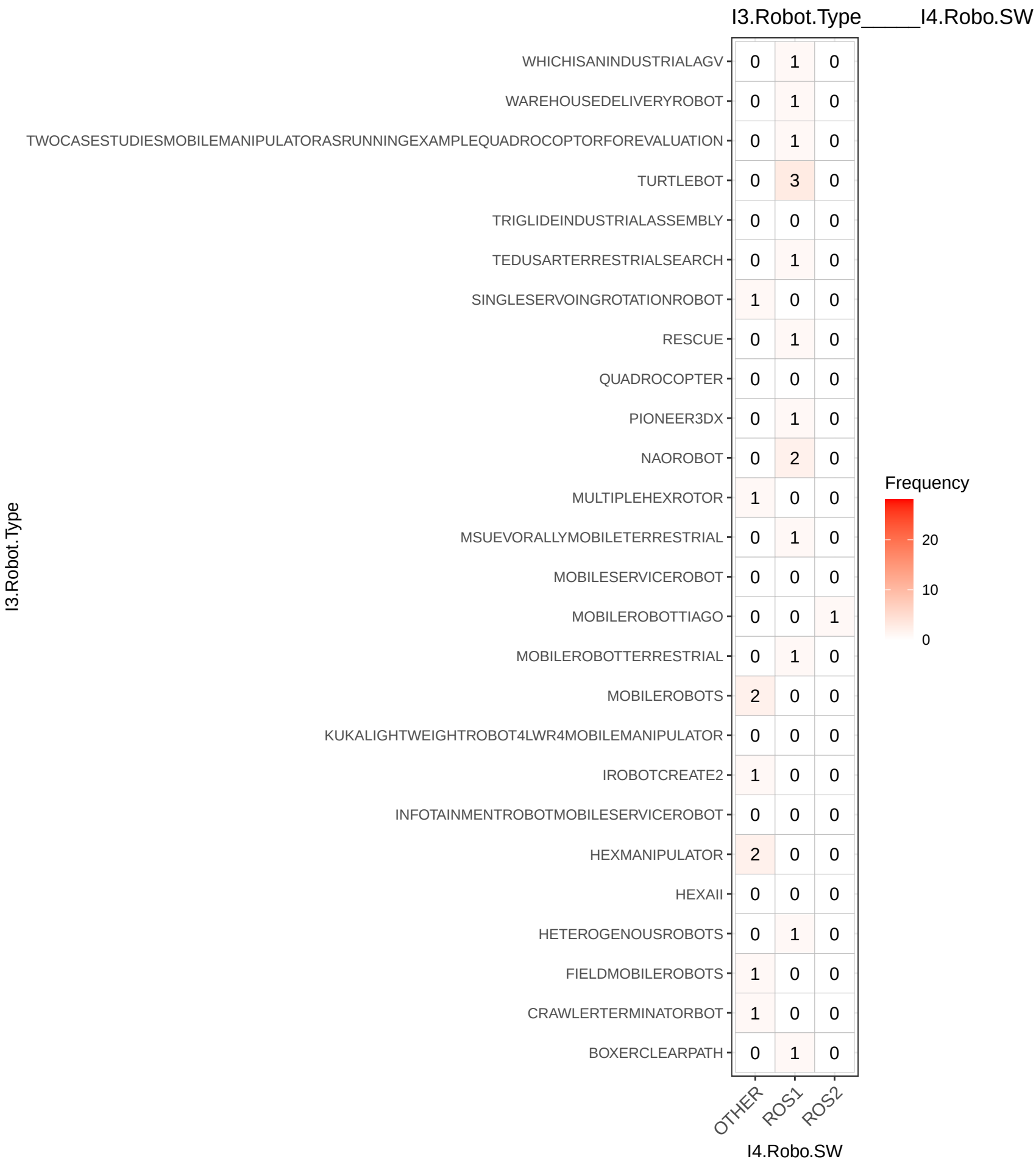

I2.Adap..Purpose_____I10.Monitor
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
2
12
1
0
1
0
1
4
2
1
5
2
4
4
0
4
7
2
2
4
2
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I2.Adap..Purpose
I10.Monitor
Frequency
20
10
0

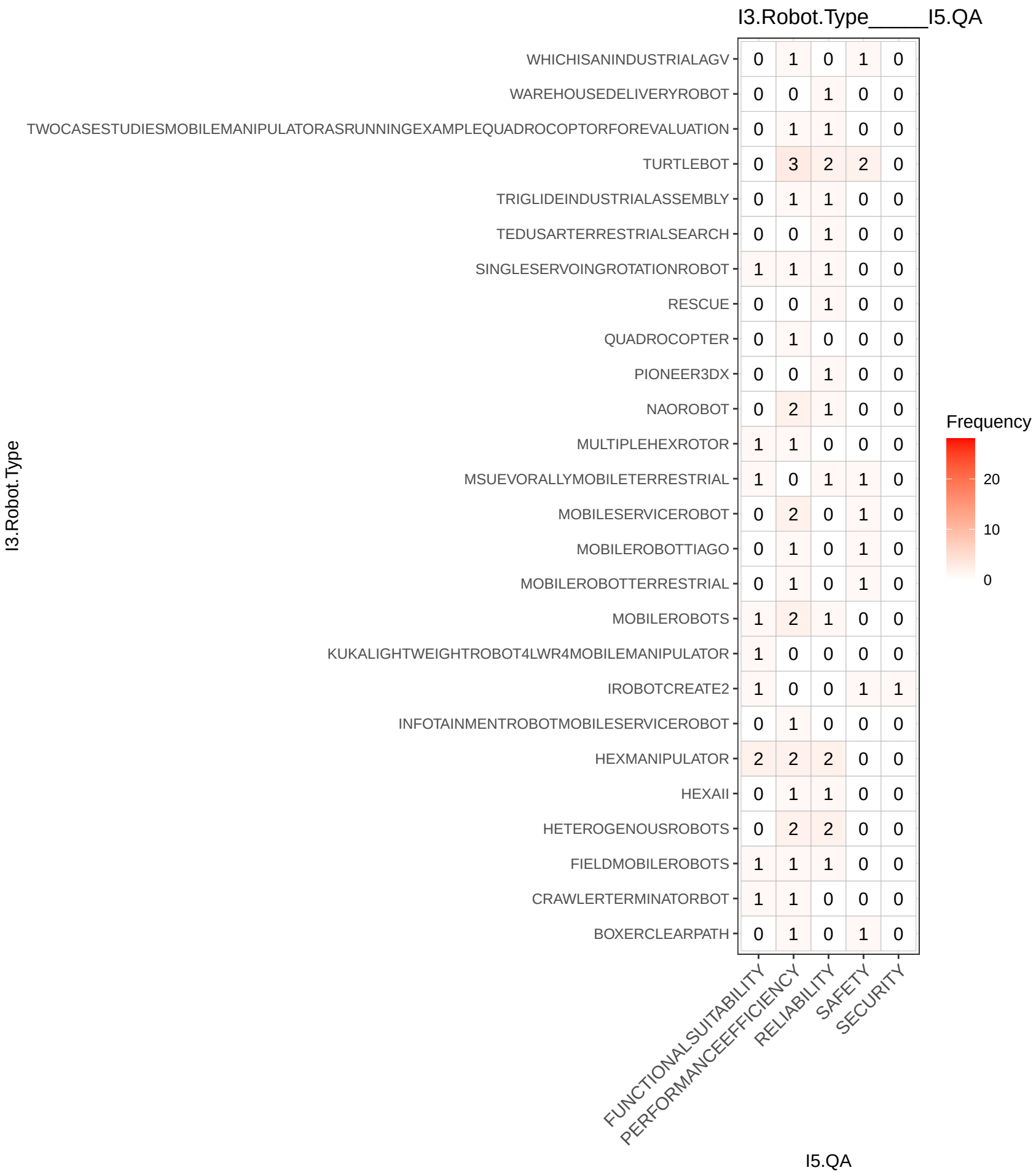

I2.Adap..Purpose_____I11.Analyze
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
I2.Adap..Purpose
5 5 3 0 2 0 1
0 1 0 0 0 0 0
1 0 3 0 0 1 0
0 0 0 0 4 1 1
0 0 0 0 2 0 1
1 1 1 1 1 2 1
0 0 3 0 1 1 0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
0

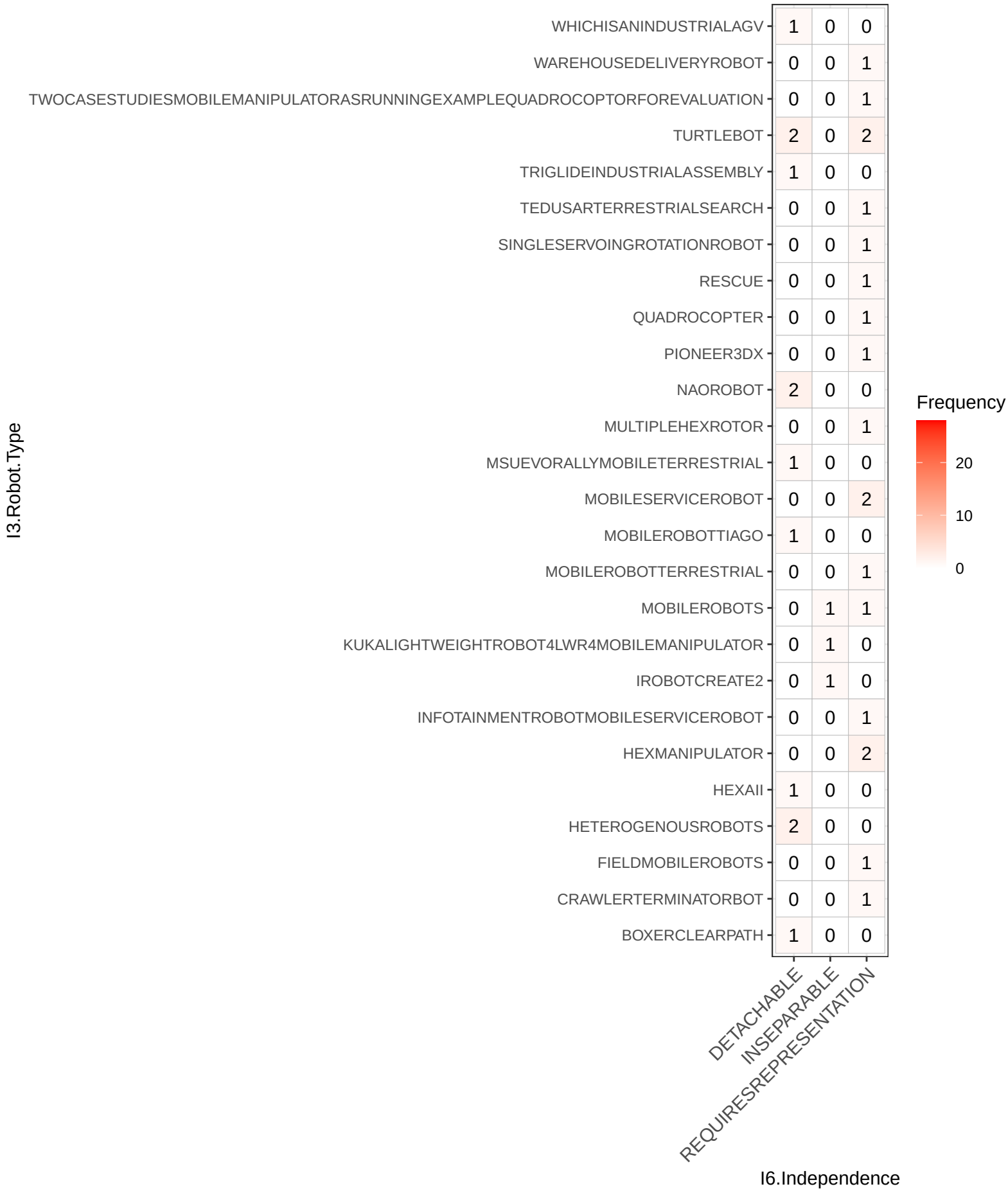

I2.Adap..Purpose_____I12.Plan
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
5
4
2
0
1
0
3
2
0
6
3
0
3
2
0
4
3
0
1
3
0
I2.Adap..Purpose
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0

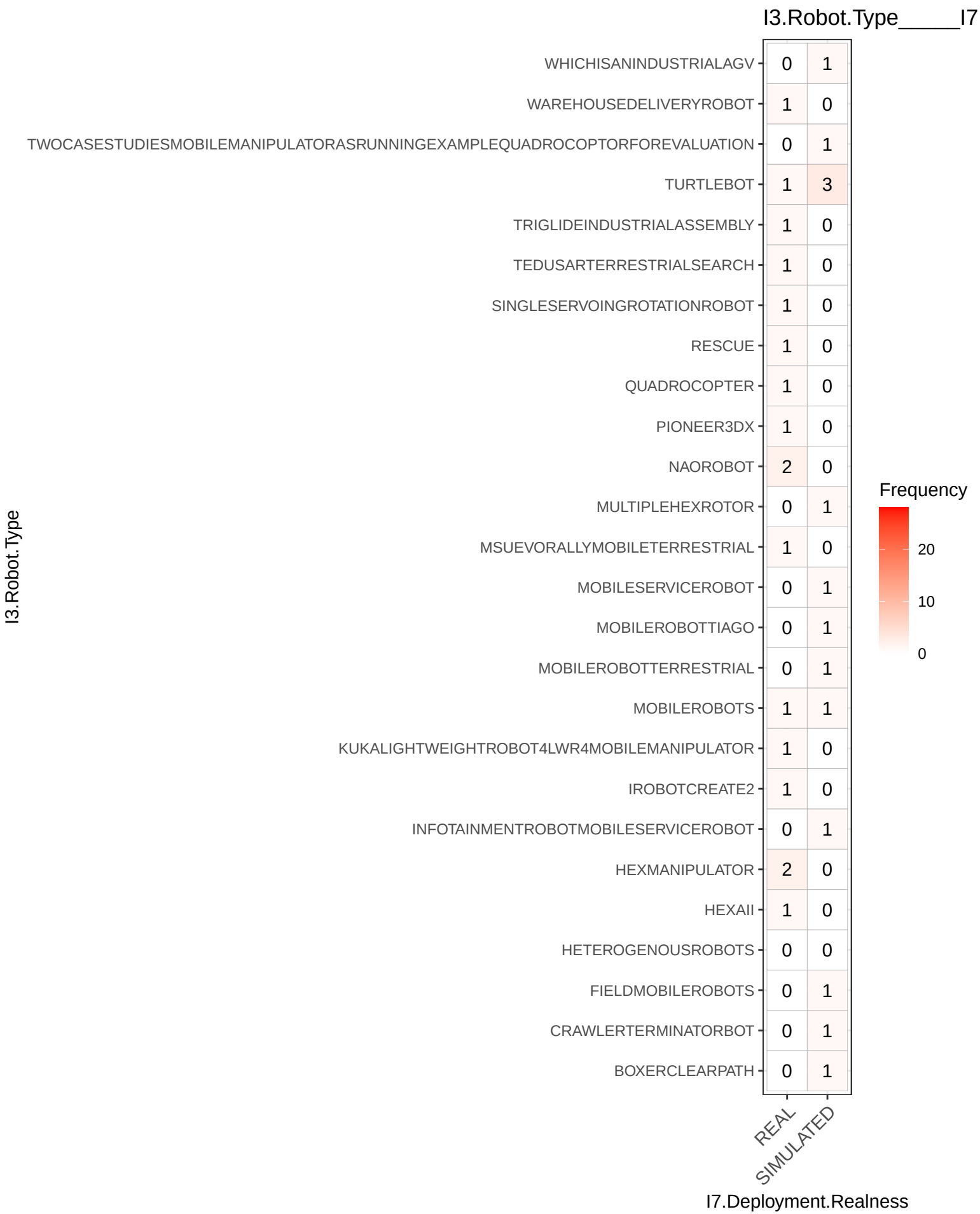

I2.Adap..Purpose_____I13.Execute
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
I2.Adap..Purpose
2 2 0 6 6
0 0 0 1 0
1 0 0 3 3
0 5 1 1 2
0 0 1 4 2
1 0 0 5 5
1 1 0 1 4
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0

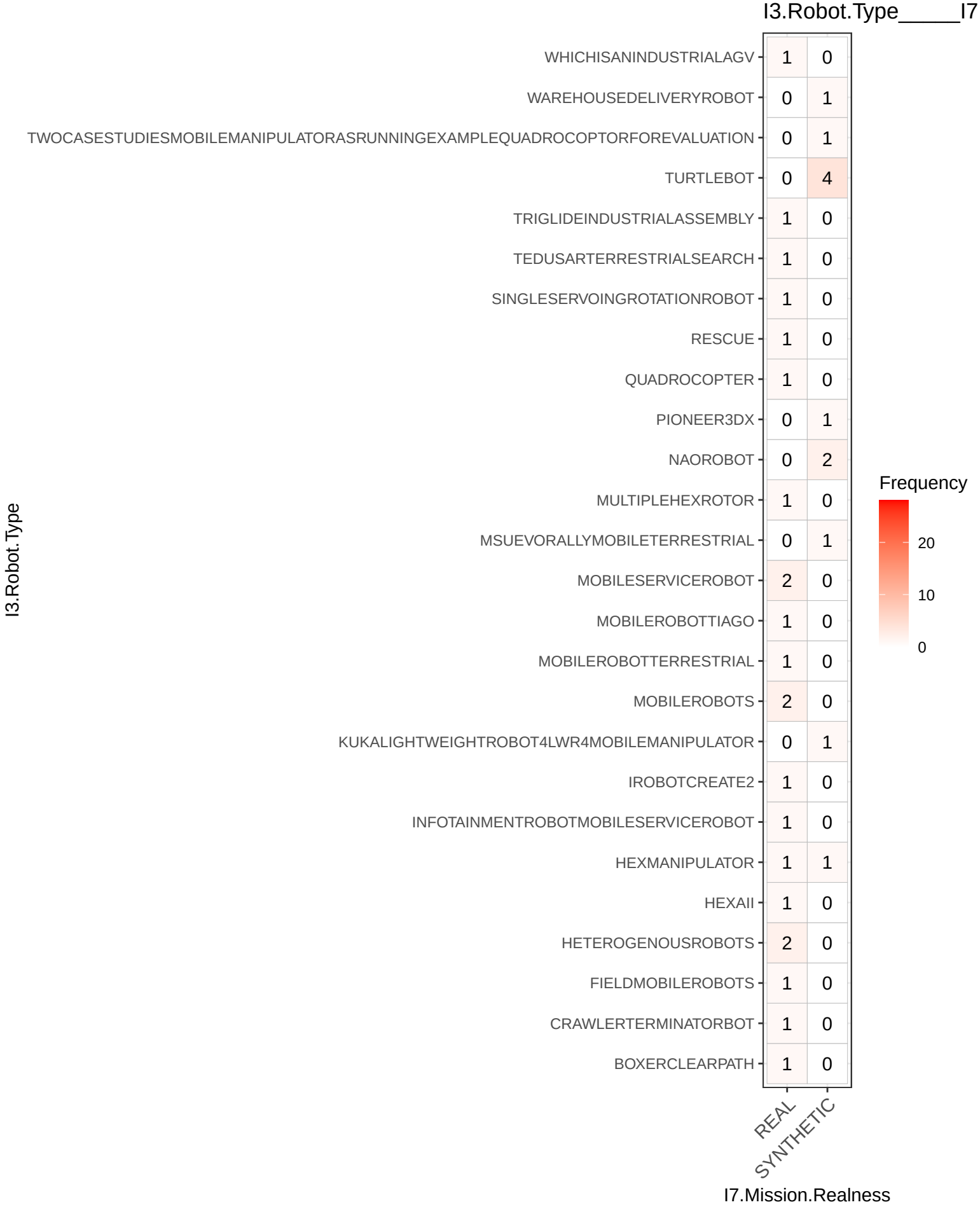

I2.Adap..Purpose_____I14.Knowledge
RECOVERFROMERRORSFAULTS
RECOVERFROMATTACKS
OPTIMIZESYSTEMPERFORMANCE
OPTIMIZERESOURCEUSAGE
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
DEALWITHENVIRONMENTALCHANGES
CHANGEFUNCTIONALBEHAVIOR
I2.Adap..Purpose
1 10 0 0 2 0
1 0 0 0 0 0
0 4 1 0 0 1
0 3 0 4 0 1
0 1 2 1 0 1
0 1 2 1 2 1
0 2 1 1 0 1
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

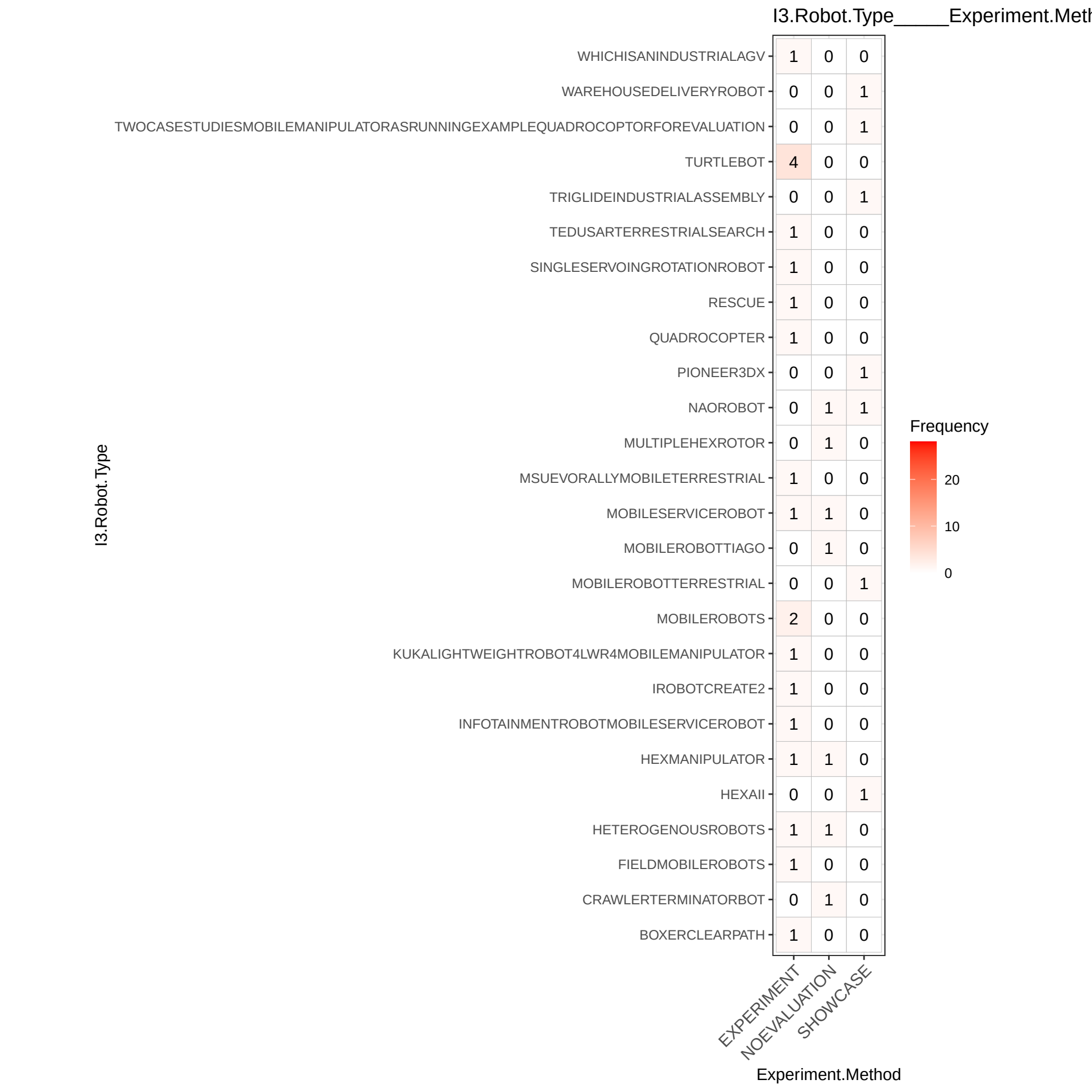

I3.Robot.Type_____I4.Robo.SW
WHICHISANINDUSTRIALAGV 0 1 0
WAREHOUSEDELIVERYROBOT 0 1 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 1 0
TURTLEBOT 0 3 0
TRIGLIDEINDUSTRIALASSEMBLY 0 0 0
TEDUSARTERRESTRIALSEARCH 0 1 0
SINGLESERVOINGROTATIONROBOT 1 0 0
RESCUE 0 1 0
QUADROCOPTER 0 0 0
PIONEER3DX 0 1 0
NAOROBOT 0 2 0
MULTIPLEHEXROTOR 1 0 0
MSUEVORALLYMOBILETERRESTRIAL 0 1 0
MOBILESERVICEROBOT 0 0 0
MOBILEROBOTTIAGO 0 0 1
MOBILEROBOTTERRESTRIAL 0 1 0
MOBILEROBOTS 2 0 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 0 0
IROBOTCREATE2 1 0 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 0 0
HEXMANIPULATOR 2 0 0
HEXAII 0 0 0
HETEROGENOUSROBOTS 0 1 0
FIELDMOBILEROBOTS 1 0 0
CRAWLERTERMINATORBOT 1 0 0
BOXERCLEARPATH 0 1 0
OTHER
ROS1
ROS2
I4.Robo.SW
I3.Robot.Type
Frequency
20
10
0

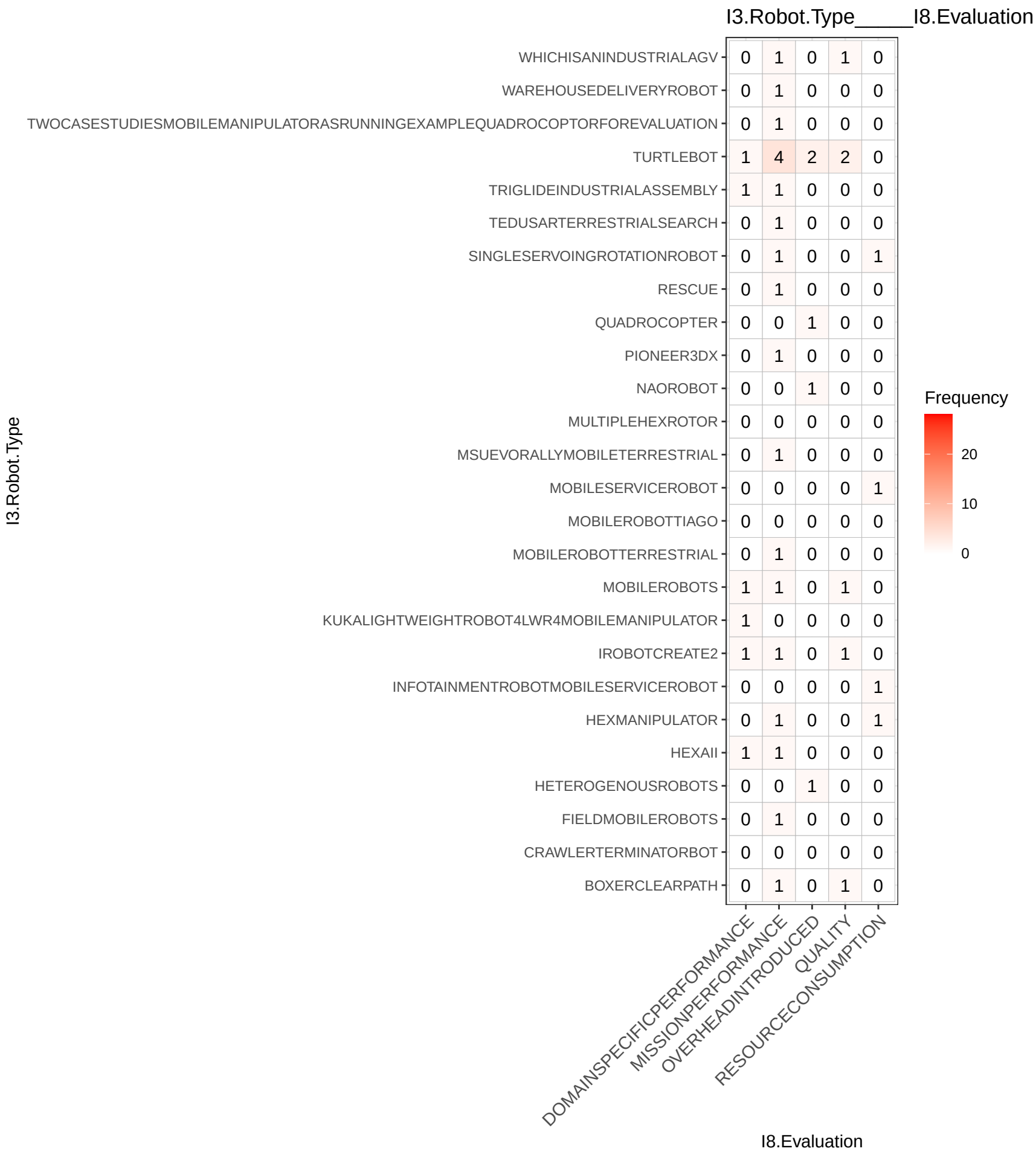

I3.Robot.Type_____I5.QA
WHICHISANINDUSTRIALAGV 0 1 0 1 0
WAREHOUSEDELIVERYROBOT 0 0 1 0 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 1 1 0 0
TURTLEBOT 0 3 2 2 0
TRIGLIDEINDUSTRIALASSEMBLY 0 1 1 0 0
TEDUSARTERRESTRIALSEARCH 0 0 1 0 0
SINGLESERVOINGROTATIONROBOT 1 1 1 0 0
RESCUE 0 0 1 0 0
QUADROCOPTER 0 1 0 0 0
PIONEER3DX 0 0 1 0 0
NAOROBOT 0 2 1 0 0
MULTIPLEHEXROTOR 1 1 0 0 0
MSUEVORALLYMOBILETERRESTRIAL 1 0 1 1 0
MOBILESERVICEROBOT 0 2 0 1 0
MOBILEROBOTTIAGO 0 1 0 1 0
MOBILEROBOTTERRESTRIAL 0 1 0 1 0
MOBILEROBOTS 1 2 1 0 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 1 0 0 0 0
IROBOTCREATE2 1 0 0 1 1
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 1 0 0 0
HEXMANIPULATOR 2 2 2 0 0
HEXAII 0 1 1 0 0
HETEROGENOUSROBOTS 0 2 2 0 0
FIELDMOBILEROBOTS 1 1 1 0 0
CRAWLERTERMINATORBOT 1 1 0 0 0
BOXERCLEARPATH 0 1 0 1 0
I3.Robot.Type
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0

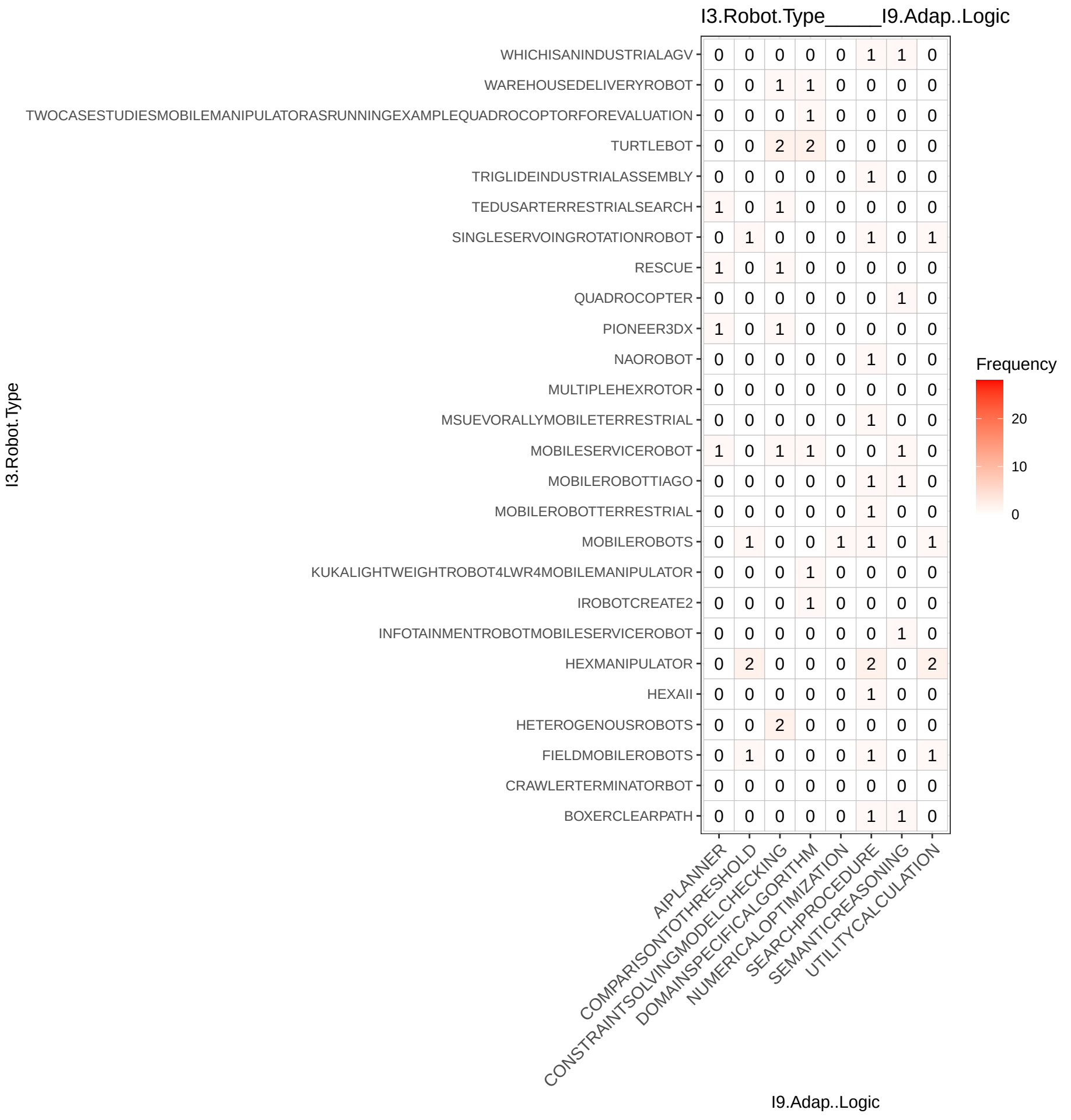

I3.Robot.Type_____I6.Independence
WHICHISANINDUSTRIALAGV
WAREHOUSEDELIVERYROBOT
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION
TURTLEBOT
TRIGLIDEINDUSTRIALASSEMBLY
TEDUSARTERRESTRIALSEARCH
SINGLESERVOINGROTATIONROBOT
RESCUE
QUADROCOPTER
PIONEER3DX
NAOROBOT
MULTIPLEHEXROTOR
MSUEVORALLYMOBILETERRESTRIAL
MOBILESERVICEROBOT
MOBILEROBOTTIAGO
MOBILEROBOTTERRESTRIAL
MOBILEROBOTS
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
IROBOTCREATE2
INFOTAINMENTROBOTMOBILESERVICEROBOT
HEXMANIPULATOR
HEXAII
HETEROGENOUSROBOTS
FIELDMOBILEROBOTS
CRAWLERTERMINATORBOT
BOXERCLEARPATH
1 0 0
0 0 1
0 0 1
2 0 2
1 0 0
0 0 1
0 0 1
0 0 1
0 0 1
0 0 1
2 0 0
0 0 1
1 0 0
0 0 2
1 0 0
0 0 1
0 1 1
0 1 0
0 1 0
0 0 1
0 0 2
1 0 0
2 0 0
0 0 1
0 0 1
1 0 0
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
I3.Robot.Type
Frequency
20
10
0

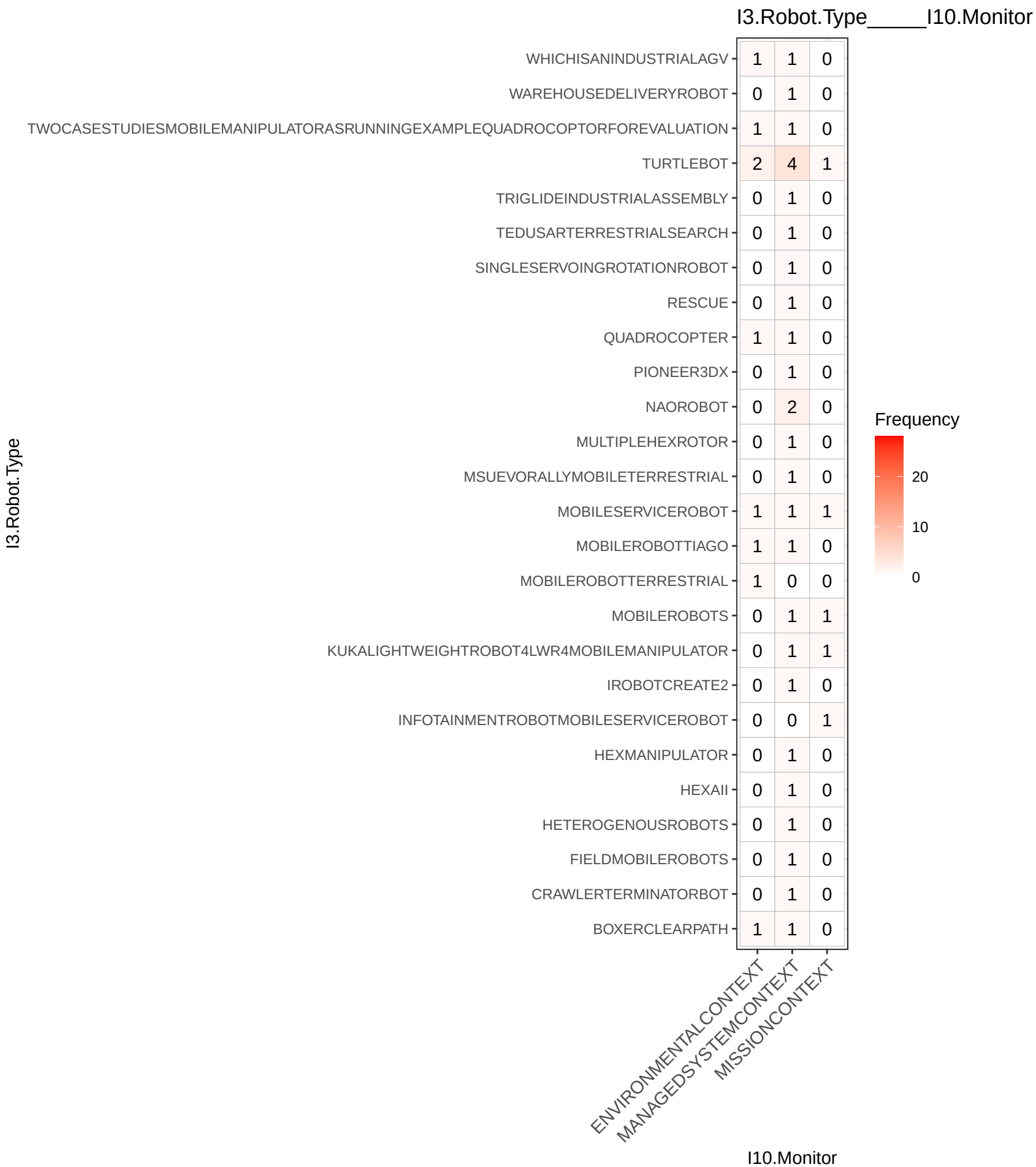

I3.Robot.Type_____I7.Deployment
WHICHISANINDUSTRIALAGV 0 1
WAREHOUSEDELIVERYROBOT 1 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 1
TURTLEBOT 1 3
TRIGLIDEINDUSTRIALASSEMBLY 1 0
TEDUSARTERRESTRIALSEARCH 1 0
SINGLESERVOINGROTATIONROBOT 1 0
RESCUE 1 0
QUADROCOPTER 1 0
PIONEER3DX 1 0
NAOROBOT 2 0
MULTIPLEHEXROTOR 0 1
MSUEVORALLYMOBILETERRESTRIAL 1 0
MOBILESERVICEROBOT 0 1
MOBILEROBOTTIAGO 0 1
MOBILEROBOTTERRESTRIAL 0 1
MOBILEROBOTS 1 1
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 1 0
IROBOTCREATE2 1 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 1
HEXMANIPULATOR 2 0
HEXAII 1 0
HETEROGENOUSROBOTS 0 0
FIELDMOBILEROBOTS 0 1
CRAWLERTERMINATORBOT 0 1
BOXERCLEARPATH 0 1
I3.Robot.Type
Frequency
20
10
0
REAL
SIMULATED
I7.Deployment.Realness

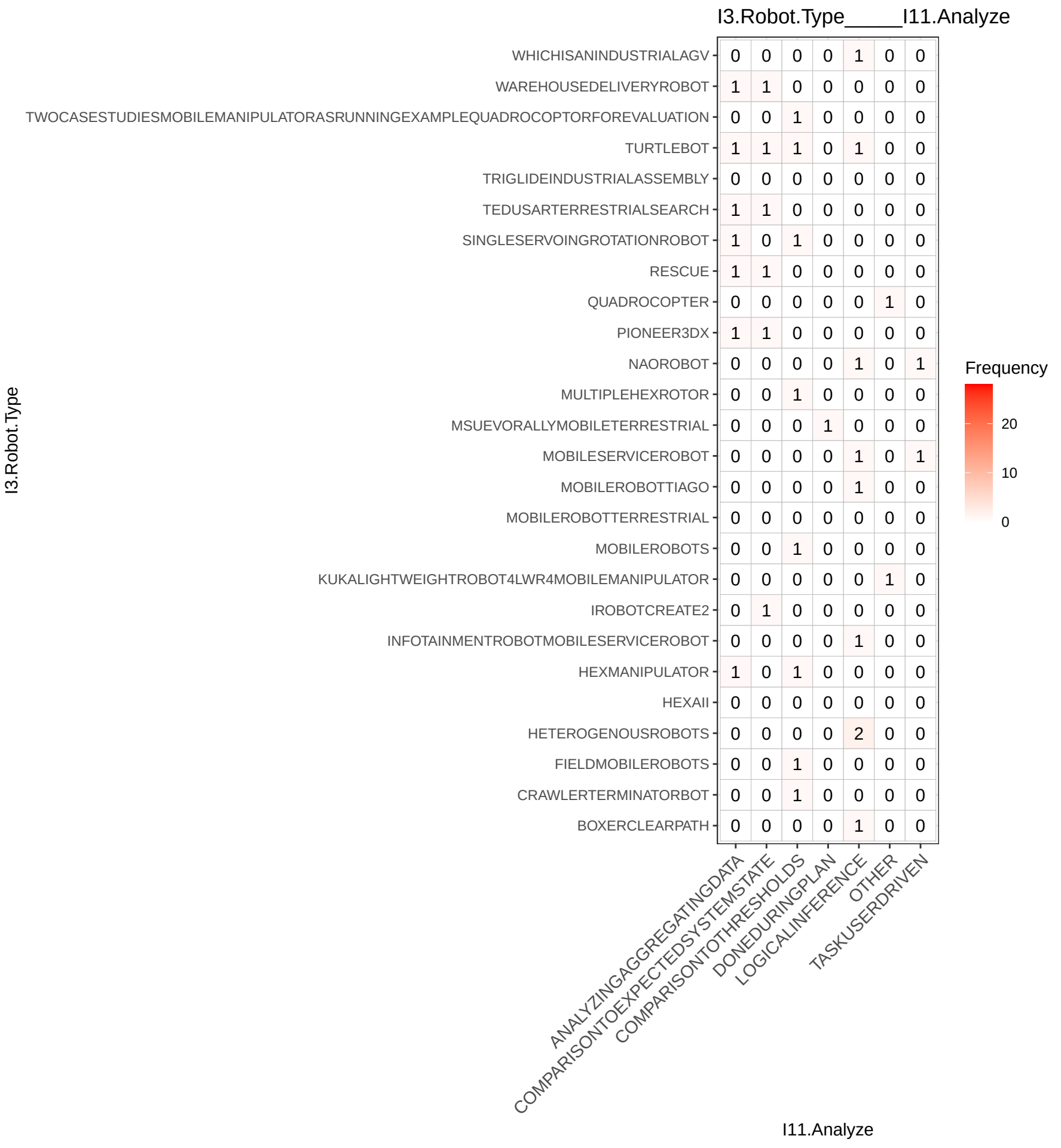

I3.Robot.Type_____I7.Mission.Rea
WHICHISANINDUSTRIALAGV 1 0
WAREHOUSEDELIVERYROBOT 0 1
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 1
TURTLEBOT 0 4
TRIGLIDEINDUSTRIALASSEMBLY 1 0
TEDUSARTERRESTRIALSEARCH 1 0
SINGLESERVOINGROTATIONROBOT 1 0
RESCUE 1 0
QUADROCOPTER 1 0
PIONEER3DX 0 1
NAOROBOT 0 2
MULTIPLEHEXROTOR 1 0
MSUEVORALLYMOBILETERRESTRIAL 0 1
MOBILESERVICEROBOT 2 0
MOBILEROBOTTIAGO 1 0
MOBILEROBOTTERRESTRIAL 1 0
MOBILEROBOTS 2 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 1
IROBOTCREATE2 1 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 1 0
HEXMANIPULATOR 1 1
HEXAII 1 0
HETEROGENOUSROBOTS 2 0
FIELDMOBILEROBOTS 1 0
CRAWLERTERMINATORBOT 1 0
BOXERCLEARPATH 1 0
I3.Robot.Type
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0

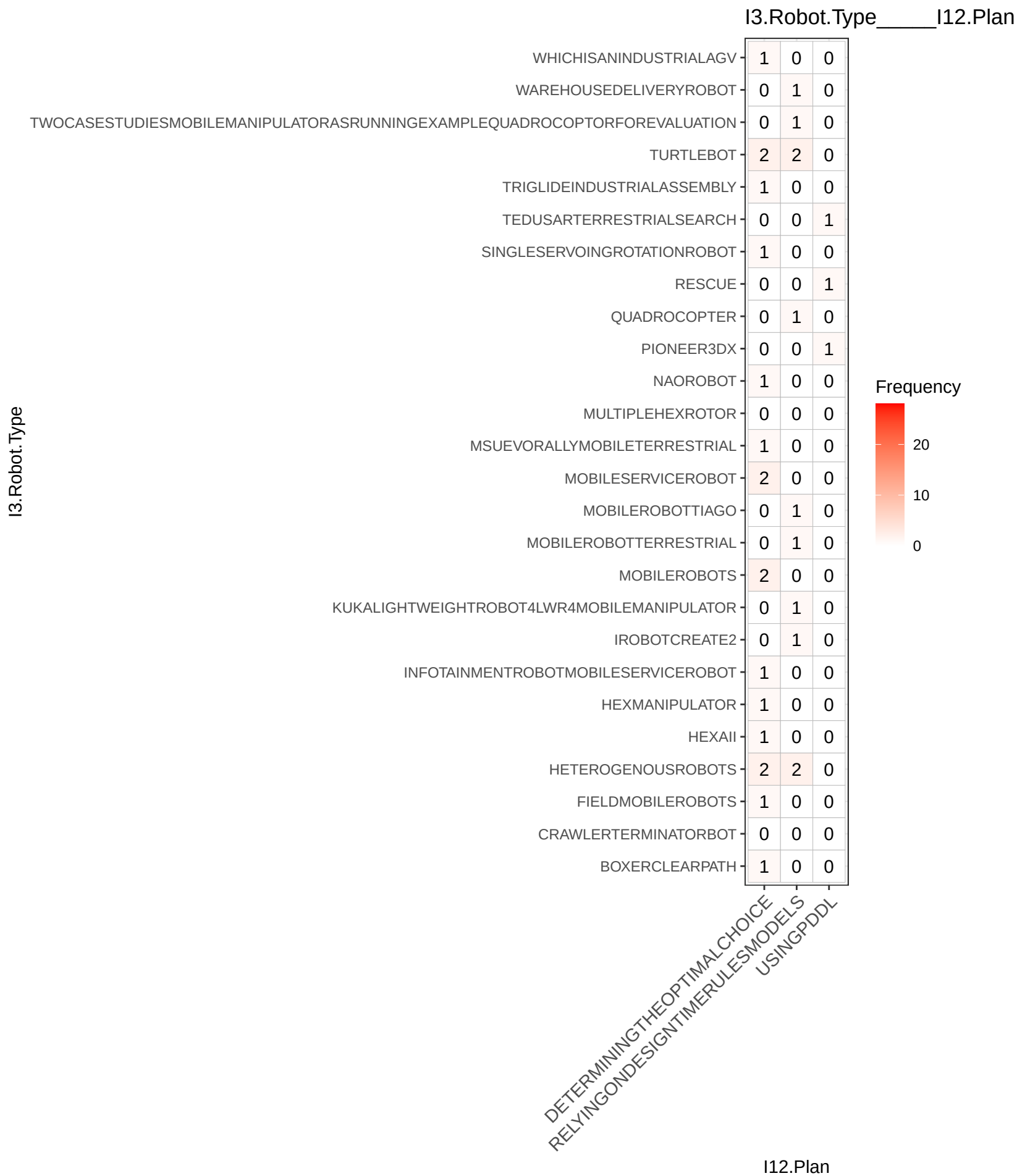

I3.Robot.Type_____Experiment.Meth
WHICHISANINDUSTRIALAGV 1 0 0
WAREHOUSEDELIVERYROBOT 0 0 1
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 0 1
TURTLEBOT 4 0 0
TRIGLIDEINDUSTRIALASSEMBLY 0 0 1
TEDUSARTERRESTRIALSEARCH 1 0 0
SINGLESERVOINGROTATIONROBOT 1 0 0
RESCUE 1 0 0
QUADROCOPTER 1 0 0
PIONEER3DX 0 0 1
NAOROBOT 0 1 1
MULTIPLEHEXROTOR 0 1 0
MSUEVORALLYMOBILETERRESTRIAL 1 0 0
MOBILESERVICEROBOT 1 1 0
MOBILEROBOTTIAGO 0 1 0
MOBILEROBOTTERRESTRIAL 0 0 1
MOBILEROBOTS 2 0 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 1 0 0
IROBOTCREATE2 1 0 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 1 0 0
HEXMANIPULATOR 1 1 0
HEXAII 0 0 1
HETEROGENOUSROBOTS 1 1 0
FIELDMOBILEROBOTS 1 0 0
CRAWLERTERMINATORBOT 0 1 0
BOXERCLEARPATH 1 0 0
I3.Robot.Type
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0

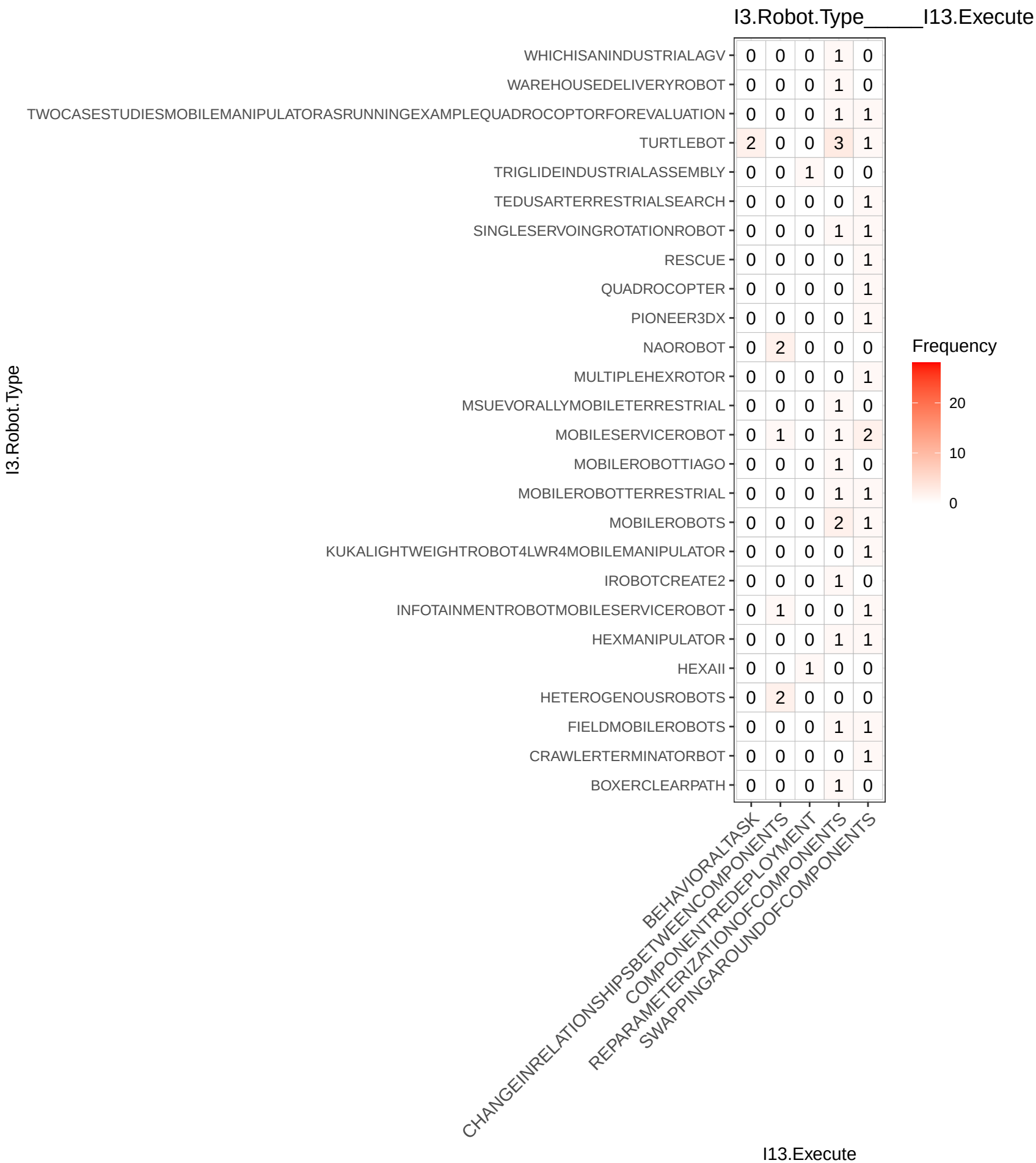

I3.Robot.Type_____I8.Evaluation
WHICHISANINDUSTRIALAGV 0 1 0 1 0
WAREHOUSEDELIVERYROBOT 0 1 0 0 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 1 0 0 0
TURTLEBOT 1 4 2 2 0
TRIGLIDEINDUSTRIALASSEMBLY 1 1 0 0 0
TEDUSARTERRESTRIALSEARCH 0 1 0 0 0
SINGLESERVOINGROTATIONROBOT 0 1 0 0 1
RESCUE 0 1 0 0 0
QUADROCOPTER 0 0 1 0 0
PIONEER3DX 0 1 0 0 0
NAOROBOT 0 0 1 0 0
MULTIPLEHEXROTOR 0 0 0 0 0
MSUEVORALLYMOBILETERRESTRIAL 0 1 0 0 0
MOBILESERVICEROBOT 0 0 0 0 1
MOBILEROBOTTIAGO 0 0 0 0 0
MOBILEROBOTTERRESTRIAL 0 1 0 0 0
MOBILEROBOTS 1 1 0 1 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 1 0 0 0 0
IROBOTCREATE2 1 1 0 1 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 0 0 0 1
HEXMANIPULATOR 0 1 0 0 1
HEXAII 1 1 0 0 0
HETEROGENOUSROBOTS 0 0 1 0 0
FIELDMOBILEROBOTS 0 1 0 0 0
CRAWLERTERMINATORBOT 0 0 0 0 0
BOXERCLEARPATH 0 1 0 1 0
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
I3.Robot.Type
Frequency
20
10
0

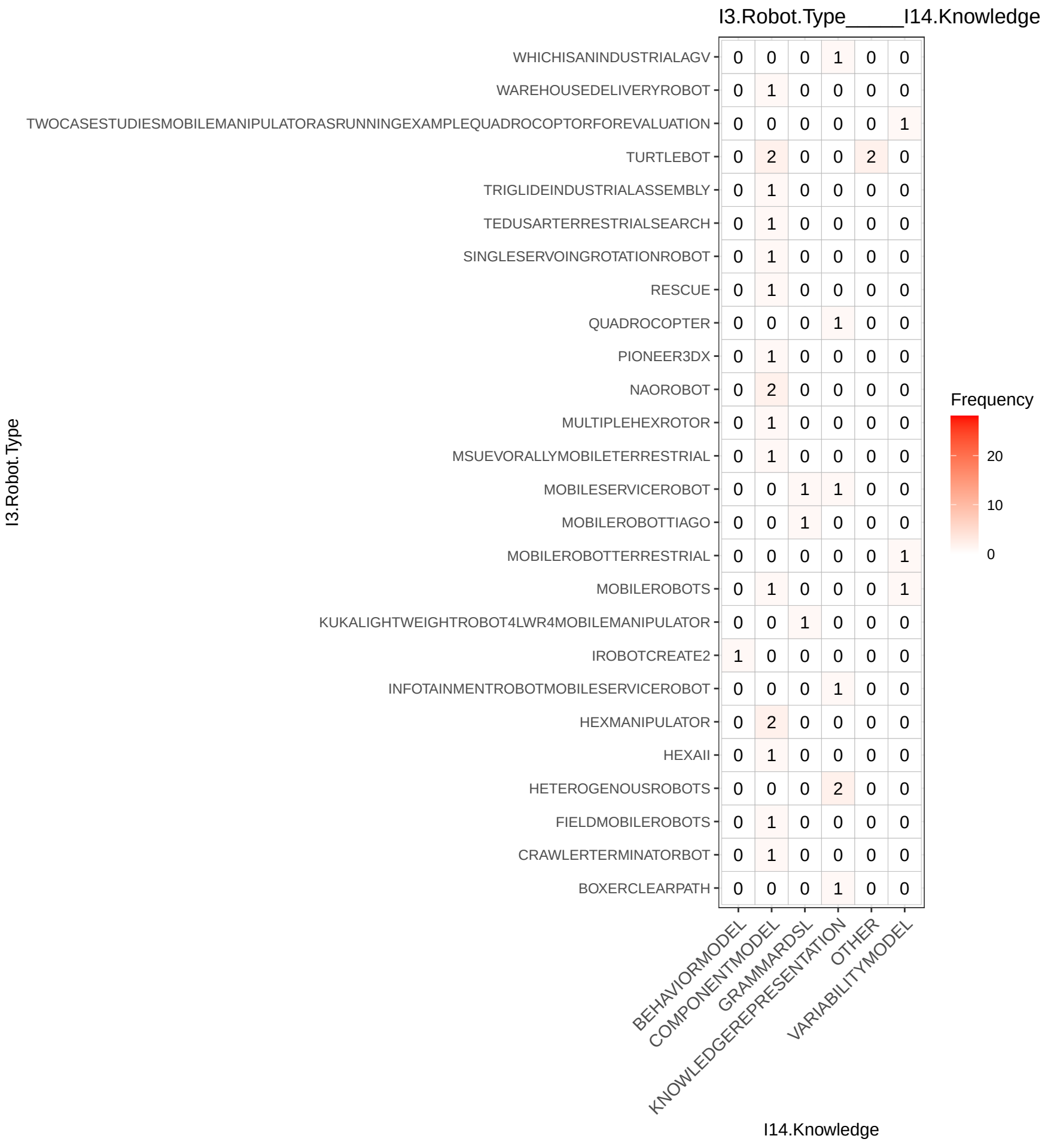

I3.Robot.Type_____I9.Adap..Logic
WHICHISANINDUSTRIALAGV 0 0 0 0 0 1 1 0
WAREHOUSEDELIVERYROBOT 0 0 1 1 0 0 0 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 0 0 1 0 0 0 0
TURTLEBOT 0 0 2 2 0 0 0 0
TRIGLIDEINDUSTRIALASSEMBLY 0 0 0 0 0 1 0 0
TEDUSARTERRESTRIALSEARCH 1 0 1 0 0 0 0 0
SINGLESERVOINGROTATIONROBOT 0 1 0 0 0 1 0 1
RESCUE 1 0 1 0 0 0 0 0
QUADROCOPTER 0 0 0 0 0 0 1 0
PIONEER3DX 1 0 1 0 0 0 0 0
NAOROBOT 0 0 0 0 0 1 0 0
MULTIPLEHEXROTOR 0 0 0 0 0 0 0 0
MSUEVORALLYMOBILETERRESTRIAL 0 0 0 0 0 1 0 0
MOBILESERVICEROBOT 1 0 1 1 0 0 1 0
MOBILEROBOTTIAGO 0 0 0 0 0 1 1 0
MOBILEROBOTTERRESTRIAL 0 0 0 0 0 1 0 0
MOBILEROBOTS 0 1 0 0 1 1 0 1
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 0 0 1 0 0 0 0
IROBOTCREATE2 0 0 0 1 0 0 0 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 0 0 0 0 0 1 0
HEXMANIPULATOR 0 2 0 0 0 2 0 2
HEXAII 0 0 0 0 0 1 0 0
HETEROGENOUSROBOTS 0 0 2 0 0 0 0 0
FIELDMOBILEROBOTS 0 1 0 0 0 1 0 1
CRAWLERTERMINATORBOT 0 0 0 0 0 0 0 0
BOXERCLEARPATH 0 0 0 0 0 1 1 0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I3.Robot.Type
I9.Adap..Logic
Frequency
20
10
0

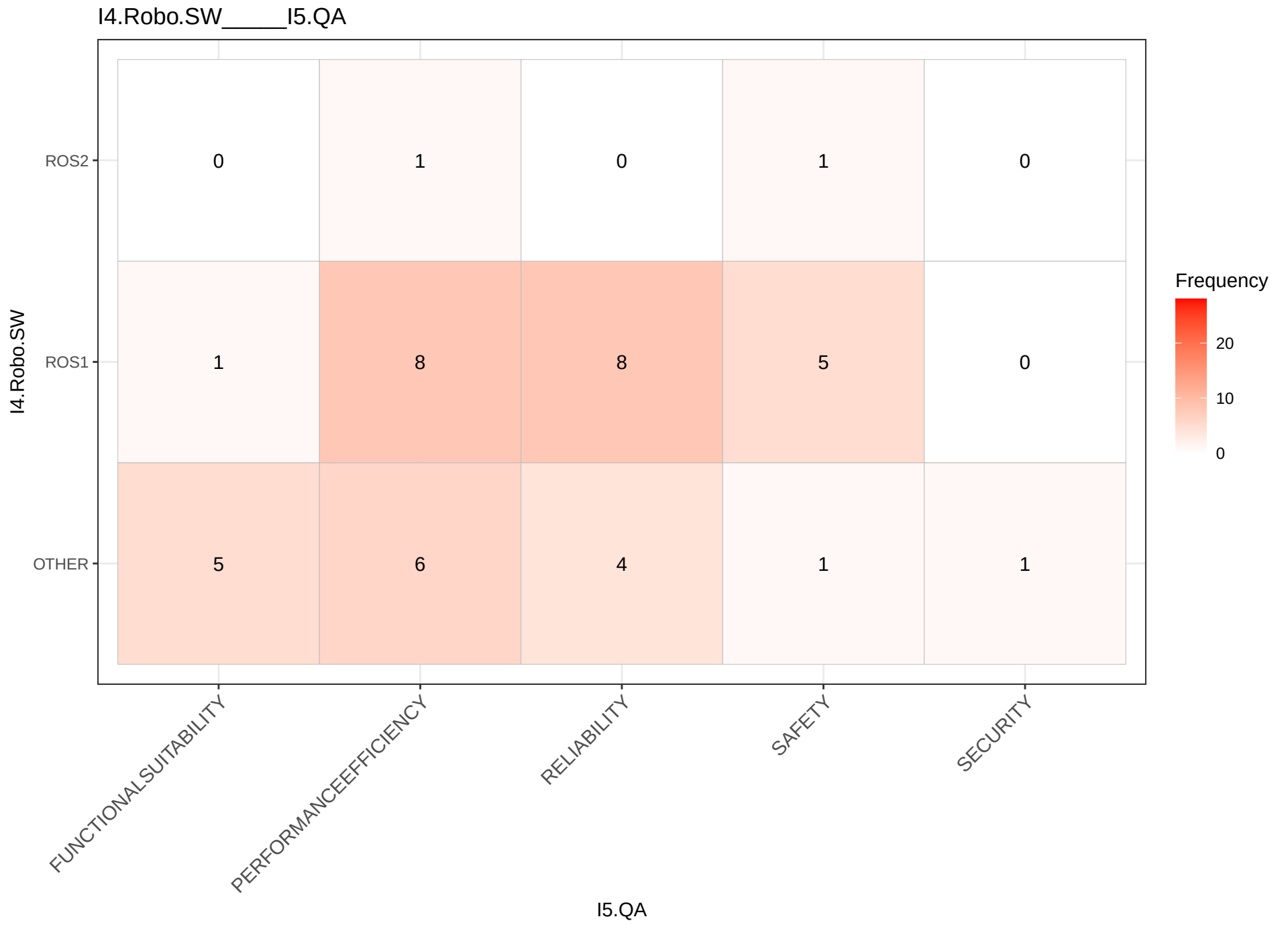

I3.Robot.Type_____I10.Monitor
WHICHISANINDUSTRIALAGV 1 1 0
WAREHOUSEDELIVERYROBOT 0 1 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 1 1 0
TURTLEBOT 2 4 1
TRIGLIDEINDUSTRIALASSEMBLY 0 1 0
TEDUSARTERRESTRIALSEARCH 0 1 0
SINGLESERVOINGROTATIONROBOT 0 1 0
RESCUE 0 1 0
QUADROCOPTER 1 1 0
PIONEER3DX 0 1 0
NAOROBOT 0 2 0
MULTIPLEHEXROTOR 0 1 0
MSUEVORALLYMOBILETERRESTRIAL 0 1 0
MOBILESERVICEROBOT 1 1 1
MOBILEROBOTTIAGO 1 1 0
MOBILEROBOTTERRESTRIAL 1 0 0
MOBILEROBOTS 0 1 1
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 1 1
IROBOTCREATE2 0 1 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 0 1
HEXMANIPULATOR 0 1 0
HEXAII 0 1 0
HETEROGENOUSROBOTS 0 1 0
FIELDMOBILEROBOTS 0 1 0
CRAWLERTERMINATORBOT 0 1 0
BOXERCLEARPATH 1 1 0
I3.Robot.Type
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0

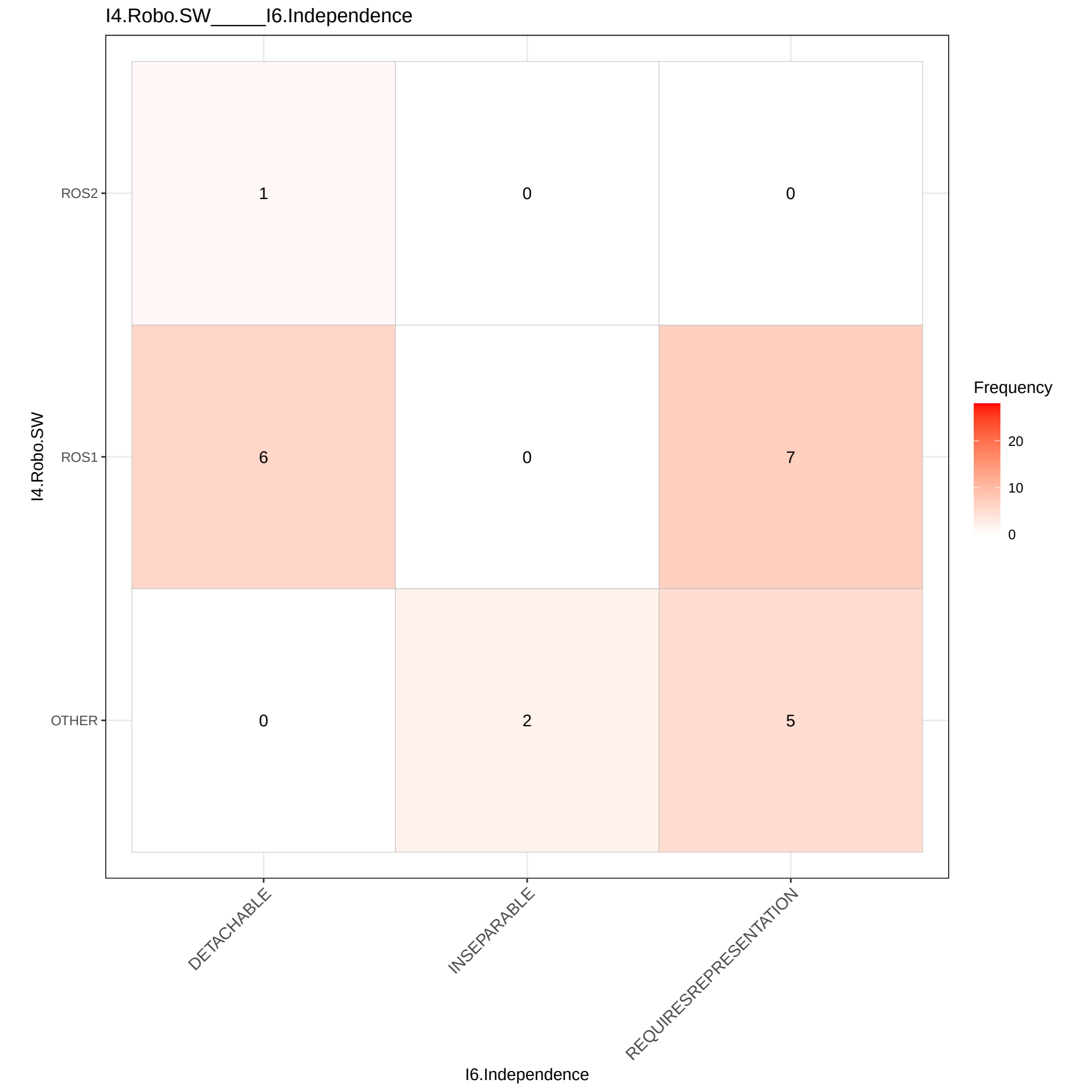

I3.Robot.Type_____I11.Analyze
WHICHISANINDUSTRIALAGV 0 0 0 0 1 0 0
WAREHOUSEDELIVERYROBOT 1 1 0 0 0 0 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 0 1 0 0 0 0
TURTLEBOT 1 1 1 0 1 0 0
TRIGLIDEINDUSTRIALASSEMBLY 0 0 0 0 0 0 0
TEDUSARTERRESTRIALSEARCH 1 1 0 0 0 0 0
SINGLESERVOINGROTATIONROBOT 1 0 1 0 0 0 0
RESCUE 1 1 0 0 0 0 0
QUADROCOPTER 0 0 0 0 0 1 0
PIONEER3DX 1 1 0 0 0 0 0
NAOROBOT 0 0 0 0 1 0 1
MULTIPLEHEXROTOR 0 0 1 0 0 0 0
MSUEVORALLYMOBILETERRESTRIAL 0 0 0 1 0 0 0
MOBILESERVICEROBOT 0 0 0 0 1 0 1
MOBILEROBOTTIAGO 0 0 0 0 1 0 0
MOBILEROBOTTERRESTRIAL 0 0 0 0 0 0 0
MOBILEROBOTS 0 0 1 0 0 0 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 0 0 0 0 1 0
IROBOTCREATE2 0 1 0 0 0 0 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 0 0 0 1 0 0
HEXMANIPULATOR 1 0 1 0 0 0 0
HEXAII 0 0 0 0 0 0 0
HETEROGENOUSROBOTS 0 0 0 0 2 0 0
FIELDMOBILEROBOTS 0 0 1 0 0 0 0
CRAWLERTERMINATORBOT 0 0 1 0 0 0 0
BOXERCLEARPATH 0 0 0 0 1 0 0
I3.Robot.Type
Frequency
20
10
0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze

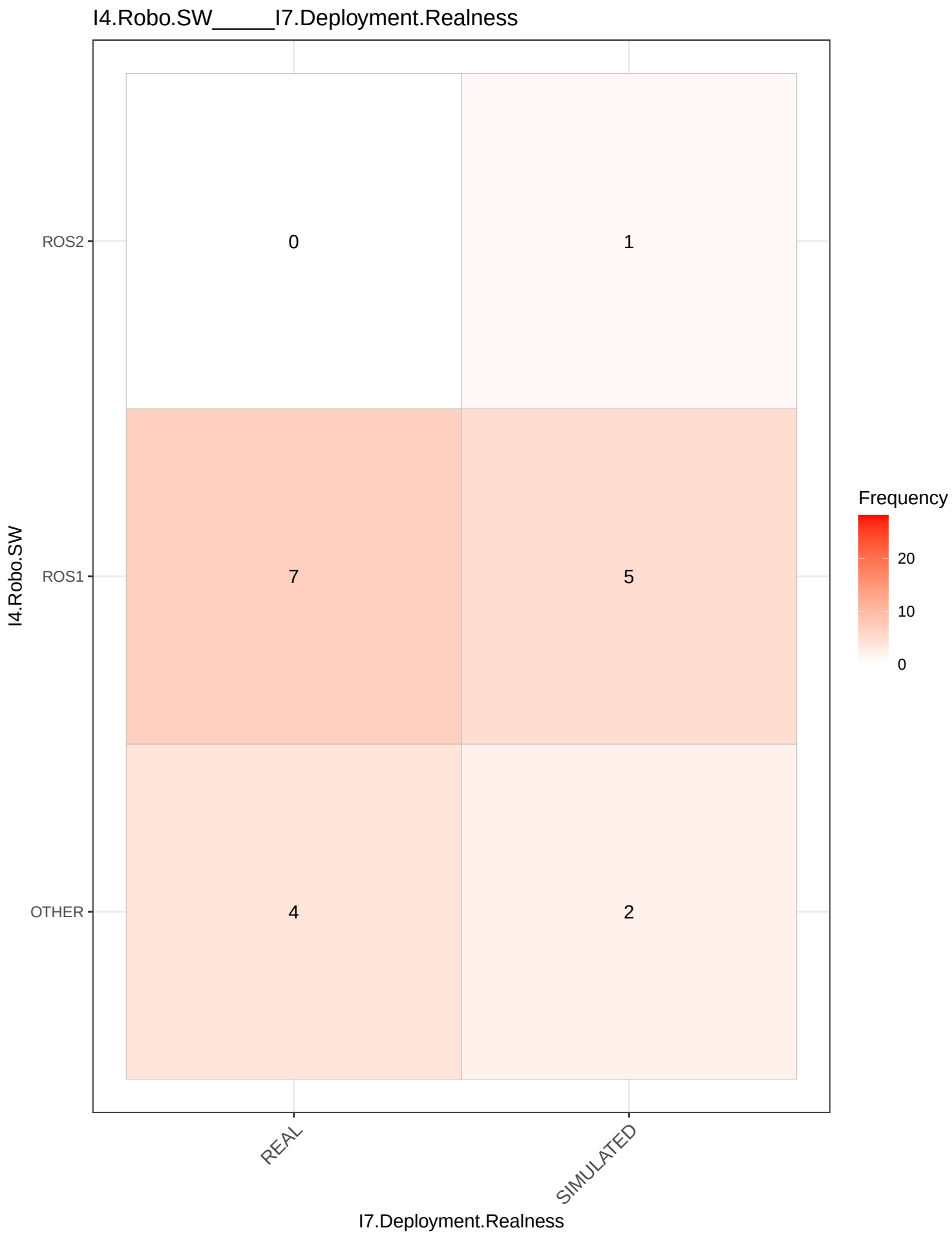

I3.Robot.Type_____I12.Plan
WHICHISANINDUSTRIALAGV 1 0 0
WAREHOUSEDELIVERYROBOT 0 1 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 1 0
TURTLEBOT 2 2 0
TRIGLIDEINDUSTRIALASSEMBLY 1 0 0
TEDUSARTERRESTRIALSEARCH 0 0 1
SINGLESERVOINGROTATIONROBOT 1 0 0
RESCUE 0 0 1
QUADROCOPTER 0 1 0
PIONEER3DX 0 0 1
NAOROBOT 1 0 0
MULTIPLEHEXROTOR 0 0 0
MSUEVORALLYMOBILETERRESTRIAL 1 0 0
MOBILESERVICEROBOT 2 0 0
MOBILEROBOTTIAGO 0 1 0
MOBILEROBOTTERRESTRIAL 0 1 0
MOBILEROBOTS 2 0 0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 1 0
IROBOTCREATE2 0 1 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 1 0 0
HEXMANIPULATOR 1 0 0
HEXAII 1 0 0
HETEROGENOUSROBOTS 2 2 0
FIELDMOBILEROBOTS 1 0 0
CRAWLERTERMINATORBOT 0 0 0
BOXERCLEARPATH 1 0 0
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
I3.Robot.Type
Frequency
20
10
0

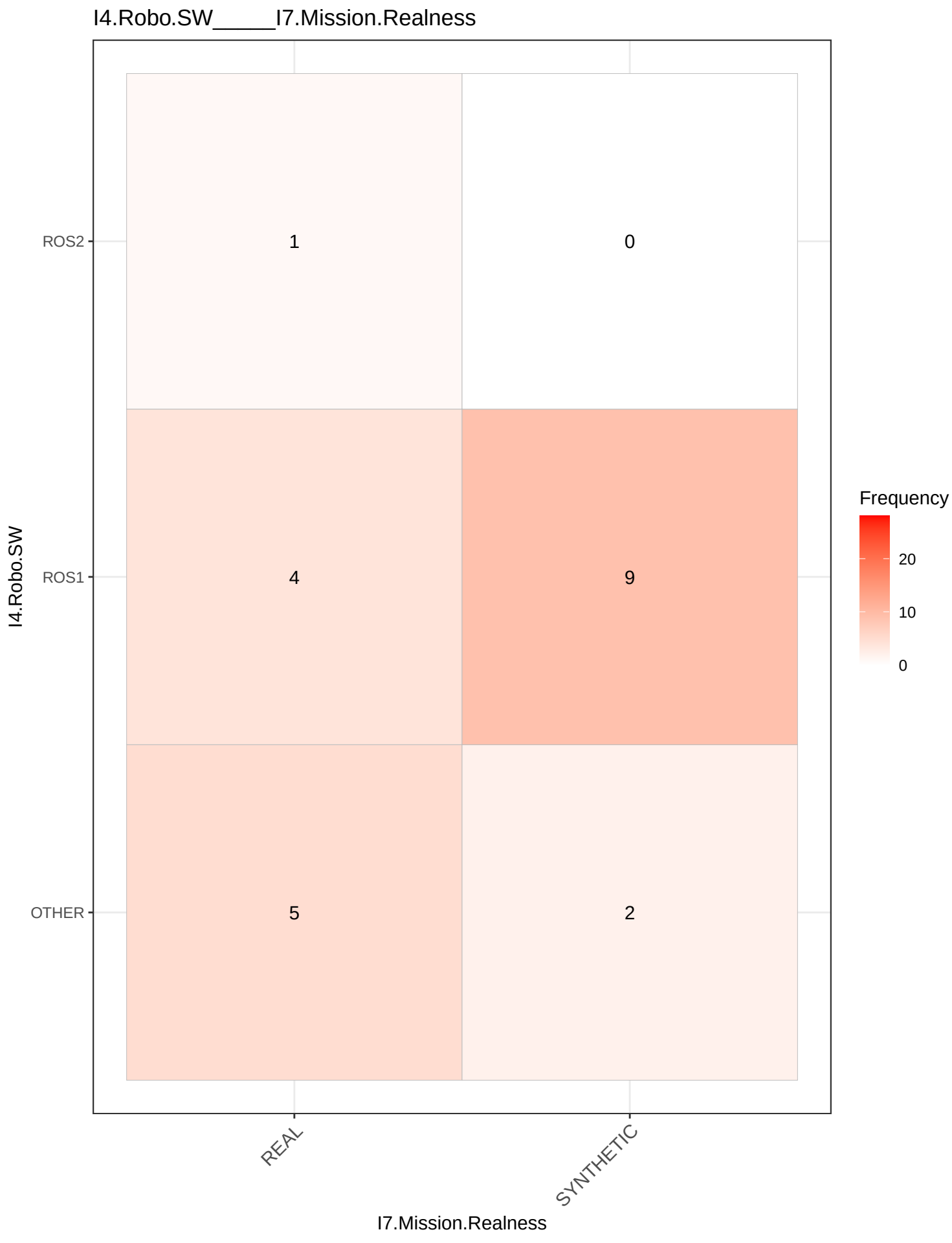

I3.Robot.Type_____I13.Execute
WHICHISANINDUSTRIALAGV 0 0 0 1 0
WAREHOUSEDELIVERYROBOT 0 0 0 1 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 0 0 1 1
TURTLEBOT 2 0 0 3 1
TRIGLIDEINDUSTRIALASSEMBLY 0 0 1 0 0
TEDUSARTERRESTRIALSEARCH 0 0 0 0 1
SINGLESERVOINGROTATIONROBOT 0 0 0 1 1
RESCUE 0 0 0 0 1
QUADROCOPTER 0 0 0 0 1
PIONEER3DX 0 0 0 0 1
NAOROBOT 0 2 0 0 0
MULTIPLEHEXROTOR 0 0 0 0 1
MSUEVORALLYMOBILETERRESTRIAL 0 0 0 1 0
MOBILESERVICEROBOT 0 1 0 1 2
MOBILEROBOTTIAGO 0 0 0 1 0
MOBILEROBOTTERRESTRIAL 0 0 0 1 1
MOBILEROBOTS 0 0 0 2 1
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 0 0 0 1
IROBOTCREATE2 0 0 0 1 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 1 0 0 1
HEXMANIPULATOR 0 0 0 1 1
HEXAII 0 0 1 0 0
HETEROGENOUSROBOTS 0 2 0 0 0
FIELDMOBILEROBOTS 0 0 0 1 1
CRAWLERTERMINATORBOT 0 0 0 0 1
BOXERCLEARPATH 0 0 0 1 0
I3.Robot.Type
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
Frequency
20
10
0
I13.Execute

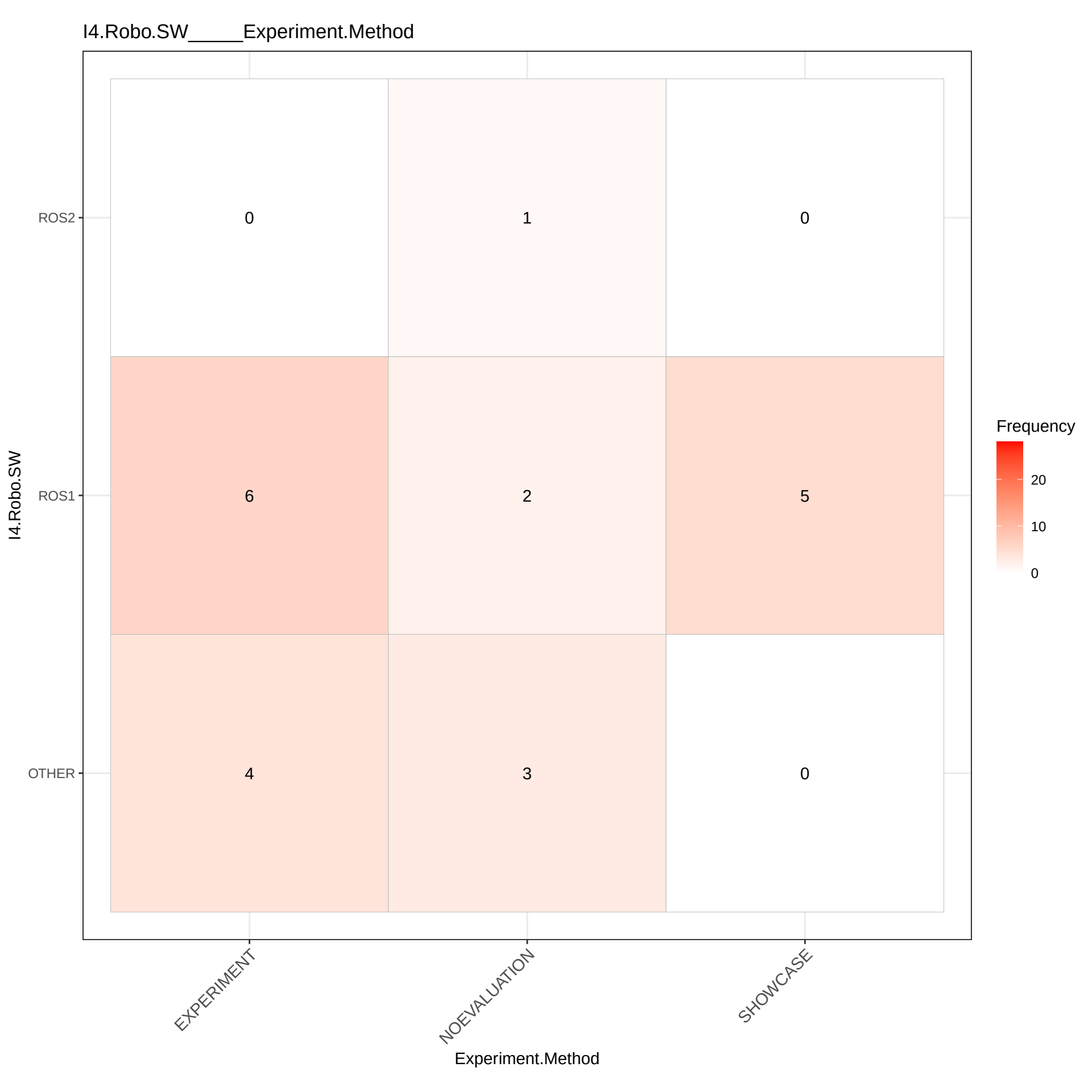

I3.Robot.Type_____I14.Knowledge
WHICHISANINDUSTRIALAGV 0 0 0 1 0 0
WAREHOUSEDELIVERYROBOT 0 1 0 0 0 0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION 0 0 0 0 0 1
TURTLEBOT 0 2 0 0 2 0
TRIGLIDEINDUSTRIALASSEMBLY 0 1 0 0 0 0
TEDUSARTERRESTRIALSEARCH 0 1 0 0 0 0
SINGLESERVOINGROTATIONROBOT 0 1 0 0 0 0
RESCUE 0 1 0 0 0 0
QUADROCOPTER 0 0 0 1 0 0
PIONEER3DX 0 1 0 0 0 0
NAOROBOT 0 2 0 0 0 0
MULTIPLEHEXROTOR 0 1 0 0 0 0
MSUEVORALLYMOBILETERRESTRIAL 0 1 0 0 0 0
MOBILESERVICEROBOT 0 0 1 1 0 0
MOBILEROBOTTIAGO 0 0 1 0 0 0
MOBILEROBOTTERRESTRIAL 0 0 0 0 0 1
MOBILEROBOTS 0 1 0 0 0 1
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR 0 0 1 0 0 0
IROBOTCREATE2 1 0 0 0 0 0
INFOTAINMENTROBOTMOBILESERVICEROBOT 0 0 0 1 0 0
HEXMANIPULATOR 0 2 0 0 0 0
HEXAII 0 1 0 0 0 0
HETEROGENOUSROBOTS 0 0 0 2 0 0
FIELDMOBILEROBOTS 0 1 0 0 0 0
CRAWLERTERMINATORBOT 0 1 0 0 0 0
BOXERCLEARPATH 0 0 0 1 0 0
I3.Robot.Type
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

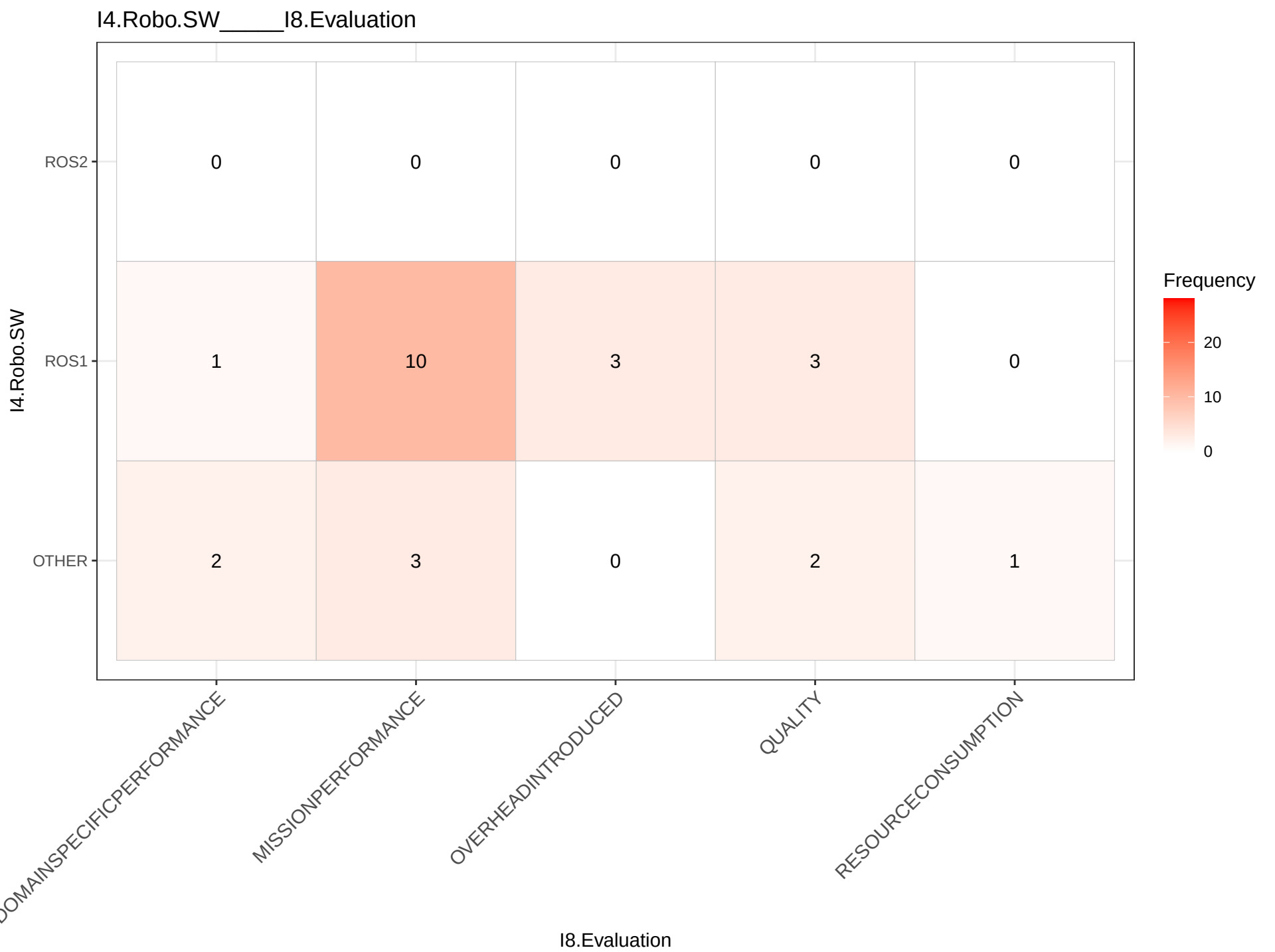

I4.Robo.SW_____I5.QA
ROS2
ROS1
OTHER
I4.Robo.SW
0
1
0
1
0
1
8
8
5
0
5
6
4
1
1
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY
I5.QA
Frequency
20
10
0


I4.Robo.SW_____I6.Independence
ROS2
ROS1
OTHER
1
0
0
6
0
7
0
2
5
I4.Robo.SW
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I4.Robo.SW_____I7.Deployment.Realness
ROS2
ROS1
OTHER
I4.Robo.SW
0
1
7
5
4
2
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
0


I4.Robo.SW_____I7.Mission.Realness
ROS2
ROS1
OTHER
I4.Robo.SW
1
0
4
9
5
2
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
0


I4.Robo.SW_____Experiment.Method
ROS2
ROS1
OTHER
I4.Robo.SW
0
1
0
6
2
5
4
3
0
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I4.Robo.SW_____I8.Evaluation
ROS2
ROS1
OTHER
I4.Robo.SW
0
0
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0
0
1
10
3
3
0
2
3
0
2
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Frequency
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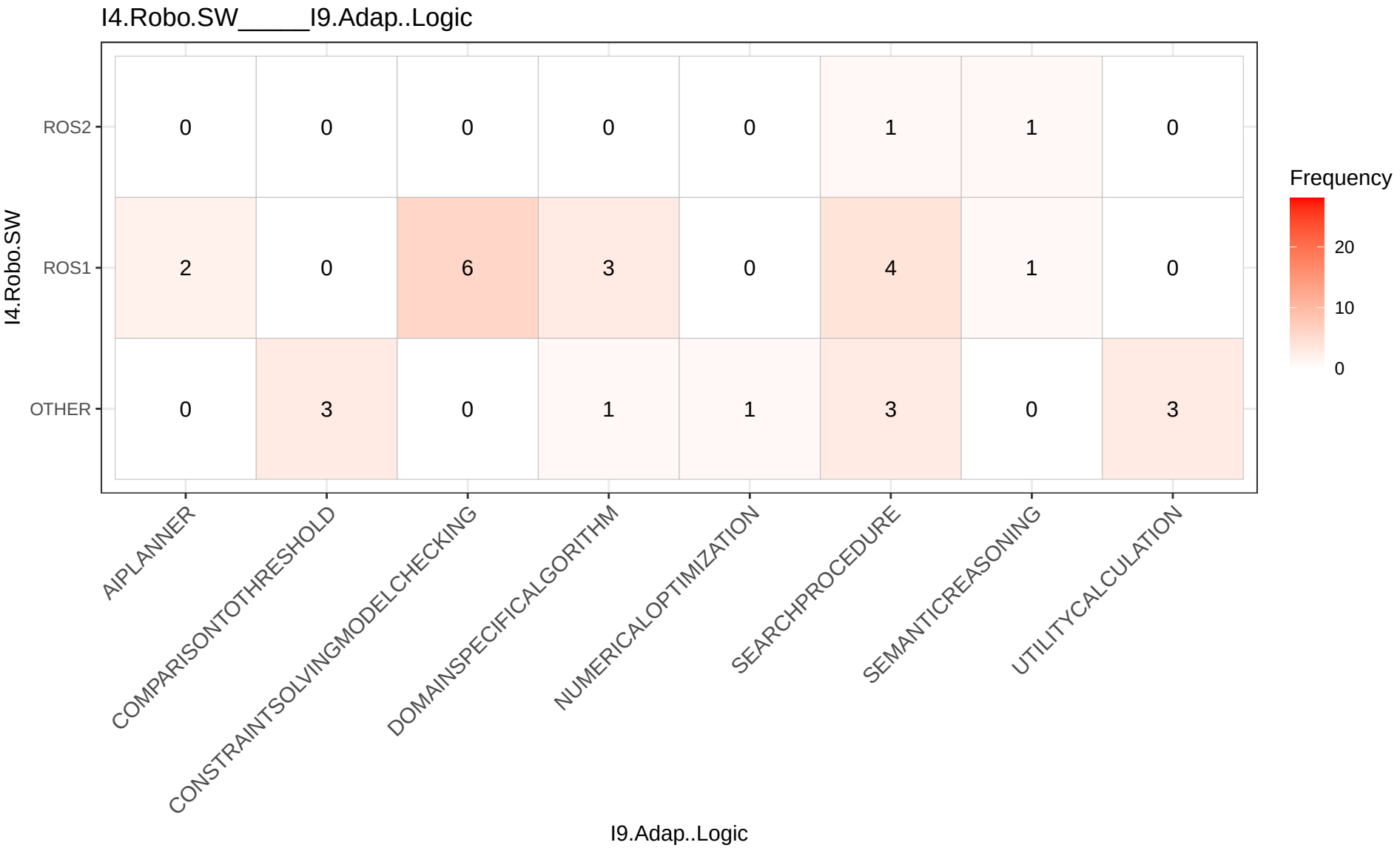
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation


I4.Robo.SW_____I9.Adap..Logic
ROS2
ROS1
OTHER
I4.Robo.SW
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2 0 6 3 0 4 1 0
0 3 0 1 1 3 0 3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
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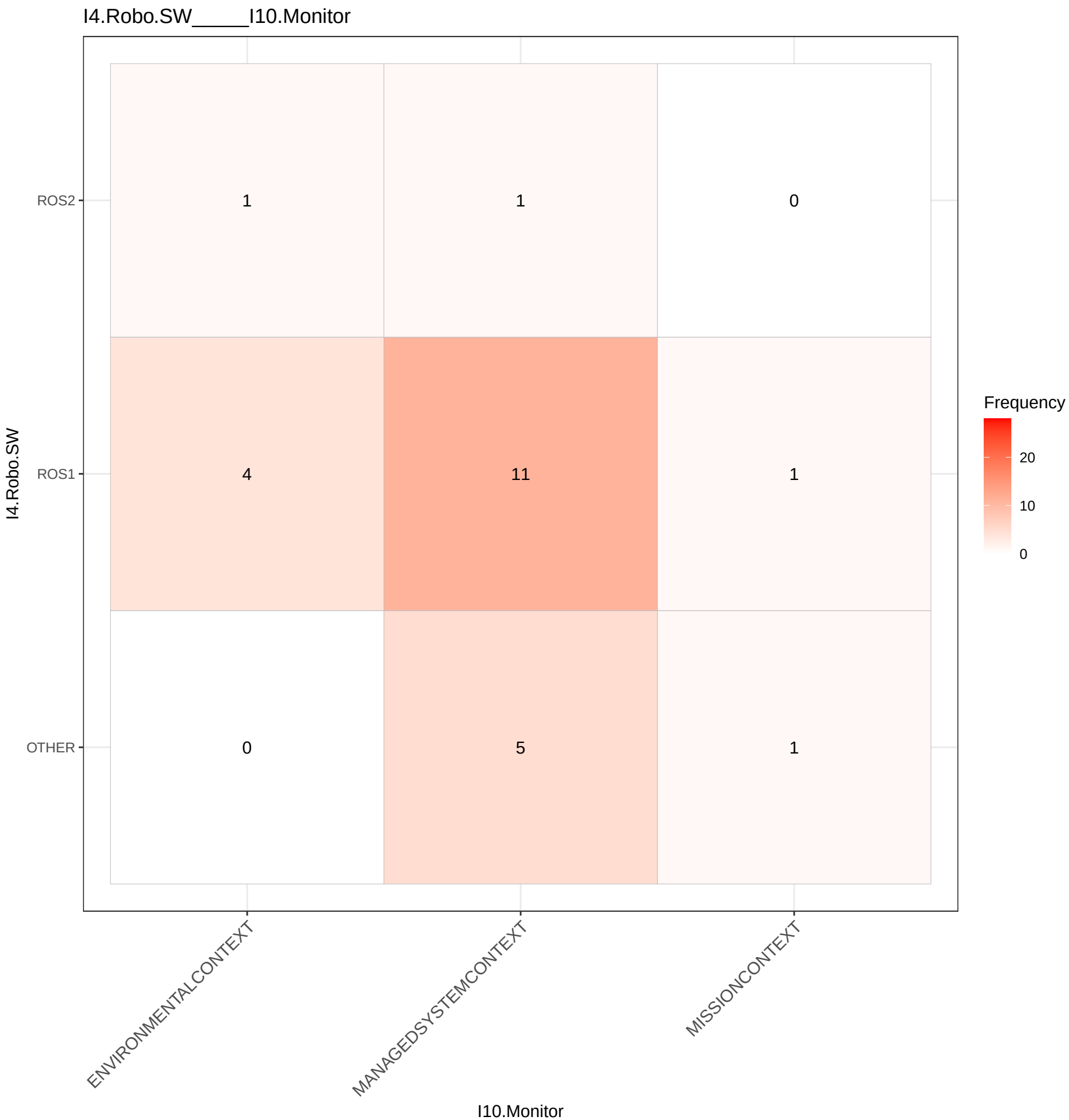
I4.Robo.SW_____I10.Monitor
ROS2
ROS1
OTHER
1
1
0
4
11
1
0
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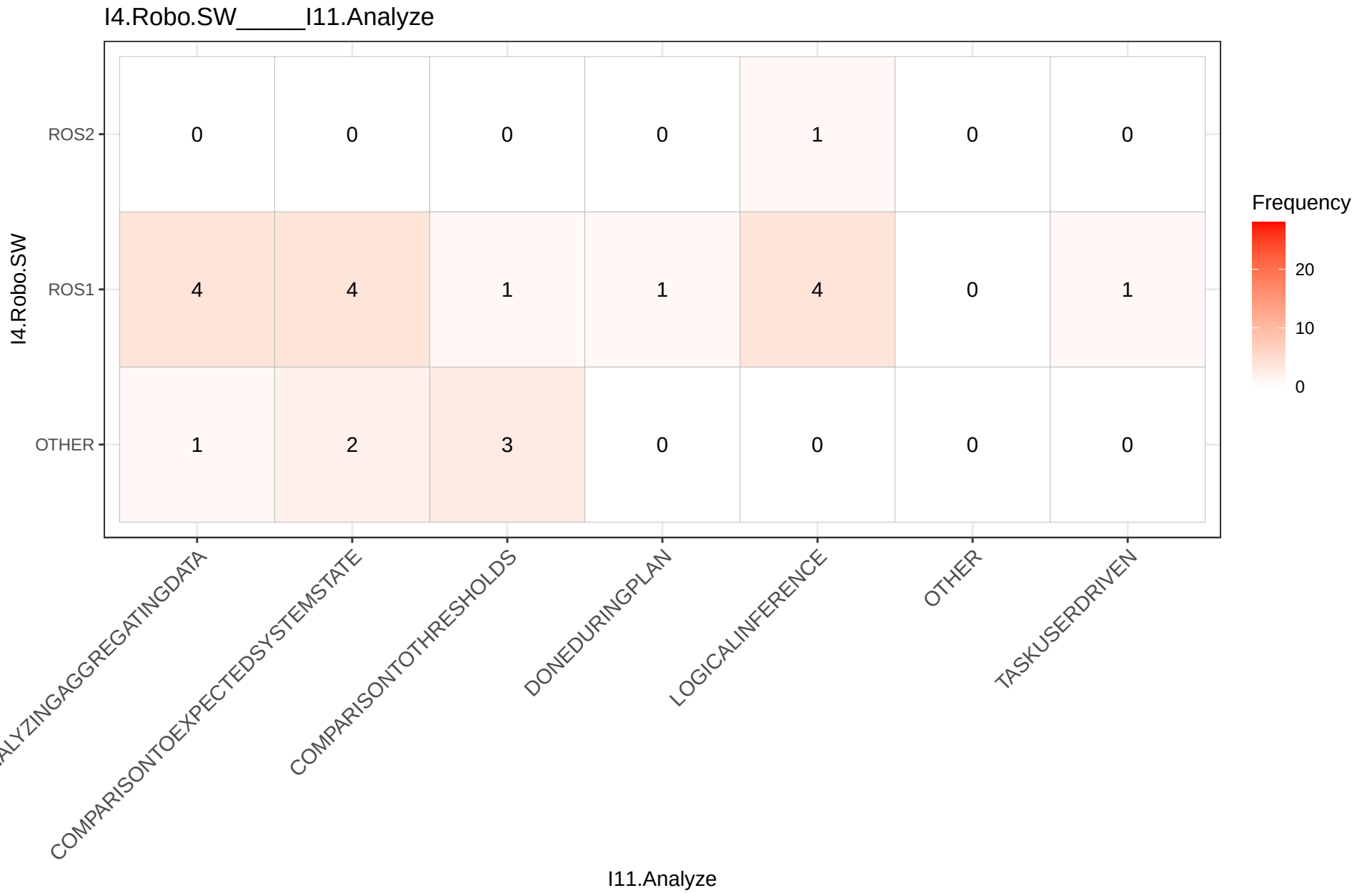
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I4.Robo.SW
I10.Monitor
Frequency
20
10
0


I4.Robo.SW_____I11.Analyze
ROS2
ROS1
OTHER
I4.Robo.SW
0 0 0 0 1 0 0
4 4 1 1 4 0 1
1 2 3 0 0 0 0
ALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
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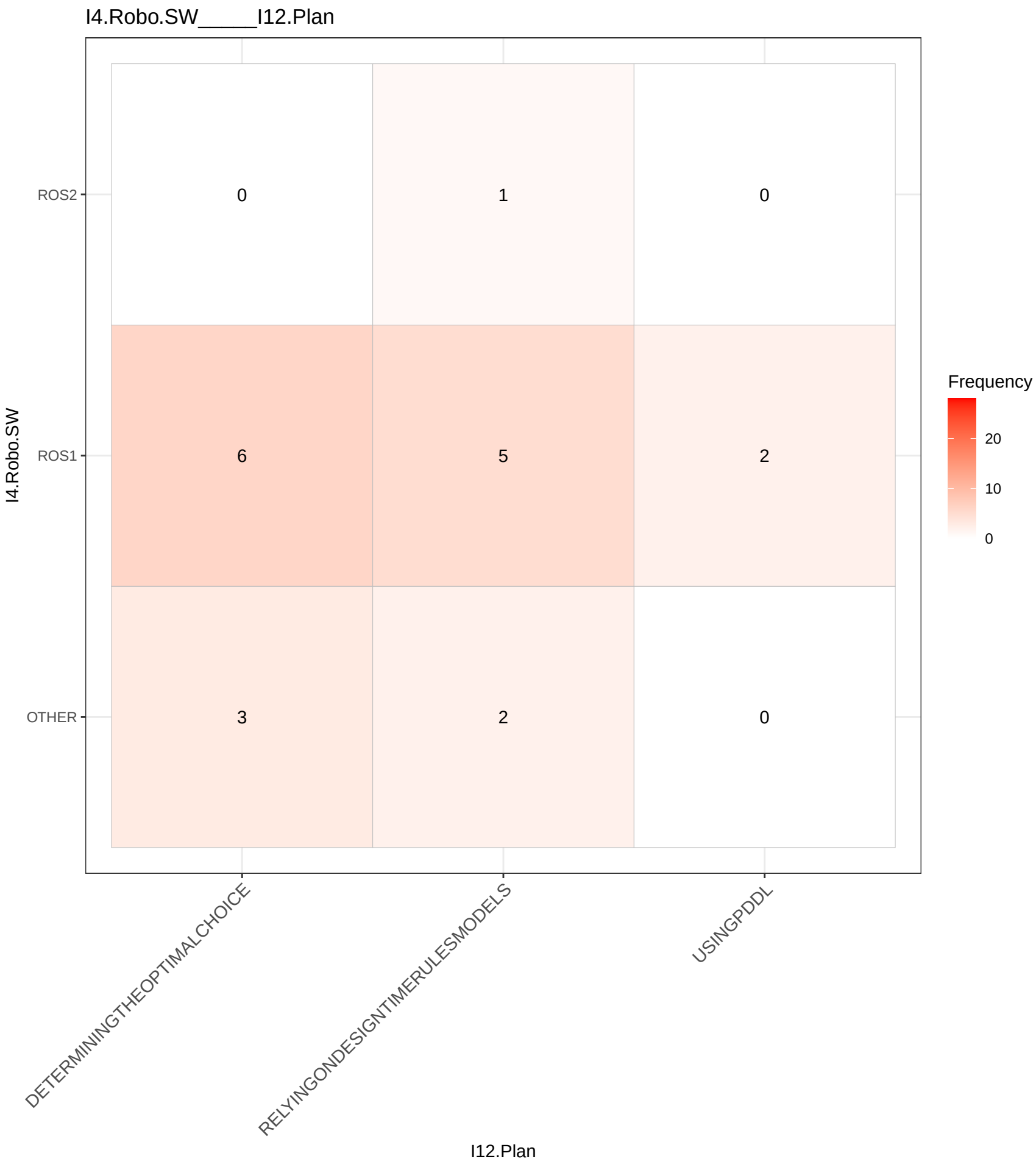
I4.Robo.SW_____I12.Plan
ROS2
ROS1
OTHER
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5
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3
2
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Frequency
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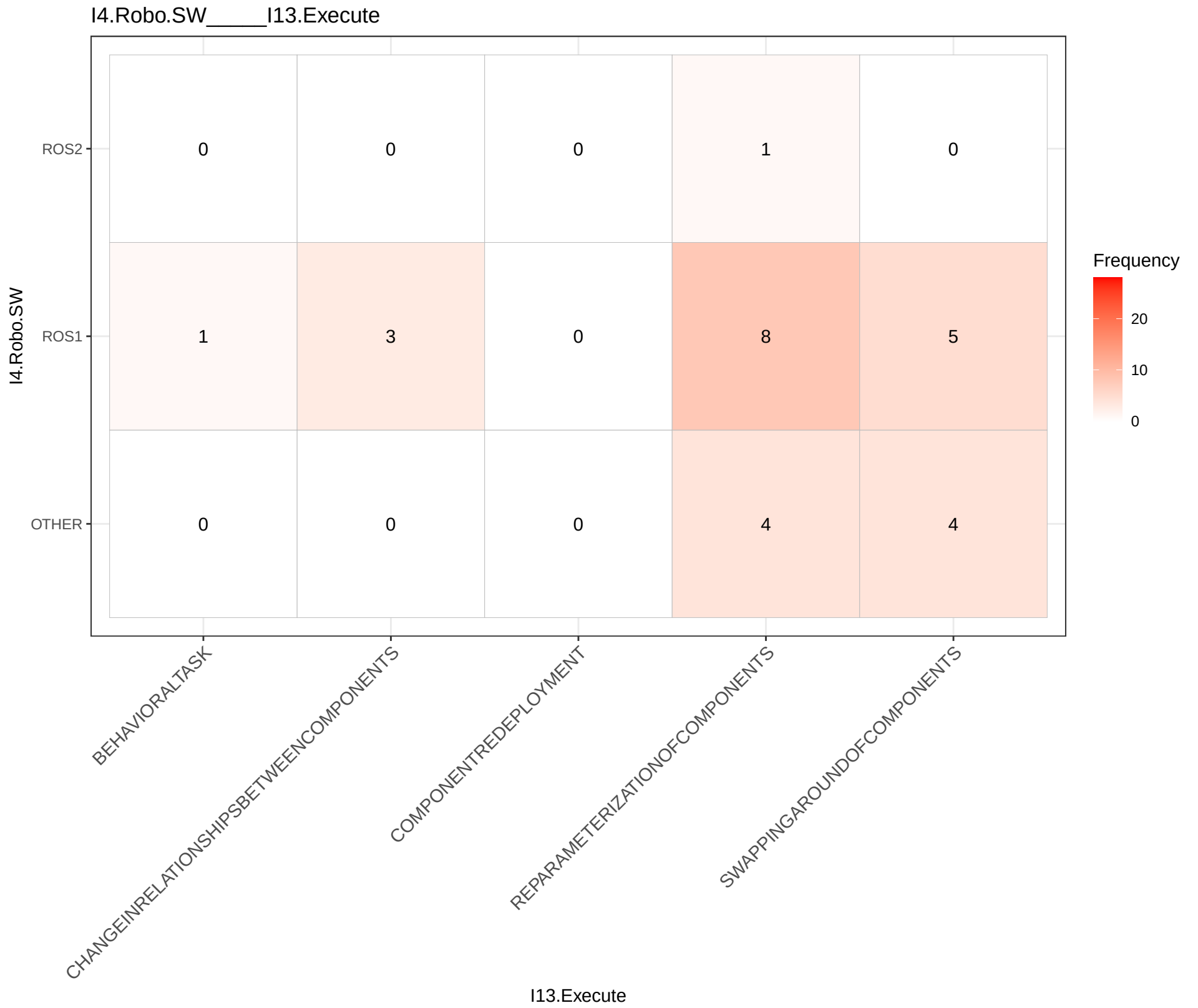
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan


I4.Robo.SW_____I13.Execute
ROS2
ROS1
OTHER
I4.Robo.SW
0
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1
0
1
3
0
8
5
0
0
0
4
4
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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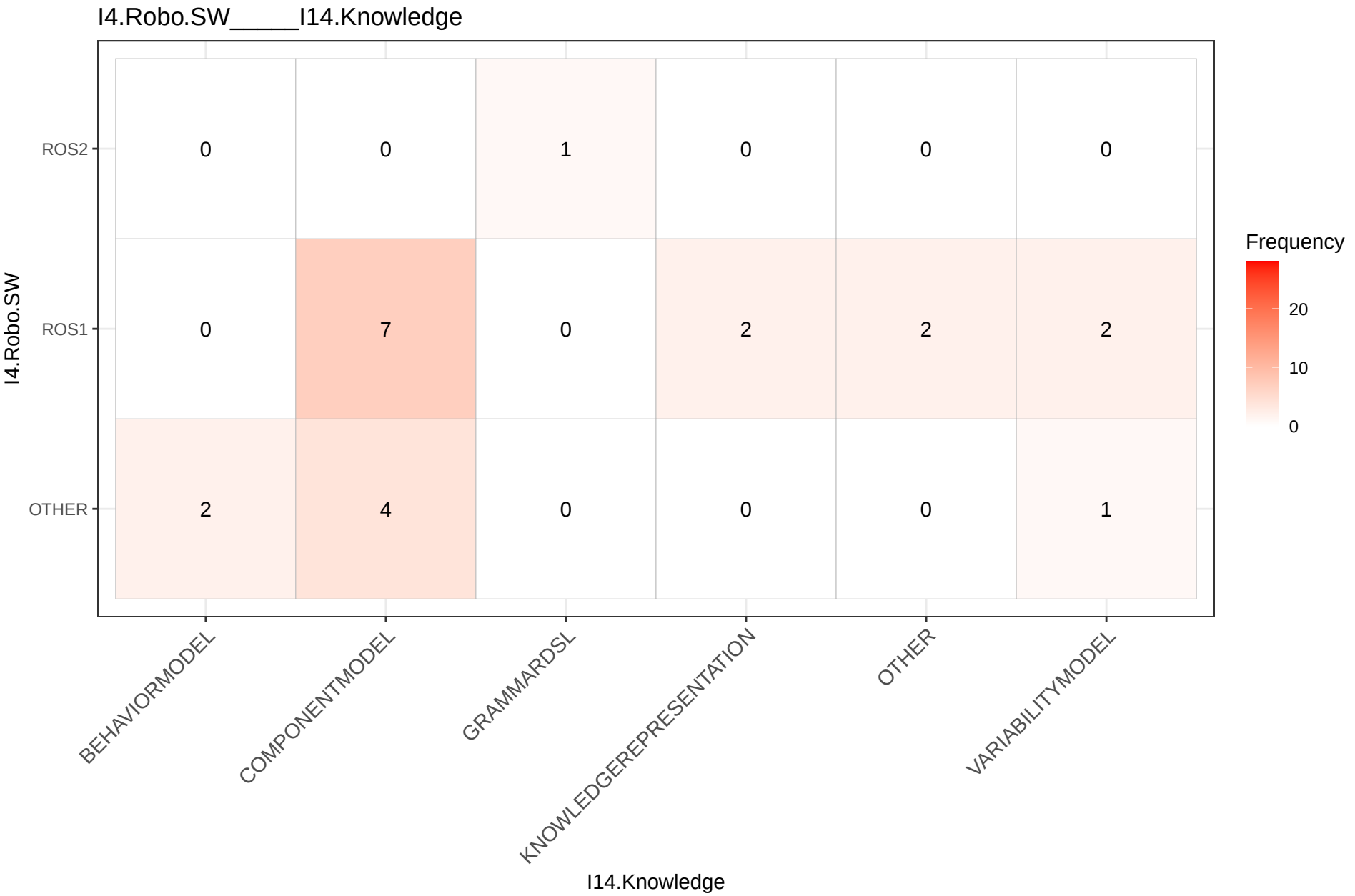
I4.Robo.SW_____I14.Knowledge
ROS2
ROS1
OTHER
I4.Robo.SW
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7
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2
2
2
2
4
0
0
0
1
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
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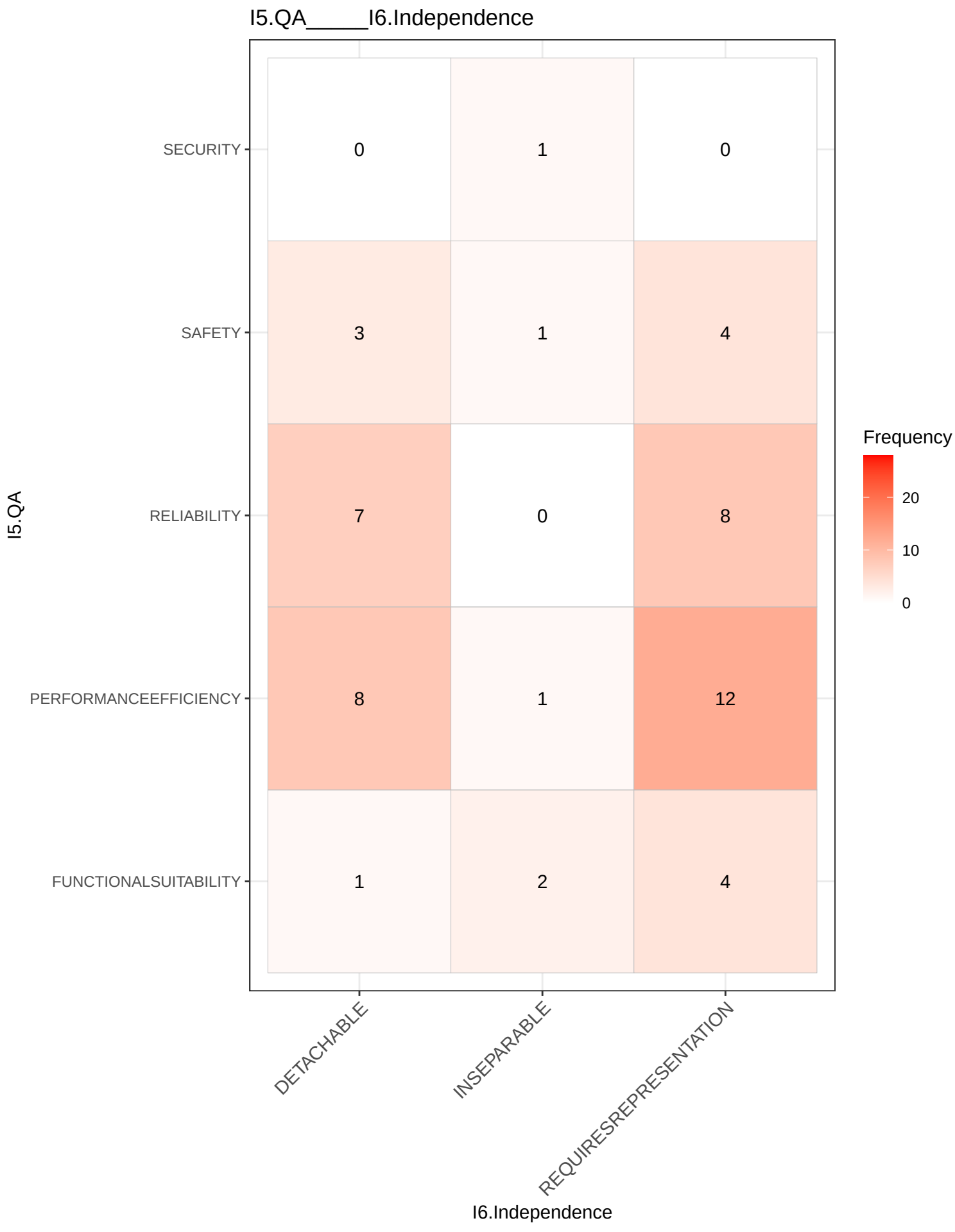
I5.QA_____I6.Independence
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
0
1
0
3
1
4
7
0
8
8
1
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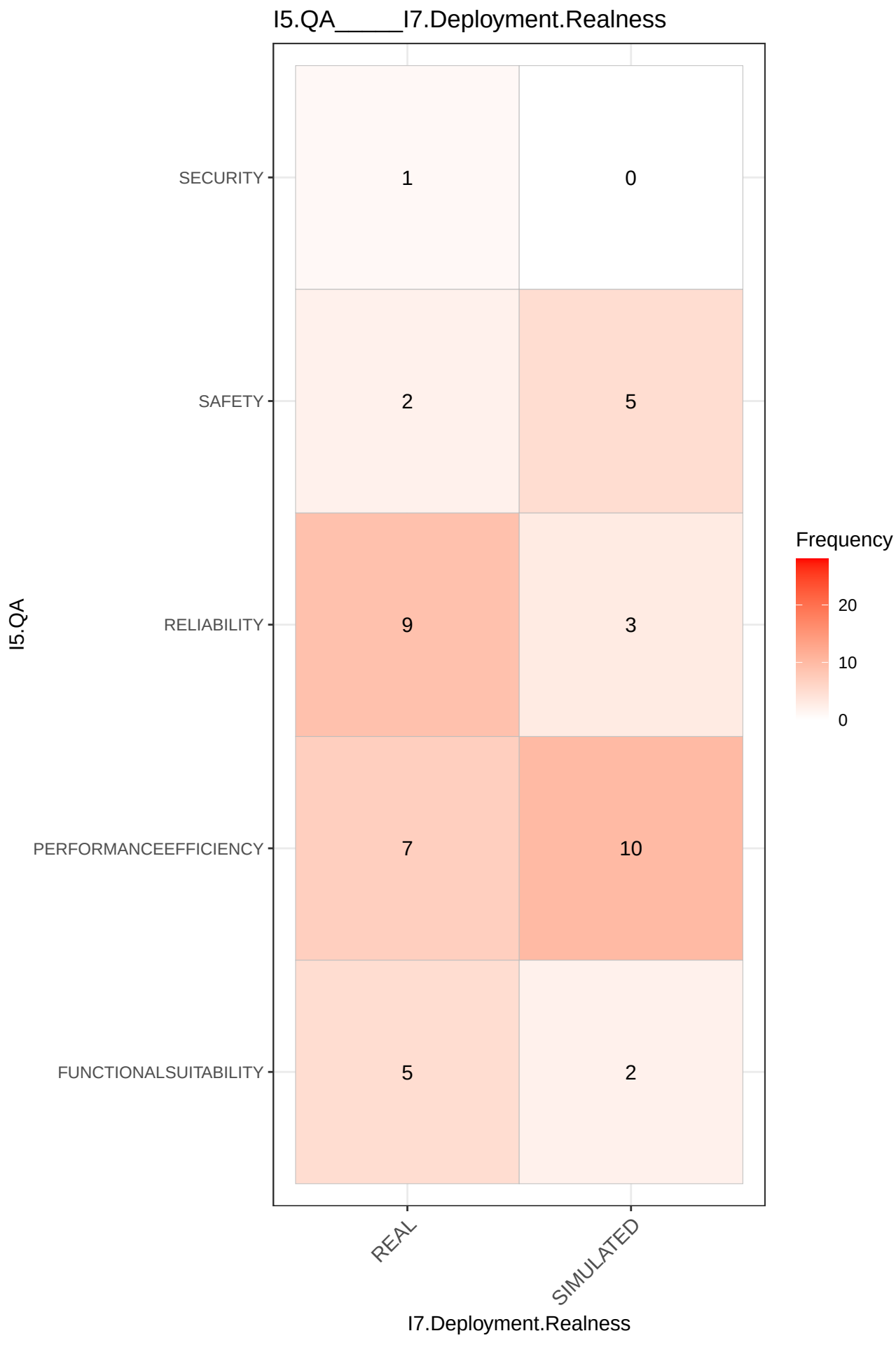
1
2
4
DETACHABLE
INSEPARABLE
REQUIRESREPRESENTATION
I6.Independence
Frequency
20
10
0


I5.QA_____I7.Deployment.Realness
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
1
0
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9
3
7
10
5
2
REAL
SIMULATED
I7.Deployment.Realness
Frequency
20
10
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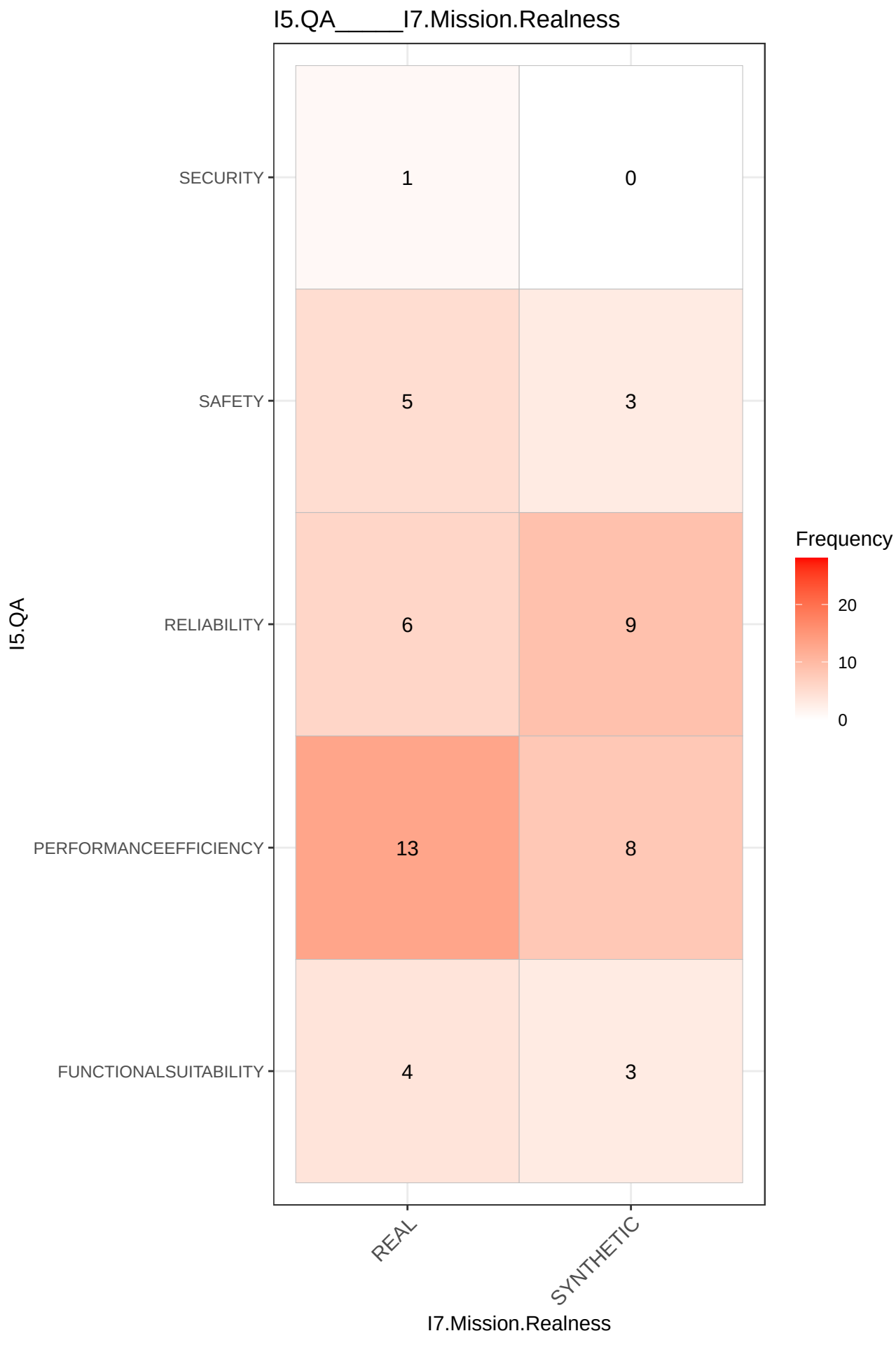
I5.QA_____I7.Mission.Realness
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
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13
8
4
3
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
10
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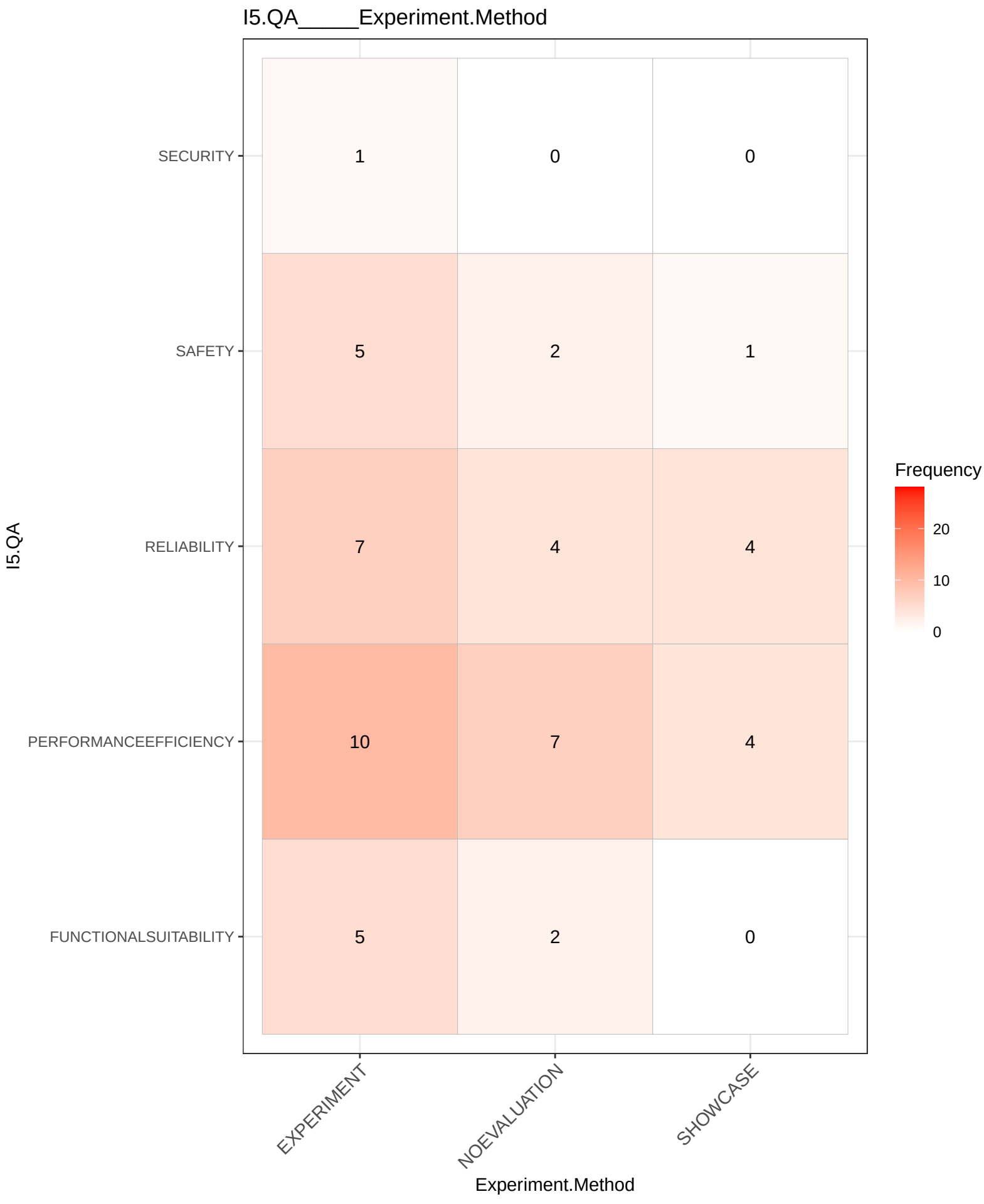
I5.QA_____Experiment.Method
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
1
0
0
5
2
1
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4
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4
5
2
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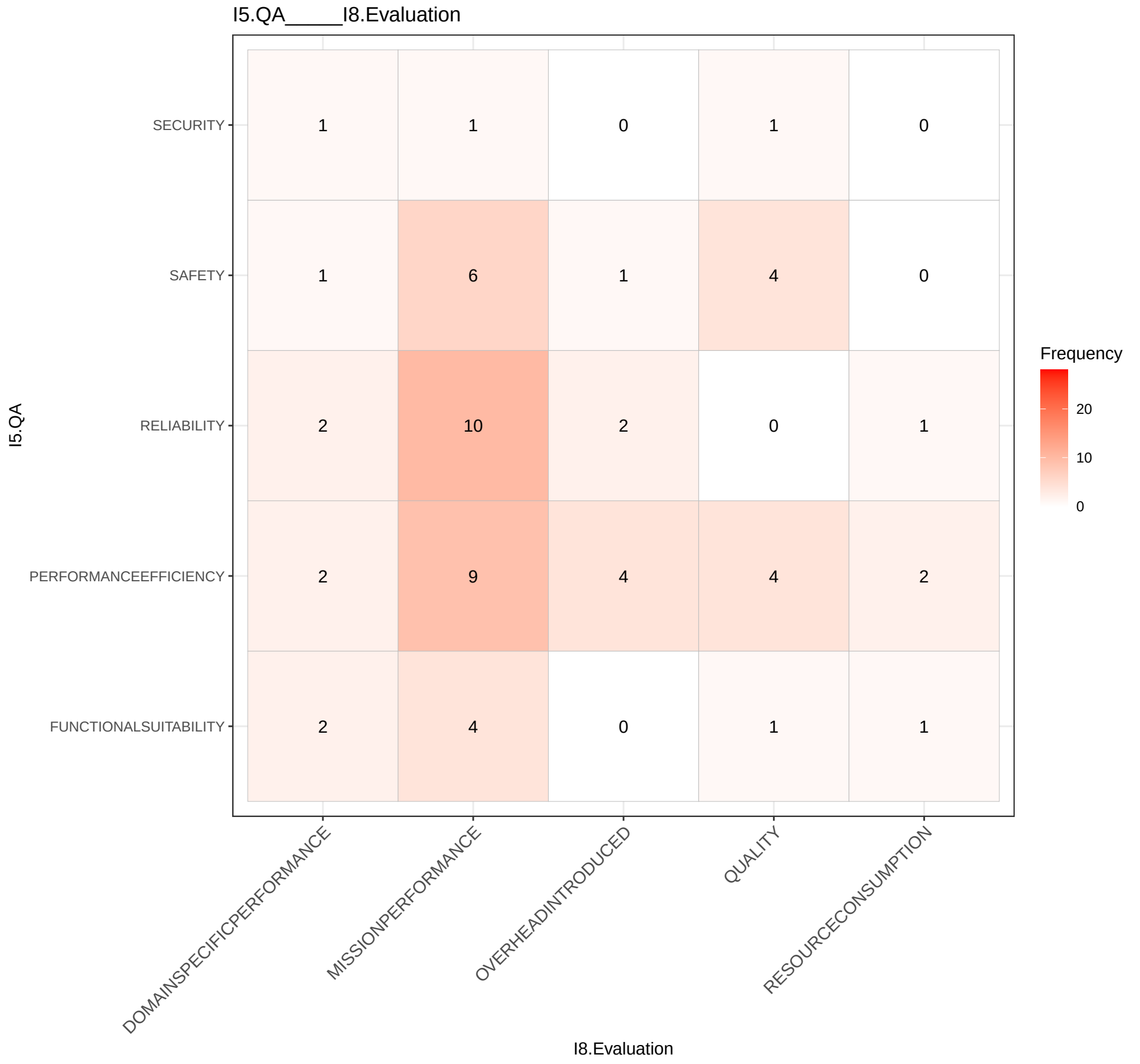
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
0


I5.QA_____I8.Evaluation
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
1 1 0 1 0
1 6 1 4 0
2 10 2 0 1
2 9 4 4 2
2 4 0 1 1
DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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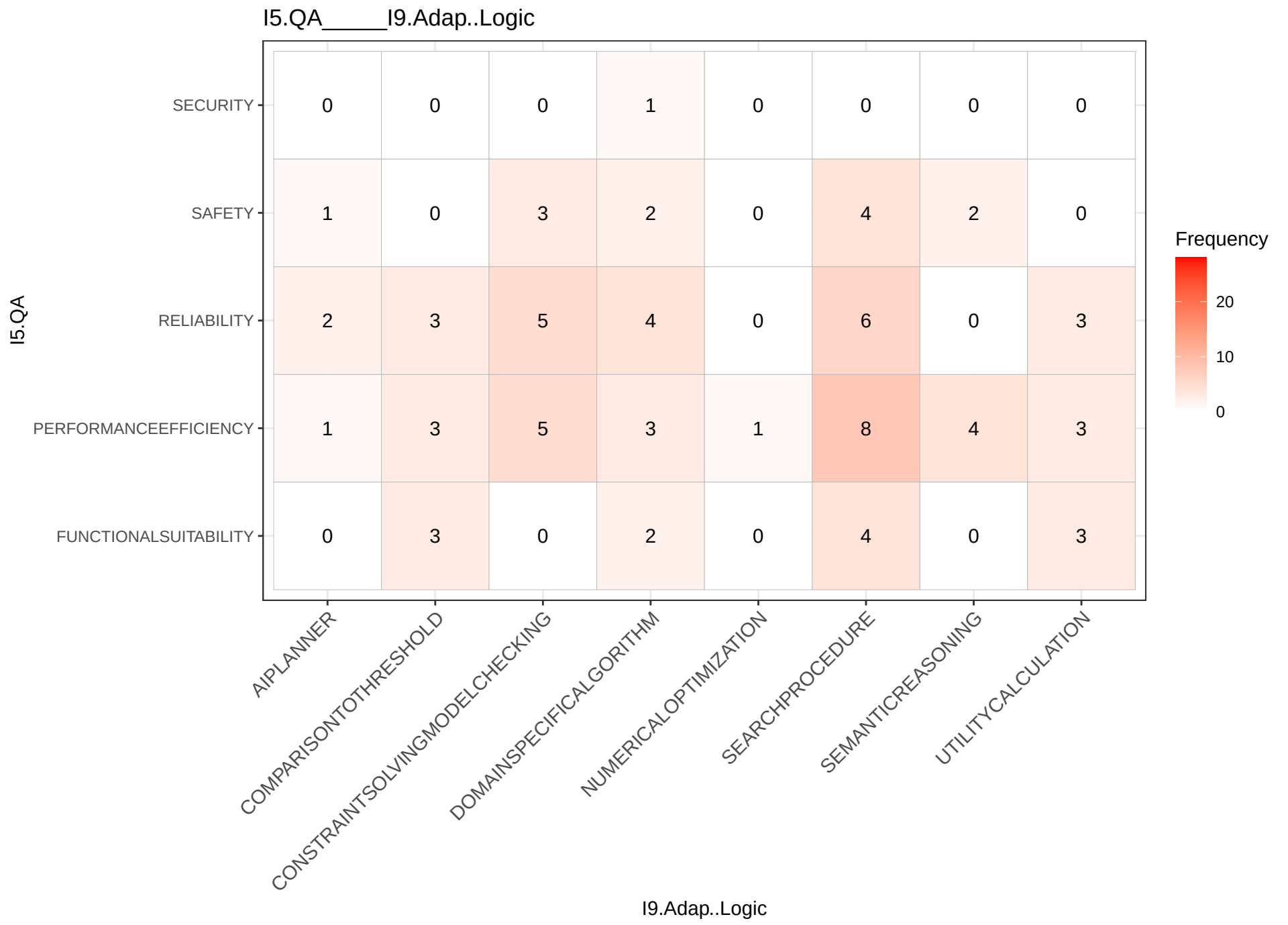
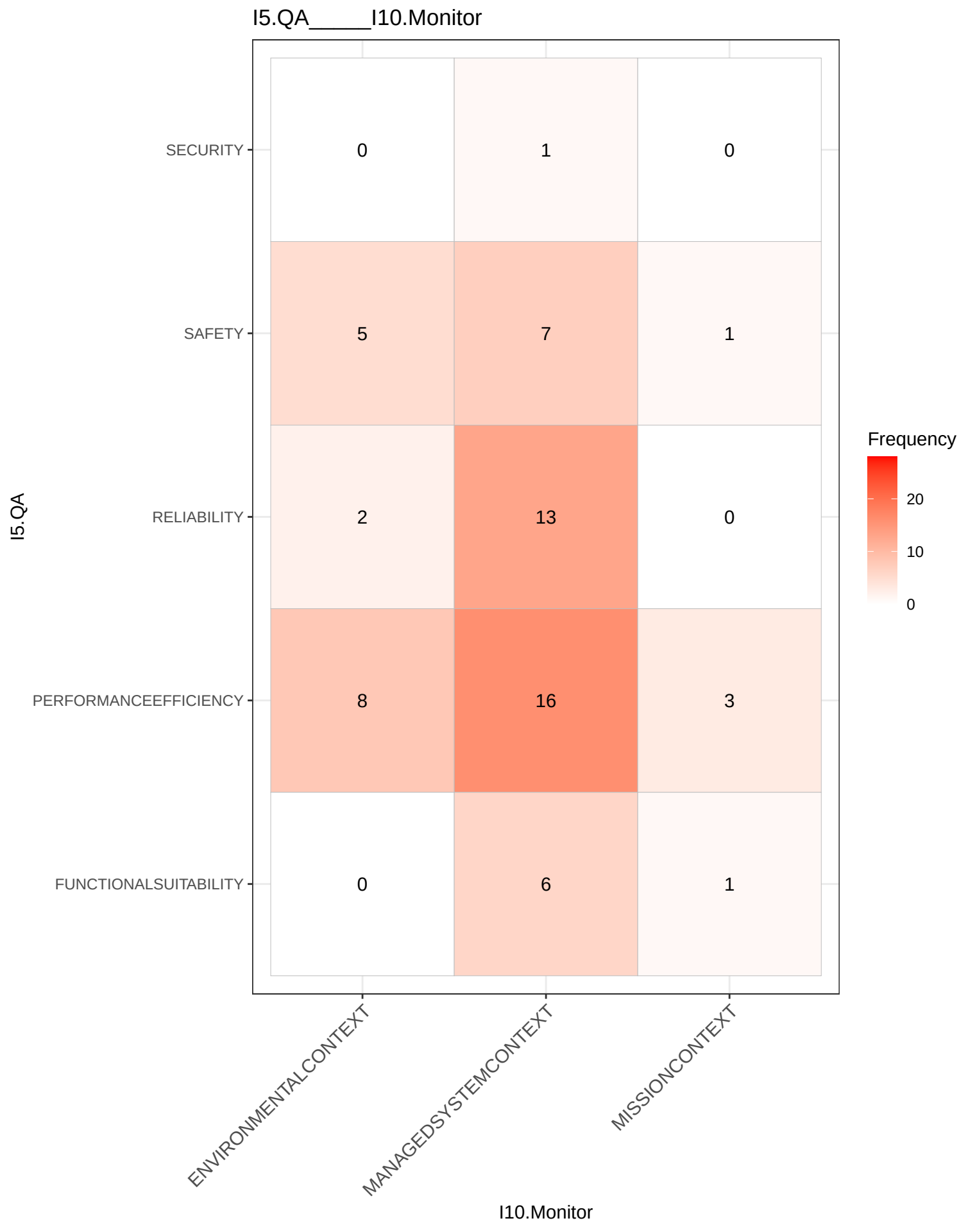

I5.QA_____I9.Adap..Logic
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
0 0 0 1 0 0 0 0
1 0 3 2 0 4 2 0
2 3 5 4 0 6 0 3
1 3 5 3 1 8 4 3
0 3 0 2 0 4 0 3
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
10
0


I5.QA_____I10.Monitor
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
0
1
0
5
7
1
2
13
0
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1
Frequency
20
10
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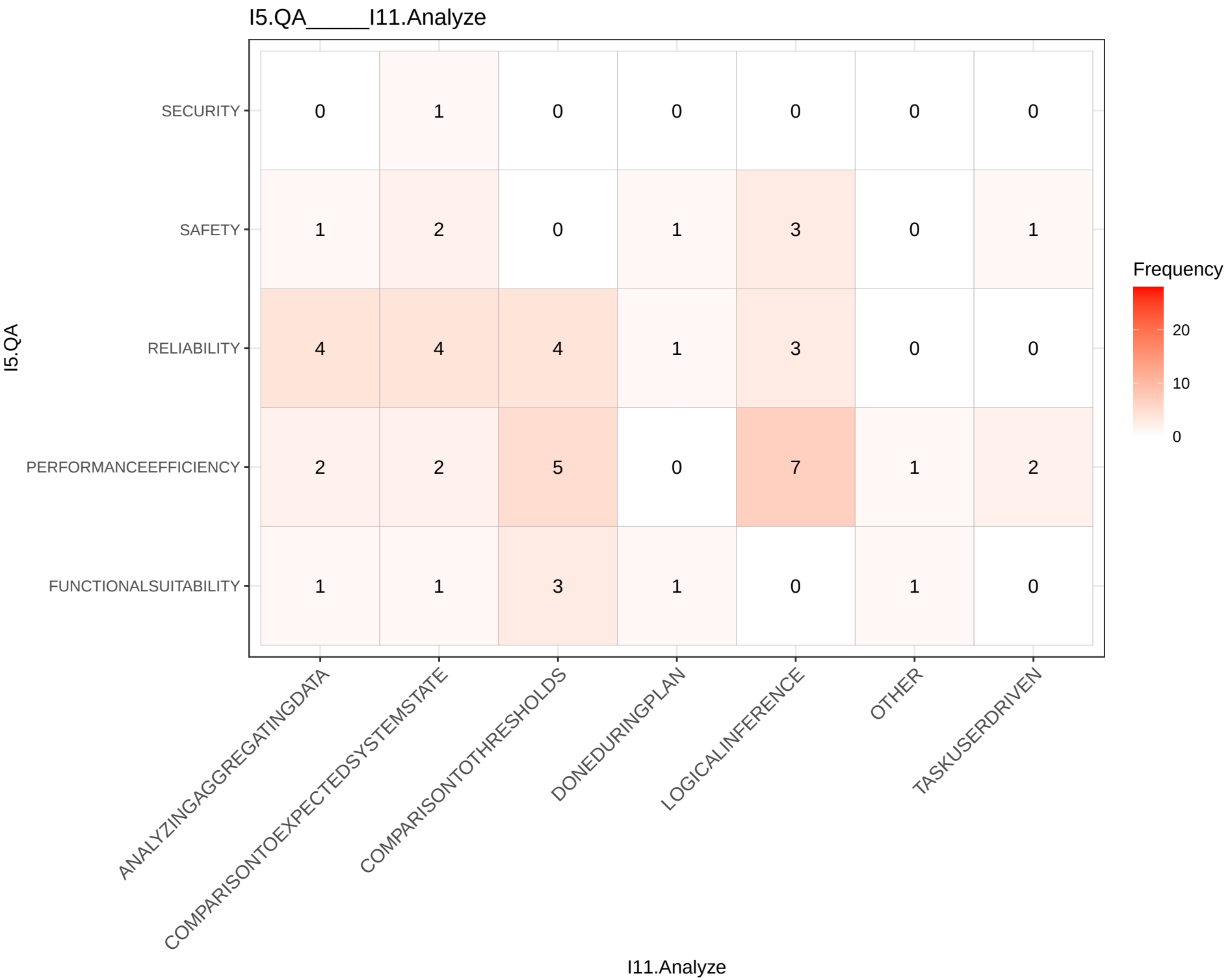
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor


I5.QA_____I11.Analyze
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
0 1 0 0 0 0 0
1 2 0 1 3 0 1
4 4 4 1 3 0 0
2 2 5 0 7 1 2
1 1 3 1 0 1 0
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
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10
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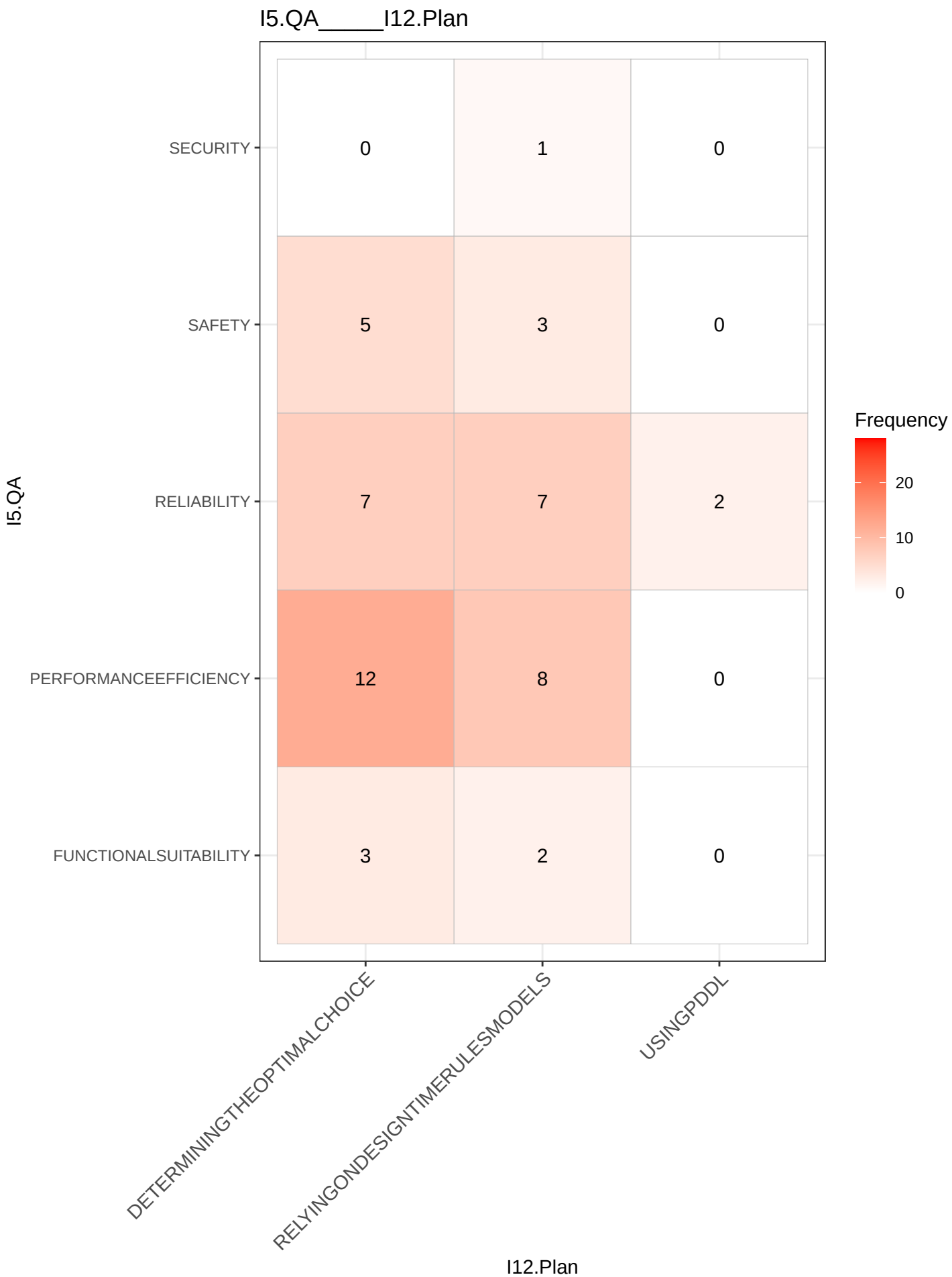
I5.QA_____I12.Plan
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
0
1
0
5
3
0
7
7
2
12
8
0
3
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Frequency
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10
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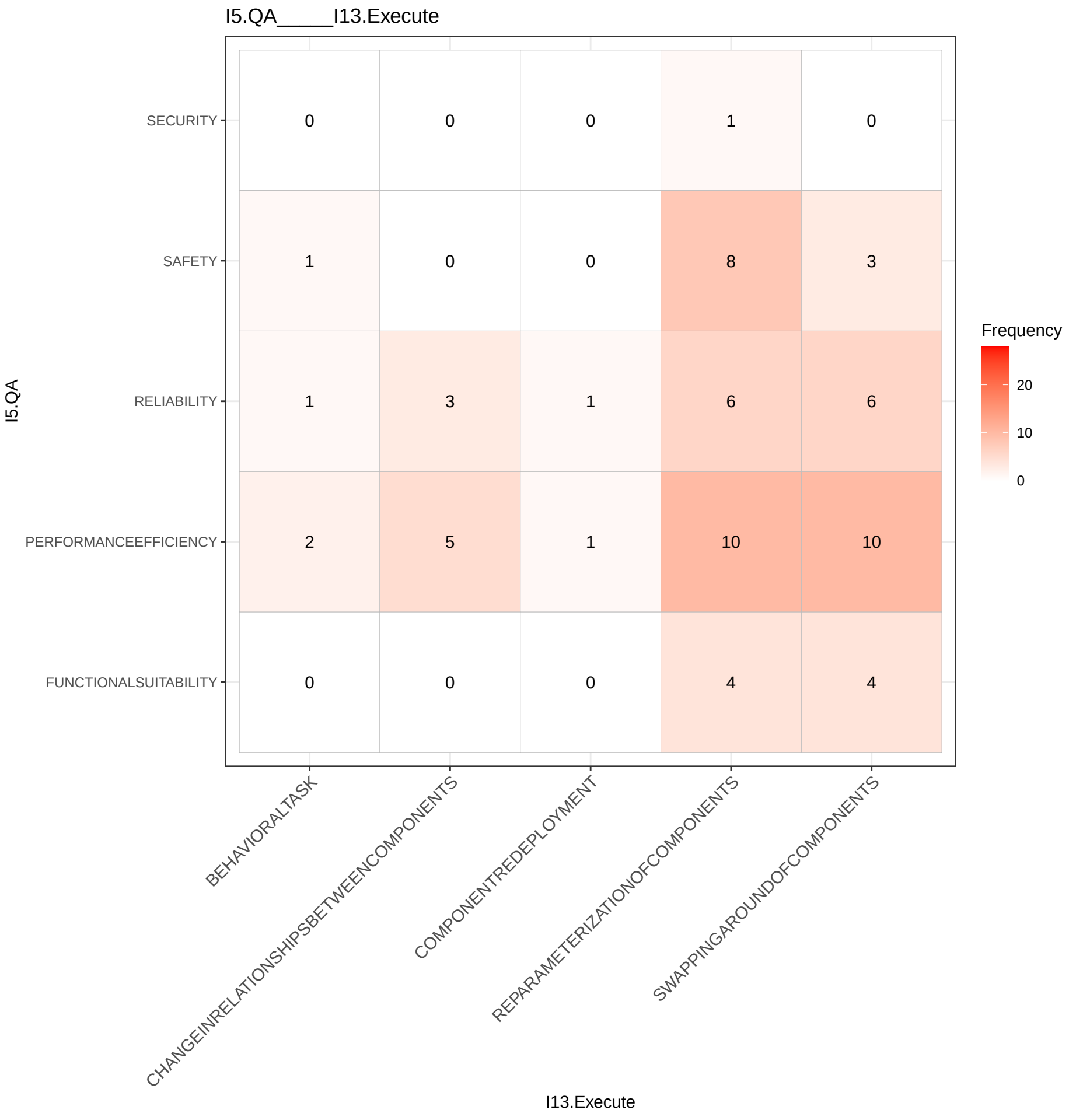
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan


I5.QA_____I13.Execute
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
0 0 0 1 0
1 0 0 8 3
1 3 1 6 6
2 5 1 10 10
0 0 0 4 4
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
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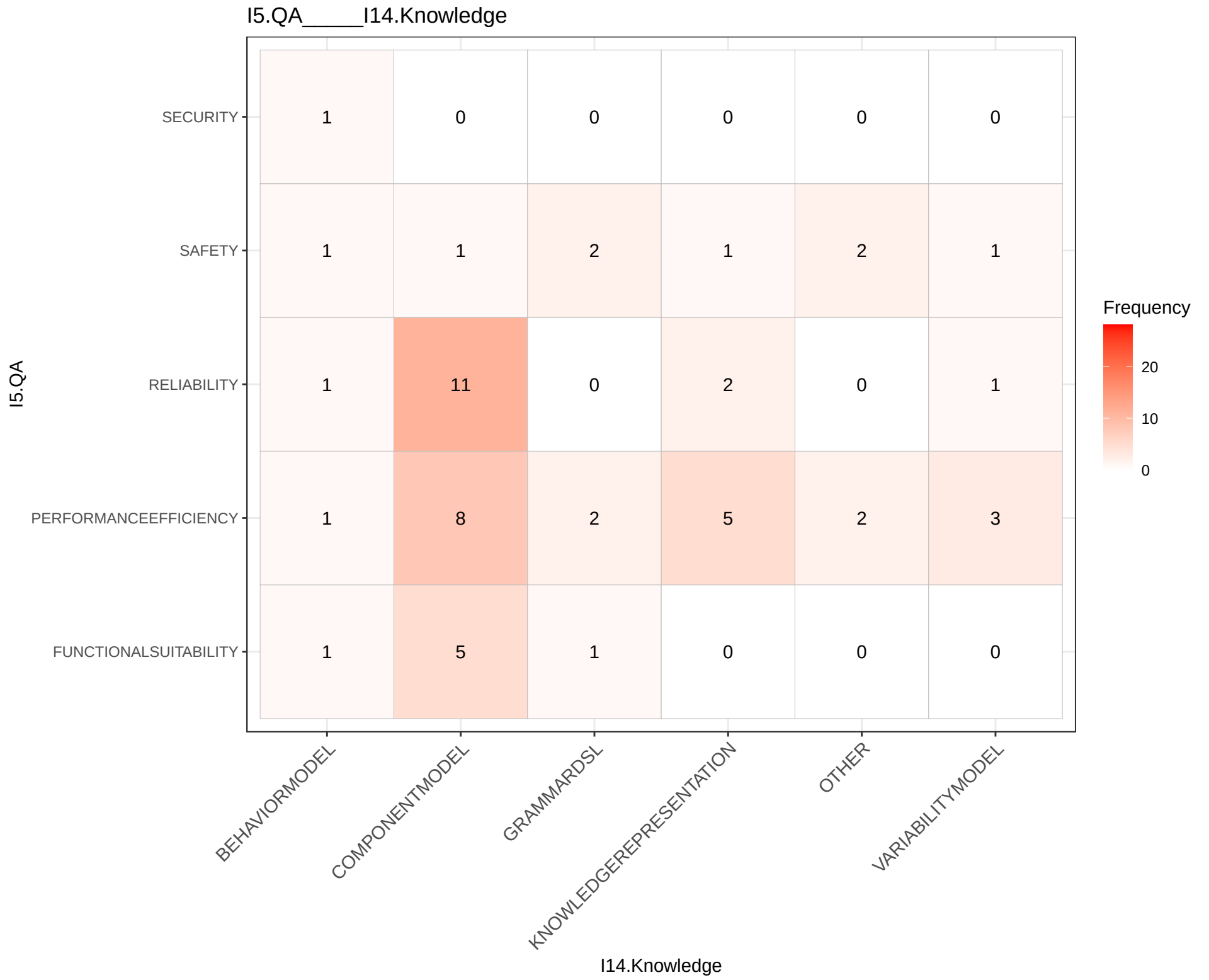
I5.QA_____I14.Knowledge
SECURITY
SAFETY
RELIABILITY
PERFORMANCEEFFICIENCY
FUNCTIONALSUITABILITY
I5.QA
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1 1 2 1 2 1
1 11 0 2 0 1
1 8 2 5 2 3
1 5 1 0 0 0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
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10
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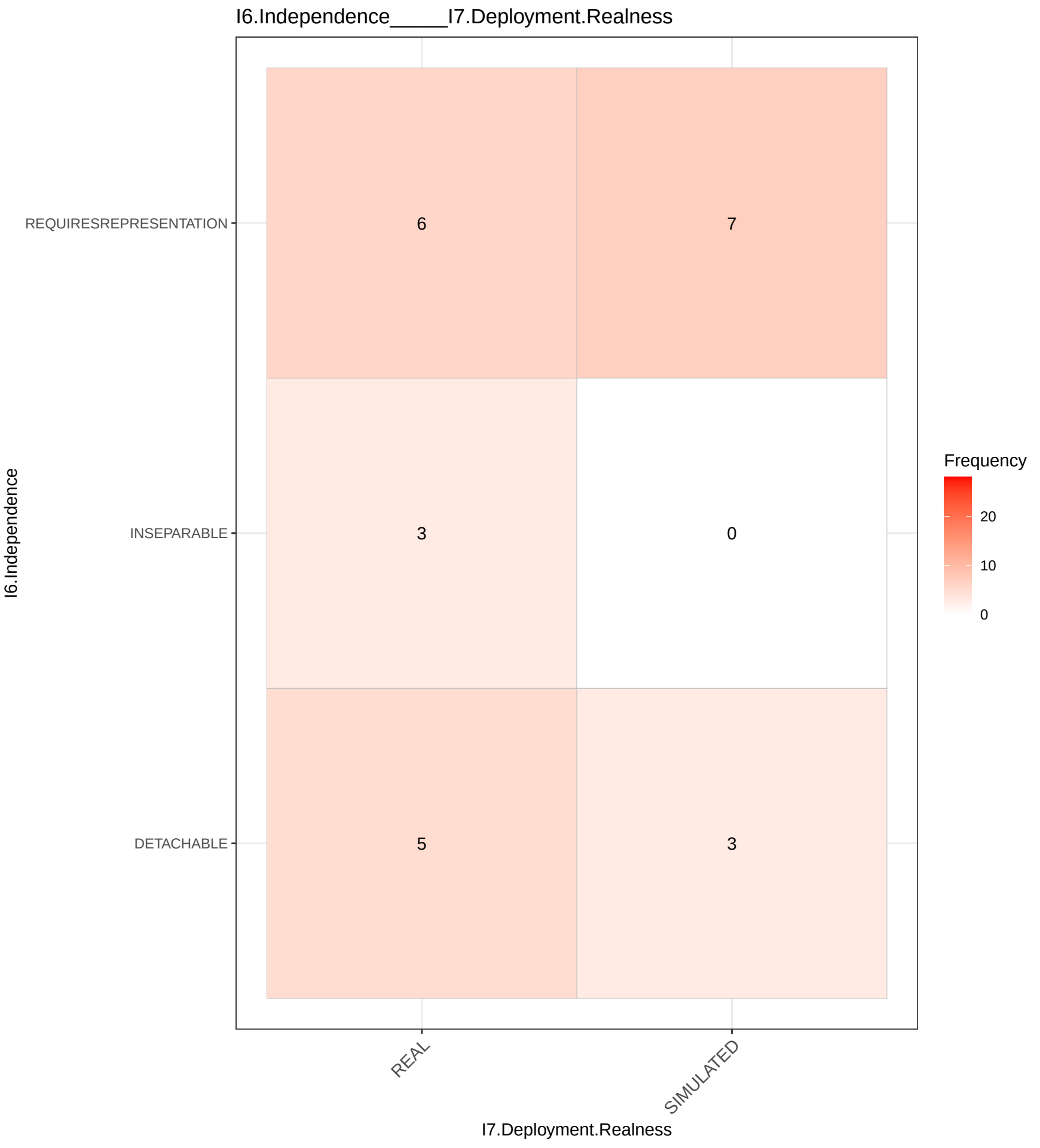
I6.Independence_____I7.Deployment.Realness
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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REAL
SIMULATED
I7.Deployment.Realness
Frequency
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10
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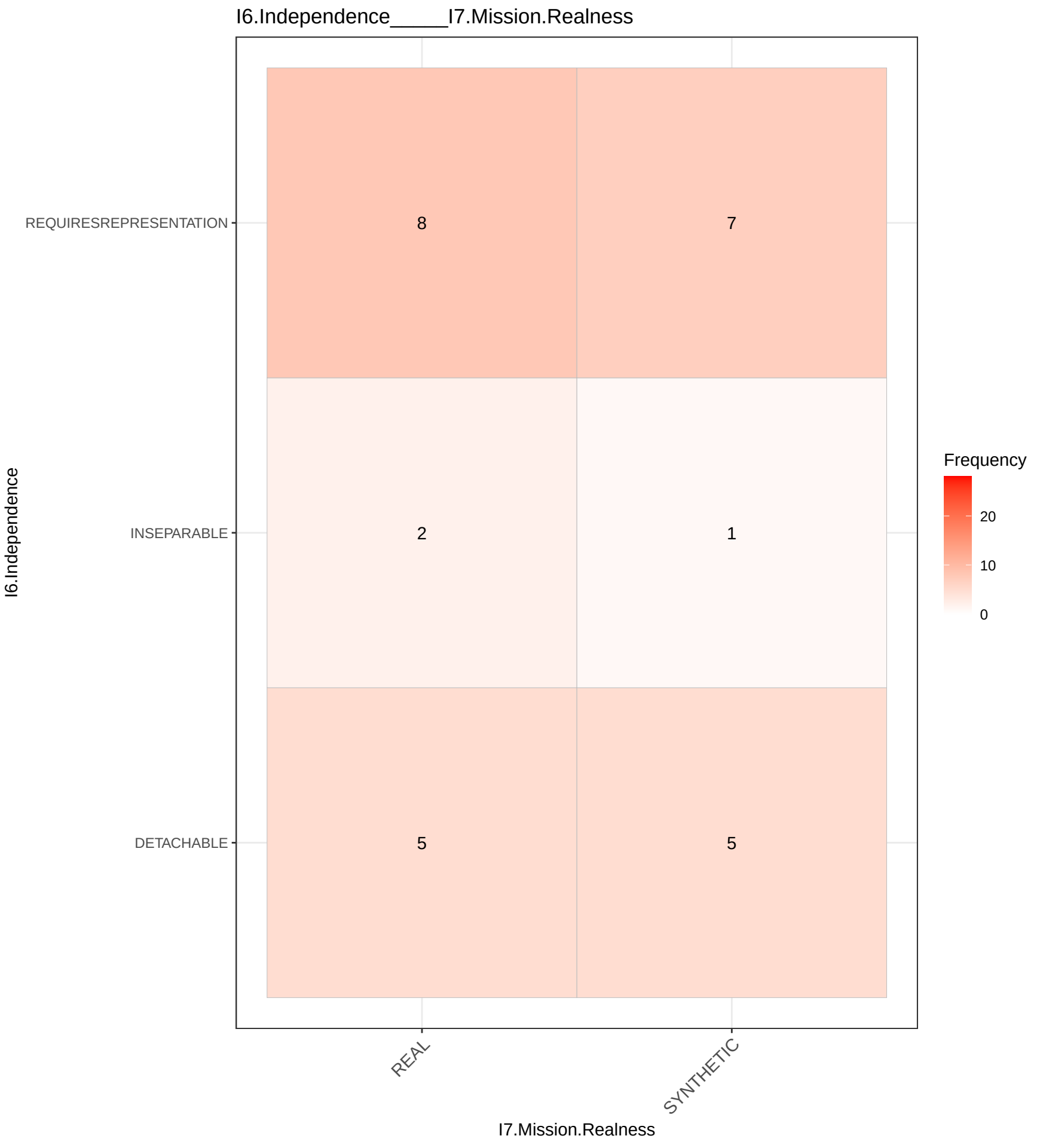
I6.Independence_____I7.Mission.Realness
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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REAL
SYNTHETIC
I7.Mission.Realness
Frequency
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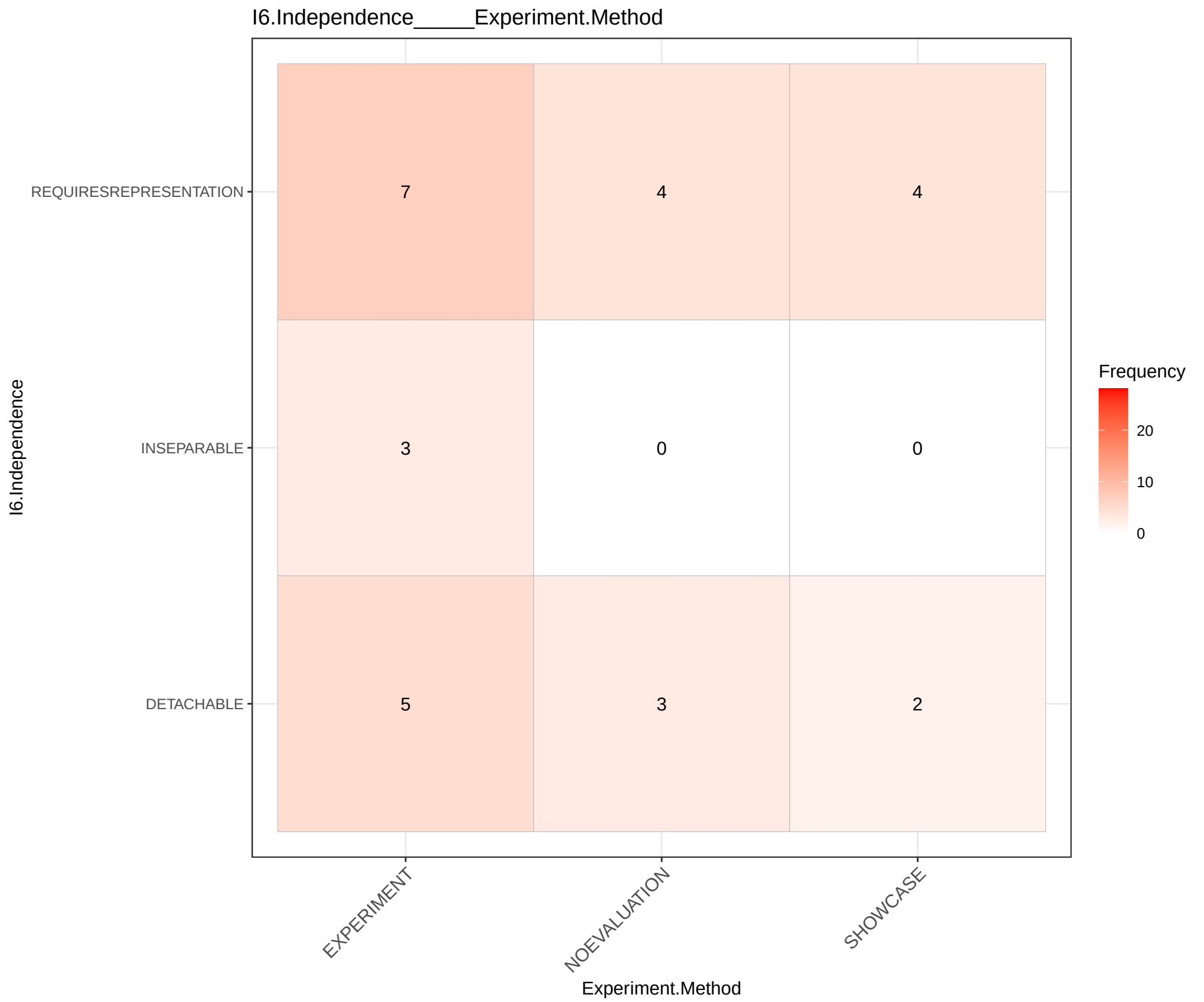
I6.Independence_____Experiment.Method
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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2
Frequency
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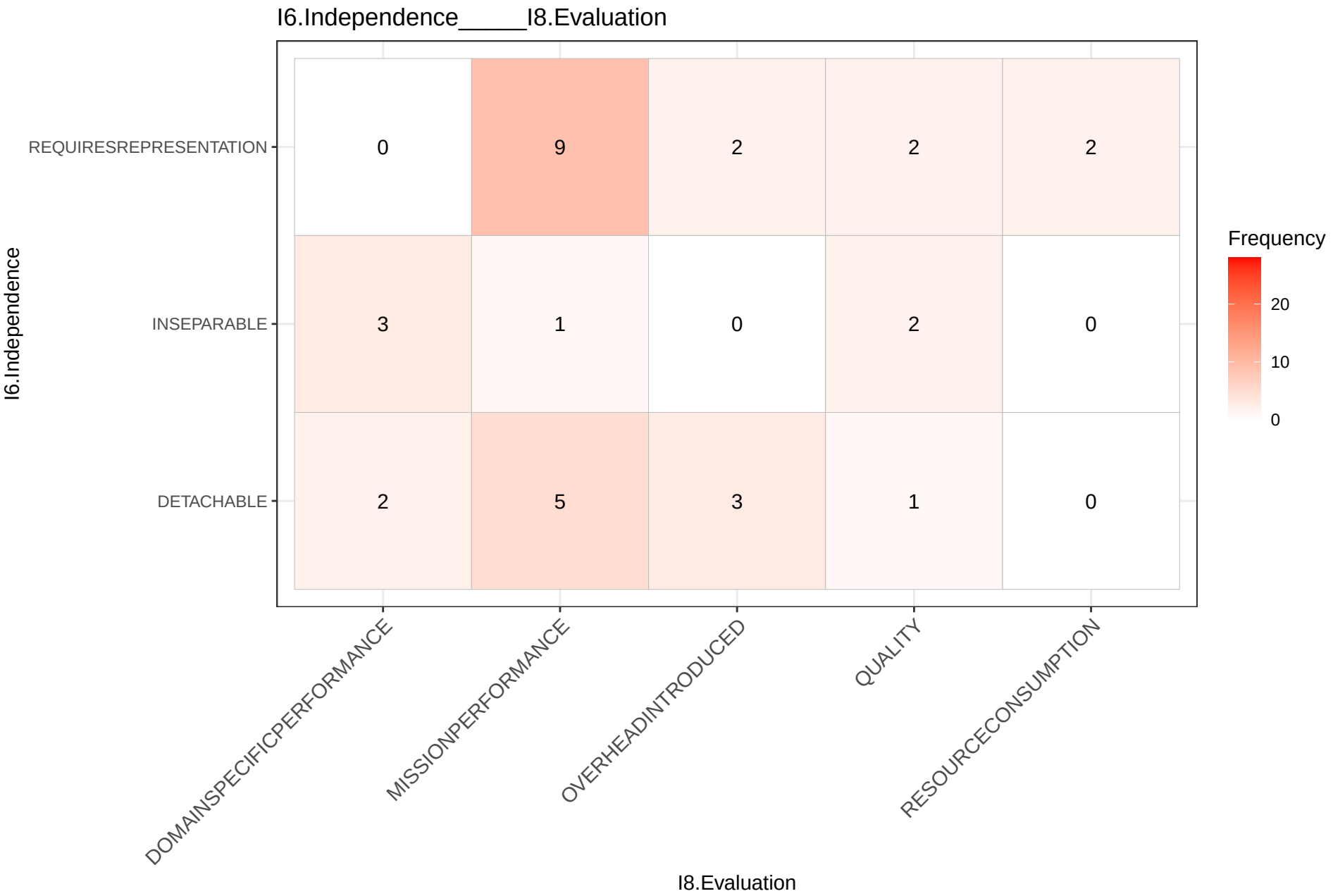
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method


I6.Independence_____I8.Evaluation
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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2
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2
3
1
0
2
0
2
5
3
1
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DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
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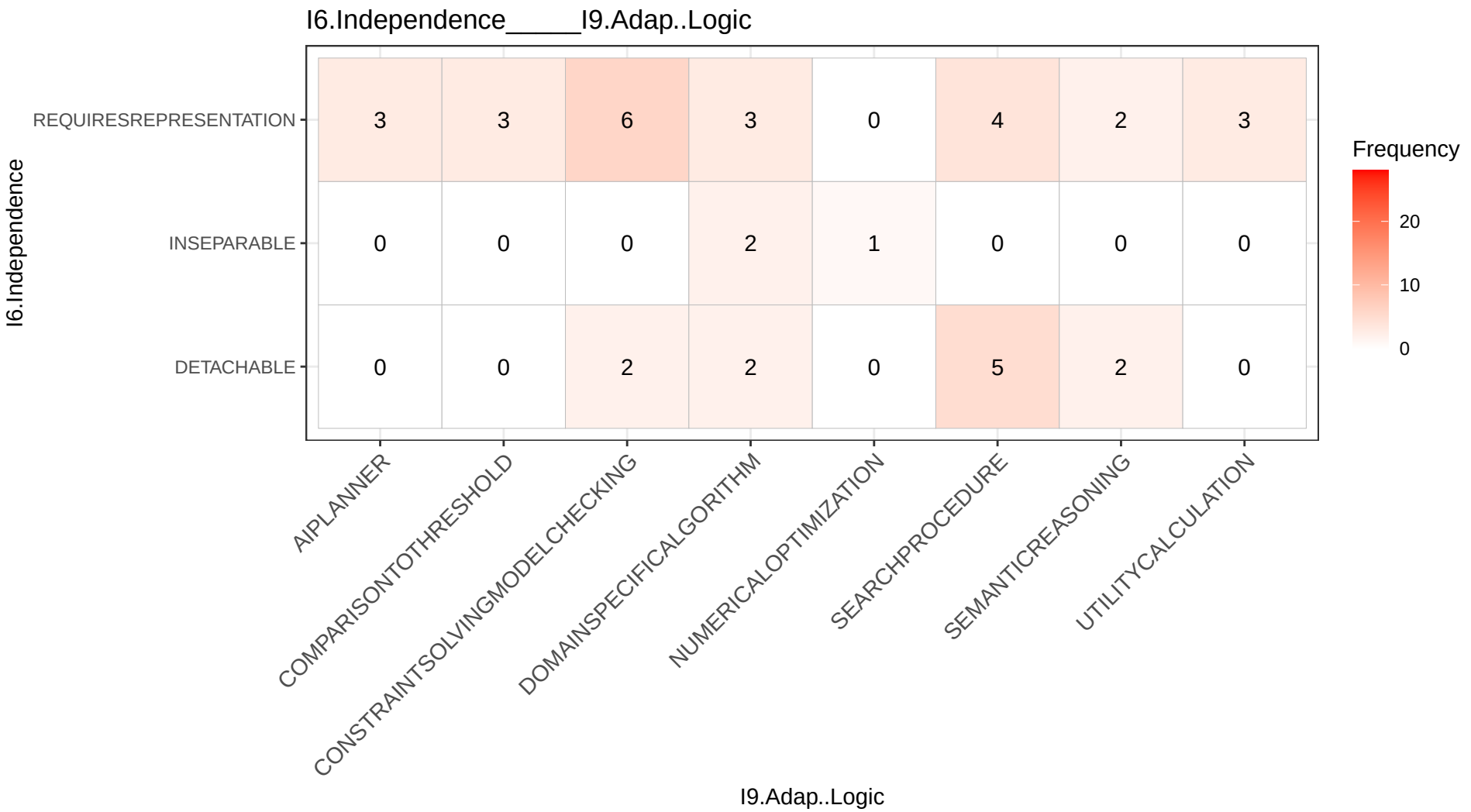
I6.Independence_____I9.Adap..Logic
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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0 0 0 2 1 0 0 0
0 0 2 2 0 5 2 0
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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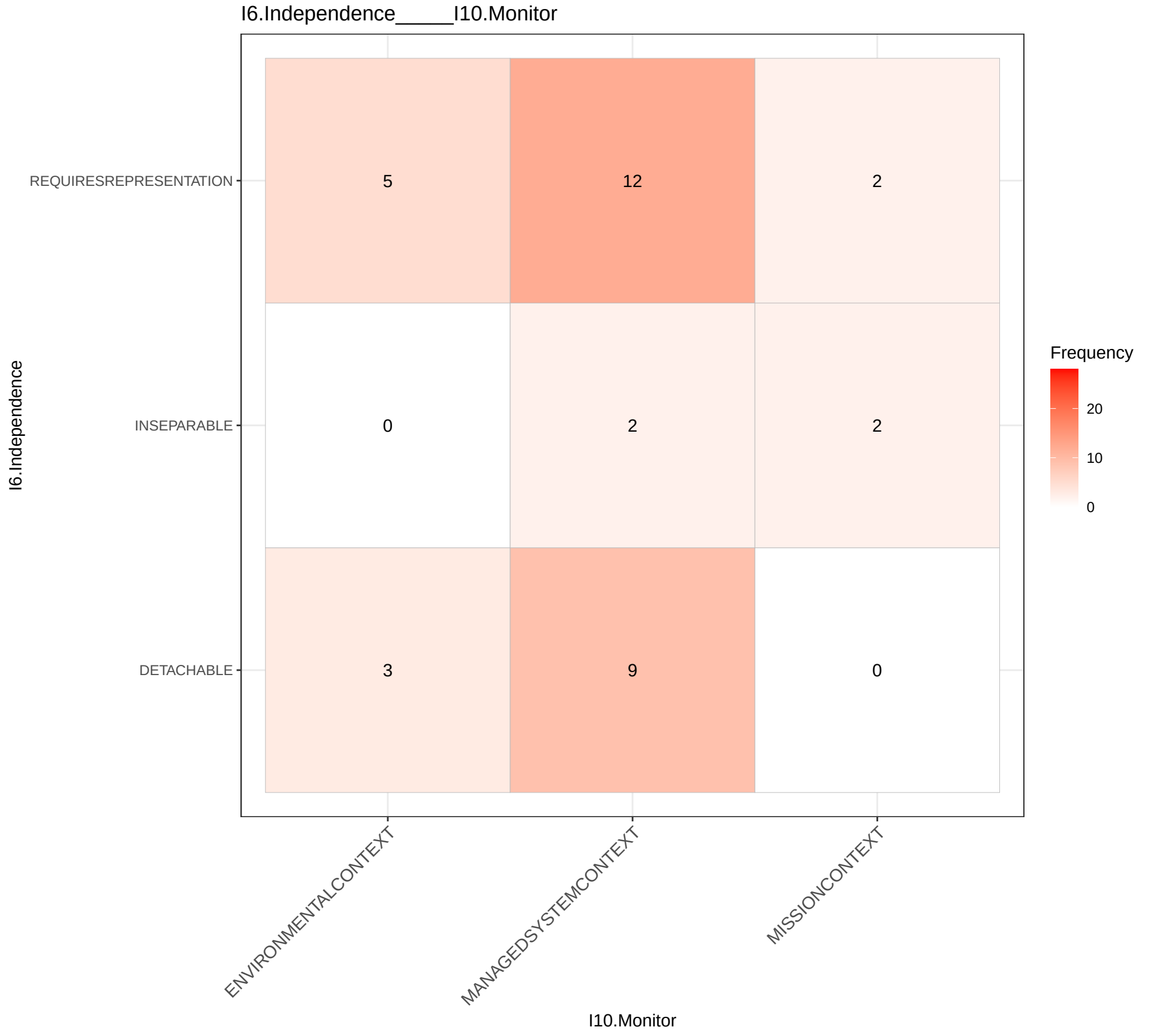
I6.Independence_____I10.Monitor
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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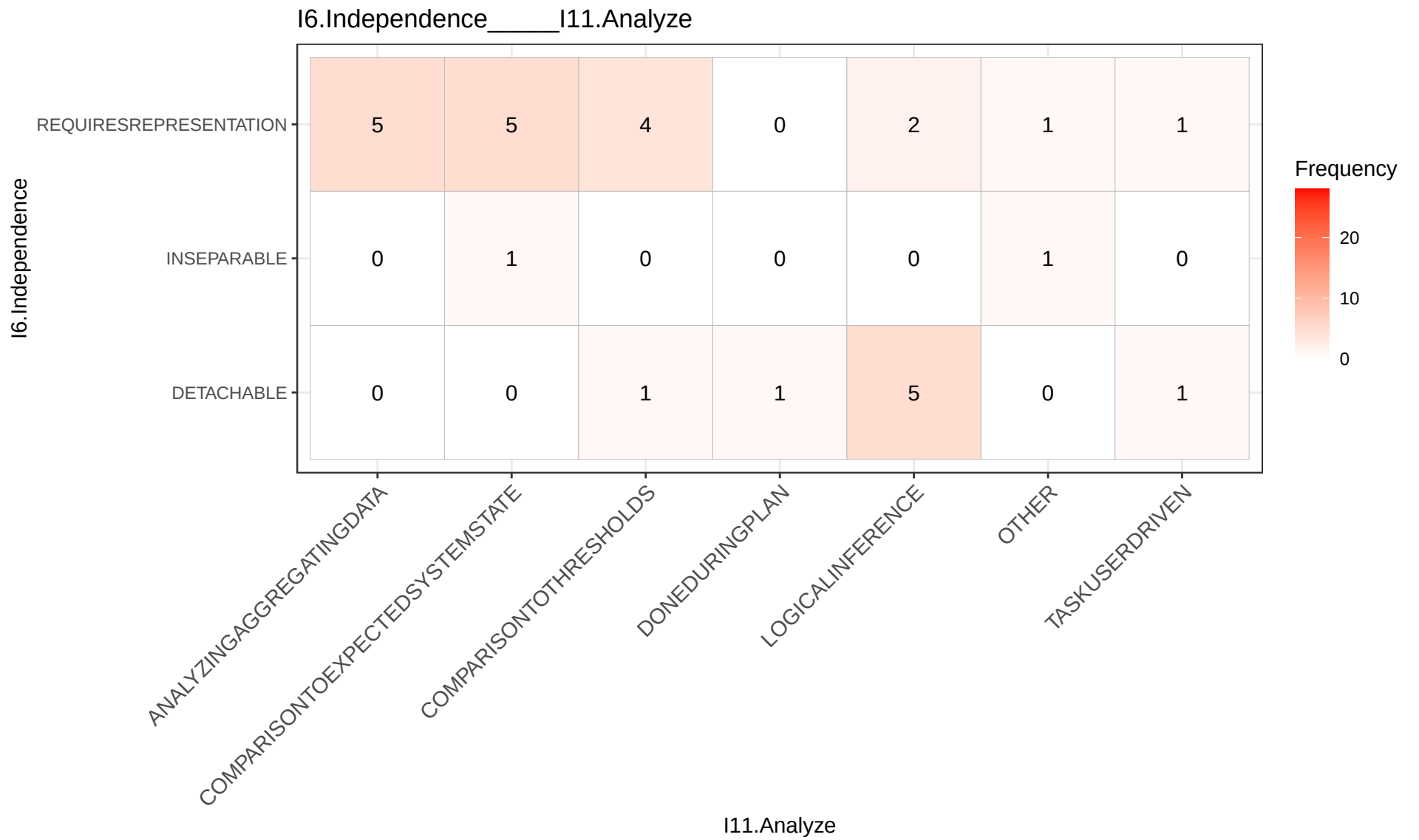
I6.Independence_____I11.Analyze
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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0 1 0 0 0 1 0
0 0 1 1 5 0 1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
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DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
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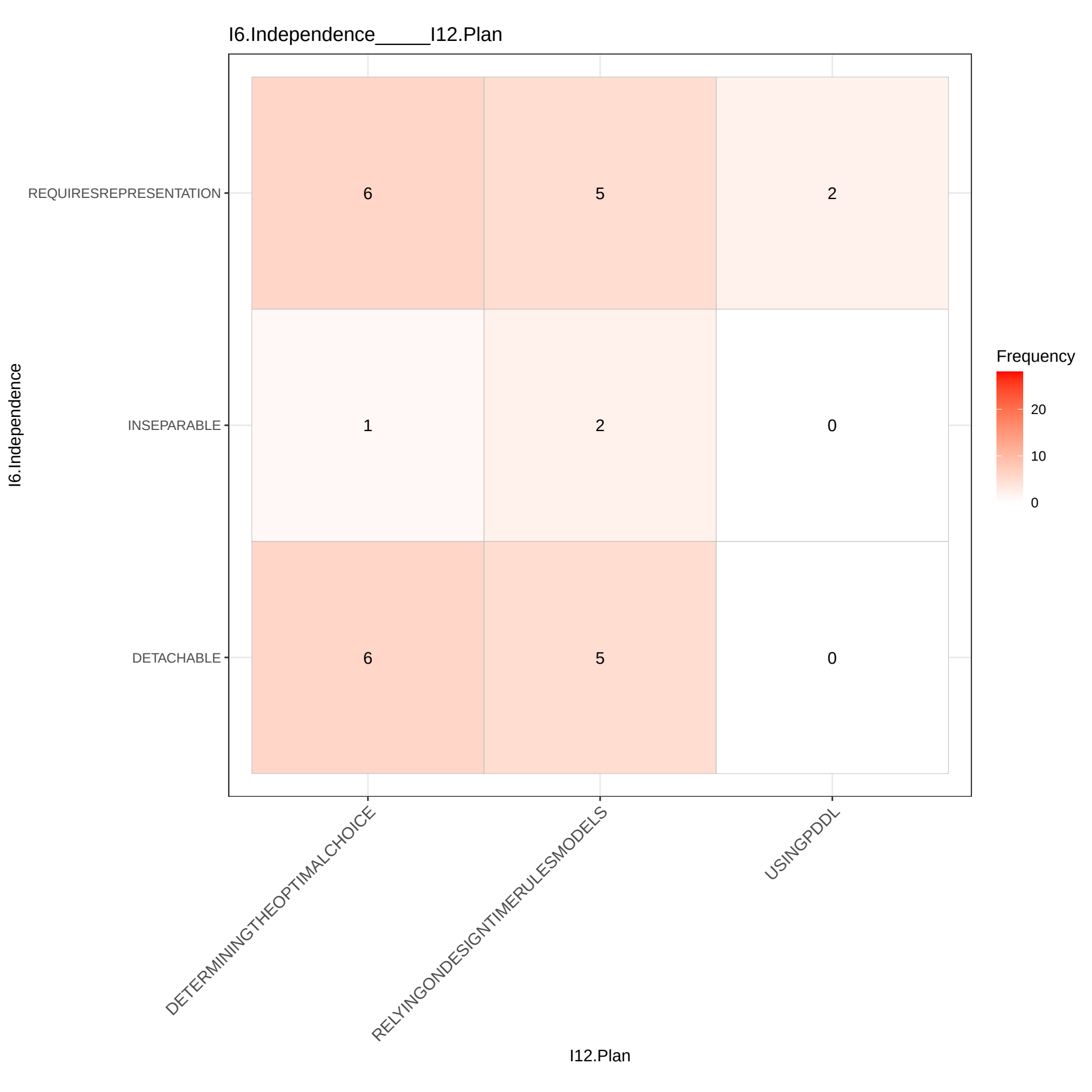
I6.Independence_____I12.Plan
REQUIRESREPRESENTATION
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DETACHABLE
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DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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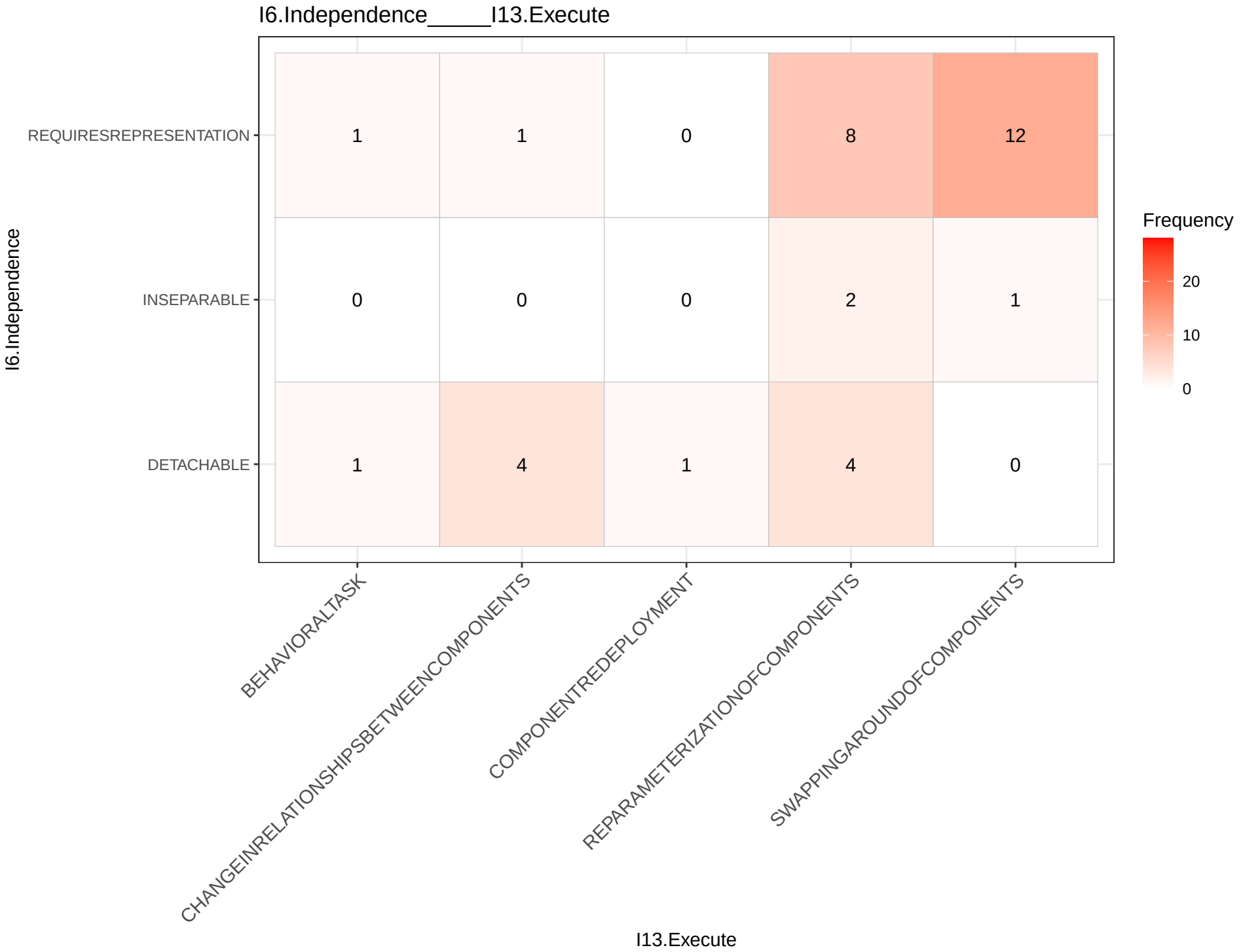
I6.Independence_____I13.Execute
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INSEPARABLE
DETACHABLE
I6.Independence
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BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
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Frequency
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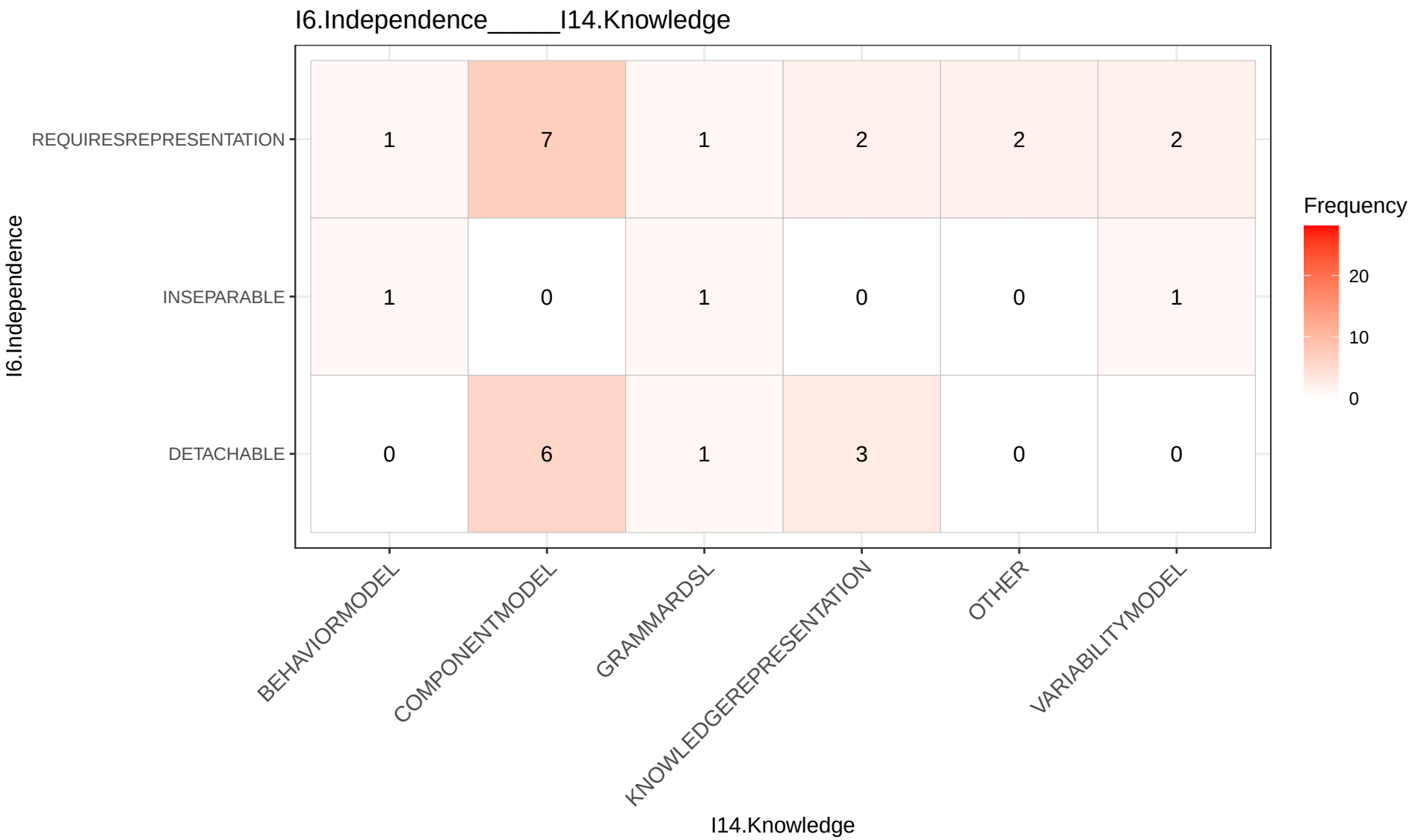
I6.Independence_____I14.Knowledge
REQUIRESREPRESENTATION
INSEPARABLE
DETACHABLE
I6.Independence
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BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
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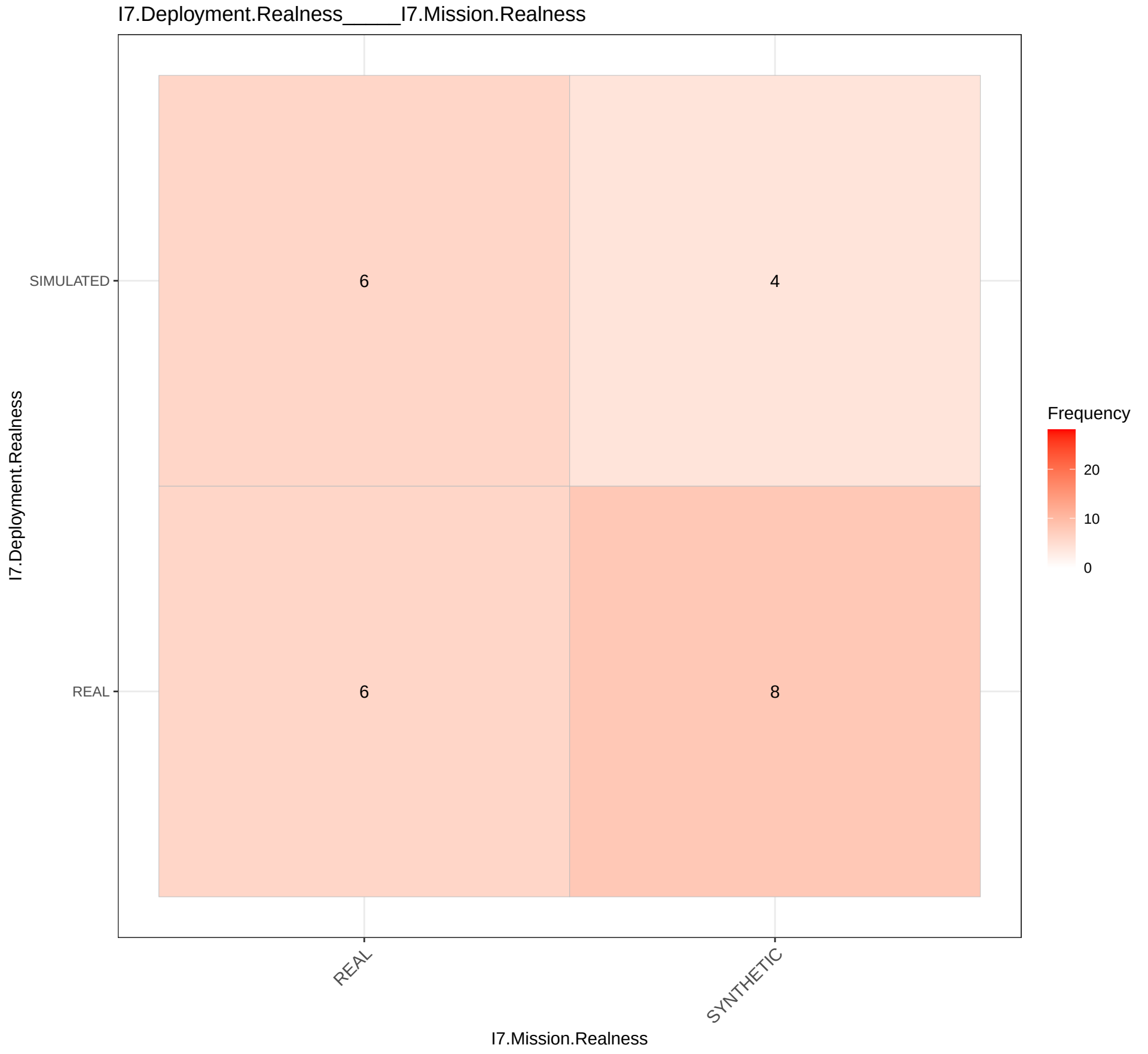
I7.Deployment.Realness_____I7.Mission.Realness
SIMULATED
REAL
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4
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8
I7.Deployment.Realness
REAL
SYNTHETIC
I7.Mission.Realness
Frequency
20
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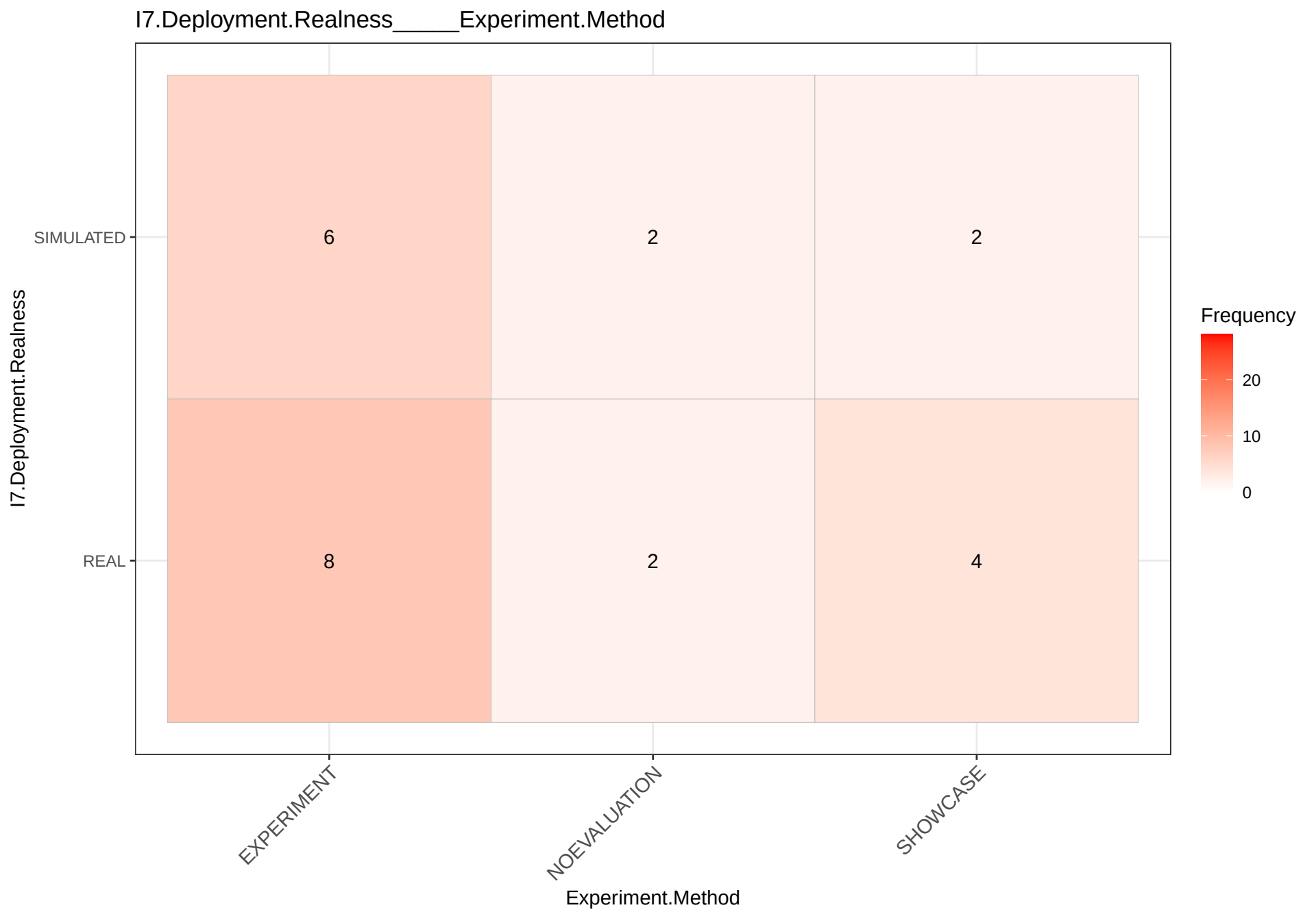
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REAL
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EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
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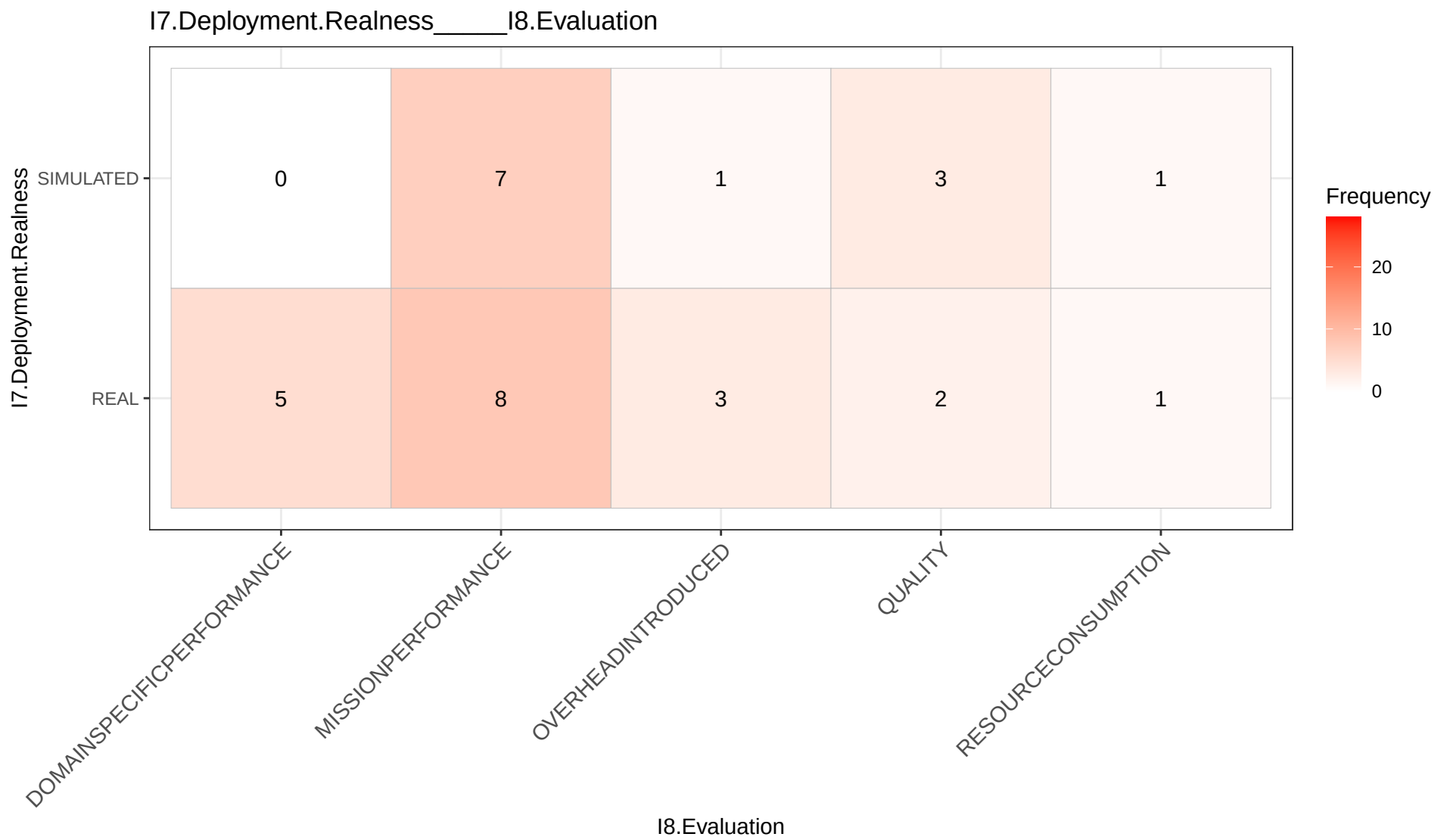
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REAL
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MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
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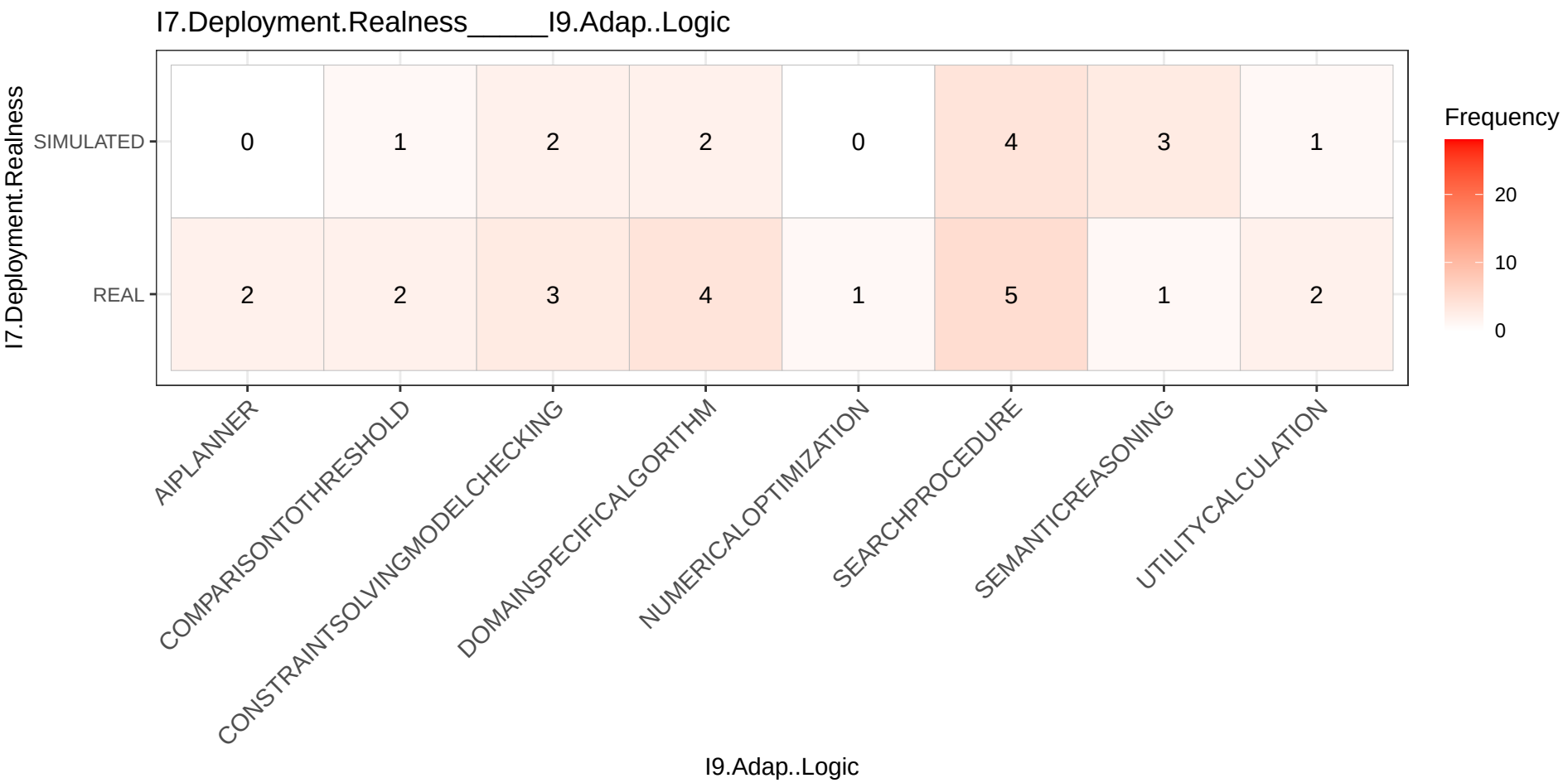
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REAL
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1
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1
2
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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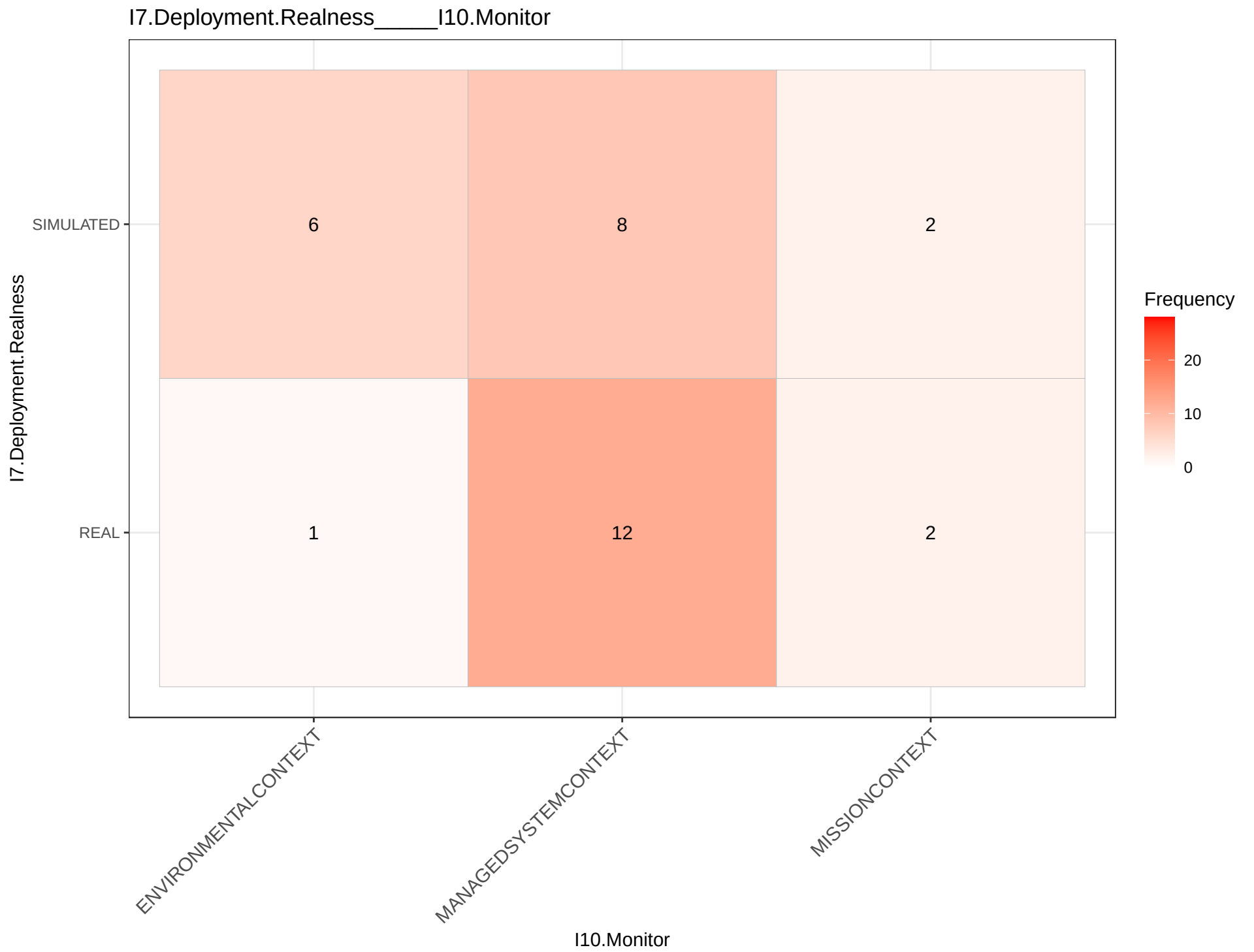
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SIMULATED
REAL
6
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ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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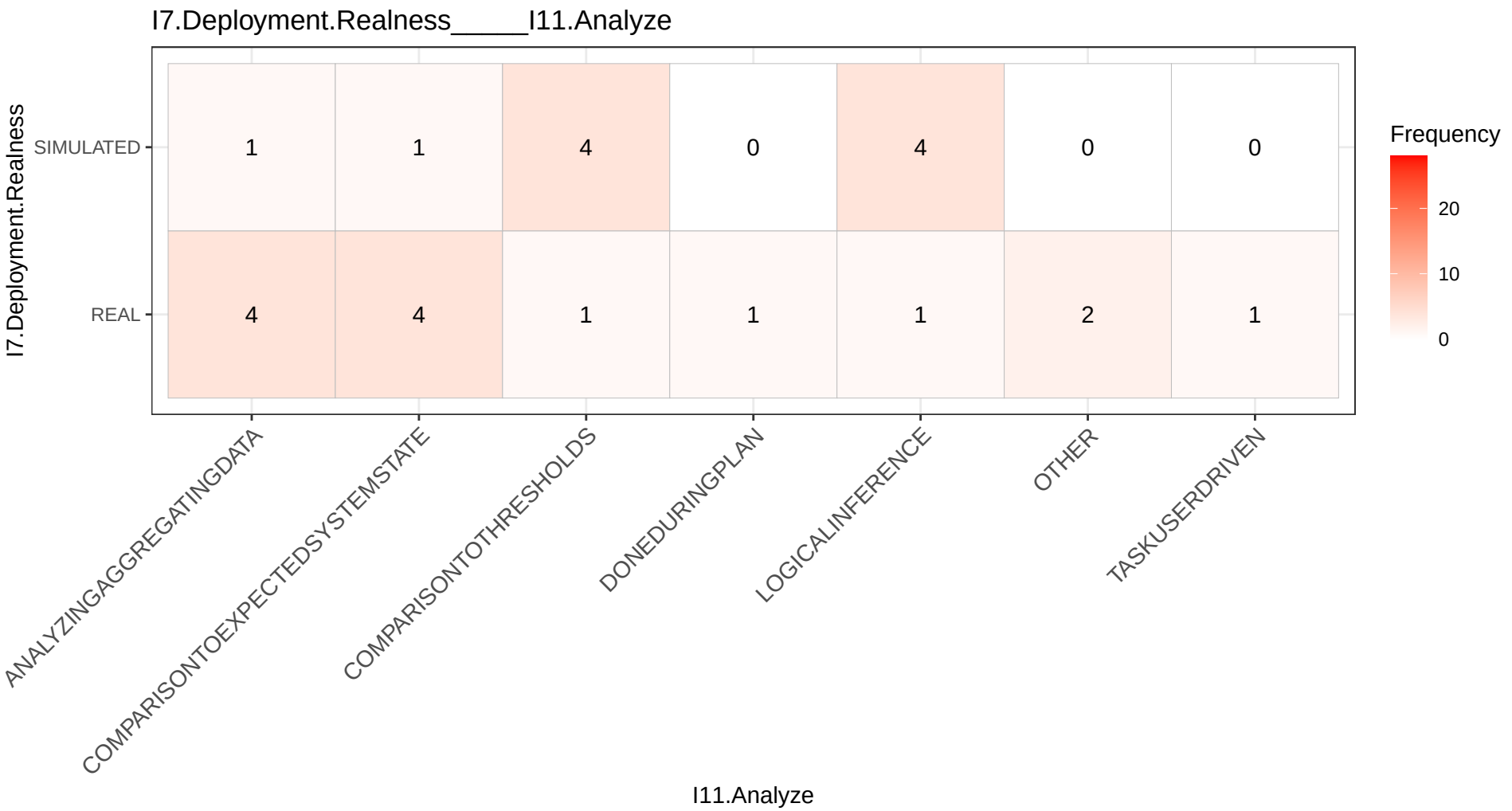
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REAL
1
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4
1
1
1
2
1
Frequency
20
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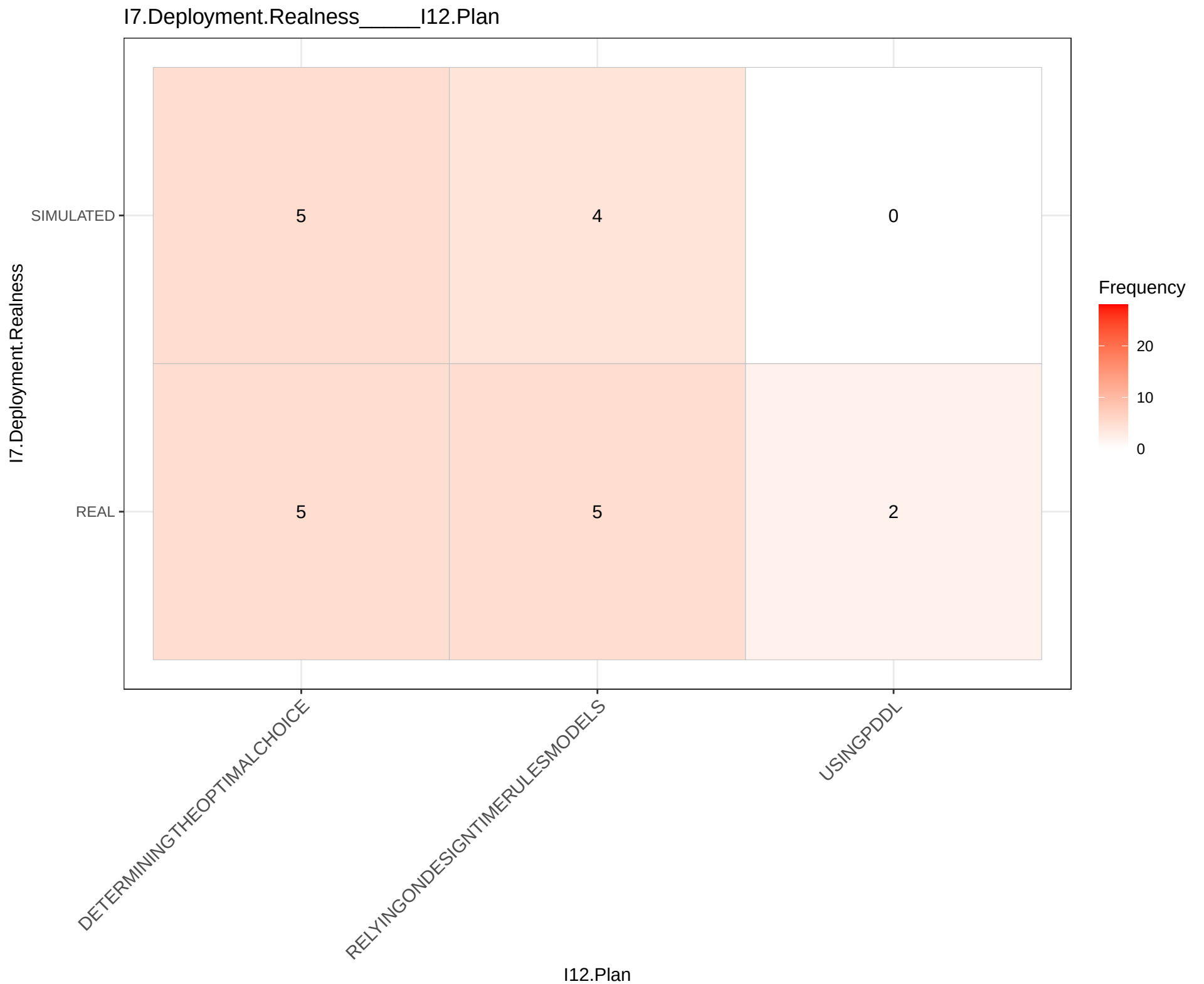
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze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SIMULATED
REAL
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DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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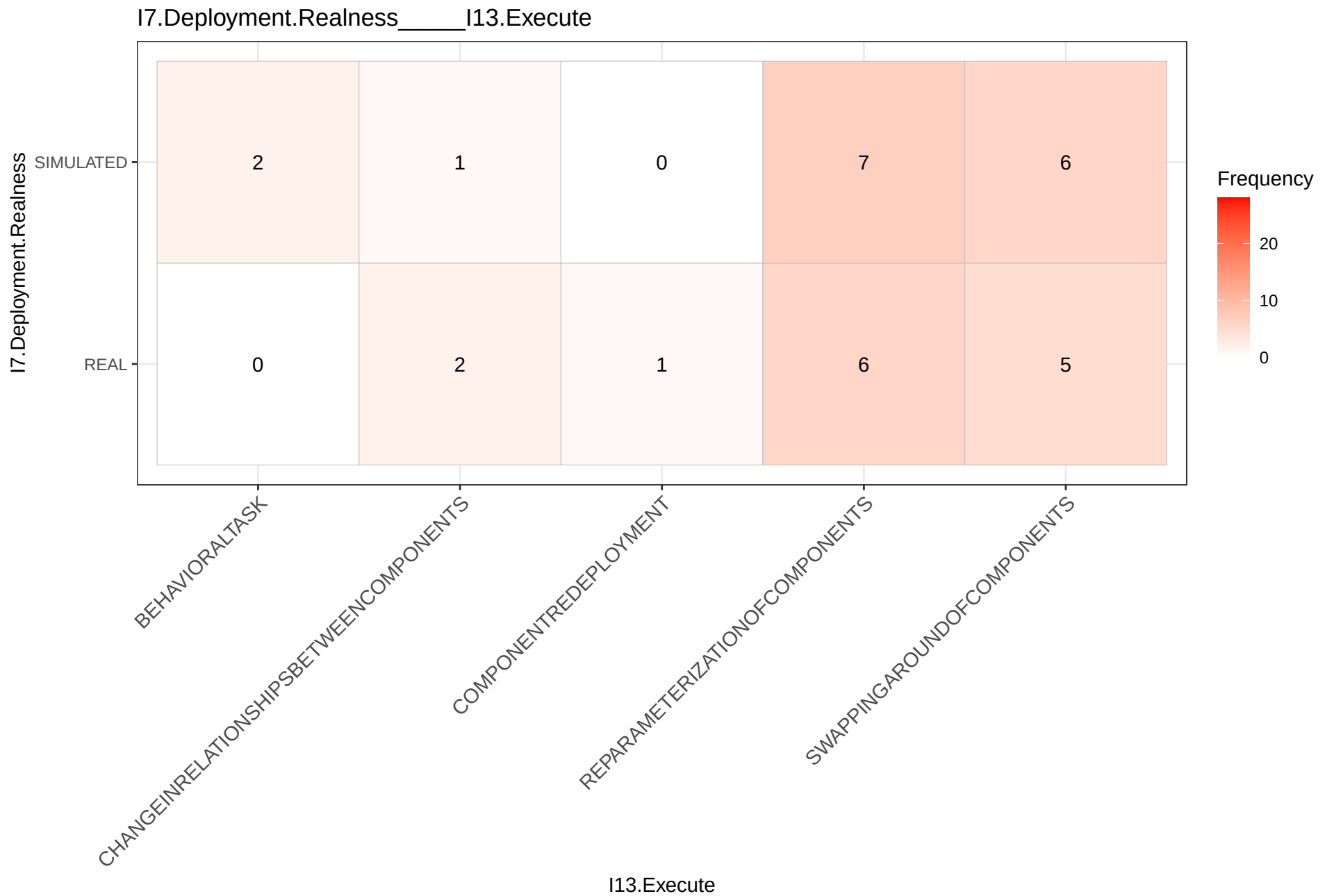
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SIMULATED
REAL
2
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2
1
6
5
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
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REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
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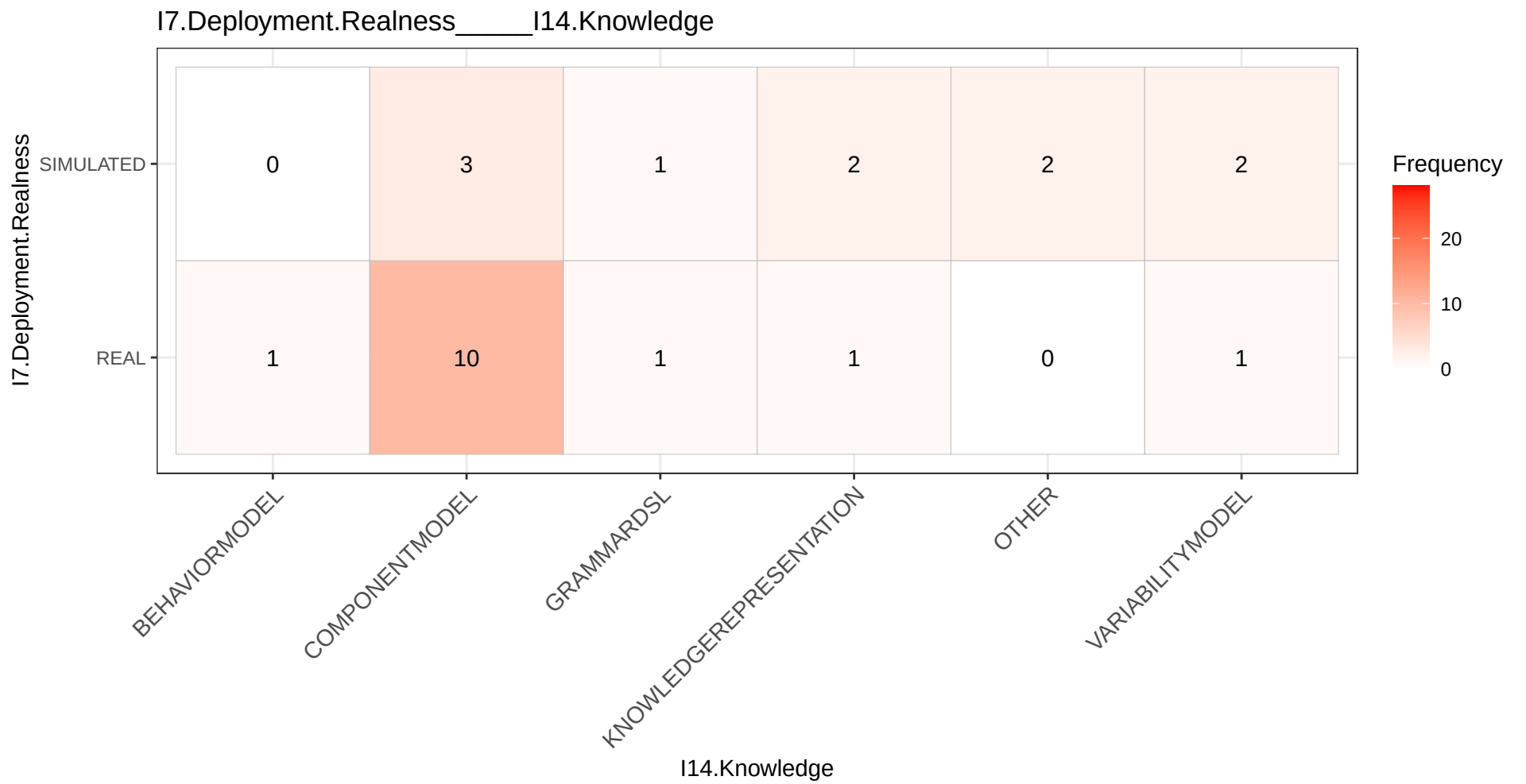
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I7.Deployment.Realness
SIMULATED
REAL
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2
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1
10
1
1
0
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BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
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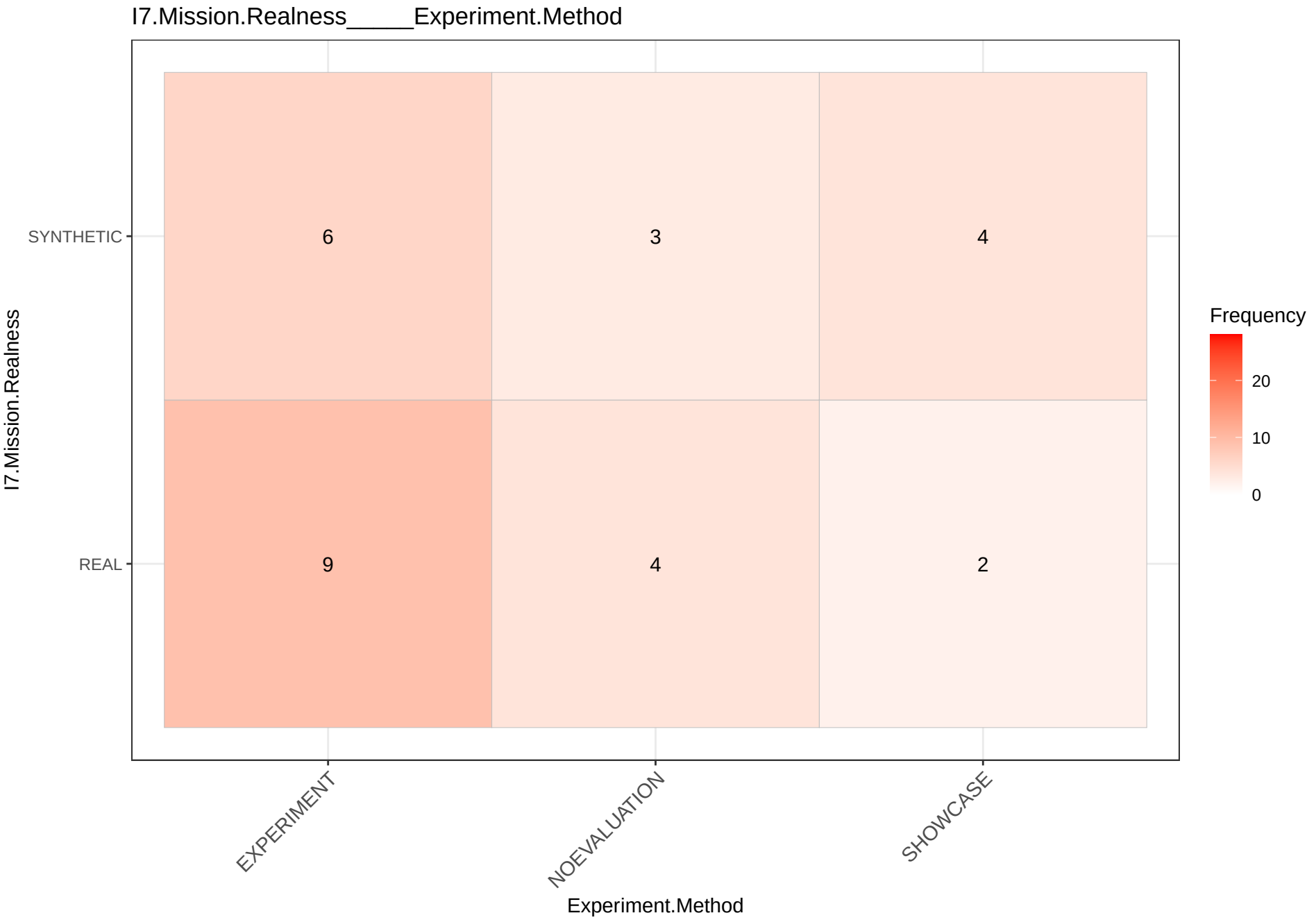
I7.Mission.Realness_____Experiment.Method
SYNTHETIC
REAL
6
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I7.Mission.Realness
EXPERIMENT
NOEVALUATION
SHOWCASE
Experiment.Method
Frequency
20
10
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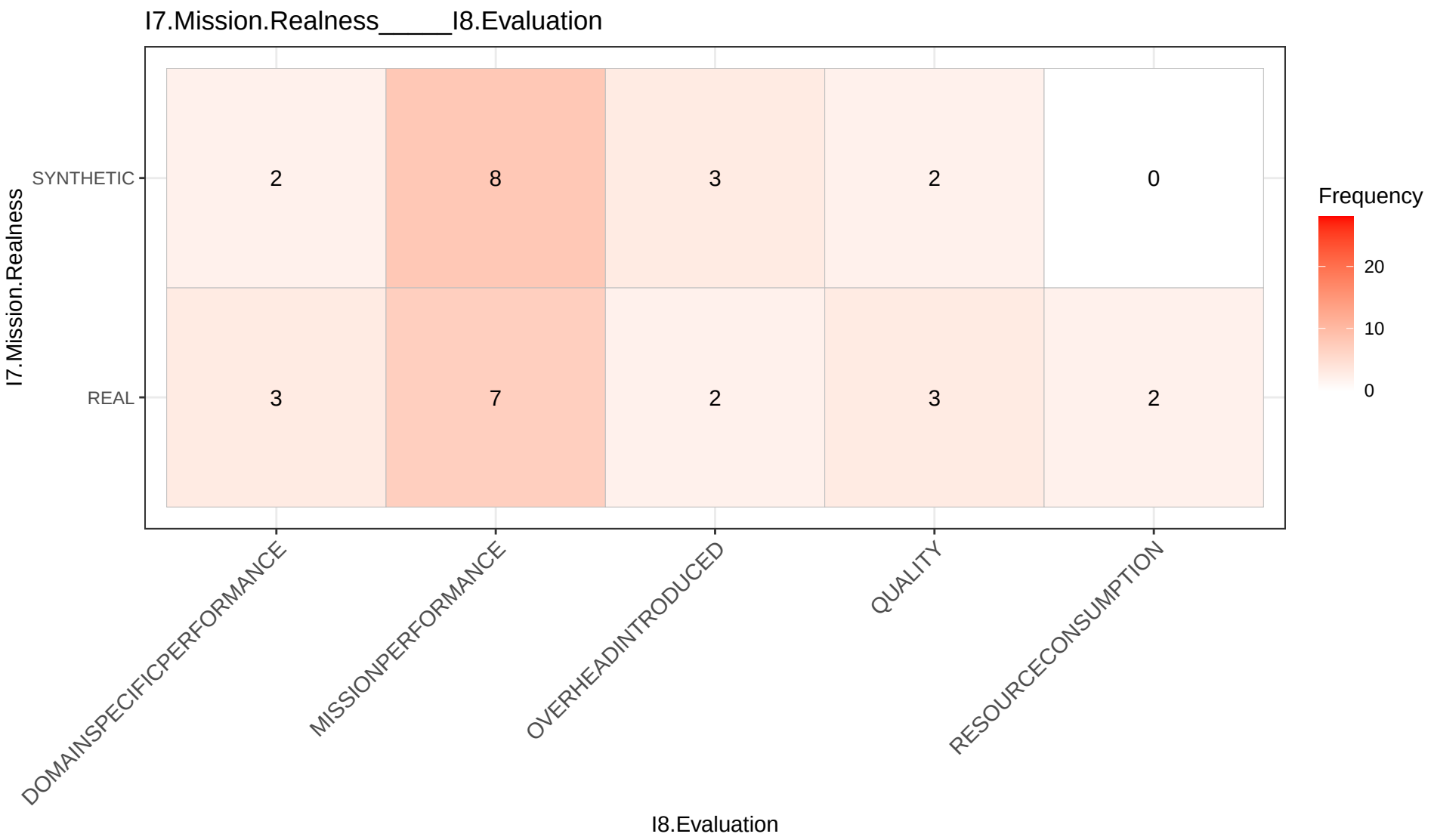
I7.Mission.Realness_____I8.Evaluation
I7.Mission.Realness
SYNTHETIC
REAL
2
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2
3
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DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
I8.Evaluation
Frequency
20
10
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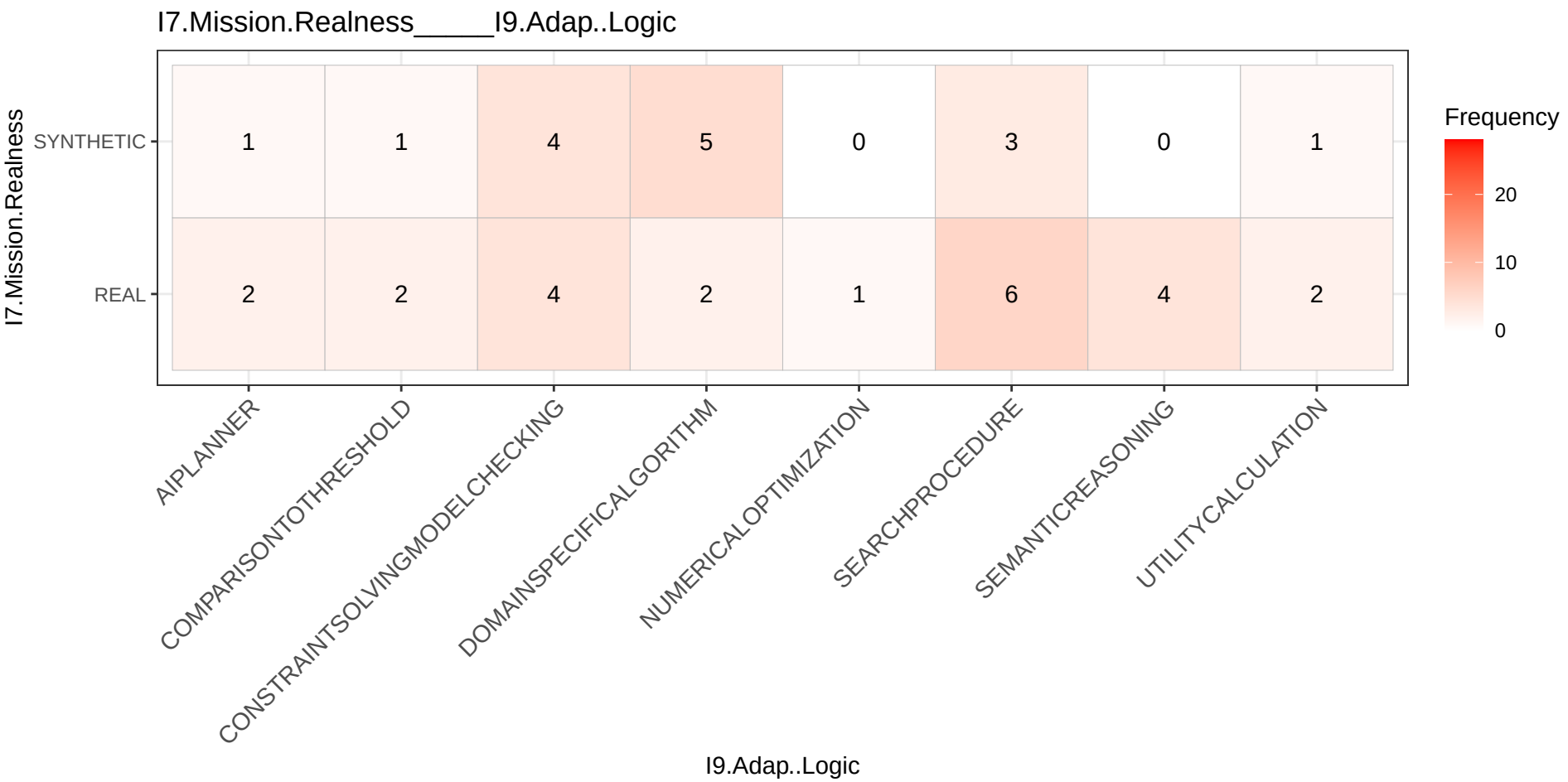
I7.Mission.Realness_____I9.Adap..Logic
I7.Mission.Realness
SYNTHETIC
REAL
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2
2
4
2
1
6
4
2
AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
20
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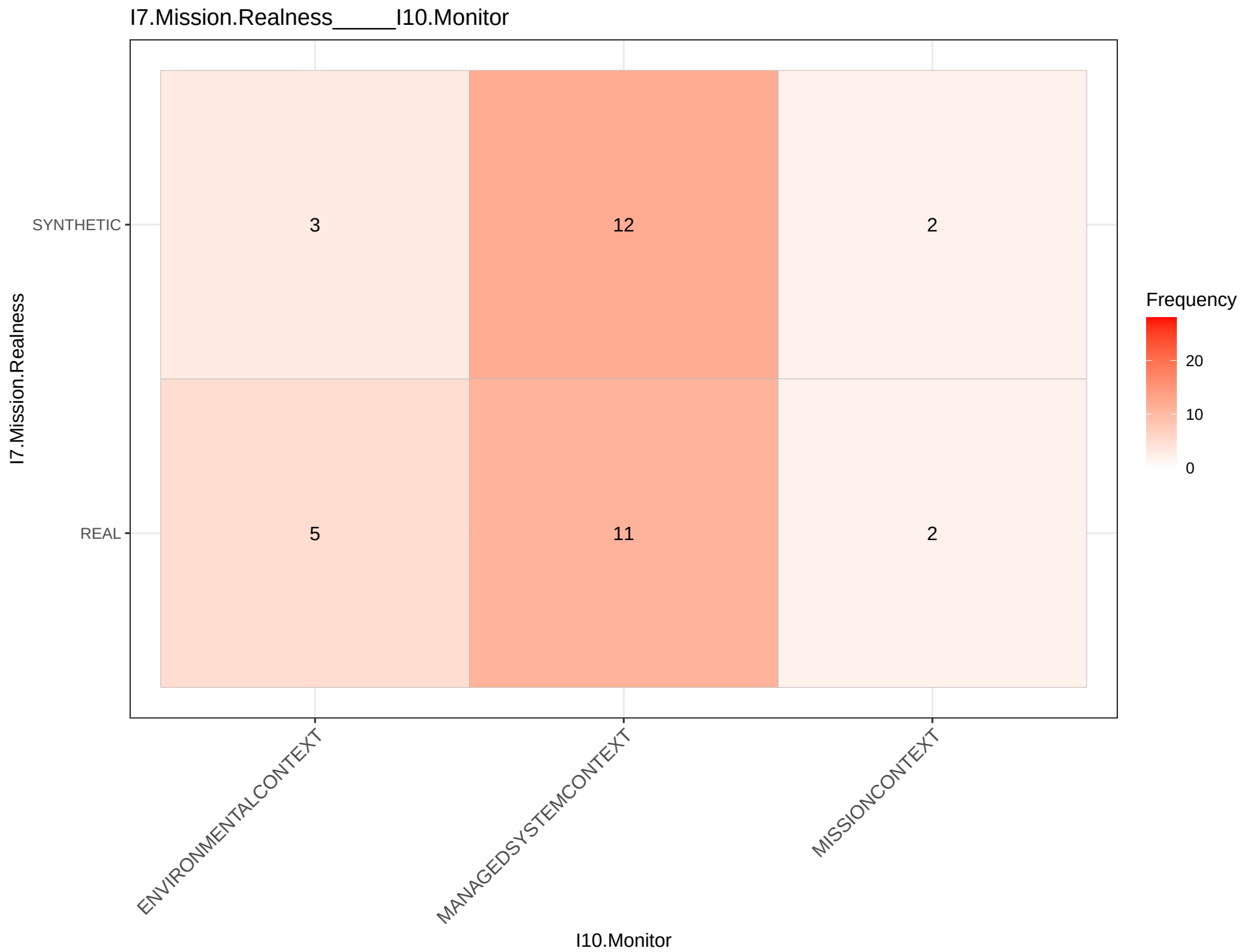
I7.Mission.Realness_____I10.Monitor
SYNTHETIC
REAL
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12
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5
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ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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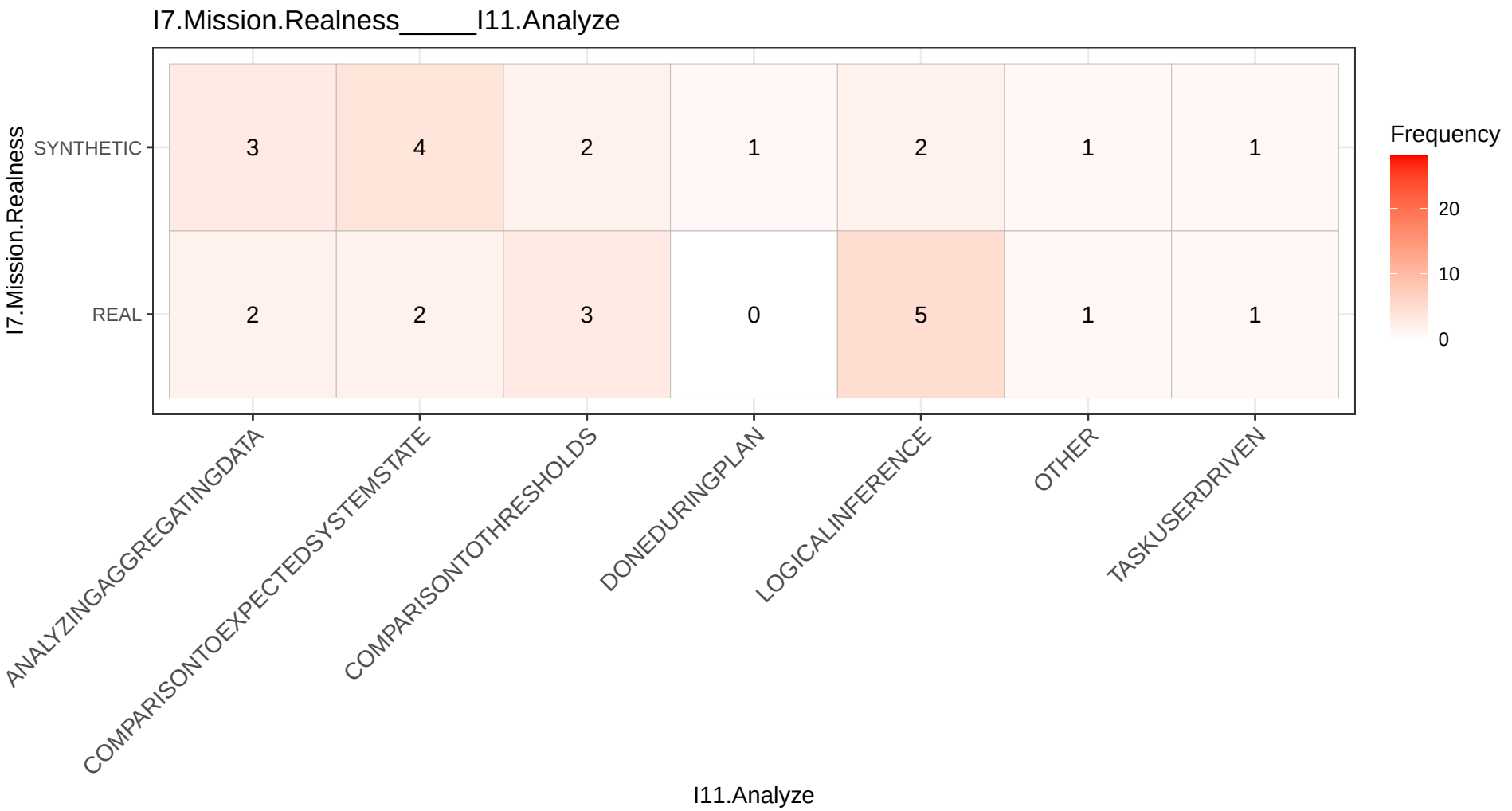
I7.Mission.Realness_____I11.Analyze
I7.Mission.Realness
SYNTHETIC
REAL
3
4
2
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2
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2
2
3
0
5
1
1
Frequency
20
10
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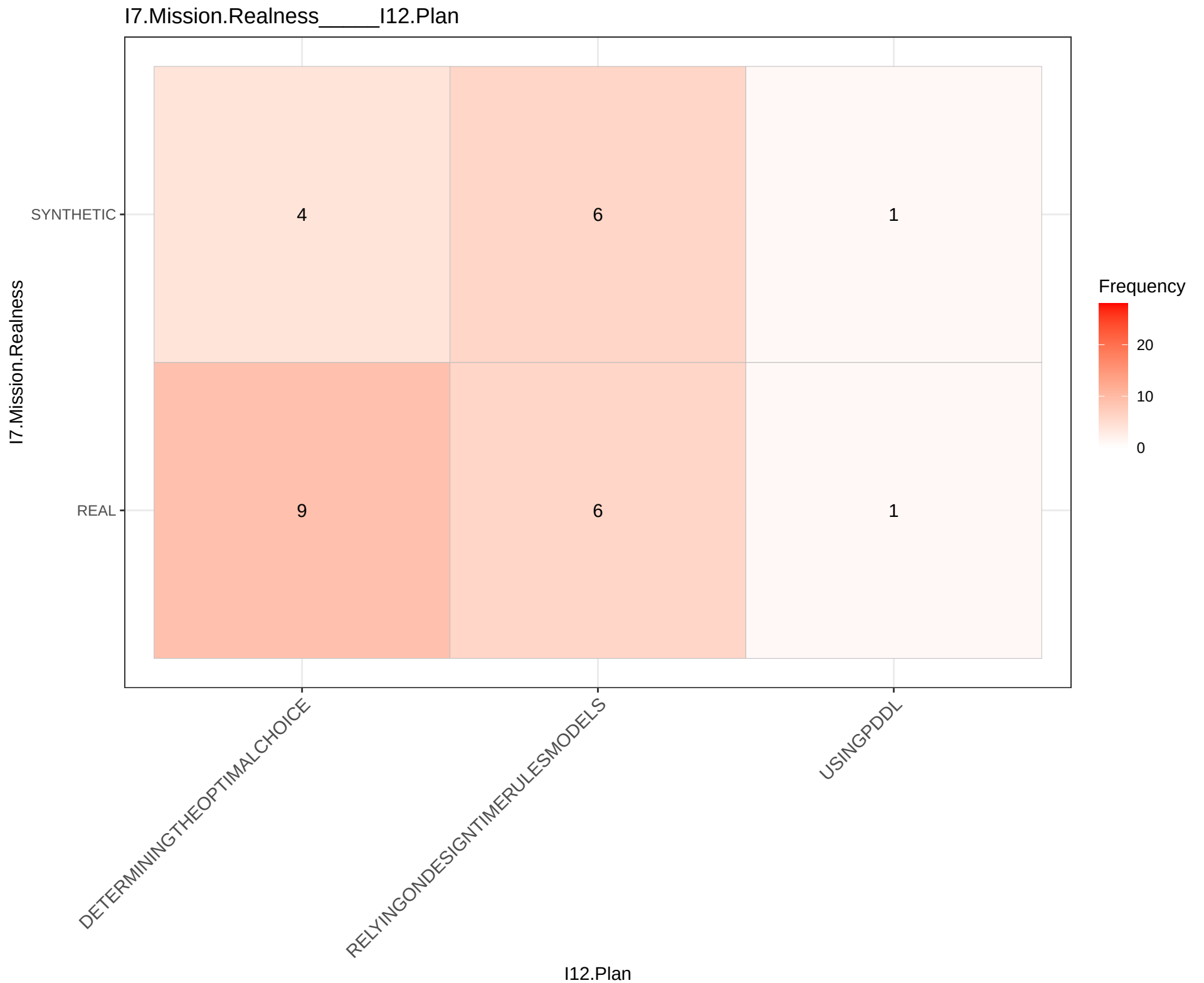
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze


I7.Mission.Realness_____I12.Plan
SYNTHETIC
REAL
4
6
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DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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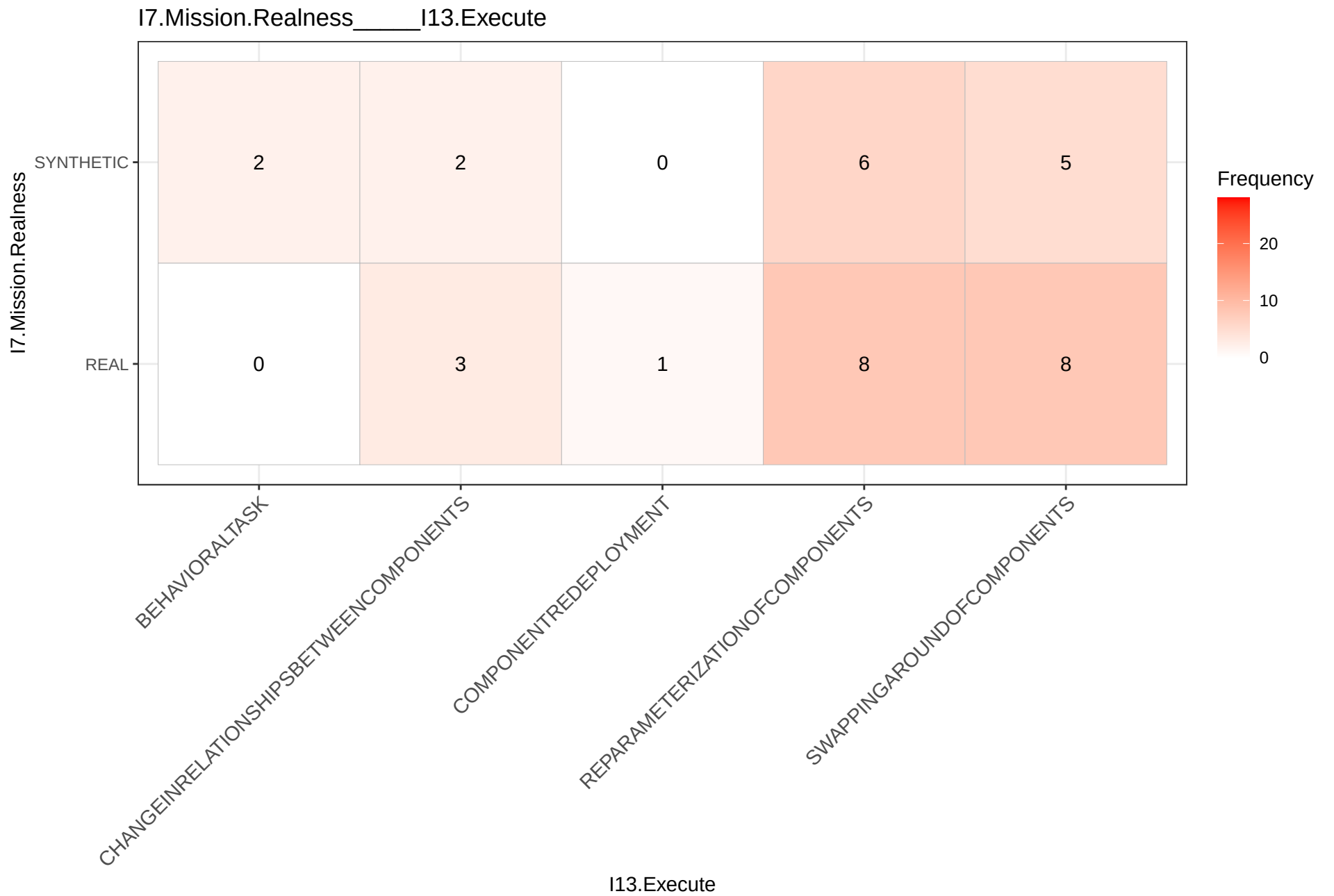
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REAL
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BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
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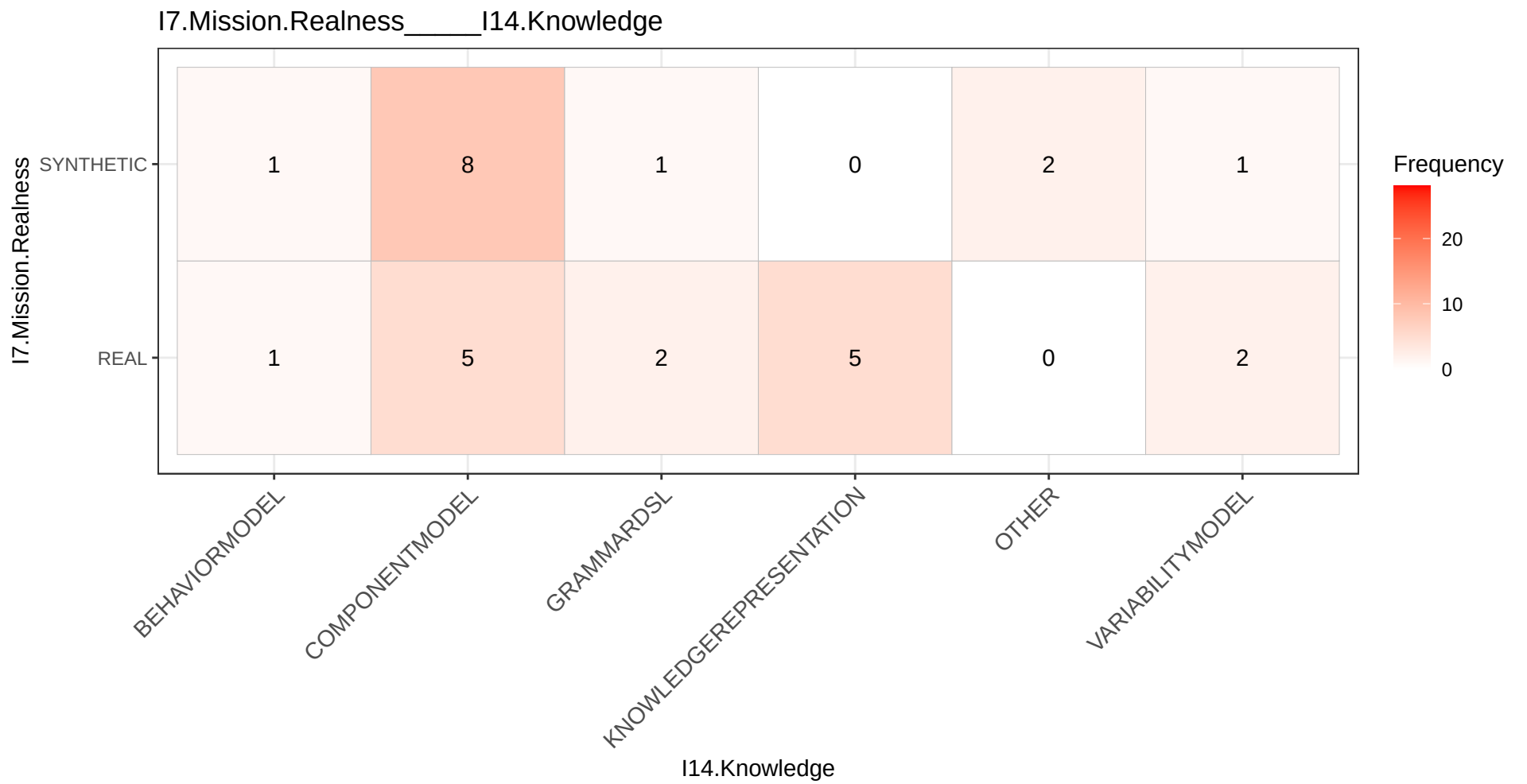
I7.Mission.Realness_____I14.Knowledge
I7.Mission.Realness
SYNTHETIC
REAL
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COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
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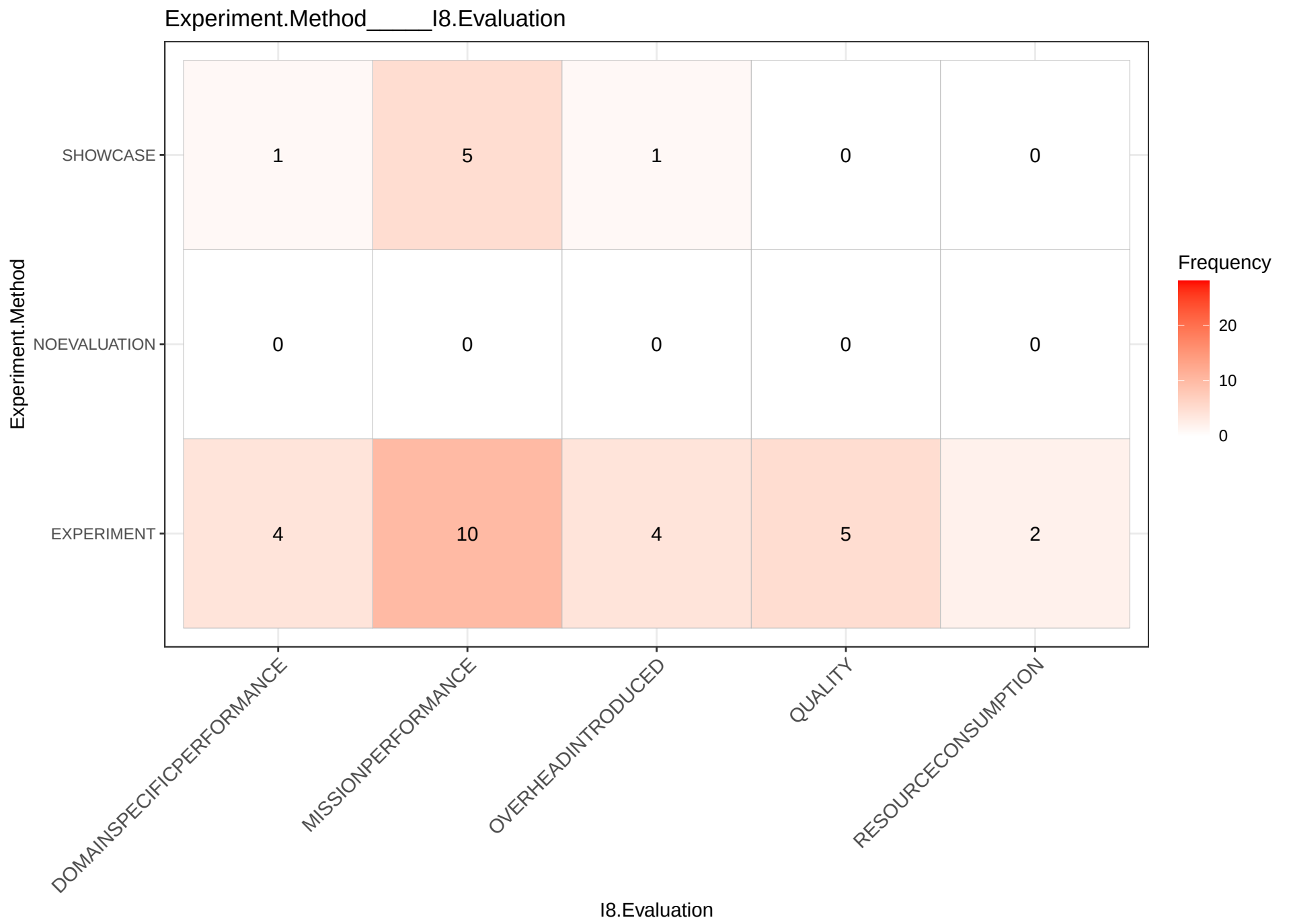
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SHOWCASE
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EXPERIMENT
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DOMAINSPECIFICPERFORMANCE
MISSIONPERFORMANCE
OVERHEADINTRODUCED
QUALITY
RESOURCECONSUMPTION
Experiment.Method
I8.Evaluation
Frequency
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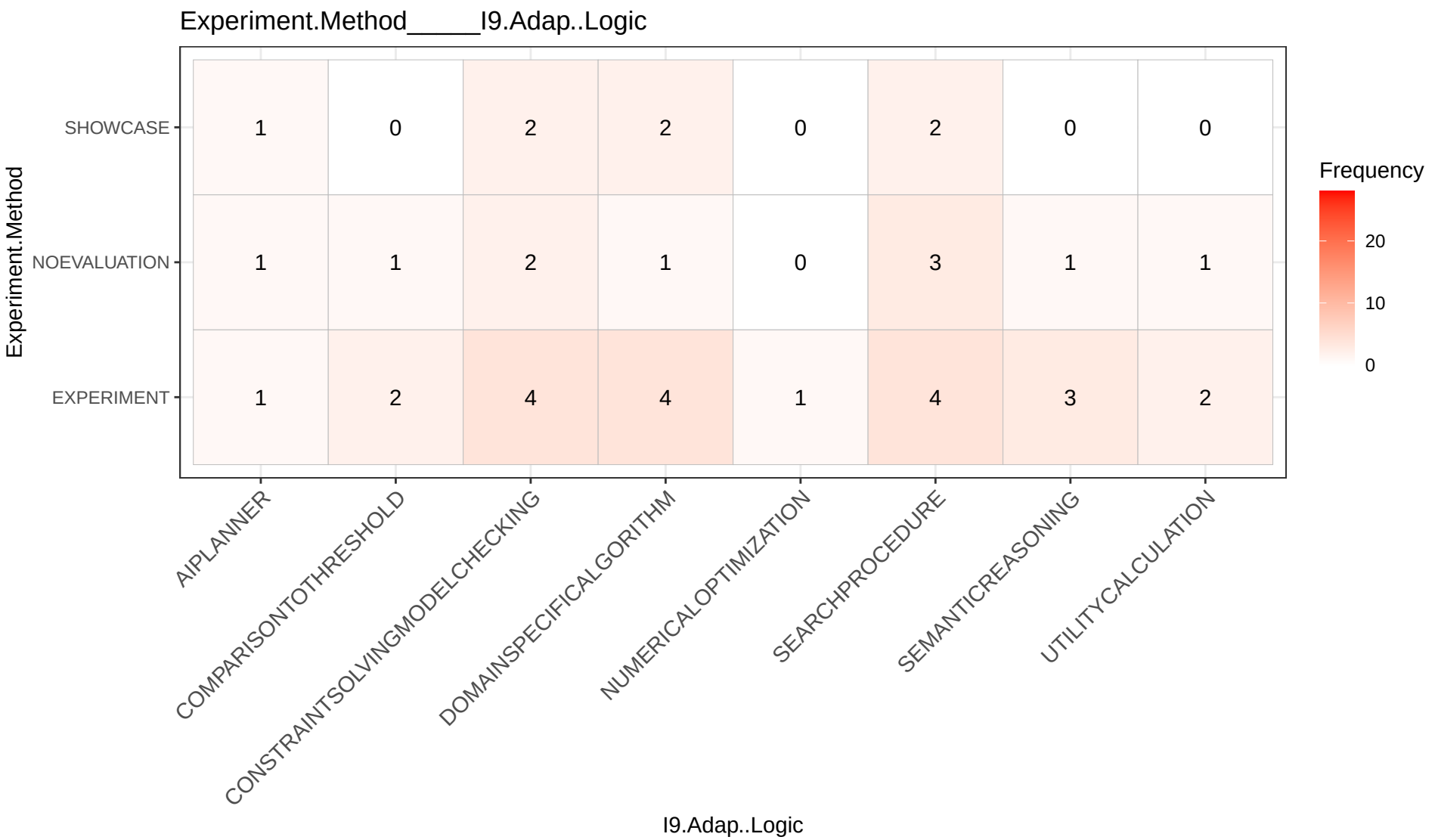
Experiment.Method_____I9.Adap..Logic
Experiment.Method
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EXPERIMENT
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AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I9.Adap..Logic
Frequency
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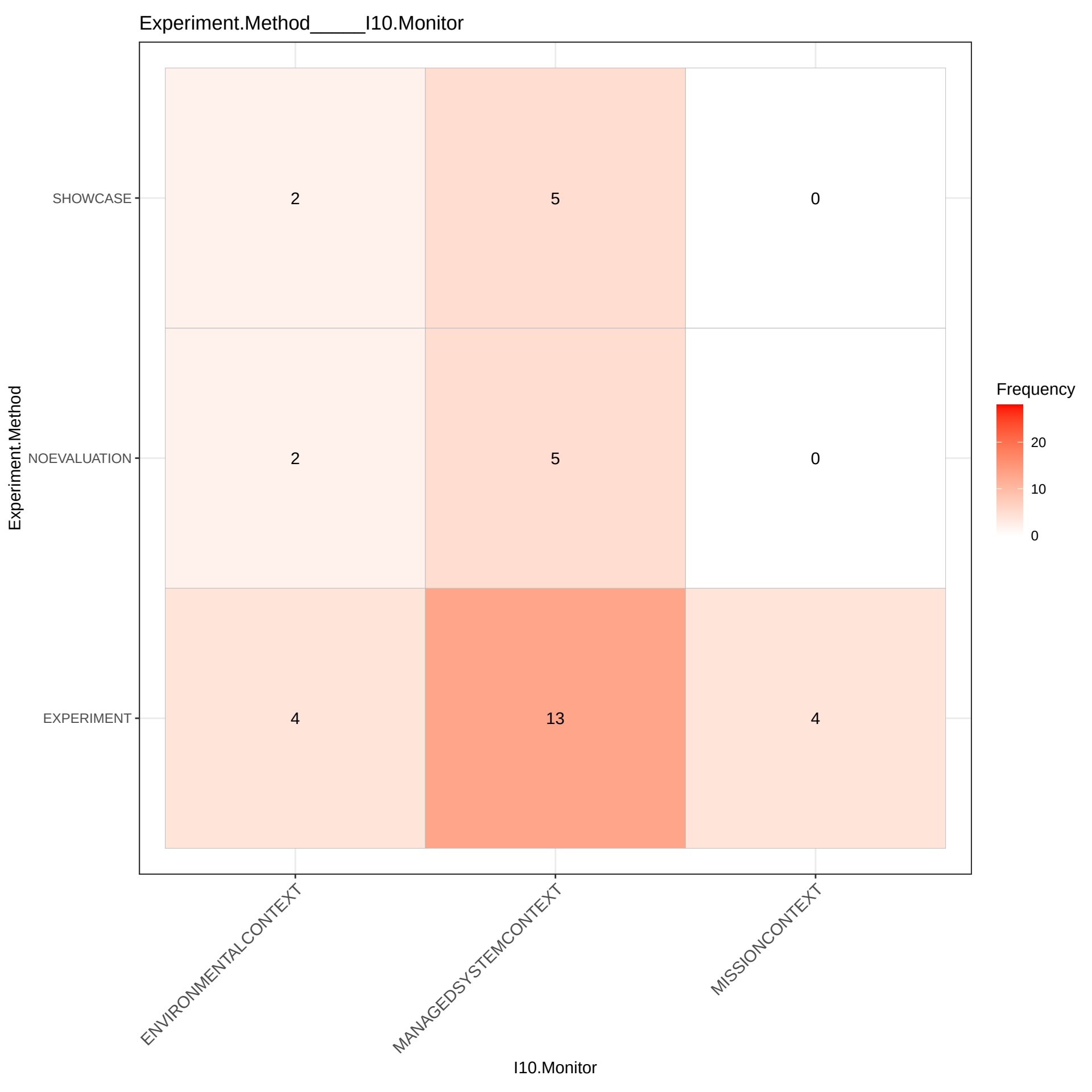
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MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
Experiment.Method
I10.Monitor
Frequency
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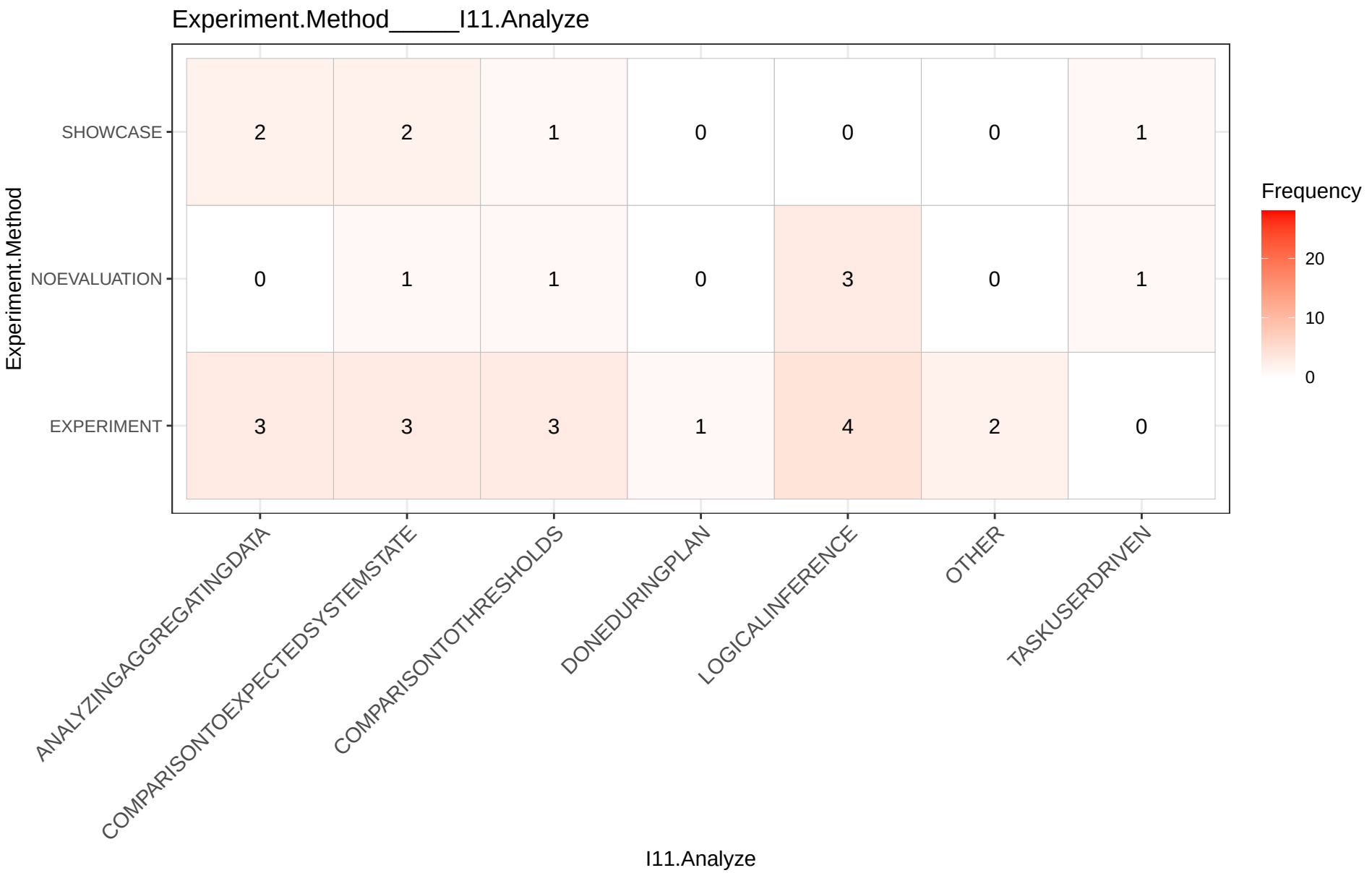
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Experiment.Method
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EXPERIMENT
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ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
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DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
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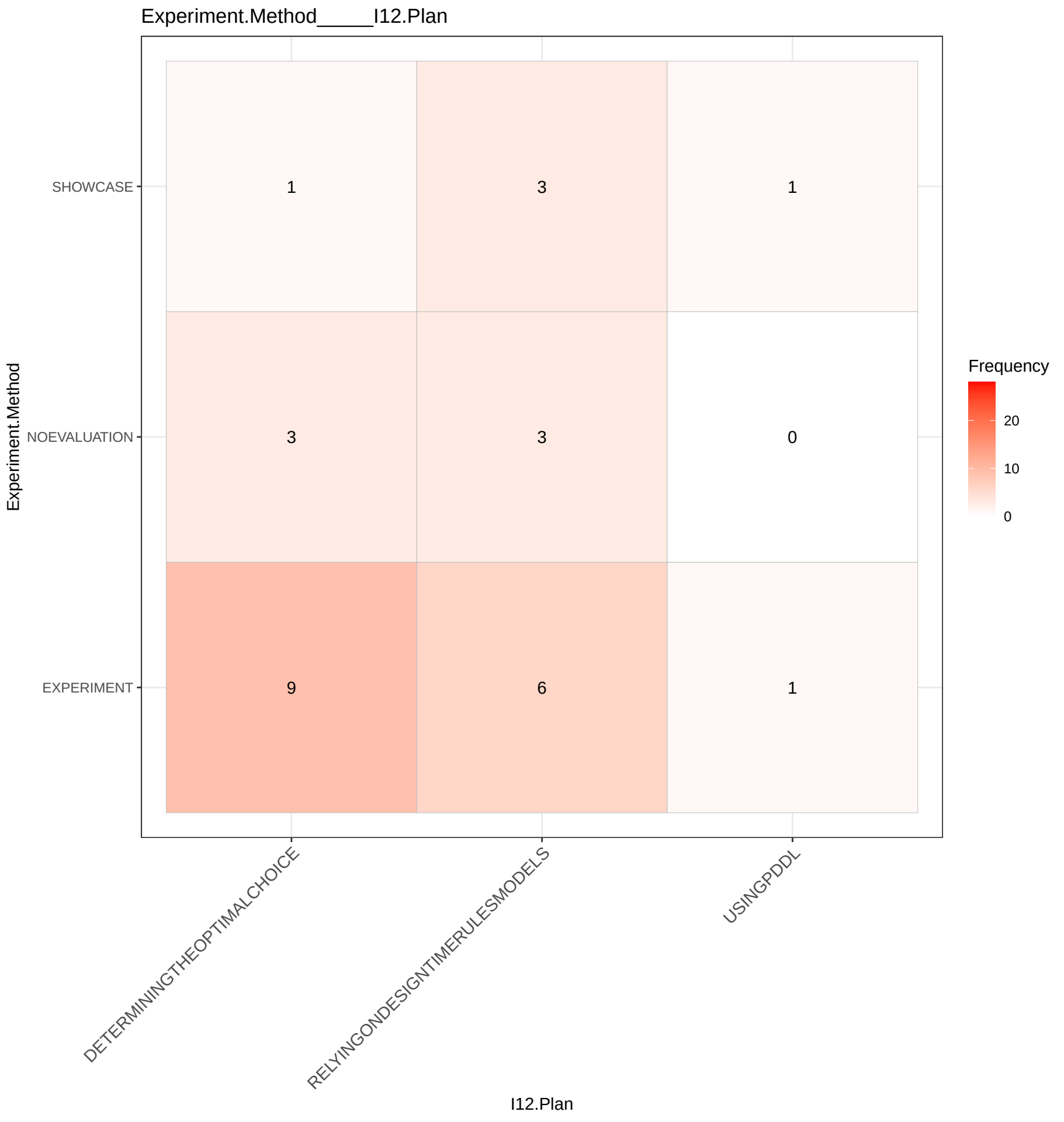
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RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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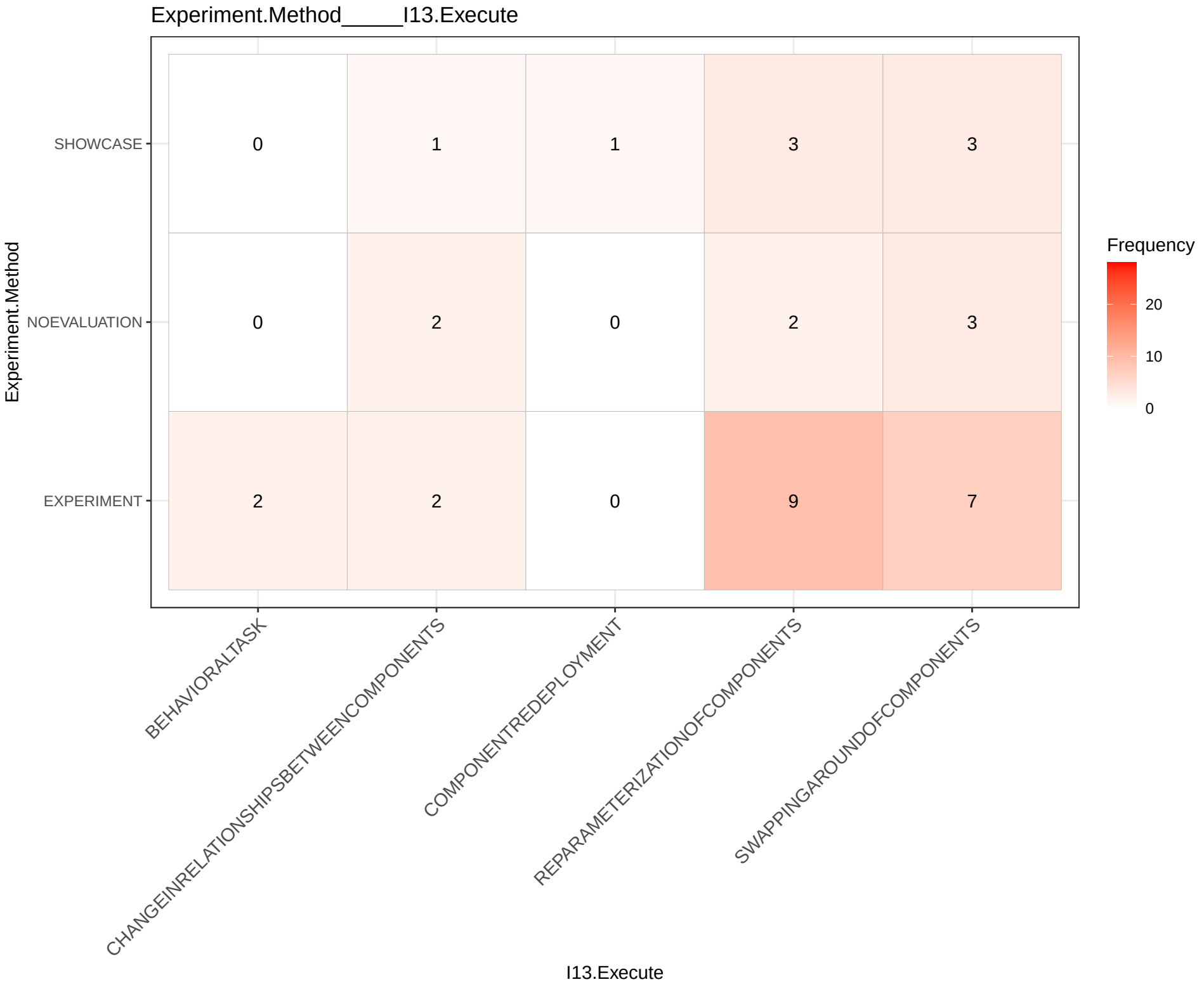
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BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
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SWAPPINGAROUNDOFCOMPONENTS
Experiment.Method
I13.Execute
Frequency
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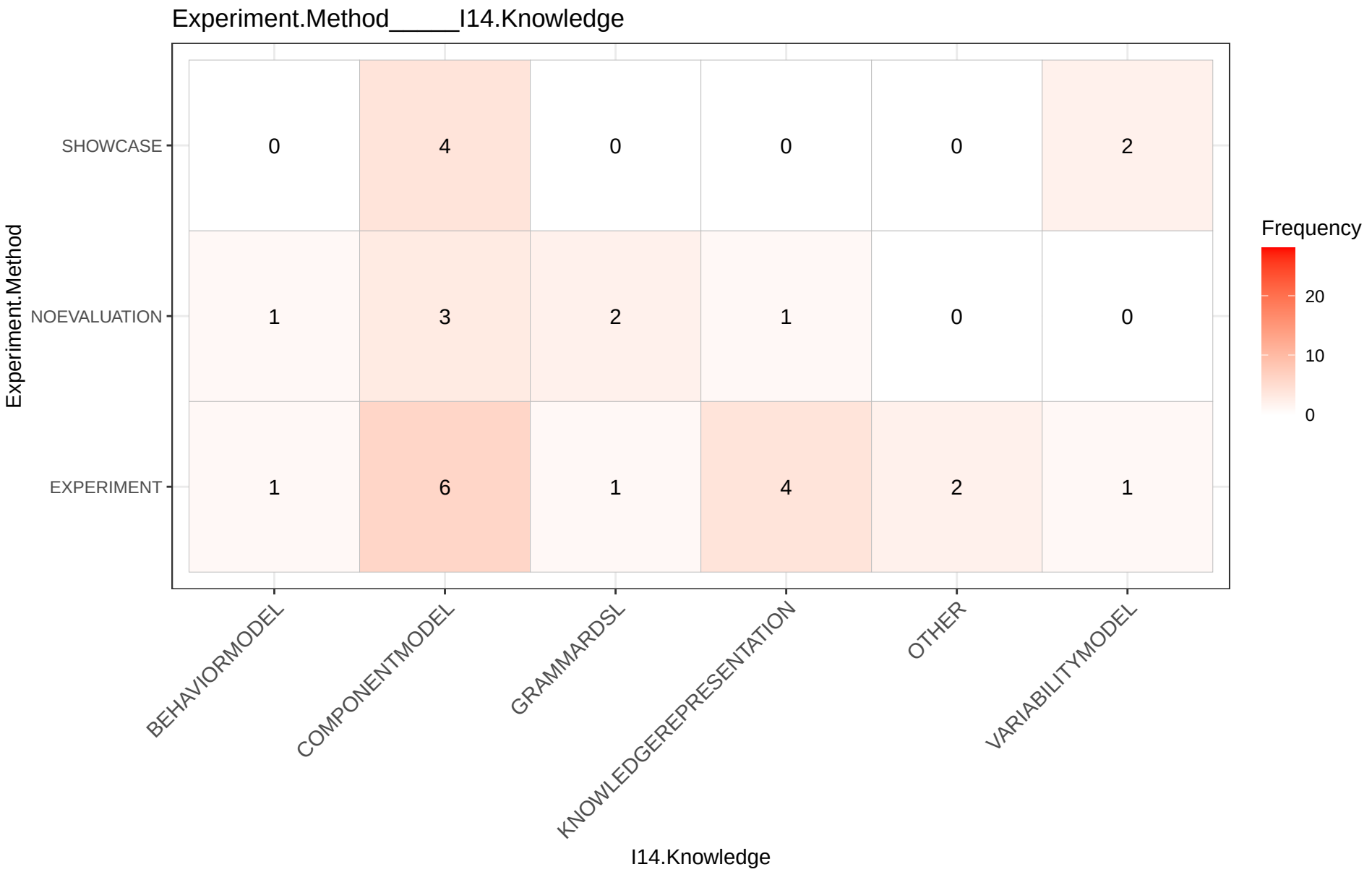
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Experiment.Method
SHOWCASE
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EXPERIMENT
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GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
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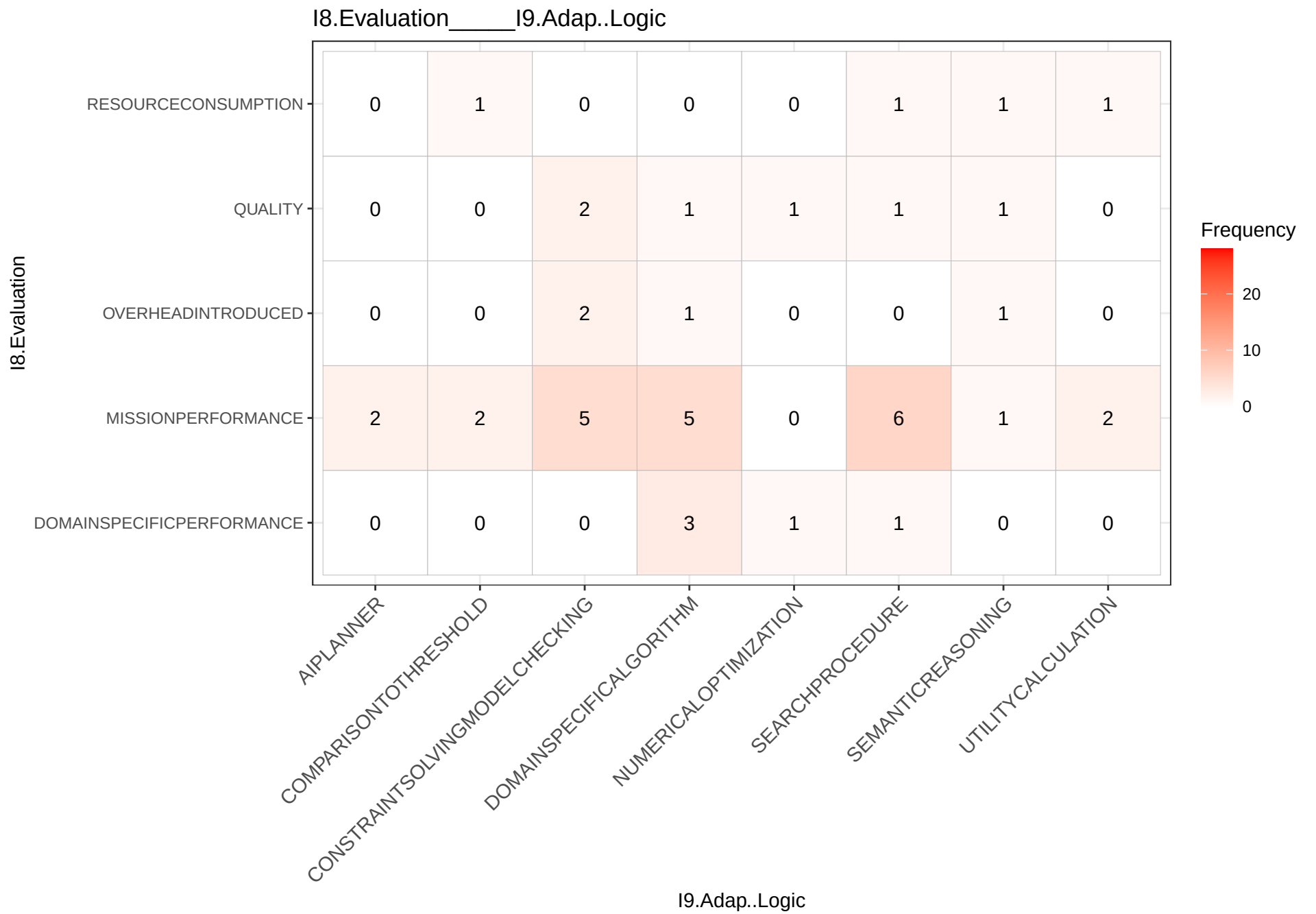
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RESOURCECONSUMPTION
QUALITY
OVERHEADINTRODUCED
MISSIONPERFORMANCE
DOMAINSPECIFICPERFORMANCE
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AIPLANNER
COMPARISONTOTHRESHOLD
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICALGORITHM
NUMERICALOPTIMIZATION
SEARCHPROCEDURE
SEMANTICREASONING
UTILITYCALCULATION
I8.Evaluation
I9.Adap..Logic
Frequency
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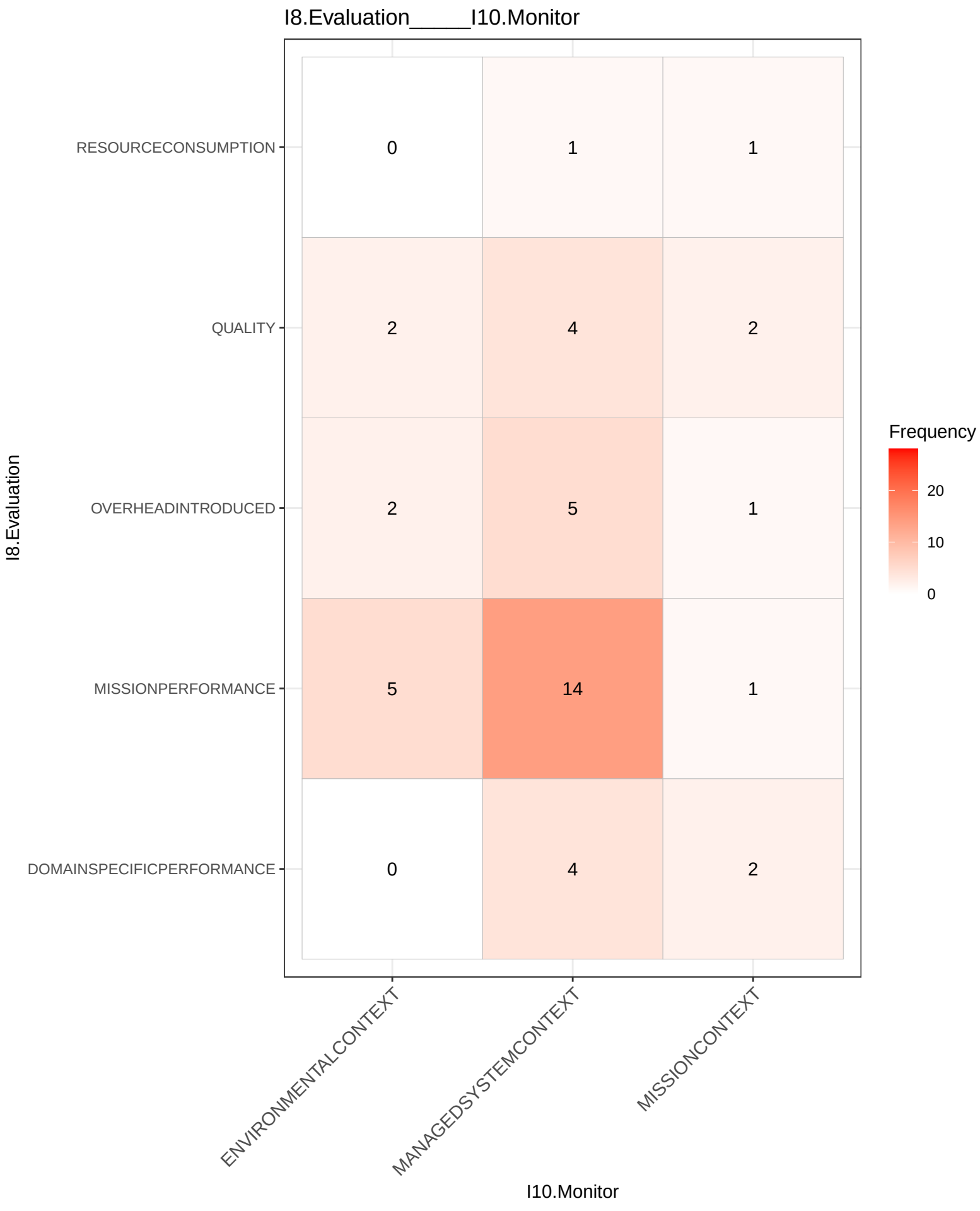
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RESOURCECONSUMPTION
QUALITY
OVERHEADINTRODUCED
MISSIONPERFORMANCE
DOMAINSPECIFICPERFORMANCE
I8.Evaluation
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MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
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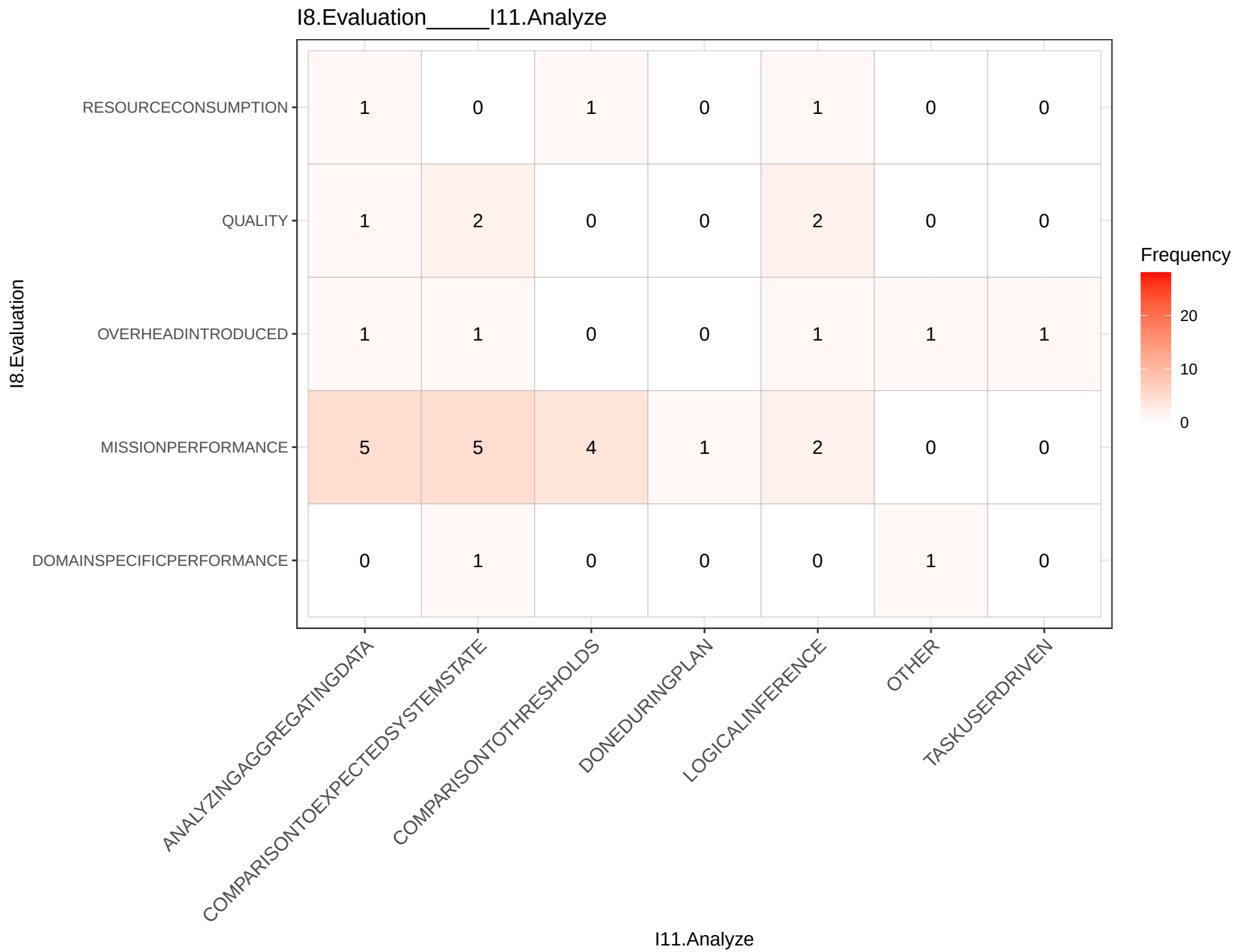
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RESOURCECONSUMPTION
QUALITY
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MISSIONPERFORMANCE
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I8.Evaluation
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ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
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DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
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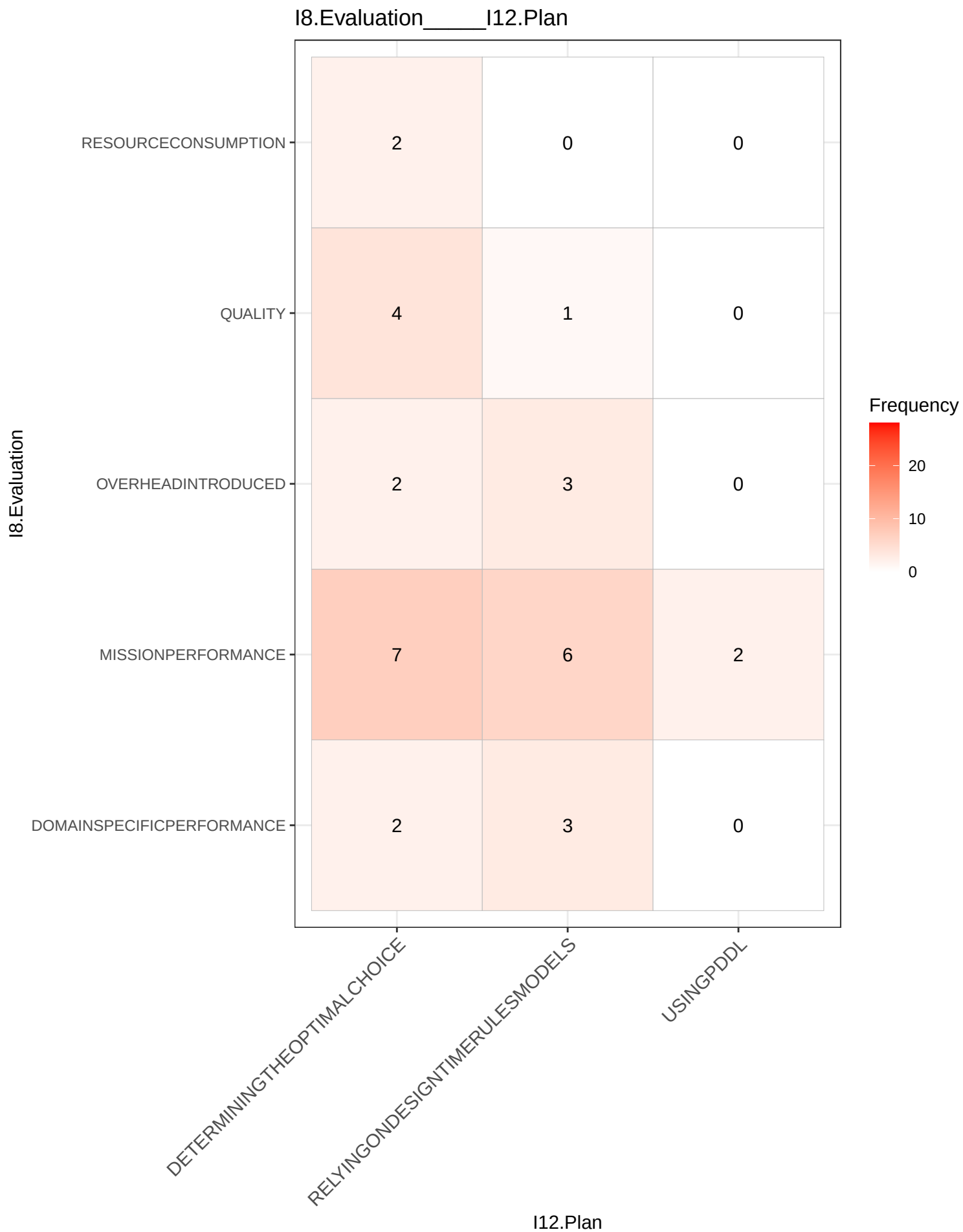
I8.Evaluation_____I12.Plan
RESOURCECONSUMPTION
QUALITY
OVERHEADINTRODUCED
MISSIONPERFORMANCE
DOMAINSPECIFICPERFORMANCE
I8.Evaluation
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RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
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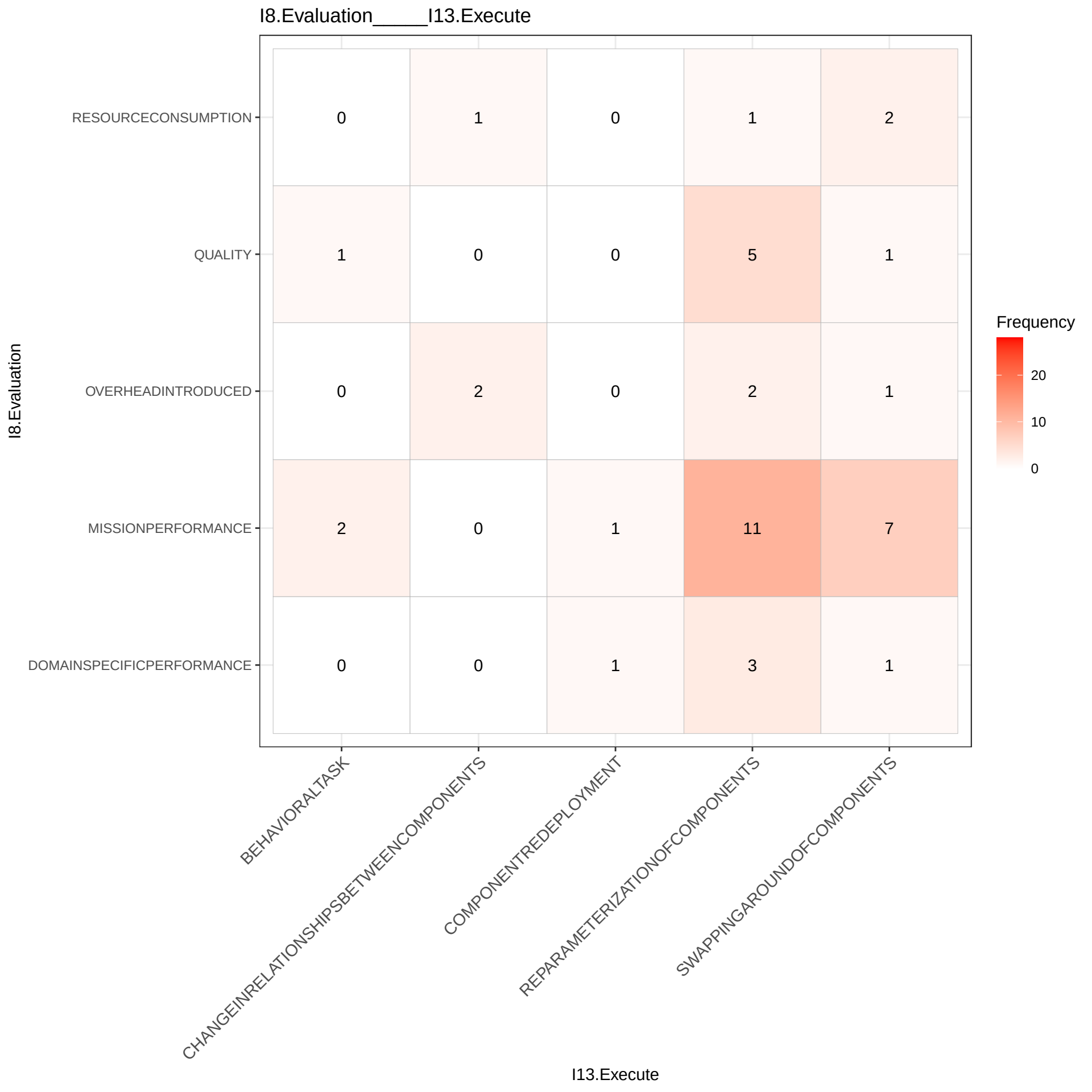
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QUALITY
OVERHEADINTRODUCED
MISSIONPERFORMANCE
DOMAINSPECIFICPERFORMANCE
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I8.Evaluation
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
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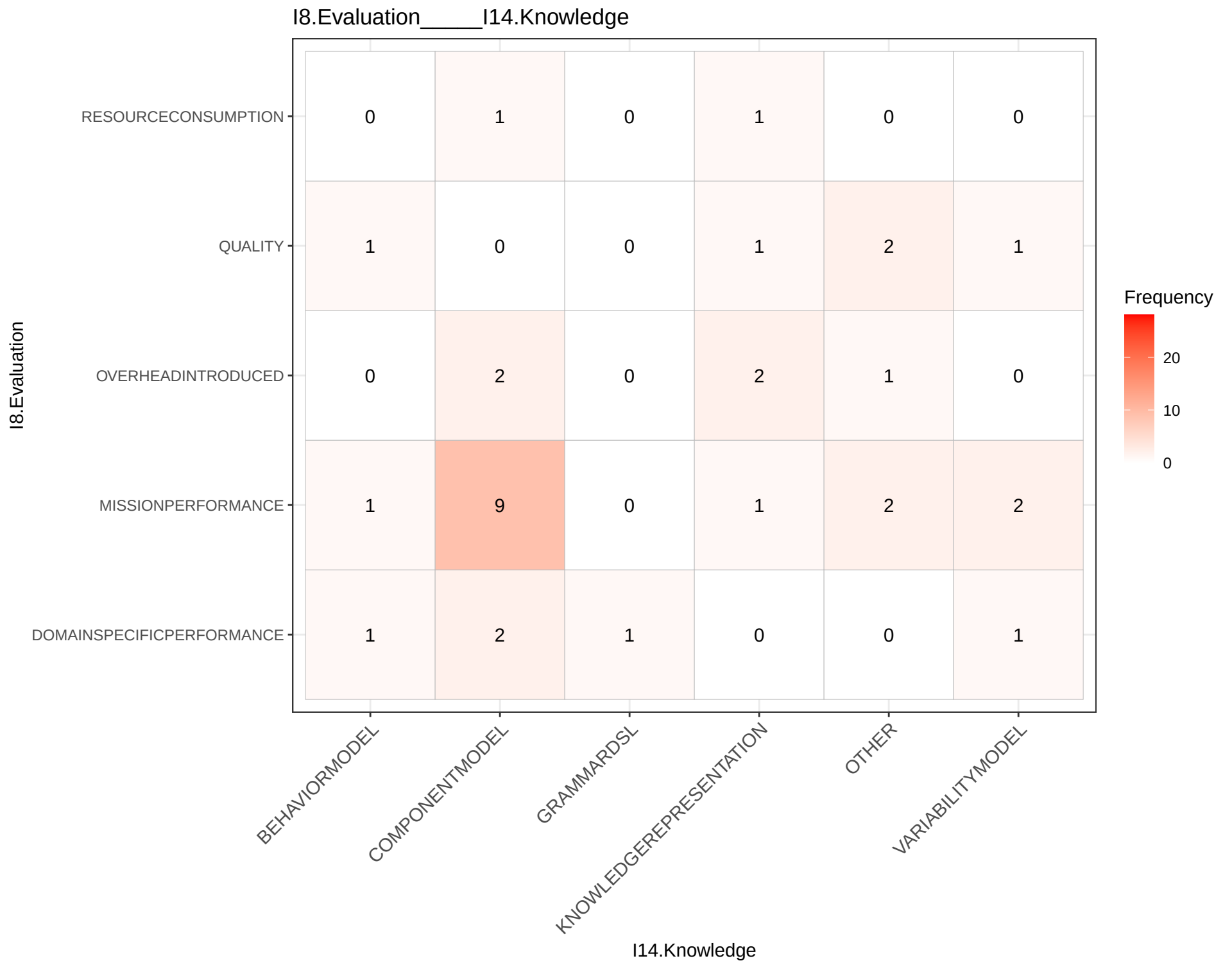
I8.Evaluation_____I14.Knowledge
RESOURCECONSUMPTION
QUALITY
OVERHEADINTRODUCED
MISSIONPERFORMANCE
DOMAINSPECIFICPERFORMANCE
I8.Evaluation
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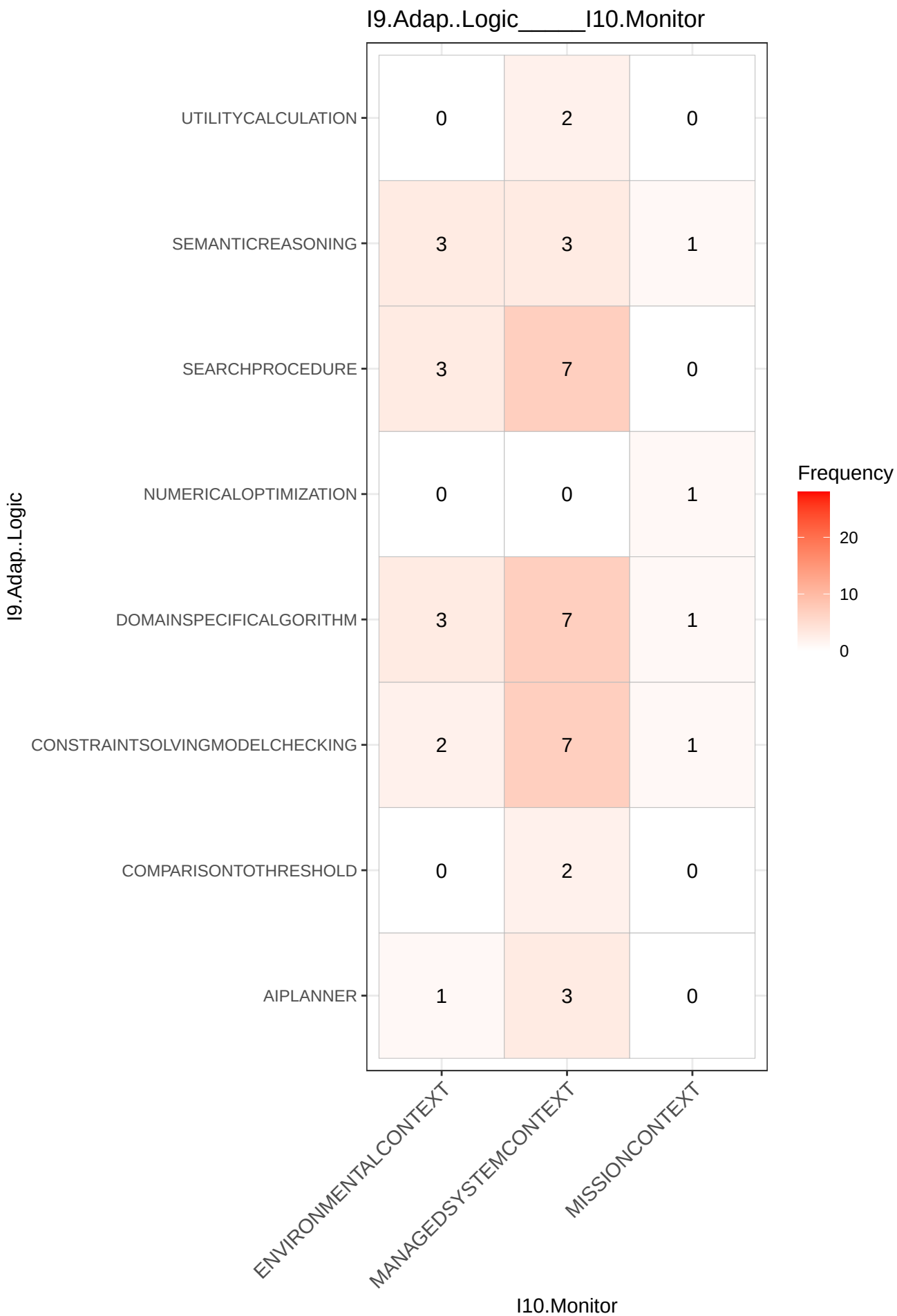
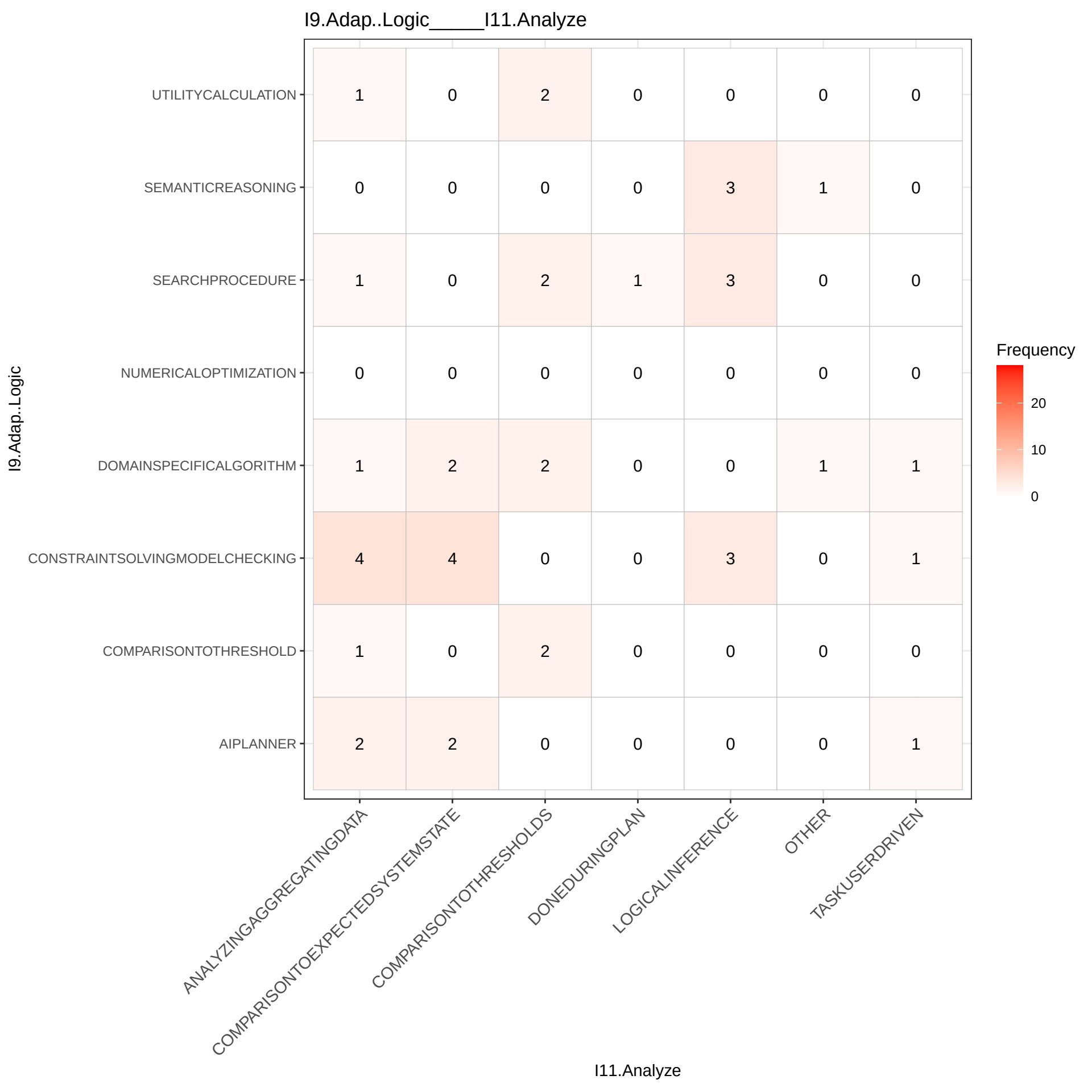
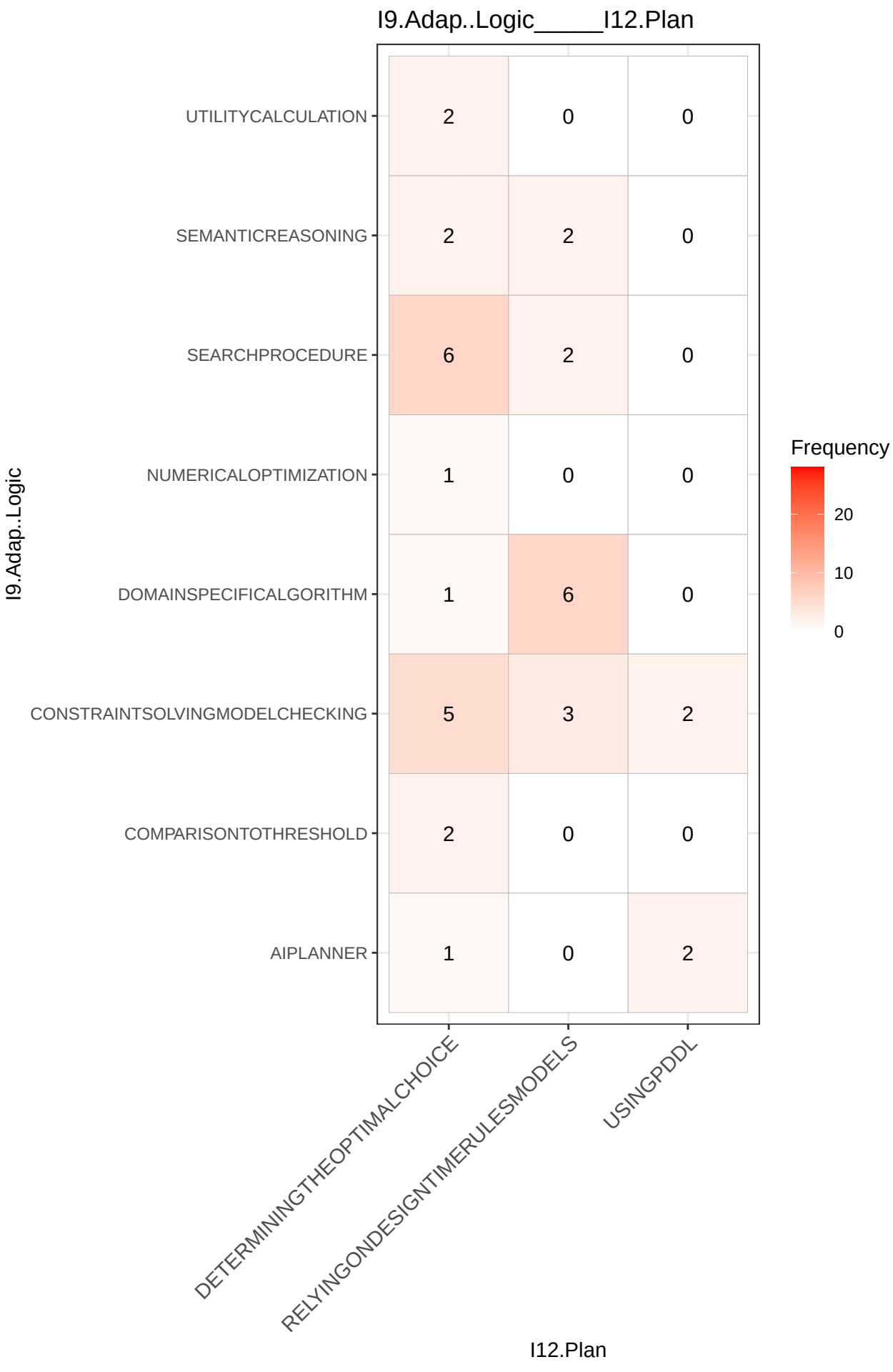
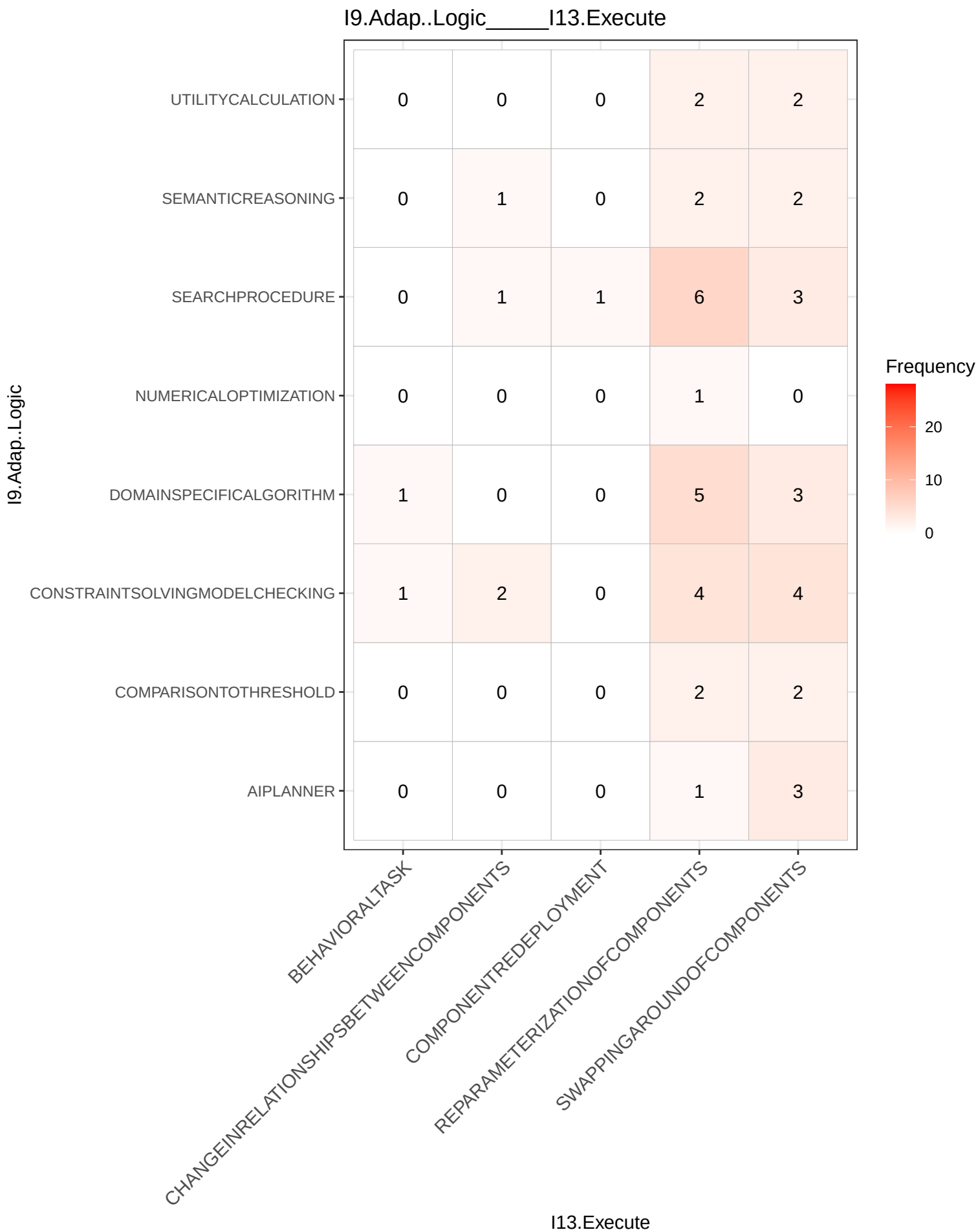
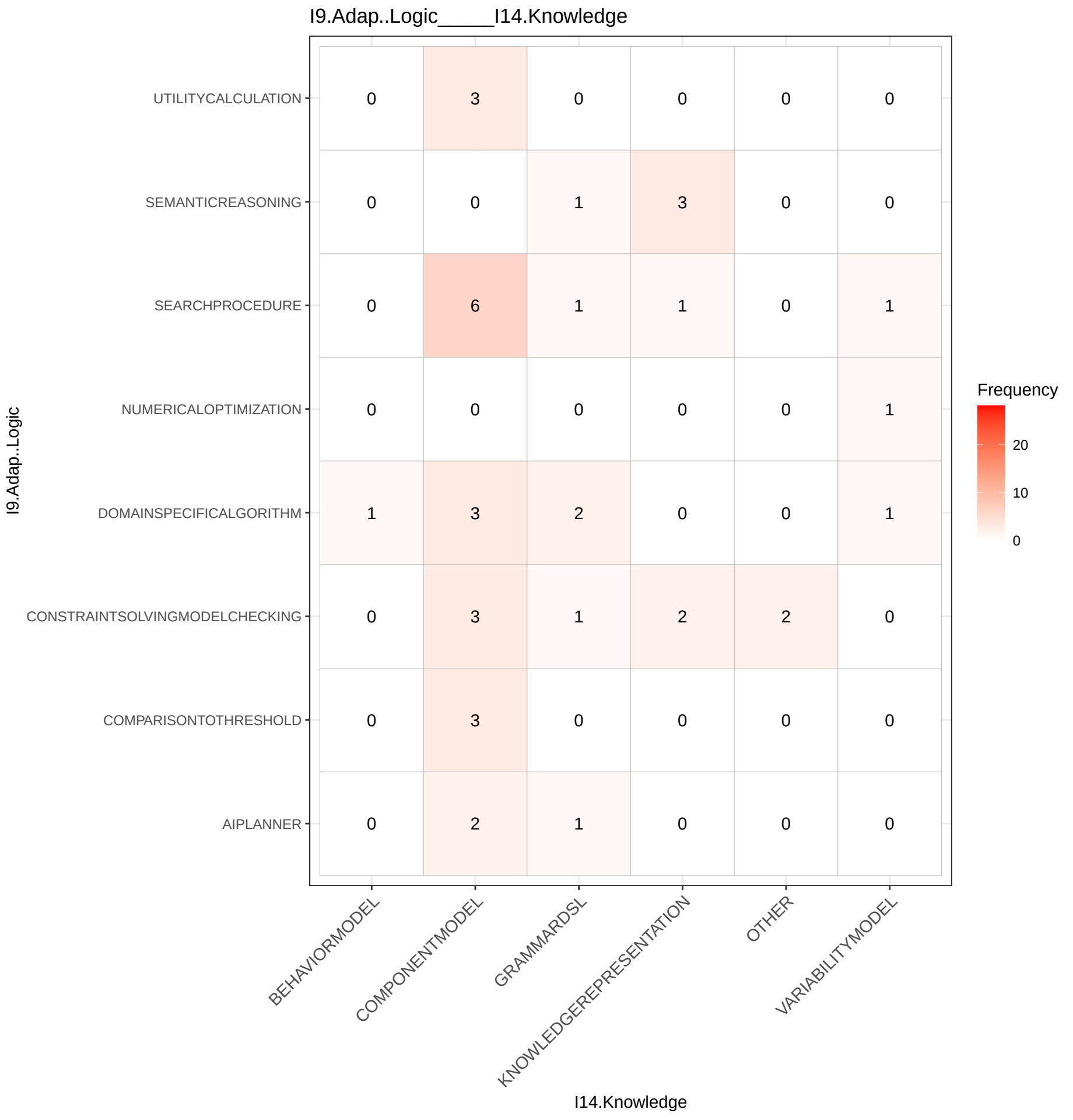
1 2 1 0 0 1
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

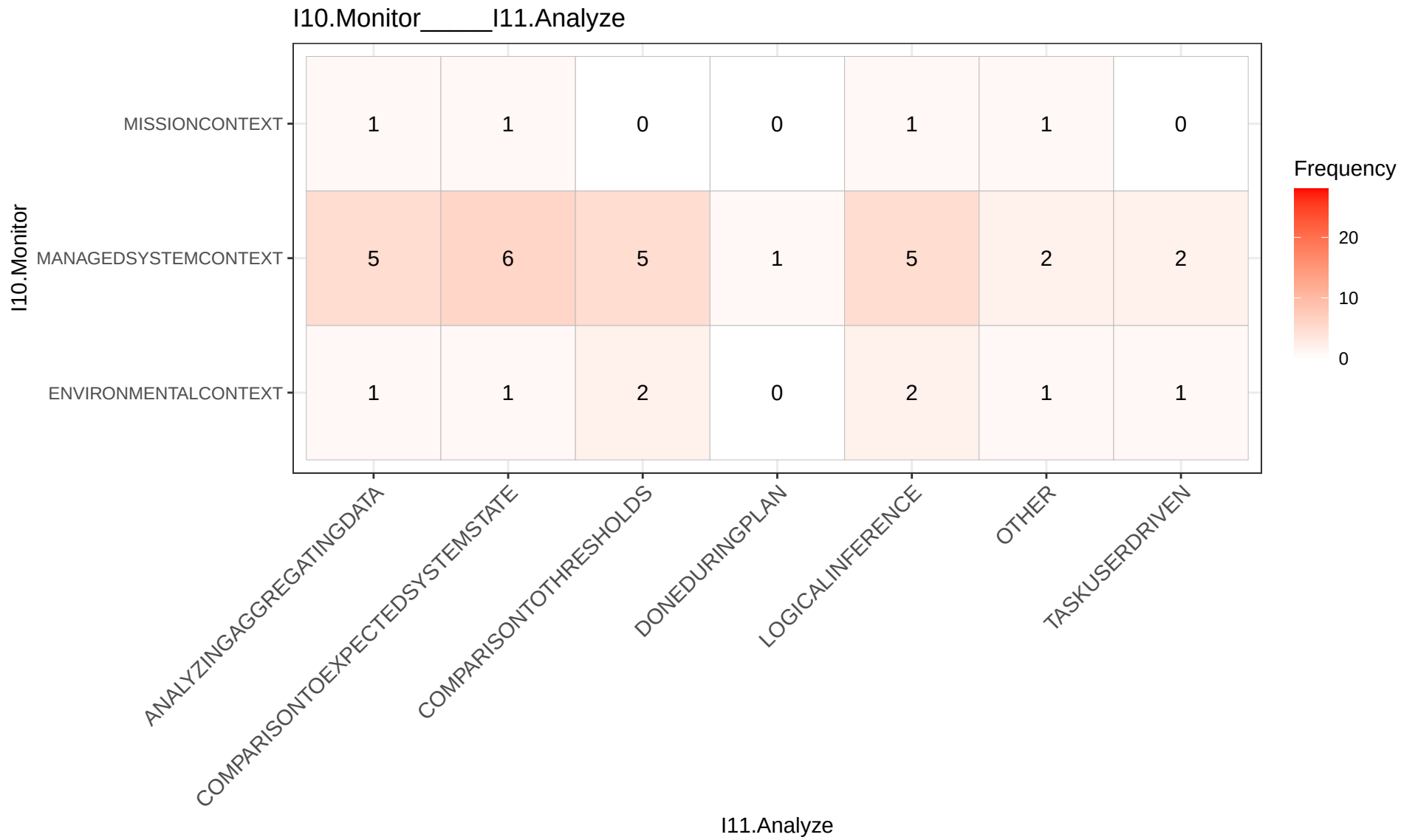

I9.Adap..Logic_____I10.Monitor
UTILITYCALCULATION
SEMANTICREASONING
SEARCHPROCEDURE
NUMERICALOPTIMIZATION
DOMAINSPECIFICALGORITHM
CONSTRAINTSOLVINGMODELCHECKING
COMPARISONTOTHRESHOLD
AIPLANNER
0 2 0
3 3 1
3 7 0
0 0 1
3 7 1
2 7 1
0 2 0
1 3 0
I9.Adap..Logic
ENVIRONMENTALCONTEXT
MANAGEDSYSTEMCONTEXT
MISSIONCONTEXT
I10.Monitor
Frequency
20
10
0

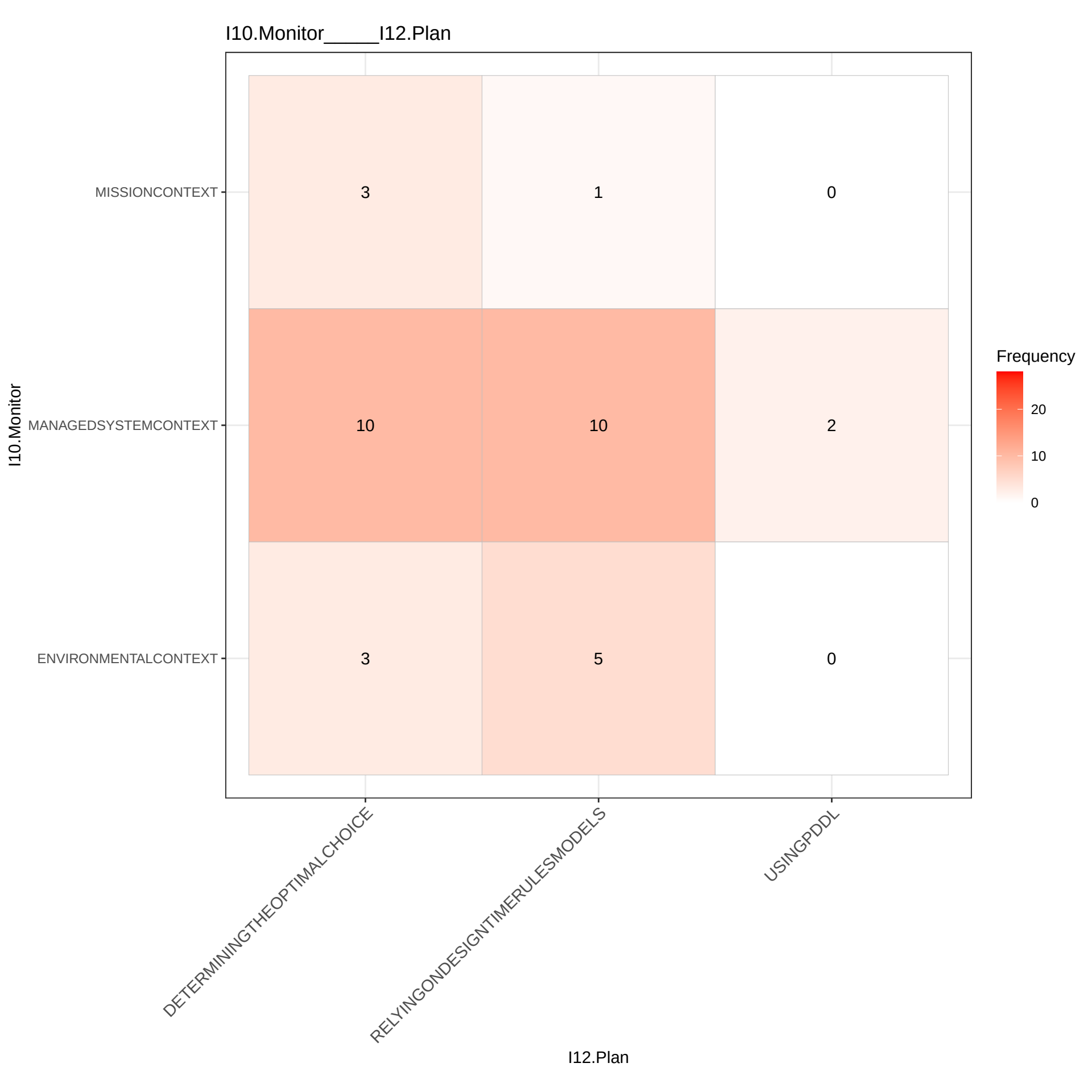

I9.Adap..Logic_____I11.Analyze
UTILITYCALCULATION
SEMANTICREASONING
SEARCHPROCEDURE
NUMERICALOPTIMIZATION
DOMAINSPECIFICALGORITHM
CONSTRAINTSOLVINGMODELCHECKING
COMPARISONTOTHRESHOLD
AIPLANNER
1 0 2 0 0 0 0
0 0 0 0 3 1 0
1 0 2 1 3 0 0
0 0 0 0 0 0 0
1 2 2 0 0 1 1
4 4 0 0 3 0 1
1 0 2 0 0 0 0
2 2 0 0 0 0 1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I9.Adap..Logic
I11.Analyze
Frequency
20
10
0

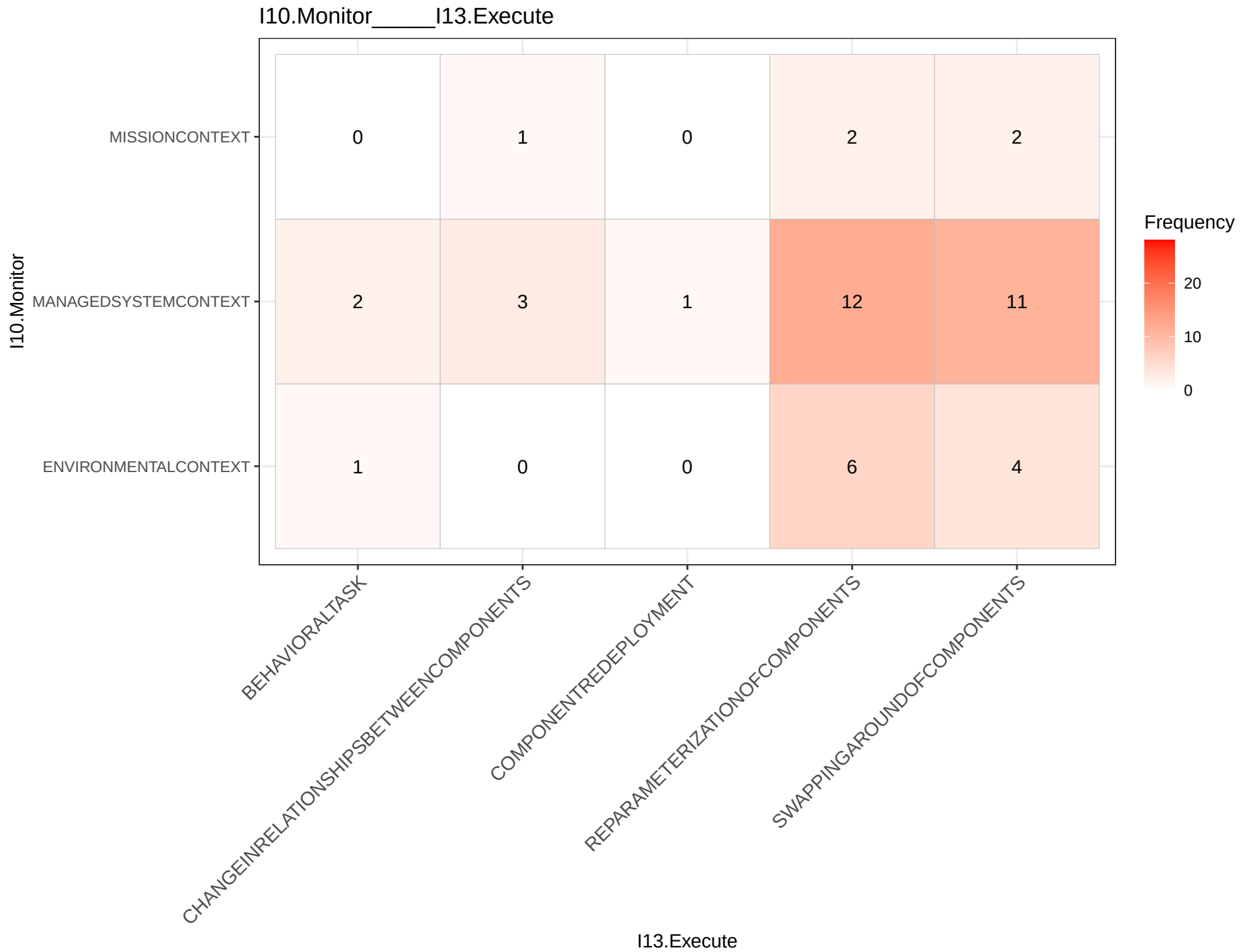

I9.Adap..Logic_____I12.Plan
UTILITYCALCULATION
SEMANTICREASONING
SEARCHPROCEDURE
NUMERICALOPTIMIZATION
DOMAINSPECIFICALGORITHM
CONSTRAINTSOLVINGMODELCHECKING
COMPARISONTOTHRESHOLD
AIPLANNER
I9.Adap..Logic
2 0 0
2 2 0
6 2 0
1 0 0
1 6 0
5 3 2
2 0 0
1 0 2
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0

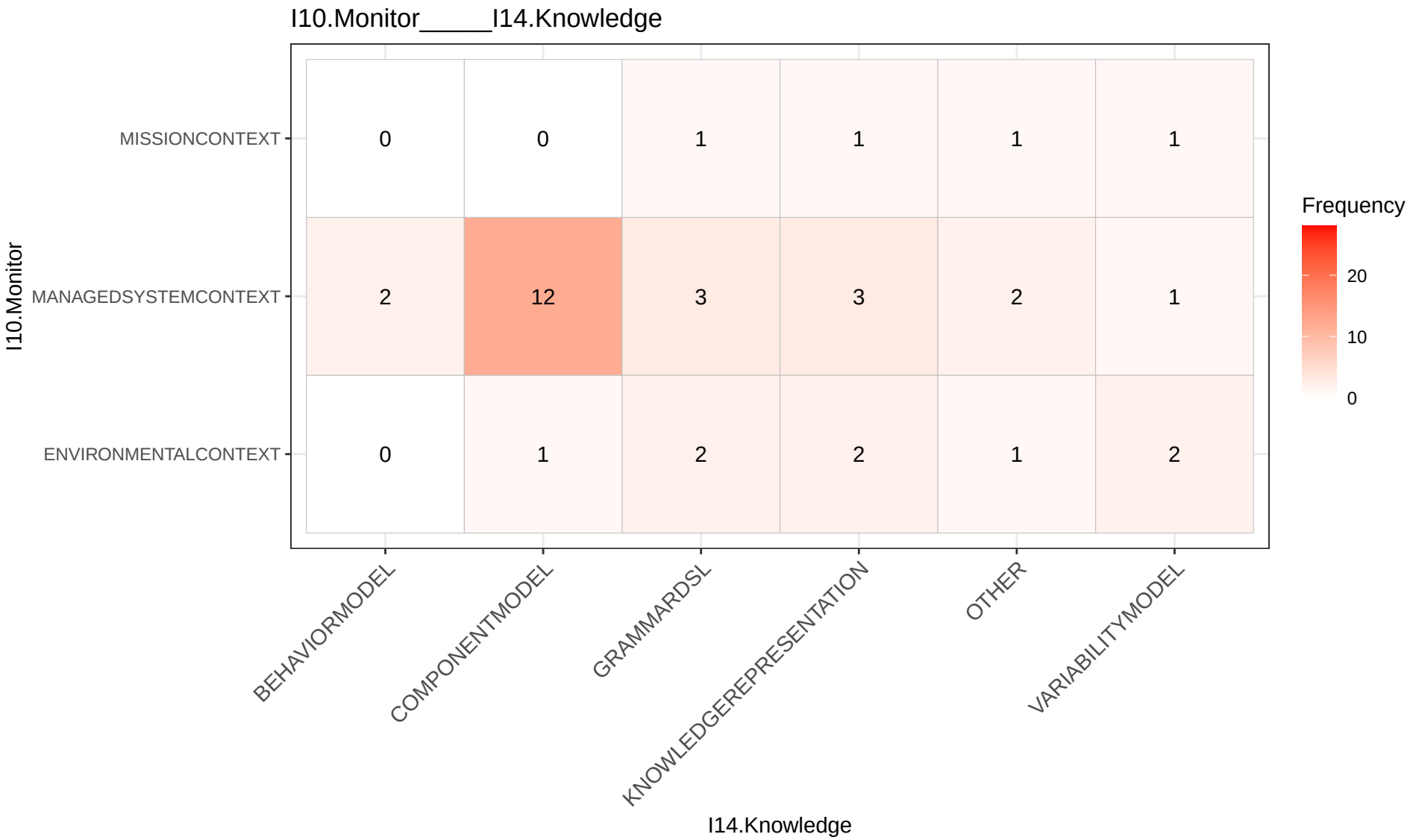

I9.Adap..Logic_____I13.Execute
UTILITYCALCULATION
SEMANTICREASONING
SEARCHPROCEDURE
NUMERICALOPTIMIZATION
DOMAINSPECIFICALGORITHM
CONSTRAINTSOLVINGMODELCHECKING
COMPARISONTOTHRESHOLD
AIPLANNER
0 0 0 2 2
0 1 0 2 2
0 1 1 6 3
0 0 0 1 0
1 0 0 5 3
1 2 0 4 4
0 0 0 2 2
0 0 0 1 3
I9.Adap..Logic
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0

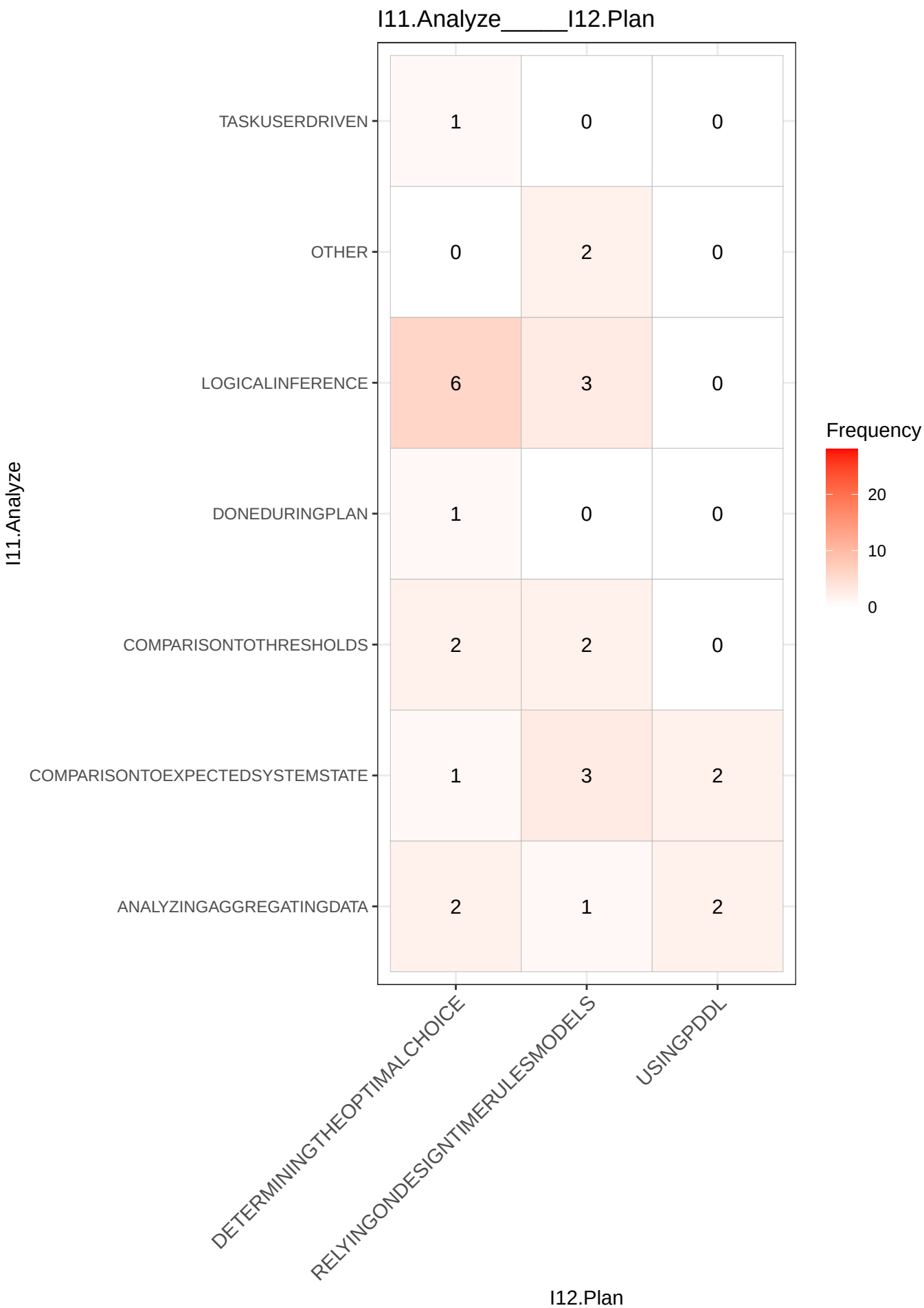

I9.Adap..Logic_____I14.Knowledge
UTILITYCALCULATION
SEMANTICREASONING
SEARCHPROCEDURE
NUMERICALOPTIMIZATION
DOMAINSPECIFICALGORITHM
CONSTRAINTSOLVINGMODELCHECKING
COMPARISONTOTHRESHOLD
AIPLANNER
I9.Adap..Logic
0 3 0 0 0 0
0 0 1 3 0 0
0 6 1 1 0 1
0 0 0 0 0 1
1 3 2 0 0 1
0 3 1 2 2 0
0 3 0 0 0 0
0 2 1 0 0 0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0

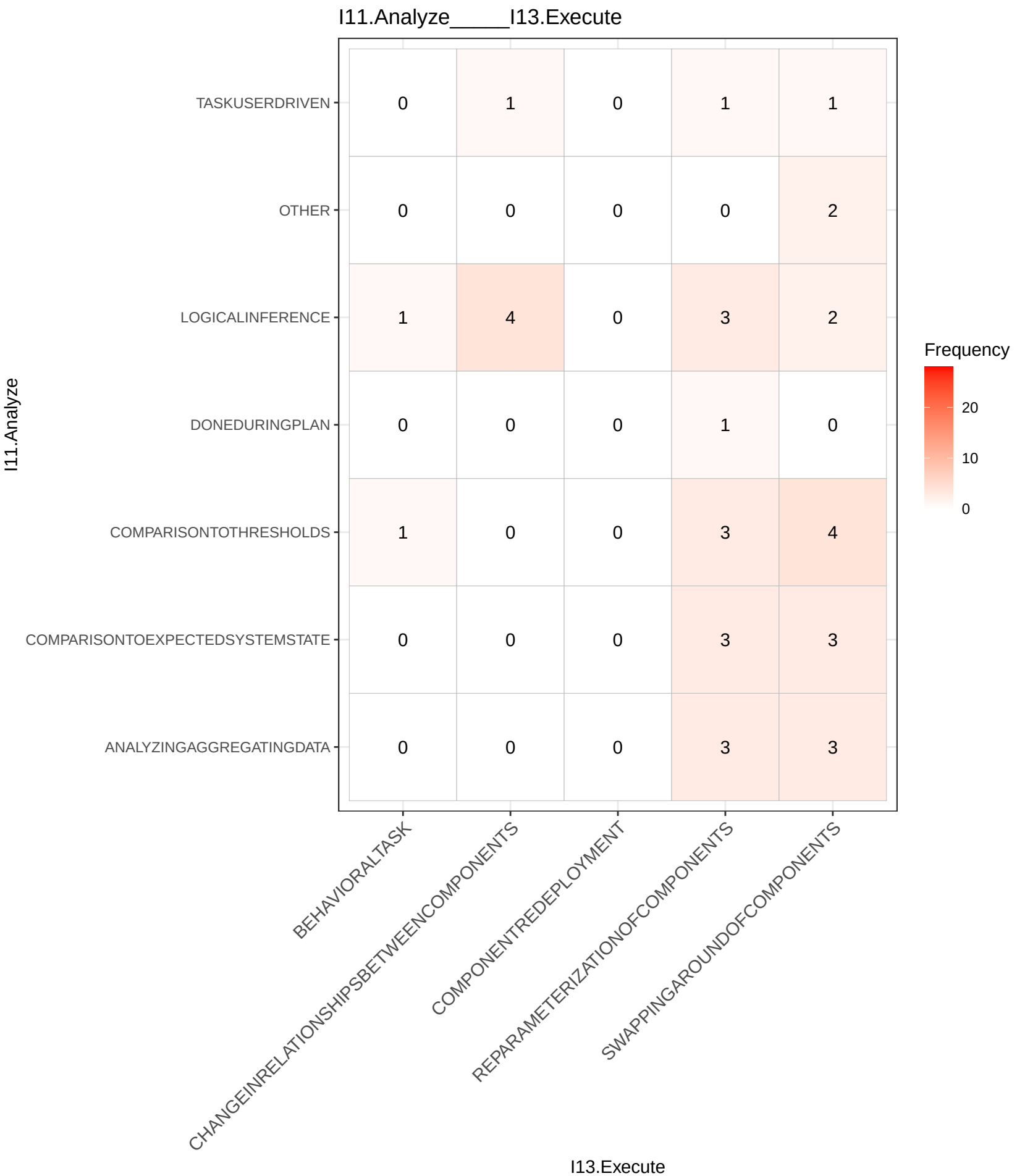

I10.Monitor_____I11.Analyze
MISSIONCONTEXT
MANAGEDSYSTEMCONTEXT
ENVIRONMENTALCONTEXT
I10.Monitor
1 1 0 0 1 1 0
5 6 5 1 5 2 2
1 1 2 0 2 1 1
ANALYZINGAGGREGATINGDATA
COMPARISONTOEXPECTEDSYSTEMSTATE
COMPARISONTOTHRESHOLDS
DONEDURINGPLAN
LOGICALINFERENCE
OTHER
TASKUSERDRIVEN
I11.Analyze
Frequency
20
10
0

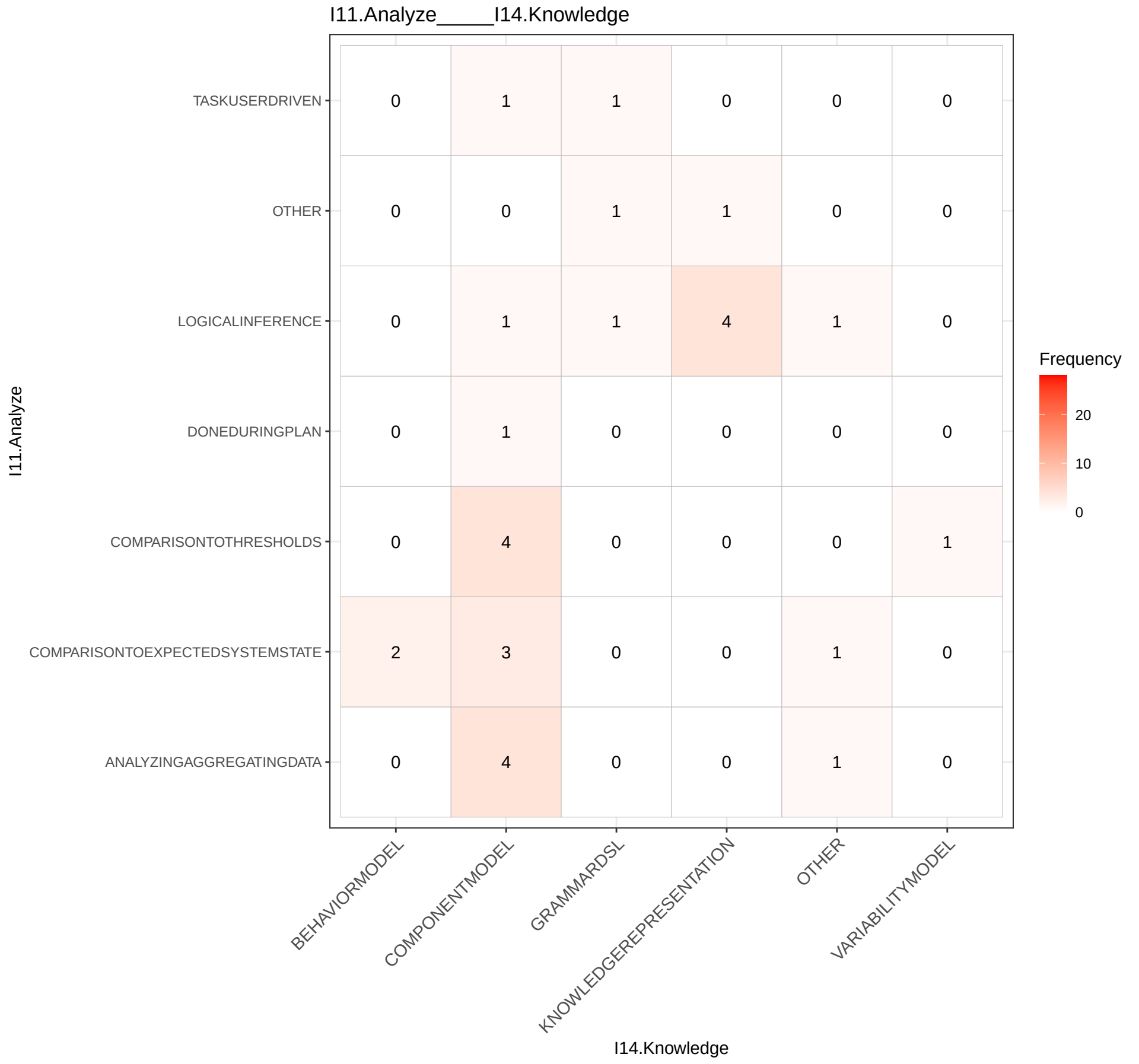

I10.Monitor_____I12.Plan
MISSIONCONTEXT
MANAGEDSYSTEMCONTEXT
ENVIRONMENTALCONTEXT
I10.Monitor
3
1
0
10
10
2
3
5
0
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0

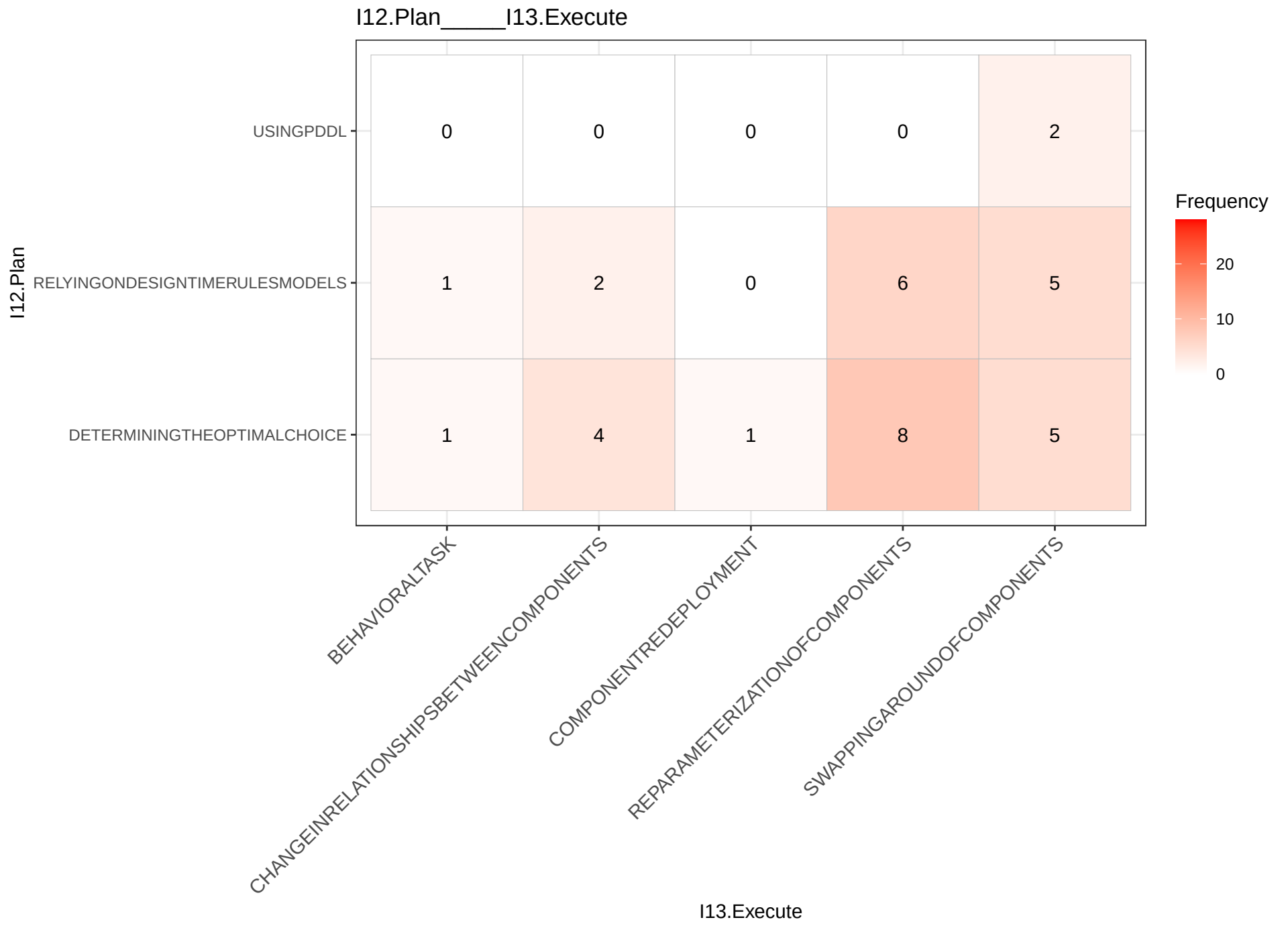

I10.Monitor_____I13.Execute
MISSIONCONTEXT
MANAGEDSYSTEMCONTEXT
ENVIRONMENTALCONTEXT
I10.Monitor
0
1
0
2
2
2
3
1
12
11
1
0
0
6
4
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0


I10.Monitor_____I14.Knowledge
MISSIONCONTEXT
MANAGEDSYSTEMCONTEXT
ENVIRONMENTALCONTEXT
I10.Monitor
0
0
1
1
1
1
2
12
3
3
2
1
0
1
2
2
1
2
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0


I11.Analyze_____I12.Plan
TASKUSERDRIVEN
OTHER
LOGICALINFERENCE
DONEDURINGPLAN
COMPARISONTOTHRESHOLDS
COMPARISONTOEXPECTEDSYSTEMSTATE
ANALYZINGAGGREGATINGDATA
1 0 0
0 2 0
6 3 0
1 0 0
2 2 0
1 3 2
2 1 2
I11.Analyze
DETERMININGTHEOPTIMALCHOICE
RELYINGONDESIGNTIMERULESMODELS
USINGPDDL
I12.Plan
Frequency
20
10
0


I11.Analyze_____I13.Execute
TASKUSERDRIVEN
OTHER
LOGICALINFERENCE
DONEDURINGPLAN
COMPARISONTOTHRESHOLDS
COMPARISONTOEXPECTEDSYSTEMSTATE
ANALYZINGAGGREGATINGDATA
I11.Analyze
0 1 0 1 1
0 0 0 0 2
1 4 0 3 2
0 0 0 1 0
1 0 0 3 4
0 0 0 3 3
0 0 0 3 3
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
0


I11.Analyze_____I14.Knowledge
TASKUSERDRIVEN
OTHER
LOGICALINFERENCE
DONEDURINGPLAN
COMPARISONTOTHRESHOLDS
COMPARISONTOEXPECTEDSYSTEMSTATE
ANALYZINGAGGREGATINGDATA
0 1 1 0 0 0
0 0 1 1 0 0
0 1 1 4 1 0
0 1 0 0 0 0
0 4 0 0 0 1
2 3 0 0 1 0
0 4 0 0 1 0
I11.Analyze
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0


I12.Plan_____I13.Execute
USINGPDDL
RELYINGONDESIGNTIMERULESMODELS
DETERMININGTHEOPTIMALCHOICE
I12.Plan
0
0
0
0
2
1
2
0
6
5
1
4
1
8
5
BEHAVIORALTASK
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
COMPONENTREDEPLOYMENT
REPARAMETERIZATIONOFCOMPONENTS
SWAPPINGAROUNDOFCOMPONENTS
I13.Execute
Frequency
20
10
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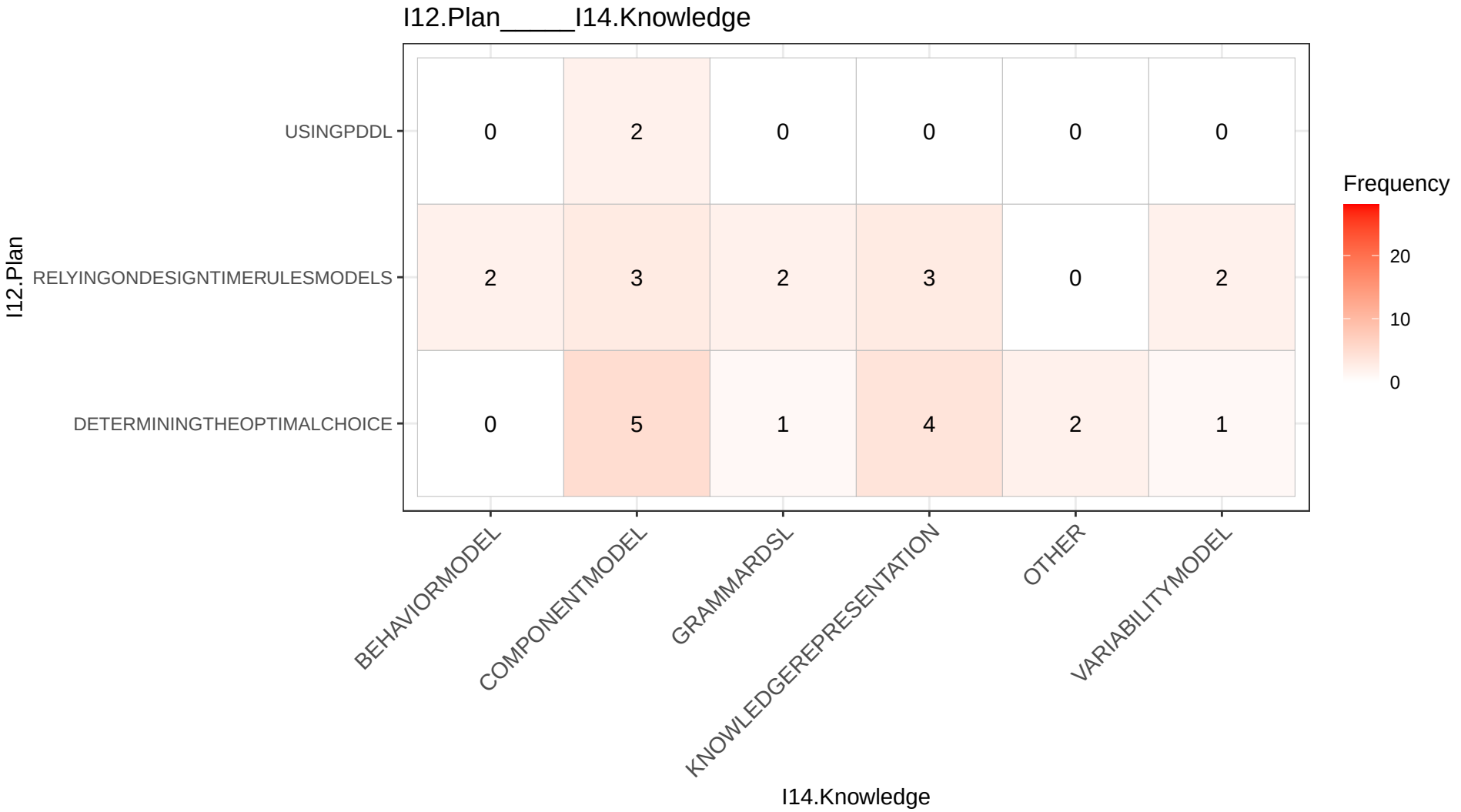
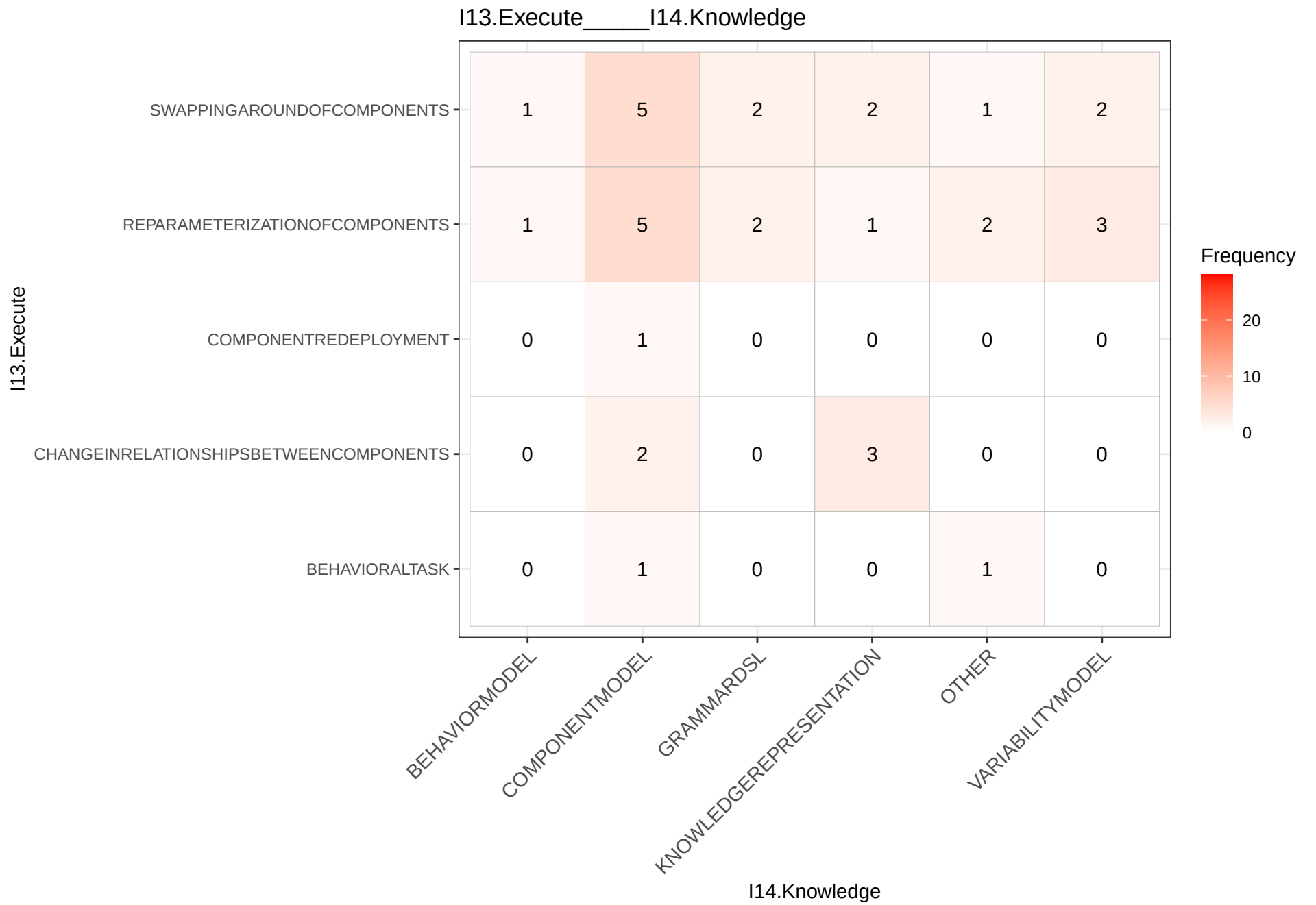

I12.Plan_____I14.Knowledge
I12.Plan
USINGPDDL
RELYINGONDESIGNTIMERULESMODELS
DETERMININGTHEOPTIMALCHOICE
0
2
0
0
0
0
2
3
2
3
0
2
0
5
1
4
2
1
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0


I13.Execute_____I14.Knowledge
SWAPPINGAROUNDOFCOMPONENTS
REPARAMETERIZATIONOFCOMPONENTS
COMPONENTREDEPLOYMENT
CHANGEINRELATIONSHIPSBETWEENCOMPONENTS
BEHAVIORALTASK
I13.Execute
1 5 2 2 1 2
1 5 2 1 2 3
0 1 0 0 0 0
0 2 0 3 0 0
0 1 0 0 1 0
BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL
I14.Knowledge
Frequency
20
10
0