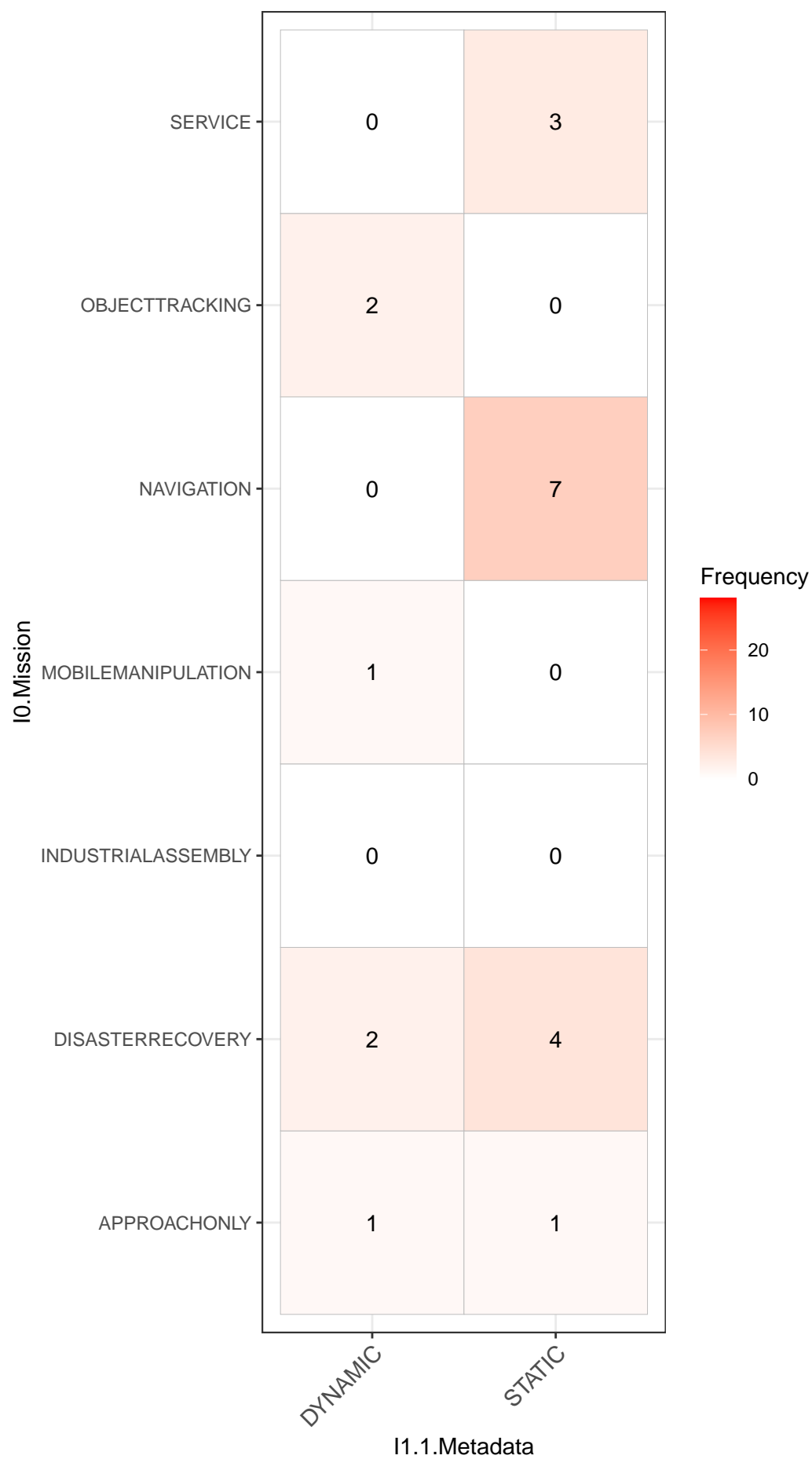
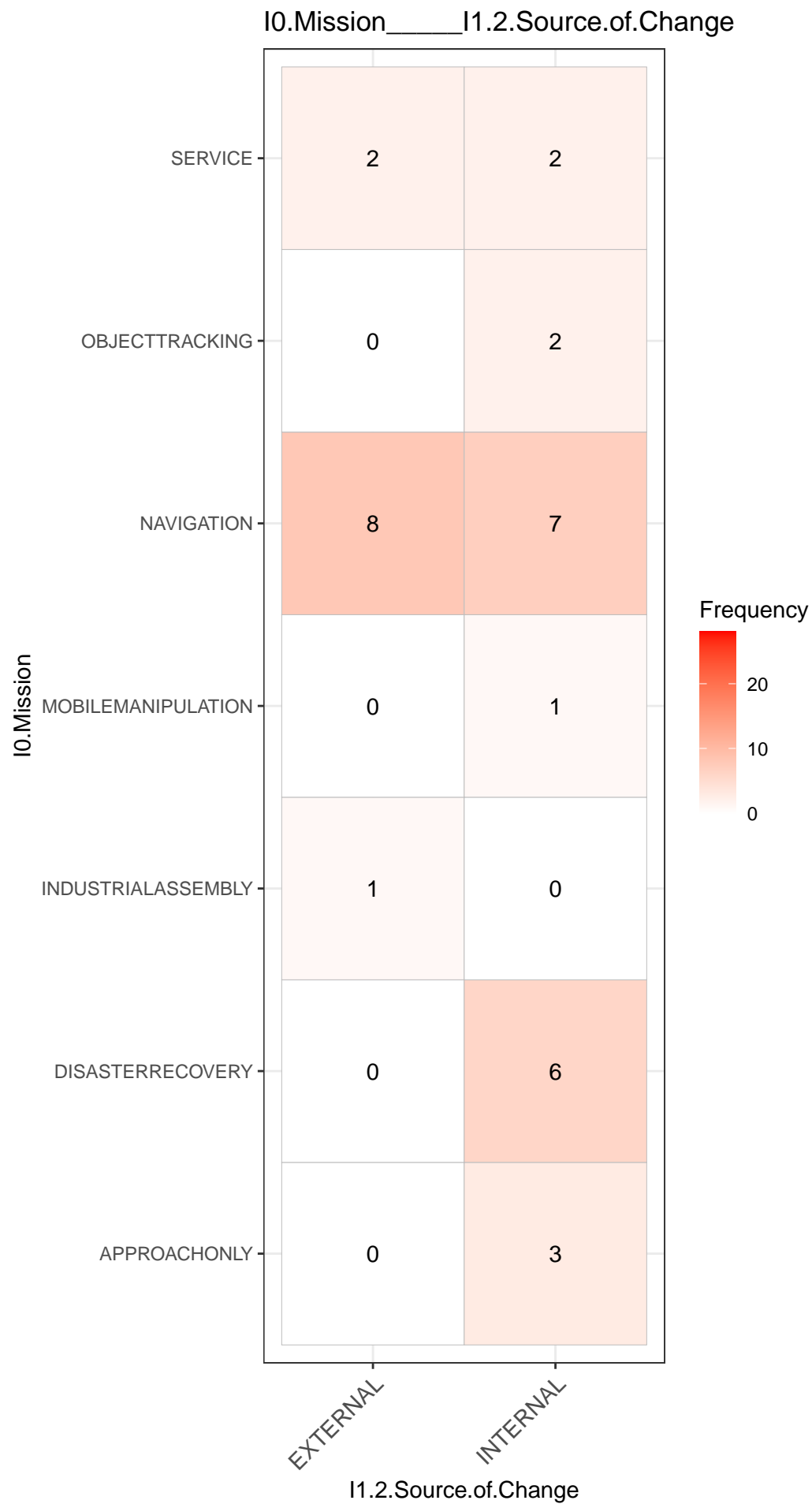


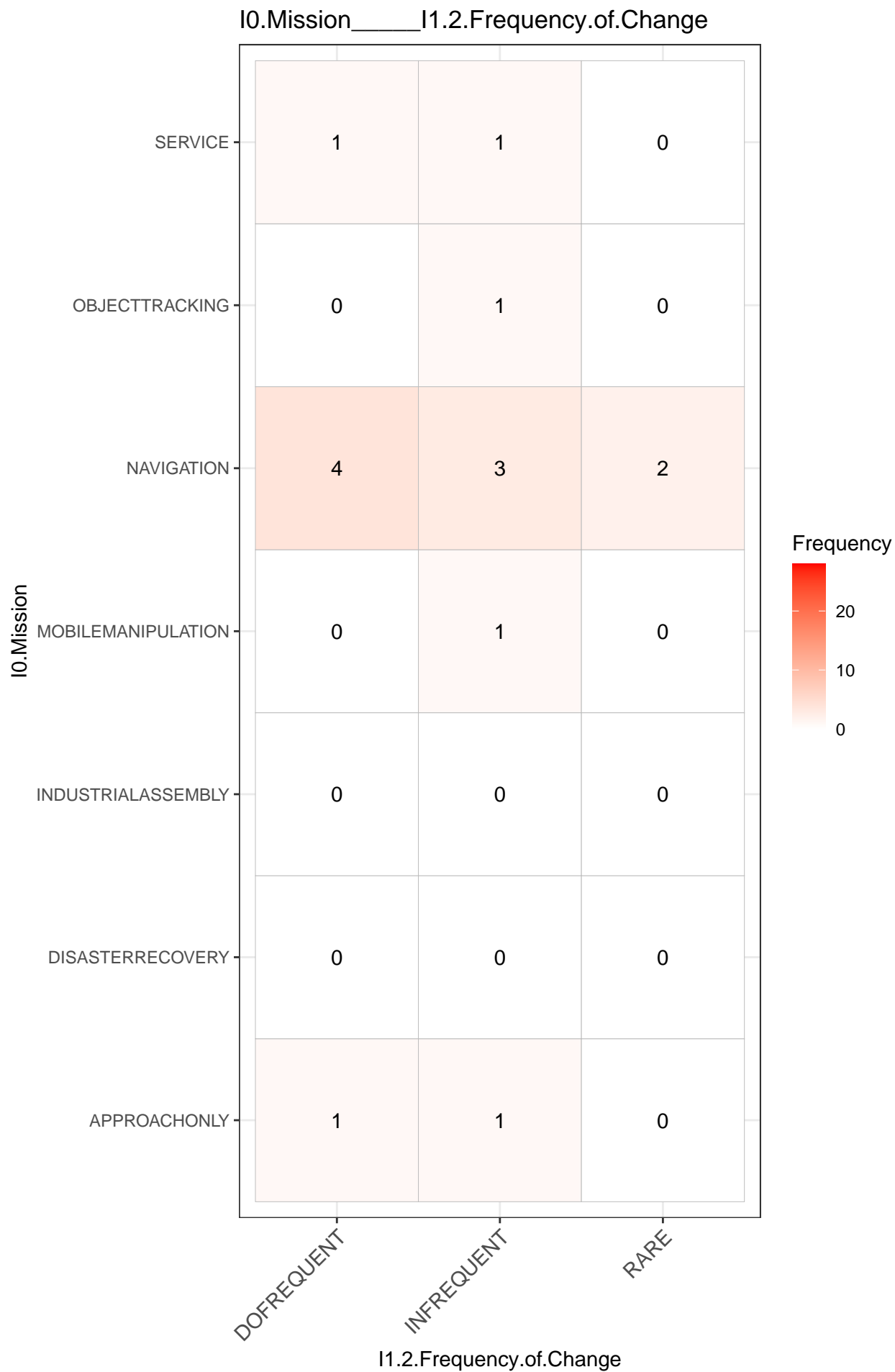
I0.Mission_____I1.1.Metadata

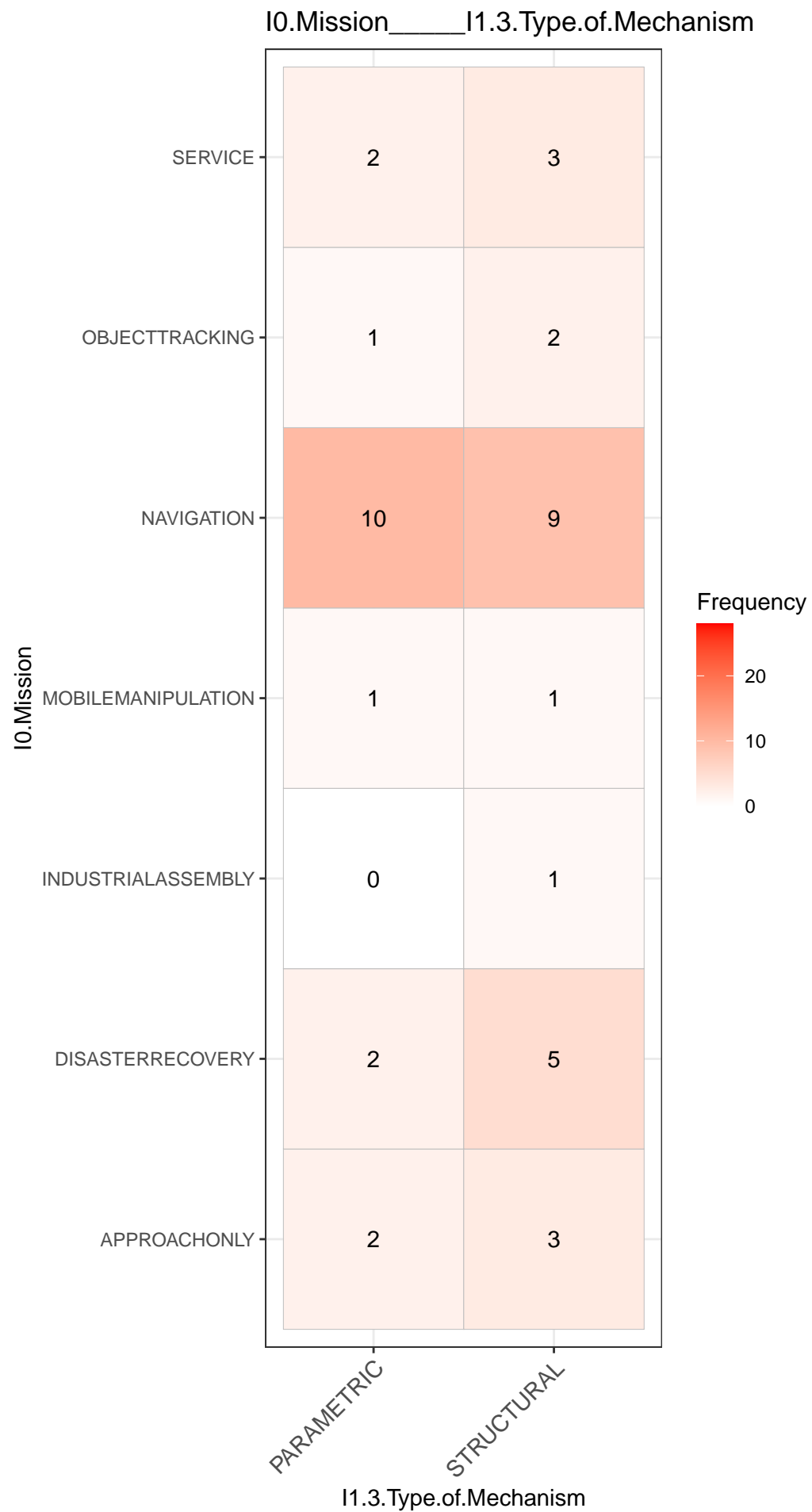


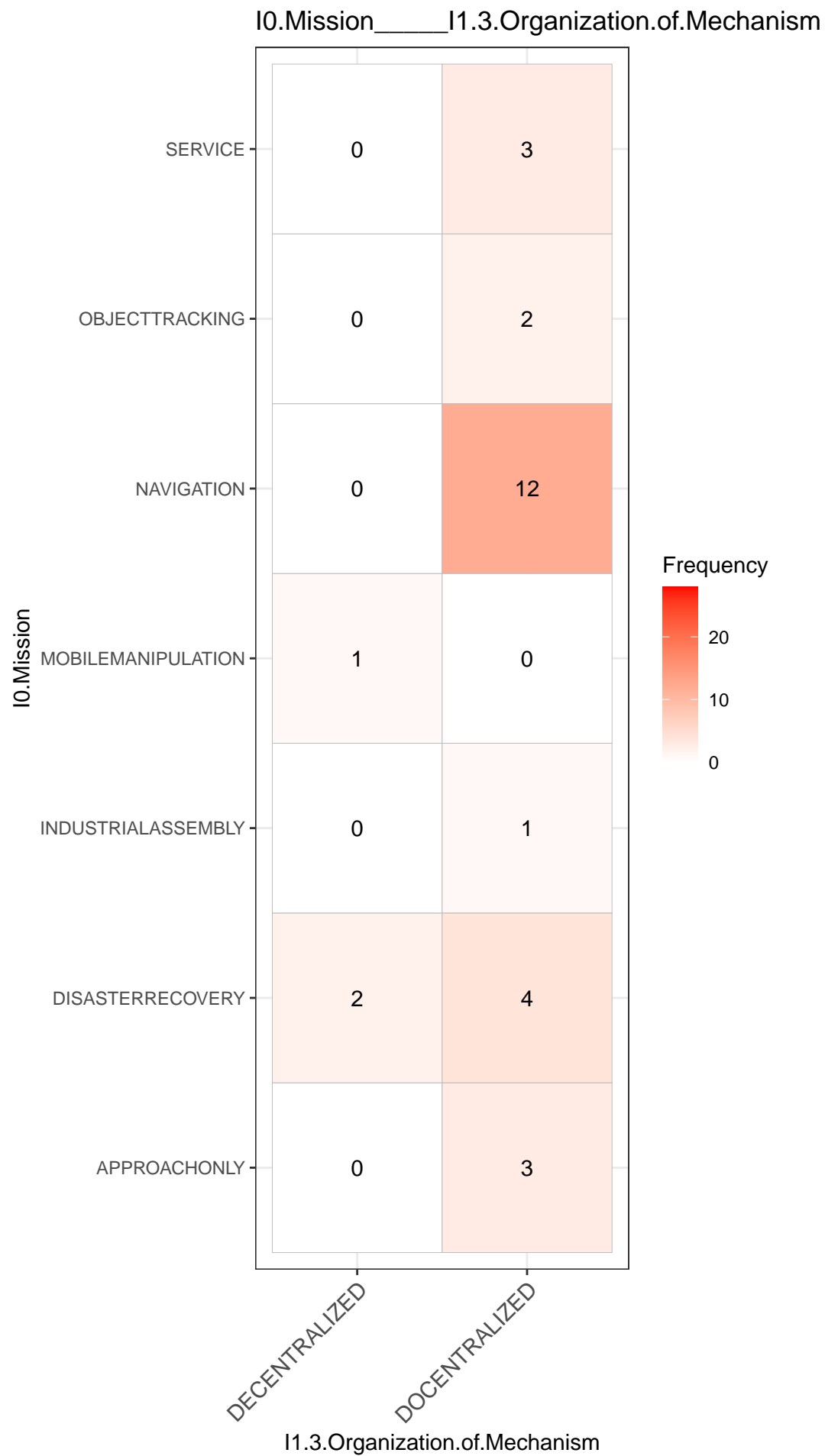


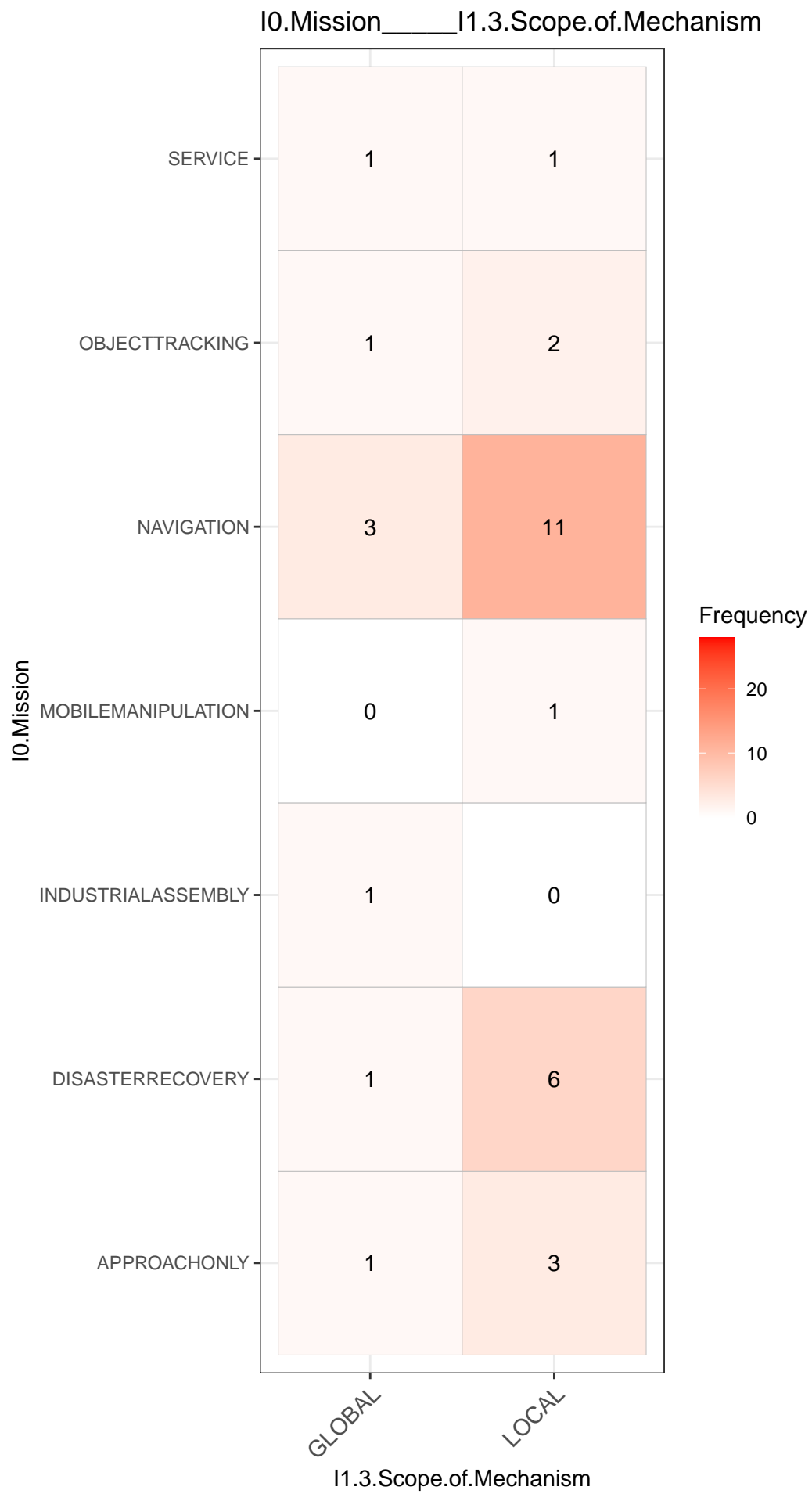


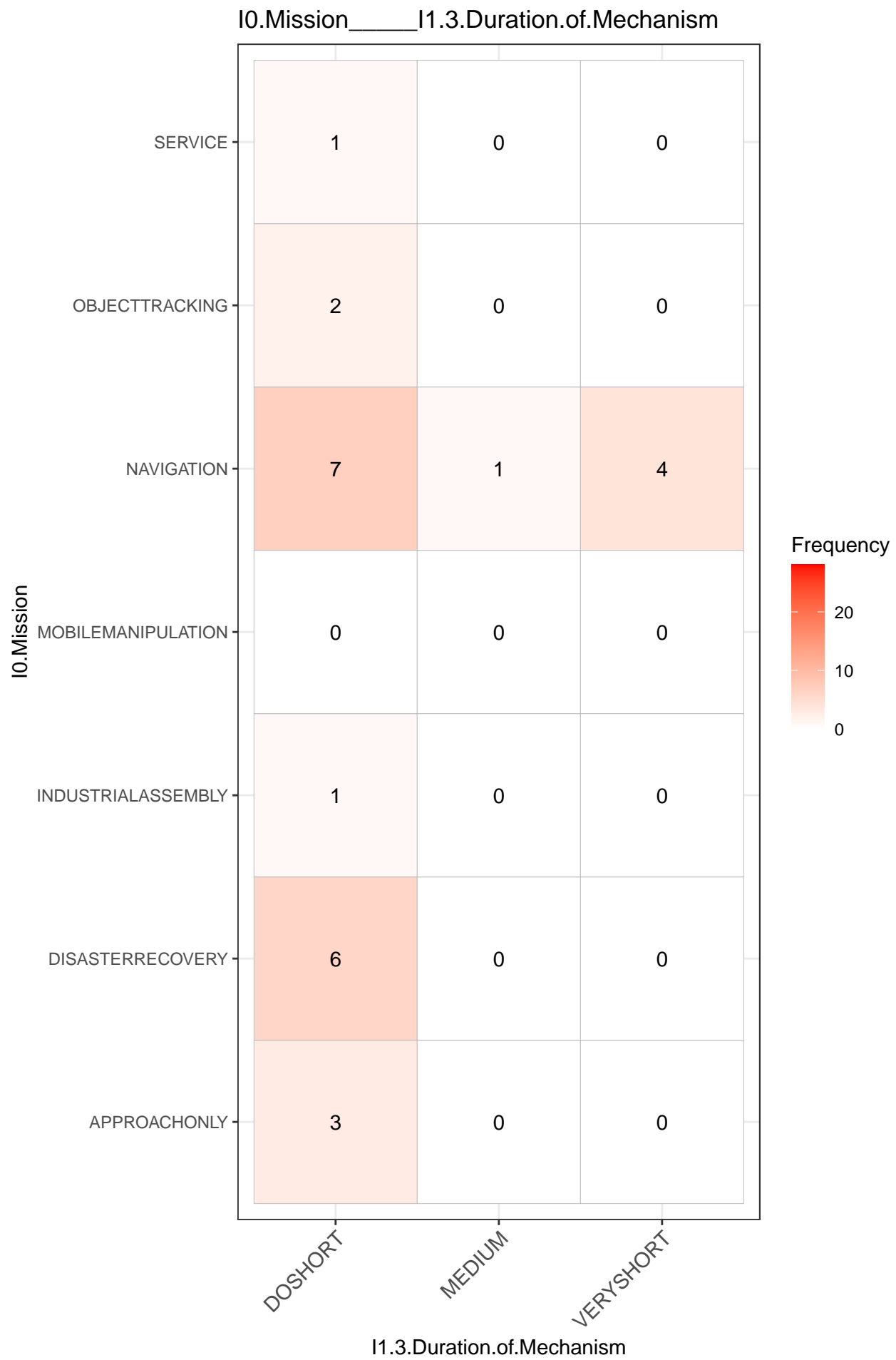


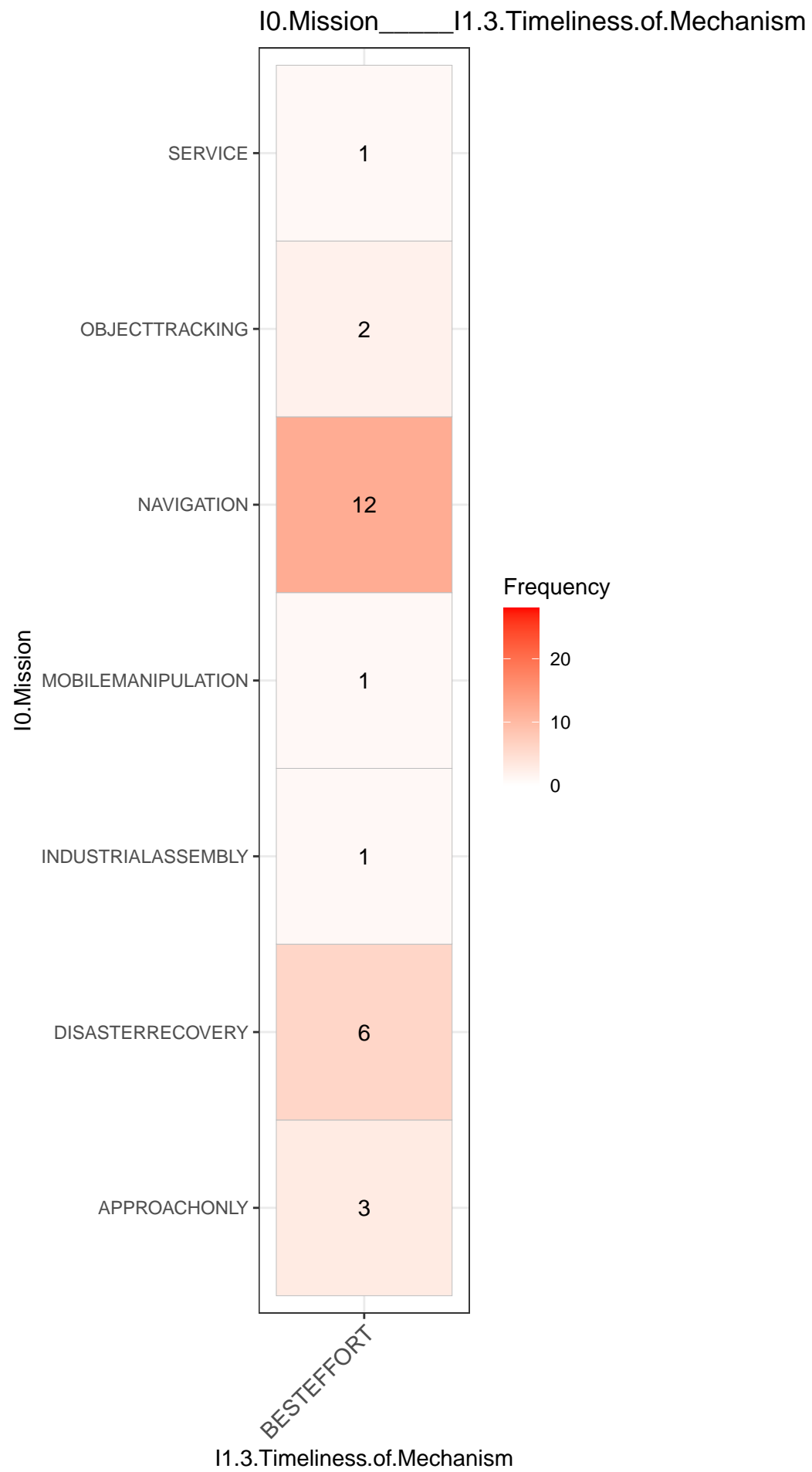


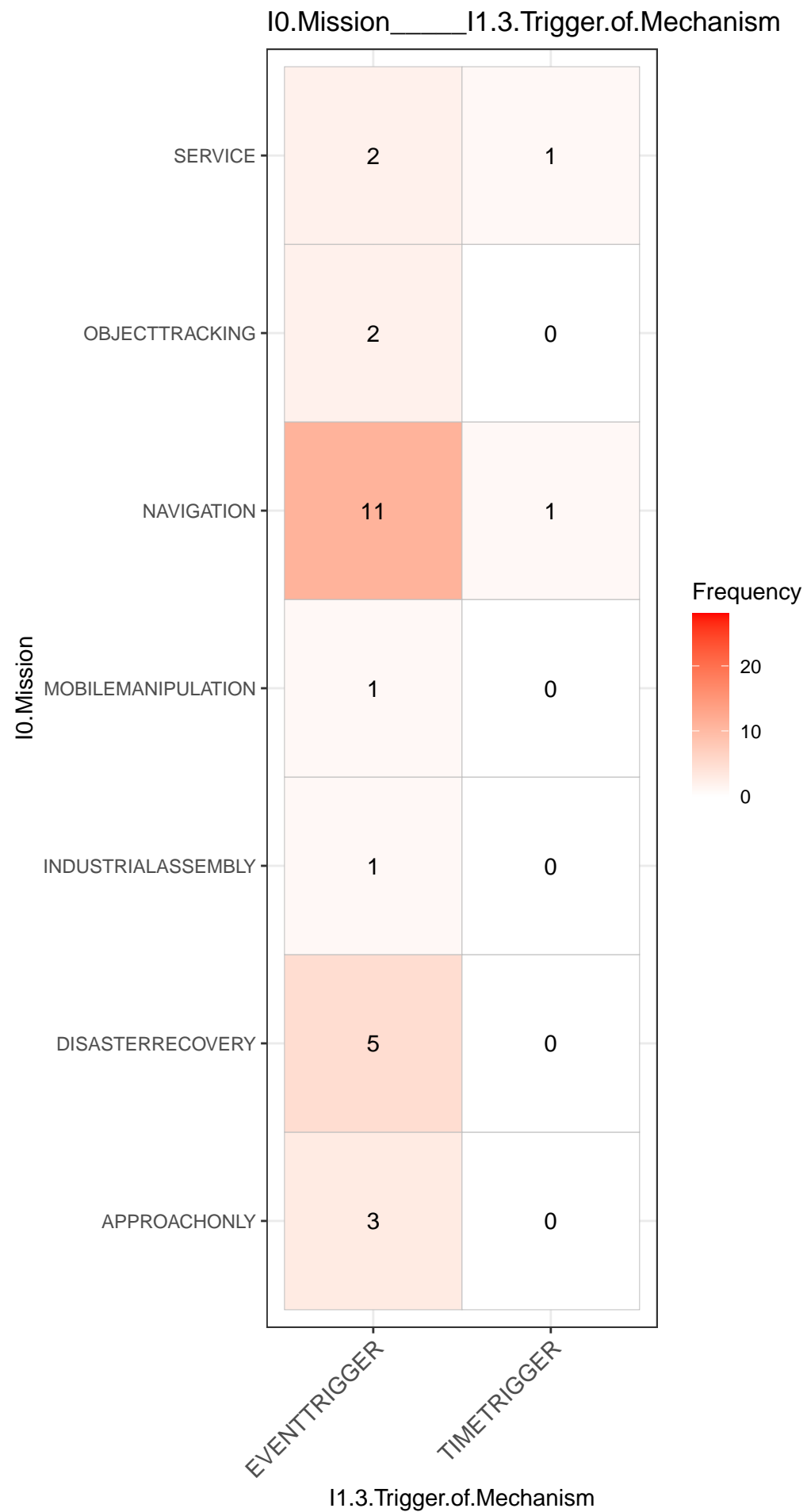


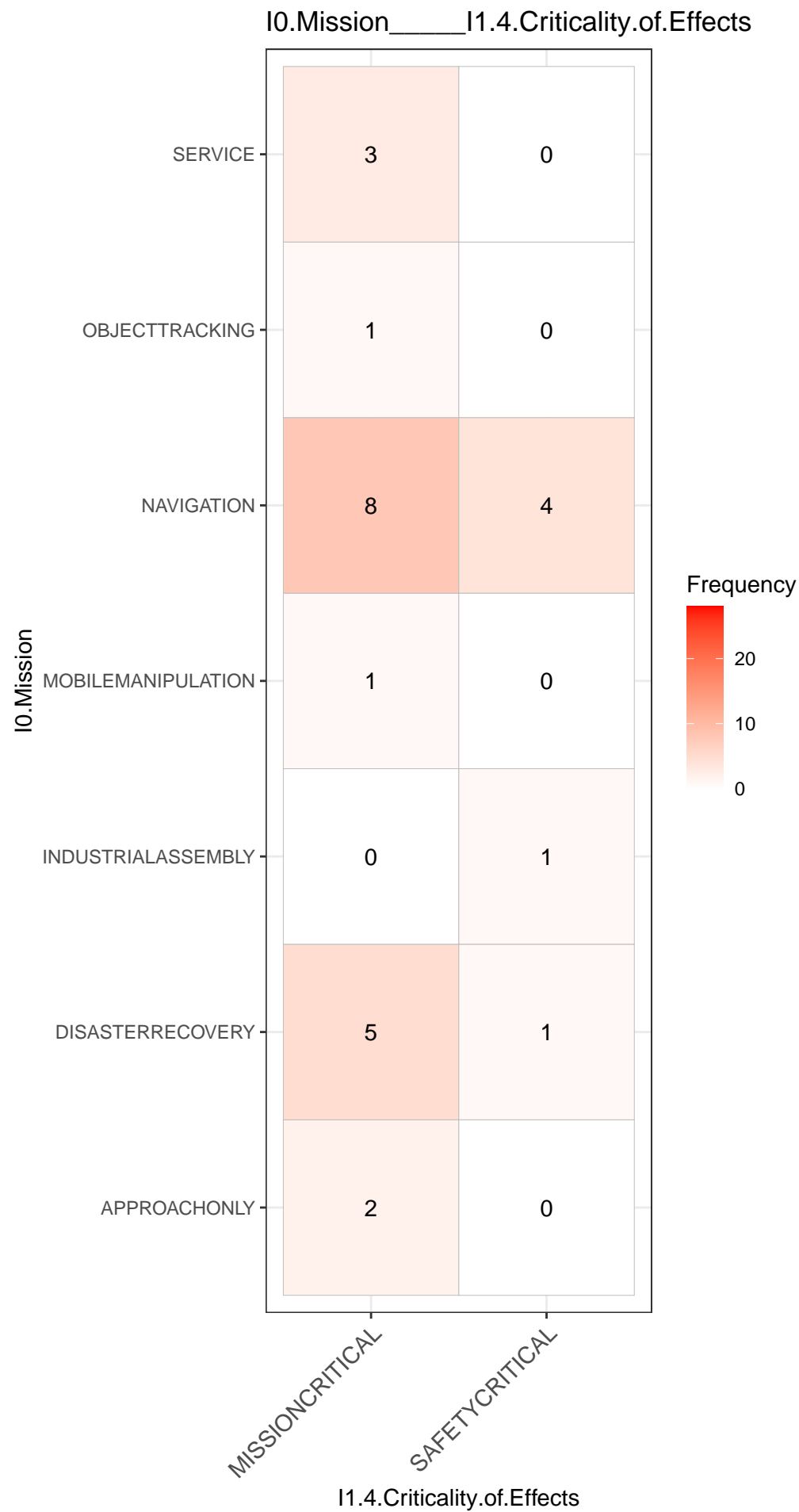


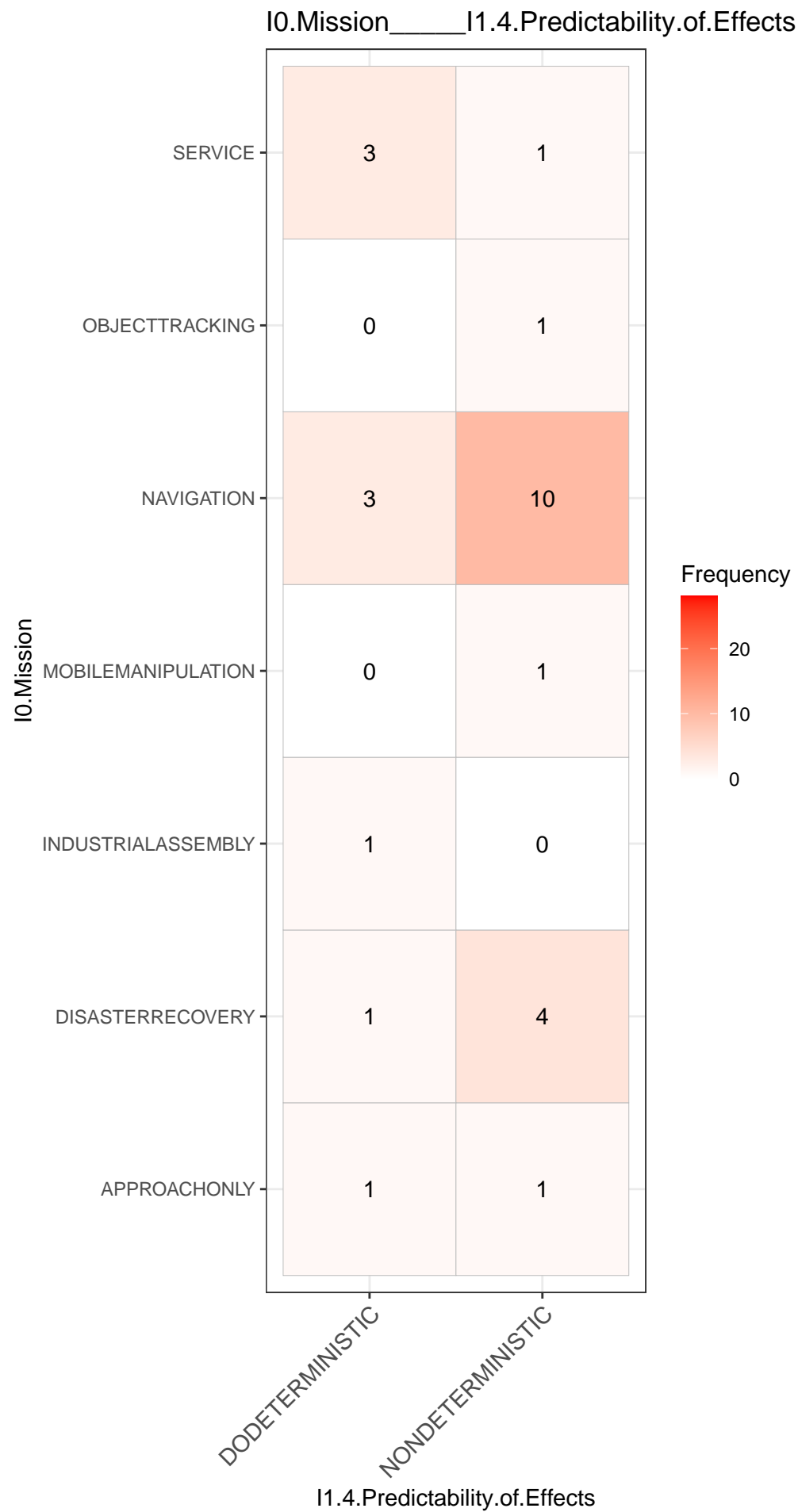




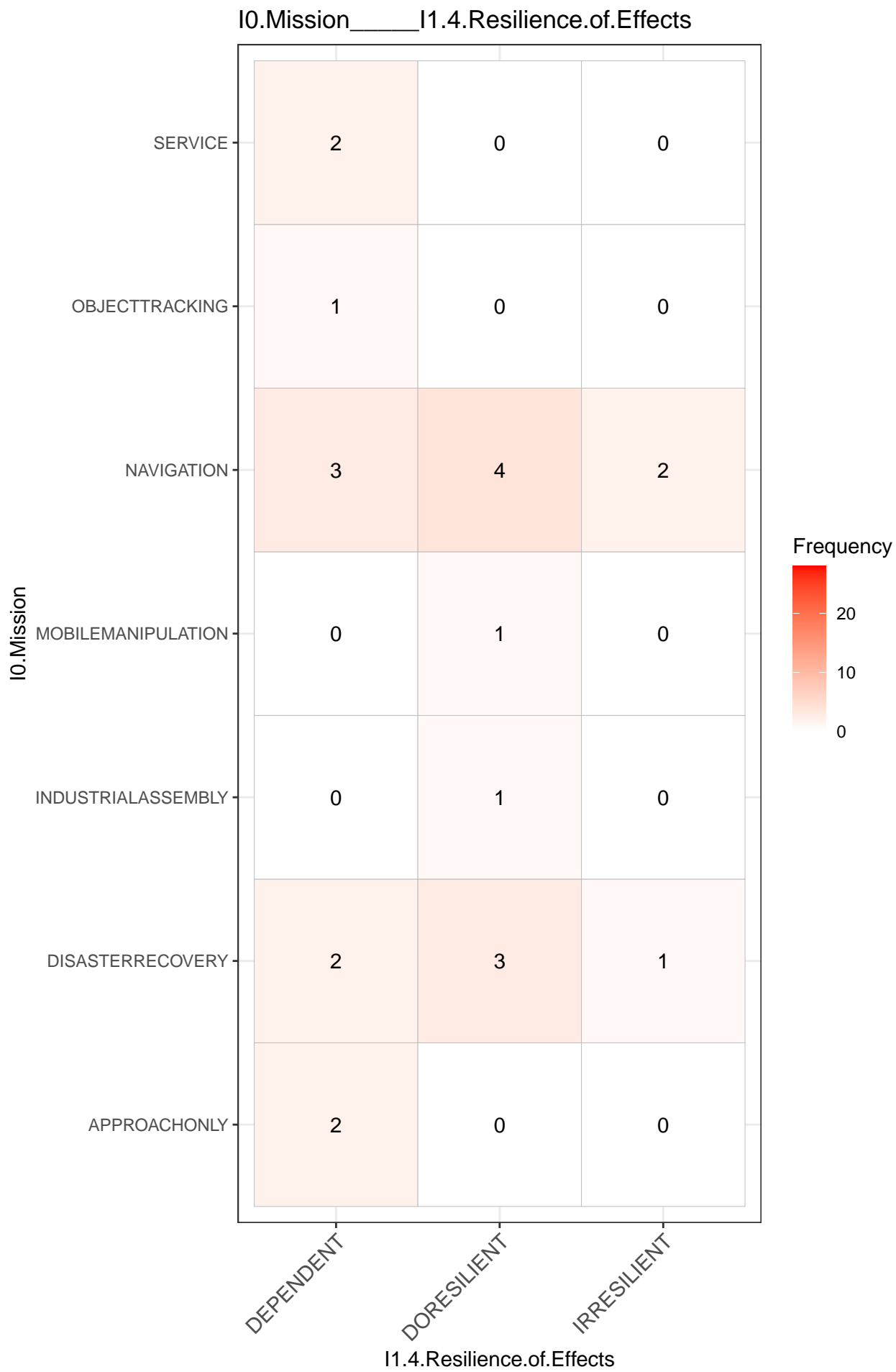


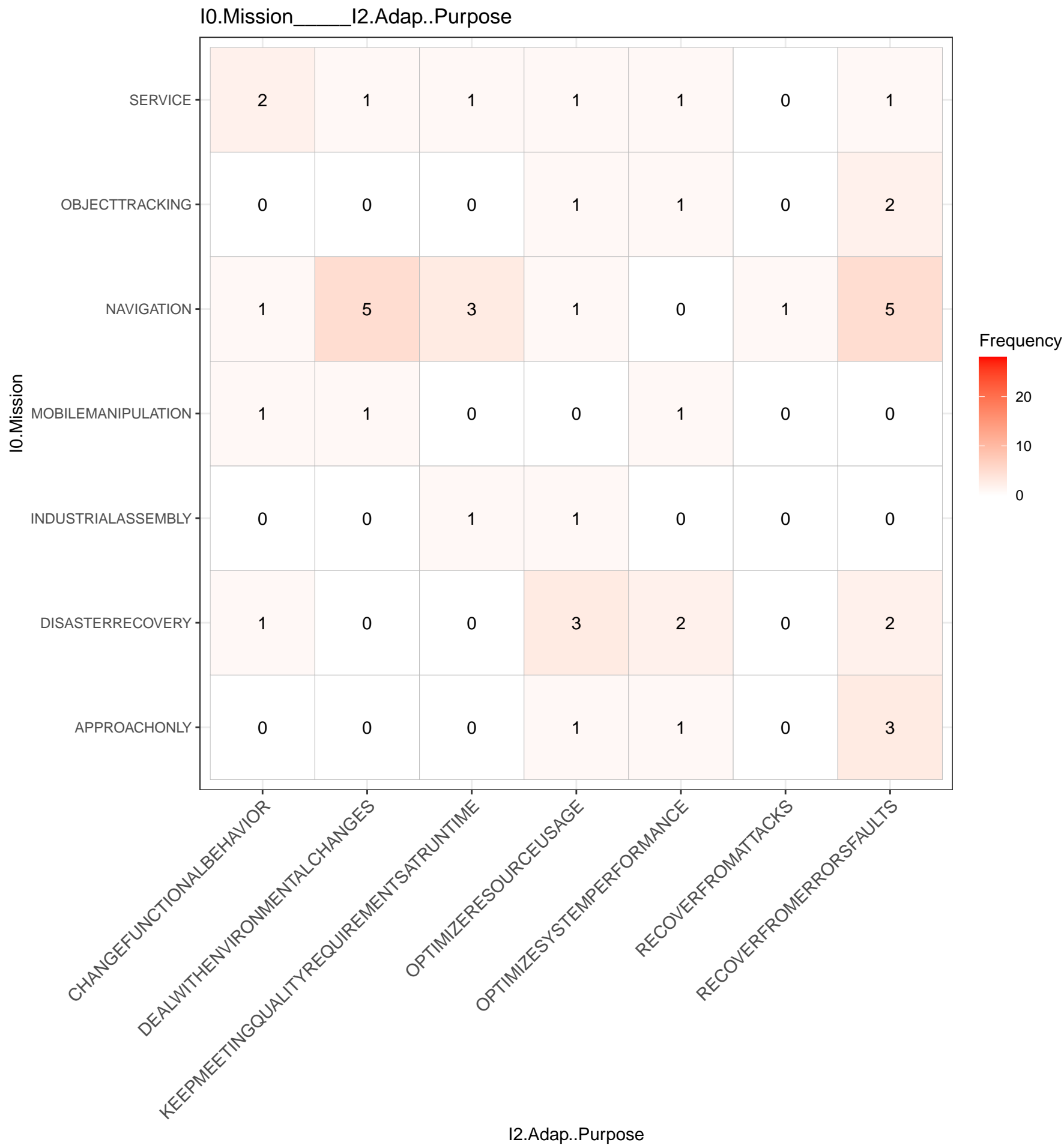


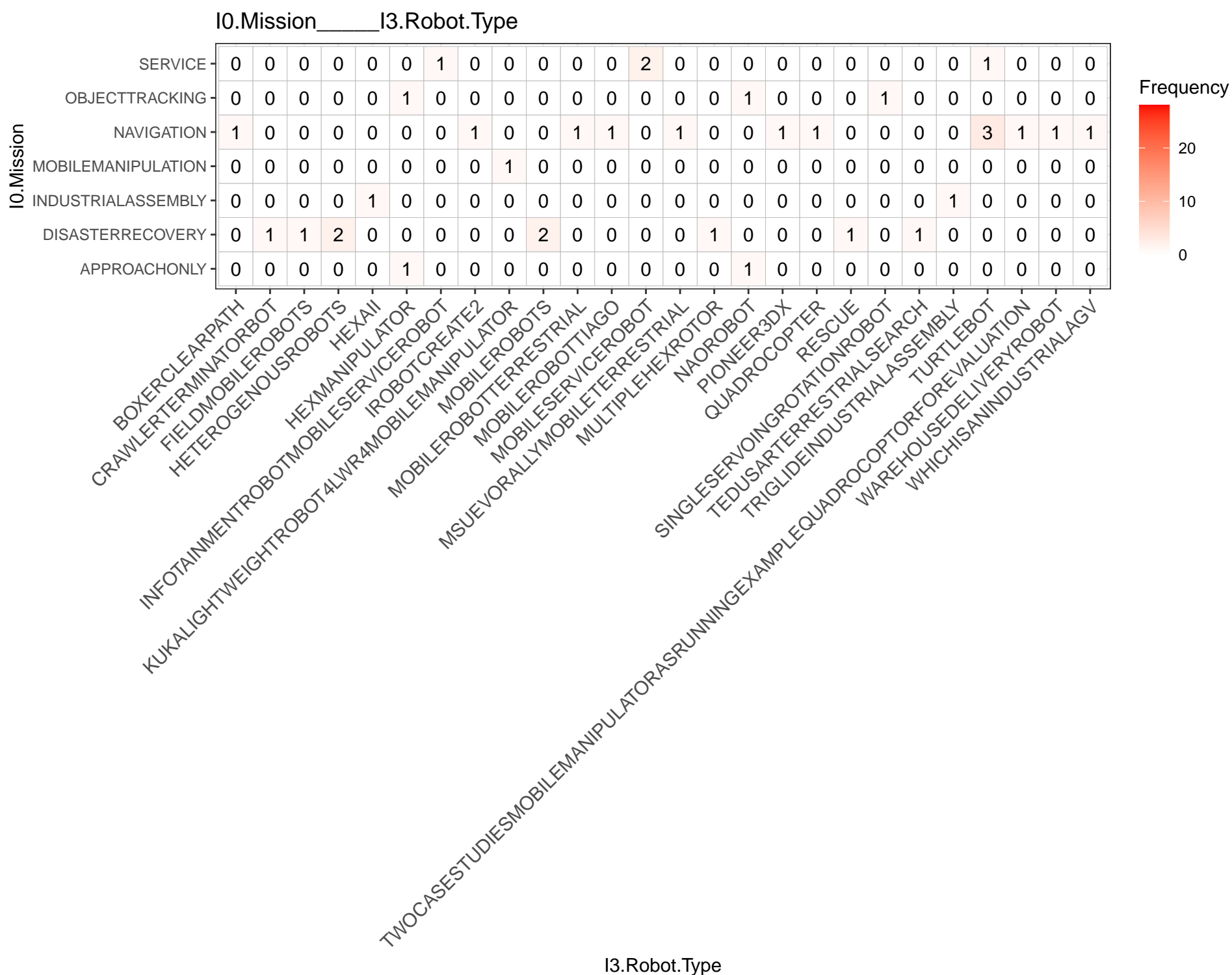






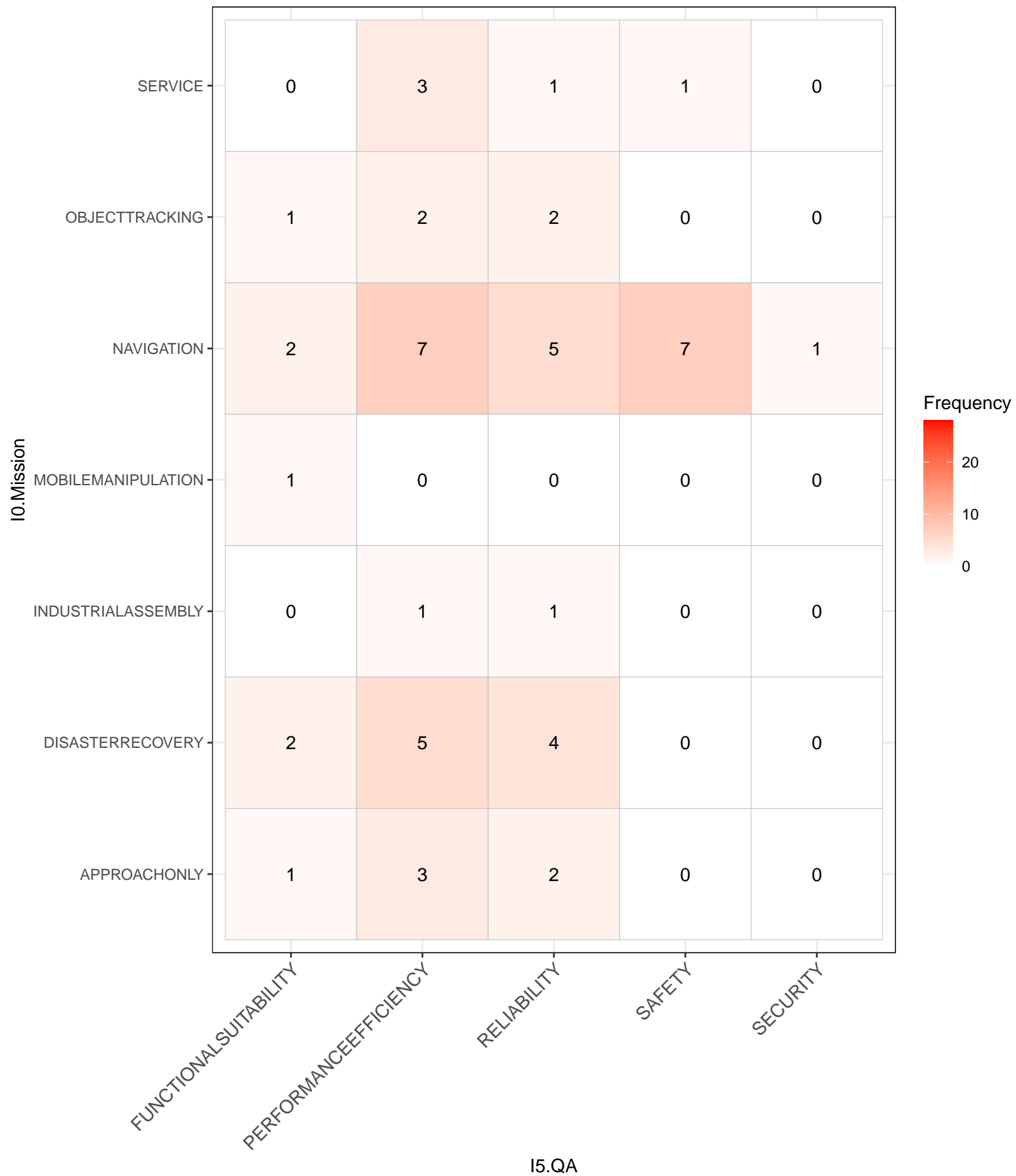




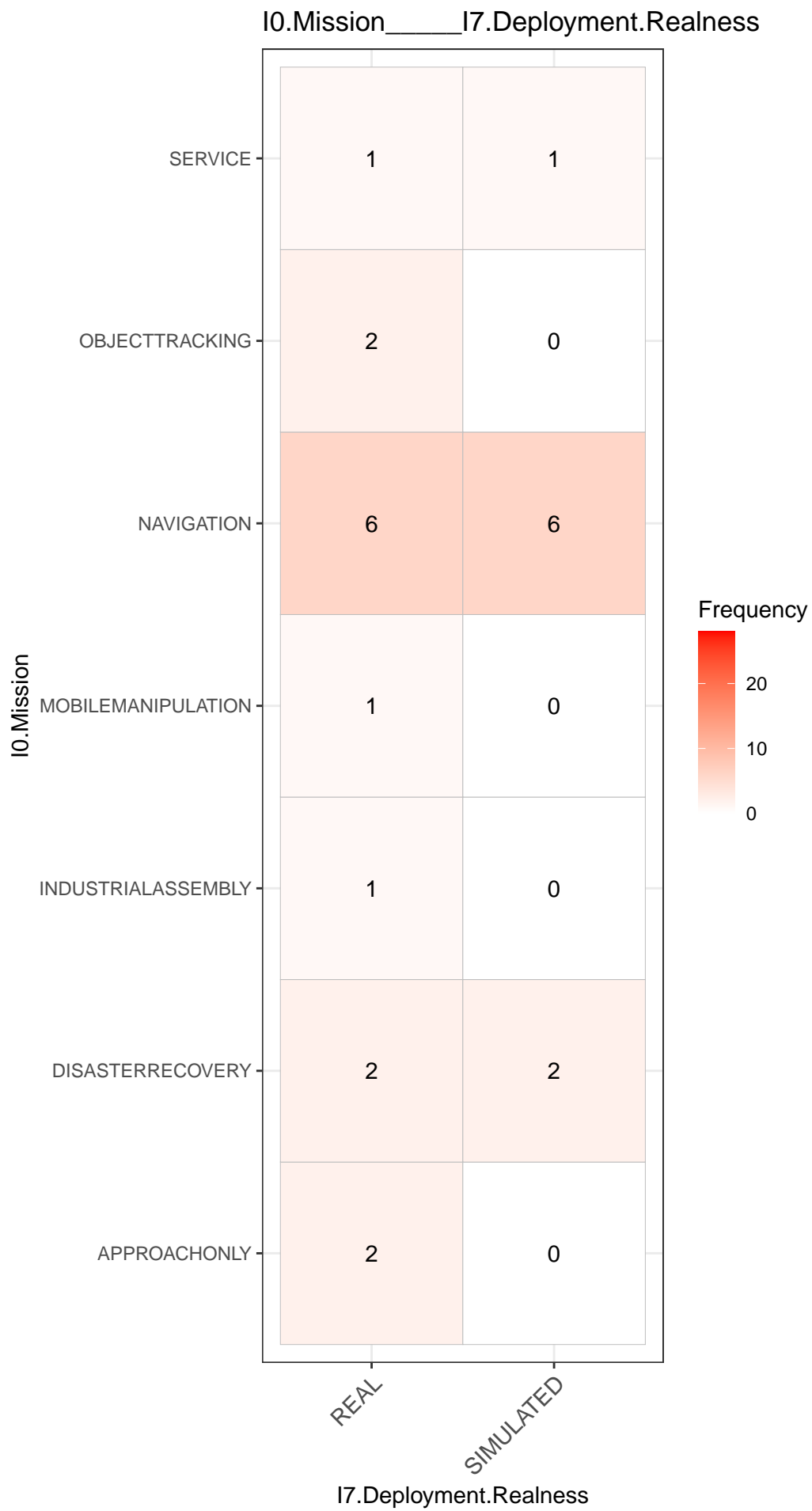


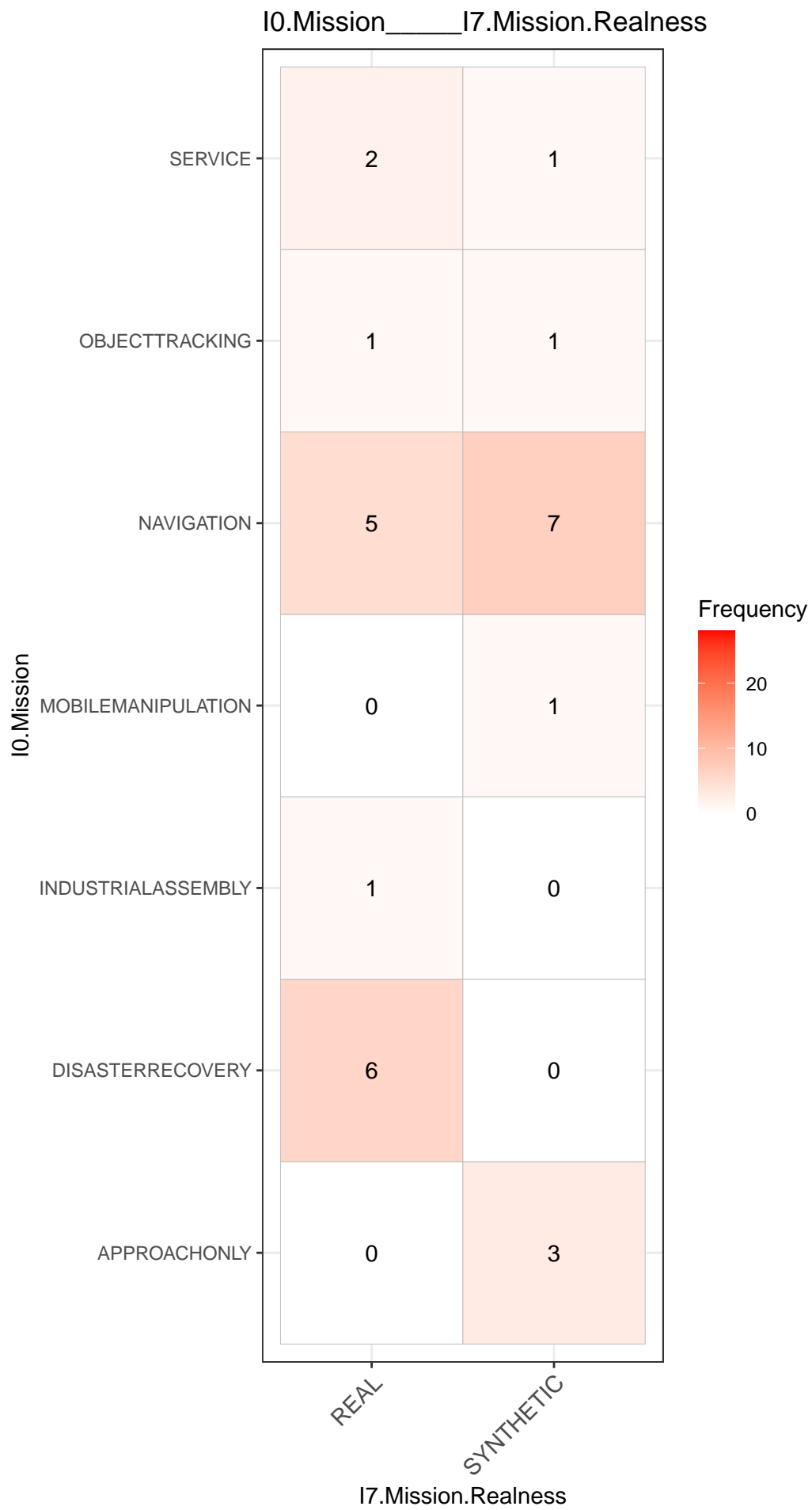


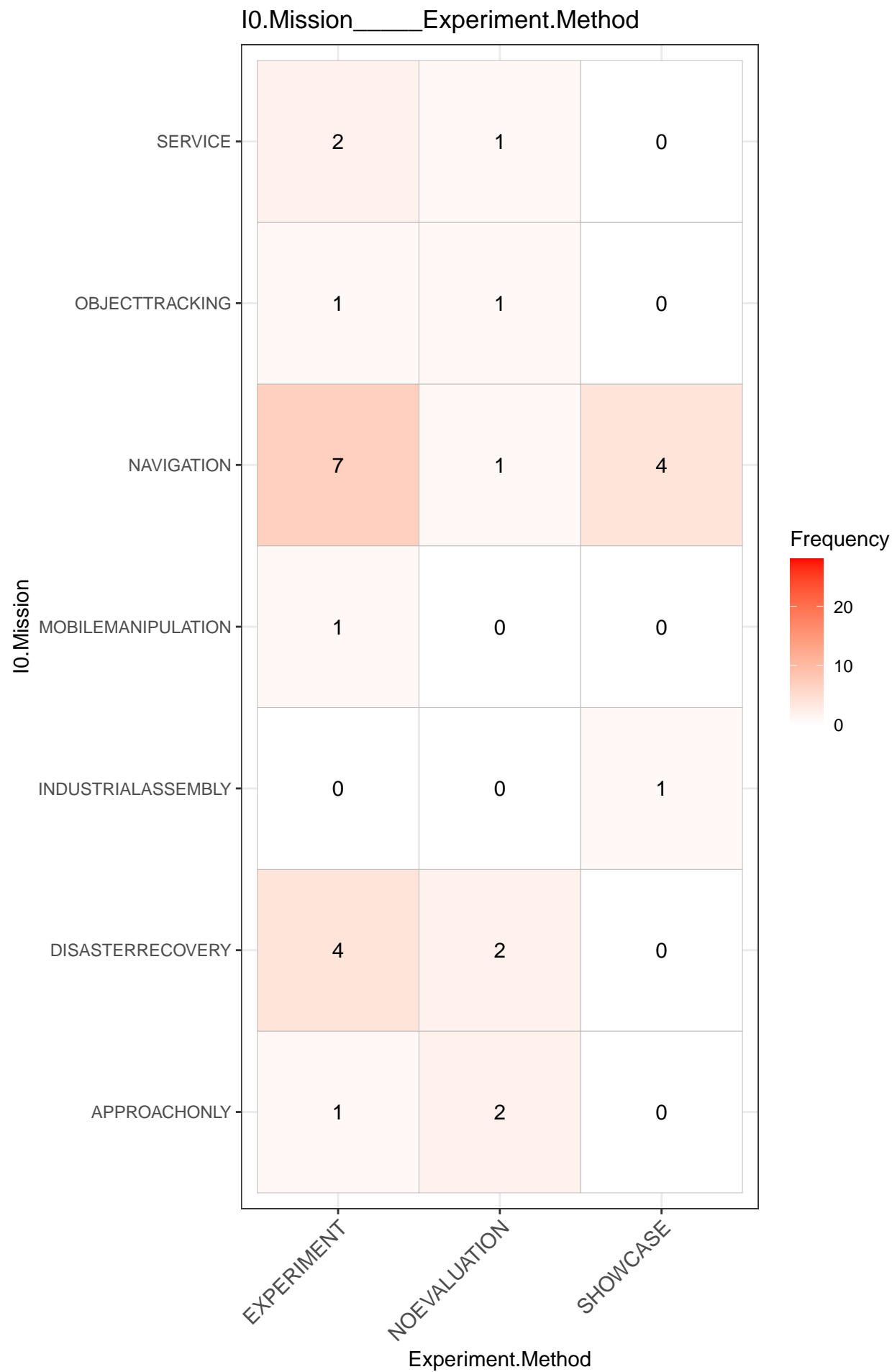
I0.Mission_____I5.QA

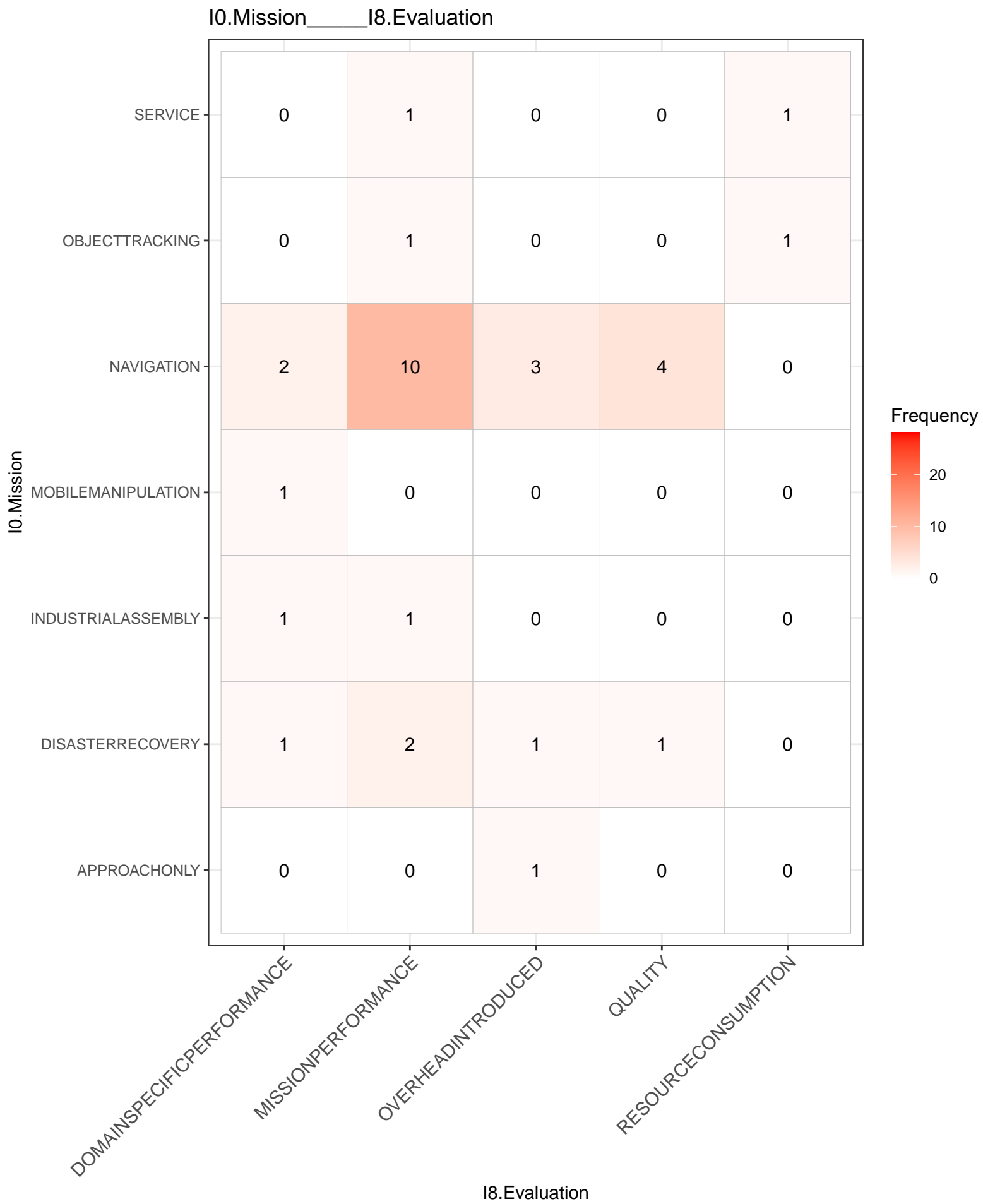






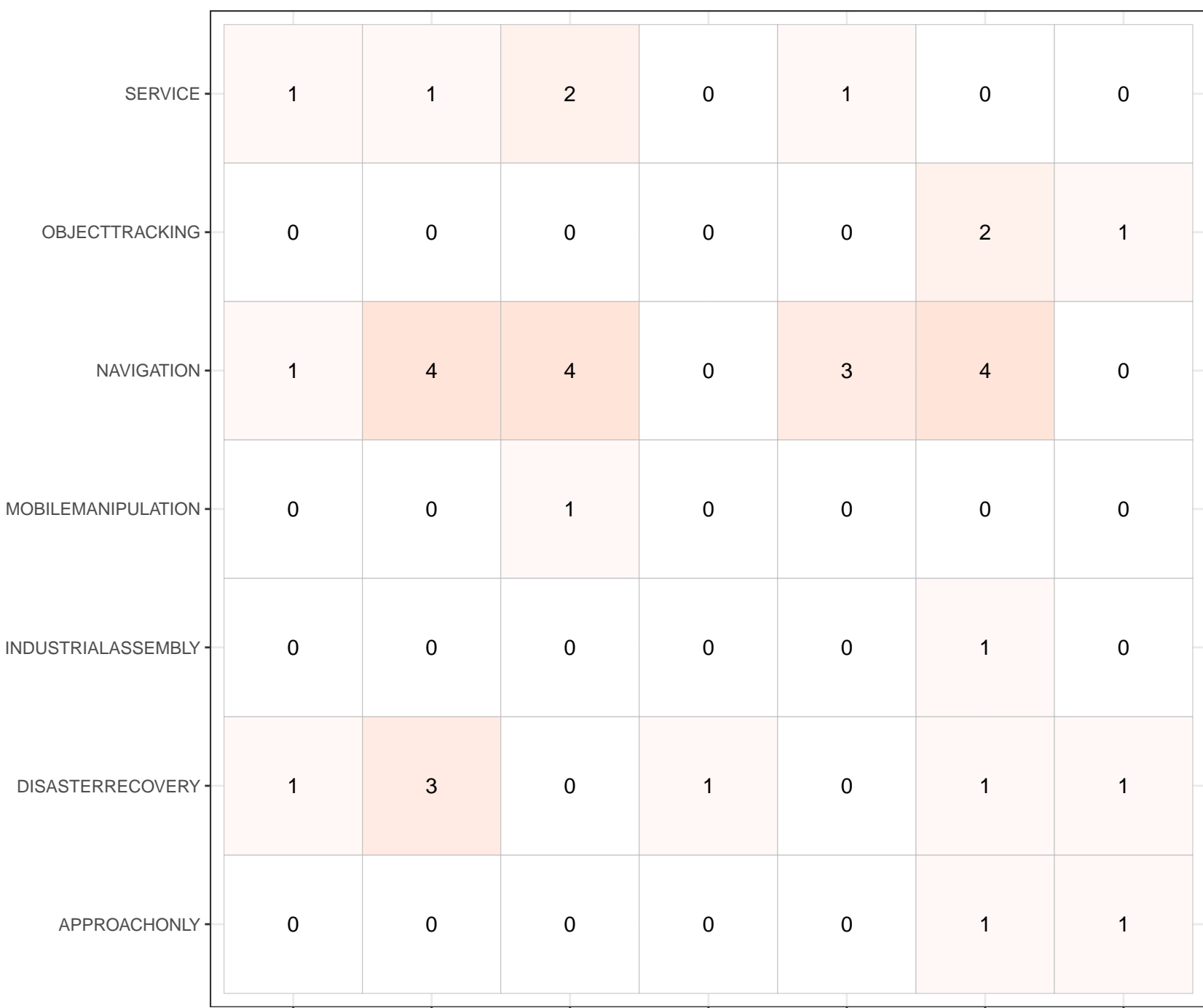






IO.Mission_I9.Adap..Logic

IO.Mission



Frequency



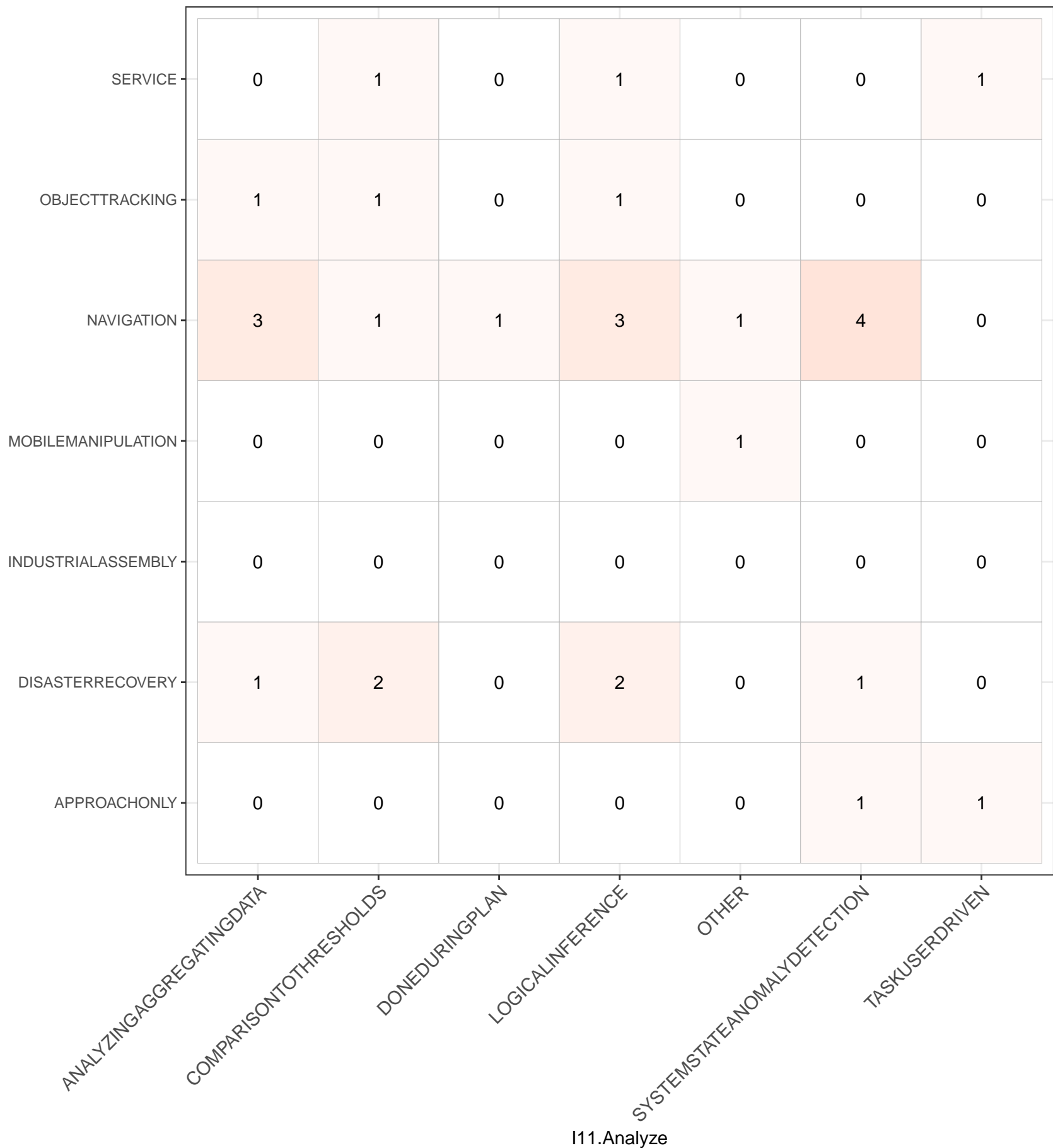
AIPLANNER
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECIFICGORTHM
NUMERICALOPTIMIZATION
ONTOLOGICALREASONING
SEARCHPROCEDURE
UTILITYCALCULATION

I9.Adap..Logic



I0.Mission_____I11.Analyze

I0.Mission



Frequency

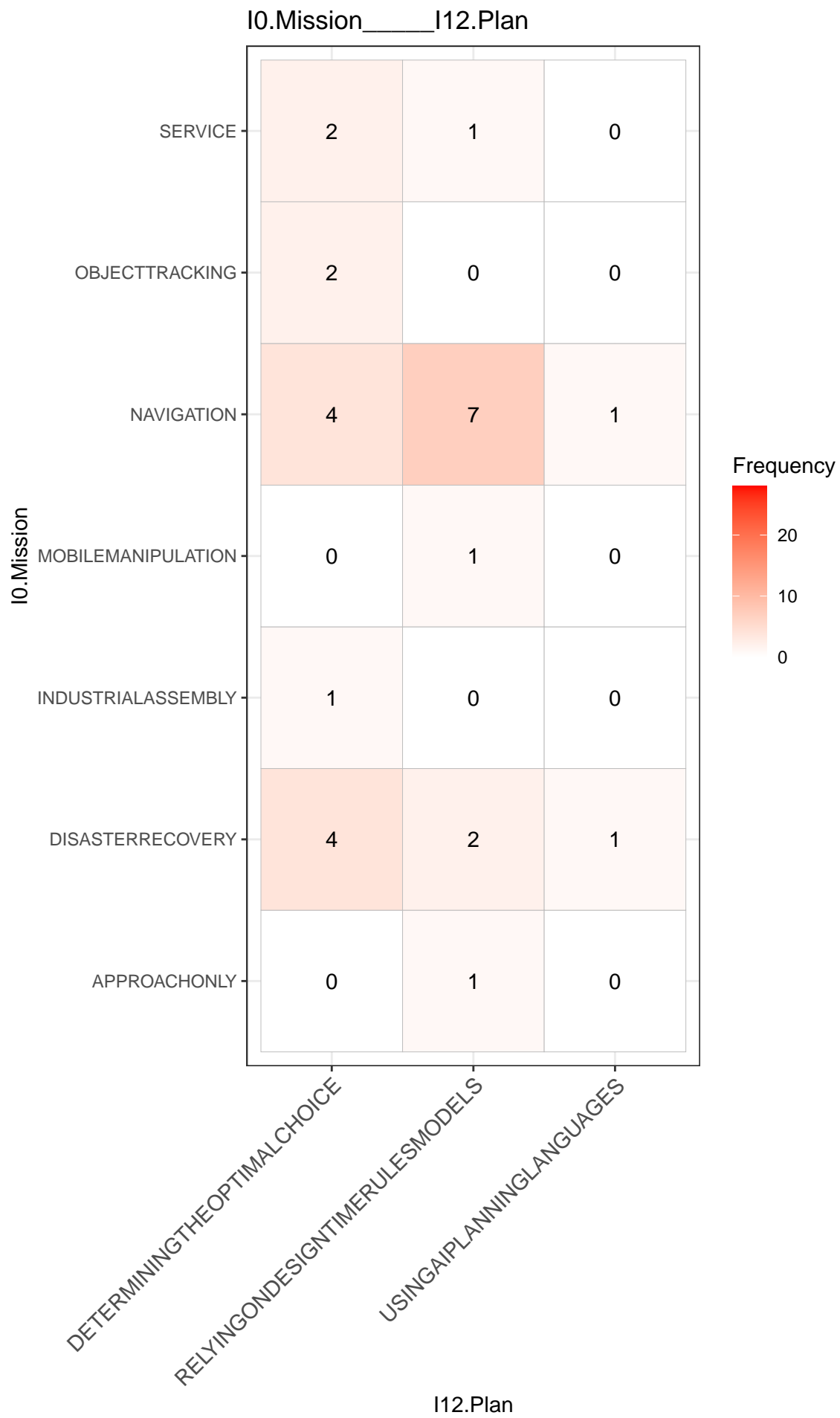


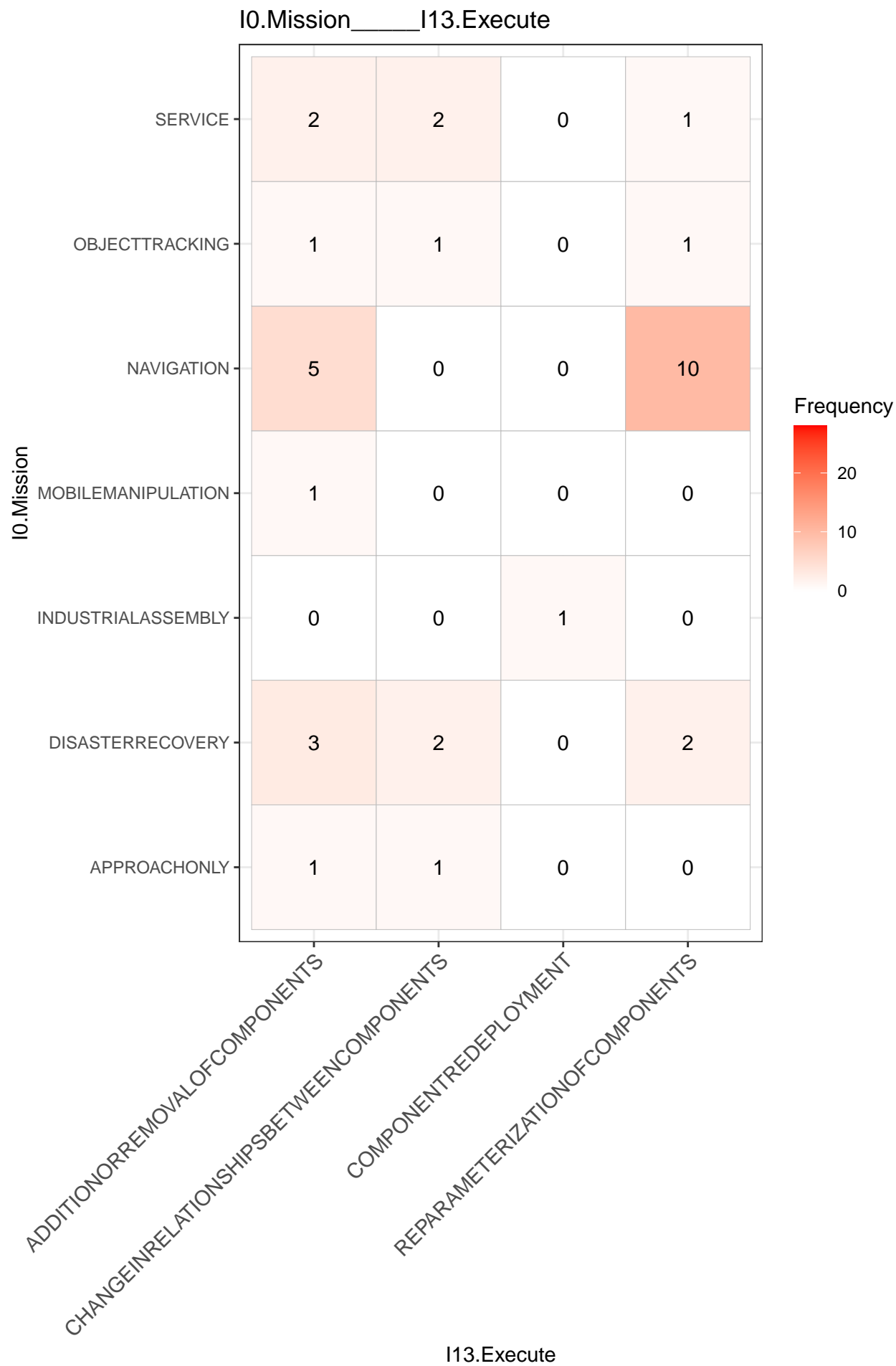
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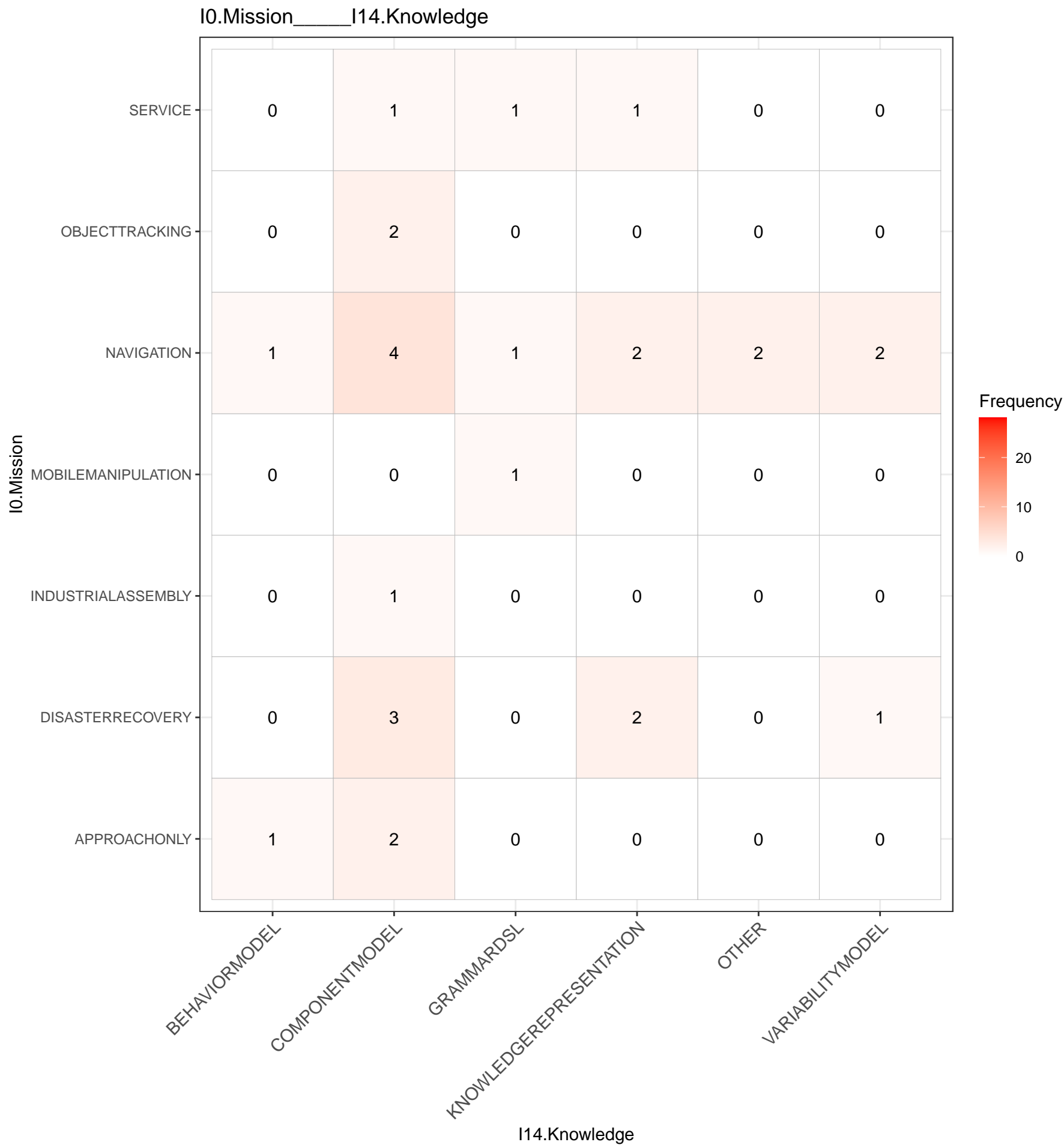
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0

I11.Analyze







I1.1.Metadata_____I1.2.Source.of.Change

I1.1.Metadata

STATIC

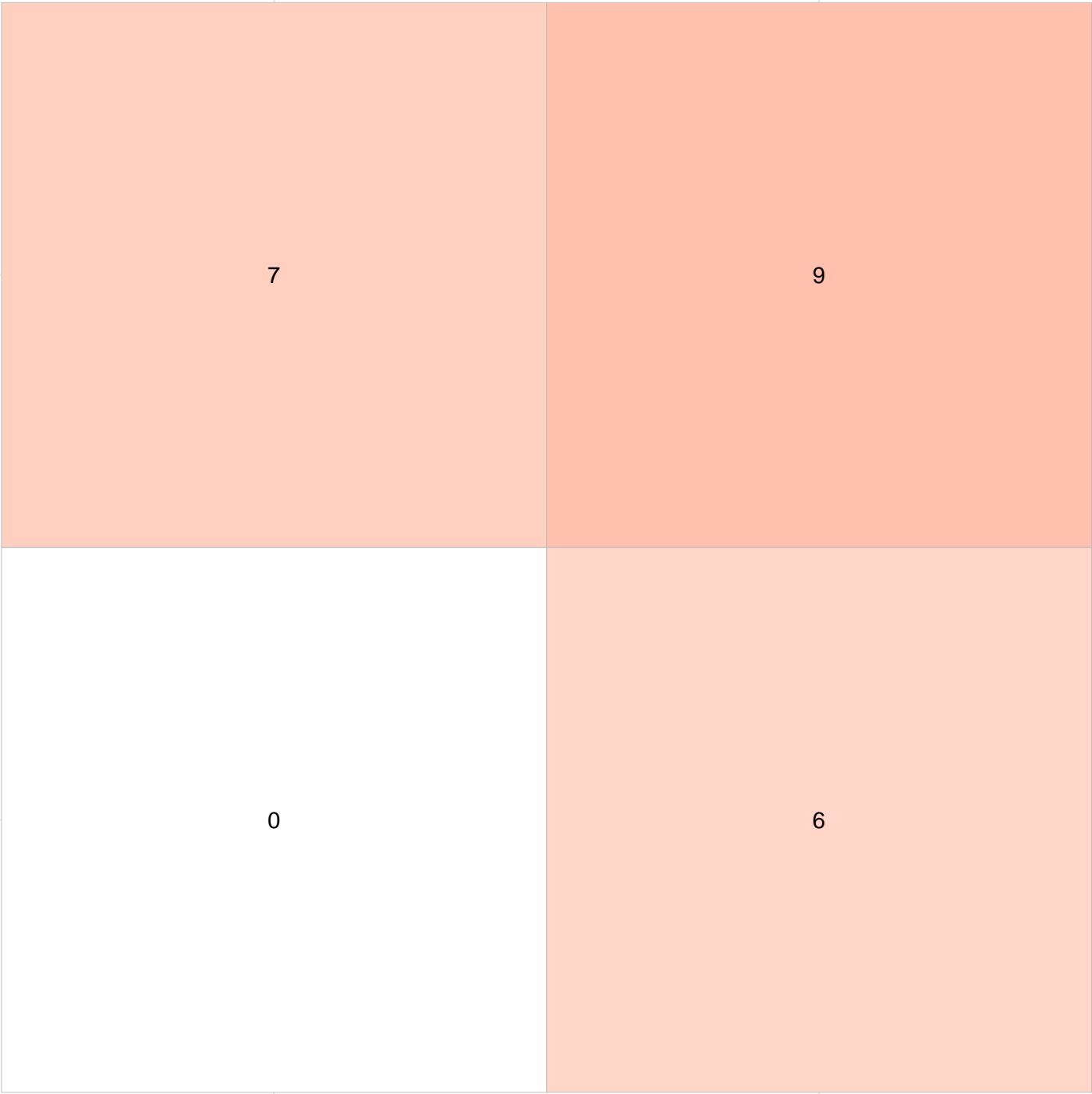
DYNAMIC

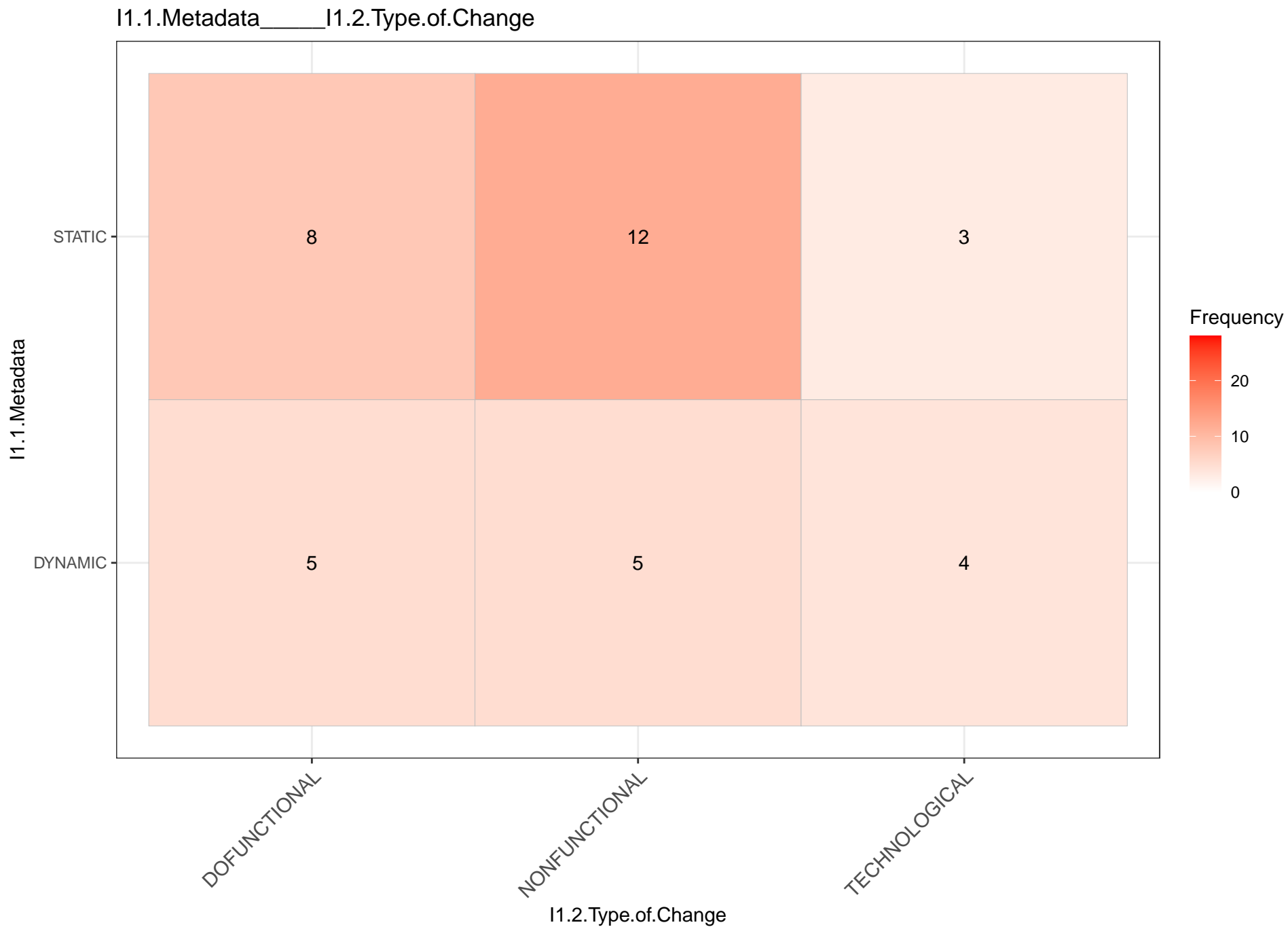
EXTERNAL

INTERNAL

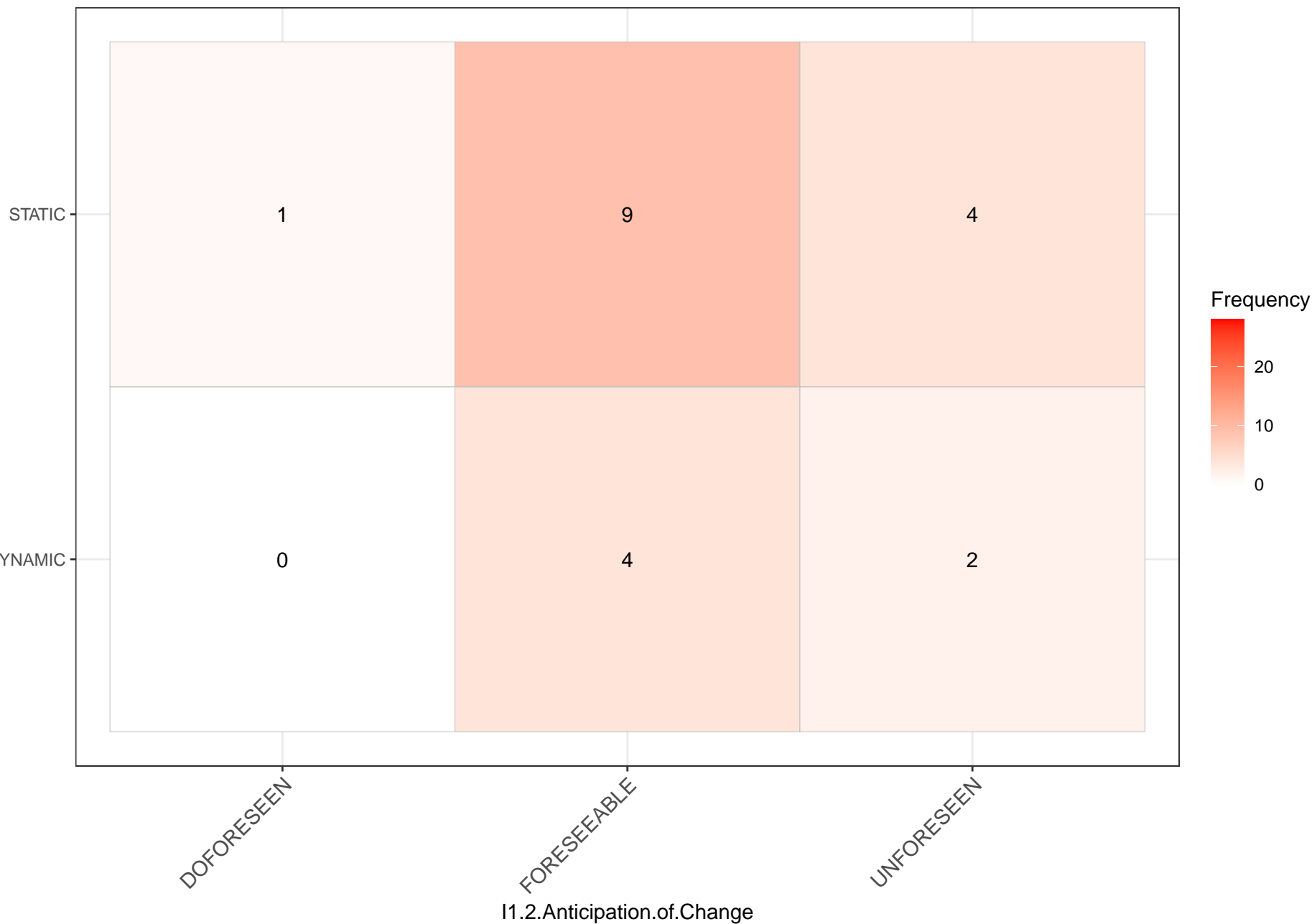
I1.2.Source.of.Change

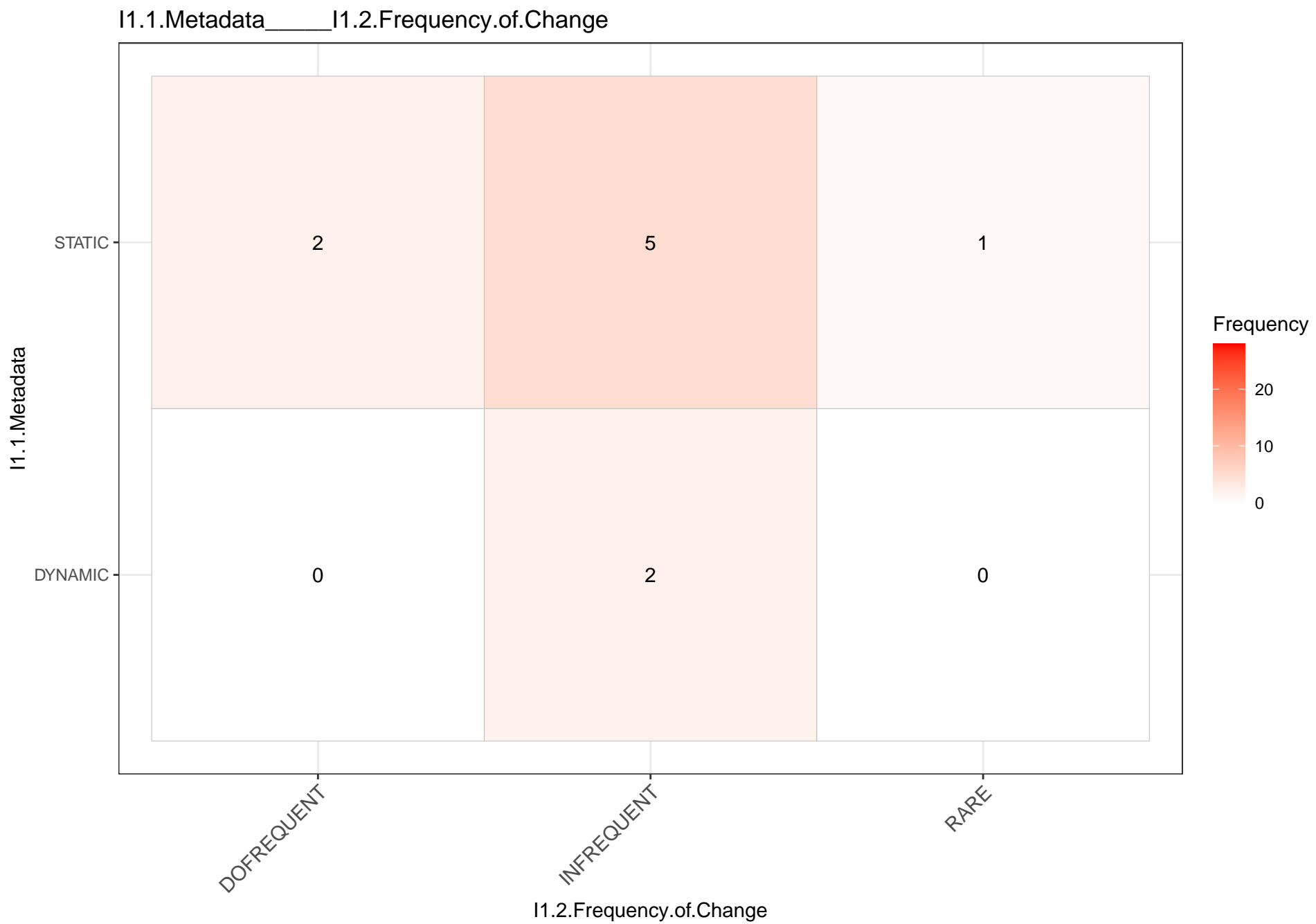
Frequency





I1.1.Metadata_____I1.2.Anticipation.of.Change





I1.1.Metadata_____I1.3.Type.of.Mechanism

I1.1.Metadata

STATIC

11

12

DYNAMIC

2

6

PARAMETRIC

STRUCTURAL

I1.3.Type.of.Mechanism

Frequency



20

10

0

STATIC

2

13

DYNAMIC

1

5

DECENTRALIZED

DOCENTRALIZED

Frequency



20

10

0

I1.1.Metadata_____I1.3.Scope.of.Mechanism

I1.1.Metadata

STATIC

2

13

DYNAMIC

1

6

GLOBAL

LOCAL

I1.3.Scope.of.Mechanism

Frequency

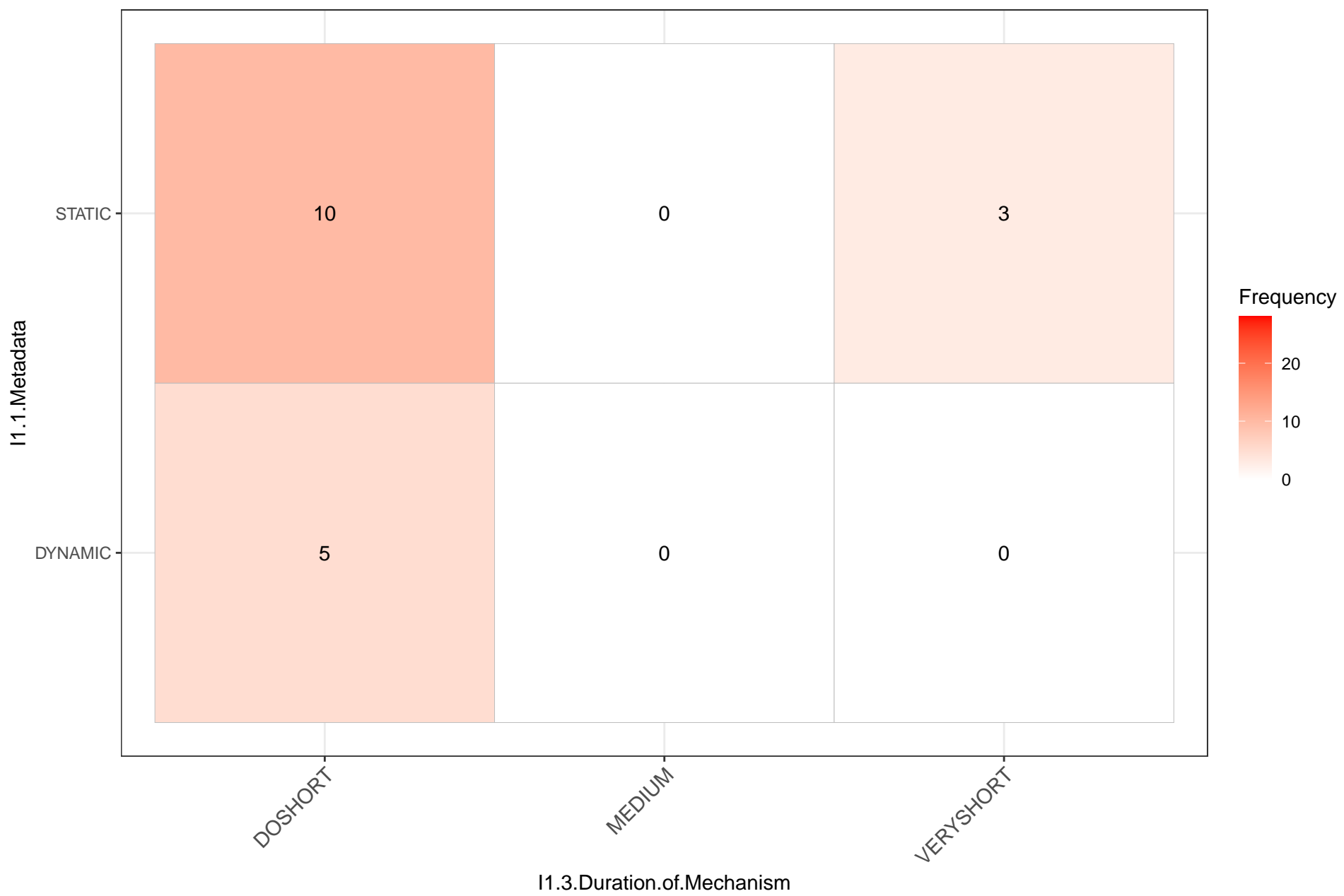


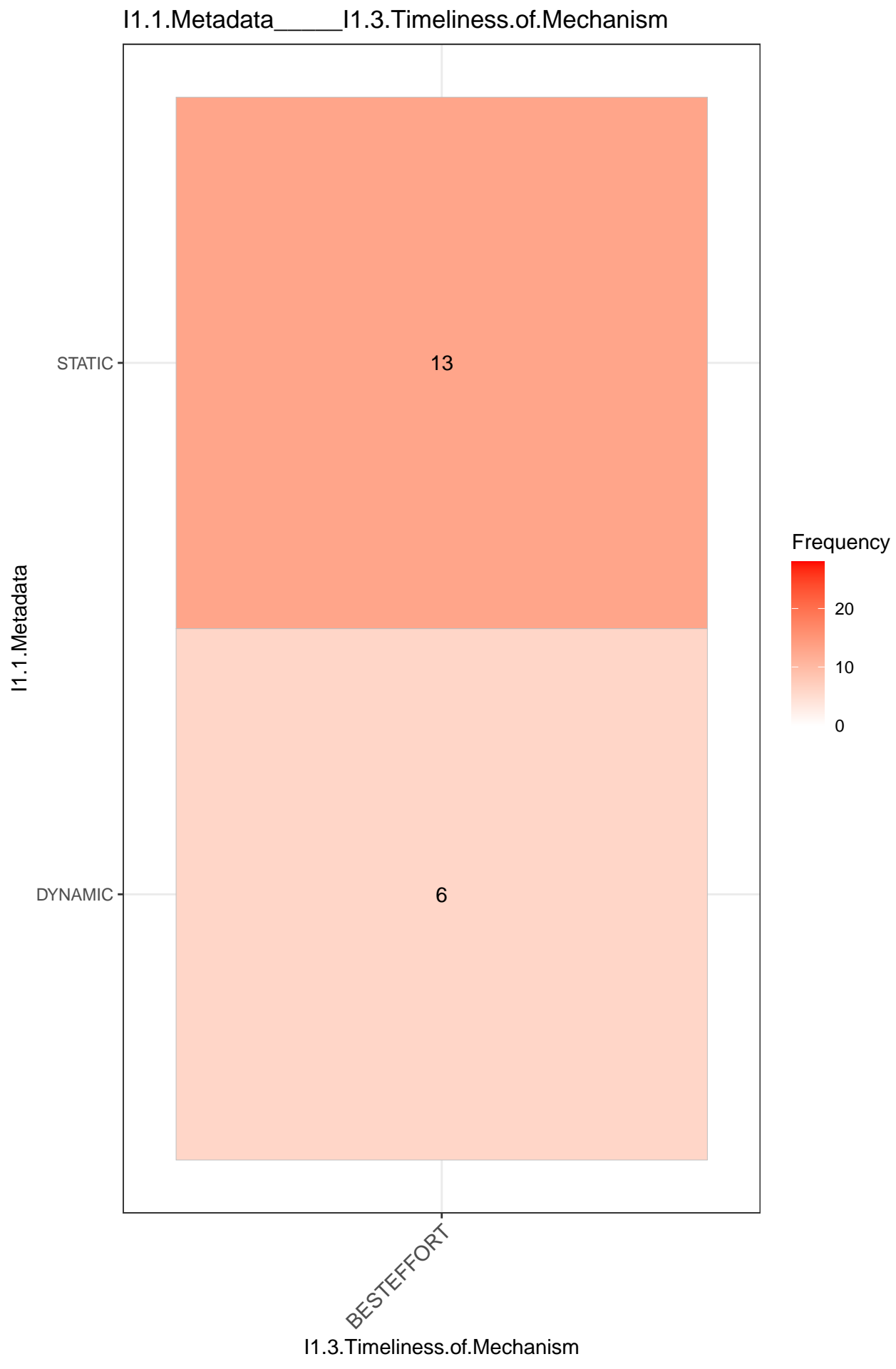
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10

0

I1.1.Metadata_____I1.3.Duration.of.Mechanism





I1.1.Metadata

STATIC

12

2

DYNAMIC

6

0

EVENTTRIGGER

TIMETRIGGER

I1.3.Trigger.of.Mechanism

Frequency



20

10

0

I1.1.Metadata

STATIC

13

2

DYNAMIC

5

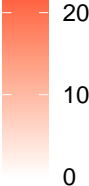
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MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

Frequency



I1.1.Metadata_____I1.4.Predictability.of.Effects

I1.1.Metadata

STATIC

6

11

DYNAMIC

0

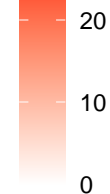
4

DODETERMINISTIC

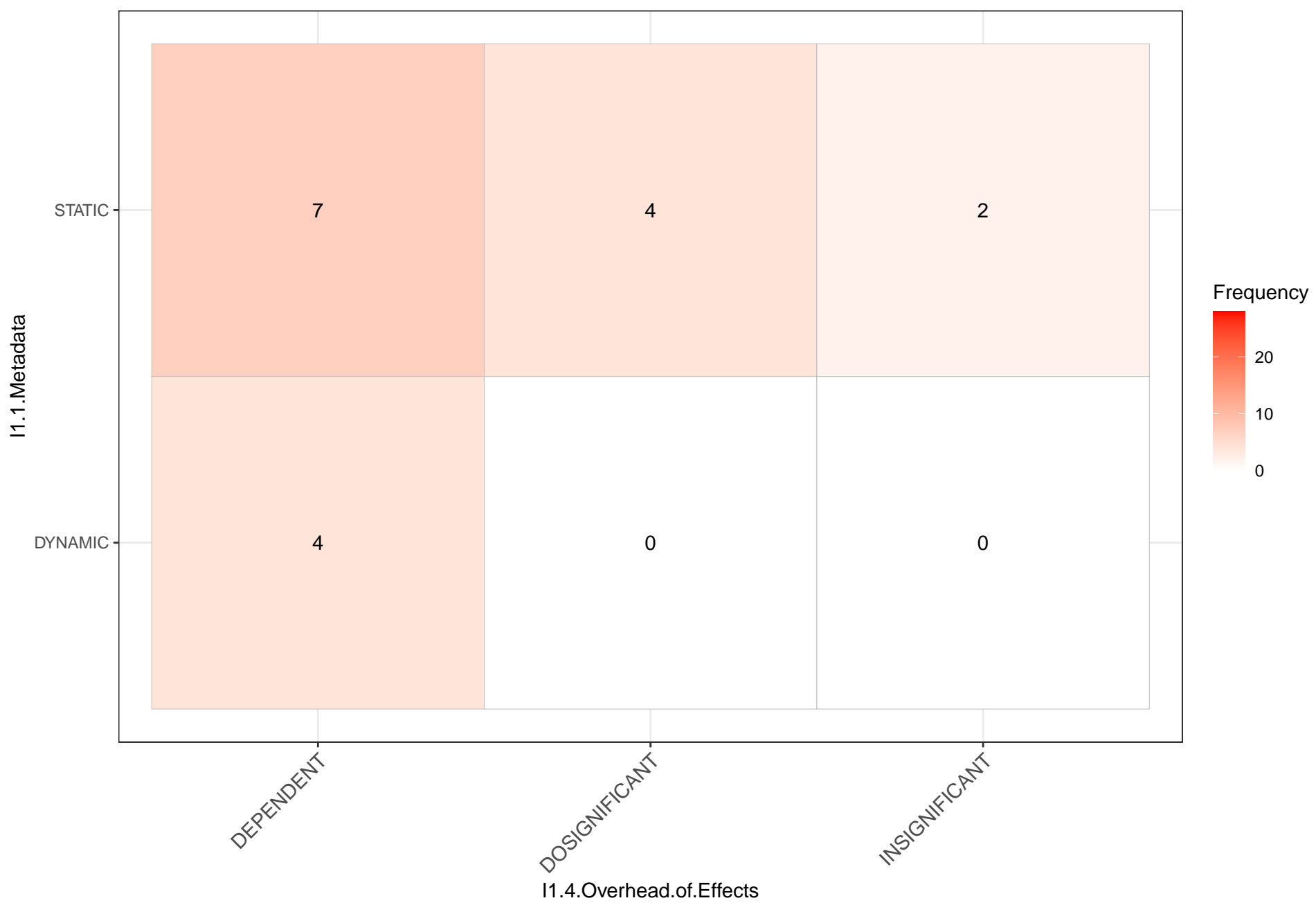
NONDETERMINISTIC

I1.4.Predictability.of.Effects

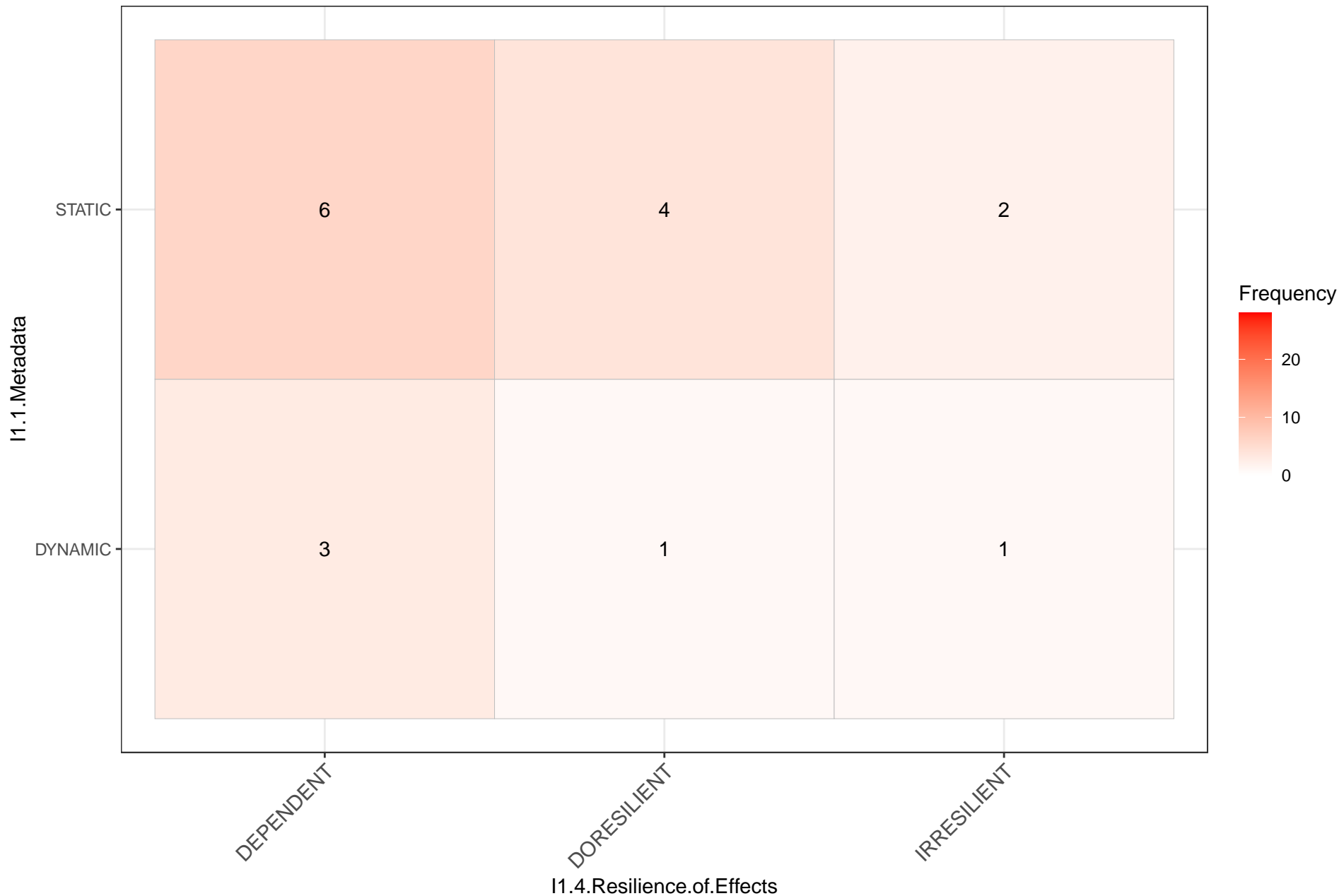
Frequency

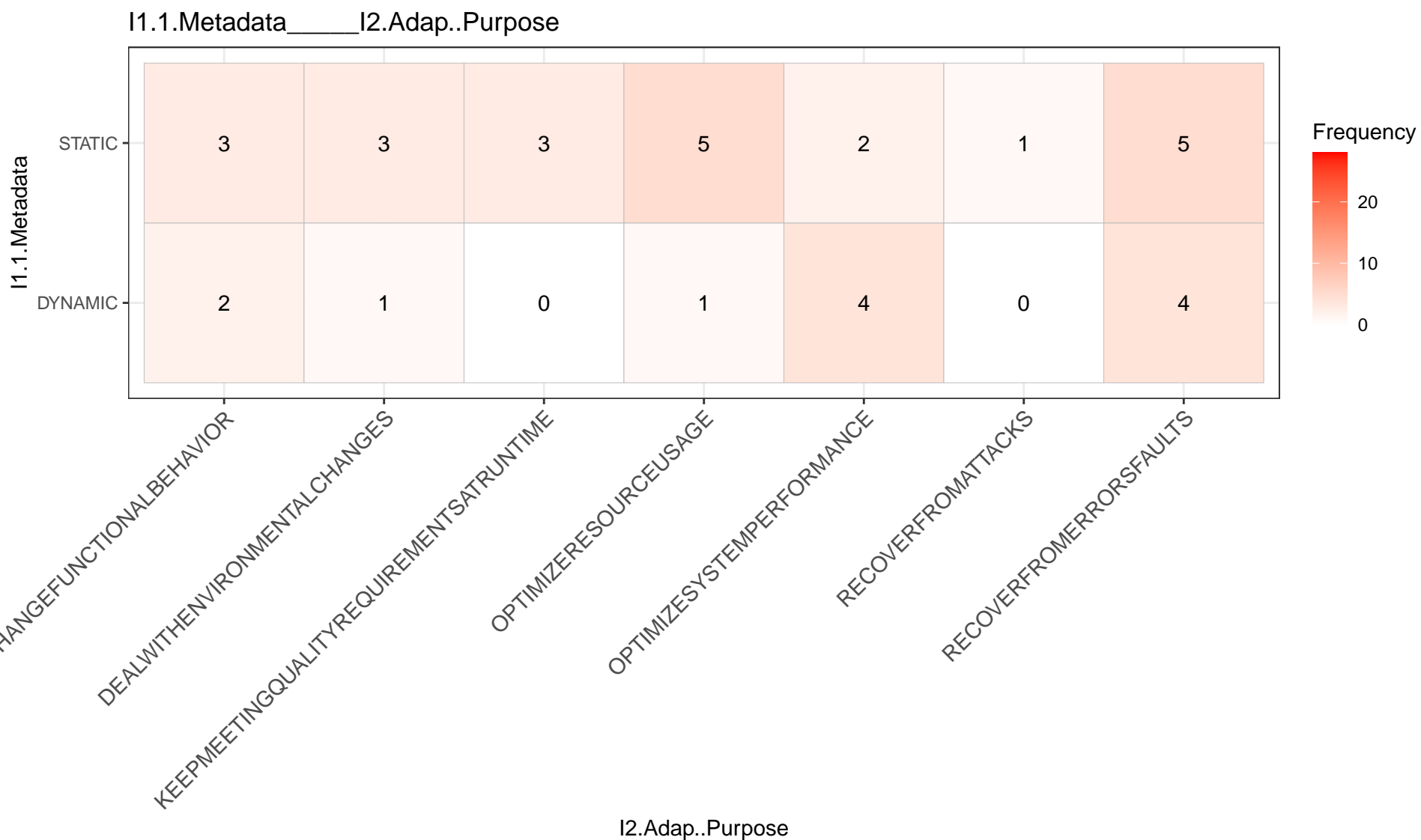


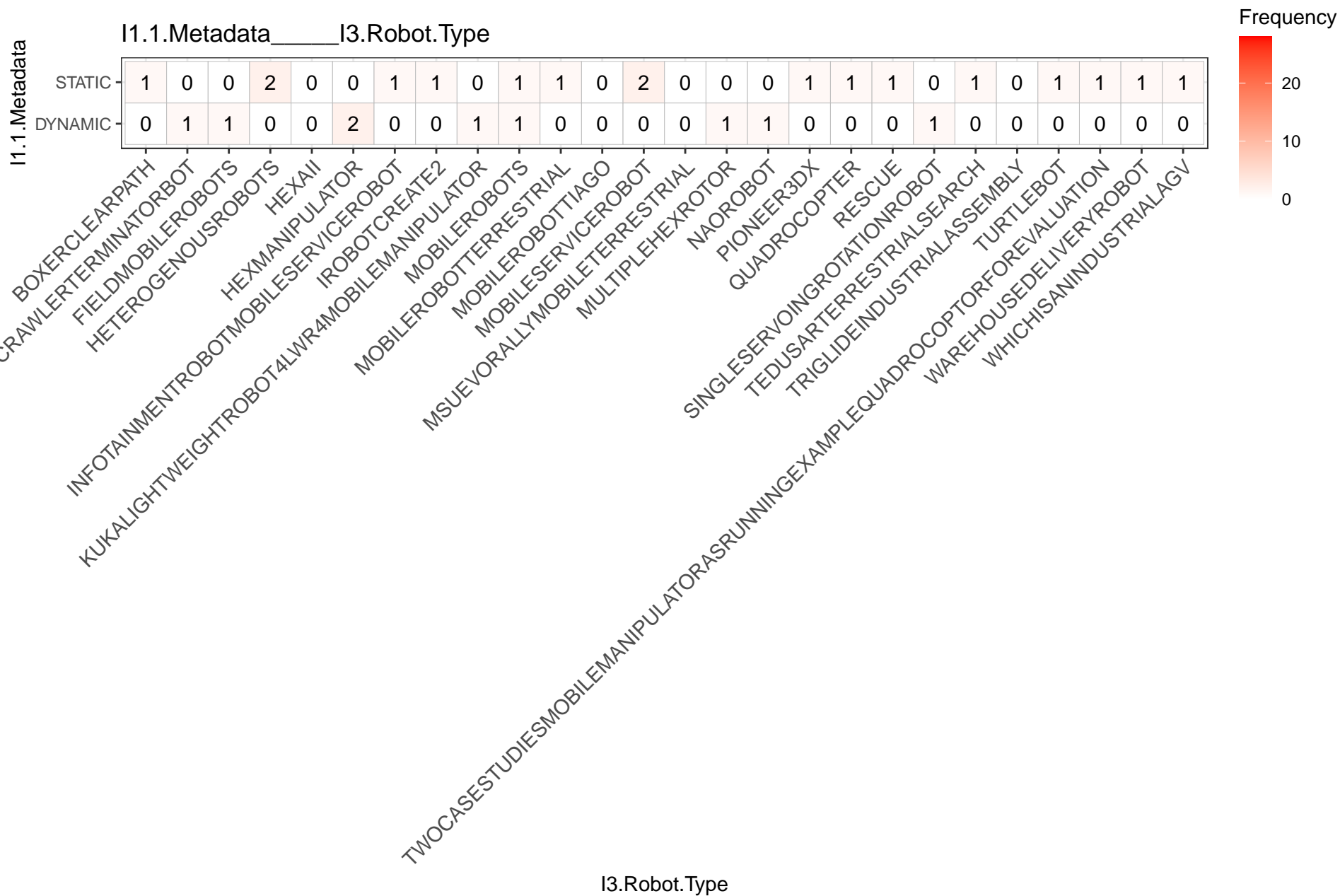
I1.1.Metadata_____I1.4.Overhead.of.Effects



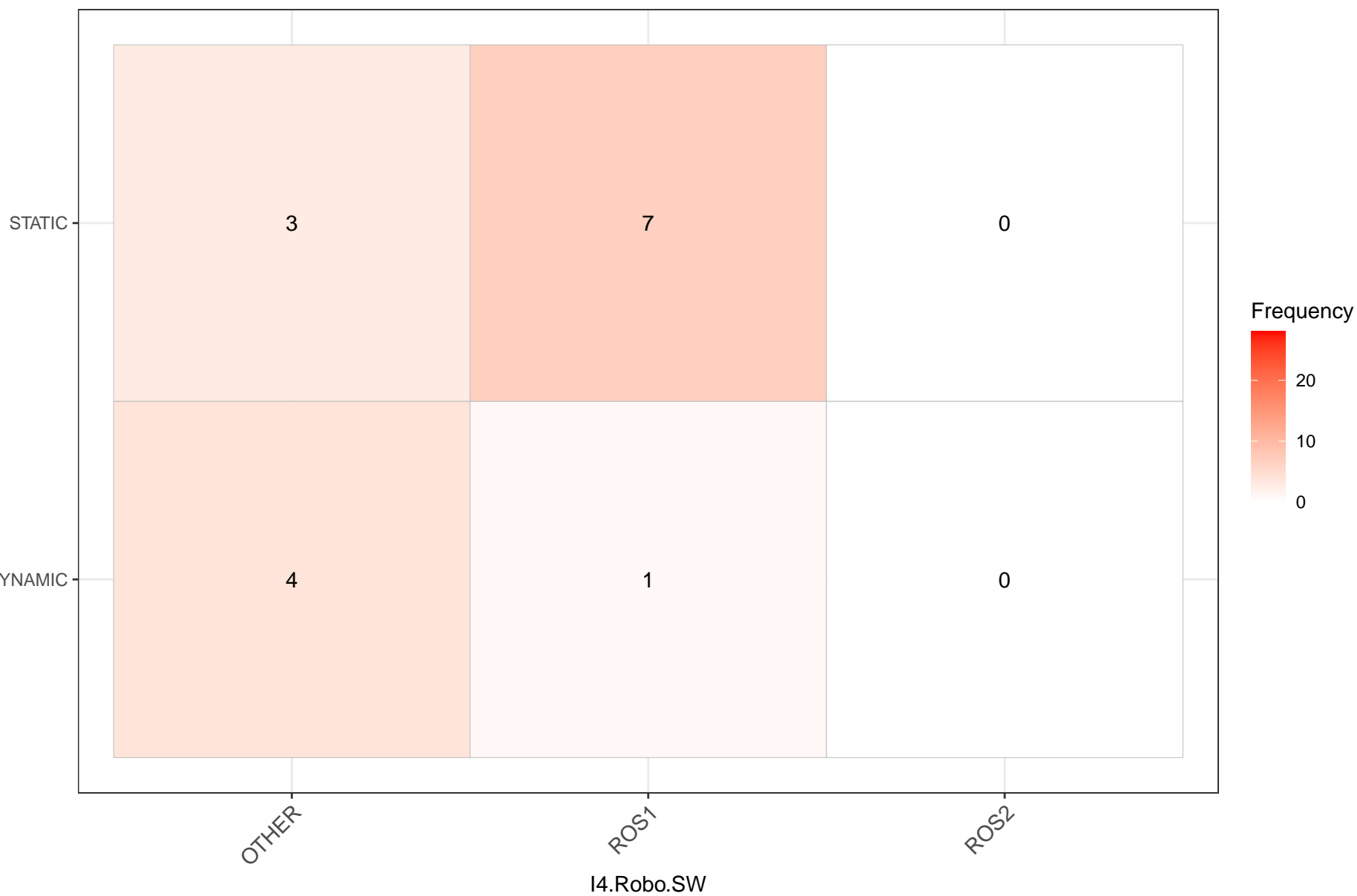
I1.1.Metadata_____I1.4.Resilience.of.Effects

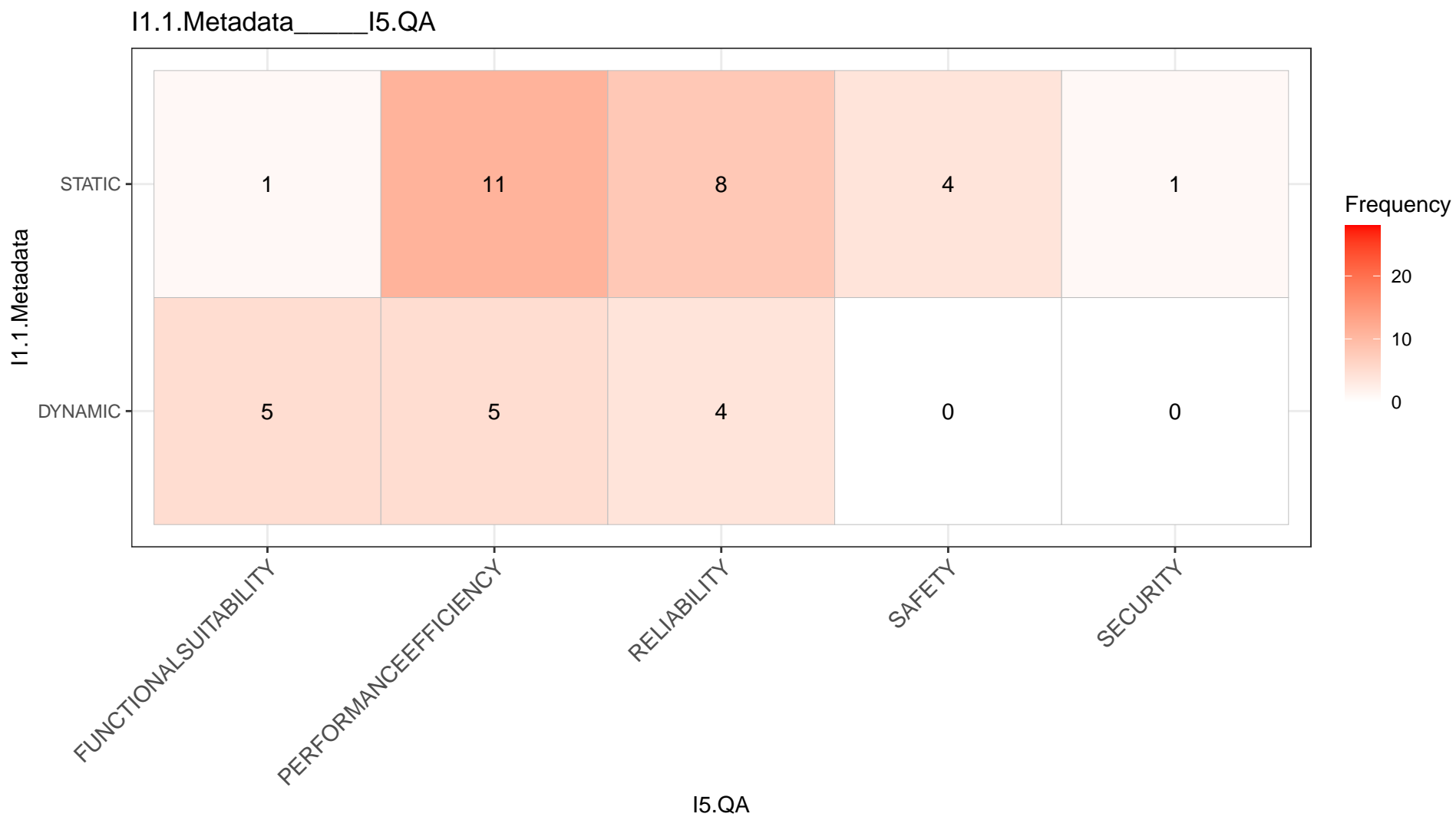




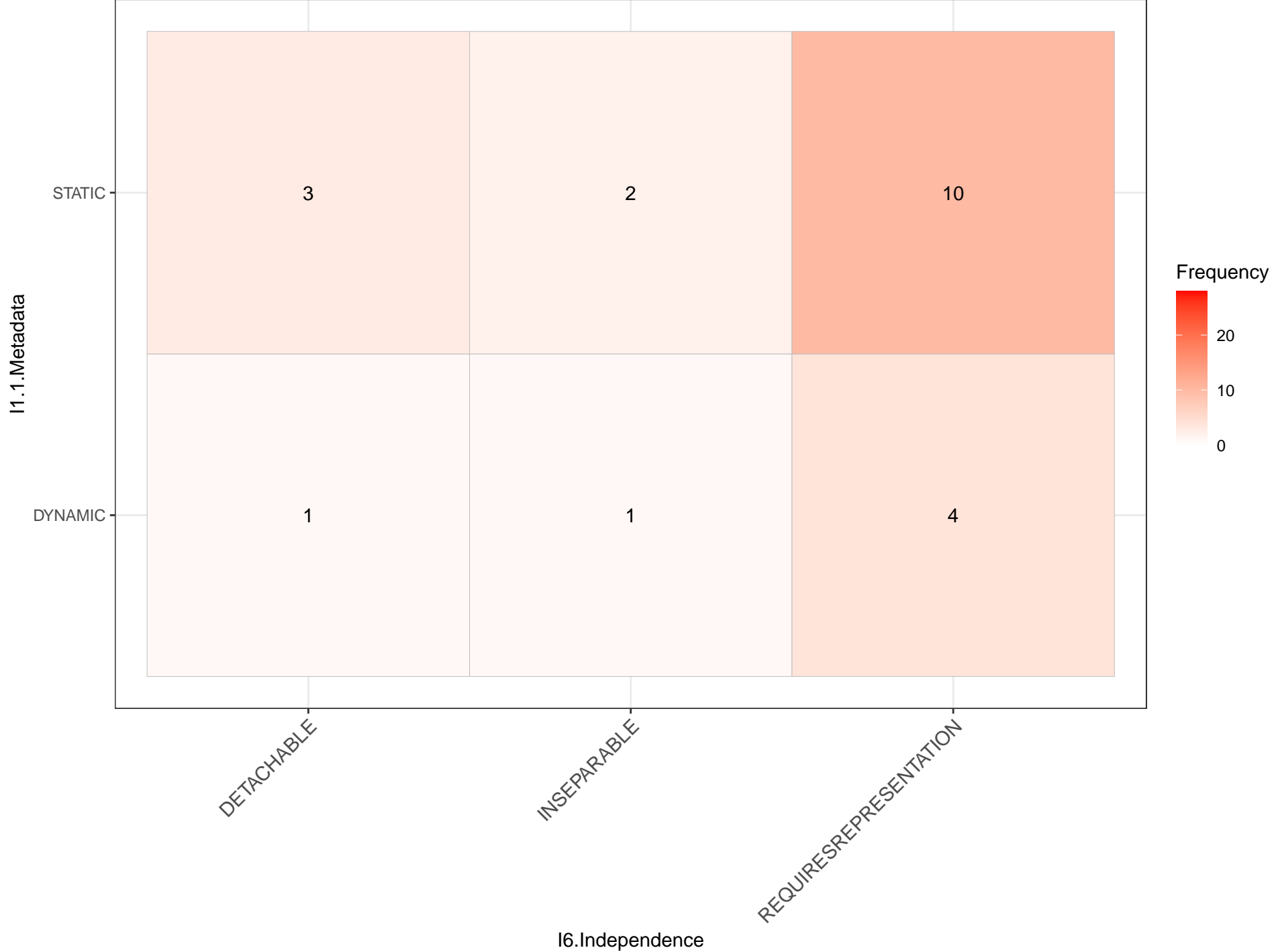


I1.1.Metadata I4.Robo.SW

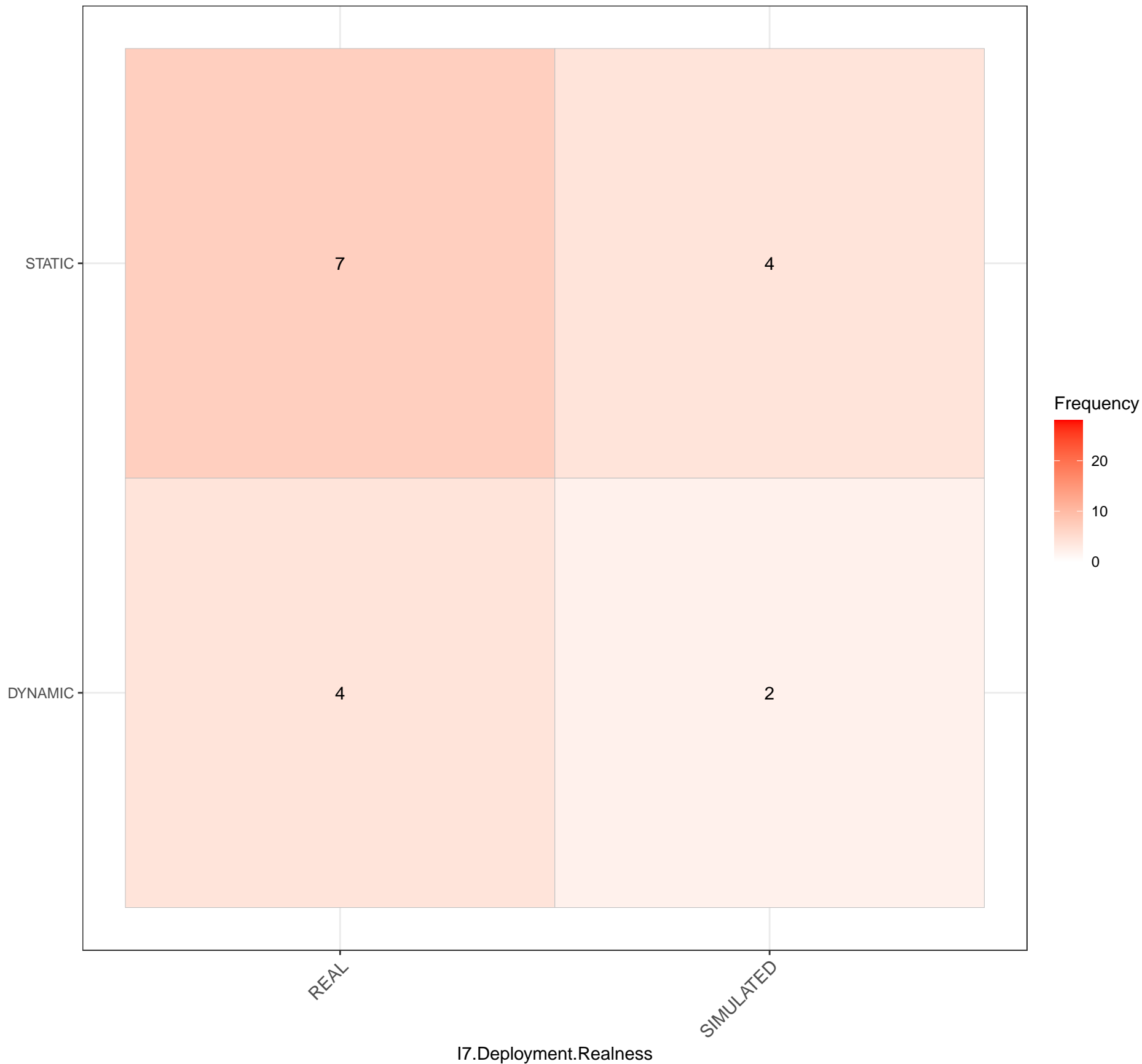




I1.1.Metadata_____I6.Independence



I1.1.Metadata_____I7.Deployment.Realness



I1.1.Metadata_____I7.Mission.Realness

I1.1.Metadata

STATIC

10

5

DYNAMIC

3

3

REAL

SYNTHETIC

I7.Mission.Realness

Frequency

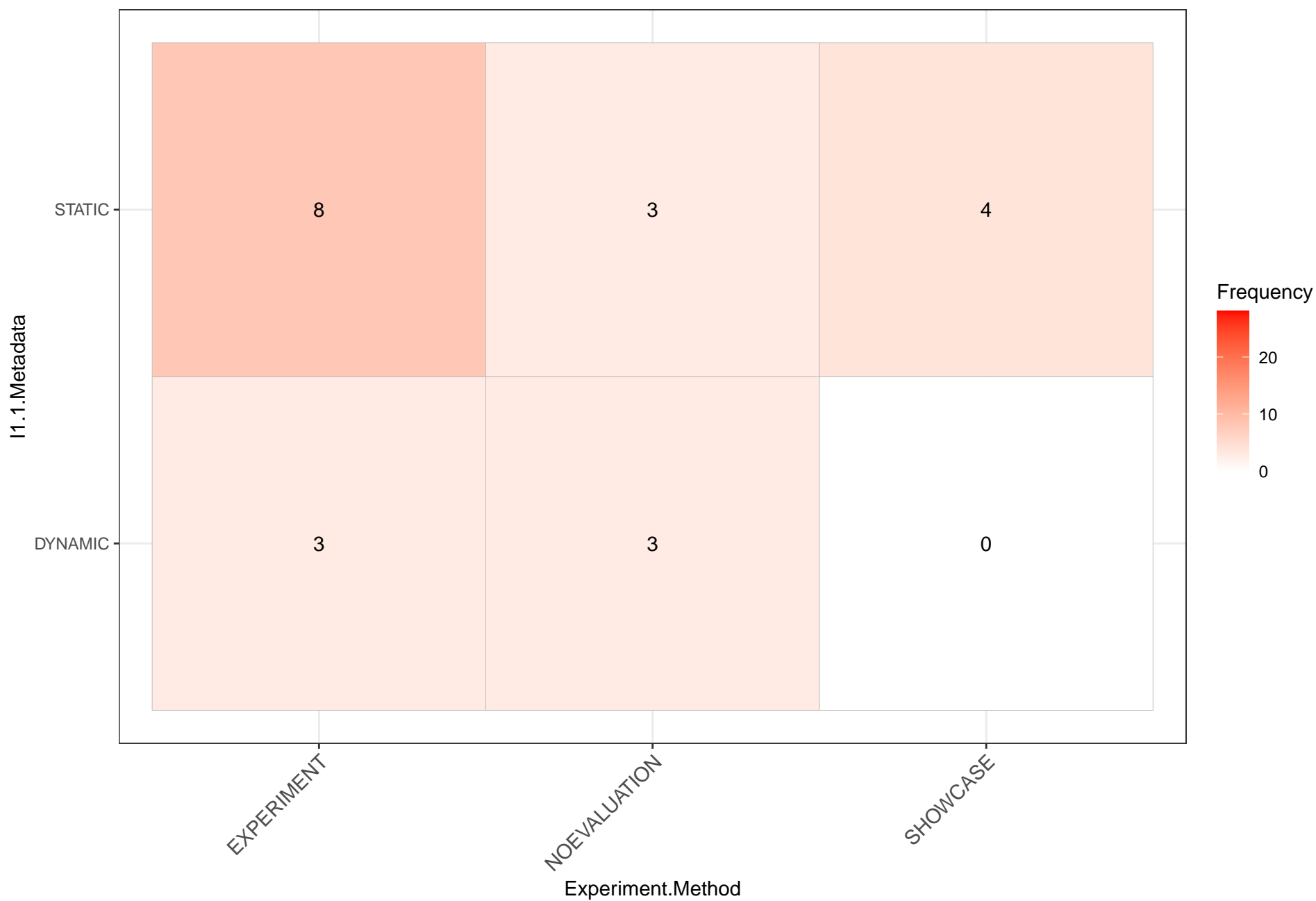


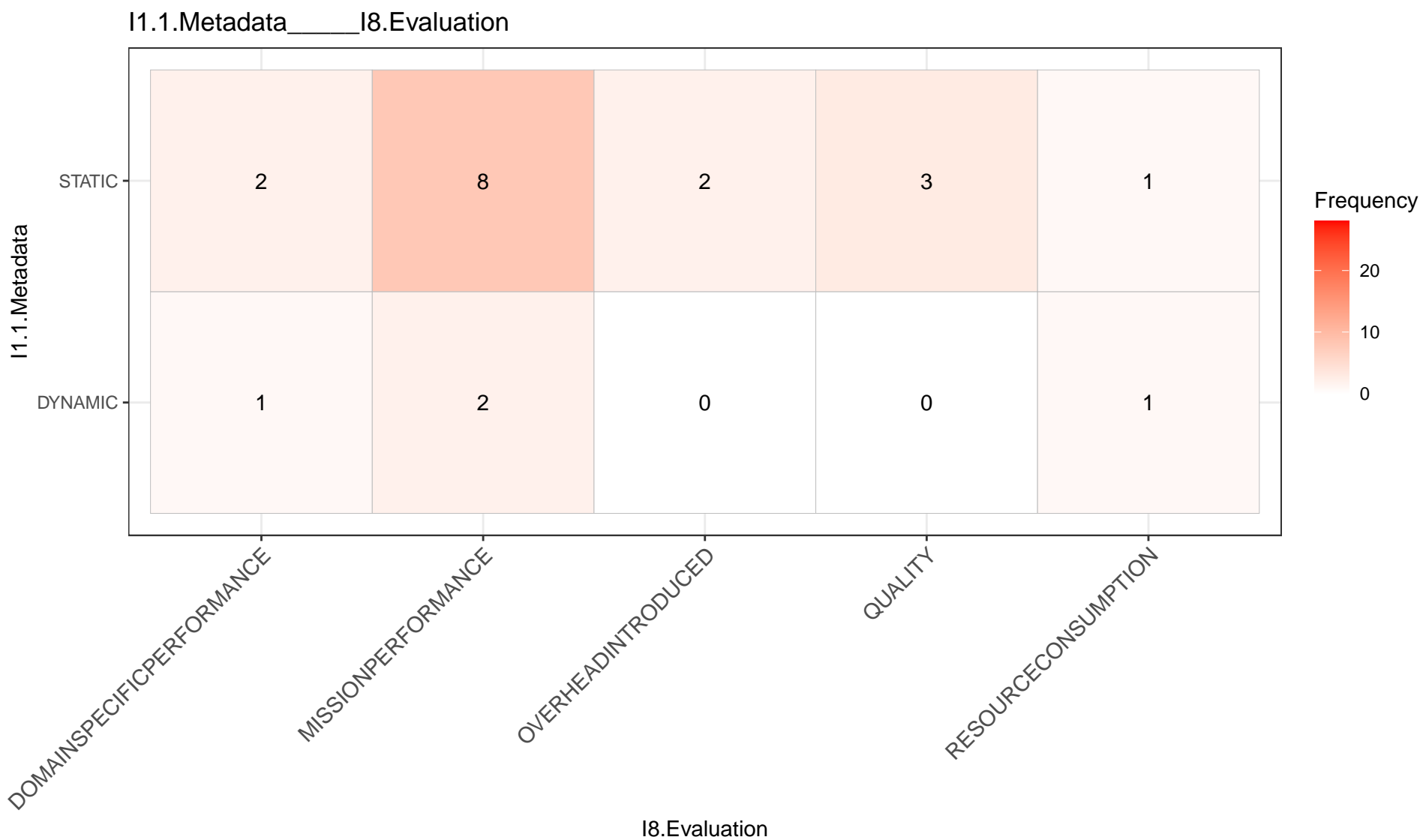
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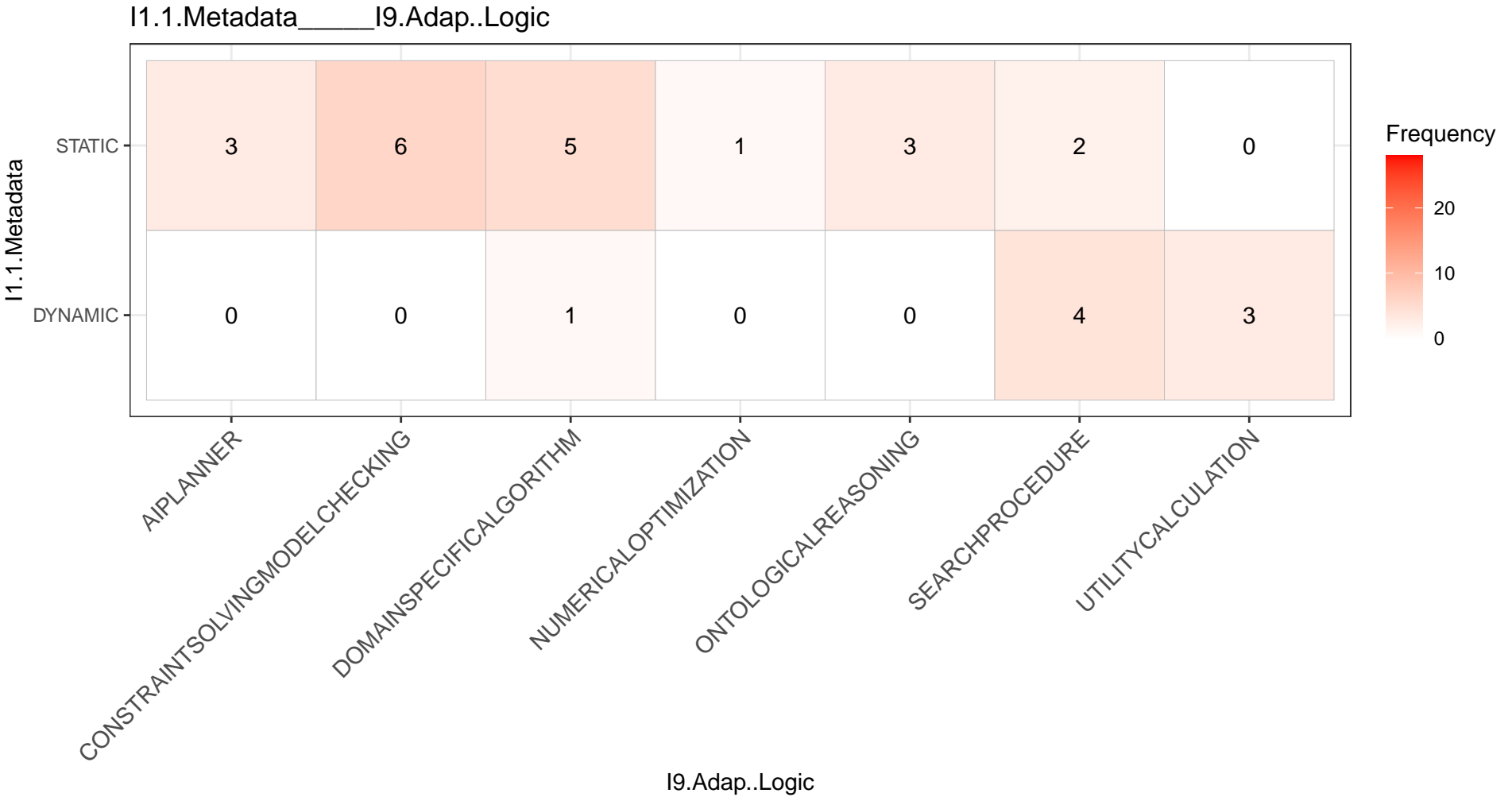
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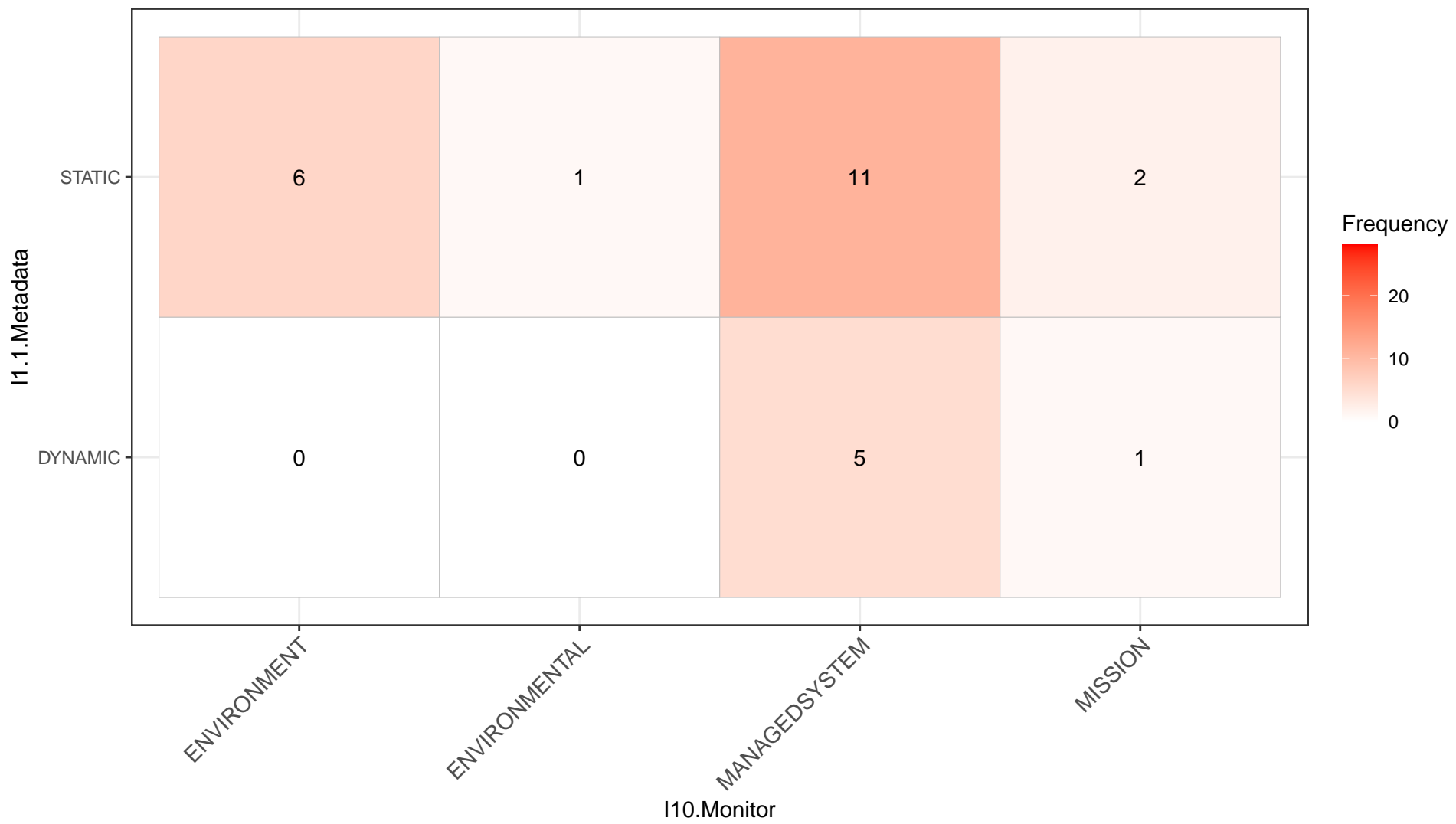
I1.1.Metadata_____Experiment.Method

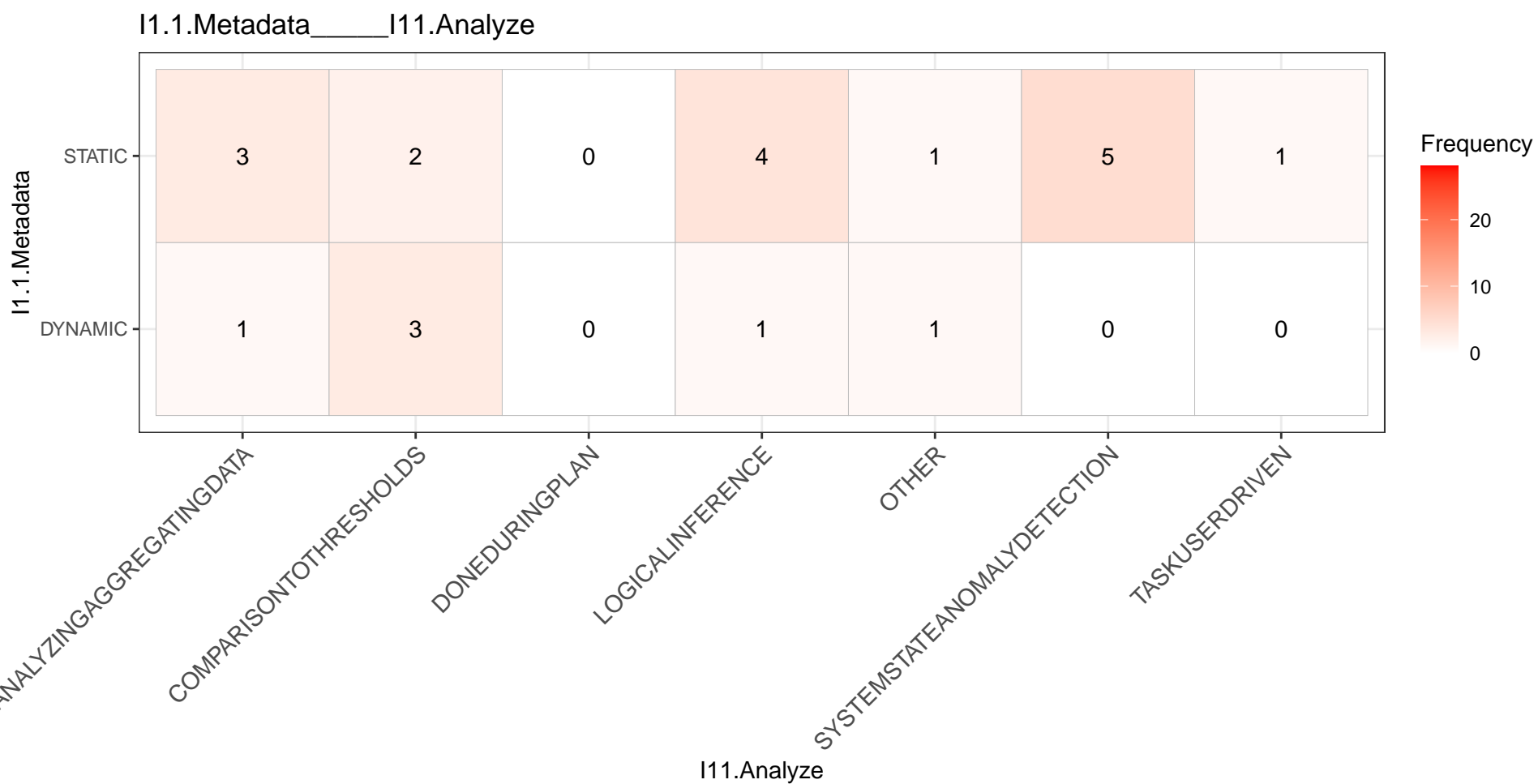






I1.1.Metadata_____I10.Monitor





I1.1.Metadata_____I12.Plan

I1.1.Metadata

STATIC

6

9

2

DYNAMIC

3

1

0

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPLANNINGLANGUAGES

I12.Plan

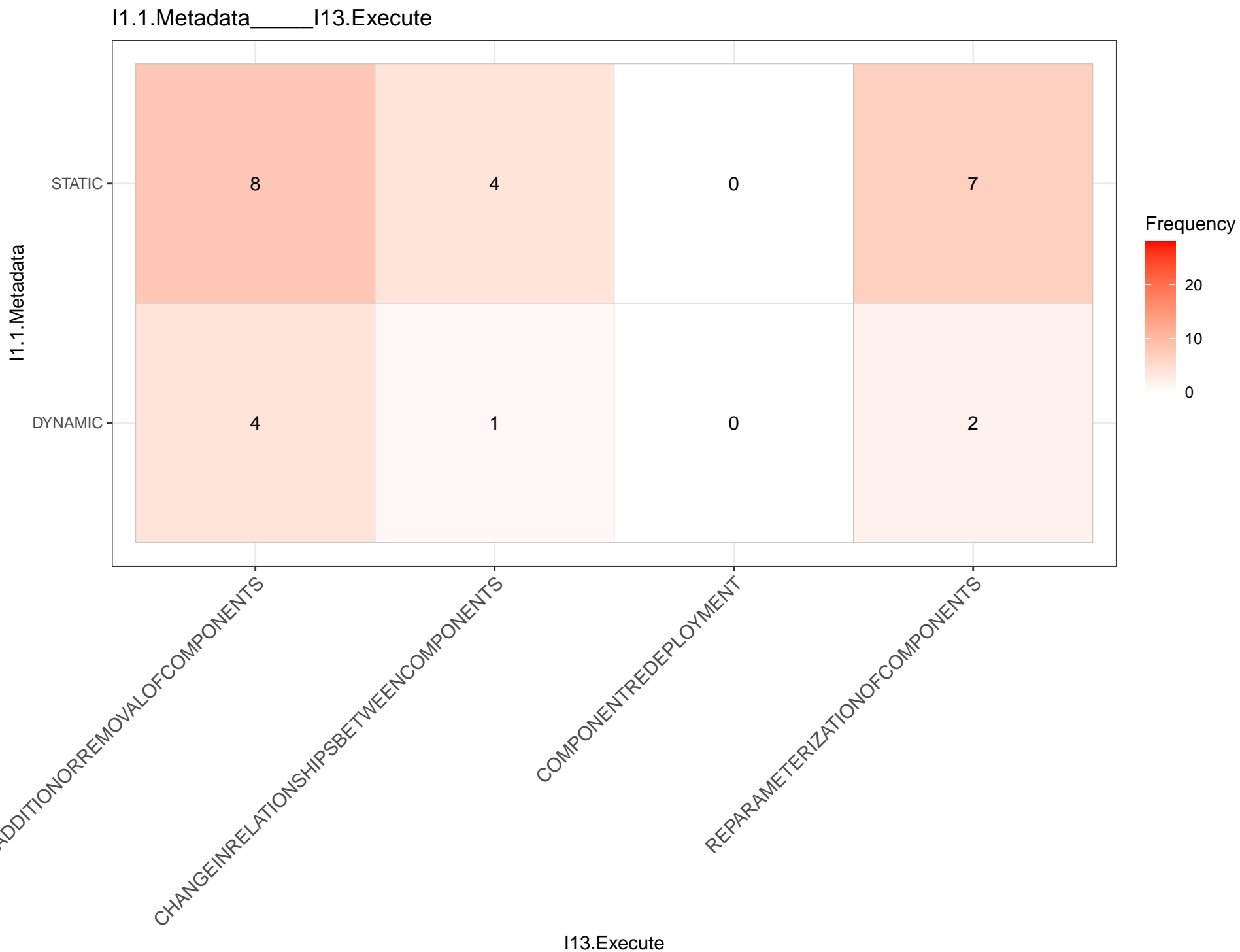
Frequency

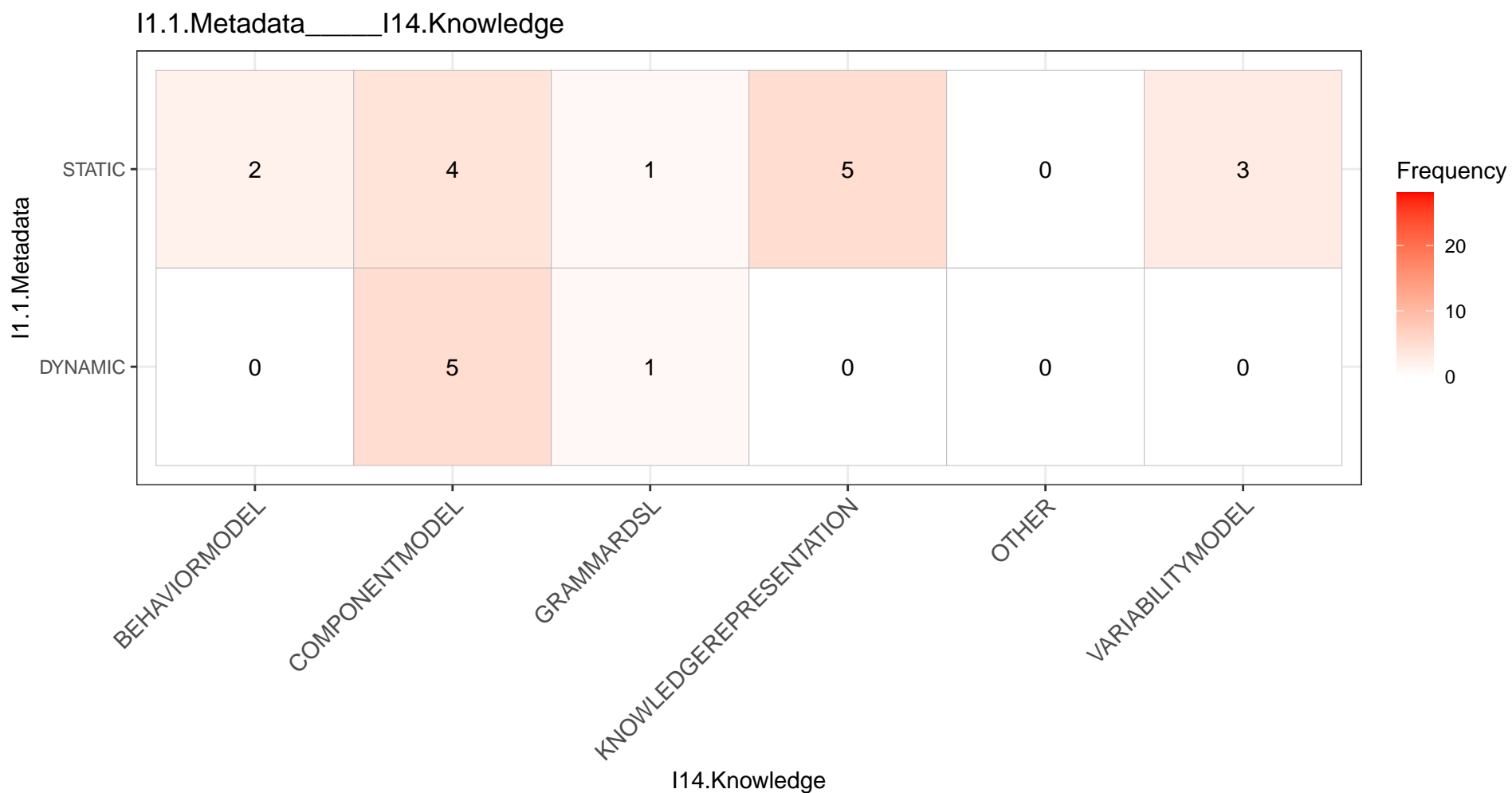


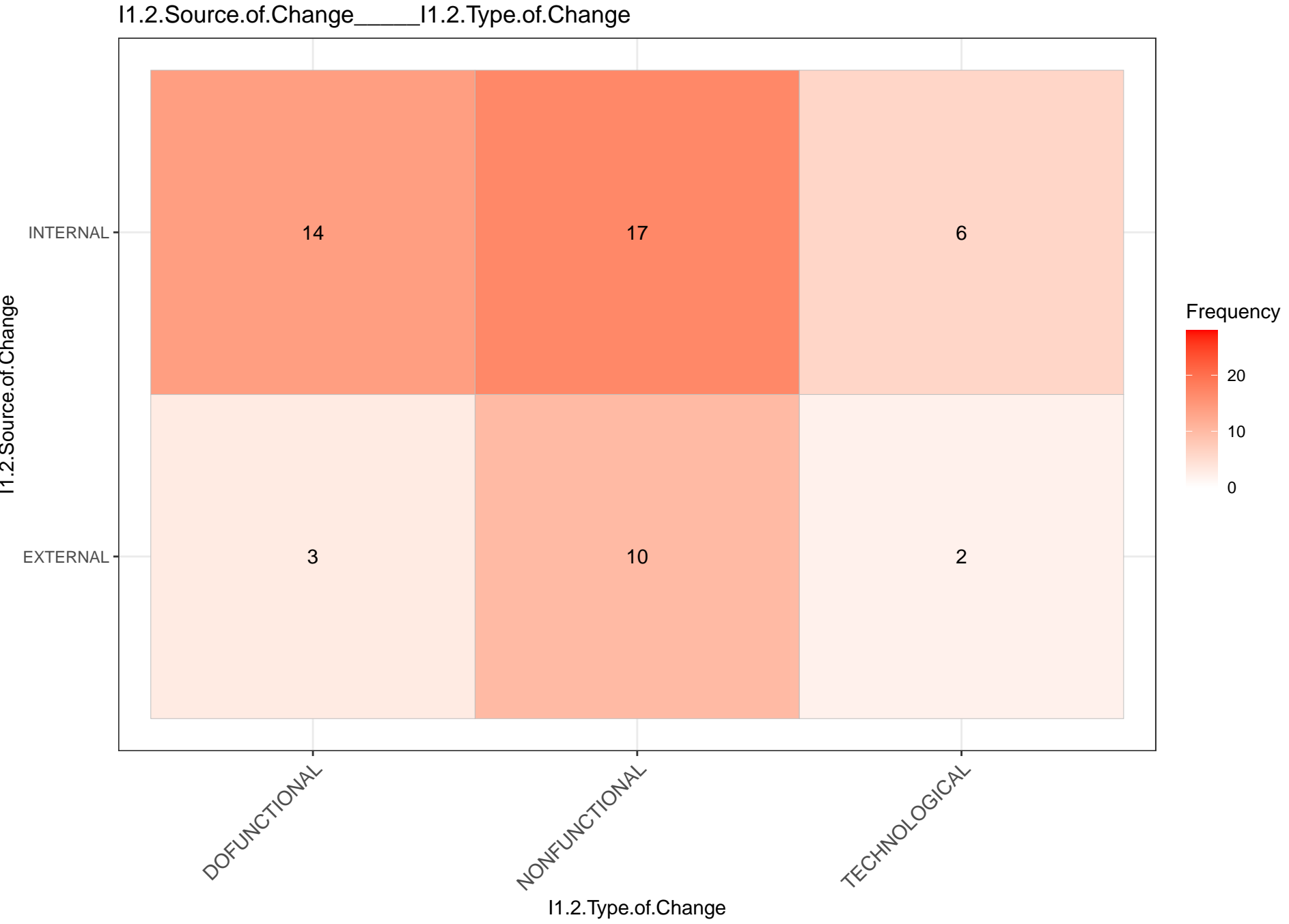
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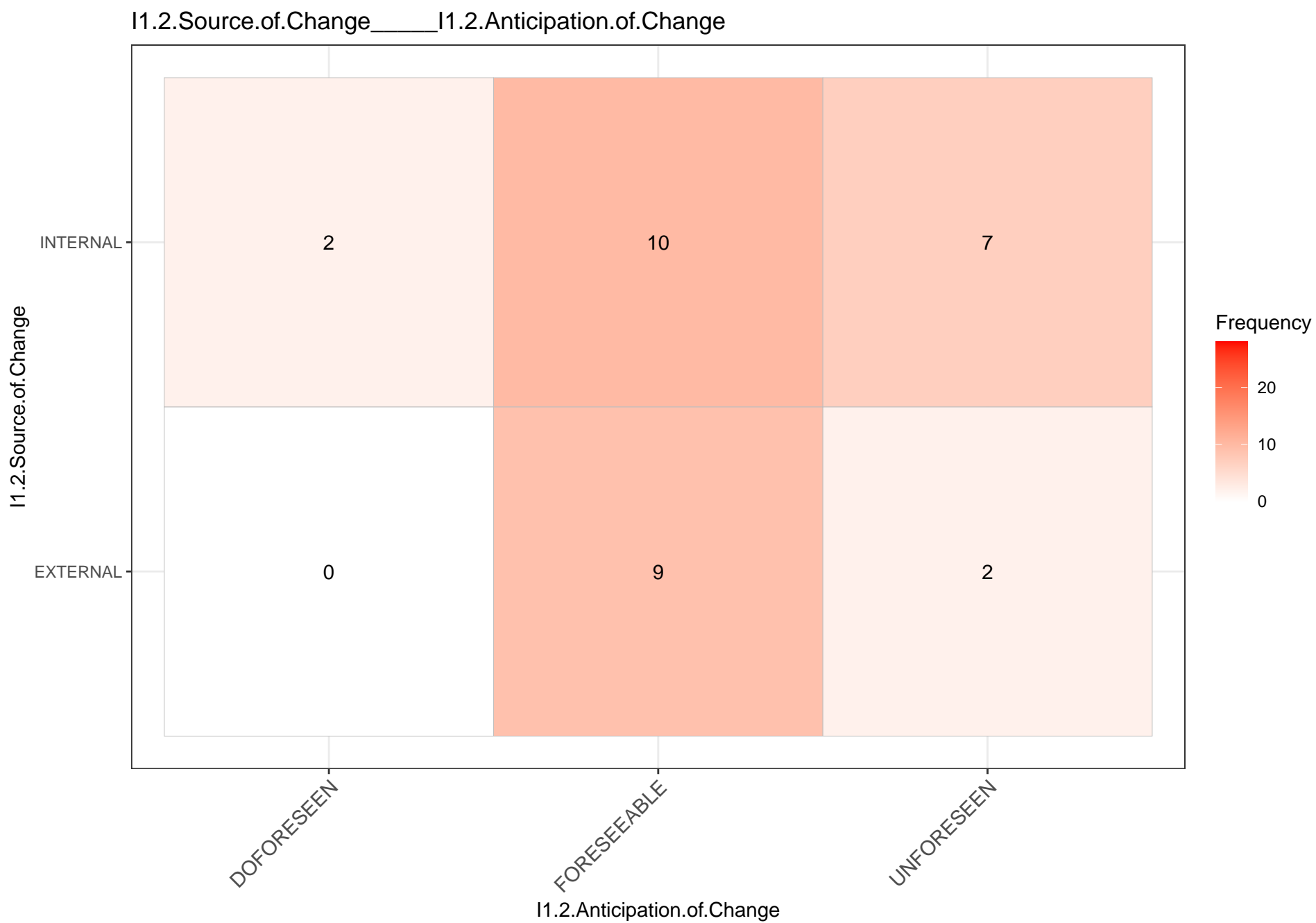
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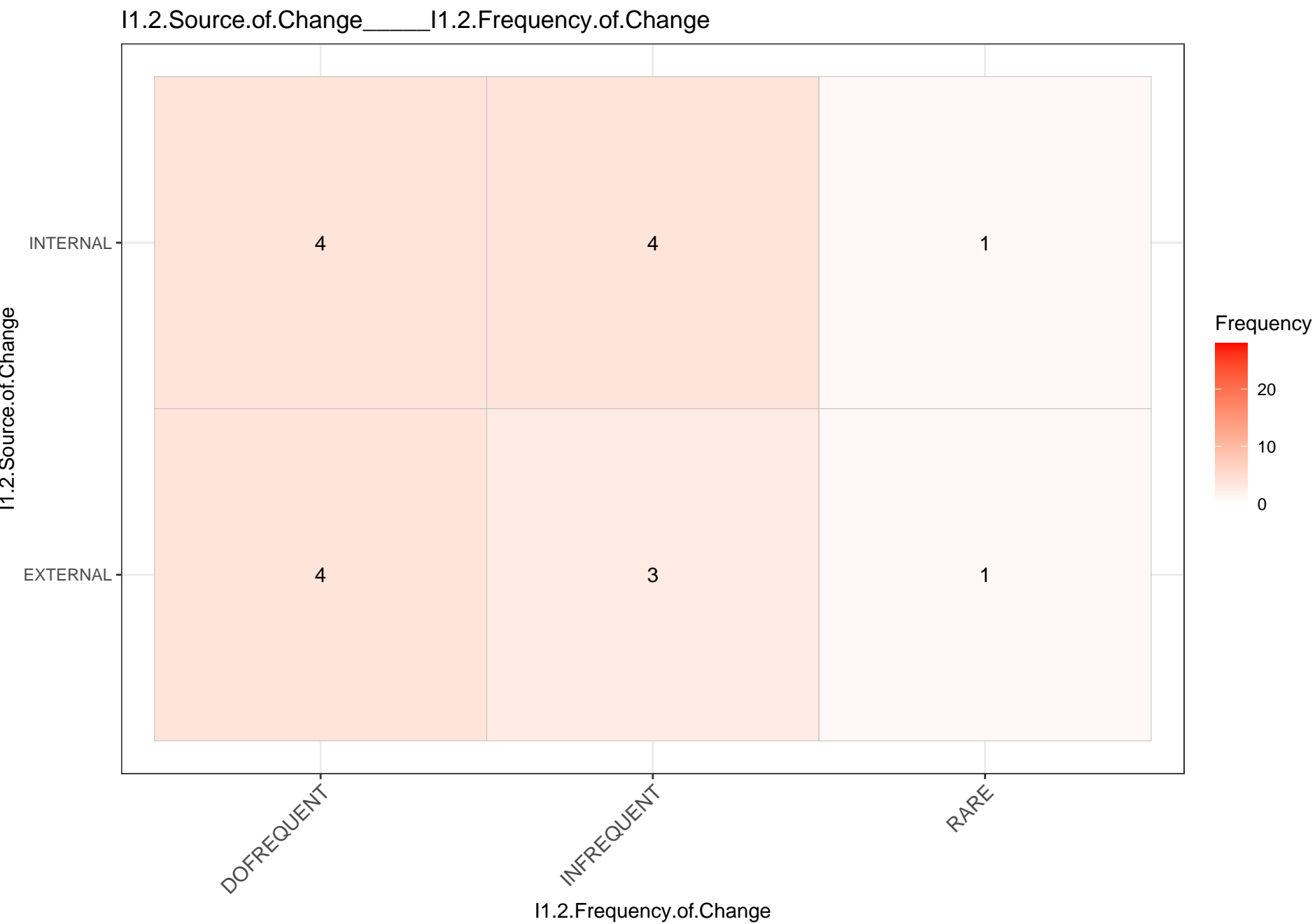
0











I1.2.Source.of.Change_____I1.3.Type.of.Mechanism

I1.2.Source.of.Change

INTERNAL

13

18

EXTERNAL

9

10

PARAMETRIC

STRUCTURAL

I1.3.Type.of.Mechanism

Frequency



20

10

0

I1.2.Source.of.Change_____I1.3.Organization.of.Mechanism

I1.2.Source.of.Change

INTERNAL

3

18

EXTERNAL

0

11

DECENTRALIZED

DOCENTRALIZED

I1.3.Organization.of.Mechanism

Frequency



20

10

0

I1.2.Source.of.Change_____I1.3.Scope.of.Mechanism

I1.2.Source.of.Change

INTERNAL

7

19

EXTERNAL

5

8

GLOBAL

LOCAL

I1.3.Scope.of.Mechanism

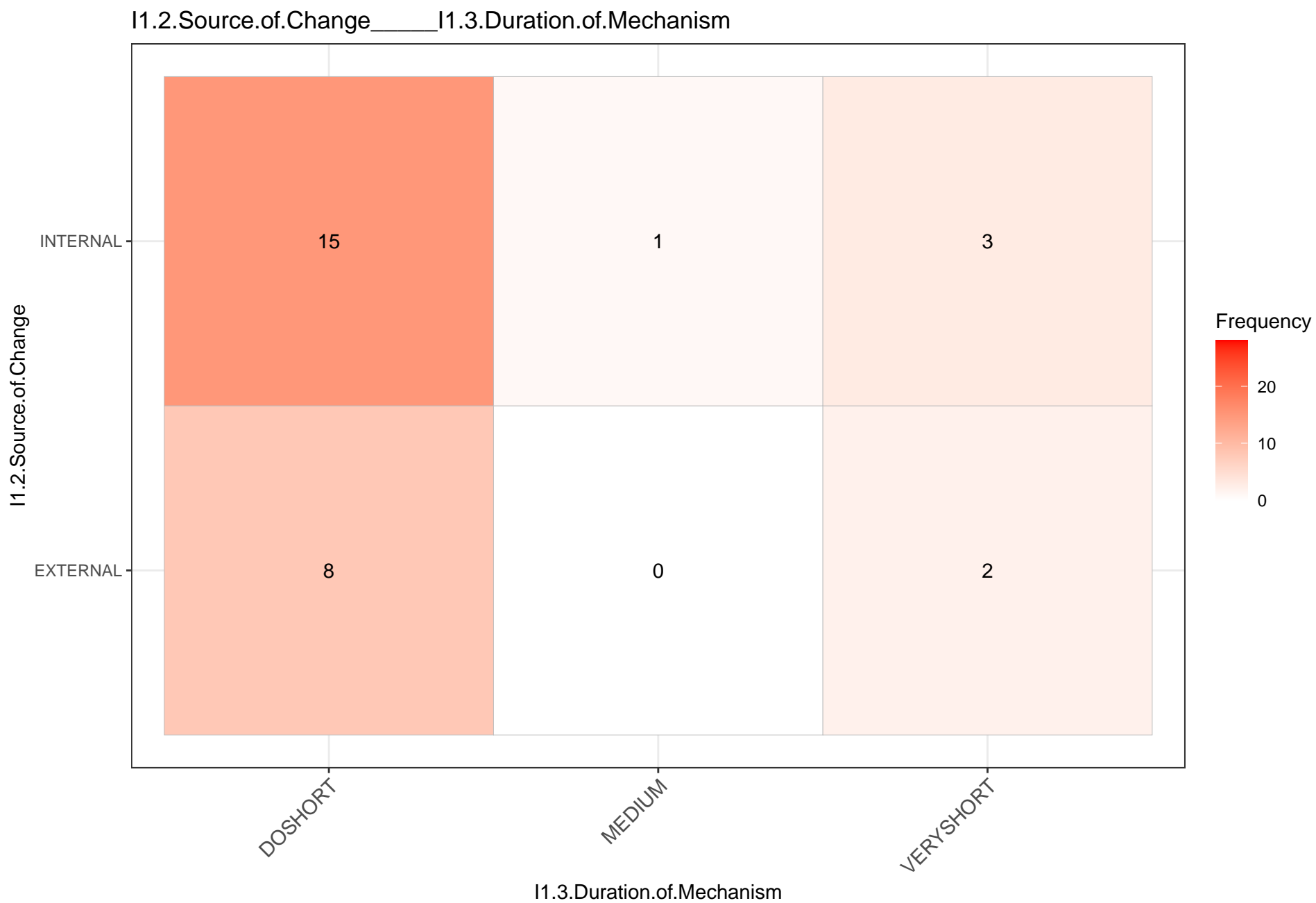
Frequency

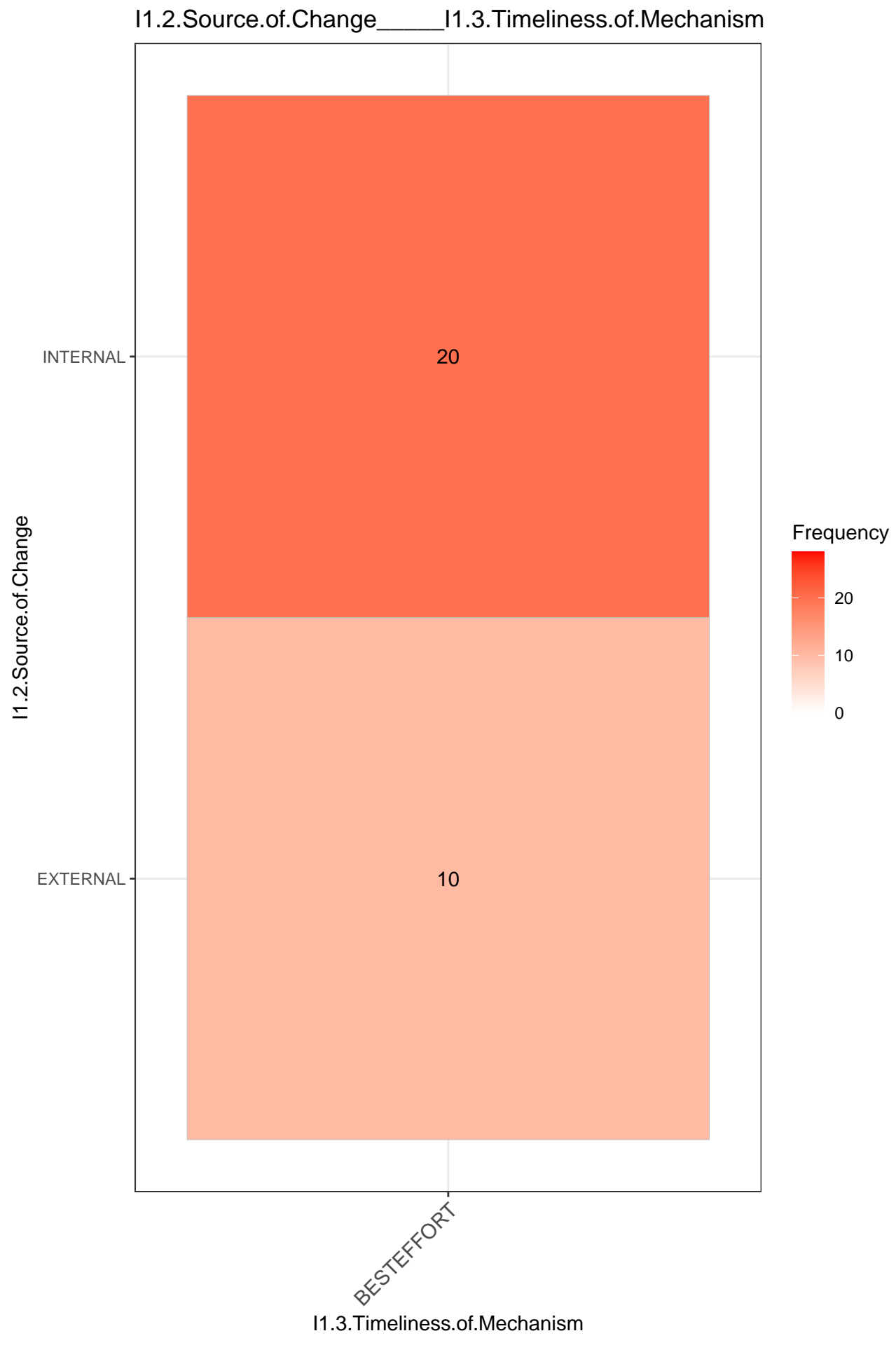


20

10

0





I1.2.Source.of.Change_____I1.3.Trigger.of.Mechanism

I1.2.Source.of.Change

INTERNAL

19

1

EXTERNAL

9

2

EVENTTRIGGER

TIMETRIGGER

I1.3.Trigger.of.Mechanism

Frequency

20

10

0



I1.2.Source.of.Change_____I1.4.Criticality.of.Effects

I1.2.Source.of.Change

INTERNAL

15

4

EXTERNAL

7

4

MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

Frequency



20

10

0

I1.2.Source.of.Change_____I1.4.Predictability.of.Effects

I1.2.Source.of.Change

INTERNAL

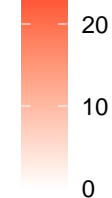
EXTERNAL

DODETERMINISTIC

NONDETERMINISTIC

I1.4.Predictability.of.Effects

Frequency

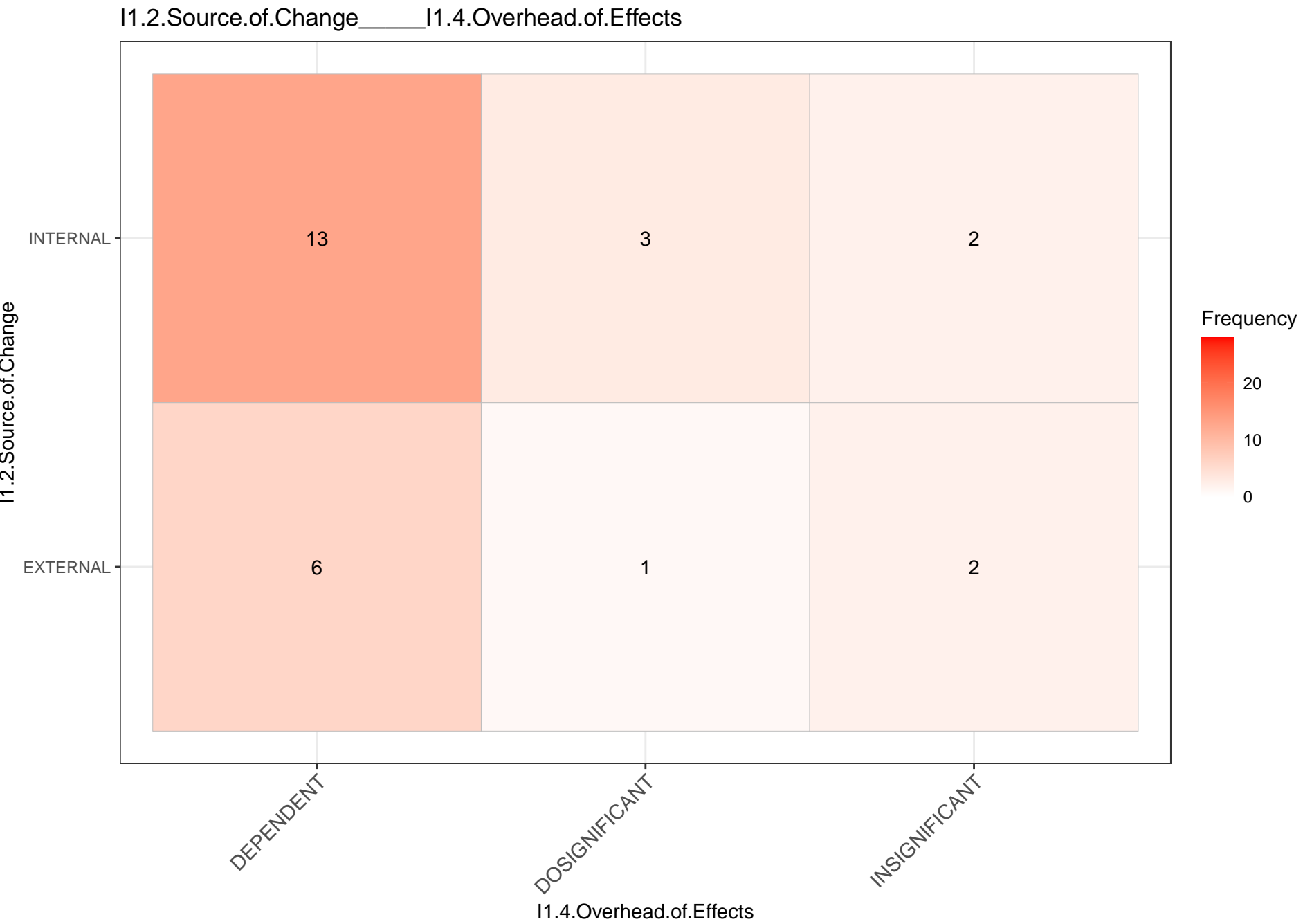


6

13

5

8



I1.2.Source.of.Change_____I1.4.Resilience.of.Effects

I1.2.Source.of.Change

INTERNAL

EXTERNAL

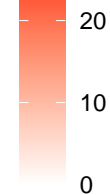
DEPENDENT

DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects

Frequency



9

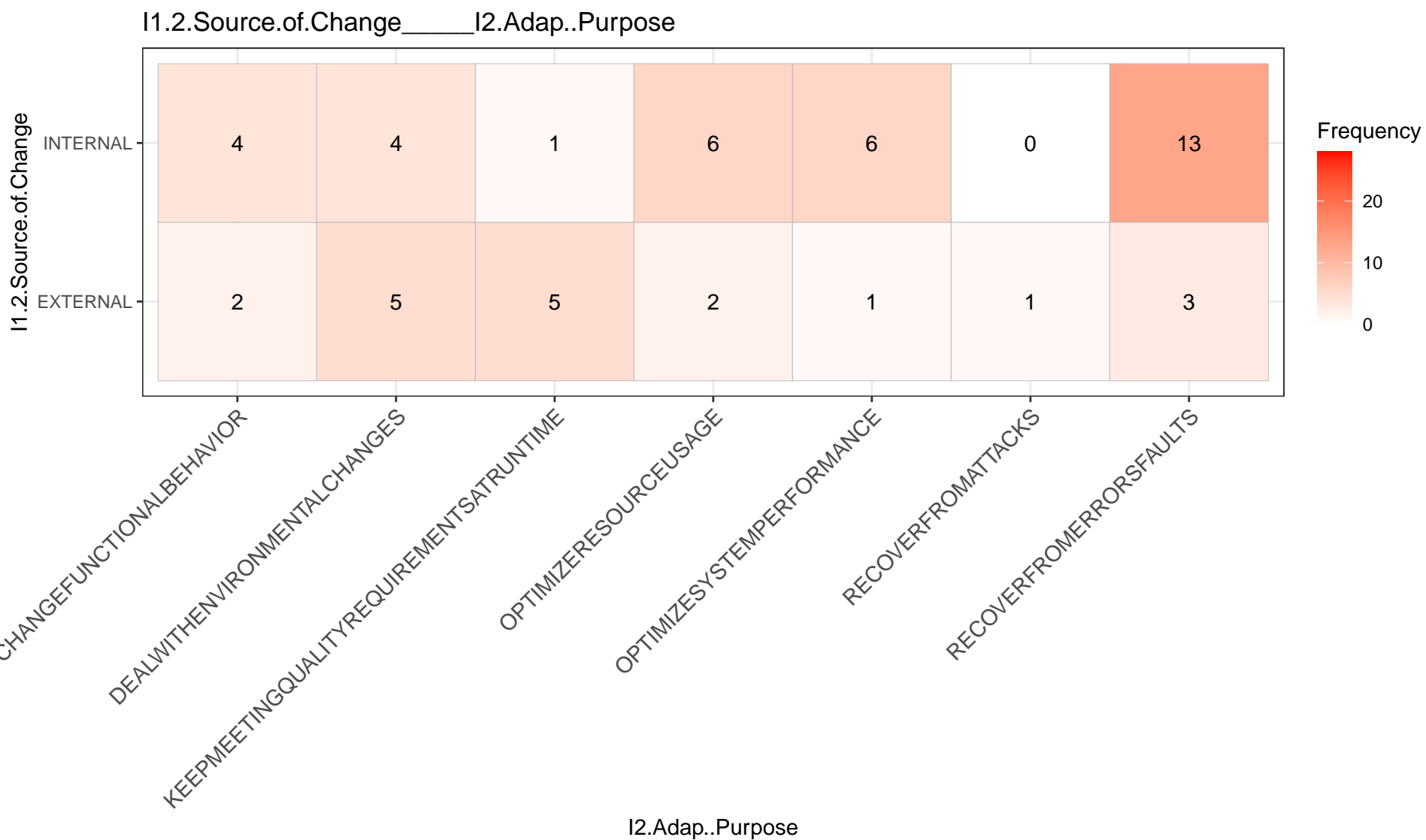
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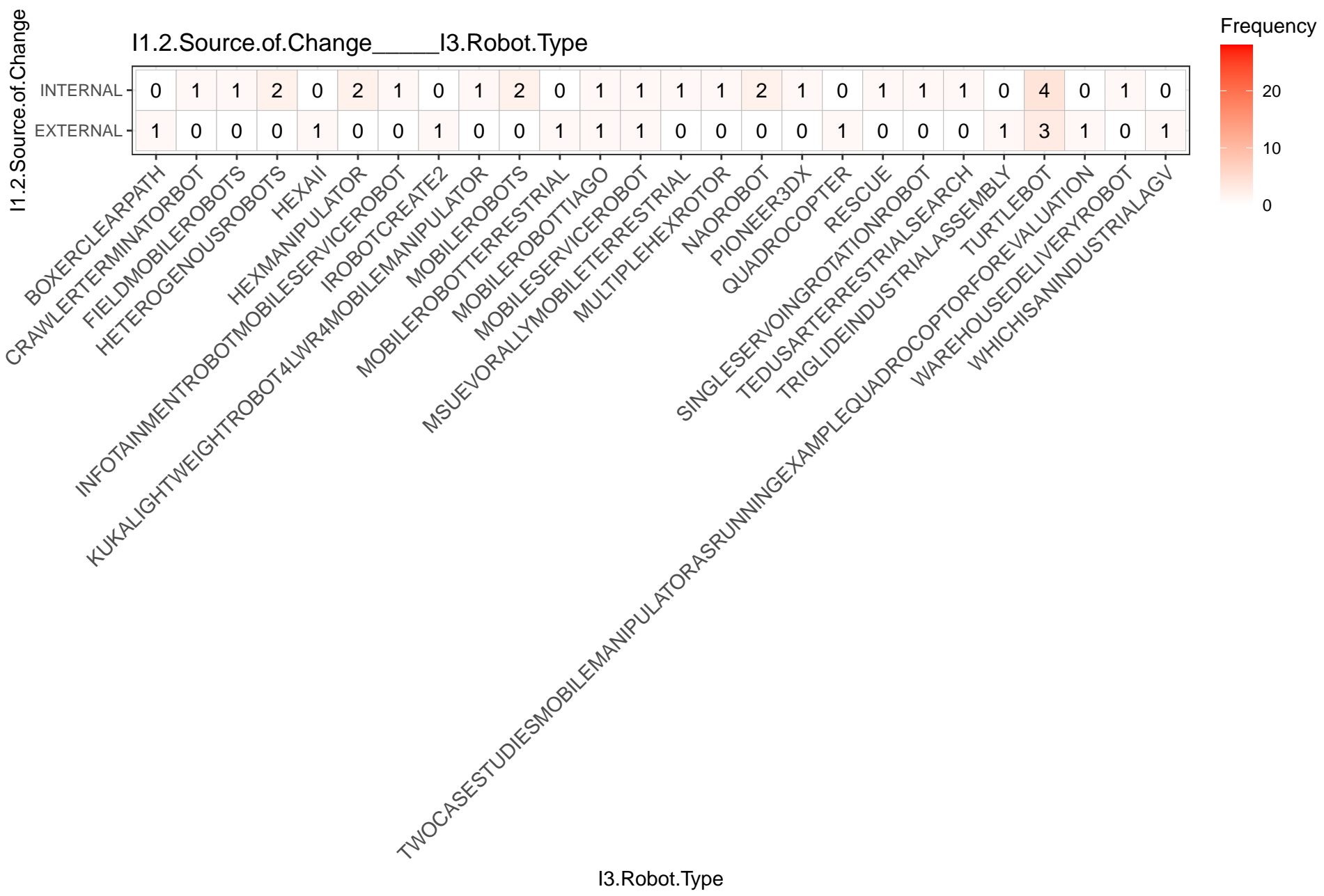
1

3

4

2





I1.2.Source.of.Change____I4.Robo.SW

I1.2.Source.of.Change

INTERNAL

EXTERNAL

OTHER

ROS1

ROS2

I4.Robo.SW

Frequency



6

10

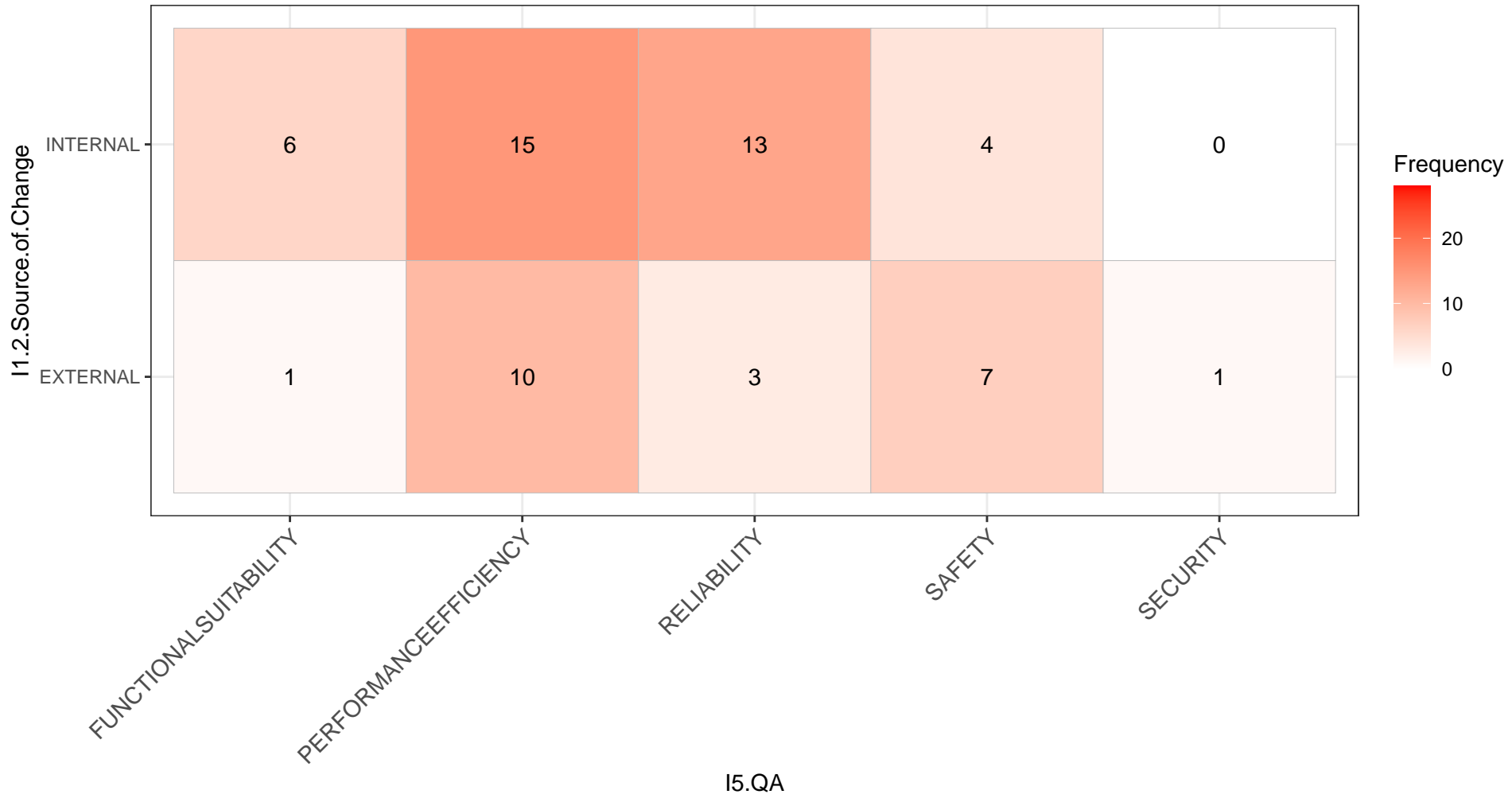
1

1

5

1

I1.2.Source.of.Change_____I5.QA



I1.2.Source.of.Change_____I6.Independence

I1.2.Source.of.Change

INTERNAL

EXTERNAL

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

Frequency



20

10

0

8

2

11

3

1

7

I1.2.Source.of.Change____I7.Deployment.Realness

I1.2.Source.of.Change

INTERNAL

12

6

EXTERNAL

3

7

REAL

SIMULATED

I7.Deployment.Realness

Frequency



I1.2.Source.of.Change_____I7.Mission.Realness

I1.2.Source.of.Change

INTERNAL

EXTERNAL

REAL

SYNTHETIC

I7.Mission.Realness

Frequency



20

10

0

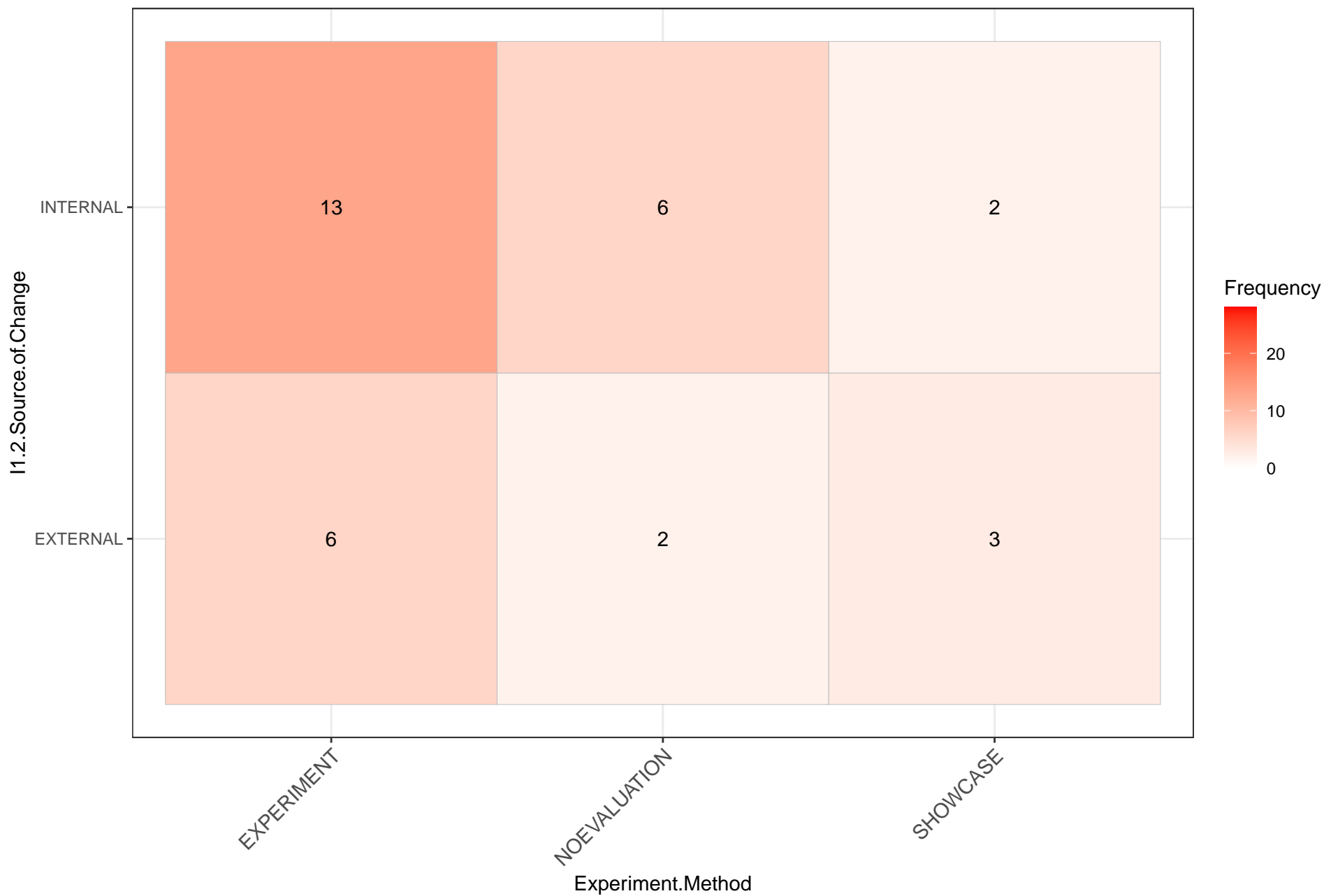
9

12

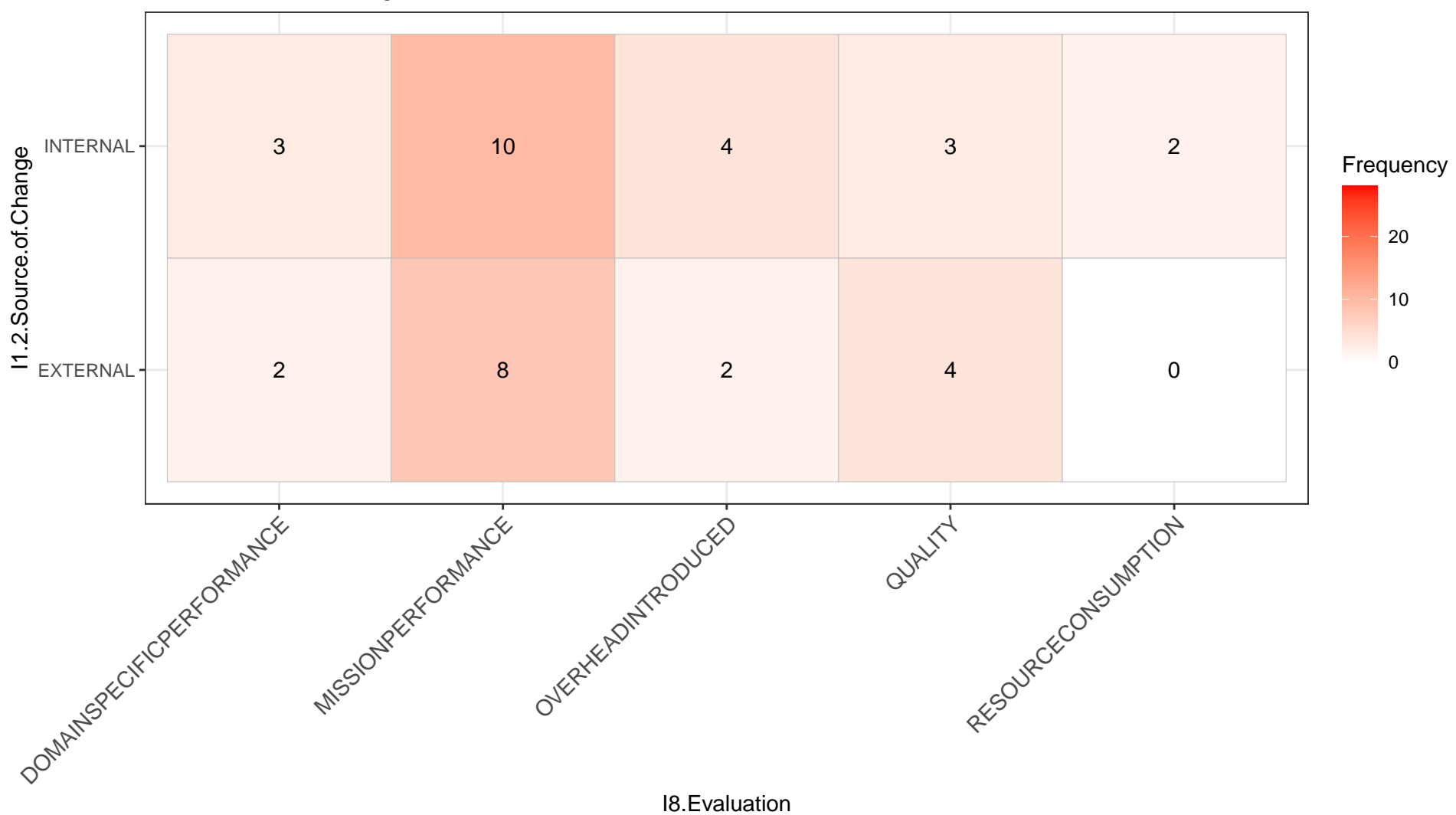
7

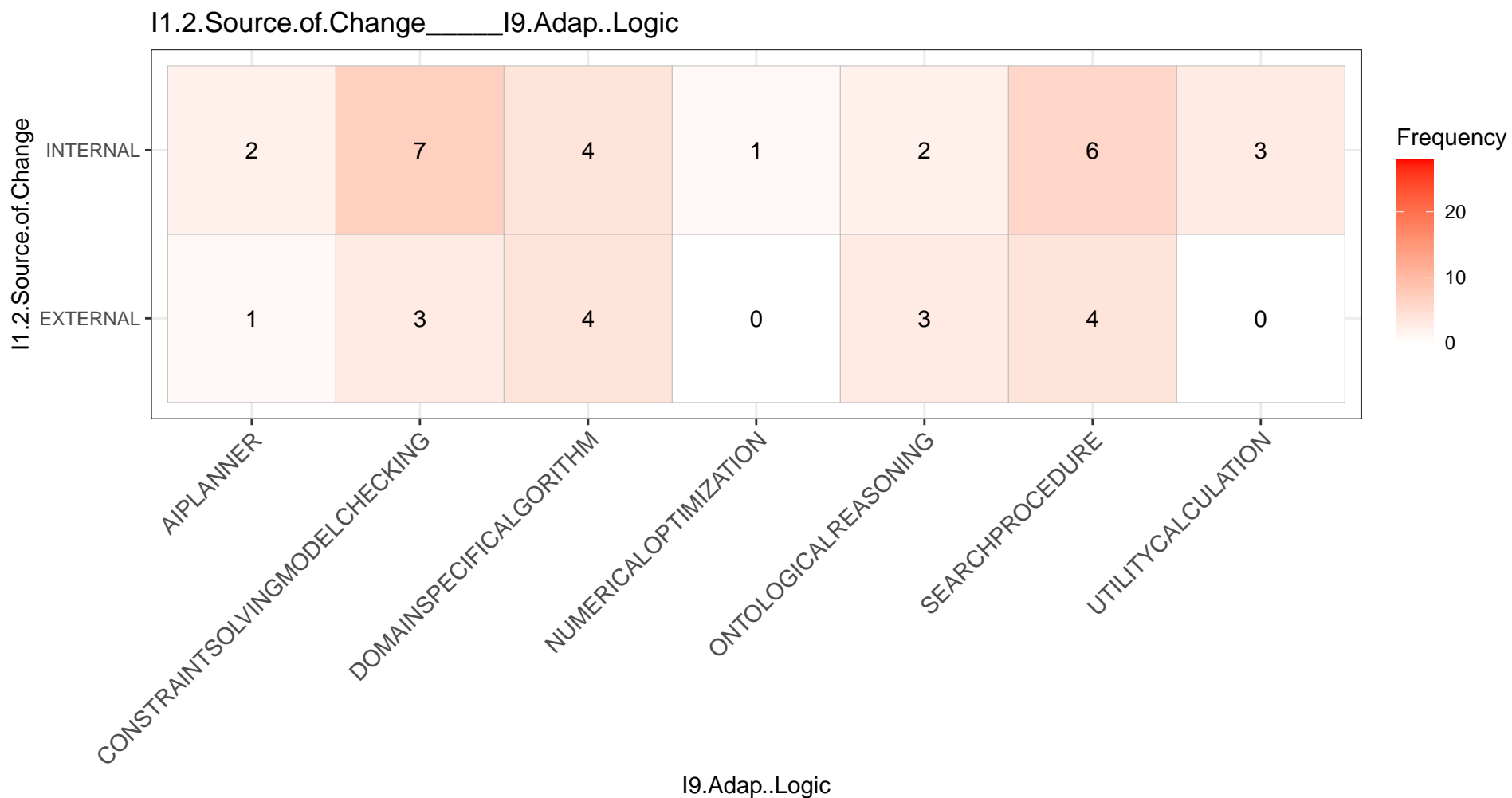
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I1.2.Source.of.Change_____Experiment.Method

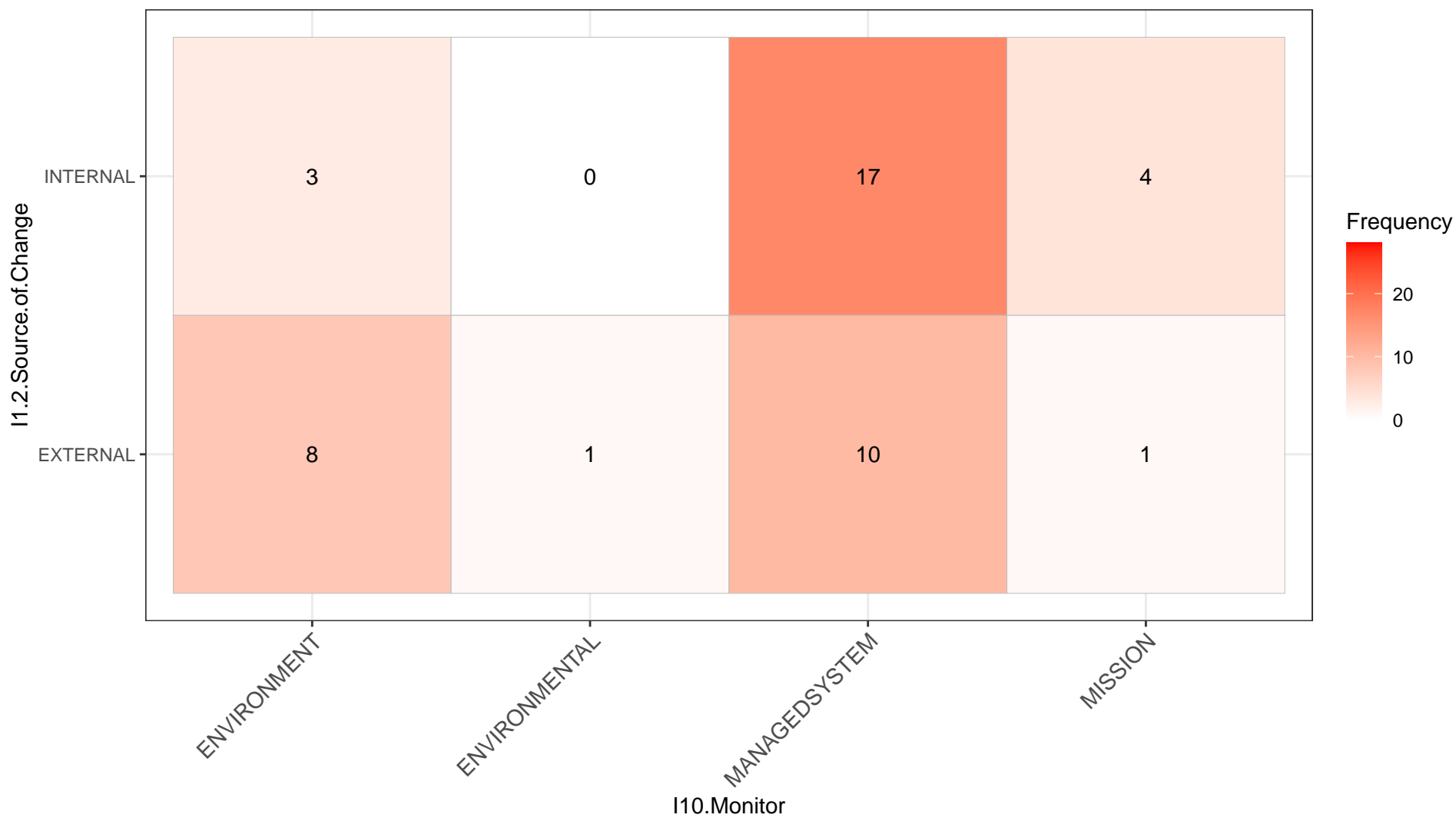


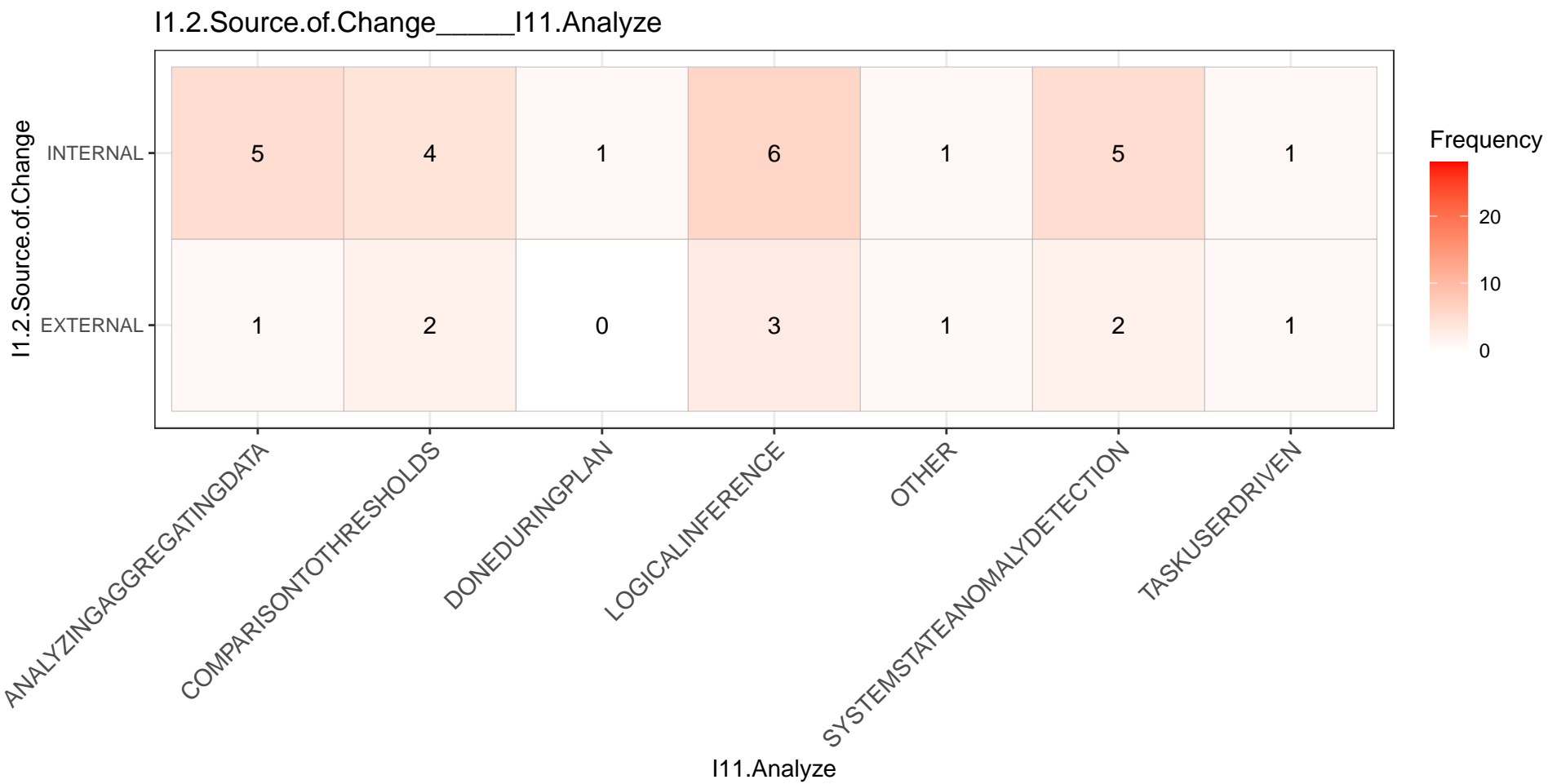
I1.2.Source.of.Change_____I8.Evaluation





I1.2.Source.of.Change____I10.Monitor





I1.2.Source.of.Change_____I12.Plan

I1.2.Source.of.Change

INTERNAL

EXTERNAL

Frequency

20

10

0

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPANNINGLANGUAGES

I12.Plan

10

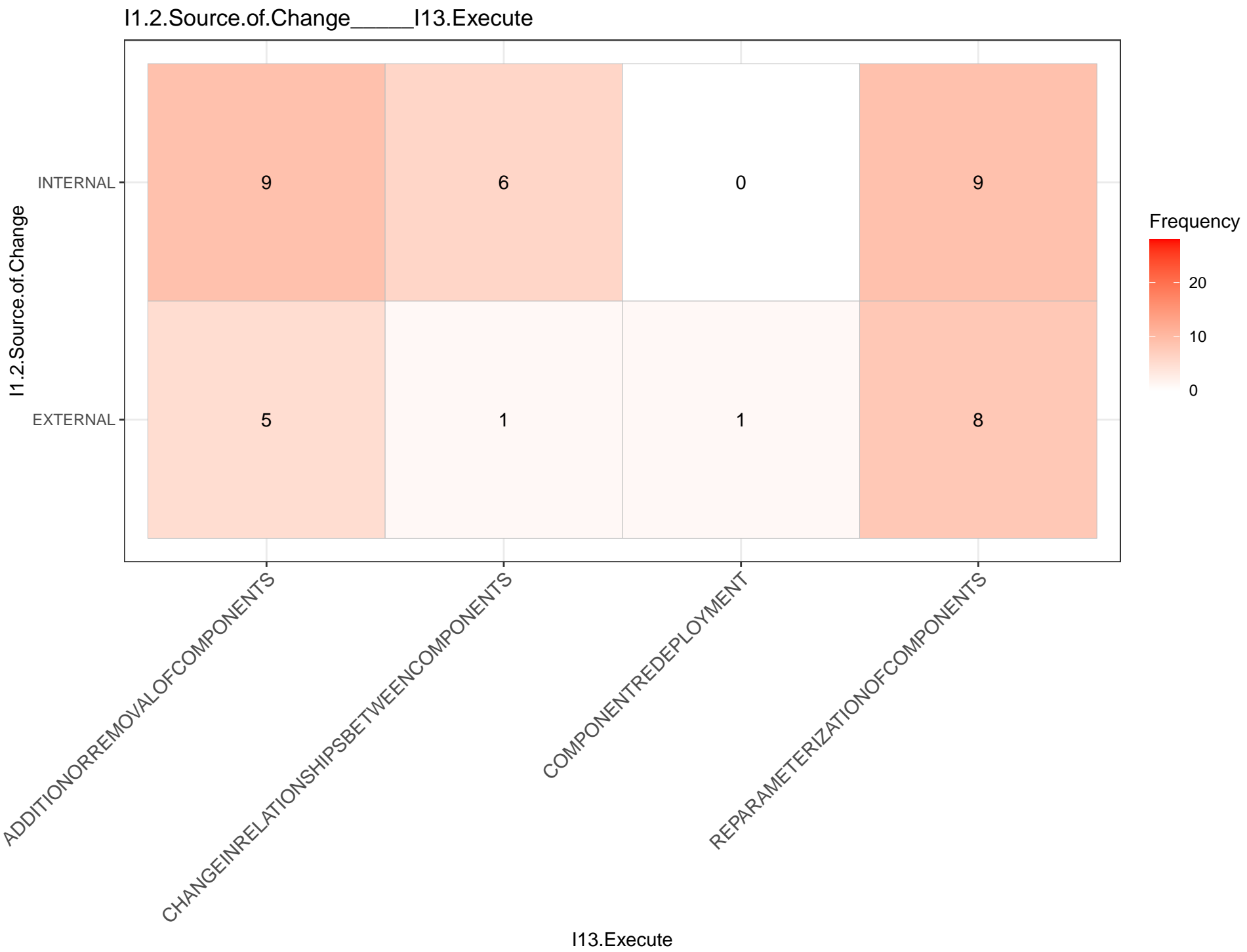
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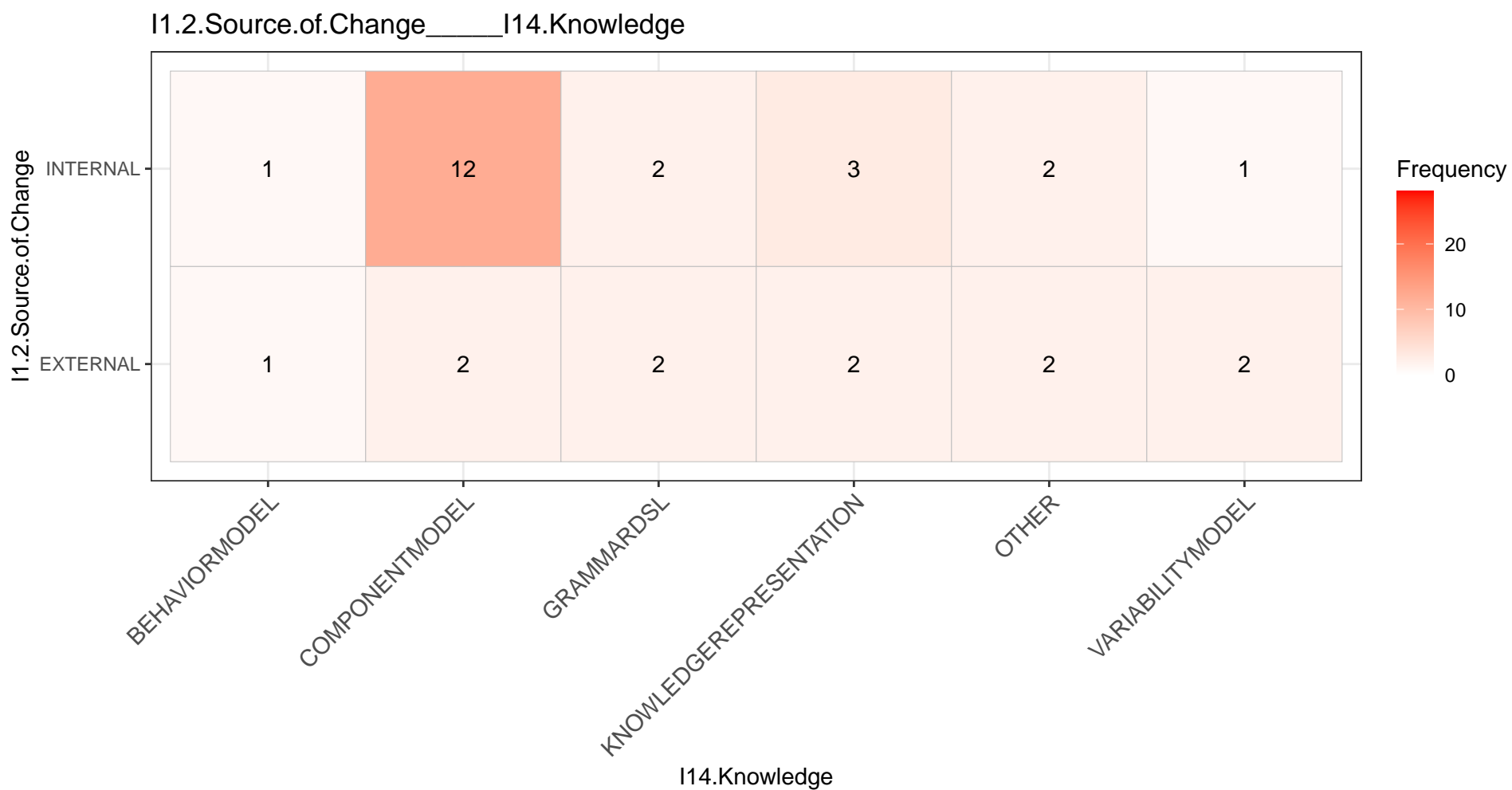
2

5

6

0





I1.2.Type.of.Change_____I1.2.Anticipation.of.Change

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

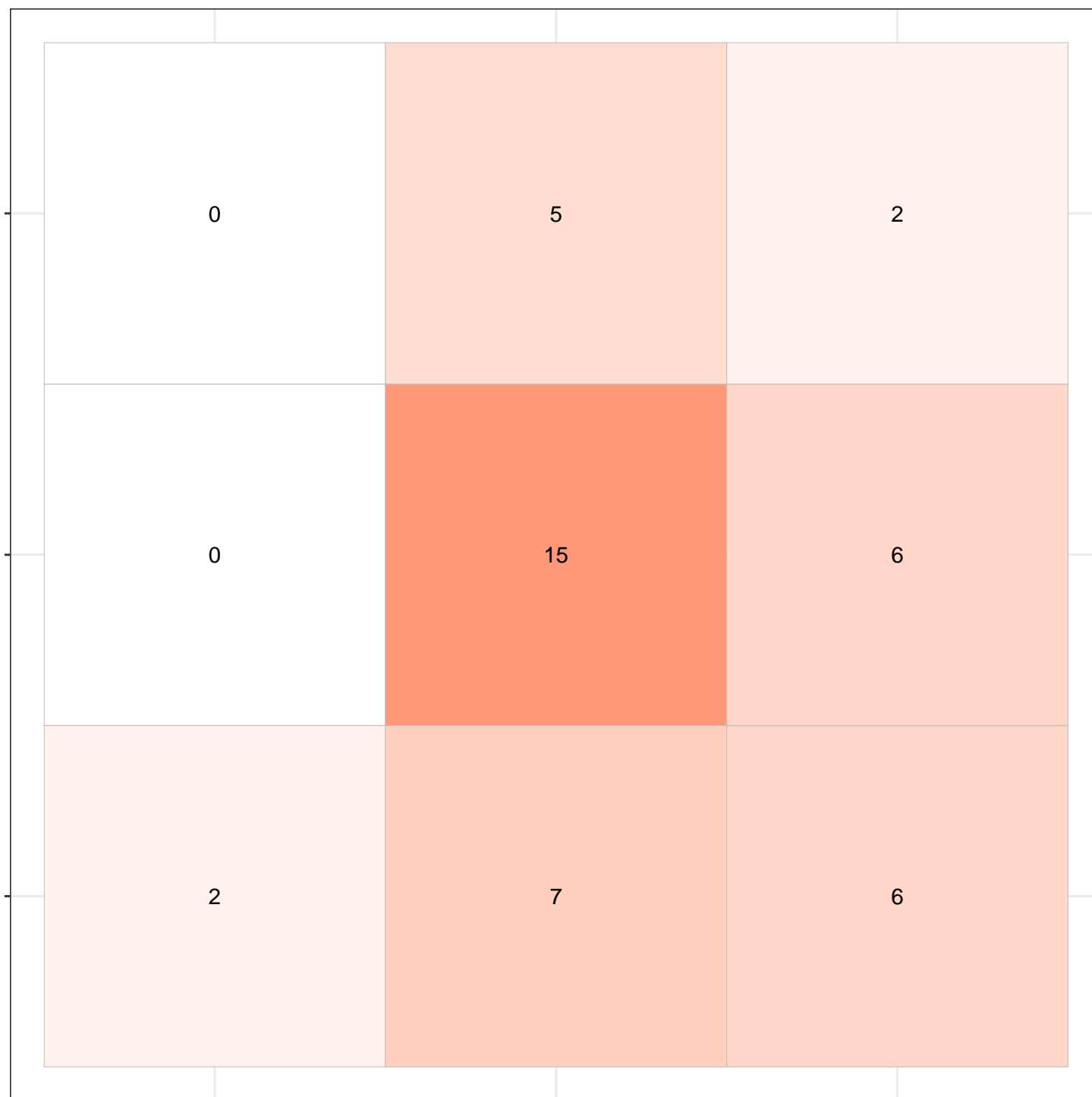
DOFORESEEN

FORESEEABLE

UNFORESEEN

I1.2.Anticipation.of.Change

Frequency



I1.2.Type.of.Change_____I1.2.Frequency.of.Change

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

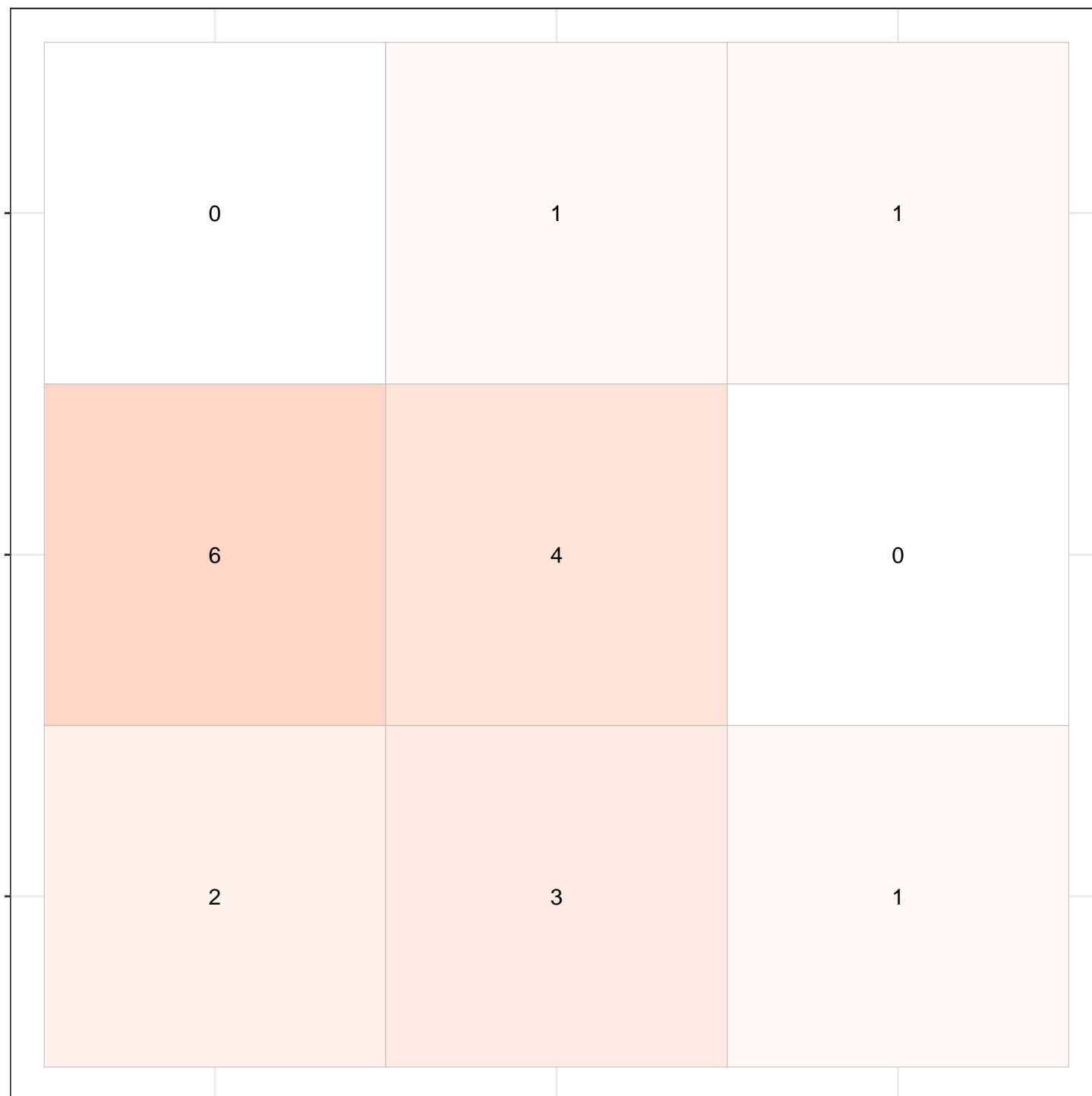
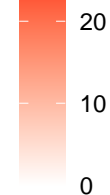
DOFREQUENT

INFREQUENT

RARE

I1.2.Frequency.of.Change

Frequency



I1.2.Type.of.Change_____I1.3.Type.of.Mechanism

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

PARAMETRIC

STRUCTURAL

I1.3.Type.of.Mechanism

Frequency



20

10

0

3

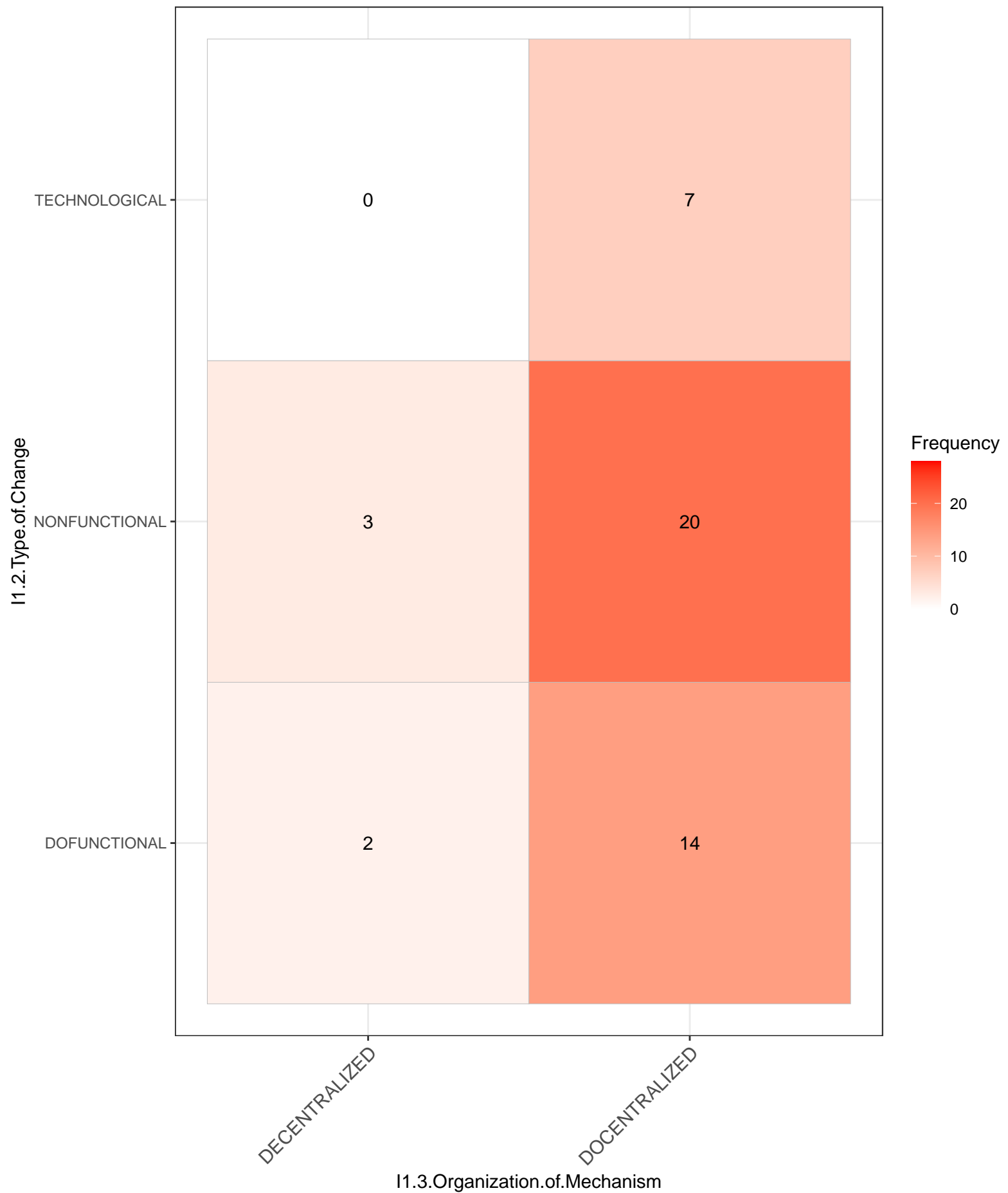
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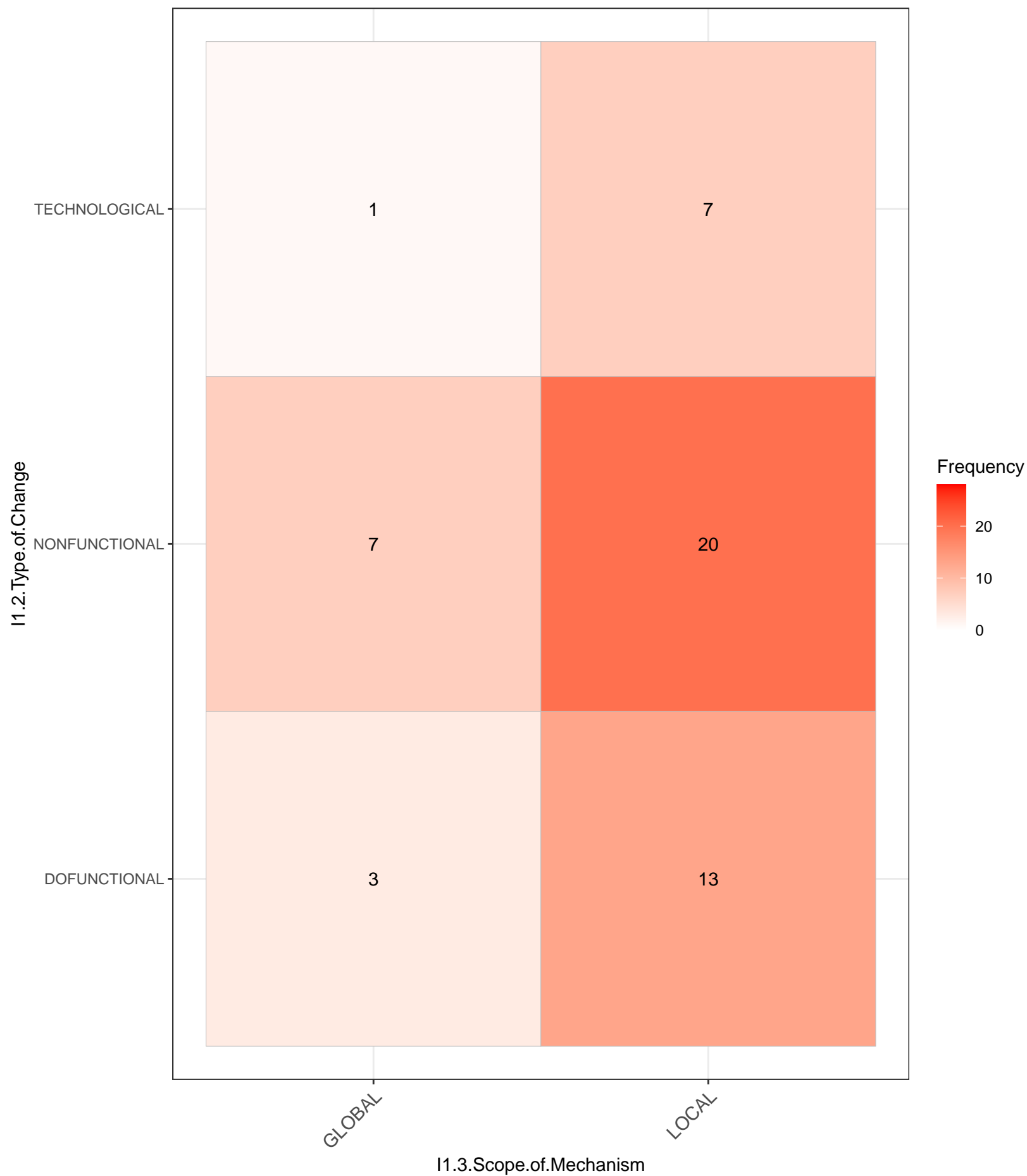
15

20

8

15





I1.2.Type.of.Change_____I1.3.Duration.of.Mechanism

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

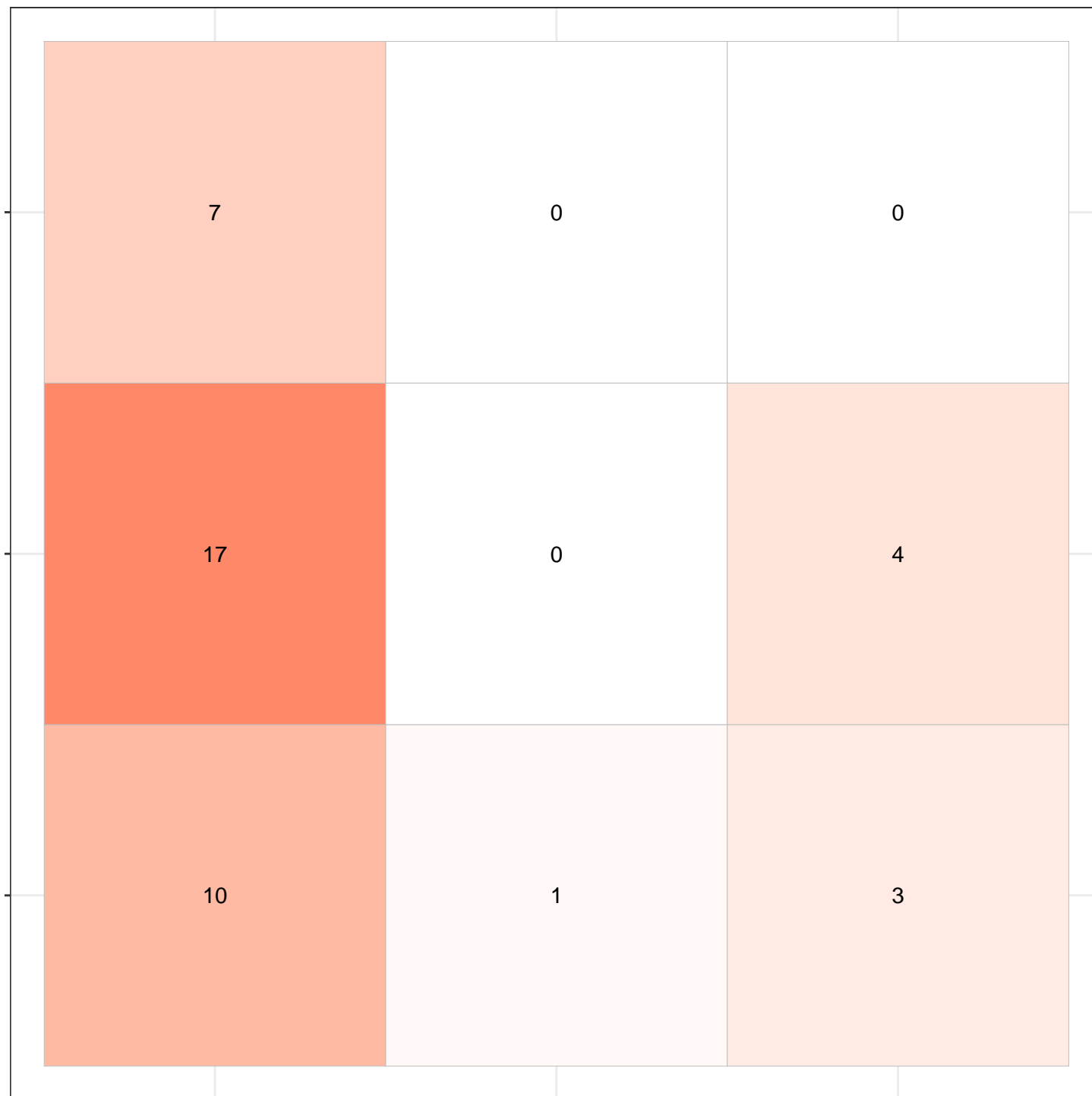
DOSHORT

MEDIUM

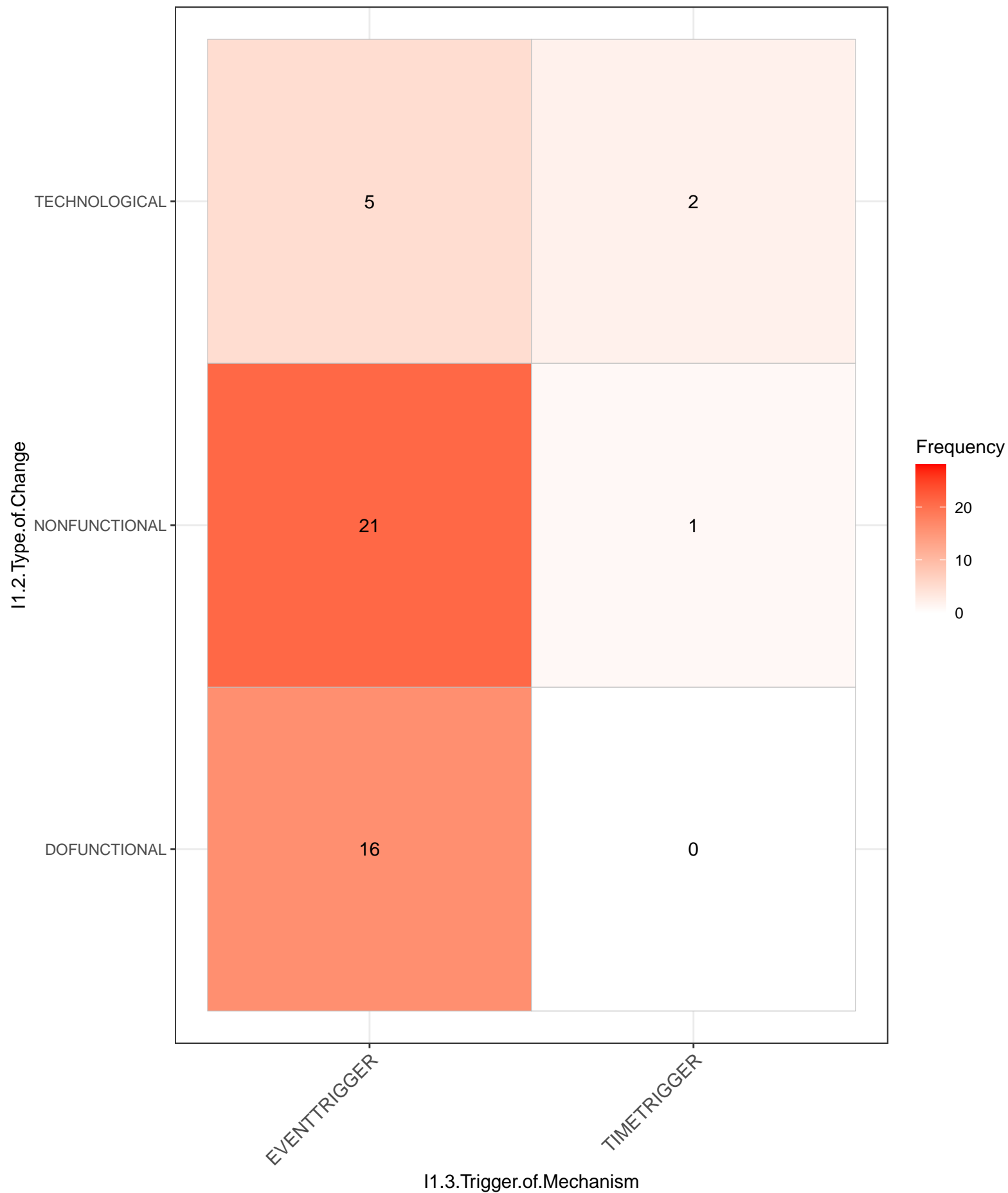
VERYSHORT

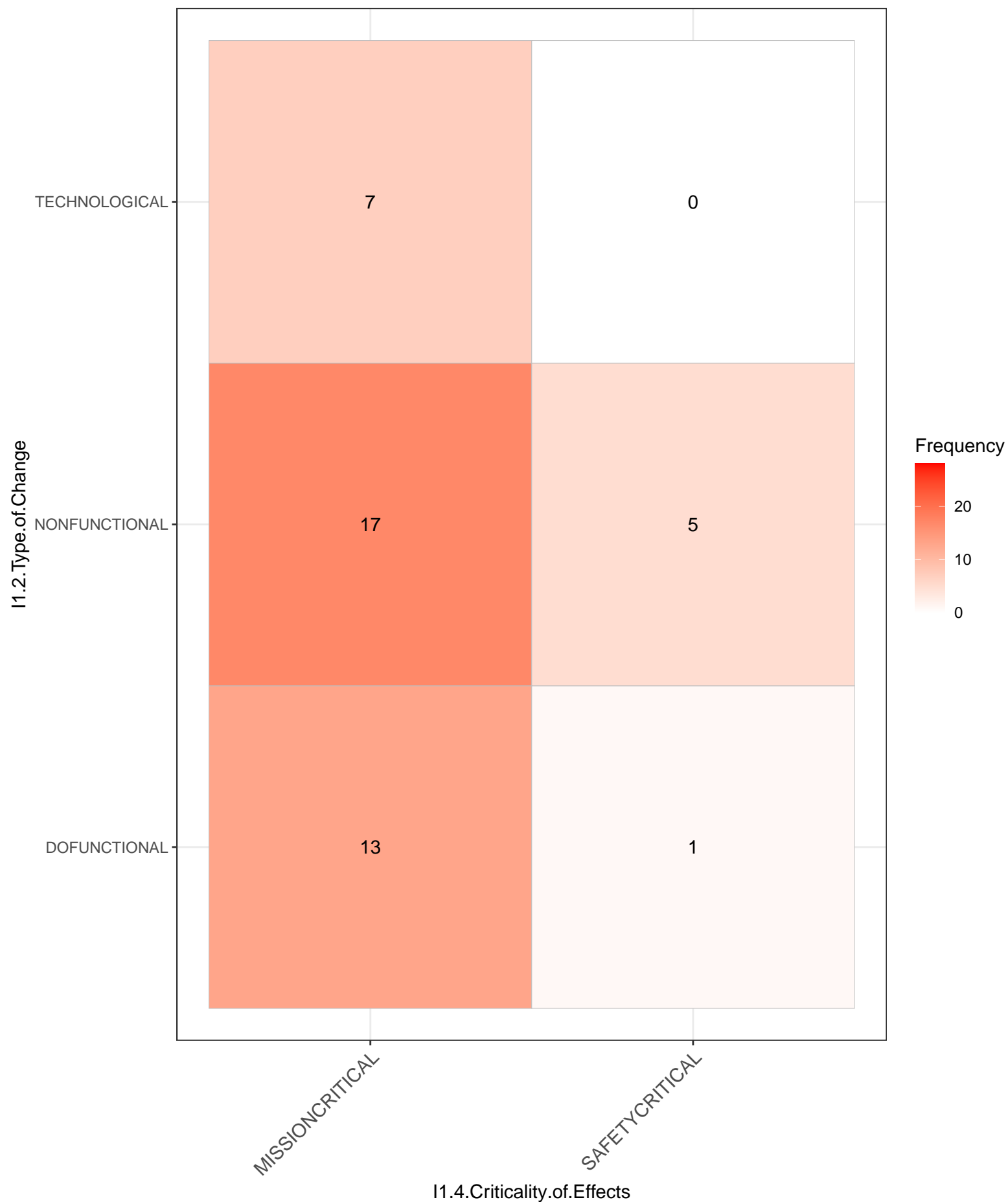
I1.3.Duration.of.Mechanism

Frequency

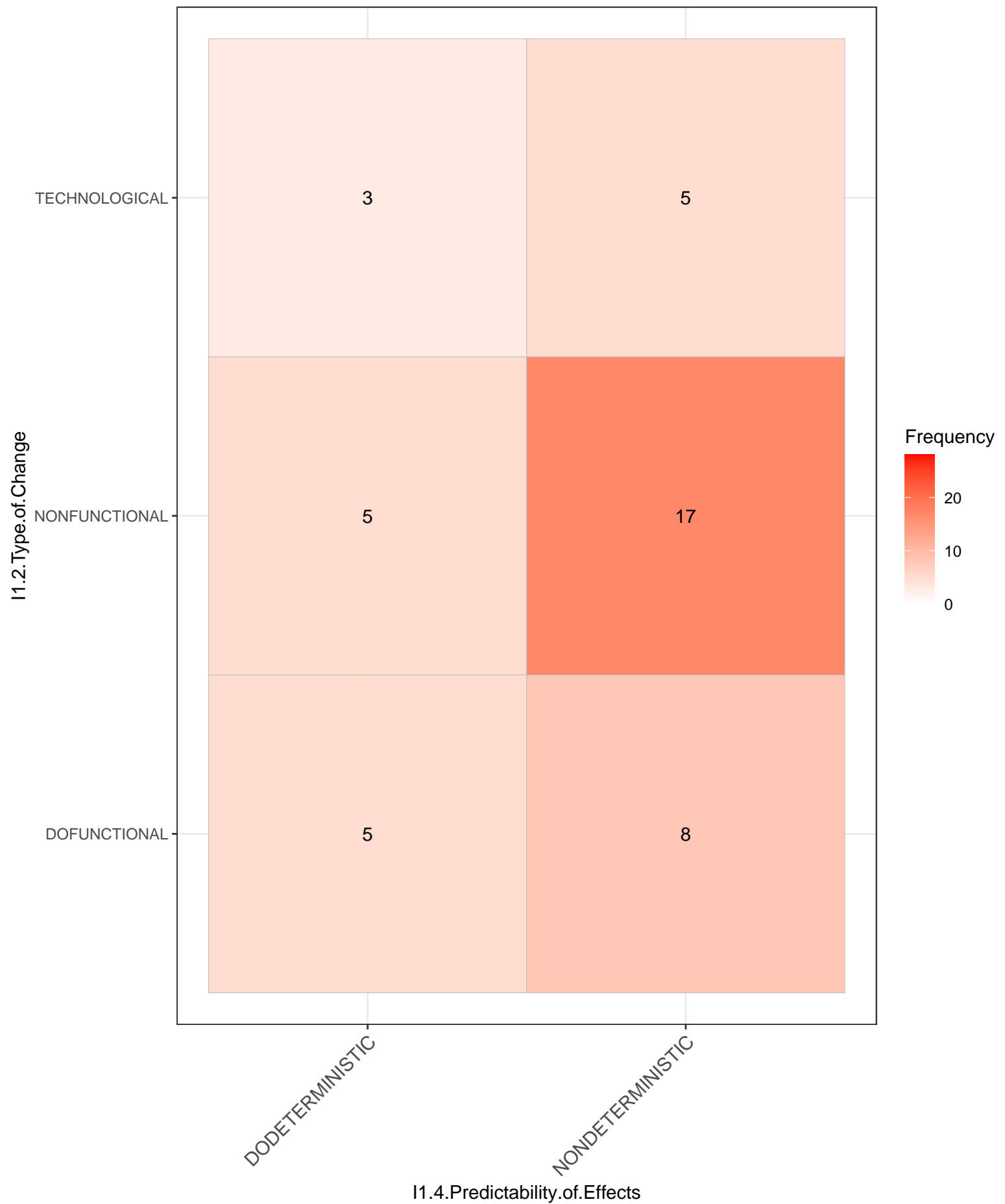


I1.2.Type.of.Change_____I1.3.Trigger.of.Mechanism





I1.2.Type.of.Change_____I1.4.Predictability.of.Effects



I1.2.Type.of.Change_____I1.4.Overhead.of.Effects

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

DEPENDENT

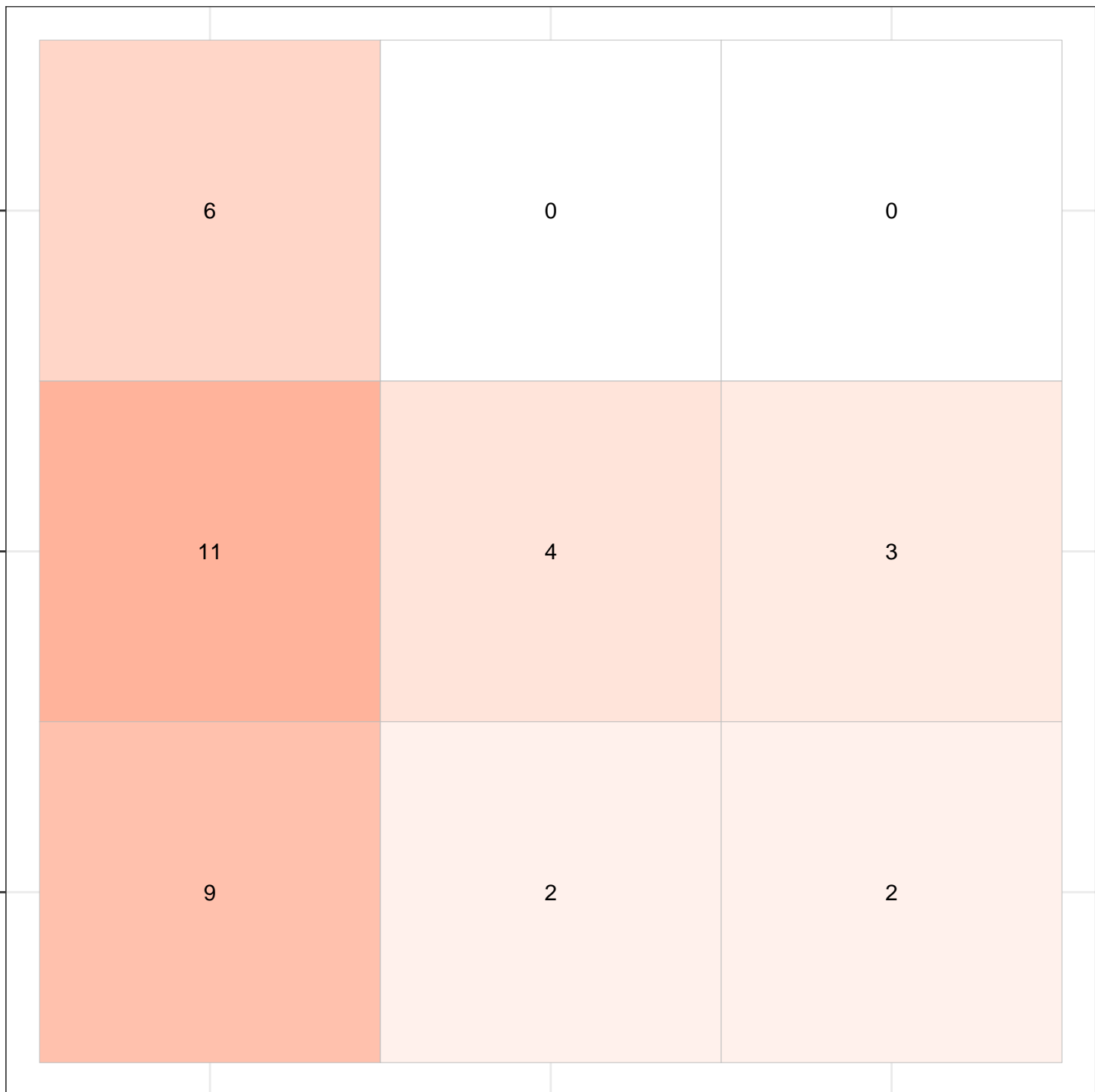
DOSIGNIFICANT

INSIGNIFICANT

I1.4.Overhead.of.Effects

Frequency

20
10
0



I1.2.Type.of.Change_____I1.4.Resilience.of.Effects

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

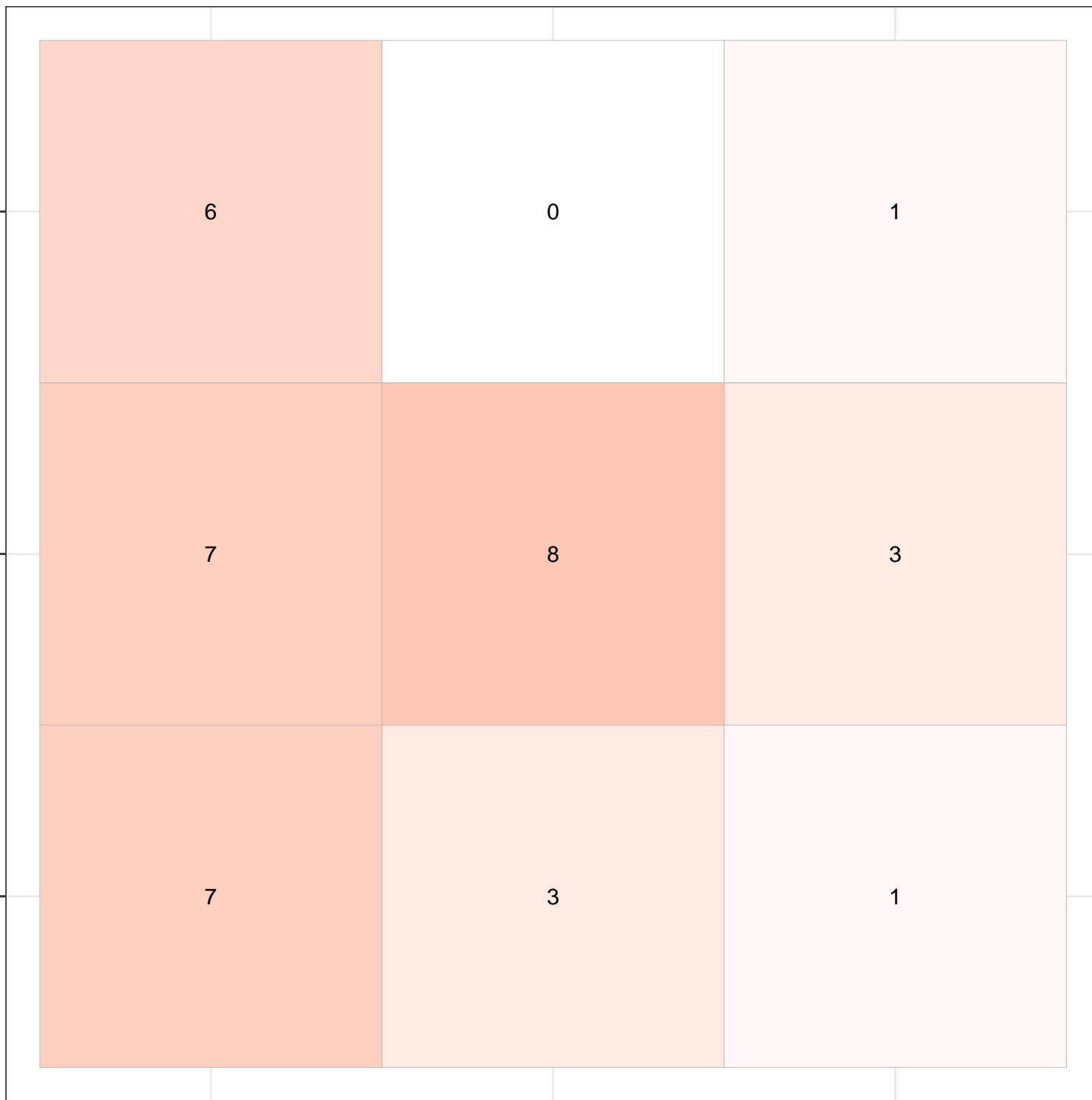
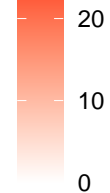
DEPENDENT

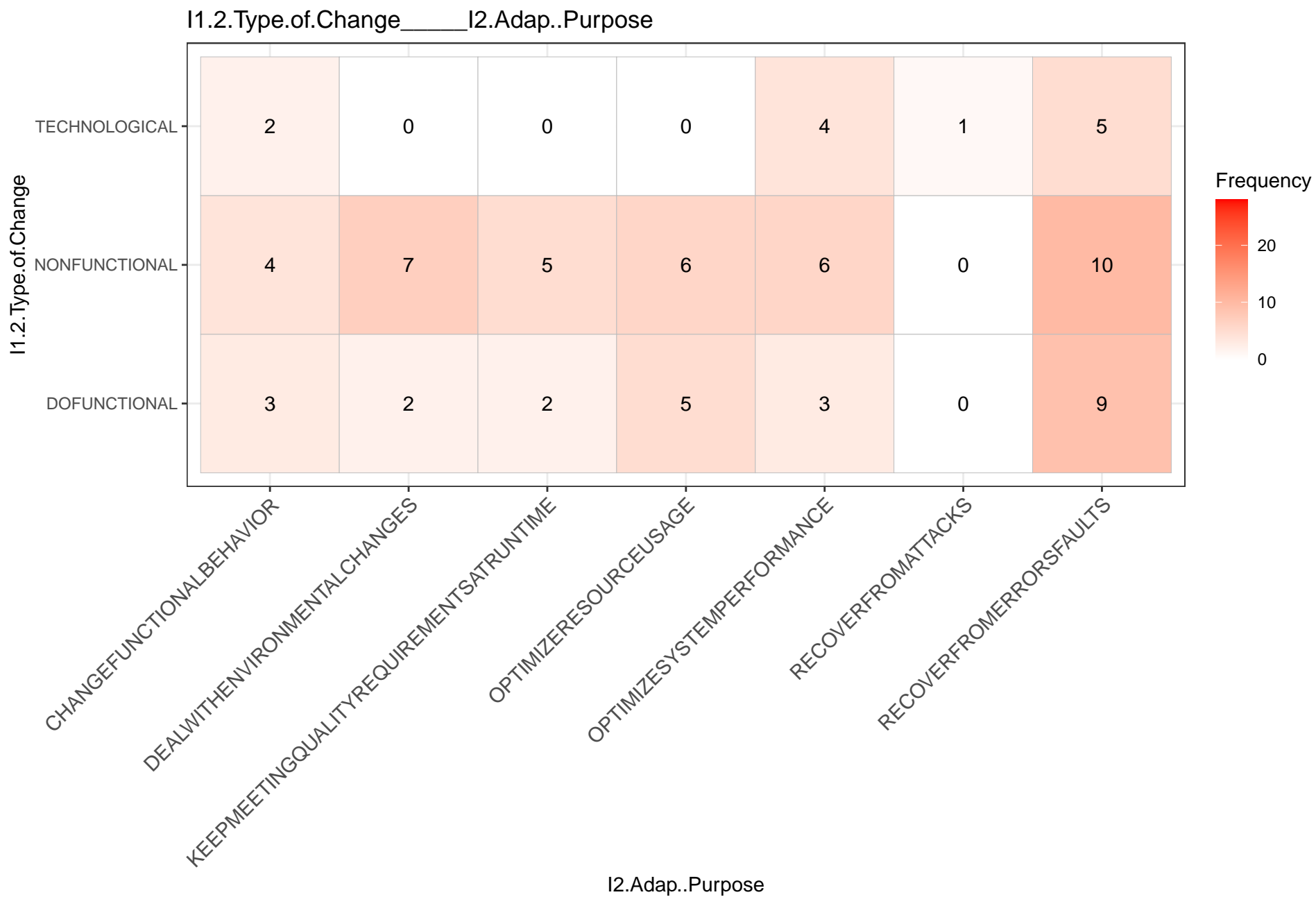
DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects

Frequency





I1.2.Type.of.Change

I1.2.Type.of.Change_____I3.Robot.Type

TECHNOLOGICAL	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
NONFUNCTIONAL	1	1	1	2	1	2	0	0	1	2	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	
DOFUNCTIONAL	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
HEXMANIPULATOR
INFOTAINMENTROBOTMOBILESERVICE
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV

Frequency



I3.Robot.Type

I1.2.Type.of.Change_____I4.Robo.SW

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

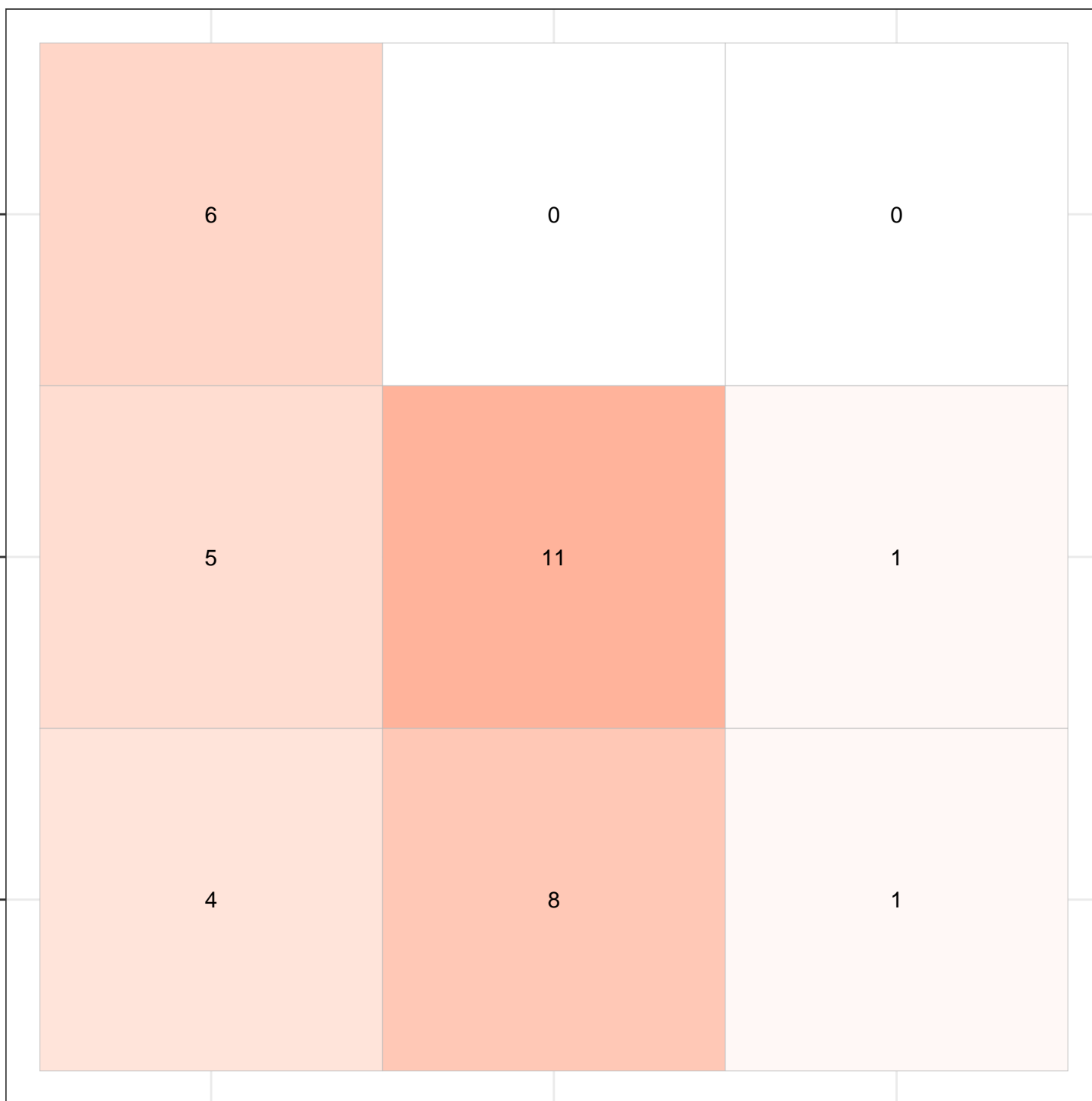
OTHER

ROS1

ROS2

I4.Robo.SW

Frequency



I1.2.Type.of.Change_____I5.QA

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

FUNCTIONALSUITABILITY

PERFORMANCEEFFICIENCY

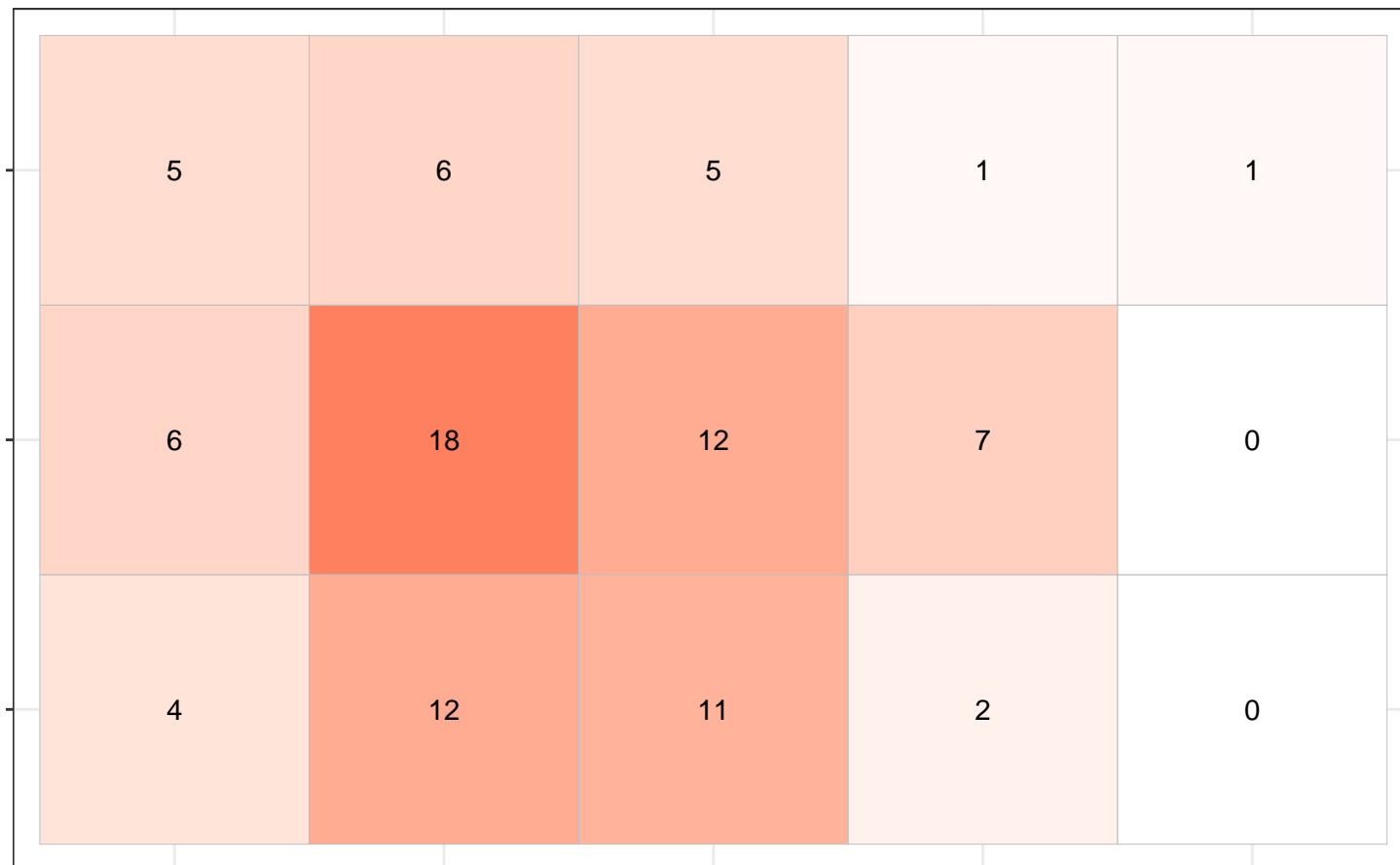
RELIABILITY

SAFETY

SECURITY

I5.QA

Frequency



I1.2.Type.of.Change_____I6.Independence

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

Frequency



1

1

5

7

2

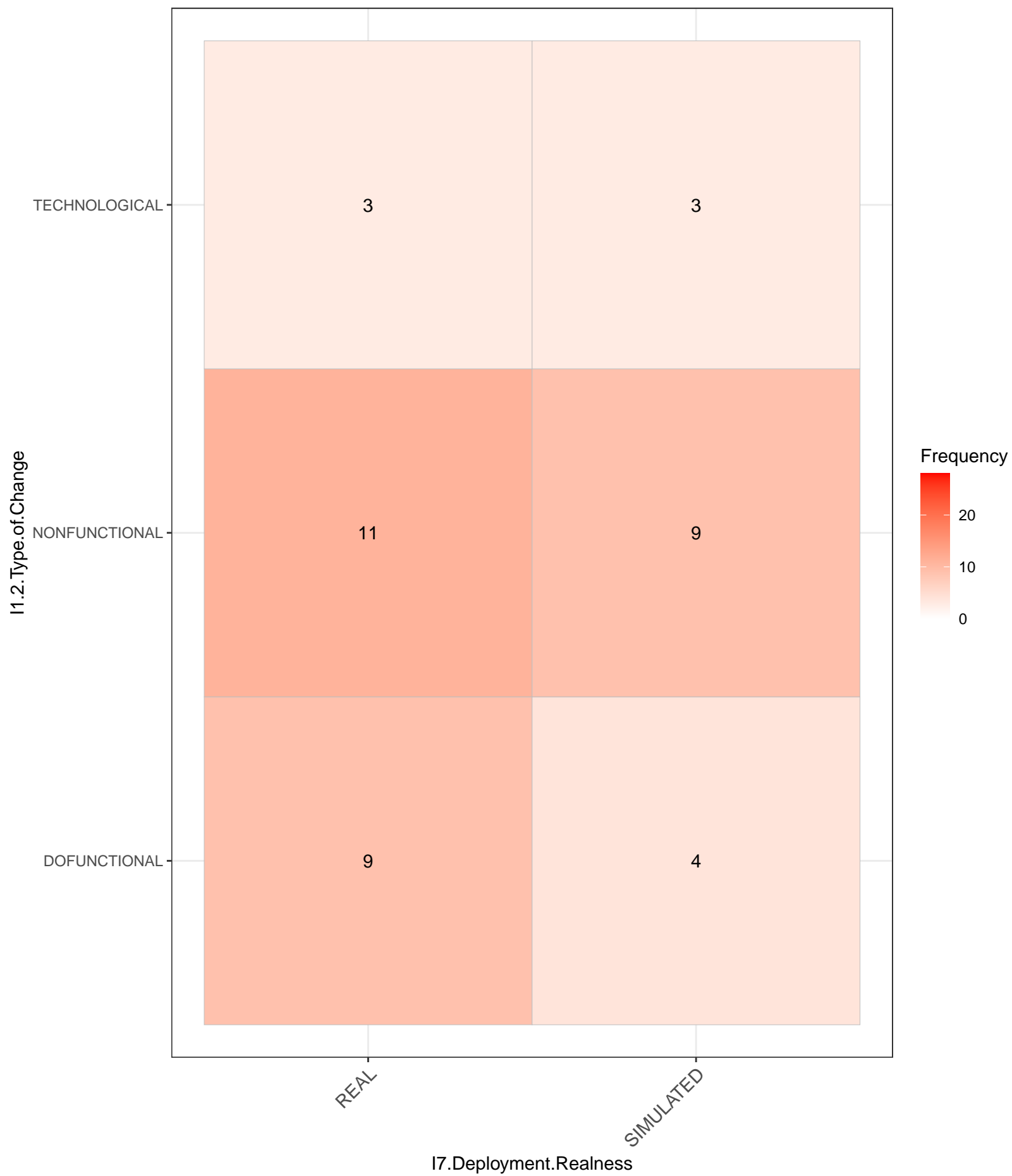
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6

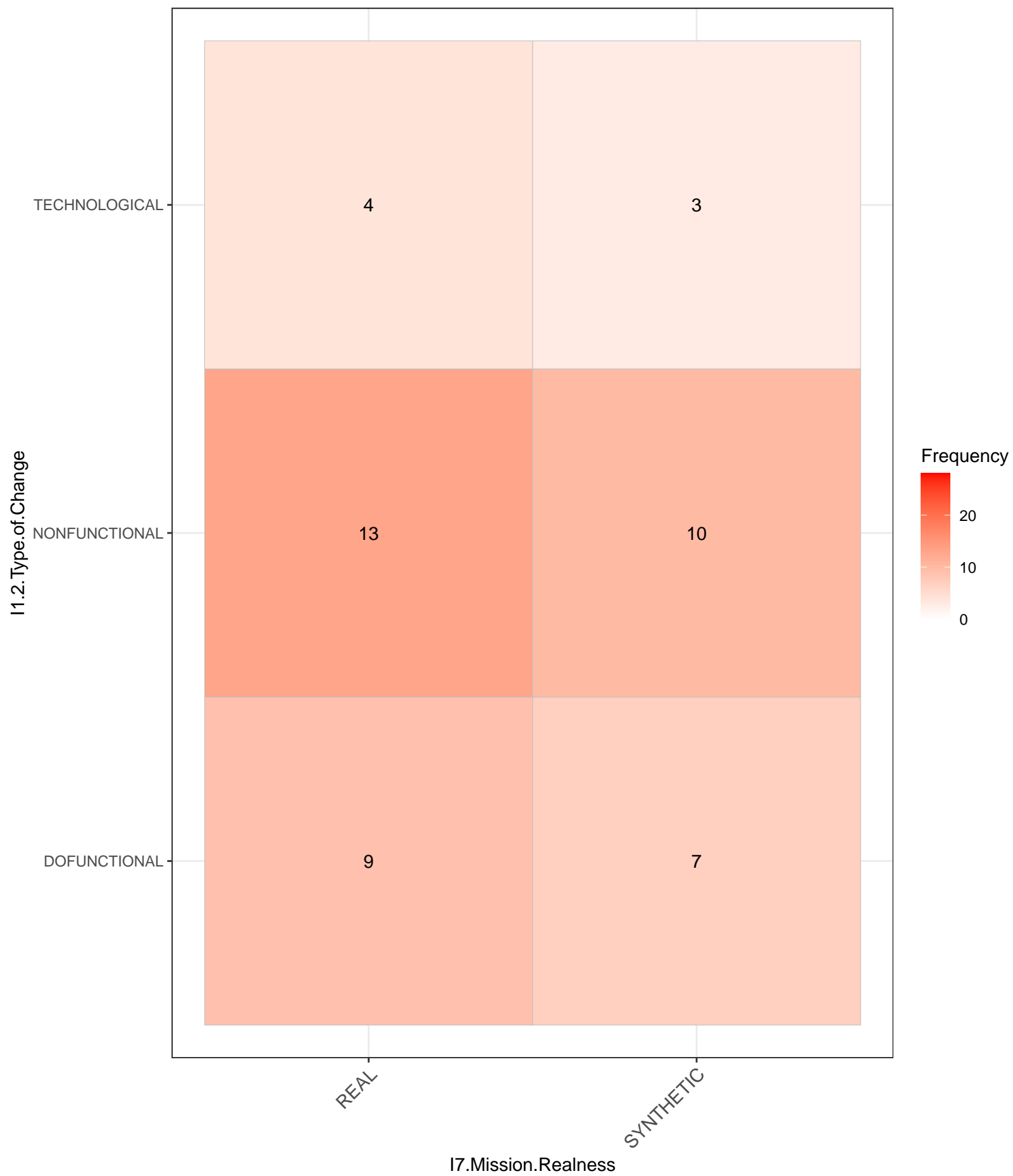
0

10

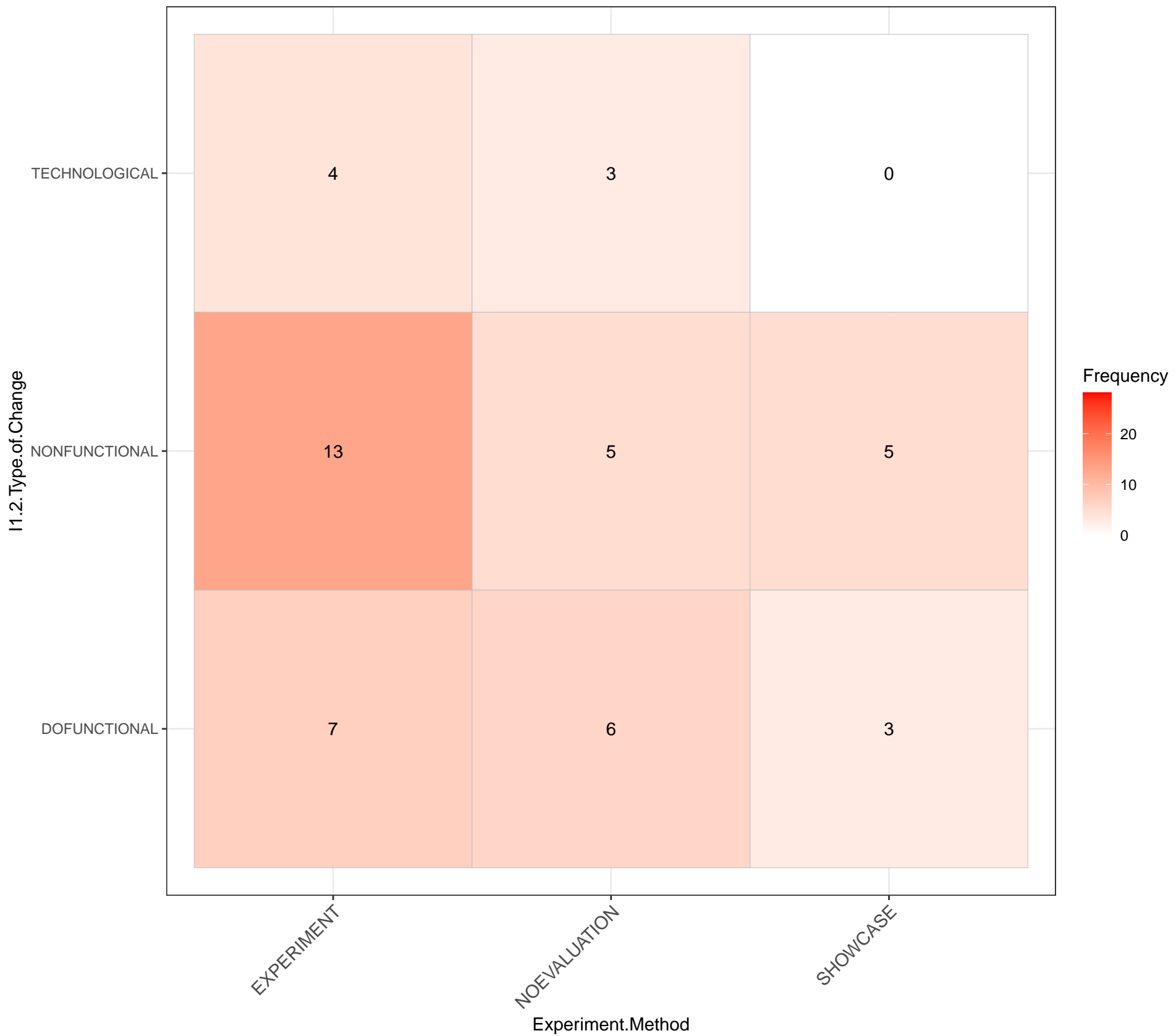
I1.2.Type.of.Change_____I7.Deployment.Realness



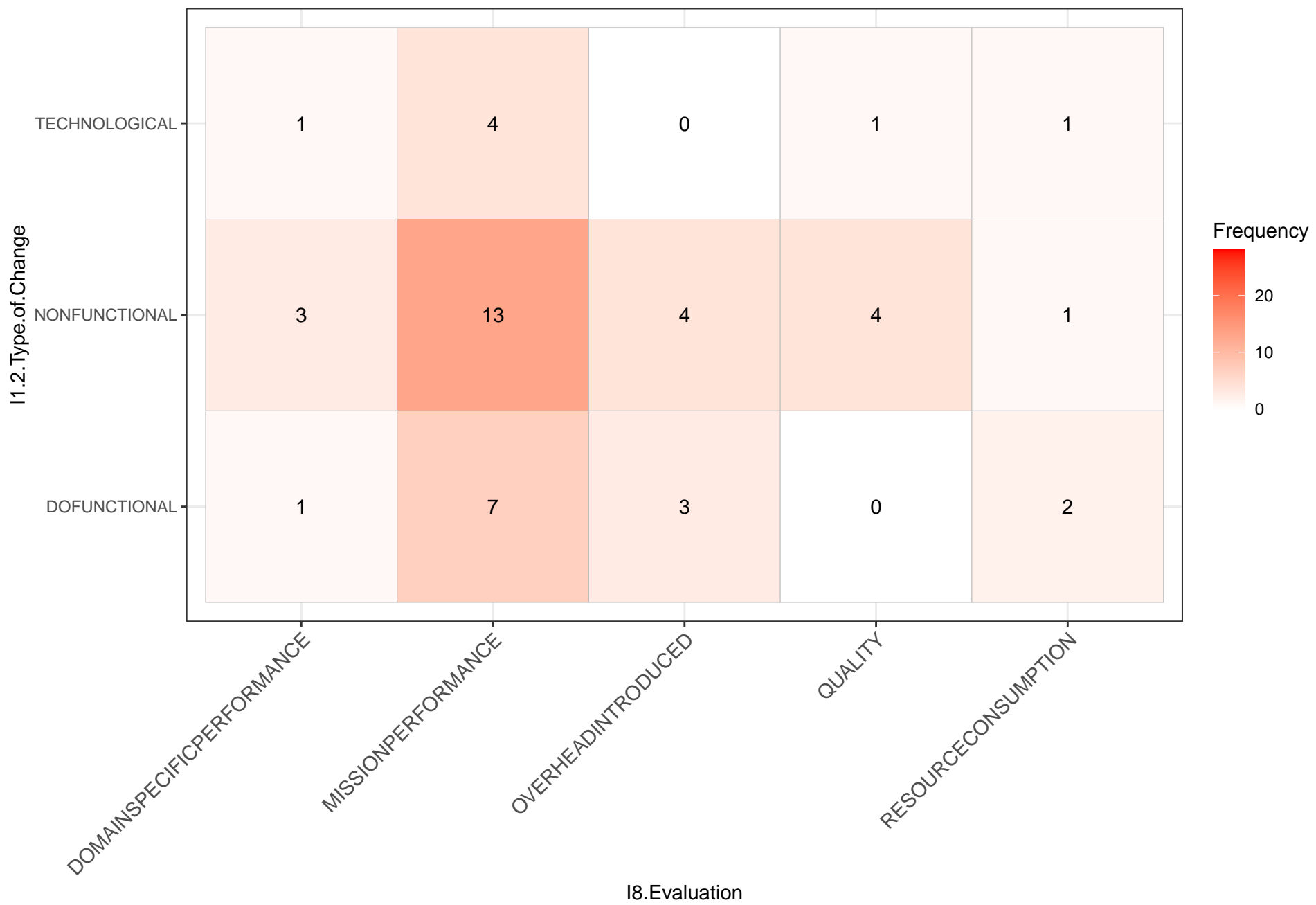
I1.2.Type.of.Change_____I7.Mission.Realness



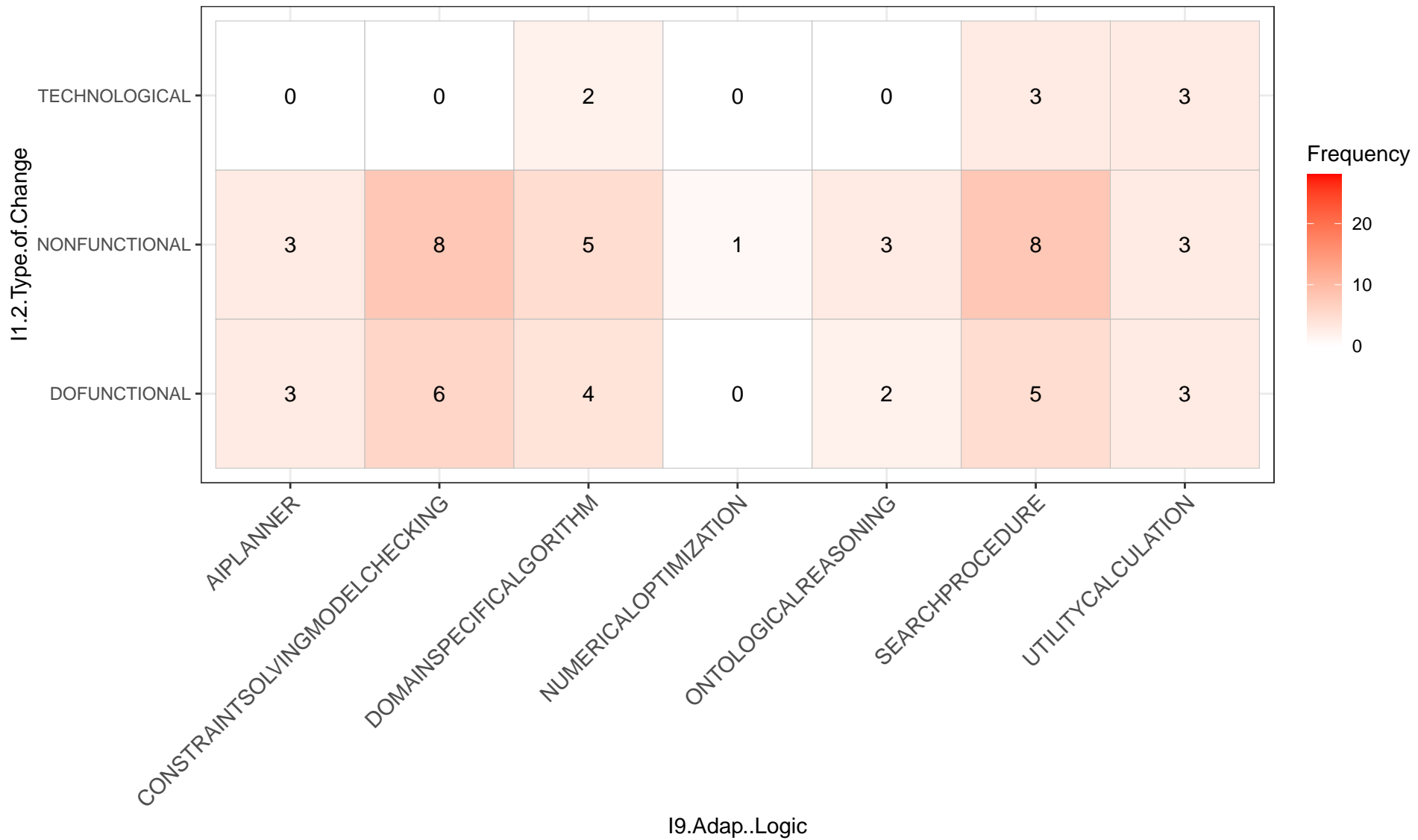
I1.2.Type.of.Change_____Experiment.Method



I1.2.Type.of.Change_____I8.Evaluation



I1.2.Type.of.Change_____I9.Adap..Logic



I1.2.Type.of.Change_____I10.Monitor

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

ENVIRONMENT

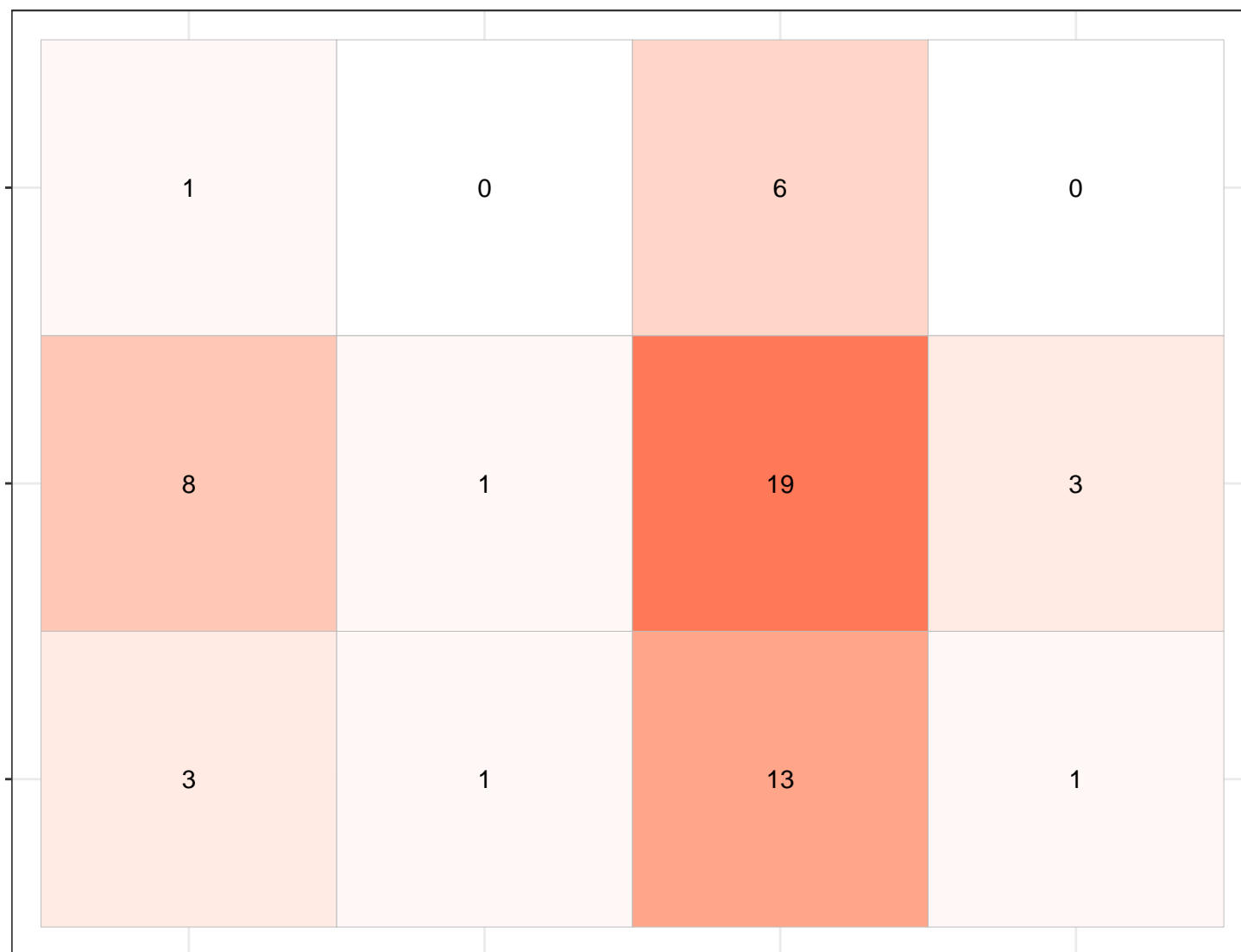
ENVIRONMENTAL

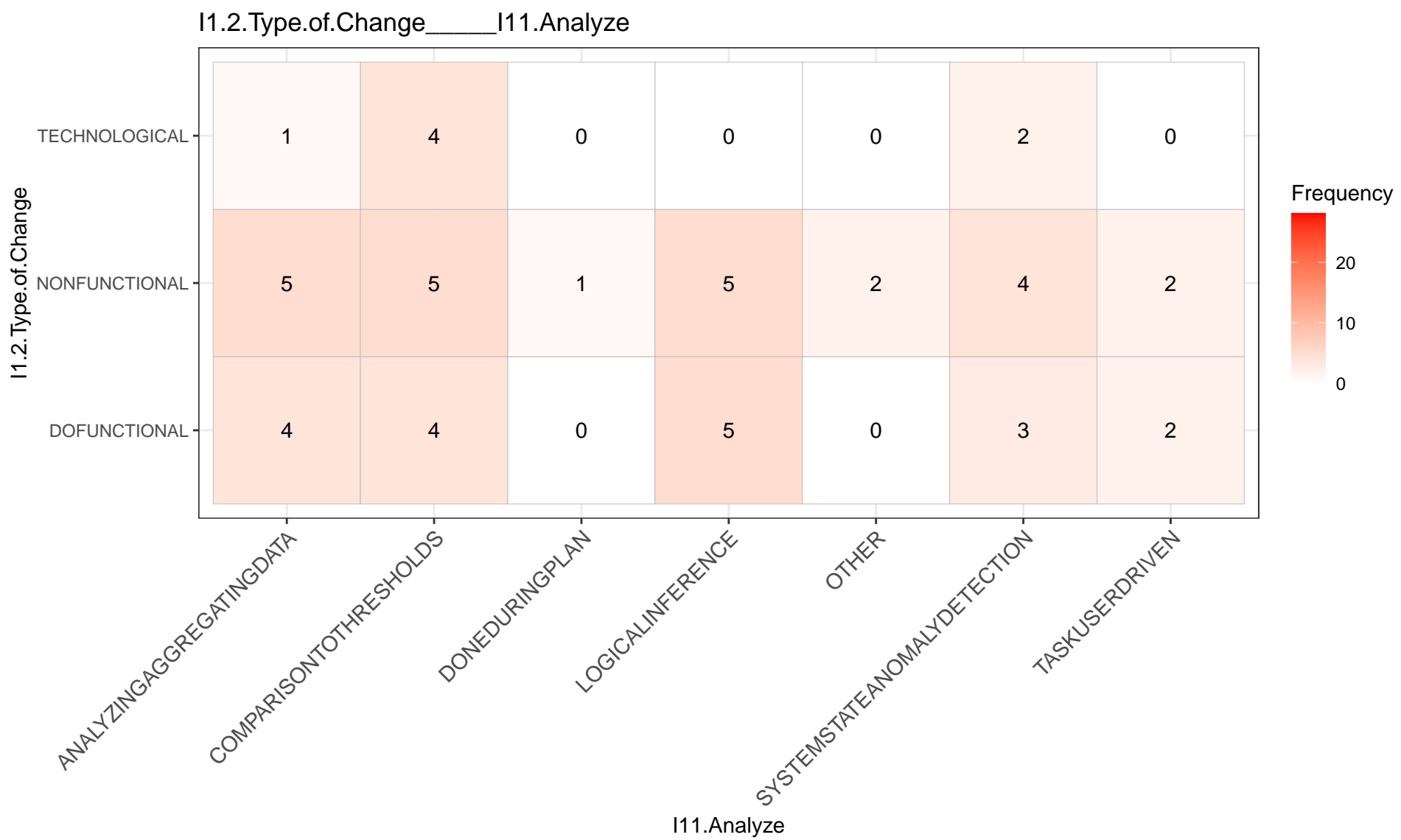
MANAGEDSYSTEM

MISSION

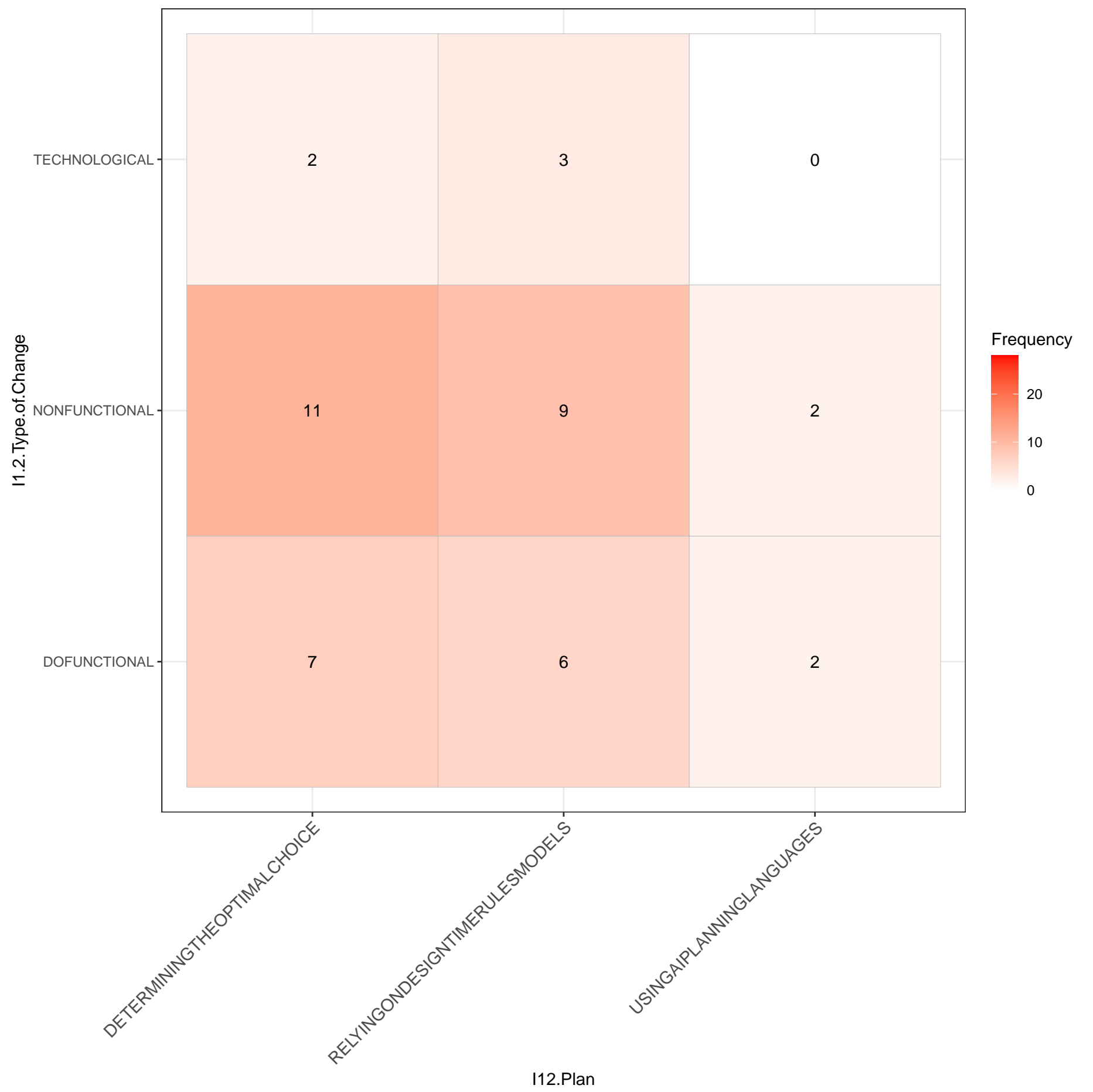
I10.Monitor

Frequency





I1.2.Type.of.Change_____I12.Plan



I1.2.Type.of.Change____I13.Execute

I1.2.Type.of.Change

TECHNOLOGICAL

NONFUNCTIONAL

DOFUNCTIONAL

Frequency

20

10

0

4

1

0

3

11

4

1

12

8

5

0

7

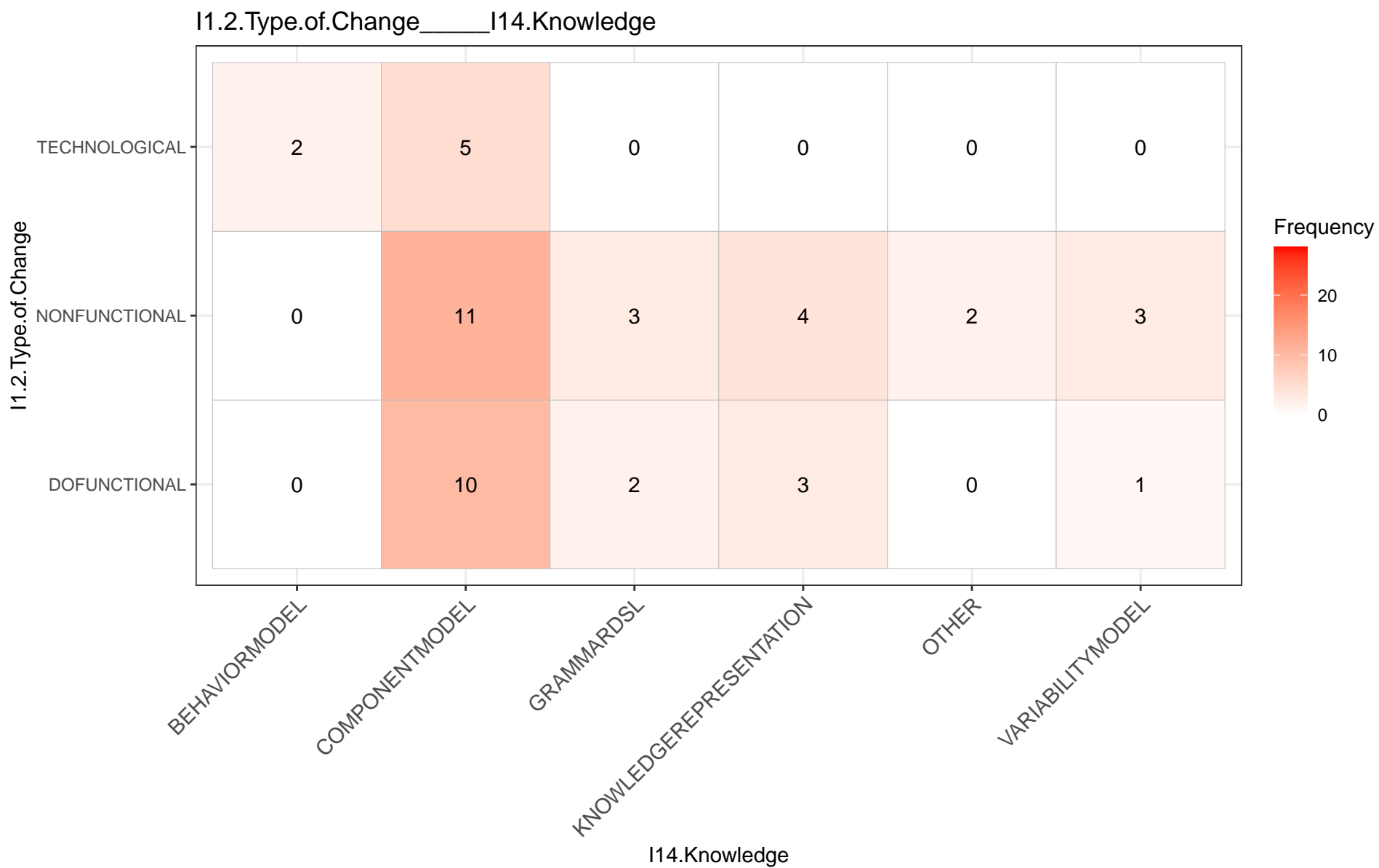
ADDITIONORREMOVALOFCOMPONENTS

CHANGEINRELATIONSHIPS BETWEENCOMPONENTS

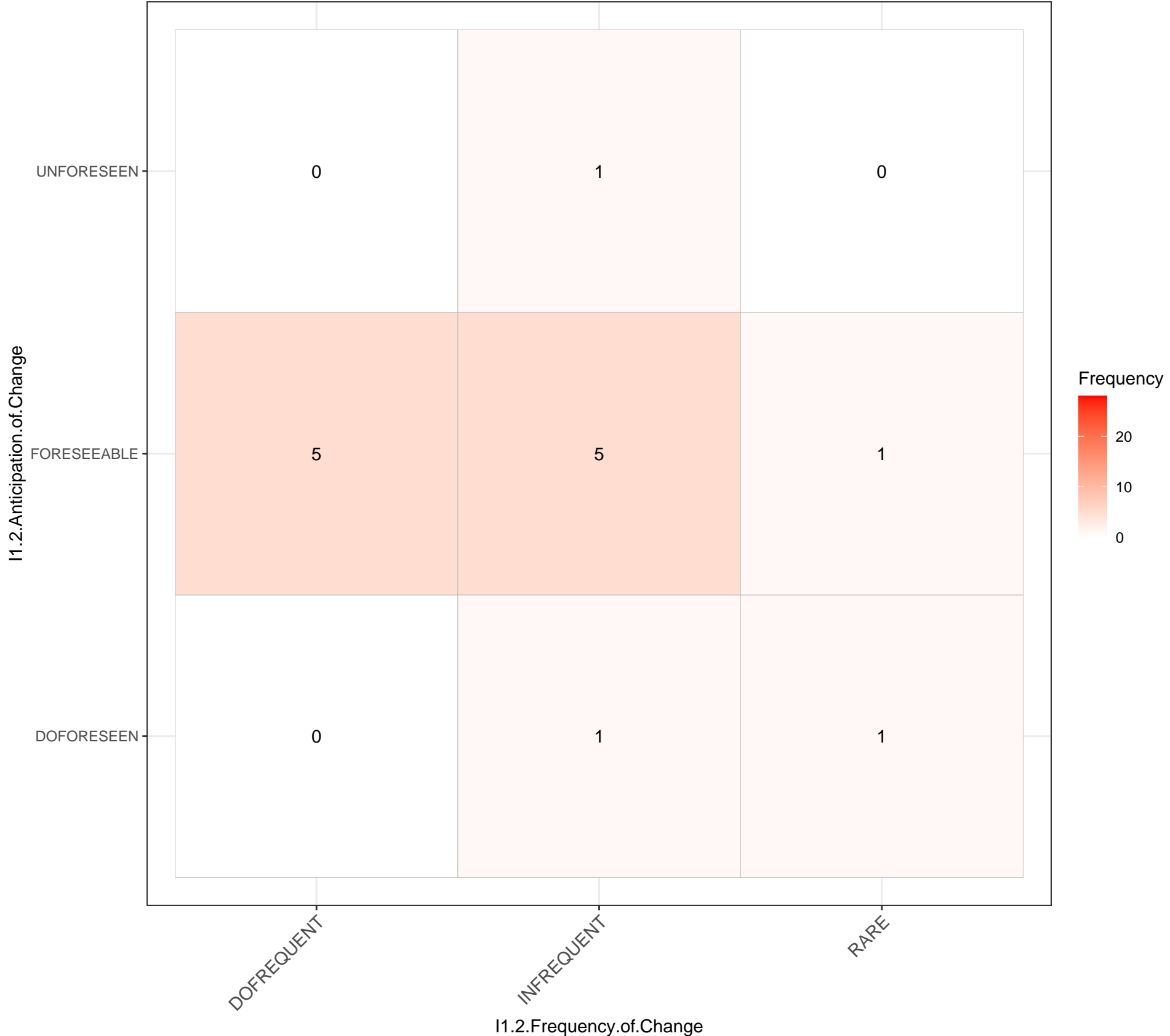
COMPONENTREDEPLOYMENT

REPARAMETERIZATIONOFCOMPONENTS

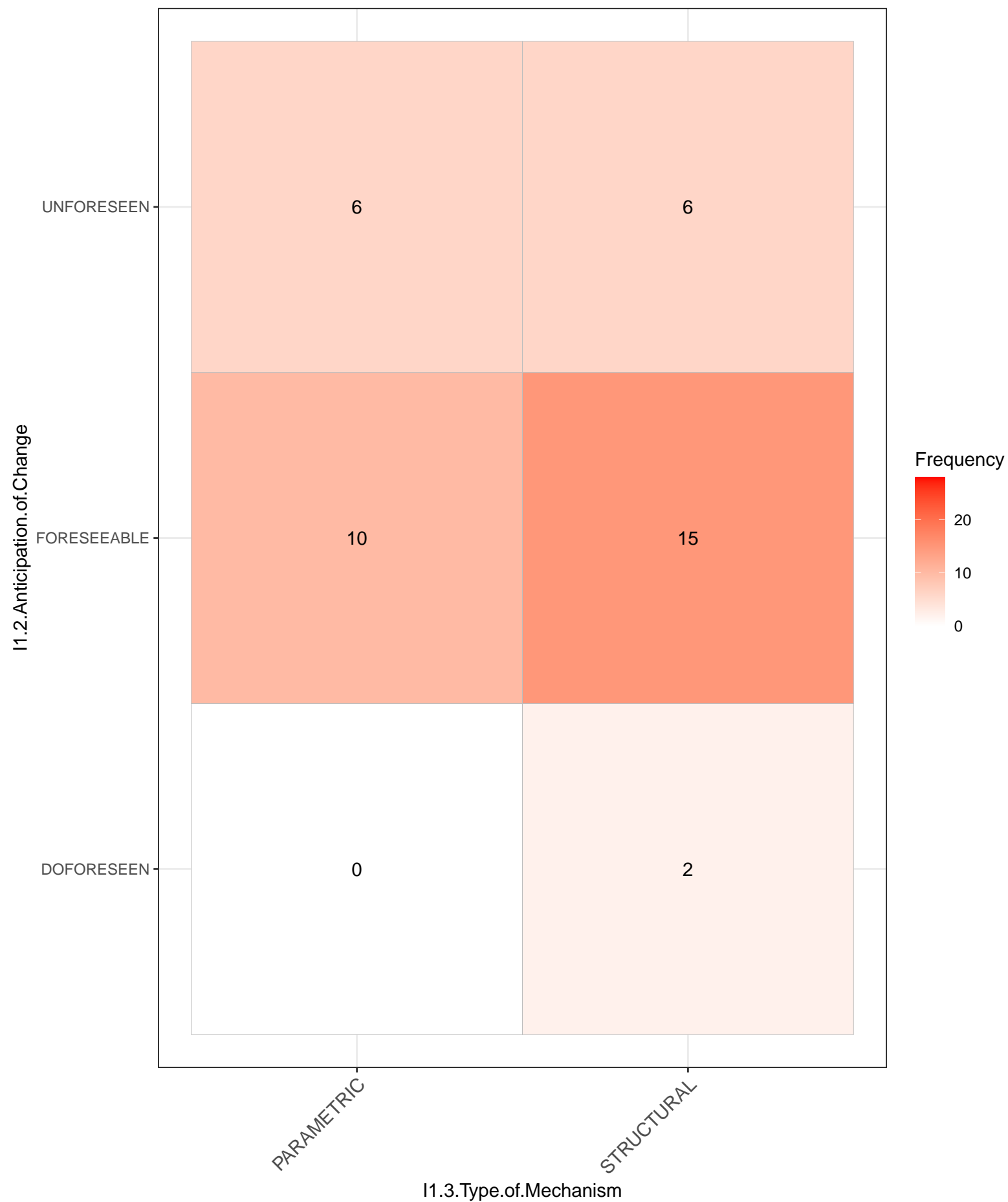
I13.Execute

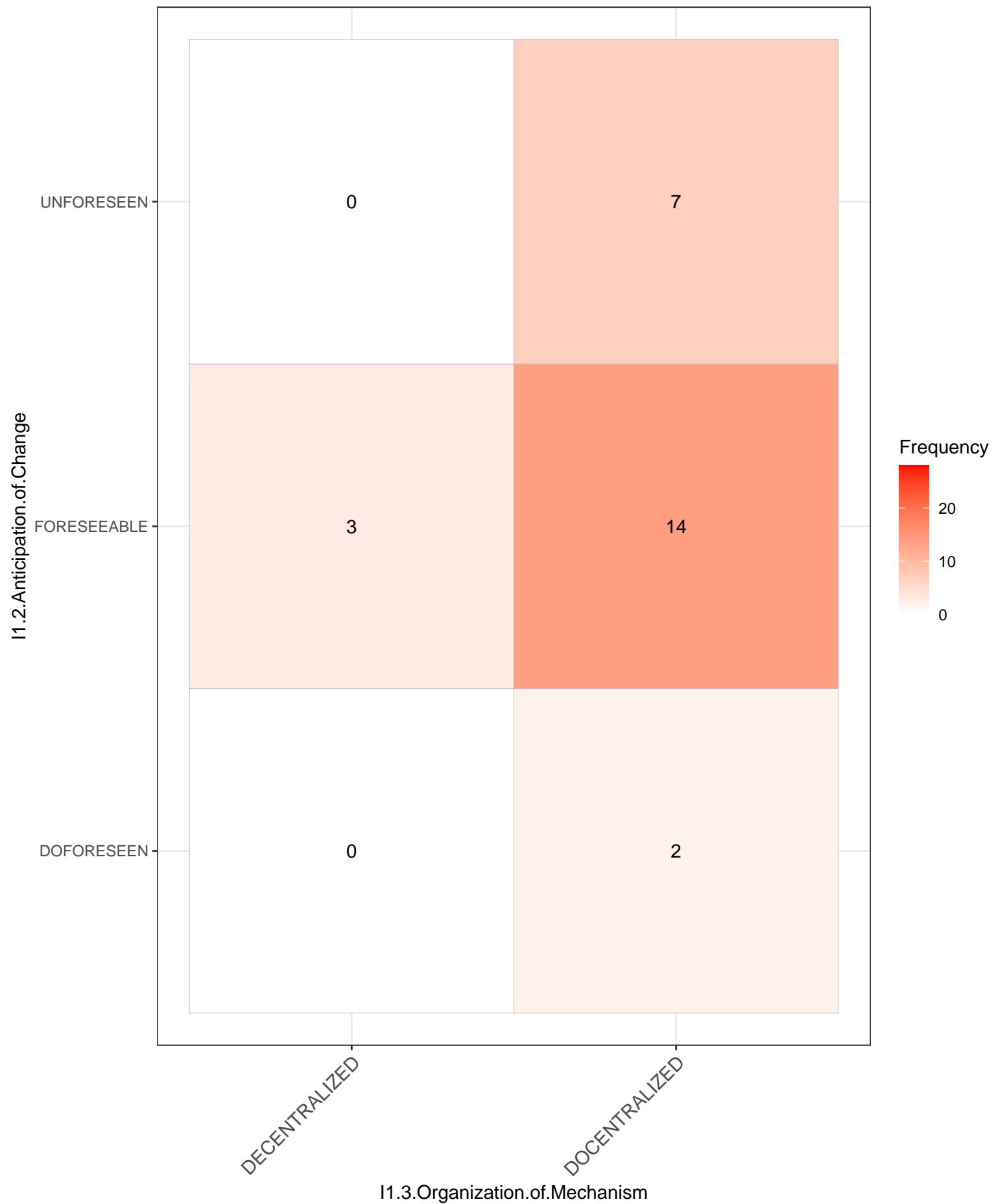


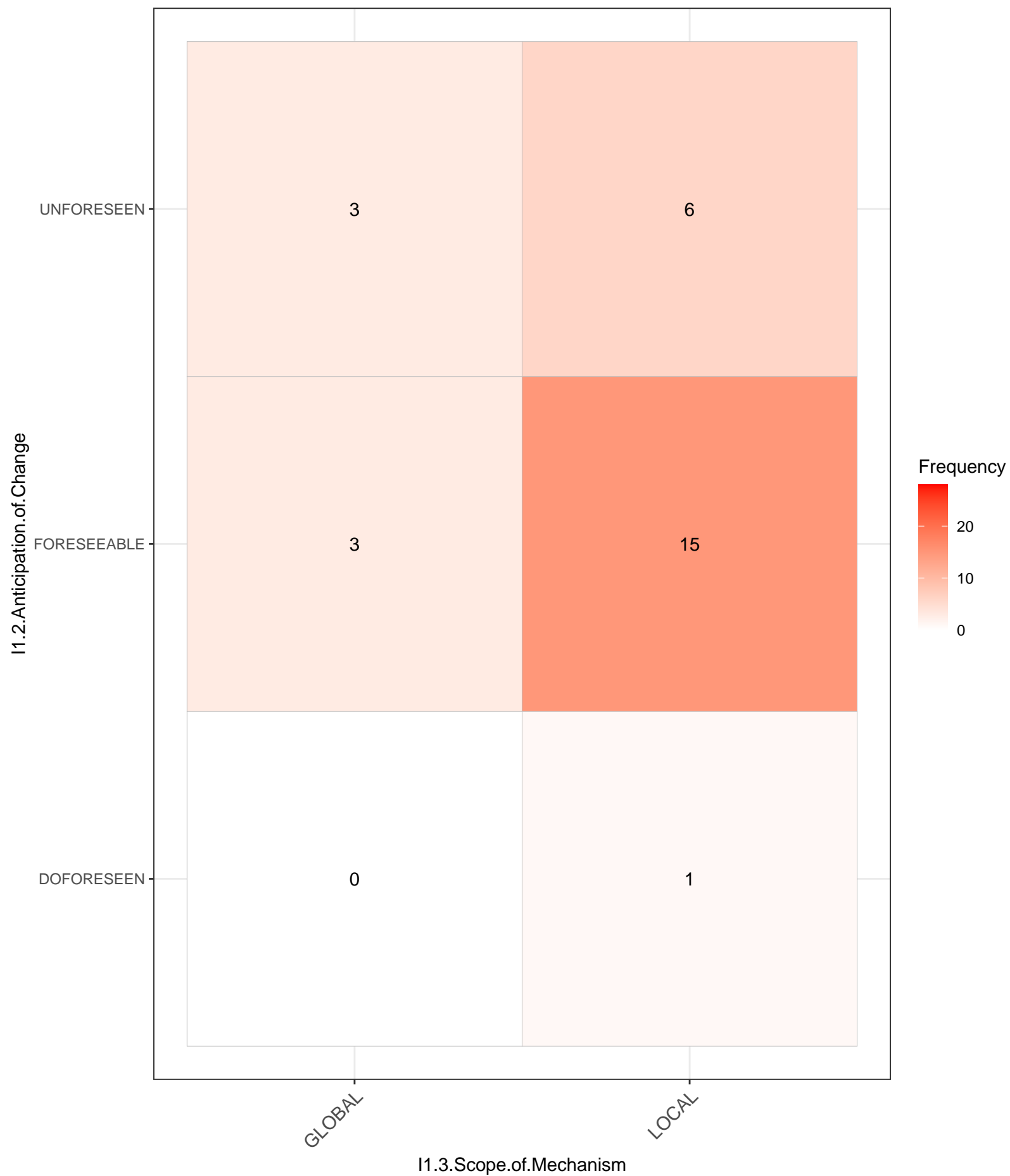
I1.2.Anticipation.of.Change_____I1.2.Frequency.of.Change



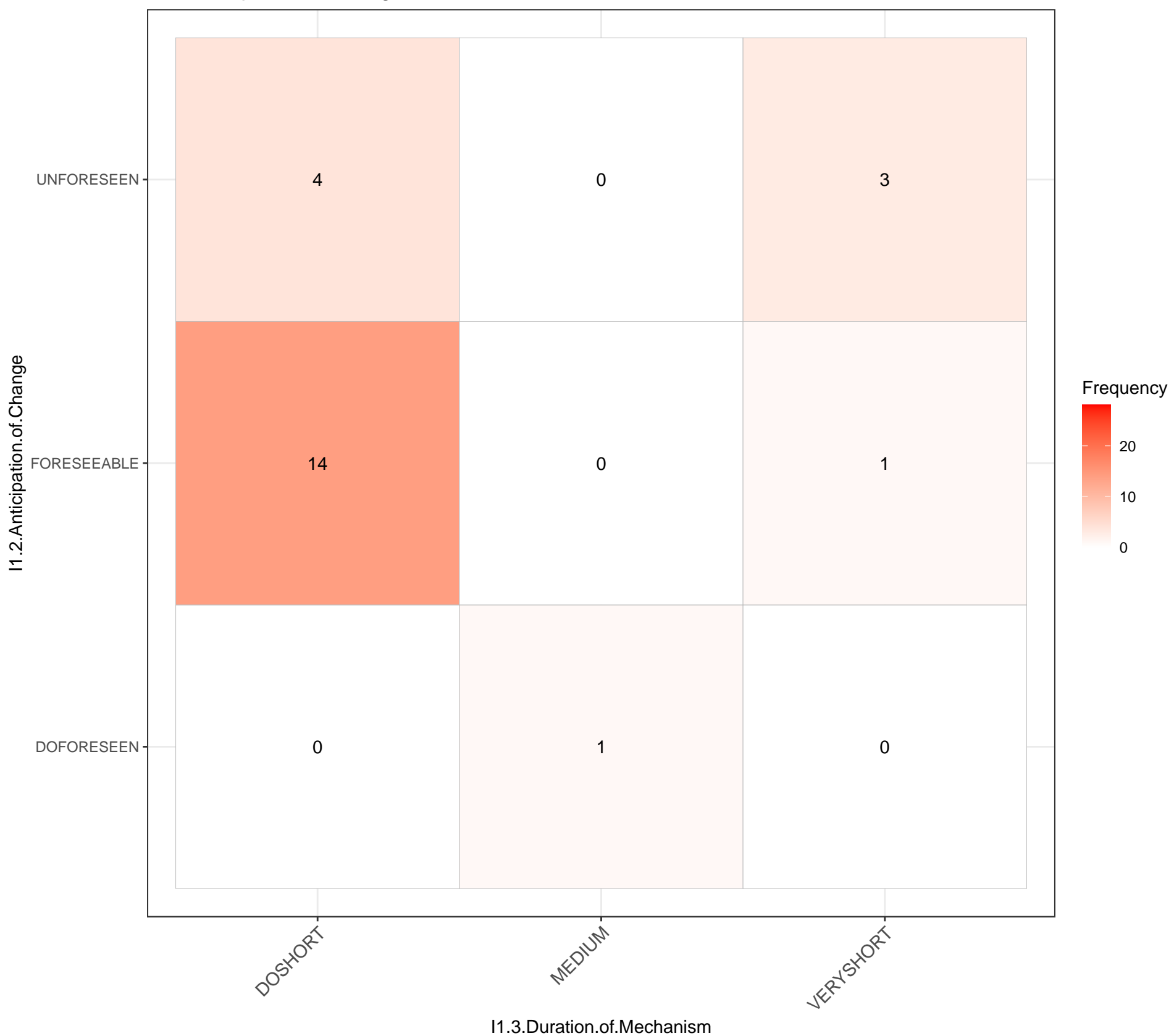
I1.2.Anticipation.of.Change_____I1.3.Type.of.Mechanism

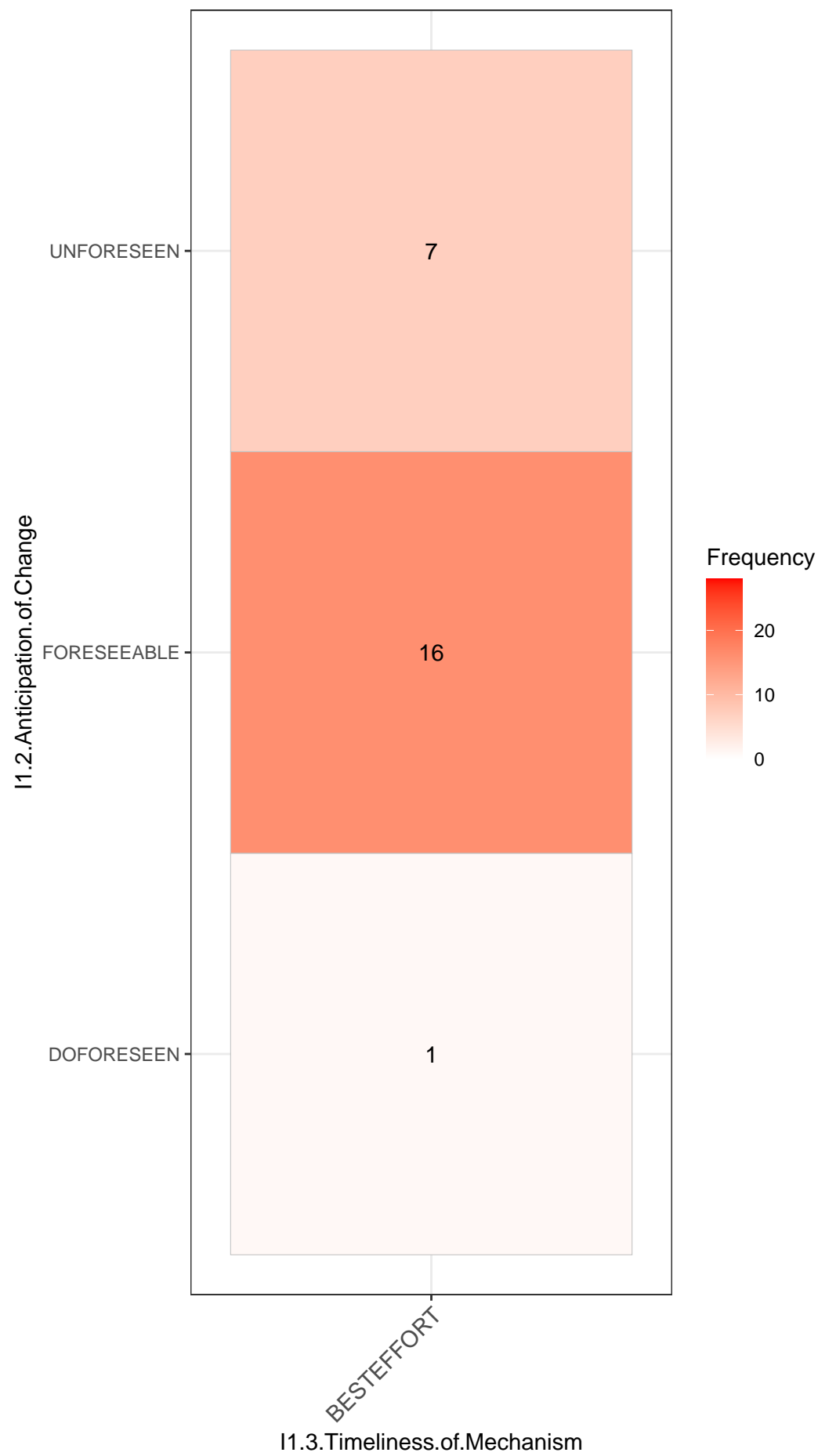






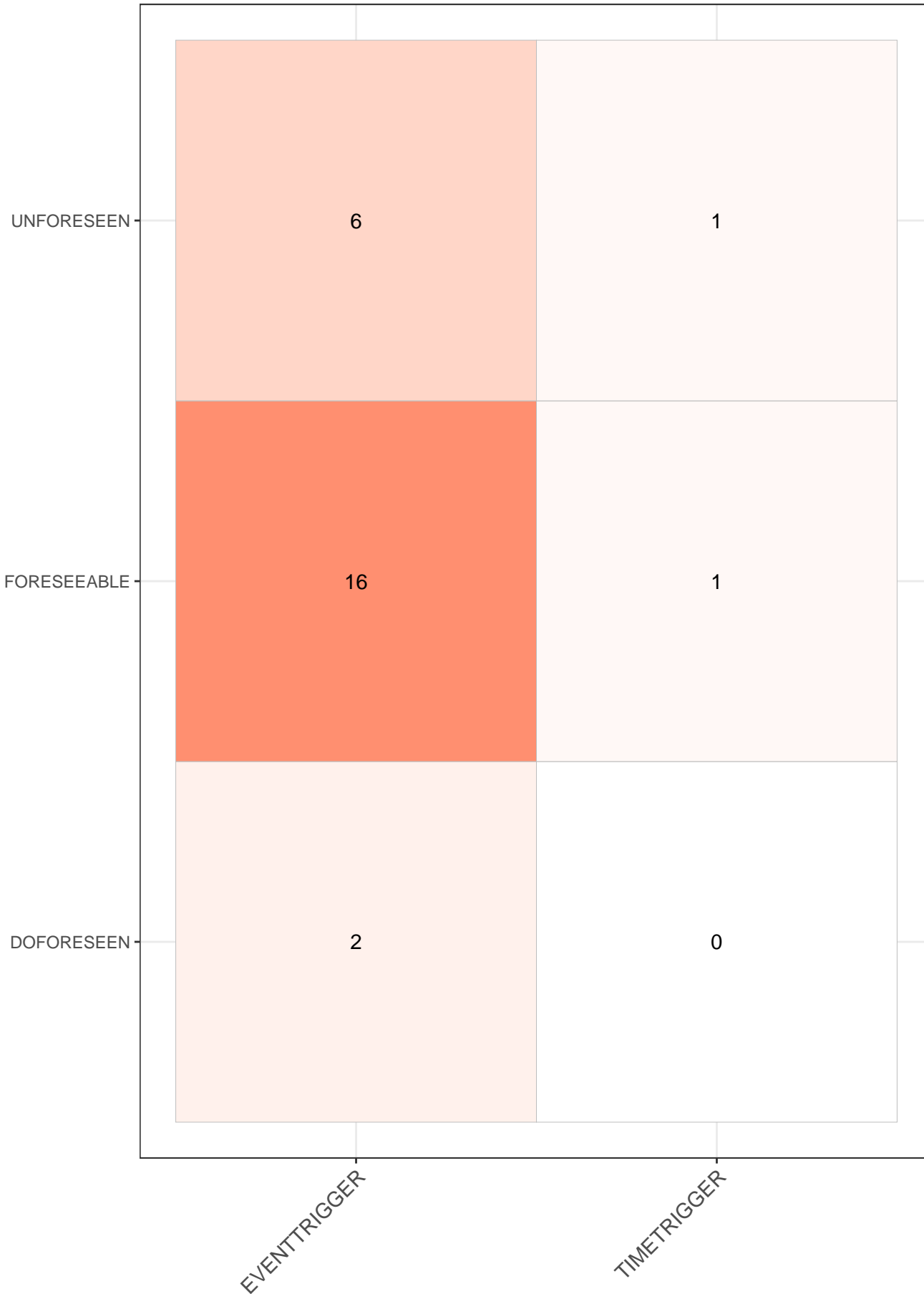
I1.2.Anticipation.of.Change_____I1.3.Duration.of.Mechanism





I1.2.Anticipation.of.Change_____I1.3.Trigger.of.Mechanism

I1.2.Anticipation.of.Change

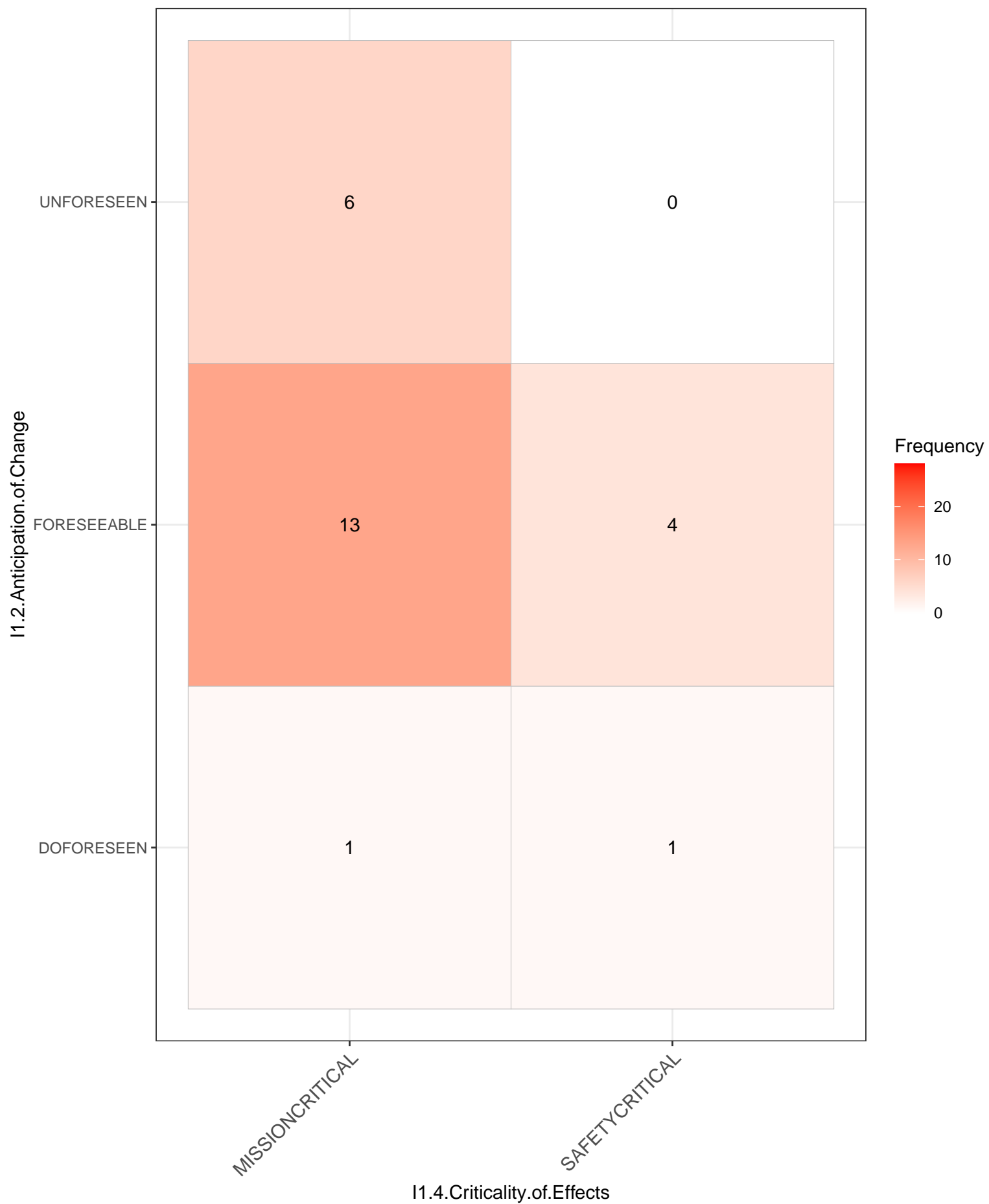


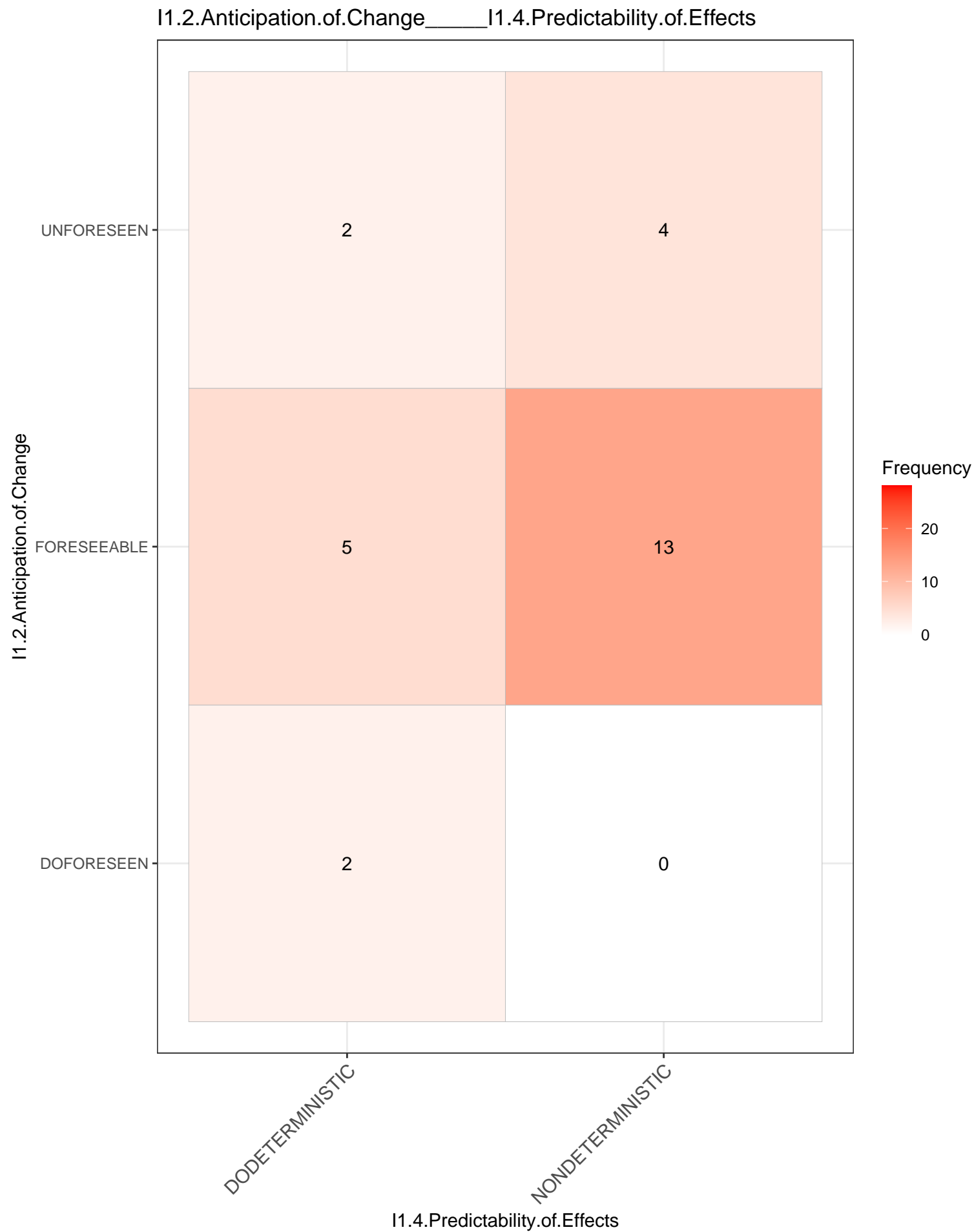
Frequency

20
10
0

I1.3.Trigger.of.Mechanism

I1.2.Anticipation.of.Change_____I1.4.Criticality.of.Effects





I1.2.Anticipation.of.Change_____I1.4.Overhead.of.Effects

I1.2.Anticipation.of.Change

UNFORESEEN

3

2

1

FORESEEABLE

10

1

2

DOFORESEEN

1

0

1

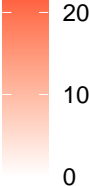
DEPENDENT

DOSIGNIFICANT

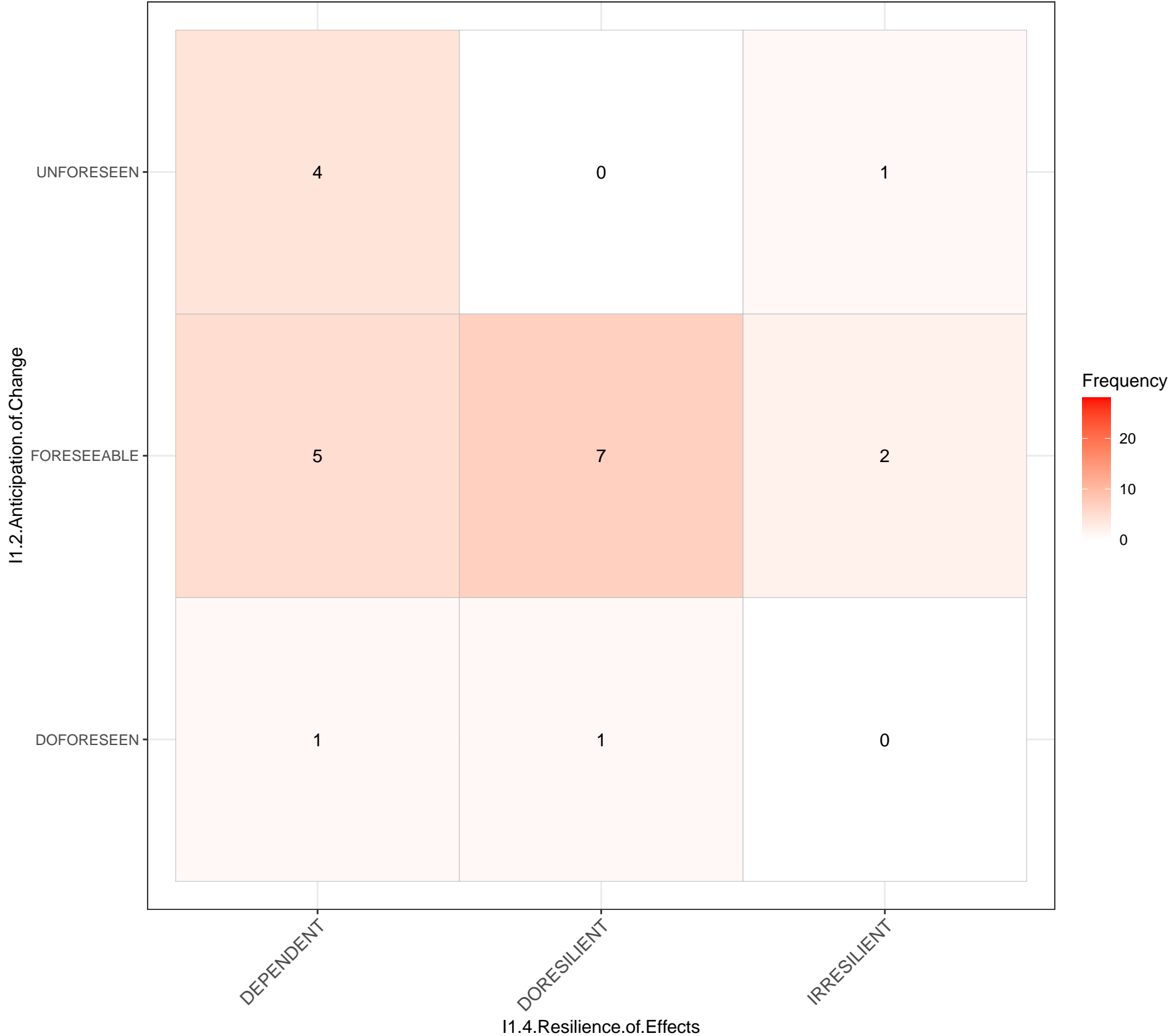
INSIGNIFICANT

I1.4.Overhead.of.Effects

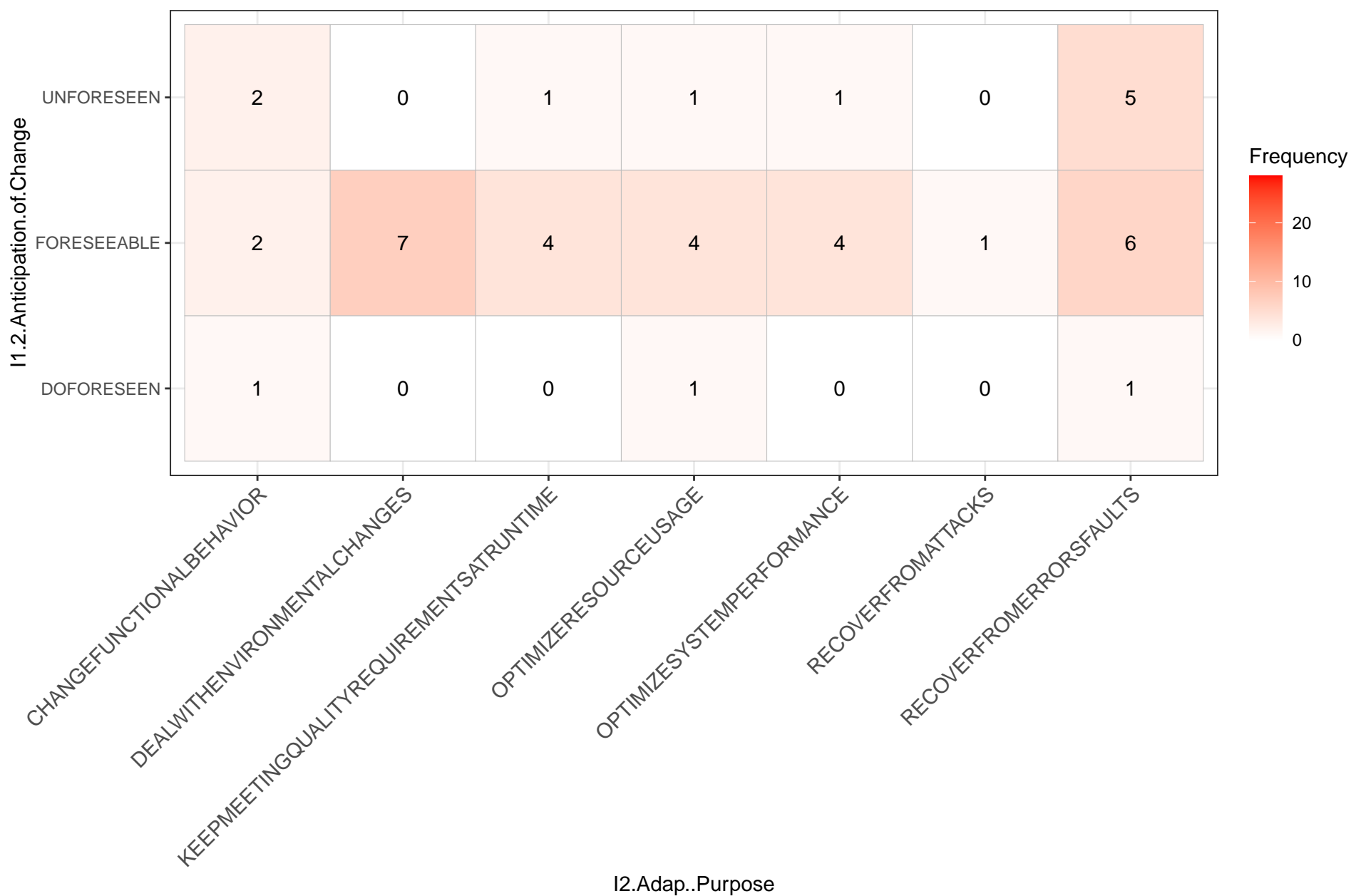
Frequency



I1.2.Anticipation.of.Change_____I1.4.Resilience.of.Effects

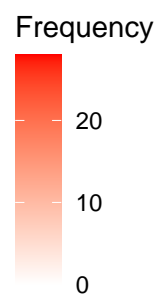
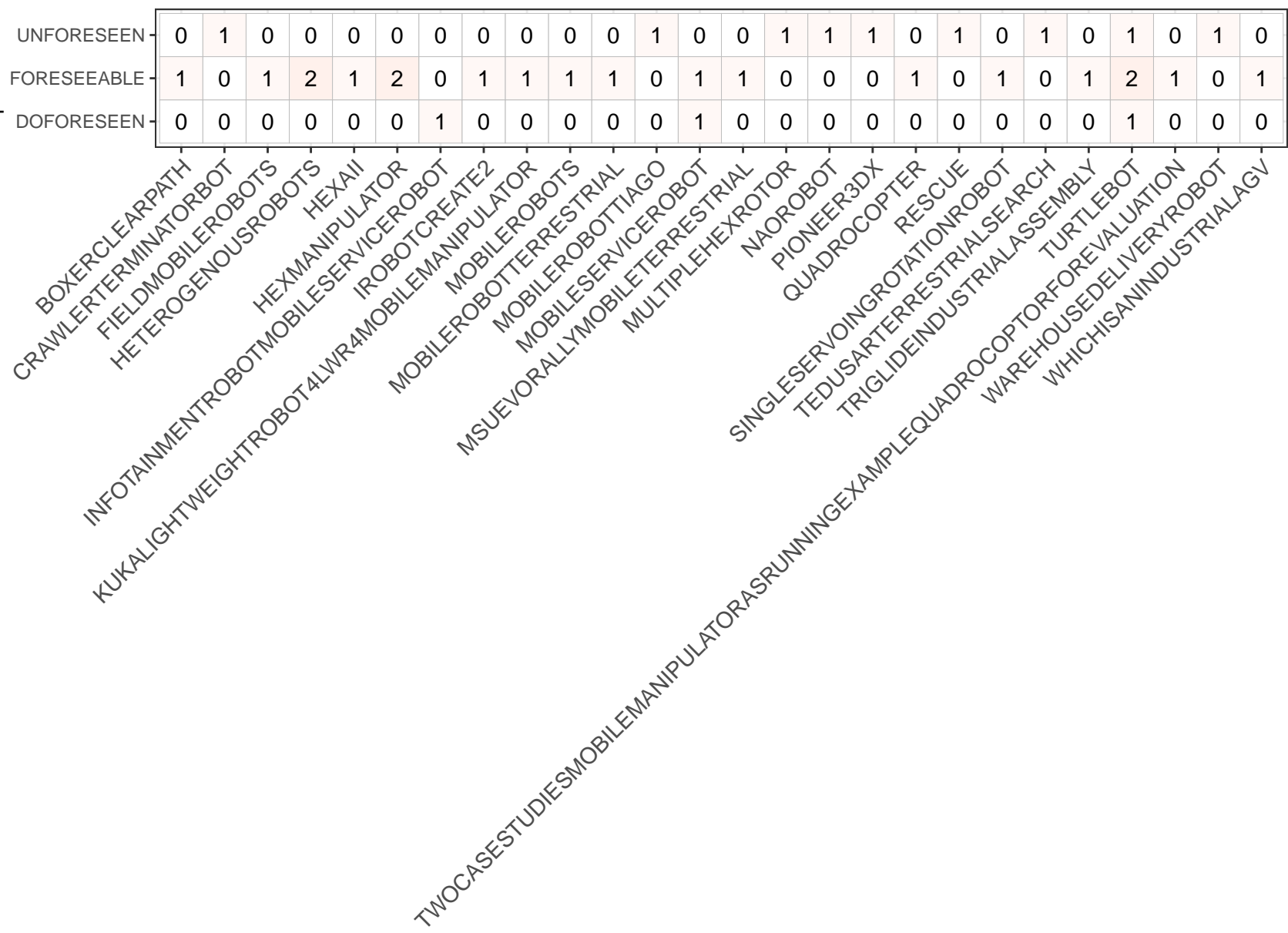


I1.2.Anticipation.of.Change_____I2.Adap..Purpose



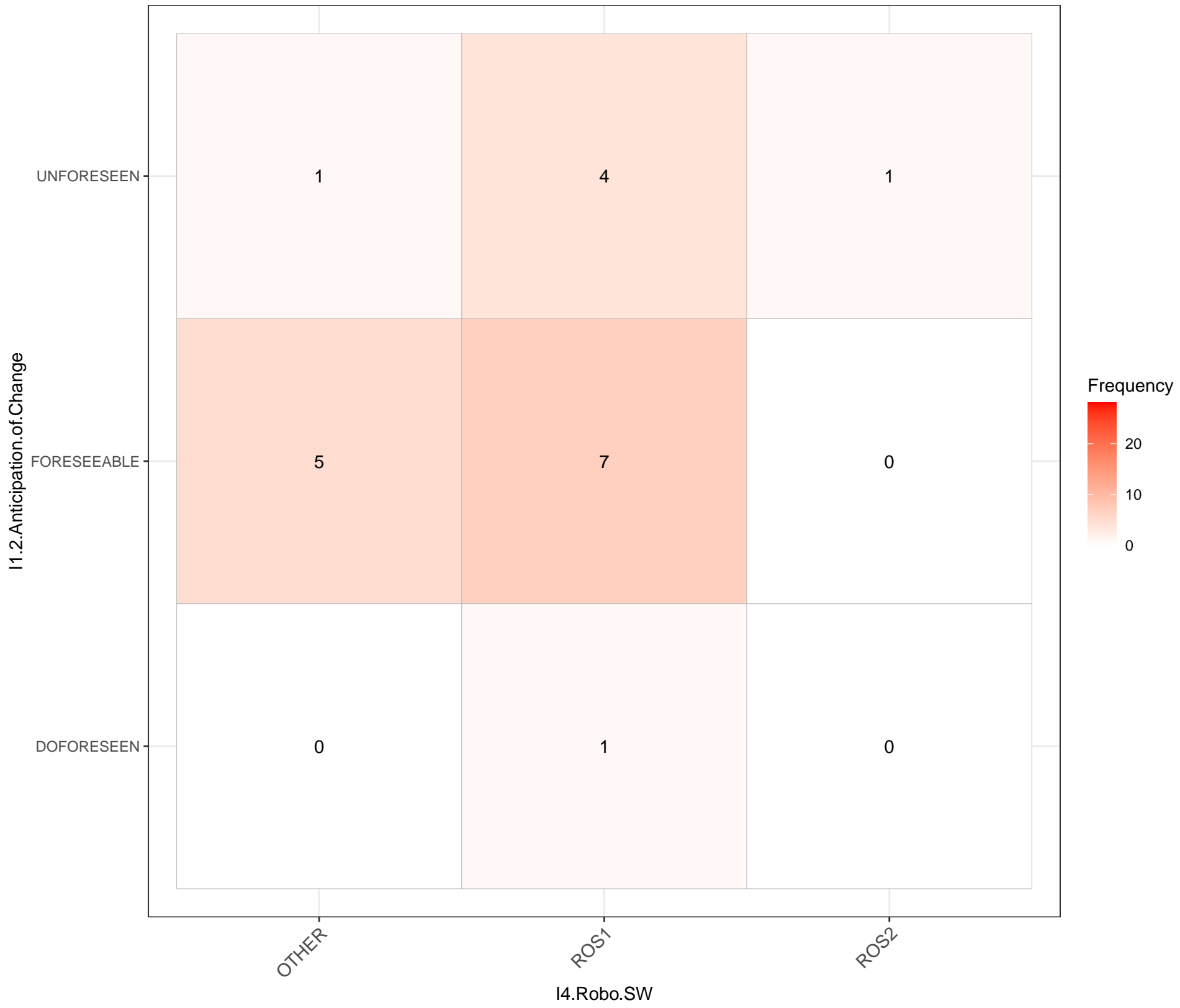
I1.2.Anticipation.of.Change

I1.2.Anticipation.of.Change_____I3.Robot.Type



I3.Robot.Type

I1.2.Anticipation.of.Change_____I4.Robo.SW



I1.2.Anticipation.of.Change_____I5.QA

I1.2.Anticipation.of.Change

UNFORESEEN

FORESEEABLE

DOFORESEEN

FUNCTIONALSUITABILITY

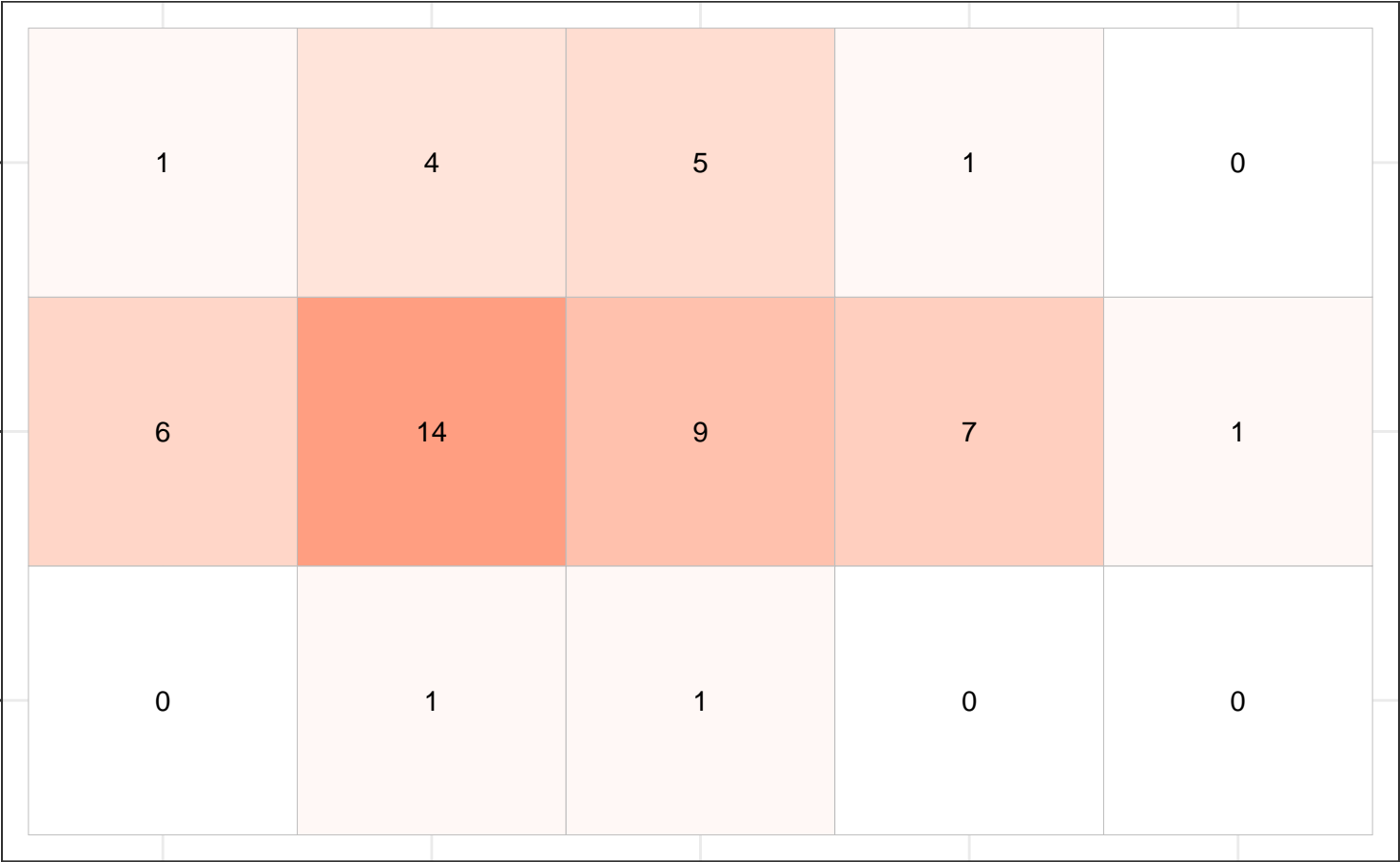
PERFORMANCEEFFICIENCY

RELIABILITY

SAFETY

SECURITY

I5.QA



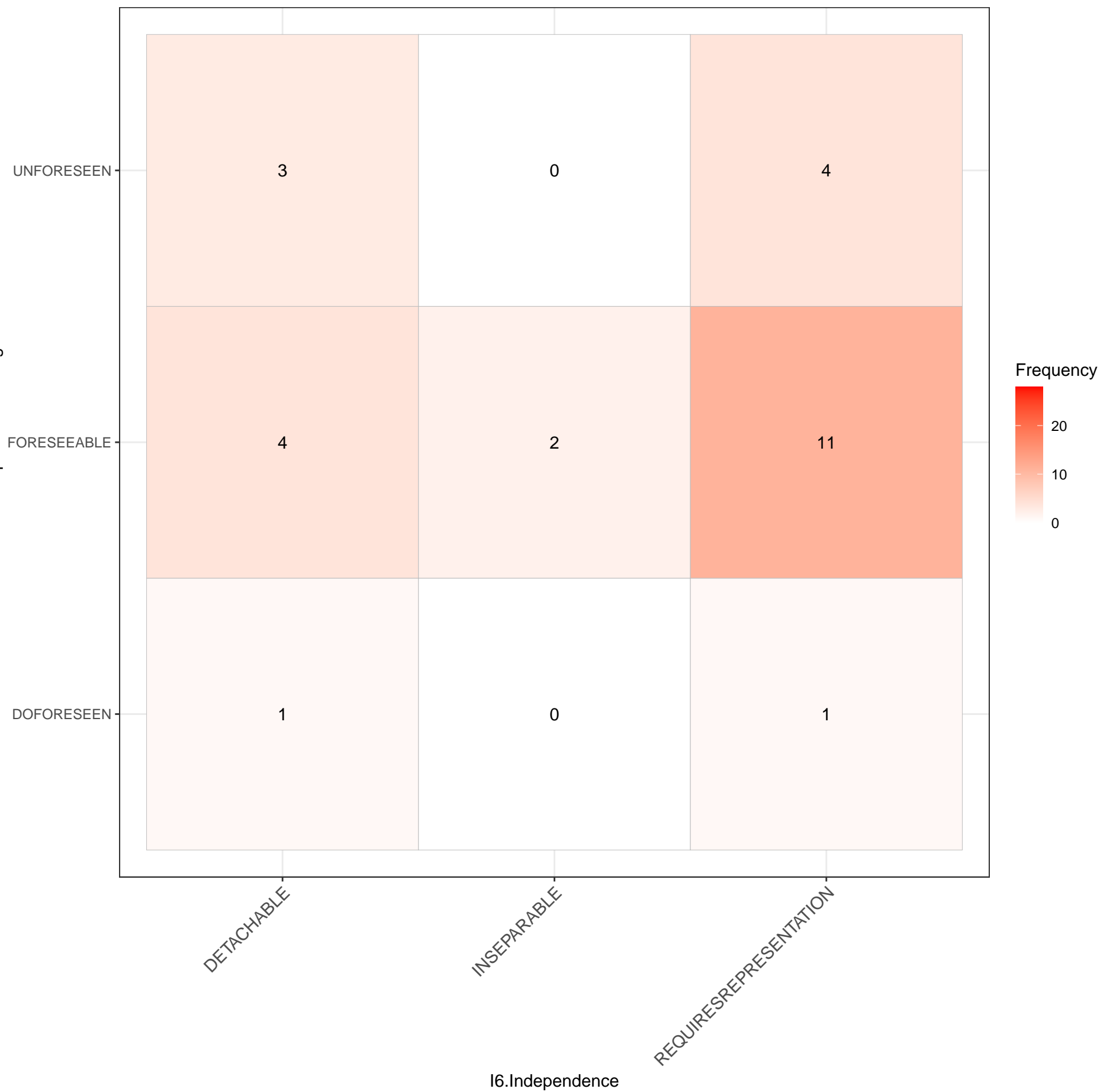
Frequency



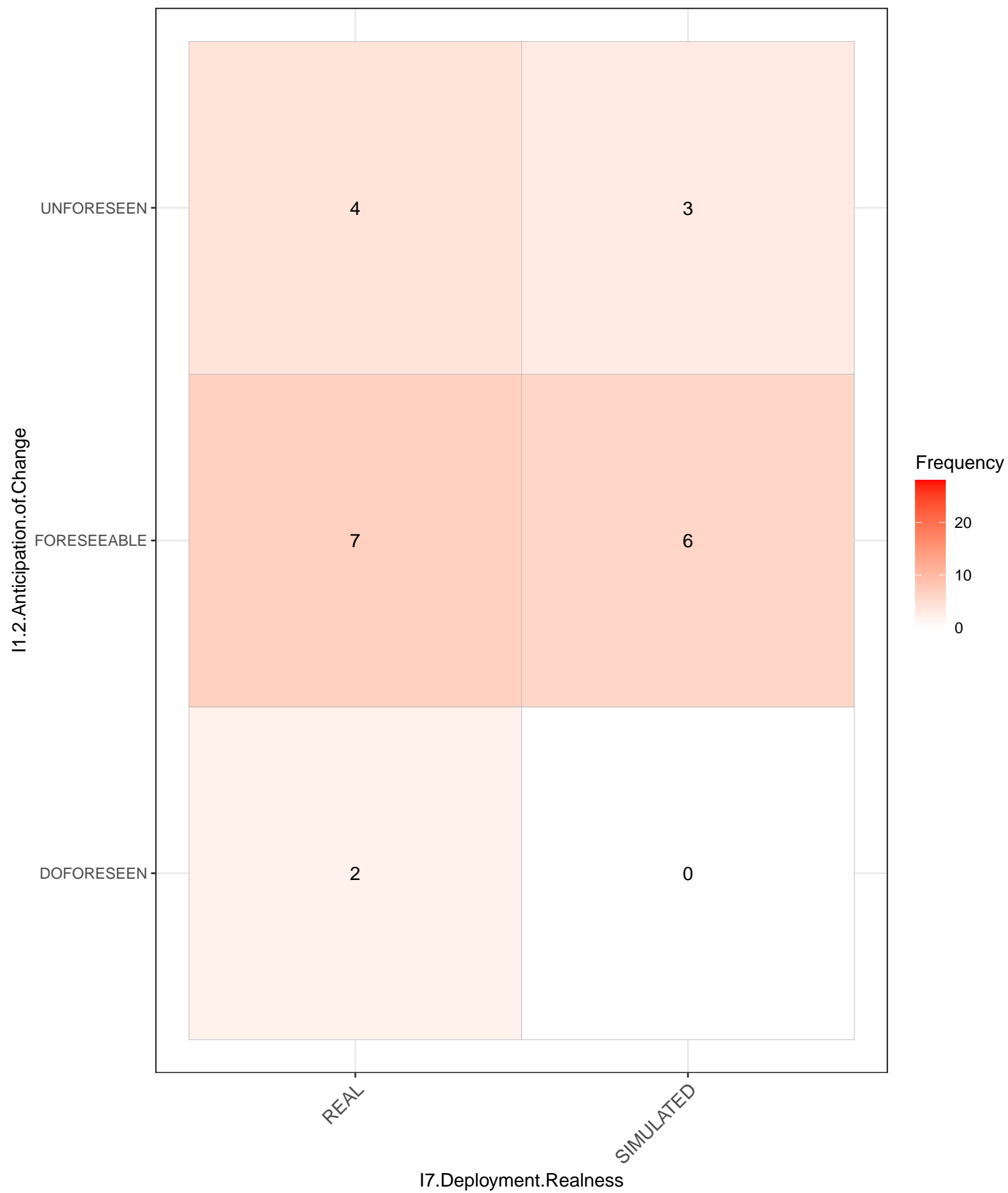
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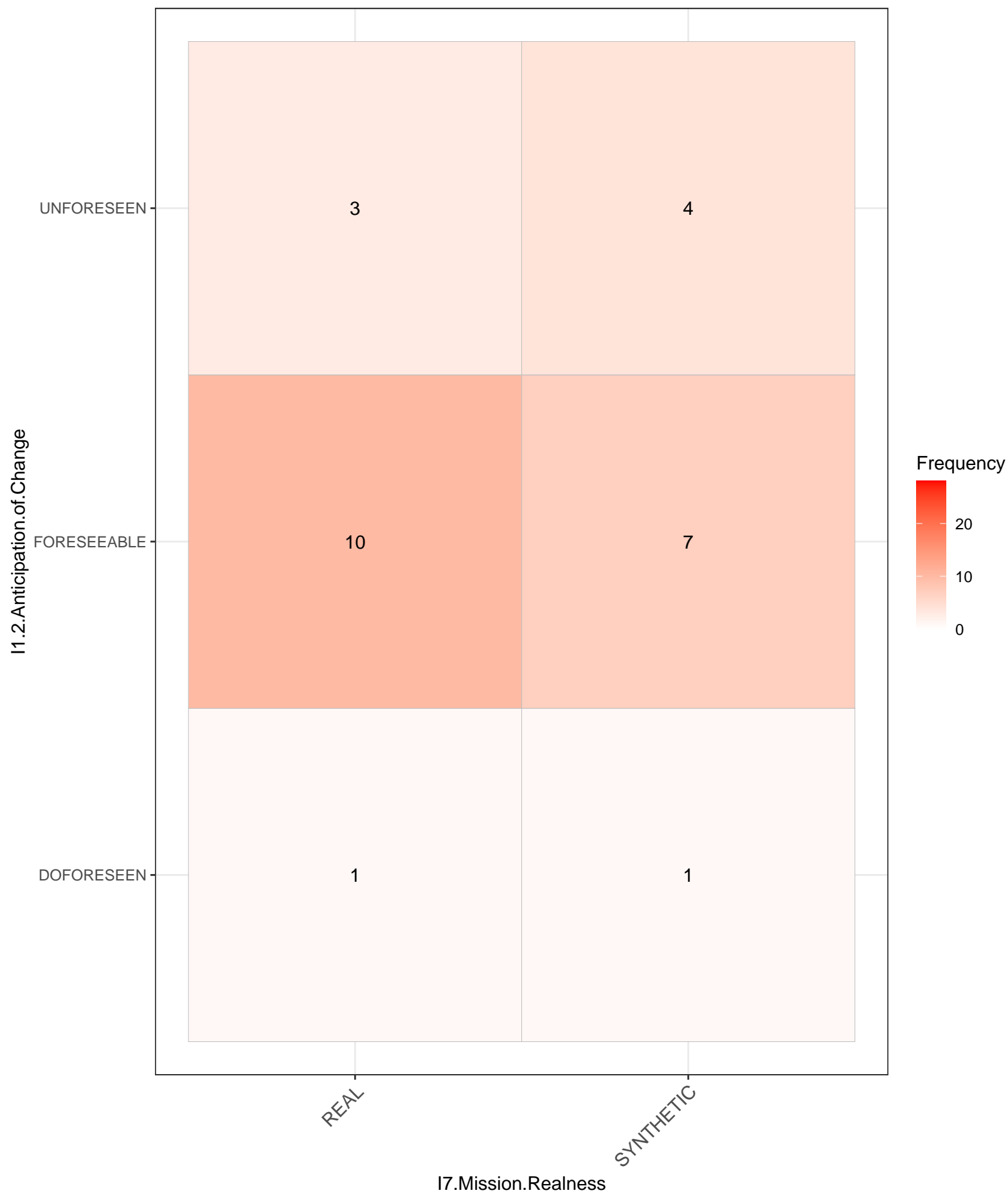
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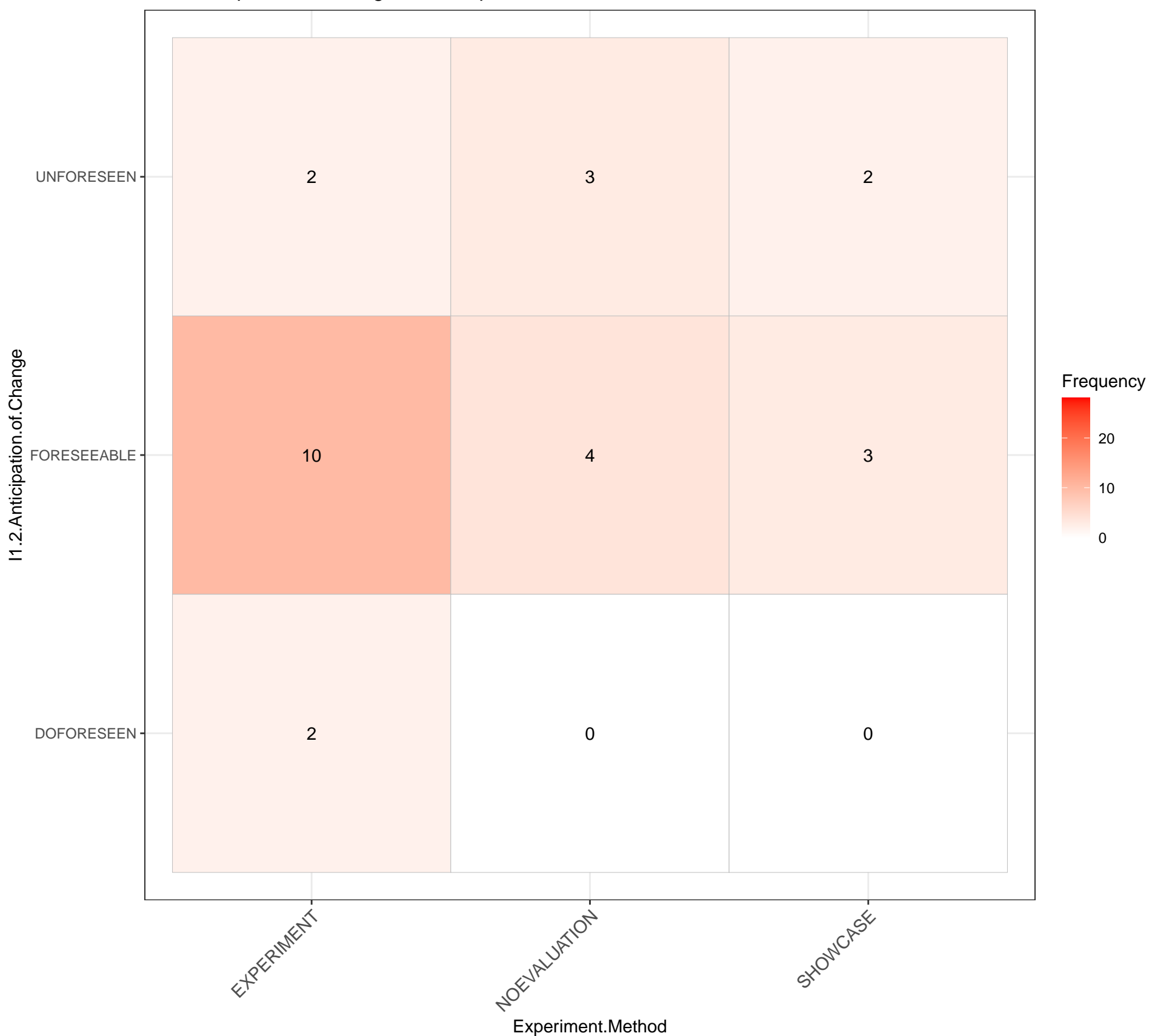
I1.2.Anticipation.of.Change_____I7.Deployment.Realness



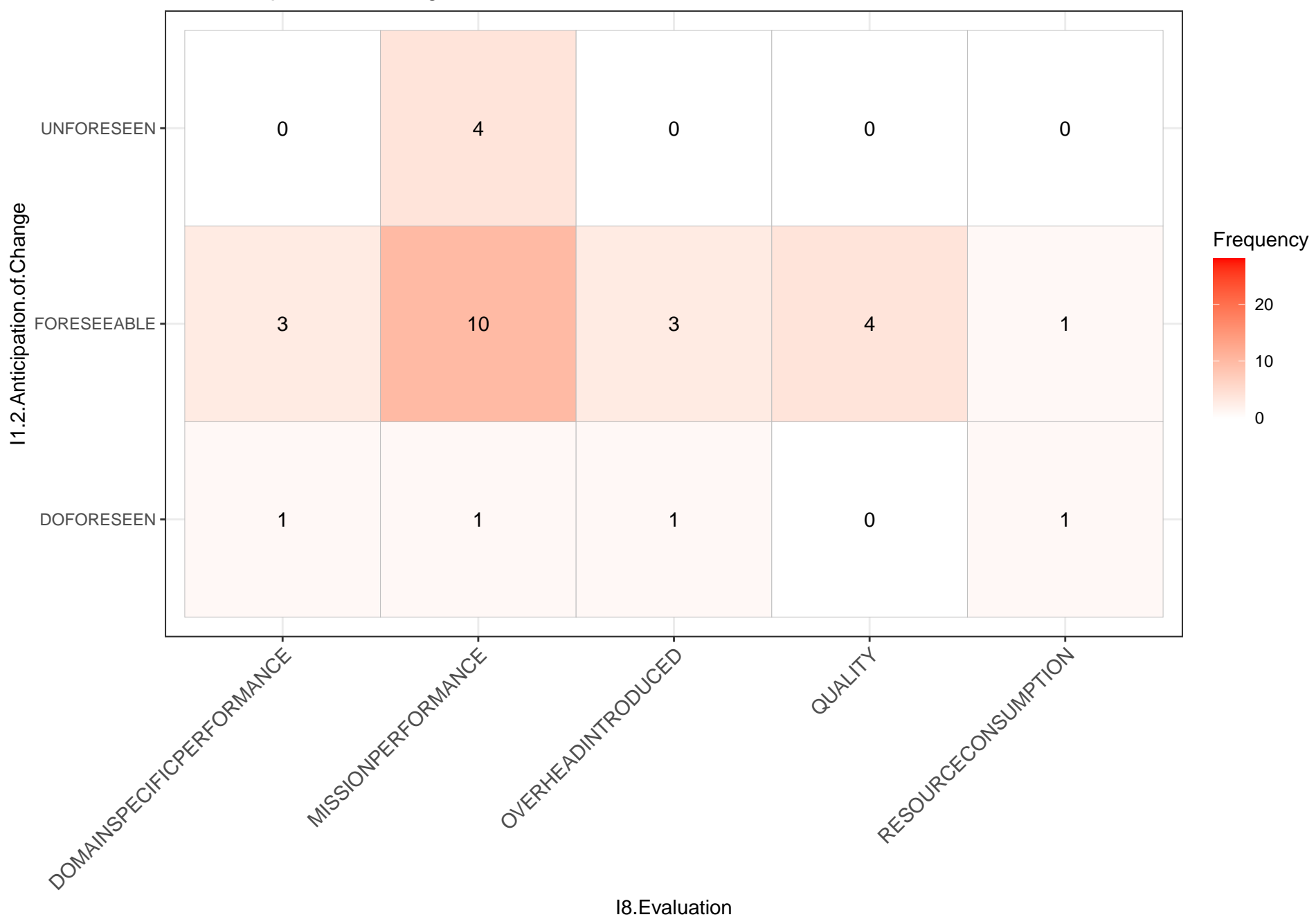
I1.2.Anticipation.of.Change_____I7.Mission.Realness



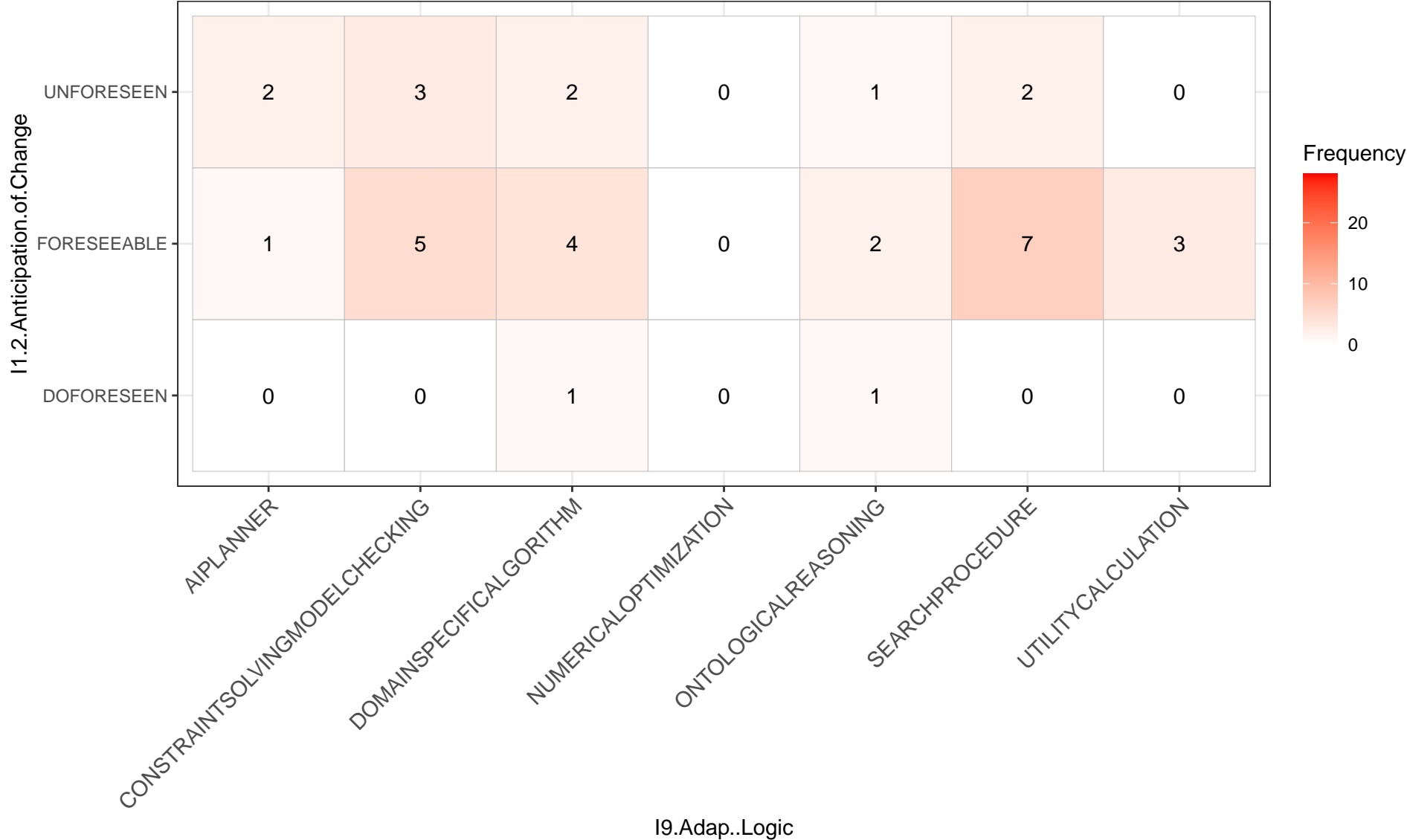
I1.2.Anticipation.of.Change_____Experiment.Method



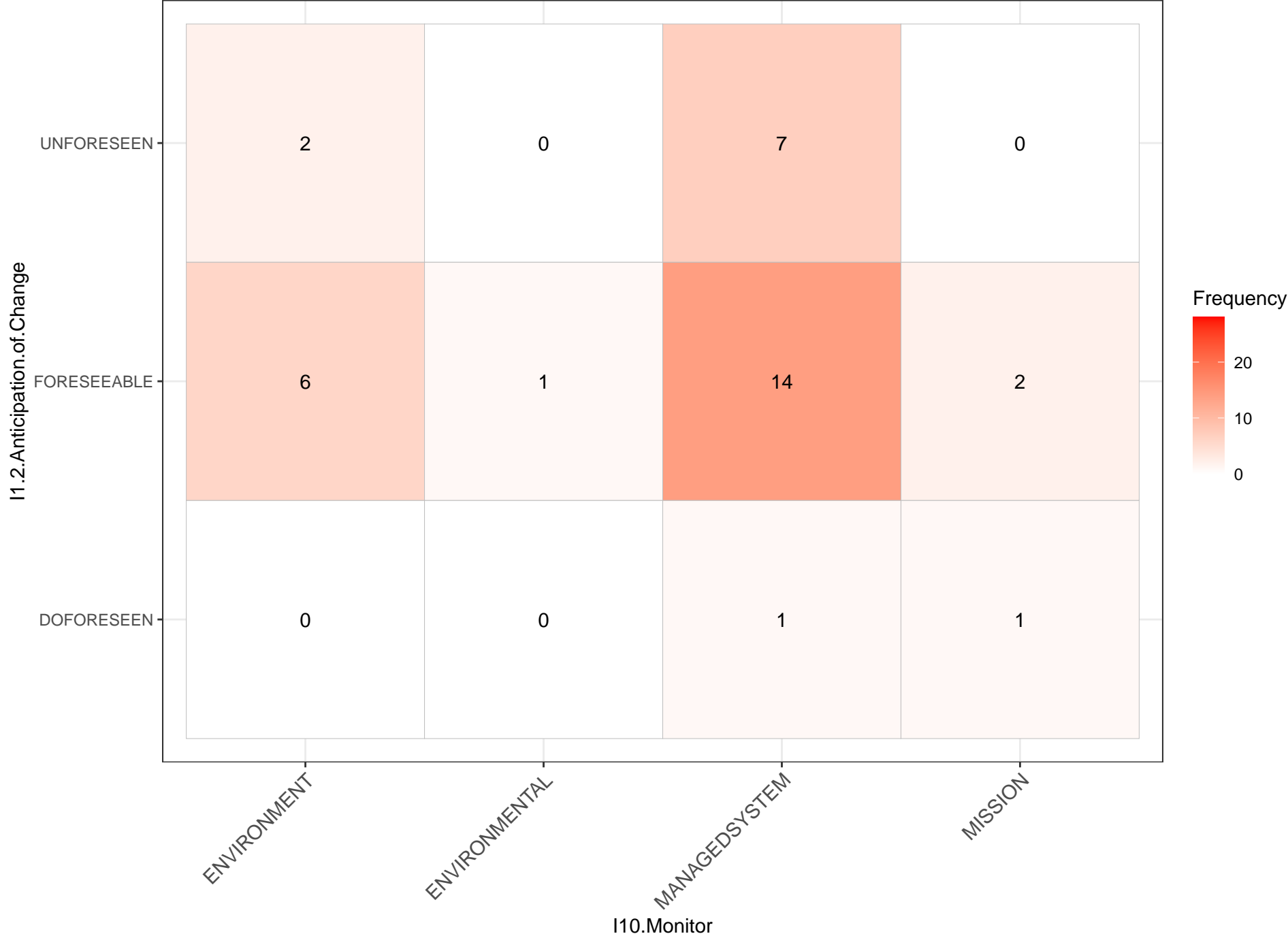
I1.2.Anticipation.of.Change_____I8.Evaluation



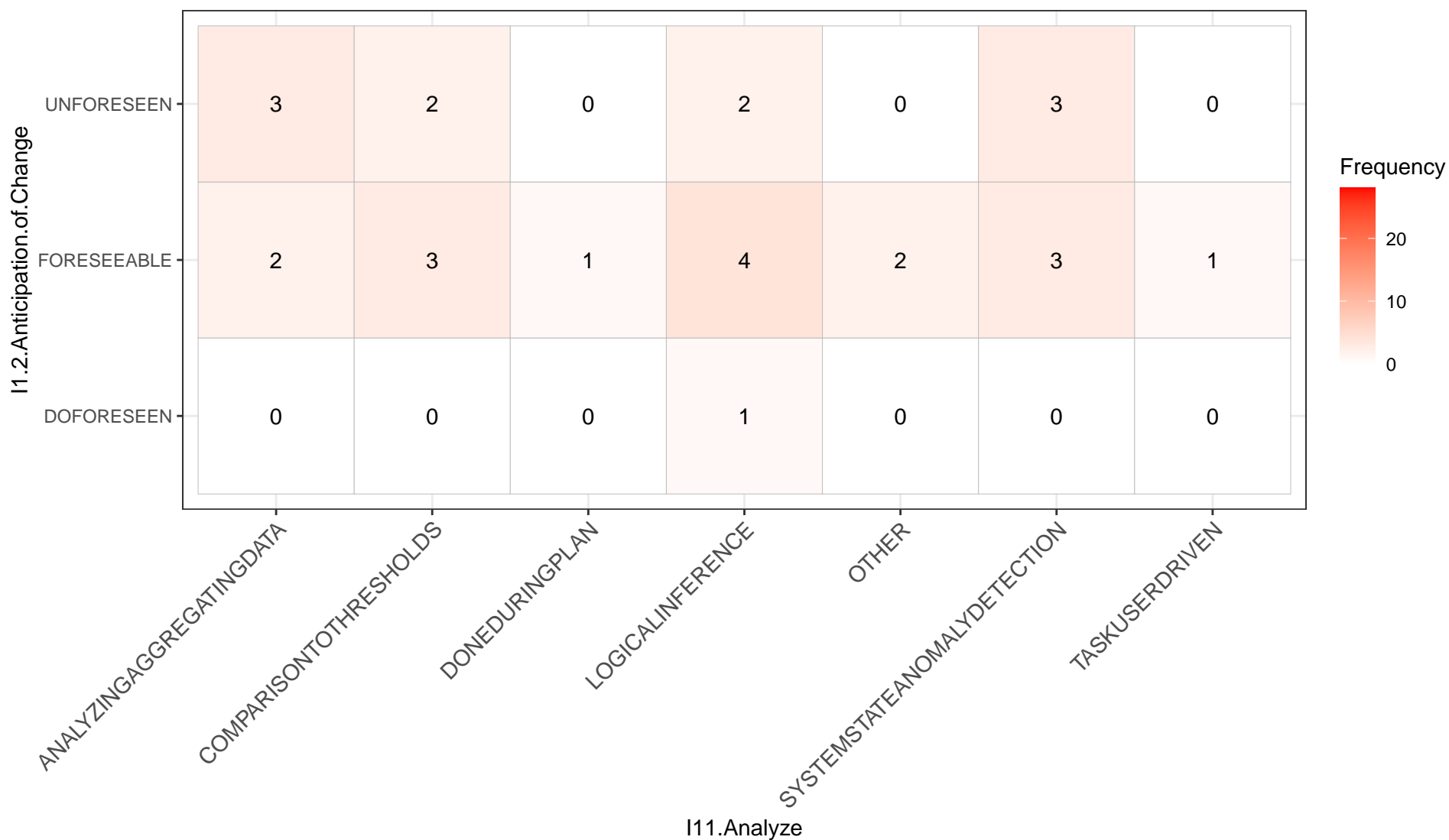
I1.2.Anticipation.of.Change_____I9.Adap..Logic

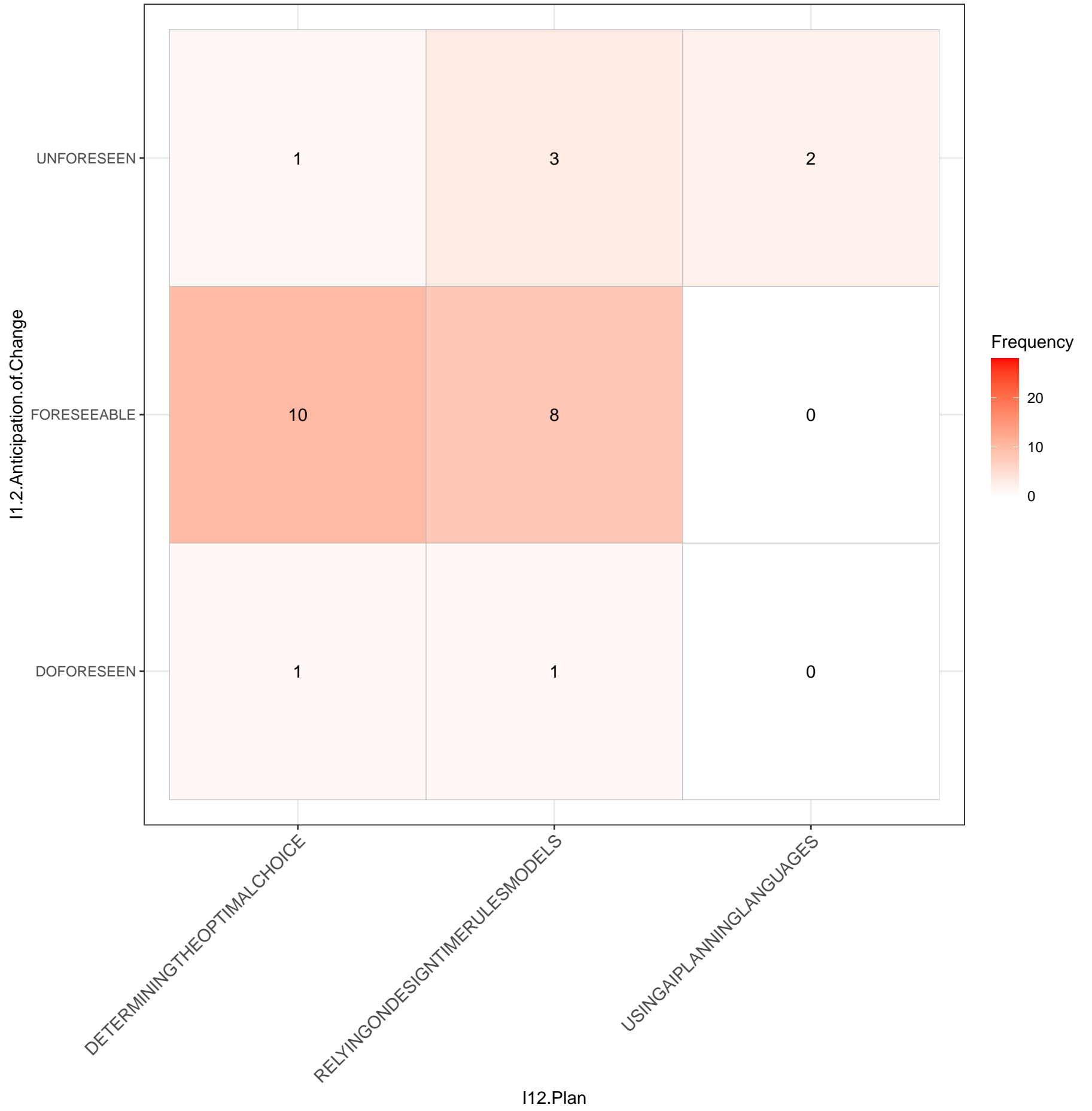


I1.2.Anticipation.of.Change_____I10.Monitor

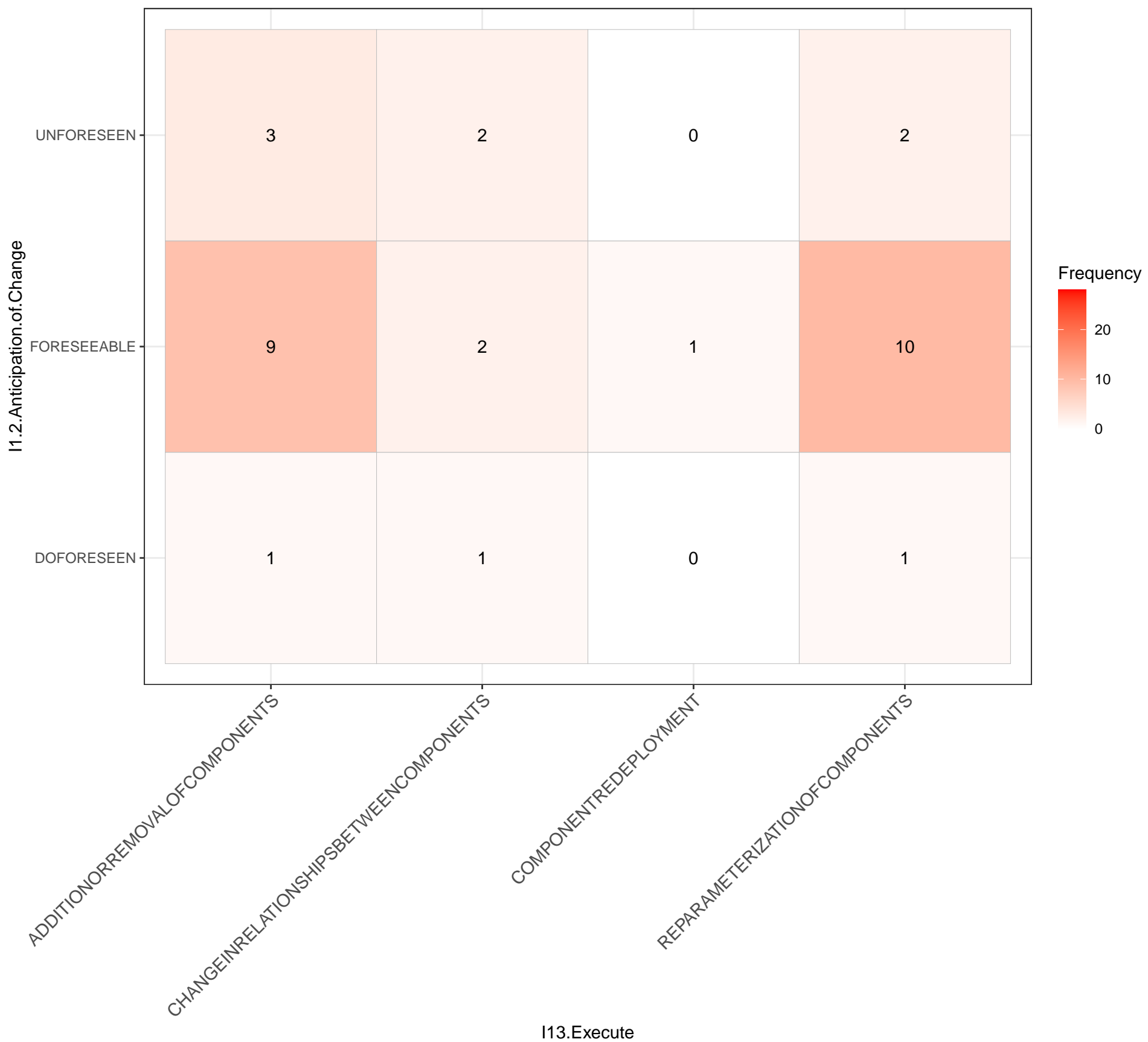


I1.2.Anticipation.of.Change_____I11.Analyze

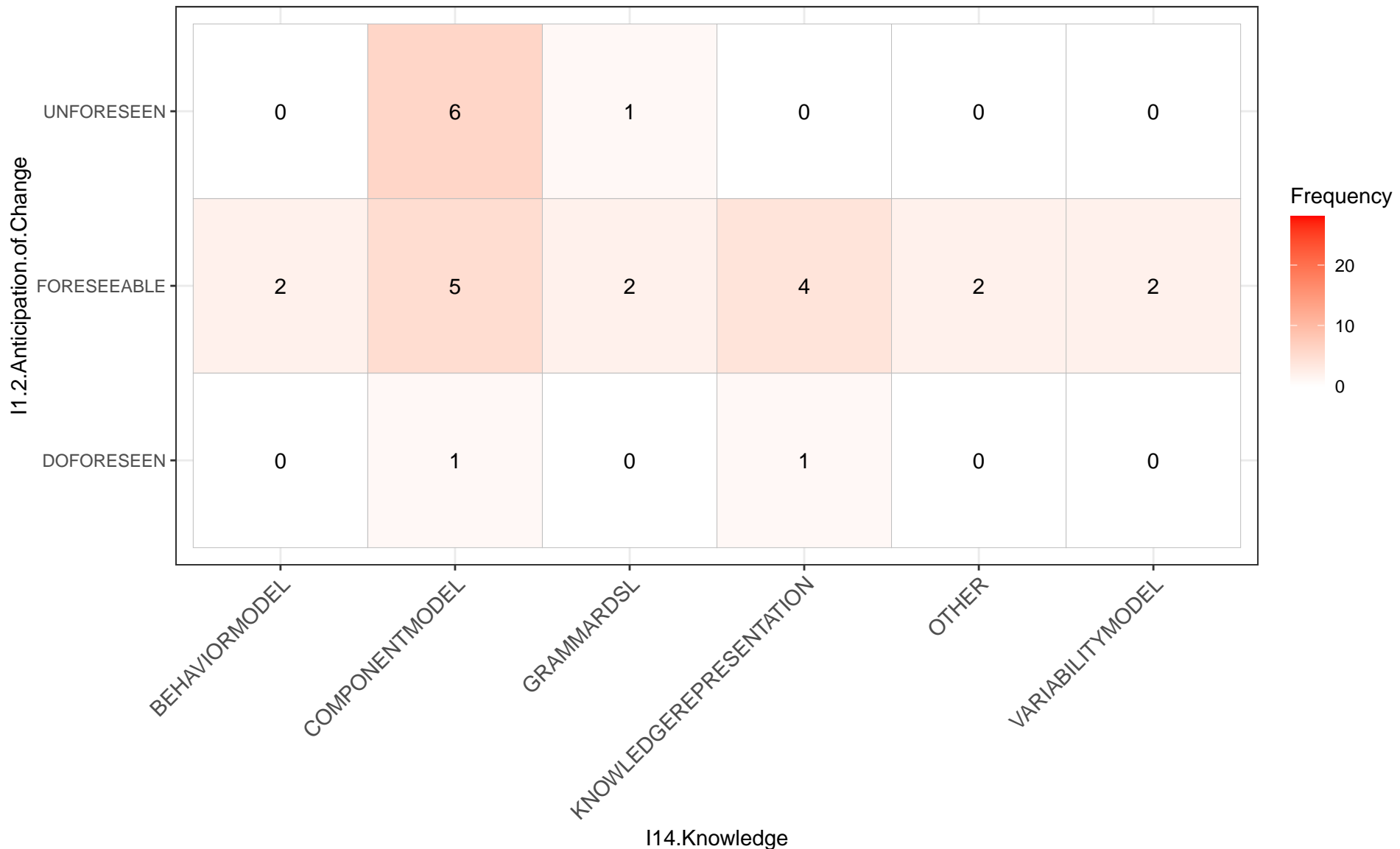


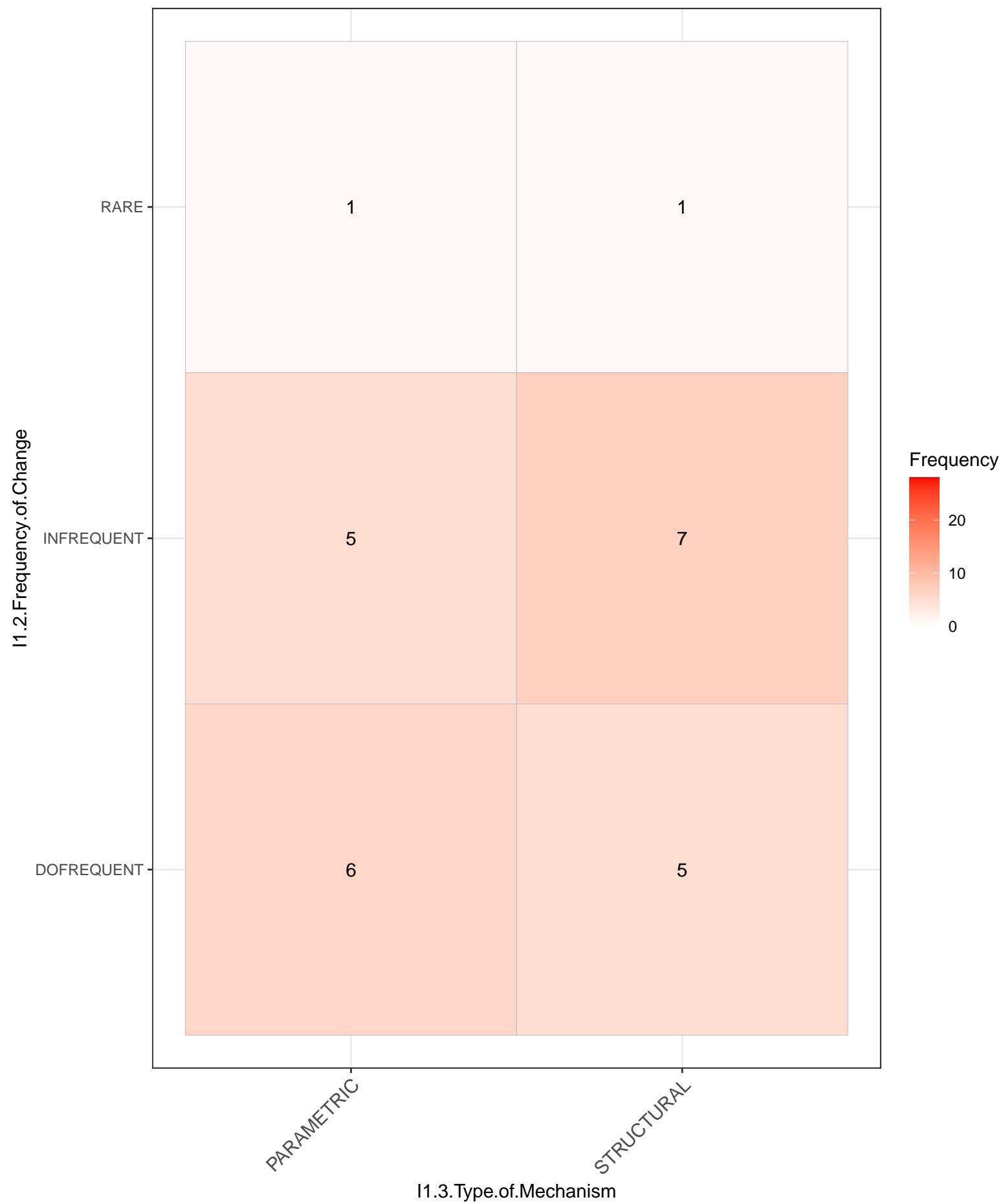


I1.2.Anticipation.of.Change_____I13.Execute

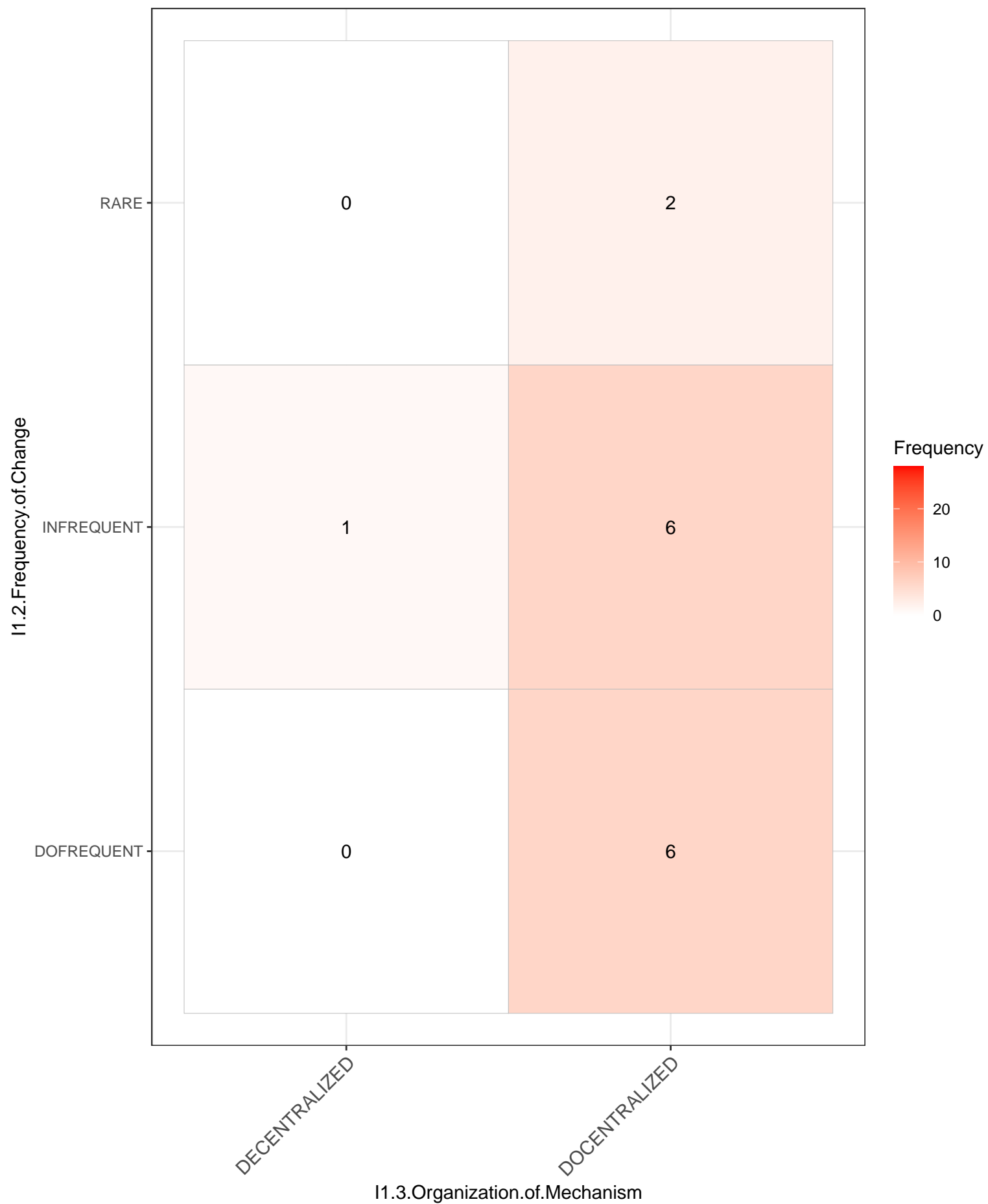


I1.2.Anticipation.of.Change_____I14.Knowledge

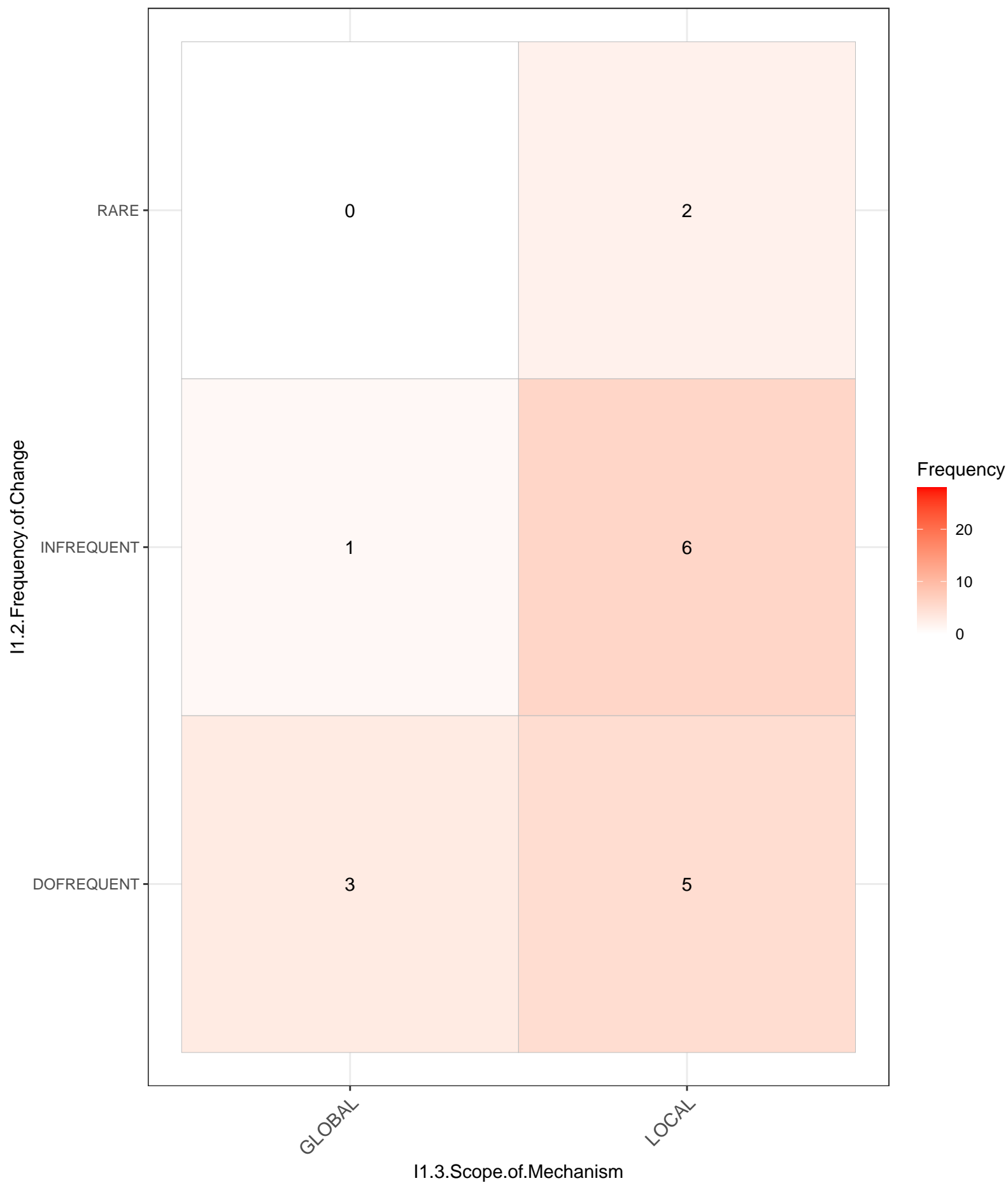




I1.2.Frequency.of.Change_____I1.3.Organization.of.Mechanism

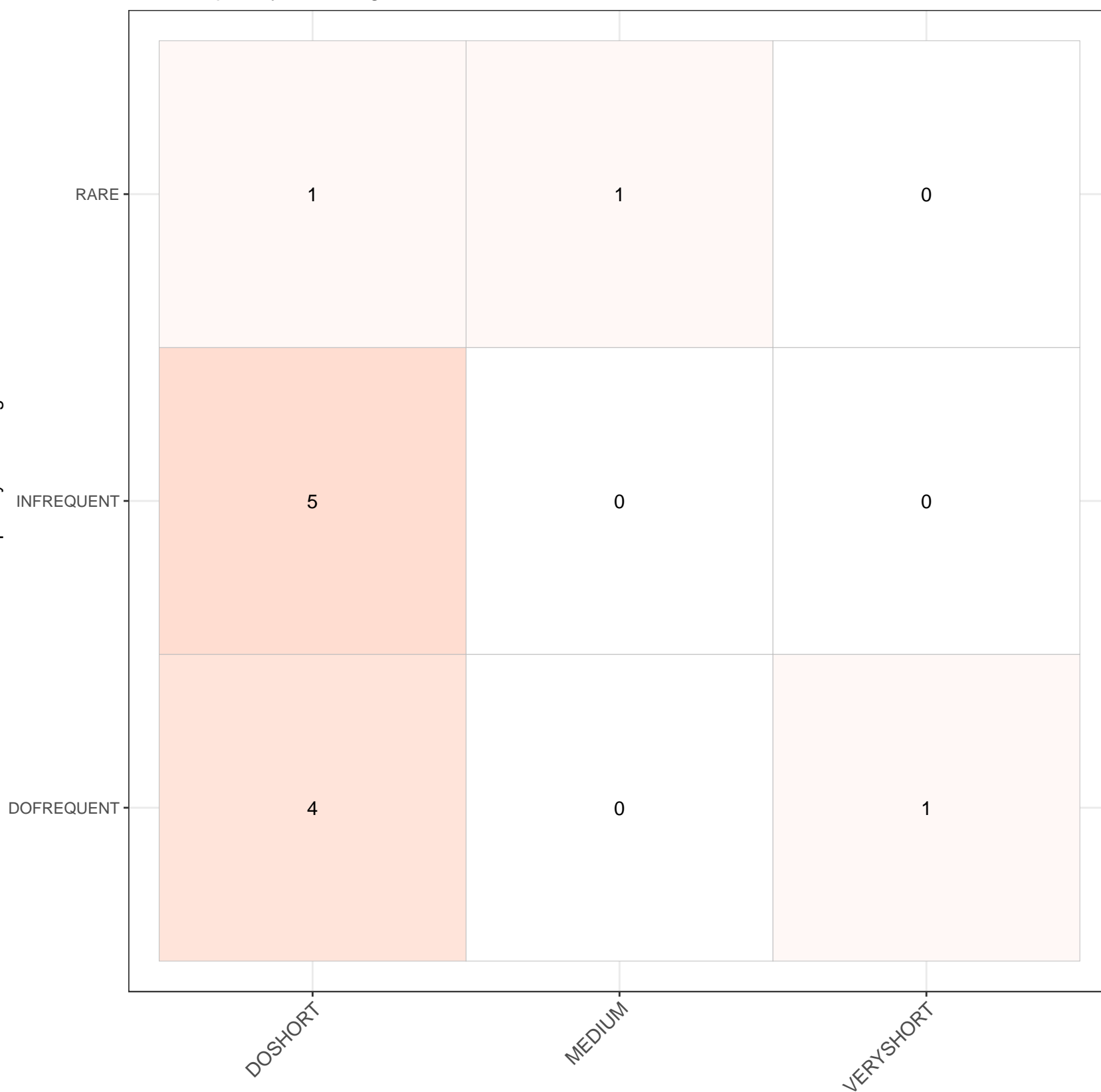


I1.2.Frequency.of.Change_____I1.3.Scope.of.Mechanism



I1.2.Frequency.of.Change_____I1.3.Duration.of.Mechanism

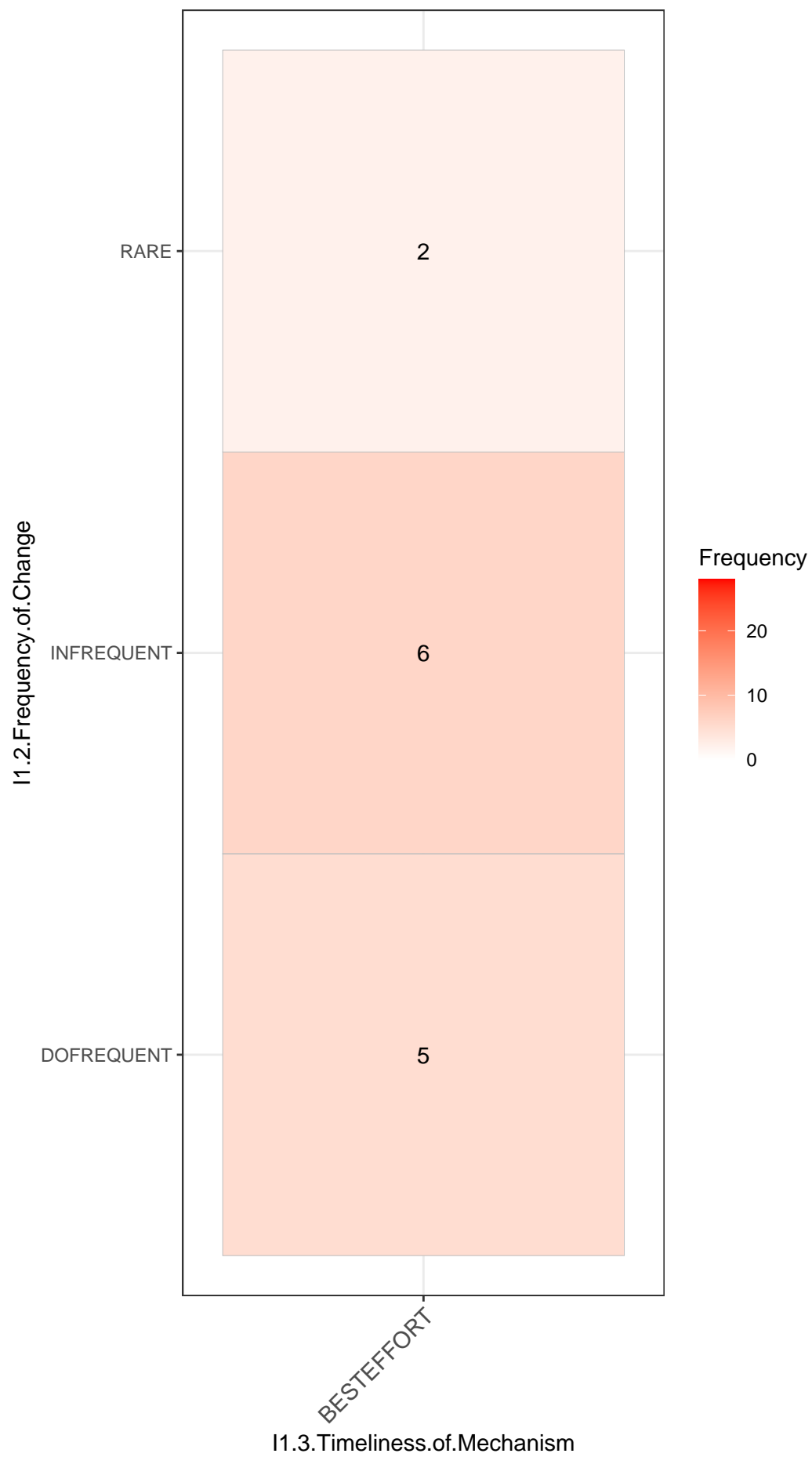
I1.2.Frequency.of.Change



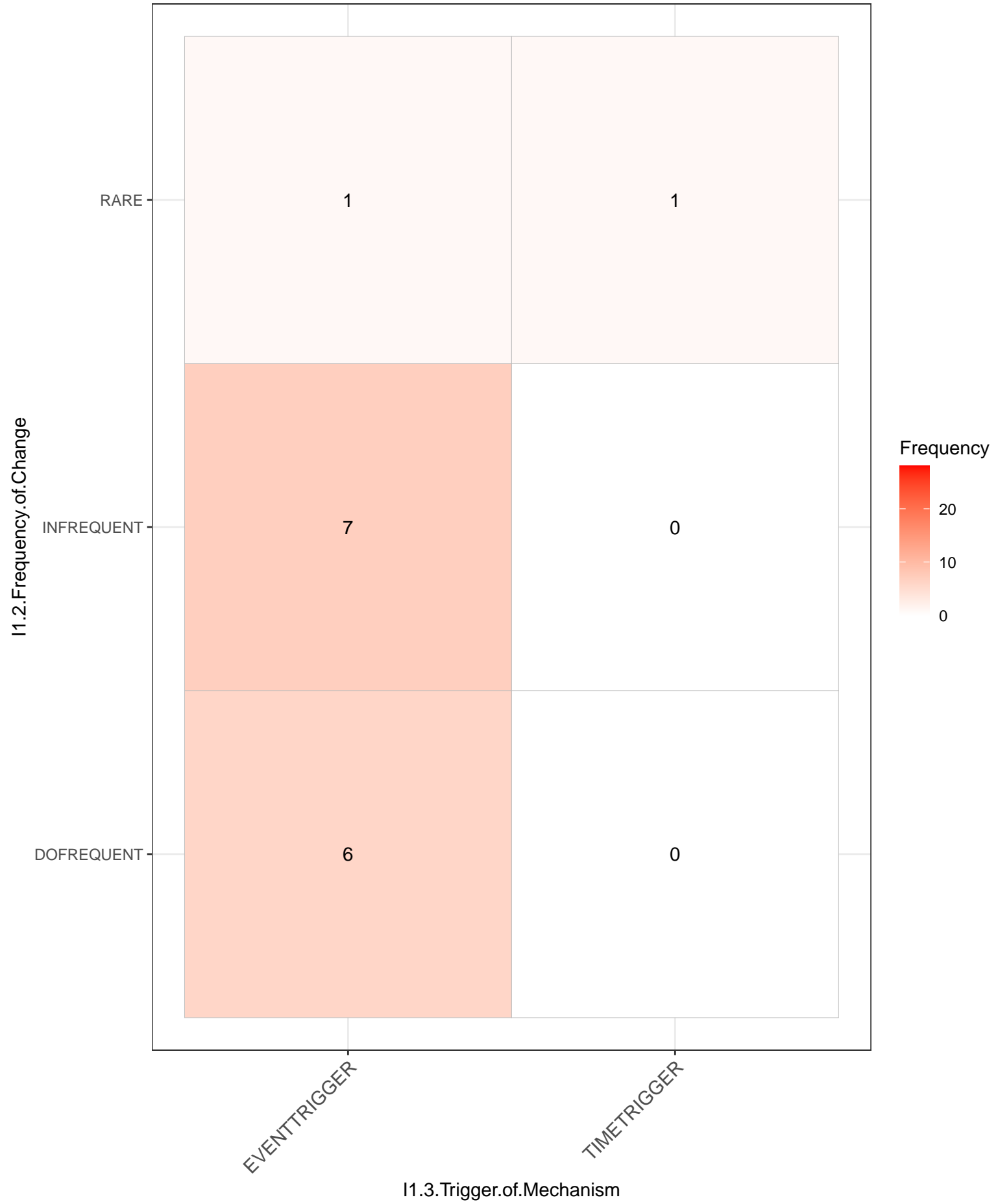
Frequency

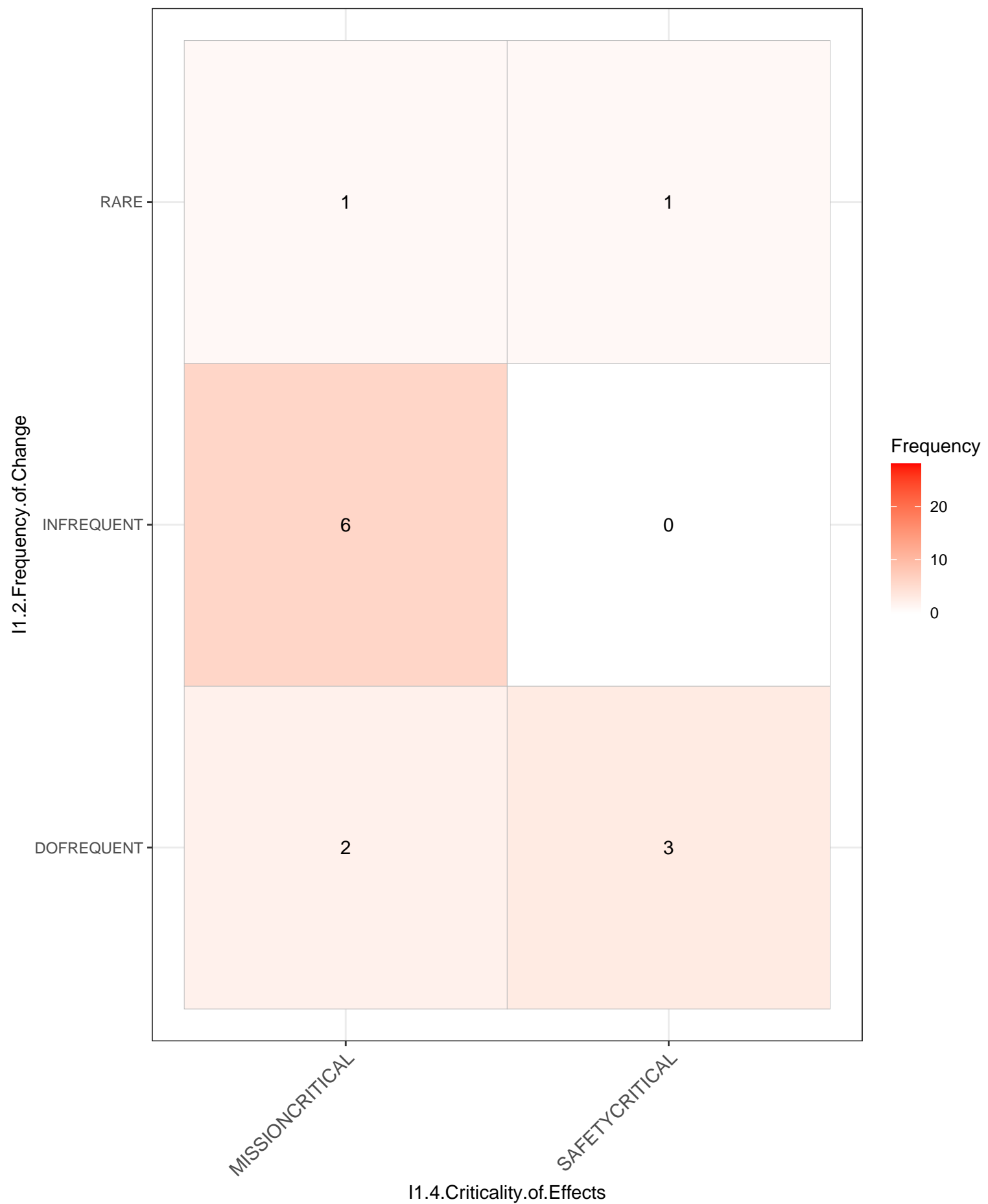


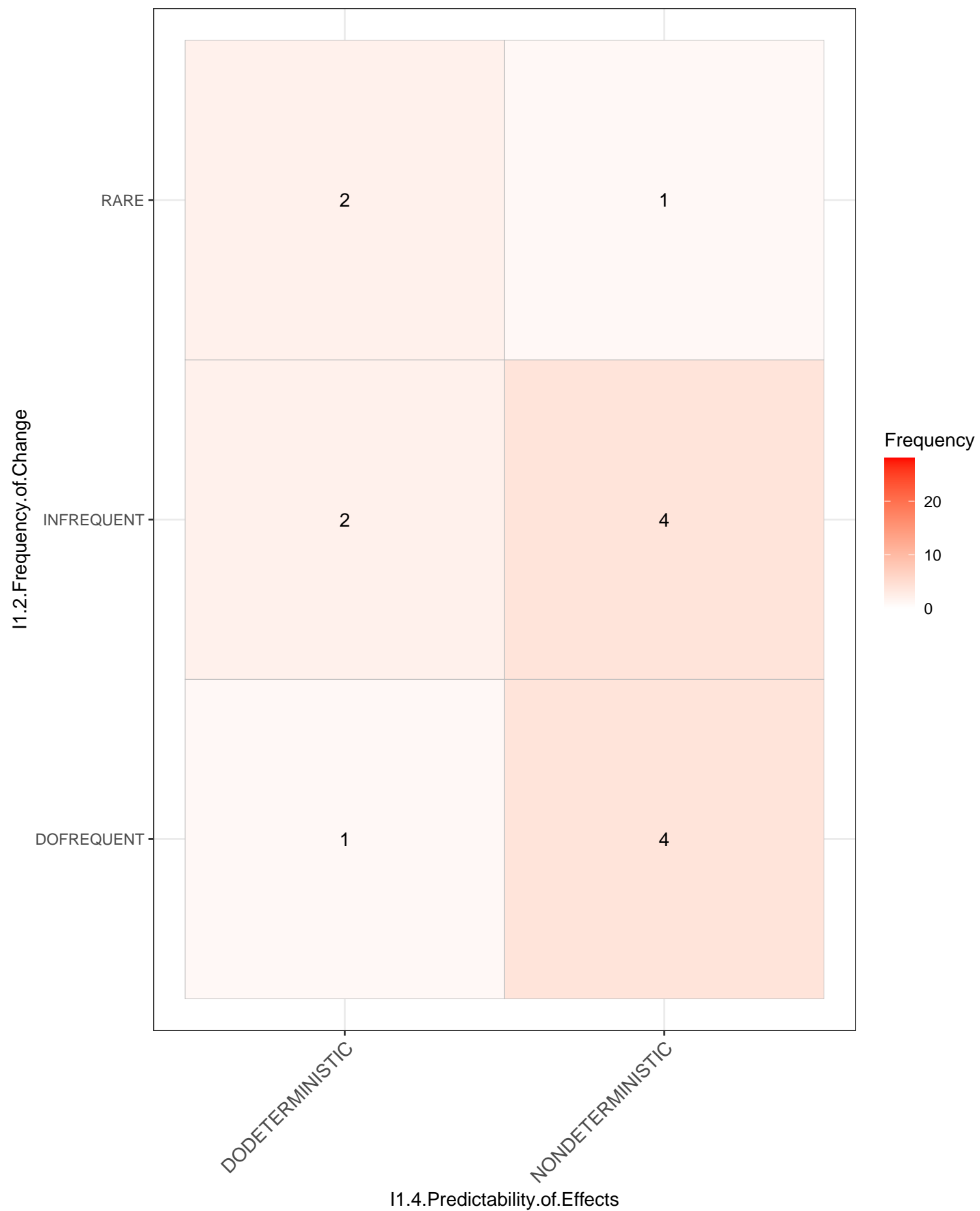
I1.3.Duration.of.Mechanism



I1.2.Frequency.of.Change_____I1.3.Trigger.of.Mechanism

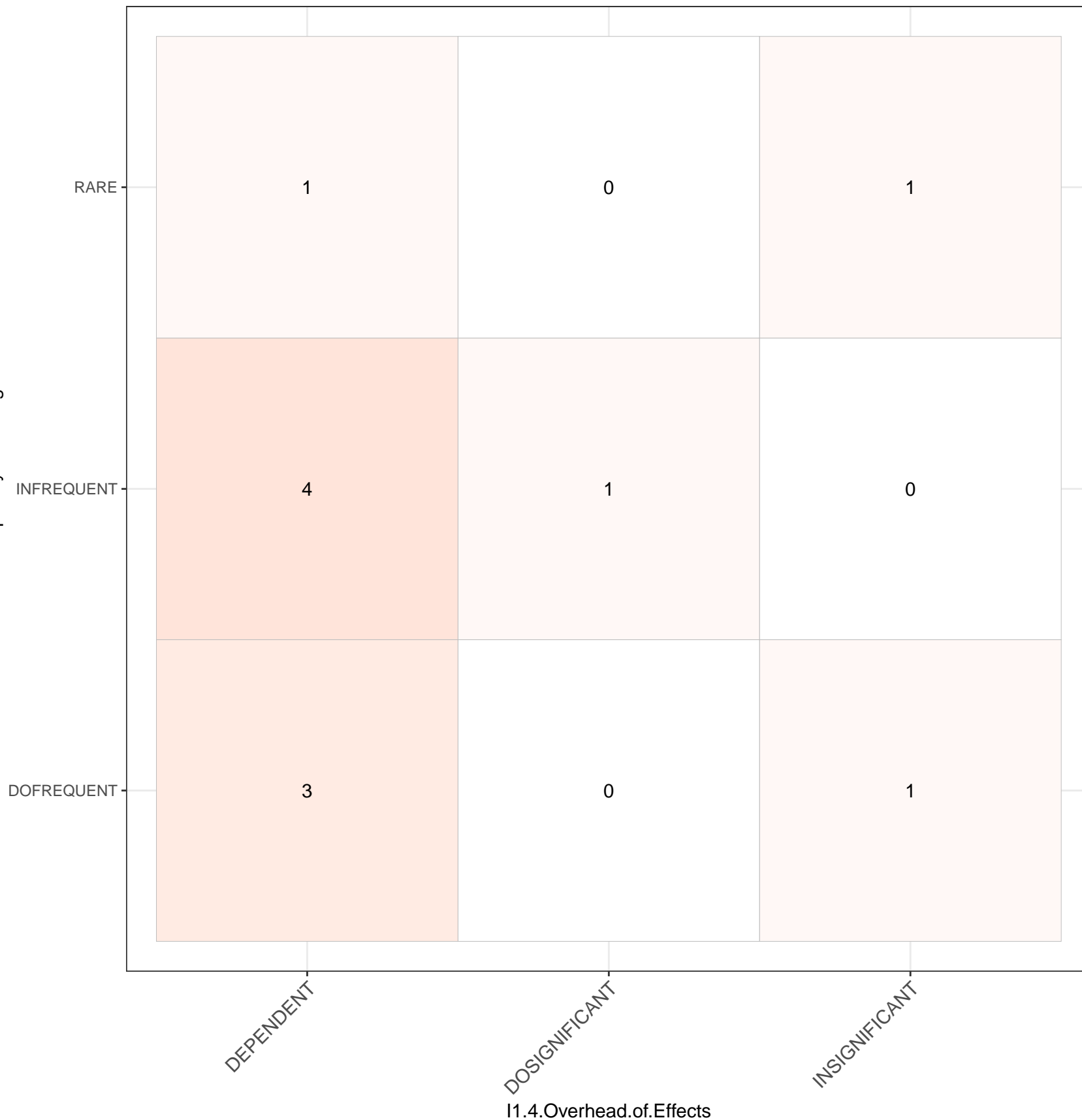






I1.2.Frequency.of.Change_____I1.4.Overhead.of.Effects

I1.2.Frequency.of.Change



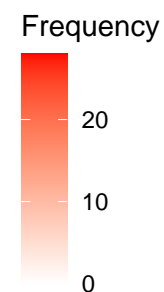
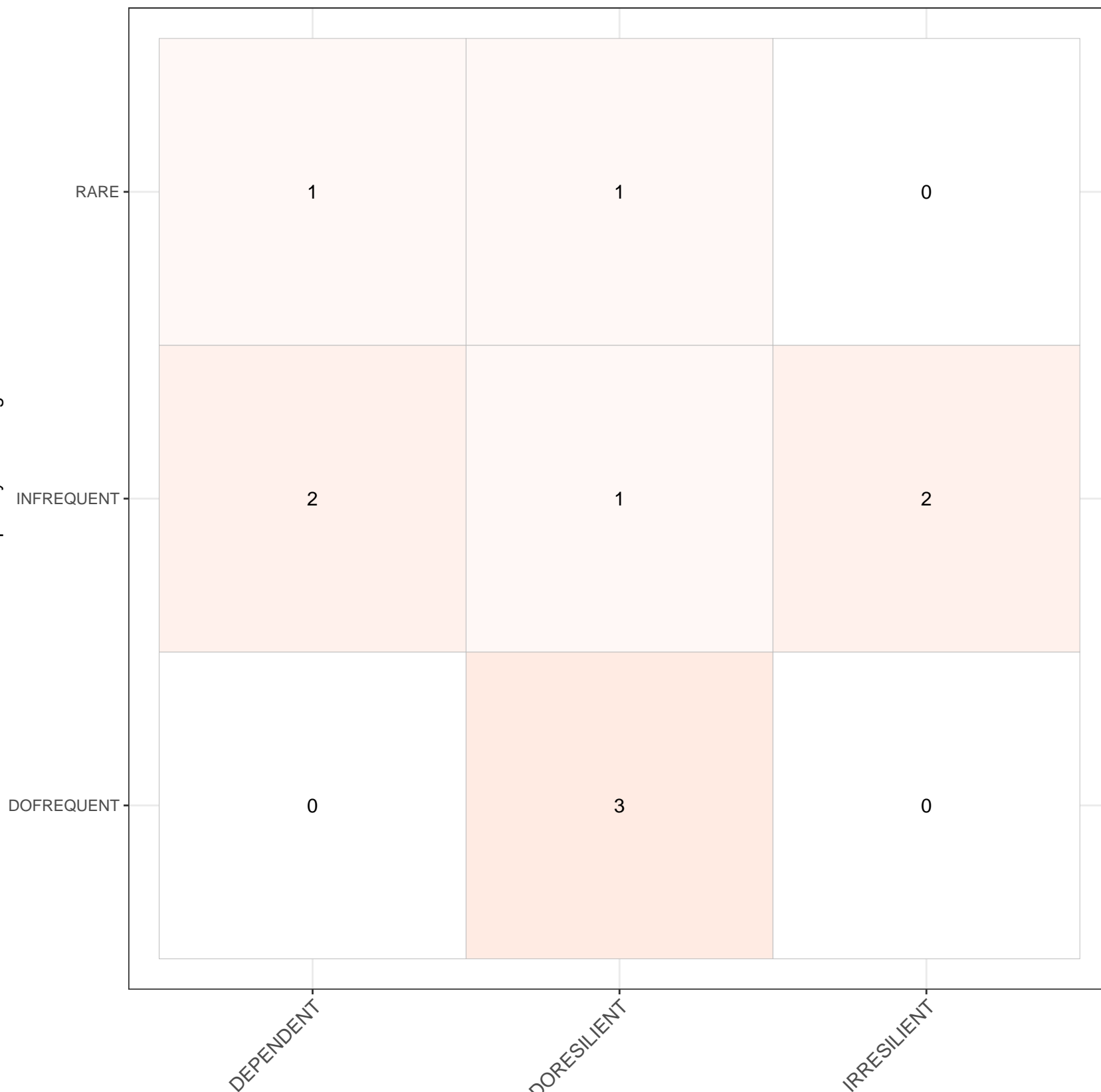
Frequency

20
10
0

I1.4.Overhead.of.Effects

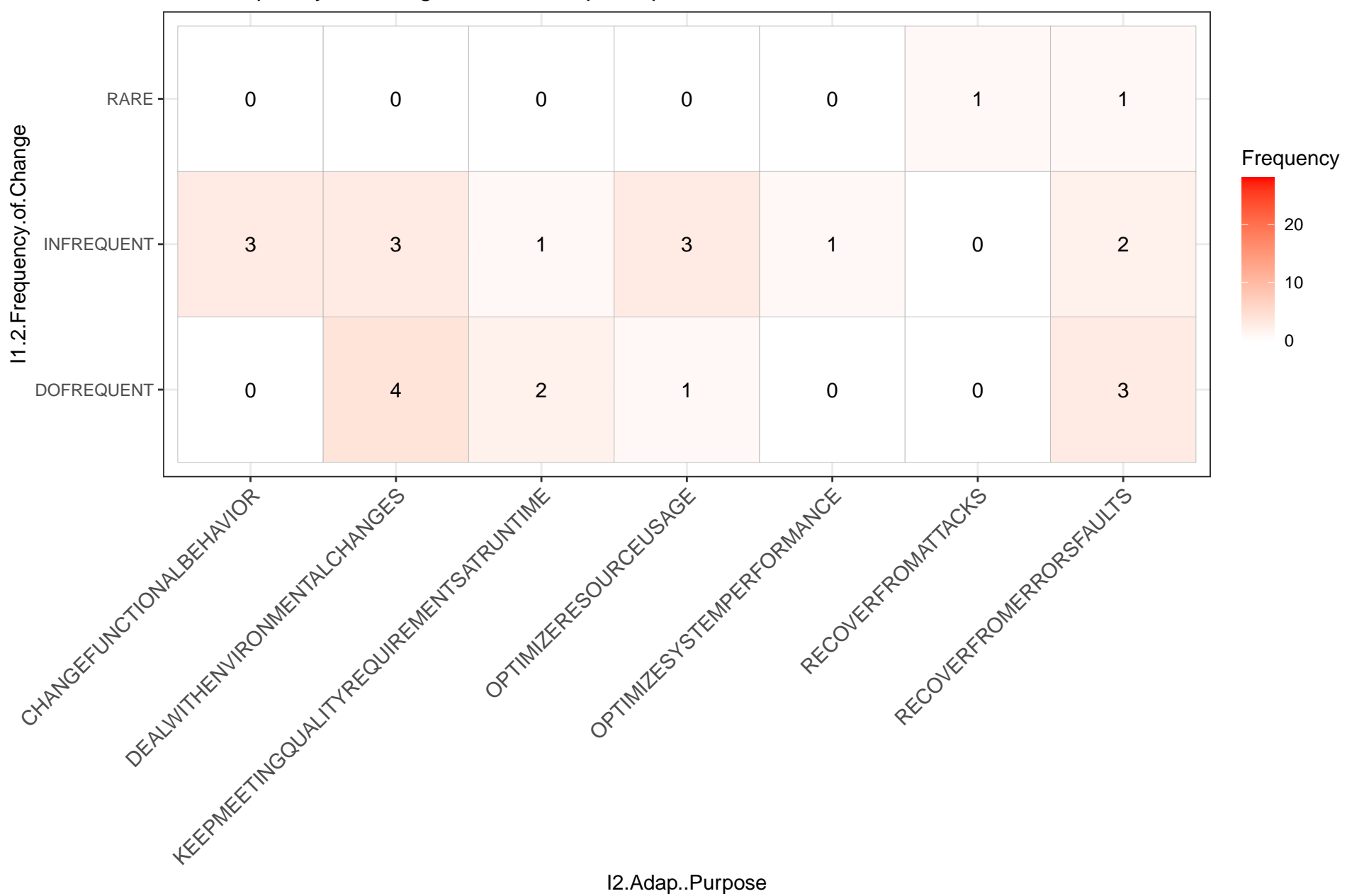
I1.2.Frequency.of.Change_____I1.4.Resilience.of.Effects

I1.2.Frequency.of.Change



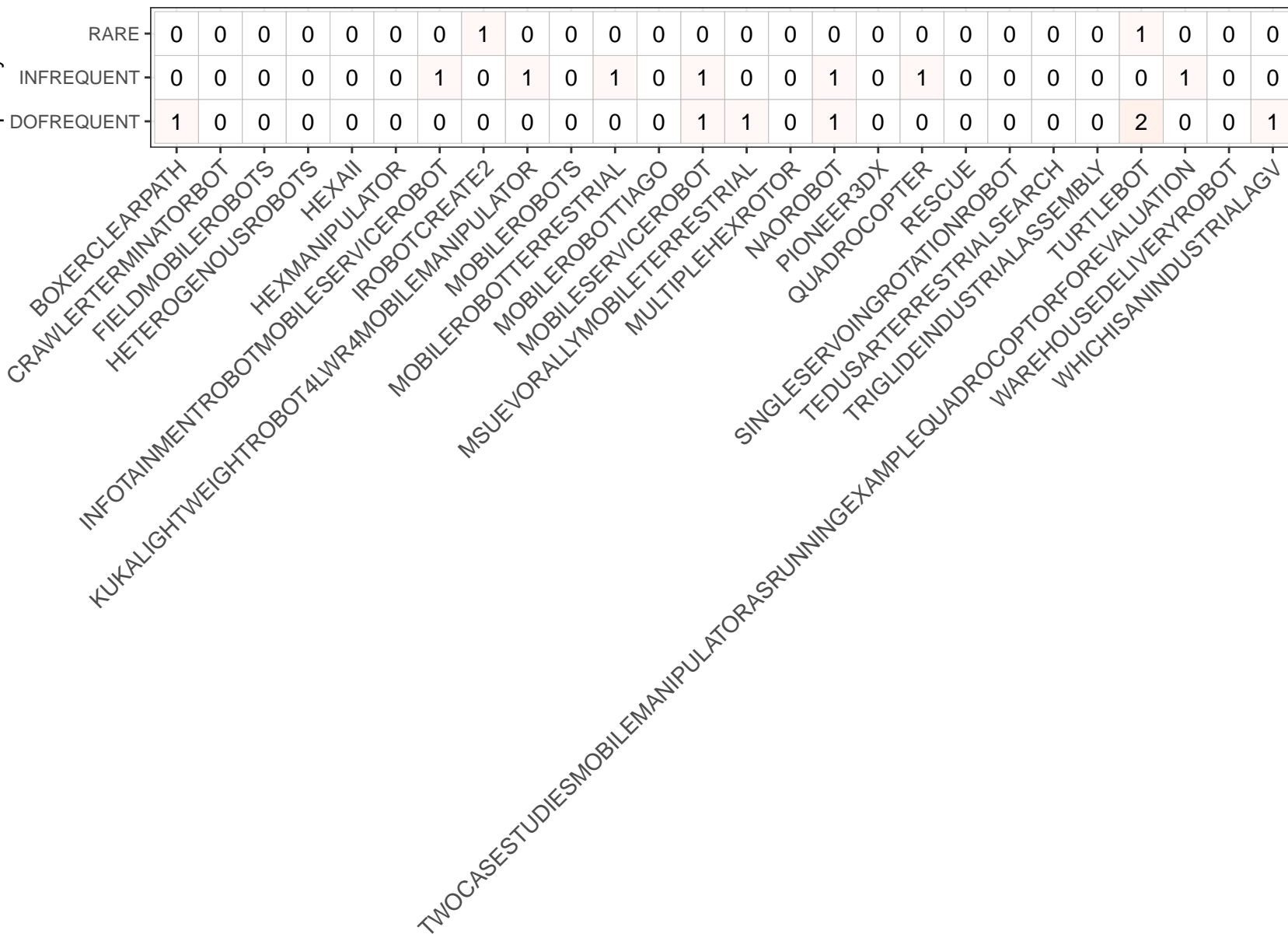
I1.4.Resilience.of.Effects

I1.2.Frequency.of.Change_____I2.Adap..Purpose



I1.2.Frequency.of.Change

I1.2.Frequency.of.Change_____I3.Robot.Type



Frequency

20

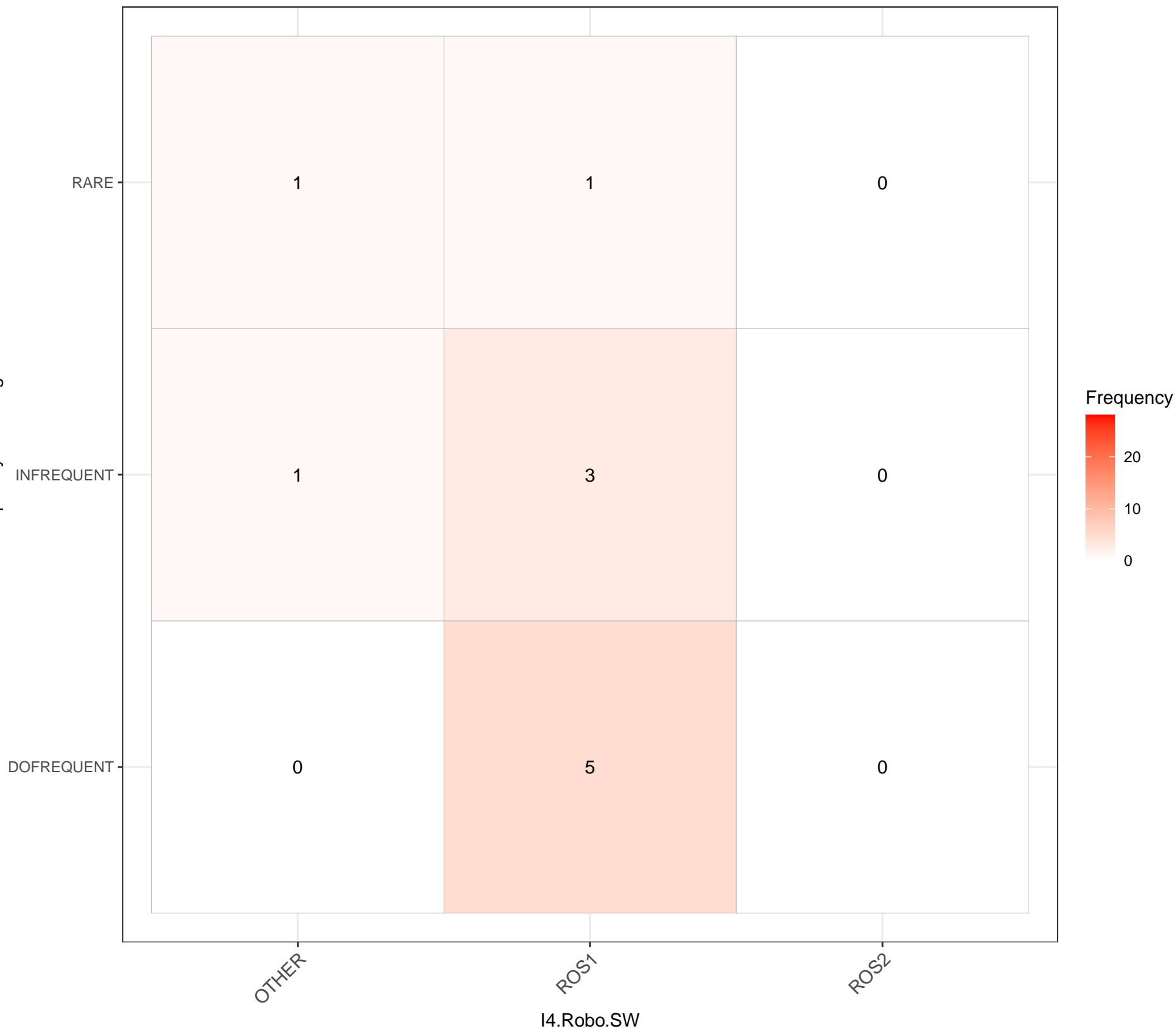
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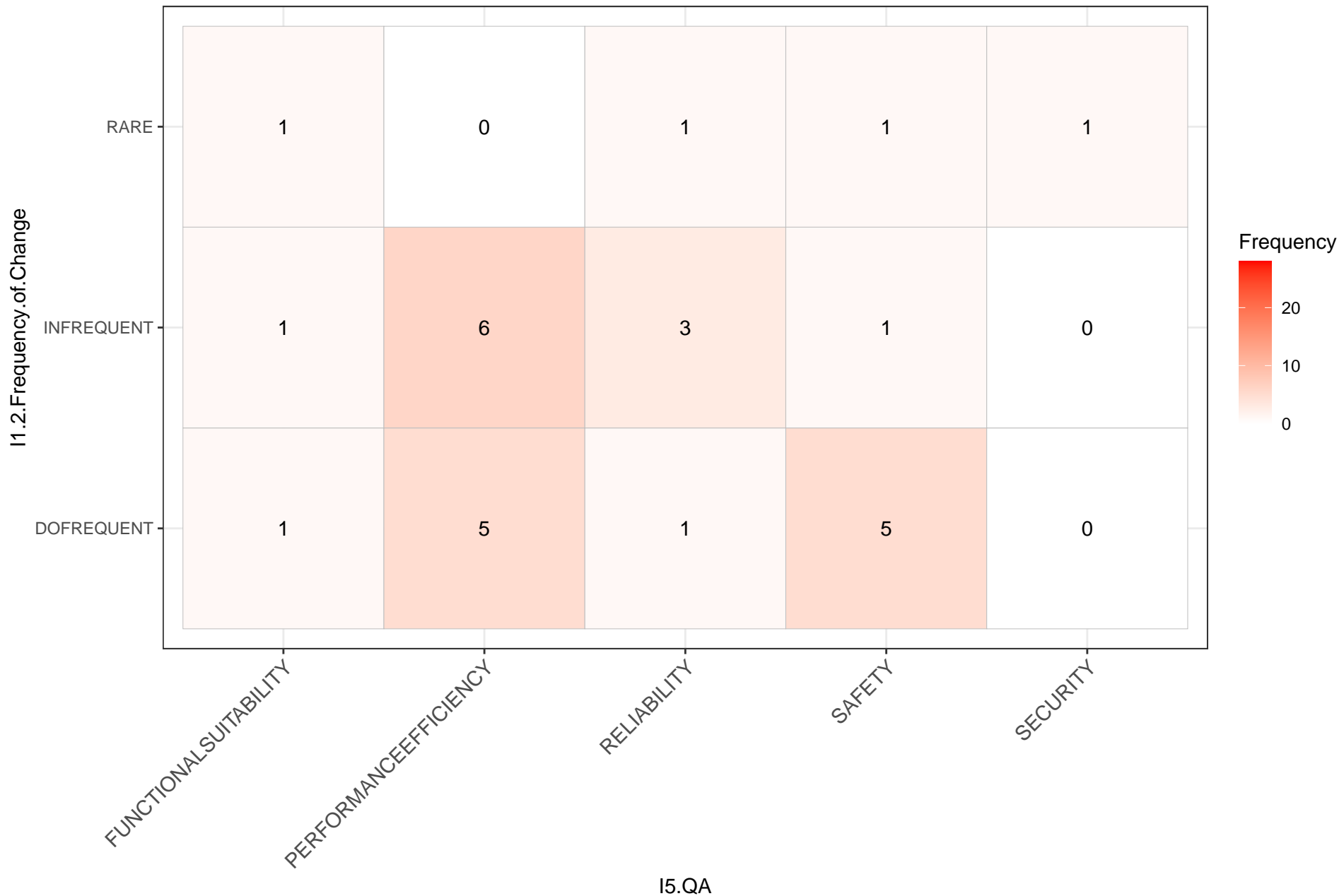
I3.Robot.Type

I1.2.Frequency.of.Change_____I4.Robo.SW

I1.2.Frequency.of.Change

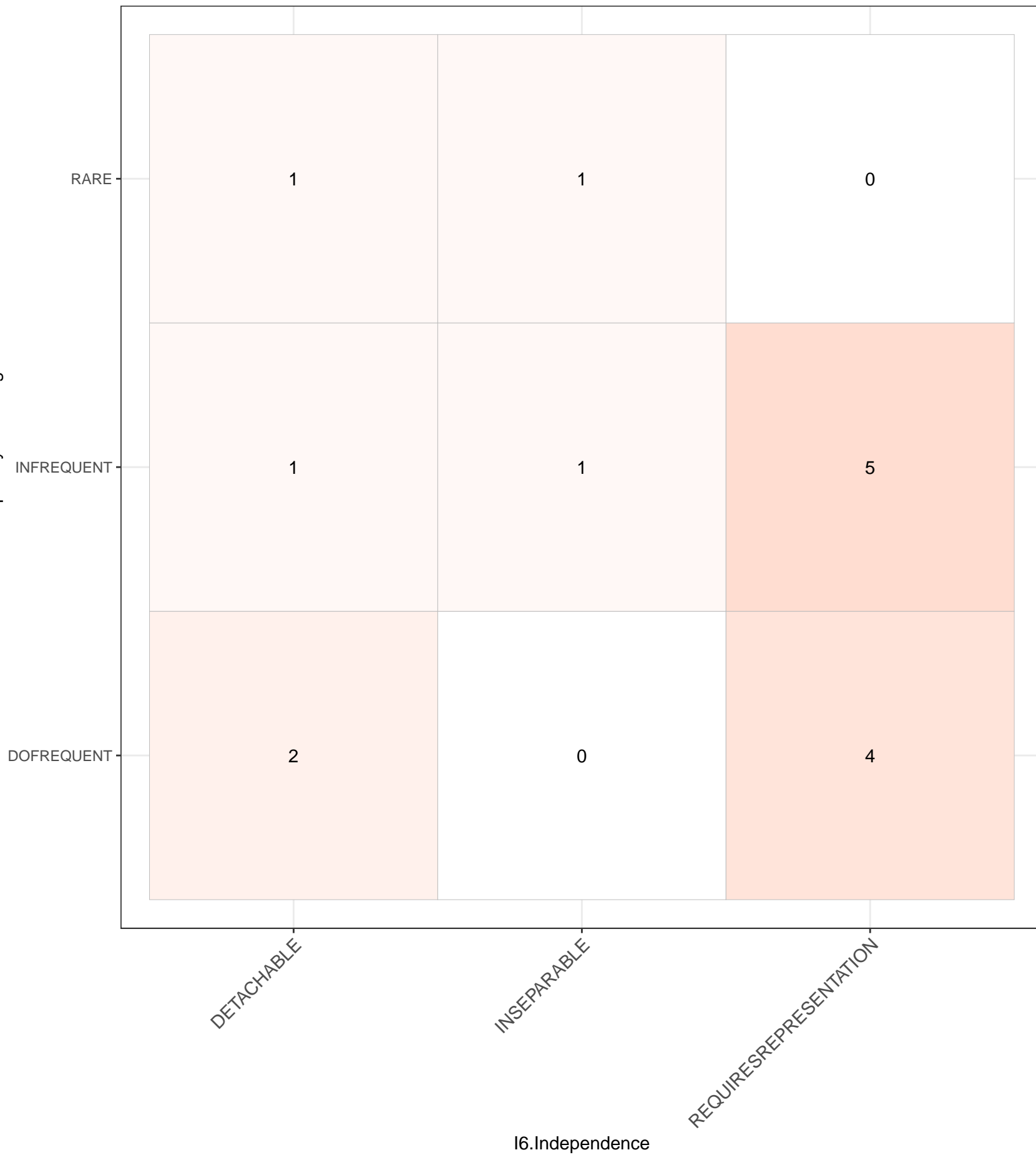


I1.2.Frequency.of.Change_____I5.QA

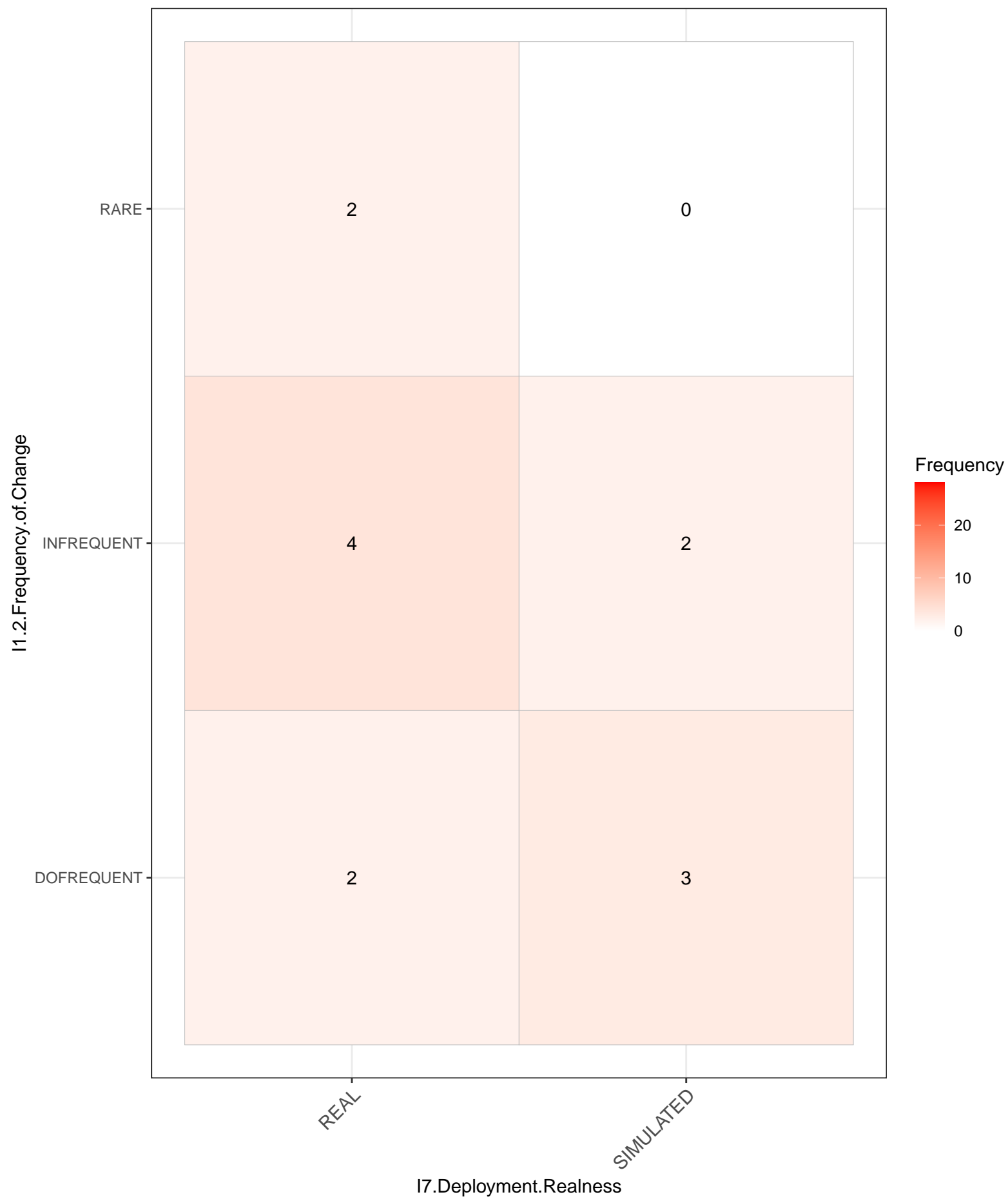


I1.2.Frequency.of.Change_____I6.Independence

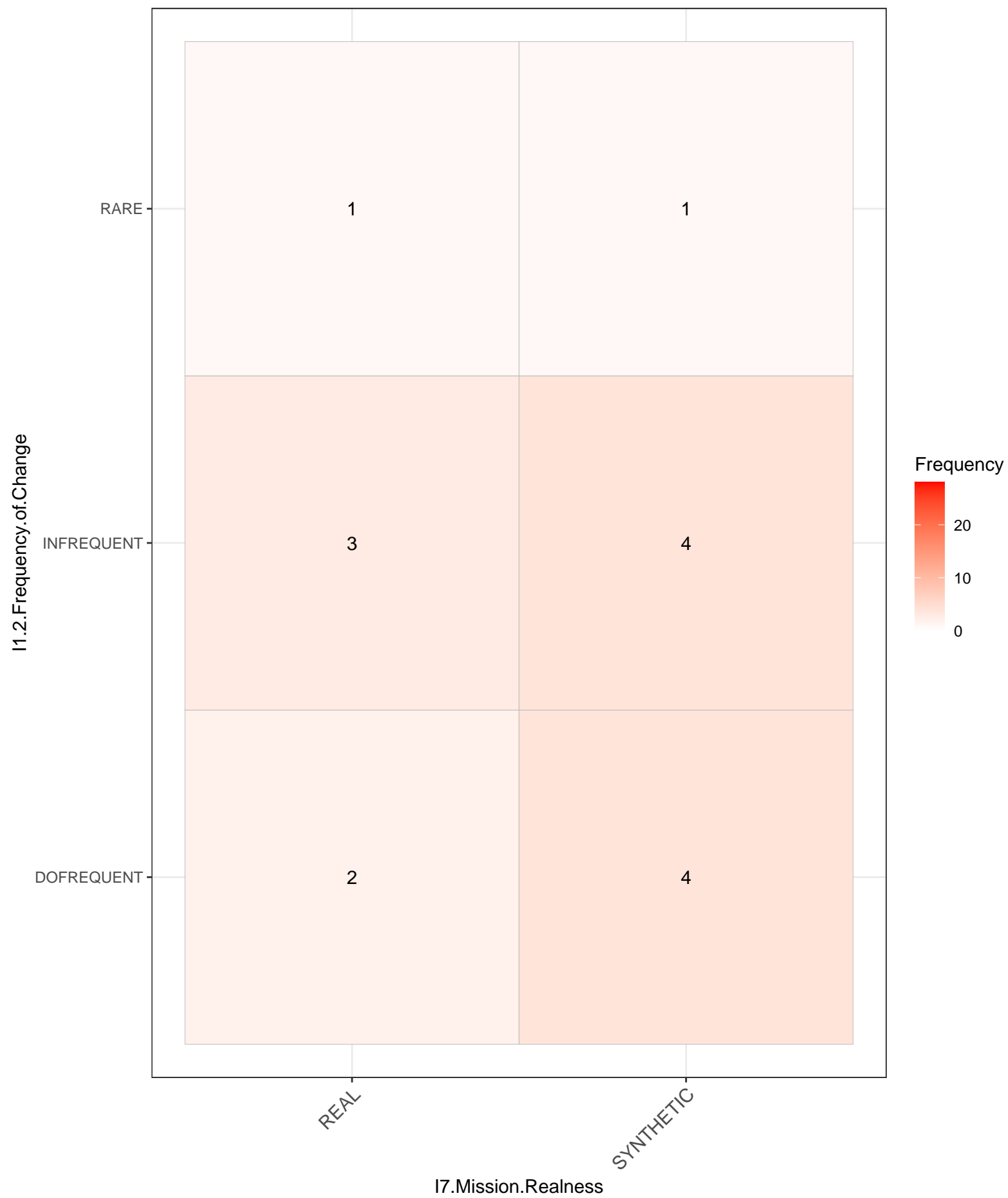
I1.2.Frequency.of.Change



I1.2.Frequency.of.Change_____I7.Deployment.Realness

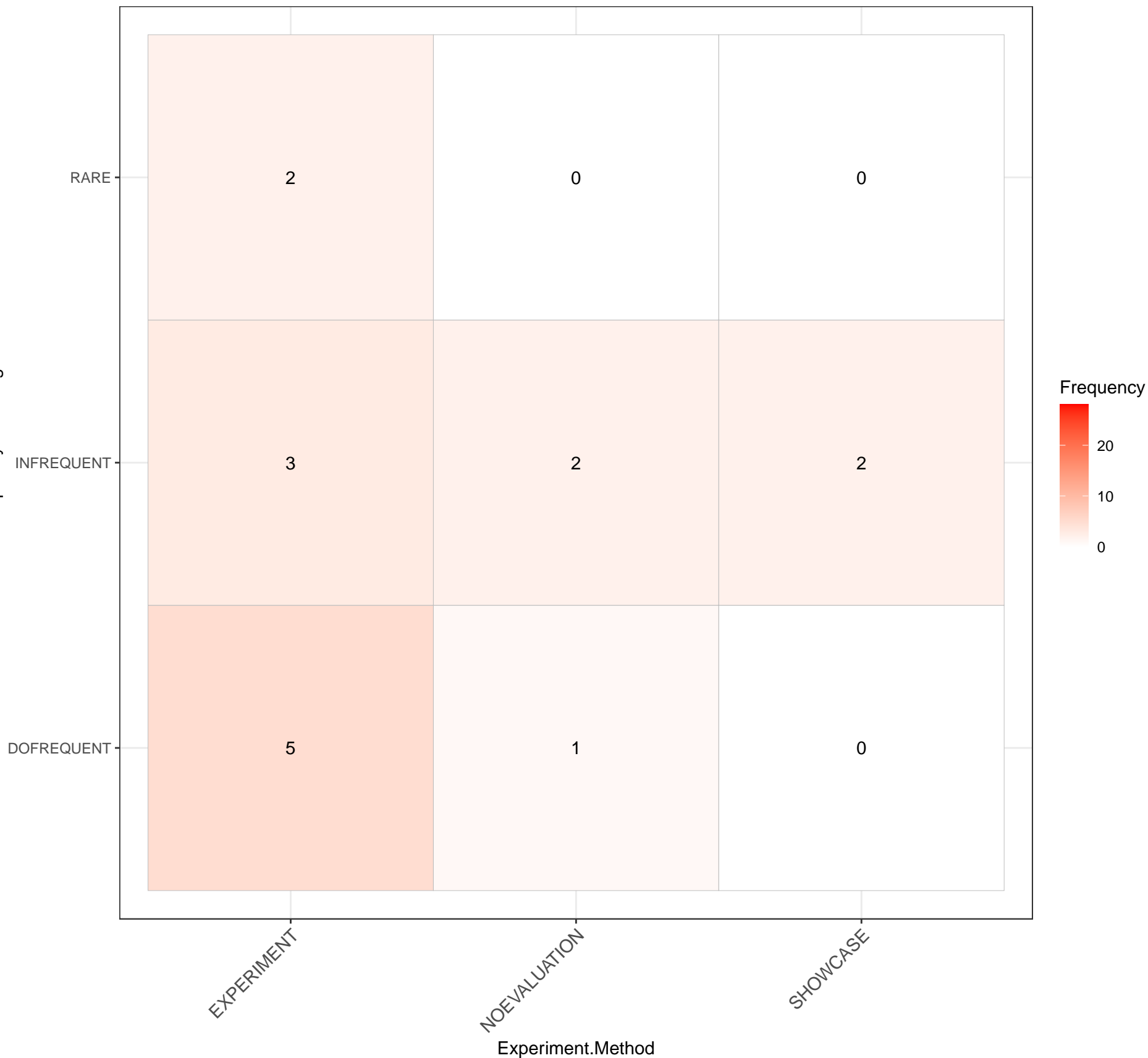


I1.2.Frequency.of.Change_____I7.Mission.Realness

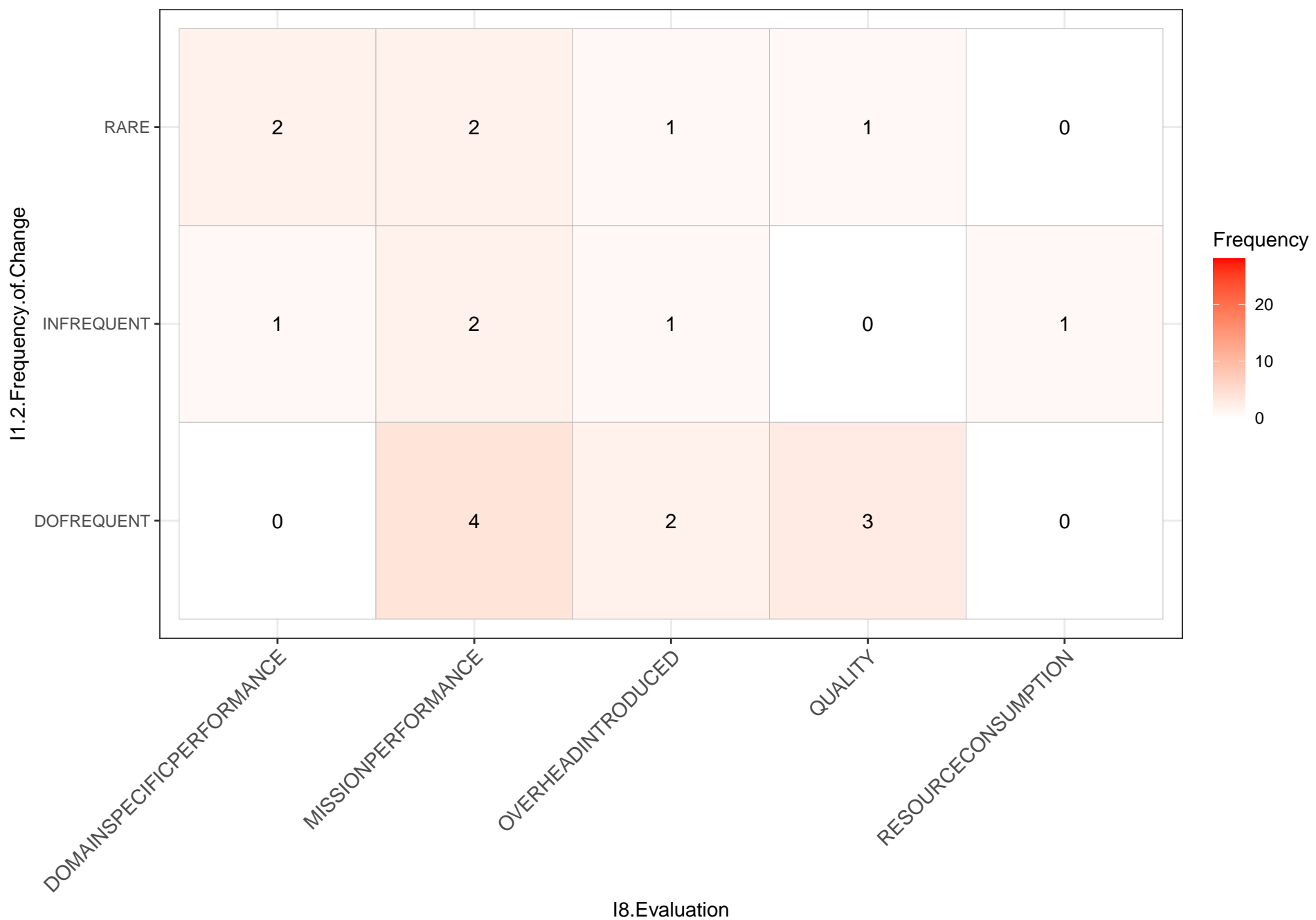


I1.2.Frequency.of.Change_____Experiment.Method

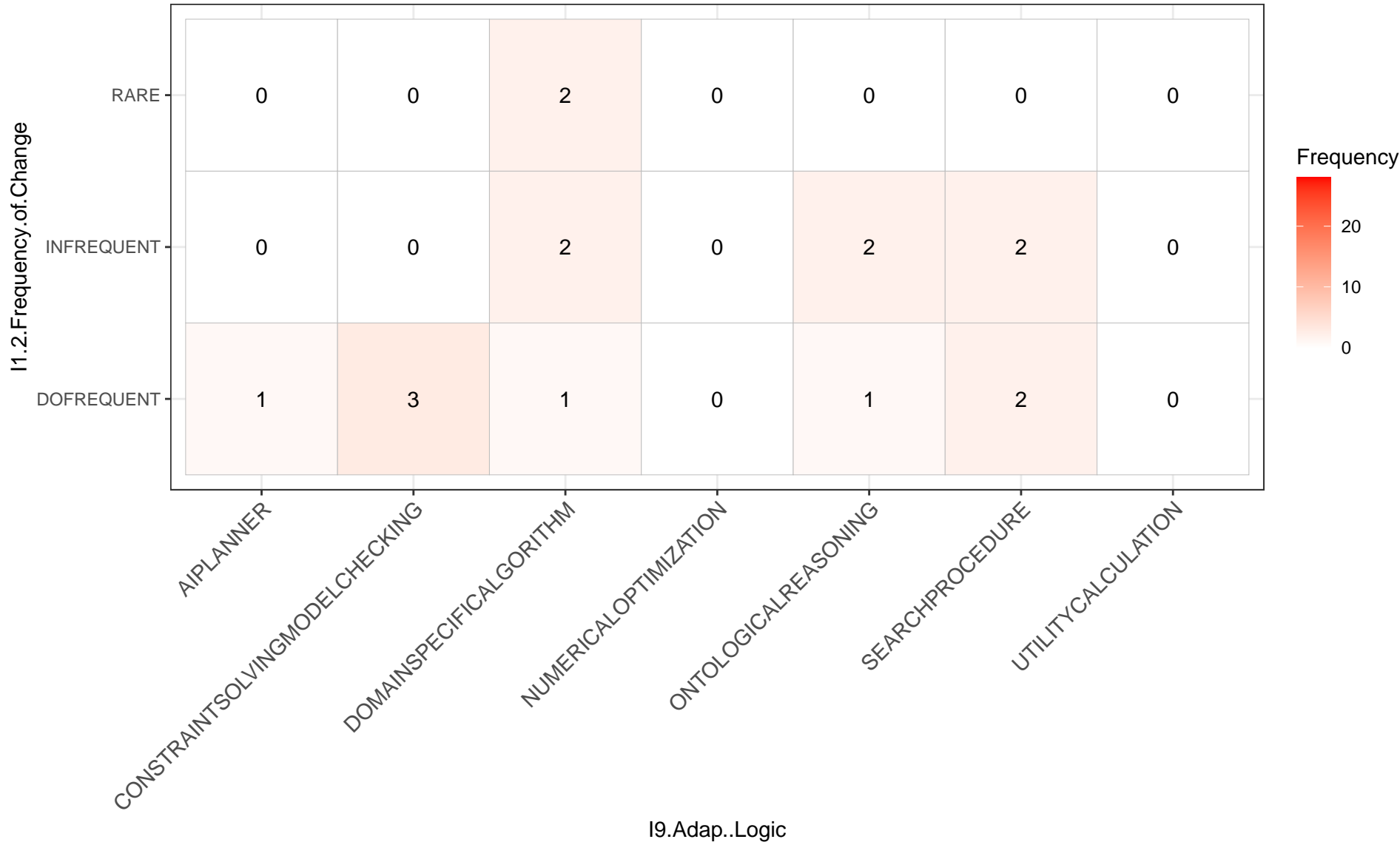
I1.2.Frequency.of.Change



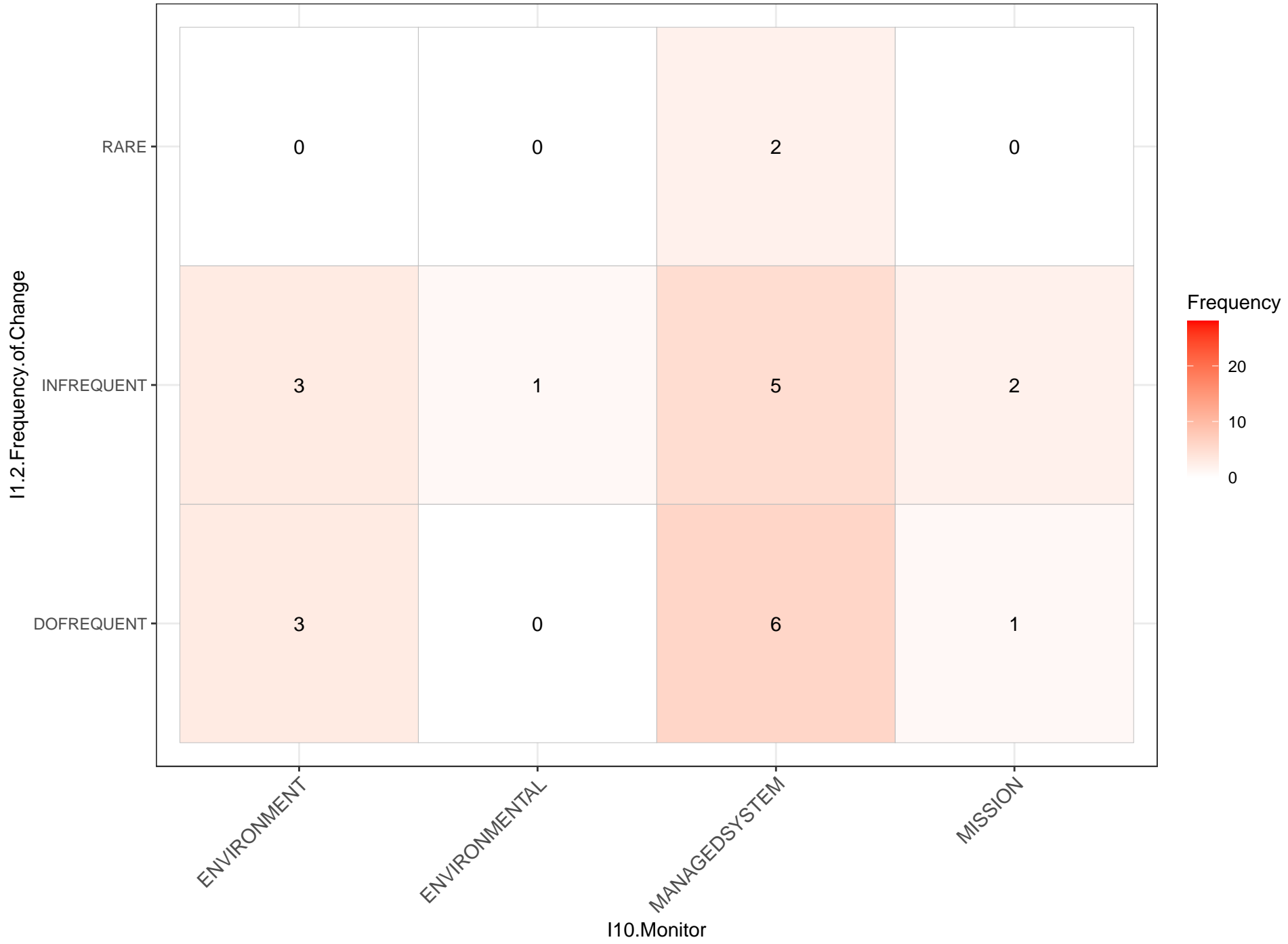
I1.2.Frequency.of.Change_____I8.Evaluation



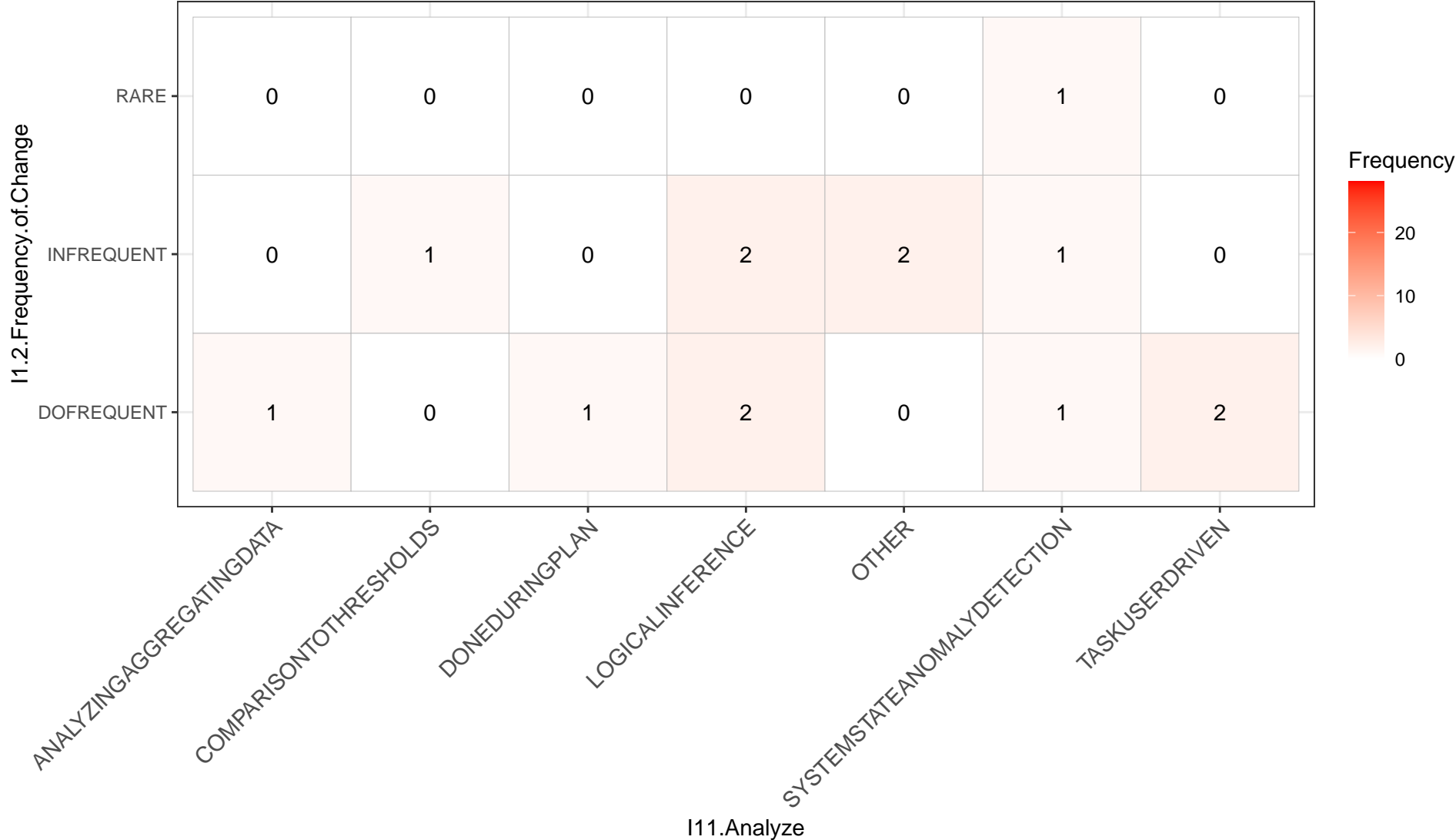
I1.2.Frequency.of.Change_____I9.Adap..Logic



I1.2.Frequency.of.Change_____I10.Monitor



I1.2.Frequency.of.Change_____I11.Analyze



I1.2.Frequency.of.Change_____I12.Plan

I1.2.Frequency.of.Change

RARE

INFREQUENT

DOFREQUENT

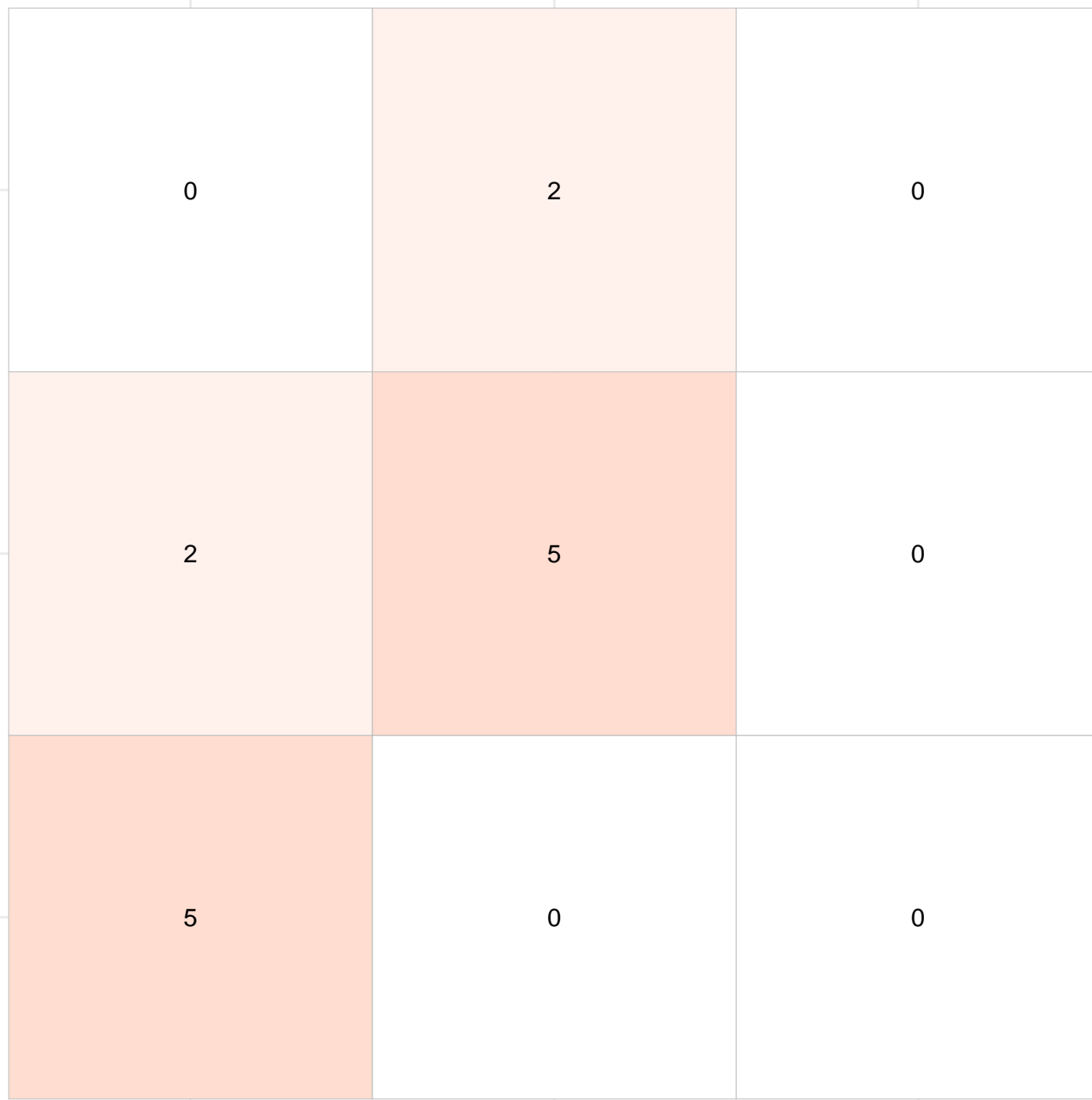
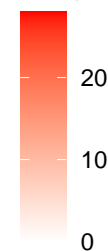
DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

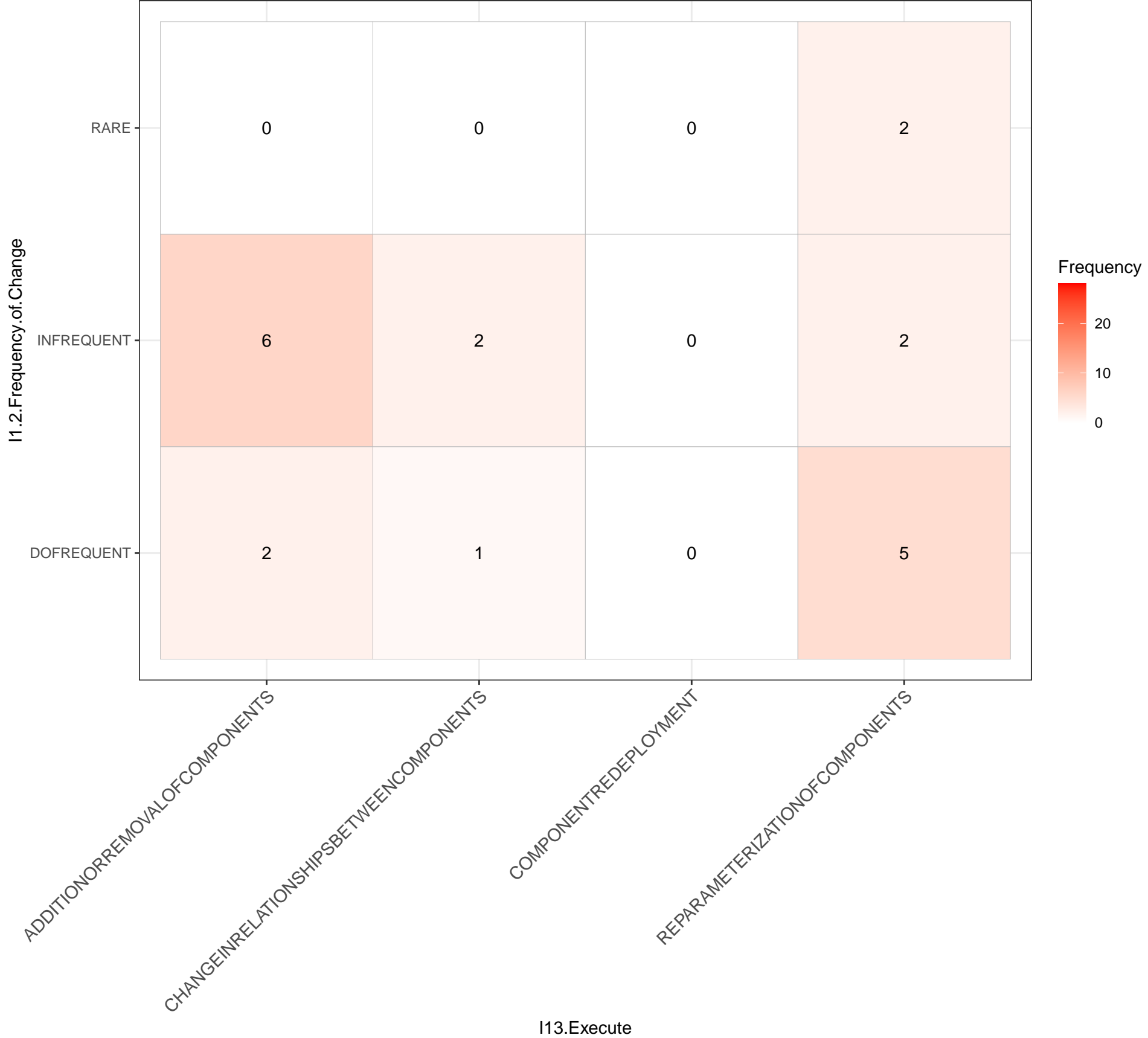
USINGAIPLANNINGLANGUAGES

I12.Plan

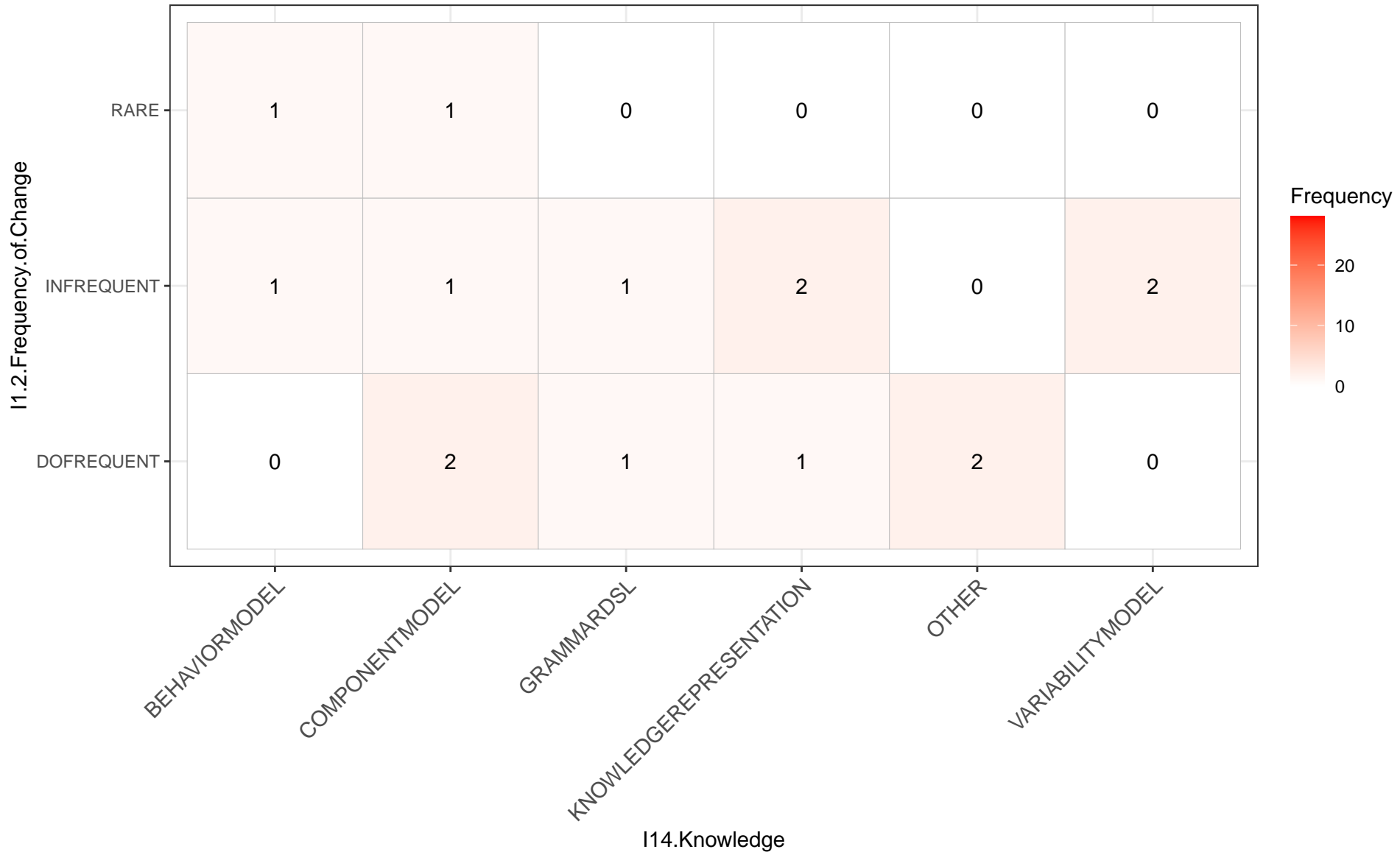
Frequency



I1.2.Frequency.of.Change_____I13.Execute



I1.2.Frequency.of.Change_____I14.Knowledge



I1.3.Type.of.Mechanism_____I1.3.Organization.of.Mechanism

I1.3.Type.of.Mechanism

STRUCTURAL

3

21

PARAMETRIC

1

17

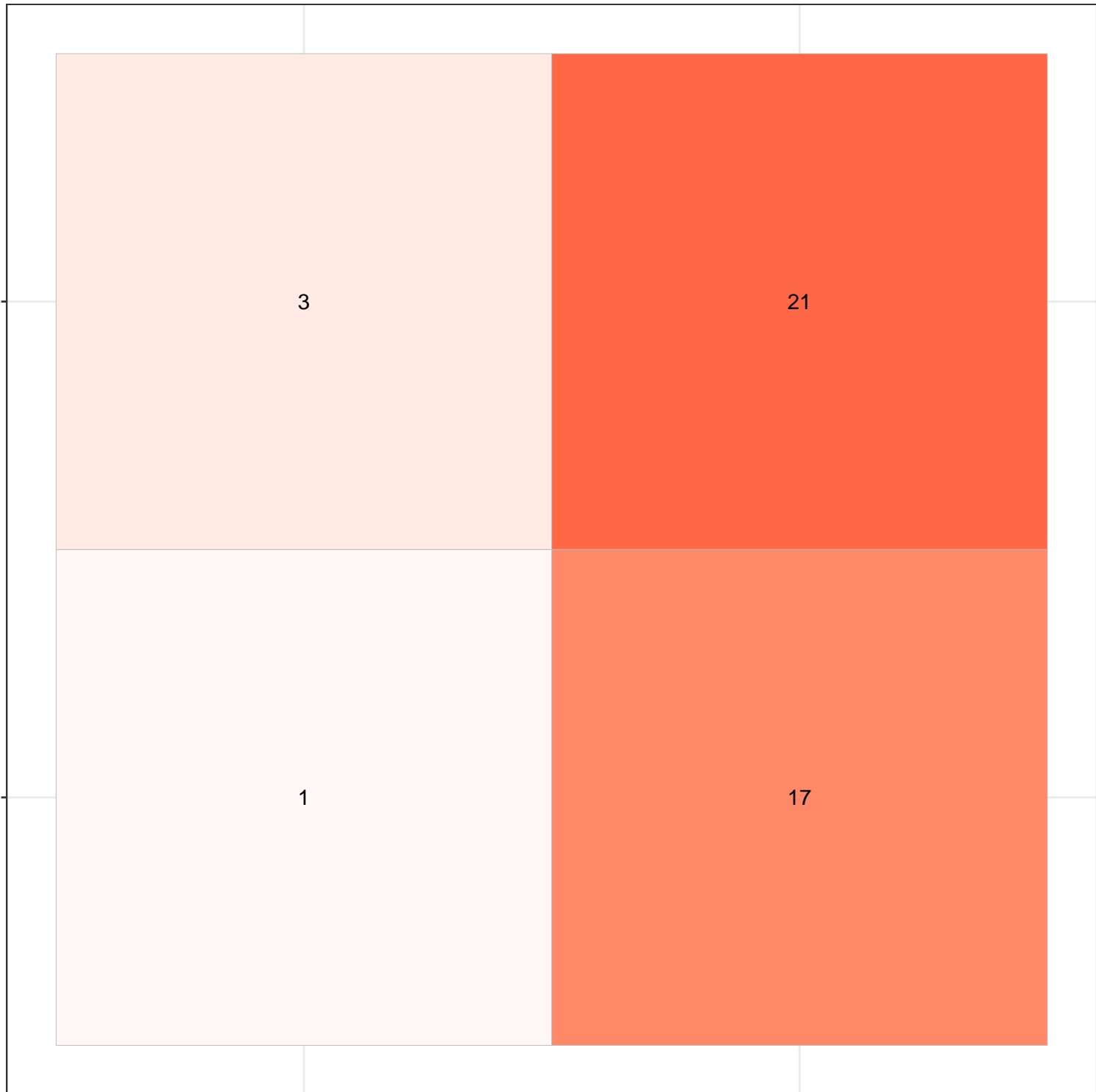
DECENTRALIZED

DOCENTRALIZED

I1.3.Organization.of.Mechanism

Frequency

20
10
0



I1.3.Type.of.Mechanism_____I1.3.Scope.of.Mechanism

I1.3.Type.of.Mechanism

STRUCTURAL

7

20

PARAMETRIC

7

16

GLOBAL

LOCAL

I1.3.Scope.of.Mechanism

Frequency



I1.3.Type.of.Mechanism____I1.3.Duration.of.Mechanism

I1.3.Type.of.Mechanism

STRUCTURAL

17

1

3

PARAMETRIC

12

0

4

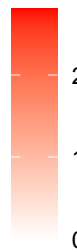
DOSHORT

MEDIUM

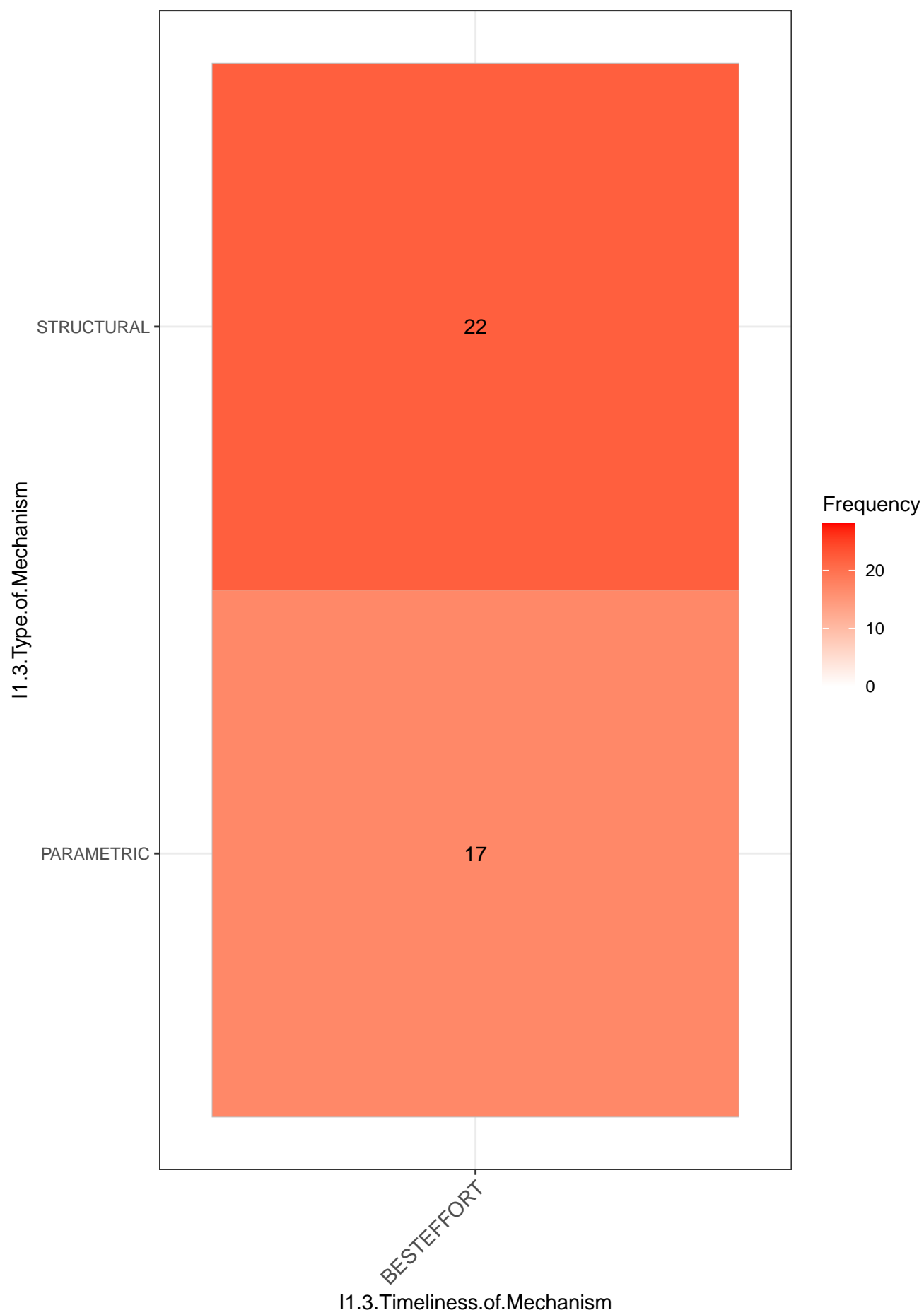
VERYSHORT

I1.3.Duration.of.Mechanism

Frequency



I1.3.Type.of.Mechanism_____I1.3.Timeliness.of.Mechanism



I1.3.Type.of.Mechanism_____I1.3.Trigger.of.Mechanism

I1.3.Type.of.Mechanism

STRUCTURAL

23

1

PARAMETRIC

15

2

EVENTTRIGGER

TIMETRIGGER

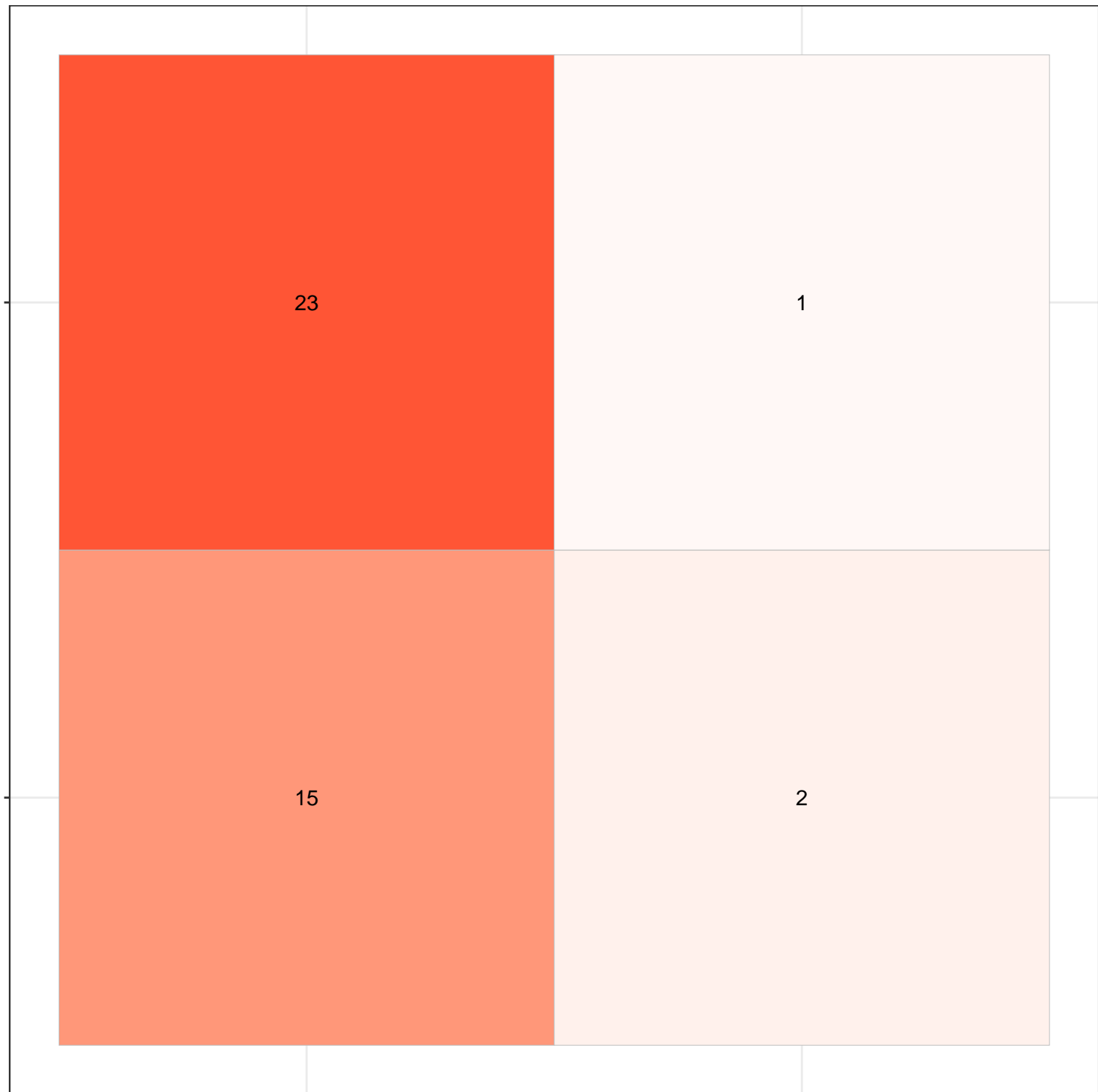
I1.3.Trigger.of.Mechanism

Frequency

20

10

0



I1.3.Type.of.Mechanism____I1.4.Criticality.of.Effects

I1.3.Type.of.Mechanism

STRUCTURAL

17

5

PARAMETRIC

12

4

MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

Frequency

20

10

0

I1.3.Type.of.Mechanism_____I1.4.Predictability.of.Effects

I1.3.Type.of.Mechanism

STRUCTURAL

8

14

PARAMETRIC

5

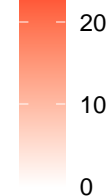
13

DODETERMINISTIC

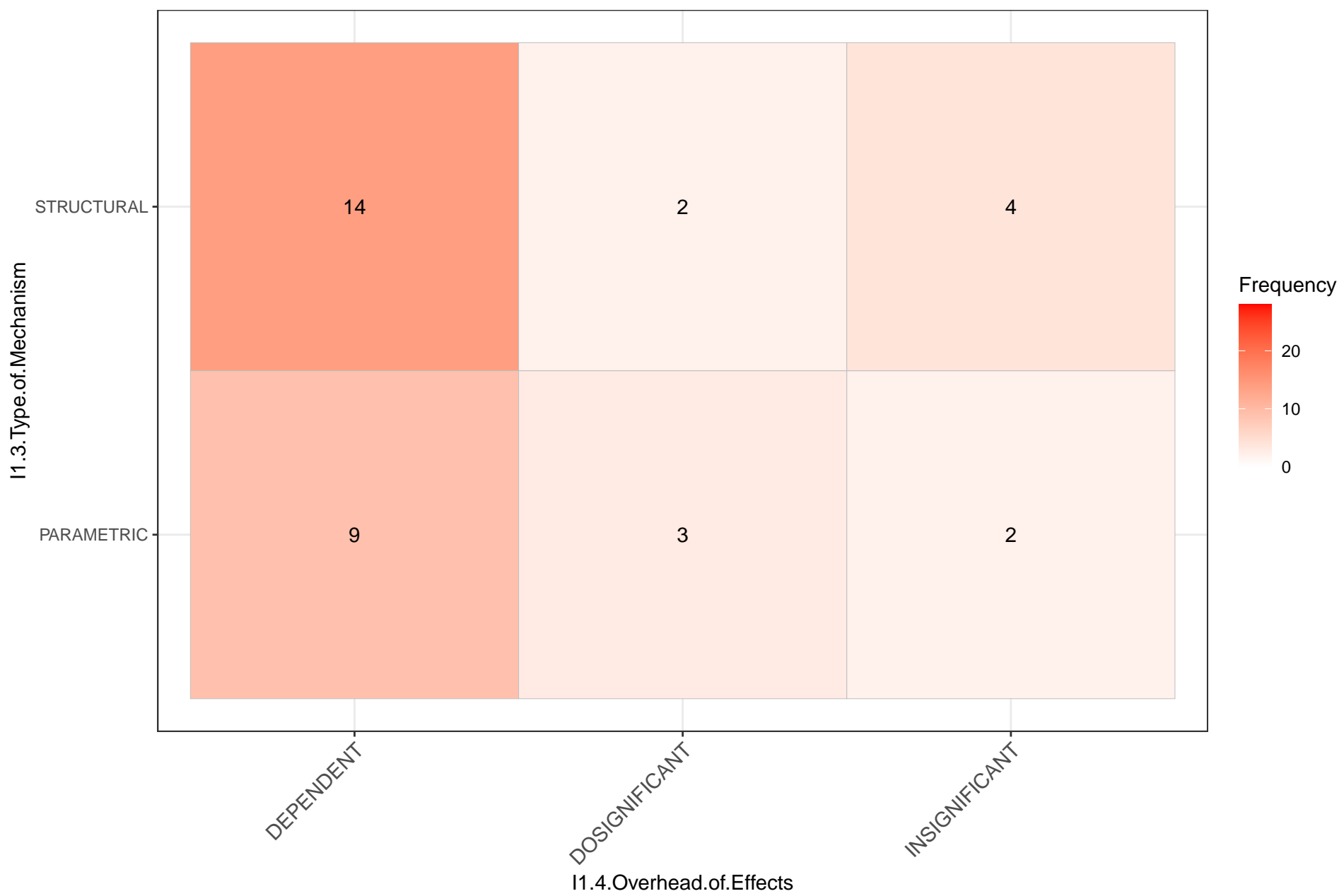
NONDETERMINISTIC

I1.4.Predictability.of.Effects

Frequency



I1.3.Type.of.Mechanism_____I1.4.Overhead.of.Effects



I1.3.Type.of.Mechanism_____I1.4.Resilience.of.Effects

I1.3.Type.of.Mechanism

STRUCTURAL

PARAMETRIC

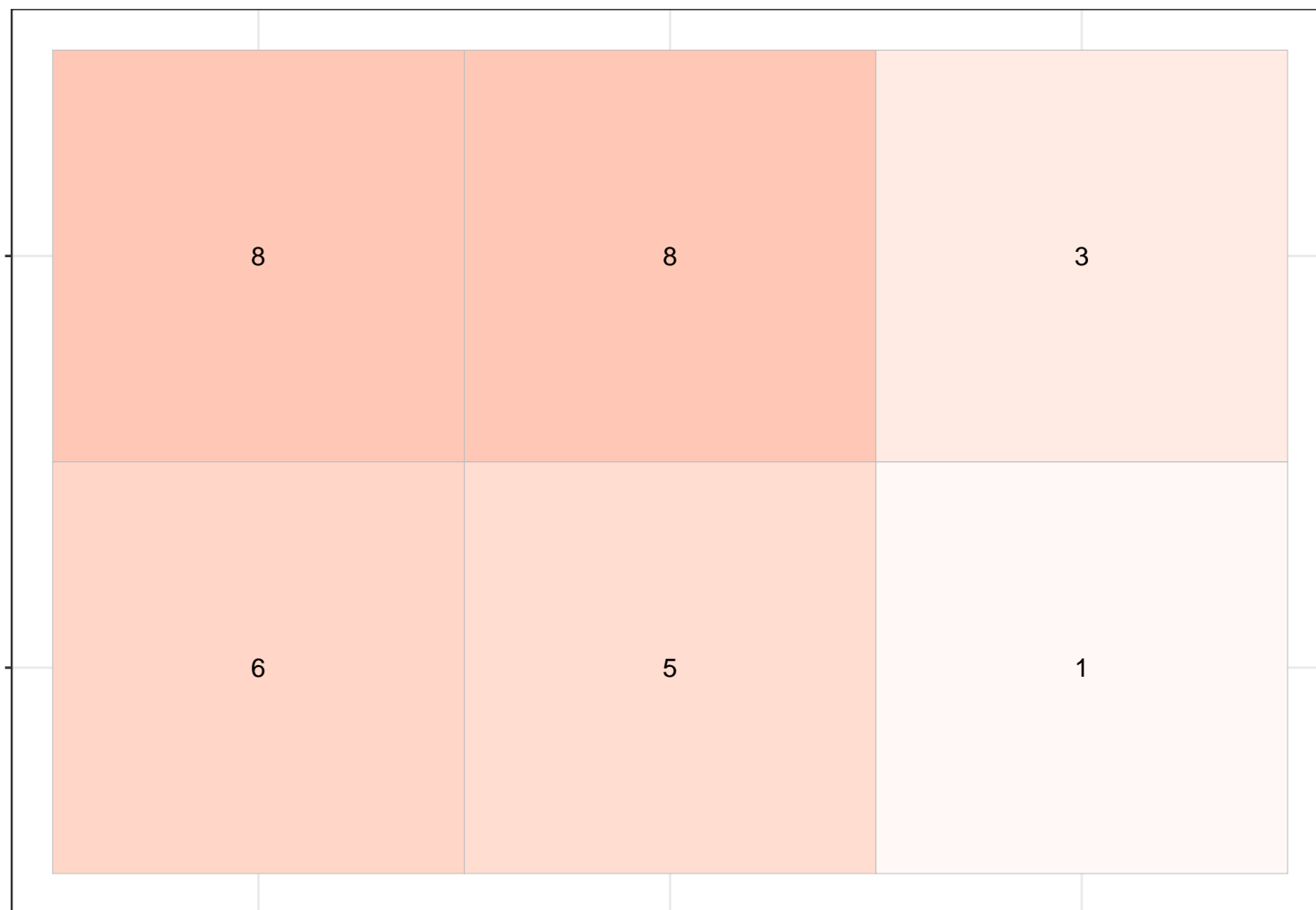
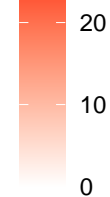
DEPENDENT

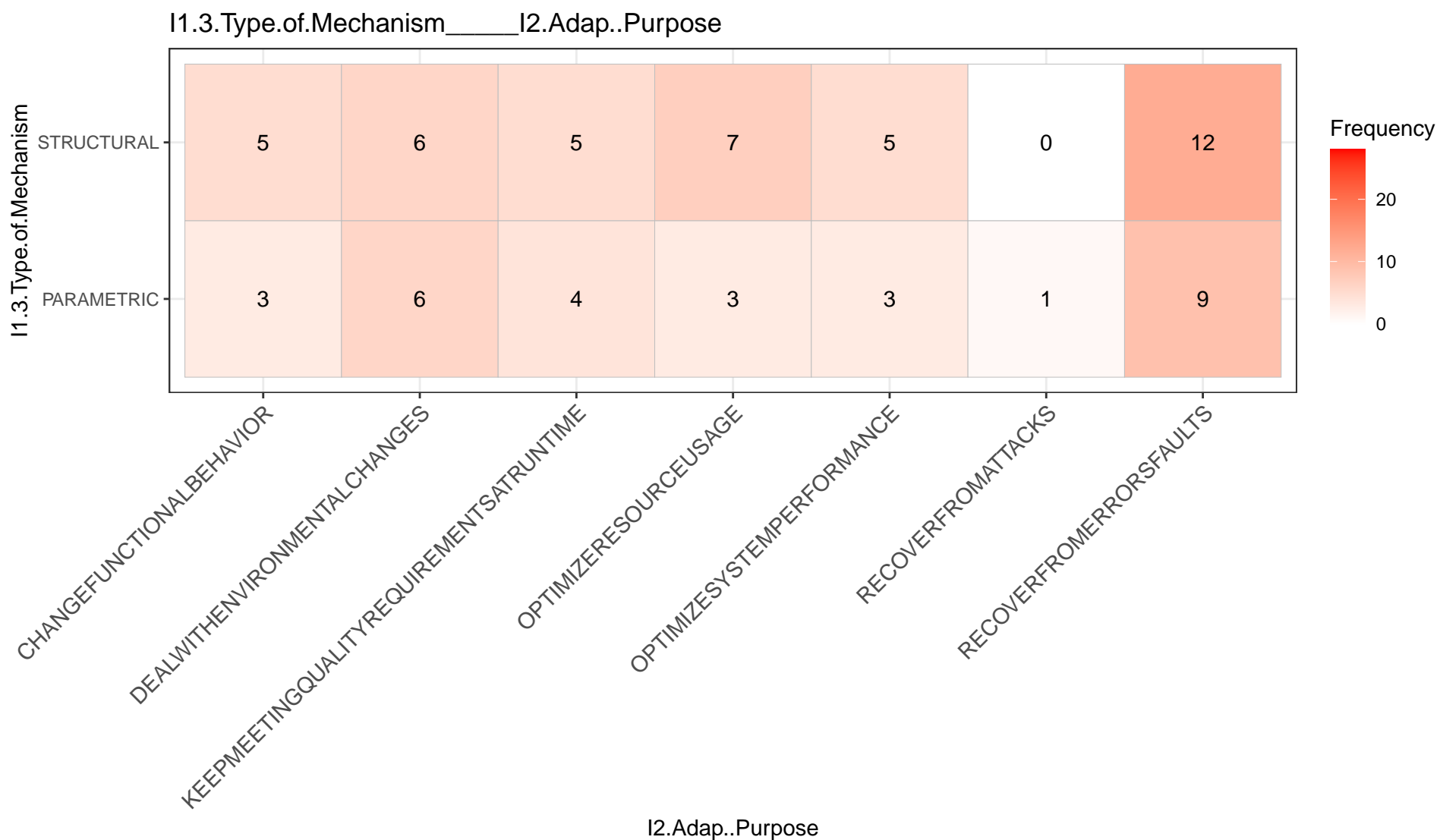
DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects

Frequency





I1.3.Type.of.Mechanism

I1.3.Type.of.Mechanism_____I3.Robot.Type

I3.Type	STRUCTURAL	1	1	1	2	1	2	1	0	1	1	1	1	2	0	1	2	0	1	1	1	1	4	1	1	1
	PARAMETRIC	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
	BOXERCLEARPATH	CRAWLERTERMINATORBOT	FIELDMOBILEROBOTS	HETEROGENOUSROBOTS	HEXAII	HEXMANIPULATOR	MOBILESERVICEROBOT	IROBOTCREATE2	MOBILEROBOTMANIPULATOR	MOBILEROBOTS	MOBILERTERRESTRIAL	MOBILEROBOTTIAGO	MOBILESERVICEROBOT	MULTIPLEHERESTRIAL	NAOROBOT	PIONEER3DX	QUADROCOPTER	RESCUE	SINGLESERVINGROTATIONROBOT	TEDUSARTERRESTRIALSEARCH	TRIGLIDEINDUSTRIALASSEMBLY	TURTLEBOT	WAREHOUSEDELIVERYROBOT	WHICHISANINDUSTRIALAGV	TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION	

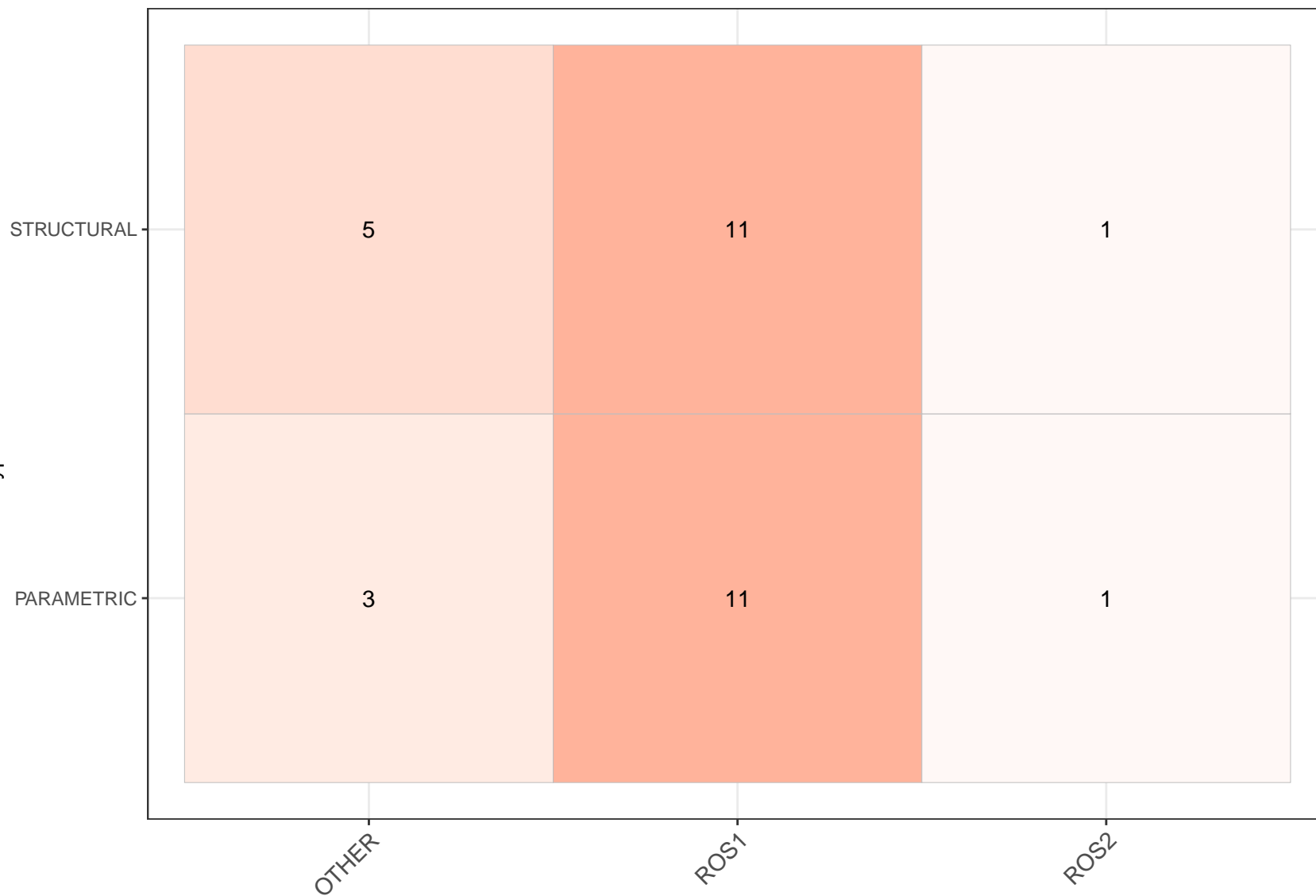
Frequency



I3.Robot.Type

I1.3.Type.of.Mechanism____I4.Robo.SW

I1.3.Type.of.Mechanism



PARAMETRIC

OTHER

ROS1
I4.Robo.SW

ROS2

Frequency

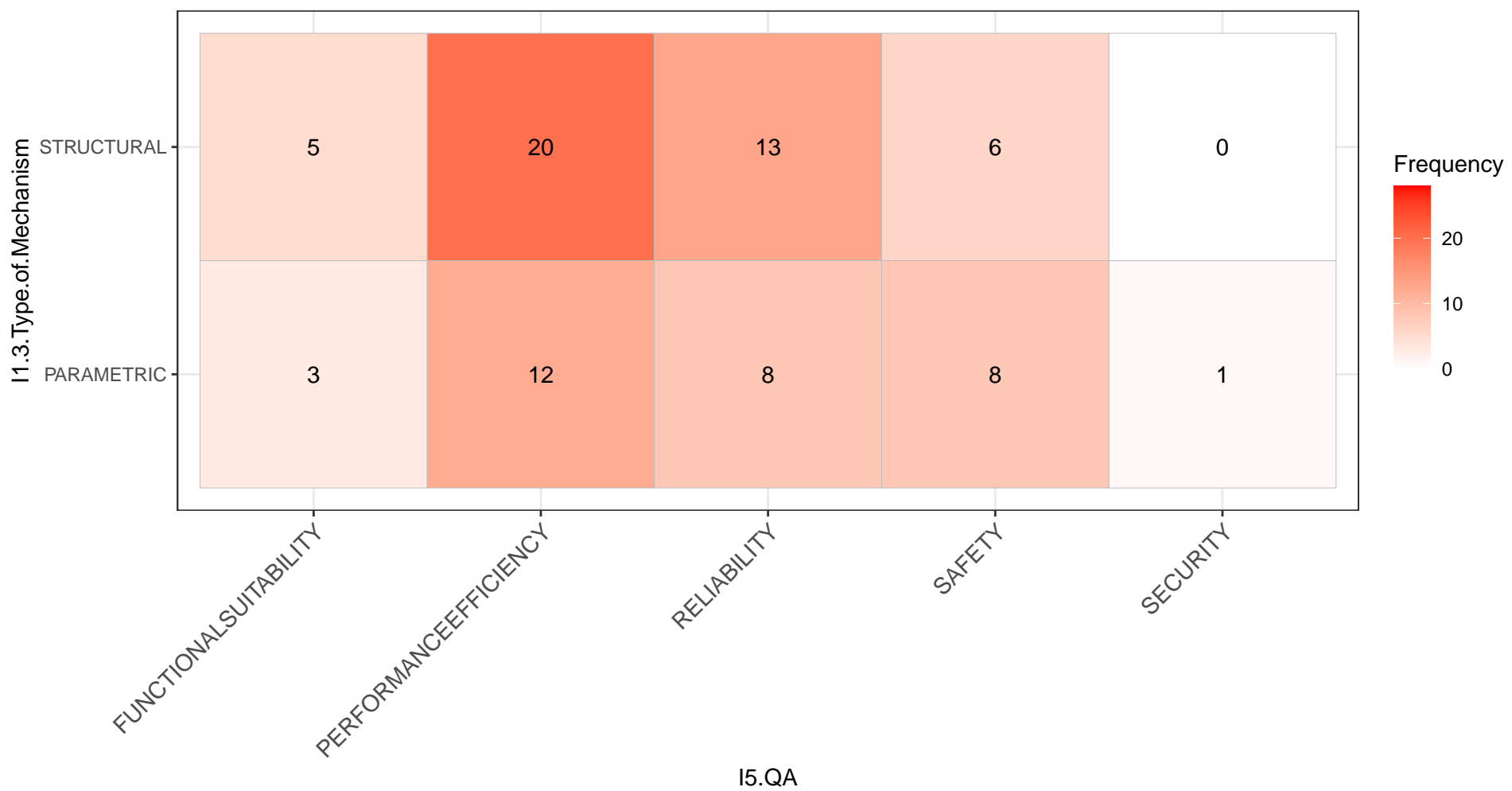


20

10

0

I1.3.Type.of.Mechanism_____I5.QA



I1.3.Type.of.Mechanism_____I6.Independence

I1.3.Type.of.Mechanism

STRUCTURAL

PARAMETRIC

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

Frequency



20

10

0

8

1

15

5

3

10

I1.3.Type.of.Mechanism____I7.Deployment.Realness

I1.3.Type.of.Mechanism

STRUCTURAL

PARAMETRIC

REAL

SIMULATED

I7.Deployment.Realness

Frequency



20

10

0

11

9

9

7

I1.3.Type.of.Mechanism____I7.Mission.Realness

I1.3.Type.of.Mechanism

STRUCTURAL

13

11

PARAMETRIC

7

11

REAL

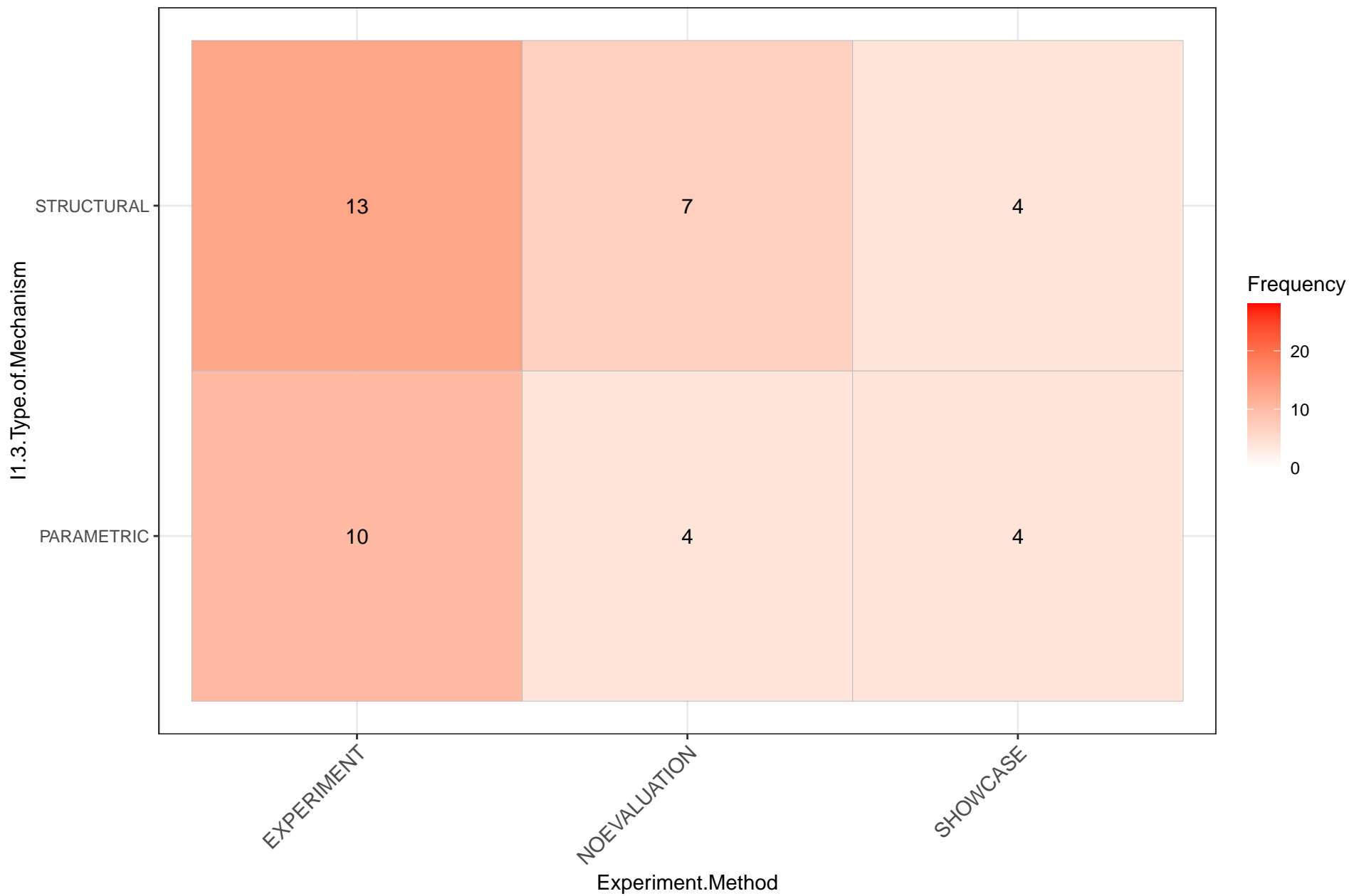
SYNTHETIC

I7.Mission.Realness

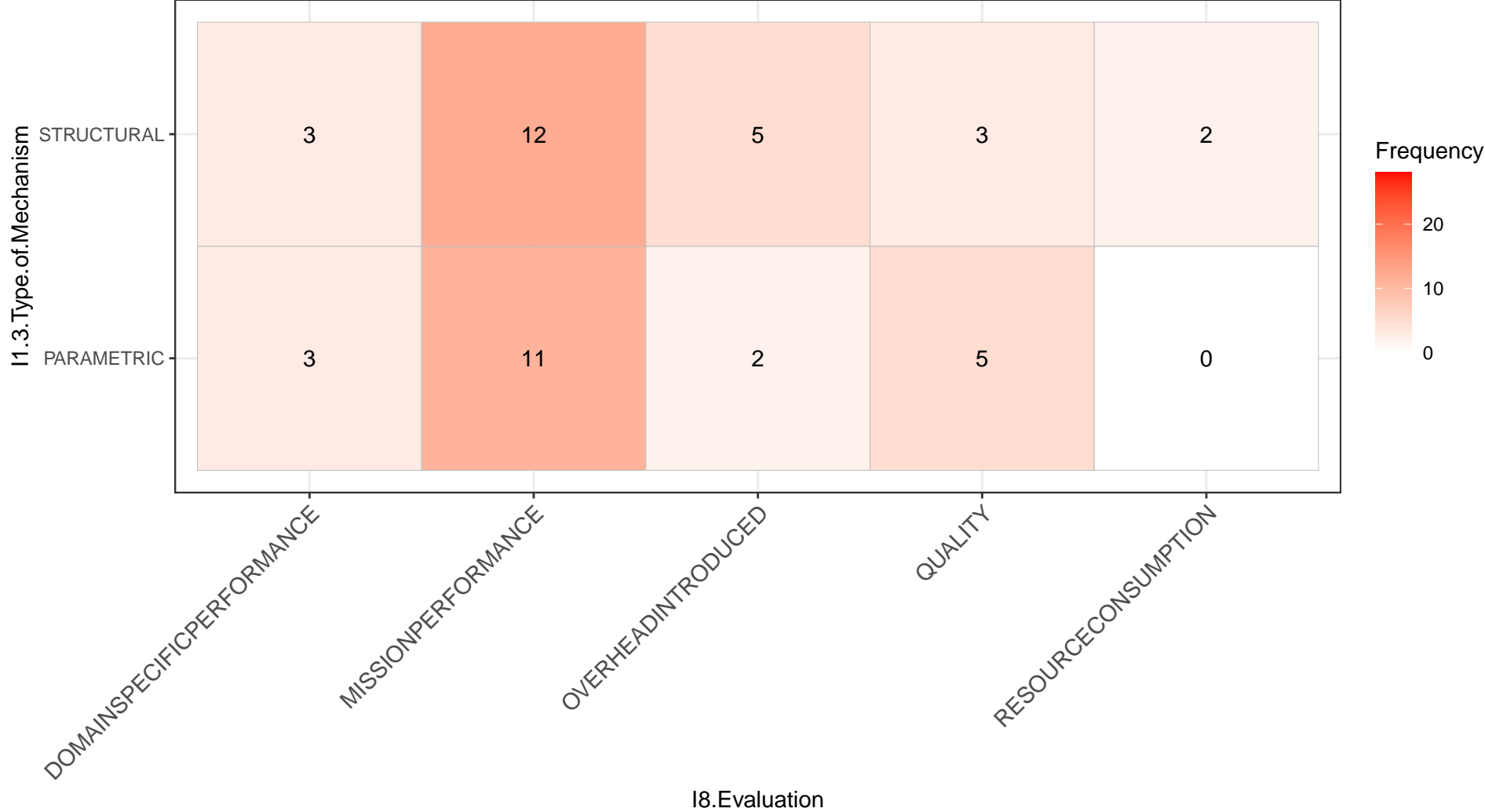
Frequency



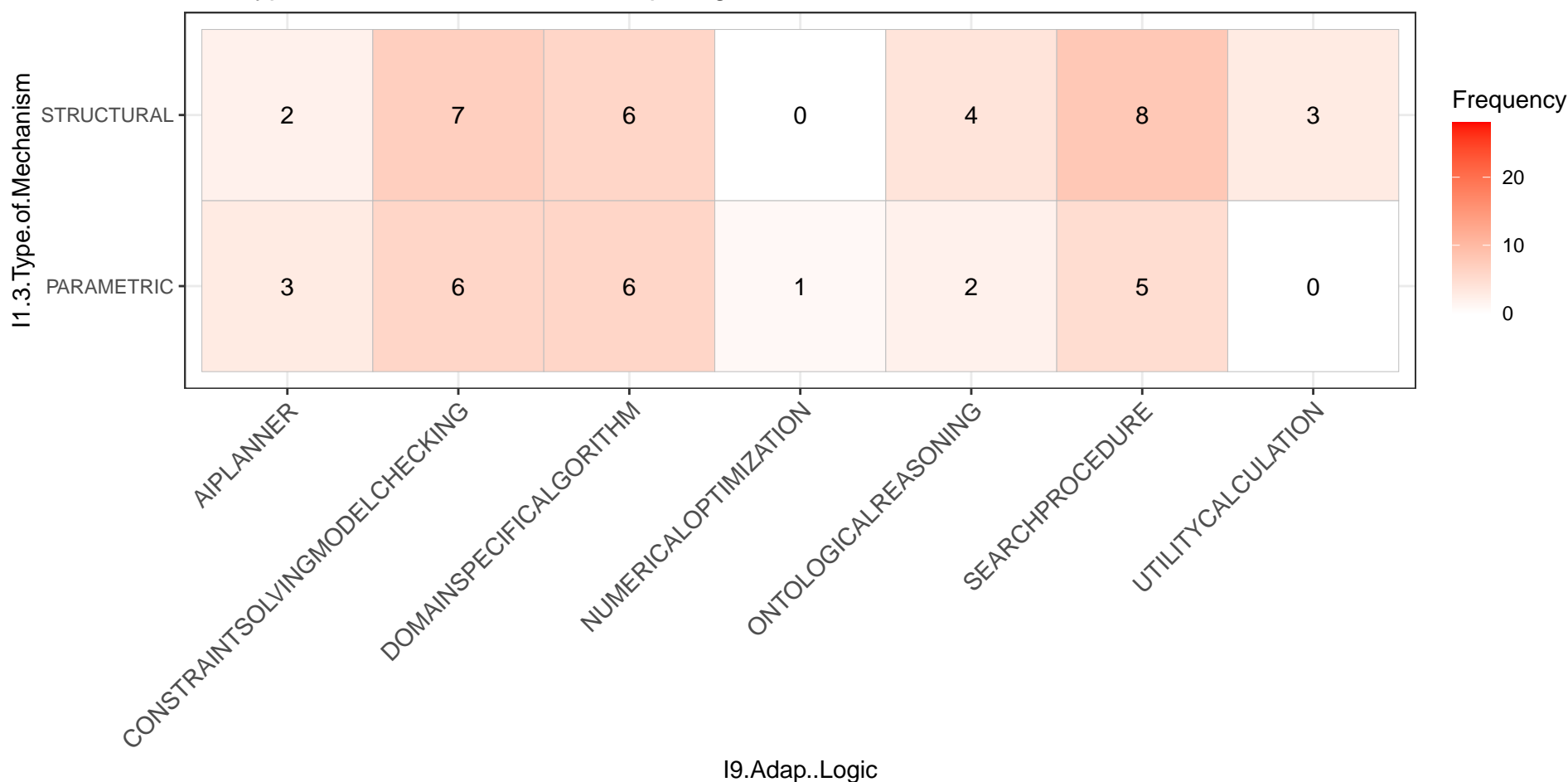
I1.3.Type.of.Mechanism_____Experiment.Method



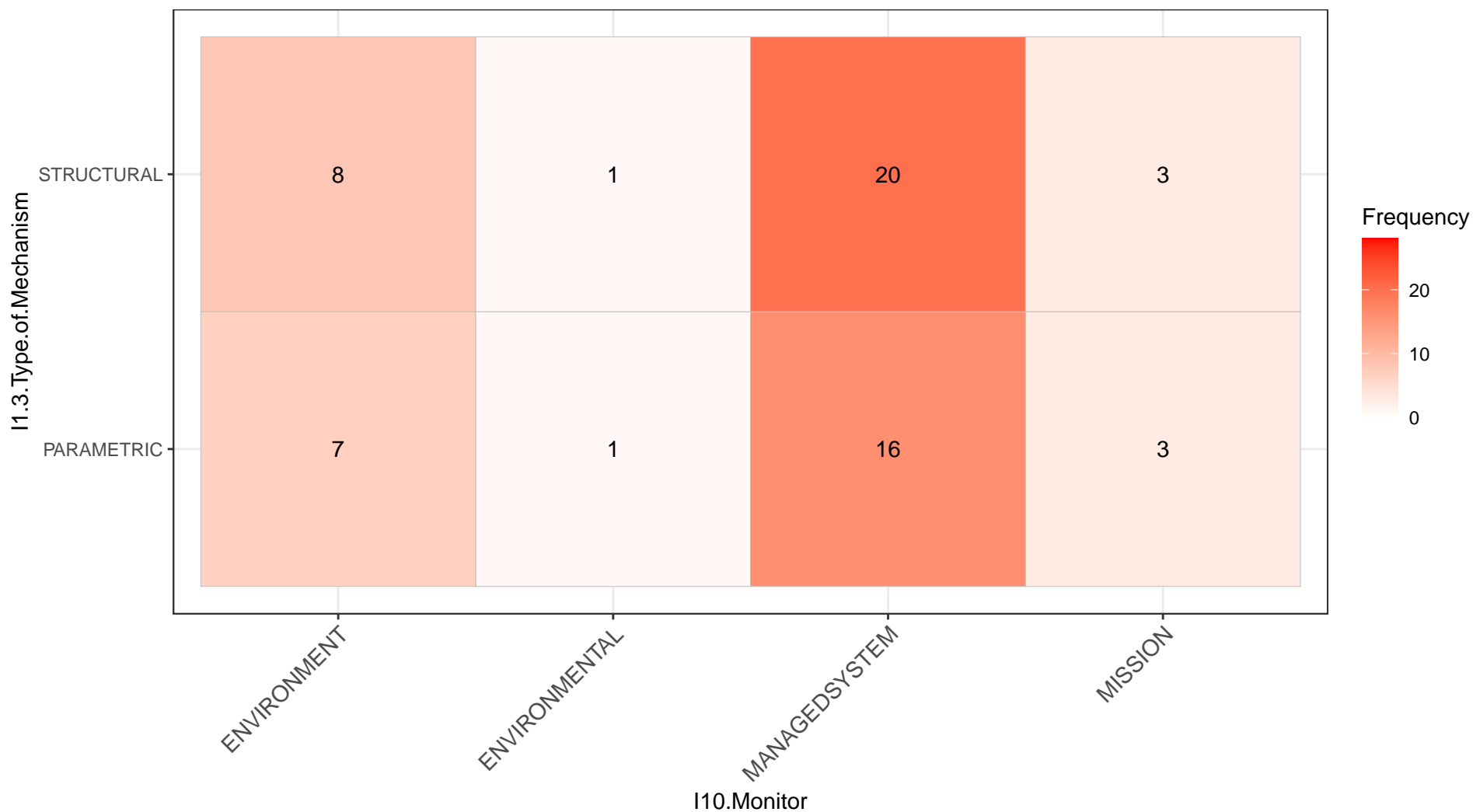
I1.3.Type.of.Mechanism_____I8.Evaluation

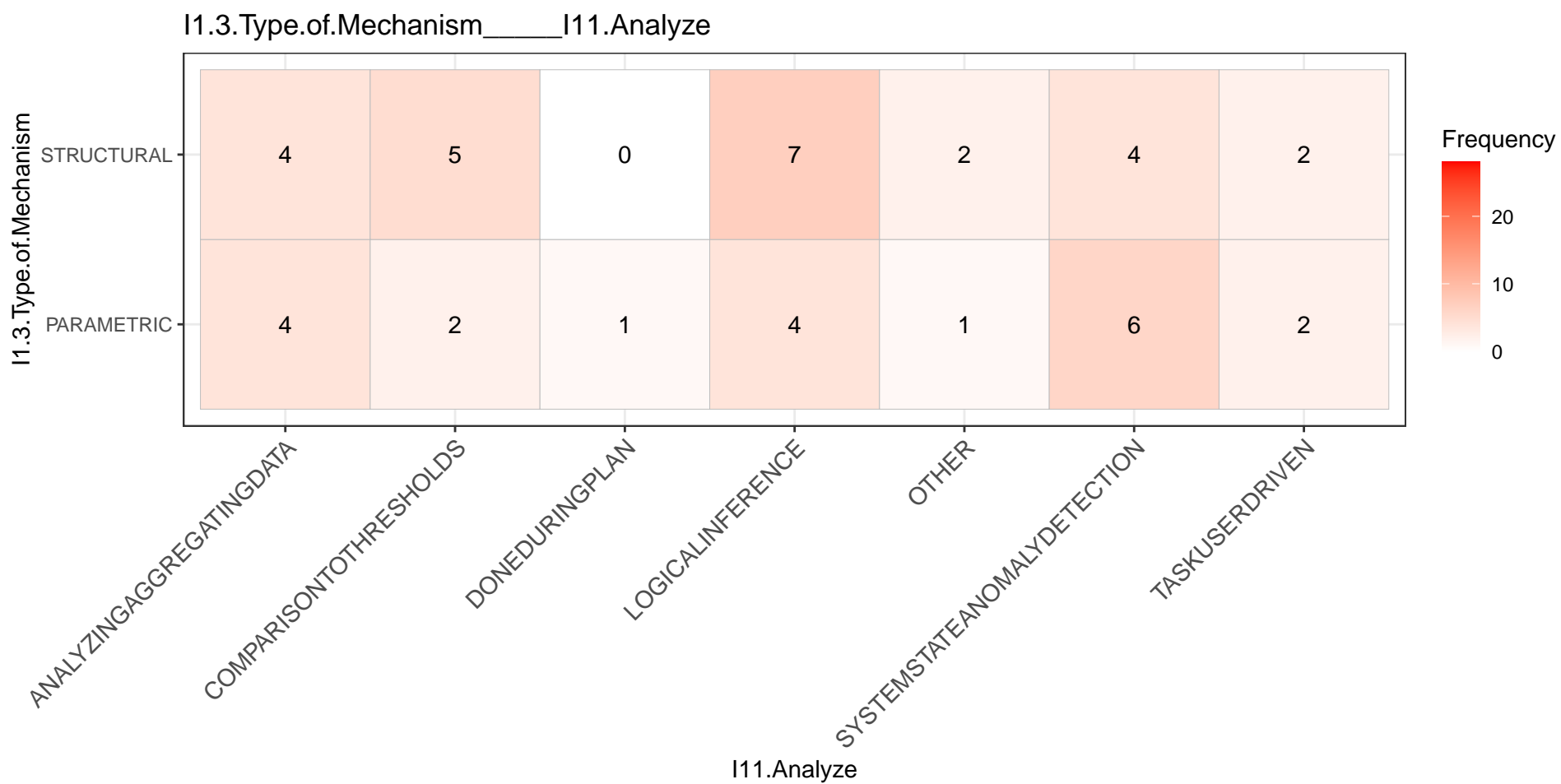


I1.3.Type.of.Mechanism_____I9.Adap..Logic



I1.3.Type.of.Mechanism____I10.Monitor





I1.3.Type.of.Mechanism_____I12.Plan

I1.3.Type.of.Mechanism

STRUCTURAL

11

11

1

PARAMETRIC

7

8

2

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPLANNINGLANGUAGES

I12.Plan

Frequency



20

10

0

I1.3.Type.of.Mechanism____I13.Execute

I1.3.Type.of.Mechanism

STRUCTURAL

PARAMETRIC

Frequency

20

10

0

ADDITIONORREMOVALOFCOMPONENTS

CHANGEINRELATIONSHIPSBEWEENCOMPONENTS

COMPONENTREDEPLOYMENT

REPARAMETERIZATIONOFCOMPONENTS

I13.Execute

12

6

1

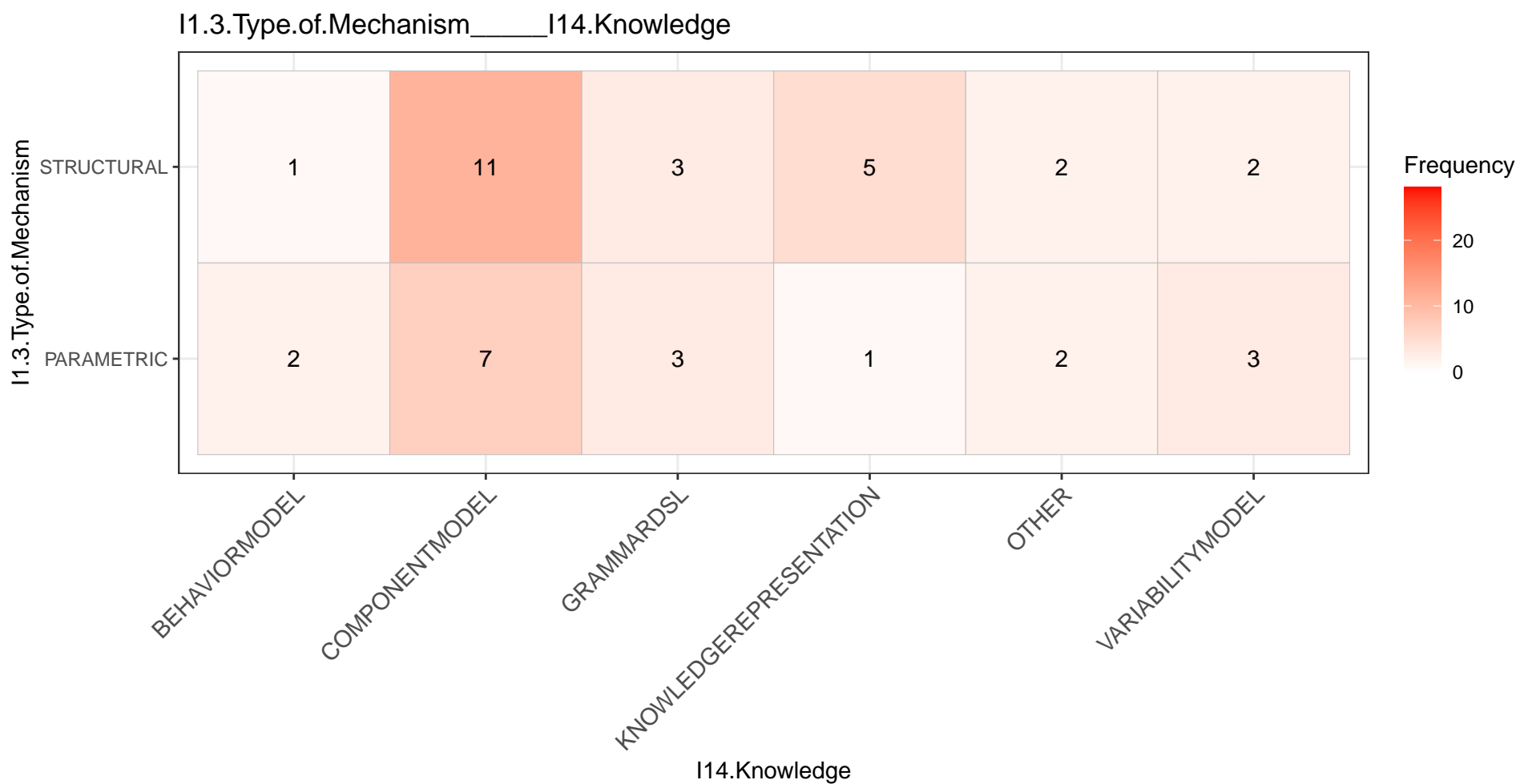
11

8

3

0

11



I1.3.Organization.of.Mechanism_____I1.3.Scope.of.Mechanism

I1.3.Organization.of.Mechanism

DOCENTRALIZED

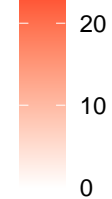
DECENTRALIZED

GLOBAL

LOCAL

I1.3.Scope.of.Mechanism

Frequency



8

21

0

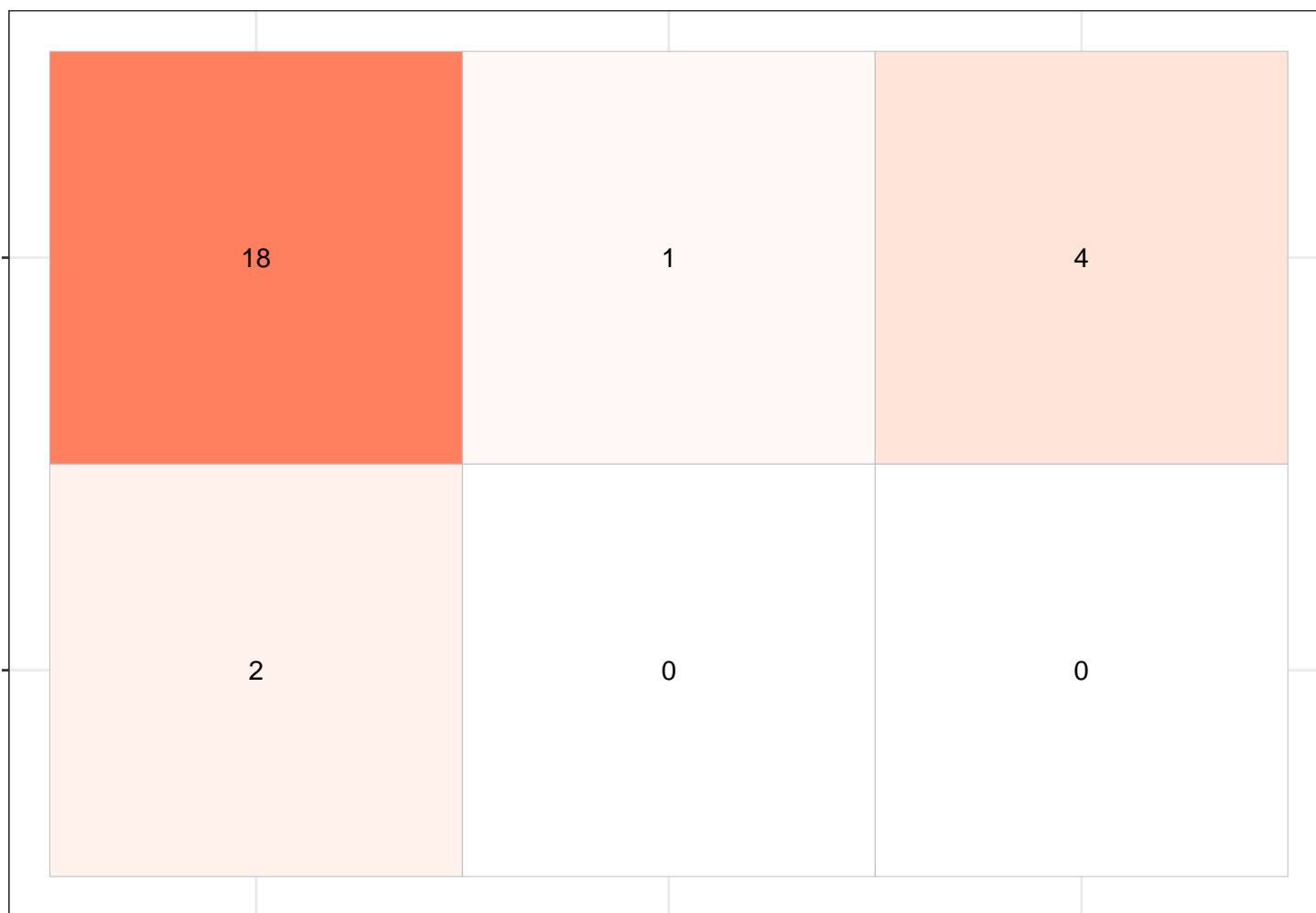
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I1.3.Organization.of.Mechanism_____I1.3.Duration.of.Mechanism

I1.3.Organization.of.Mechanism

DOCENTRALIZED

DECENTRALIZED



DOSHORT

MEDIUM

VERYSHORT

I1.3.Duration.of.Mechanism

Frequency



I1.3.Organization.of.Mechanism

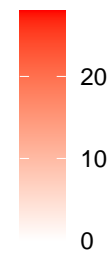
DOCENTRALIZED

DECENTRALIZED

BESTEFFECT

I1.3.Timeliness.of.Mechanism

Frequency



23

3

I1.3.Organization.of.Mechanism_____I1.3.Trigger.of.Mechanism

I1.3.Organization.of.Mechanism

DOCENTRALIZED

DECENTRALIZED

EVENTTRIGGER

TIMETRIGGER

I1.3.Trigger.of.Mechanism

Frequency

20

10

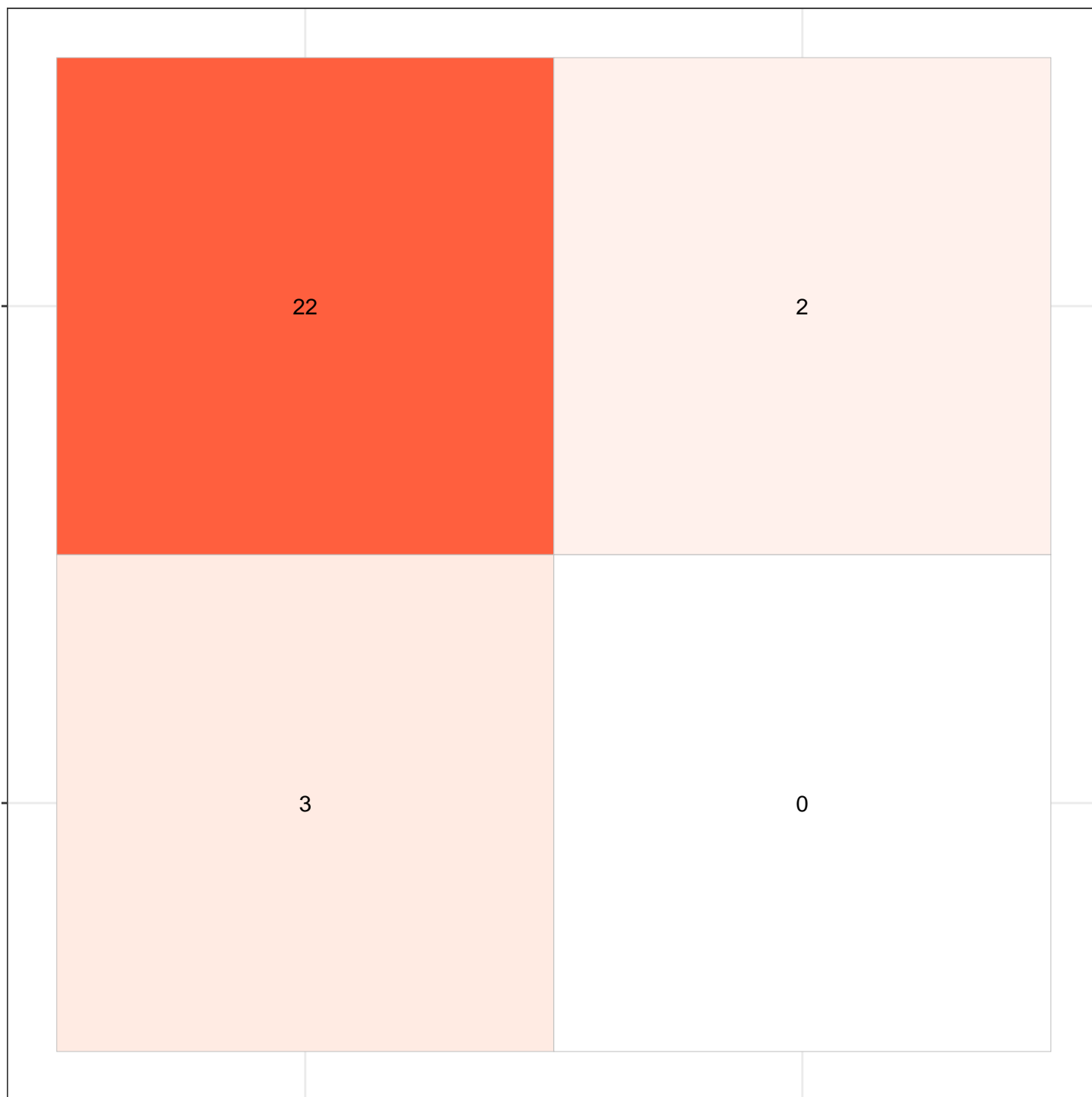
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22

2

3

0



I1.3.Organization.of.Mechanism_____I1.4.Criticality.of.Effects

I1.3.Organization.of.Mechanism

DOCENTRALIZED

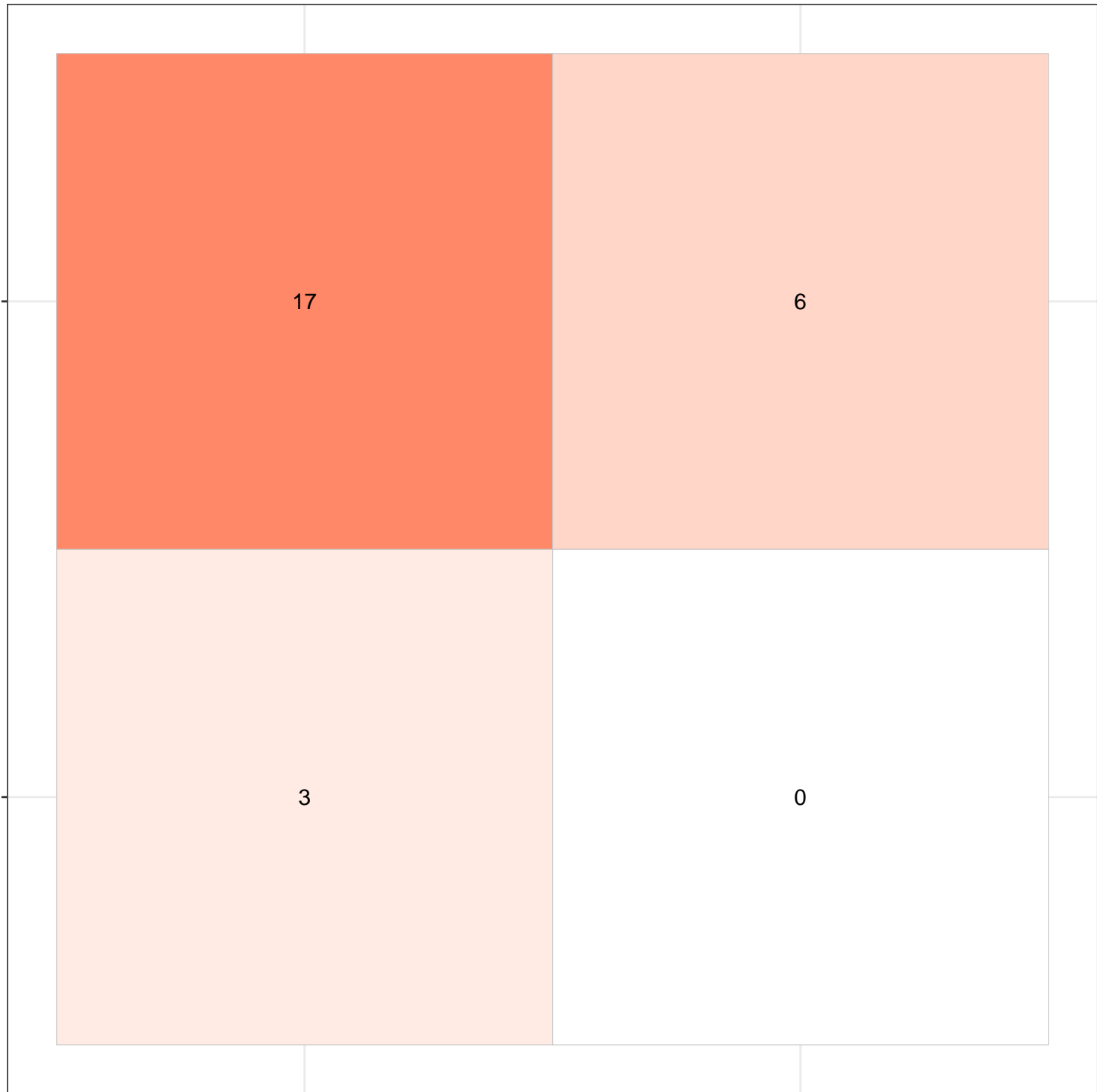
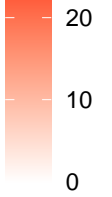
DECENTRALIZED

MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

Frequency



I1.3.Organization.of.Mechanism_____I1.4.Predictability.of.Effects

I1.3.Organization.of.Mechanism

DOCENTRALIZED

DECENTRALIZED

DODETERMINISTIC

NONDETERMINISTIC

I1.4.Predictability.of.Effects

Frequency

20

10

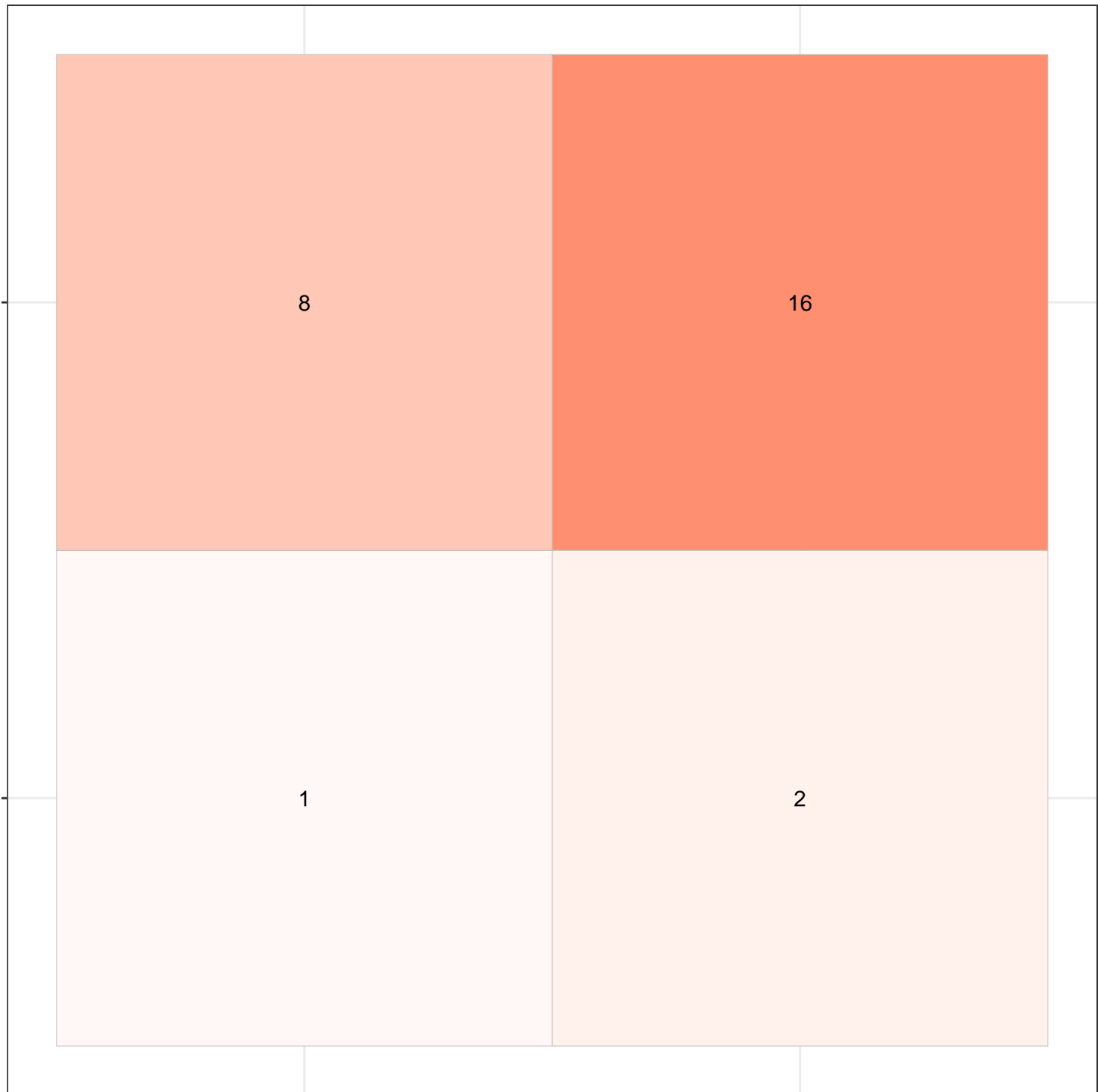
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8

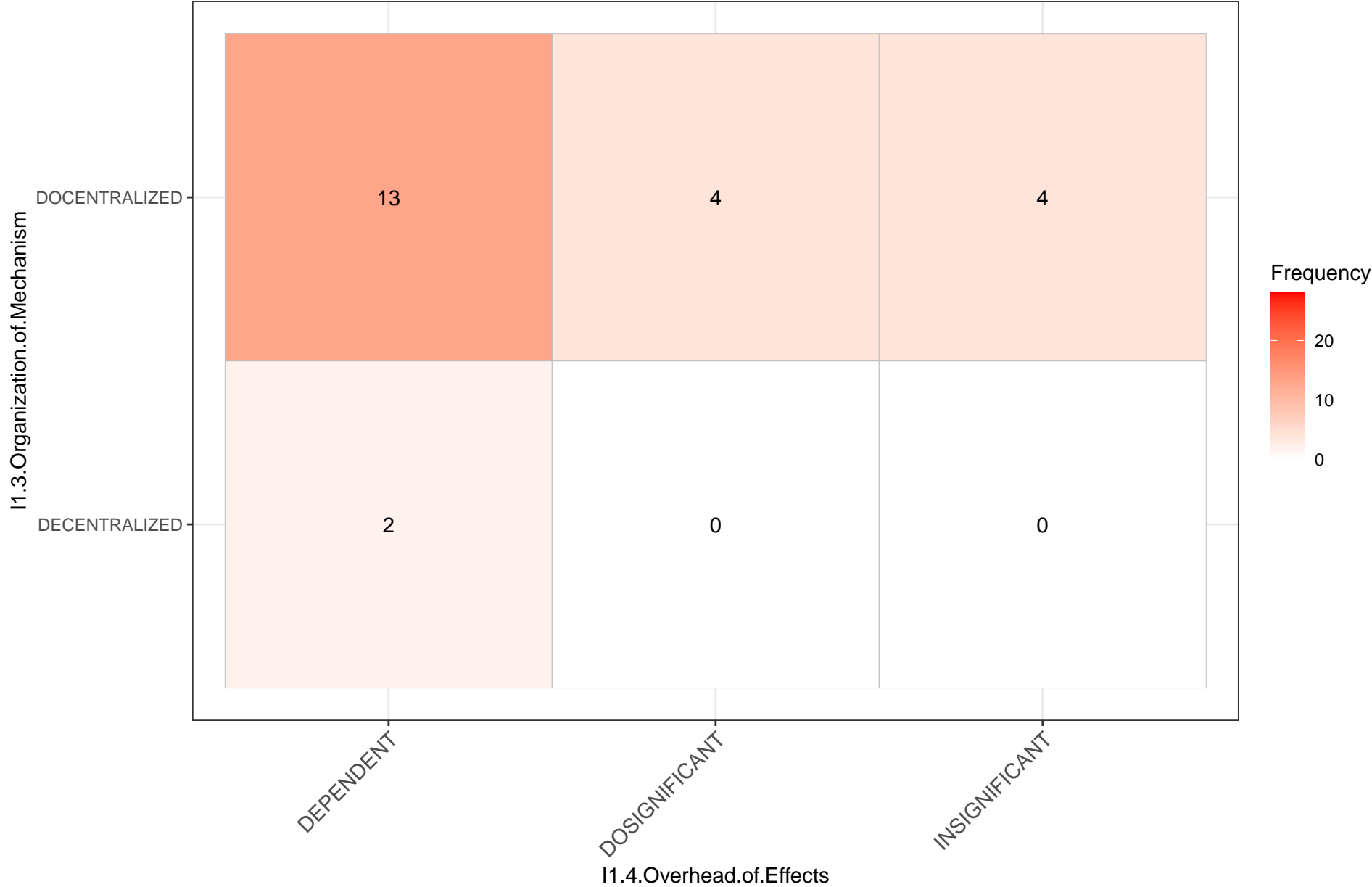
16

1

2



I1.3.Organization.of.Mechanism____I1.4.Overhead.of.Effects



I1.3.Organization.of.Mechanism_____I1.4.Resilience.of.Effects

I1.3.Organization.of.Mechanism

DOCENTRALIZED

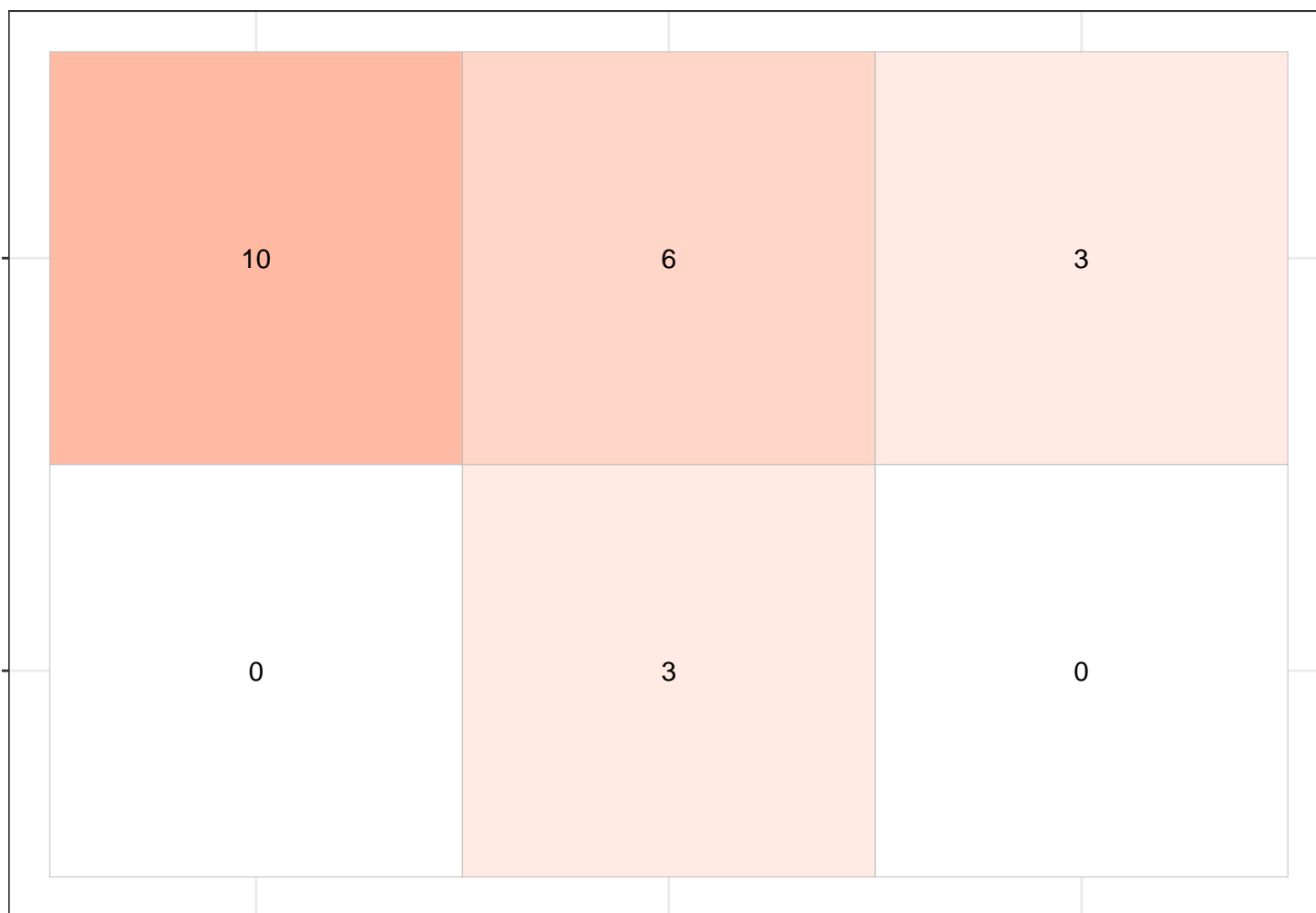
DECENTRALIZED

DEPENDENT

DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects



Frequency

20
10
0

I1.3.Organization.of.Mechanism

I1.3.Organization.of.Mechanism_____I2.Adap..Purpose

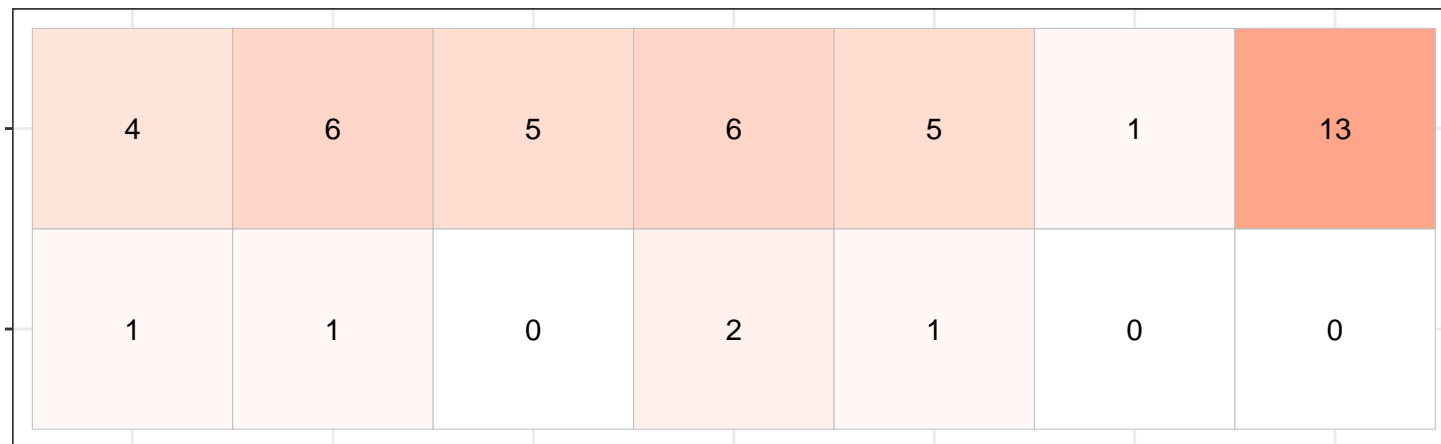
DOCENTRALIZED

DECENTRALIZED

CHANGEFUNCTIONALBEHAVIOR
DEALWITHENVIRONMENTALCHANGES
KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME
OPTIMIZERESOURCEUSAGE
OPTIMIZESYSTEMPERFORMANCE
RECOVERFROMATTACKS
RECOVERFROMERRORSFAULTS

I2.Adap..Purpose

Frequency



I1.3.Organization.of.Mechanism_____I3.Robot.Type

Frequency

13.Robot.Type

I1.3.Organization.of.Mechanism_____I4.Robo.SW

I1.3.Organization.of.Mechanism

DOCENTRALIZED

DECENTRALIZED

OTHER

ROS1

ROS2

I4.Robo.SW

Frequency

20

10

0

7

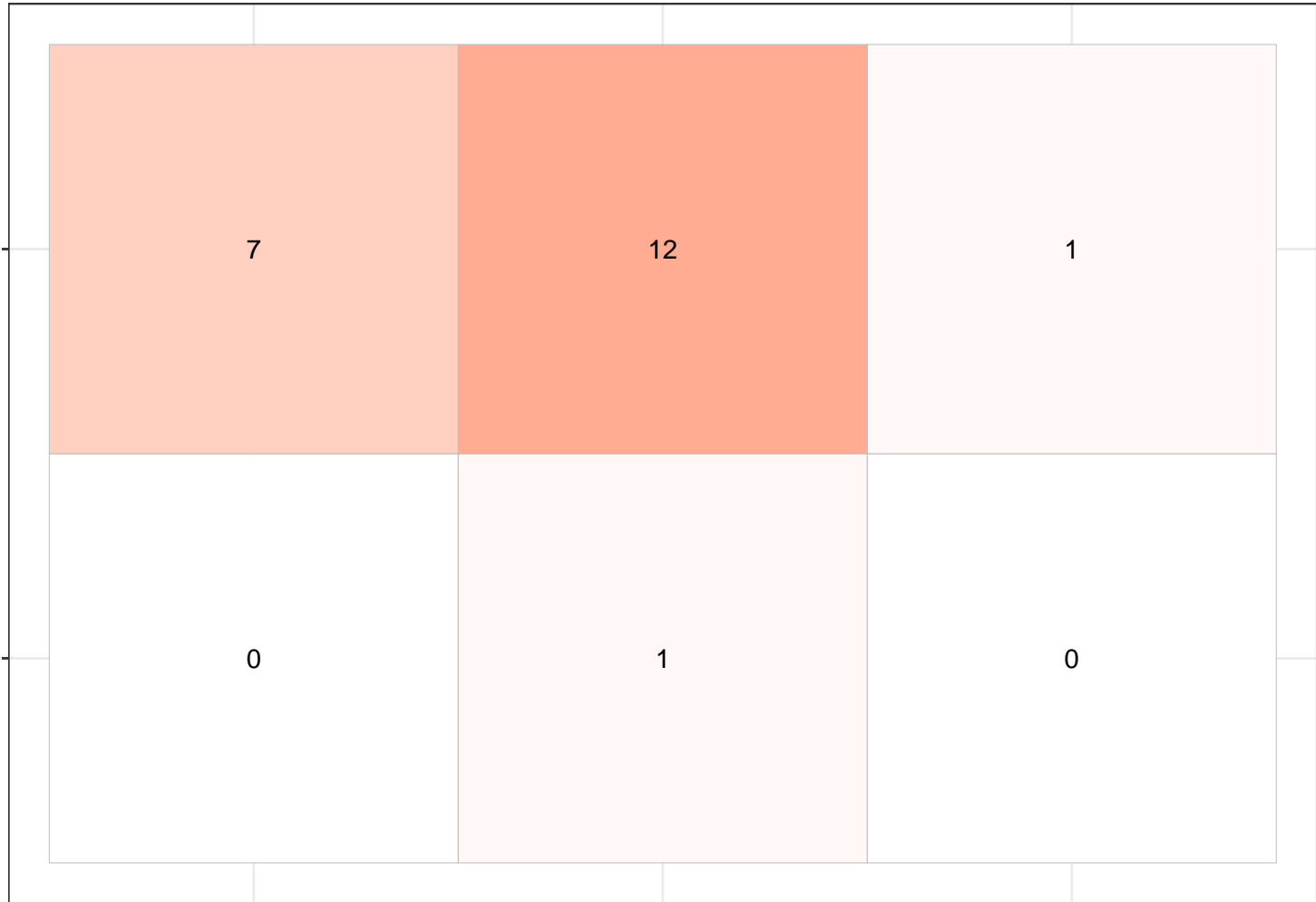
12

1

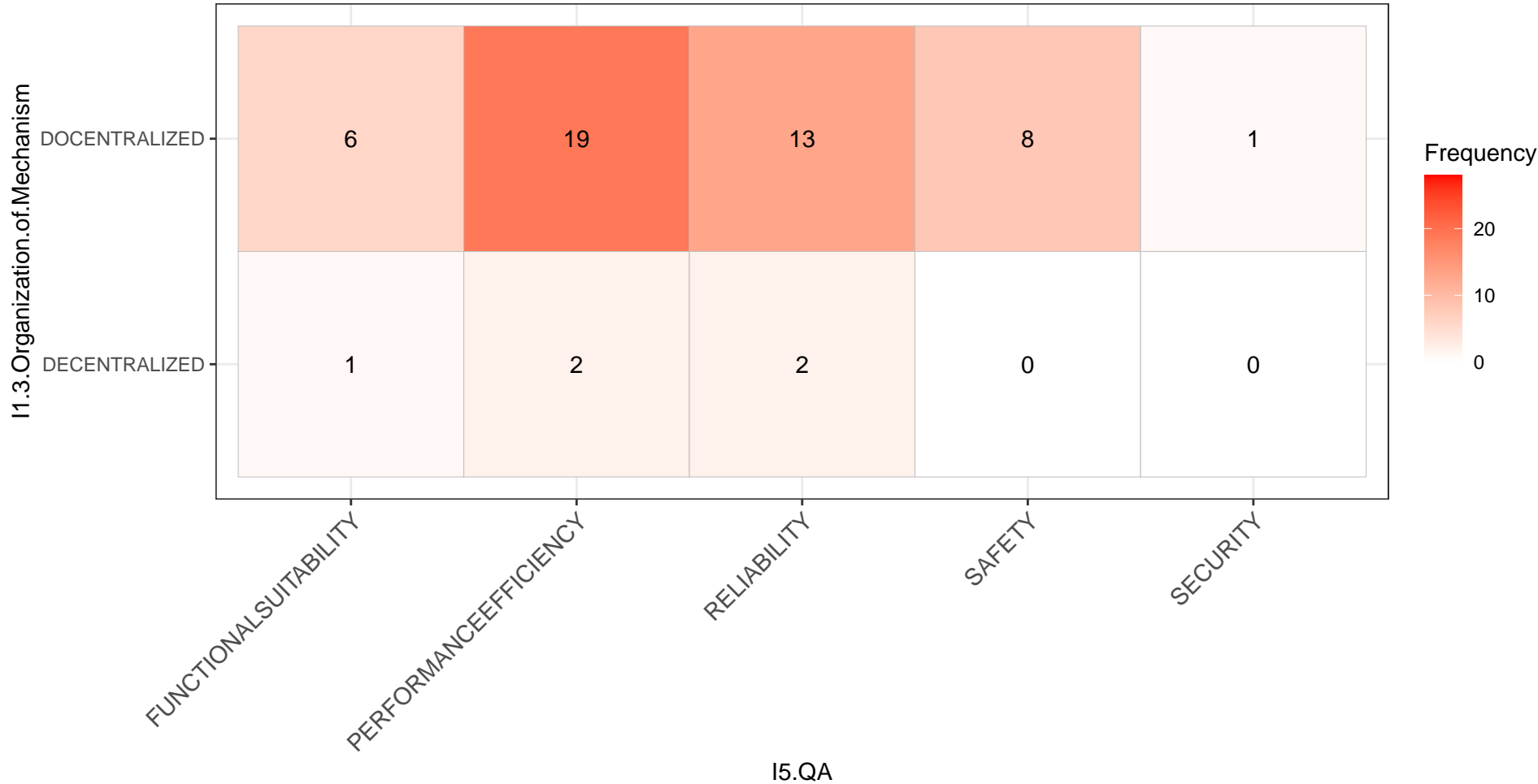
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1

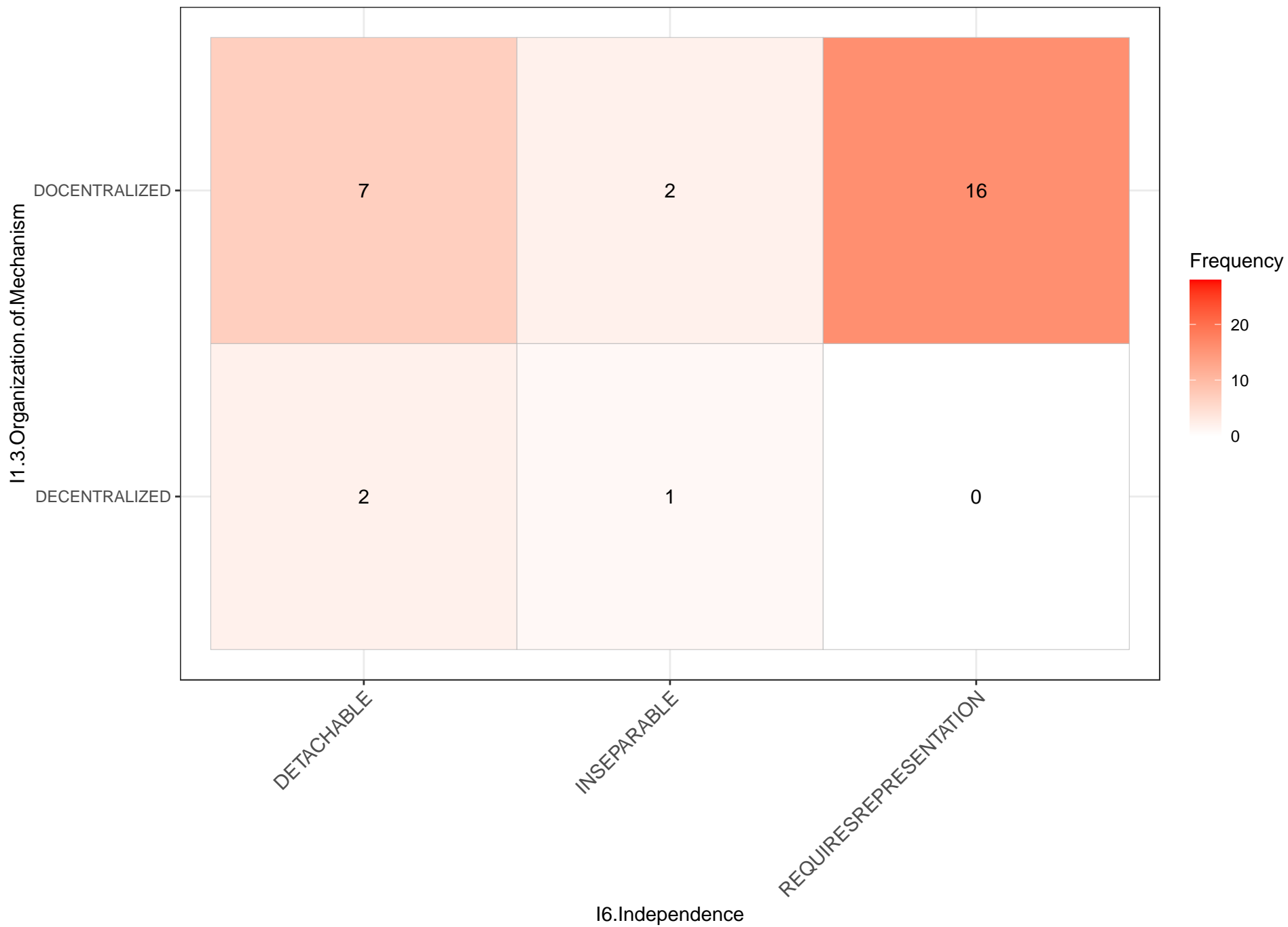
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I1.3.Organization.of.Mechanism_____I5.QA

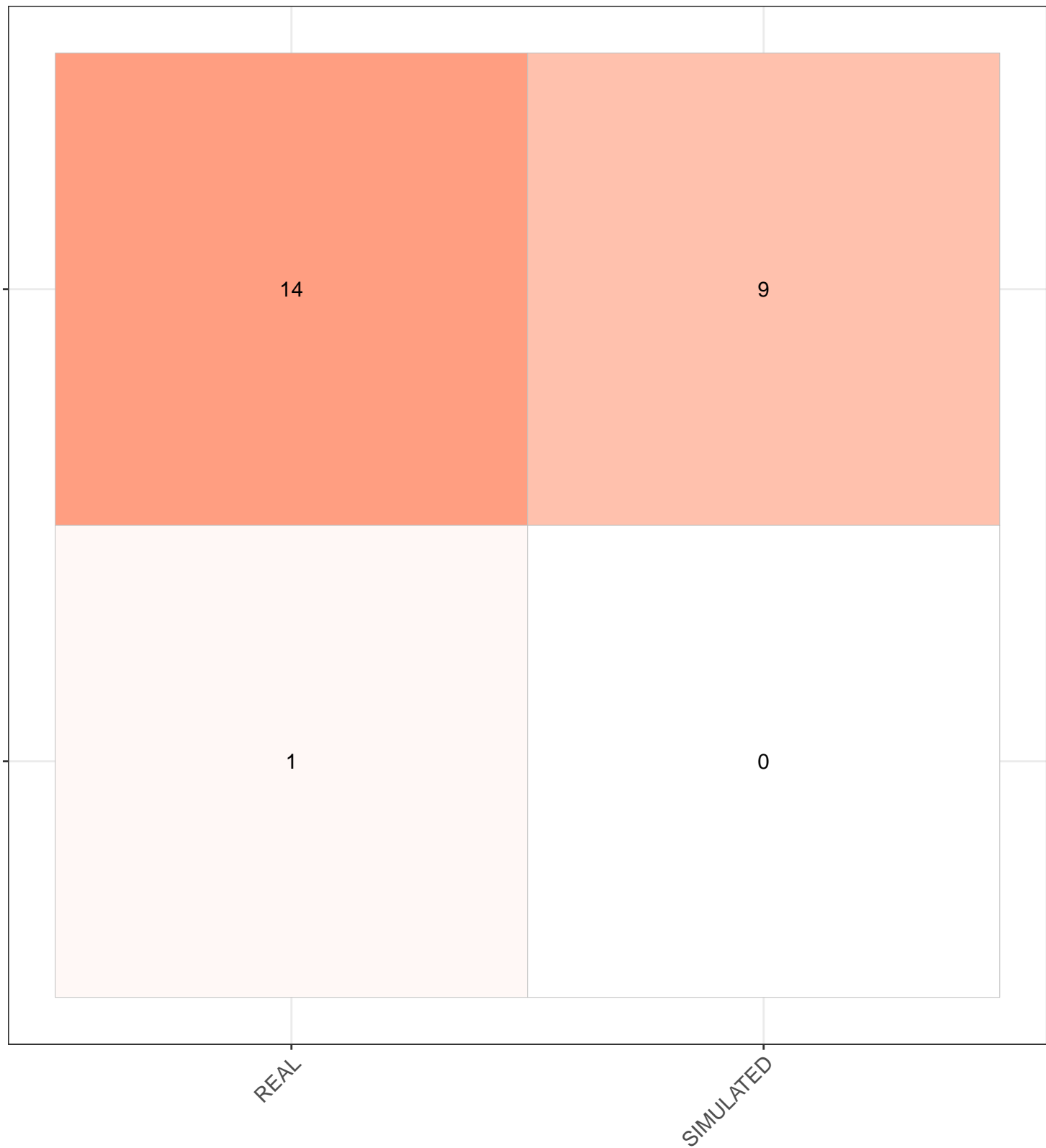


I1.3.Organization.of.Mechanism_____I6.Independence



I1.3.Organization.of.Mechanism_____I7.Deployment.Realness

I1.3.Organization.of.Mechanism



Frequency

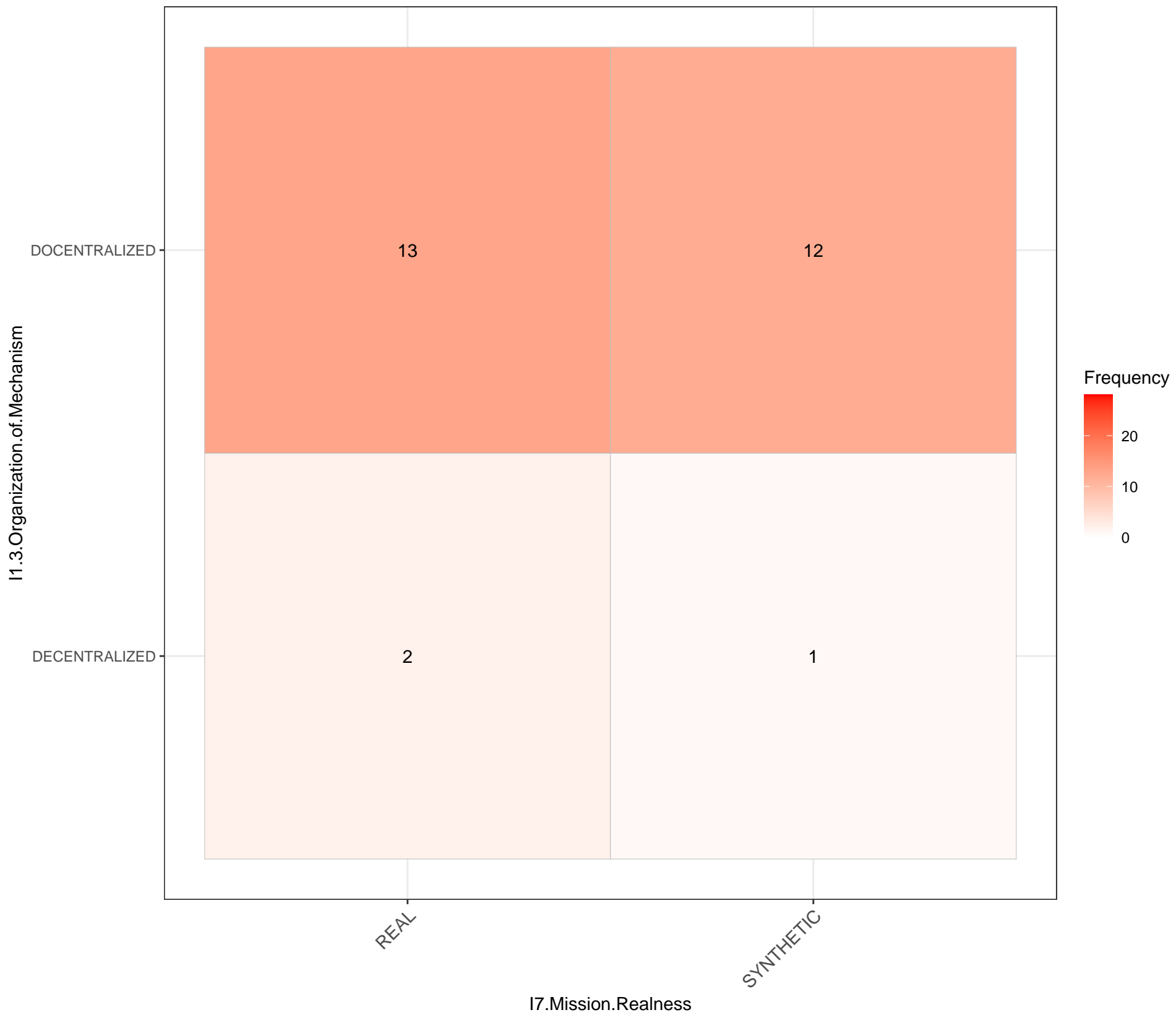
20

10

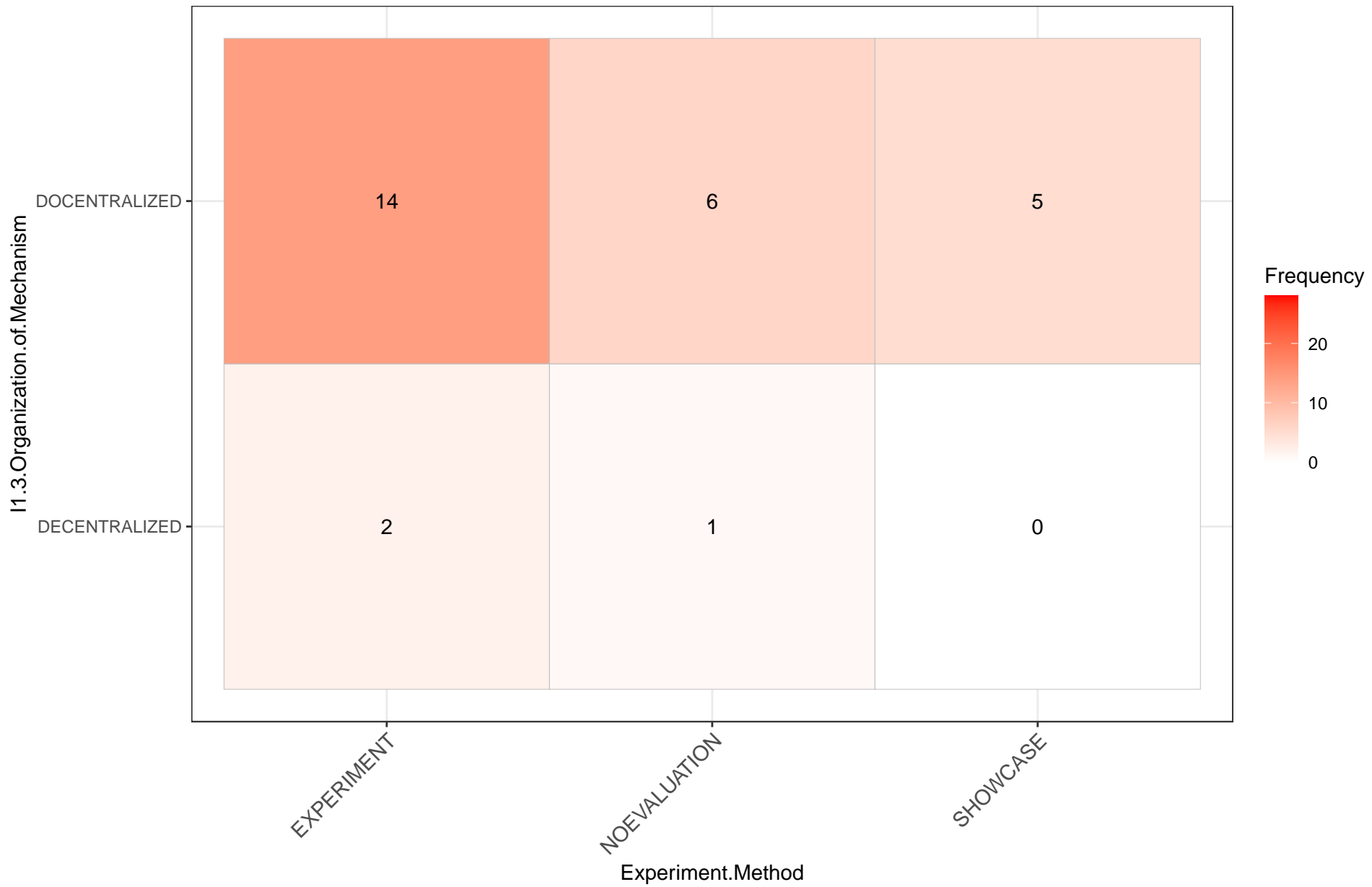
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I7.Deployment.Realness

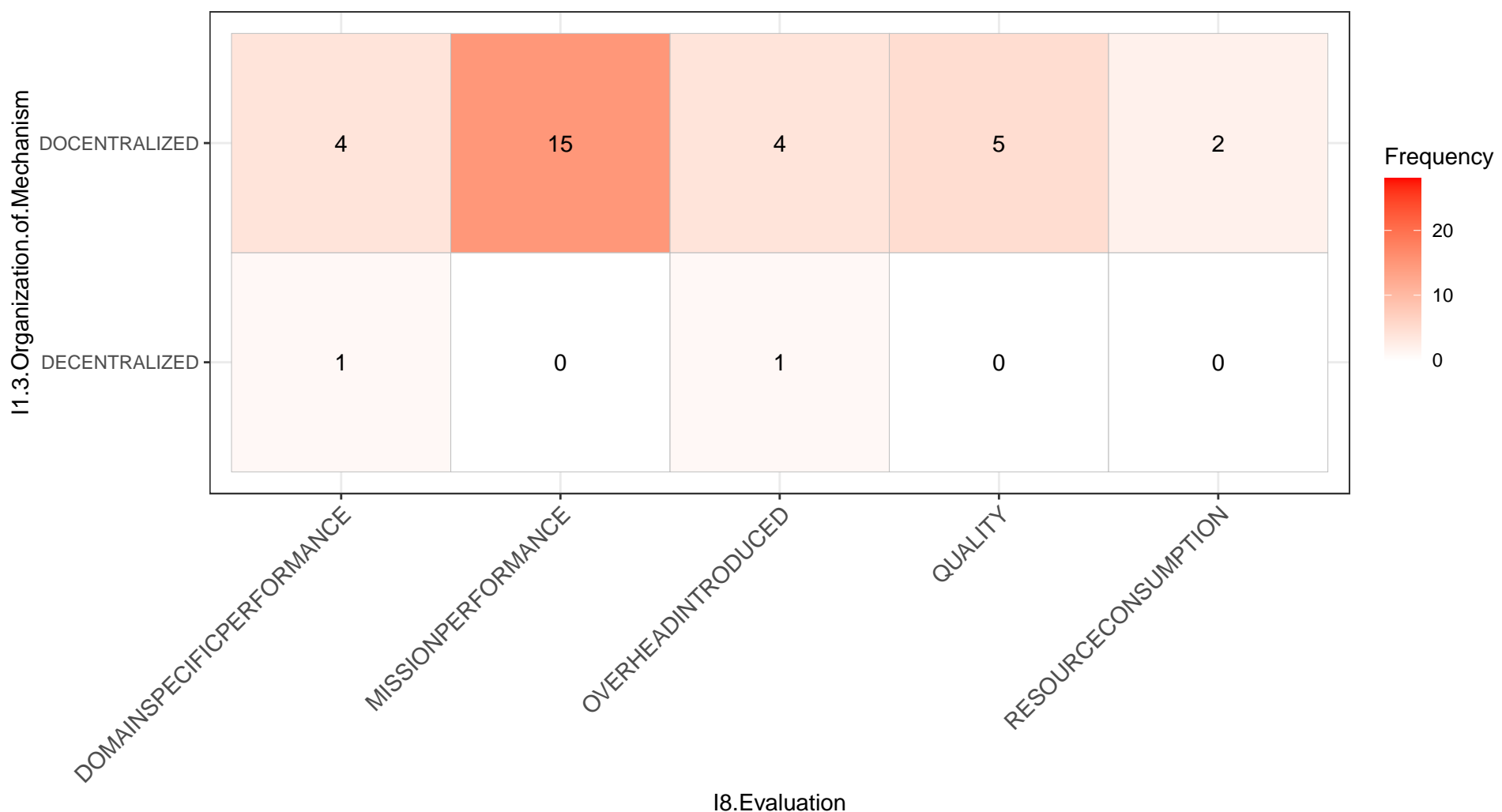
I1.3.Organization.of.Mechanism_____I7.Mission.Realness



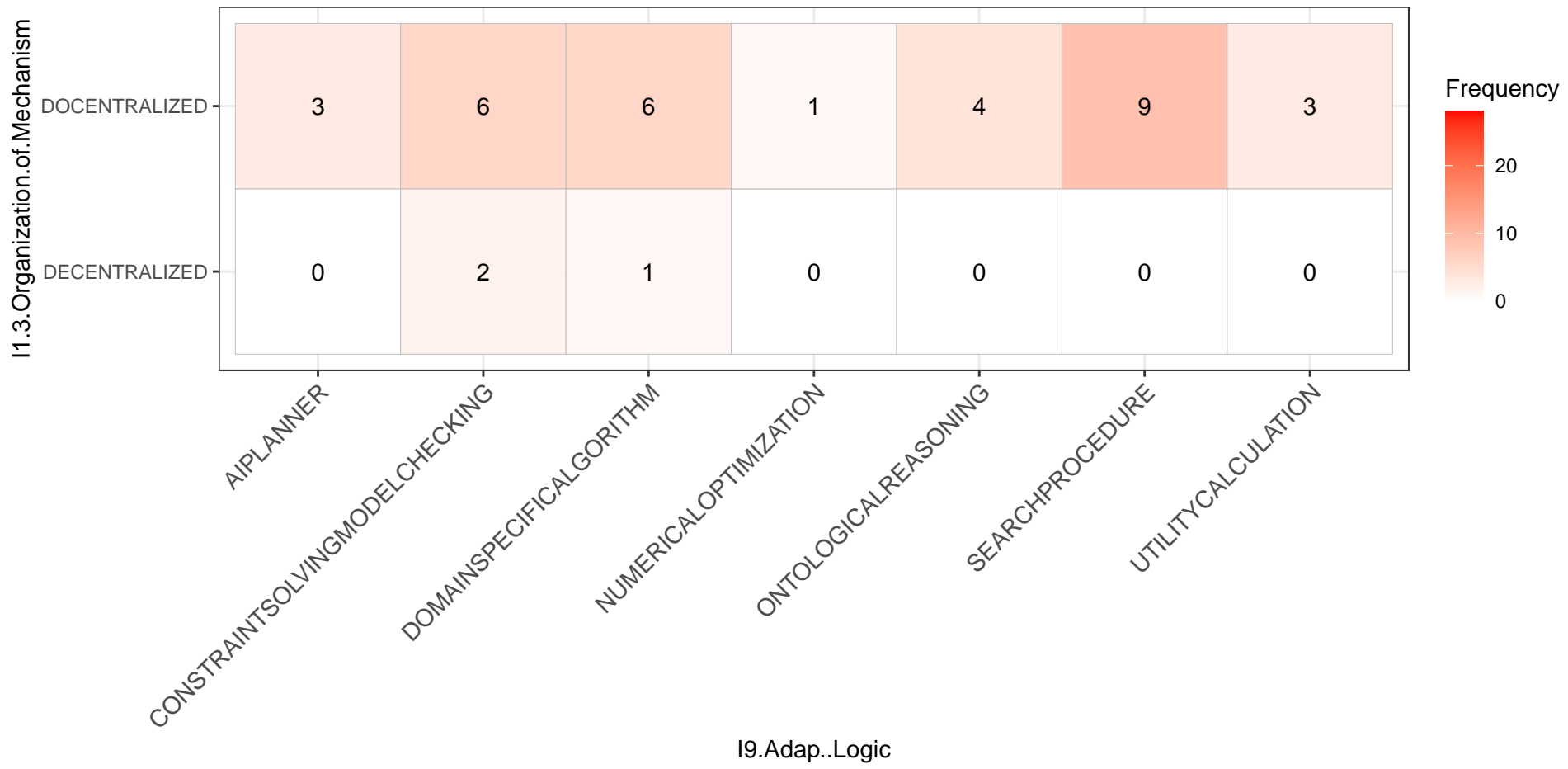
I1.3.Organization.of.Mechanism_____Experiment.Method



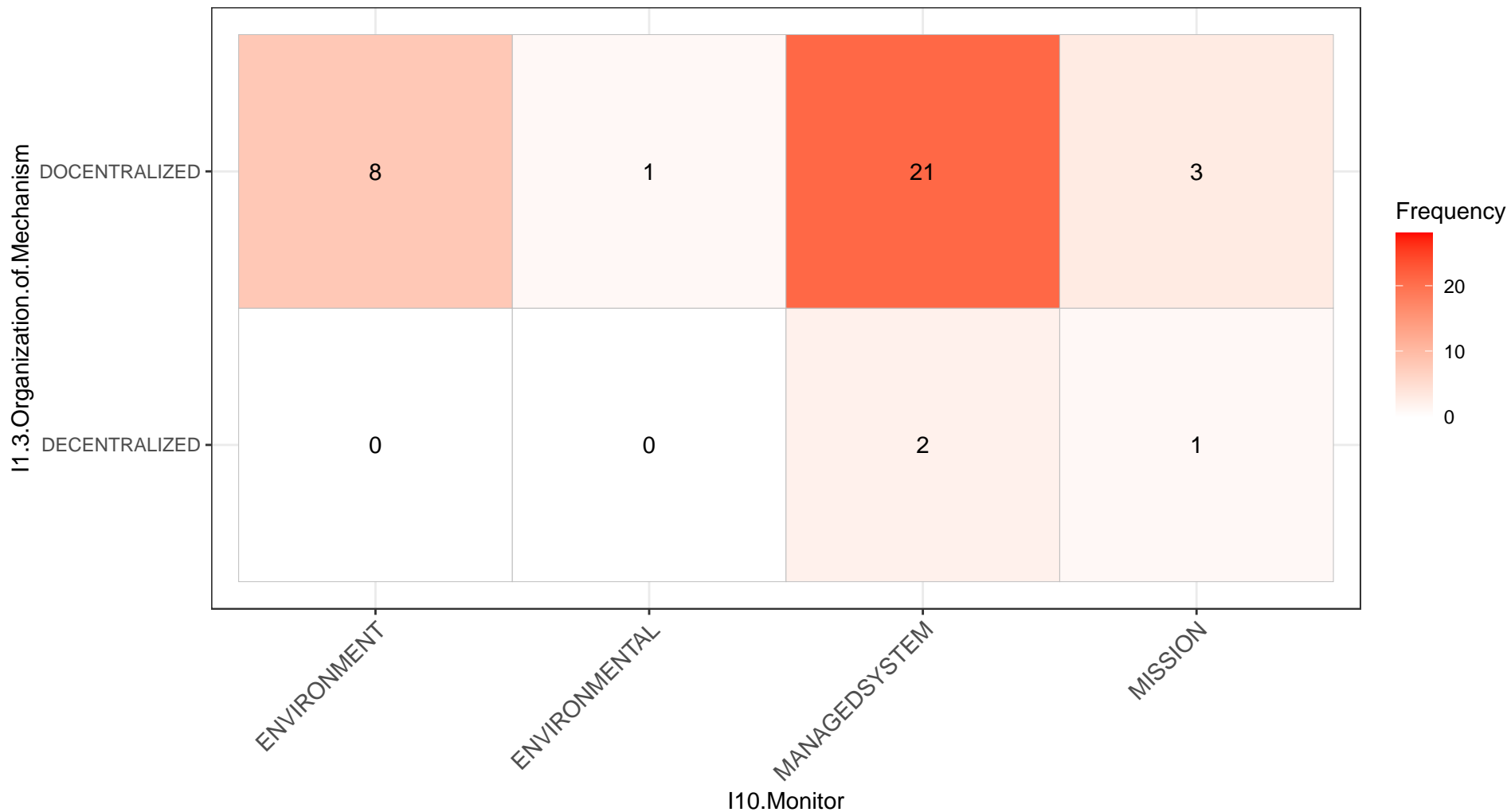
I1.3.Organization.of.Mechanism_____I8.Evaluation



I1.3.Organization.of.Mechanism_____I9.Adap..Logic

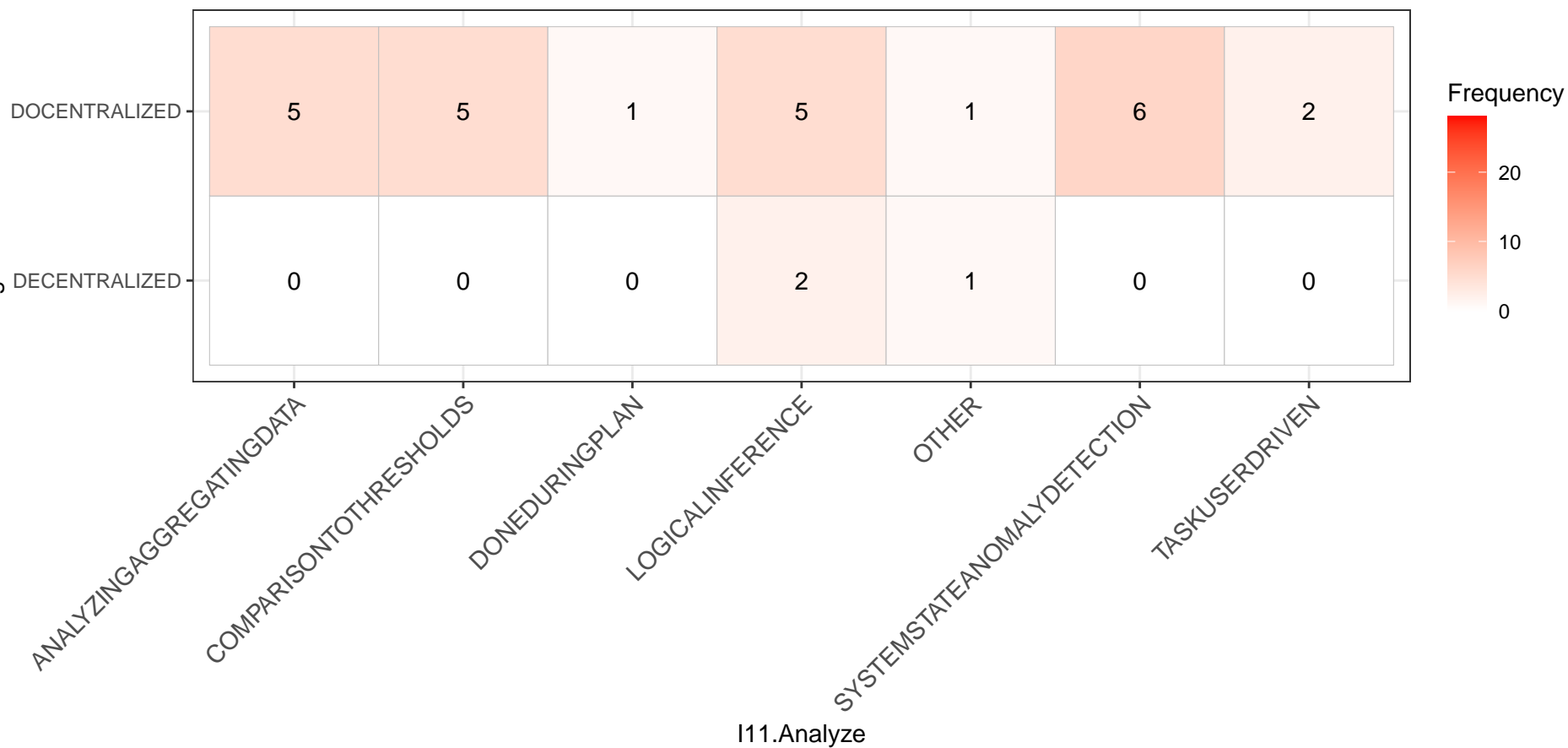


I1.3.Organization.of.Mechanism_____I10.Monitor

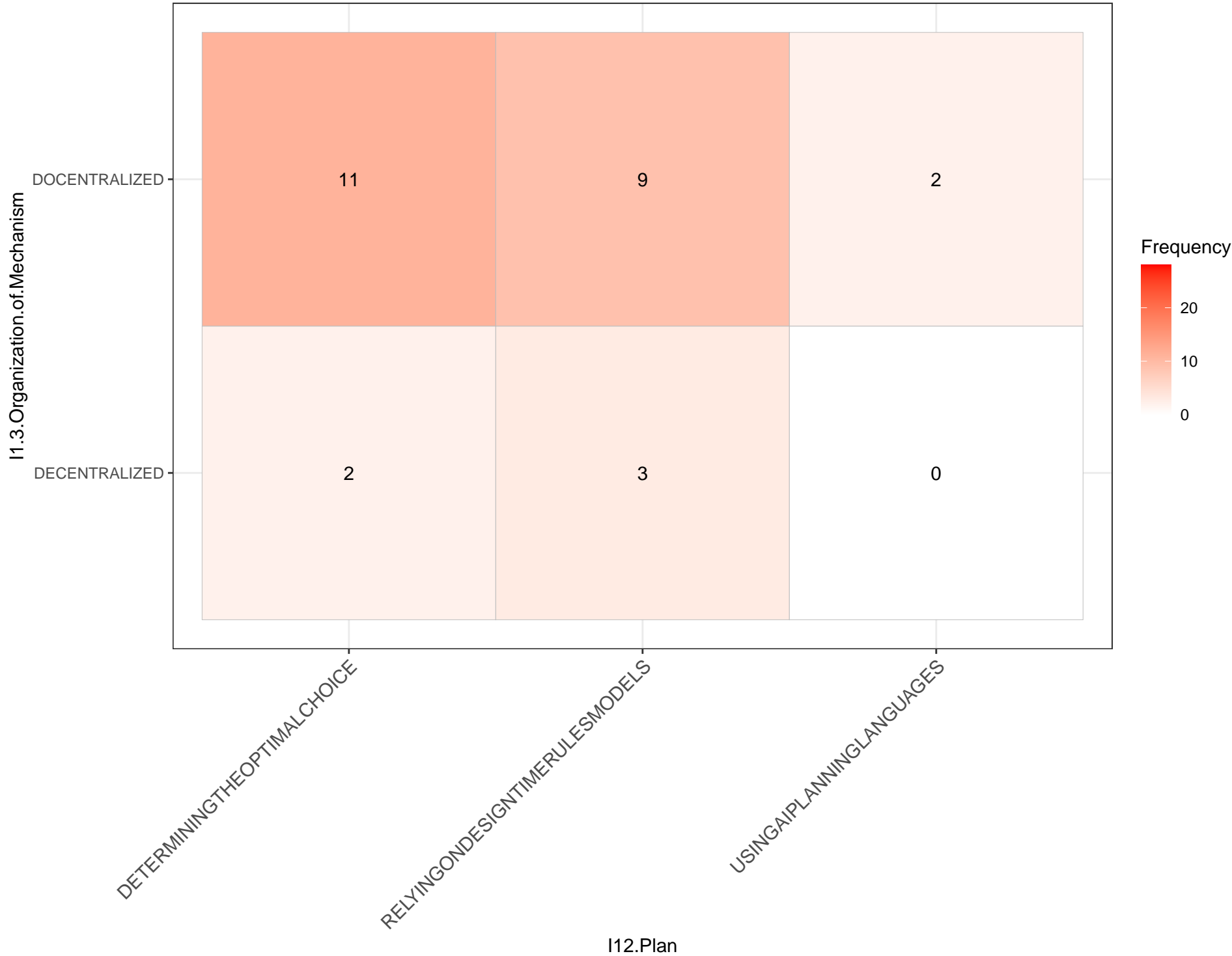


I1.3.Organization.of.Mechanism

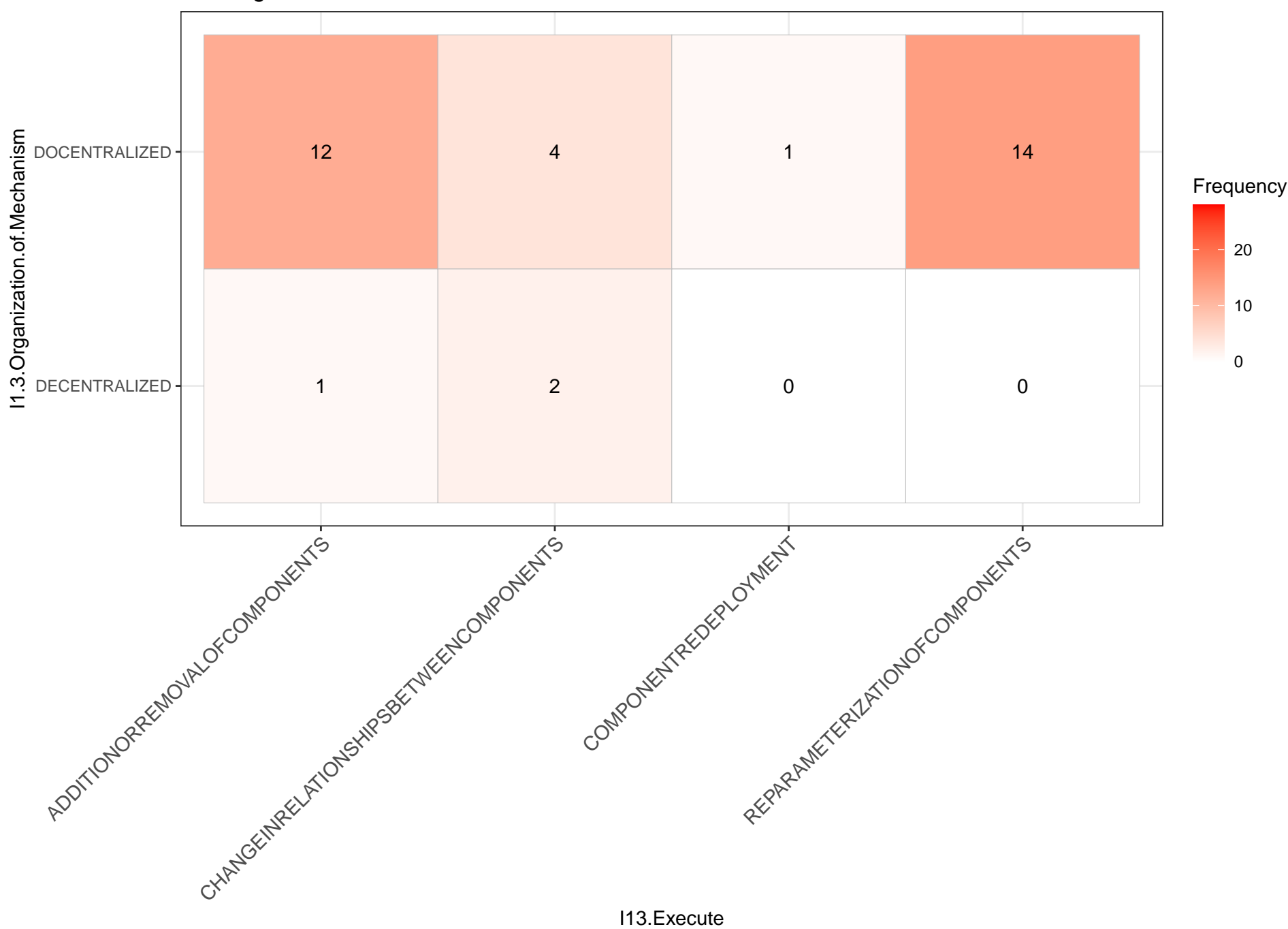
I1.3.Organization.of.Mechanism_____I11.Analyze



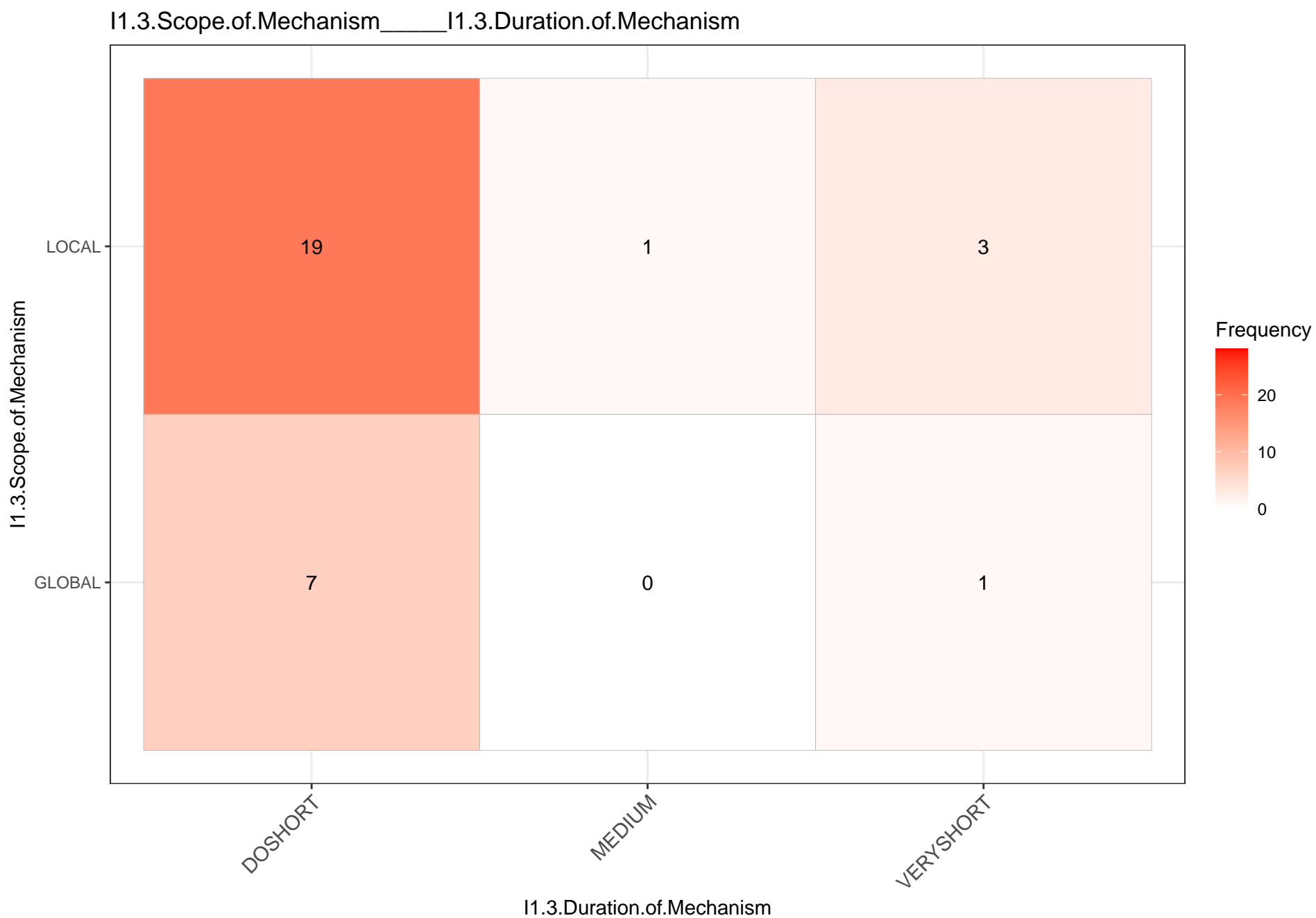
I1.3.Organization.of.Mechanism_____I12.Plan



I1.3.Organization.of.Mechanism_____I13.Execute







I1.3.Scope.of.Mechanism_____I1.3.Trigger.of.Mechanism

I1.3.Scope.of.Mechanism

LOCAL

21

2

GLOBAL

6

1

EVENTTRIGGER

TIMETRIGGER

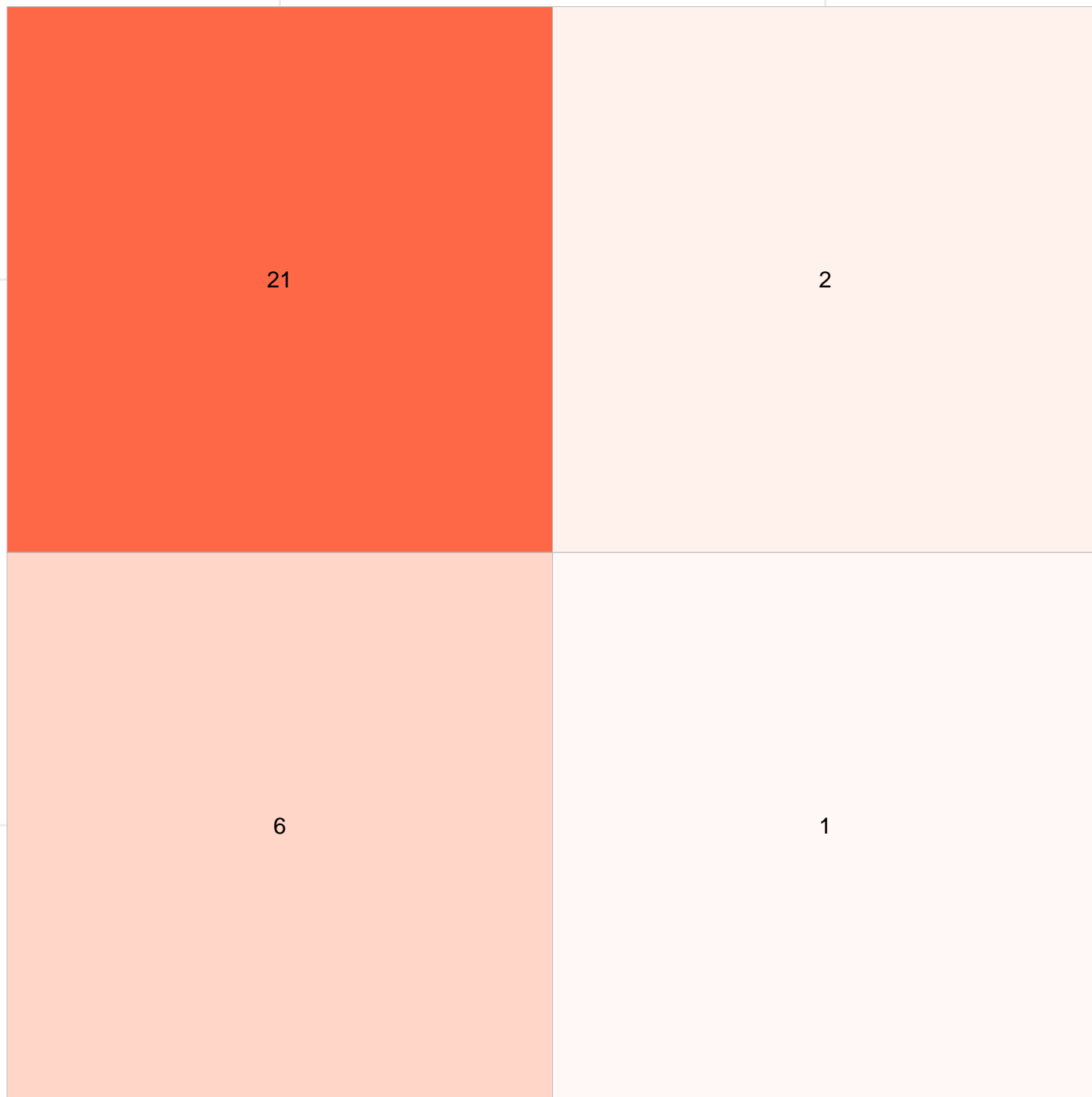
I1.3.Trigger.of.Mechanism

Frequency

20

10

0



I1.3.Scope.of.Mechanism_____I1.4.Criticality.of.Effects

I1.3.Scope.of.Mechanism

LOCAL

17

5

GLOBAL

2

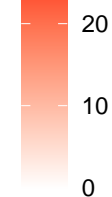
4

MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

Frequency



I1.3.Scope.of.Mechanism_____I1.4.Predictability.of.Effects

I1.3.Scope.of.Mechanism

LOCAL

5

18

GLOBAL

3

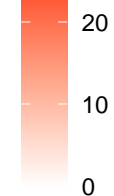
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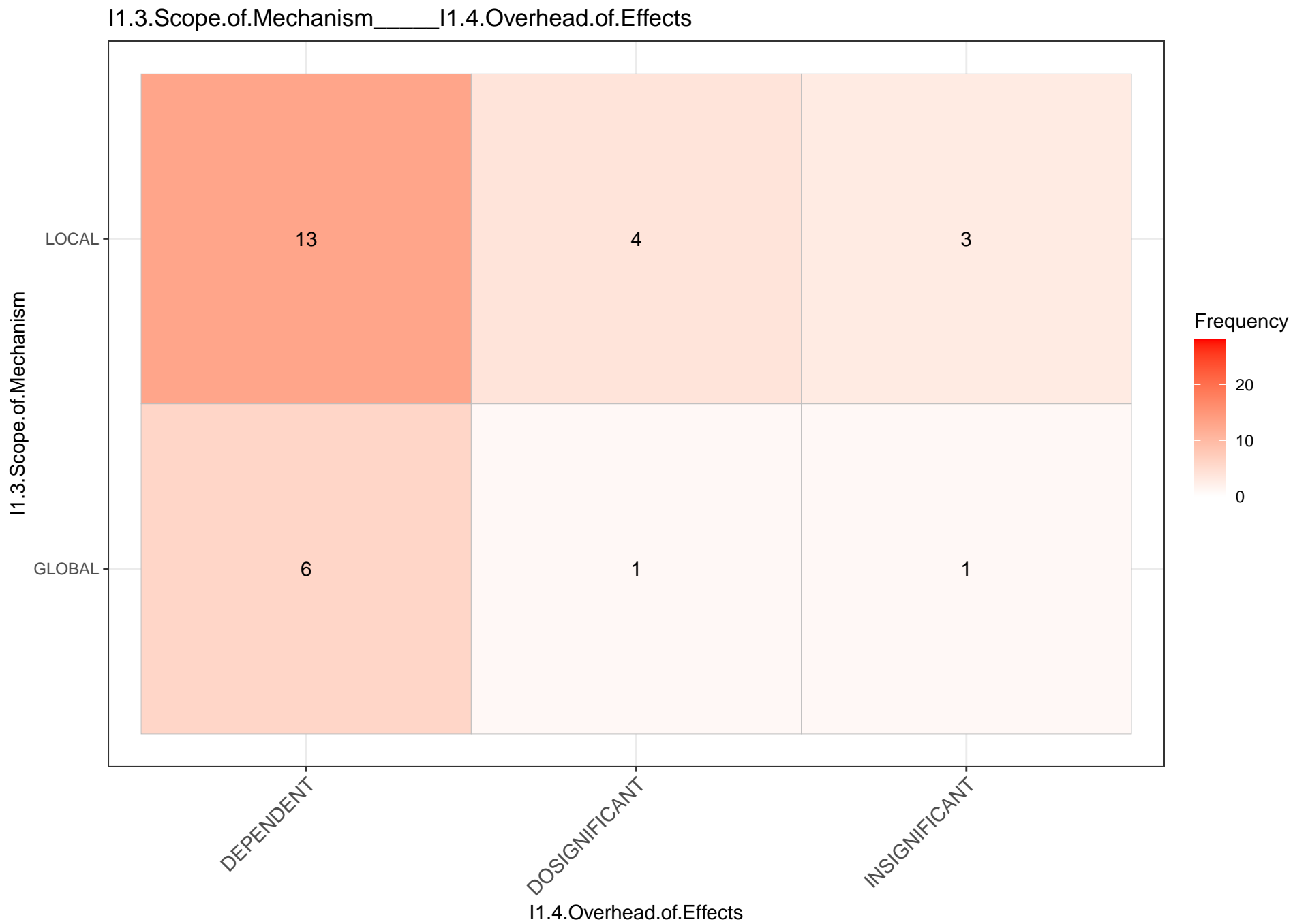
DODETERMINISTIC

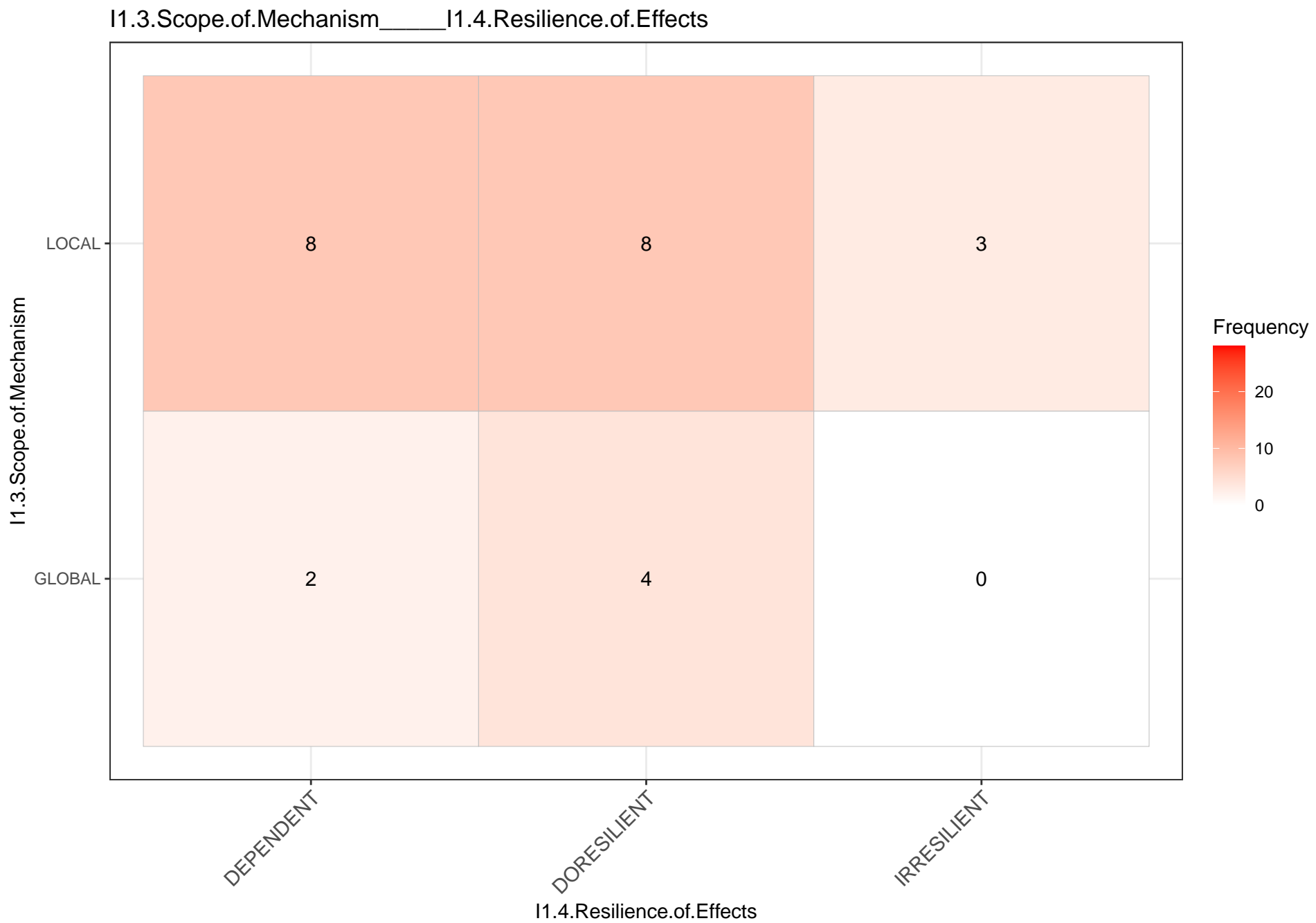
NONDETERMINISTIC

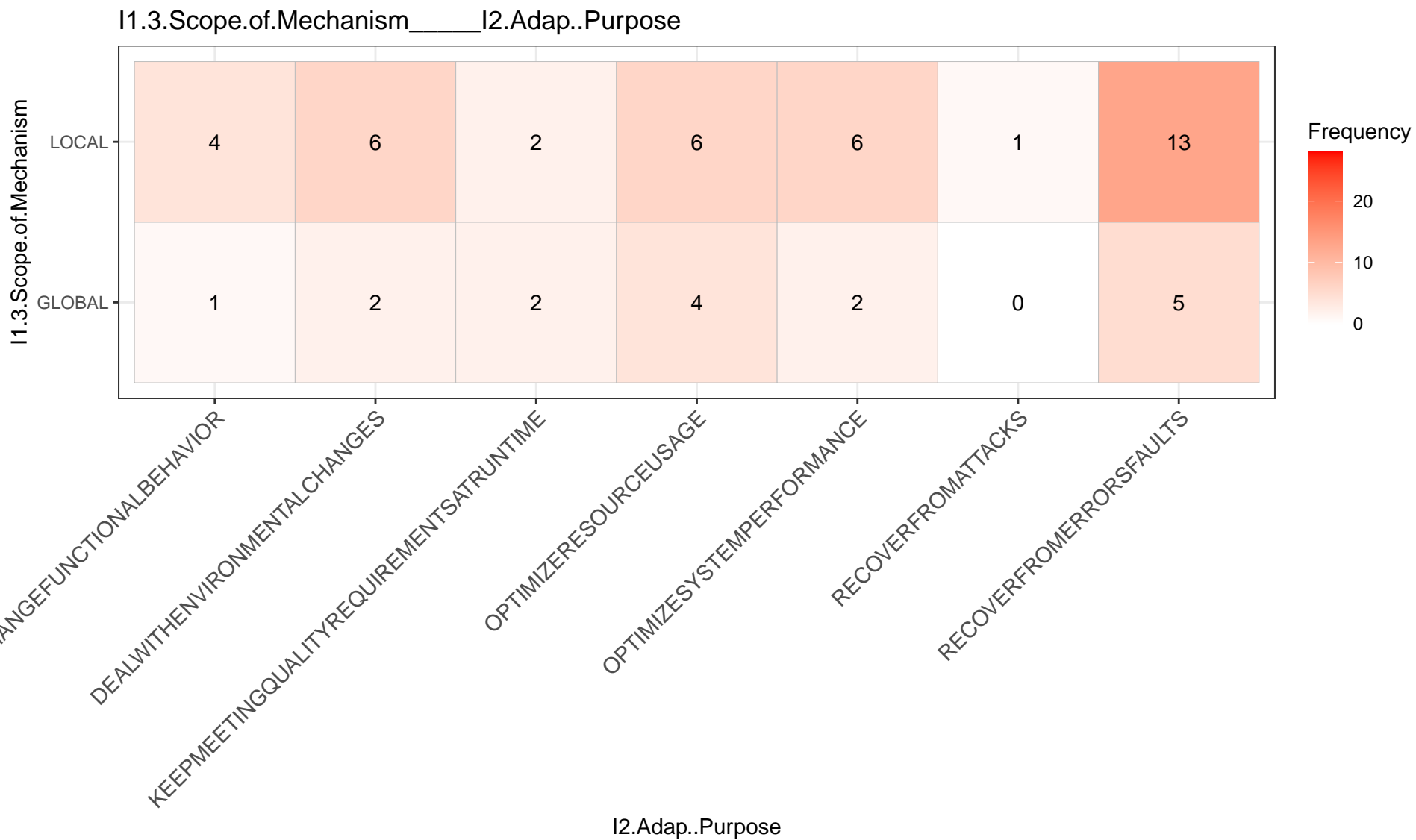
I1.4.Predictability.of.Effects

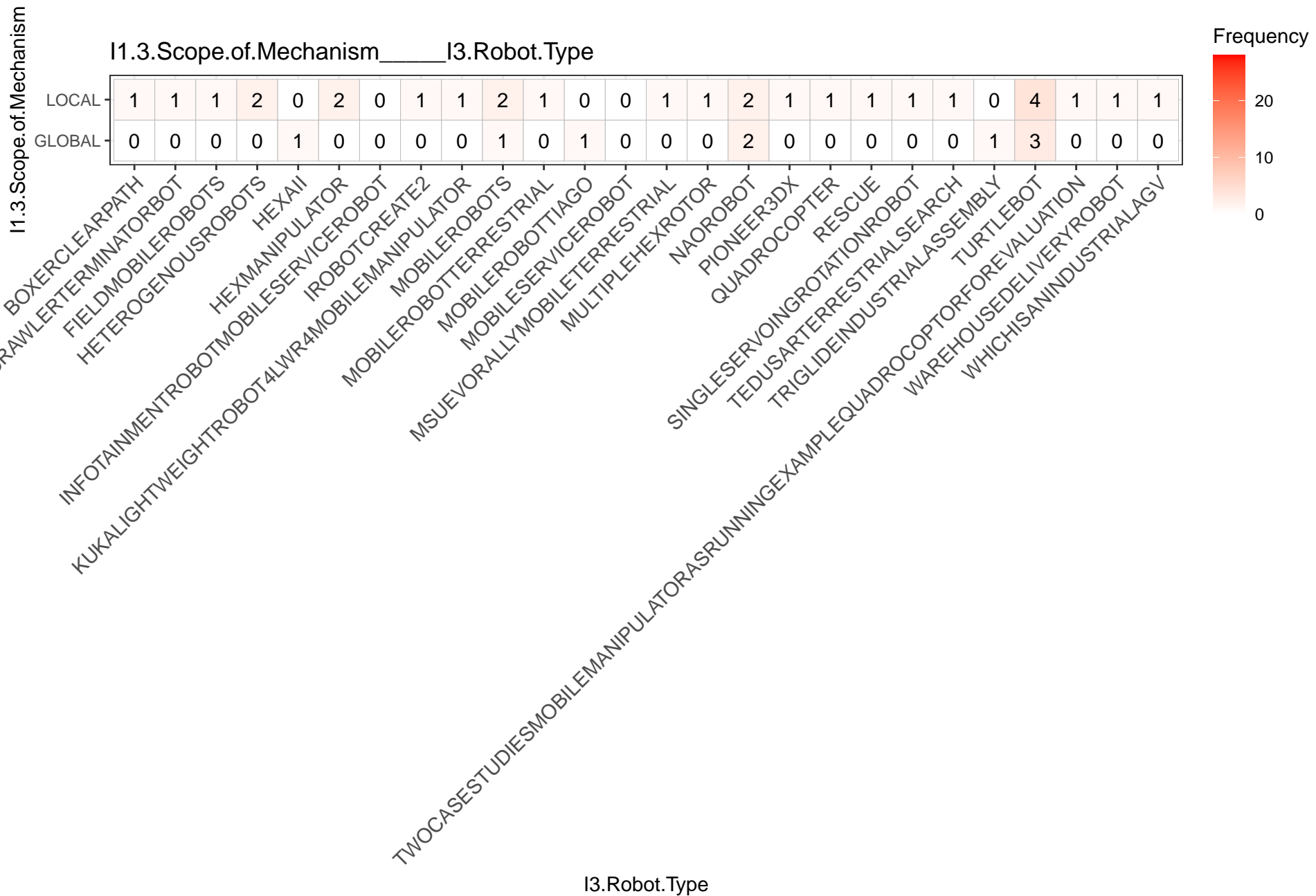
Frequency











I1.3.Scope.of.Mechanism_____I4.Robo.SW

I1.3.Scope.of.Mechanism

LOCAL

7

13

0

GLOBAL

1

4

1

OTHER

ROS1

ROS2

I4.Robo.SW

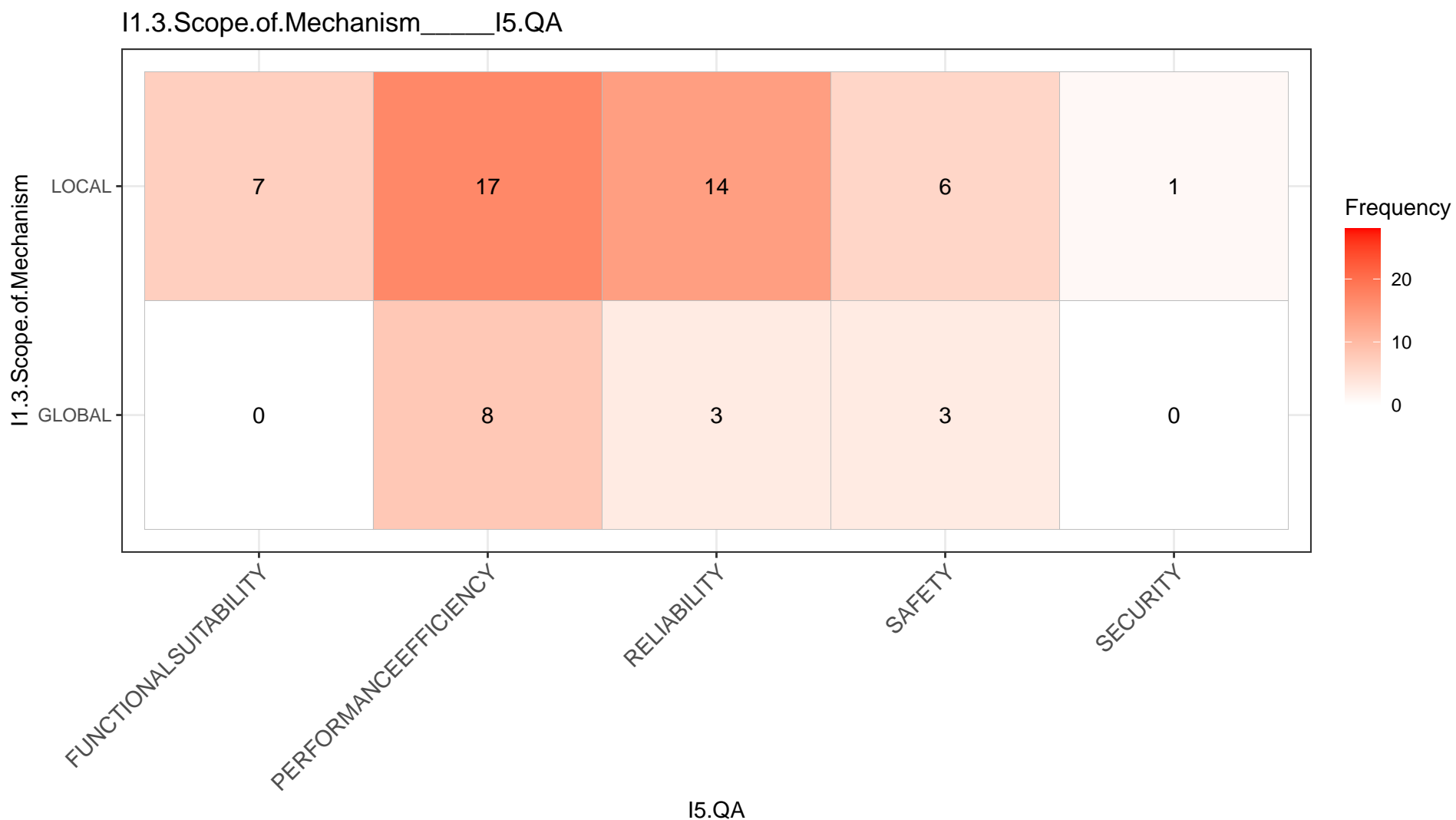
Frequency



20

10

0



I1.3.Scope.of.Mechanism_____I6.Independence

I1.3.Scope.of.Mechanism

LOCAL

7

3

14

GLOBAL

5

1

2

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

Frequency

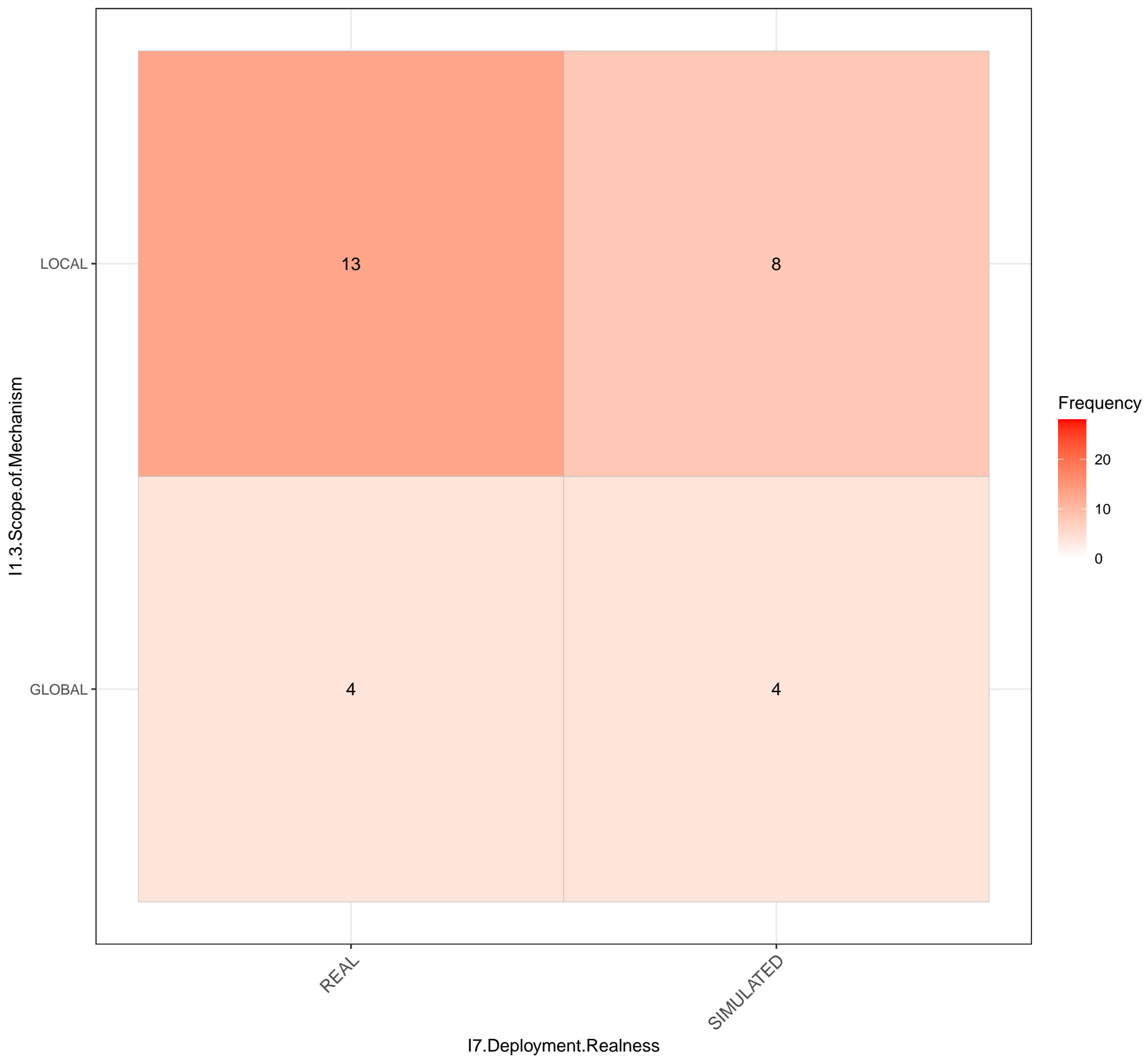


20

10

0

I1.3.Scope.of.Mechanism_____I7.Deployment.Realness



I1.3.Scope.of.Mechanism_____I7.Mission.Realness

I1.3.Scope.of.Mechanism

LOCAL

11

13

GLOBAL

3

5

REAL

SYNTHETIC

I7.Mission.Realness

Frequency



I1.3.Scope.of.Mechanism_____Experiment.Method

I1.3.Scope.of.Mechanism

LOCAL

15

5

4

GLOBAL

5

2

1

EXPERIMENT

NOEVALUATION

SHOWCASE

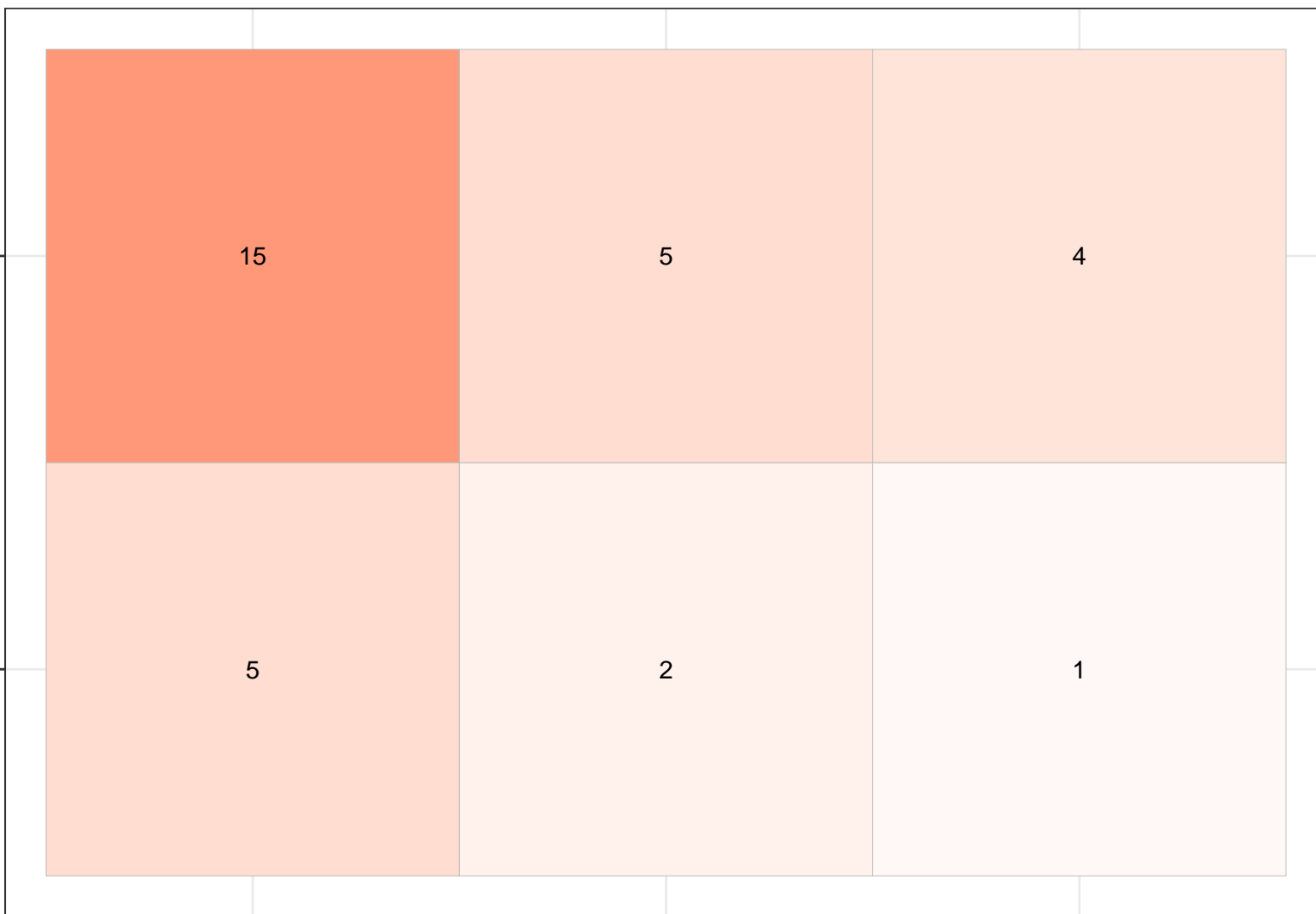
Experiment.Method

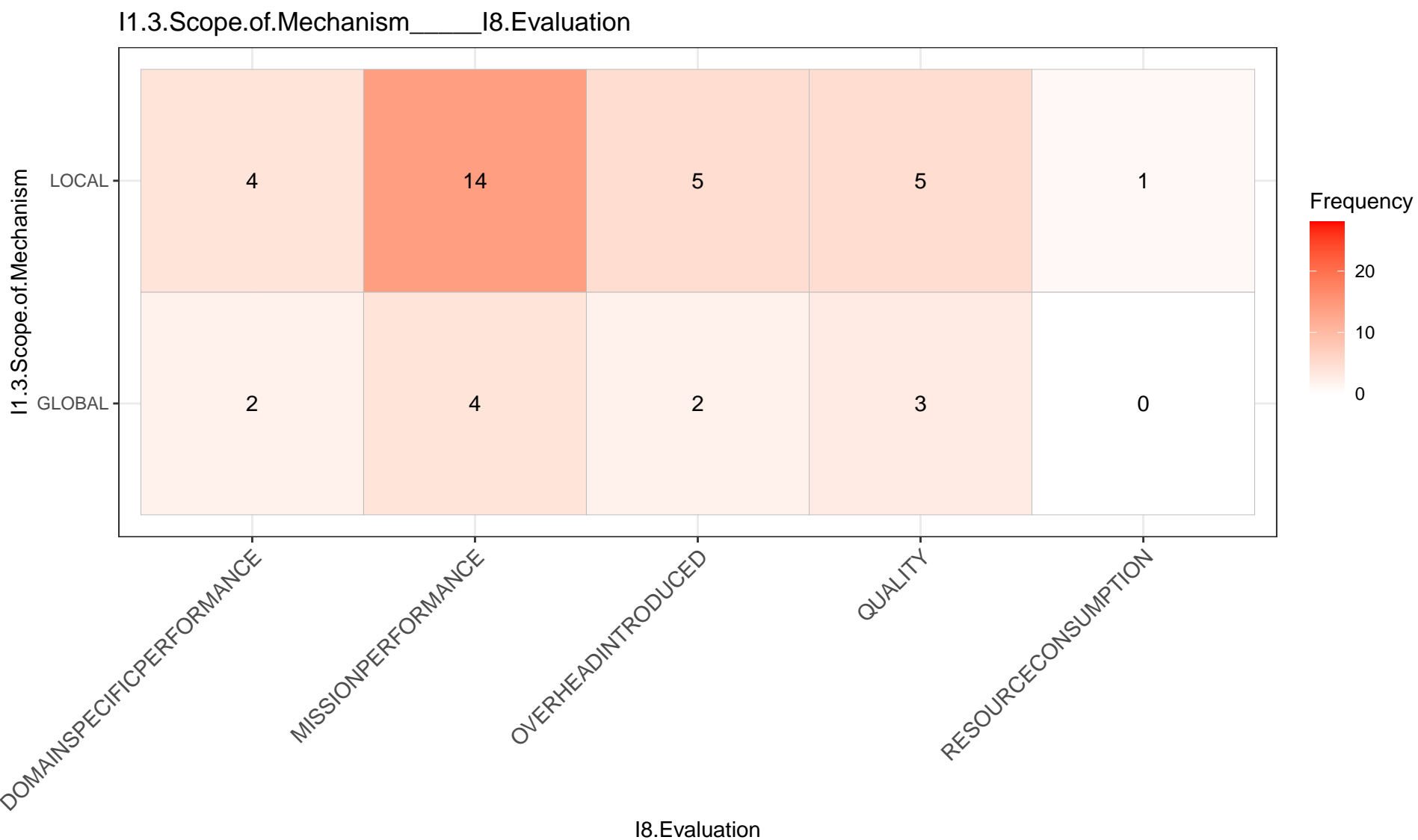
Frequency

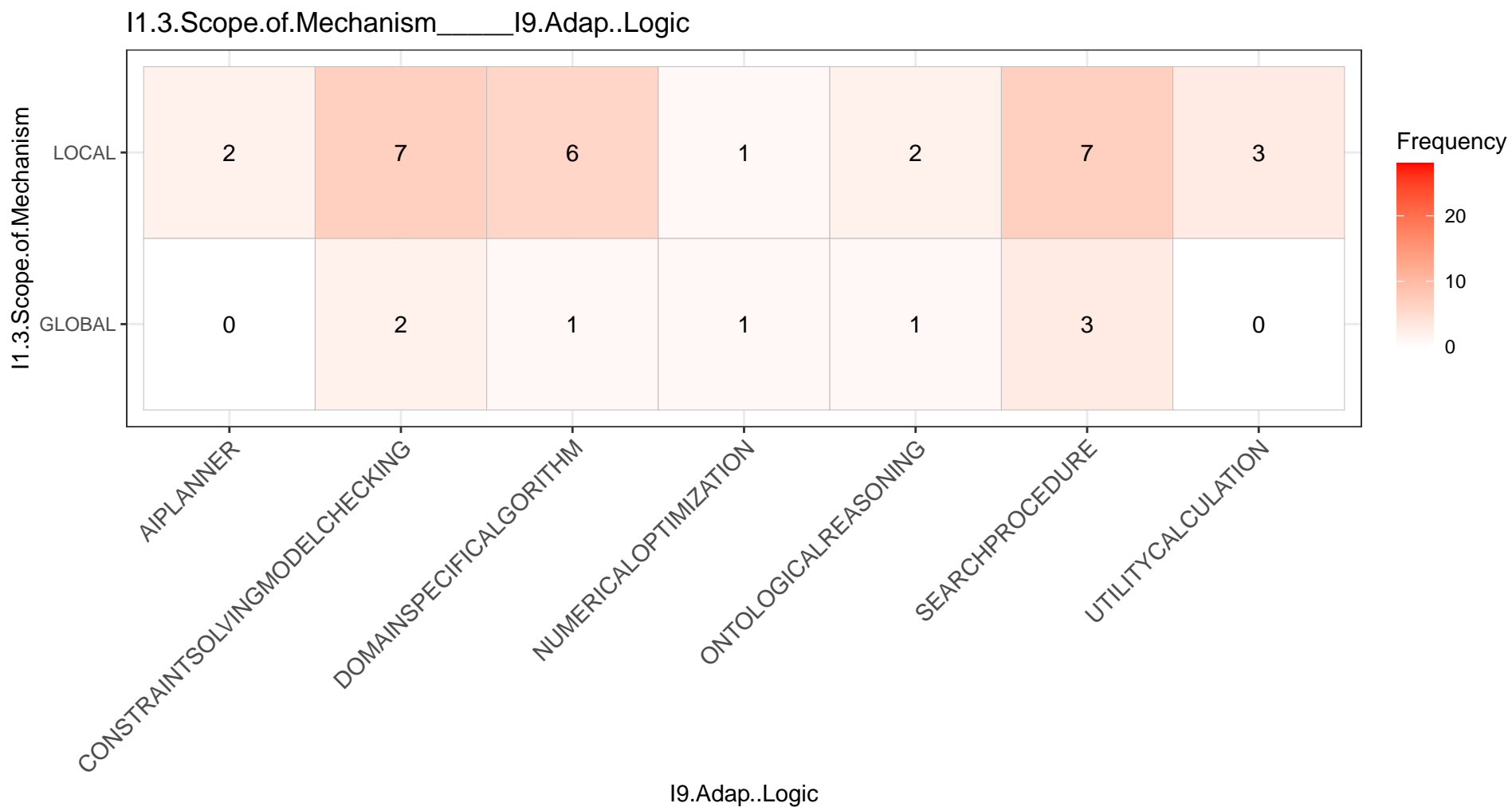
20

10

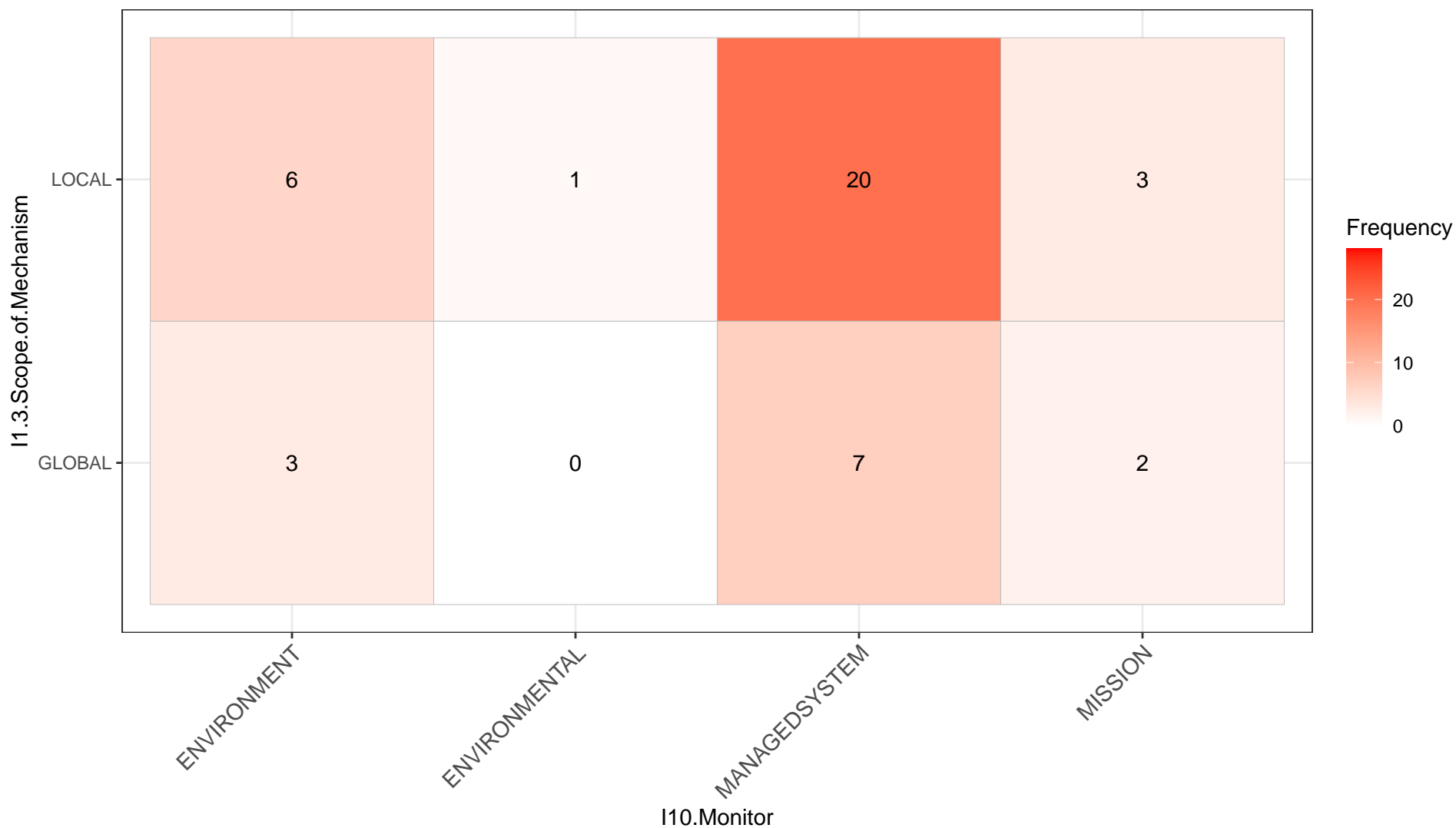
0

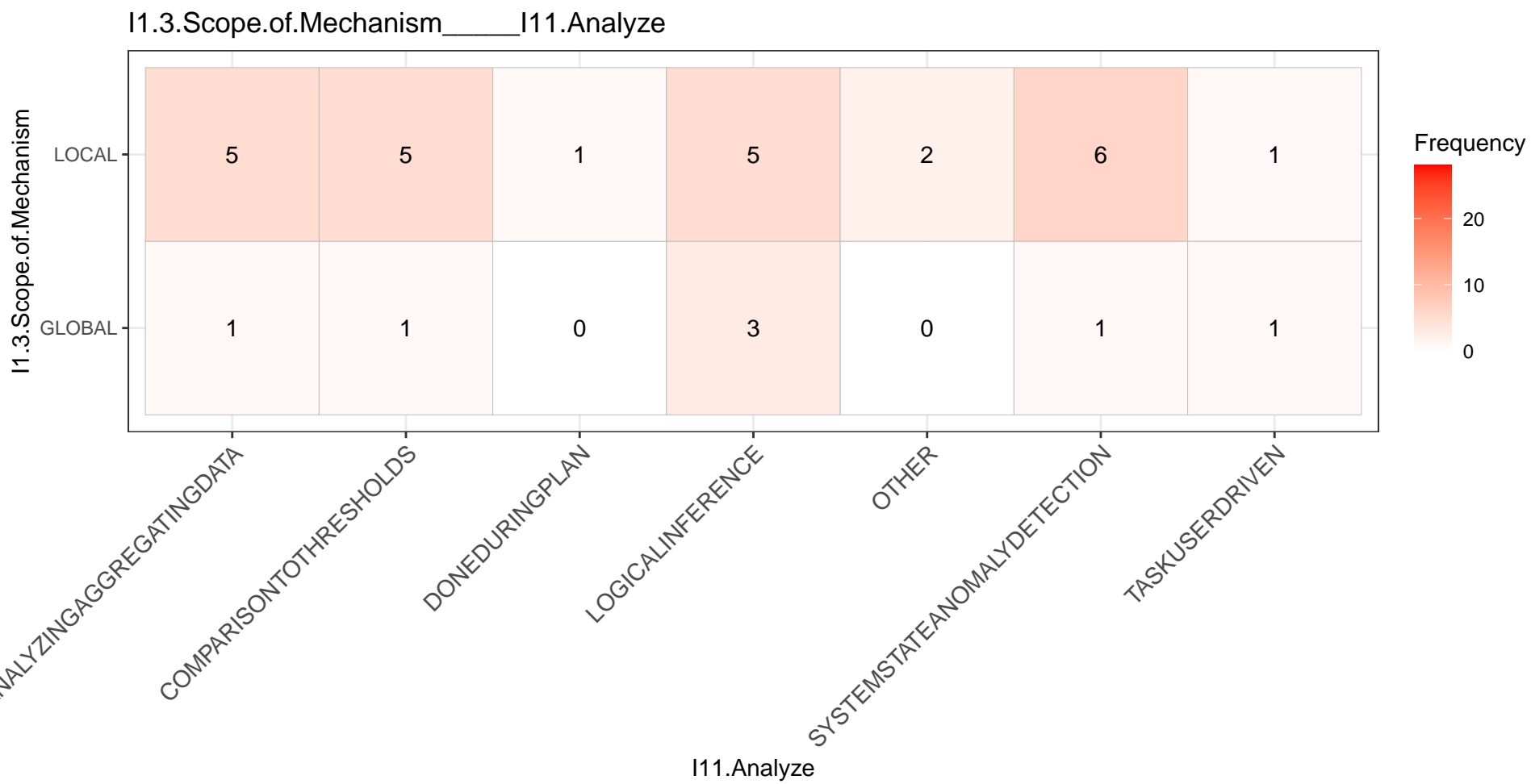




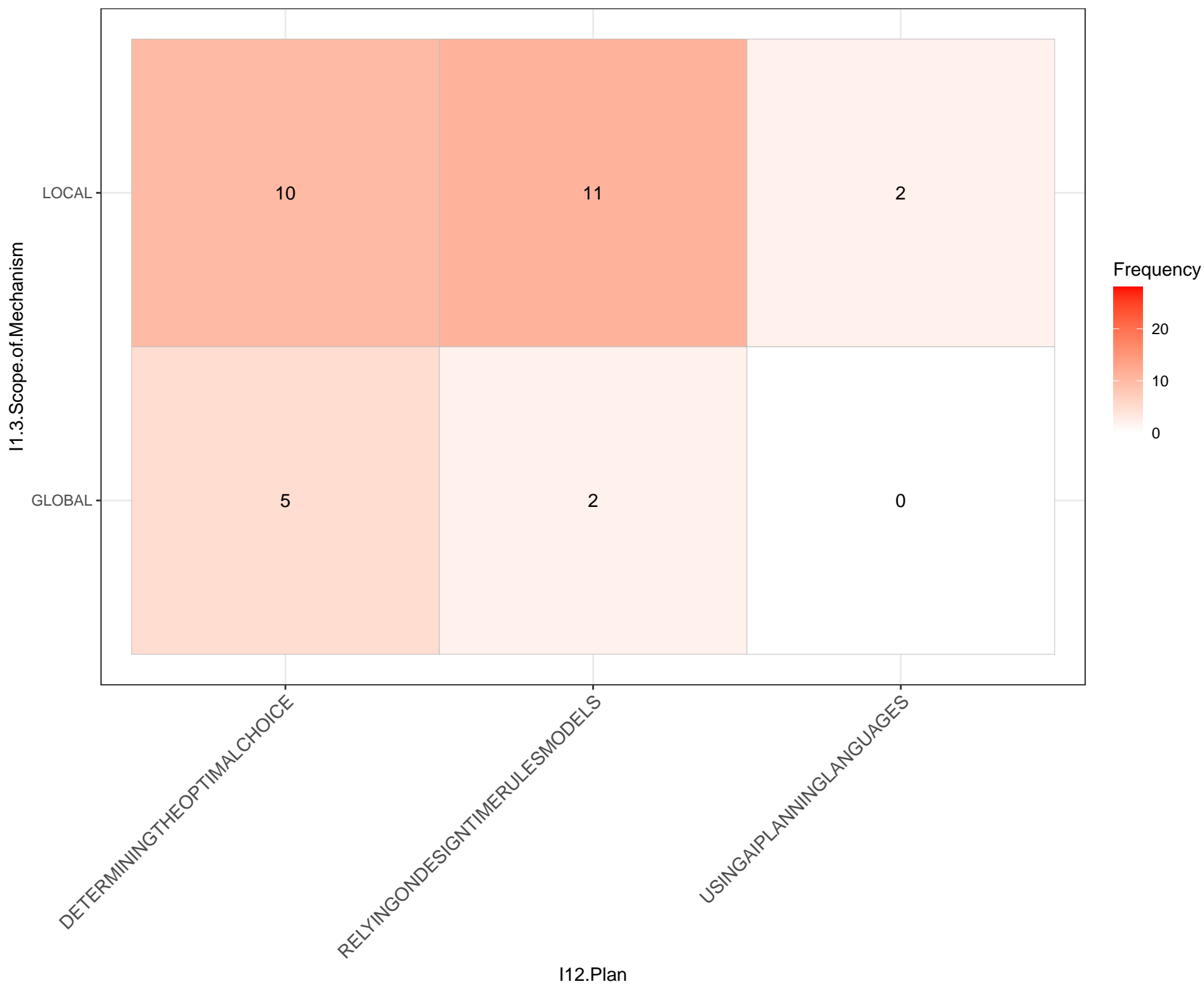


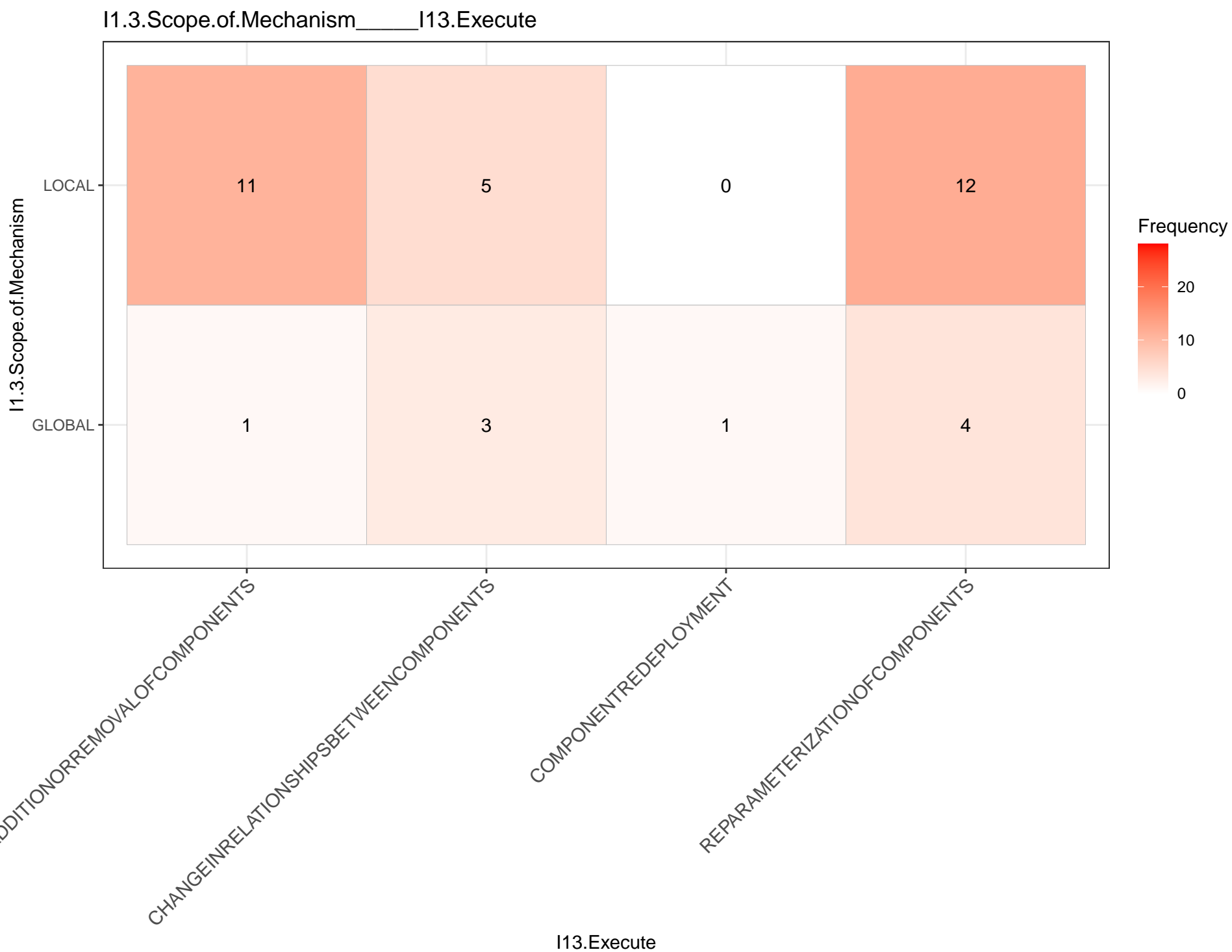
I1.3.Scope.of.Mechanism_____I10.Monitor

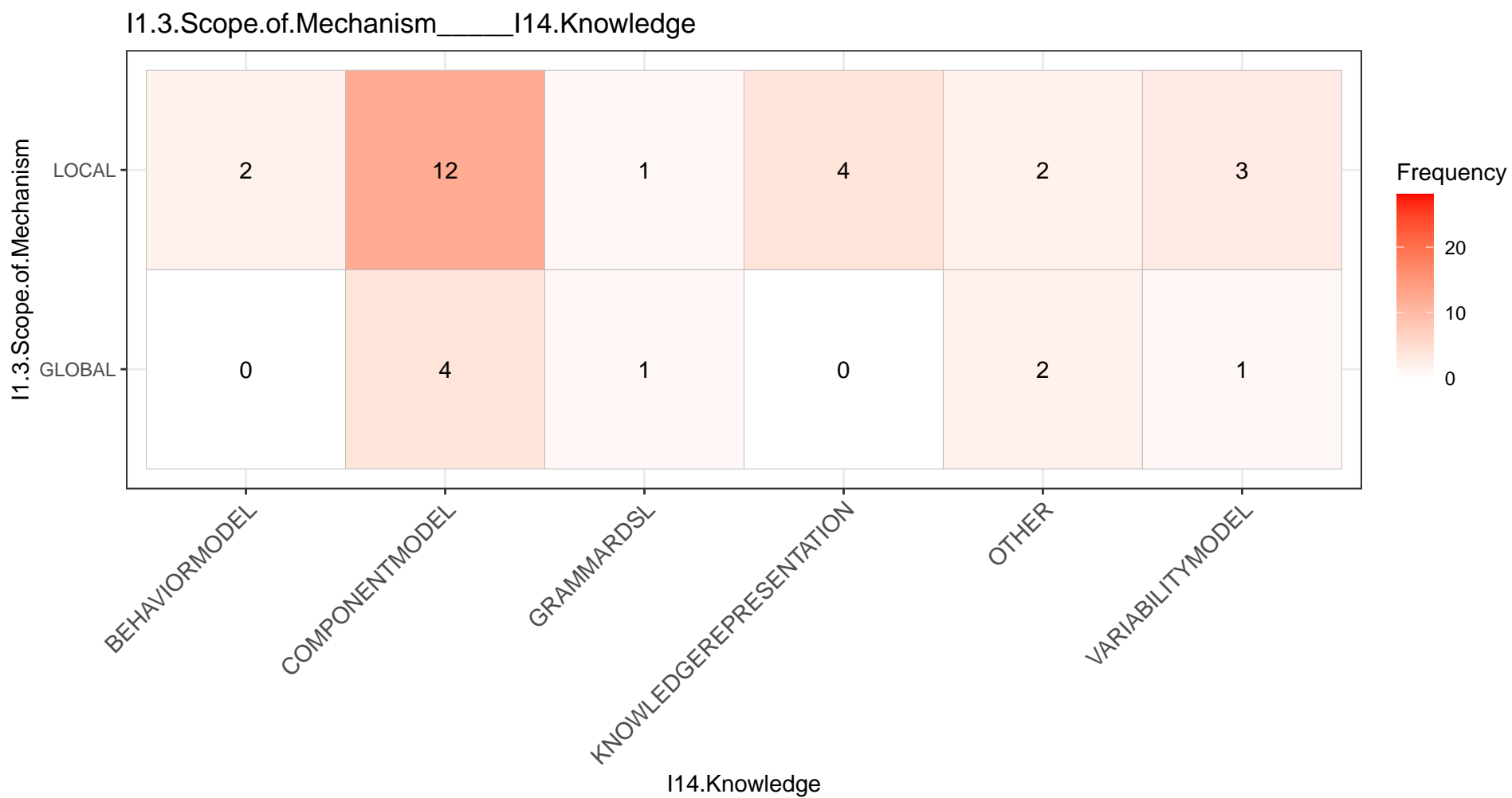




I1.3.Scope.of.Mechanism_____I12.Plan







I1.3.Duration.of.Mechanism_____I1.3.Timeliness.of.Mechanism

I1.3.Duration.of.Mechanism

VERYSHORT

4

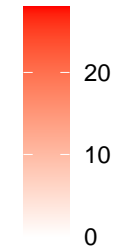
MEDIUM

1

DOSHORT

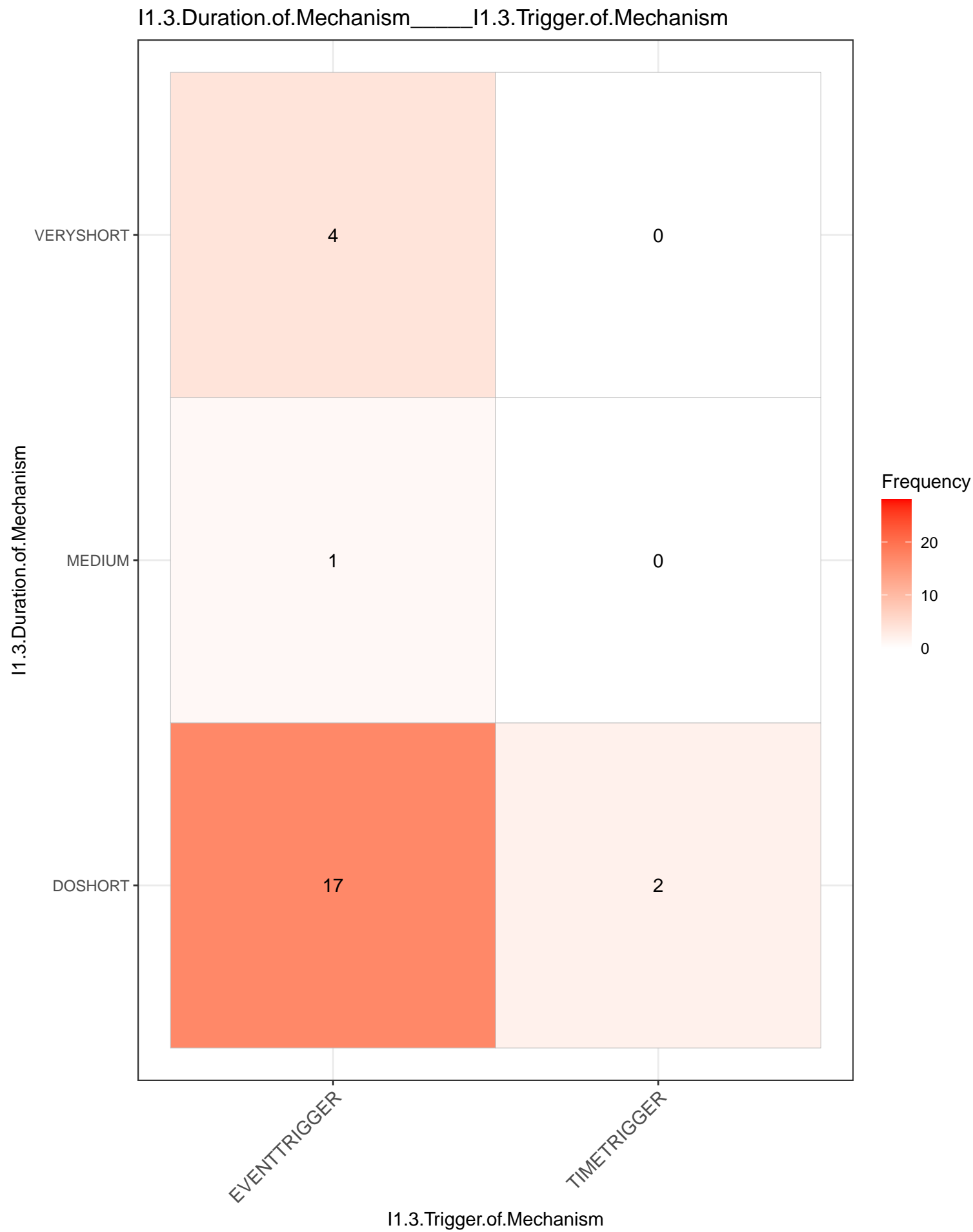
20

Frequency

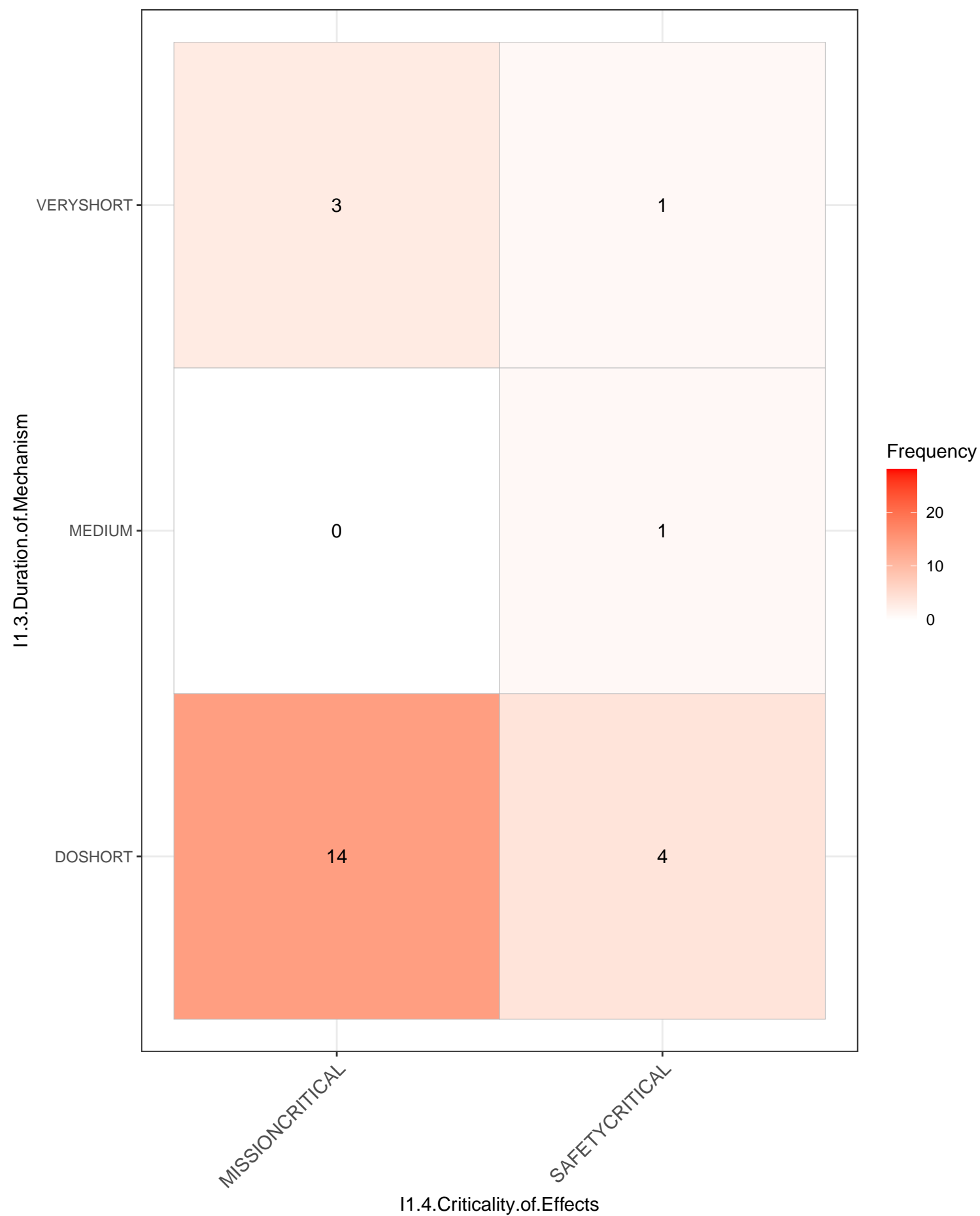


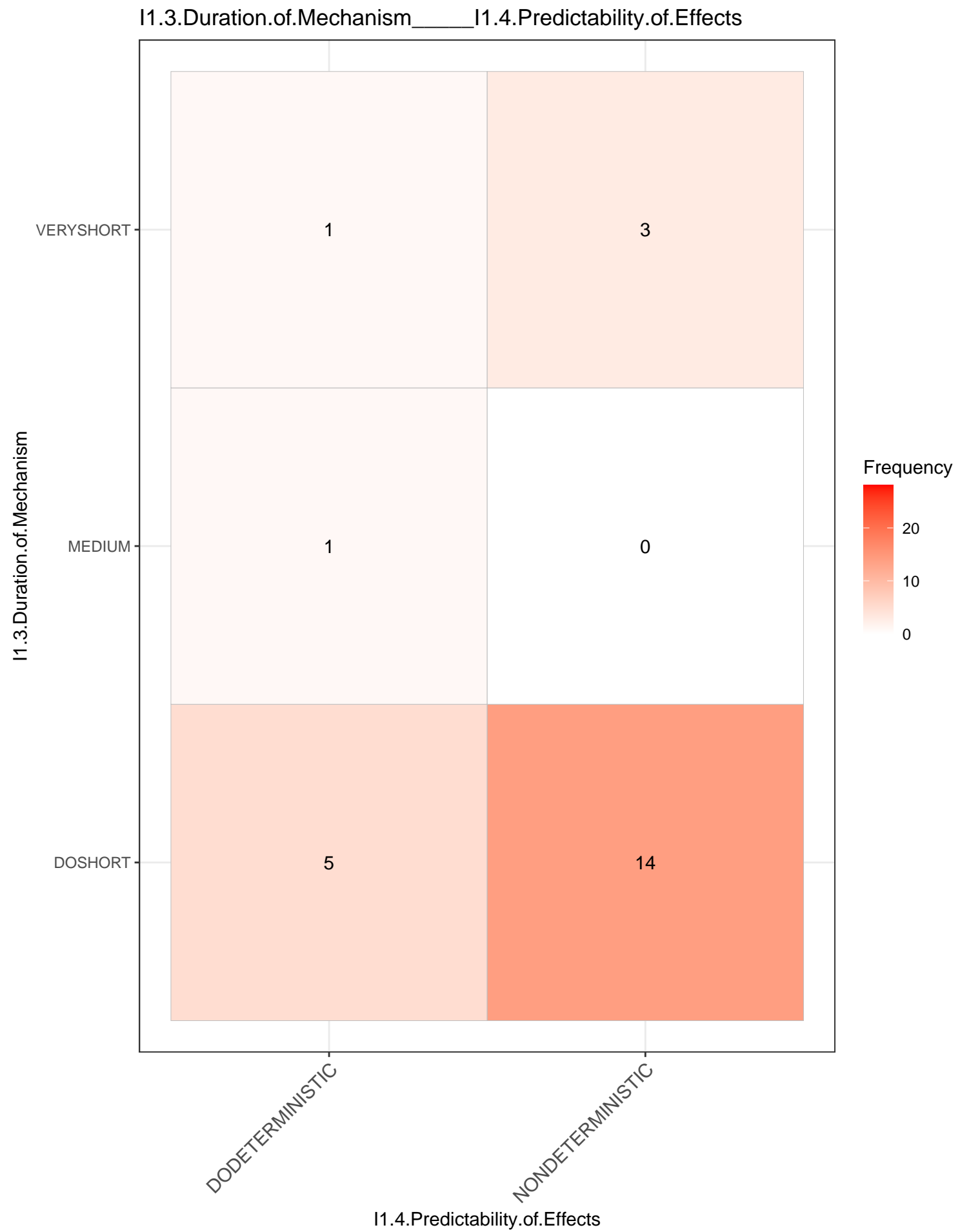
BESTEFFECT

I1.3.Timeliness.of.Mechanism



I1.3.Duration.of.Mechanism_____I1.4.Criticality.of.Effects





I1.3.Duration.of.Mechanism_____I1.4.Overhead.of.Effects

I1.3.Duration.of.Mechanism

VERYSHORT

1

1

2

MEDIUM

0

0

1

DOSHORT

13

3

1

DEPENDENT

DOSIGNIFICANT

INSIGNIFICANT

I1.4.Overhead.of.Effects

Frequency



20

10

0

I1.3.Duration.of.Mechanism_____I1.4.Resilience.of.Effects

I1.3.Duration.of.Mechanism

VERYSHORT

2

1

0

MEDIUM

0

1

0

DOSHORT

7

6

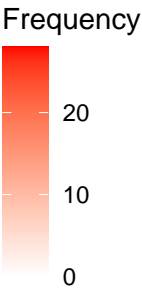
3

DEPENDENT

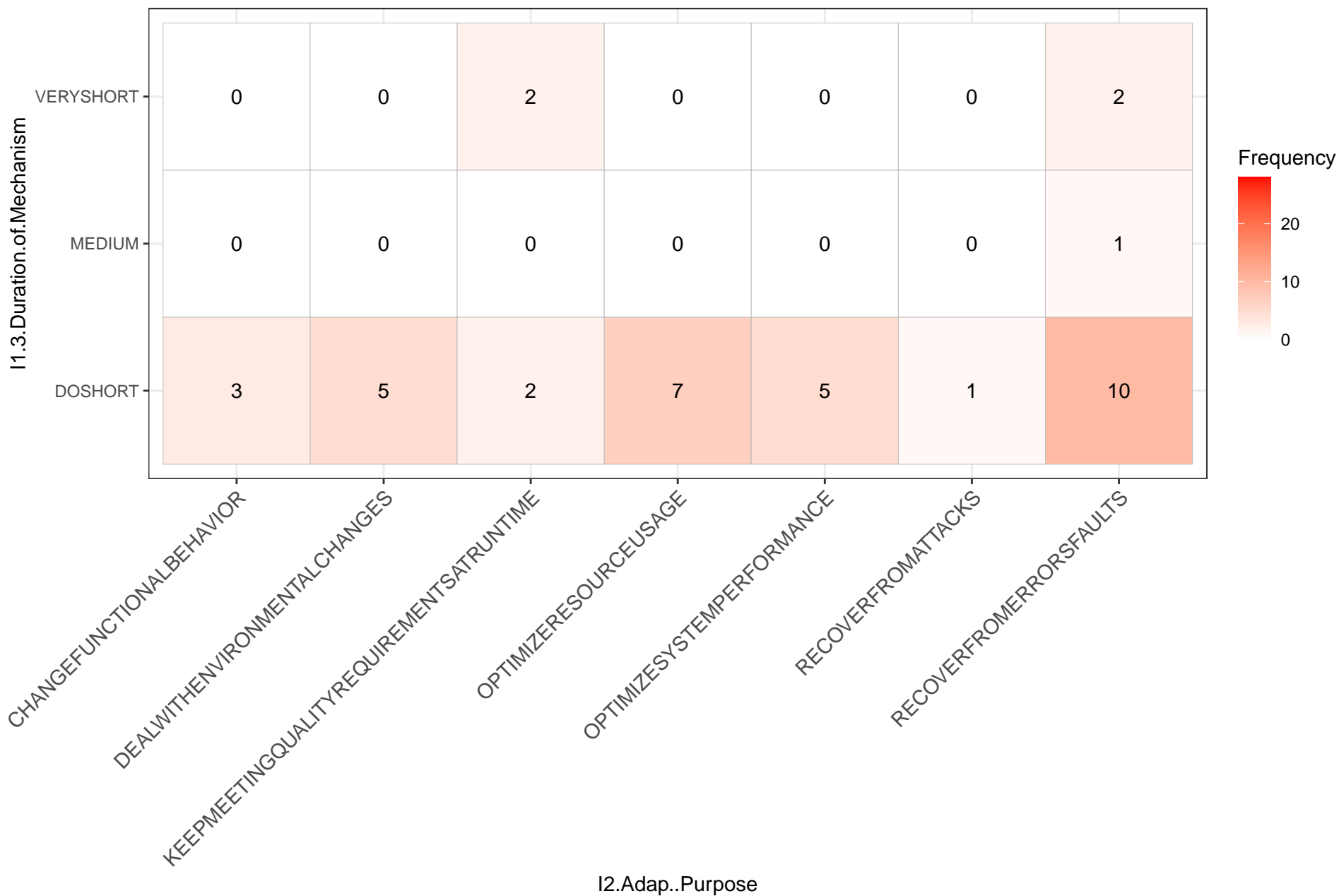
DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects



I1.3.Duration.of.Mechanism_____I2.Adap..Purpose

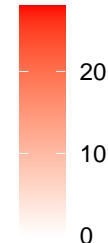


I1.3.Duration.of.Mechanism

I1.3.Duration.of.MechanismI3.Robot.Type

VERYSHORT	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	
MEDIUM	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	
DOSHORT	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

Frequency



BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOT
HETEROGENOUSROBOTS
INFOTAINMENTROBOTMOBILESERVICEIROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTTERRESTRIALMOBILEROBOTTIAGO
MSUEVORALLYMOBILETERRESTRIALMULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION

I3.Robot.Type

I1.3.Duration.of.Mechanism____I4.Robo.SW

I1.3.Duration.of.Mechanism

VERYSHORT

MEDIUM

DOSHORT

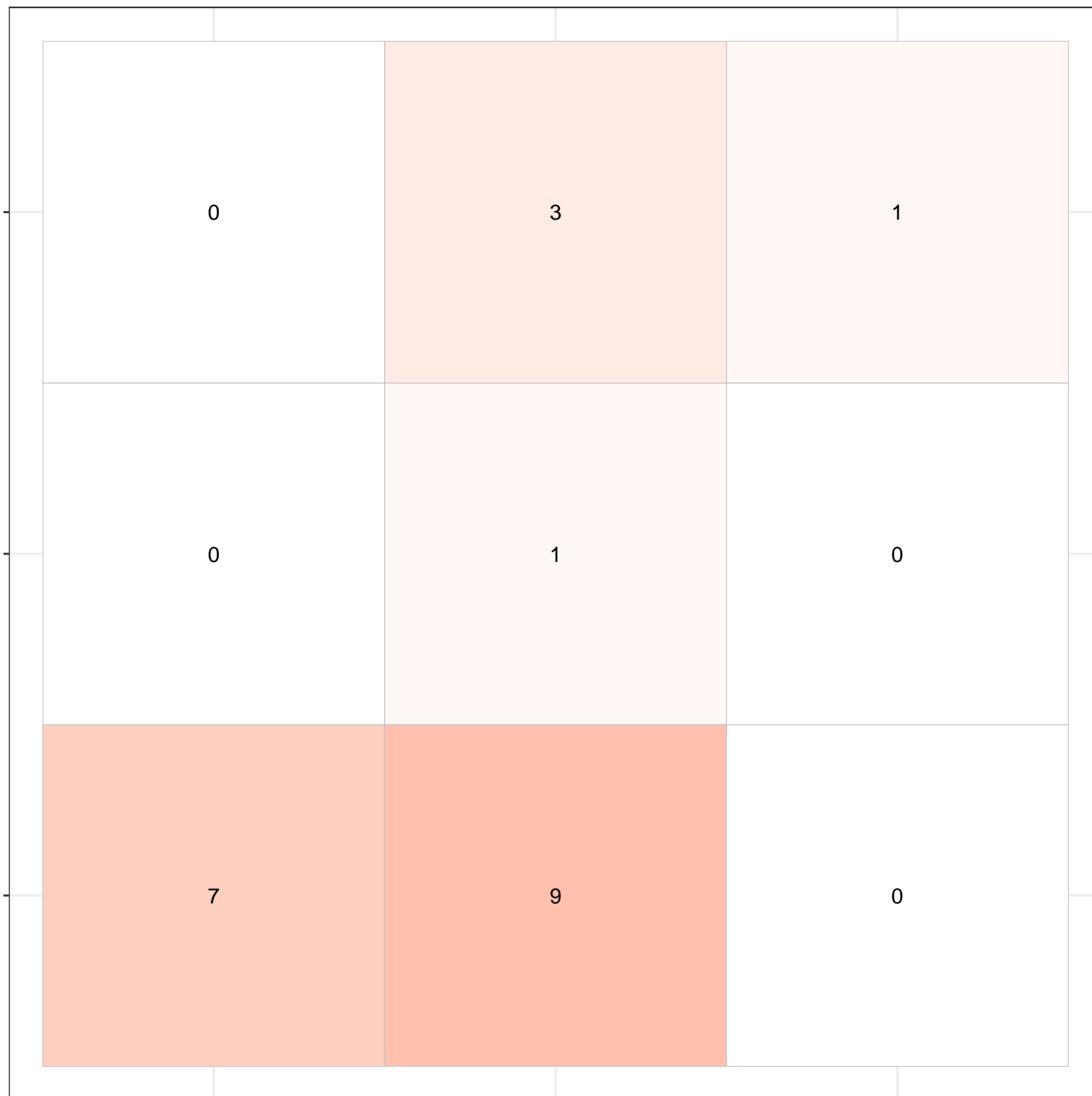
OTHER

ROS1

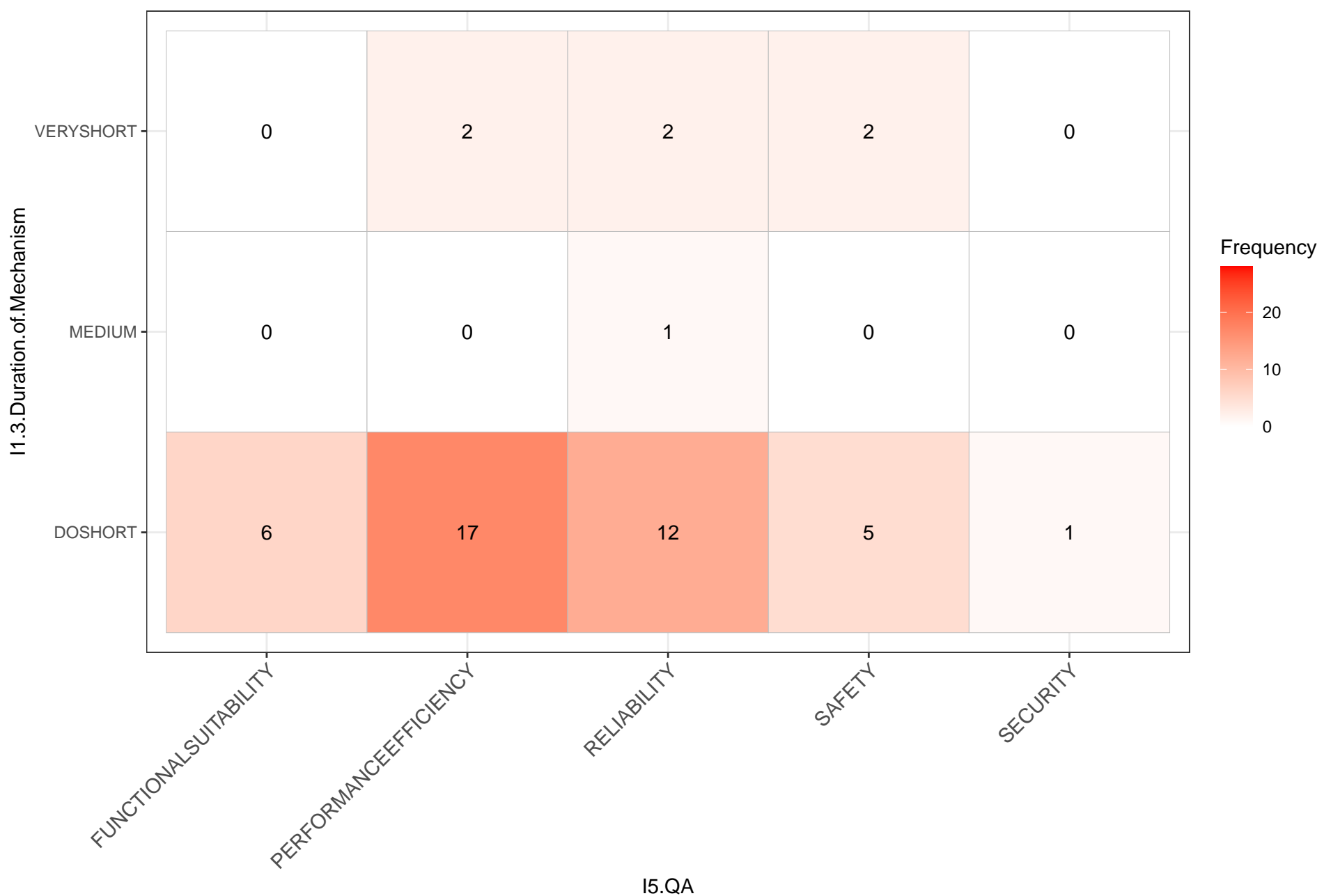
ROS2

I4.Robo.SW

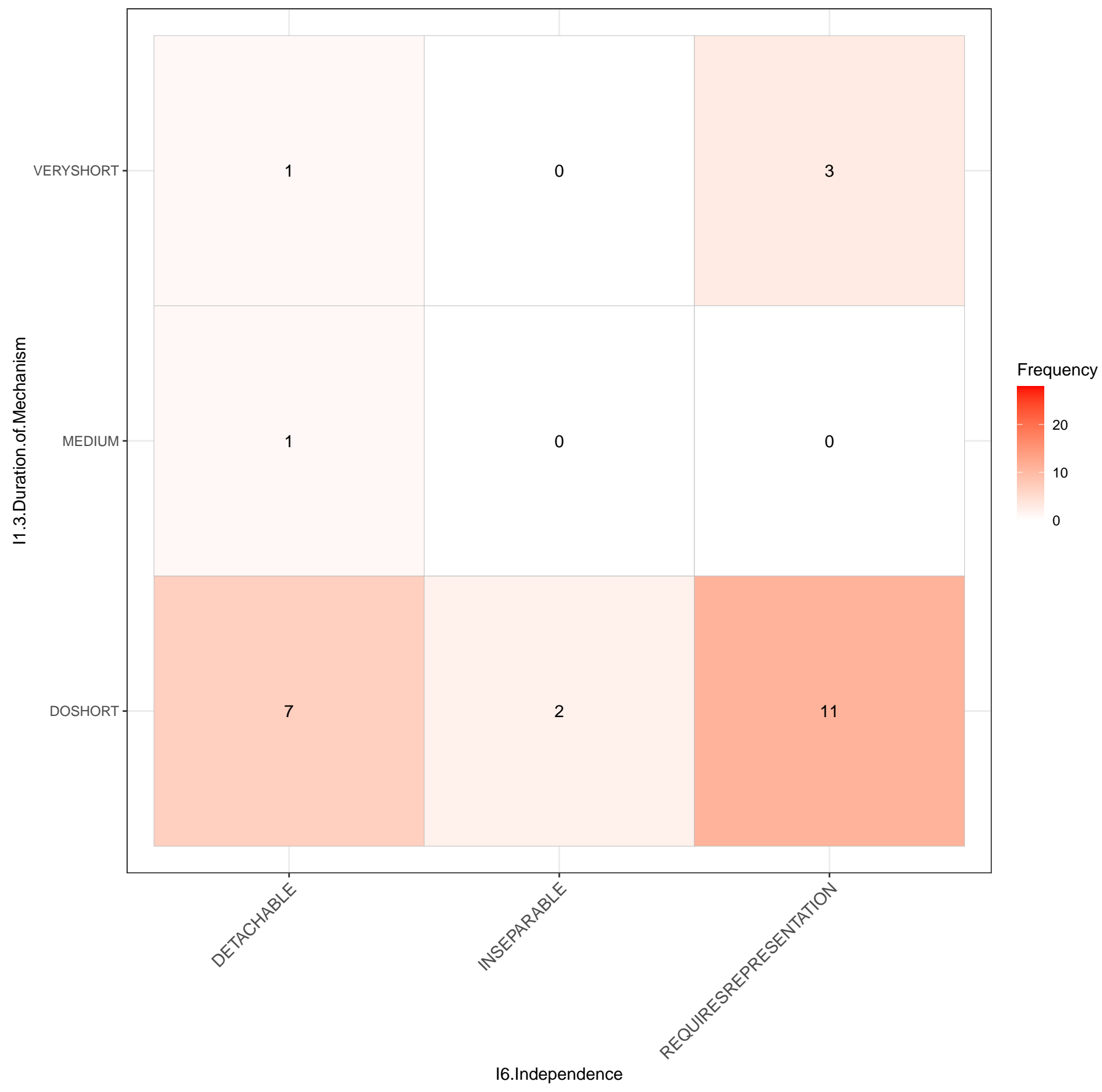
Frequency



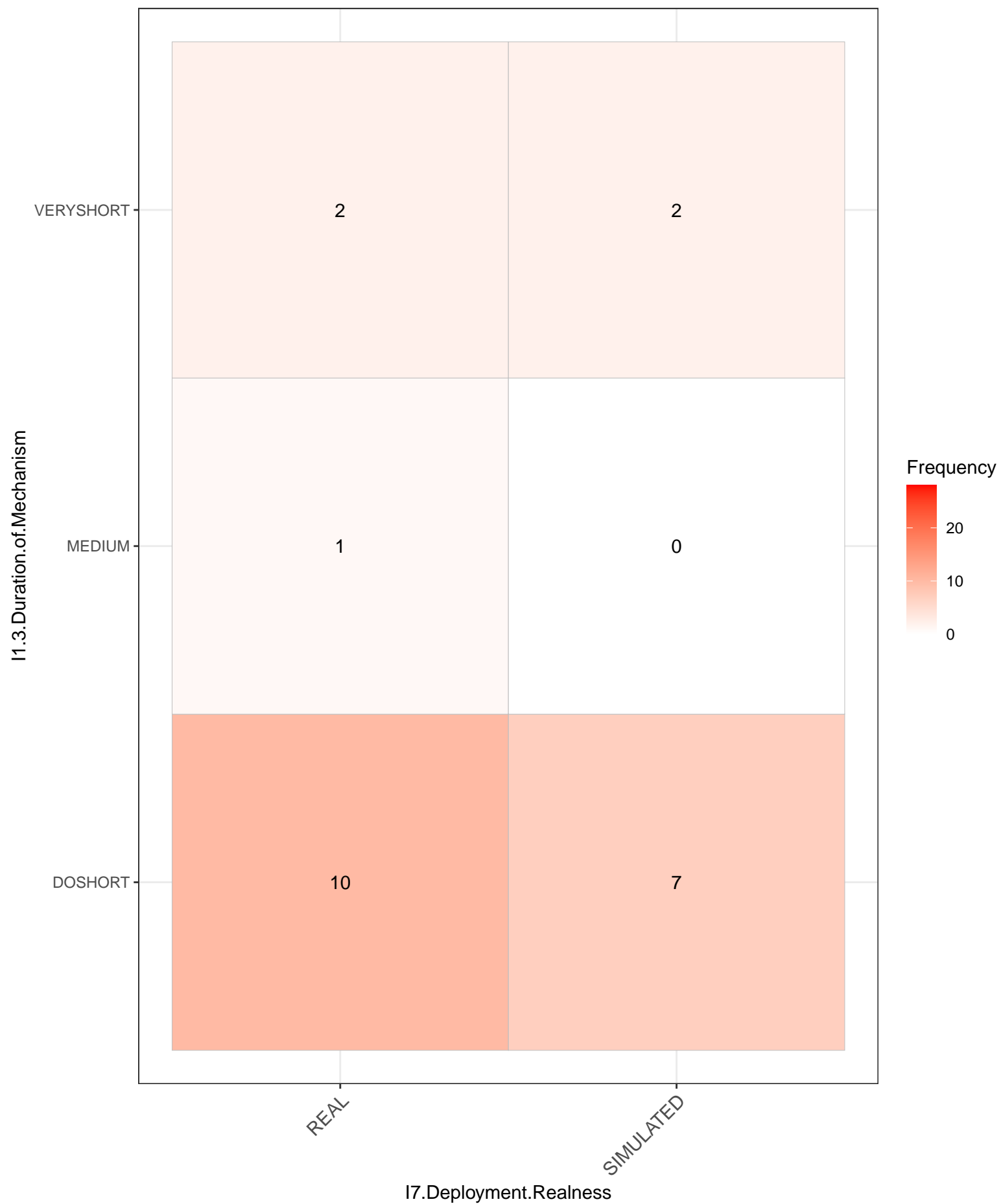
I1.3.Duration.of.Mechanism_____I5.QA



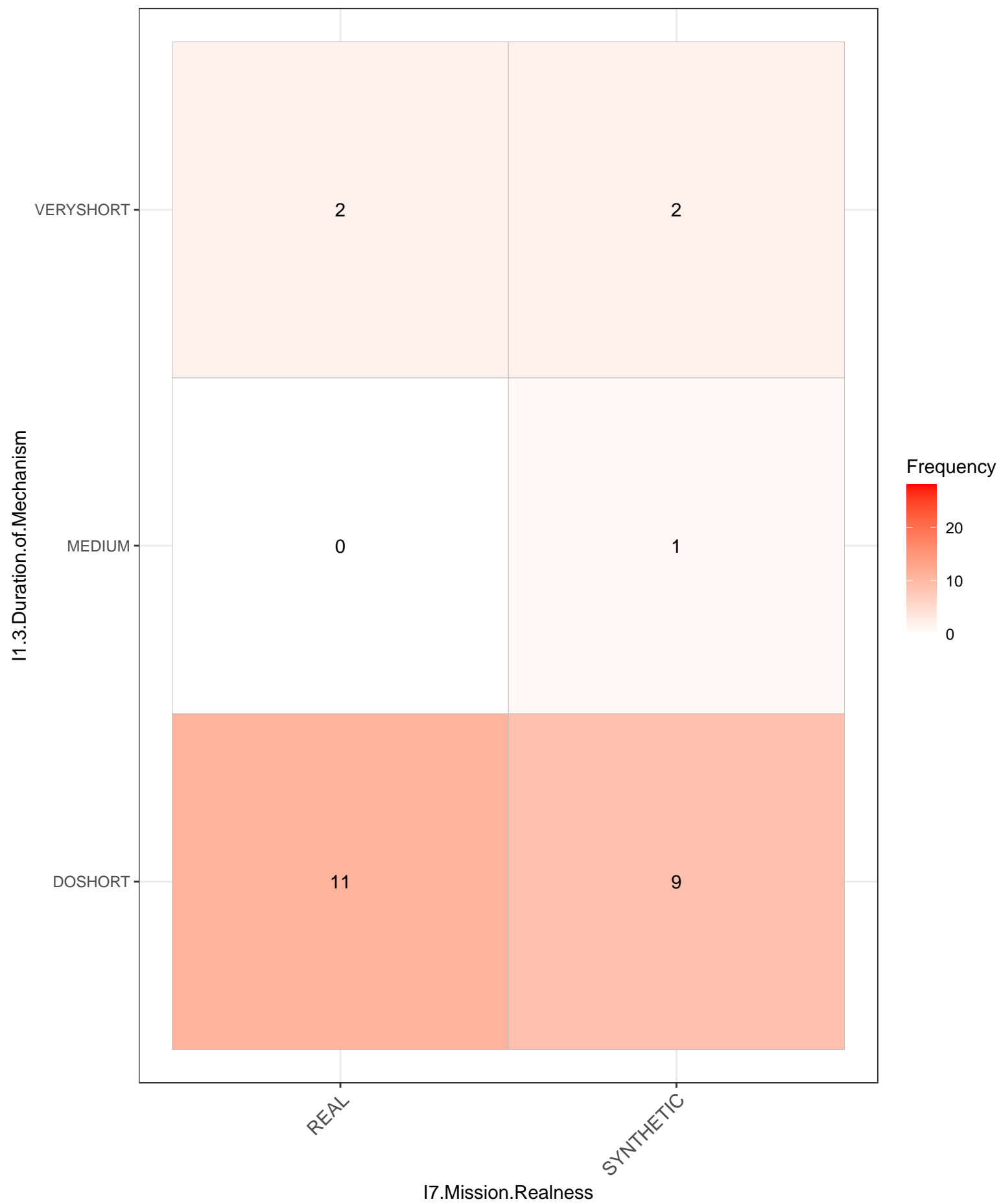
I1.3.Duration.of.Mechanism_____I6.Independence



I1.3.Duration.of.Mechanism_____I7.Deployment.Realness

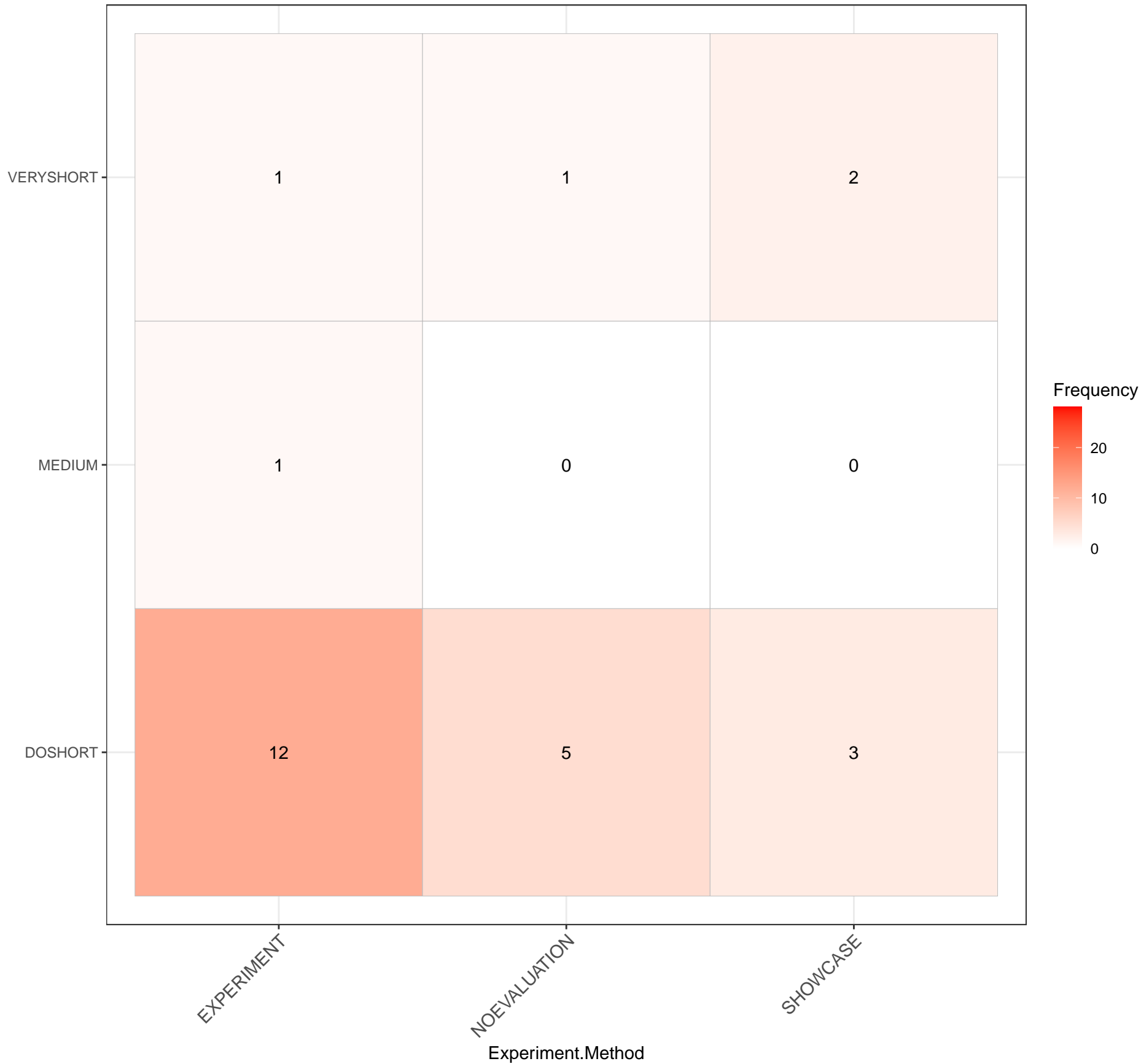


I1.3.Duration.of.Mechanism_____I7.Mission.Realness

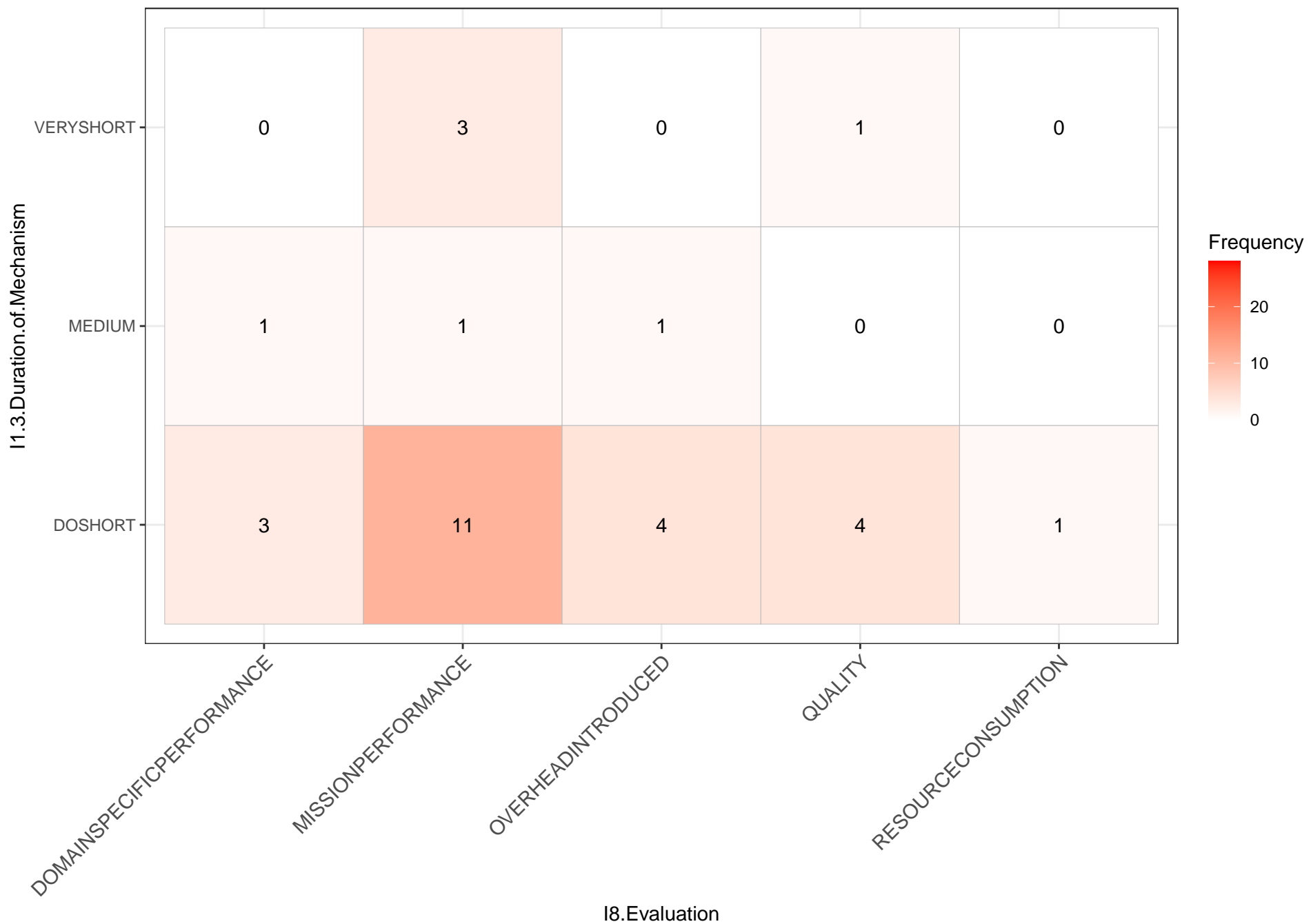


I1.3.Duration.of.Mechanism_____Experiment.Method

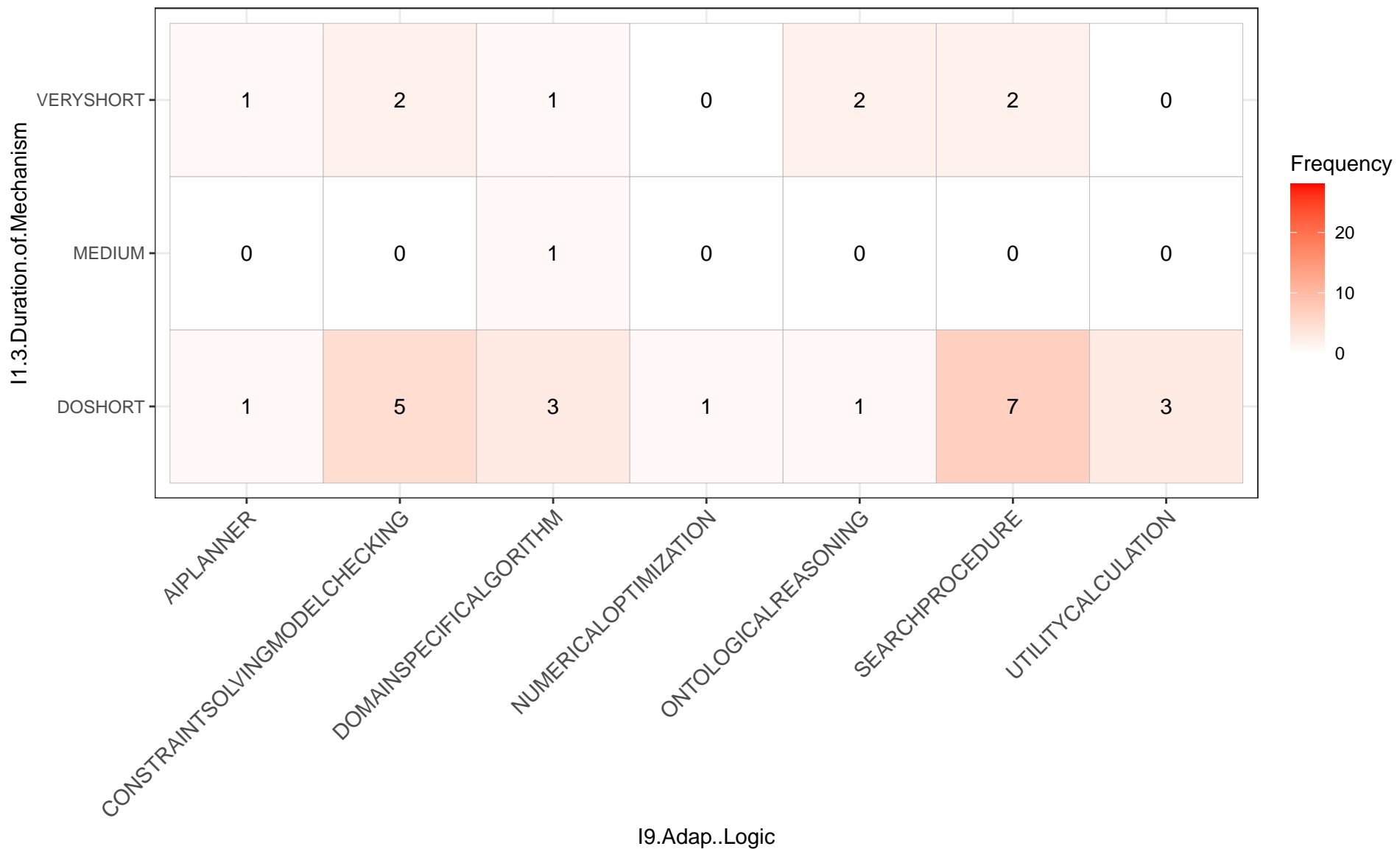
I1.3.Duration.of.Mechanism



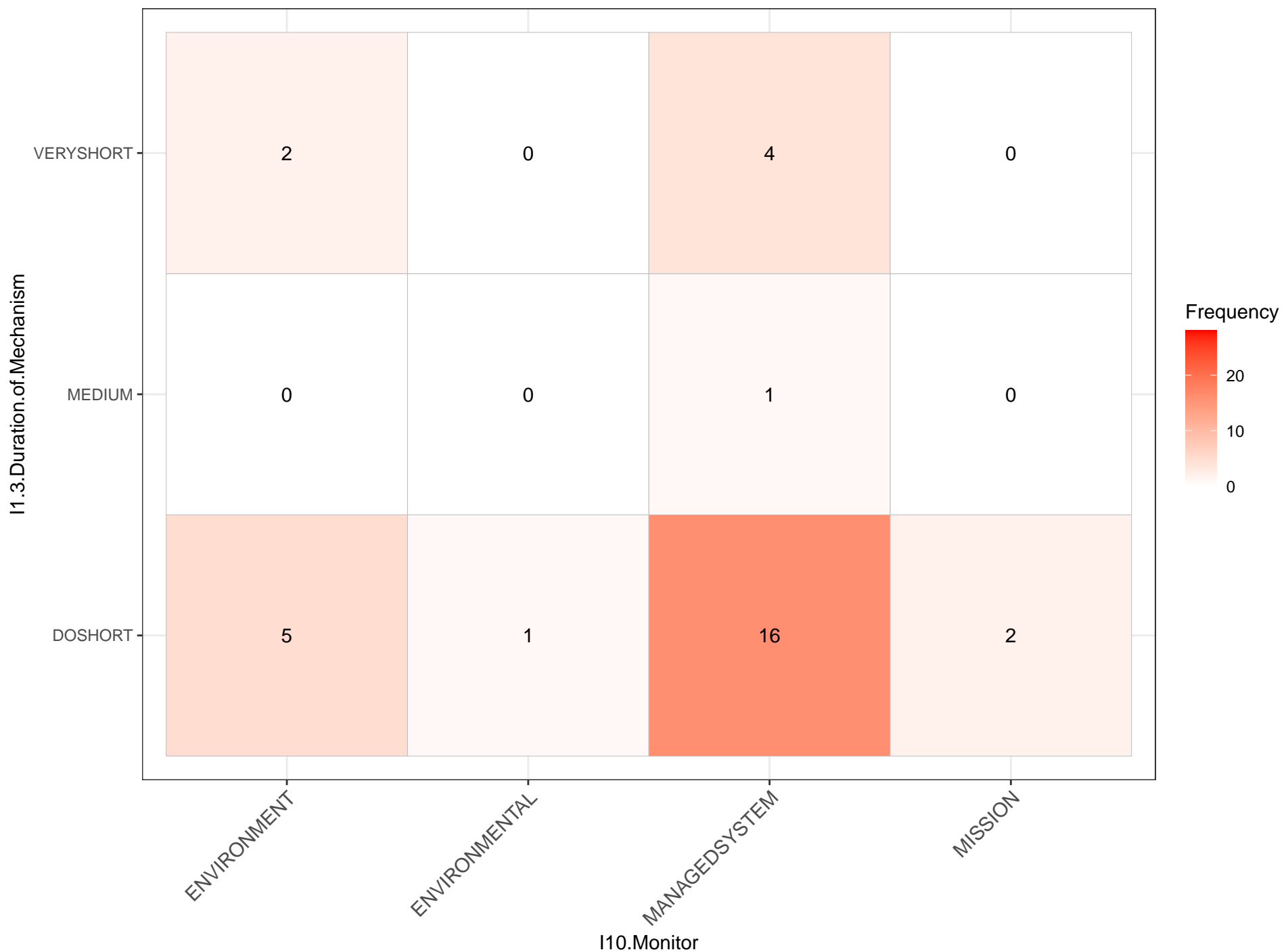
I1.3.Duration.of.Mechanism_____I8.Evaluation



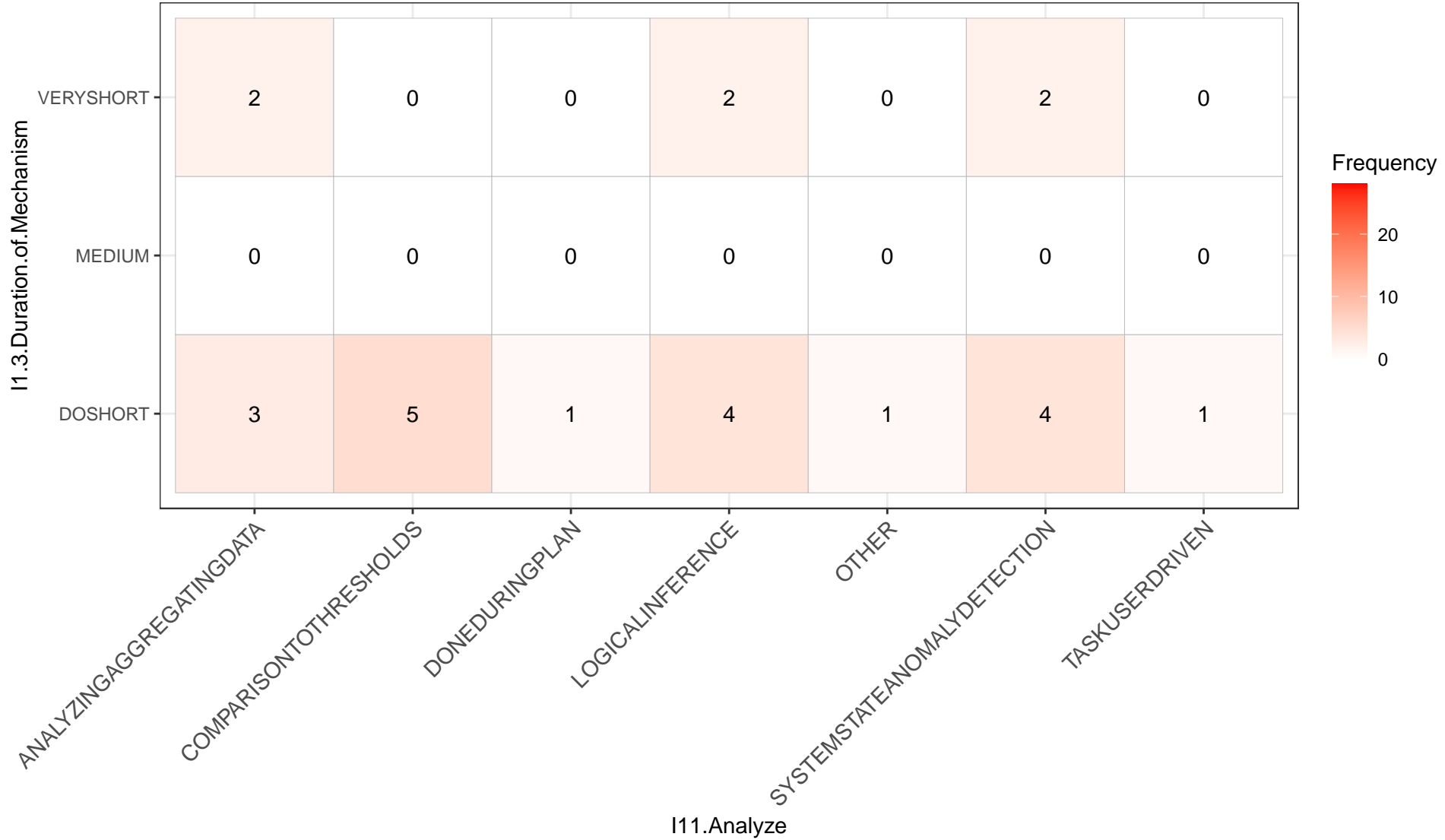
I1.3.Duration.of.Mechanism_____I9.Adap..Logic



I1.3.Duration.of.Mechanism_____I10.Monitor



I1.3.Duration.of.Mechanism_____I11.Analyze



I1.3.Duration.of.Mechanism

VERYSHORT

MEDIUM

DOSHORT

Frequency

20

10

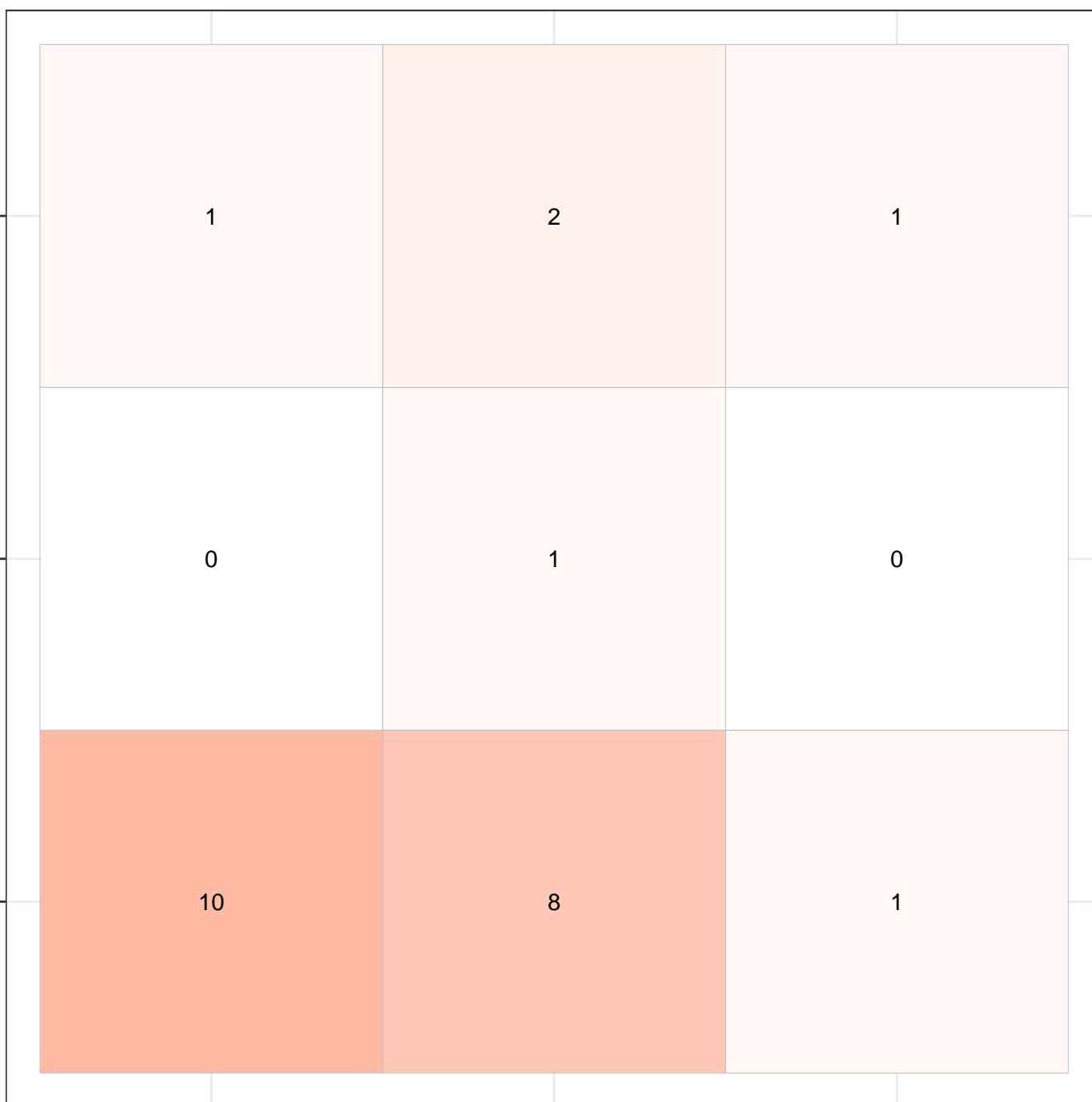
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DETERMININGTHEOPTIMALCHOICE

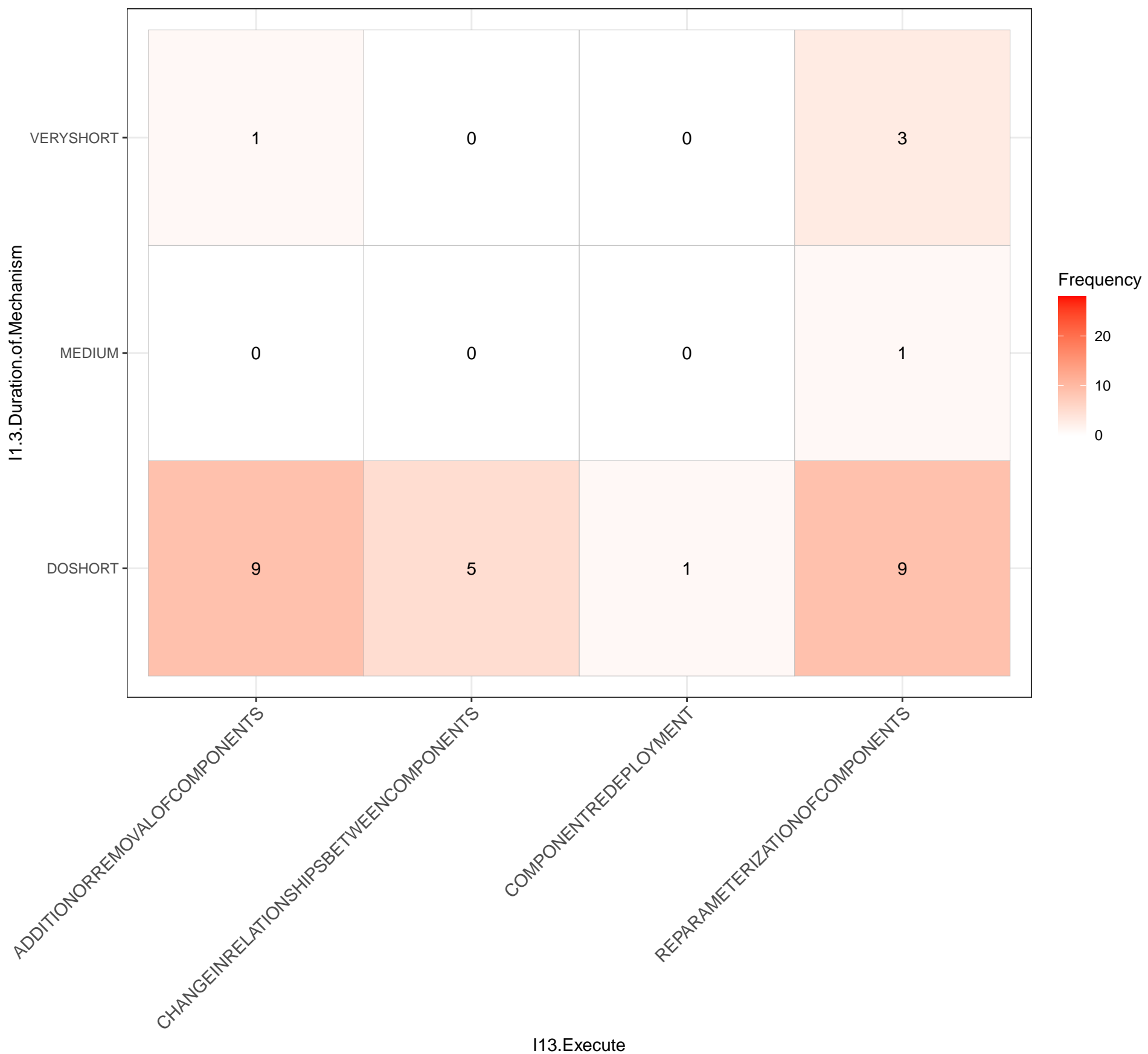
RELYINGONDESIGNTIMERULESMODELS

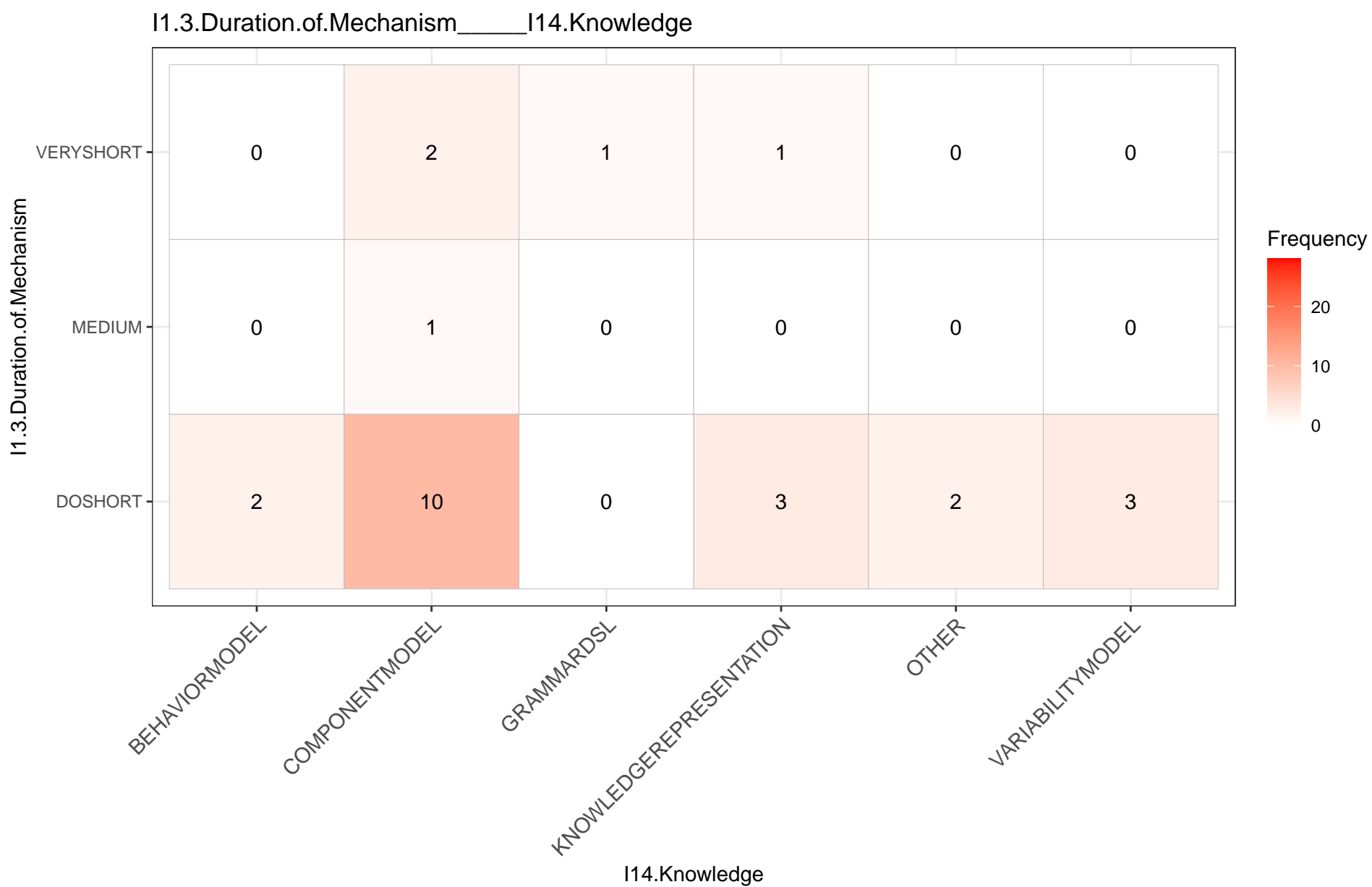
USINGAIPANNINGLANGUAGES

I12.Plan



I1.3.Duration.of.Mechanism____I13.Execute





I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I1.3.Trigger.of.Mechanism

BESTEFFORT

23

2

EVENTTRIGGER

TIMETRIGGER

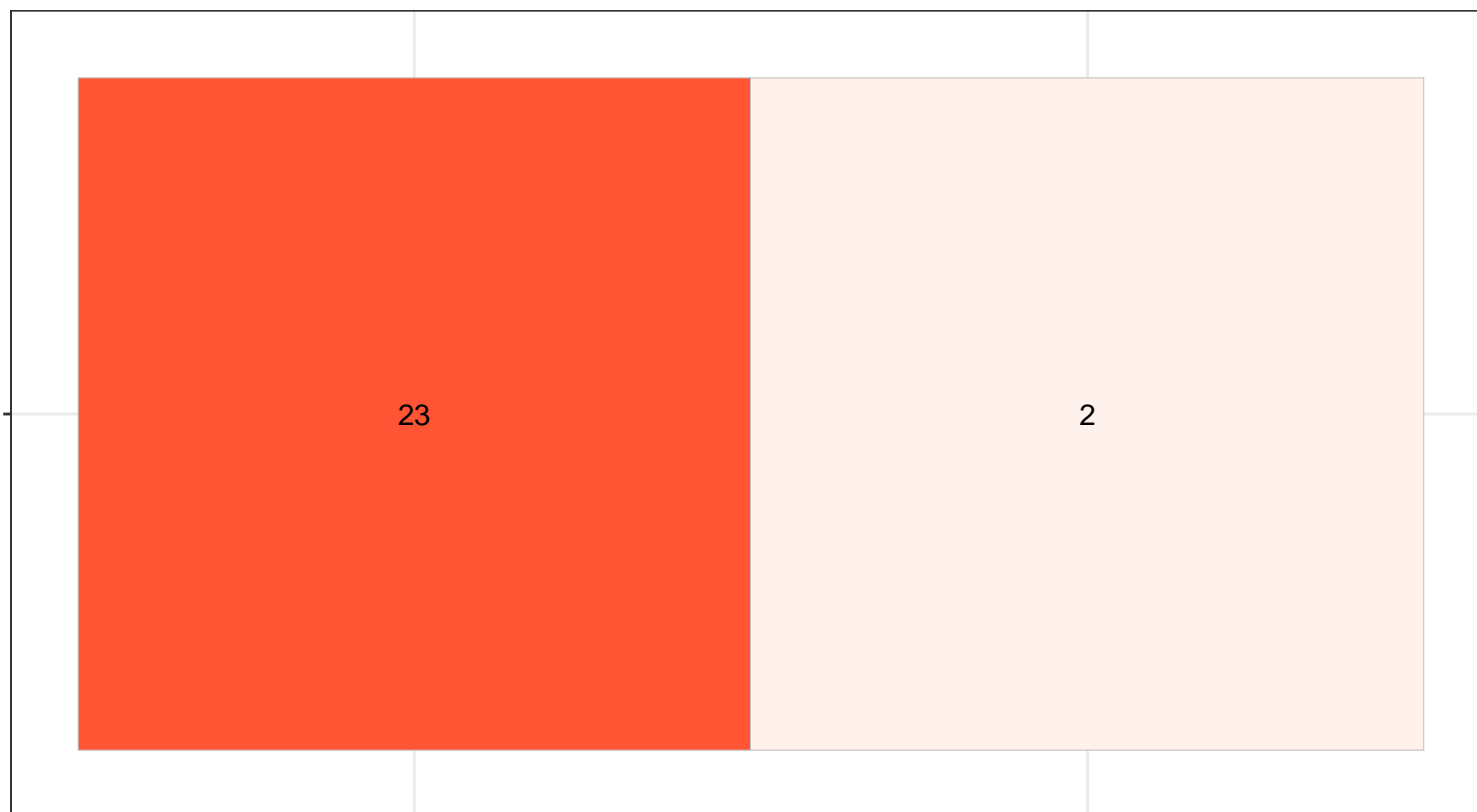
I1.3.Trigger.of.Mechanism

Frequency

20

10

0



I1.3.Timeliness.of.Mechanism_____I1.4.Criticality.of.Effects

I1.3.Timeliness.of.Mechanism

BESTEFFORT

18

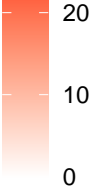
6

MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

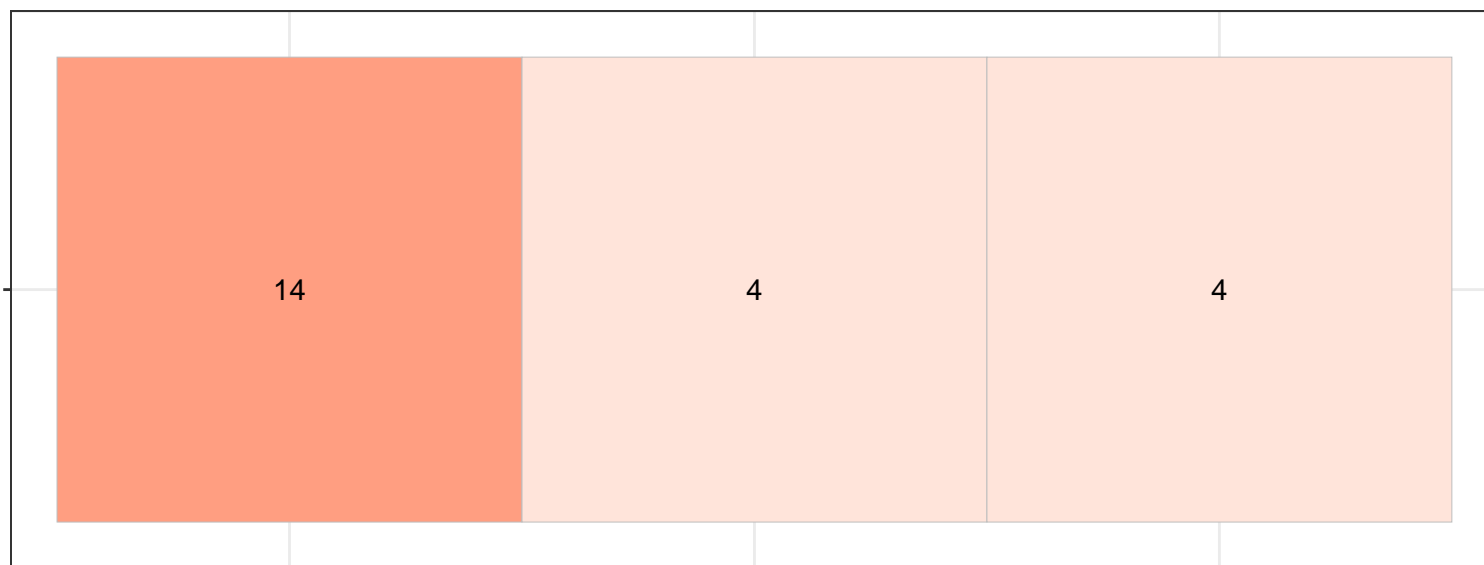
Frequency



I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I1.4.Overhead.of.Effects

BESTEFFORT



DEPENDENT

DOSIGNIFICANT

INSIGNIFICANT

I1.4.Overhead.of.Effects

Frequency

20

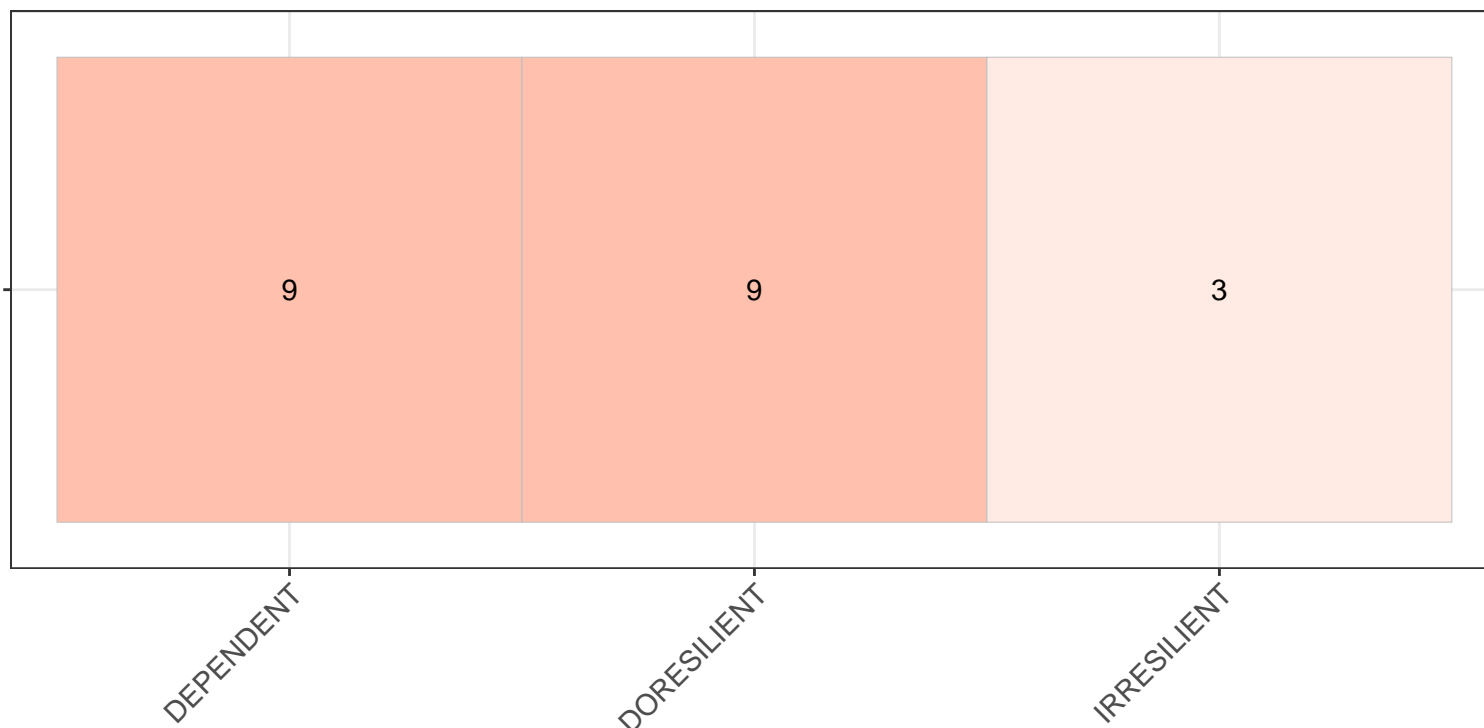
10

0

I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I1.4.Resilience.of.Effects

BESTEFFORT



Frequency

20
10
0

I1.4.Resilience.of.Effects

I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I3.Robot.Type

1	1	1	2	1	2	0	1	1	2	1	1	0	1	1	2	1	1	1	1	1	1	1	4	1	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

BESTEFFORT

BOXERCLEARPATH
CRAWLERTERMINATORBOT
FIELDMOBILEROBOT
HETEROGENOUSROBOTS
HEXMANIPULATOR
HEXAI
INFOTAINMENTROBOTMOBILESERVICEROBOT
IROBOTCREATE2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTERRESTRIAL
MOBILEROBOTTIAGO
MOBILESERVICEROBOT
MSUEVORALLYMOBILETERRESTRIAL
MULTIPLEHEXROTOR
NAOROBOT
PIONEER3DX
QUADROCOPTER
RESCUE
SINGLESERVINGROTATIONROBOT
TEDUSARTERRESTRIALSEARCH
TRIGLIDEINDUSTRIALASSEMBLY
TURTLEBOT
WAREHOUSEDELIVERYROBOT
WHICHISANINDUSTRIALAGV
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION

I3.Robot.Type

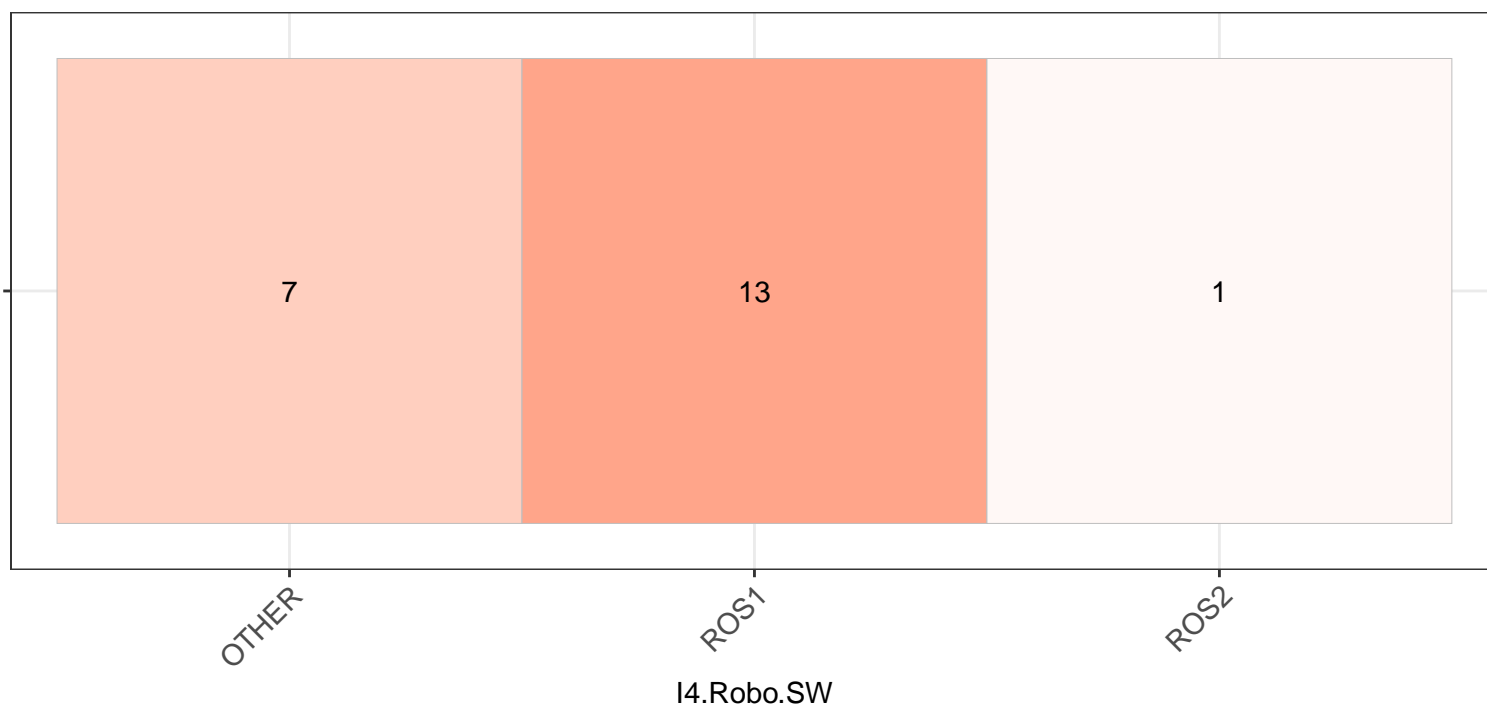
Frequency



I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I4.Robo.SW

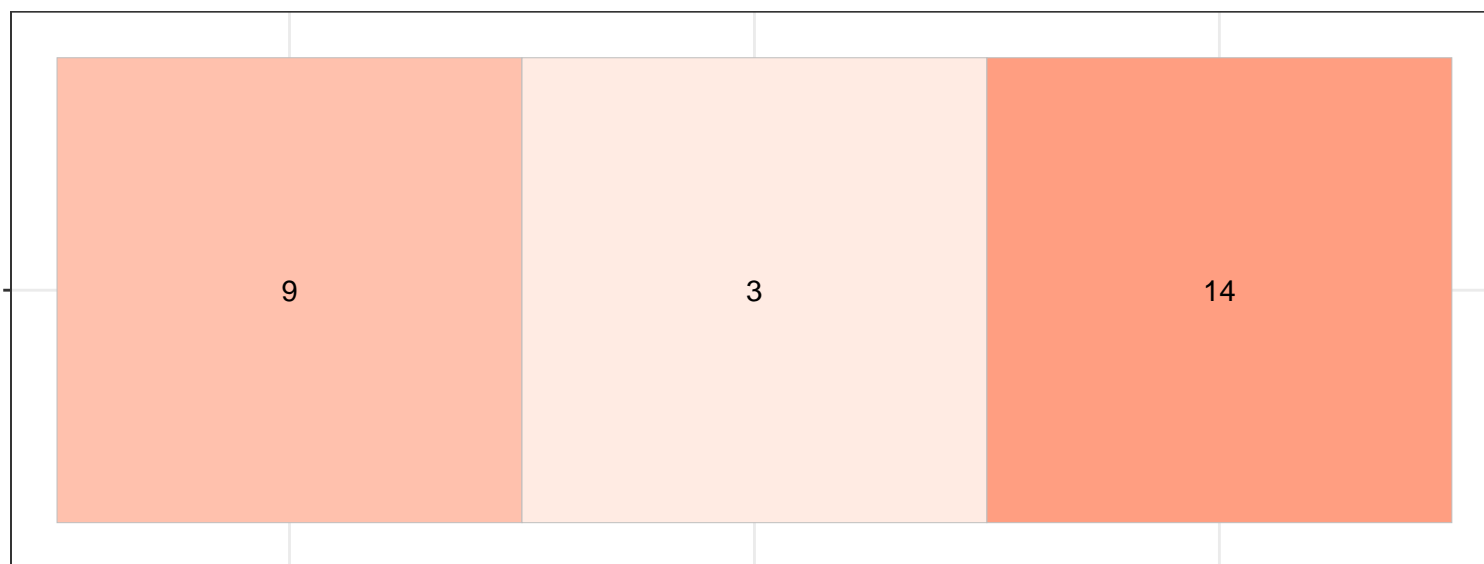
BESTEFFORT



I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I6.Independence

BESTEFFORT



DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

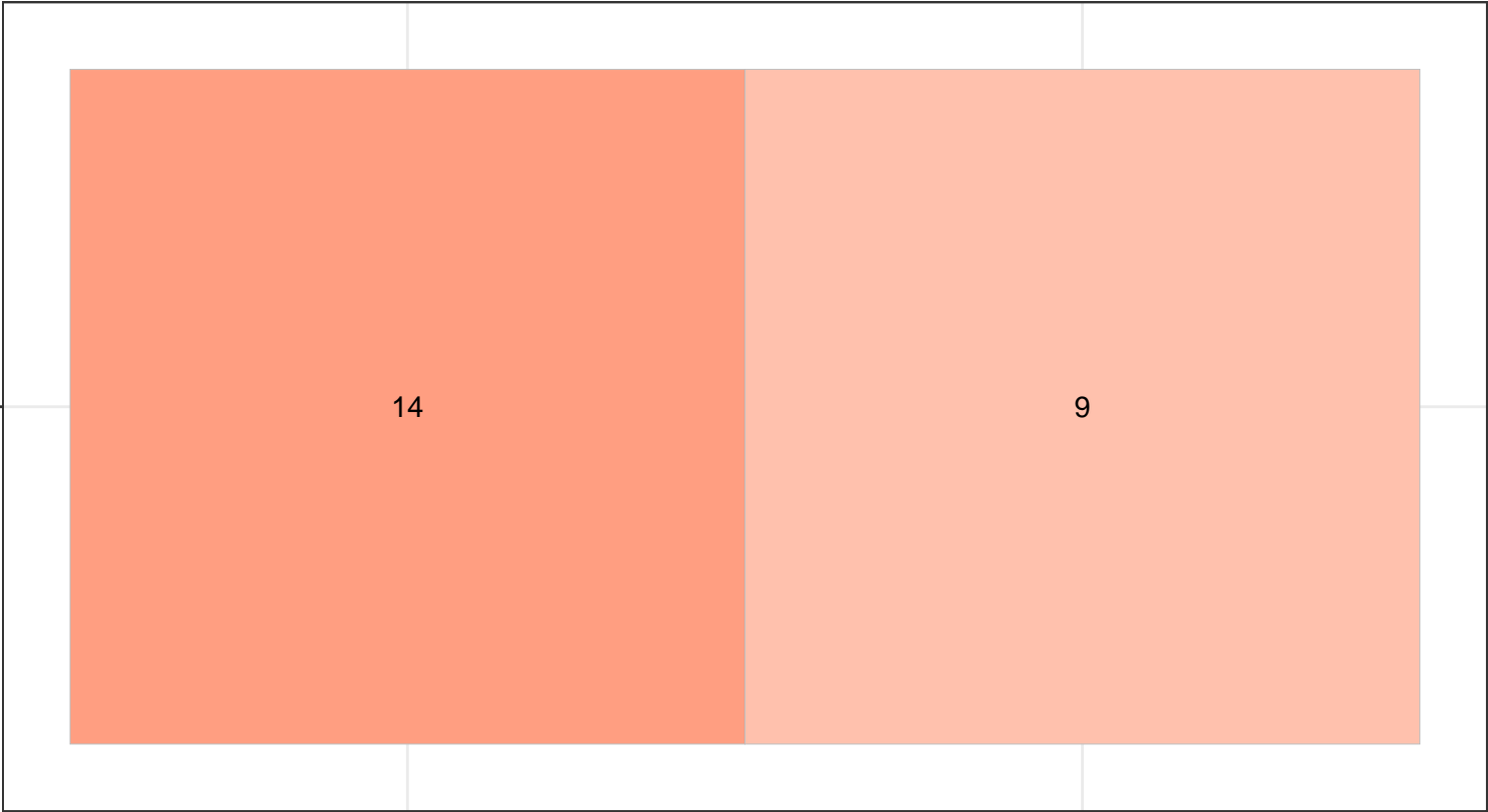
Frequency



I1.3.Timeliness.of.Mechanism_____I7.Deployment.Realness

I1.3.Timeliness.of.Mechanism

BESTEFFORT



REAL

SIMULATED

I7.Deployment.Realness

Frequency



20

10

0

I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I7.Mission.Realness

BESTEFFORT

REAL

SYNTHETIC

I7.Mission.Realness

Frequency



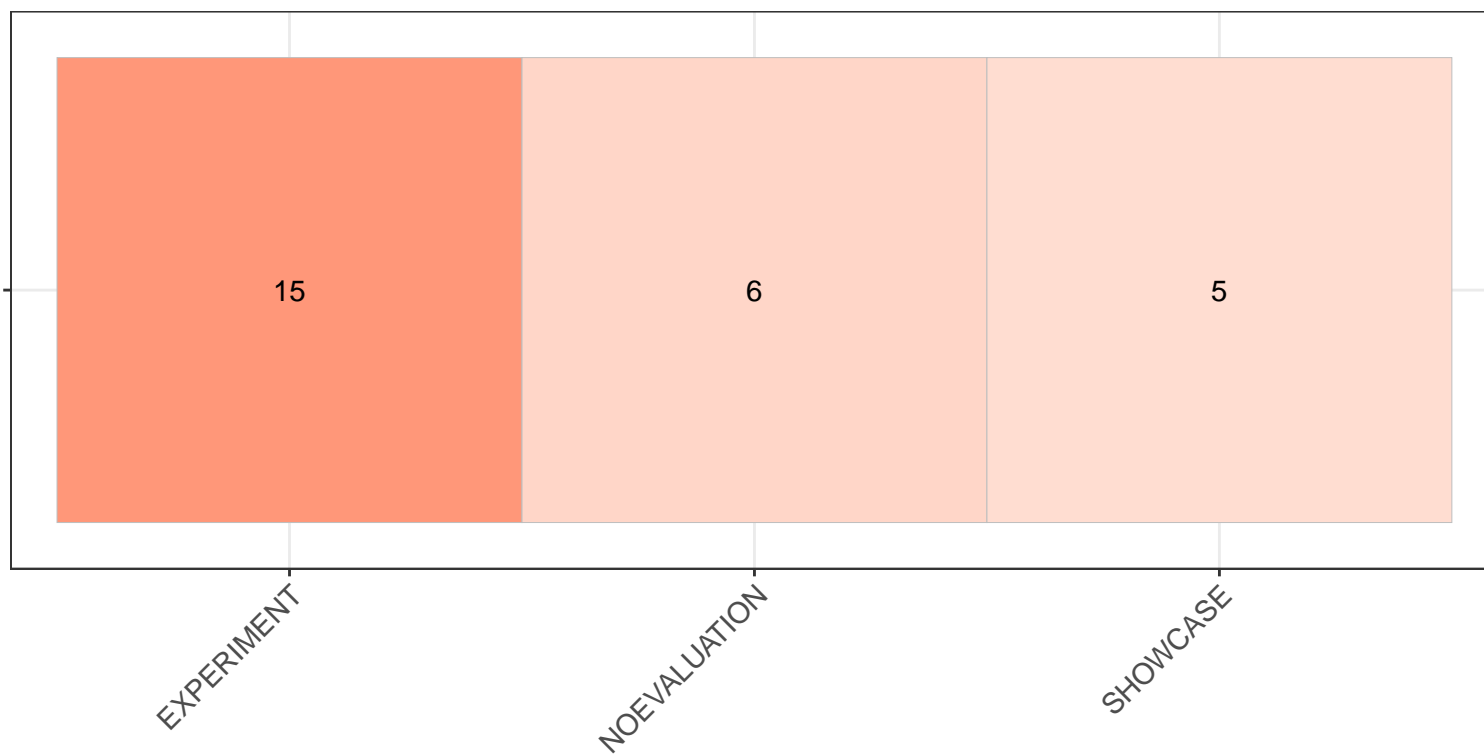
13

13

I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____Experiment.Method

BESTEFFORT



Experiment.Method

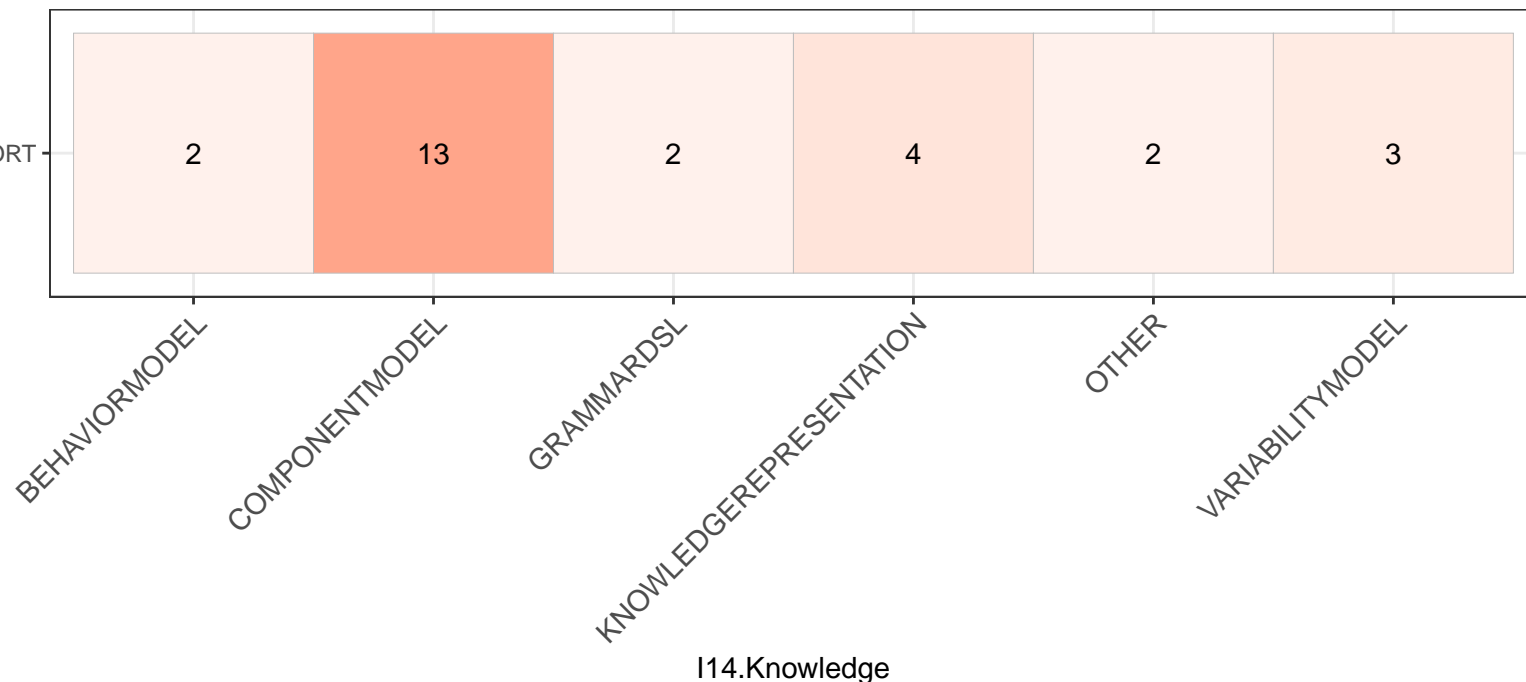
Frequency

20
10
0

I1.3.Timeliness.of.Mechanism

I1.3.Timeliness.of.Mechanism_____I14.Knowledge

BESTEFFORT



Frequency



I1.3.Trigger.of.Mechanism_____I1.4.Criticality.of.Effects

I1.3.Trigger.of.Mechanism

TIMETRIGGER

2

0

EVENTTRIGGER

18

5

MISSIONCRITICAL

SAFETYCRITICAL

I1.4.Criticality.of.Effects

Frequency



20

10

0

I1.3.Trigger.of.Mechanism_____I1.4.Predictability.of.Effects

I1.3.Trigger.of.Mechanism

TIMETRIGGER

2

2

EVENTTRIGGER

7

15

DODETERMINISTIC

NONDETERMINISTIC

I1.4.Predictability.of.Effects

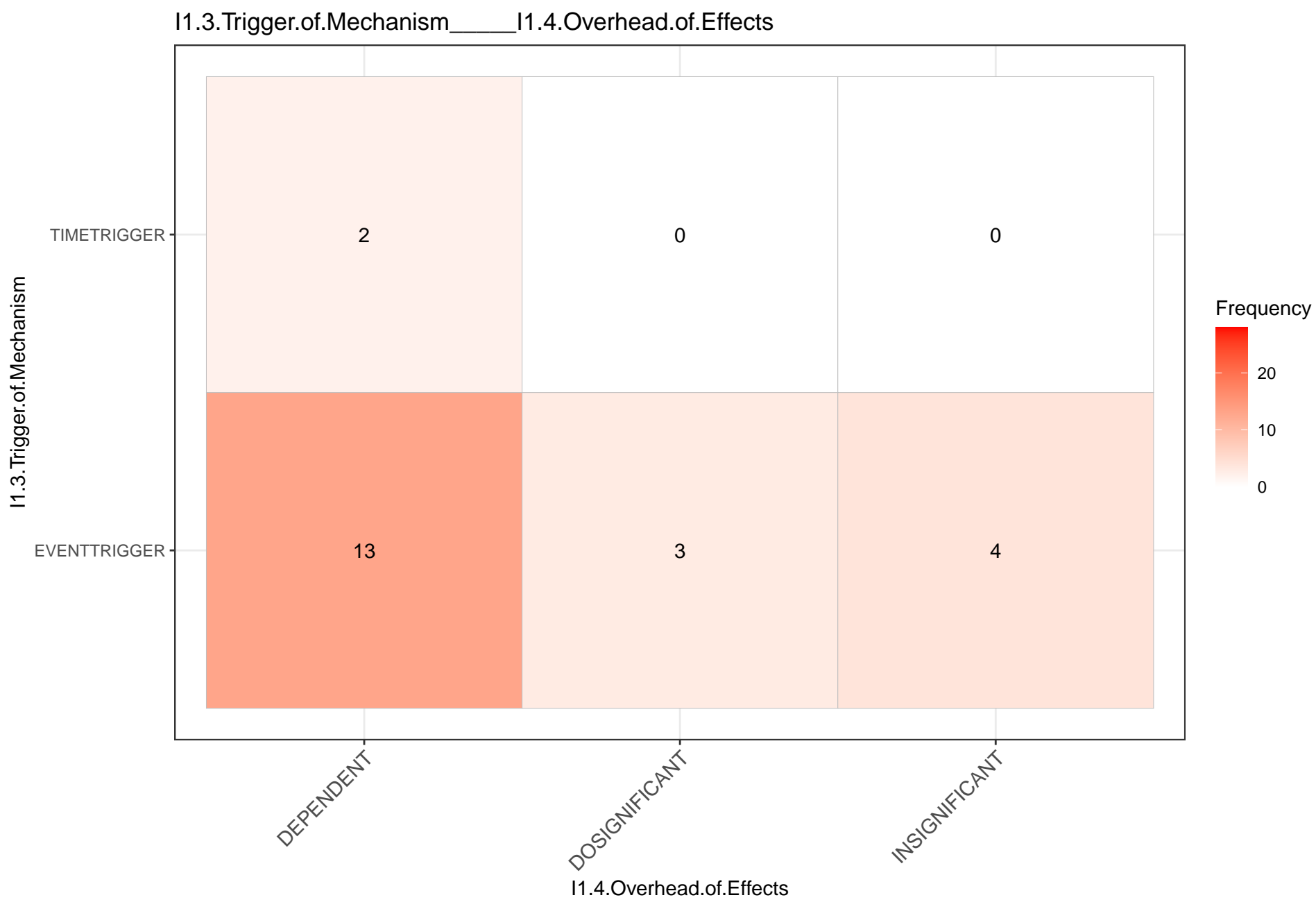
Frequency



20

10

0



I1.3.Trigger.of.Mechanism_____I1.4.Resilience.of.Effects

I1.3.Trigger.of.Mechanism

TIMETRIGGER

2

0

0

EVENTTRIGGER

8

8

3

DEPENDENT

DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects

Frequency



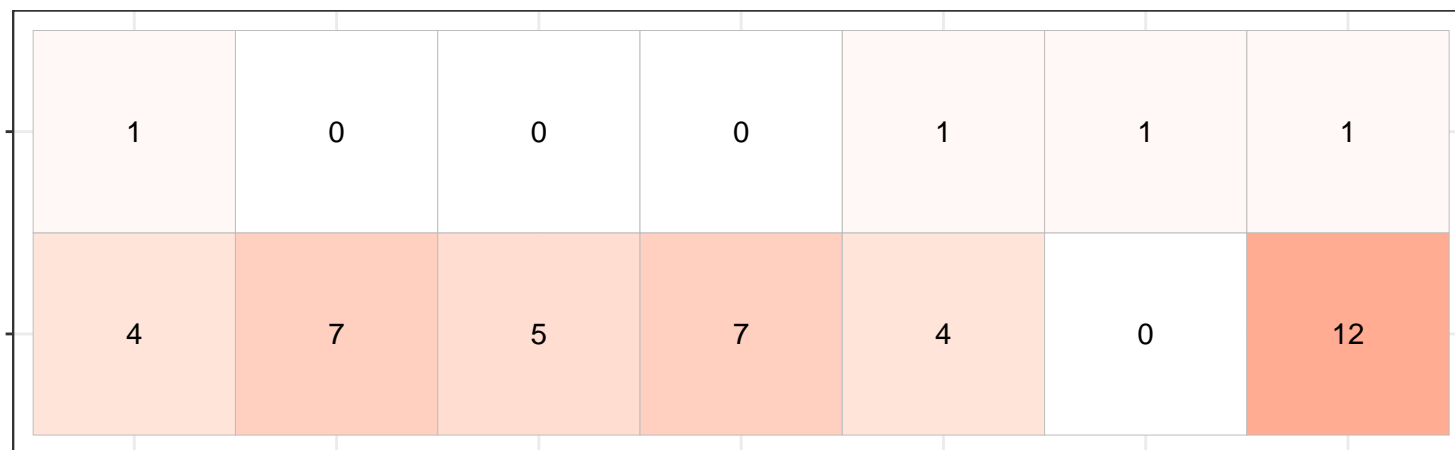
20

10

0

I1.3.Trigger.of.Mechanism

I1.3.Trigger.of.Mechanism_____I2.Adap..Purpose



Frequency

20

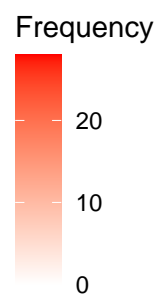
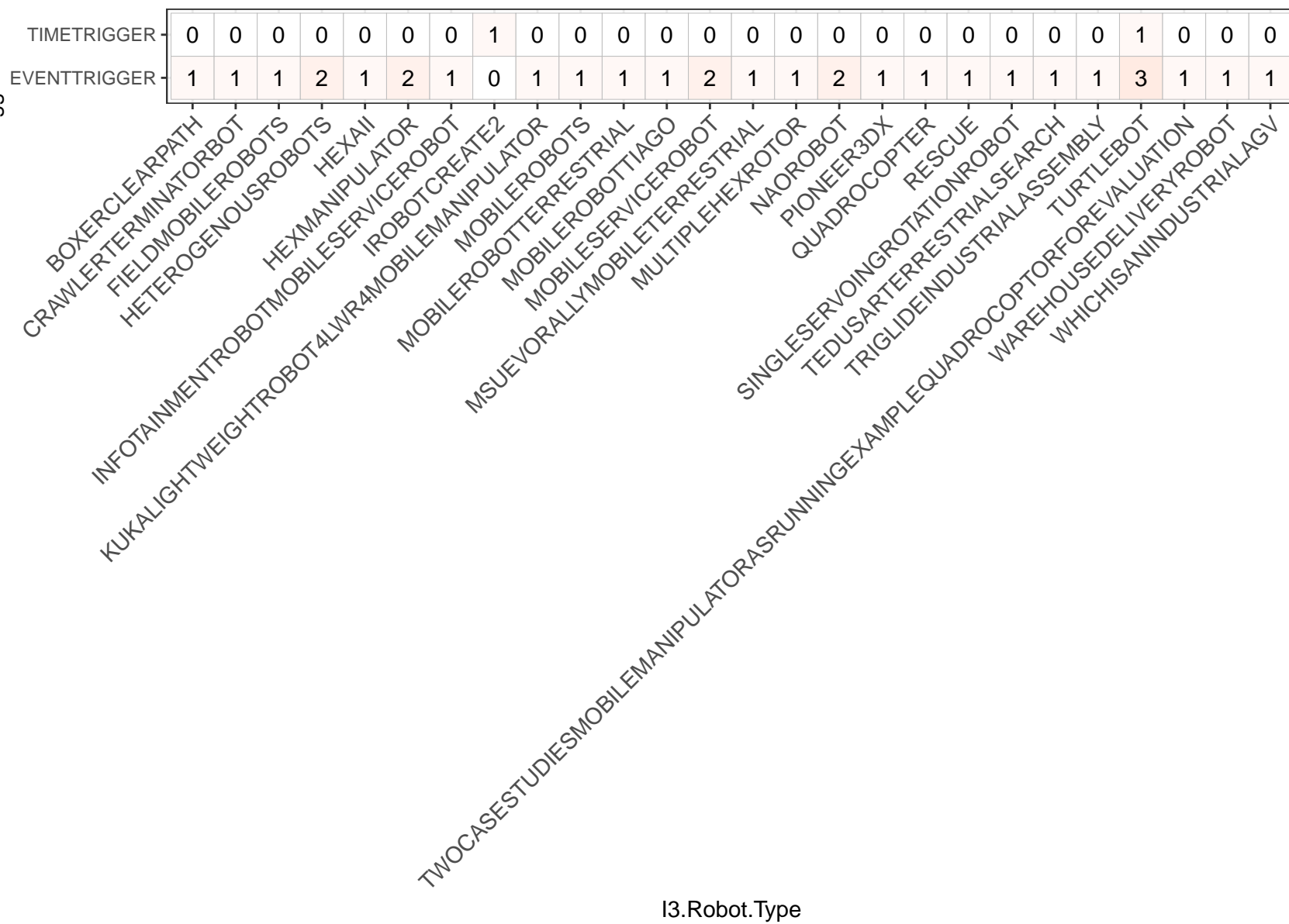
10

0

I2.Adap..Purpose

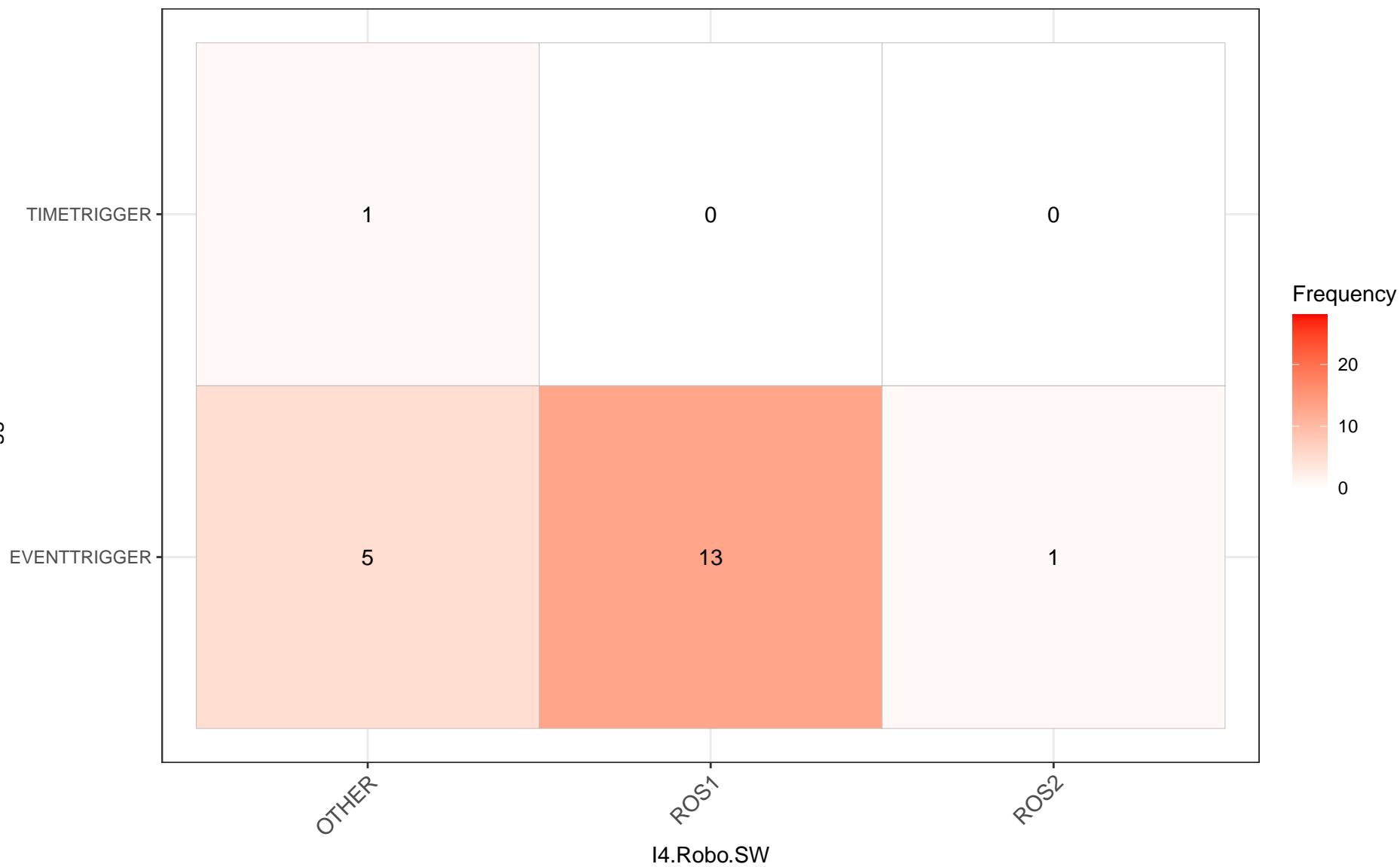
I1.3.Trigger.of.Mechanism

I1.3.Trigger.of.Mechanism_____I3.Robot.Type

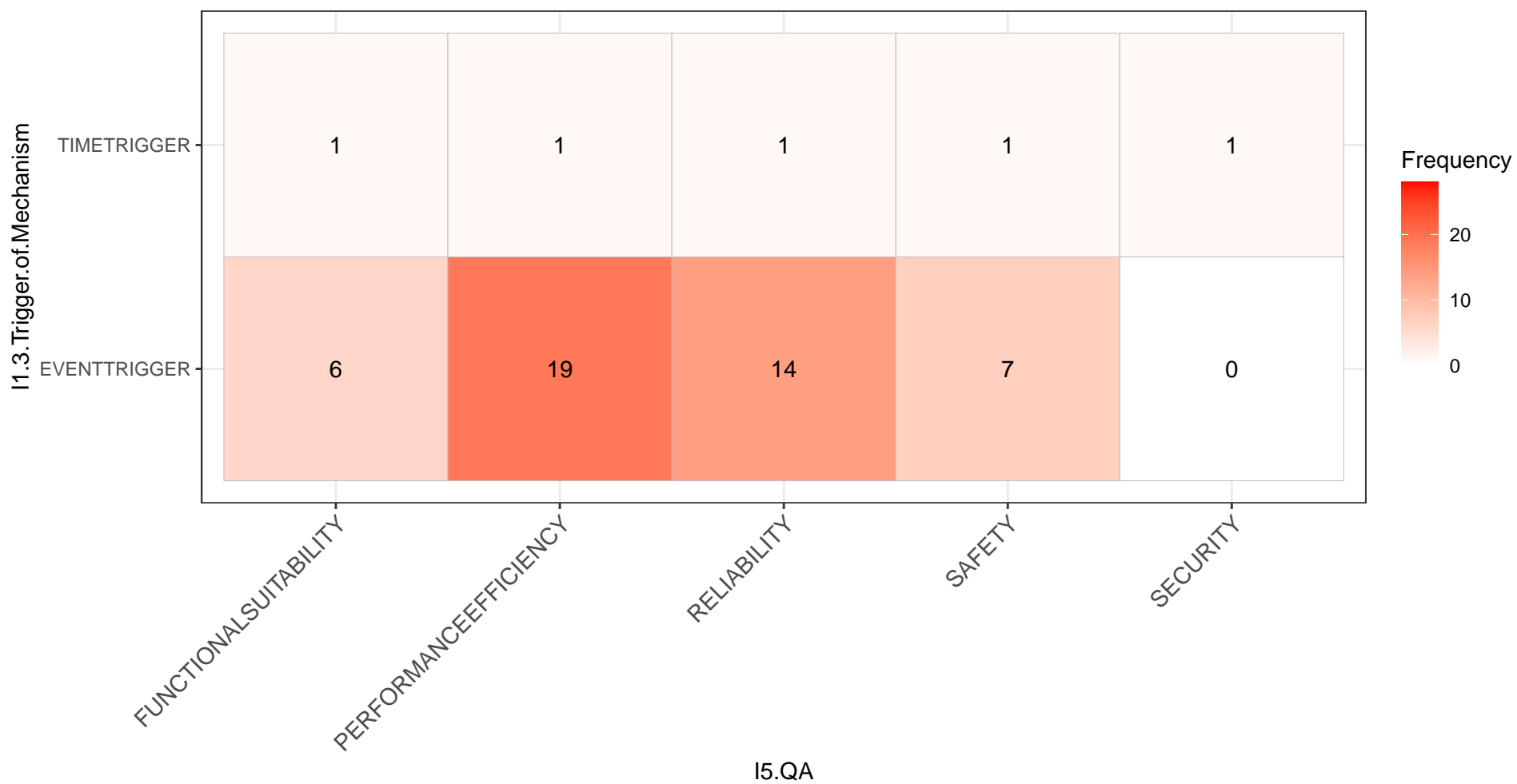


I1.3.Trigger.of.Mechanism_____I4.Robo.SW

I1.3.Trigger.of.Mechanism



I1.3.Trigger.of.Mechanism_____I5.QA



I1.3.Trigger.of.Mechanism_____I6.Independence

I1.3.Trigger.of.Mechanism

TIMETRIGGER

1

1

0

EVENTTRIGGER

8

1

16

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

Frequency



20

10

0

I1.3.Trigger.of.Mechanism_____I7.Deployment.Realness

I1.3.Trigger.of.Mechanism

TIMETRIGGER

EVENTTRIGGER

REAL

SIMULATED

I7.Deployment.Realness

Frequency



20

10

0

1

1

13

8

I1.3.Trigger.of.Mechanism_____I7.Mission.Realness

I1.3.Trigger.of.Mechanism

TIMETRIGGER

EVENTTRIGGER

REAL

SYNTHETIC

I7.Mission.Realness

Frequency



20

10

0

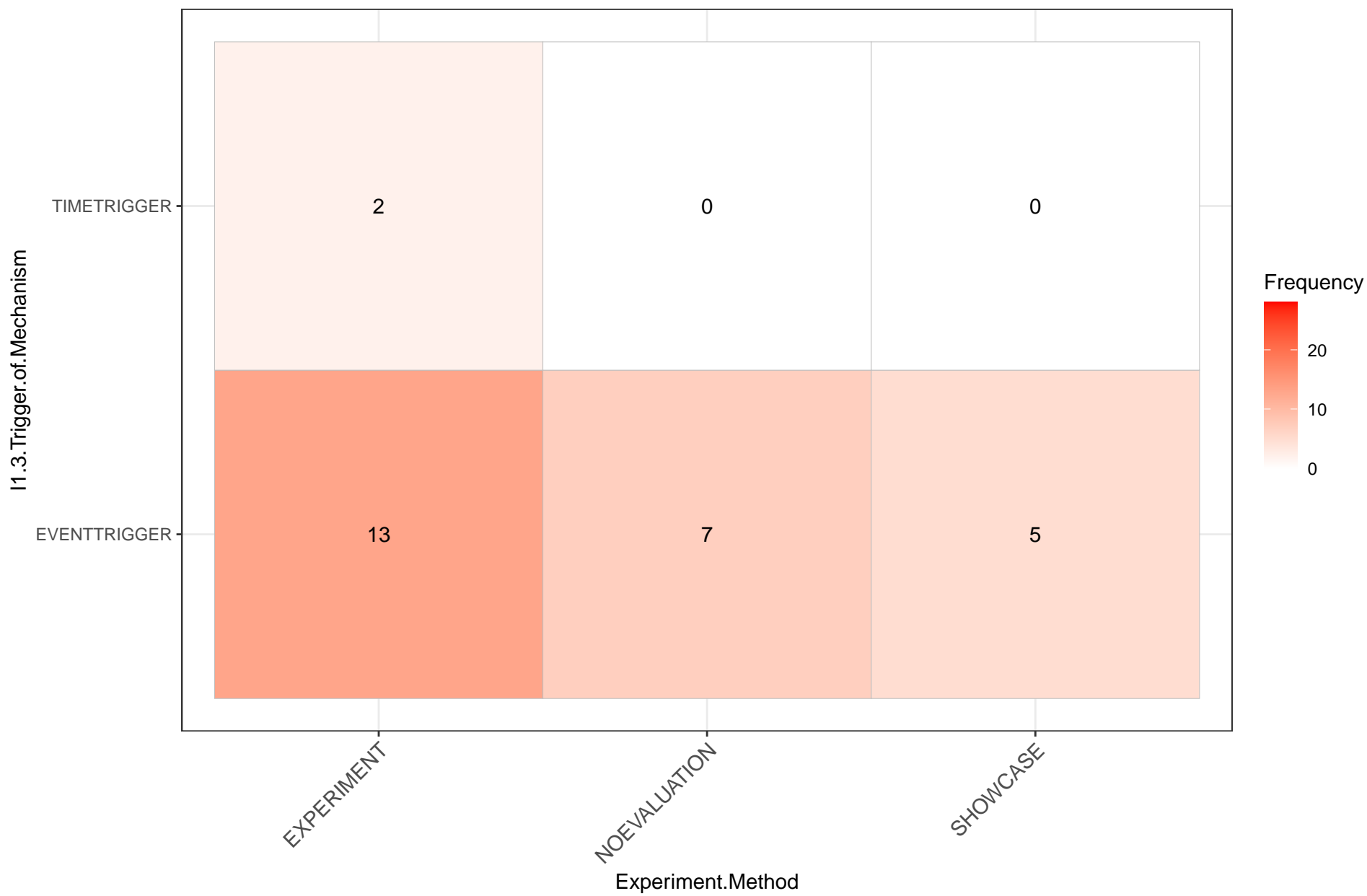
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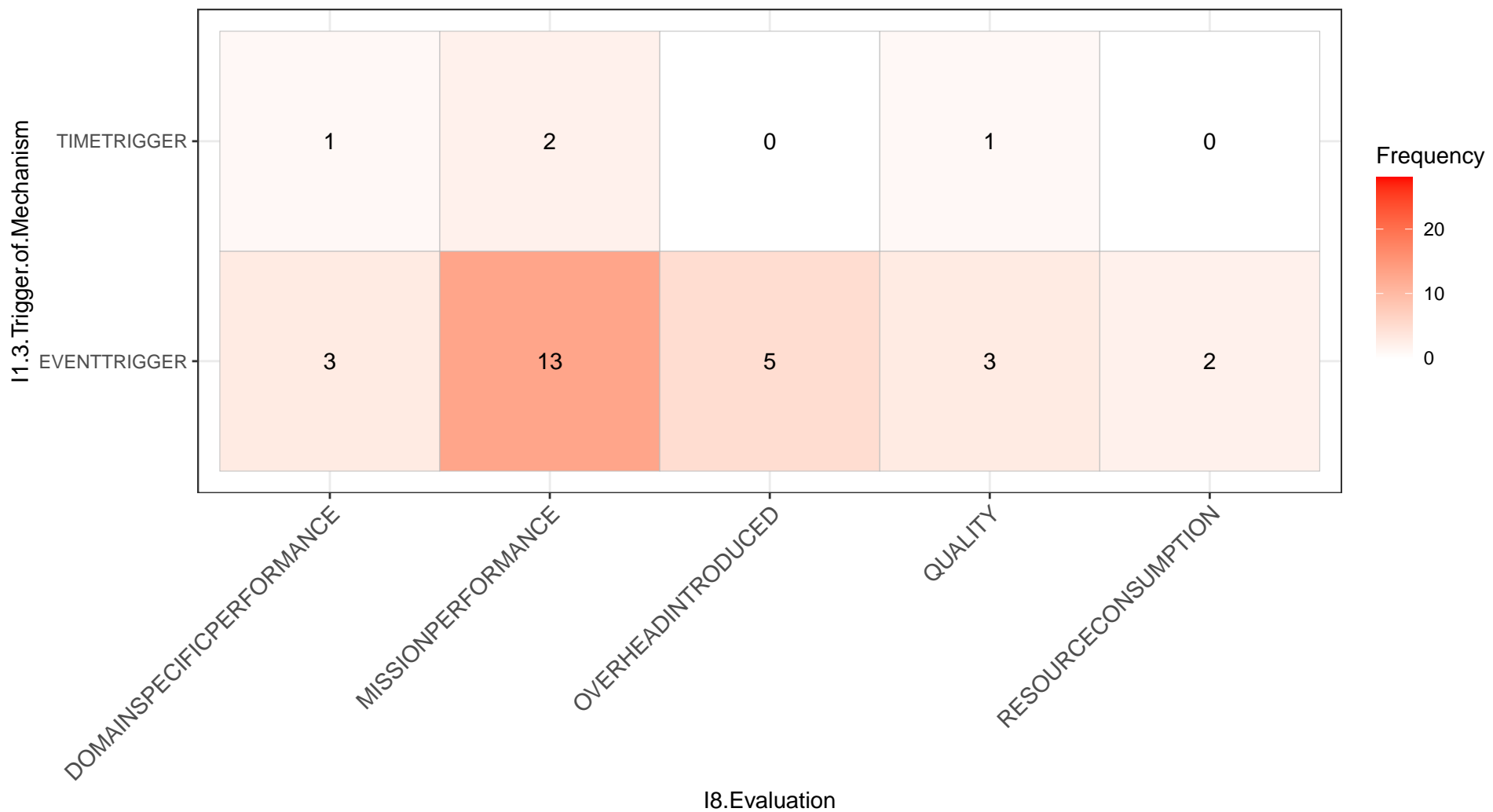
13

12

I1.3.Trigger.of.Mechanism____Experiment.Method

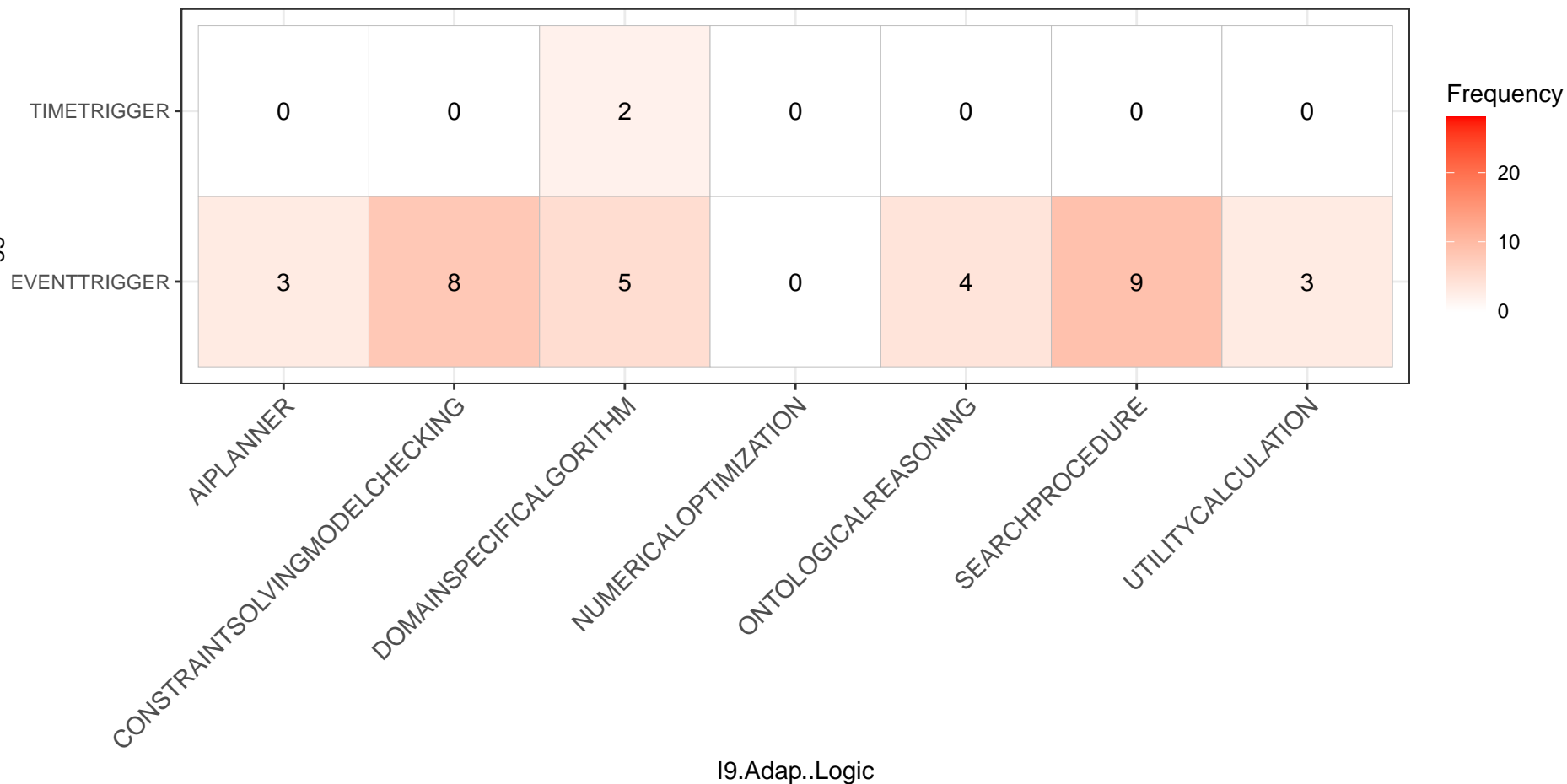


I1.3.Trigger.of.Mechanism_____I8.Evaluation

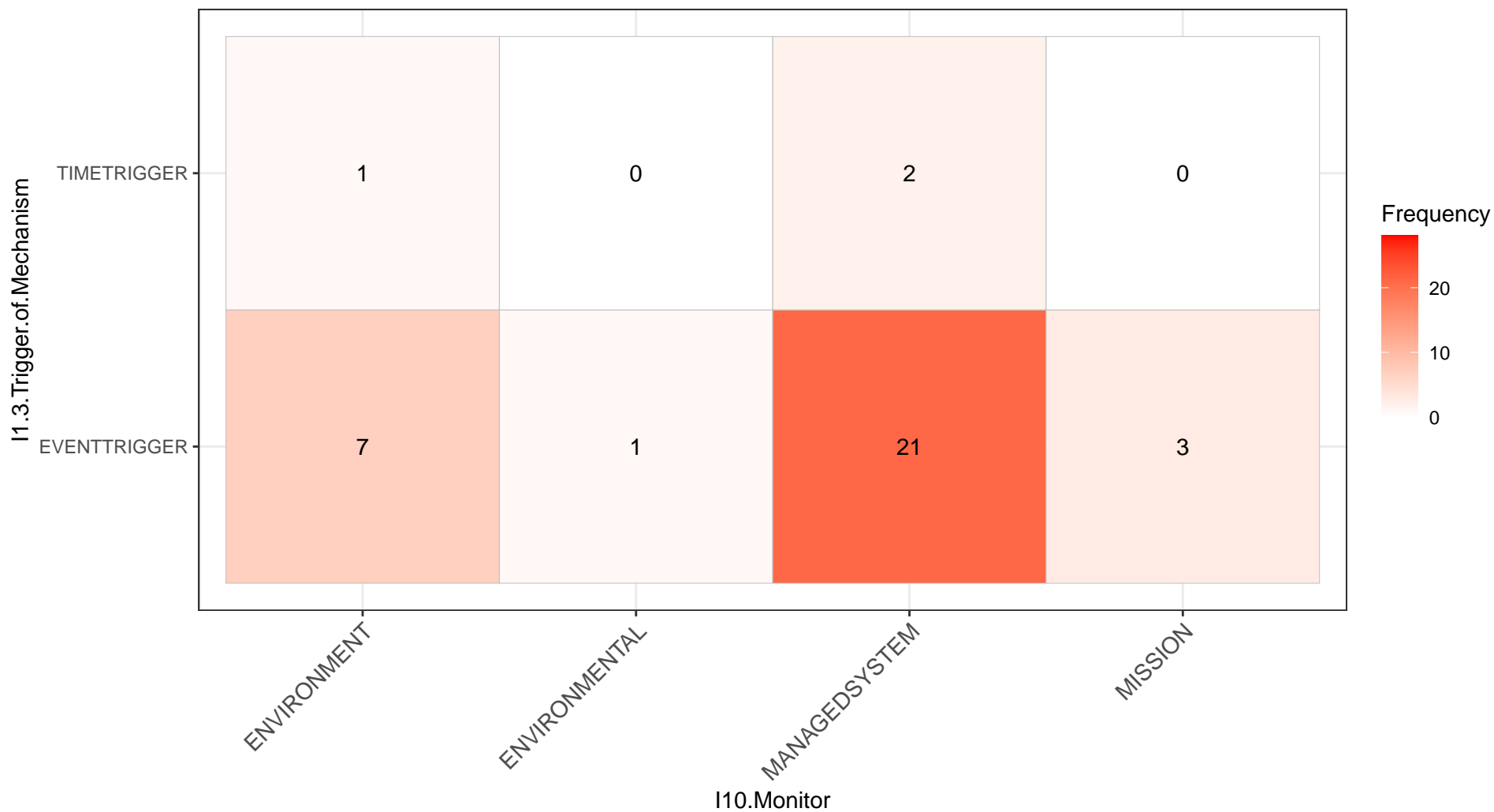


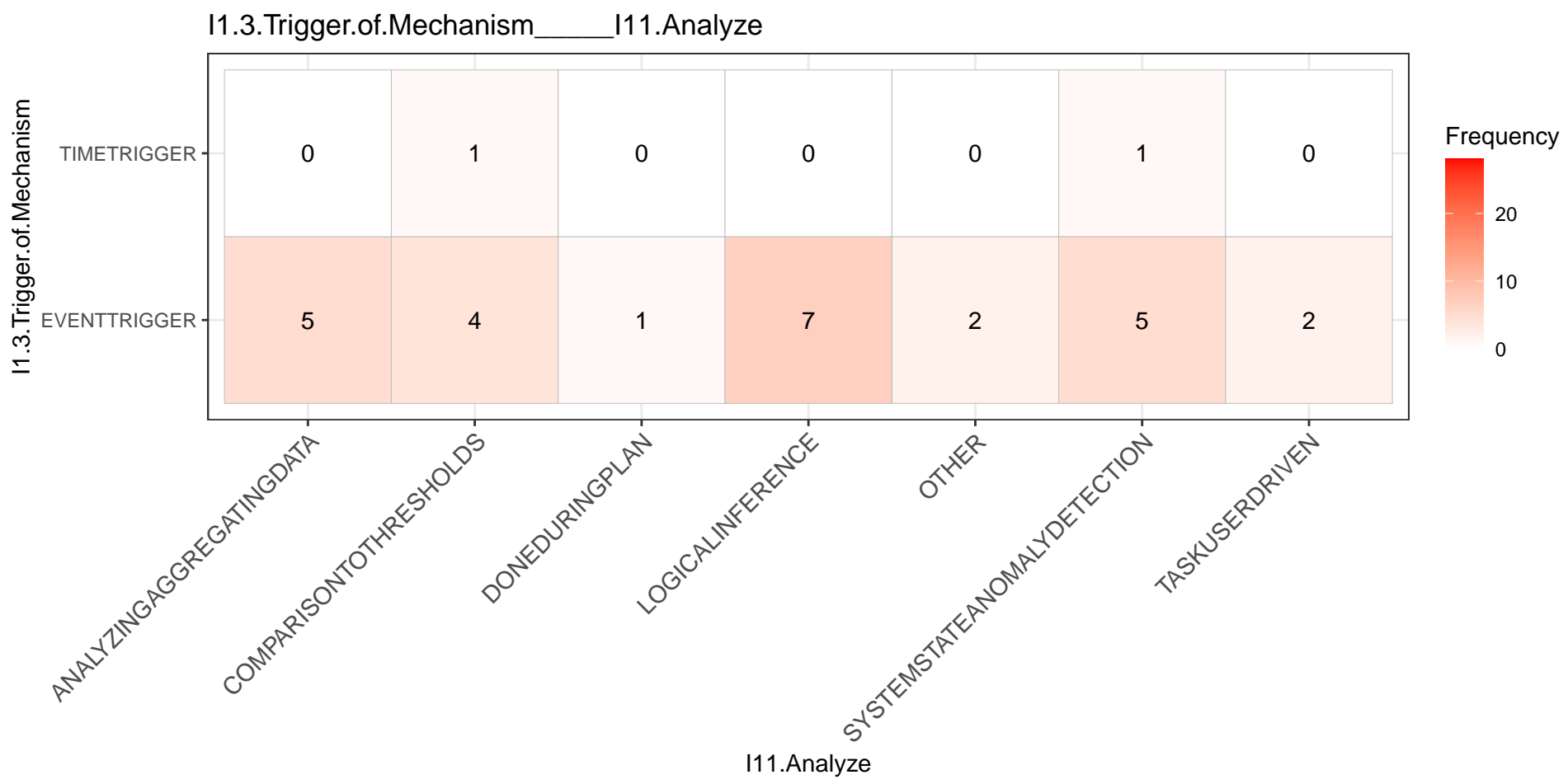
I1.3.Trigger.of.Mechanism

I1.3.Trigger.of.Mechanism_____I9.Adap..Logic



I1.3.Trigger.of.Mechanism____I10.Monitor





I1.3.Trigger.of.Mechanism_____I12.Plan

I1.3.Trigger.of.Mechanism

TIMETRIGGER

0

2

0

EVENTTRIGGER

12

10

2

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPANNINGLANGUAGES

I12.Plan

Frequency

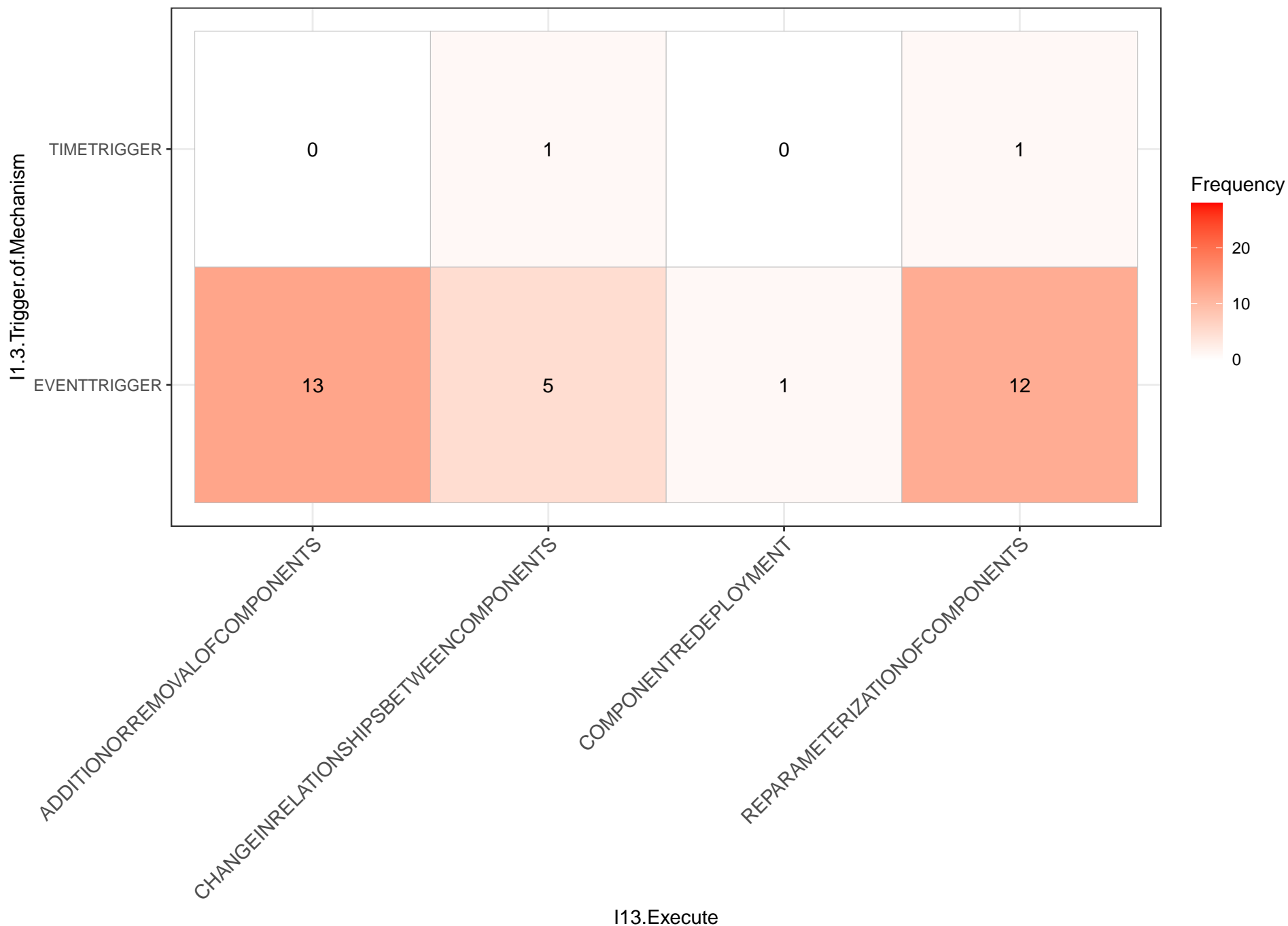


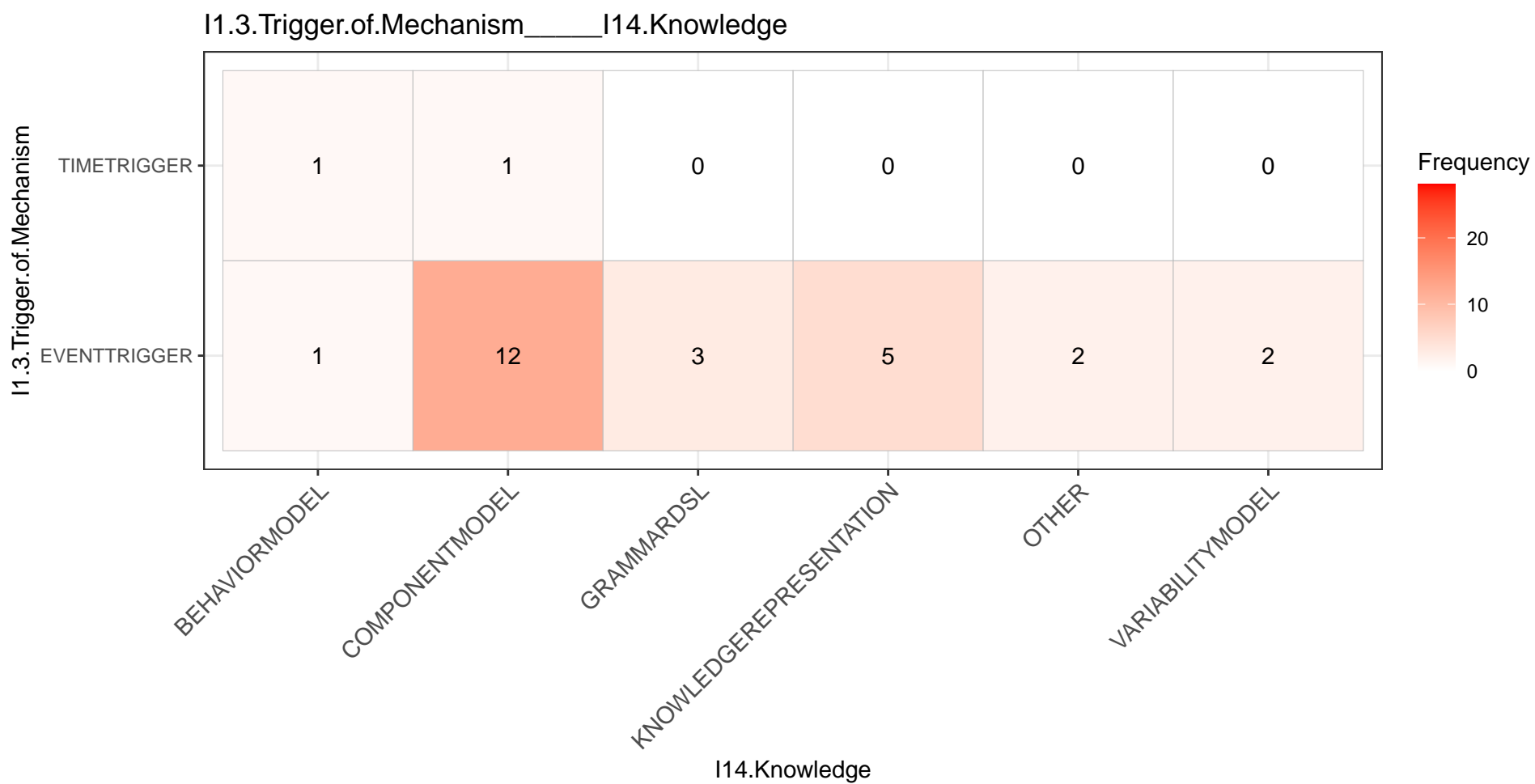
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10

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I1.3.Trigger.of.Mechanism____I13.Execute





I1.4.Criticality.of.Effects_____I1.4.Predictability.of.Effects

I1.4.Criticality.of.Effects

SAFETYCRITICAL

2

4

MISSIONCRITICAL

7

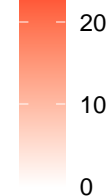
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DO
DETERMINISTIC

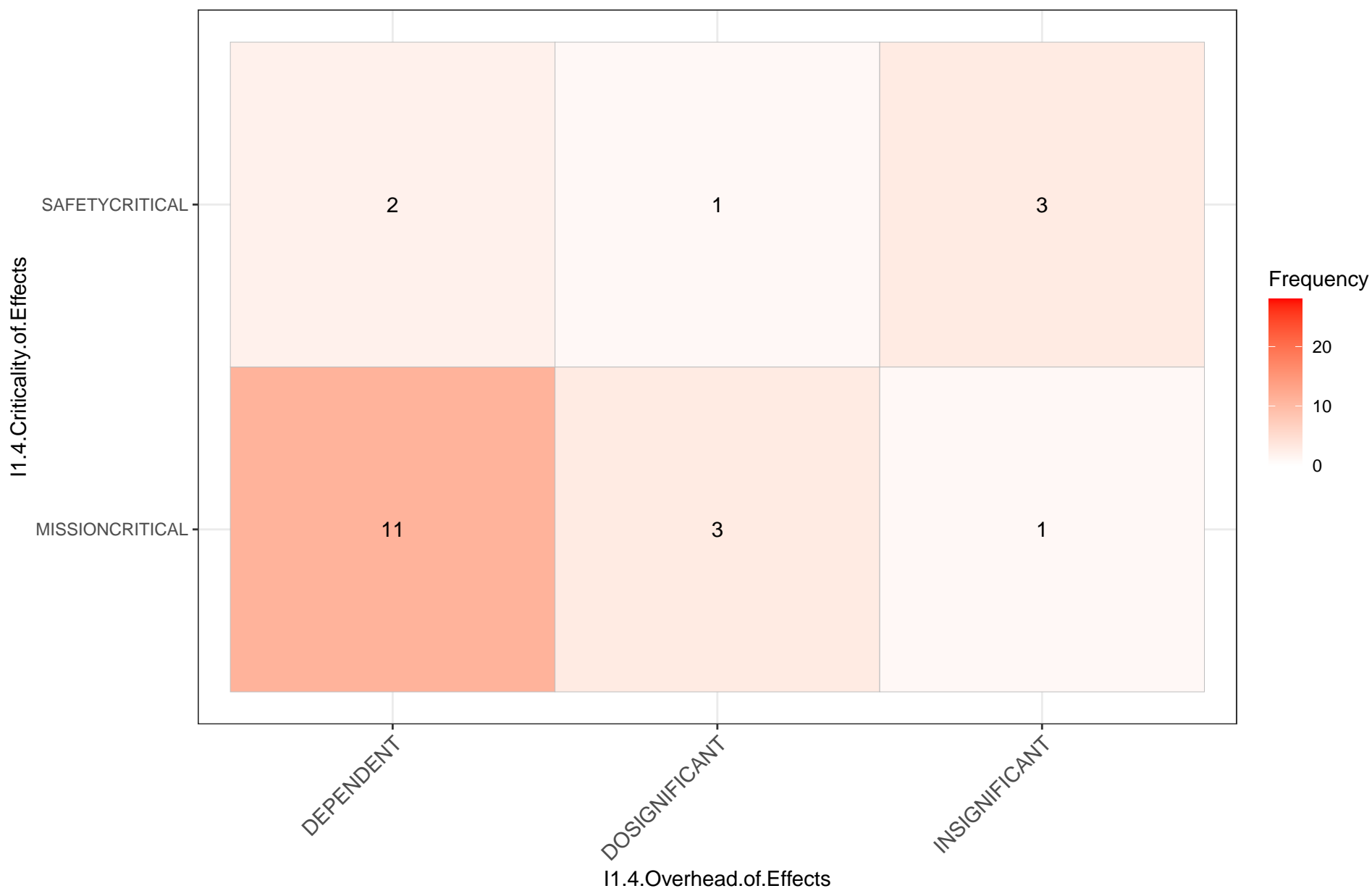
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NDETERMINISTIC

I1.4.Predictability.of.Effects

Frequency



I1.4.Criticality.of.Effects_____I1.4.Overhead.of.Effects



I1.4.Criticality.of.Effects_____I1.4.Resilience.of.Effects

I1.4.Criticality.of.Effects

SAFETYCRITICAL

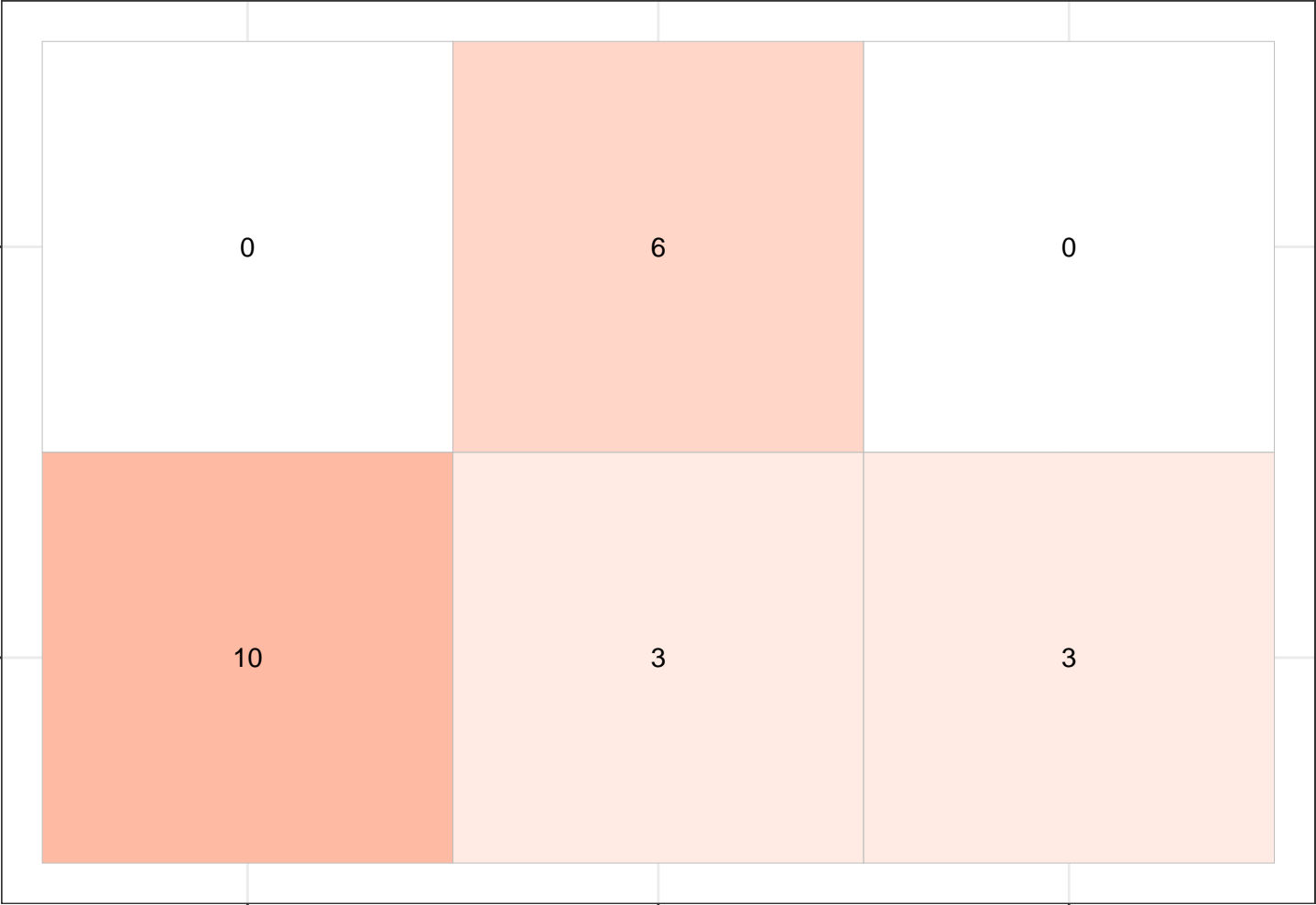
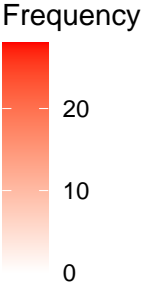
MISSIONCRITICAL

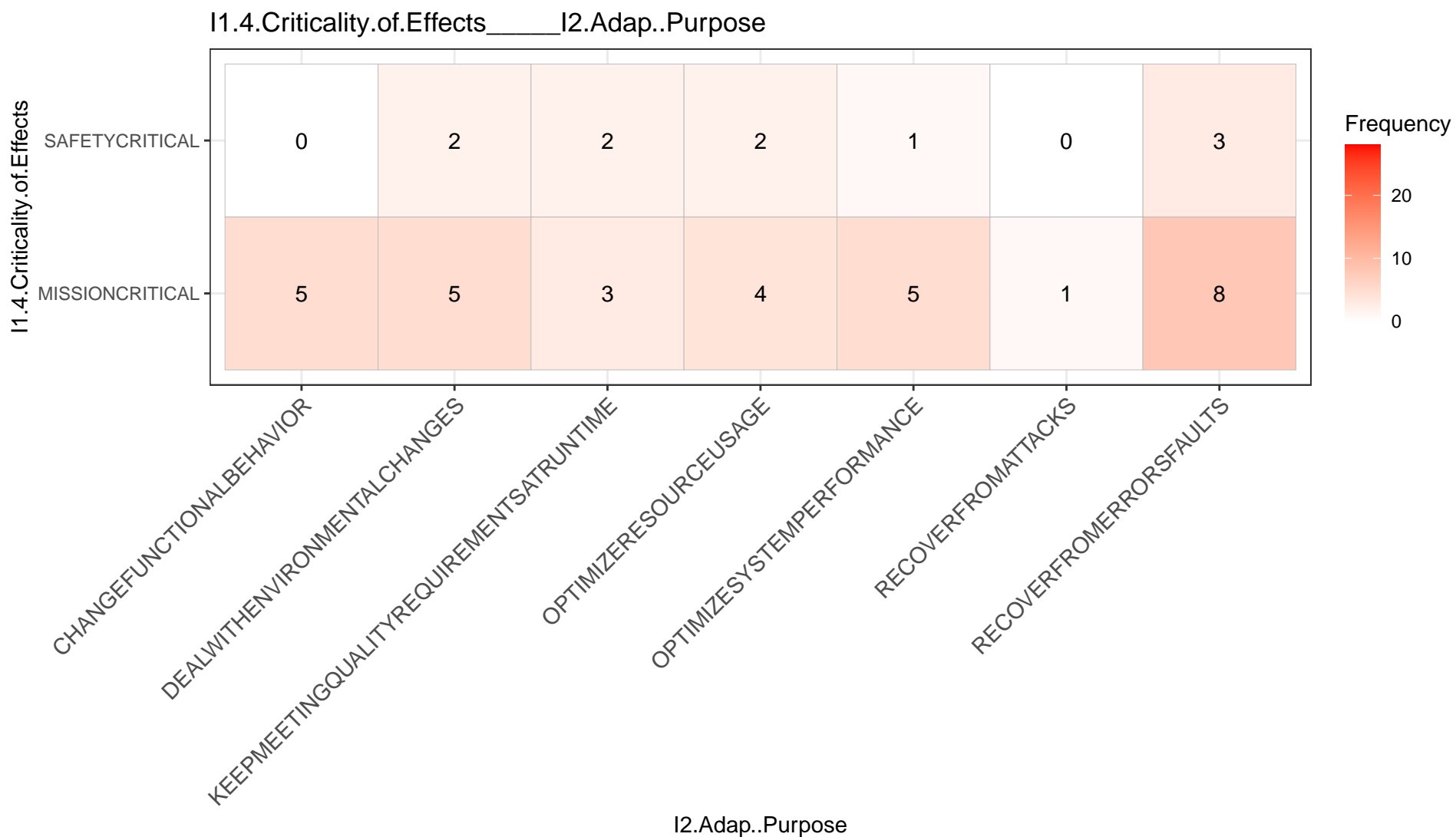
DEPENDENT

DORESILIENT

IRRESILIENT

I1.4.Resilience.of.Effects





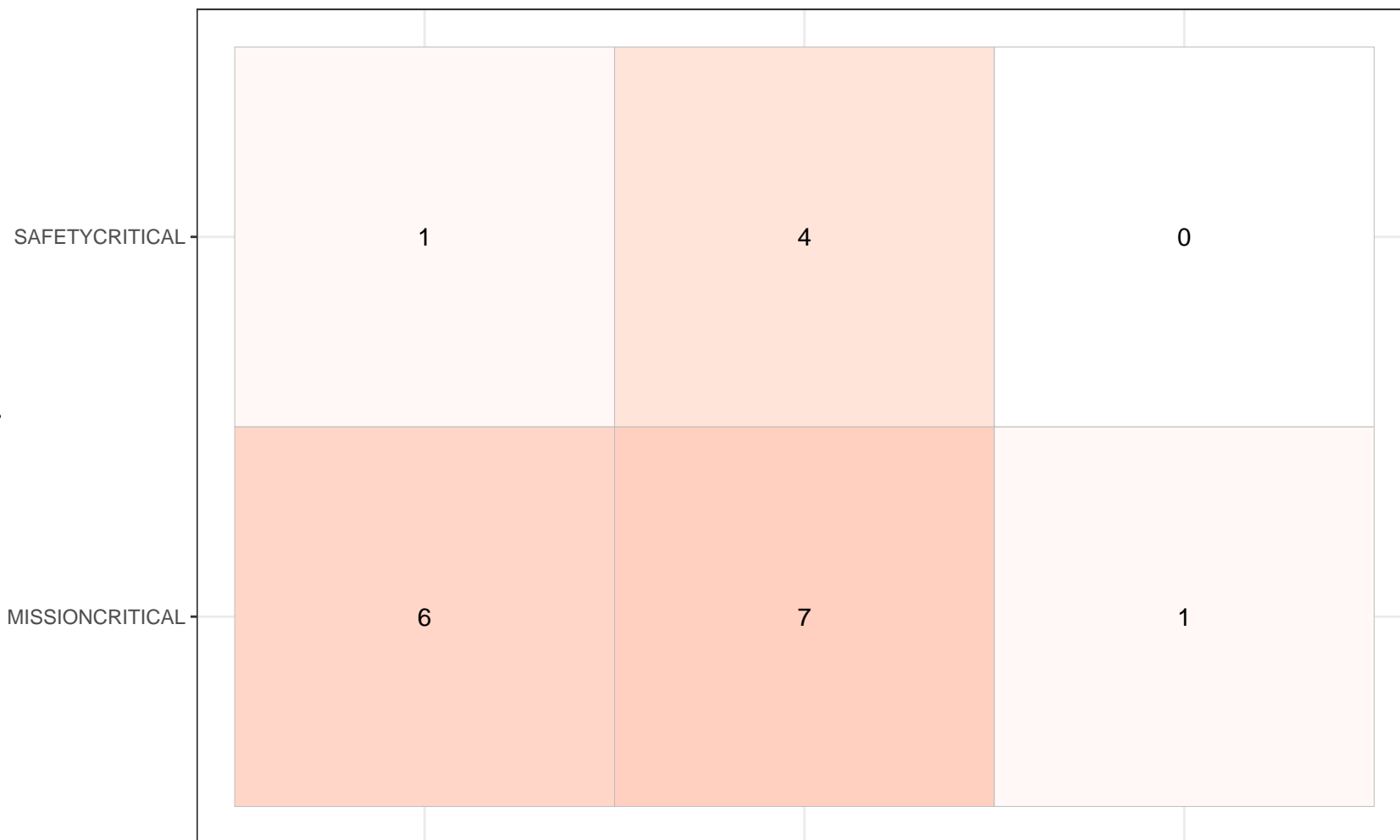
I1.4.Criticality.of.Effects_____I3.Robot.Type

Frequency

I3.Robot.Type

I1.4.Criticality.of.Effects____I4.Robo.SW

I1.4.Criticality.of.Effects



MISSIONCRITICAL

OTHER

ROS1

ROS2

I4.Robo.SW

Frequency

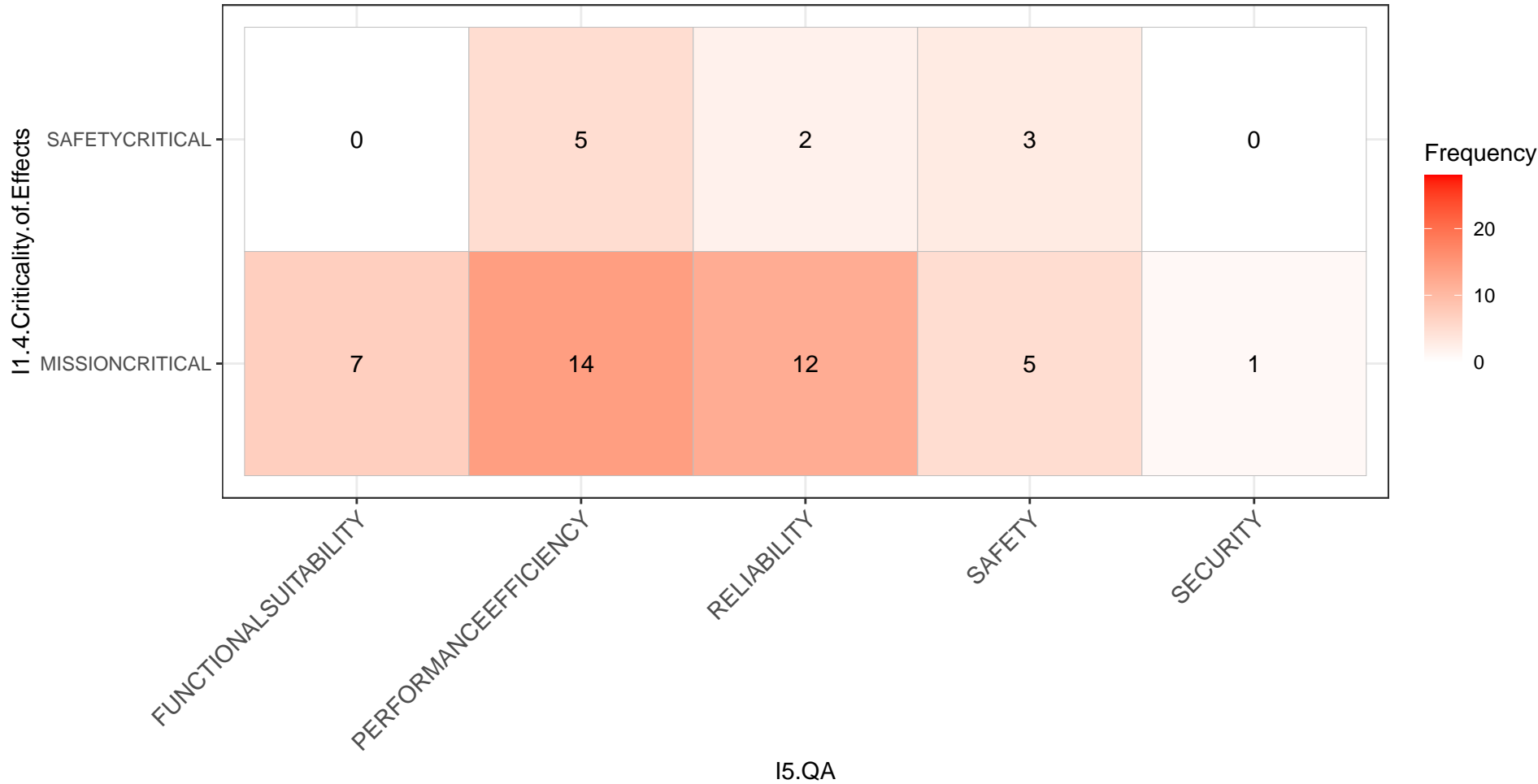


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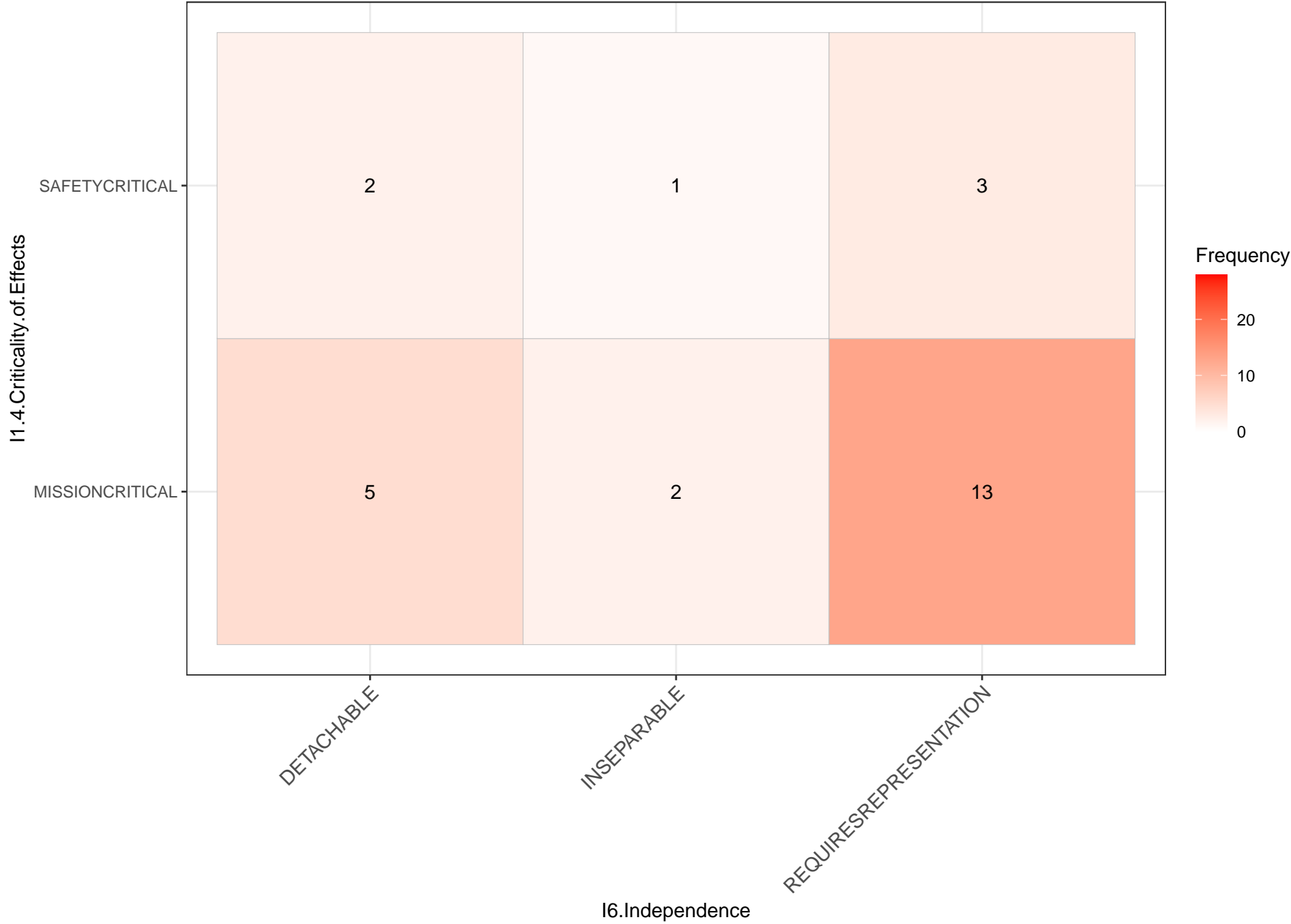
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I1.4.Criticality.of.Effects_____I5.QA



I1.4.Criticality.of.Effects_____I6.Independence



I1.4.Criticality.of.Effects_____I7.Deployment.Realness

I1.4.Criticality.of.Effects

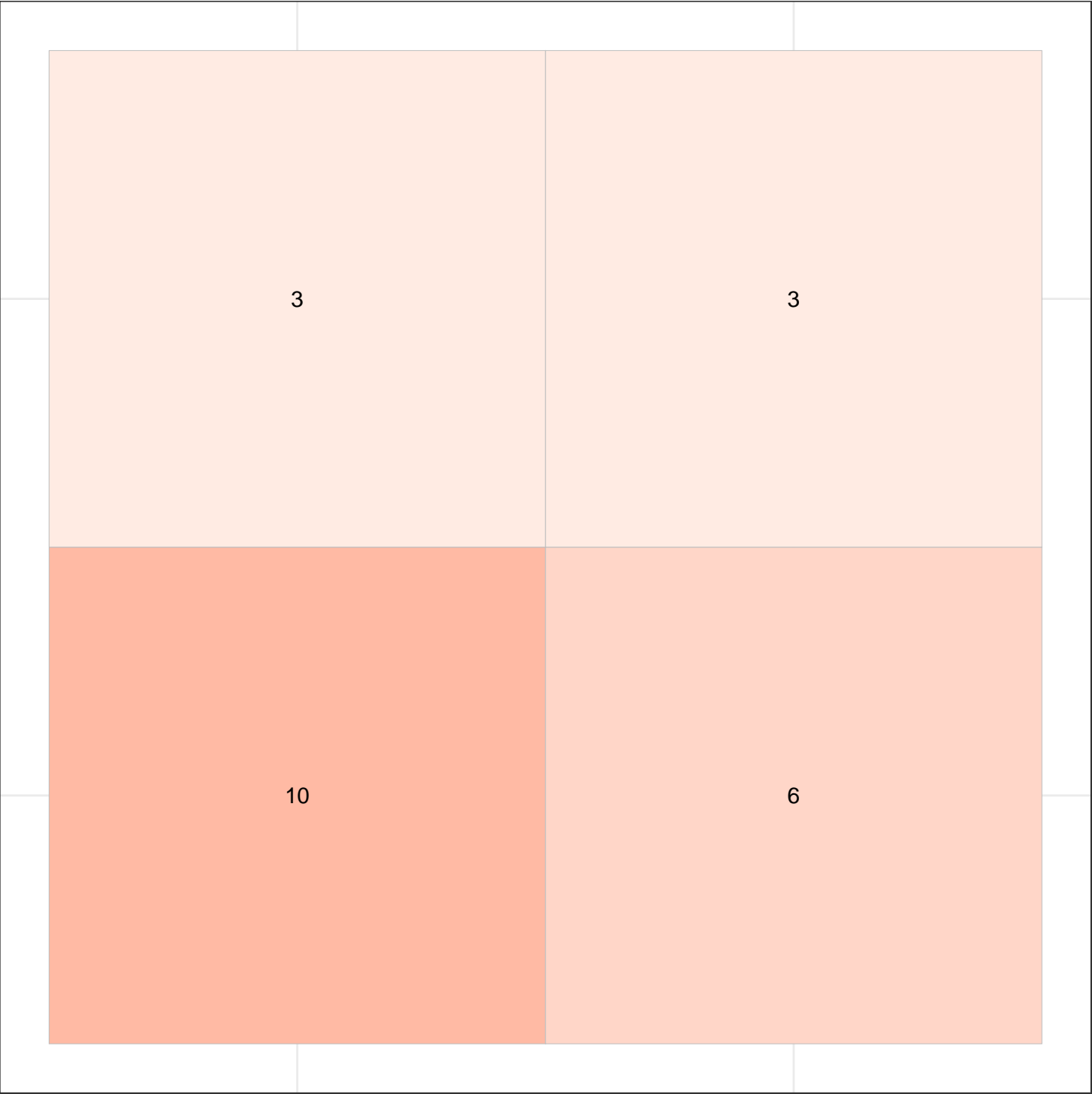
SAFETYCRITICAL

MISSIONCRITICAL

REAL

SIMULATED

I7.Deployment.Realness



Frequency

20

10

0

I1.4.Criticality.of.Effects_____I7.Mission.Realness

I1.4.Criticality.of.Effects

SAFETYCRITICAL

MISSIONCRITICAL

REAL

SYNTHETIC

I7.Mission.Realness

Frequency

20

10

0

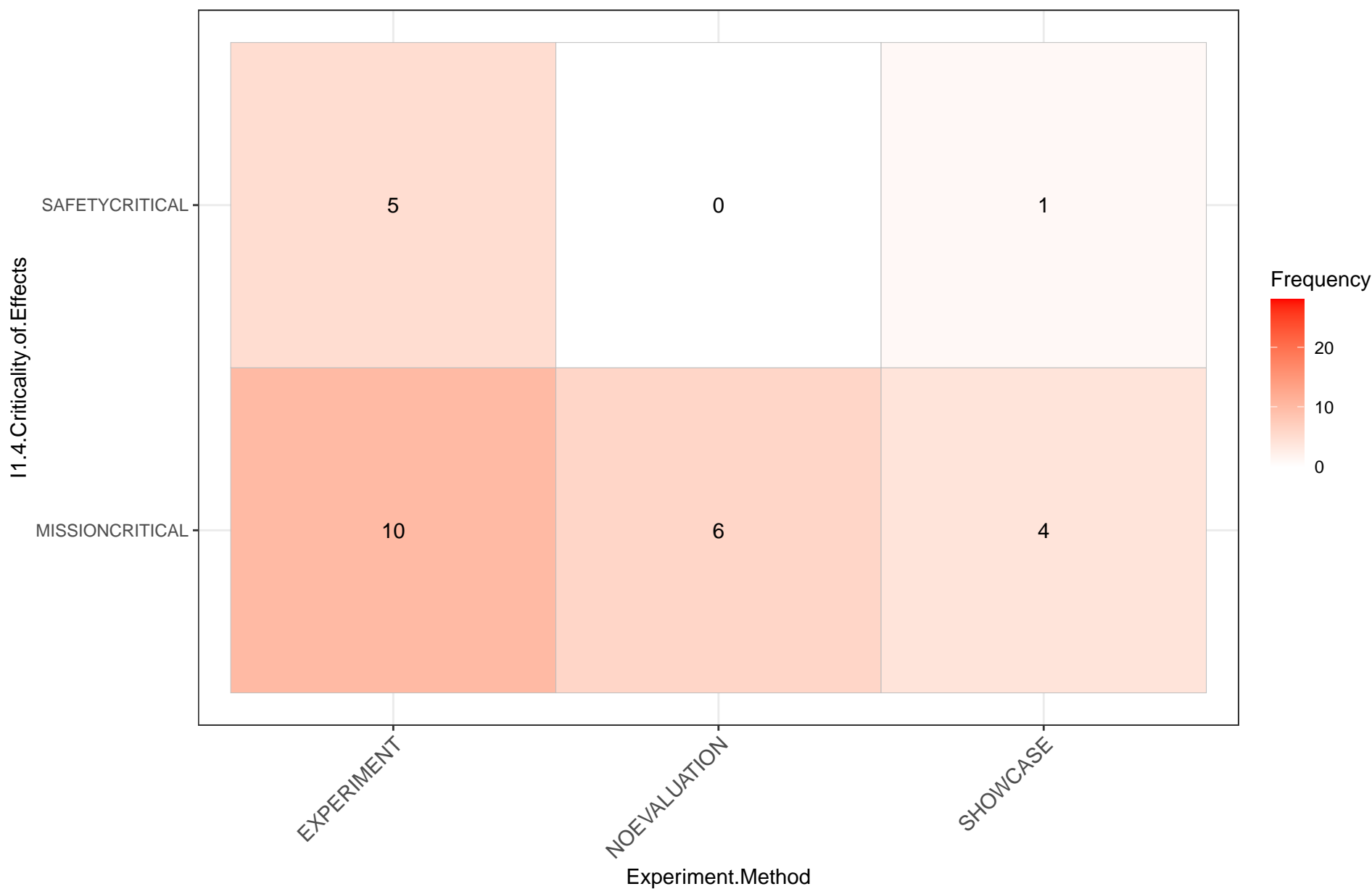
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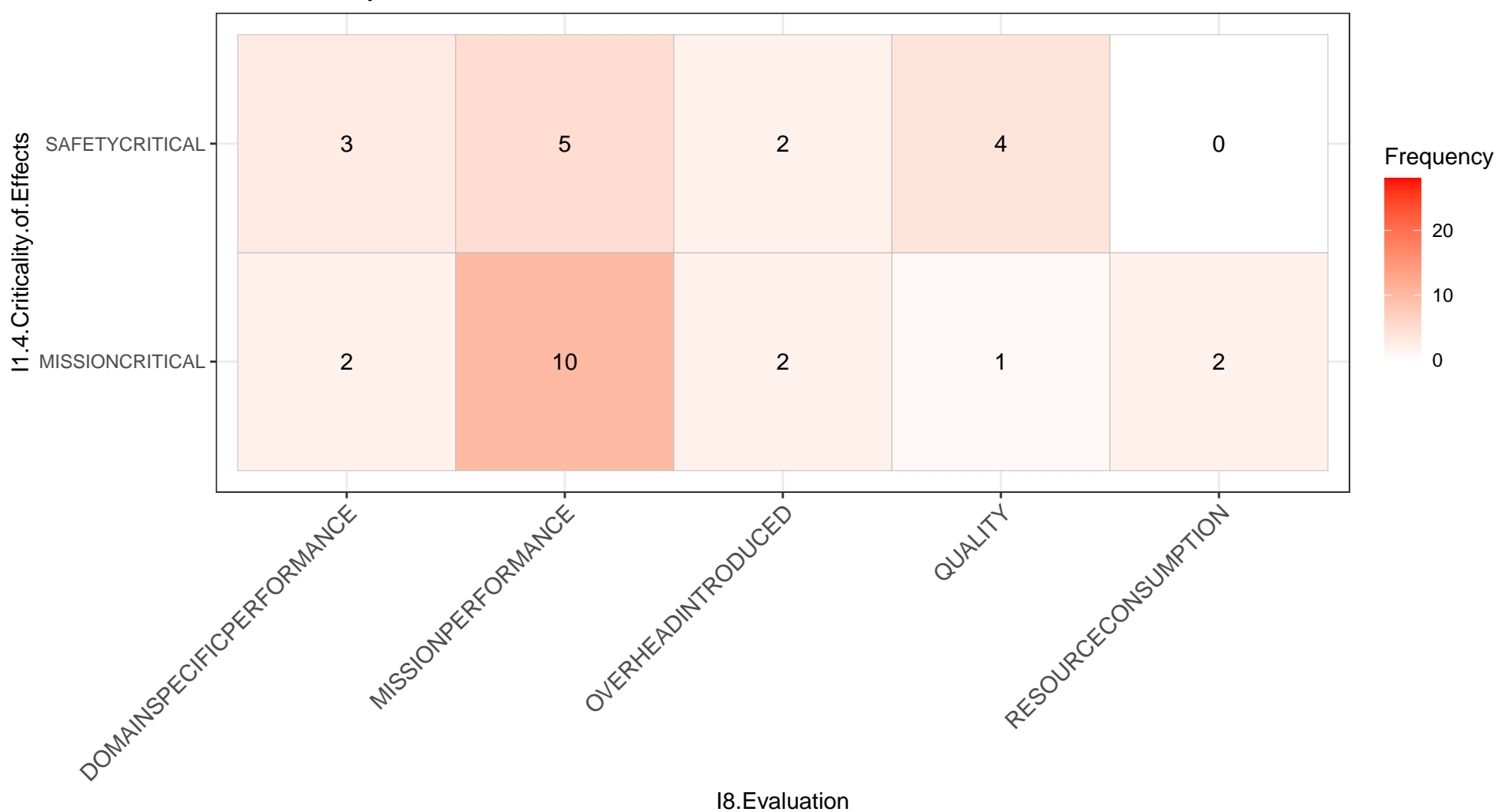
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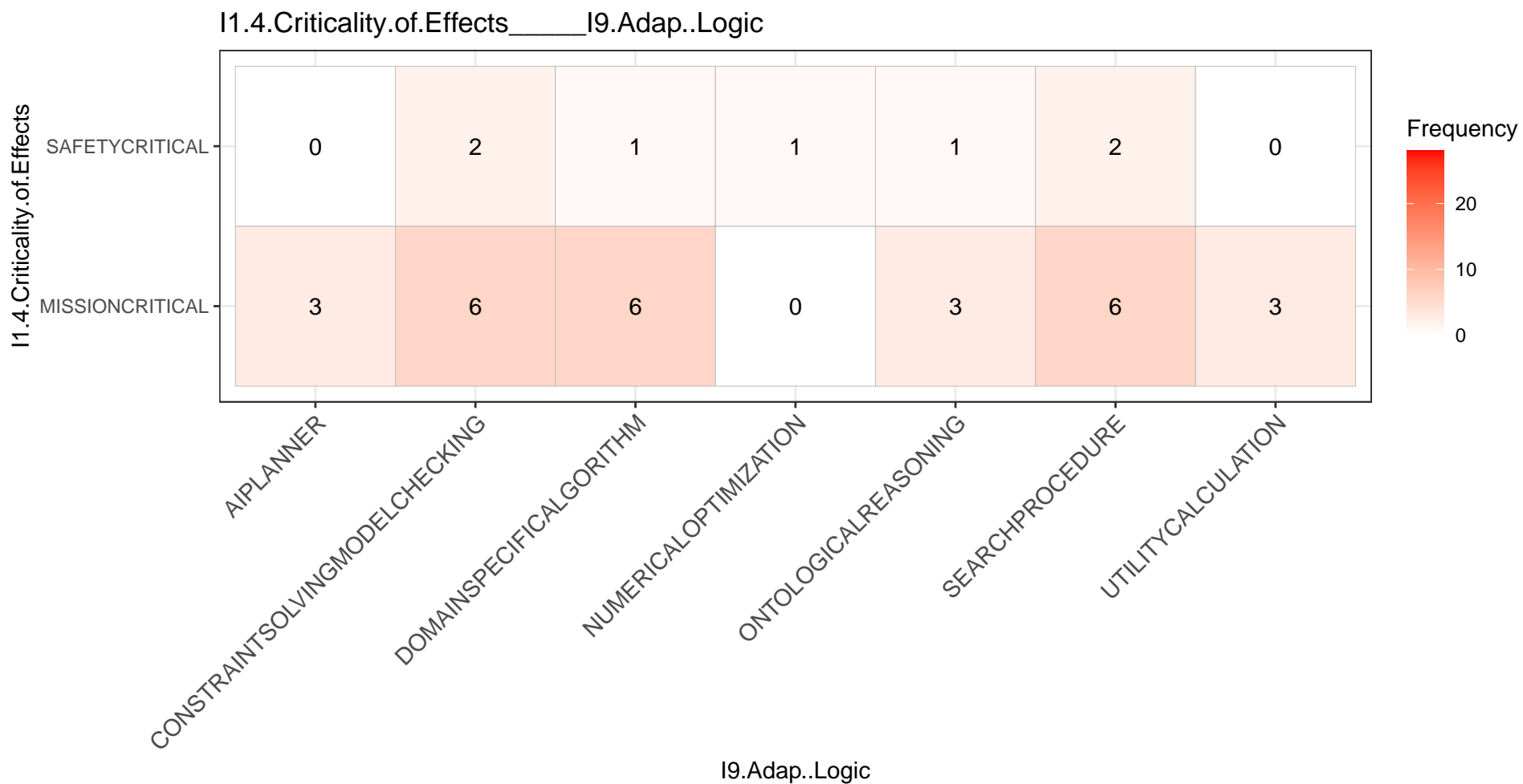
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I1.4.Criticality.of.Effects_____Experiment.Method

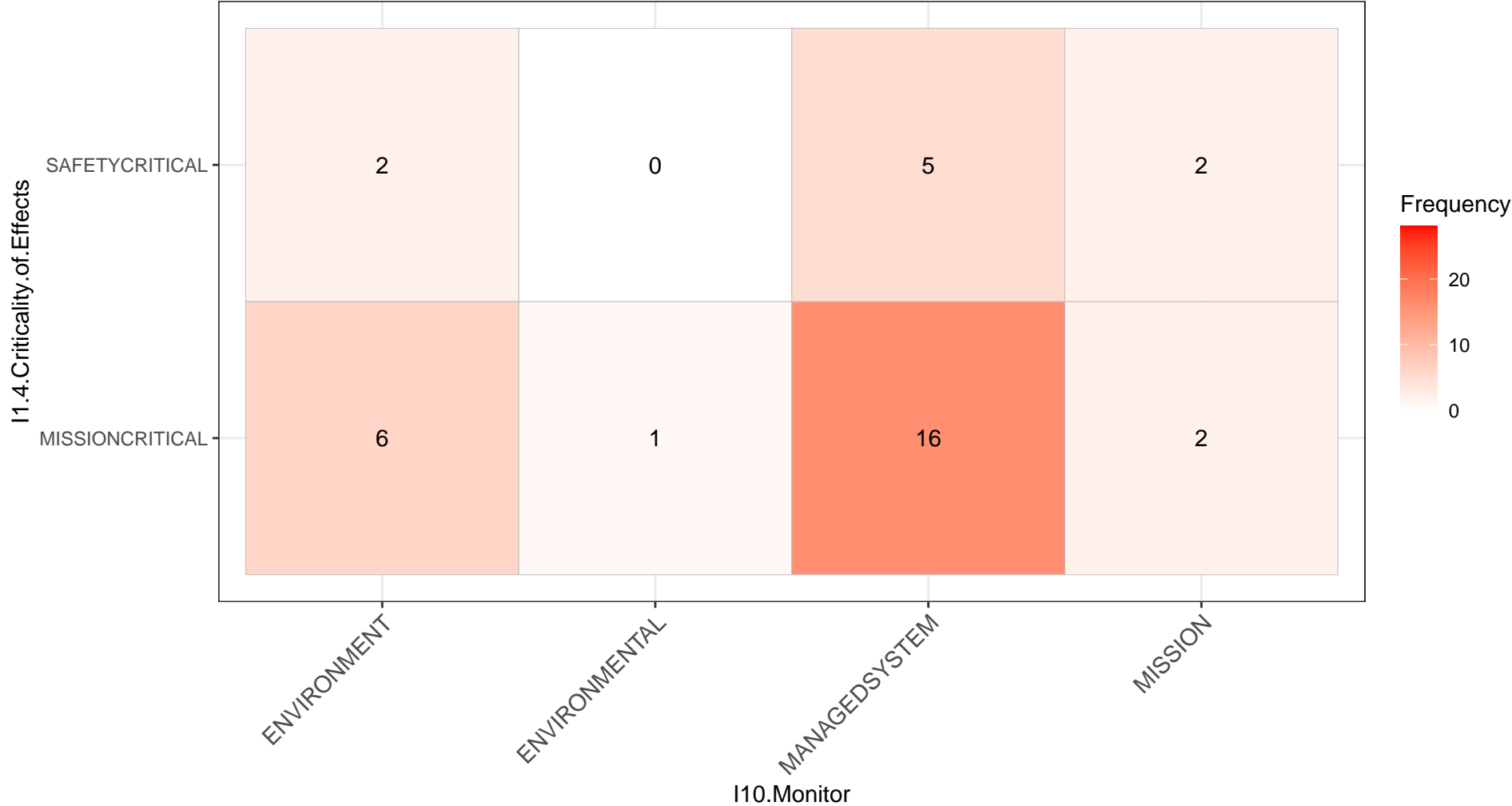


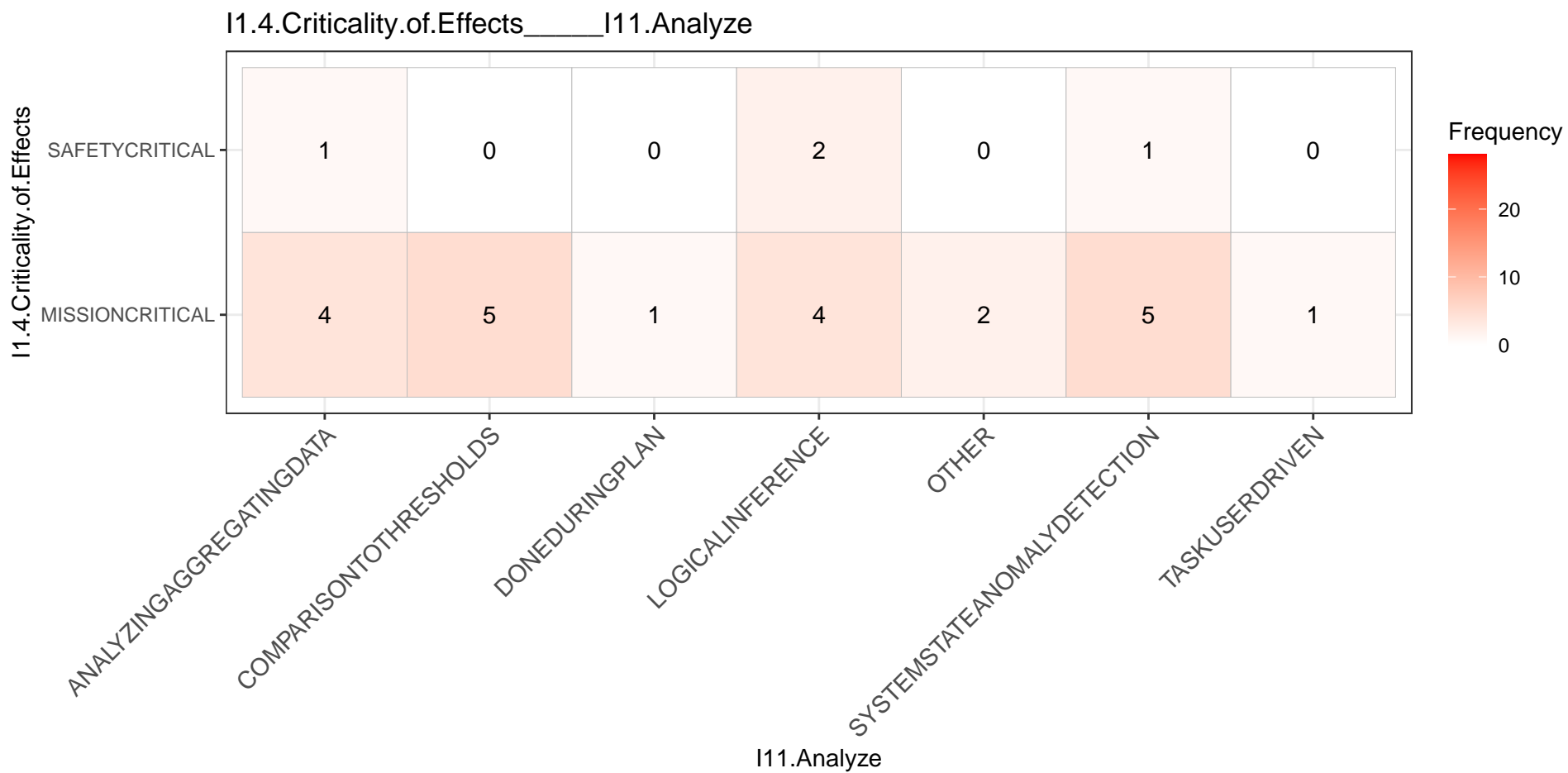
I1.4.Criticality.of.Effects_____I8.Evaluation





I1.4.Criticality.of.Effects_____I10.Monitor





I1.4.Criticality.of.Effects_____I12.Plan

I1.4.Criticality.of.Effects

SAFETYCRITICAL

MISSIONCRITICAL

Frequency

20

10

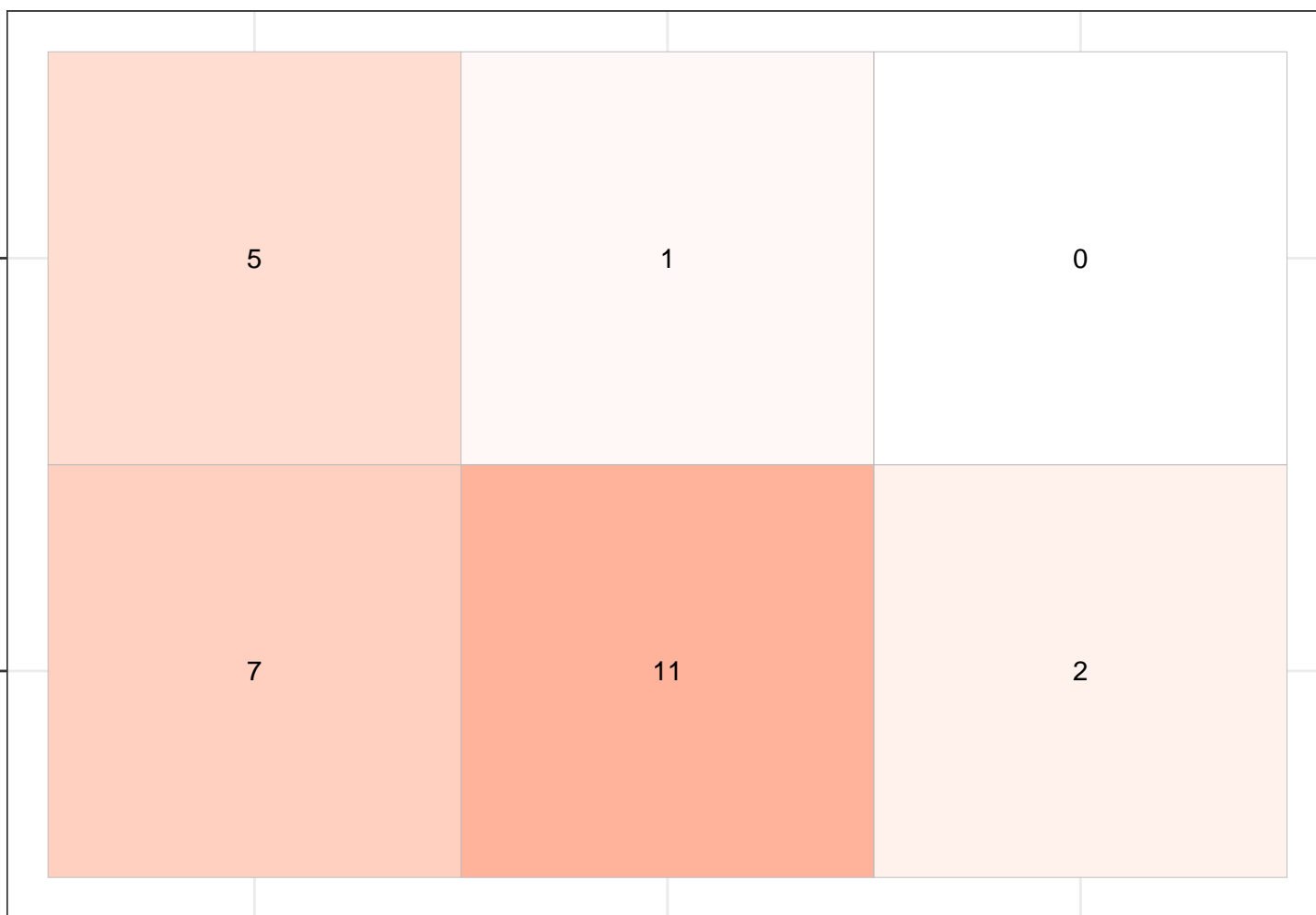
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DETERMININGTHEOPTIMALCHOICE

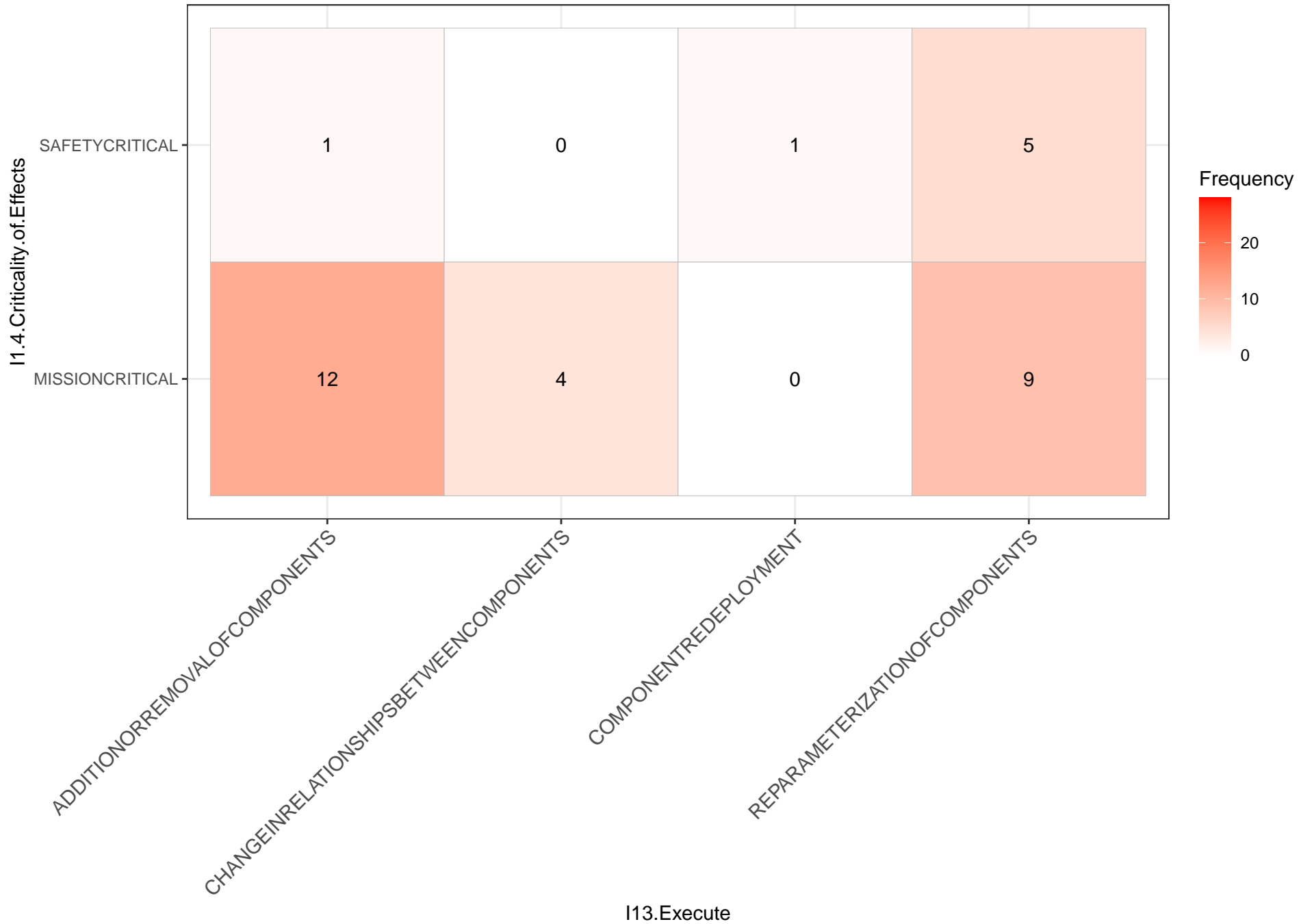
RELYINGONDESIGNTIMERULESMODELS

USINGAIPANNINGLANGUAGES

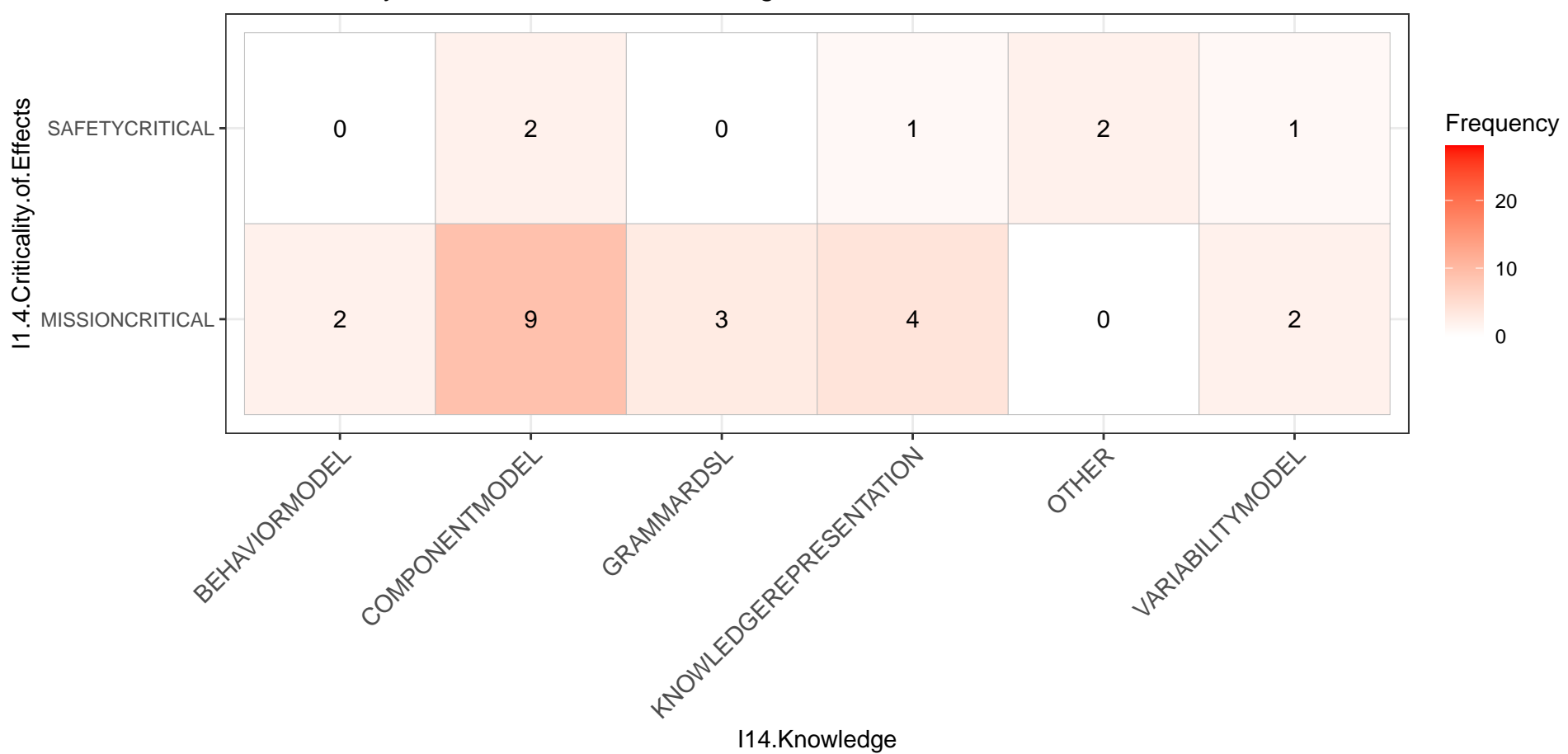
I12.Plan



I1.4.Criticality.of.Effects_____I13.Execute



I1.4.Criticality.of.Effects_____I14.Knowledge



I1.4.Predictability.of.Effects_____I1.4.Overhead.of.Effects

I1.4.Predictability.of.Effects

NONDETERMINISTIC

9

4

2

DODETERMINISTIC

6

0

2

DEPENDENT

DOSIGNIFICANT

INSIGNIFICANT

I1.4.Overhead.of.Effects

Frequency

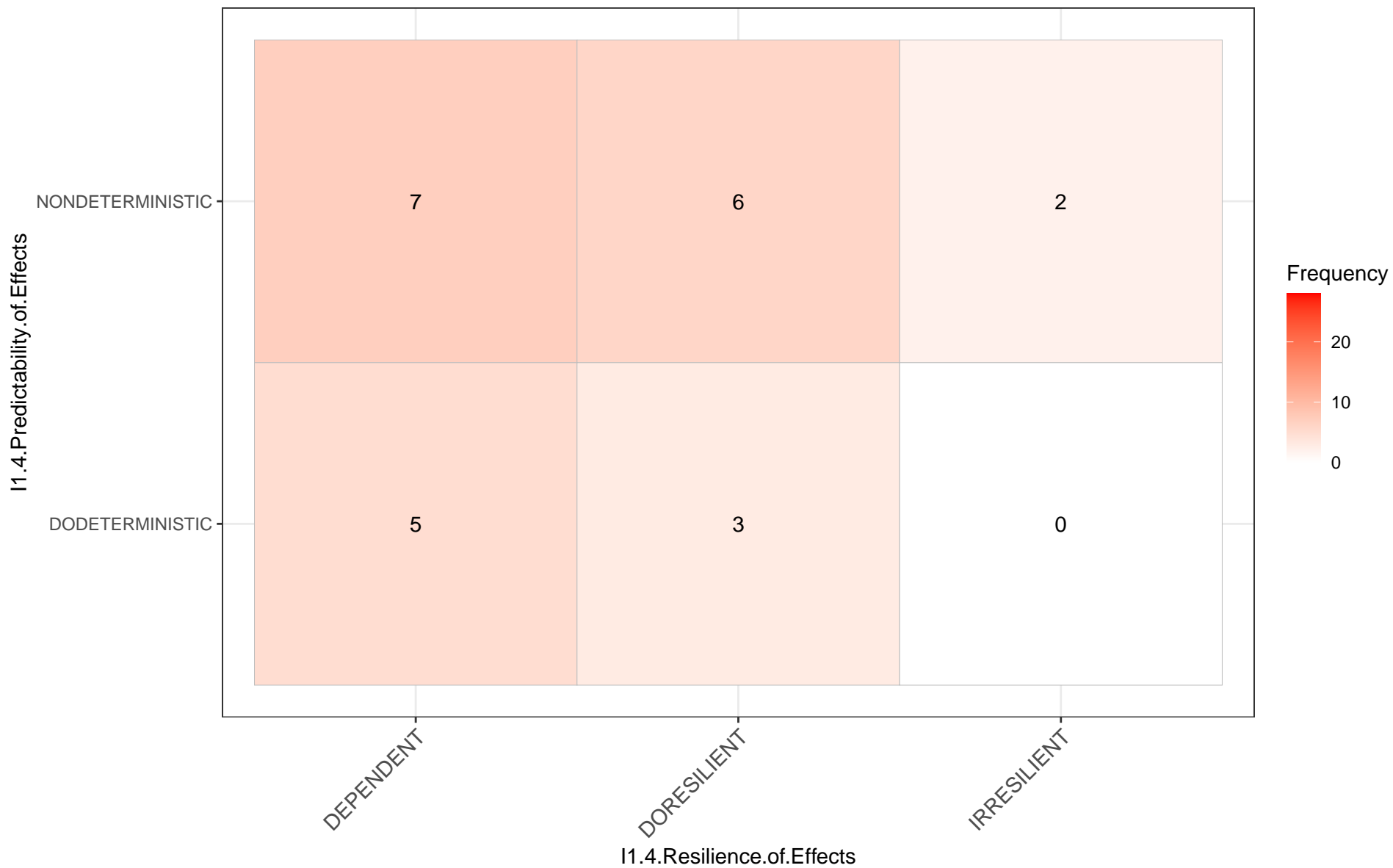


20

10

0

I1.4.Predictability.of.Effects_____I1.4.Resilience.of.Effects



I1.4.Predictability.of.Effects

I1.4.Predictability.of.Effects_____I2.Adap..Purpose

NONDETERMINISTIC

DODETERMINISTIC

Frequency

20

10

0

CHANGEFUNCTIONALBEHAVIOR

DEALWITHENVIRONMENTALCHANGES

KEEPMEETINGQUALITYREQUIREMENTSATRUNTIME

OPTIMIZERESOURCEUSAGE

OPTIMIZESEMPERFORMANCE

RECOVERFROMATTACKS

RECOVERFROMERRORSFAULTS

I2.Adap..Purpose

3

6

2

3

6

1

9

2

1

3

3

1

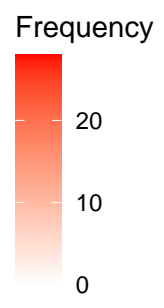
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3

I1.4.Predictability.of.Effects

I1.4.Predictability.of.Effects_____I3.Robot.Type

NONDETERMINISTIC	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
DODETERMINISTIC	0	0	0	1	1	0	1	1	0	0	0	1	2	0	0	0	0	0	0	0	0	1	2	0	0	0



- BOXERCLEARPATH
- CRAWLERTERMINATORBOT
- FIELDMOBILEROBOT
- HETEROGENOUSROBOTS
- INFOTAINMENTROBOT
- KUKALIGHTWEIGHTROBOT4LWR4
- HEXMANIPULATOR
- HEXMANIPULATOR
- MOBILESERVICEROBOT
- IRBOTCREATE2
- MOBILEROBOT
- MOBILEROBOTS
- MOBILERESTRIAL
- MOBILEROBOTTIAGO
- MOBILESERVICEROBOT
- MSUEVORALLYMOBILETERRESTRIAL
- MULTIPLEHEXROTOR
- NAOROBOT
- PIONEER3DX
- QUADROCOPTER
- RESCUE
- SINGLESERVOINGROTATIONROBOT
- TEDUSARTERRESTRIALSEARCH
- TRIGLIDEINDUSTRIALASSEMBLY
- TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLE
- QUADROCOPTORFOREVALUATION
- TURTLEBOT
- WAREHOUSEDELIVERYROBOT
- WHICHISANINDUSTRIALAGV

I3.Robot.Type

I1.4.Predictability.of.Effects_____I4.Robo.SW

I1.4.Predictability.of.Effects

NONDETERMINISTIC

5

10

0

DODETERMINISTIC

2

2

1

OTHER

ROS1

ROS2

I4.Robo.SW

Frequency



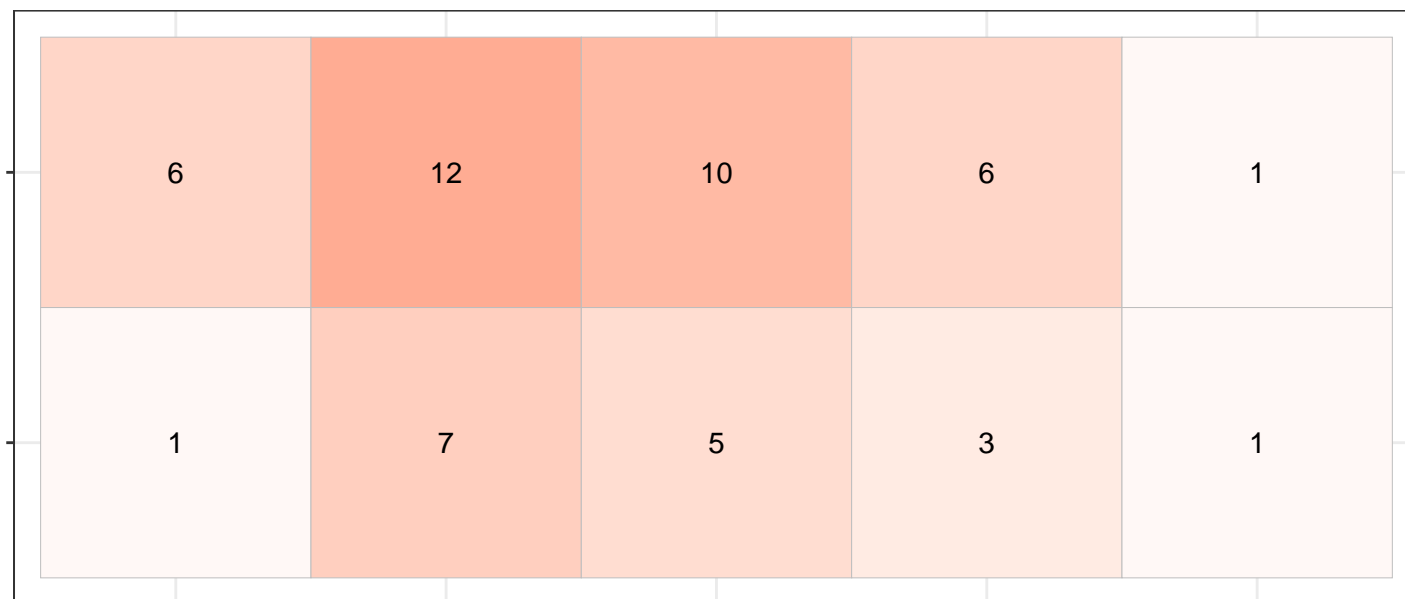
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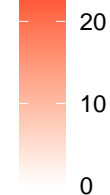
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I1.4. Predictability of Effects

I1.4. Predictability of Effects _____ I5. QA



Frequency



FUNCTIONALSUITABILITY

PERFORMANCEEFFICIENCY

RELIABILITY

SAFETY

SECURITY

I5. QA

I1.4.Predictability.of.Effects_____I6.Independence

I1.4.Predictability.of.Effects

NONDETERMINISTIC

DODETERMINISTIC

Frequency

20

10

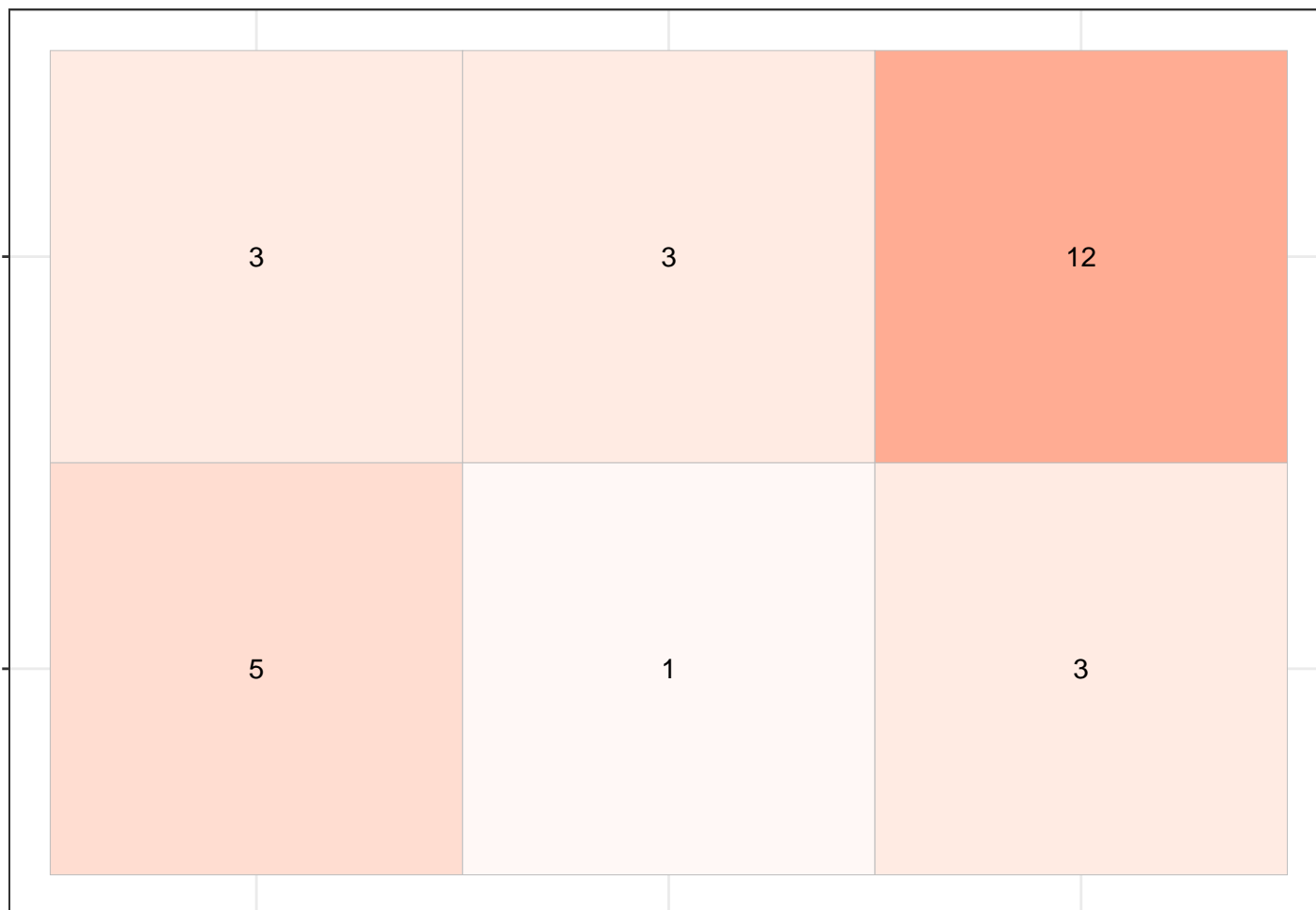
0

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence



I1.4.Predictability.of.Effects_____I7.Deployment.Realness

I1.4.Predictability.of.Effects

NONDETERMINISTIC

10

7

DODETERMINISTIC

4

2

REAL

SIMULATED

I7.Deployment.Realness

Frequency



I1.4.Predictability.of.Effects_____I7.Mission.Realness

I1.4.Predictability.of.Effects

NONDETERMINISTIC

9

9

DODETERMINISTIC

6

3

REAL

SYNTHETIC

I7.Mission.Realness

Frequency

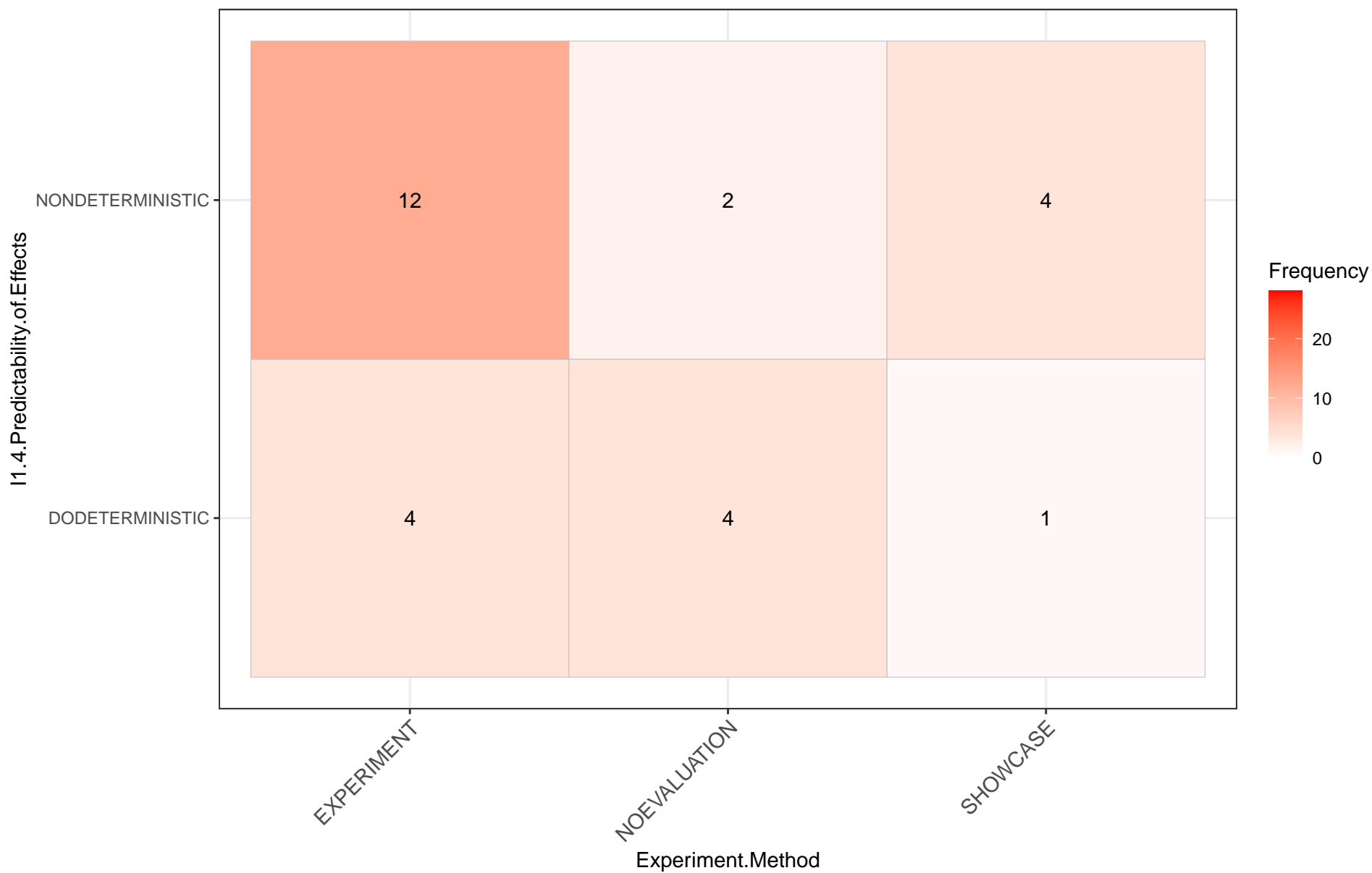


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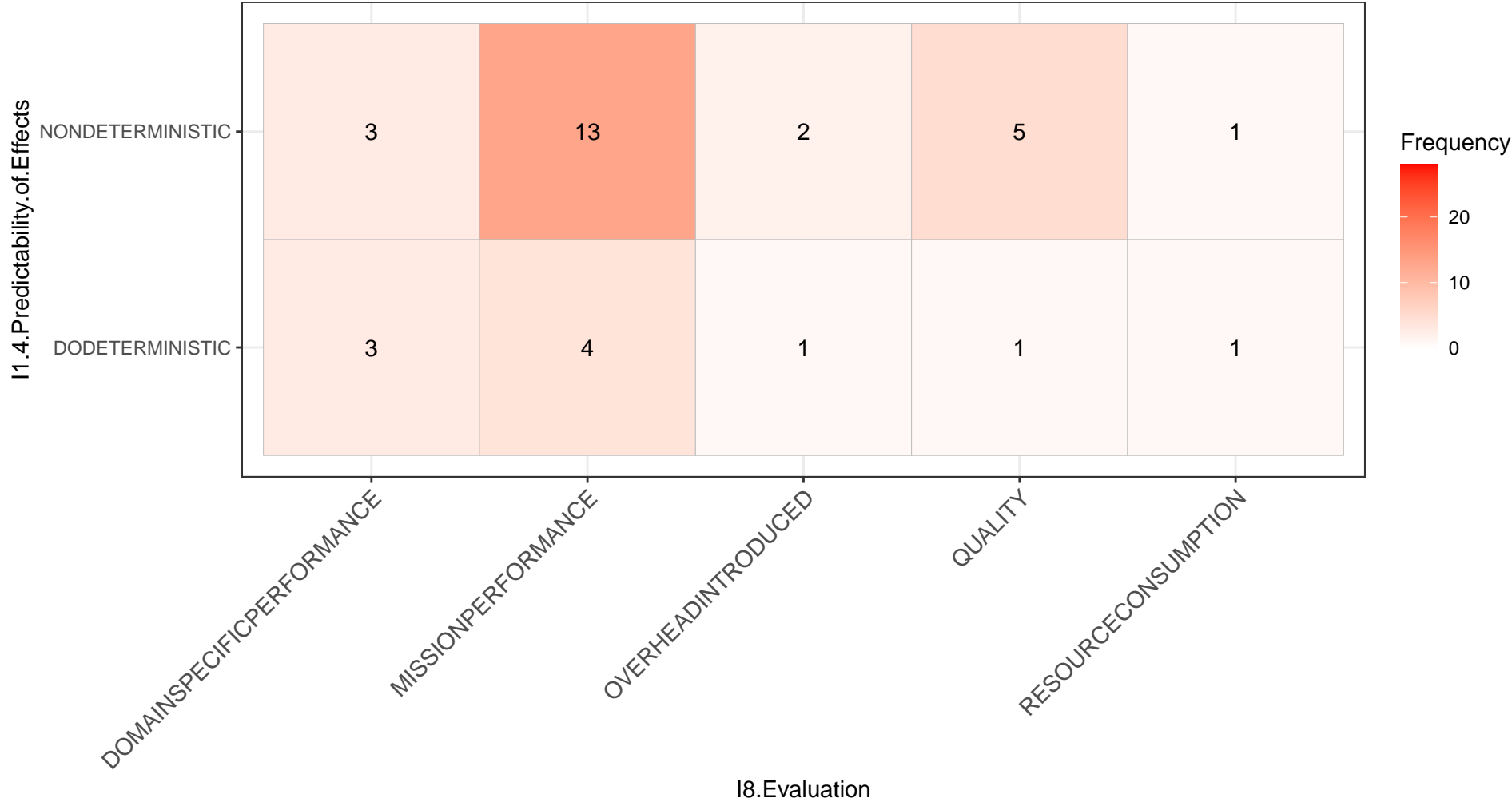
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I1.4.Predictability.of.Effects_____Experiment.Method

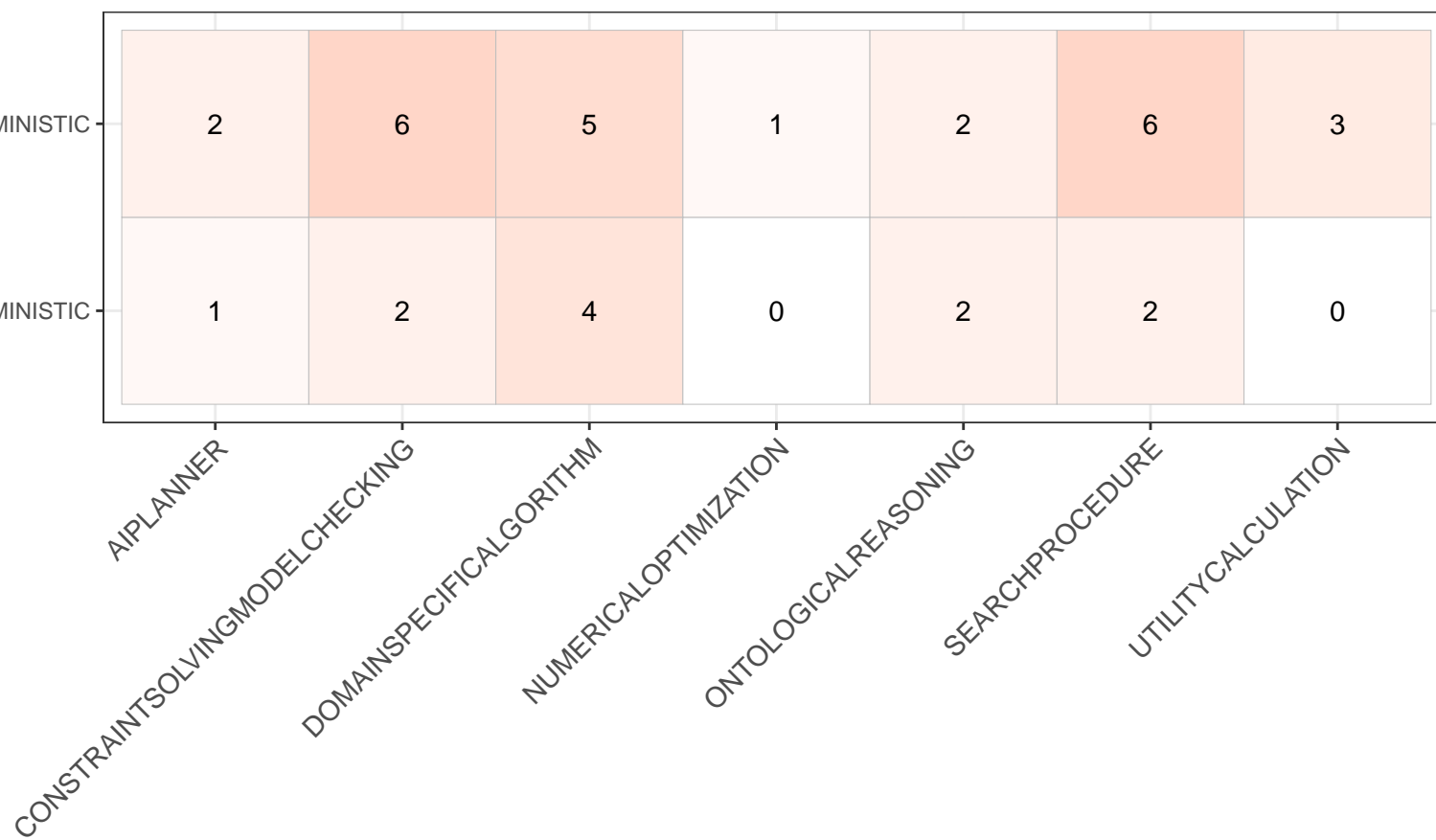


I1.4.Predictability.of.Effects_____I8.Evaluation



I1.4.Predictability.of.Effects

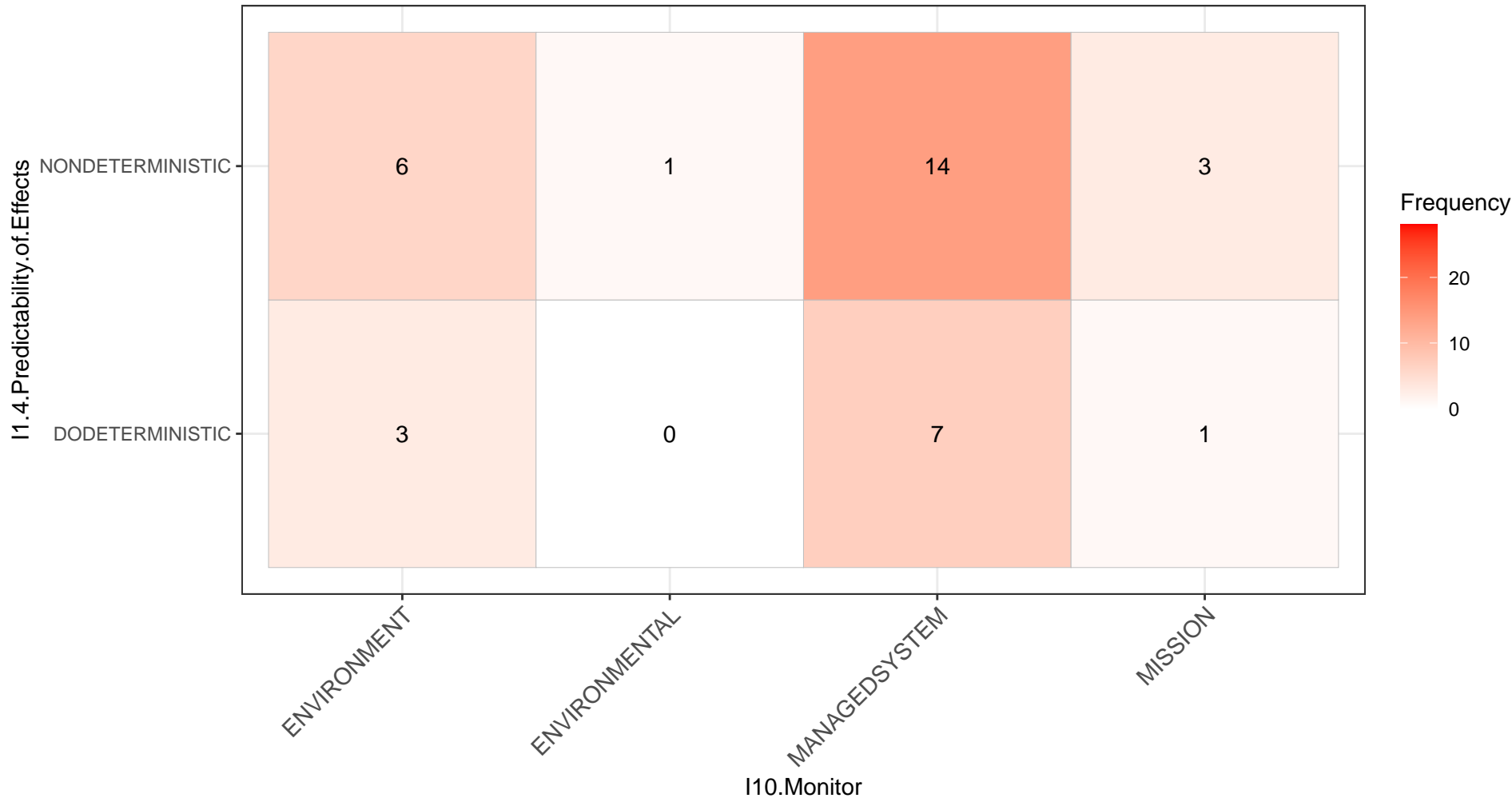
I1.4.Predictability.of.Effects_____I9.Adap..Logic



Frequency



I1.4.Predictability.of.Effects_____I10.Monitor



I1.4.Predictability.of.Effects

I1.4.Predictability.of.Effects_____I11.Analyze

NONDETERMINISTIC

DODETERMINISTIC

Frequency



20

10

0

5

4

1

3

2

5

0

0

1

0

3

0

2

1

ANALYZINGAGGREGATINGDATA

COMPARISONTOHRESHOLDS

DONEDURINGPLAN

LOGICALINFERENCE

OTHER

SYSTEMSTATEANOMALYDETECTION

TASKUSERDRIVEN

I11.Analyze

I1.4.Predictability.of.Effects_____I12.Plan

I1.4.Predictability.of.Effects

NONDETERMINISTIC

DODETERMINISTIC

Frequency

20

10

0

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPLANNINGLANGUAGES

I12.Plan

8

8

2

4

6

0

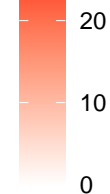
I1.4.Predictability.of.Effects_____I13.Execute

I1.4.Predictability.of.Effects

NONDETERMINISTIC

DODETERMINISTIC

Frequency



9

2

0

11

3

3

1

4

ADDITIONORREMOVALOFCOMPONENTS

CHANGEINRELATIONSHIPSBETWEENCOMPONENTS

COMPONENTREDEPLOYMENT

REPARAMETERIZATIONOFCOMPONENTS

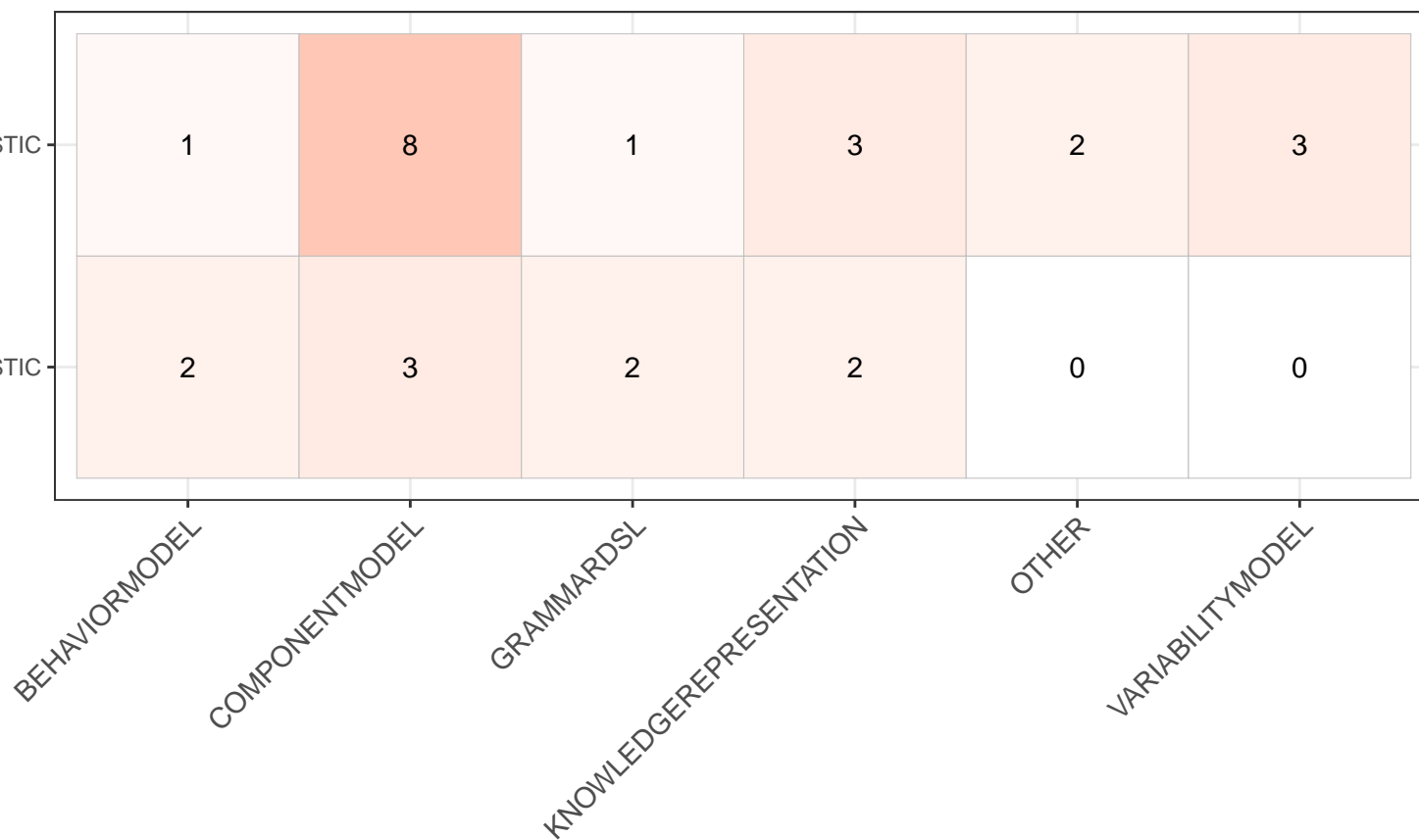
I13.Execute

I1.4.Predictability.of.Effects

I1.4.Predictability.of.Effects_____I14.Knowledge

NONDETERMINISTIC

DODETERMINISTIC



Frequency



I1.4.Overhead.of.Effects_____I1.4.Resilience.of.Effects

I1.4.Overhead.of.Effects

INSIGNIFICANT

DOSIGNIFICANT

DEPENDENT

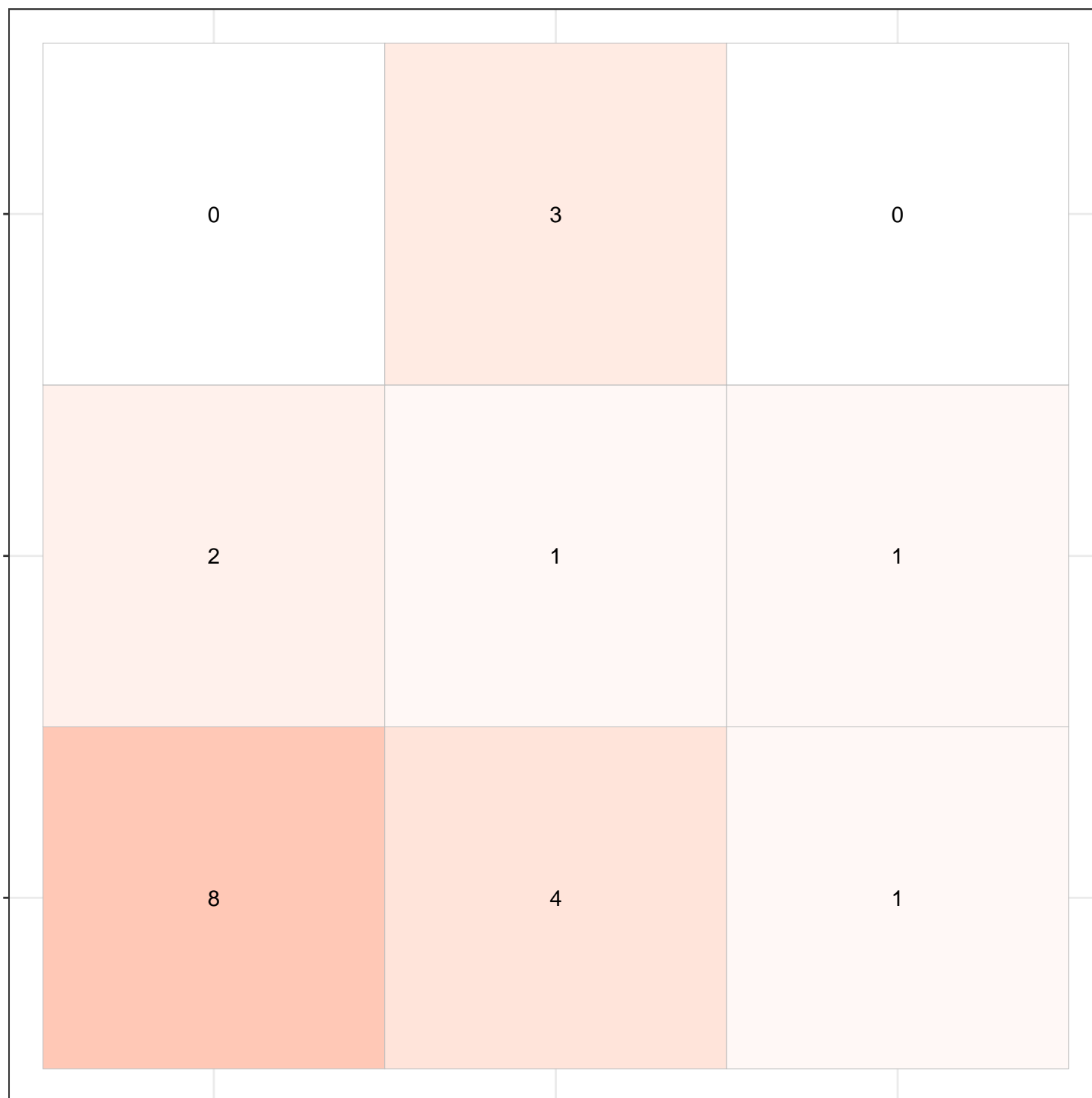
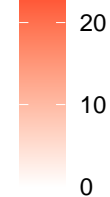
DEPENDENT

DORESILIENT

IRRESILIENT

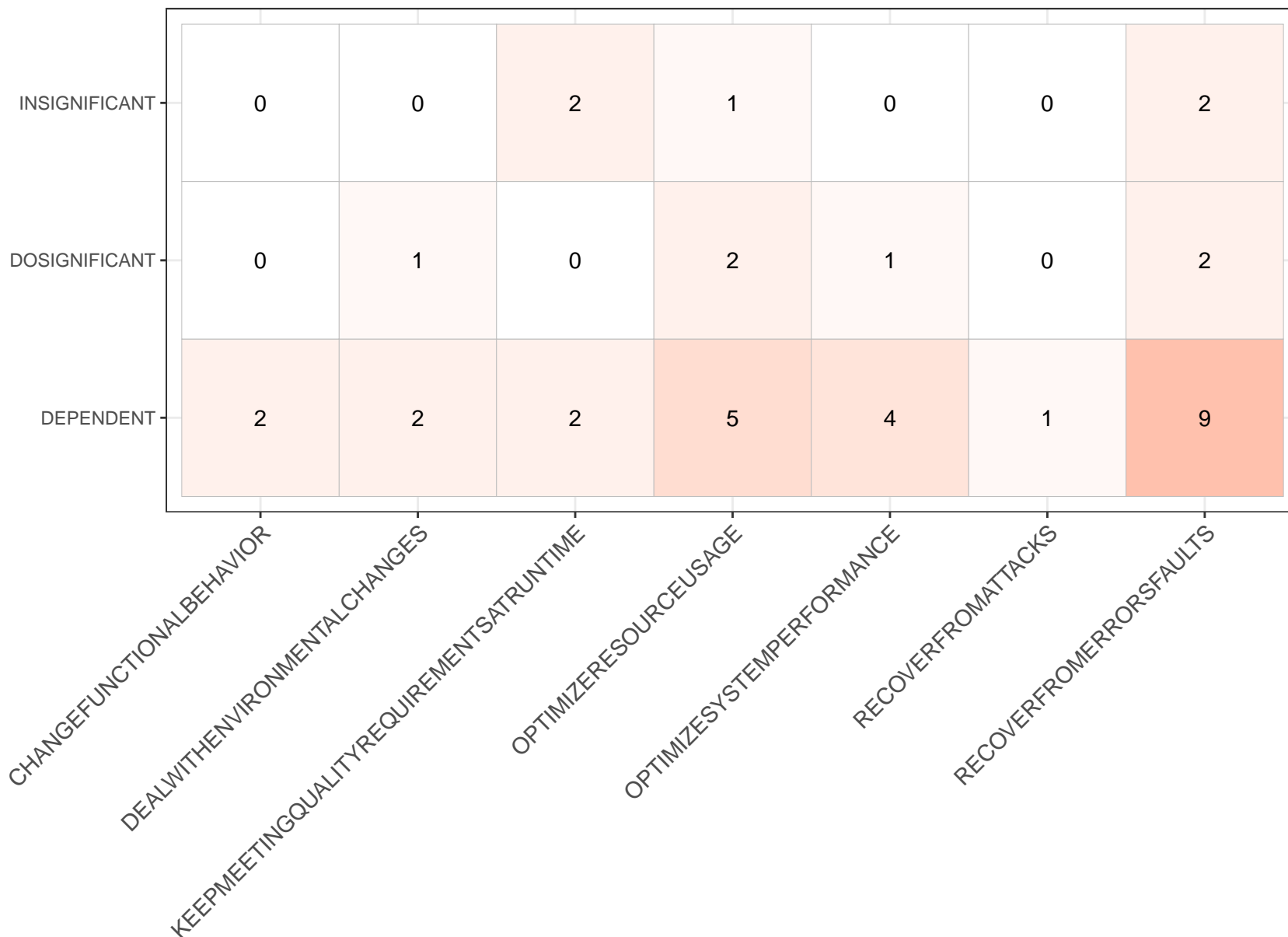
I1.4.Resilience.of.Effects

Frequency

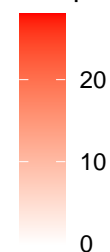


I1.4.Overhead.of.Effects_____I2.Adap..Purpose

I1.4.Overhead.of.Effects



Frequency



I1.4.Overhead.of.Effects

I1.4.Overhead.of.Effects_____I3.Robot.Type

INSIGNIFICANT	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1
DOSIGNIFICANT	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0
DEPENDENT	0	0	1	2	0	2	1	1	0	1	1	1	1	0	0	2	0	0	0	1	0	0	3	0	0
	BOXERCLEARPATH	CRAWLERTERMINATORBOT	FIELDMOBILEROBOTS	HETEROGENOUSROBOTS	HEXAII	HEXMANIPULATOR	MOBILESERVICEROBOT	IROBOTCREATE2	MOBILEROBOTS	MOBILEROBOTTERRESTRIAL	MOBILEROBOTTIAGO	MOBILESERVICEROBOT	MSUEVORALLYMOBILETERRESTRIAL	MULTIPLEHEXROTOR	NAOROBOT	PIONEER3DX	QUADROCOPTER	RESCUE	SINGLESERVINGROTATIONROBOT	TEDUSARTERRESTRIALSEARCH	TRIGLIDEINDUSTRIALASSEMBLY	TURTLEBOT	WAREHOUSEDELIVERYROBOT	WHICHISANINDUSTRIALAGV	TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION

Frequency



I3.Robot.Type

I1.4.Overhead.of.Effects_____I4.Robo.SW

I1.4.Overhead.of.Effects

INSIGNIFICANT

DOSIGNIFICANT

DEPENDENT

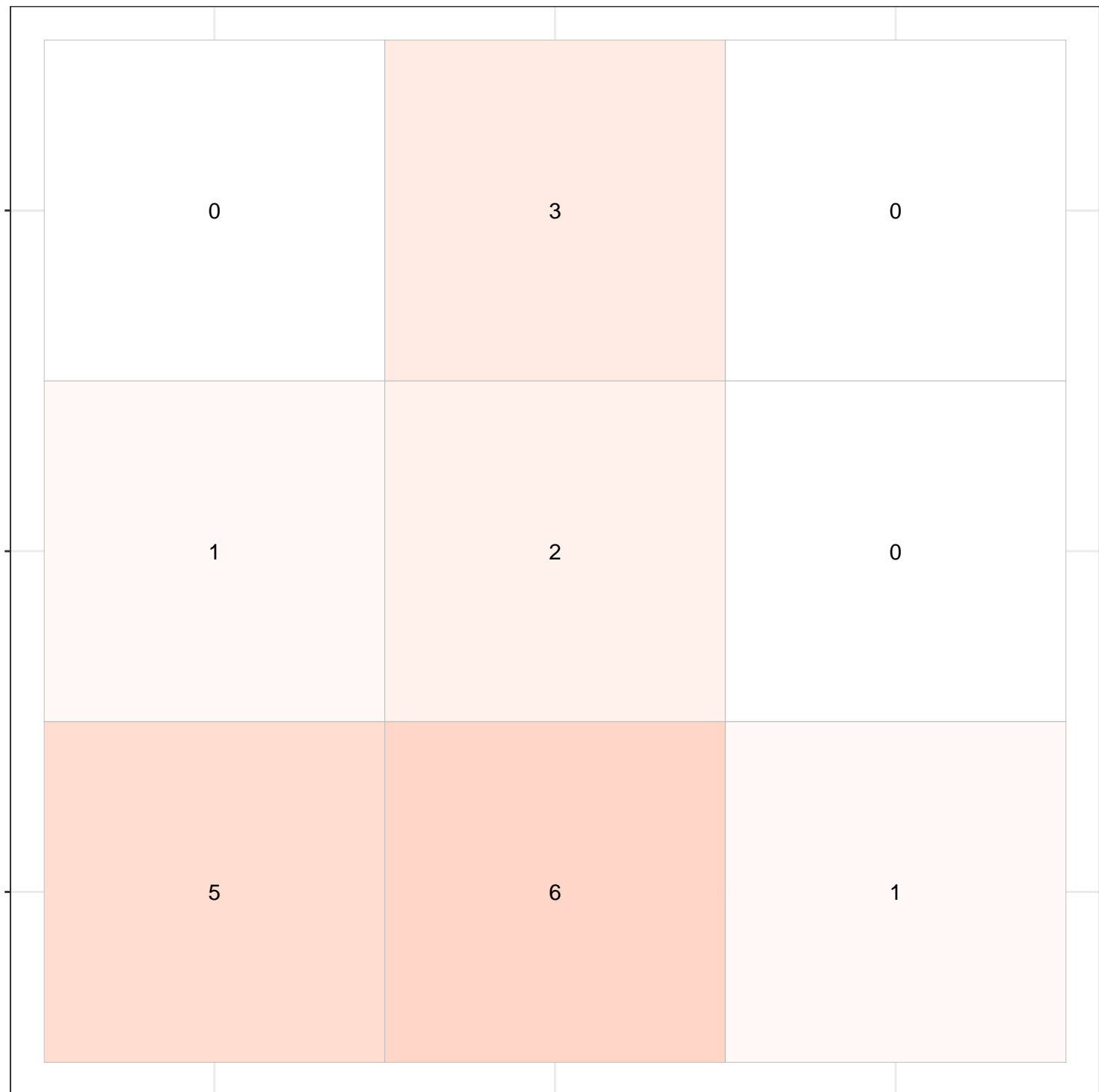
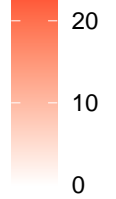
OTHER

ROS1

ROS2

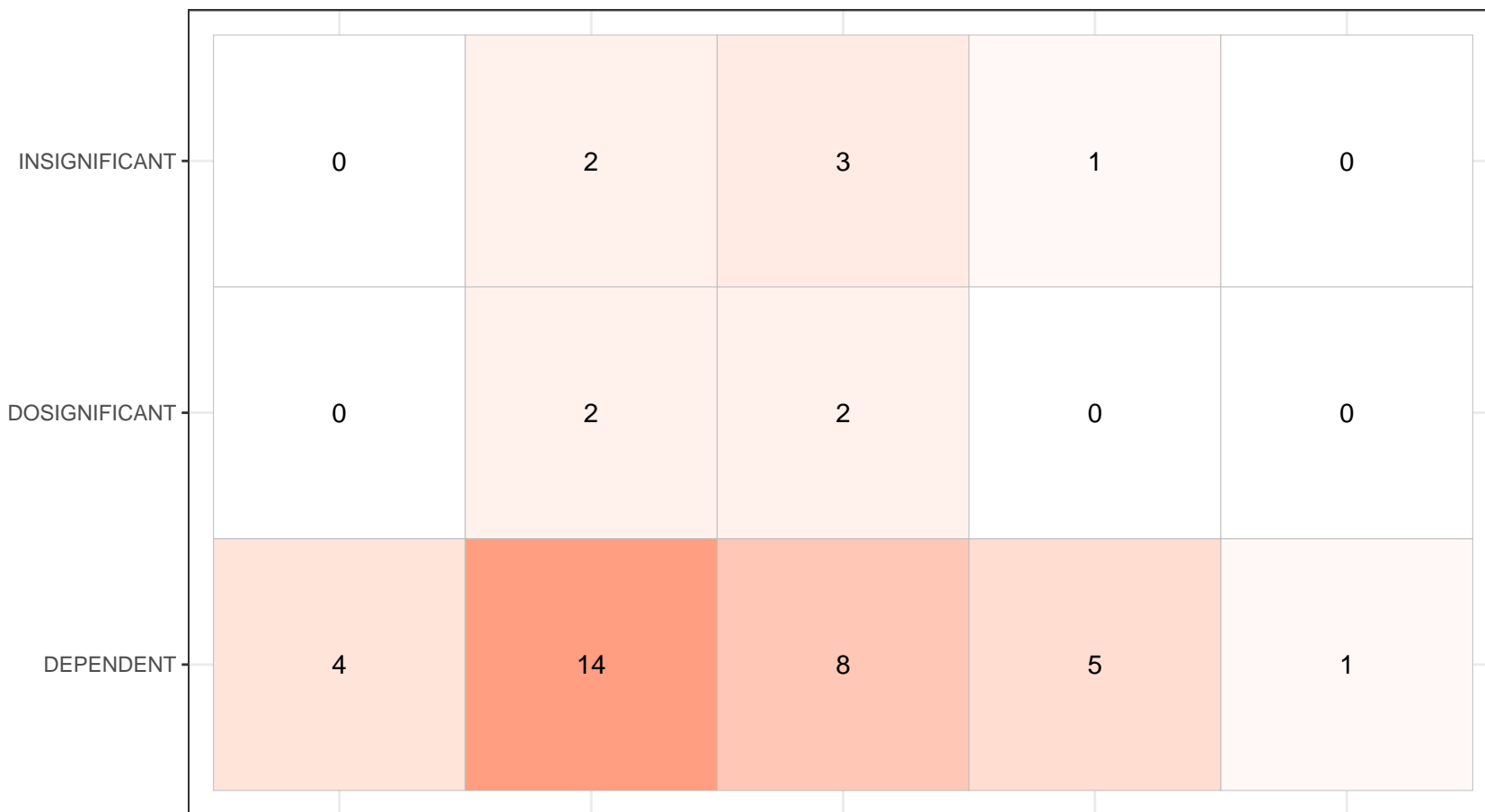
I4.Robo.SW

Frequency



I1.4.Overhead.of.Effects_____I5.QA

I1.4.Overhead.of.Effects



Frequency



I5.QA

I1.4.Overhead.of.Effects_____I6.Independence

I1.4.Overhead.of.Effects

INSIGNIFICANT

DOSIGNIFICANT

DEPENDENT

DETACHABLE

INSEPARABLE

REQUIRESREPRESENTATION

I6.Independence

Frequency



2

0

2

0

1

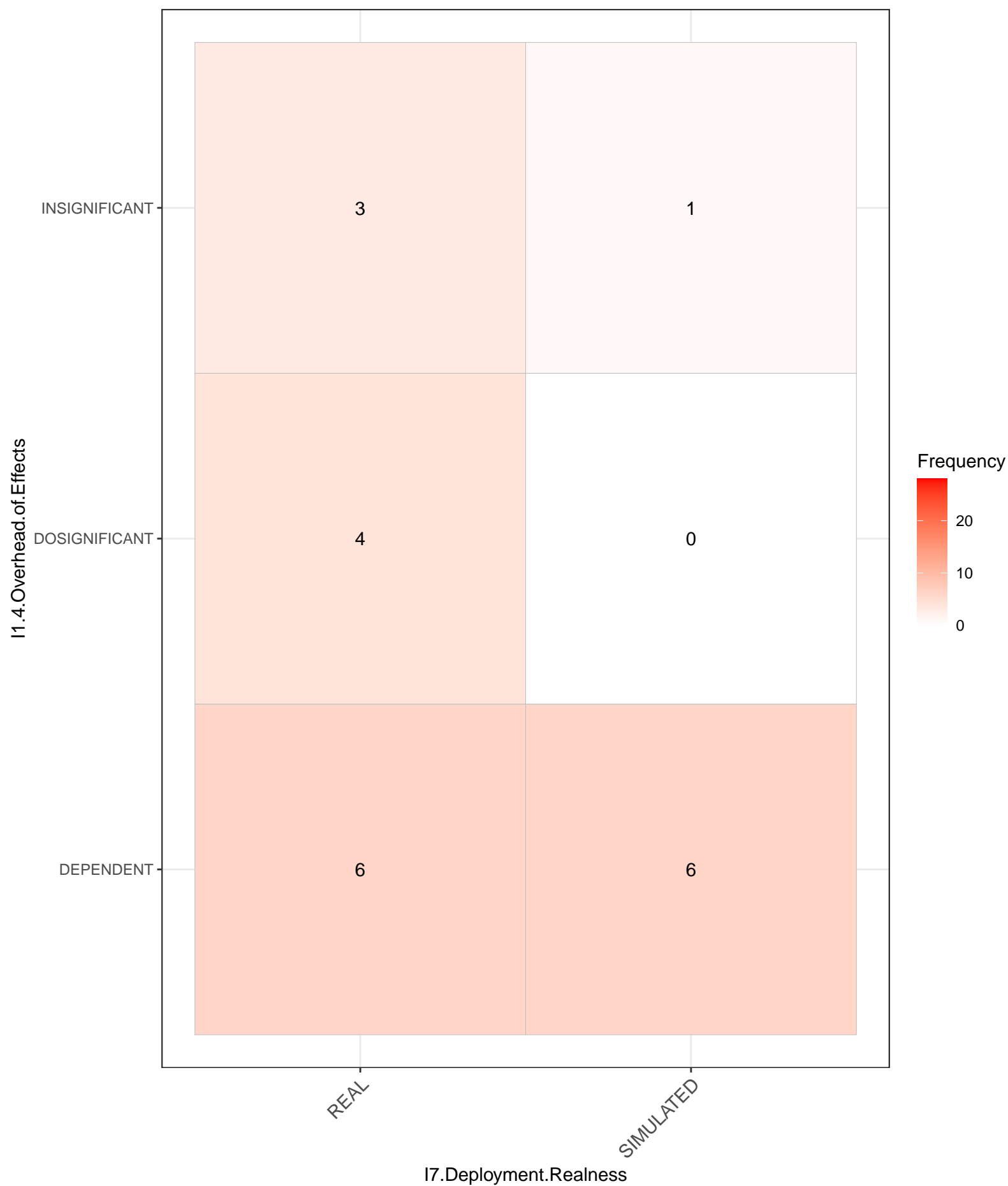
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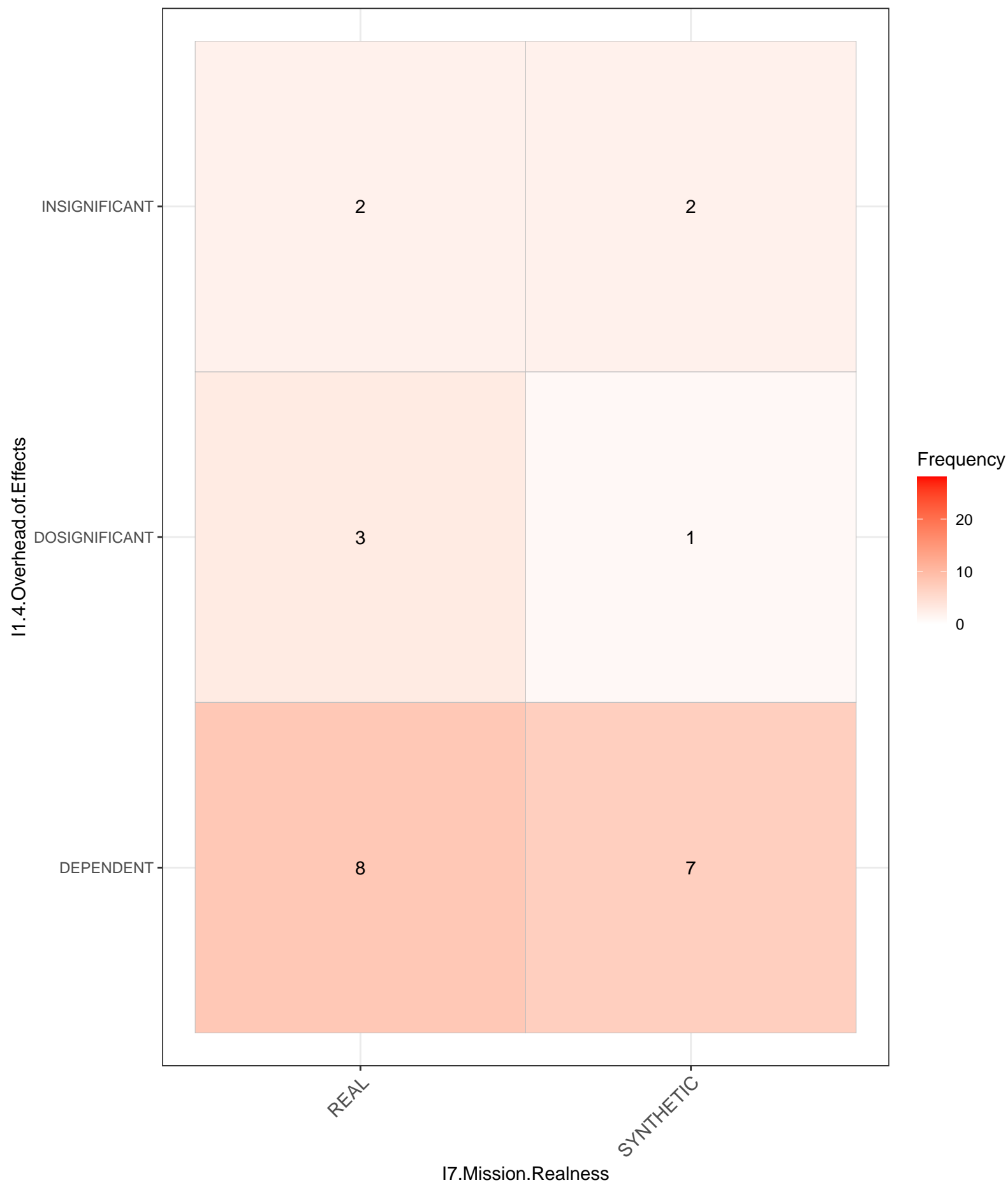
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I1.4.Overhead.of.Effects_____I7.Deployment.Realness

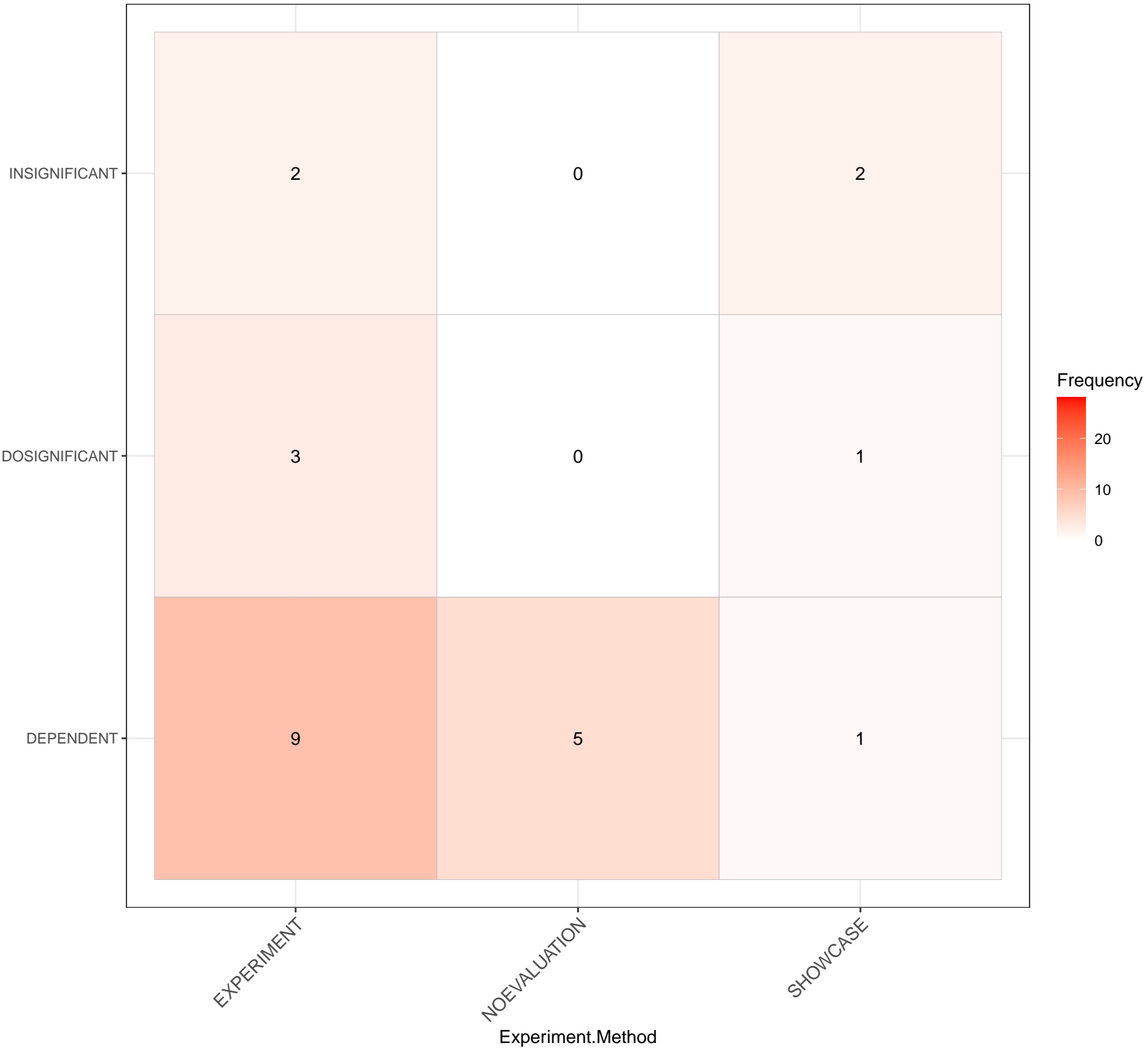


I1.4.Overhead.of.Effects_____I7.Mission.Realness

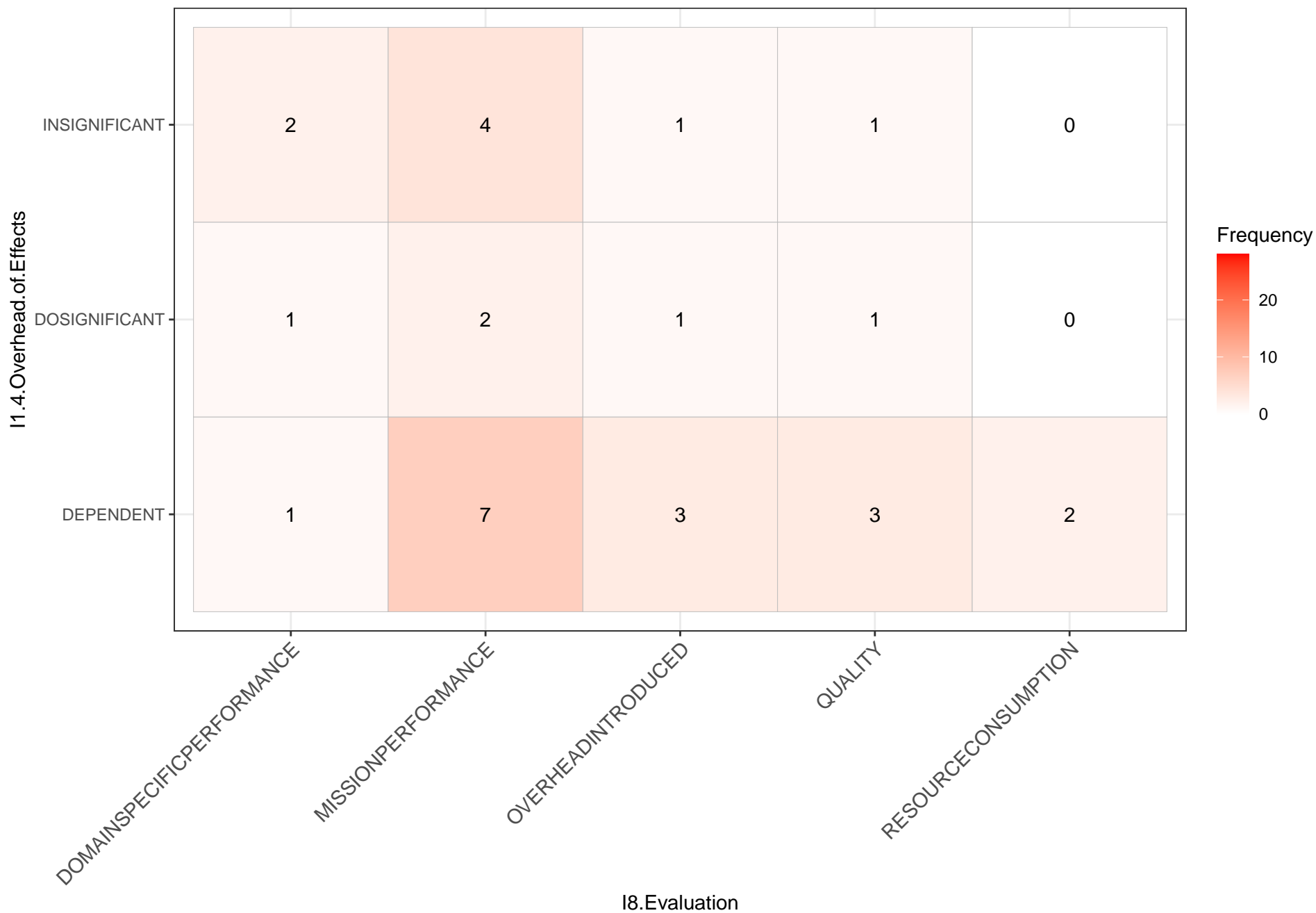


I1.4.Overhead.of.Effects_____Experiment.Method

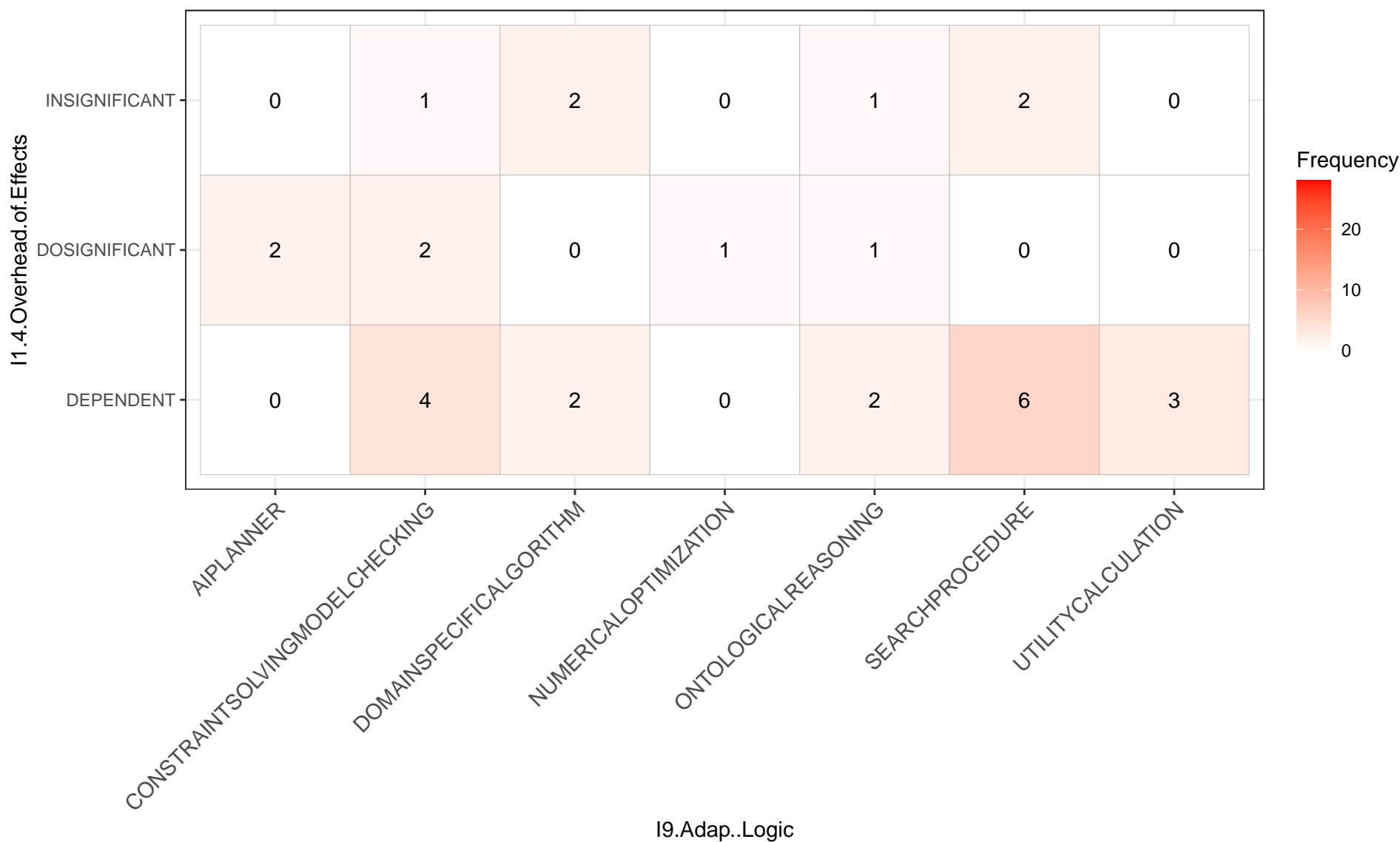
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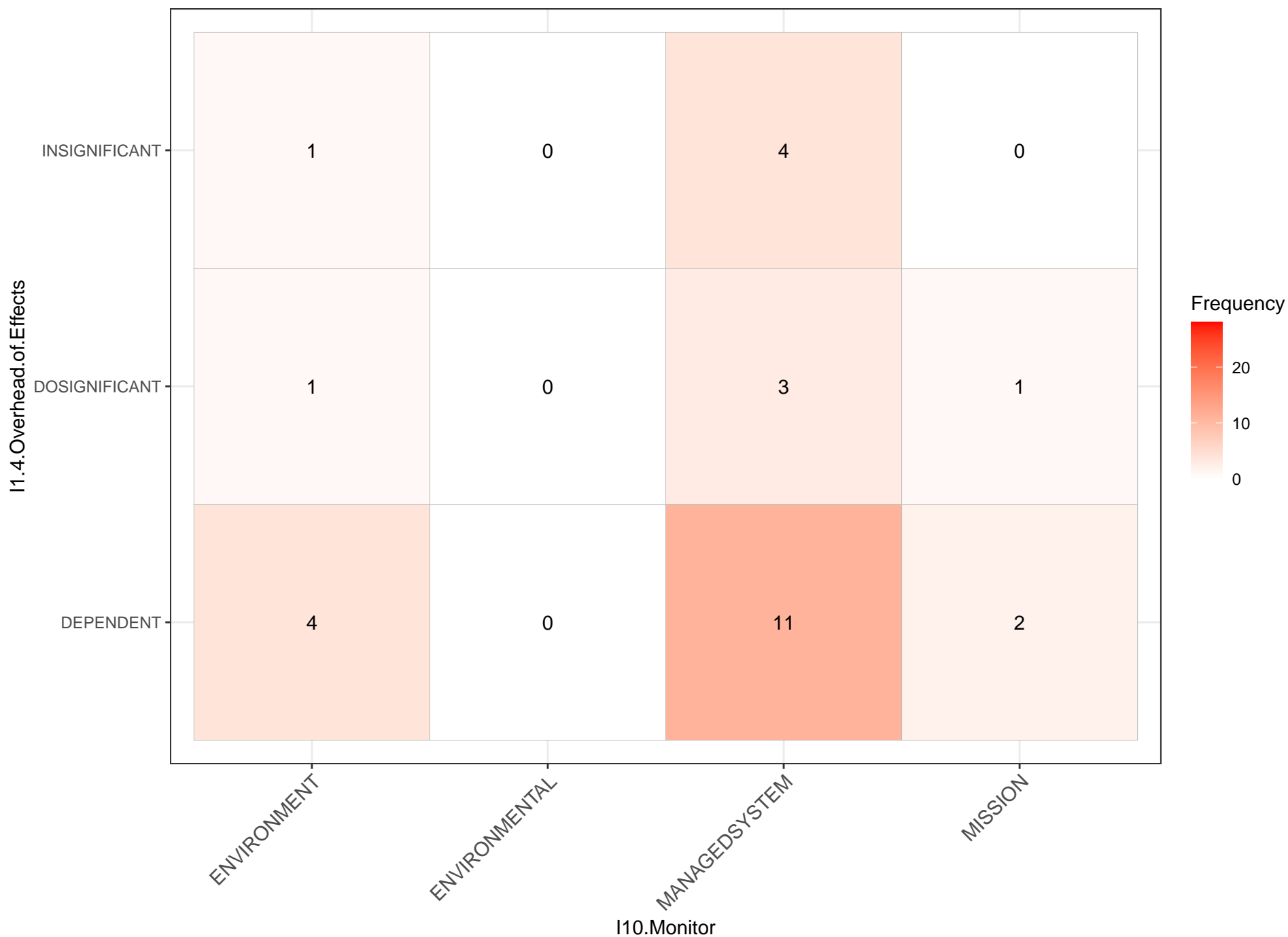
I1.4.Overhead.of.Effects_____I8.Evaluation



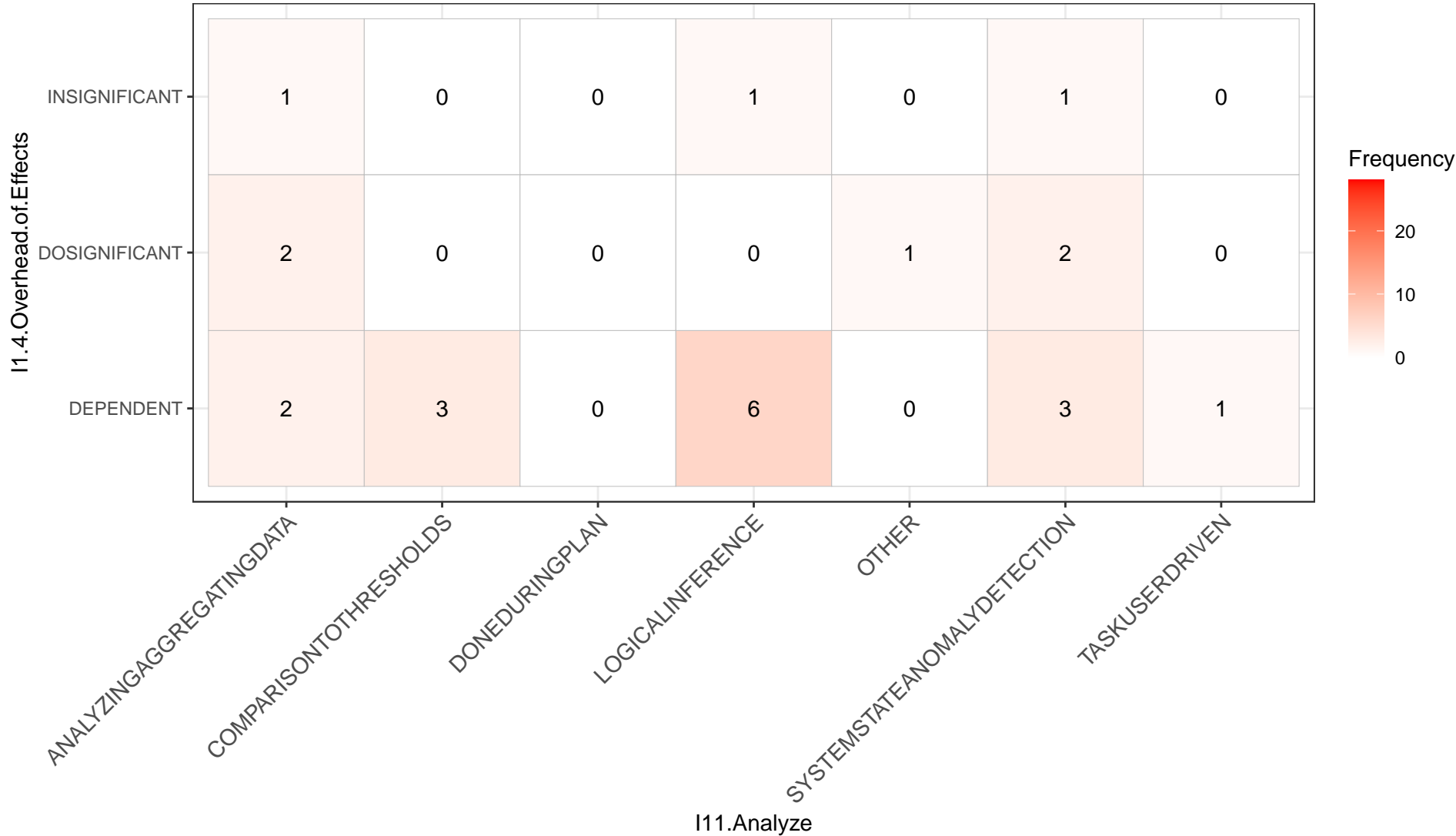
I1.4.Overhead.of.Effects_____I9.Adap..Logic



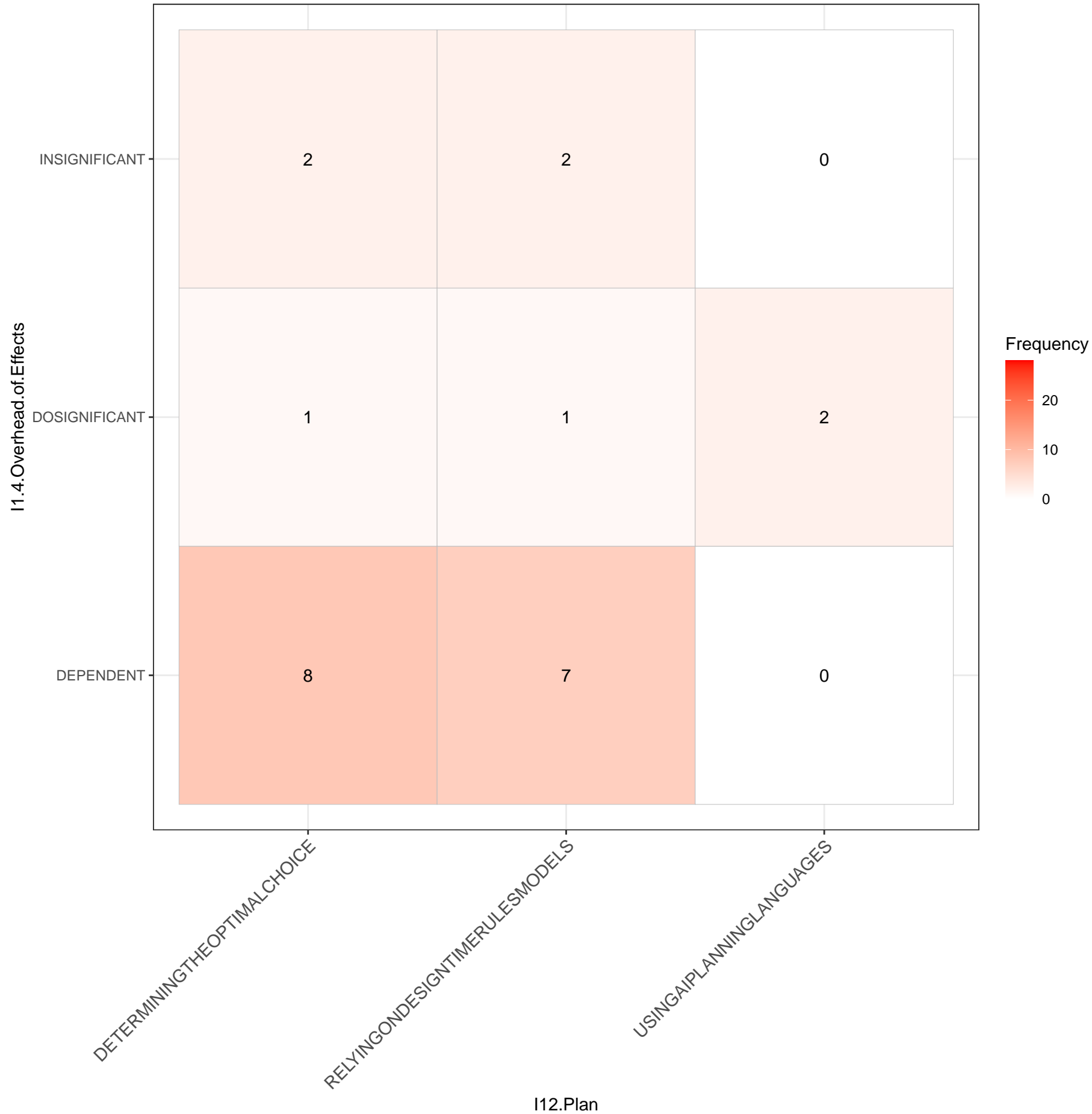
I1.4.Overhead.of.Effects_____I10.Monitor



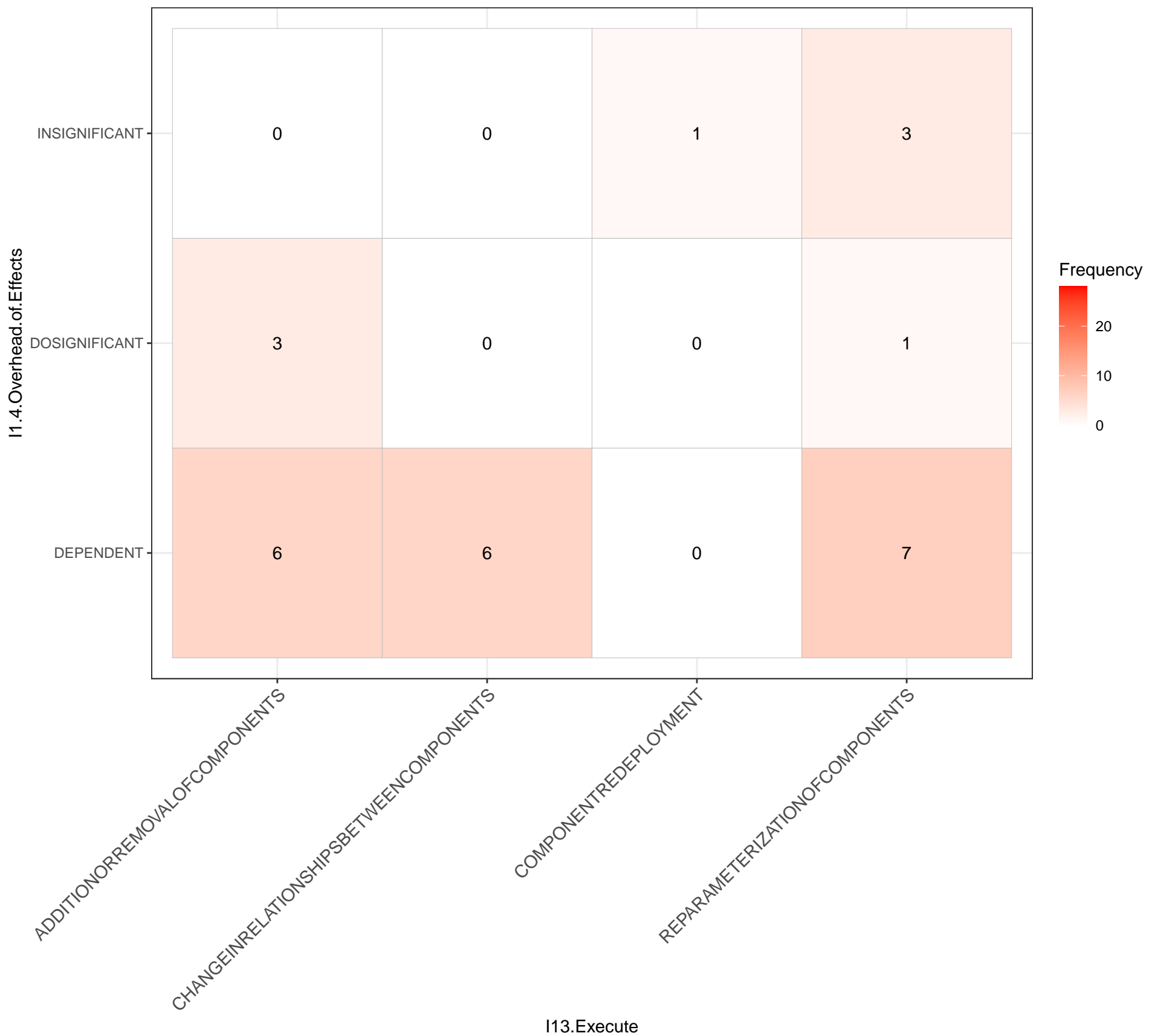
I1.4.Overhead.of.Effects_____I11.Analyze



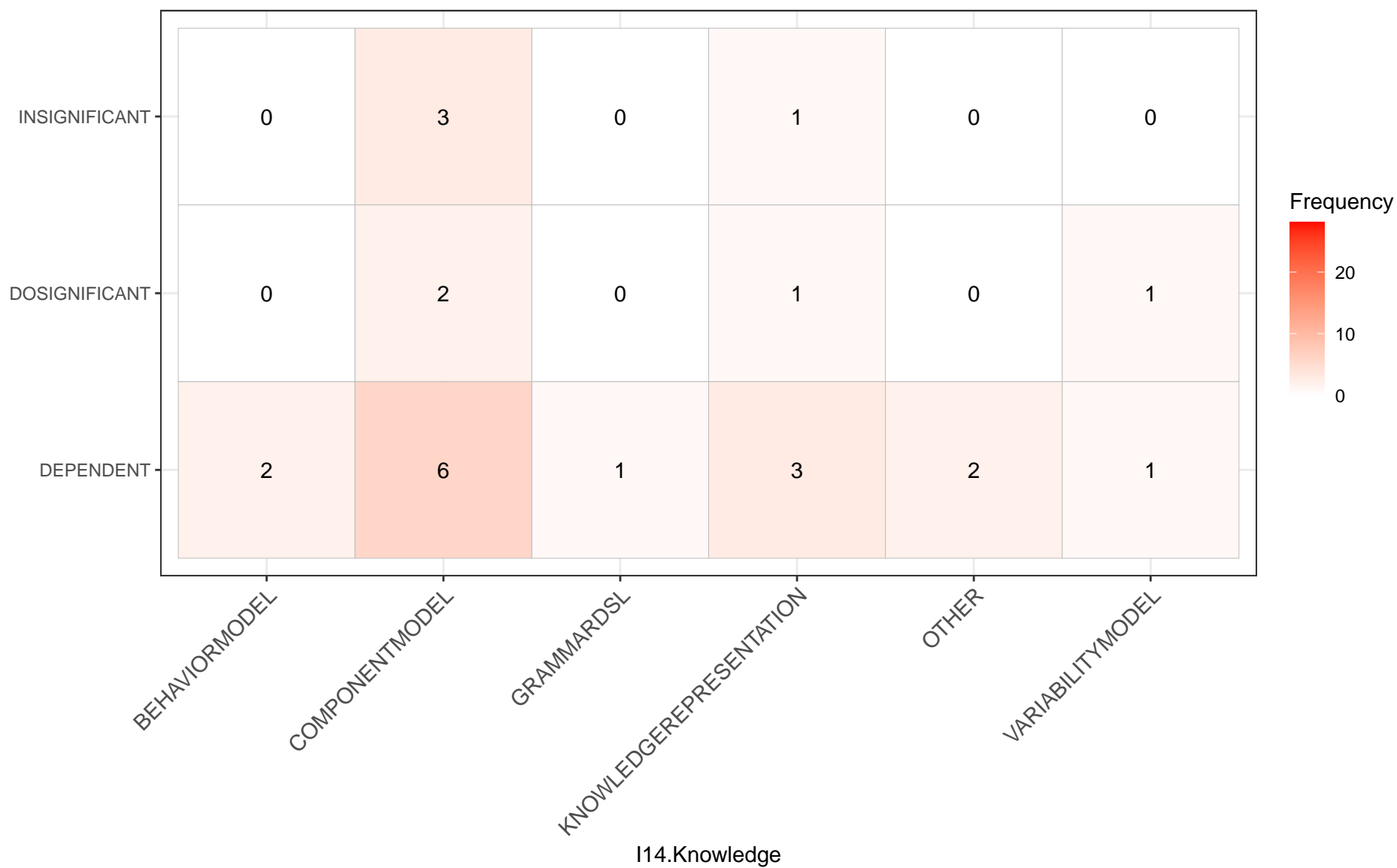
I1.4.Overhead.of.Effects_____I12.Plan



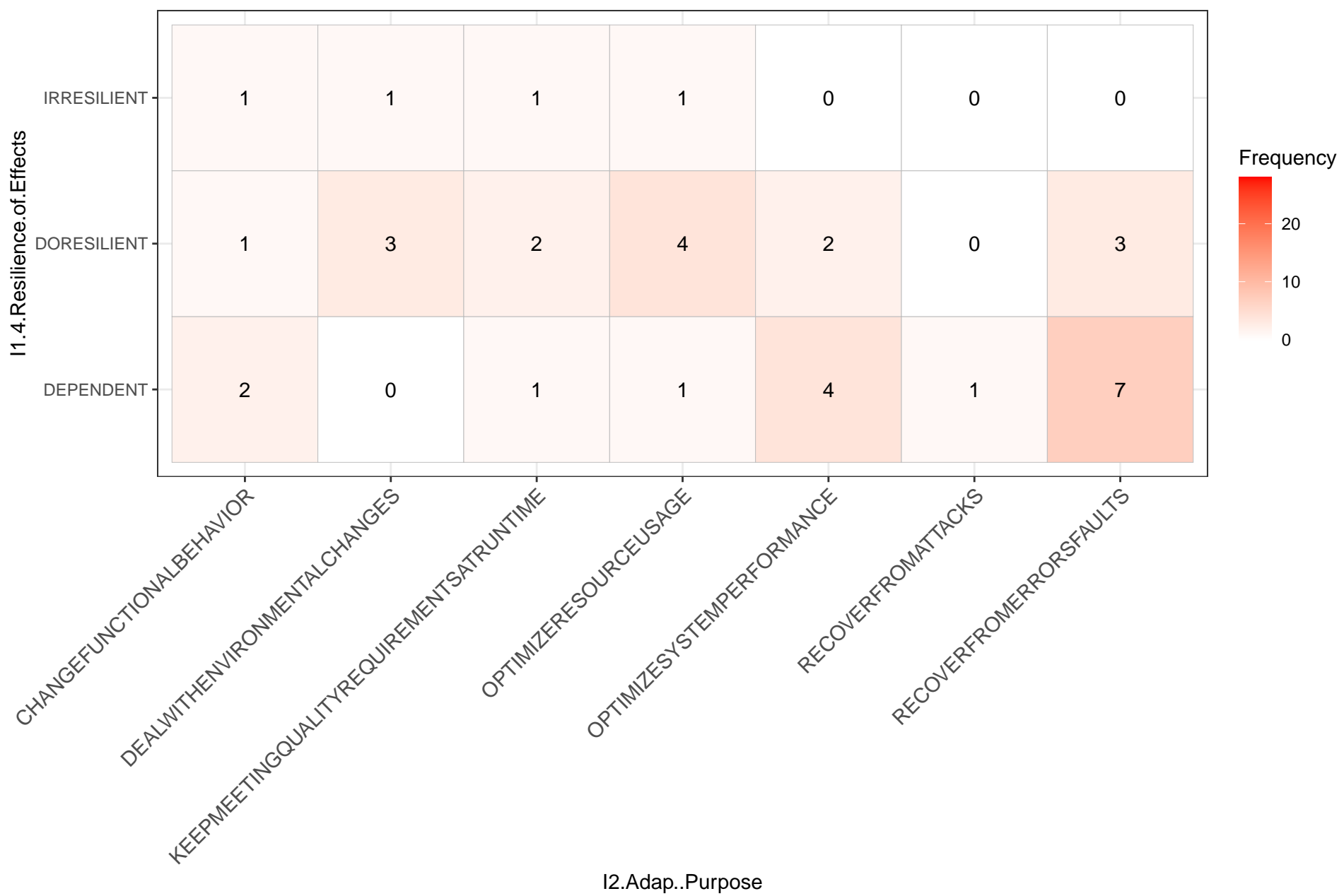
I1.4.Overhead.of.Effects_____I13.Execute



I1.4.Overhead.of.Effects_____I14.Knowledge

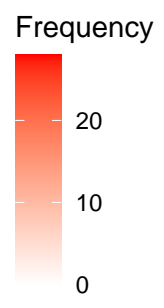
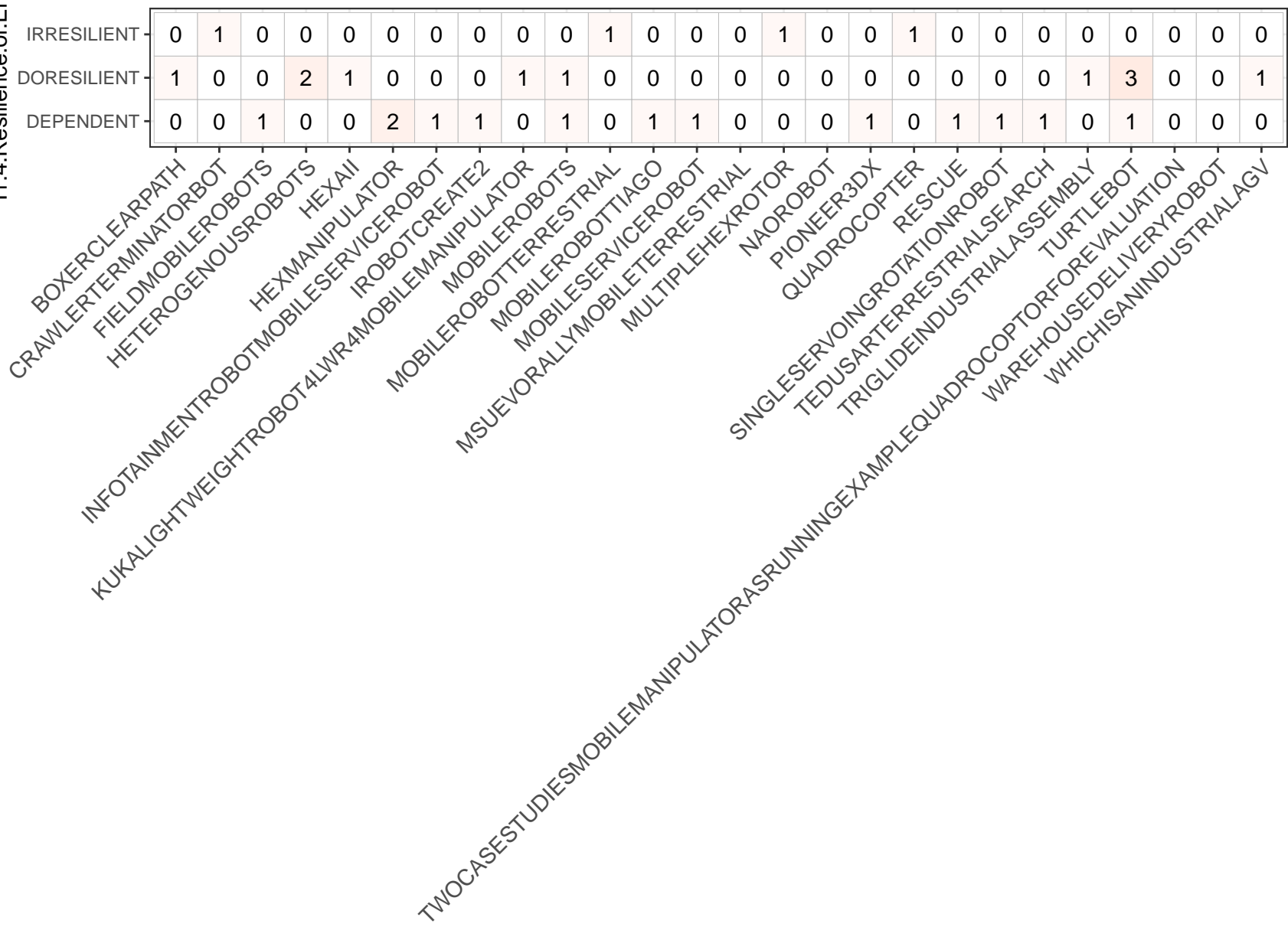


I1.4.Resilience.of.Effects_____I2.Adap..Purpose



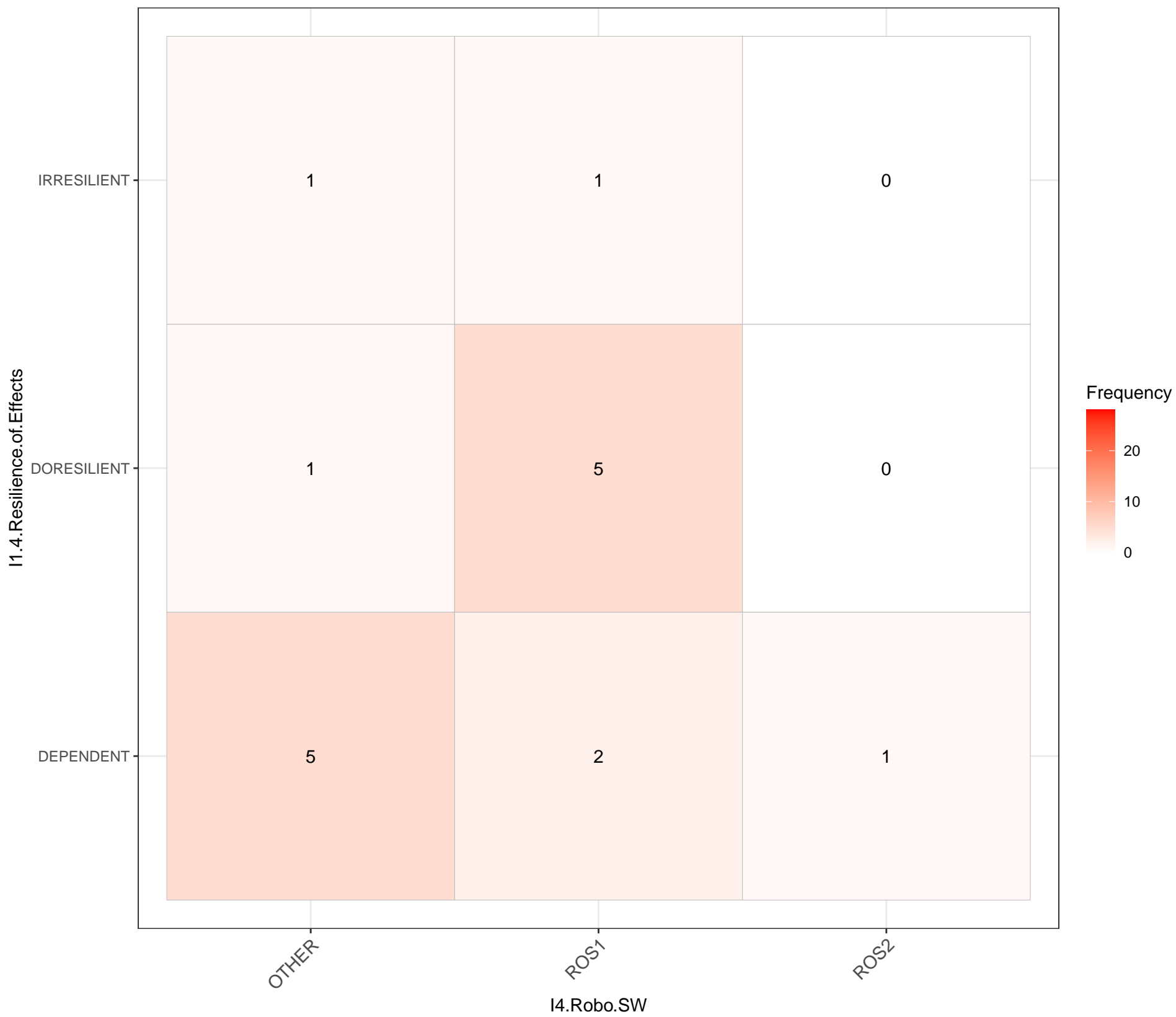
I1.4.Resilience.of.Effects

I1.4.Resilience.of.EffectsI3.Robot.Type

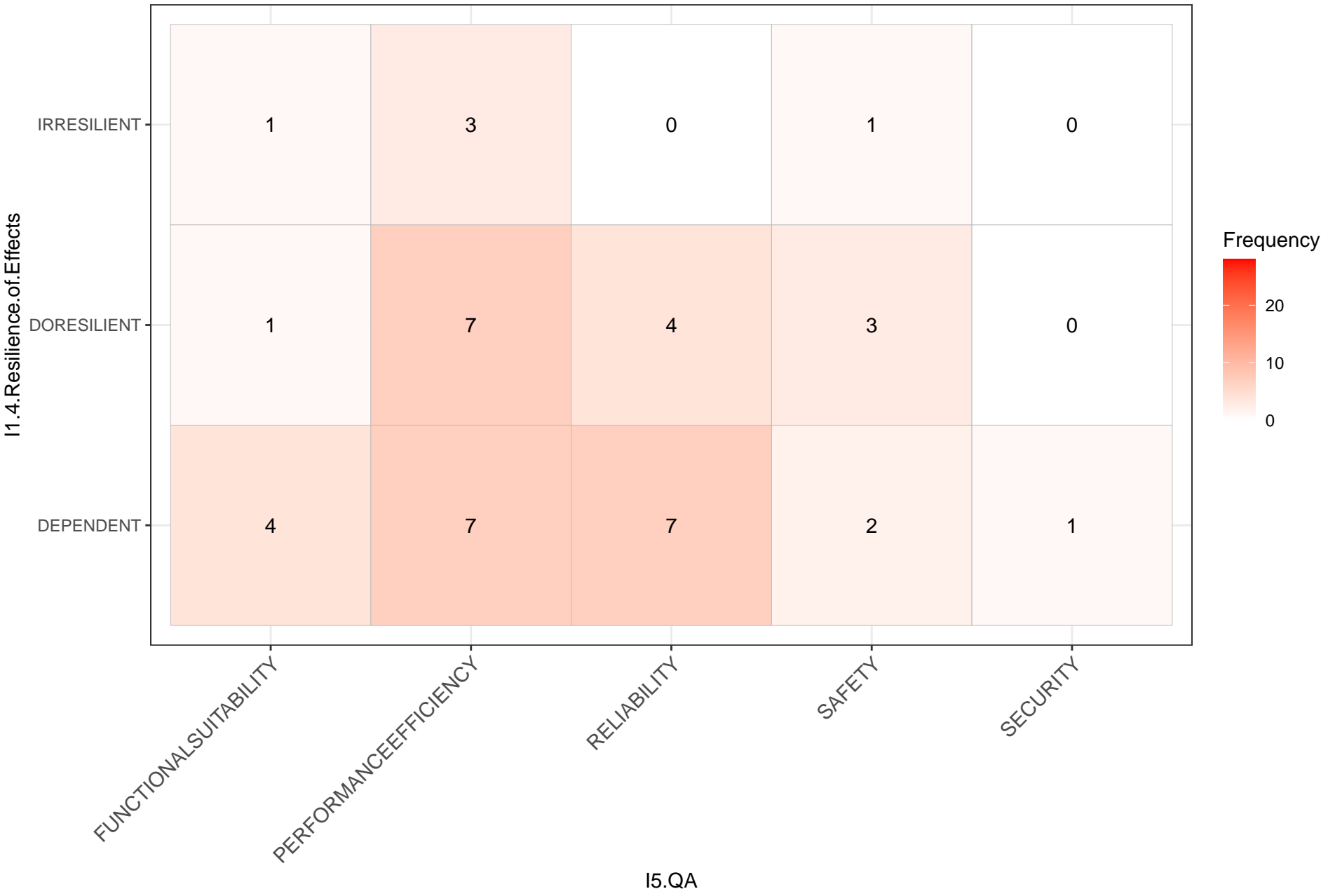


I3.Robot.Type

I1.4.Resilience.of.Effects_____I4.Robo.SW

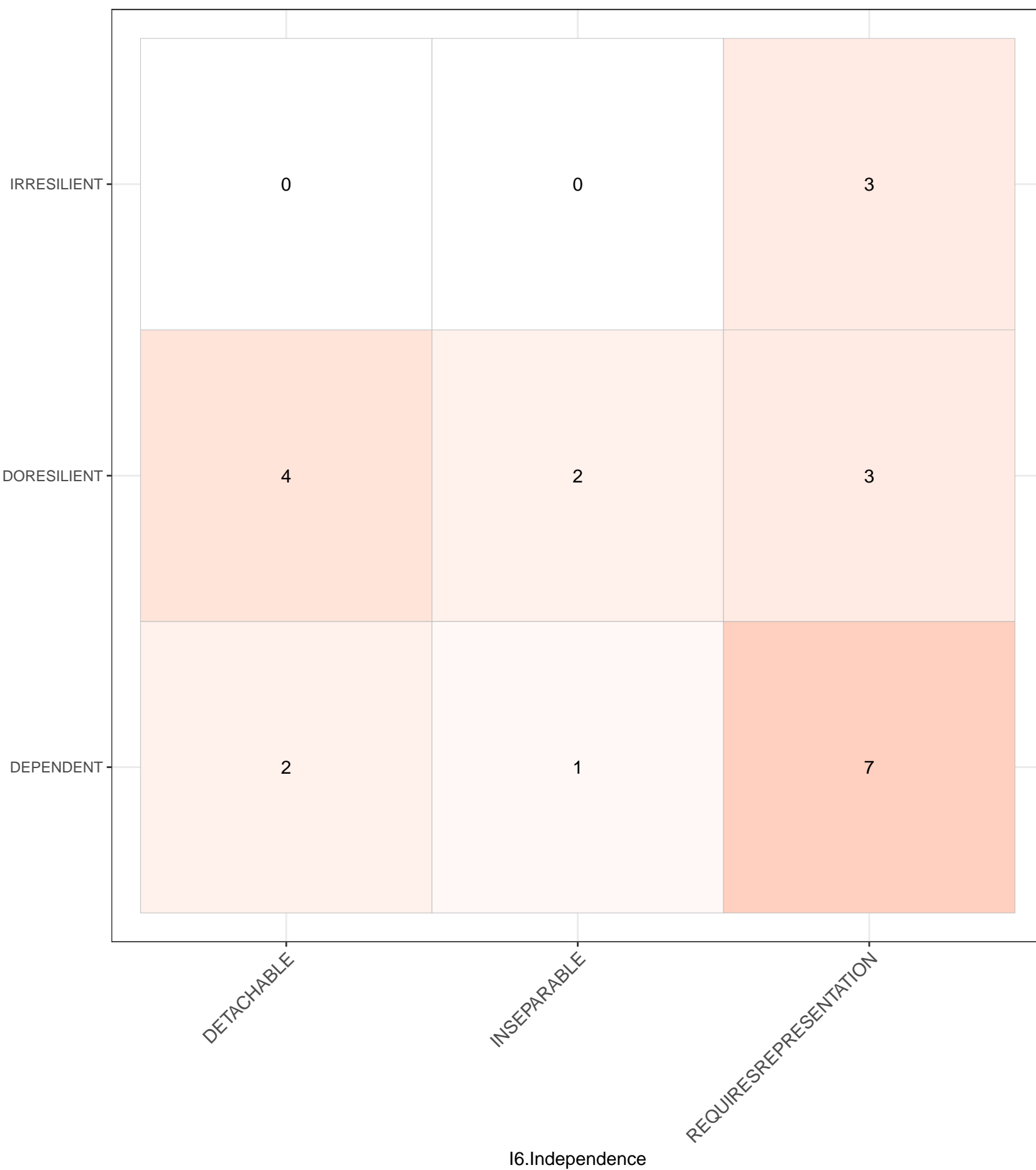


I1.4.Resilience.of.Effects_____I5.QA

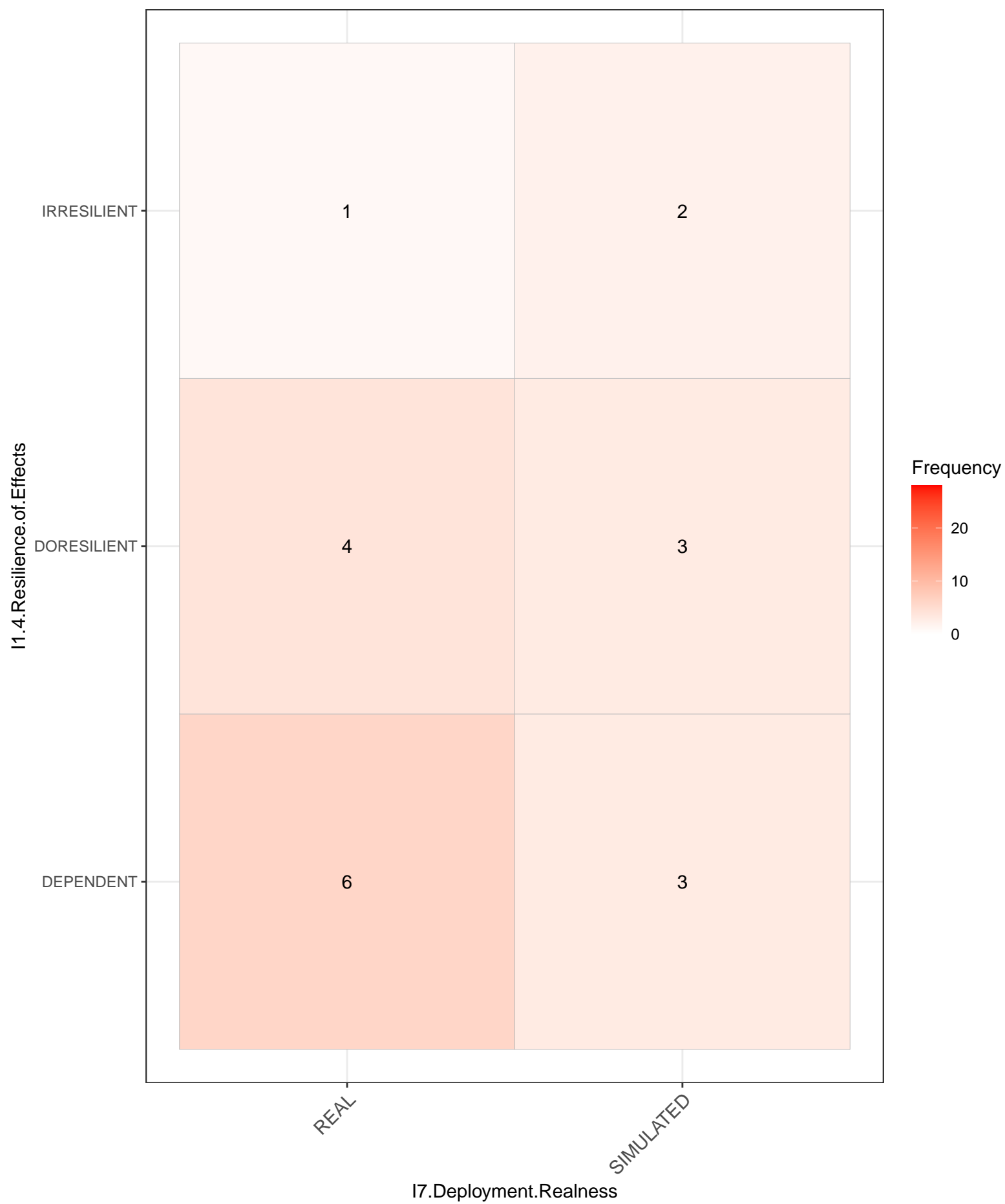


I1.4.Resilience.of.Effects_____I6.Independence

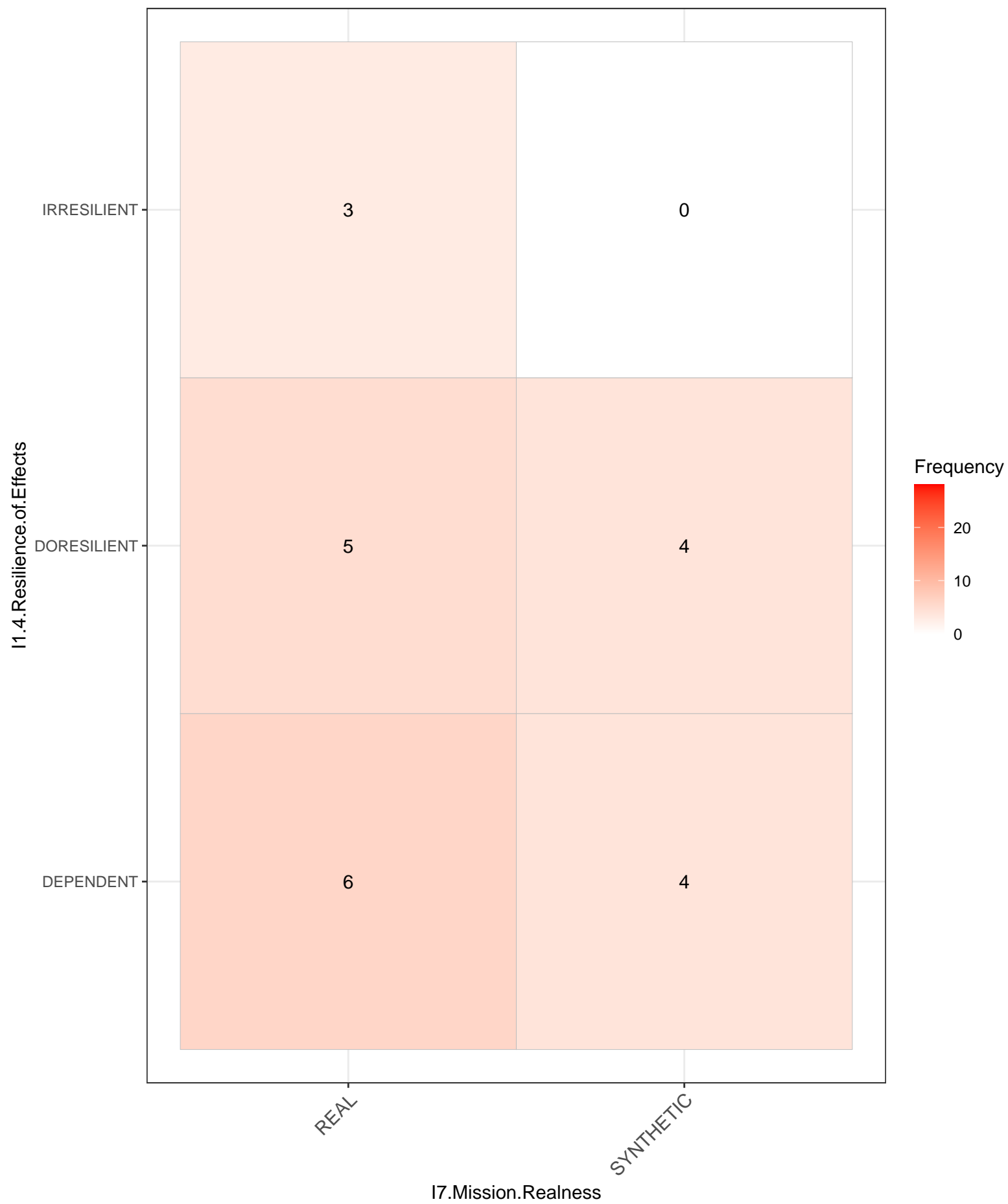
I1.4.Resilience.of.Effects



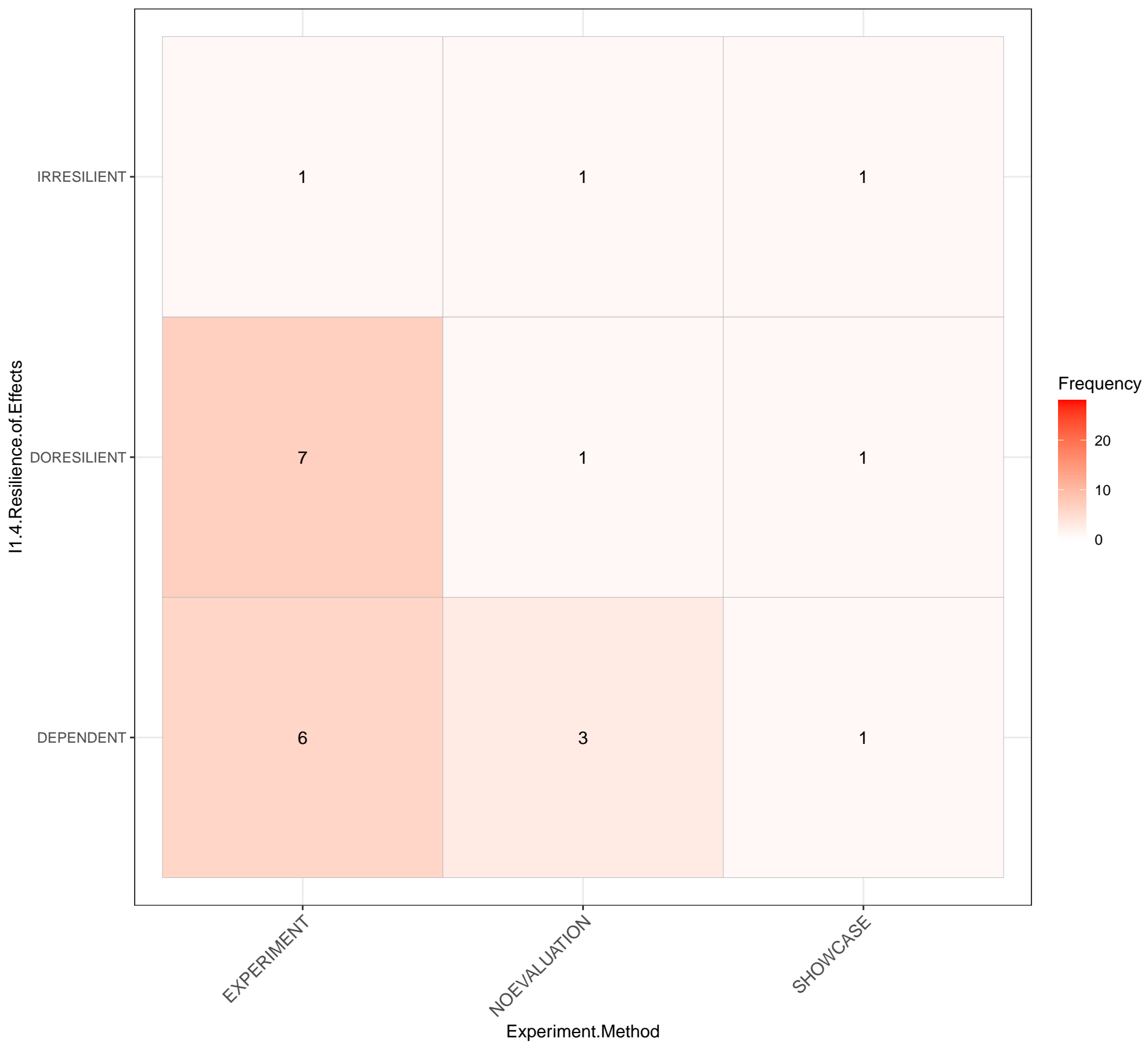
I1.4.Resilience.of.Effects_____I7.Deployment.Realness



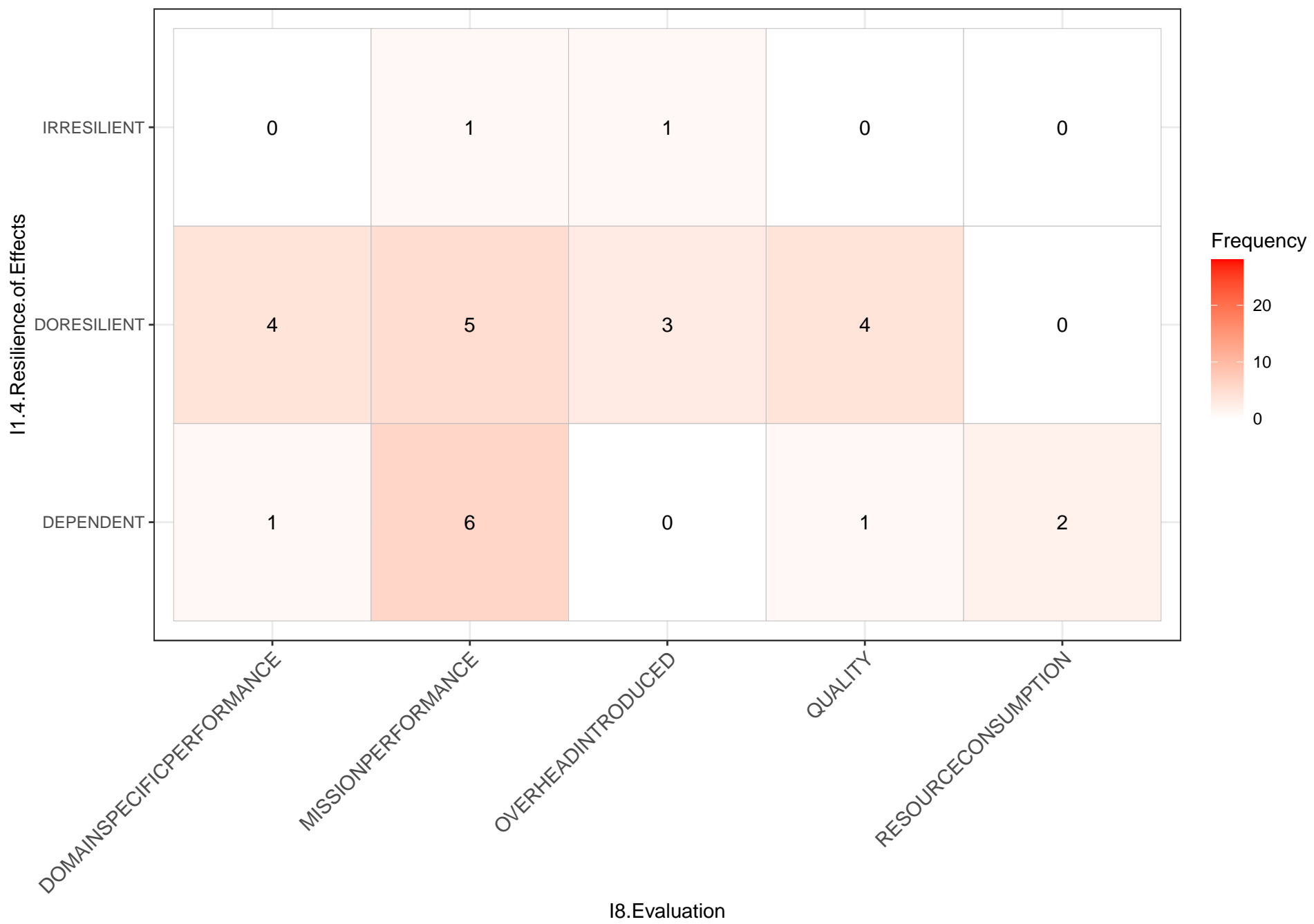
I1.4.Resilience.of.Effects_____I7.Mission.Realness



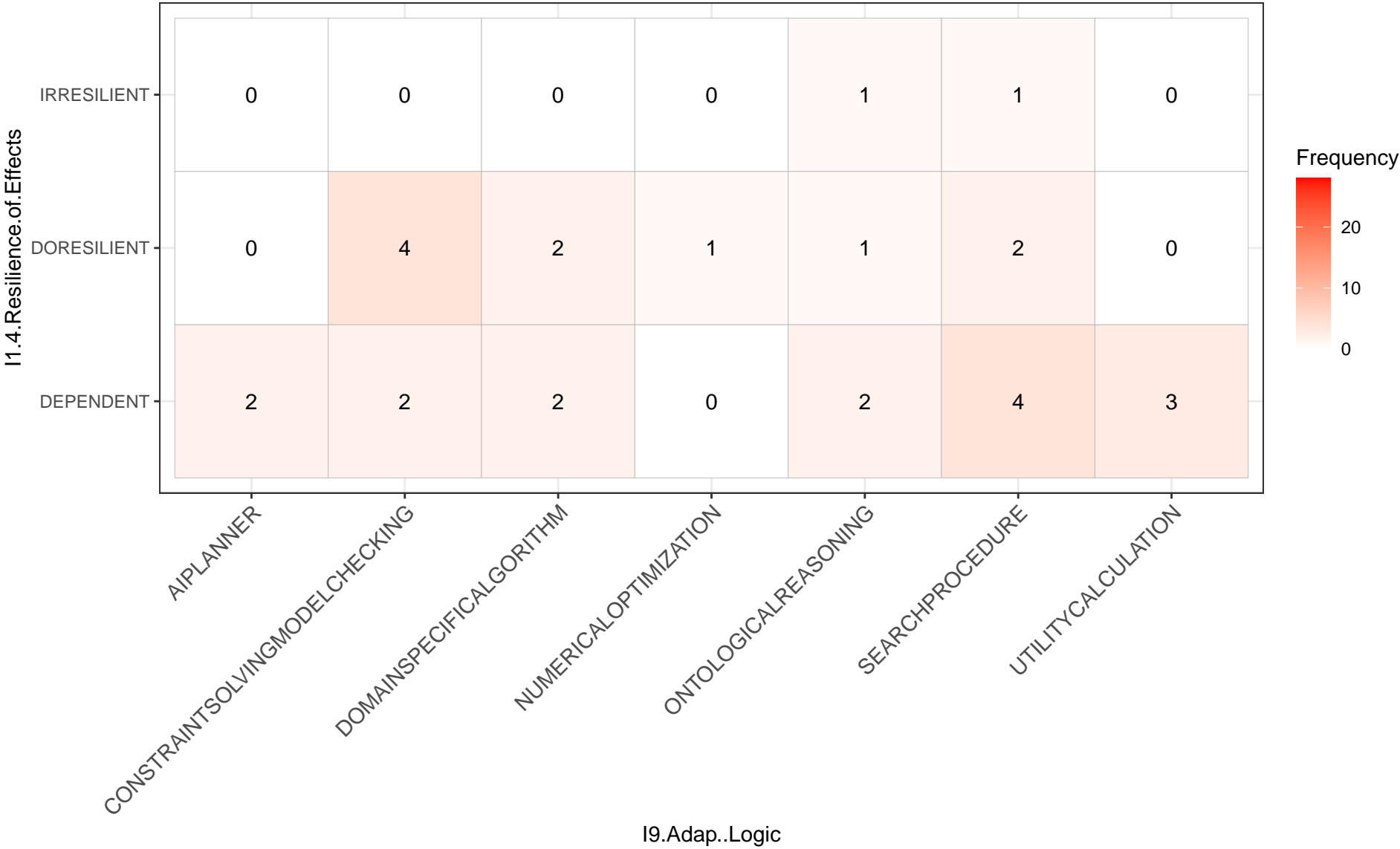
I1.4.Resilience.of.Effects_____Experiment.Method



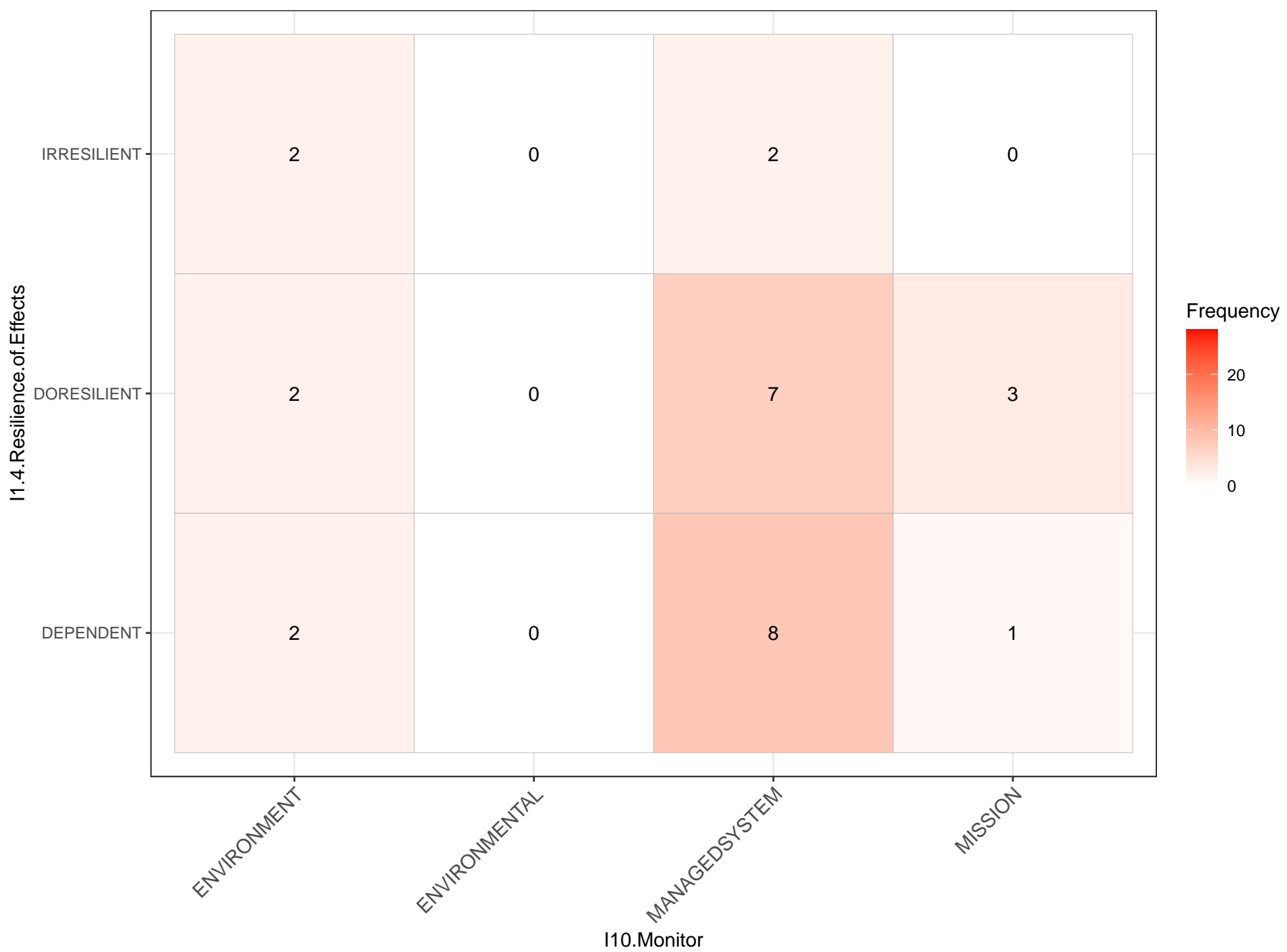
I1.4.Resilience.of.Effects_____I8.Evaluation



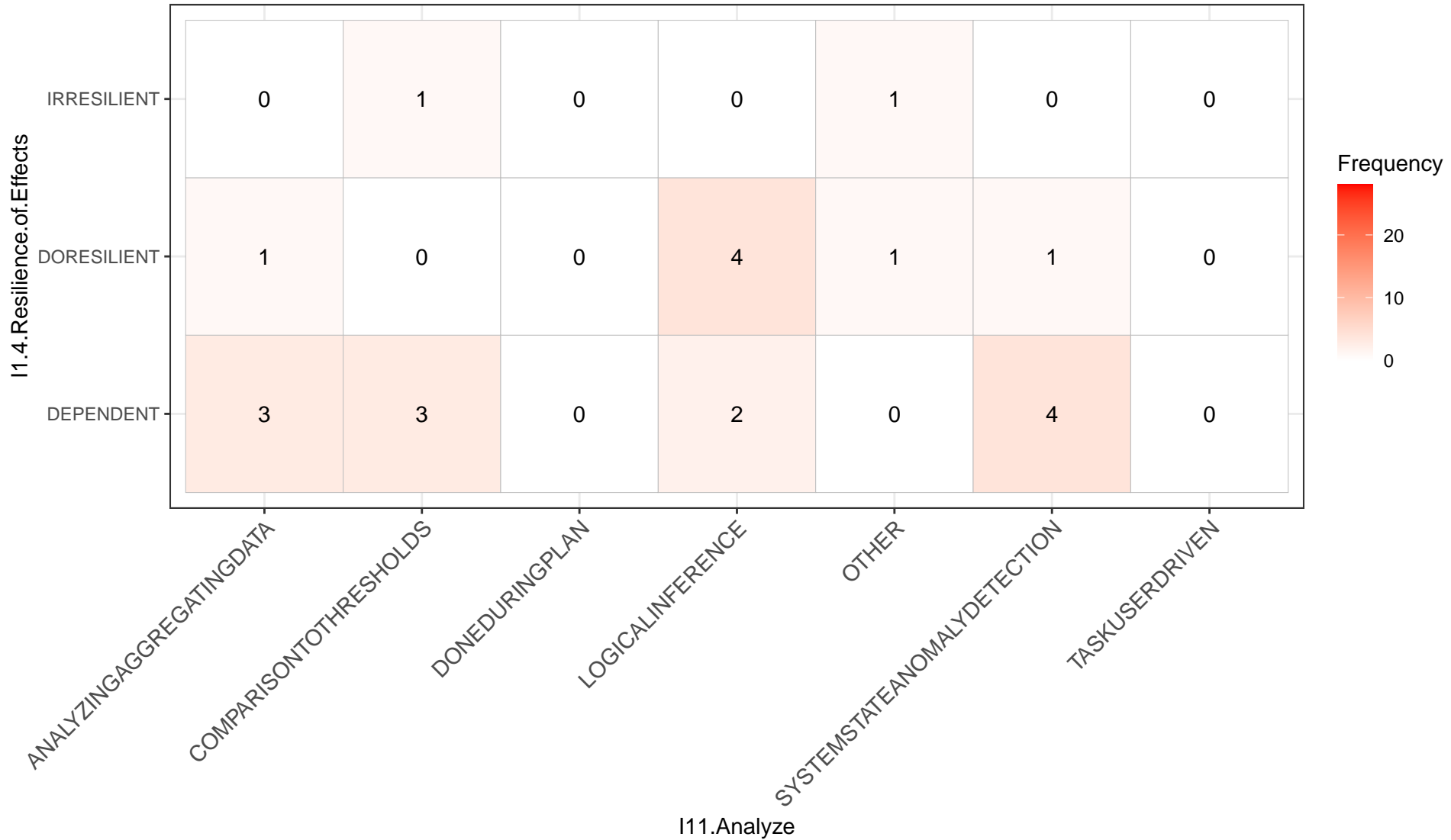
I1.4.Resilience.of.Effects_____I9.Adap..Logic

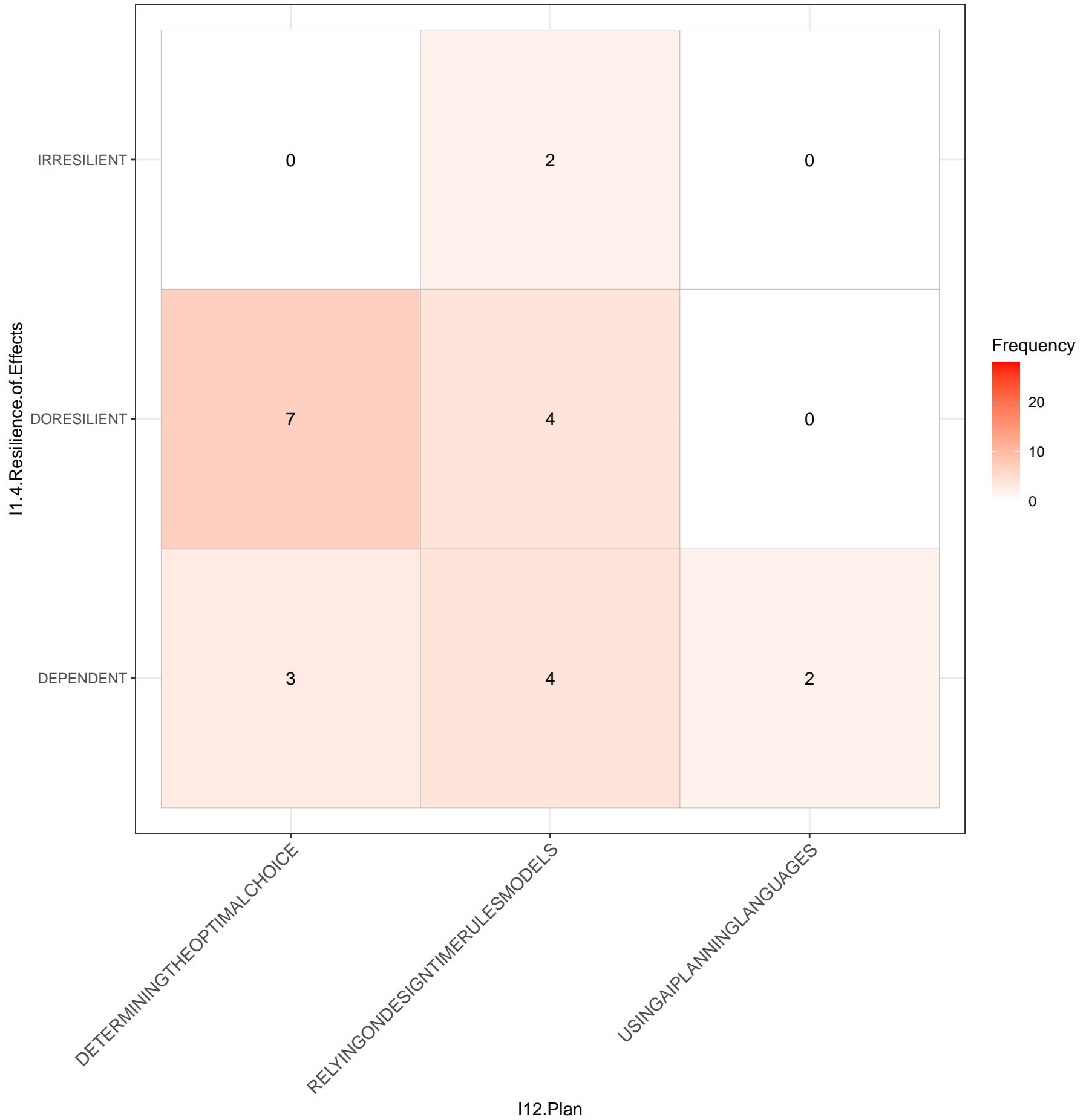


I1.4.Resilience.of.Effects_____I10.Monitor

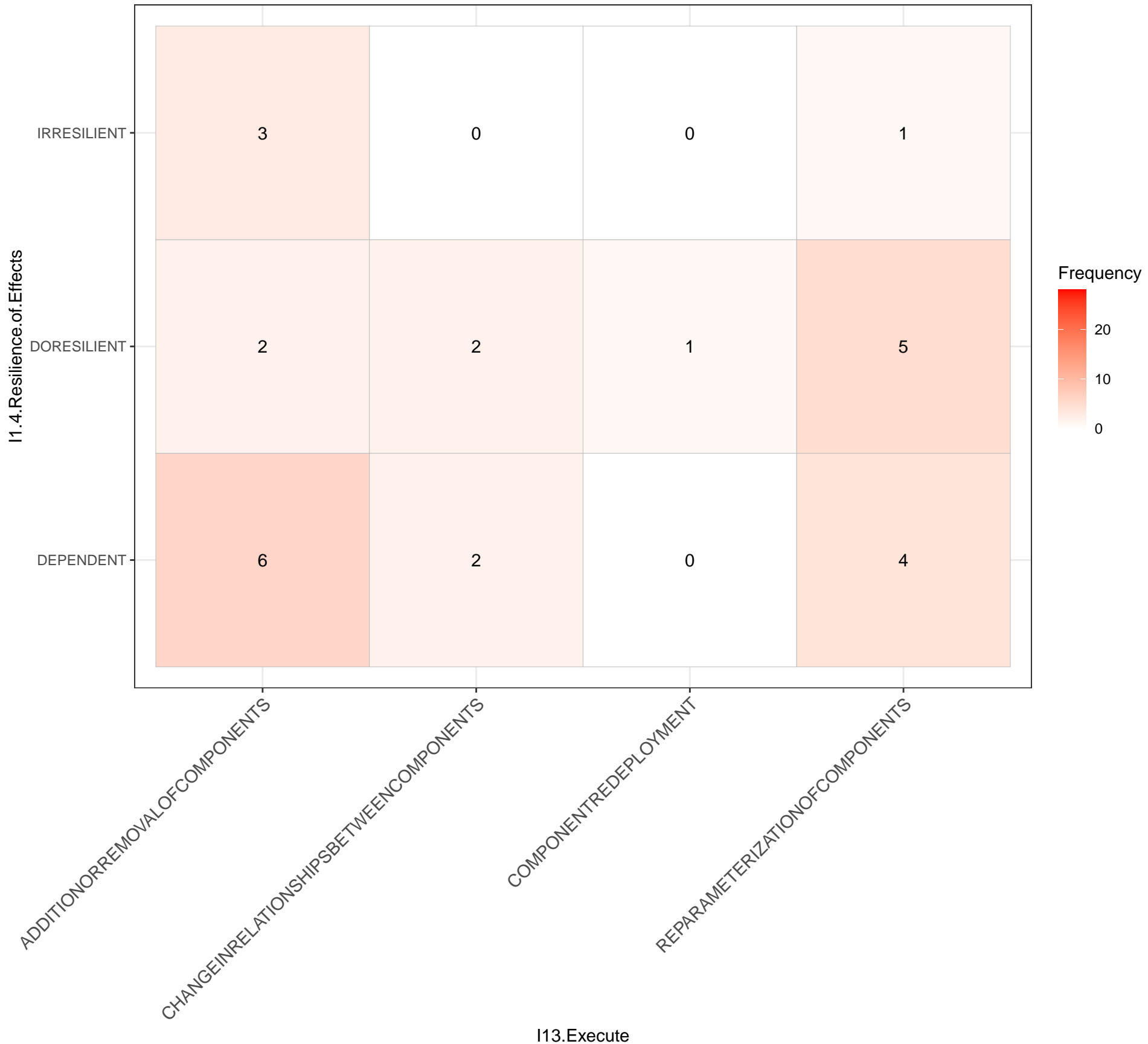


I1.4.Resilience.of.Effects_____I11.Analyze

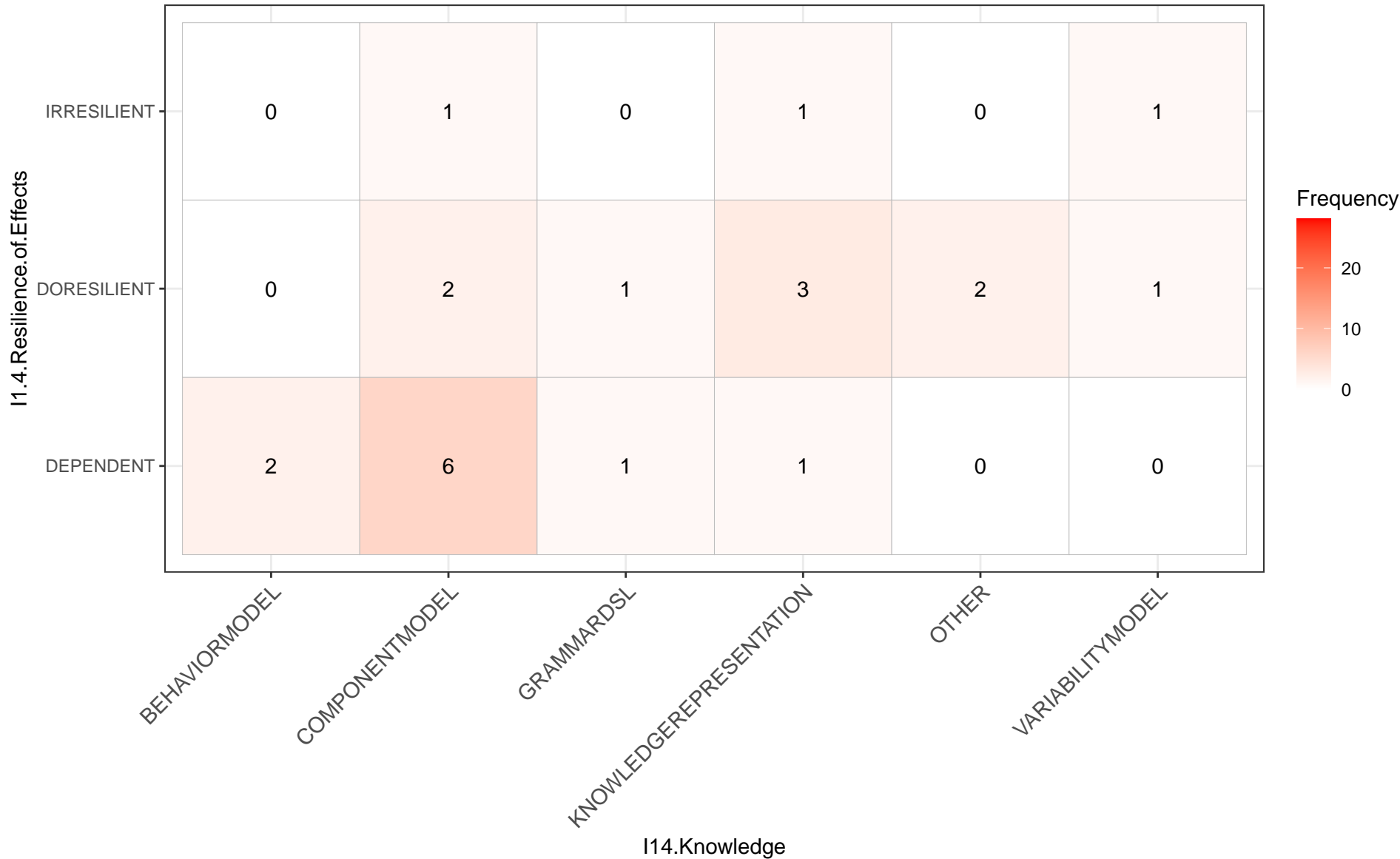


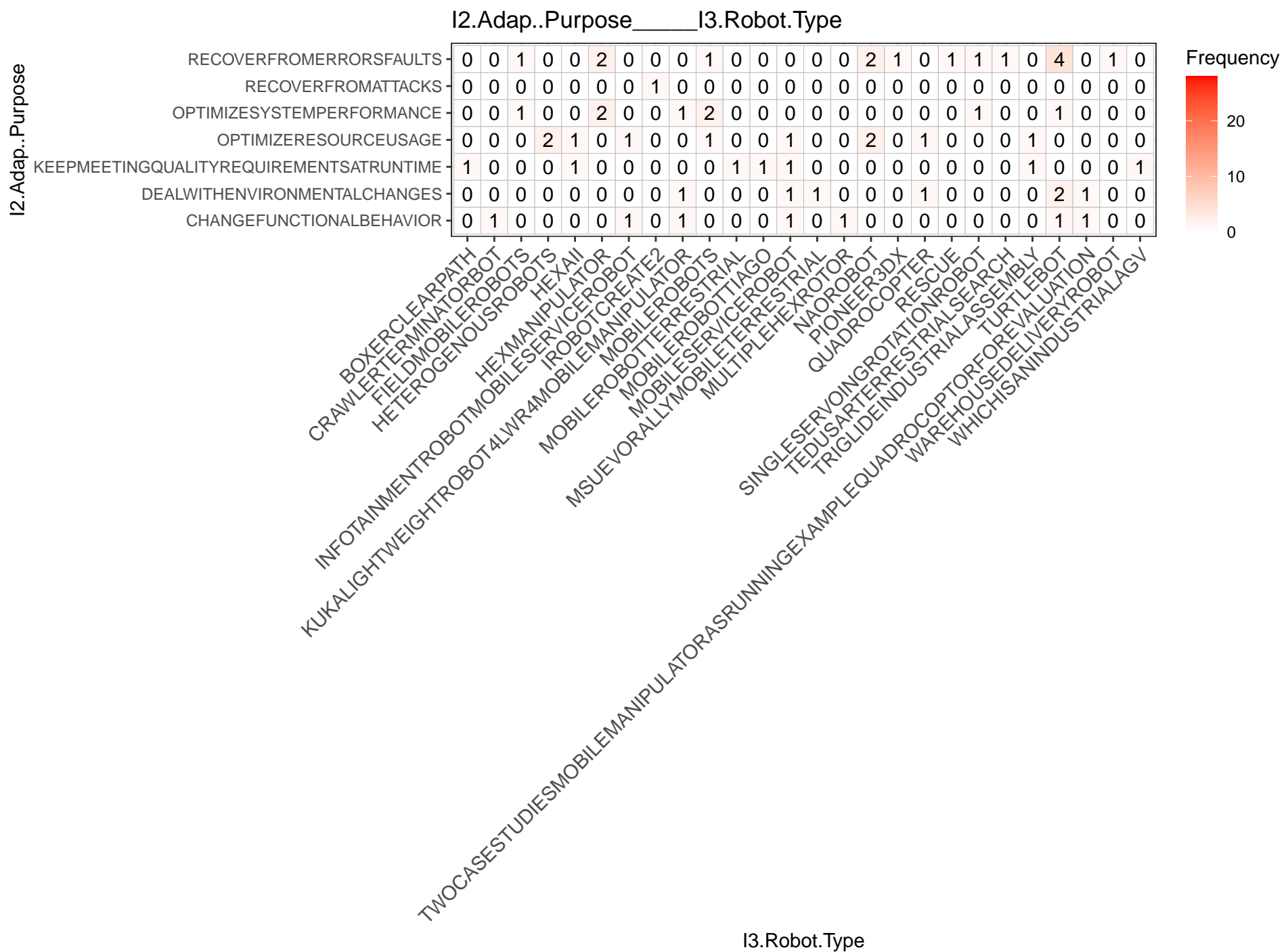


I1.4.Resilience.of.Effects_____I13.Execute



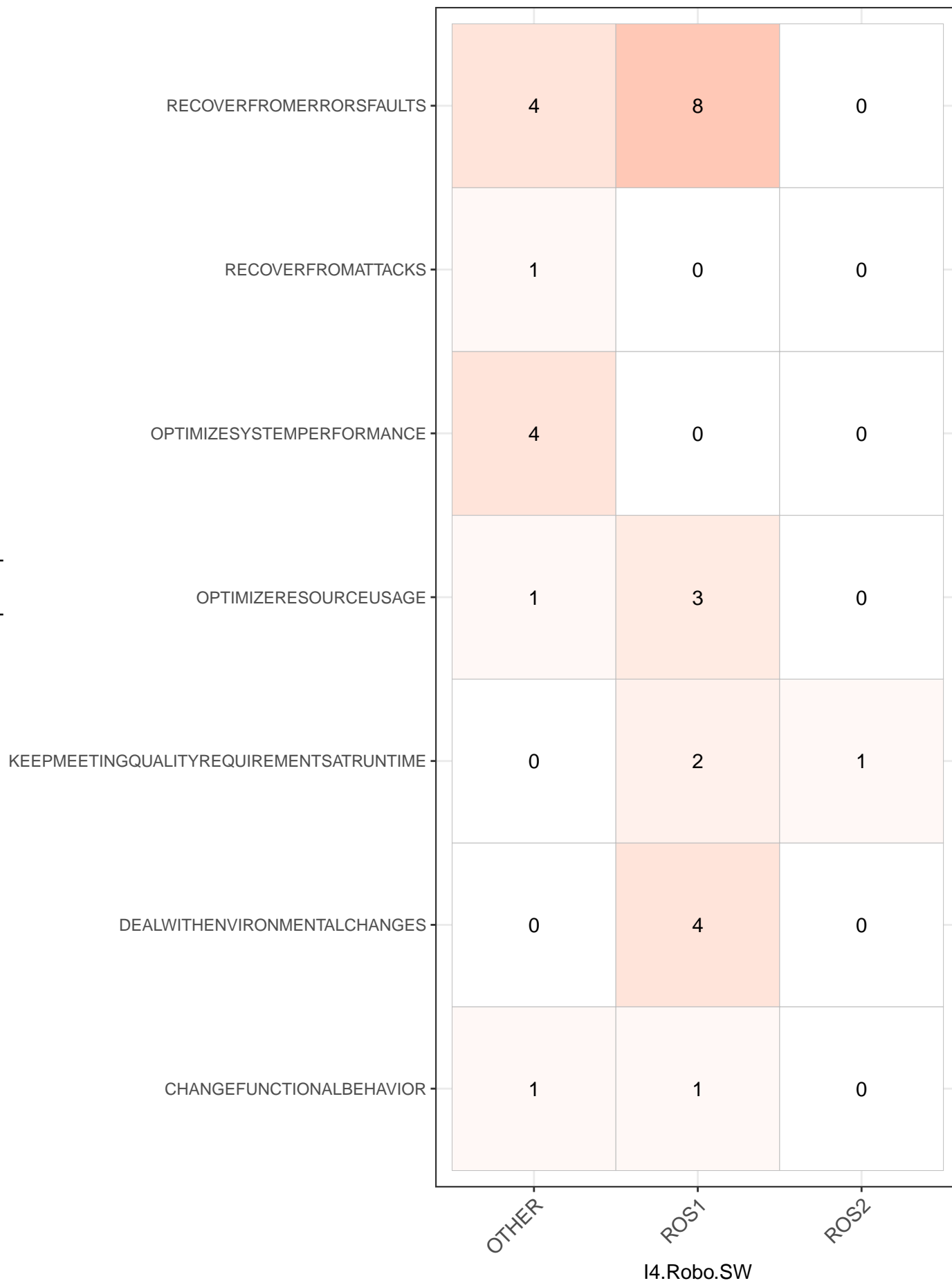
I1.4.Resilience.of.Effects_____I14.Knowledge





I2.Adap..Purpose_____I4.Robo.SW

I2.Adap..Purpose



Frequency

20

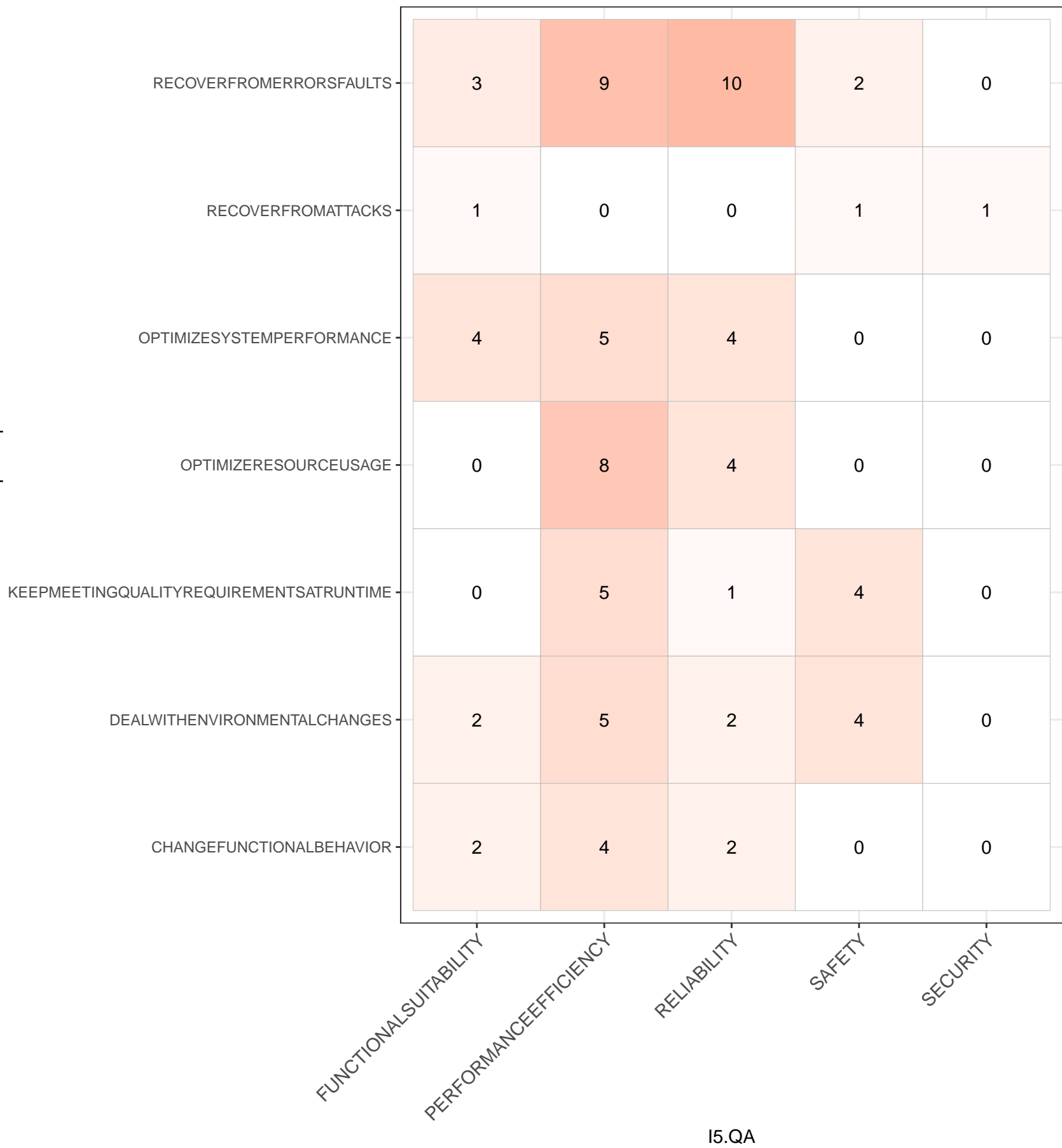
10

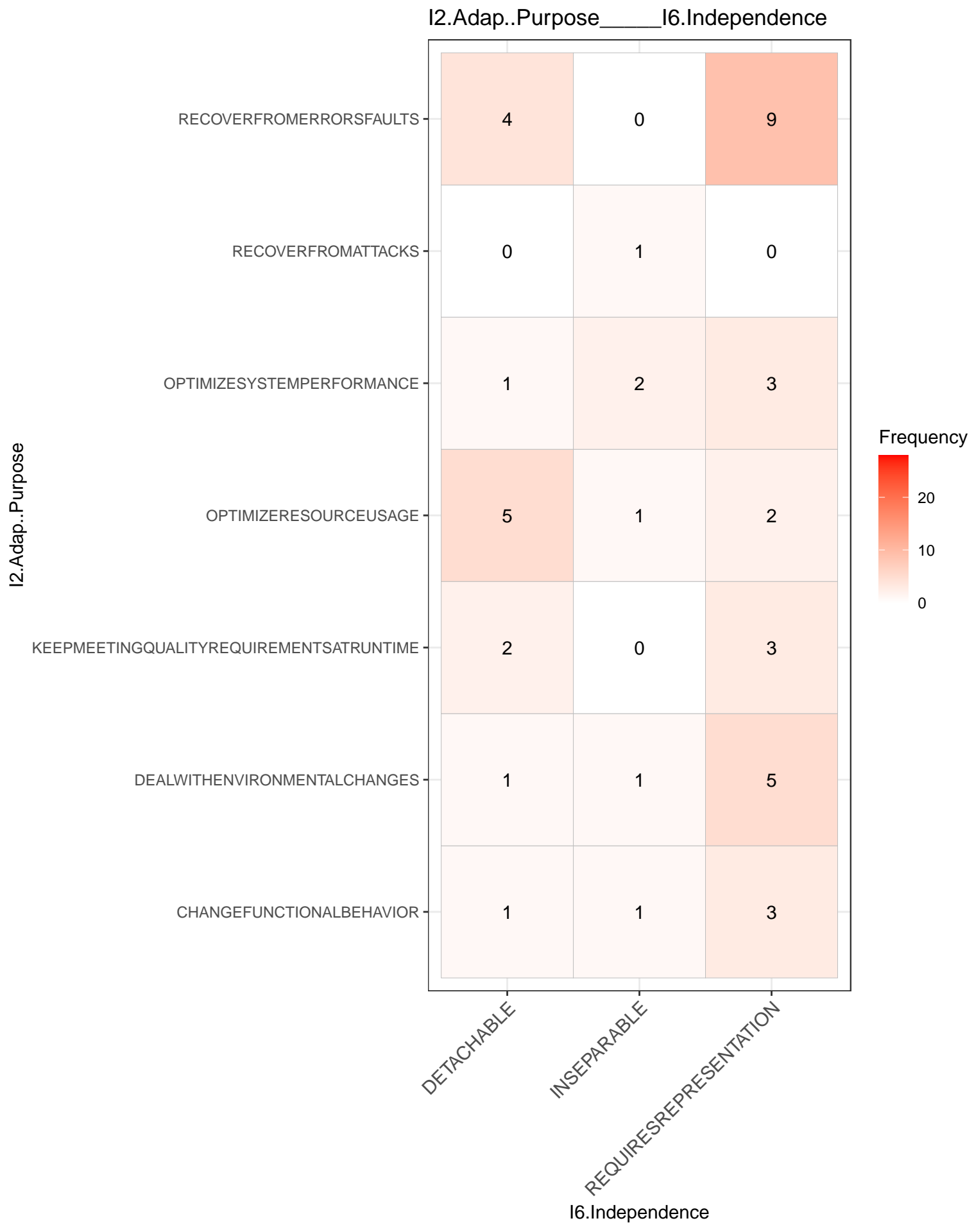
0

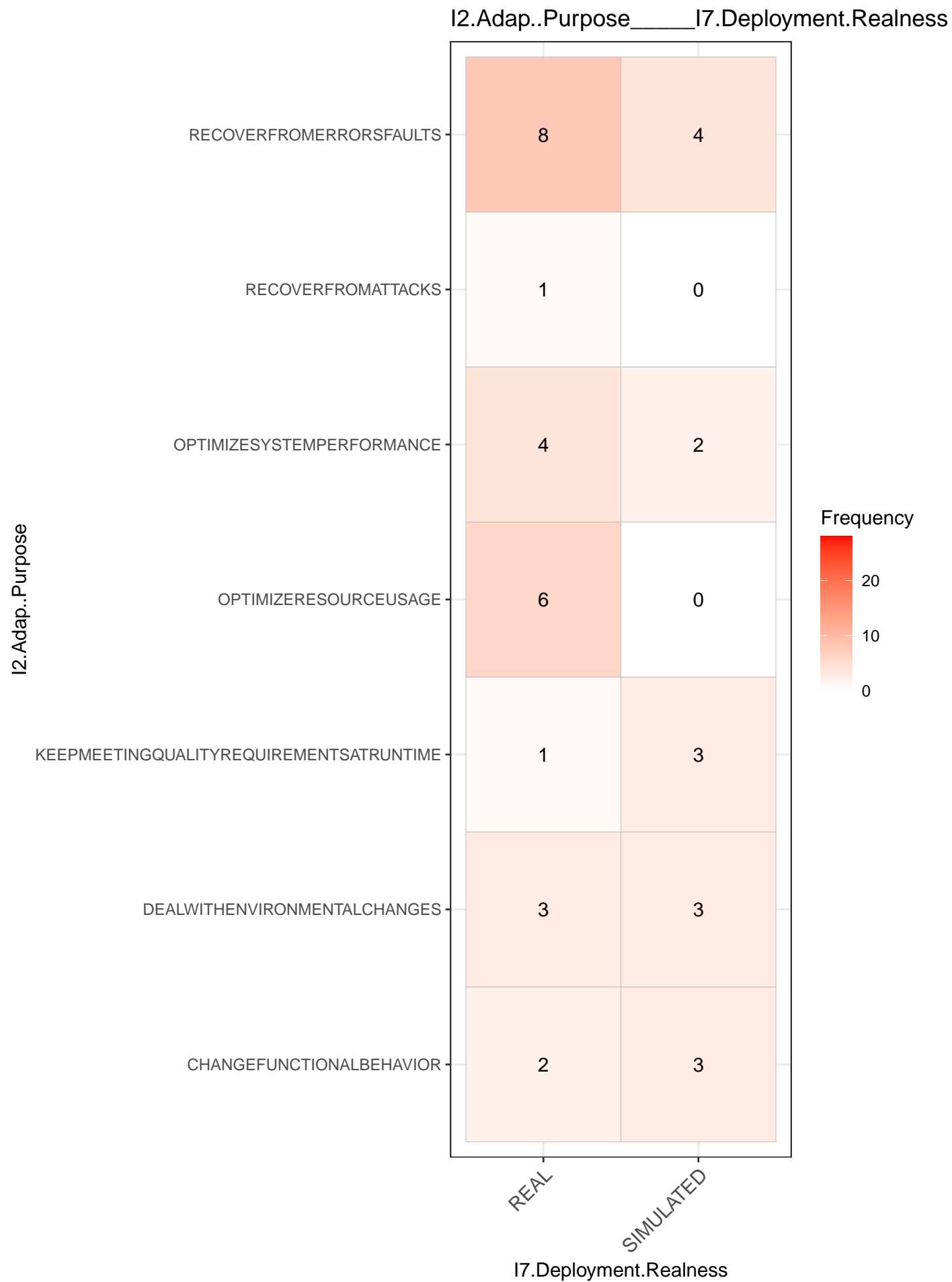
I4.Robo.SW

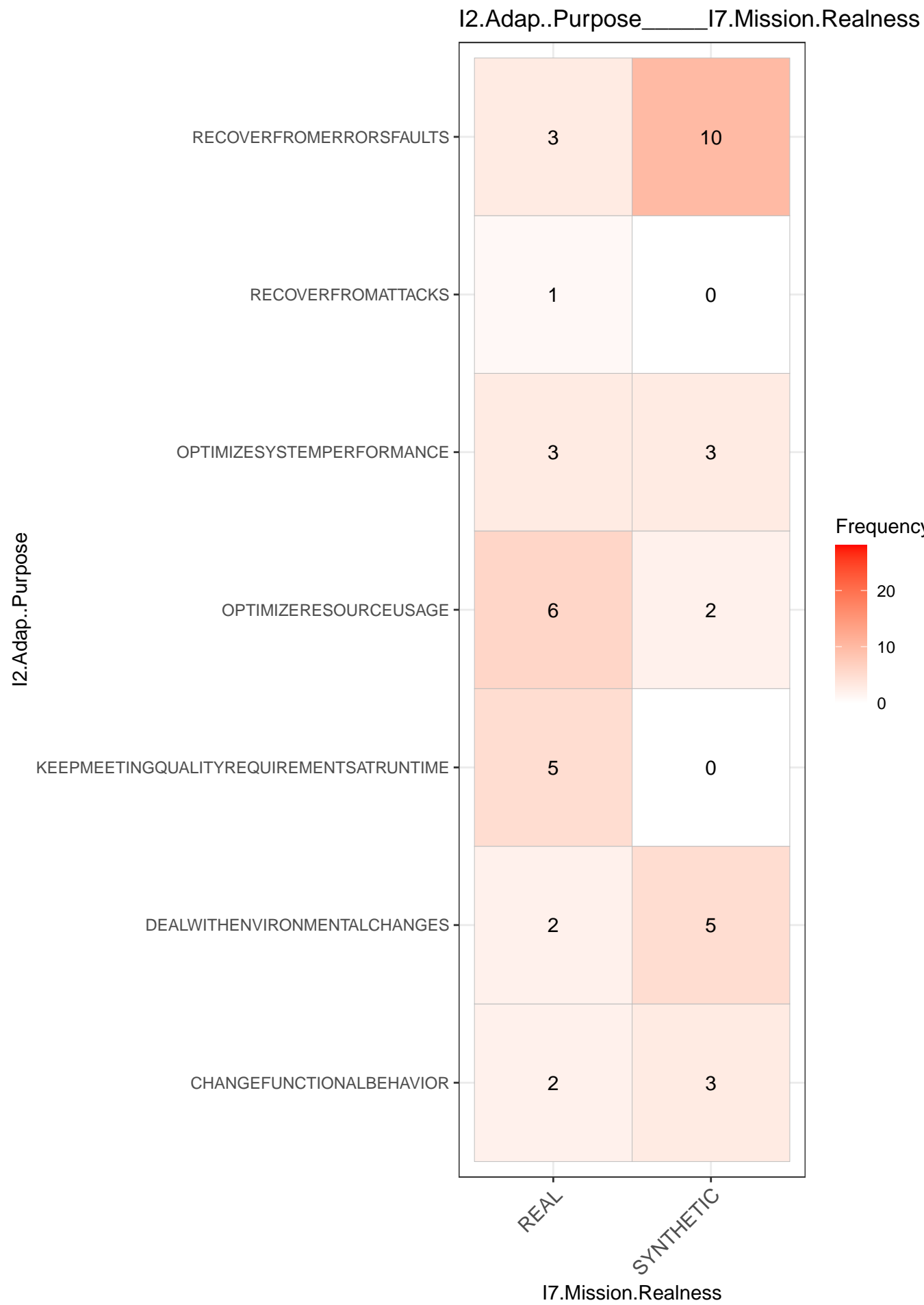
I2.Adap..Purpose_____I5.QA

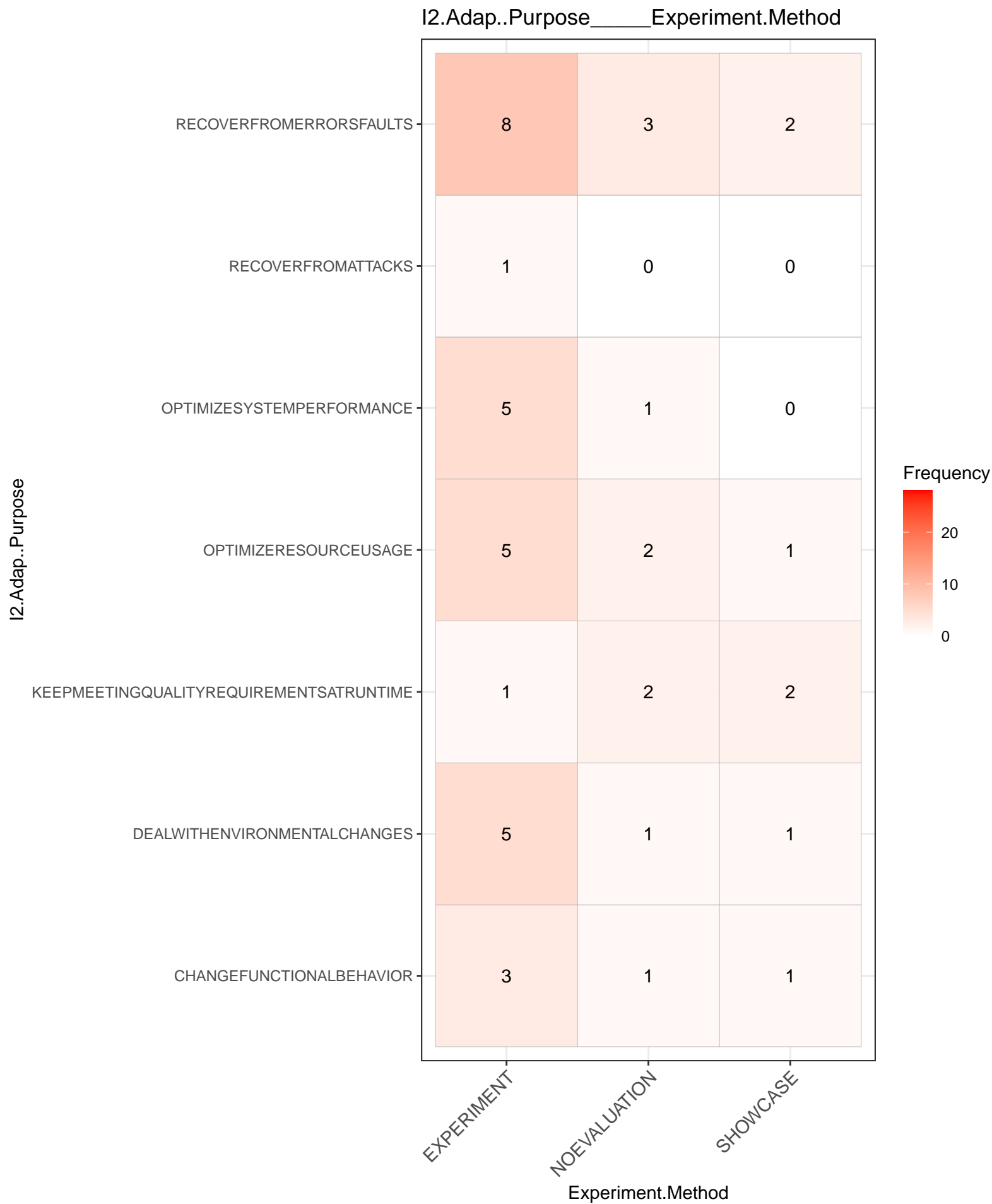
I2.Adap..Purpose





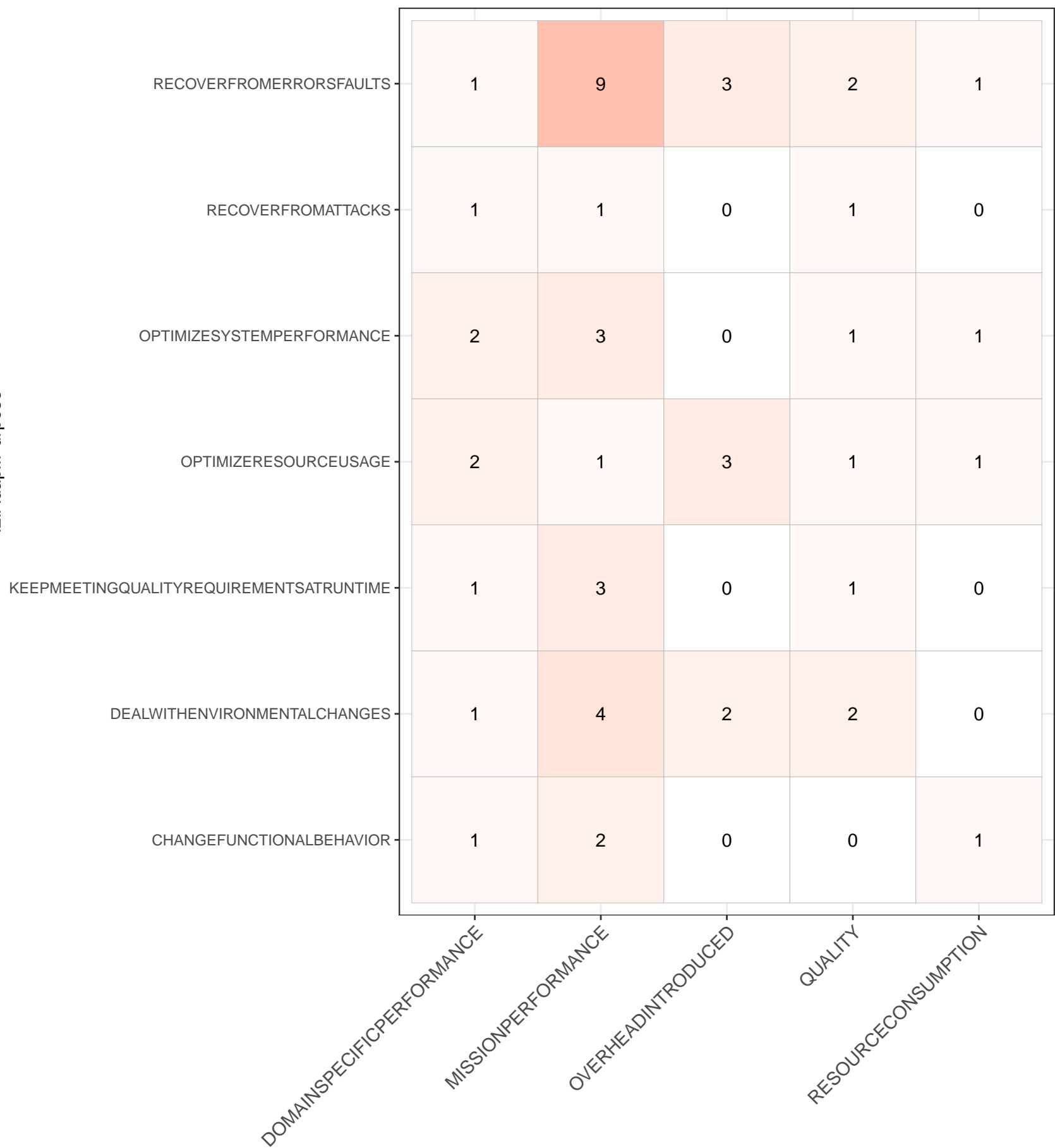






I2.Adap..Purpose_____I8.Evaluation

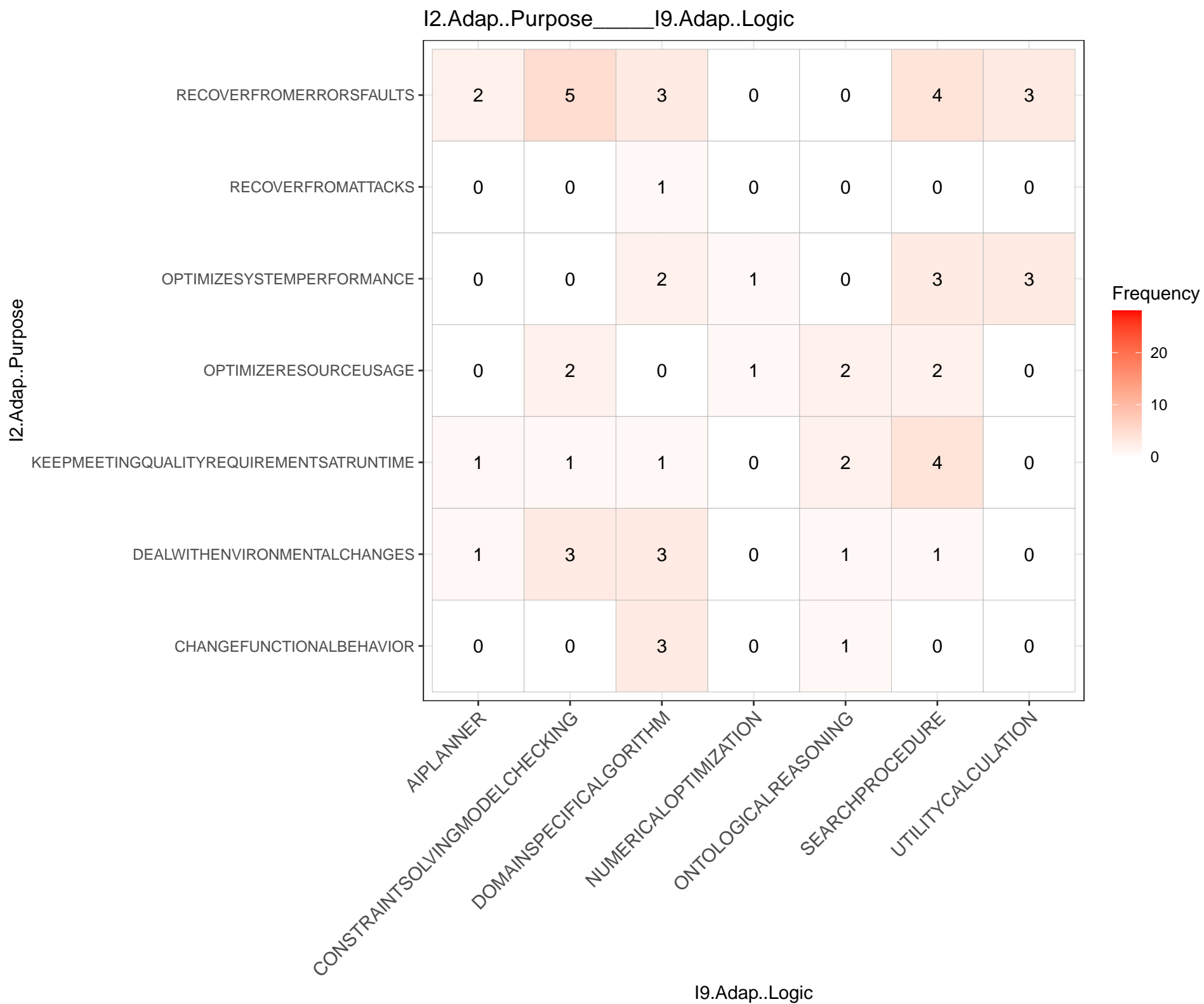
I2.Adap..Purpose



Frequency

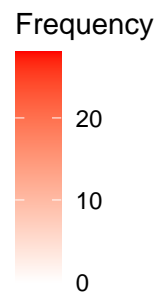
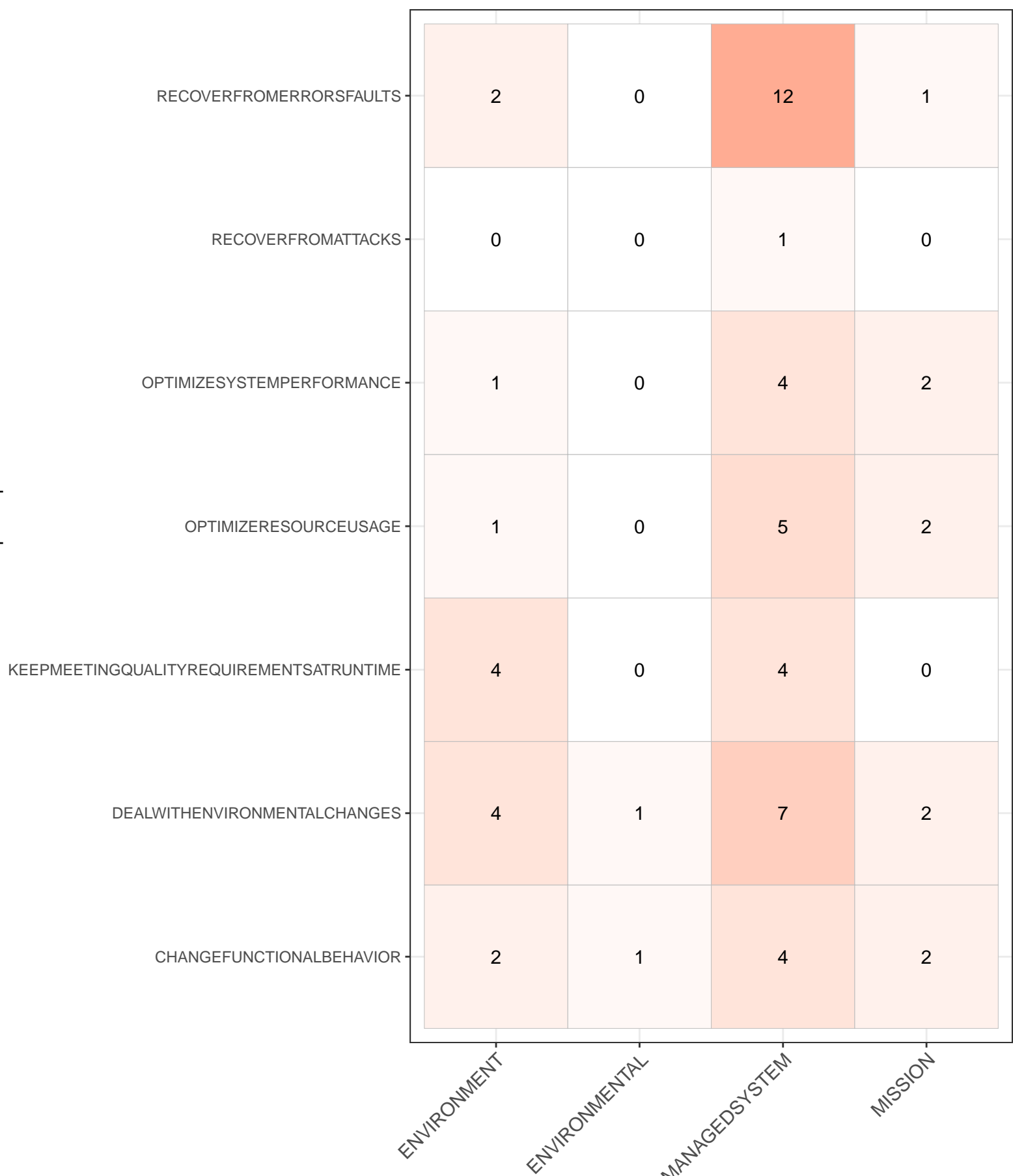
20
10
0

I8.Evaluation

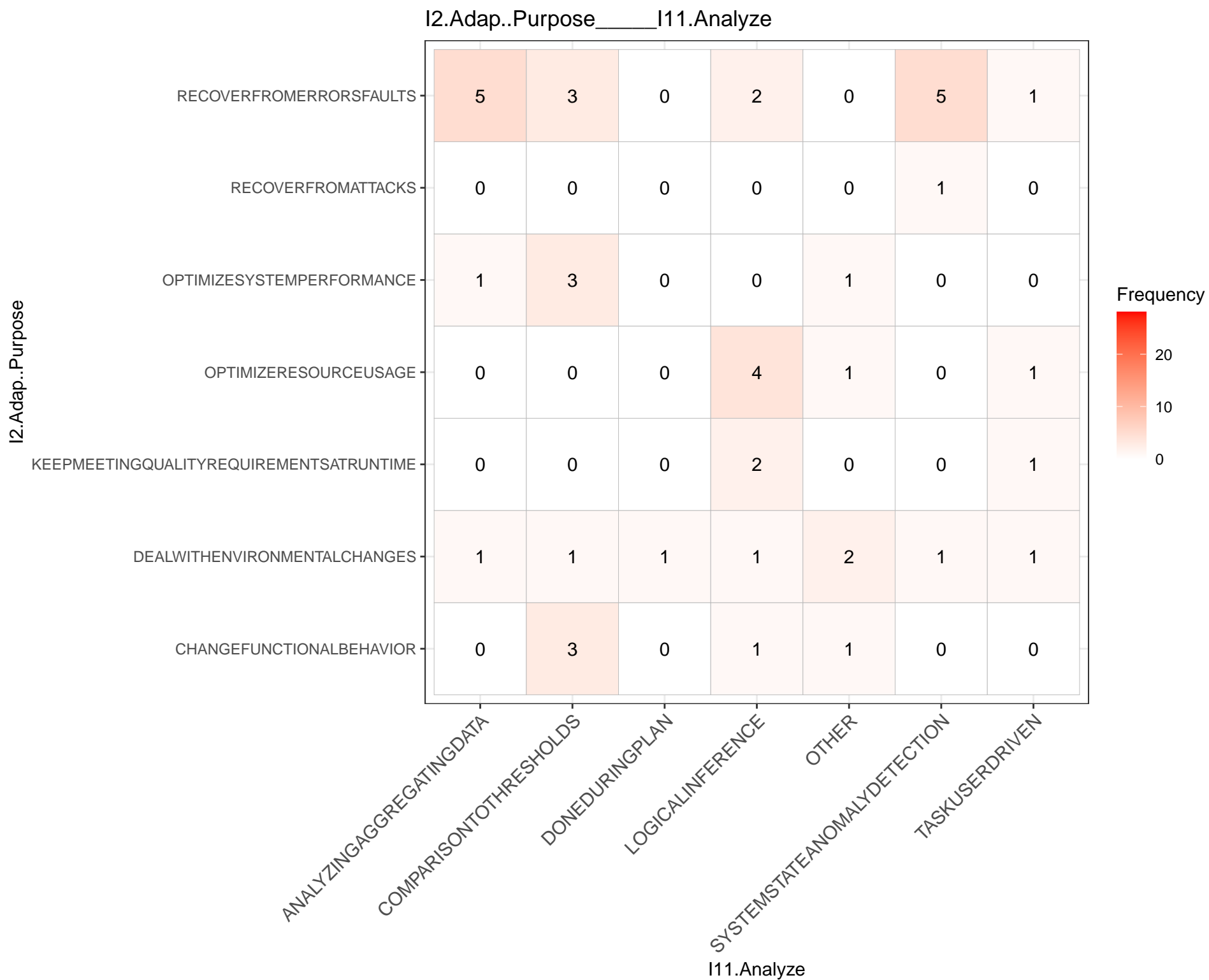


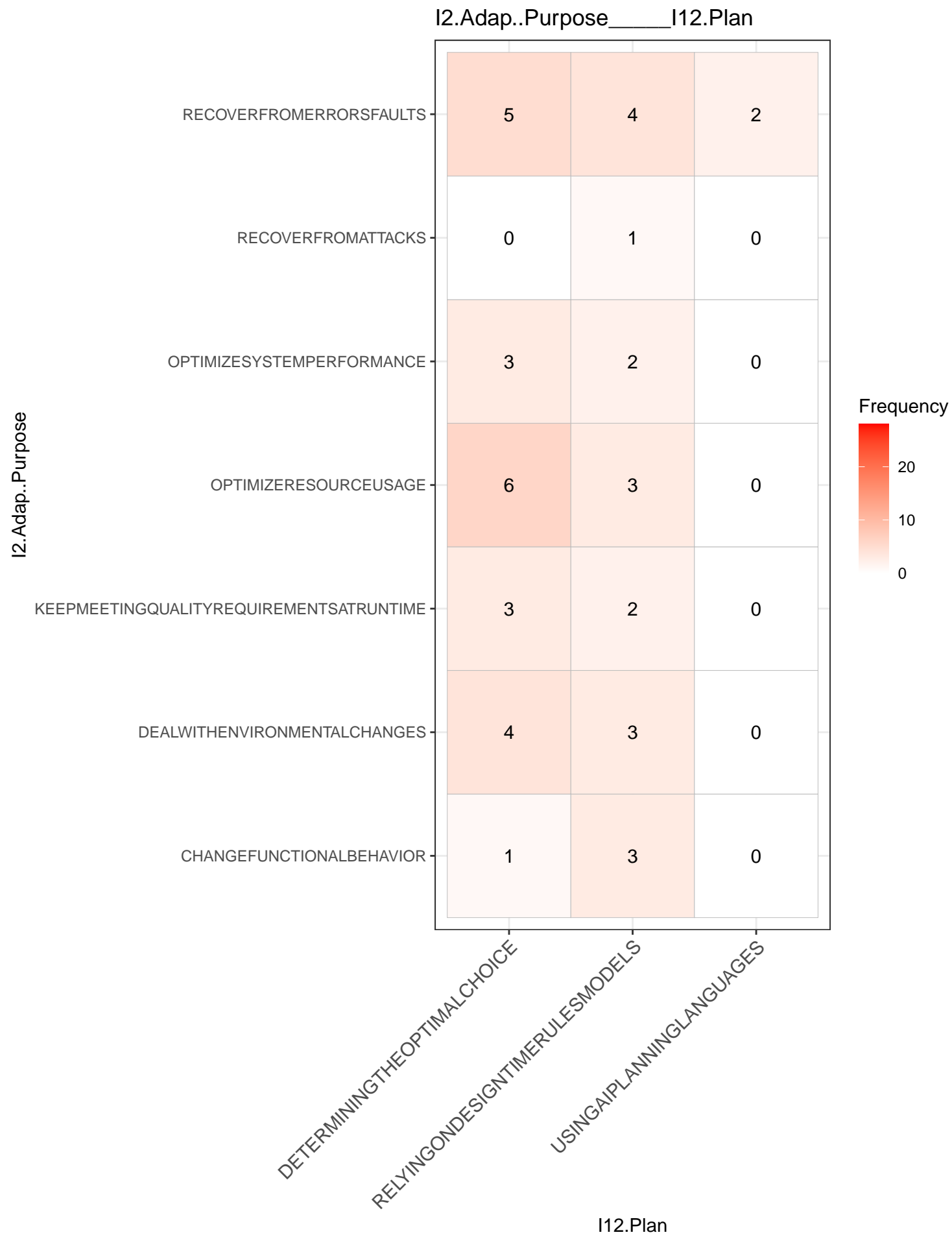
I2.Adap..Purpose_____I10.Monitor

I2.Adap..Purpose



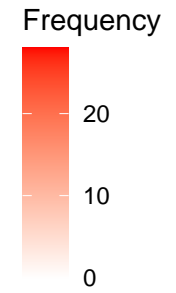
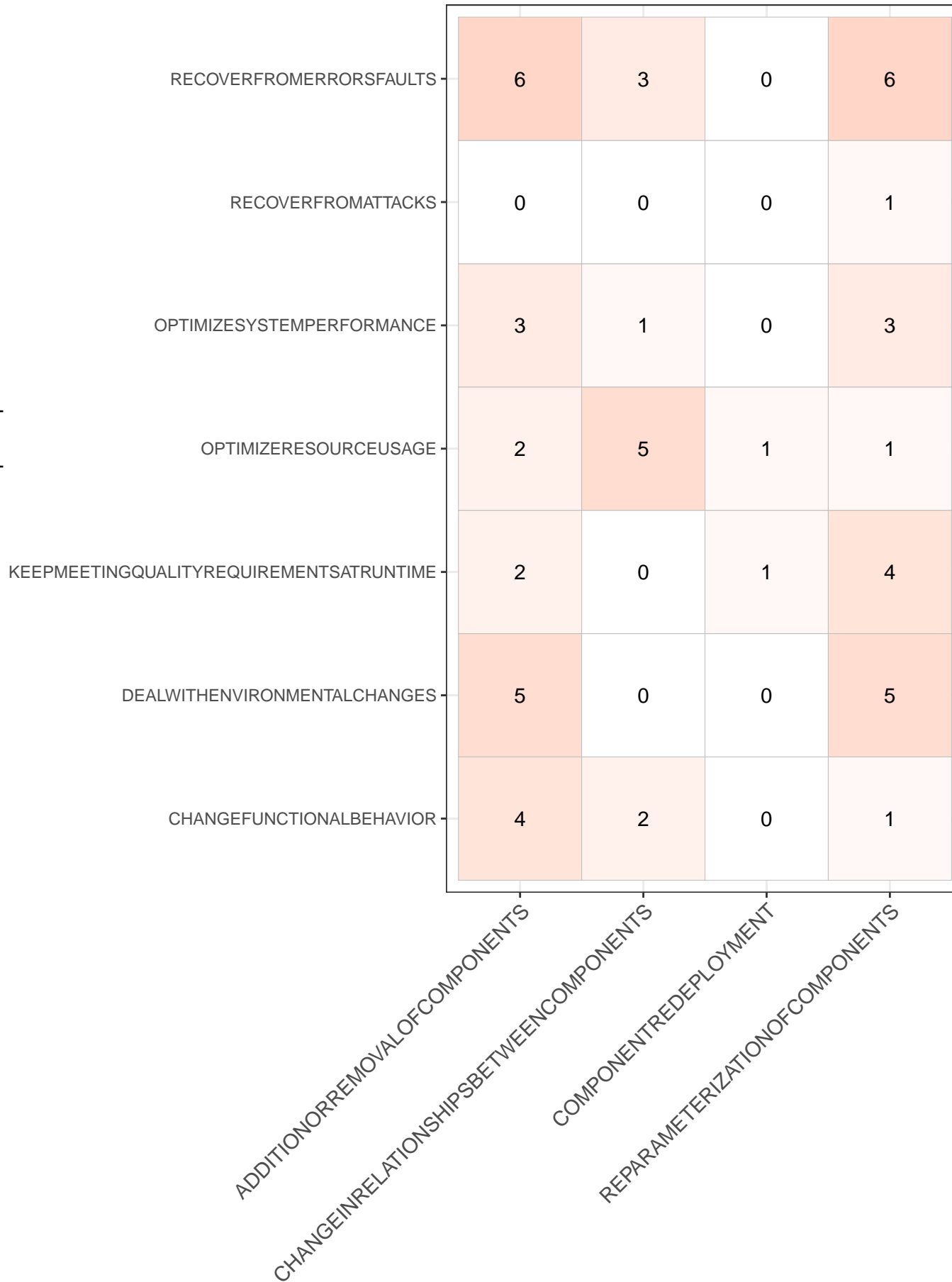
I10.Monitor





I2.Adap..Purpose_____I13.Execute

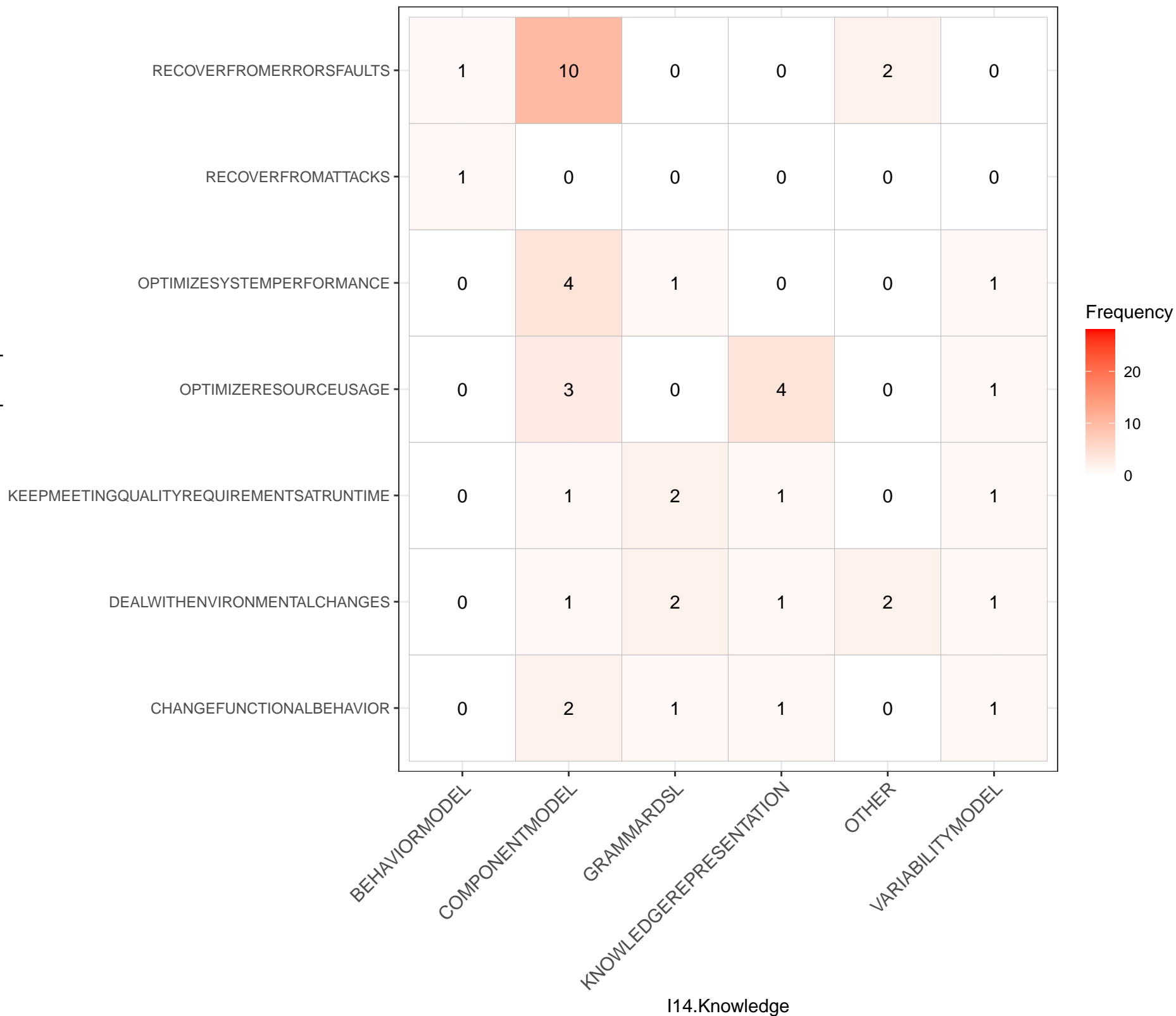
I2.Adap..Purpose



I13.Execute

I2.Adap..Purpose

I2.Adap..Purpose_____I14.Knowledge

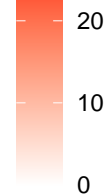


I3.Robot.TypeI4.Robo.SW

I3.Robot.Type

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

Frequency



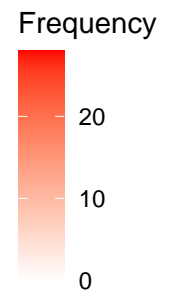
OTHER
ROS1
ROS2

I4.Robo.SW

I3.Robot.Type

I3.Robot.TypeI5.QA

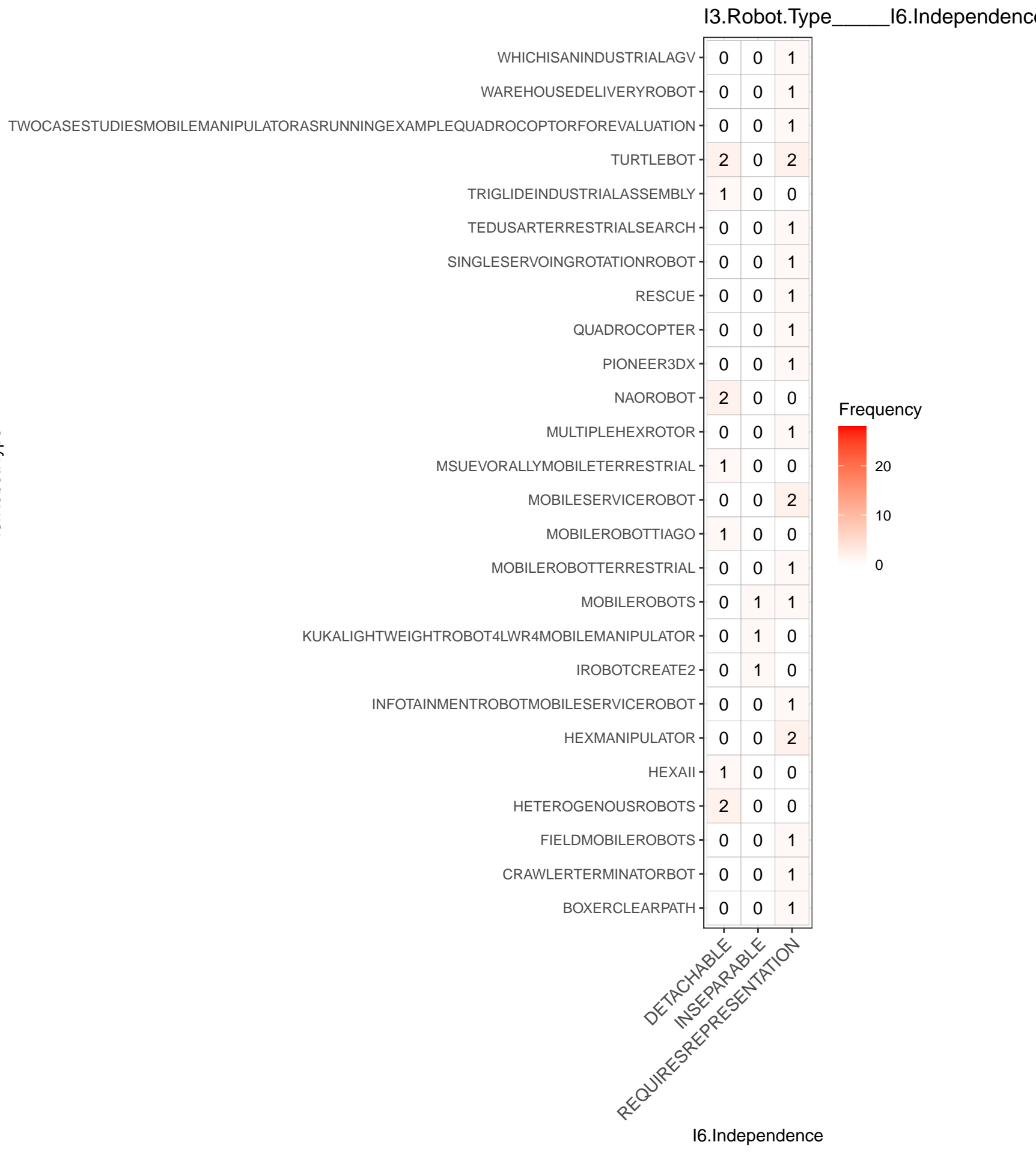
WHICHISANINDUSTRIALAGV	0	1	0	1	0
WAREHOUSEDELIVERYROBOT	0	0	1	0	0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION	0	1	1	0	0
TURTLEBOT	0	3	2	2	0
TRIGLIDEINDUSTRIALASSEMBLY	0	1	1	0	0
TEDUSARTERRESTRIALSEARCH	0	0	1	0	0
SINGLESERVOINGROTATIONROBOT	1	1	1	0	0
RESCUE	0	0	1	0	0
QUADROCOPTER	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



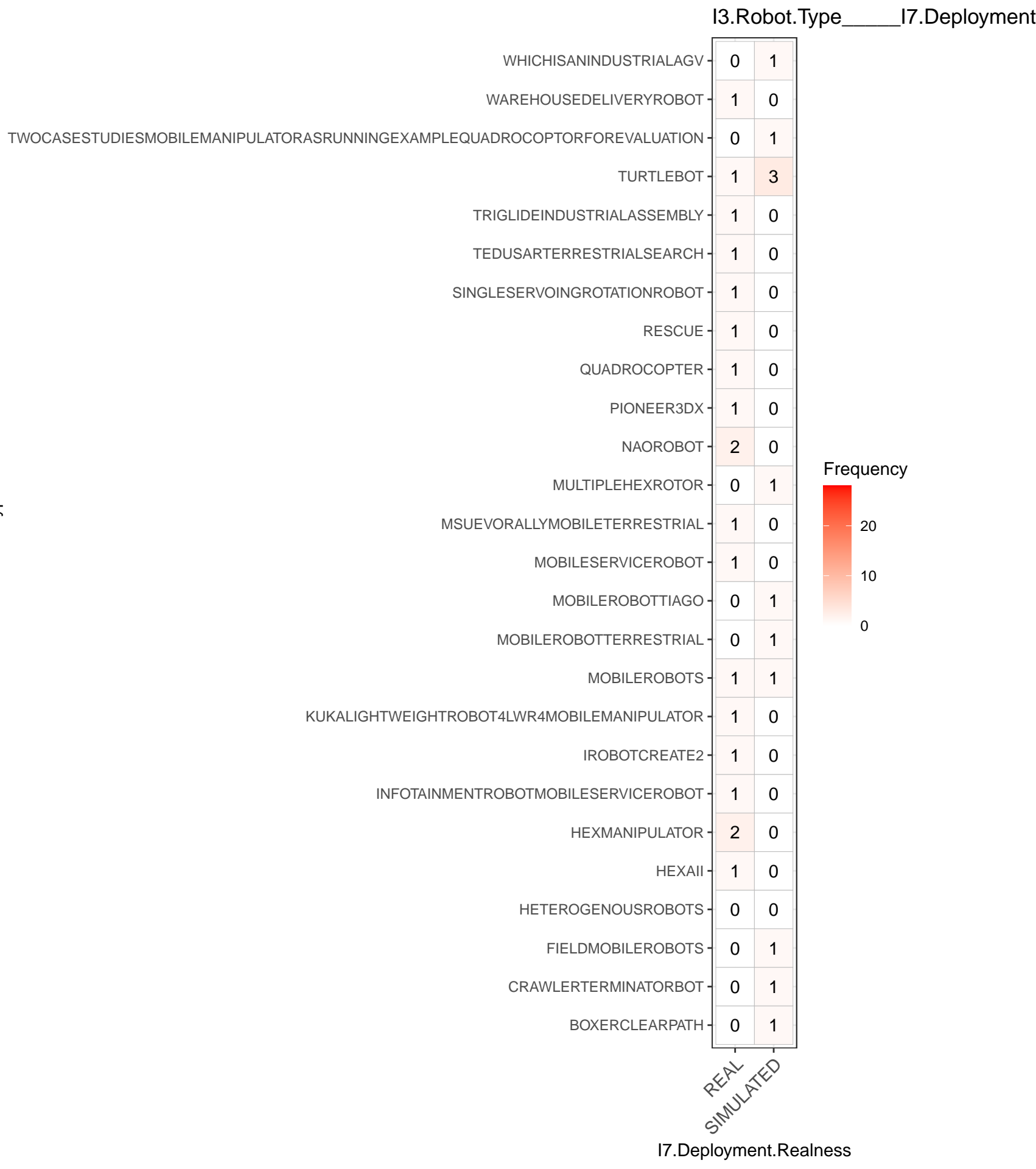
FUNCTIONALSUITABILITY
PERFORMANCEEFFICIENCY
RELIABILITY
SAFETY
SECURITY

I5.QA

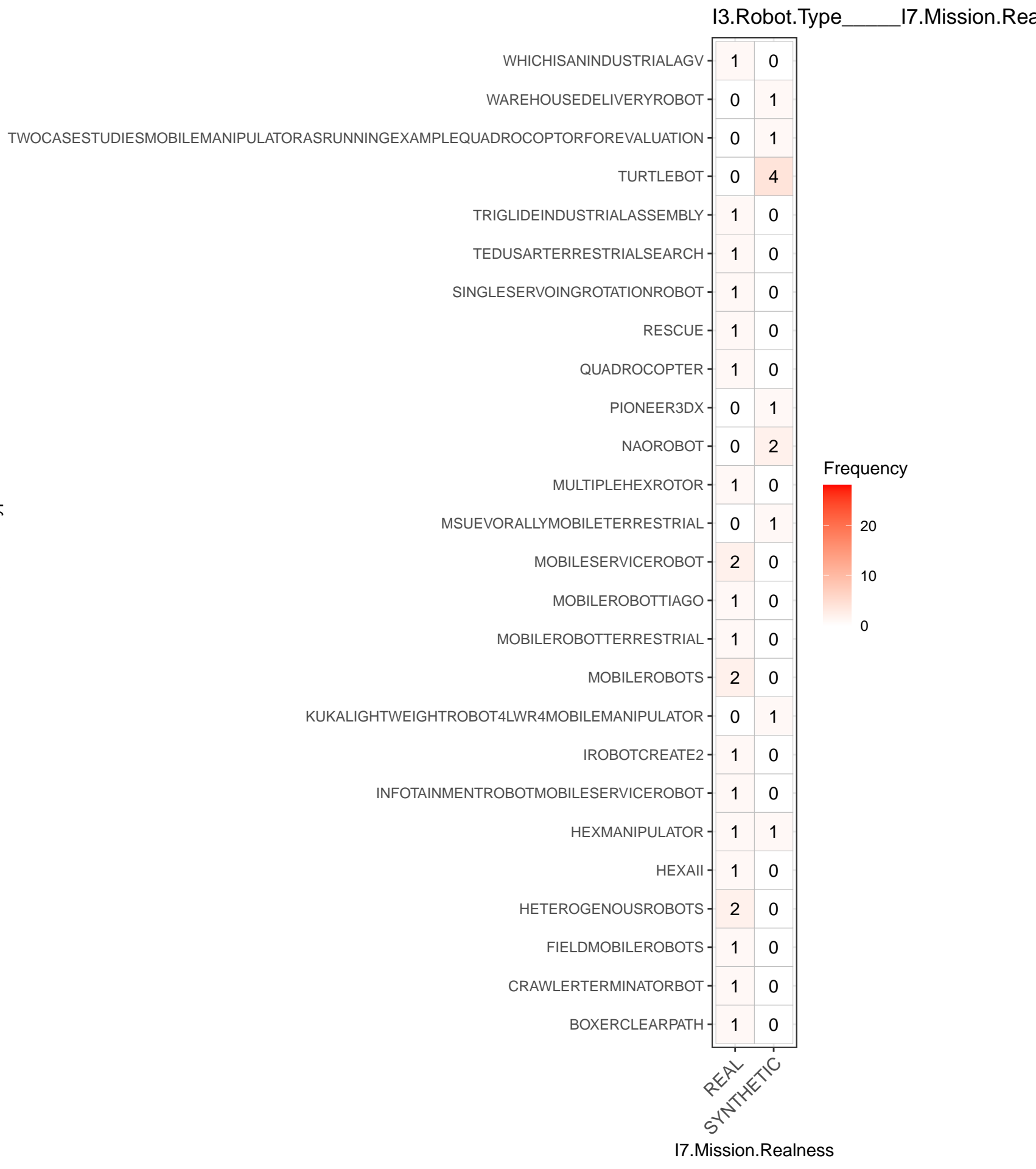
I3.Robot.Type



I3.Robot.Type



I3.Robot.Type



I3.Robot.Type

I3.Robot.TypeExperiment.Method

TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION

KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR

INFOTAINMENTROBOTMOBILESERVICEROBOT

CRAWLERTERMINATORBOT

BOXERCLEARPATH

TEDUSARTERRESTRIALSEARCH

MULTIPLEHEXROTOR

MOBILESERVICEROBOT

MOBILEROBOTTIAGO

MOBILEROBOTTERRESTRIAL

MOBILEROBOTS

IROBOTCREATE2

HEXMANIPULATOR

HEXAII

HETEROGENOUSROBOTS

FIELDMOBILEROBOTS

CRAWLERTERMINATORBOT

BOXERCLEARPATH

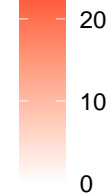
TRIGLIDEINDUSTRIALASSEMBLY

TURTLEBOT

WAREHOUSEDELIVERYROBOT

WHICHISANINDUSTRIALAGV

Frequency



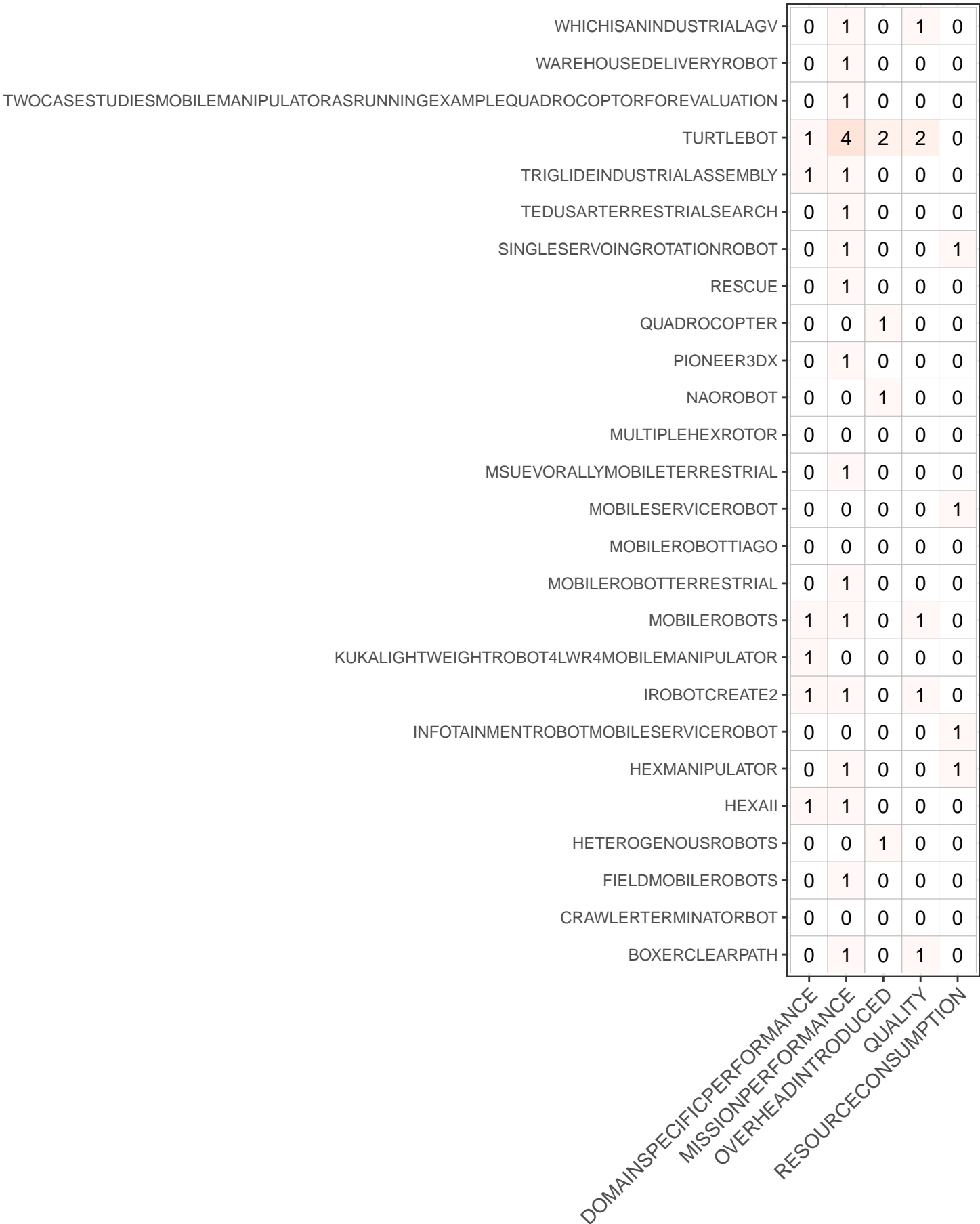
Experiment.Method

EXPERIMENT
NOEVALUATION
SHOWCASE

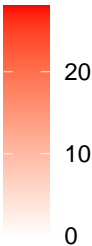
1	0	0
0	0	1
0	0	1
4	0	0
0	0	1
1	0	0
1	0	0
1	0	0
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1	0	0
0	0	1
1	1	0
0	1	0
1	0	0
1	1	0
0	1	0
0	0	1
2	0	0
1	0	0
1	0	0
1	0	0
1	1	0
0	0	1
1	1	0
1	0	0
0	1	0
1	0	0

I3.Robot.Type

I3.Robot.TypeI8.Evaluation



Frequency



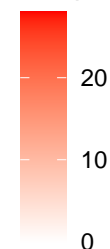
I8.Evaluation

I3.Robot.Type

I3.Robot.TypeI9.Adap..Logic

WHICHISANINDUSTRIALAGV	0	0	0	0	1	1	0
WAREHOUSEDELIVERYROBOT	0	1	1	0	0	0	0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION	0	0	1	0	0	0	0
TURTLEBOT	0	2	2	0	0	0	0
TRIGLIDEINDUSTRIALASSEMBLY	0	0	0	0	0	1	0
TEDUSARTERRESTRIALSEARCH	1	1	0	0	0	0	0
SINGLESERVOINGROTATIONROBOT	0	0	0	0	0	1	1
RESCUE	1	1	0	0	0	0	0
QUADROCOPTER	0	0	0	0	1	0	0
PIONEER3DX	1	1	0	0	0	0	0
NAOROBOT	0	0	0	0	0	1	0
MULTIPLEHEXROTOR	0	0	0	0	0	0	0
MSUEVORALLYMOBILETERRESTRIAL	0	0	0	0	0	1	0
MOBILESERVICEROBOT	1	1	1	0	1	0	0
MOBILEROBOTTIAGO	0	0	0	0	1	1	0
MOBILEROBOTTERRESTRIAL	0	0	0	0	0	1	0
MOBILEROBOTS	0	0	0	1	0	1	1
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR	0	0	1	0	0	0	0
IROBOTCREATE2	0	0	1	0	0	0	0
INFOTAINMENTROBOTMOBILESERVICEROBOT	0	0	0	0	1	0	0
HEXMANIPULATOR	0	0	0	0	0	2	2
HEXAII	0	0	0	0	0	1	0
HETEROGENOUSROBOTS	0	2	0	0	0	0	0
FIELDMOBILEROBOTS	0	0	0	0	0	1	1
CRAWLERTERMINATORBOT	0	0	0	0	0	0	0
BOXERCLEARPATH	0	0	0	0	1	1	0

Frequency



AIPLANNER
CONSTRAINTSOLVINGMODELCHECKING
DOMAINSPECICALGORITHM
NUMERICALOPTIMIZATION
ONTOLOGICALREASONING
SEARCHPROCEDURE
UTILITYCALCULATION

I9.Adap..Logic

I3.Robot.Type

I3.Robot.TypeI10.Monitor

TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION

KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR

INFOTAINMENTROBOTMOBILESERVICEROBOT

BOXERCLEARPATH

WHICHISANINDUSTRIALAGV

WAREHOUSEDELIVERYROBOT

TURTLEBOT

TRIGLIDEINDUSTRIALASSEMBLY

TEDUSARTERRESTRIALSEARCH

SINGLESERVOINGROTATIONROBOT

RESCUE

QUADROCOPTER

PIONEER3DX

NAOROBOT

MULTIPLEHEXROTOR

MSUEVORALLYMOBILETERRESTRIAL

MOBILESERVICEROBOT

MOBILEROBOTTIAGO

MOBILEROBOTTERRESTRIAL

MOBILEROBOTS

IROBOTCREATE2

HEXMANIPULATOR

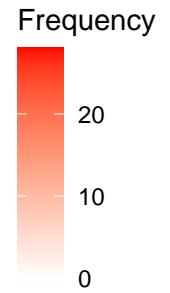
HEXAII

HETEROGENOUSROBOTS

FIELDMOBILEROBOTS

CRAWLERTERMINATORBOT

1	0	1	0
0	0	1	0
1	1	1	0
2	0	4	1
0	0	1	0
0	0	1	0
0	0	1	0
0	0	1	0
1	0	1	0
0	0	1	0
0	0	2	0
0	0	1	0
1	0	1	1
1	0	1	0
1	0	0	0
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0	0	1	1
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0	0	1	0
1	0	1	0



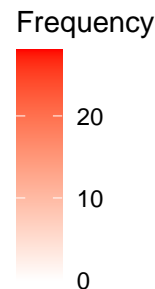
ENVIRONMENT
ENVIRONMENTAL
MANAGEDSYSTEM
MISSION

I10.Monitor

I3.Robot.Type

I3.Robot.Type_____I11.Analyze

WHICHISANINDUSTRIALAGV	0	0	0	1	0	0	0
WAREHOUSEDELIVERYROBOT	1	0	0	0	0	1	0
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION	0	1	0	0	0	0	0
TURTLEBOT	1	1	0	1	0	1	0
TRIGLIDEINDUSTRIALASSEMBLY	0	0	0	0	0	0	0
TEDUSARTERRESTRIALSEARCH	1	0	0	0	0	1	0
SINGLESERVOINGROTATIONROBOT	1	1	0	0	0	0	0
RESCUE	1	0	0	0	0	1	0
QUADROCOPTER	0	0	0	0	1	0	0
PIONEER3DX	1	0	0	0	0	1	0
NAOROBOT	0	0	0	1	0	0	1
MULTIPLEHEXROTOR	0	1	0	0	0	0	0
MSUEVORALLYMOBILETERRESTRIAL	0	0	1	0	0	0	0
MOBILESERVICEROBOT	0	0	0	1	0	0	1
MOBILEROBOTTIAGO	0	0	0	1	0	0	0
MOBILEROBOTTERRESTRIAL	0	0	0	0	0	0	0
MOBILEROBOTS	0	1	0	0	0	0	0
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR	0	0	0	0	1	0	0
IROBOTCREATE2	0	0	0	0	0	1	0
INFOTAINMENTROBOTMOBILESERVICEROBOT	0	0	0	1	0	0	0
HEXMANIPULATOR	1	1	0	0	0	0	0
HEXAII	0	0	0	0	0	0	0
HETEROGENOUSROBOTS	0	0	0	2	0	0	0
FIELDMOBILEROBOTS	0	1	0	0	0	0	0
CRAWLERTERMINATORBOT	0	1	0	0	0	0	0
BOXERCLEARPATH	0	0	0	1	0	0	0



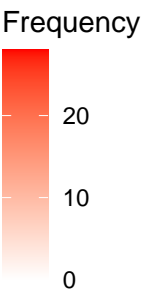
ANALYZINGAGGREGATINGDATA
COMPARISONTOHRESHOLDS
DONDURINGPLAN
LOGICALINFERENCE
SYSTEMSTATEANOMALYDETECTION
TASKUSERDRIVEN

I11.Analyze

I3.Robot.Type_____I12.Plan

I3.Robot.Type

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
USINGAIPANNINGLANGUAGES

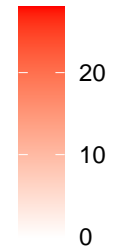
I12.Plan

I3.Robot.Type_____I13.Execute

I3.Robot.Type

WHICHISANINDUSTRIALAGV	0	0	0	1
WAREHOUSEDELIVERYROBOT	0	0	0	1
TWOCASESTUDIESMOBILEMANIPULATORASRUNNINGEXAMPLEQUADROCOPTORFOREVALUATION	1	0	0	1
TURTLEBOT	1	1	0	3
TRIGLIDEINDUSTRIALASSEMBLY	0	0	1	0
TEDUSARTERRESTRIALSEARCH	1	0	0	0
SINGLESERVOINGROTATIONROBOT	1	0	0	1
RESCUE	1	0	0	0
QUADROCOPTER	1	0	0	0
PIONEER3DX	1	0	0	0
NAOROBOT	0	2	0	0
MULTIPLEHEXROTOR	1	0	0	0
MSUEVORALLYMOBILETERRESTRIAL	0	0	0	1
MOBILESERVICEROBOT	2	1	0	1
MOBILEROBOTTIAGO	0	0	0	1
MOBILEROBOTTERRESTRIAL	1	0	0	1
MOBILEROBOTS	1	0	0	2
KUKALIGHTWEIGHTROBOT4LWR4MOBILEMANIPULATOR	1	0	0	0
IROBOTCREATE2	0	0	0	1
INFOTAINMENTROBOTMOBILESERVICEROBOT	1	1	0	0
HEXMANIPULATOR	1	0	0	1
HEXAII	0	0	1	0
HETEROGENOUSROBOTS	0	2	0	0
FIELDMOBILEROBOTS	1	0	0	1
CRAWLERTERMINATORBOT	1	0	0	0
BOXERCLEARPATH	0	0	0	1

Frequency



ADDITIONORREMOVALOFCOMPONENTS
CHANGEINRELATIONSHIPS BETWEENCOMPONENTS
REPARAMETERIZATIONOFCOMPONENTS

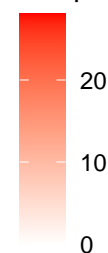
I13.Execute

I3.Robot.Type

I3.Robot.TypeI14.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

Frequency

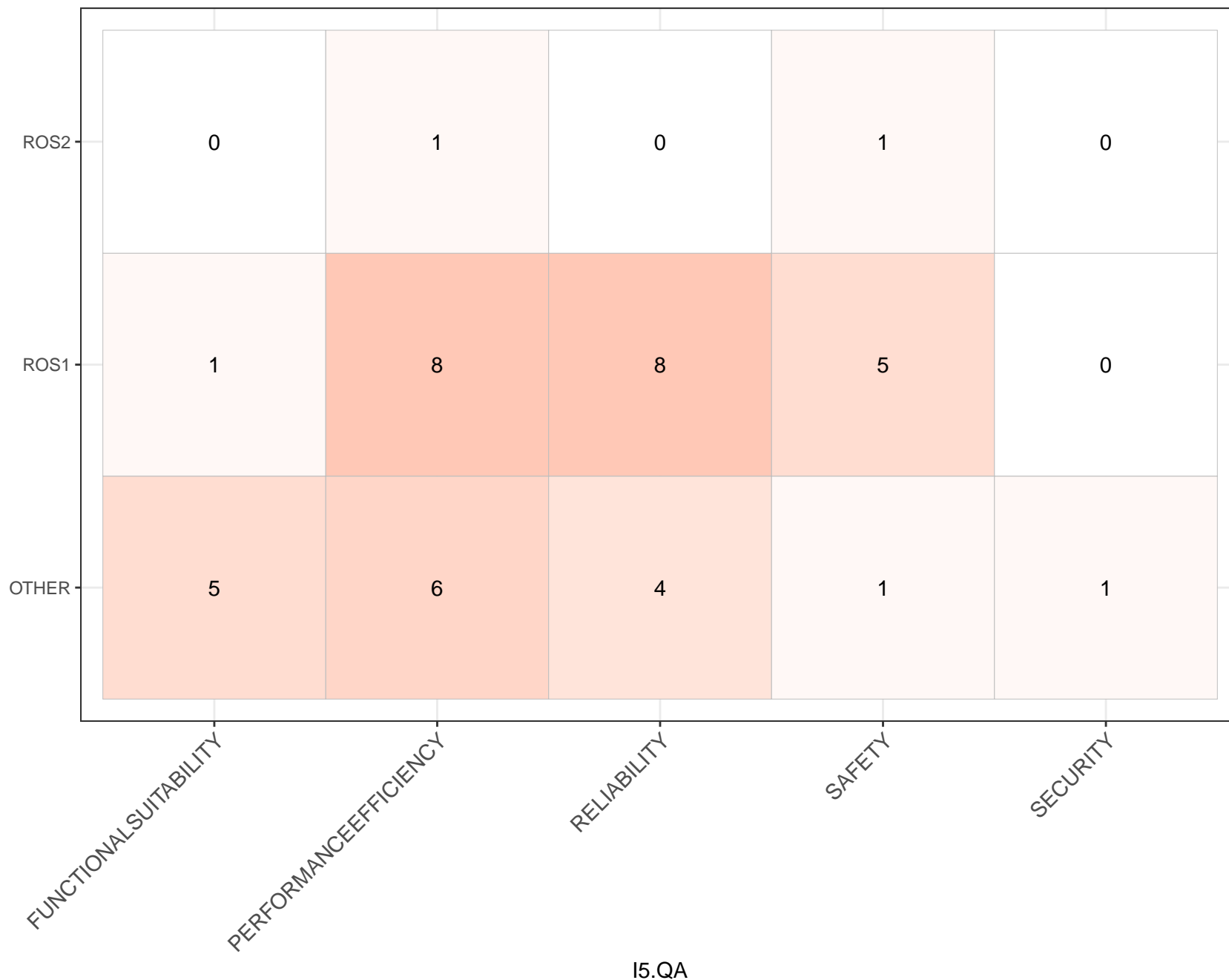


BEHAVIORMODEL
COMPONENTMODEL
GRAMMARDSL
KNOWLEDGEREPRESENTATION
OTHER
VARIABILITYMODEL

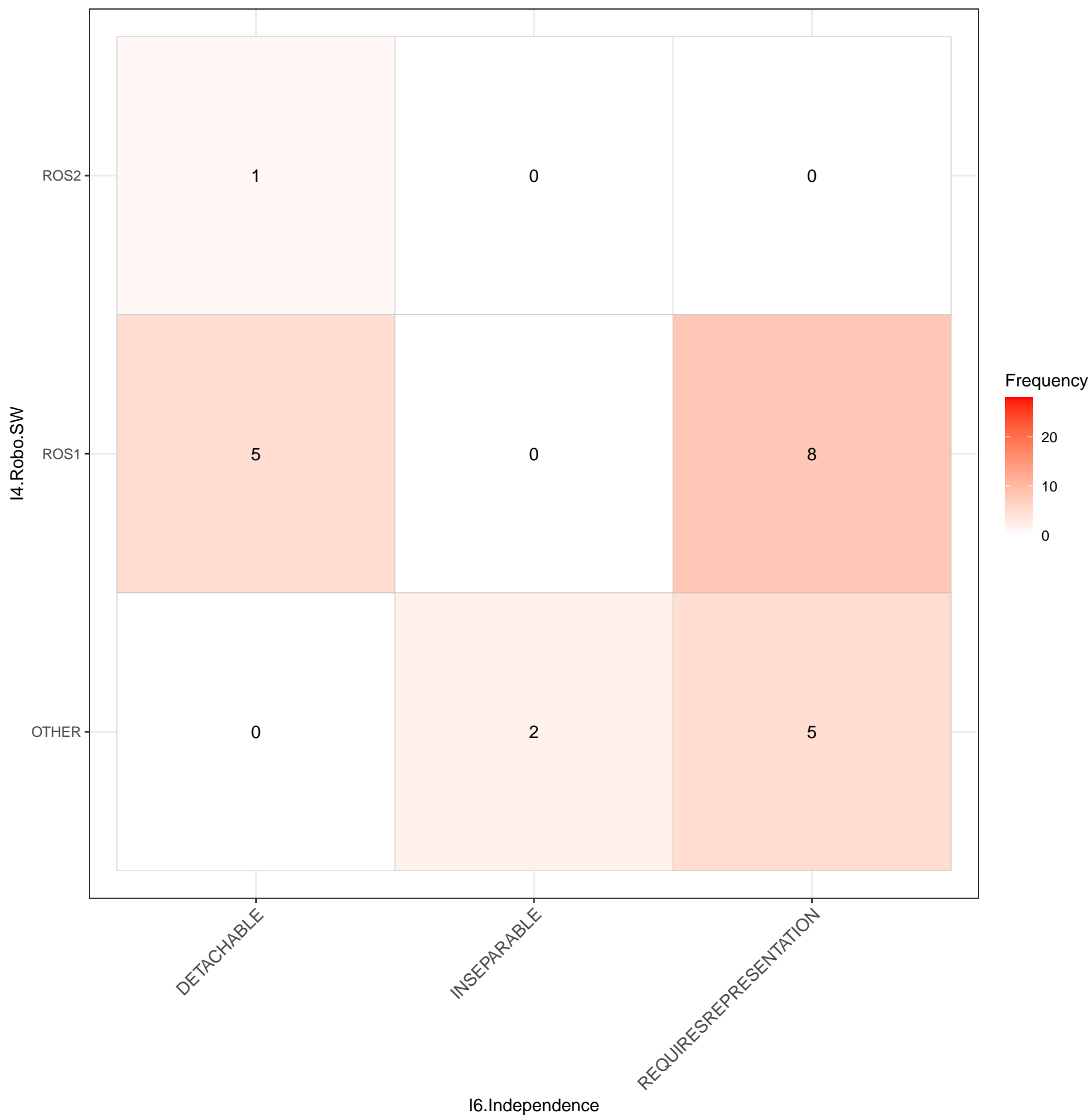
I14.Knowledge

I4.Robo.SW _____ I5.QA

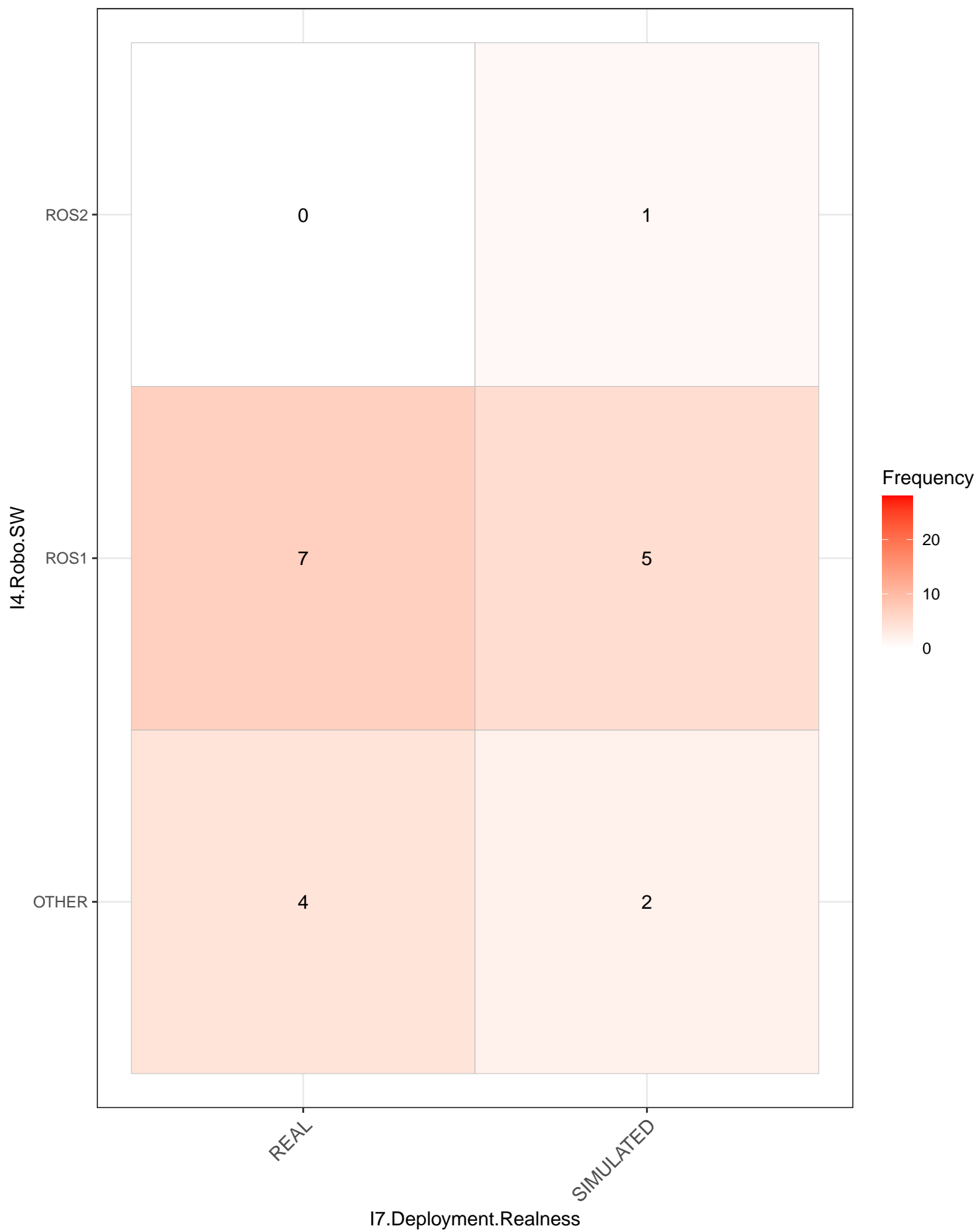
I4.Robo.SW



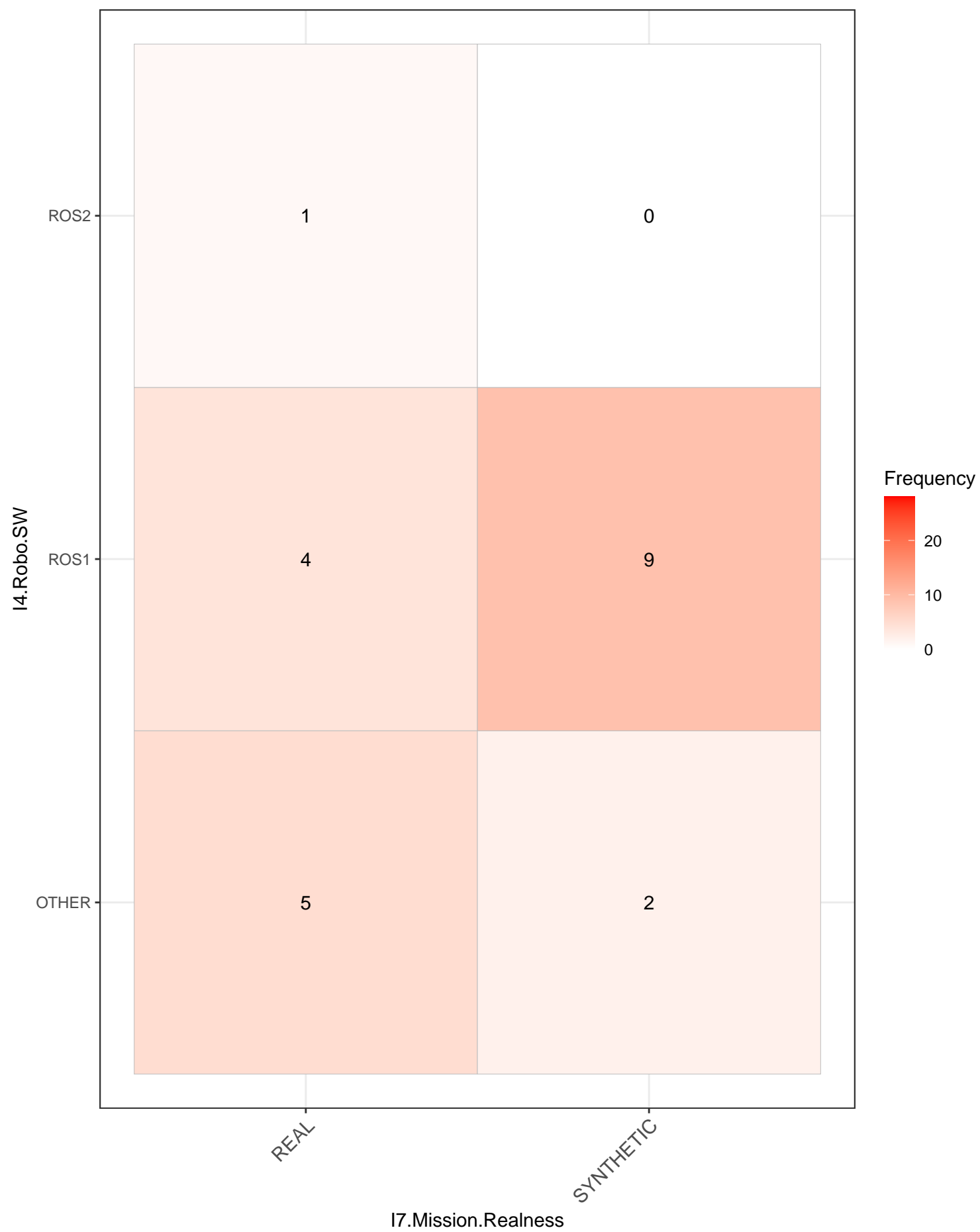
I4.Robo.SW_____I6.Independence



I4.Robo.SW_____I7.Deployment.Realness



I4.Robo.SW_____I7.Mission.Realness



I4.Robo.SW_____Experiment.Method

I4.Robo.SW

ROS2

ROS1

OTHER

EXPERIMENT

NOEVALUATION

SHOWCASE

Experiment.Method

Frequency

20

10

0

0

1

0

7

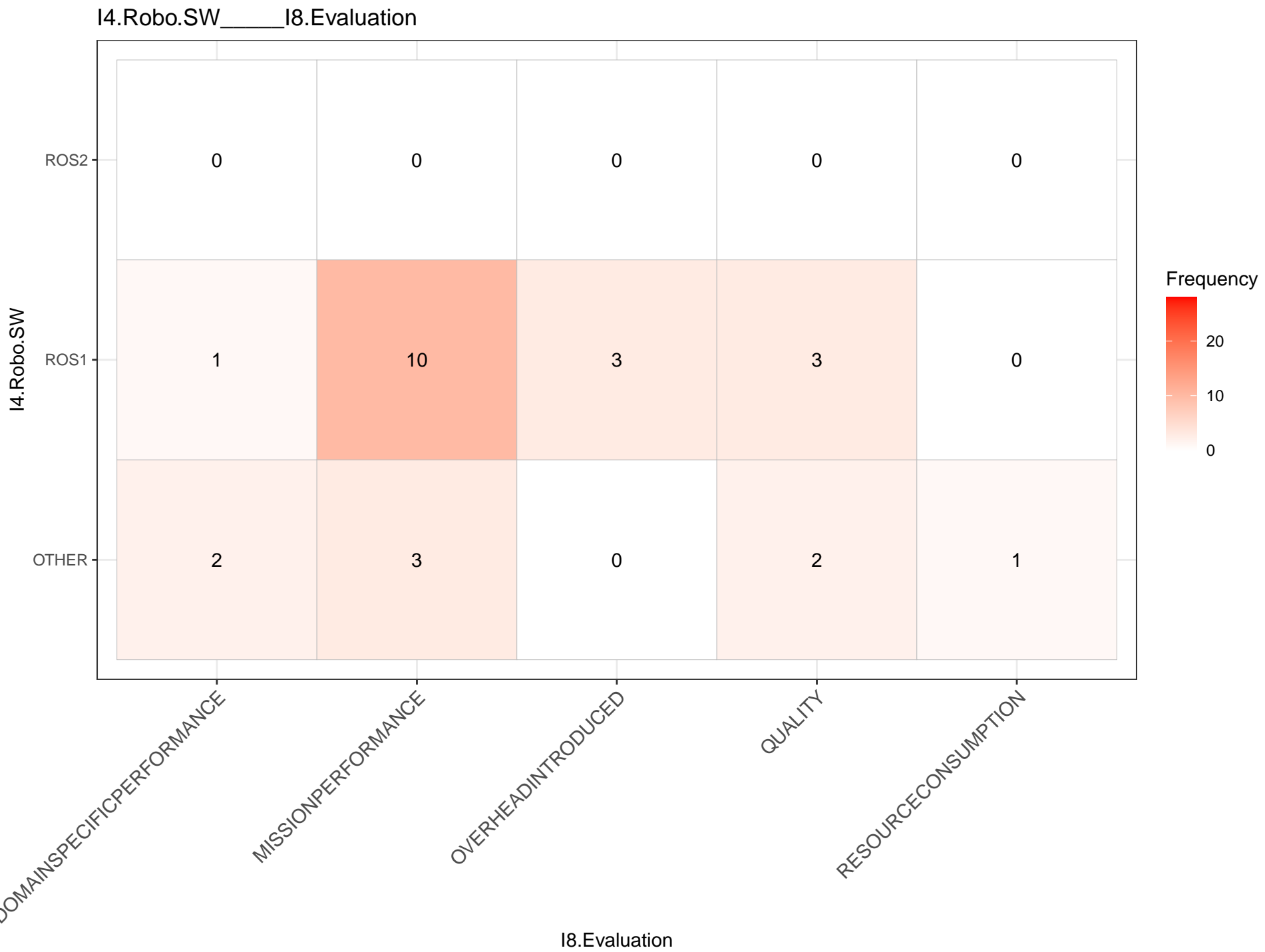
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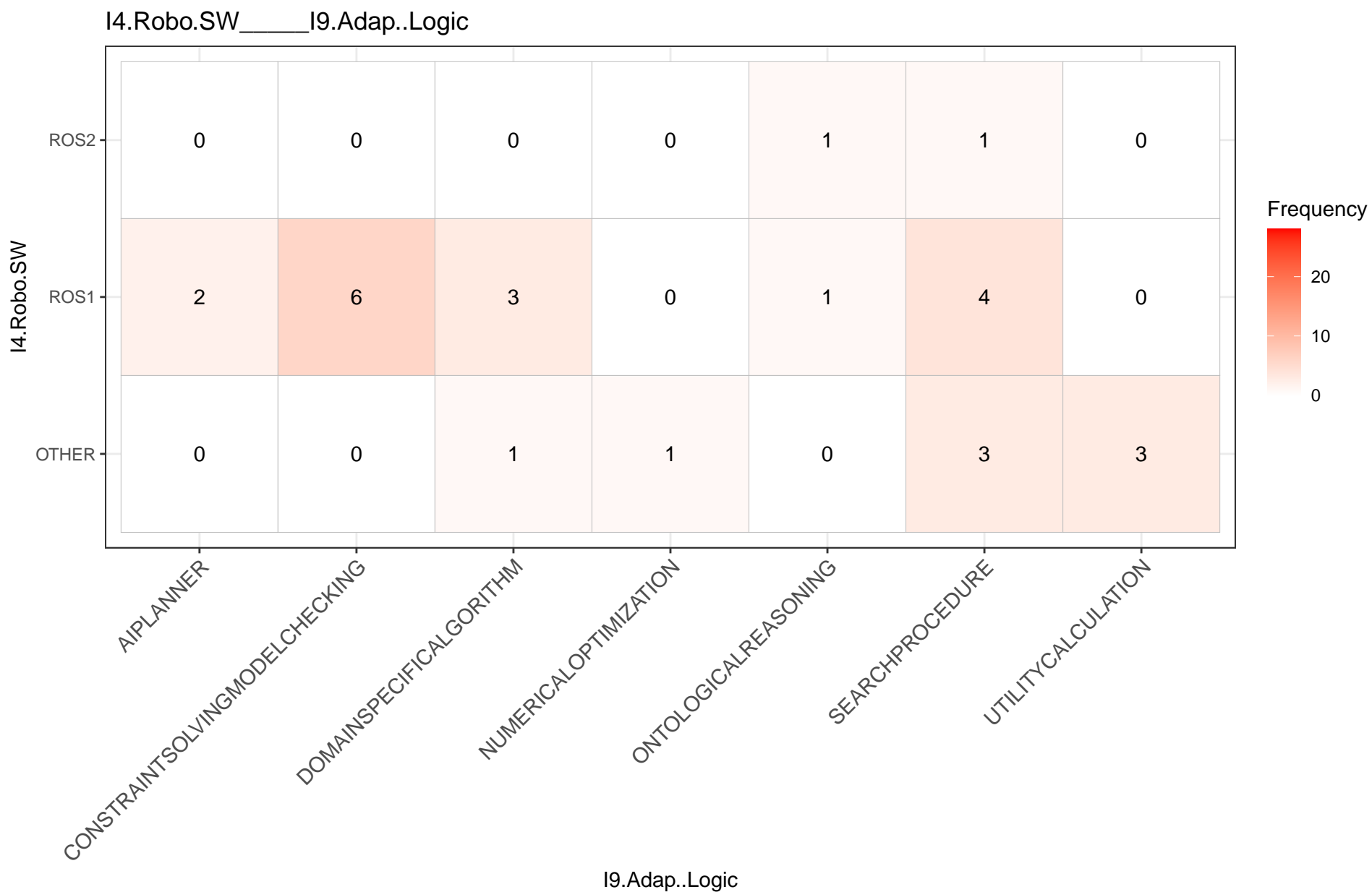
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4

3

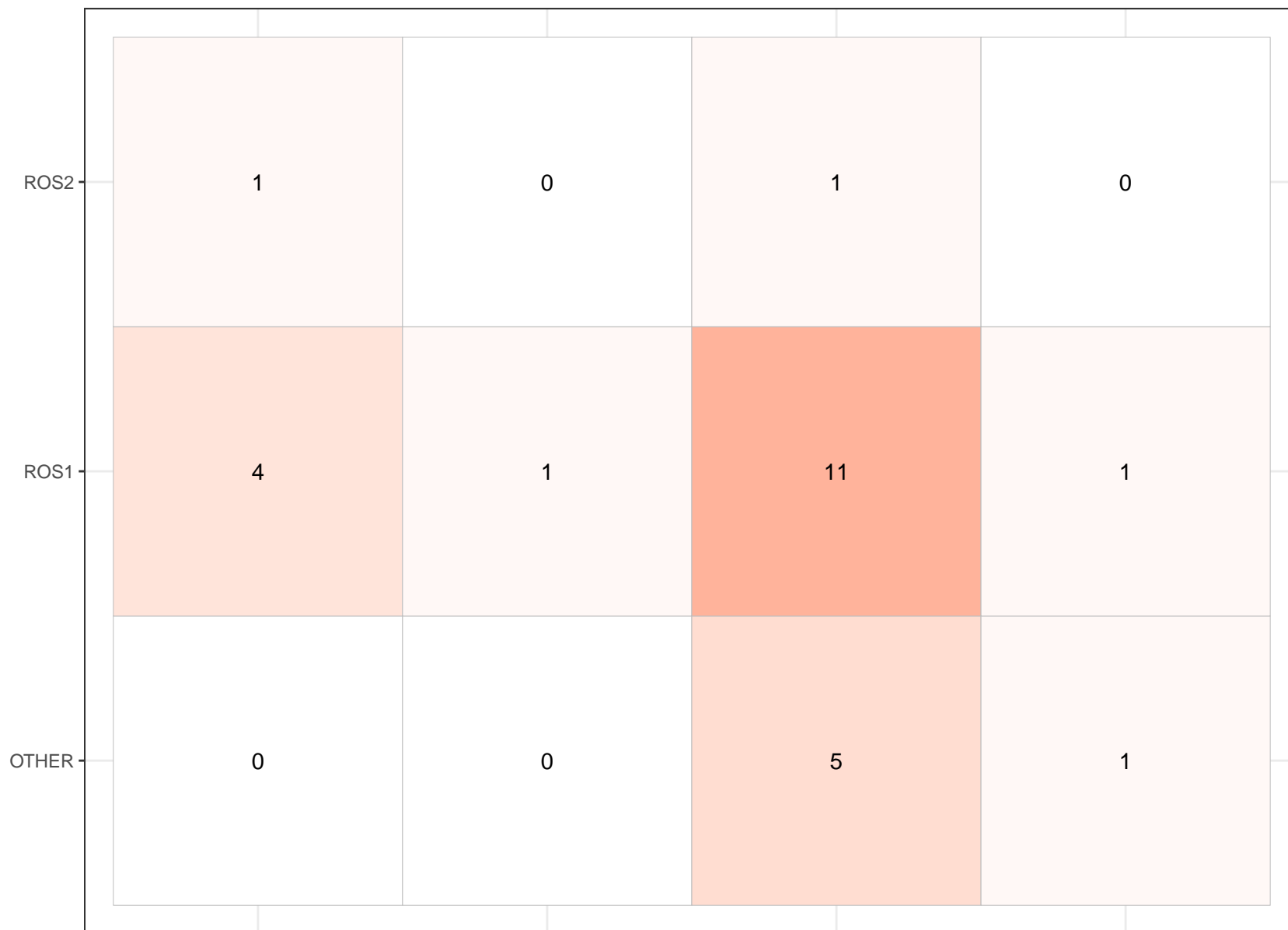
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I4.Robo.SW ____ I10.Monitor

I4.Robo.SW



OTHER

ROS2

ROS1

Frequency

20

10

0

ENVIRONMENT

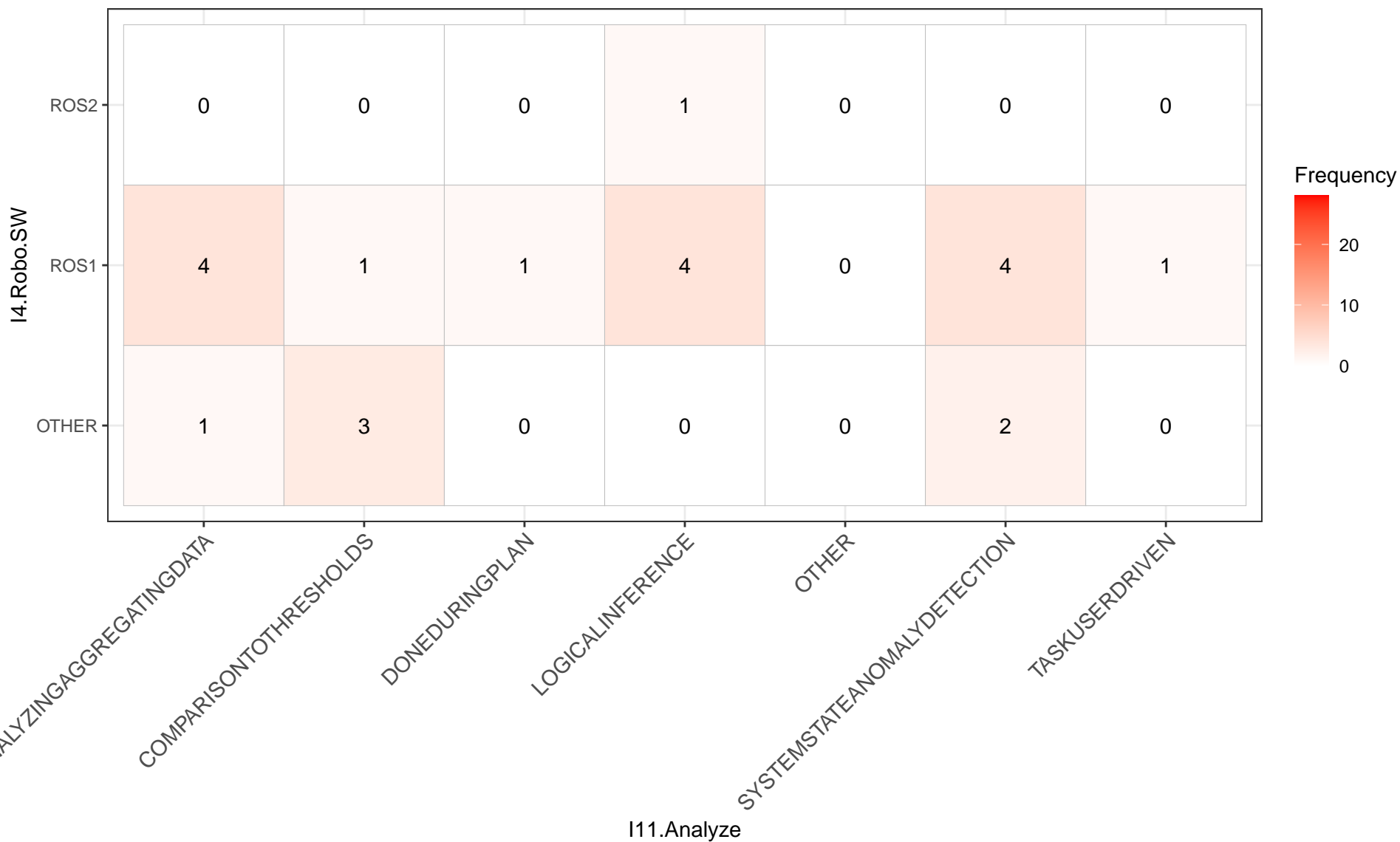
ENVIRONMENTAL

I10.Monitor

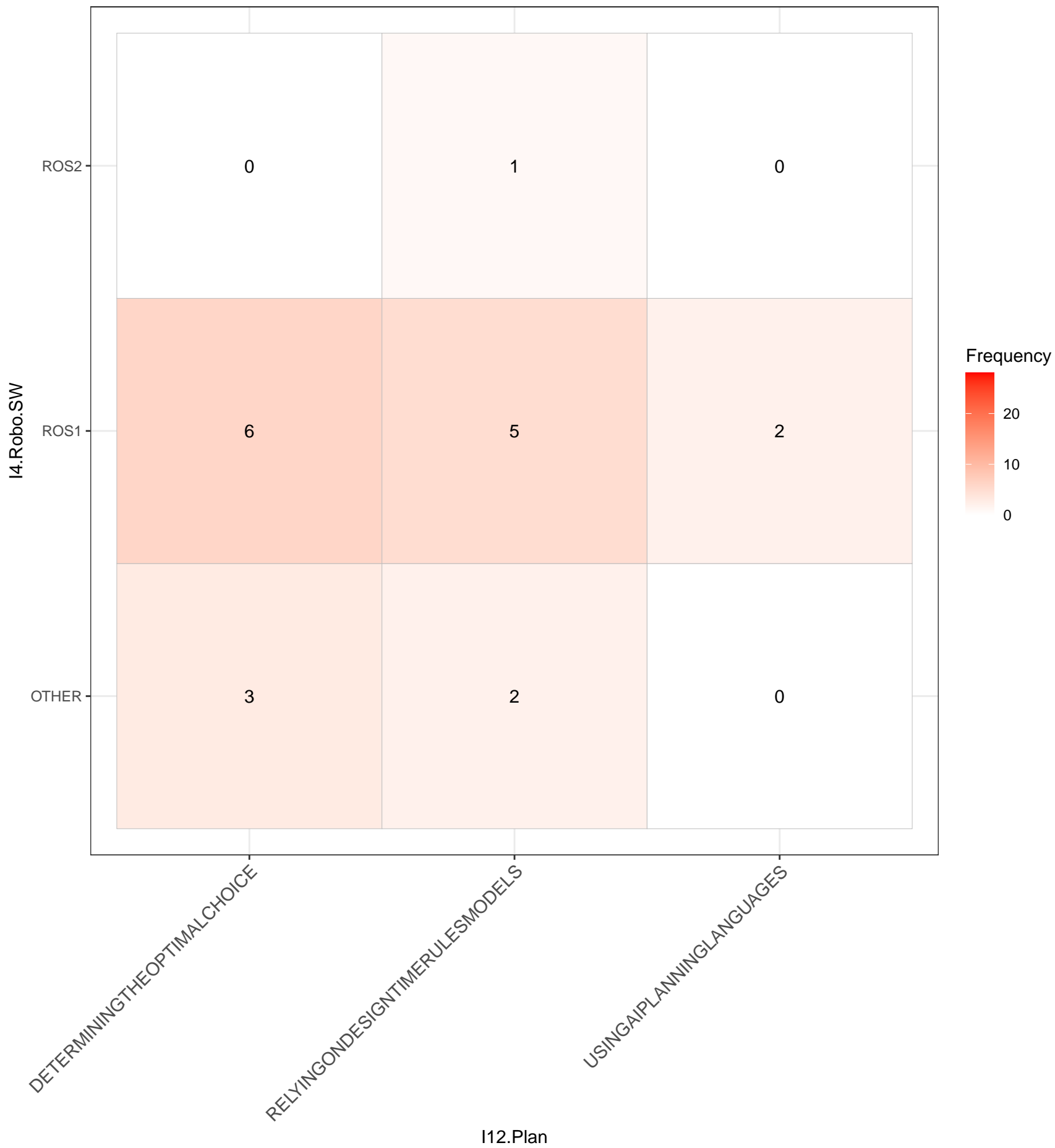
MANAGEDSYSTEM

MISSION

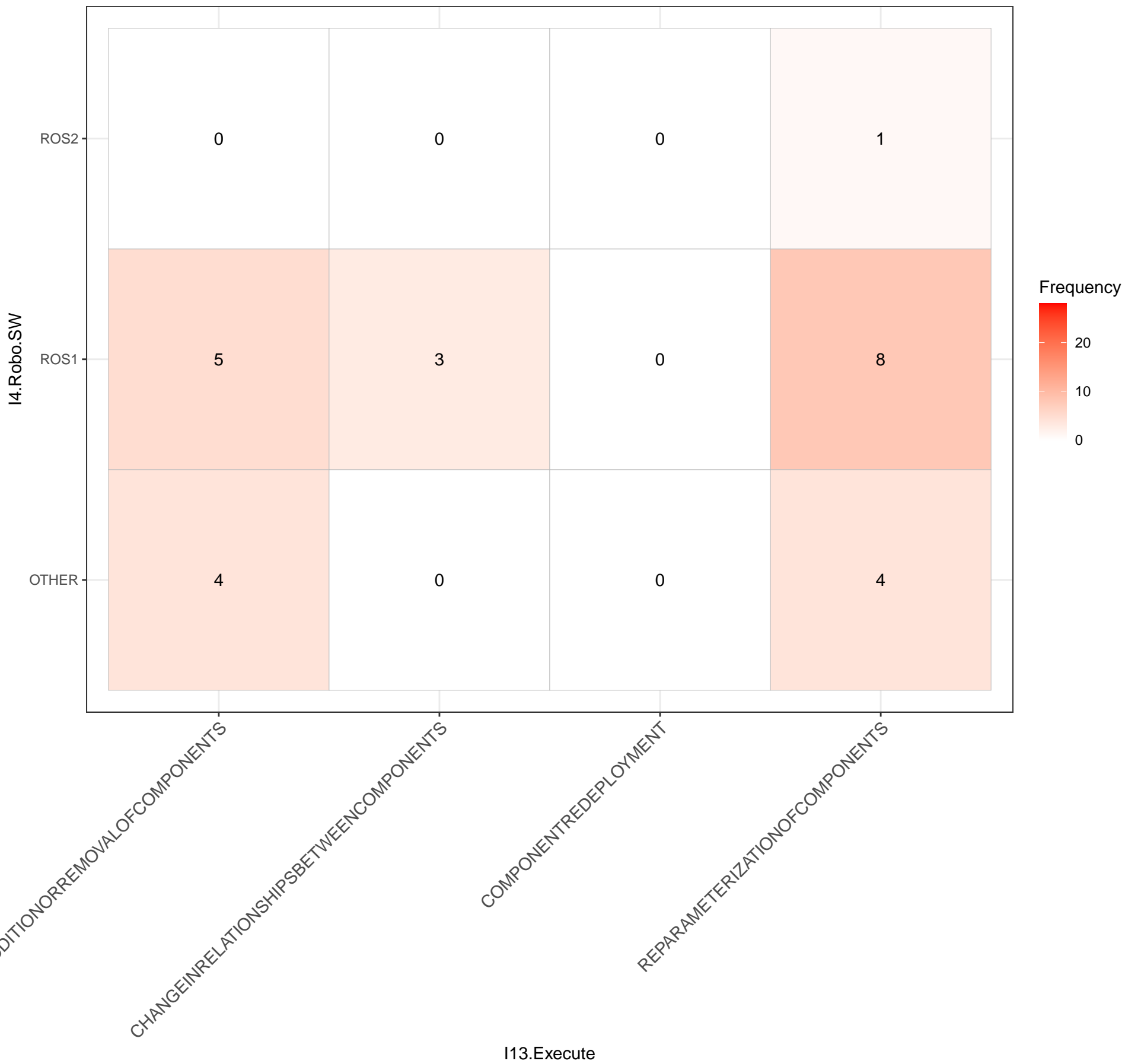
I4.Robo.SW ____ I11.Analyze



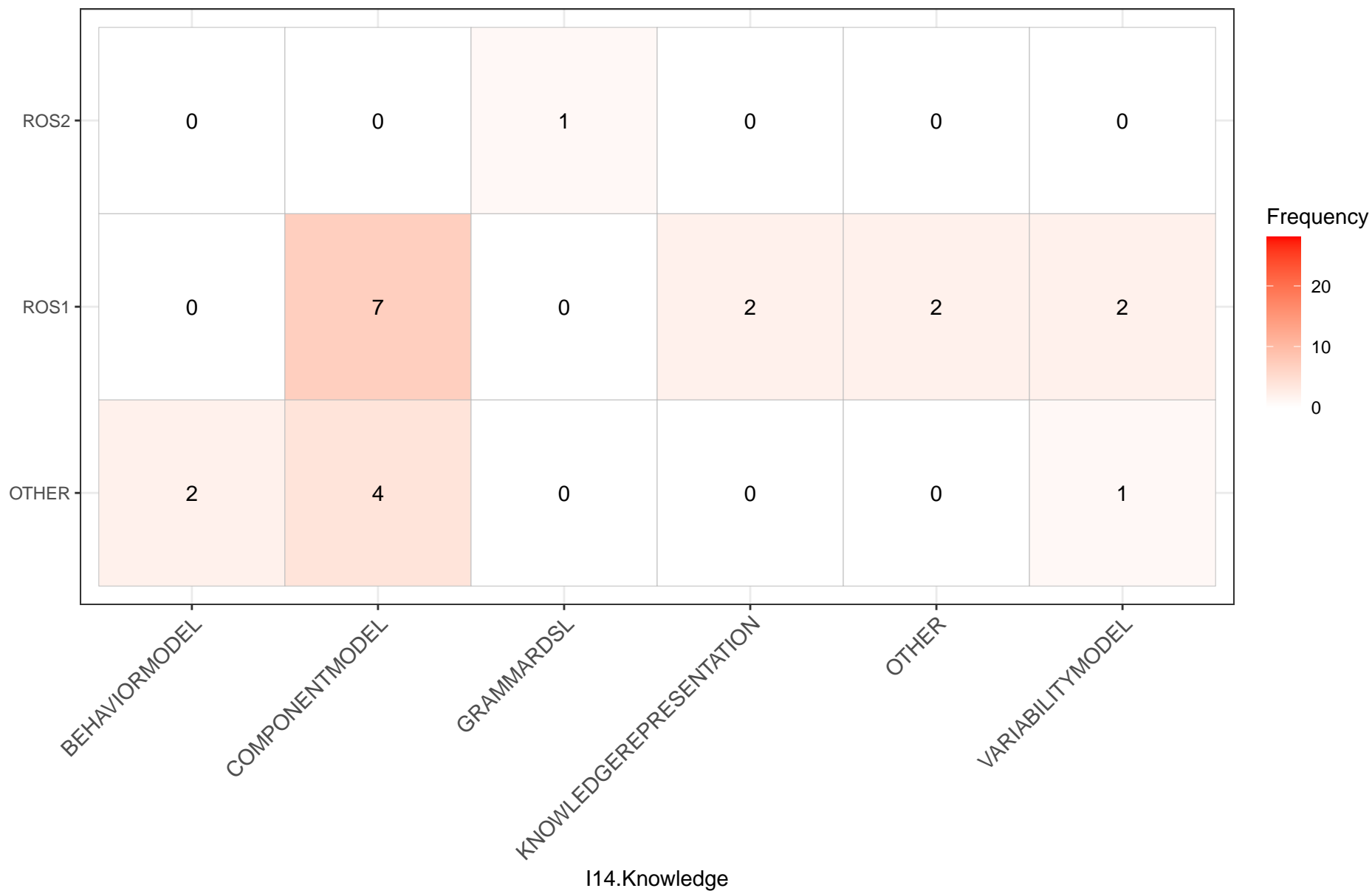
I4.Robo.SW_____I12.Plan



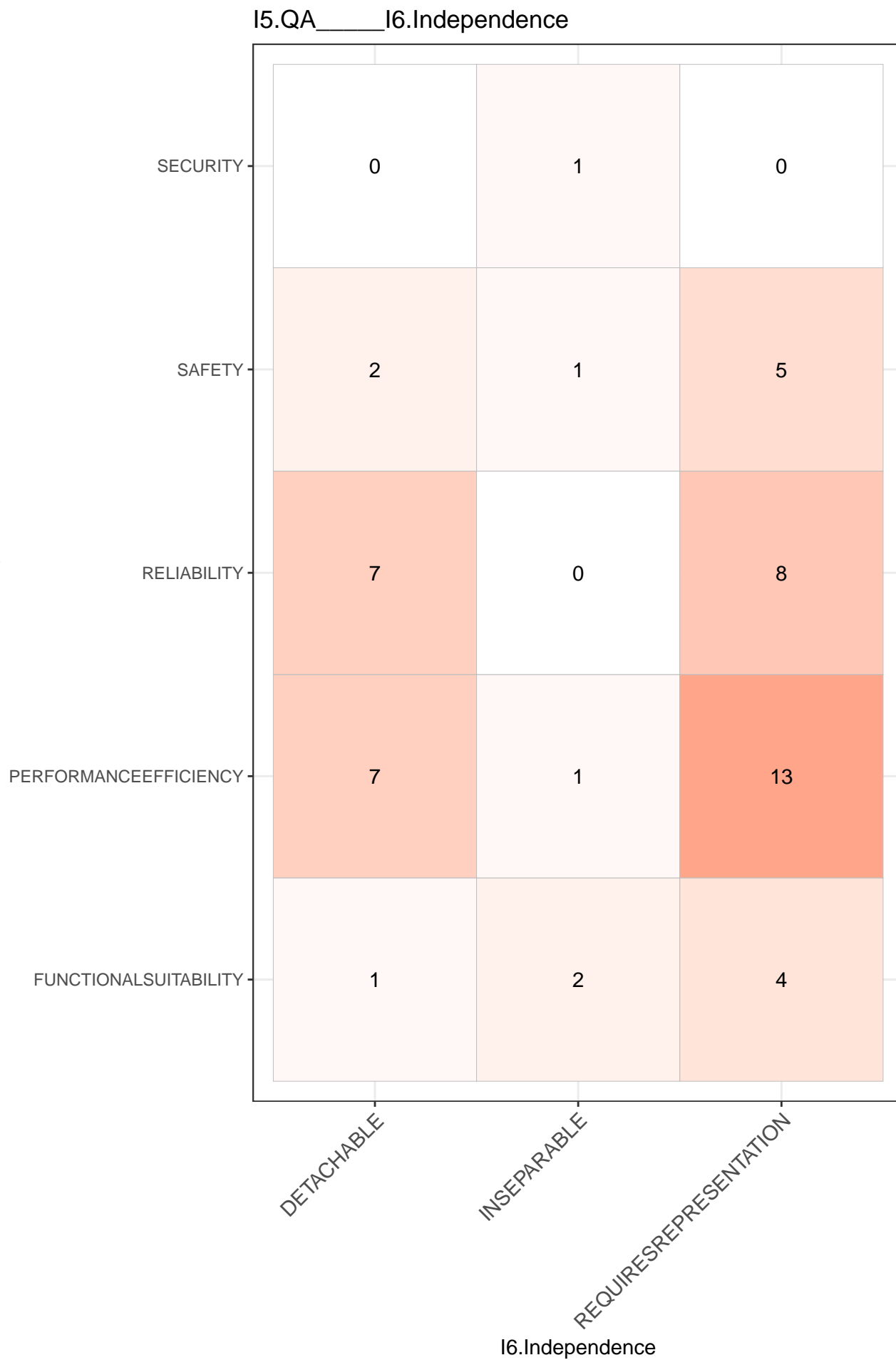
I4.Robo.SW_____I13.Execute

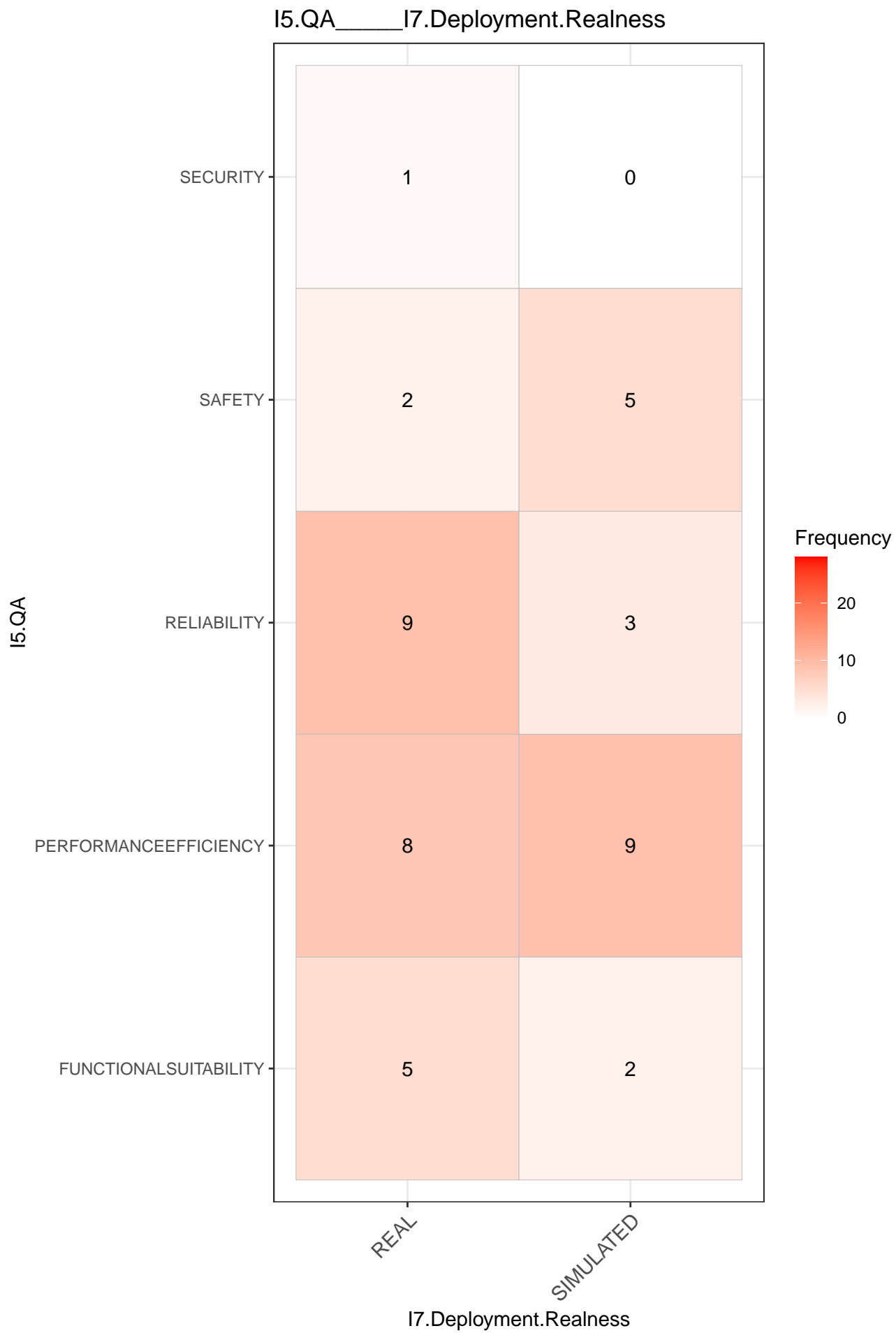


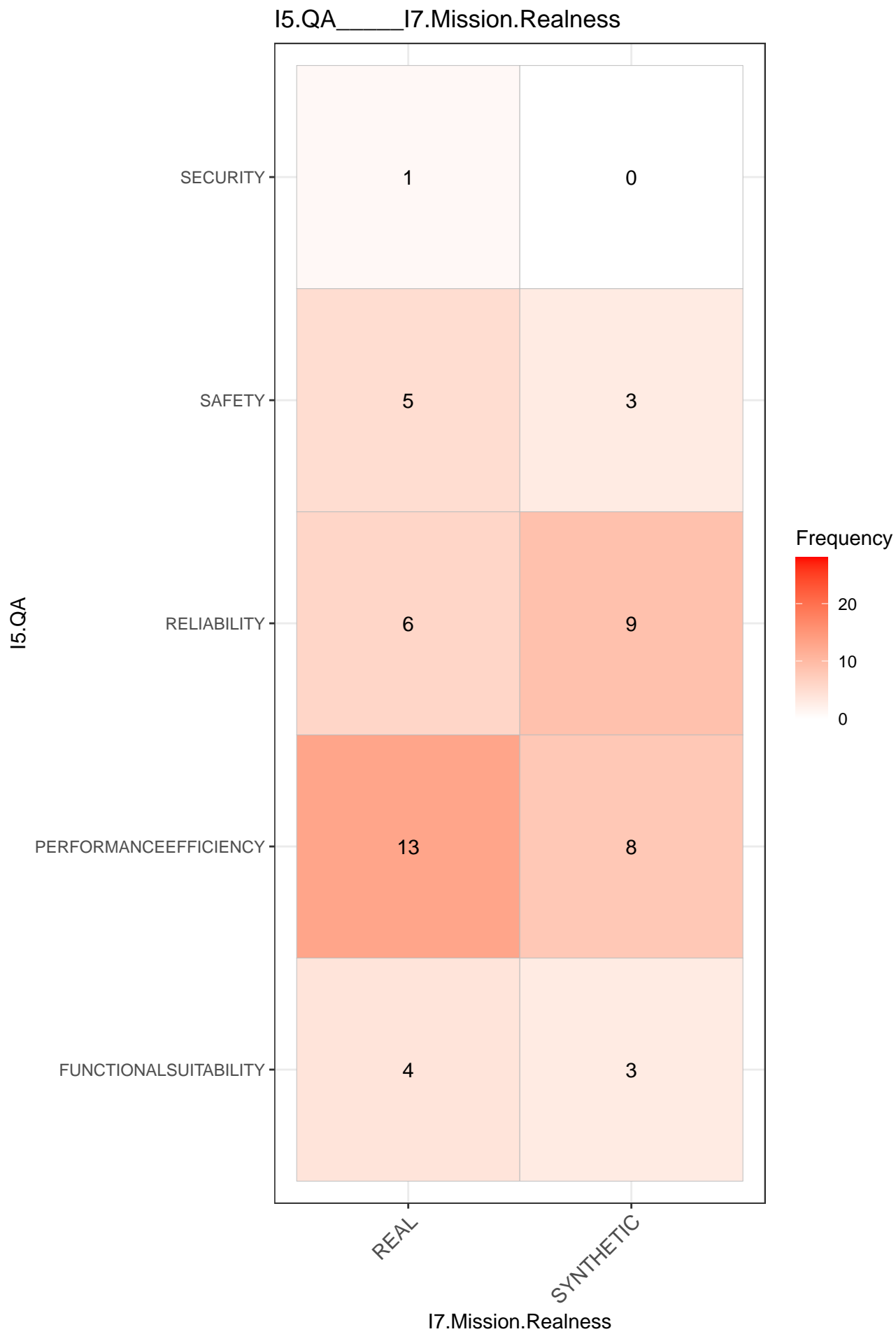
I4.Robo.SW ____ I14.Knowledge

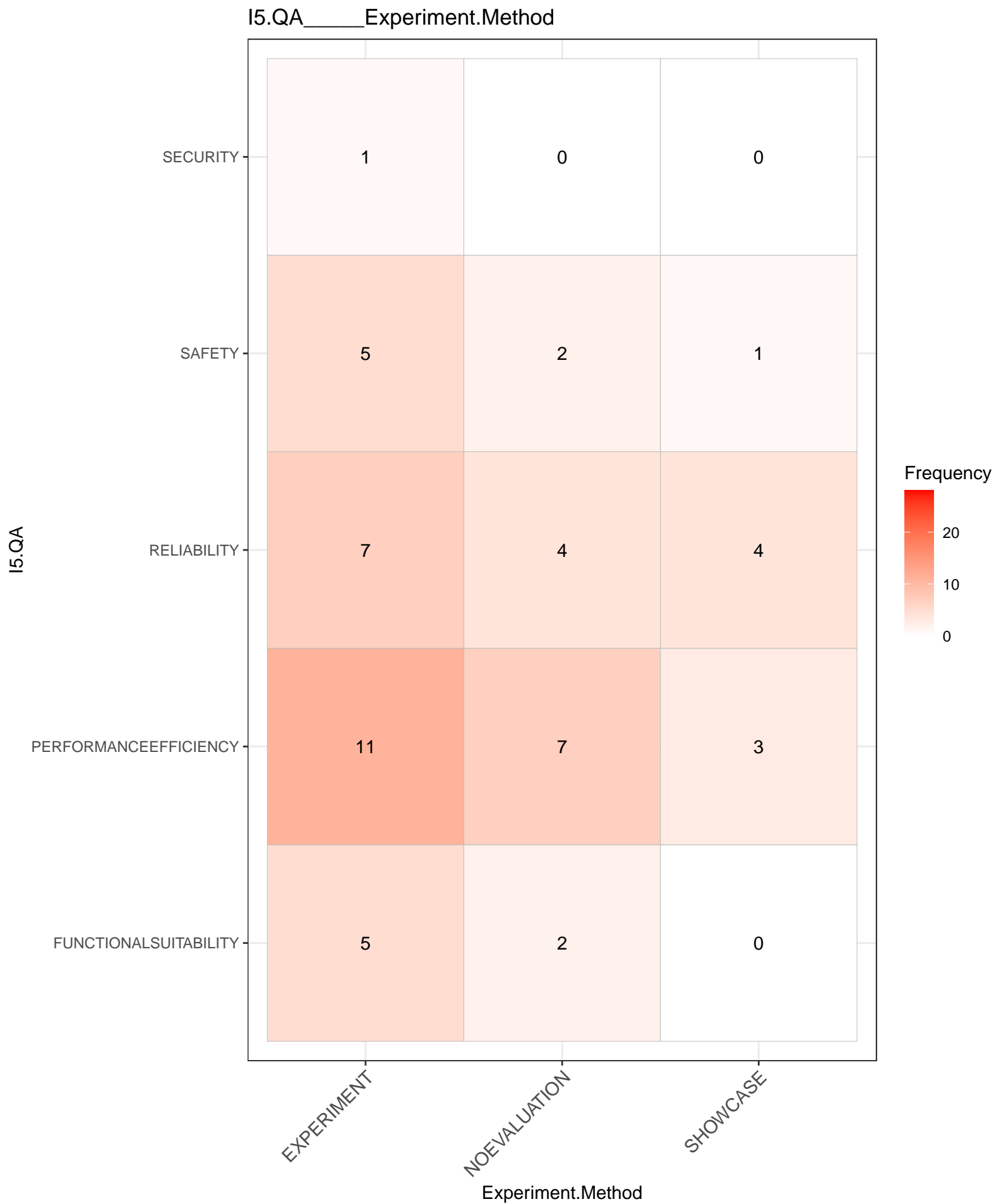


I5.QA









I5.QA_____I8.Evaluation

I5.QA

SECURITY

SAFETY

RELIABILITY

PERFORMANCEEFFICIENCY

FUNCTIONALSUITABILITY

DOMAINSPECIFICPERFORMANCE

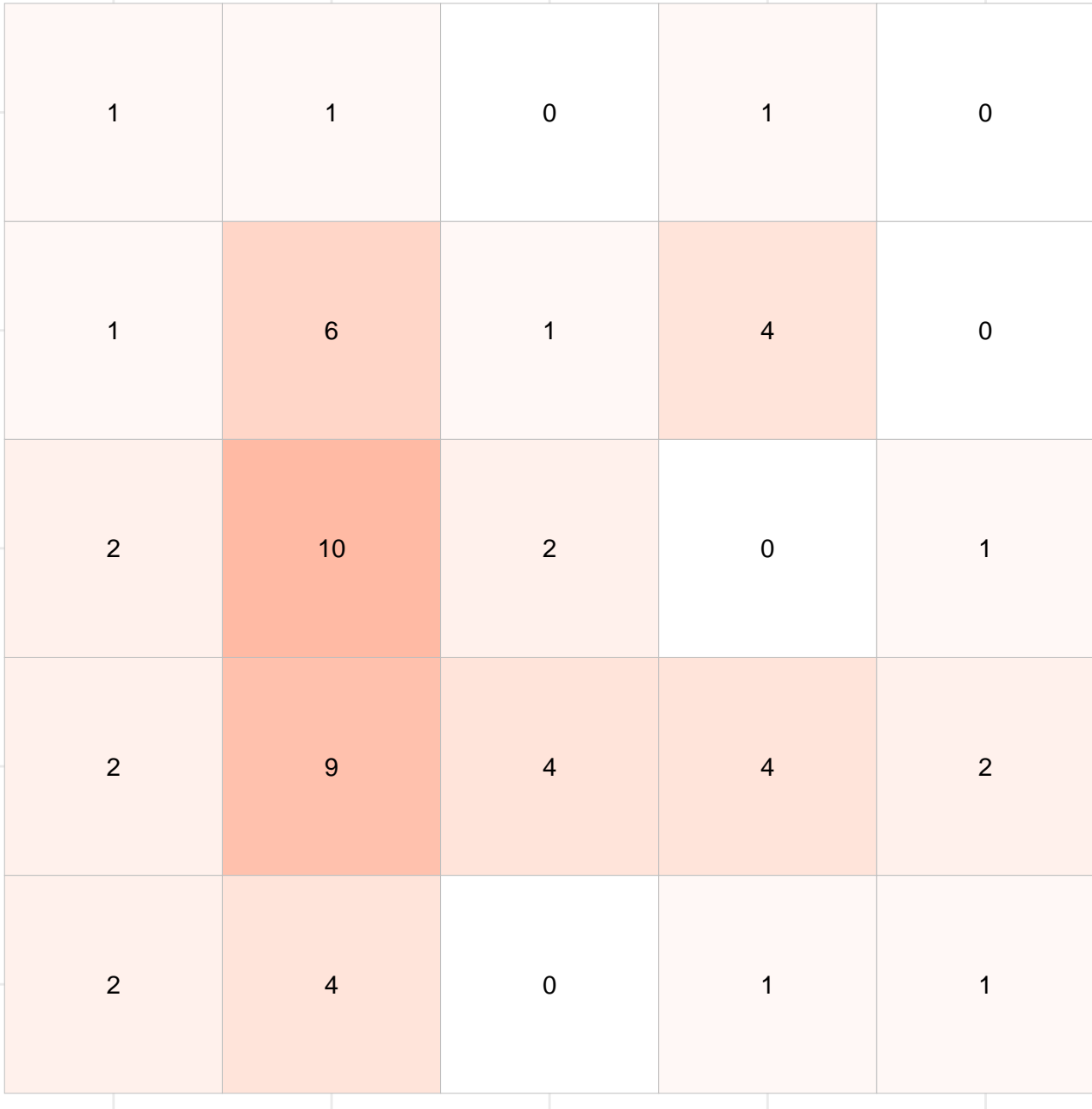
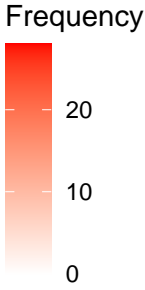
MISSIONPERFORMANCE

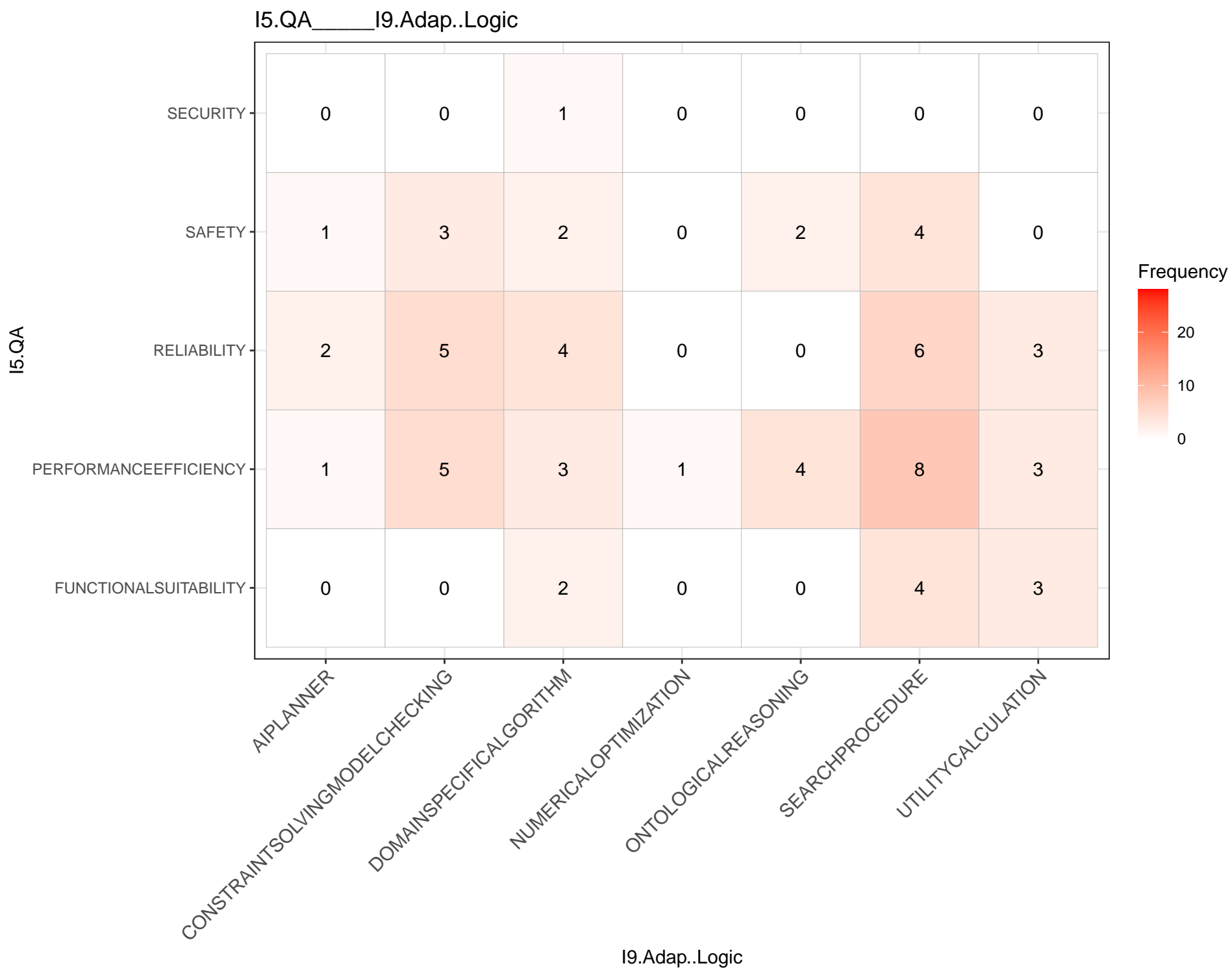
OVERHEADINTRODUCED

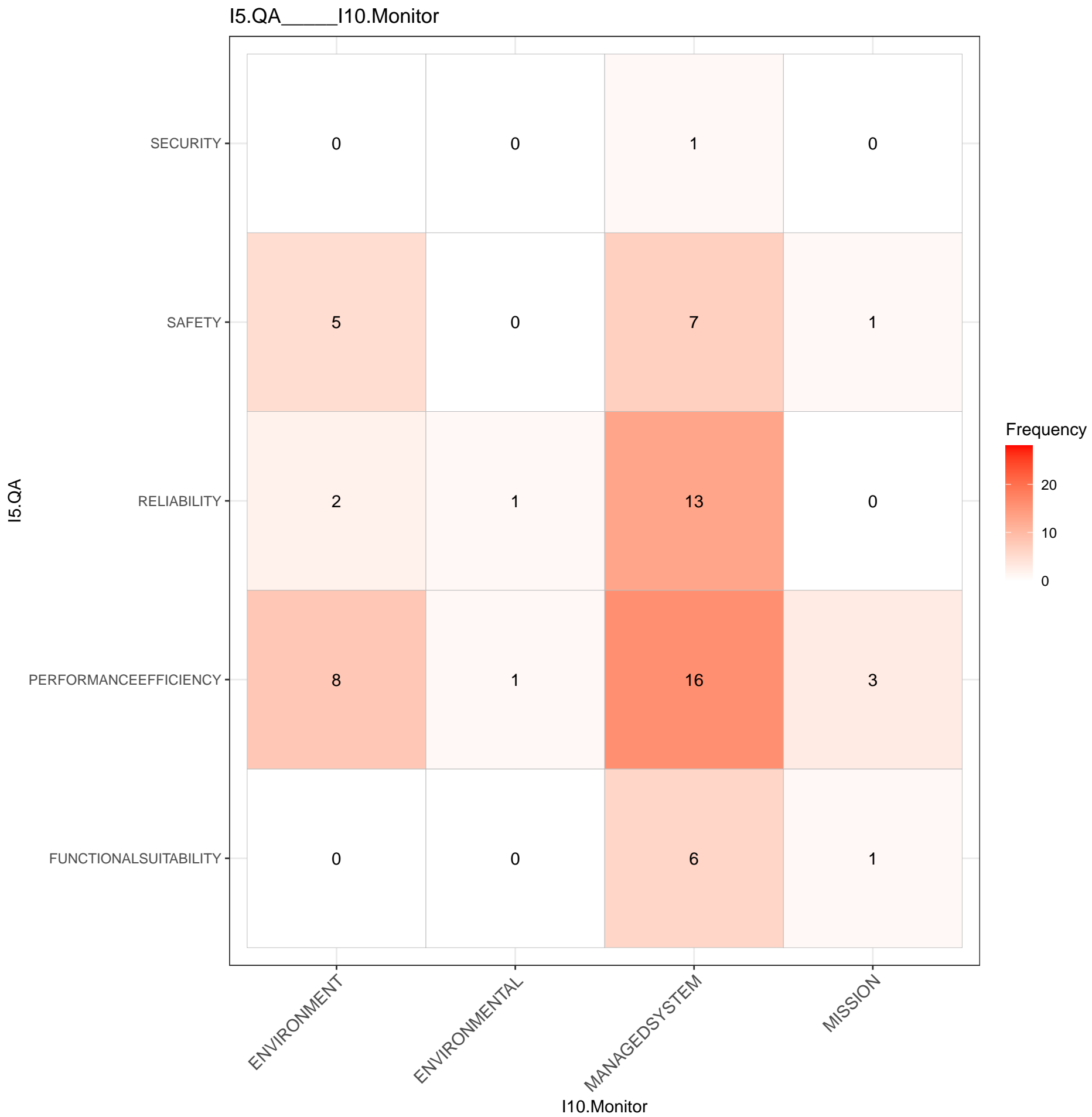
QUALITY

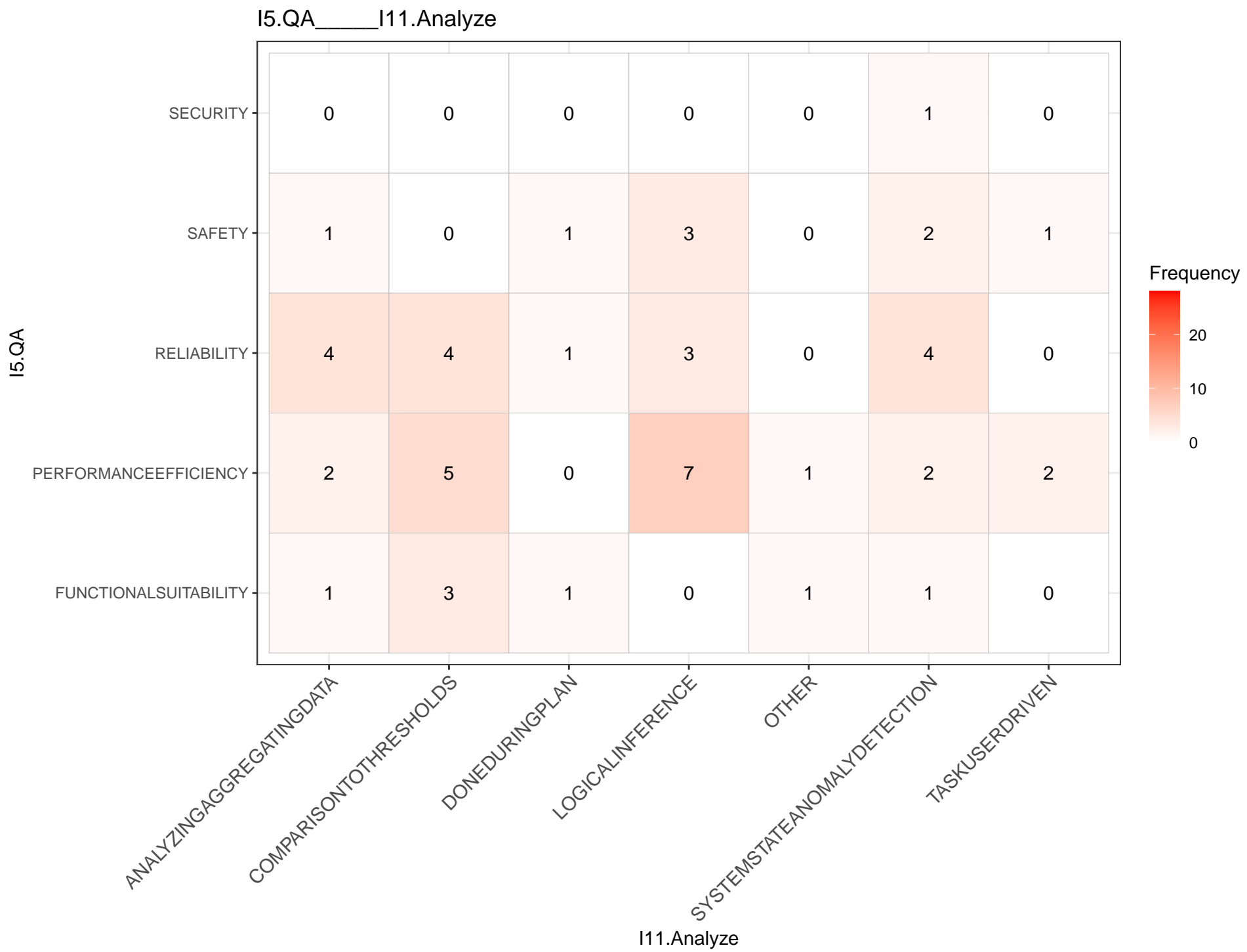
RESOURCECONSUMPTION

I8.Evaluation

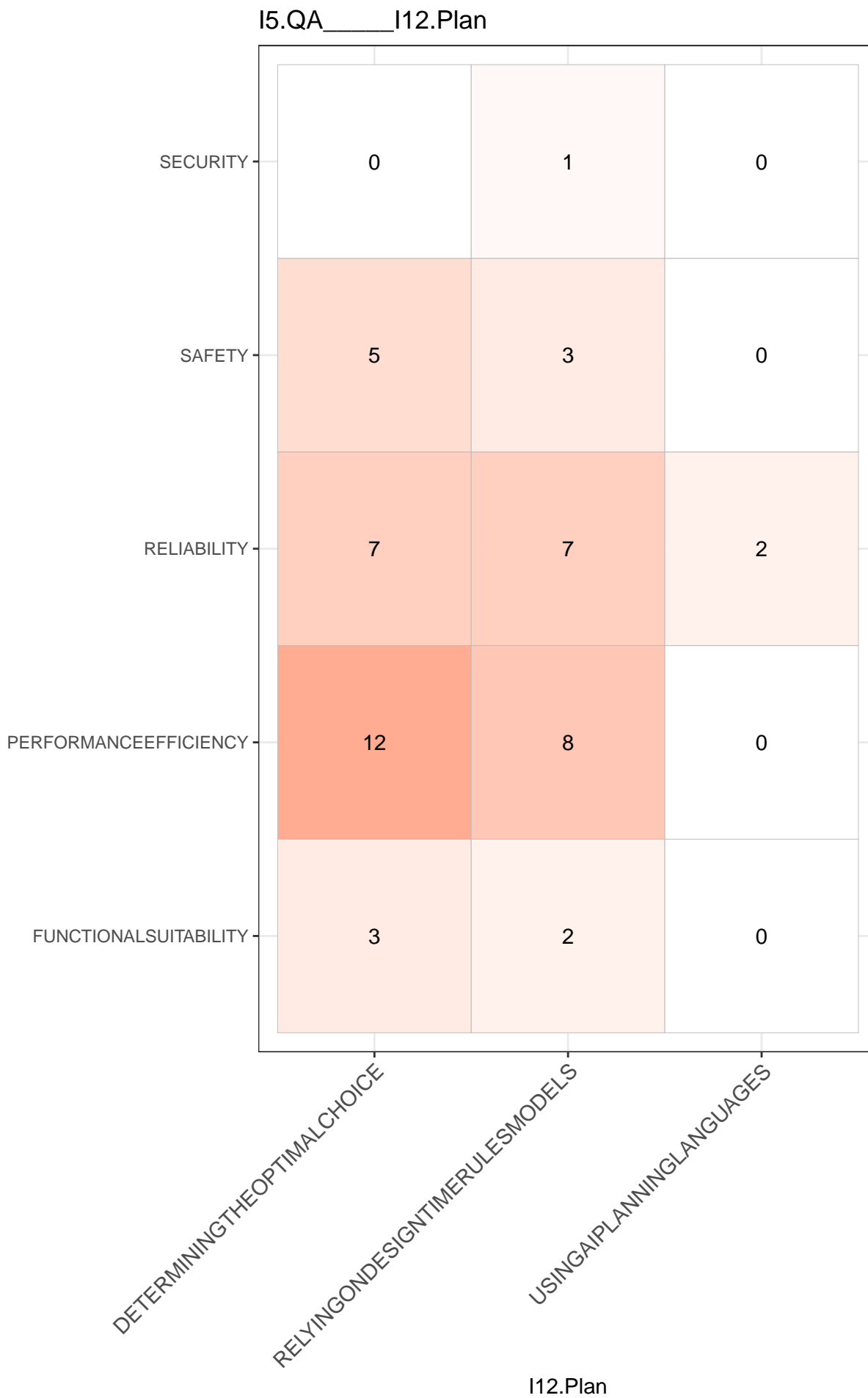






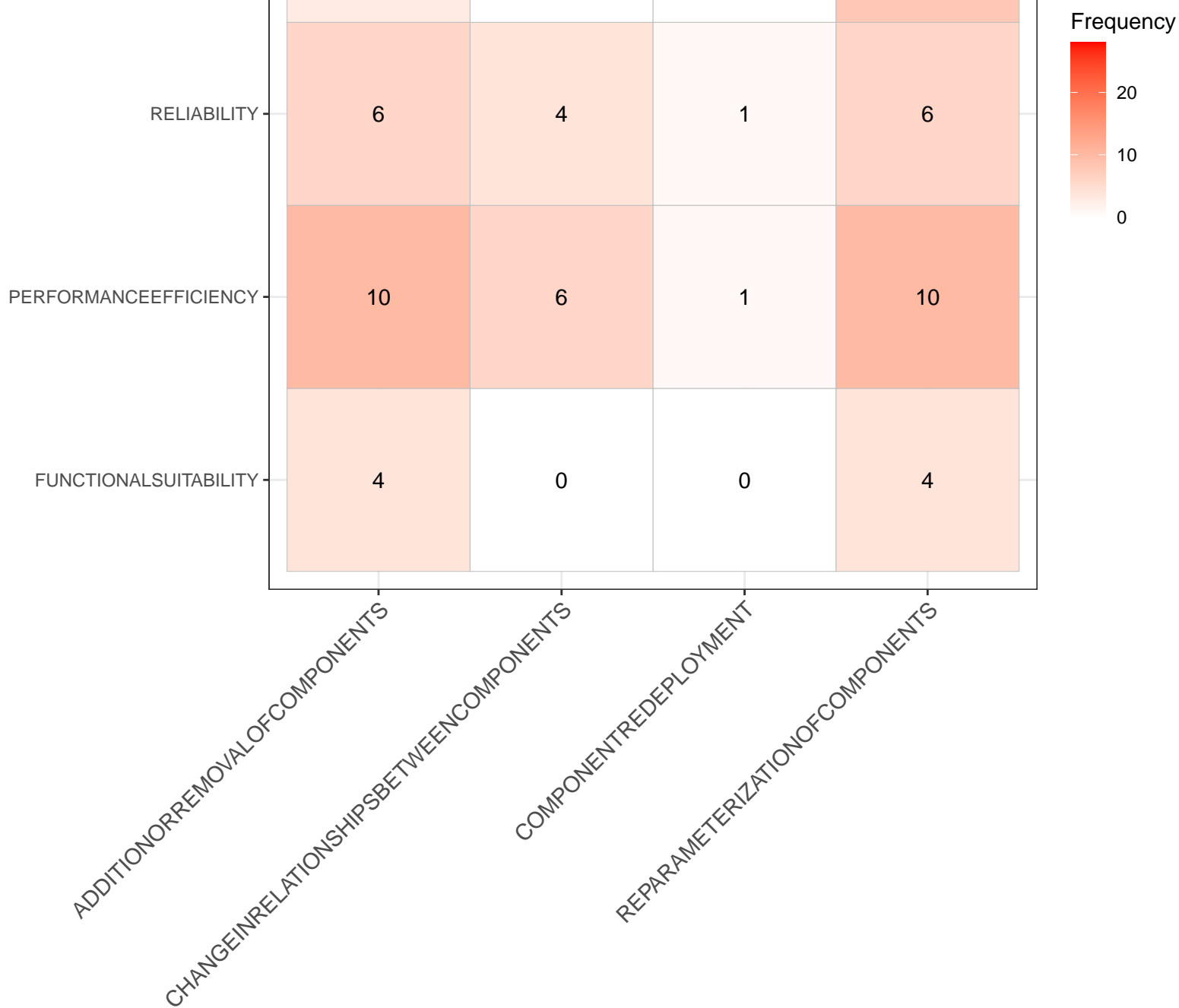


I5.QA

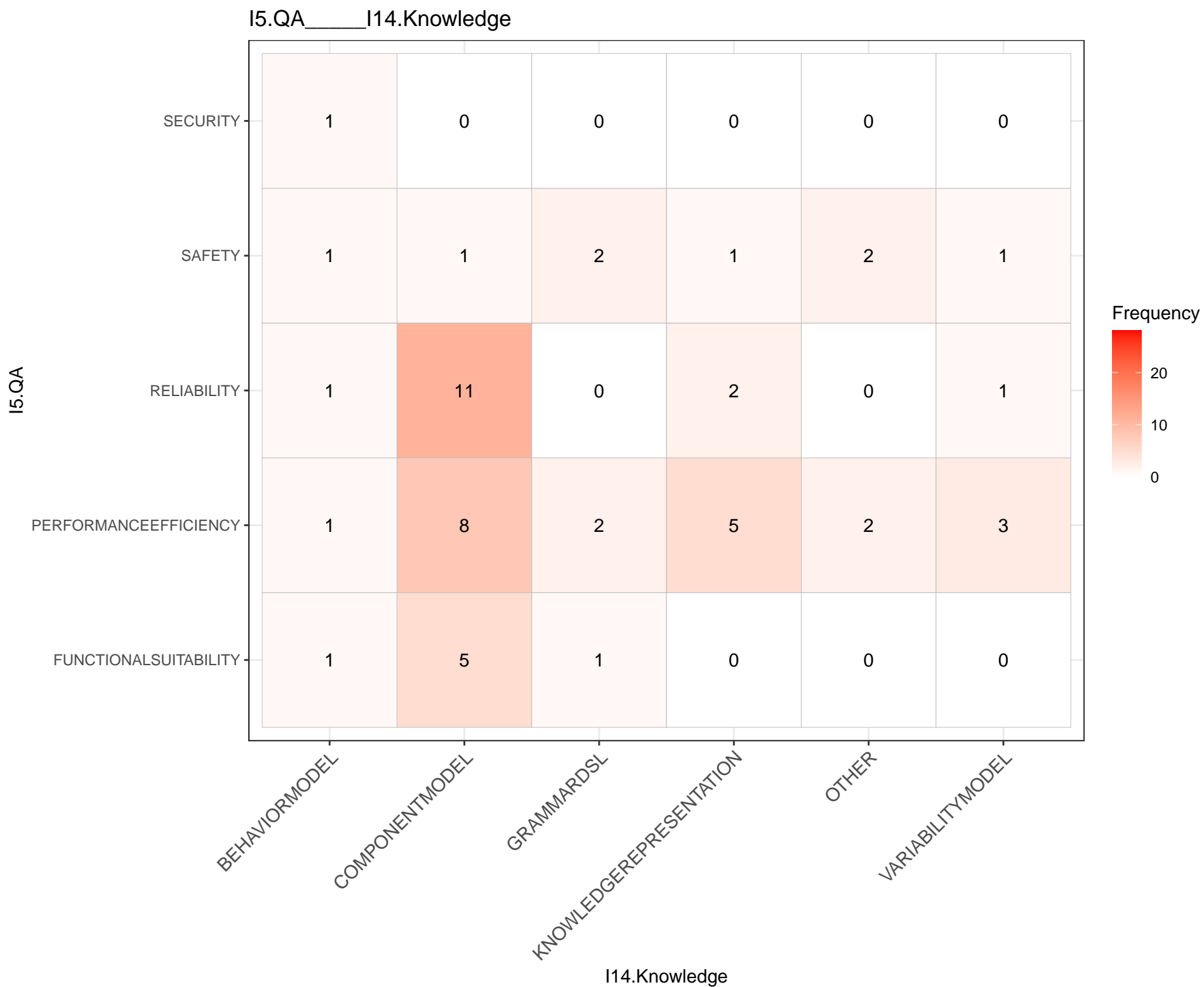


I5.QA_____I13.Execute

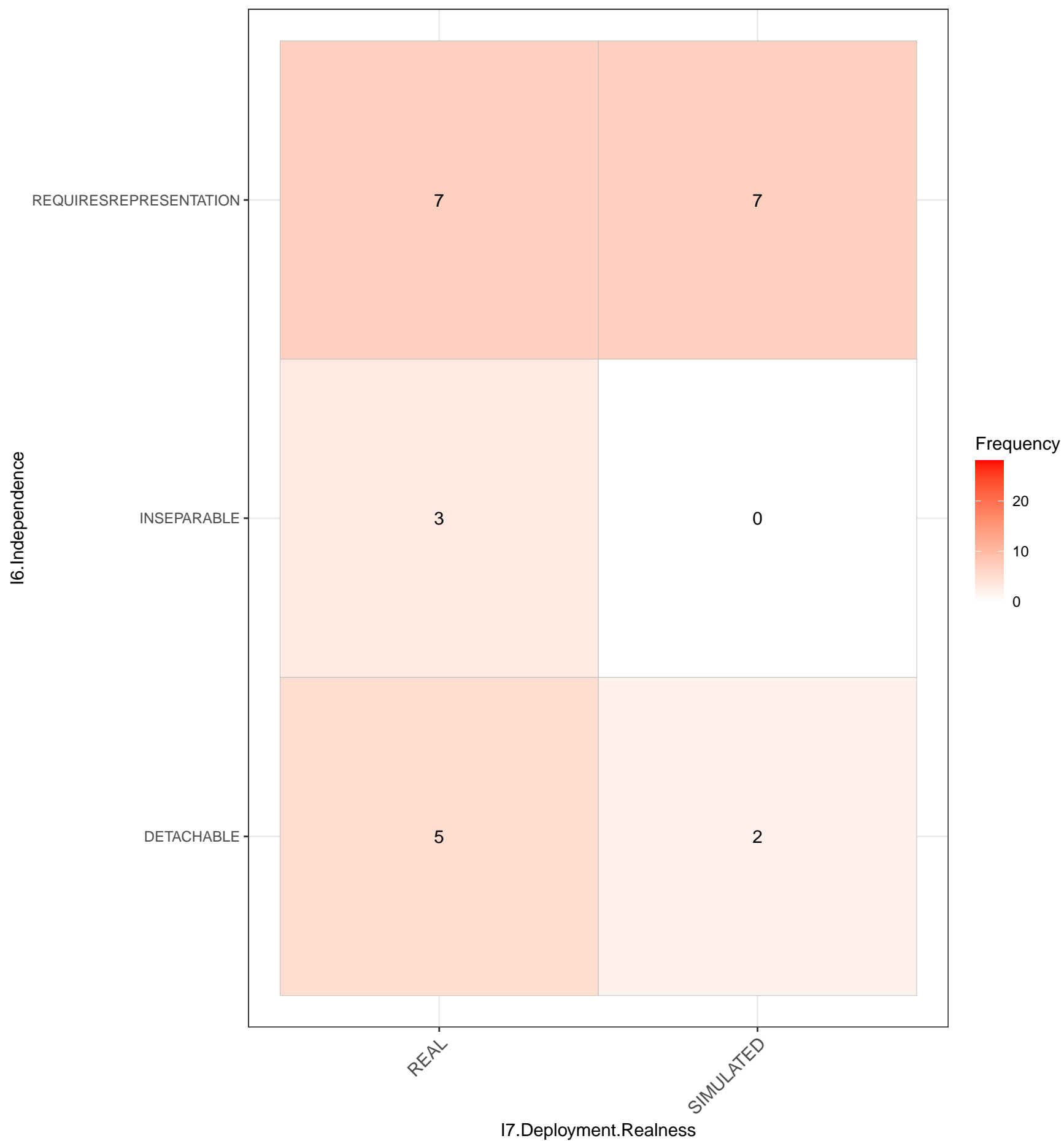
I5.QA



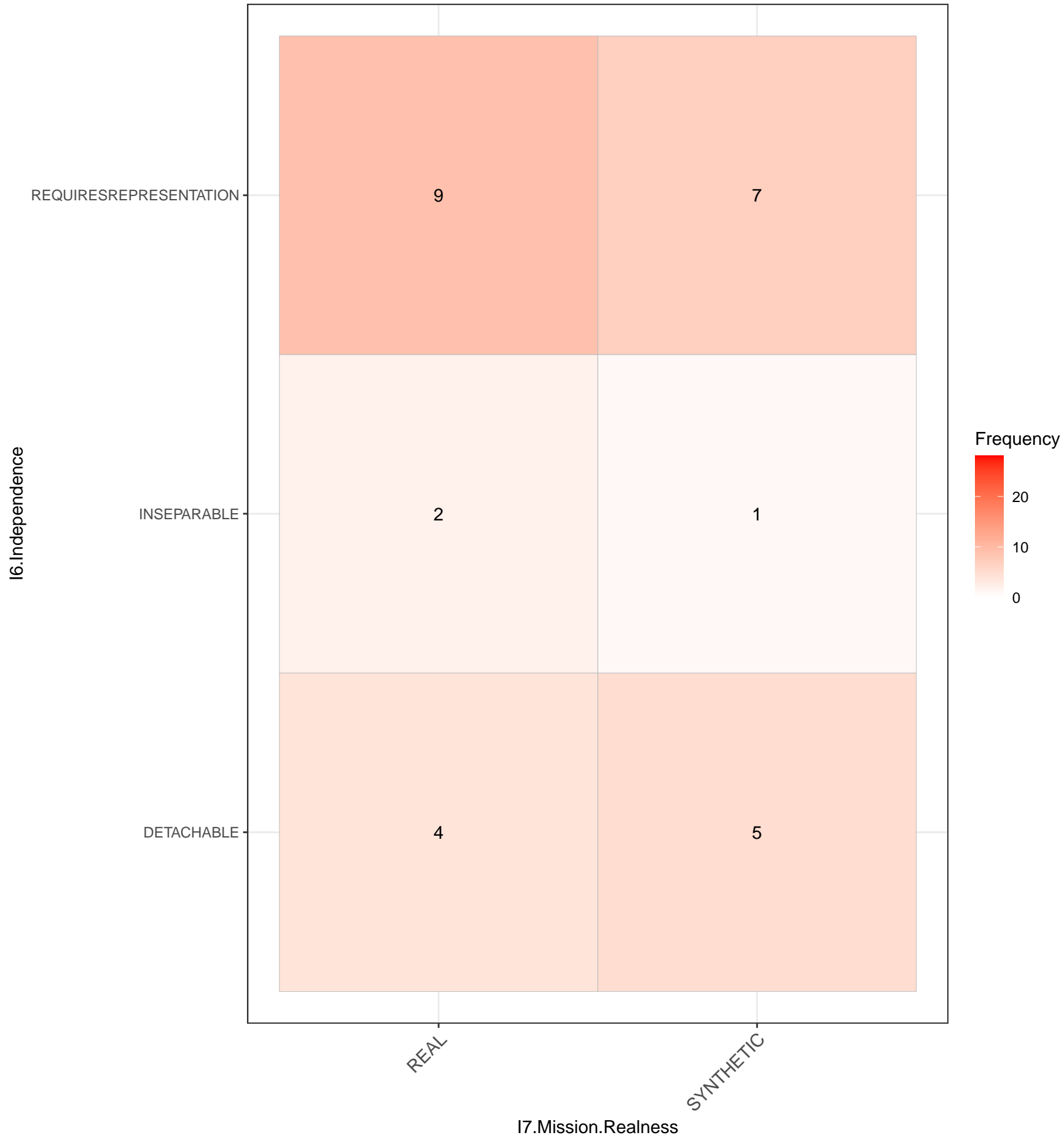
I13.Execute



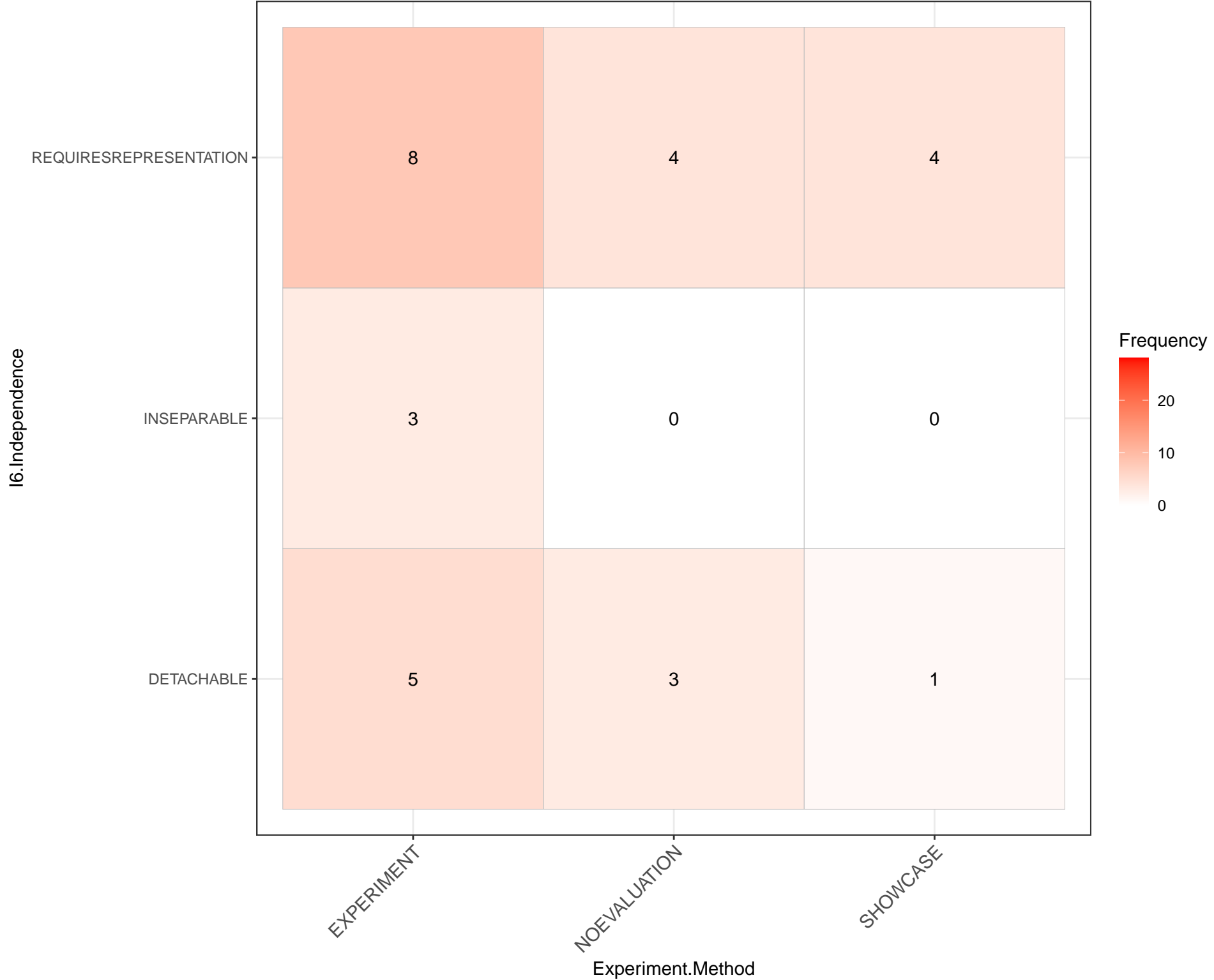
I6.Independence_____I7.Deployment.Realness

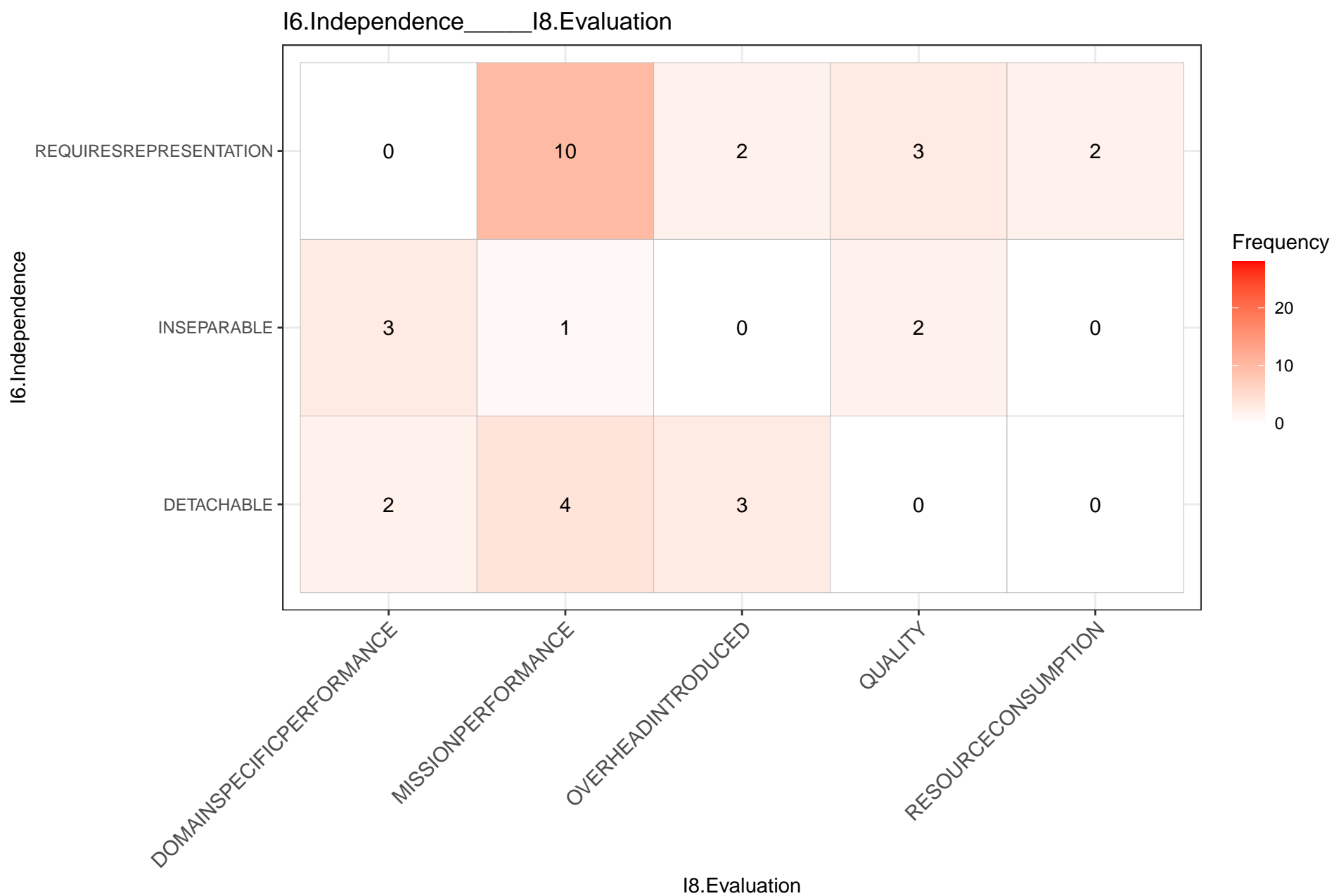


I6.Independence_____I7.Mission.Realness

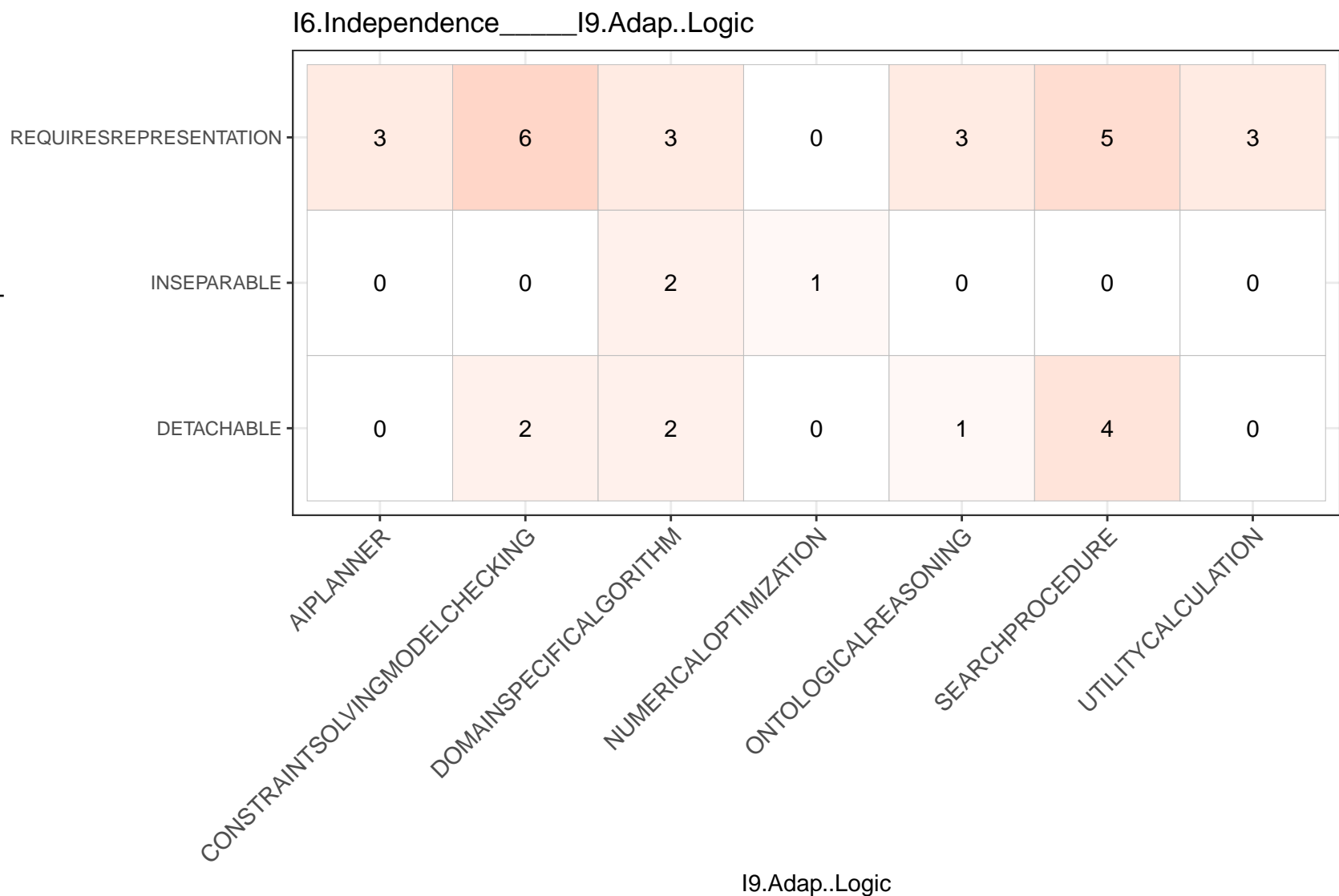


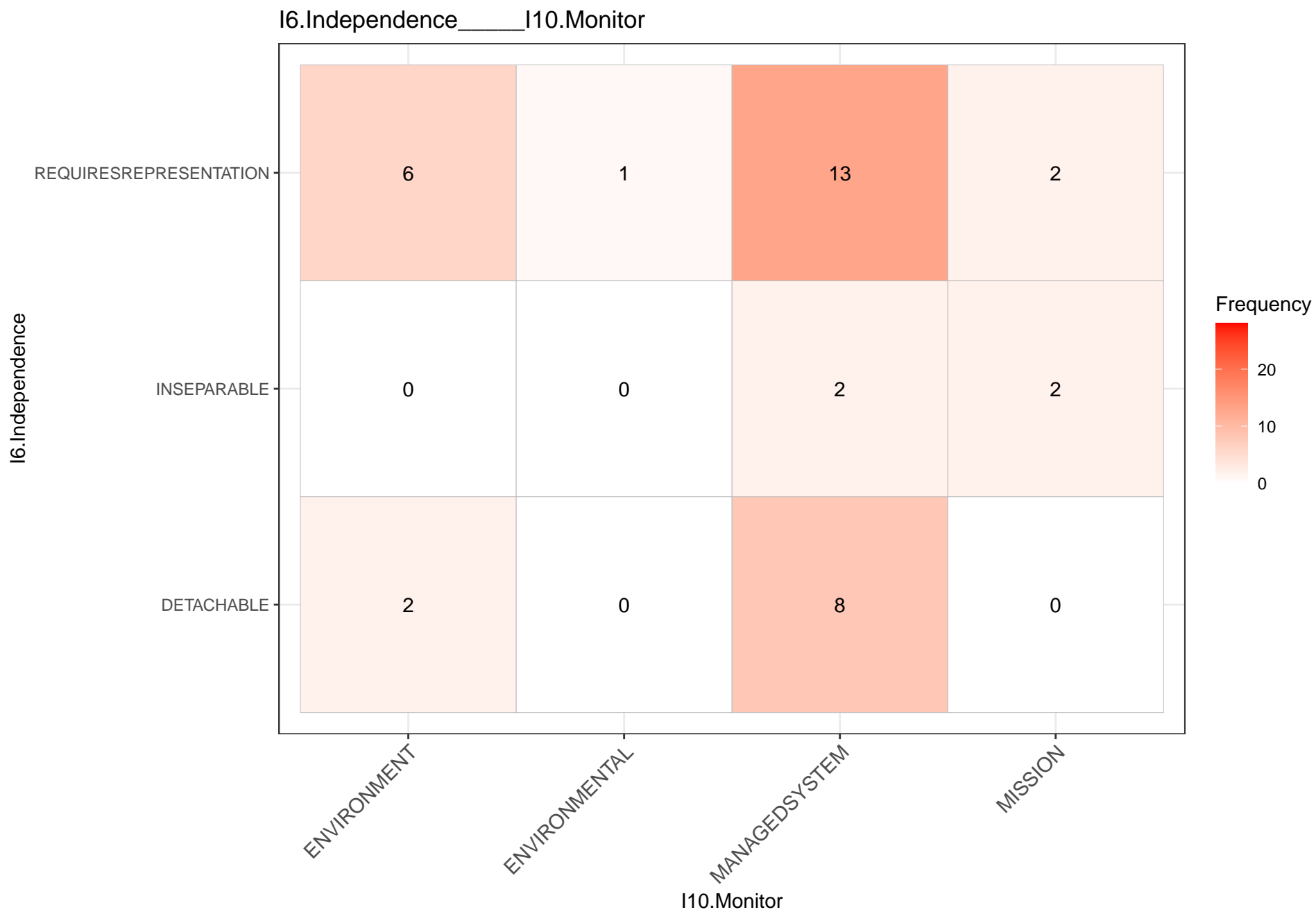
I6.Independence_____Experiment.Method



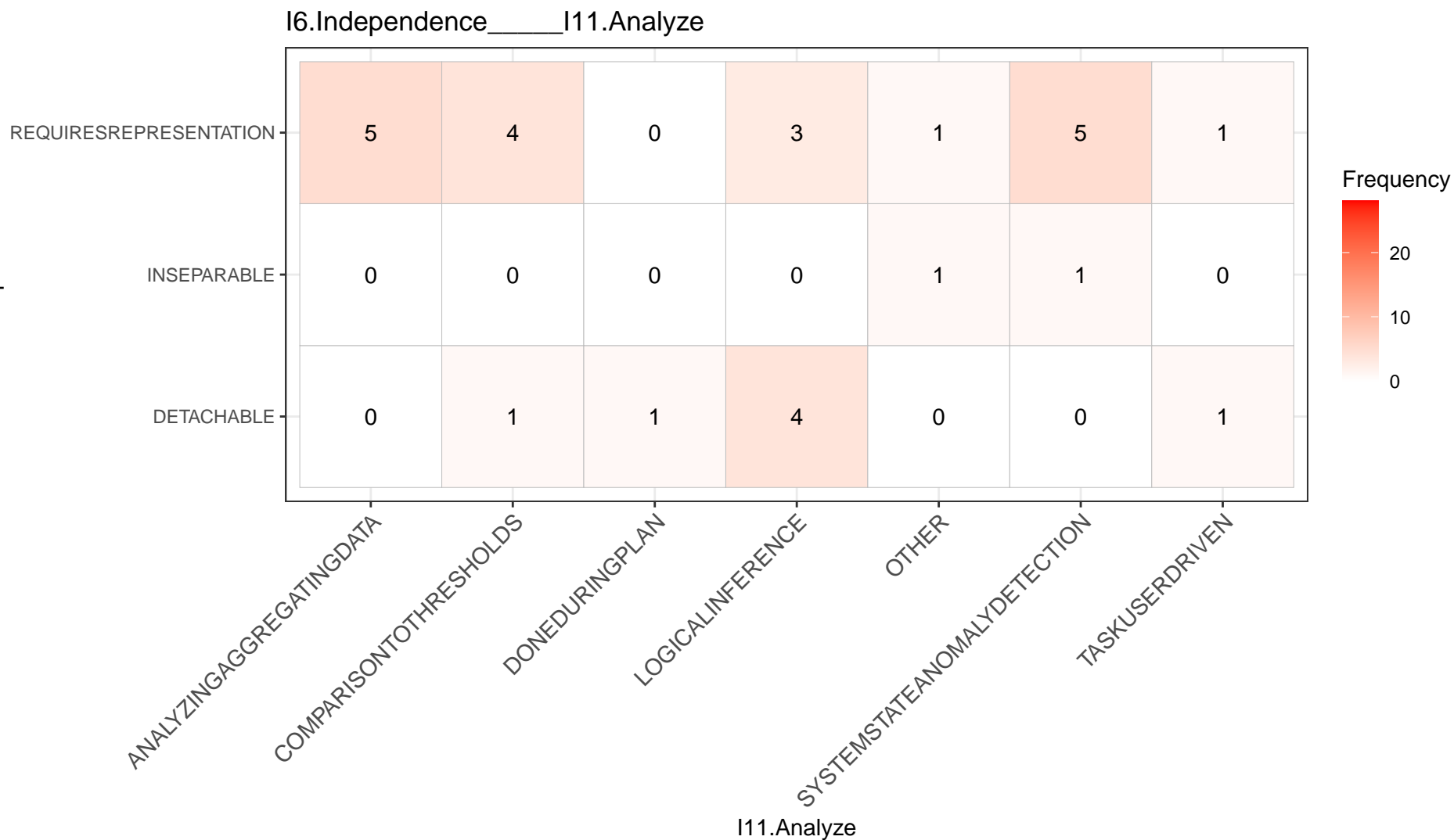


I6.Independence





I6.Independence



I6.Independence_____I12.Plan

I6.Independence

REQUIRESREPRESENTATION

INSEPARABLE

DETACHABLE

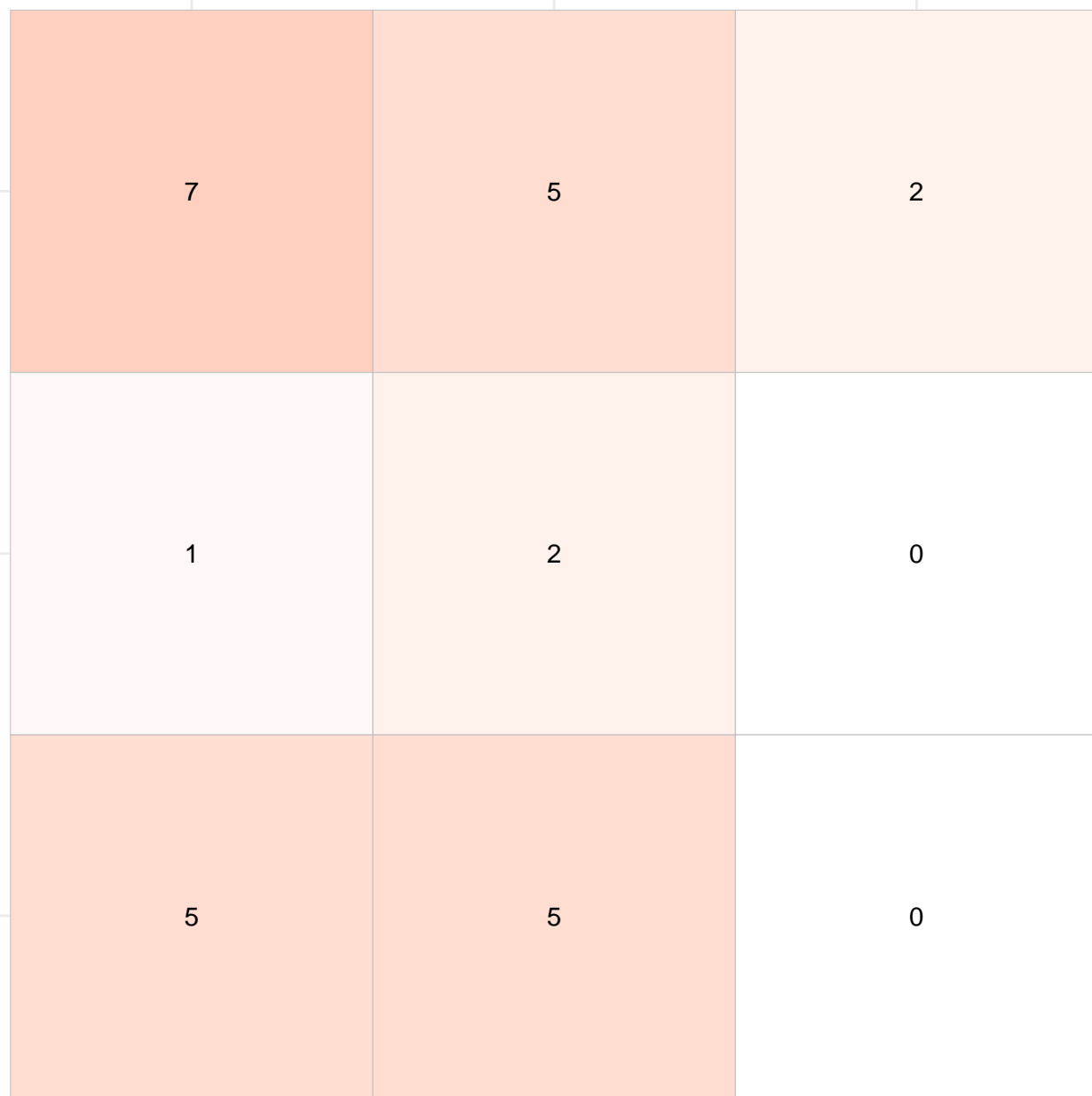
DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPANNINGLANGUAGES

I12.Plan

Frequency



I6.Independence_____I13.Execute

I6.Independence

REQUIRESREPRESENTATION

INSEPARABLE

DETACHABLE

Frequency

20

10

0

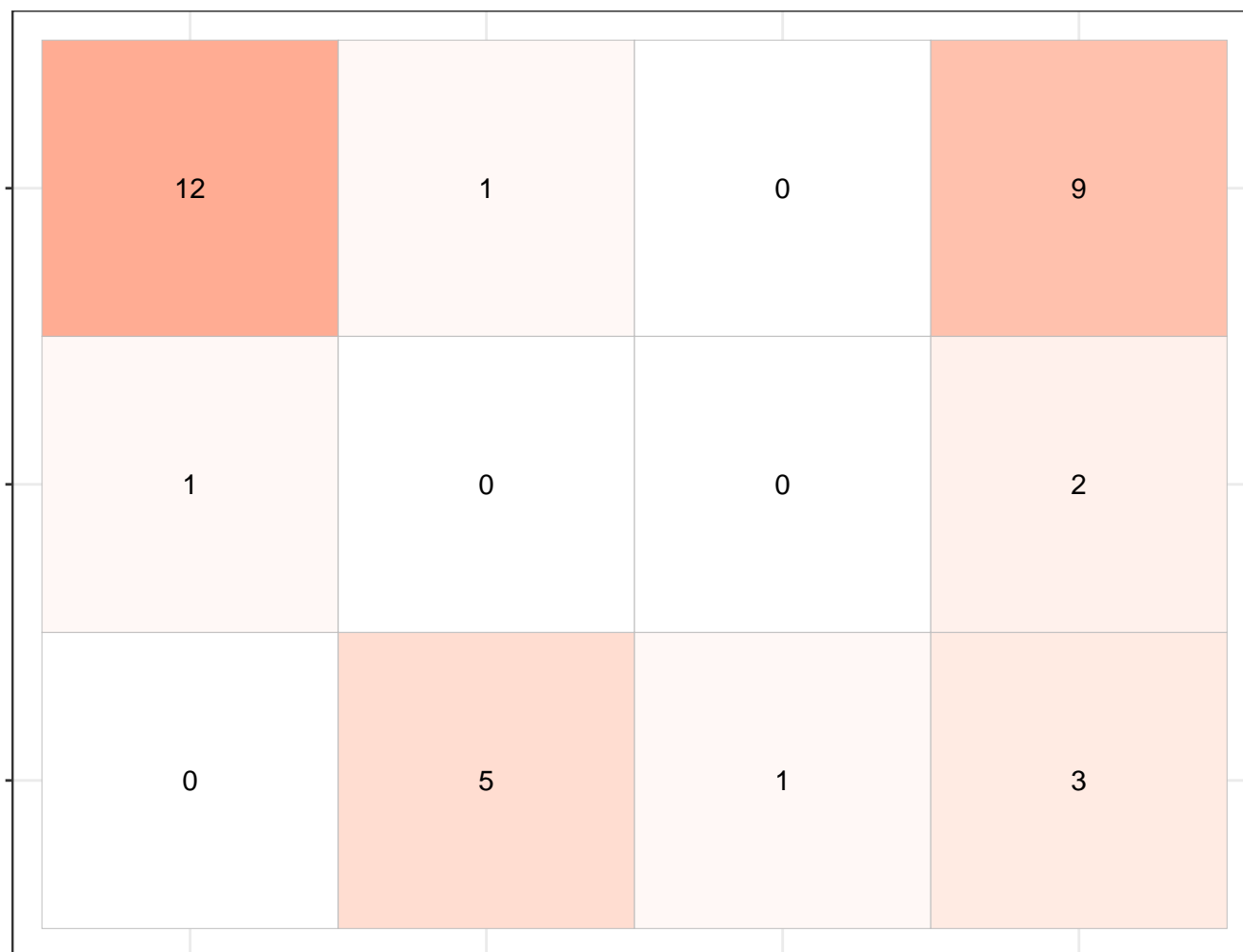
ADDITIONORREMOVALOFCOMPONENTS

CHANGEINRELATIONSHIPSBETWEENCOMPONENTS

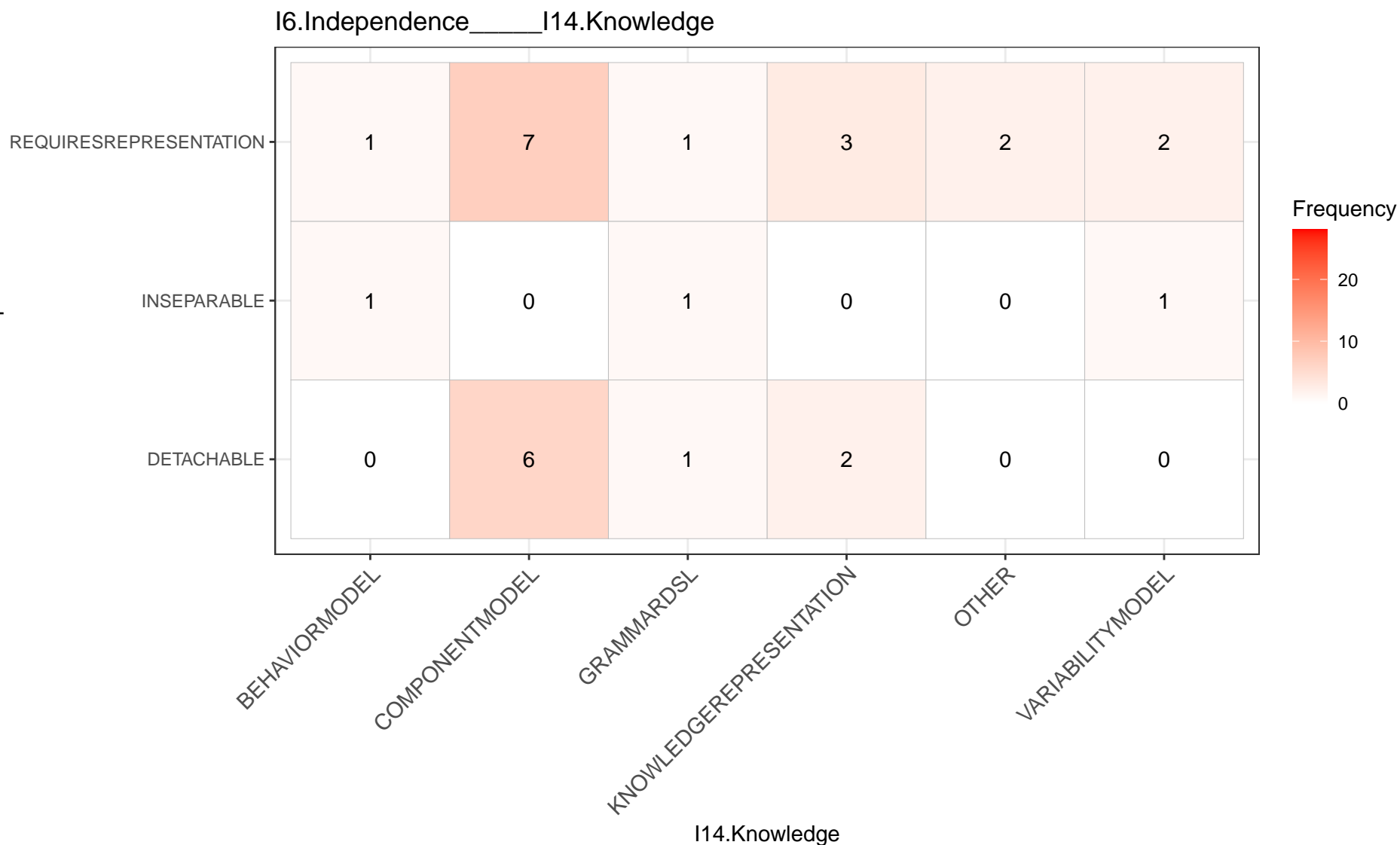
COMPONENTREDEPLOYMENT

REPARAMETERIZATIONOFCOMPONENTS

I13.Execute



I6.Independence



I7.Deployment.Realness_____I7.Mission.Realness

I7.Deployment.Realness

SIMULATED

5

4

REAL

7

8

REAL

SYNTHETIC

I7.Mission.Realness

Frequency



I7.Deployment.Realness_____Experiment.Method

I7.Deployment.Realness

SIMULATED

REAL

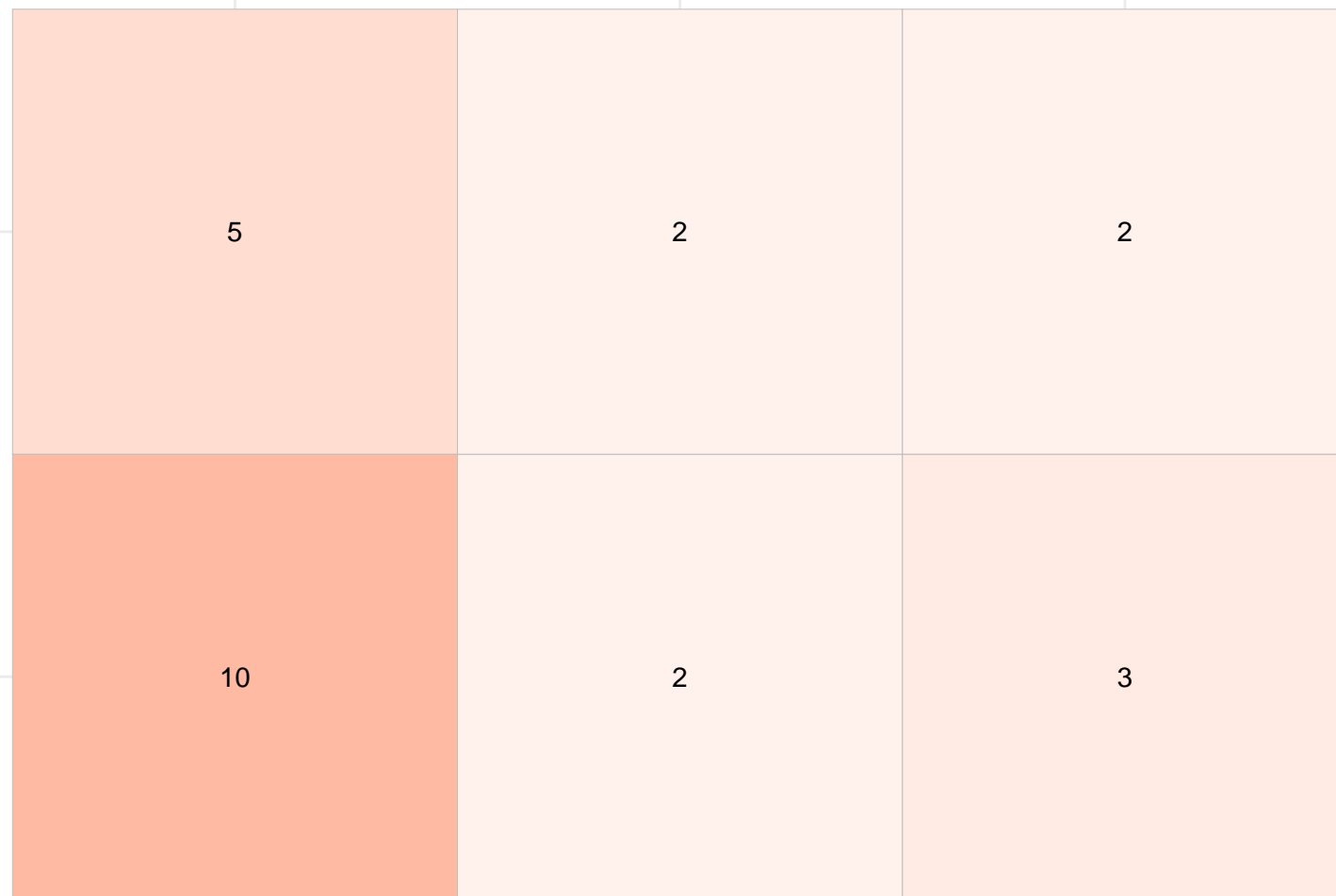
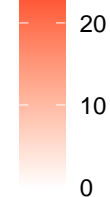
EXPERIMENT

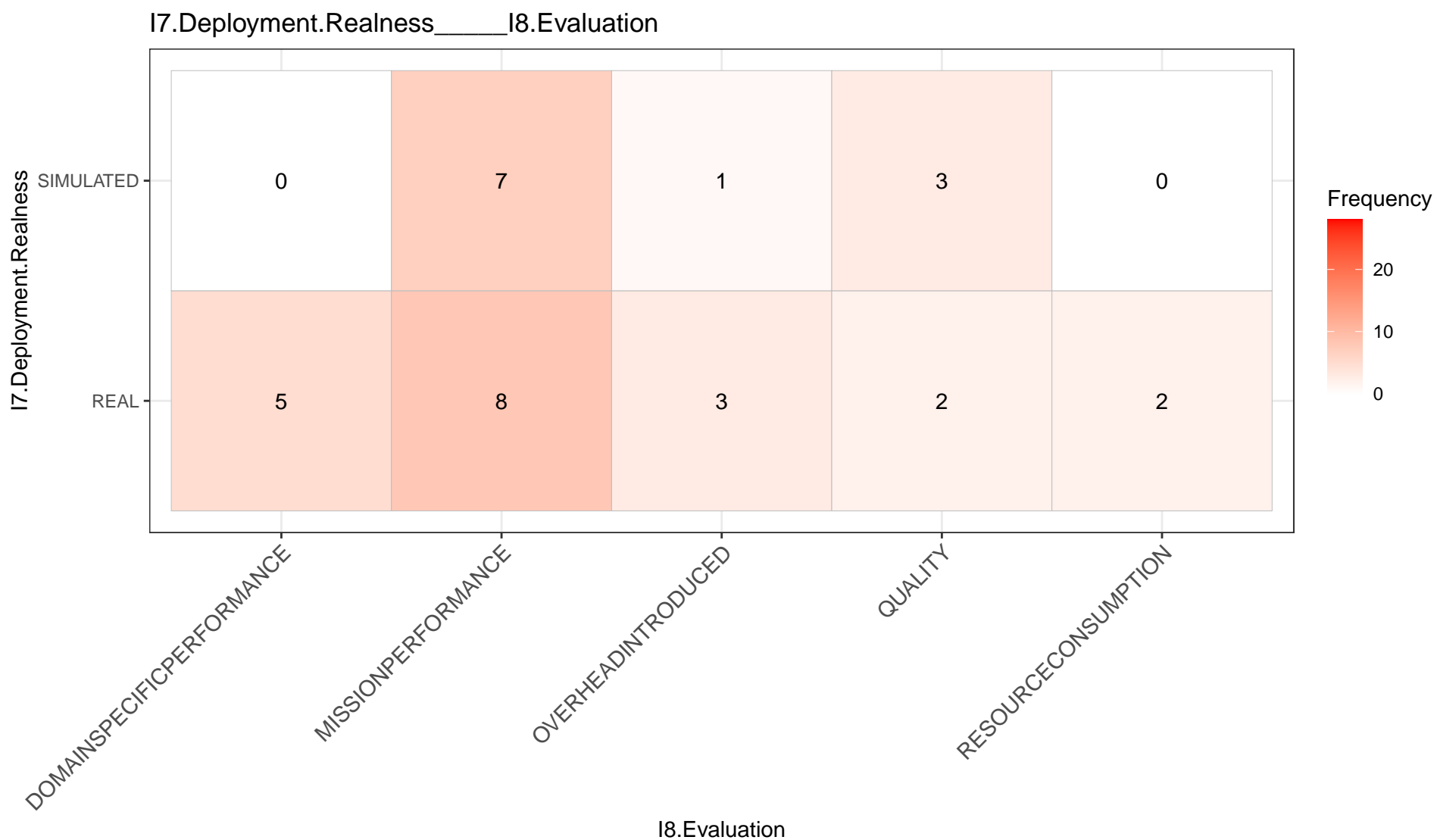
NOEVALUATION

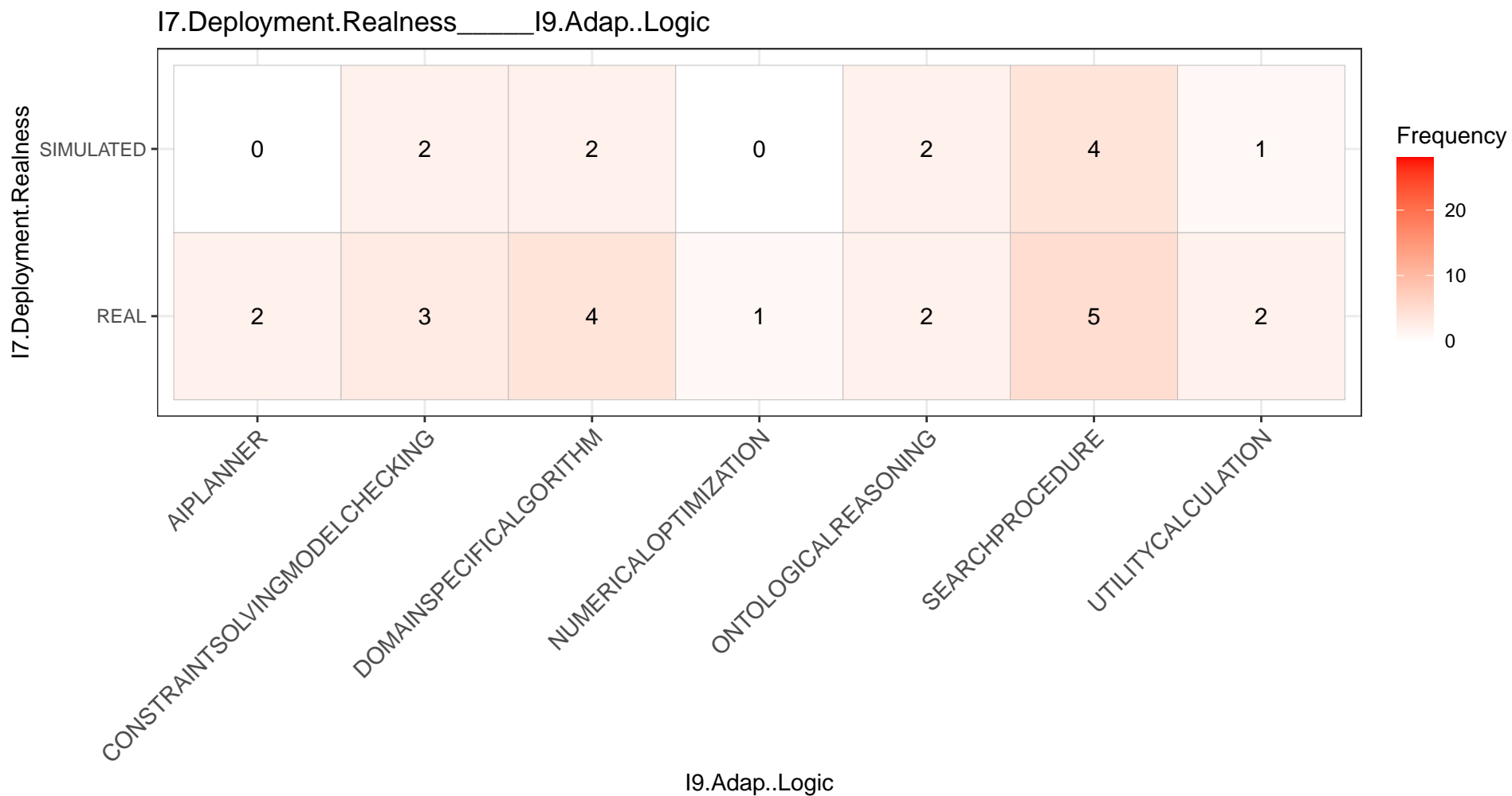
SHOWCASE

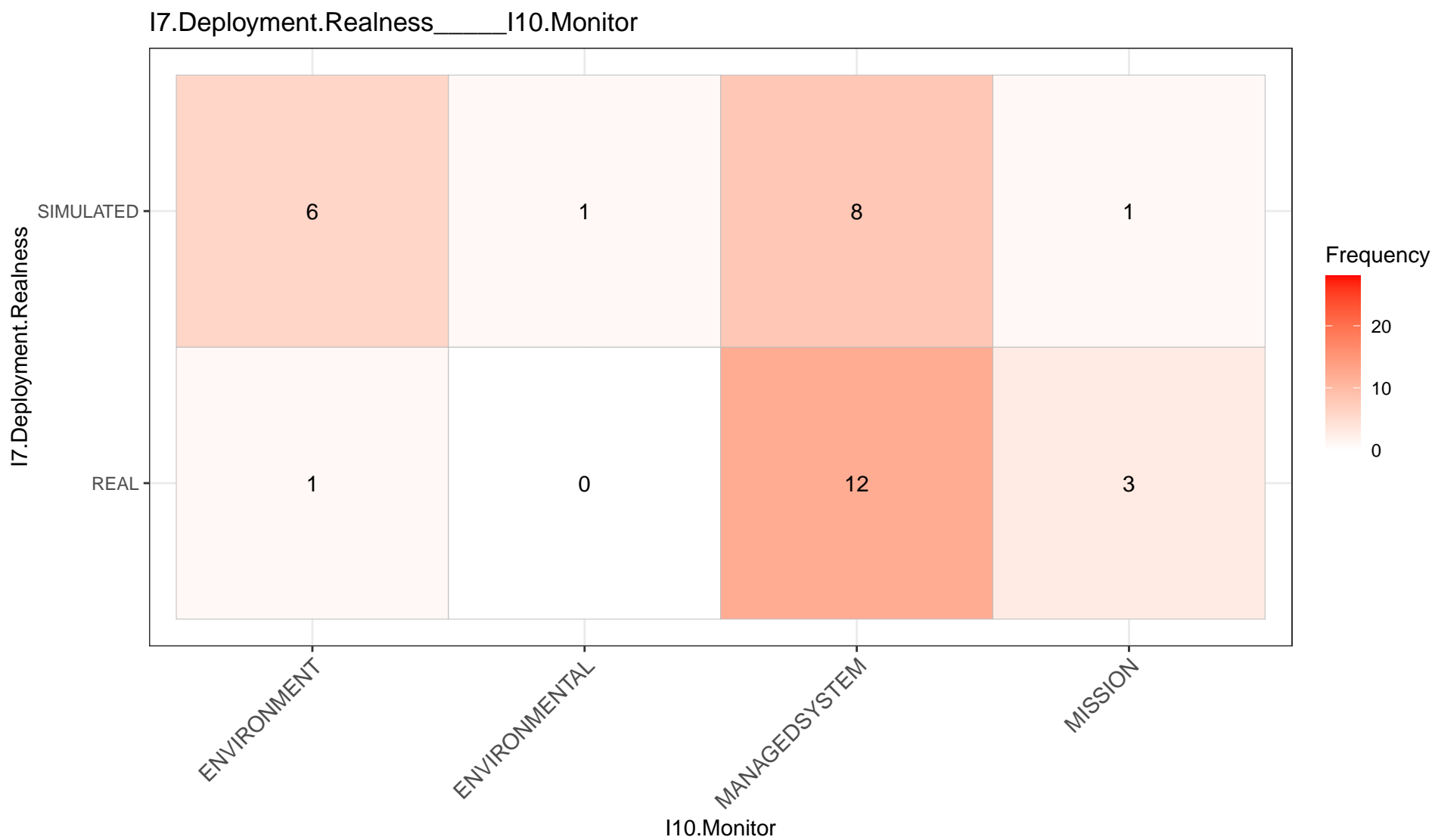
Experiment.Method

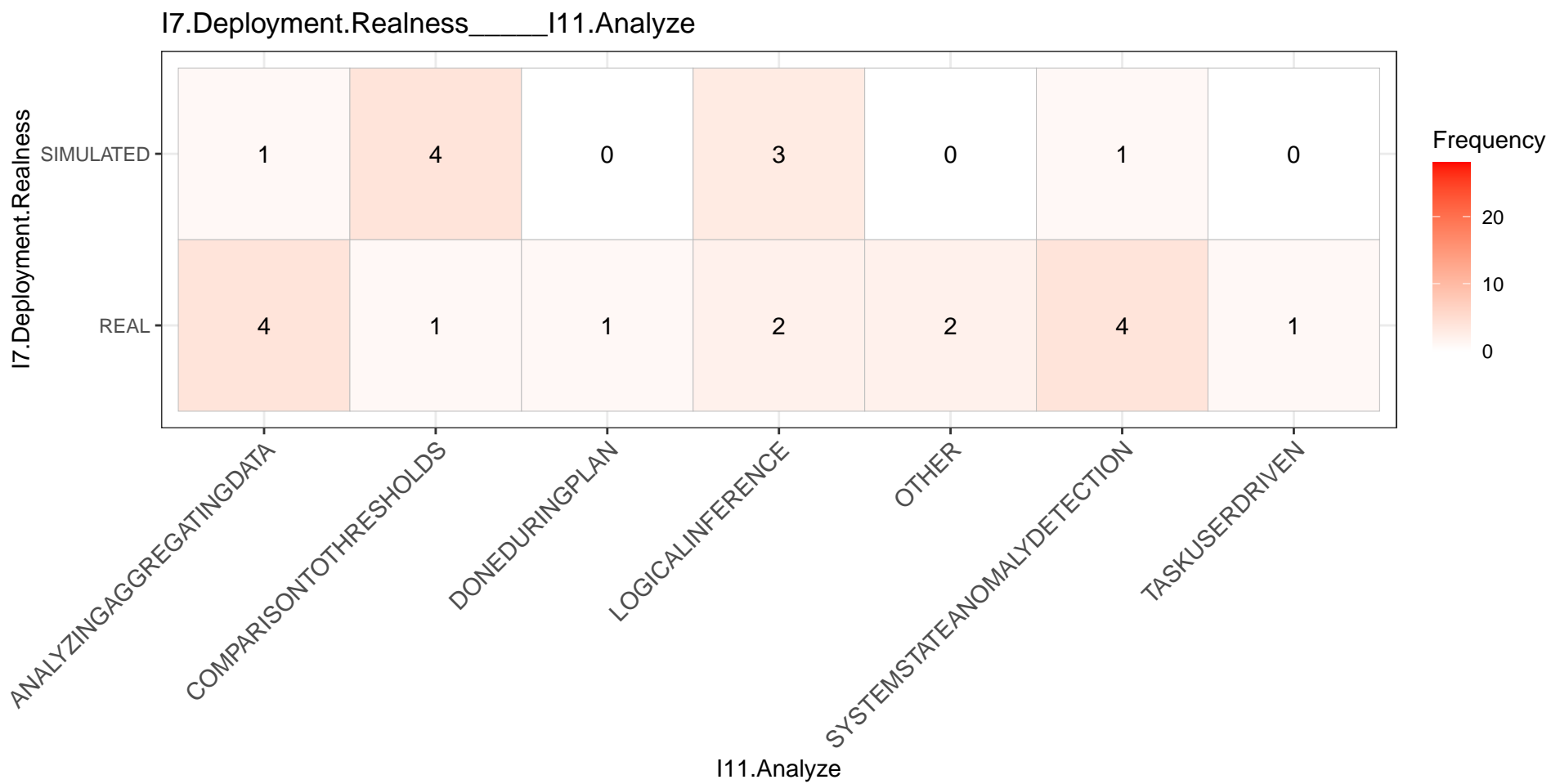
Frequency











I7.Deployment.Realness_____I12.Plan

I7.Deployment.Realness

SIMULATED

REAL

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPANNINGLANGUAGES

I12.Plan

Frequency



20

10

0

4

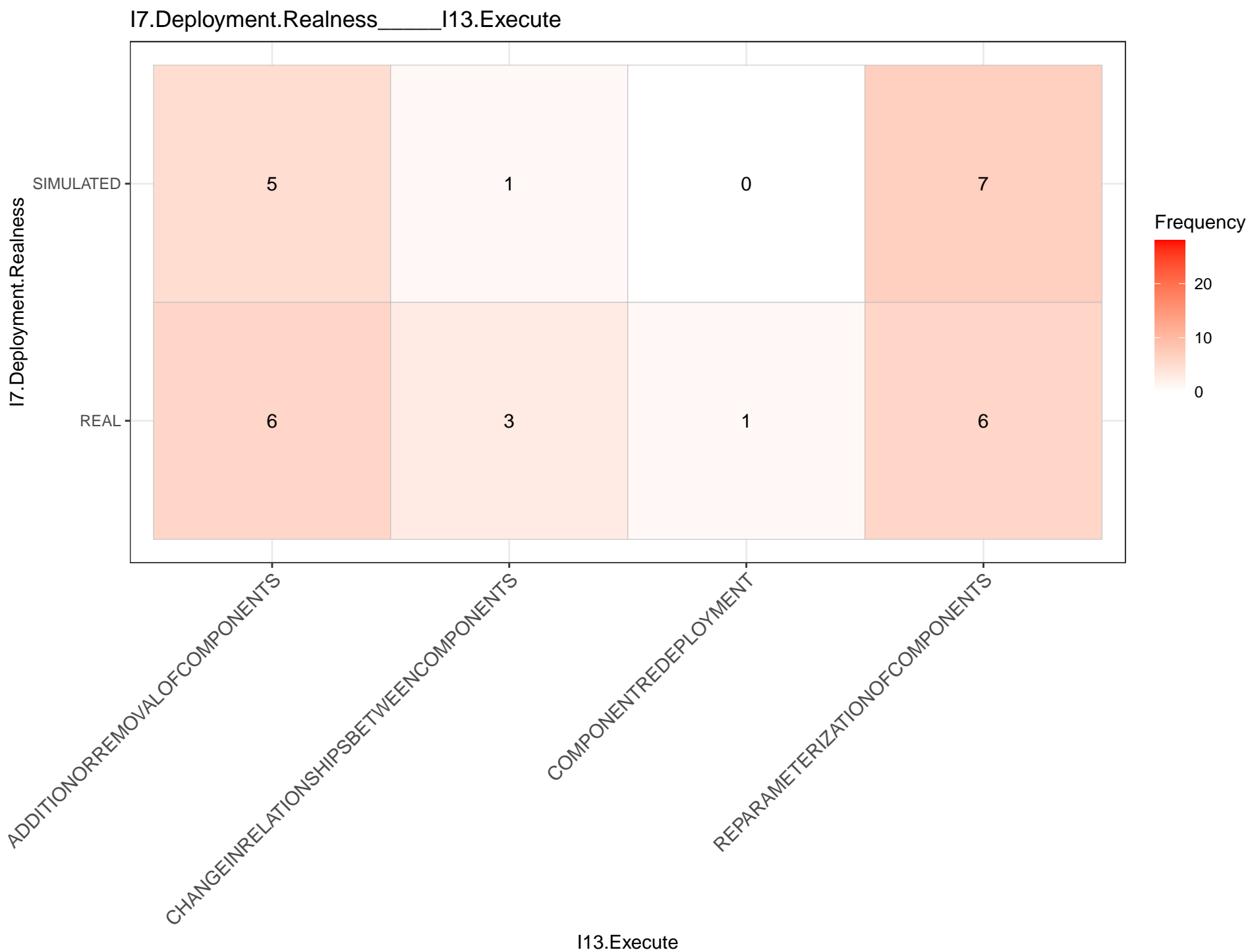
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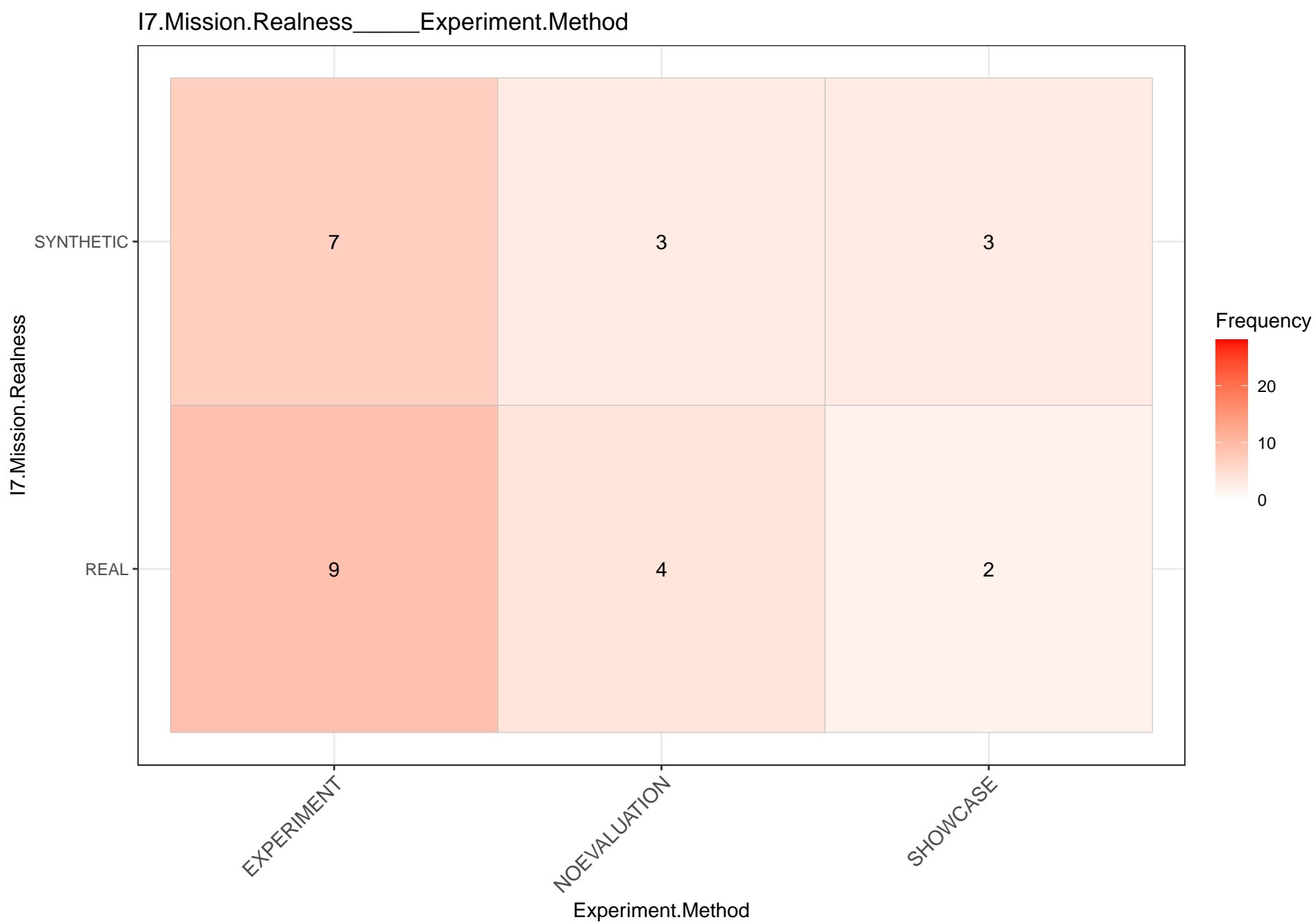
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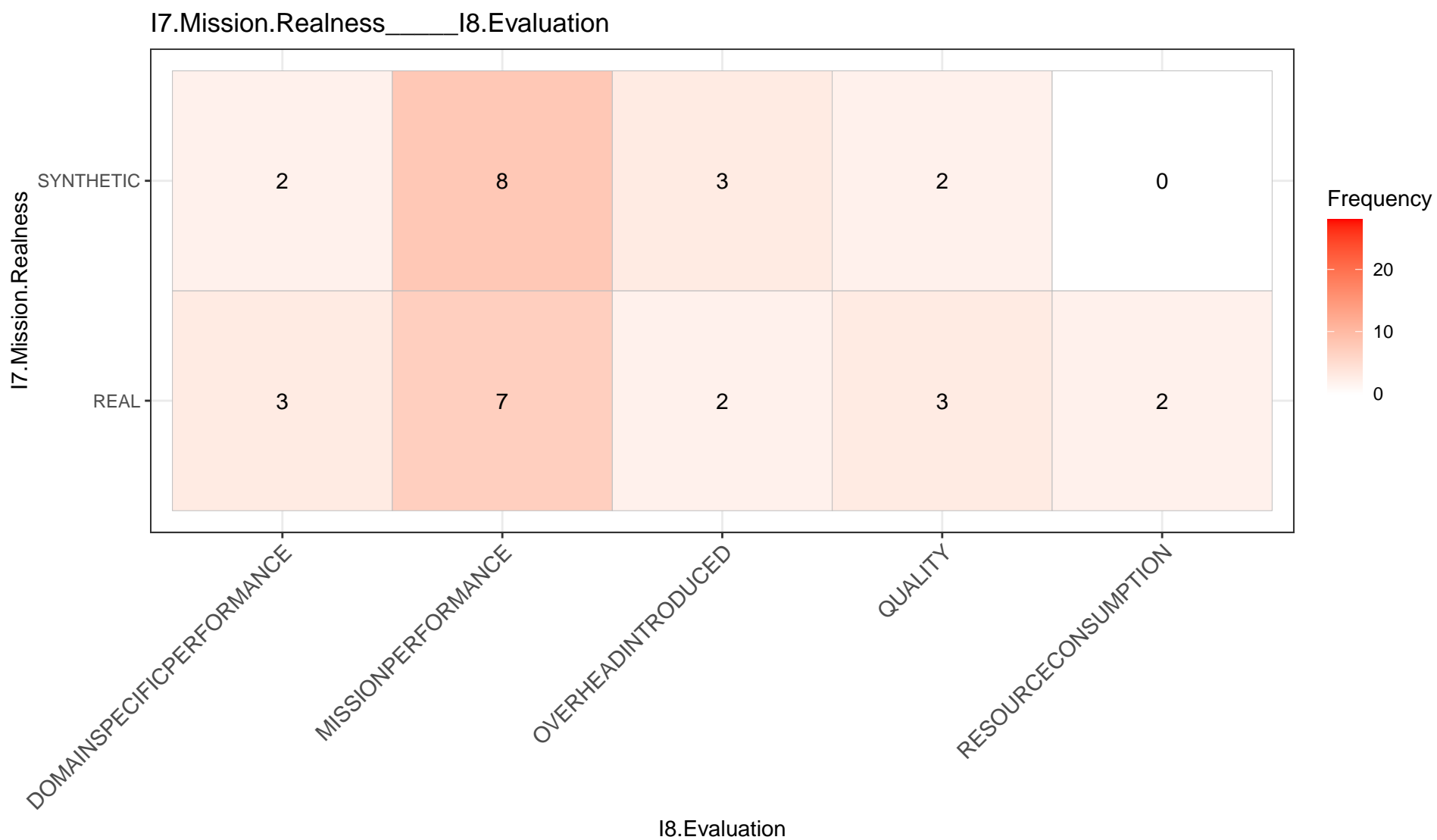
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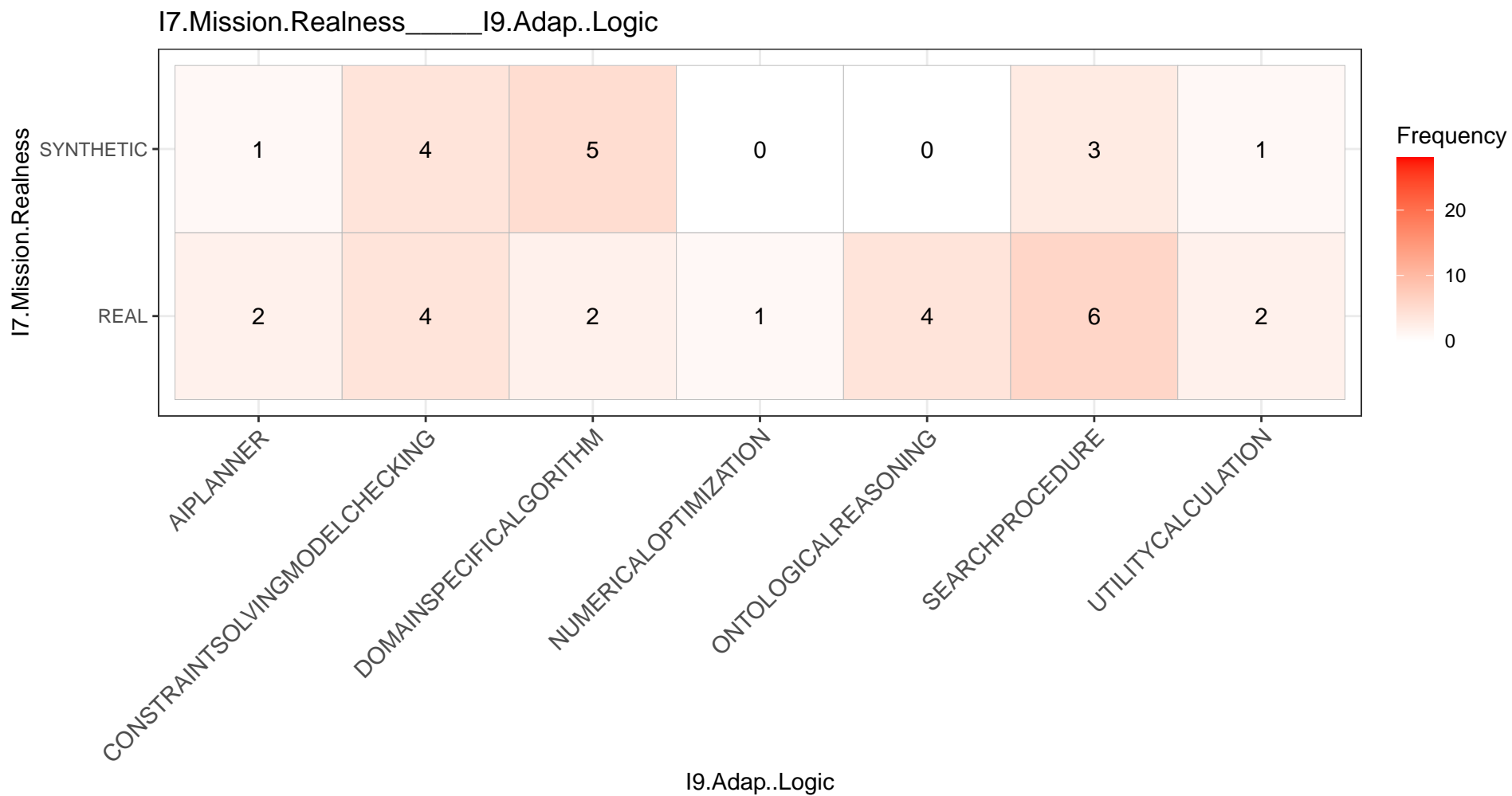
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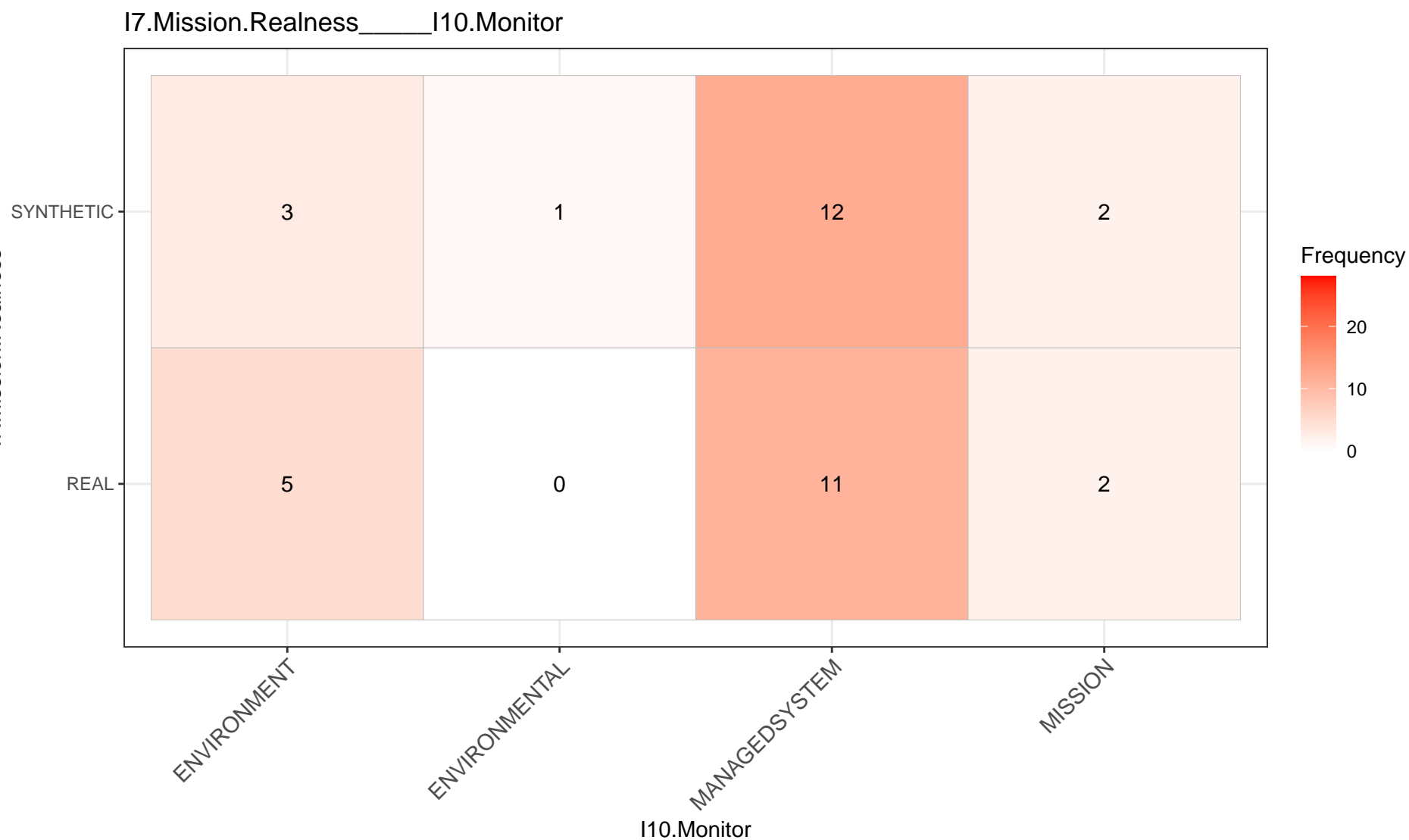


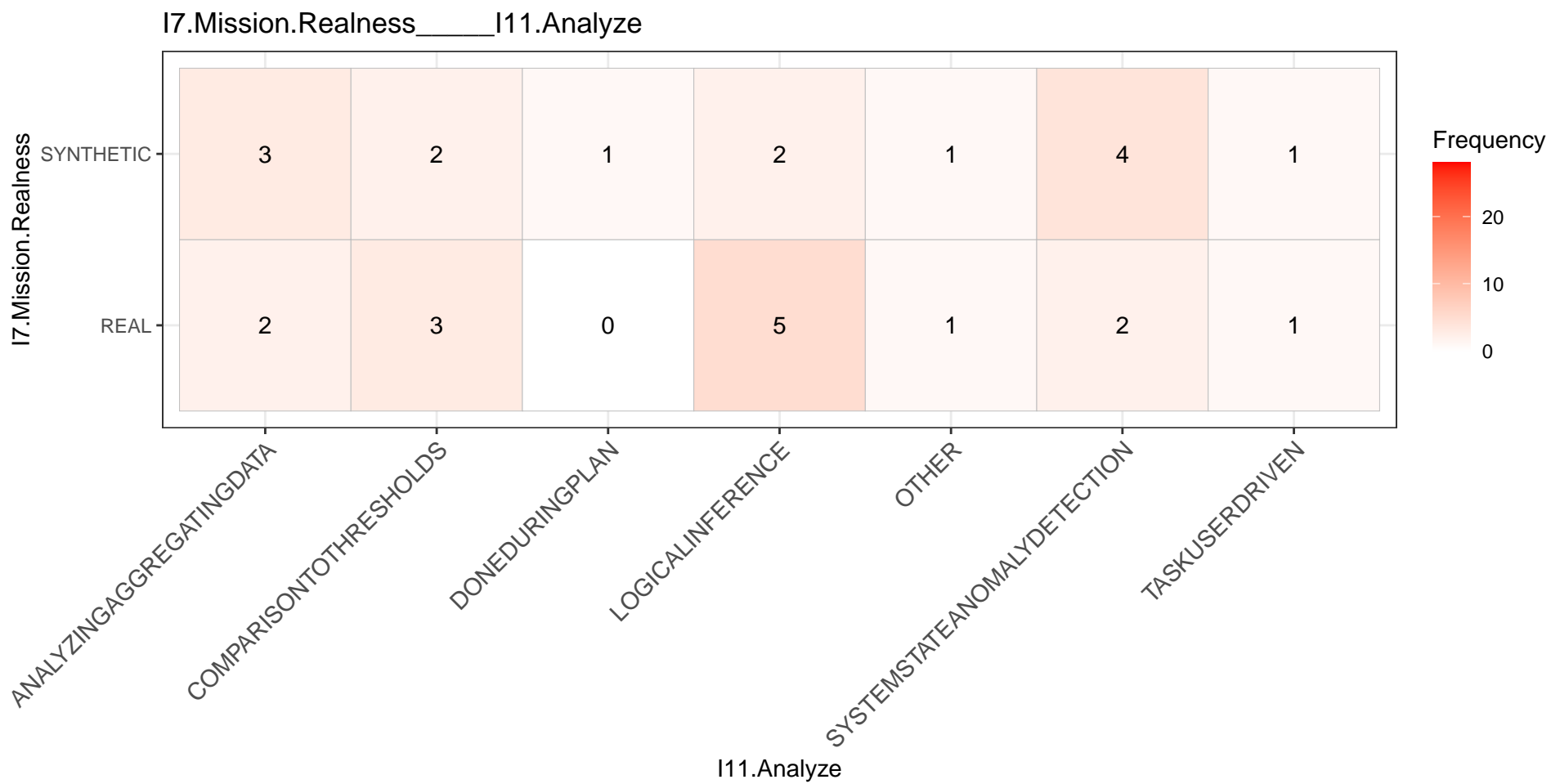






I7.Mission.Realness





I7.Mission.Realness_____I12.Plan

I7.Mission.Realness

SYNTHETIC

4

6

1

REAL

9

6

1

DETERMININGTHEOPTIMALCHOICE

RELYINGONDESIGNTIMERULESMODELS

USINGAIPANNINGLANGUAGES

I12.Plan

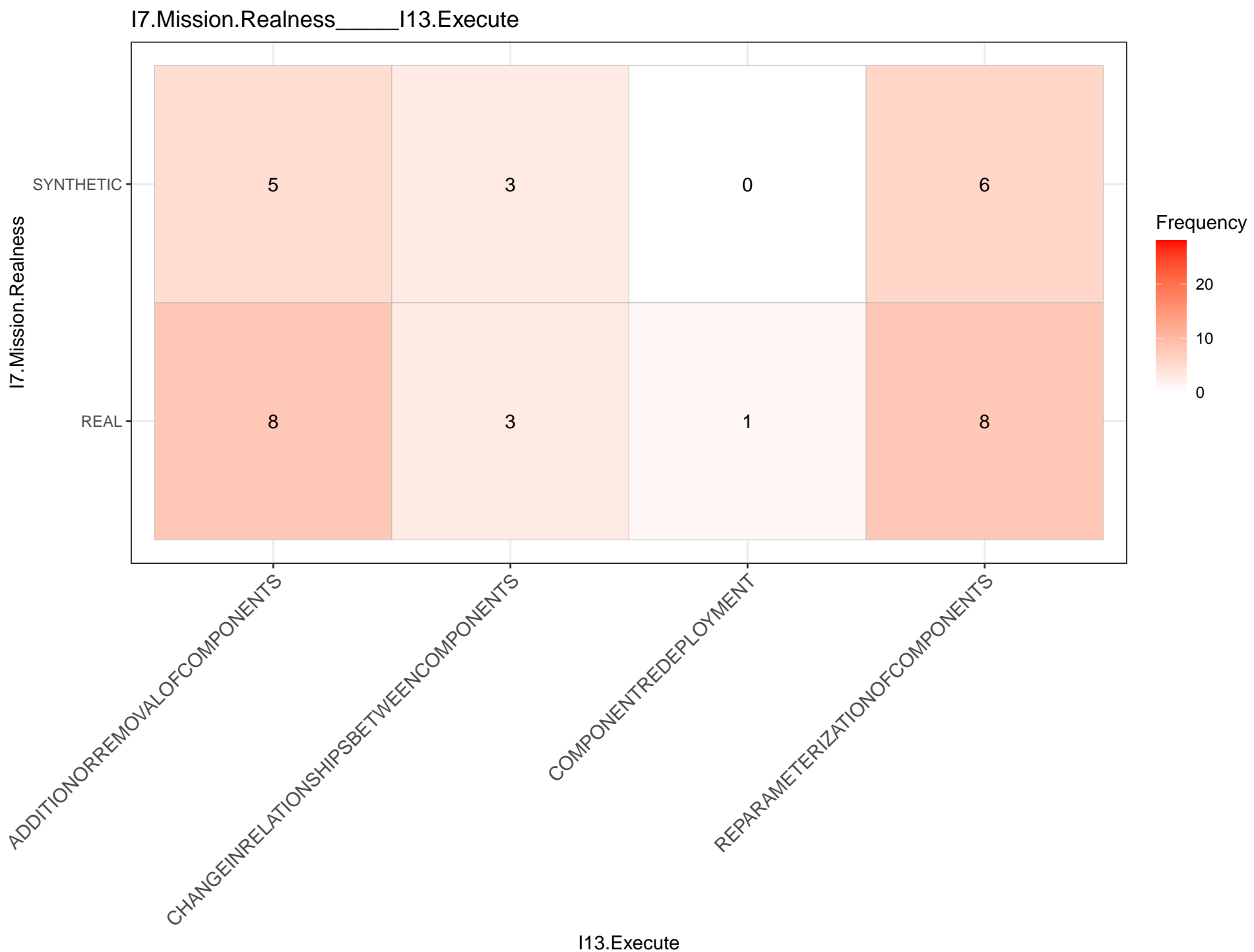
Frequency

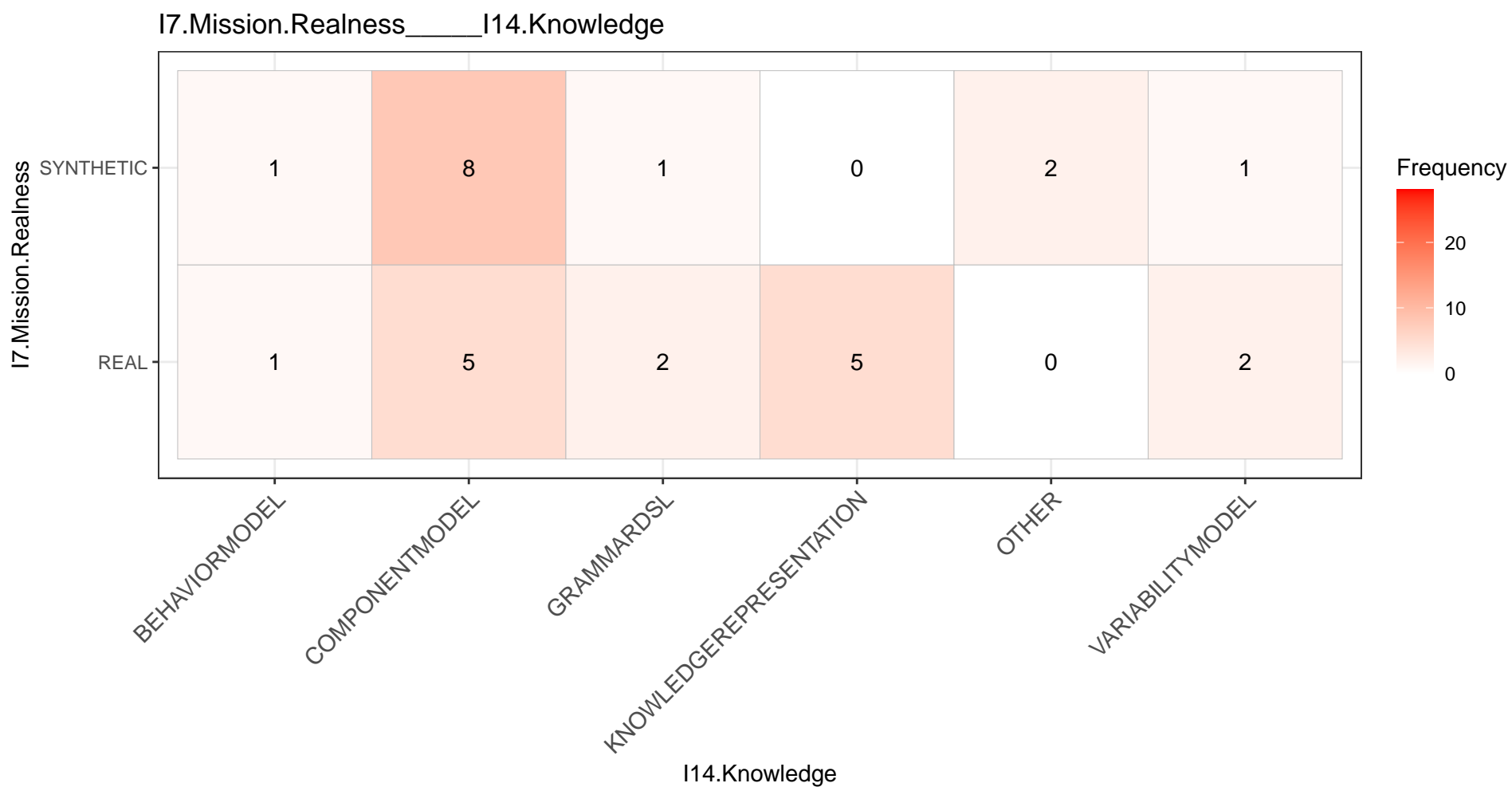


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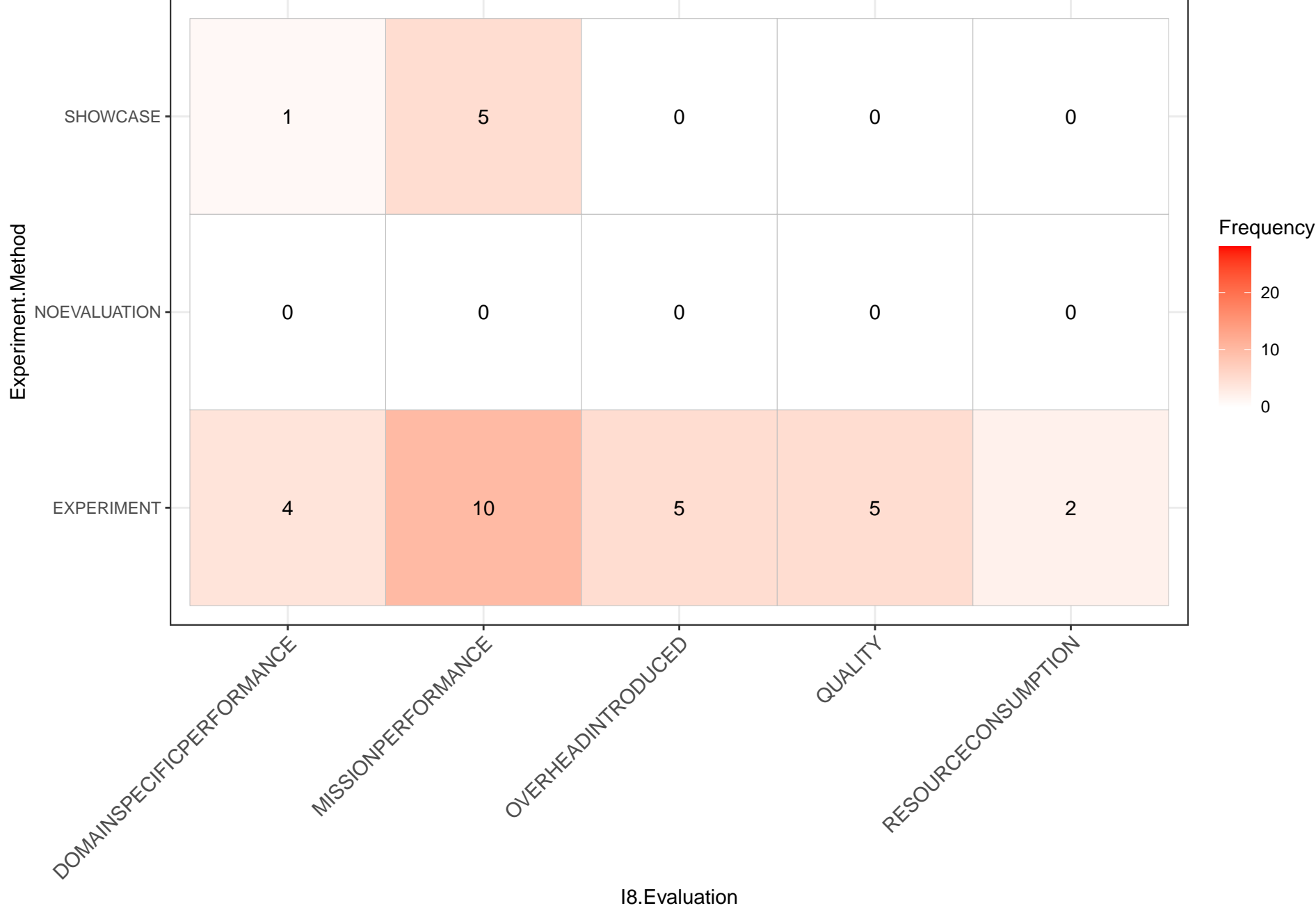
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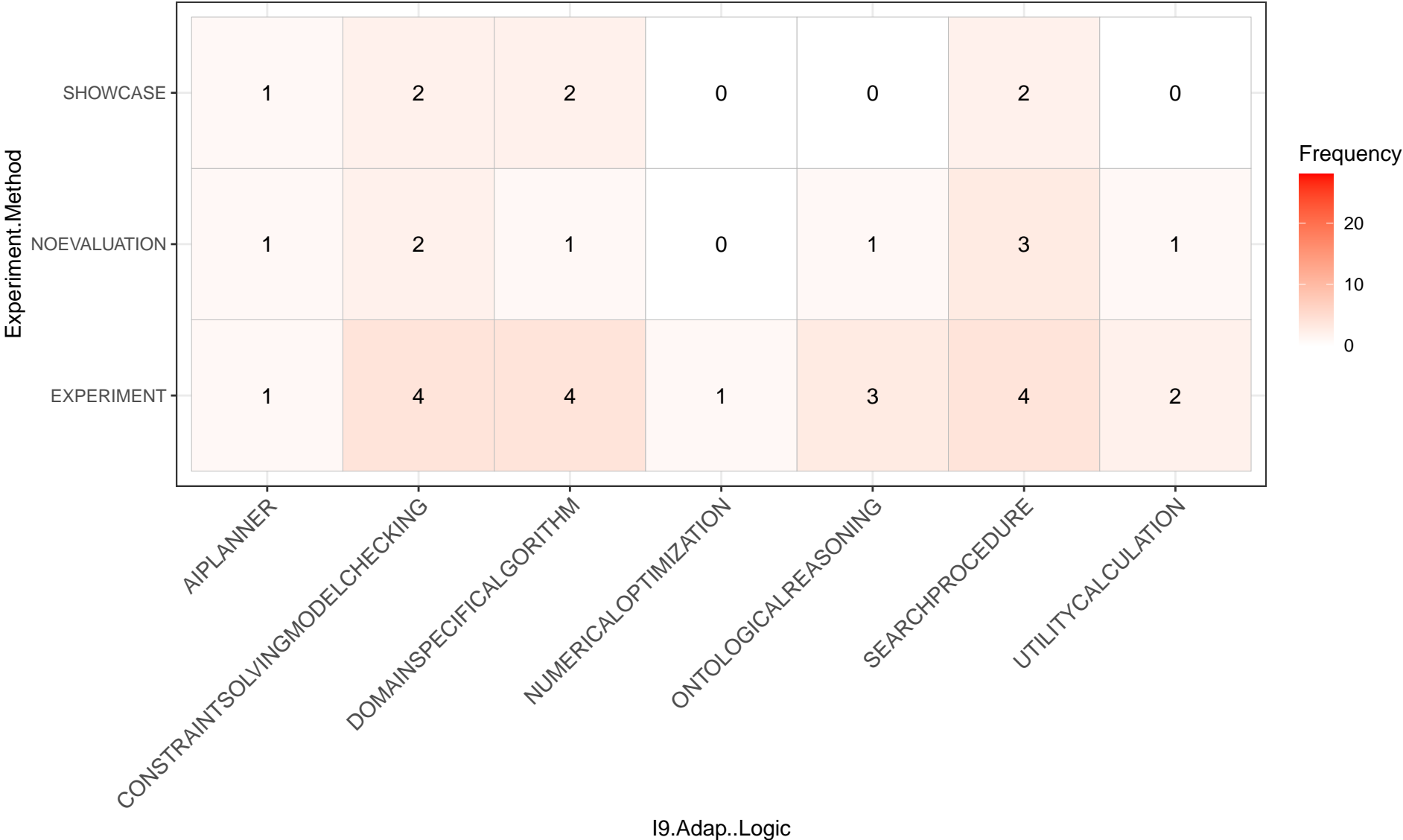




Experiment.Method_____I8.Evaluation



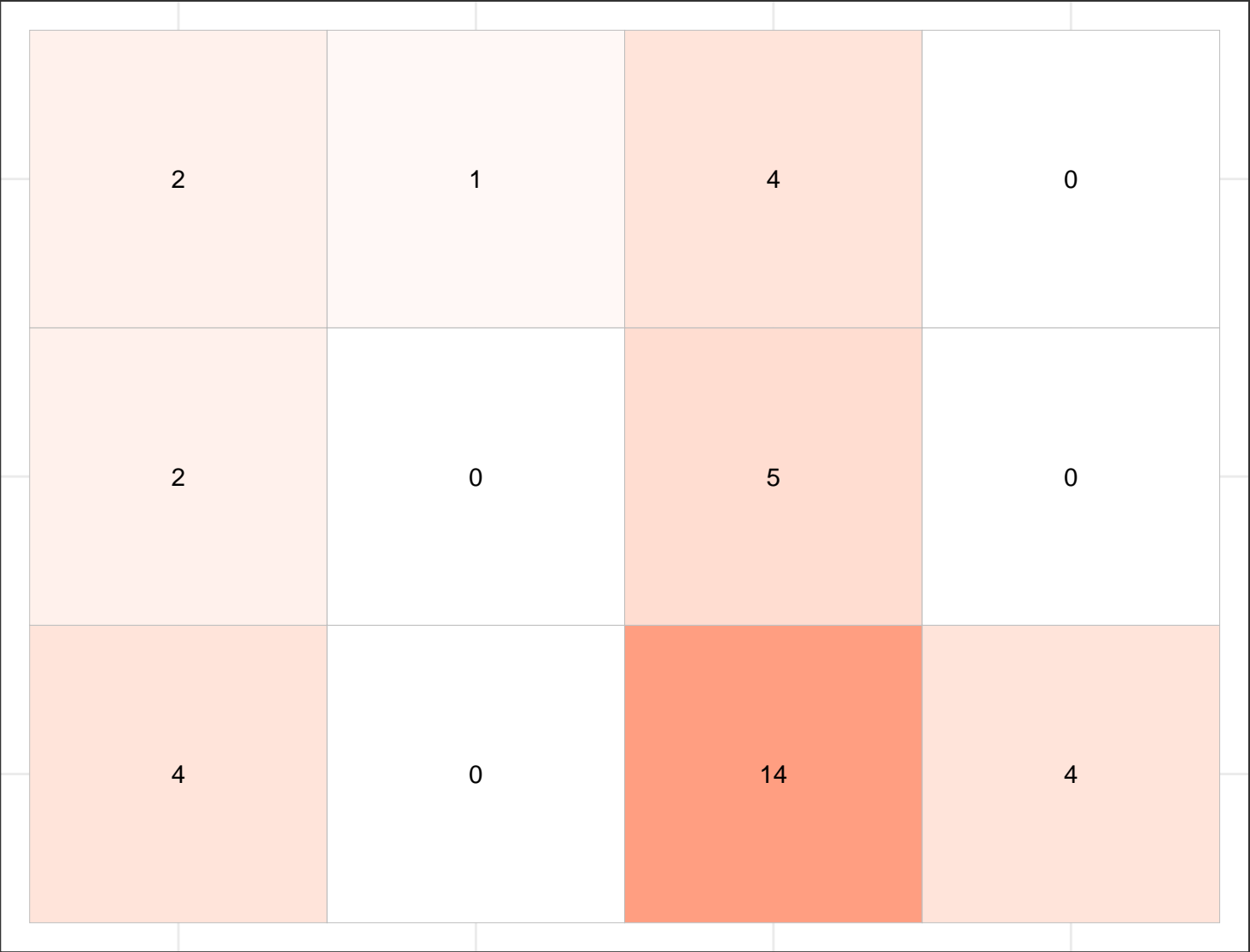
Experiment.Method_____I9.Adap..Logic



Experiment.Method____I10.Monitor

Experiment.Method

SHOWCASE
NOEVALUATION
EXPERIMENT



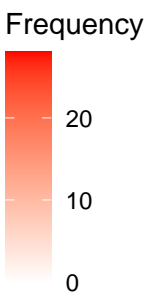
ENVIRONMENT

ENVIRONMENTAL

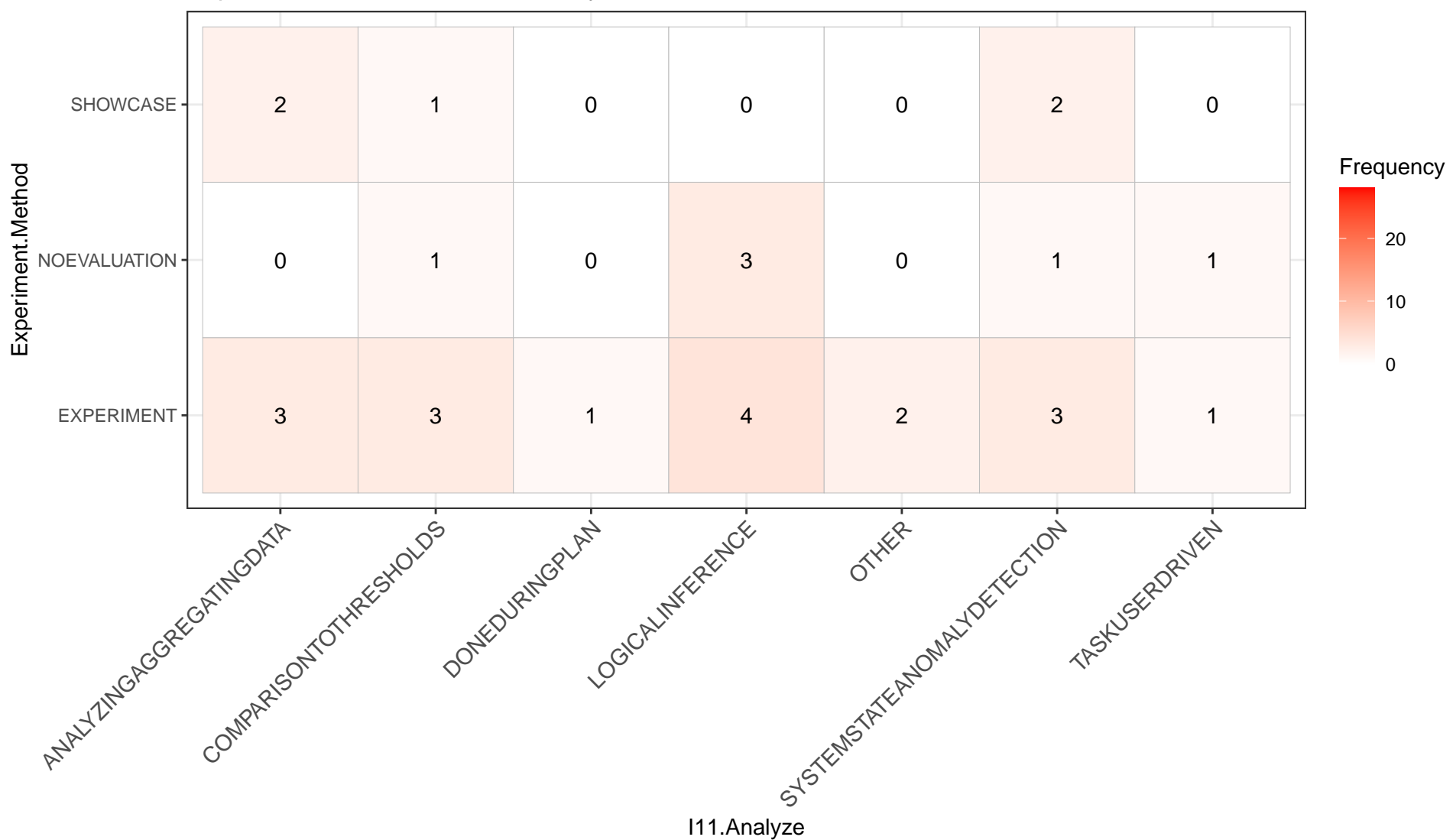
MANAGEDSYSTEM

MISSION

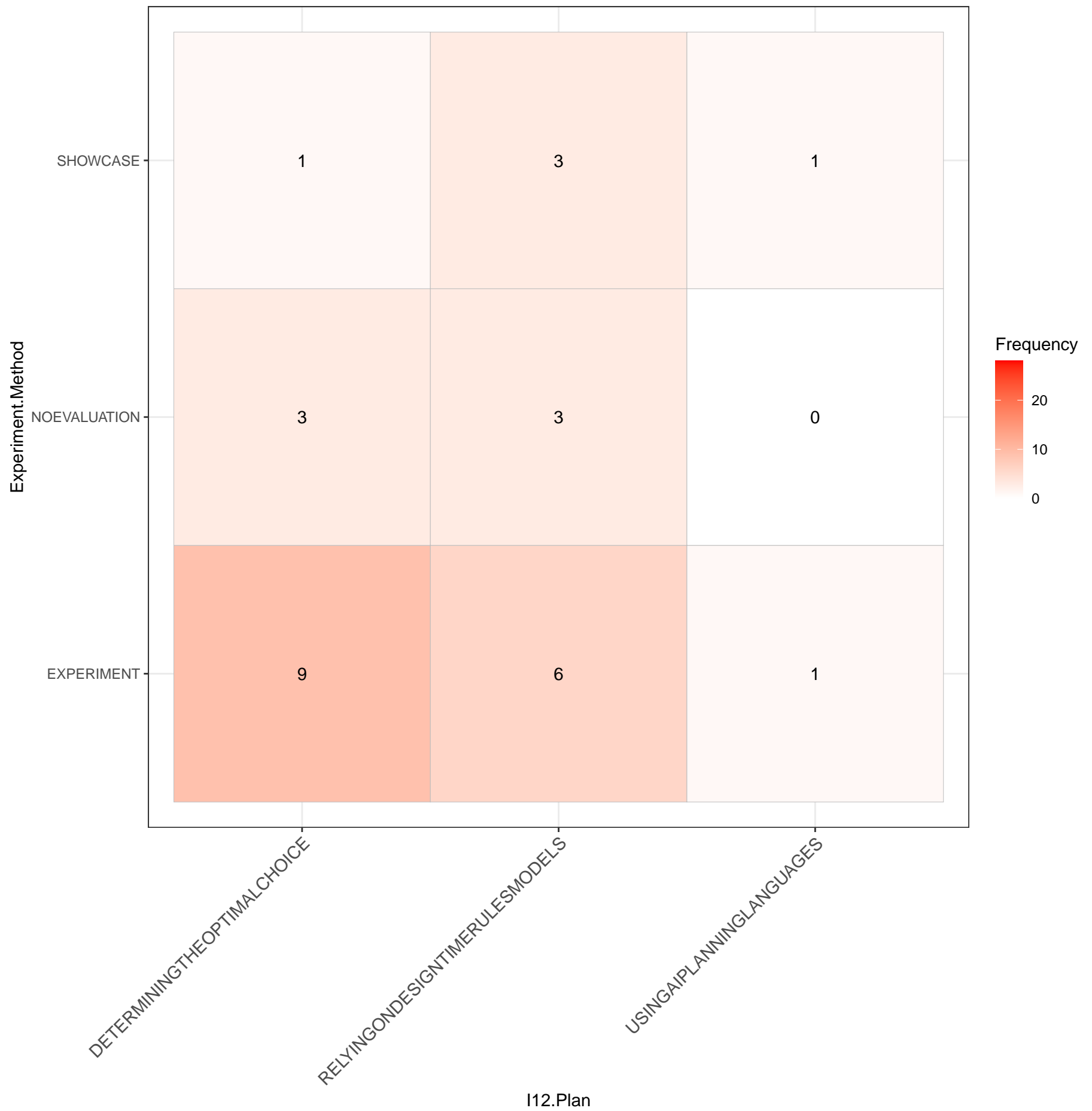
I10.Monitor



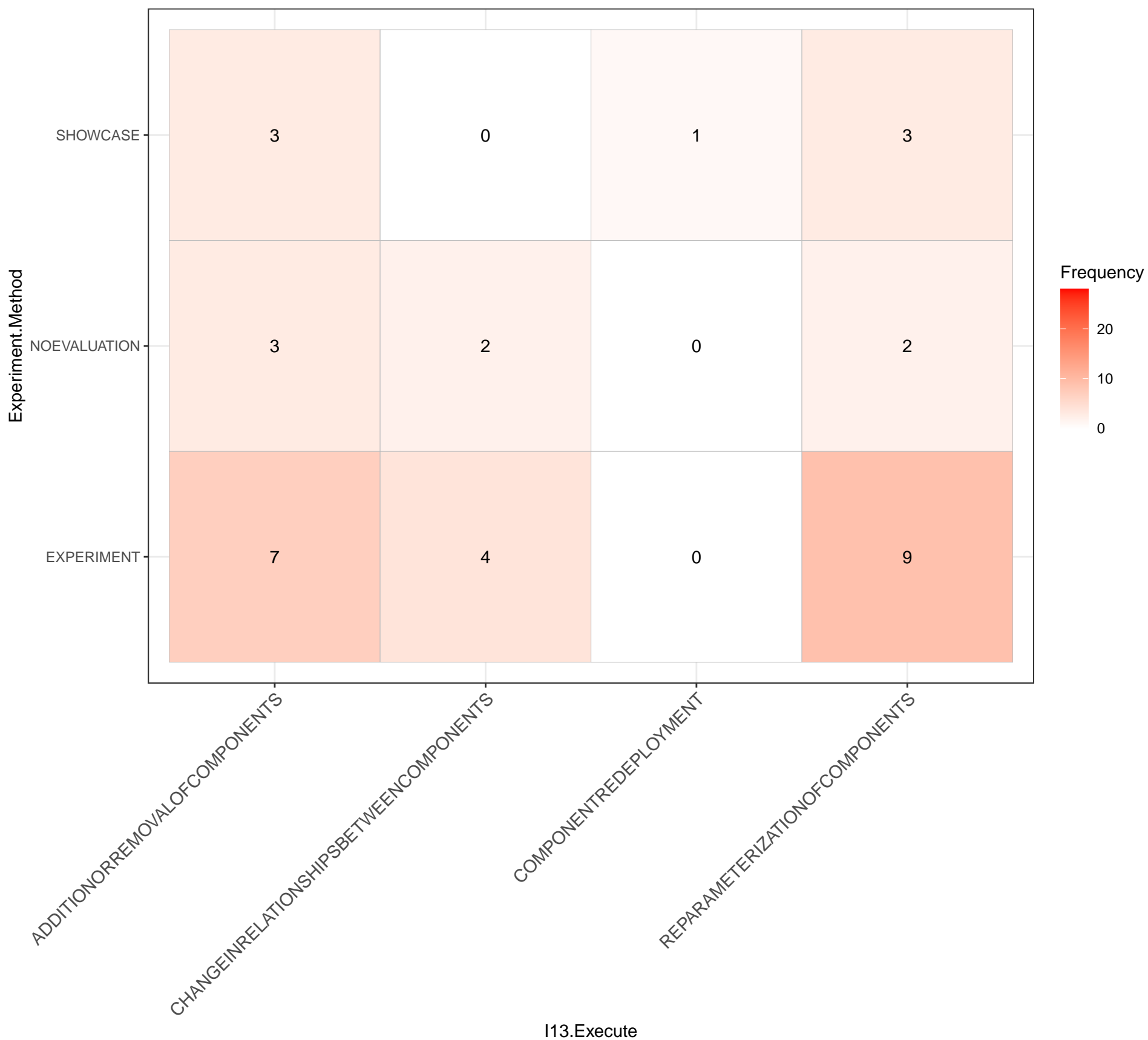
Experiment.Method____I11.Analyze

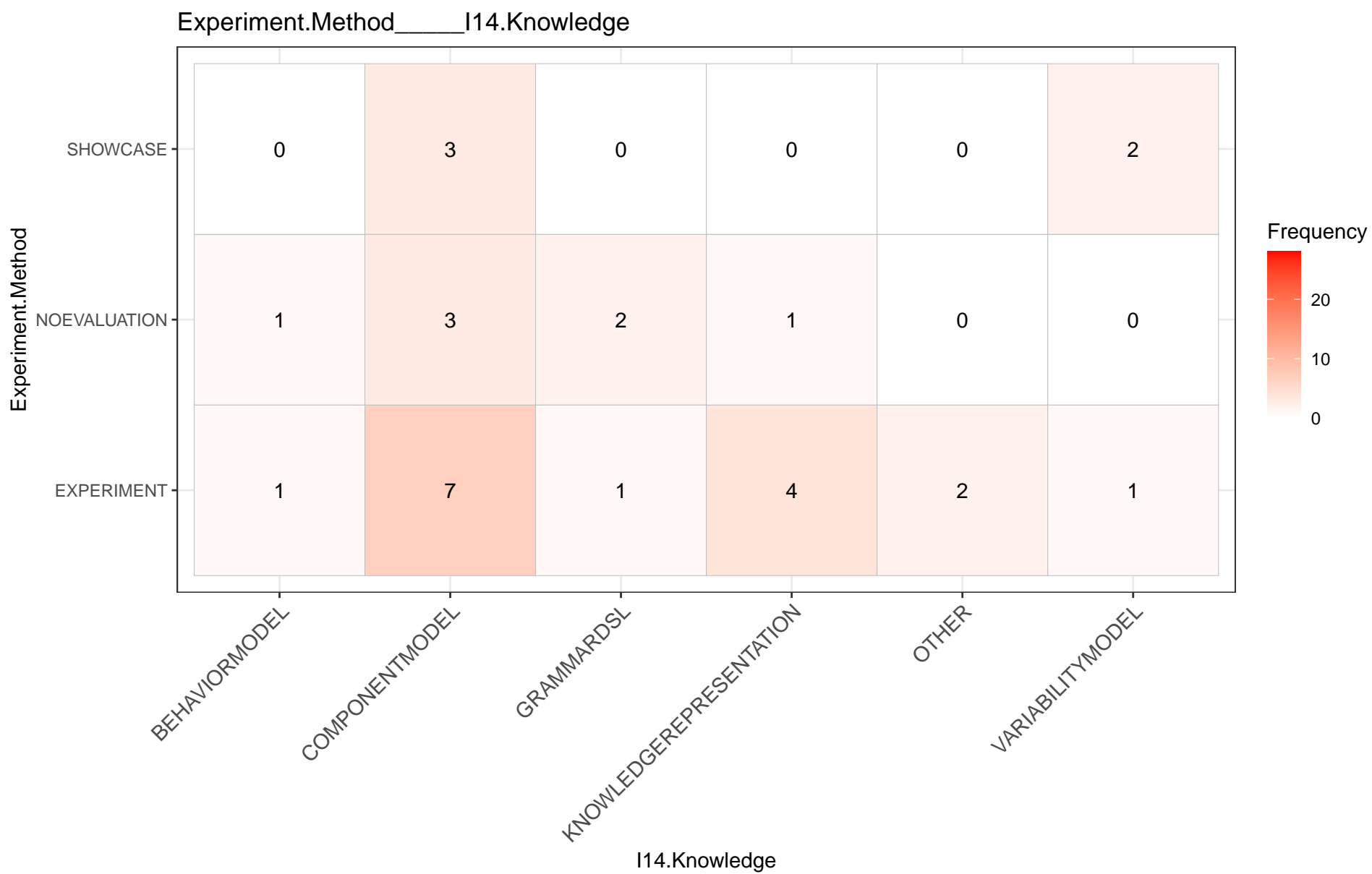


Experiment.Method_____I12.Plan



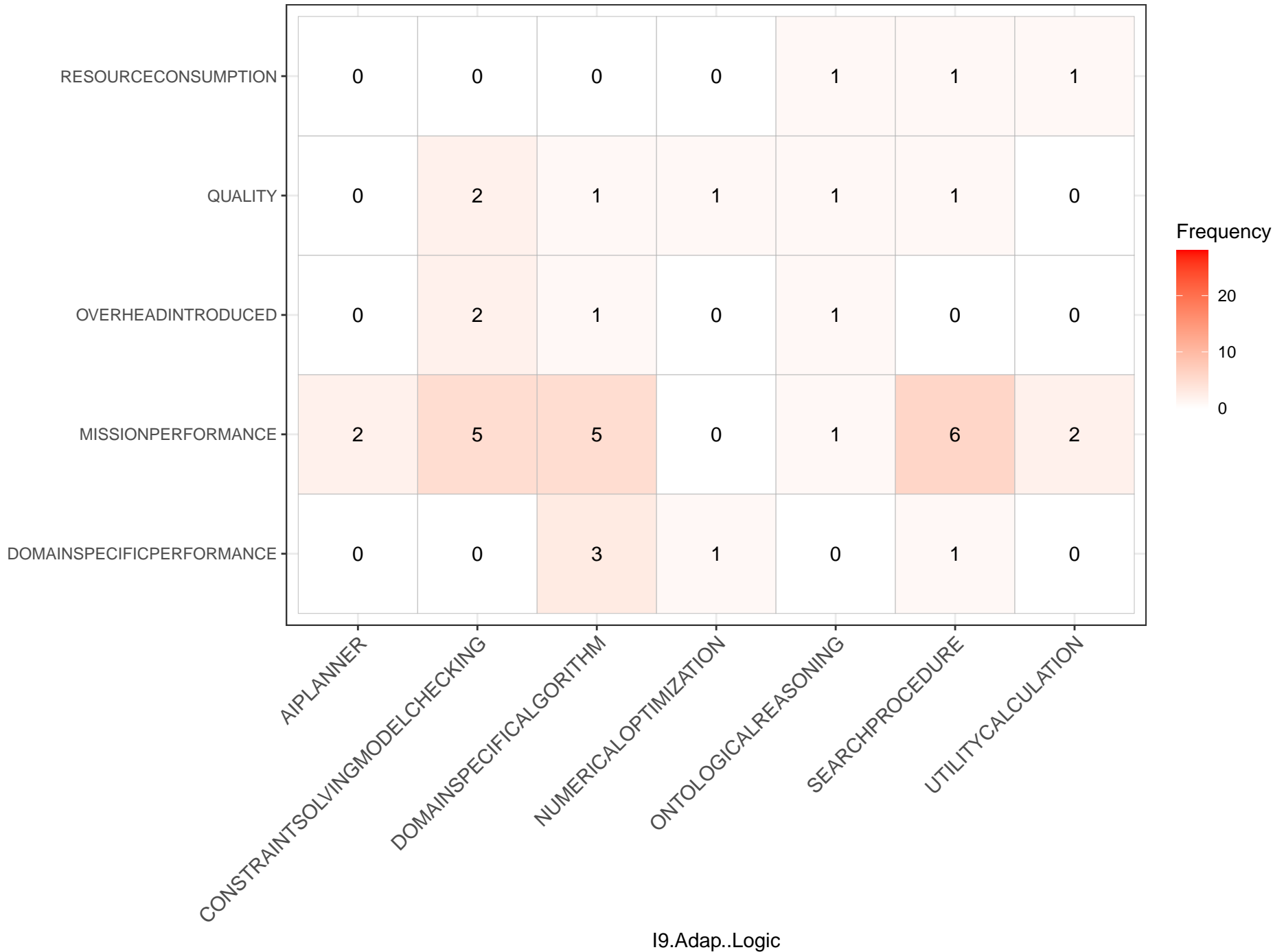
Experiment.Method_____I13.Execute





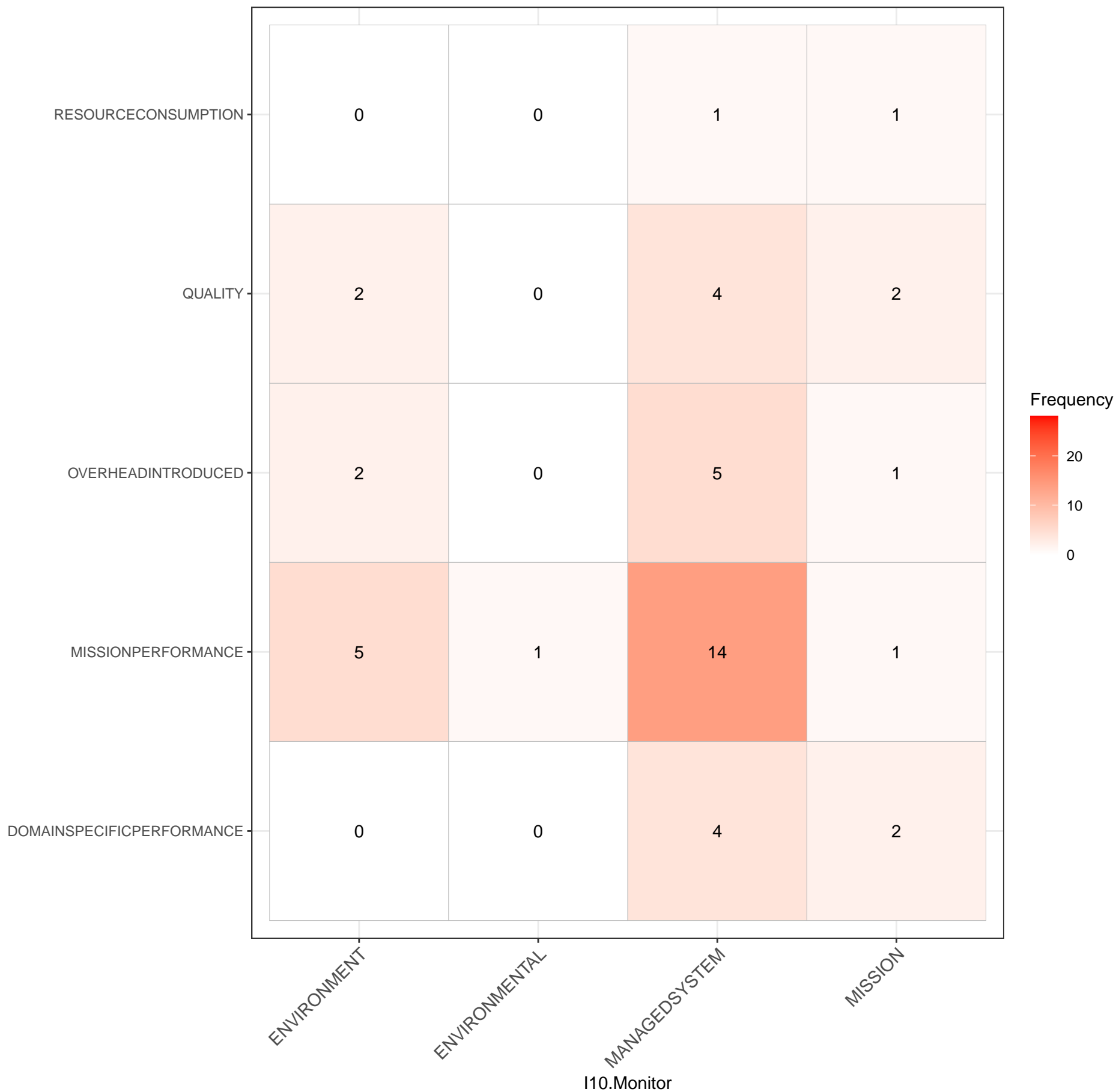
I8.Evaluation_____I9.Adap..Logic

I8.Evaluation



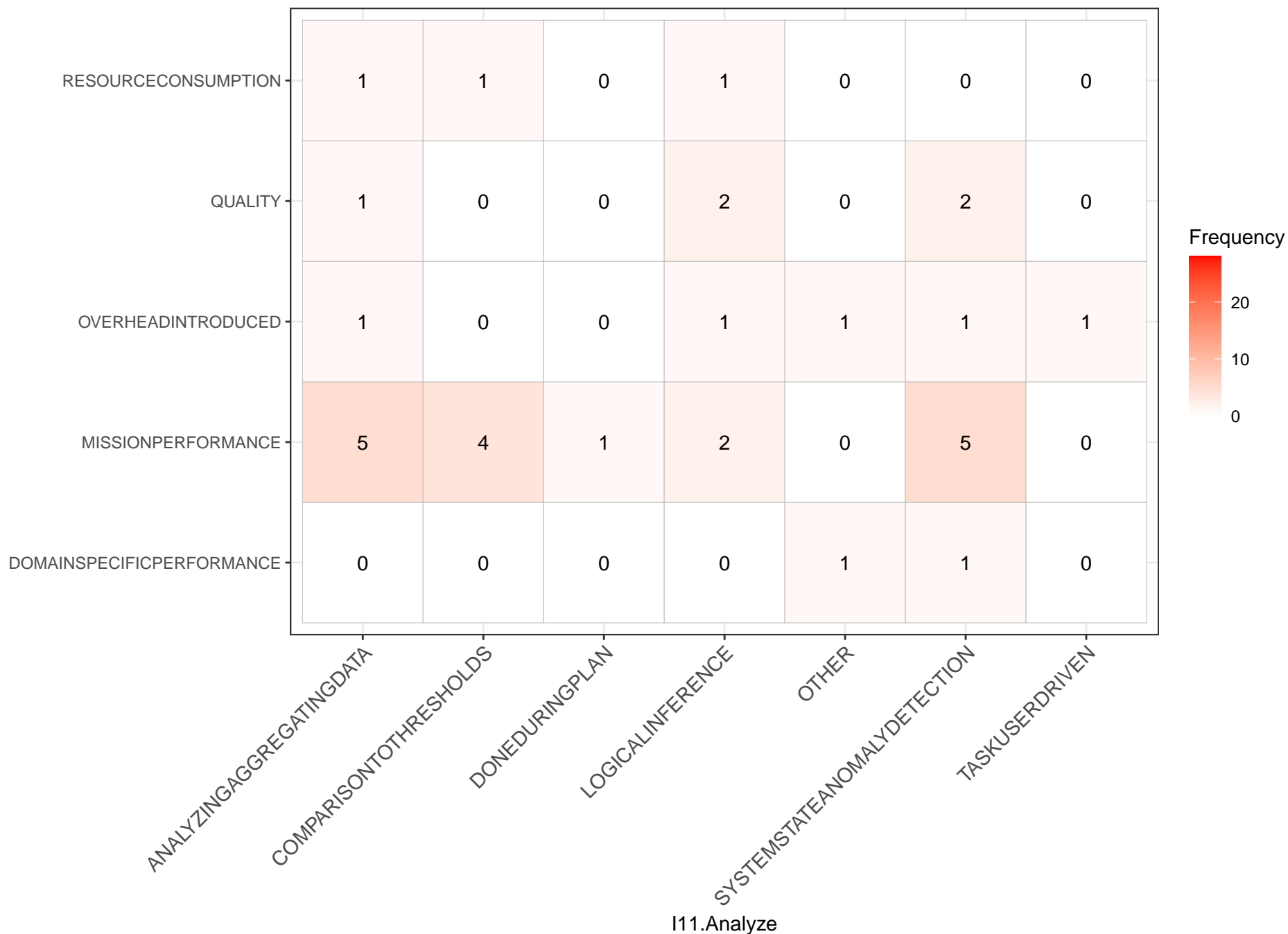
I8.Evaluation_____I10.Monitor

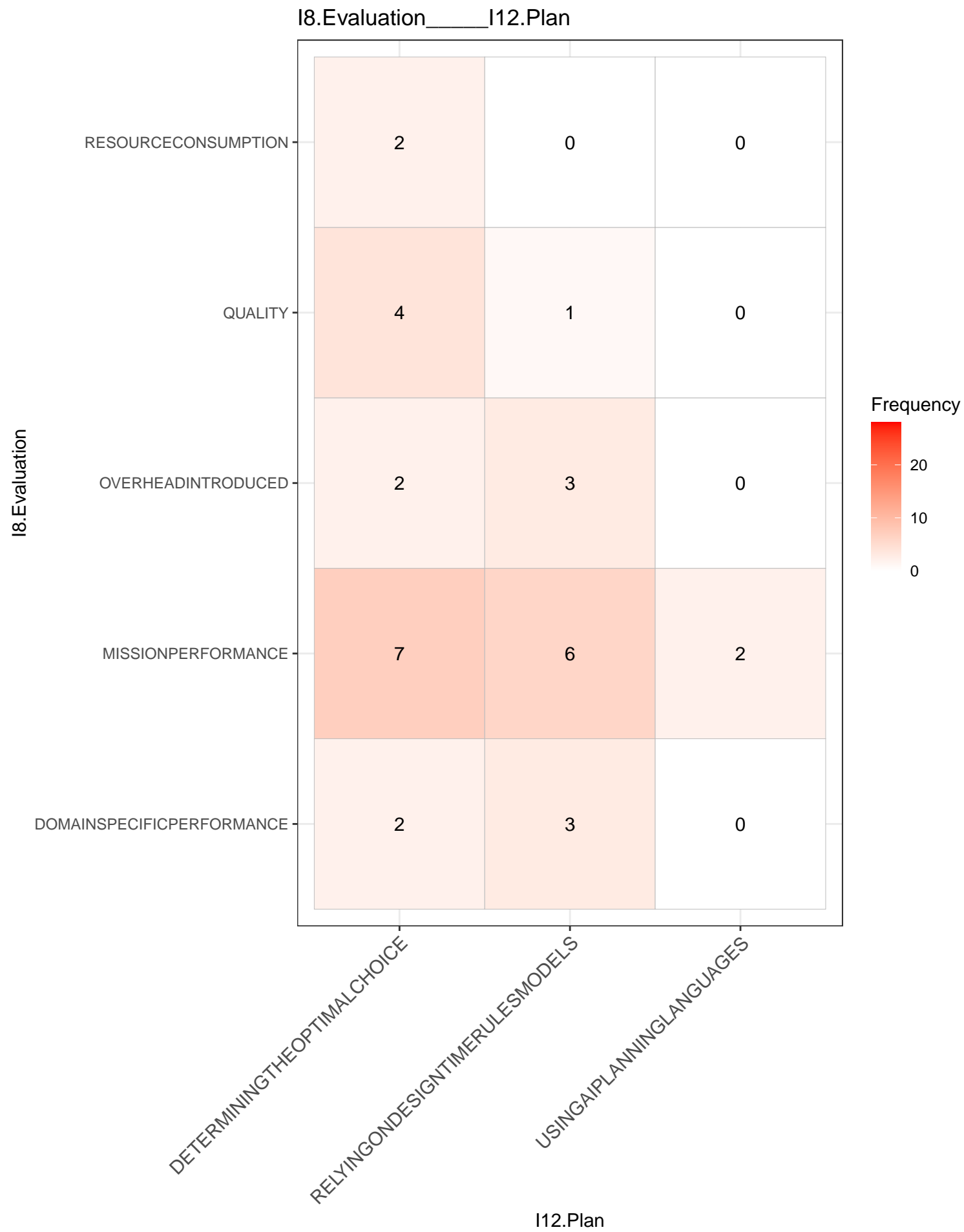
I8.Evaluation



I8.Evaluation

I8.Evaluation_____I11.Analyze





I8.Evaluation_____I13.Execute

I8.Evaluation

RESOURCECONSUMPTION

QUALITY

OVERHEADINTRODUCED

MISSIONPERFORMANCE

DOMAINSPECIFICPERFORMANCE

ADDITIONORREMOVALOFCOMPONENTS

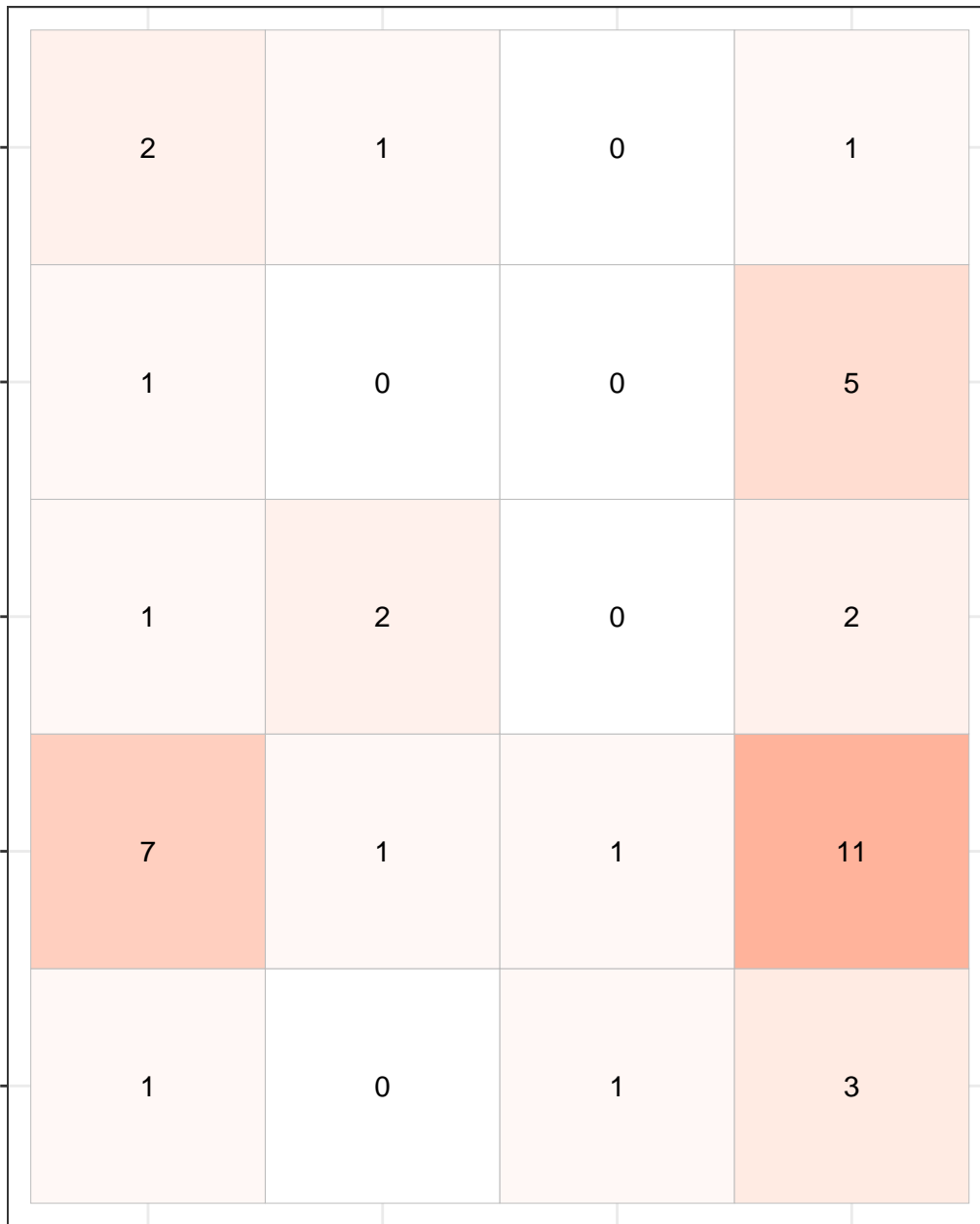
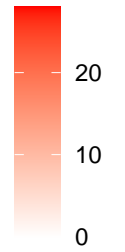
CHANGEINRELATIONSHIPS BETWEENCOMPONENTS

COMPONENTREDEPLOYMENT

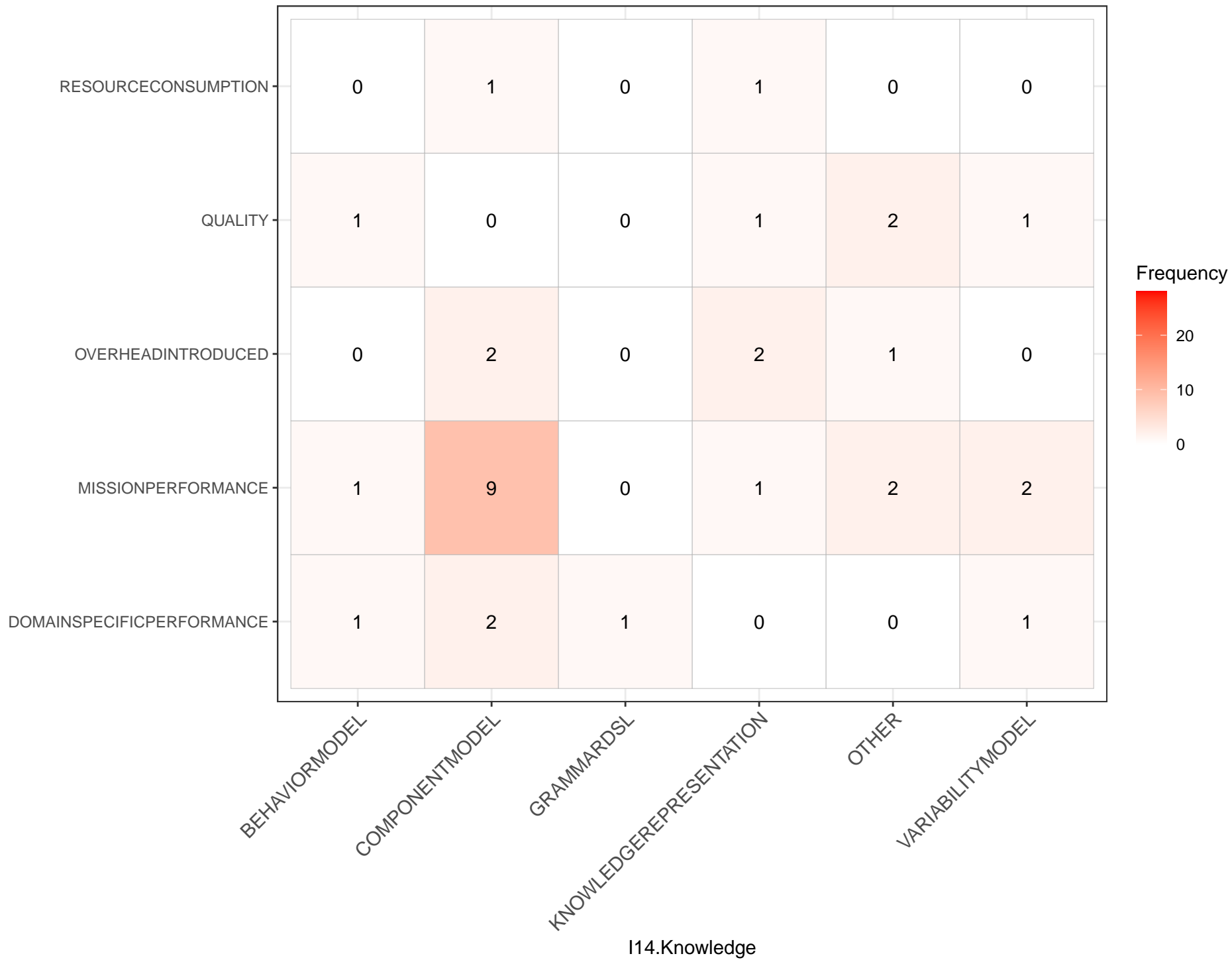
REPARAMETERIZATIONOFCOMPONENTS

I13.Execute

Frequency

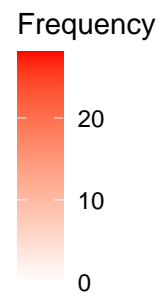
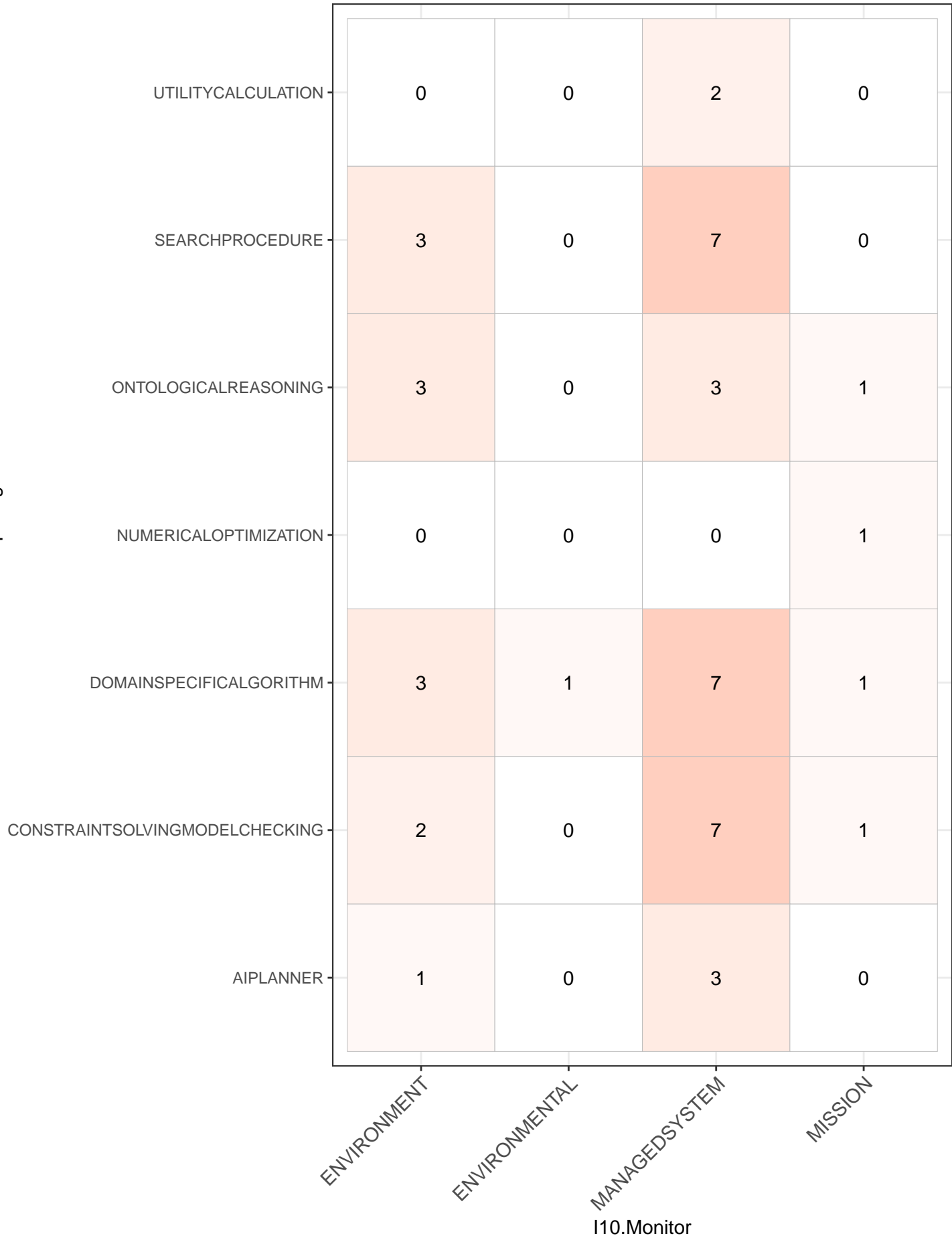


I8.Evaluation_____I14.Knowledge



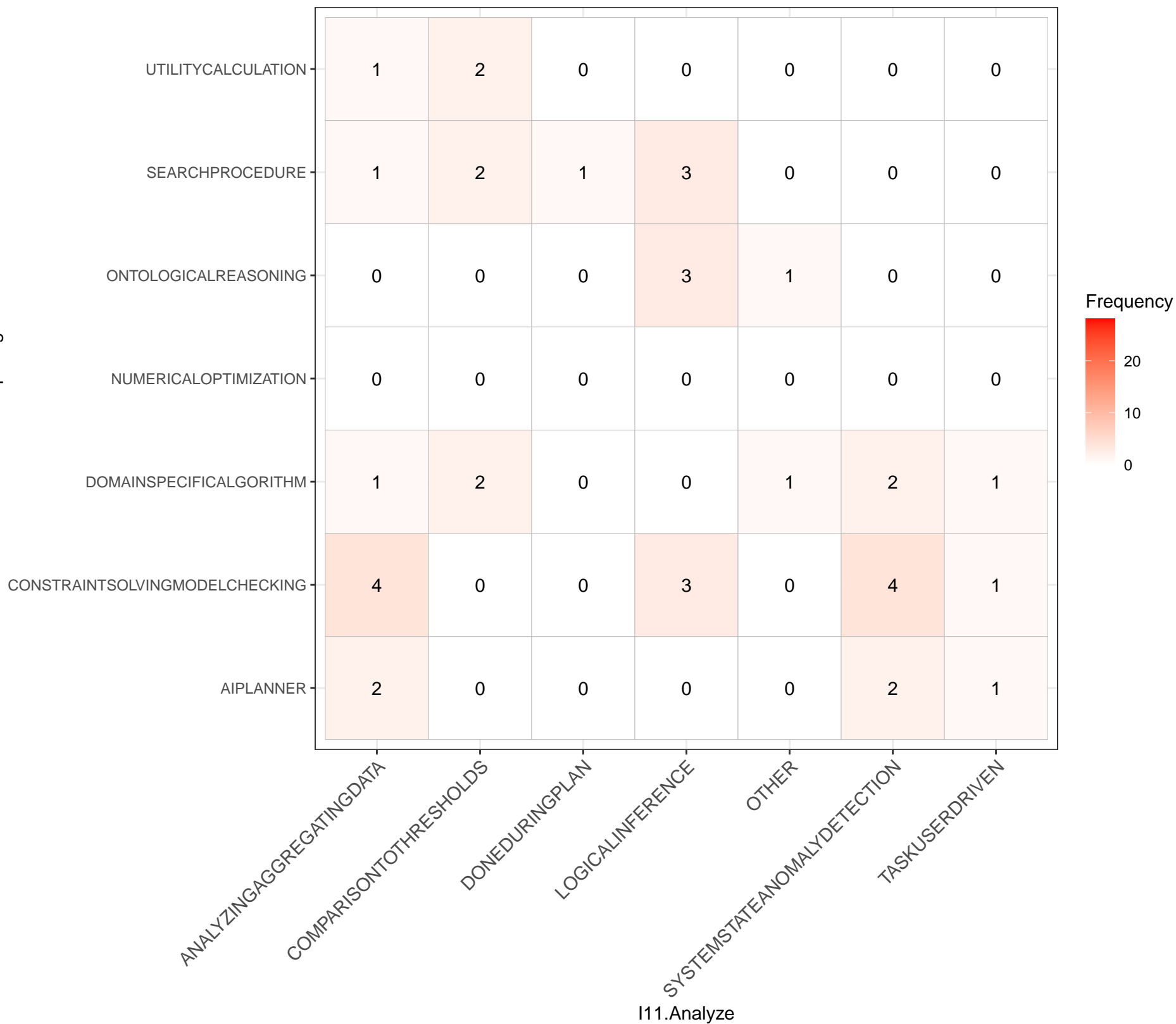
I9.Adap..Logic_____I10.Monitor

I9.Adap..Logic

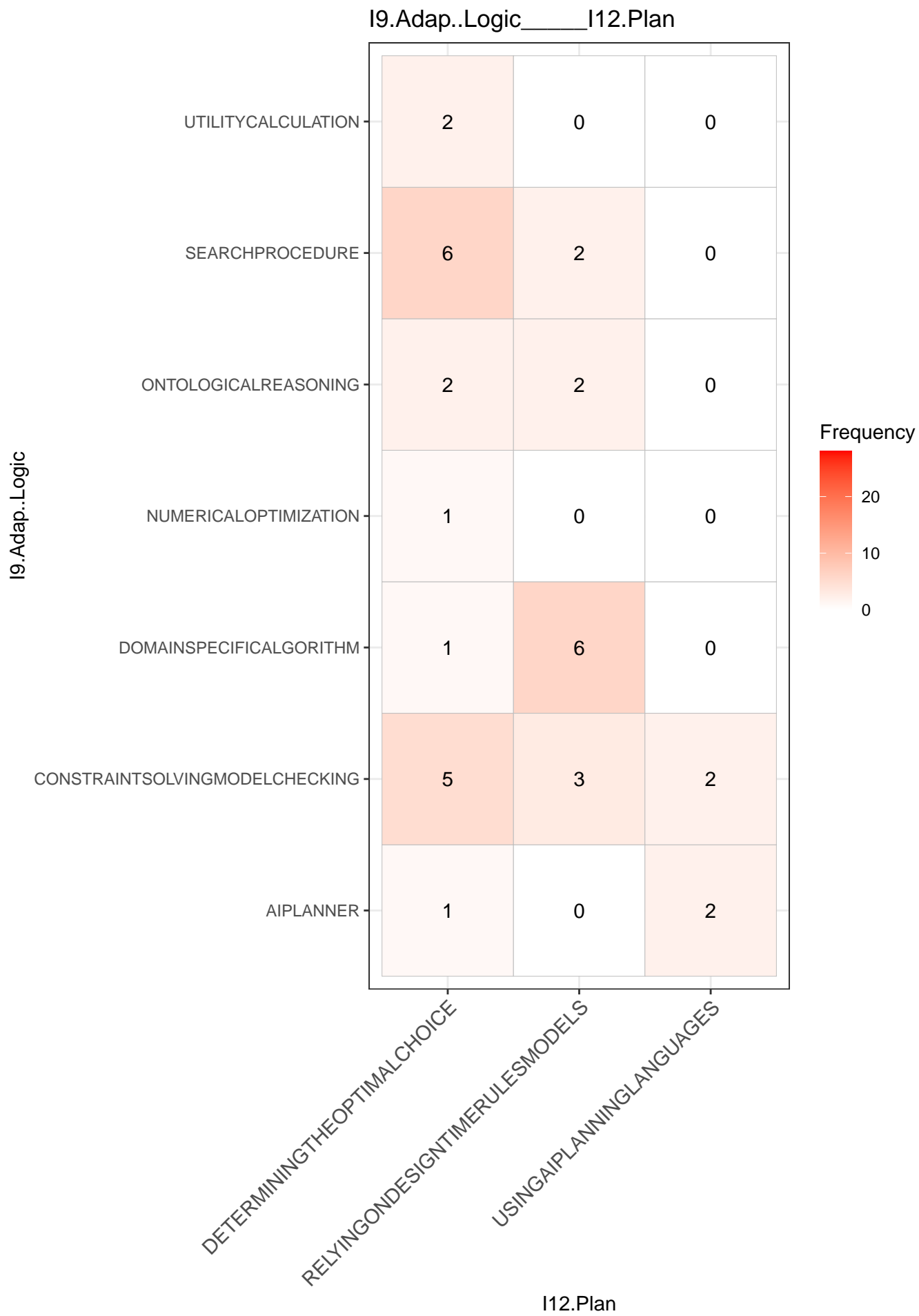


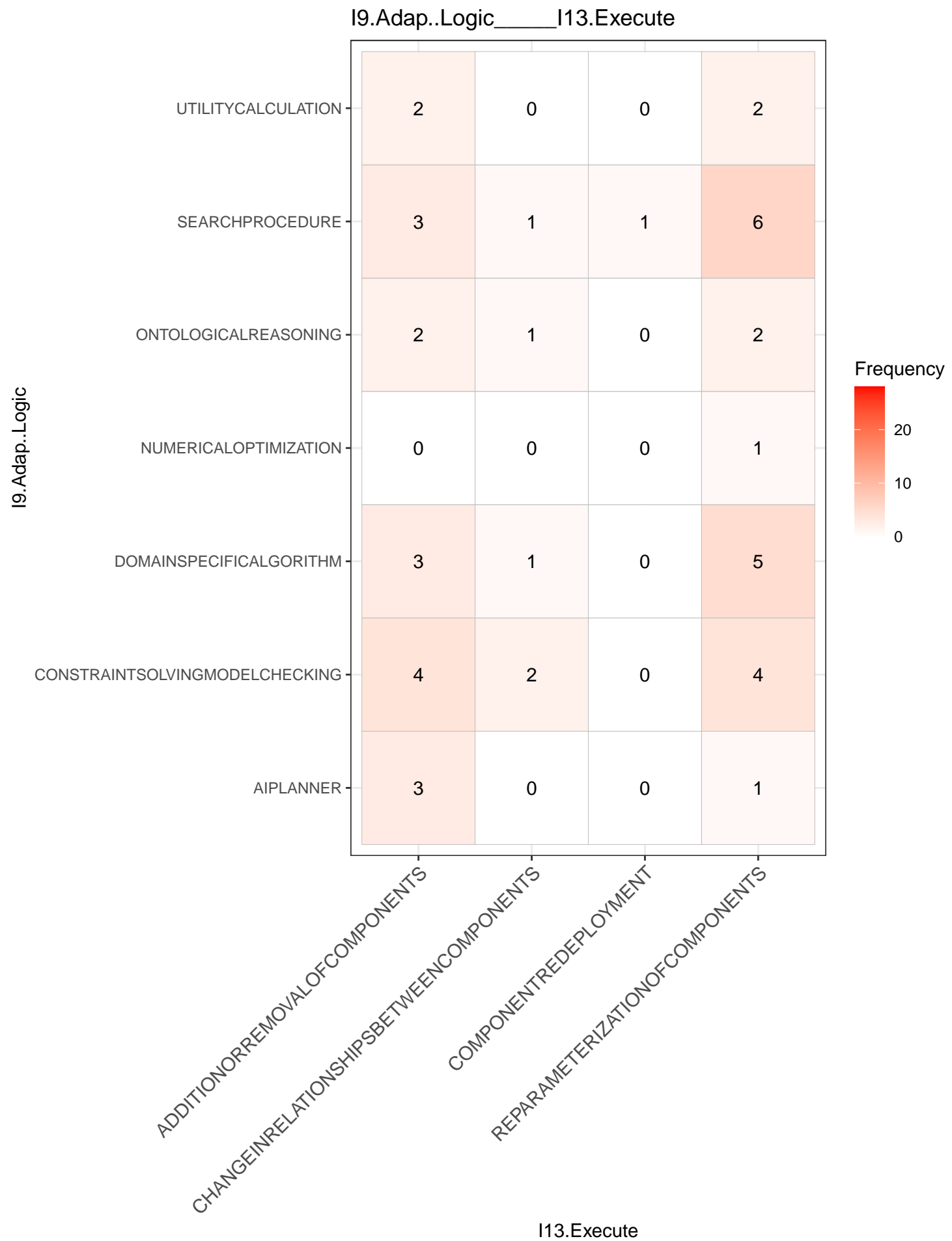
I9.Adap..Logic

I9.Adap..Logic_____I11.Analyze



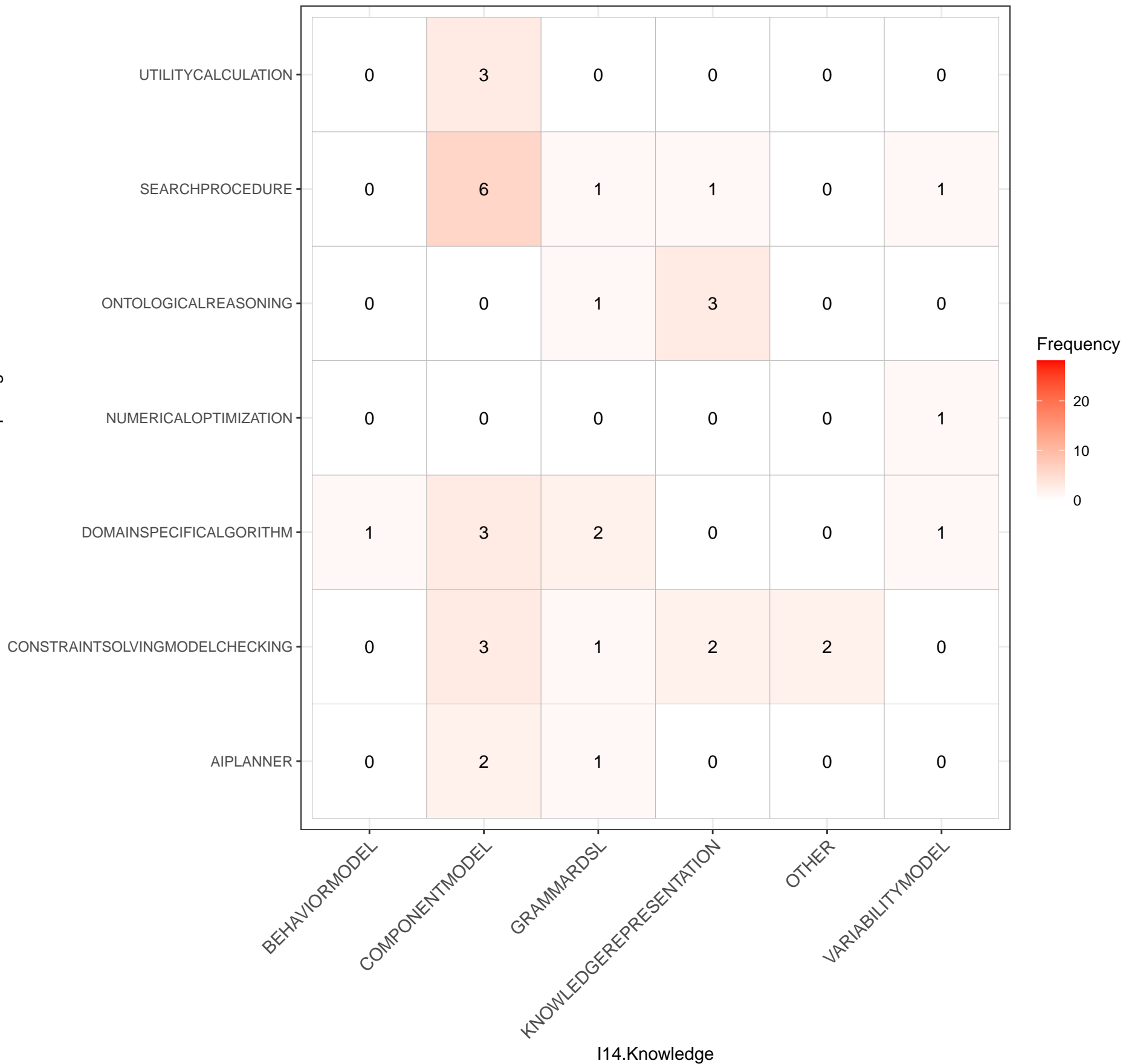
I11.Analyze





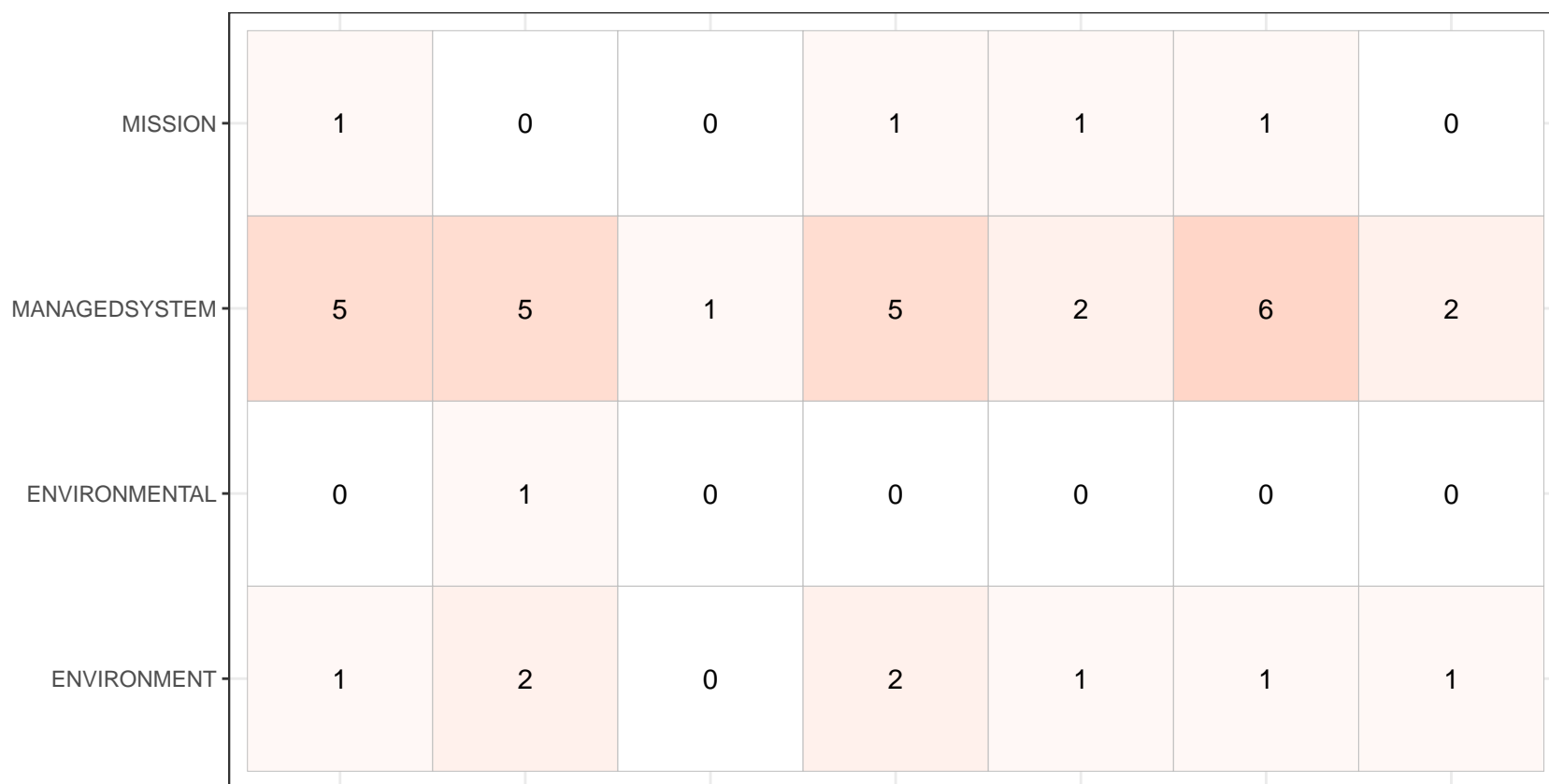
I9.Adap..Logic_____I14.Knowledge

I9.Adap..Logic



I10.Monitor_____I11.Analyze

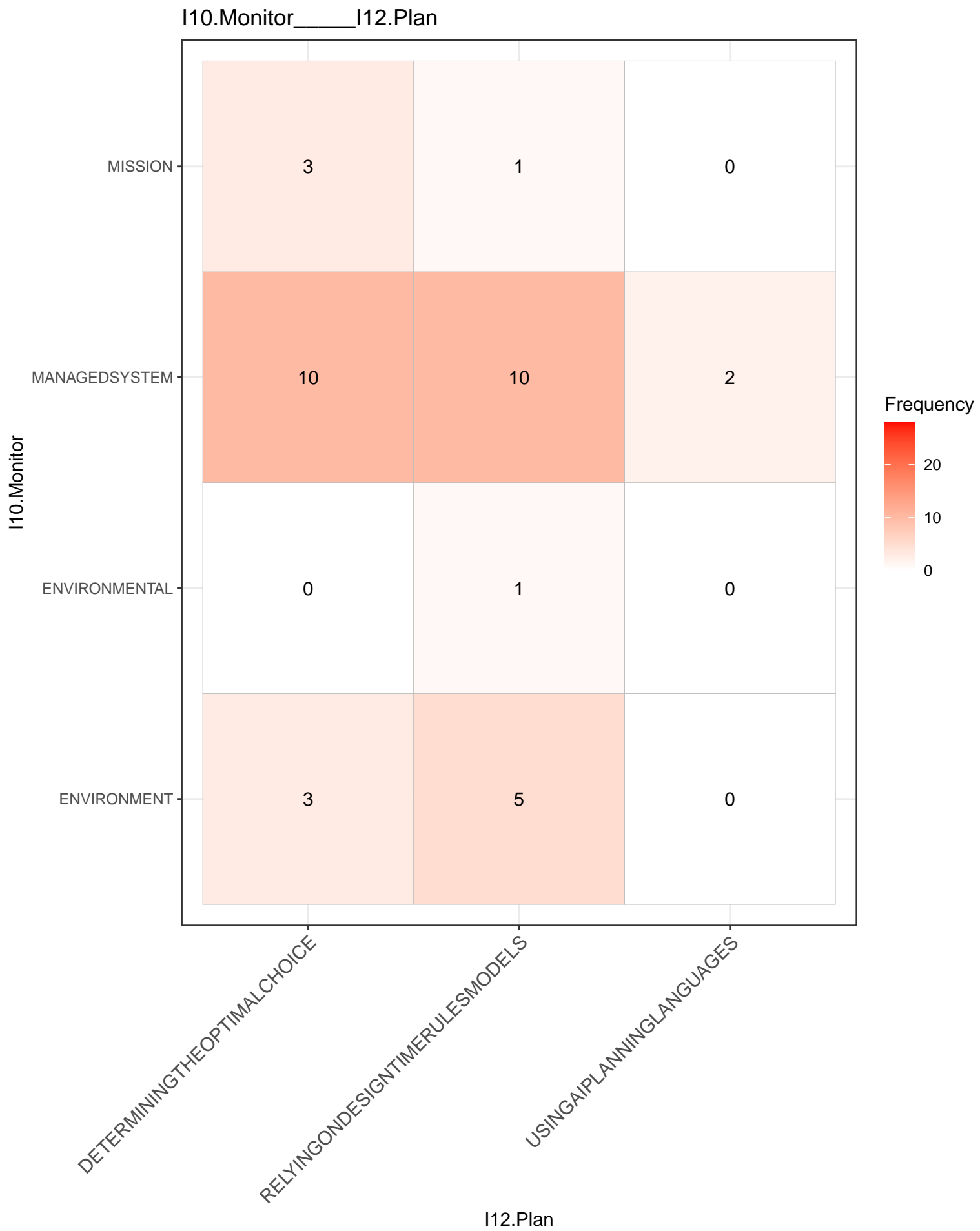
I10.Monitor

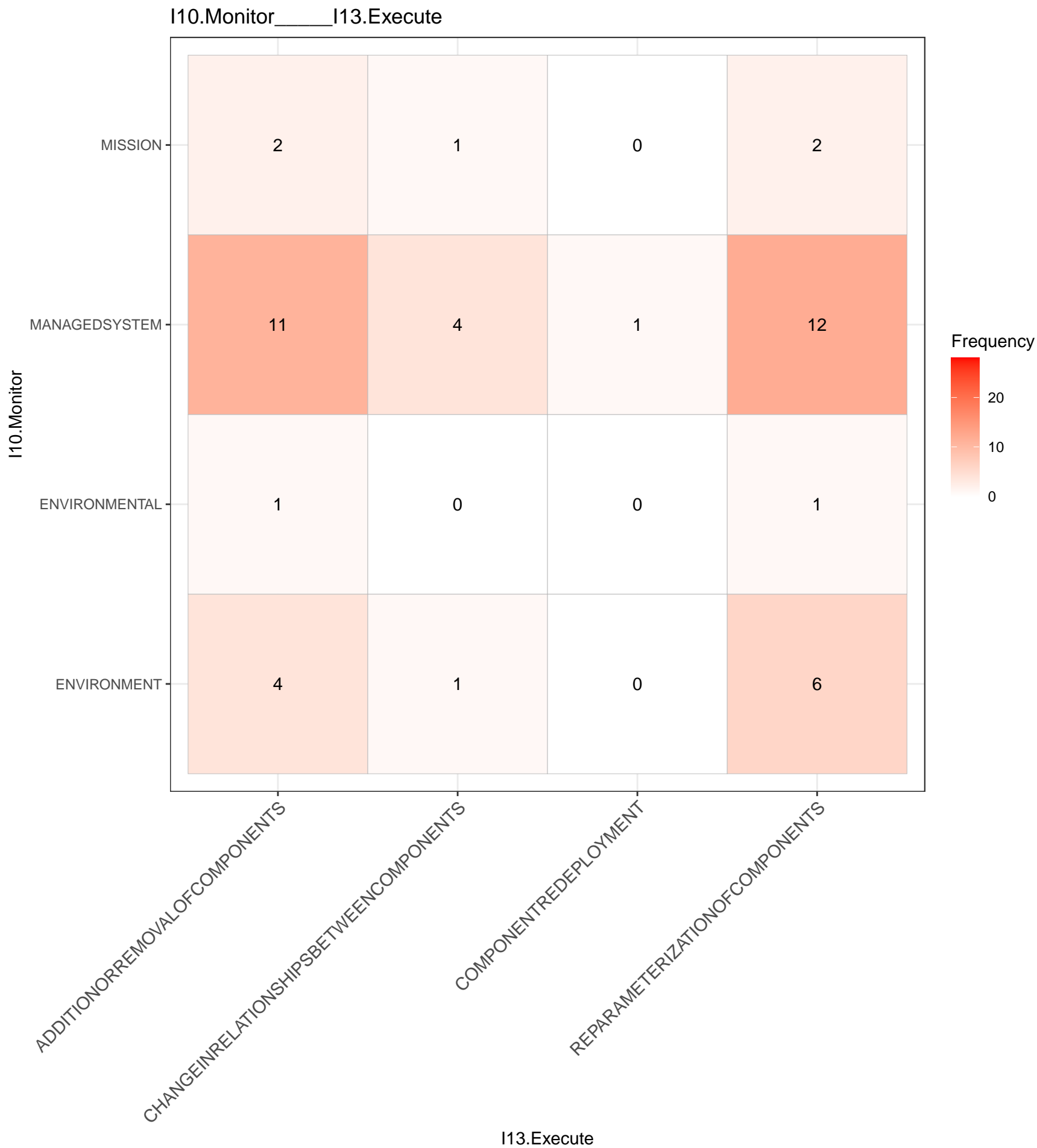


Frequency



I11.Analyze

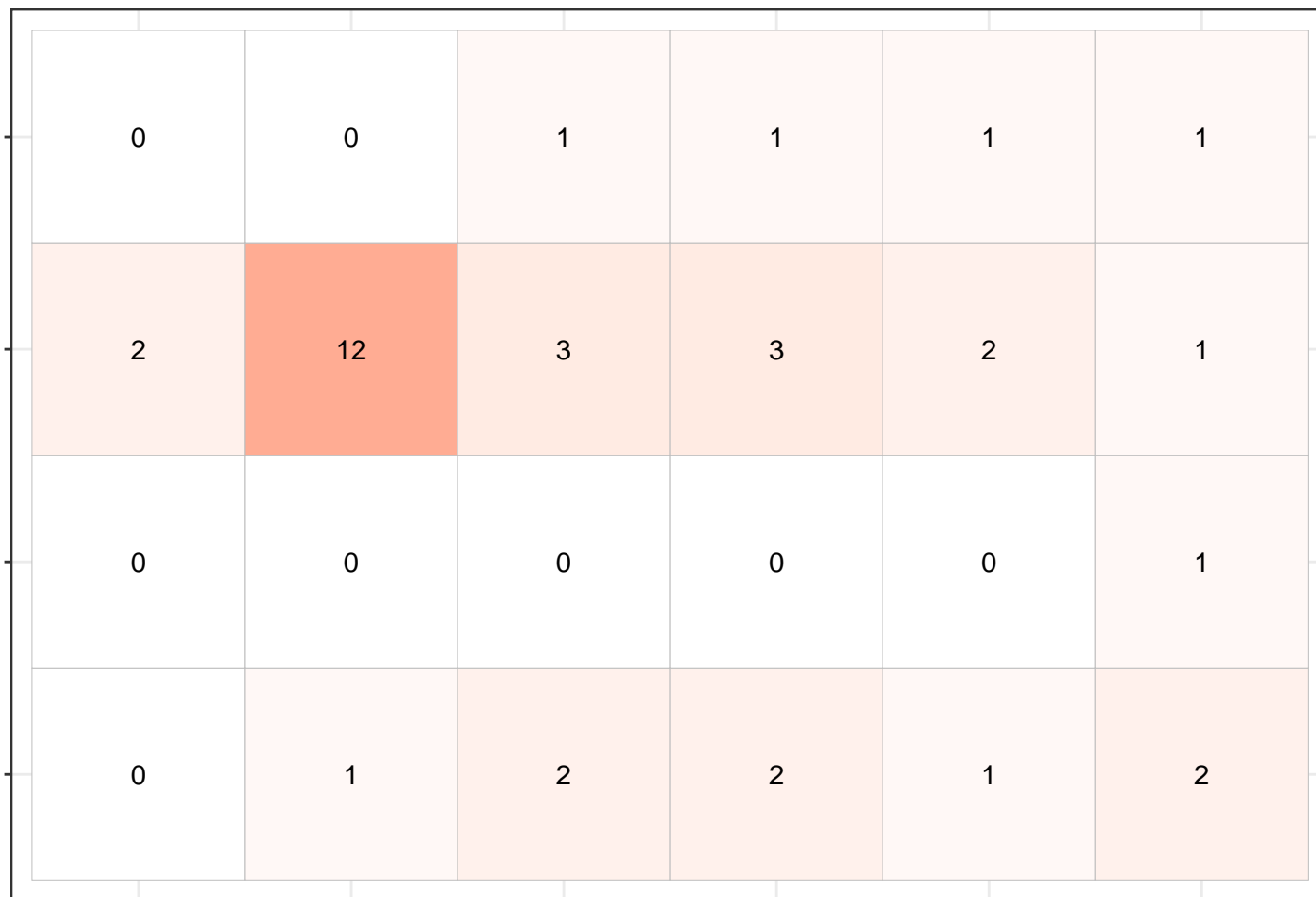




I10.Monitor_____I14.Knowledge

I10.Monitor

MISSION
MANAGEDSYSTEM
ENVIRONMENTAL
ENVIRONMENT



Frequency



I14.Knowledge

BEHAVIORMODEL

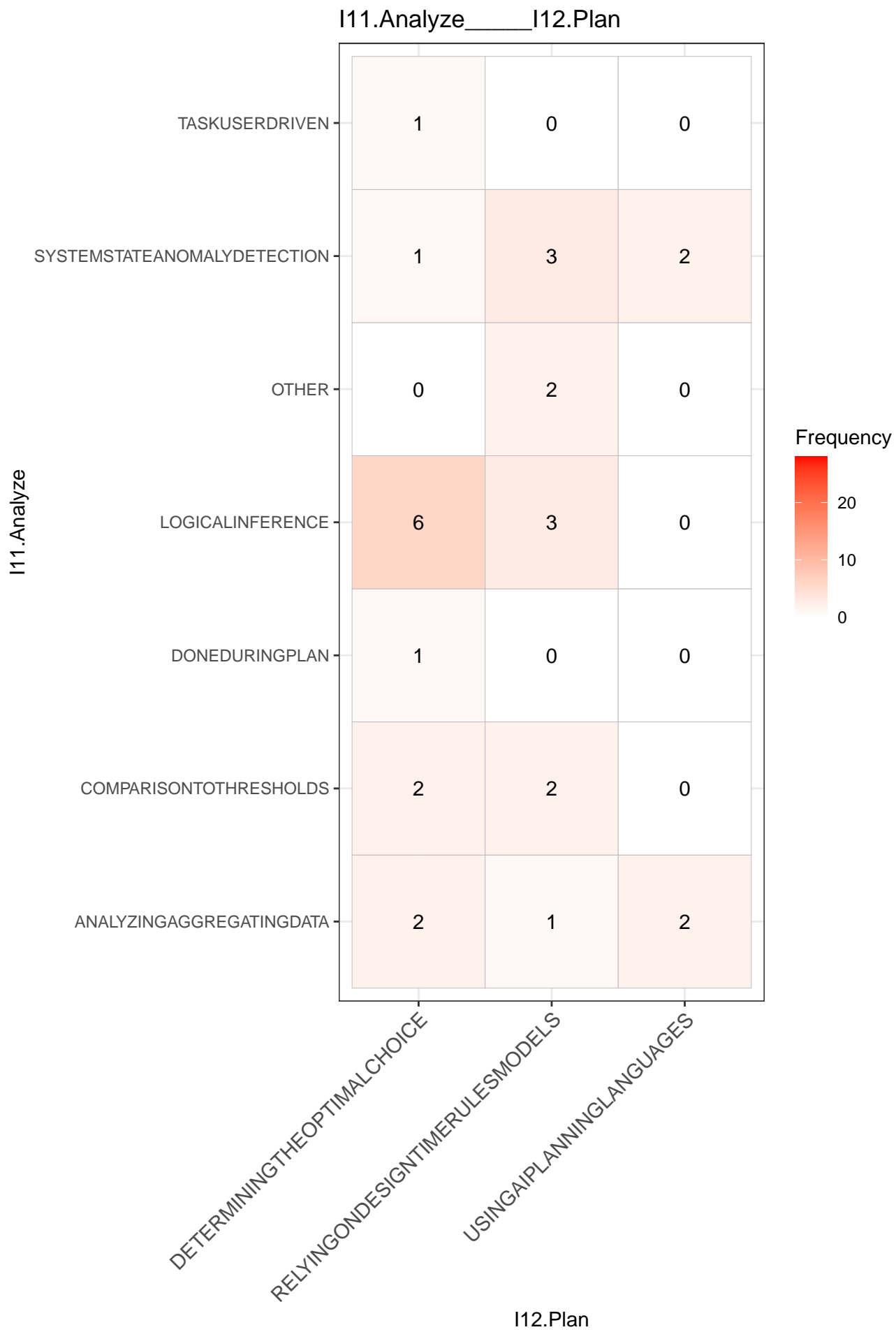
COMPONENTMODEL

GRAMMARDSL

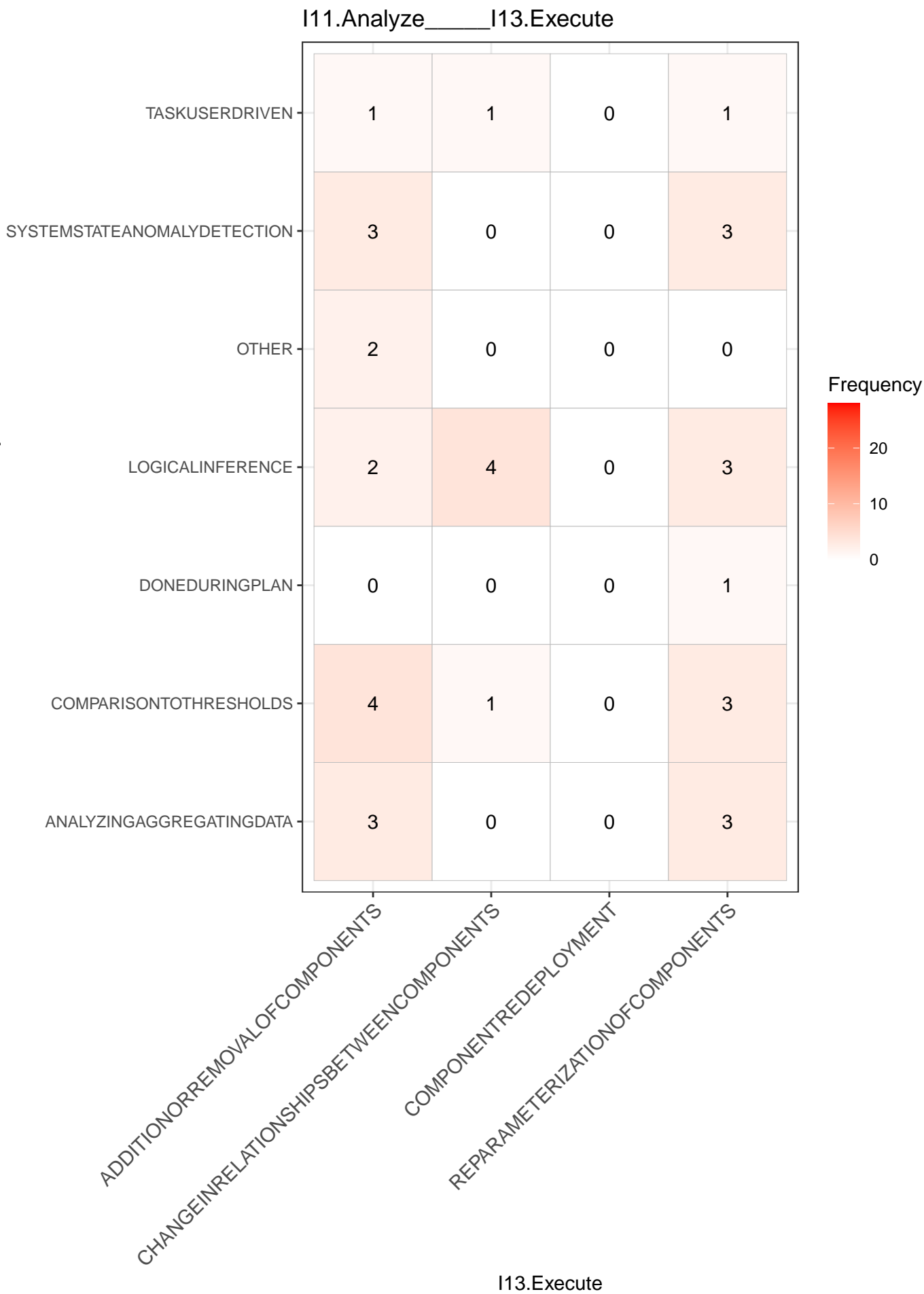
KNOWLEDGEREPRESENTATION

OTHER

VARIABILITYMODEL

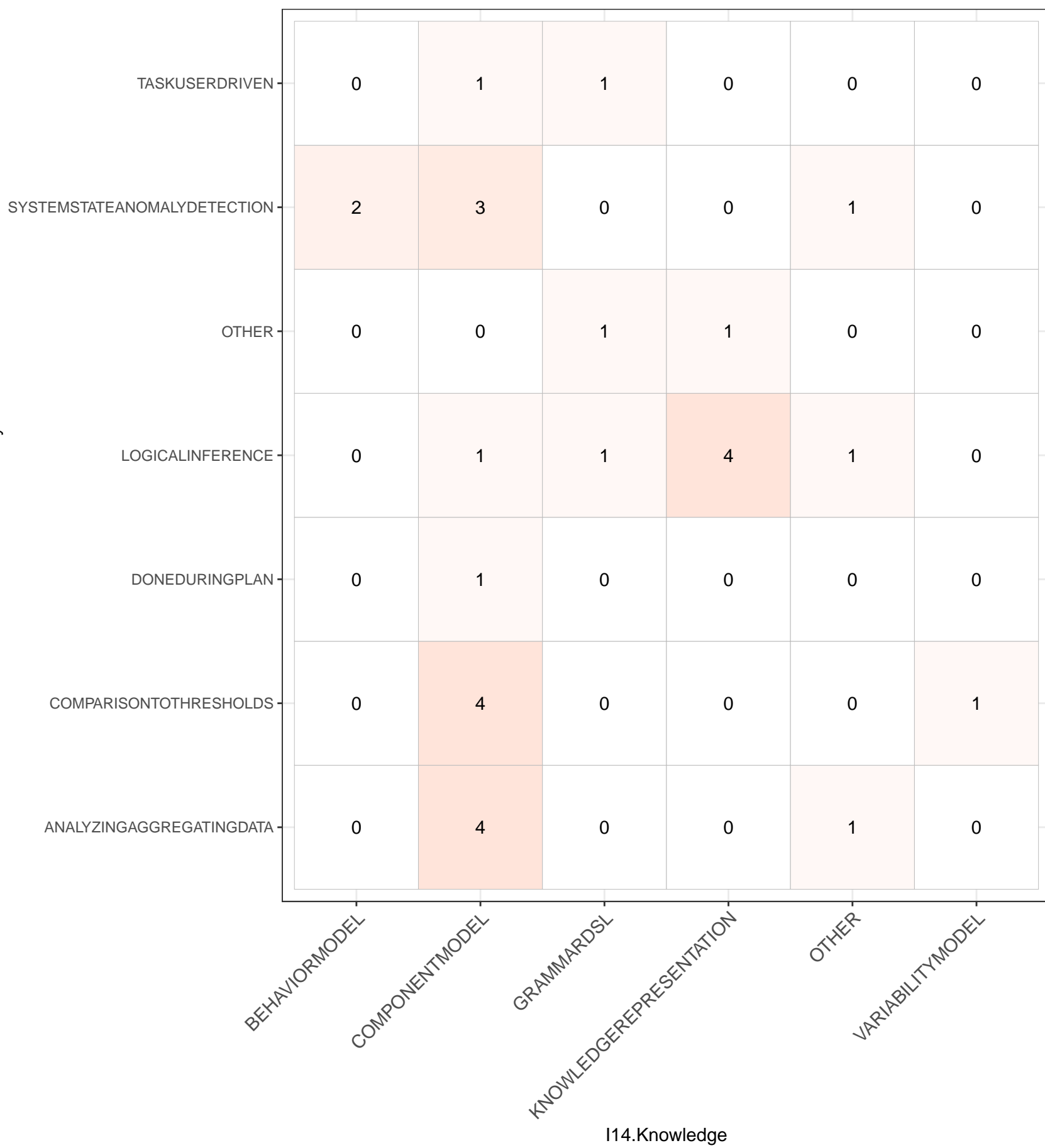


I11.Analyze



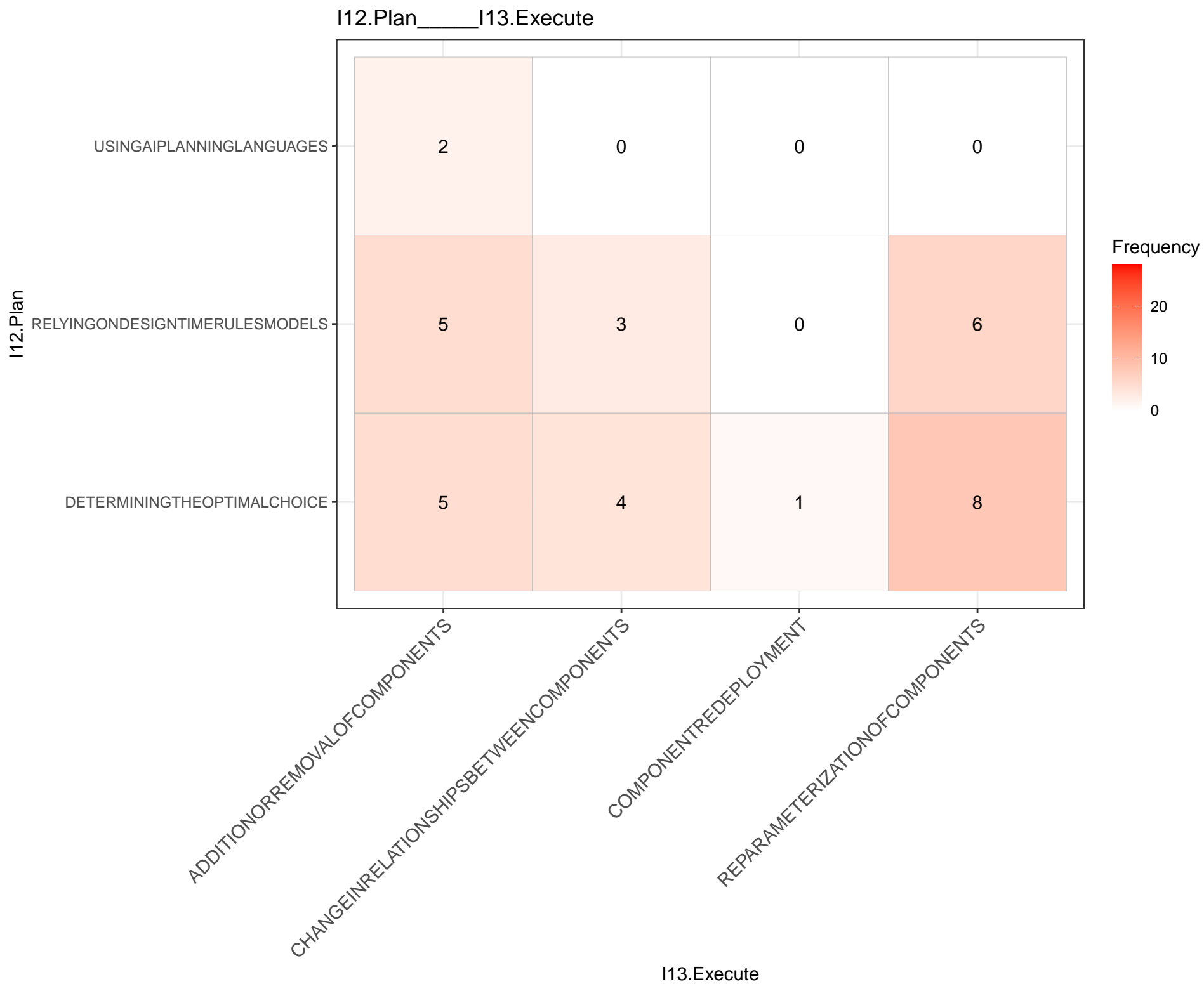
I11.Analyze_____I14.Knowledge

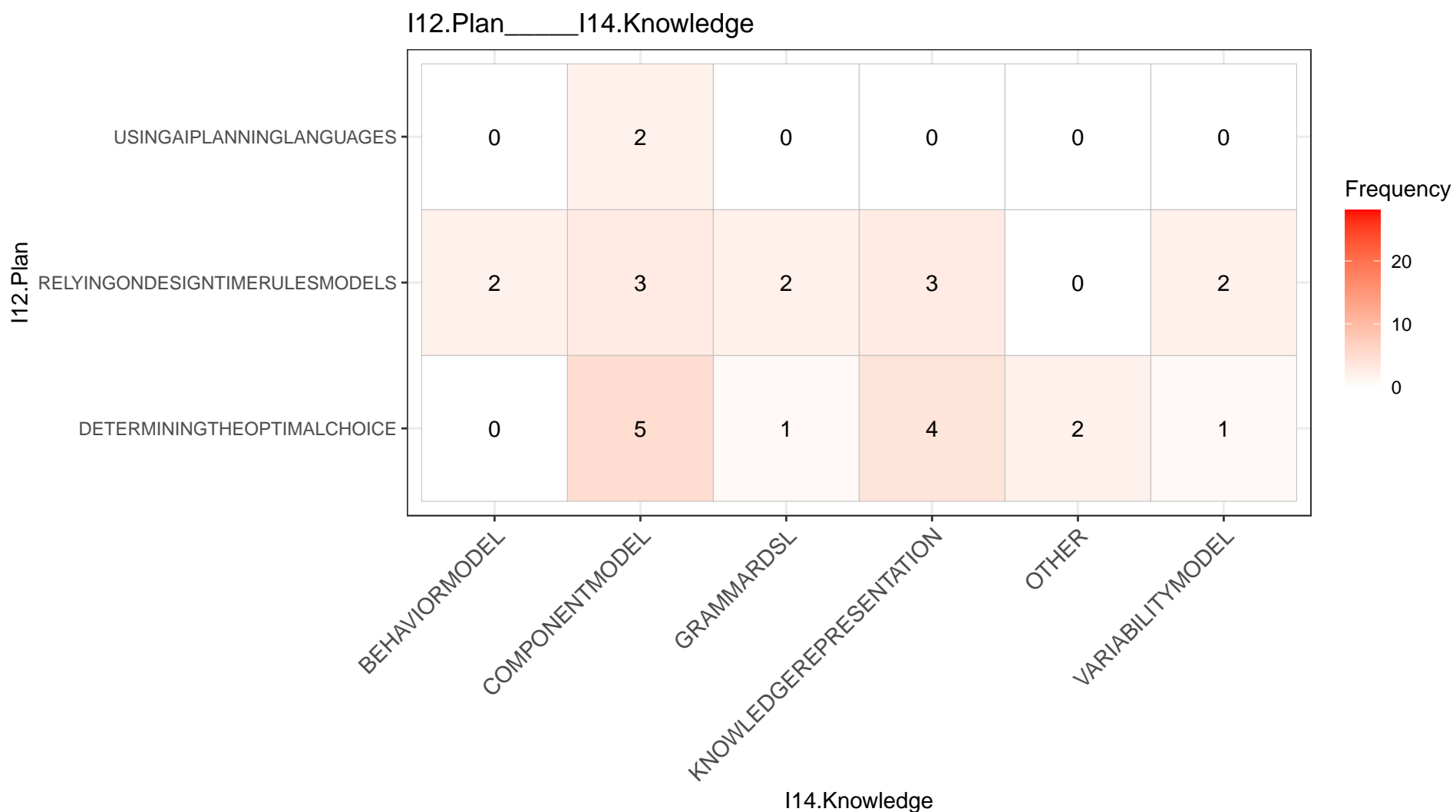
I11.Analyze



Frequency







I13.Execute

