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Architecture and Process

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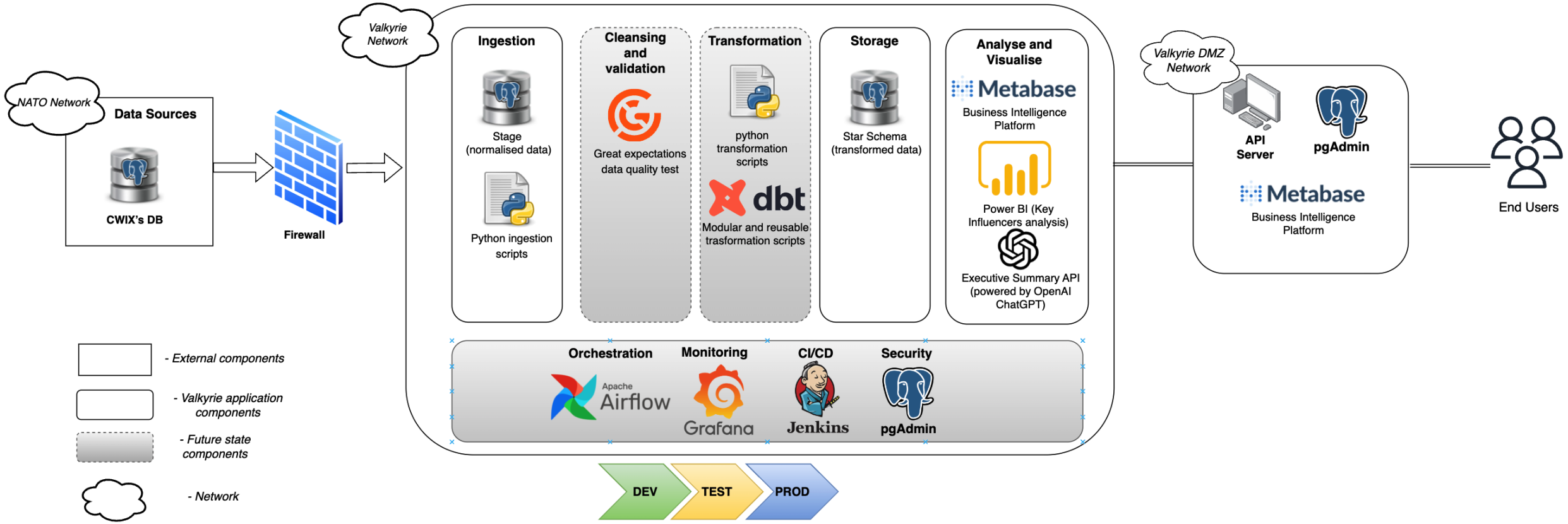
System Architecture Overview



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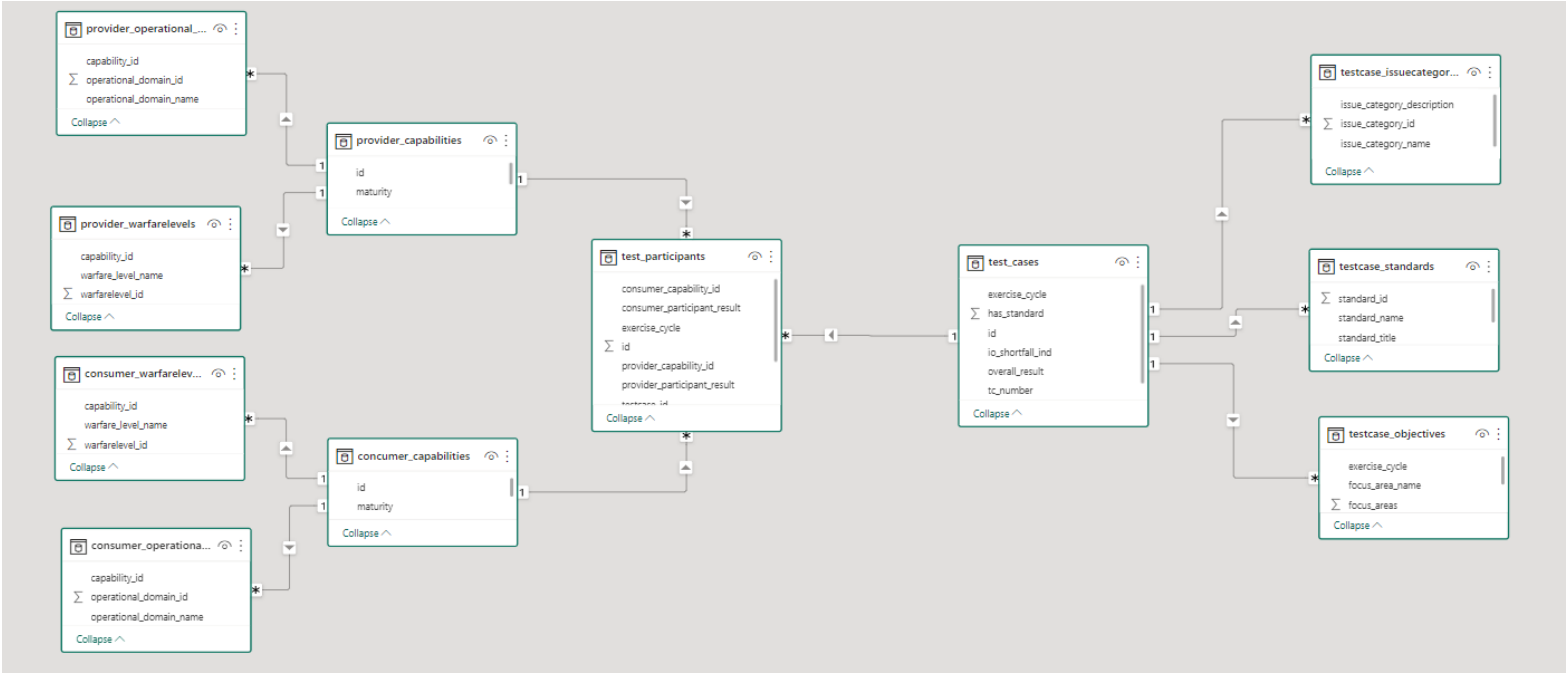
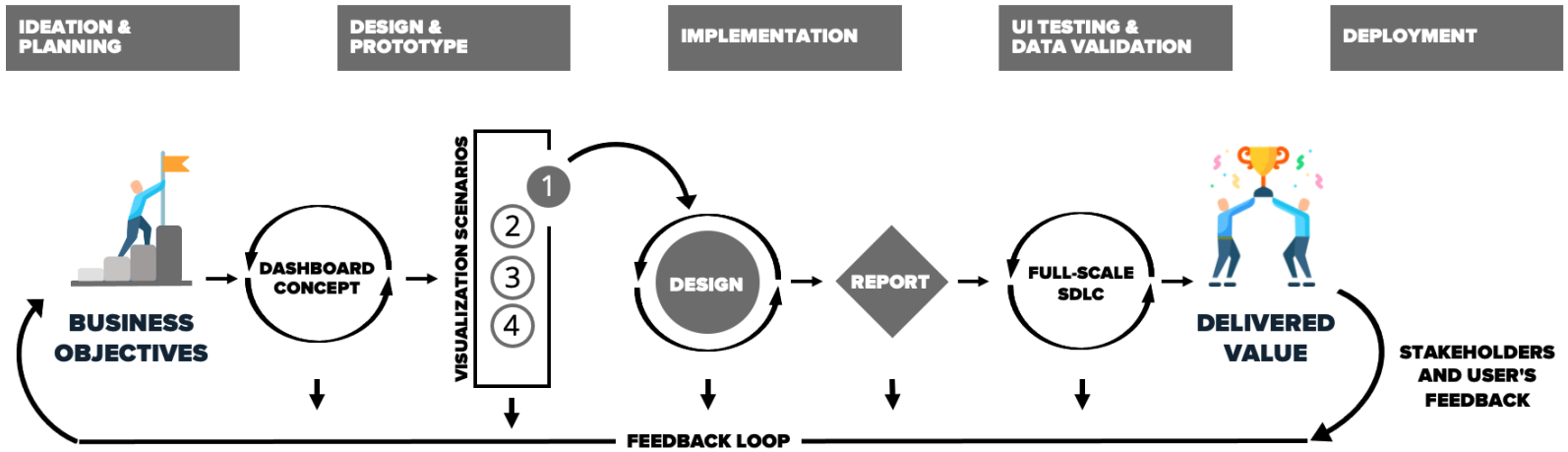
Data Warehouse Schema



BI Implementation Approach



SUCCESS FORMULA TO GET ACTIONABLE INSIGHTS

DATA PLATFORM (DATA MODEL) + REPORTING (UI+UX) + CULTURE + GOVERNANCE + MANAGEMENT

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Key Performance Indicators

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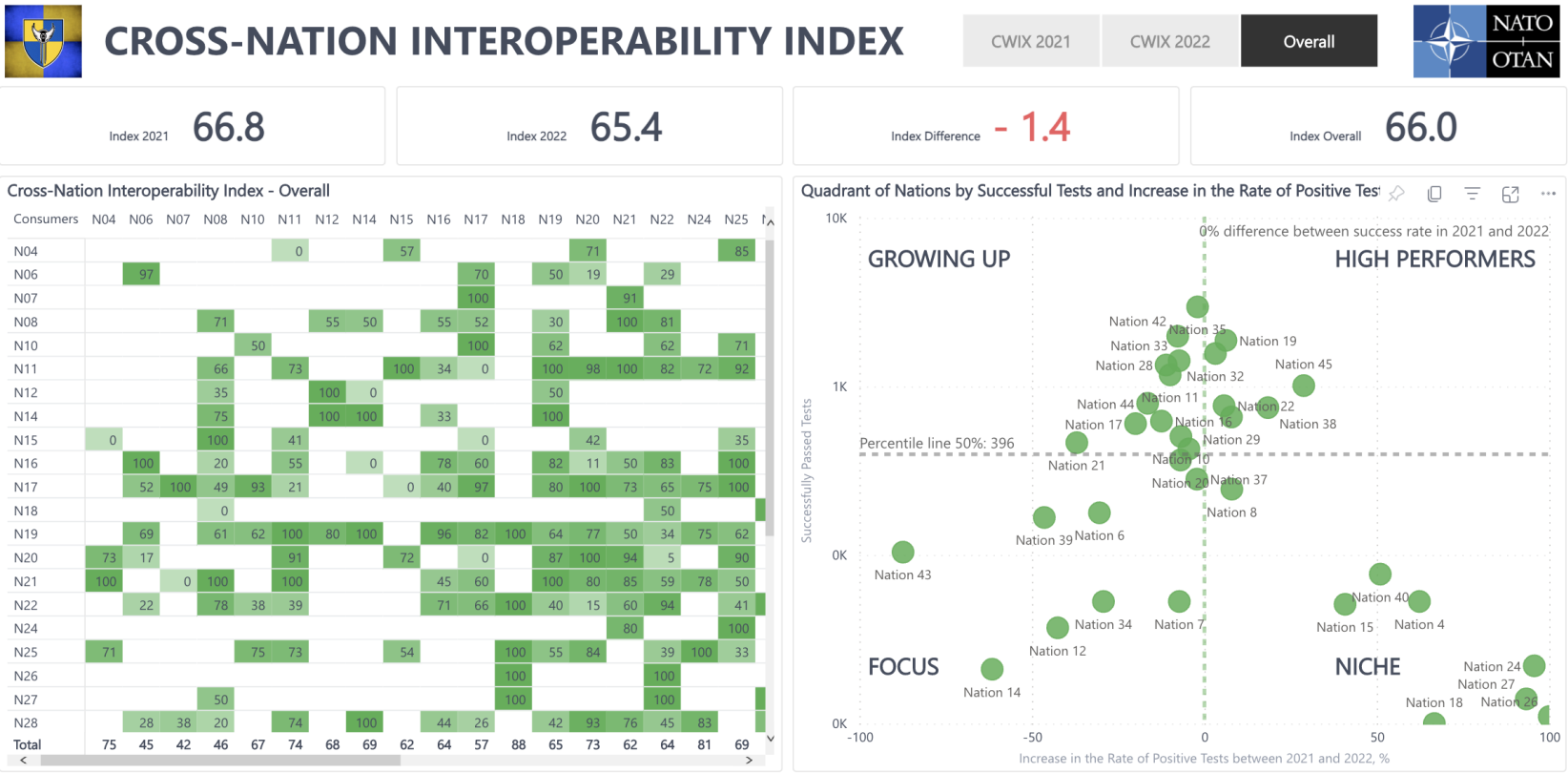
Cross-Nation Interoperability Index



The Cross-Nation Interoperability Index is a way to measure **how well countries can work together** when they do tests. It considers how good the results are when one country does the tests, and another uses them. This can help us determine how to improve testing and make it easier for countries to work together.

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Multi-Domain Capability Coverage

MULTI-DOMAIN CAPABILITY COVERAGE

Operational | Strategic | Tactical

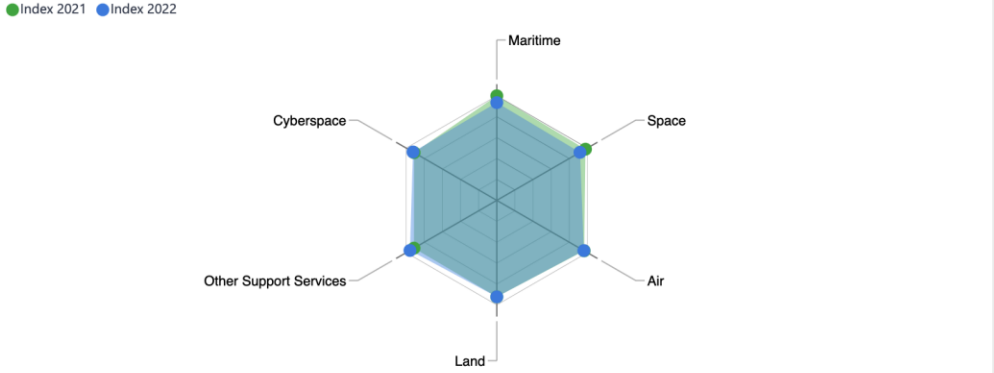
Index 2021	Index 2022	Index Difference	Index Overall
80.7	78.3	- 2.4	78.7

1 | 2 | 3 | 4

Multi-Domain Capability Coverage Details

Nations	Index 2021	Index 2022	Difference
Nation 4		100.00	100.00
Nation 6	100.00	66.67	-33.33
Nation 7	100.00	100.00	0.00
Nation 8	75.00	77.78	2.78
Nation 10	100.00	100.00	0.00
Nation 11	66.67	71.43	4.76
Nation 12	100.00		-100.00
Nation 14	100.00	66.67	-33.33
Nation 15		50.00	50.00
Nation 16	100.00	92.31	-7.69
Nation 17	100.00	80.00	-20.00
Nation 18		100.00	100.00
Nation 19	84.62	74.07	-10.54
Nation 20	100.00	75.00	-25.00
Nation 21	66.67	100.00	33.33
Nation 22	81.82	66.67	-15.15
Nation 24		0.00	0.00
Nation 25	100.00	50.00	-50.00
Nation 26		0.00	0.00
Nation 27		0.00	0.00
Nation 28	79.41	80.43	1.02
Total	80.69	78.28	-2.42

Operational Domain Coverage of Capabilities



Summary generated by OpenAI ChatGPT

The data shows that there were improvements in the Multi-Domain Capability Coverage metric for the Other Support Services and Cyberspace domains in 2022 compared to 2021. However, despite these improvements, there was an overall slight decline in the metric values for all domains in 2022, which suggests a potential decrease in the effectiveness of combined operations across different domains.

Capability Multi-Domain Coverage is a metric that shows the **percentage of testing in which capabilities are used in multiple operational domains**. It helps assess the ability of different countries to work together in diverse situations and identify areas for improvement.

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NDPP Capability Utilization Index

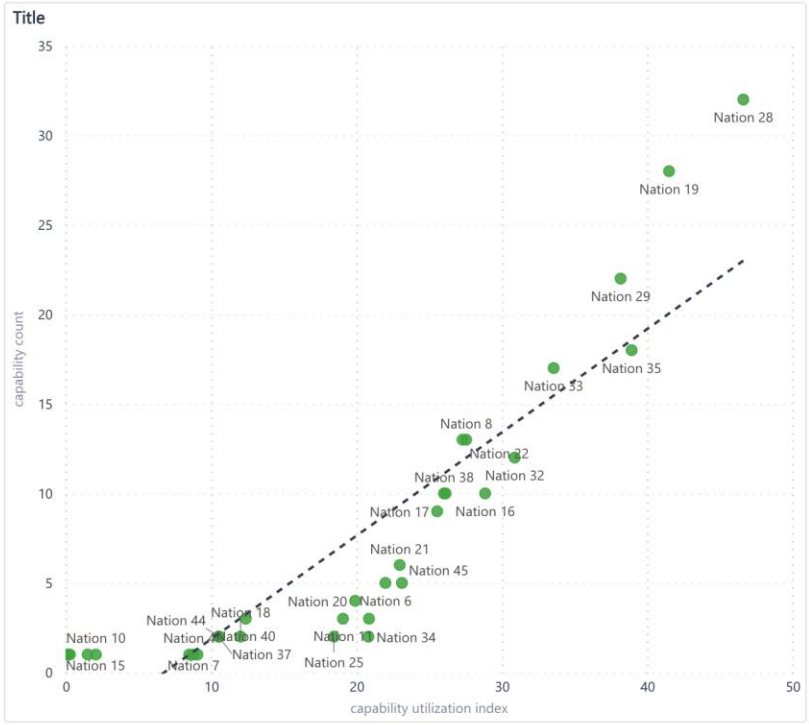
NDPP CAPABILITY UTILIZATION INDEX

CWIX 2021 | CWIX 2022 | Overall

Index 2021	Index 2022	Difference	Index Overall
19.1	19.8	0.7	23.5

NDPP Capability Utilization Index Details

Providers	Air	Cyberspace	Land	Maritime	Space	Other Supp...	Total
Nation 4				1.00	50.00		8.50
Nation 6	3.00	18.18	2.53	3.00	100.00	5.26	22.00
Nation 7				1.00	50.00	1.75	8.79
Nation 8	6.00	36.36	4.43	8.00	100.00	10.53	27.55
Nation 10	1.00	9.09	0.63			1.75	2.08
Nation 11	1.00	9.09	0.63	2.00	100.00	1.75	19.08
Nation 14	1.00		0.63	1.00	50.00	1.75	9.06
Nation 15						1.75	0.29
Nation 16	6.00	45.45	3.16	8.00	100.00	10.53	28.86
Nation 17	4.00	27.27	3.80	6.00	100.00	12.28	25.56
Nation 18		18.18	1.27	1.00	50.00	1.75	12.03
Nation 19	8.00	100.00	9.49	14.00	100.00	17.54	41.51
Nation 20	3.00	9.09	1.90	2.00	100.00	3.51	19.92
Nation 21	2.00	18.18	3.16	4.00	100.00	10.53	22.98
Nation 22	7.00	36.36	3.16	5.00	100.00	12.28	27.30
Nation 24			0.63				0.11
Nation 25		9.09	0.63	1.00	100.00		18.45
Nation 26		9.09					1.52
Nation 27				1.00			0.17
Nation 28	16.00	100.00	8.86	18.00	100.00	36.84	46.62
Nation 29	9.00	81.82	4.43	11.00	100.00	22.81	38.18
Nation 32	4.00	63.64	4.43	1.00	100.00	12.28	30.89
Nation 33	5.00	63.64	8.23	7.00	100.00	17.54	33.57
Total	4.25	35.66	2.91	4.07	87.04	9.18	19.82



The NDPP Capability Utilization Index measures how effectively nations **use NATO-recommended capabilities** during CWIX events, identifying areas for improvement, and maximizing available resources.

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Improving Future CWIX Events

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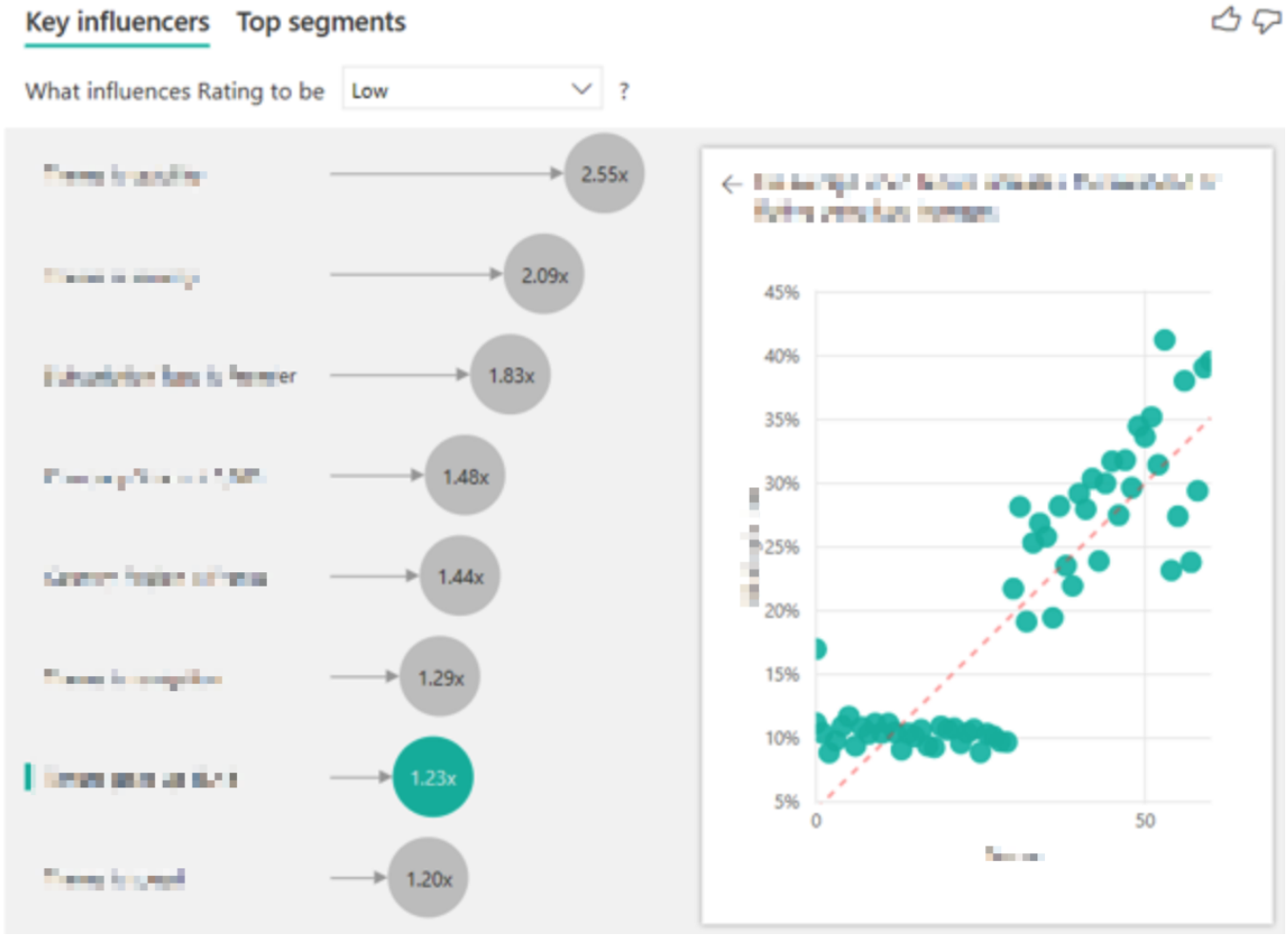
Key Influencers Report



The Key Influencers report provides insights on the Cross-Nation Interpretability Index, Multi-Domain Capability Coverage, and NDPP Capability Utilization Index, **helping identify areas for improvement**.

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Nation Pairing Recommendation Report

NATIONAL PAIRING RECOMMENDATION INDEX

Overall | Air | Cyberspace

National Pairing Recommendation Index

Consumers	N04	N06	N07	N08	N10	N11	N12	N14	N15	N16	N17	N18	N19	N20	N21	N22	N24	N25	N26	N27	N28	N29	N32	N33	N34	N35	N37	N38	N39	N40	N42	N43	N44	N45
N04	57.1	74.4	73.1	69.7	61.3	100.0	53.7	64.2	42.9	67.6	73.3	49.6	63.9	28.6	55.9	71.3	53.0	15.4	53.8	52.1	70.1	59.6	59.5	51.9	55.0	62.8	31.6	59.4	62.7	59.9	60.0	57.7	67.9	61.4
N06	61.6	3.4	63.6	73.3	61.8	60.9	60.7	71.9	73.9	62.1	29.9	49.8	50.0	81.4	62.2	71.4	51.2	58.1	54.8	55.9	75.0	42.1	76.7	55.2	0.0	9.1	69.3	62.7	63.2	93.9	57.0	53.9	22.2	59.8
N07	45.9	64.3	69.3	69.4	60.2	57.7	55.3	68.3	73.0	61.5	0.0	47.2	63.5	57.3	9.1	63.3	49.0	55.1	50.4	50.8	70.9	63.4	64.1	52.1	44.8	56.3	65.1	7.3	63.4	69.8	0.0	0.0	68.7	56.6
N08	55.4	69.5	69.0	28.6	62.8	58.4	45.5	50.0	66.6	45.5	48.3	48.3	69.5	59.7	0.0	18.5	51.7	58.8	47.7	0.0	62.3	61.8	75.0	0.0	49.6	31.6	64.2	69.1	91.2	80.0	14.3	54.0	33.3	57.3
N10	60.8	68.2	67.9	72.1	50.0	61.0	59.6	70.0	69.7	63.9	0.0	49.2	38.4	62.2	62.6	37.9	53.9	28.8	51.0	52.9	72.4	64.7	41.4	56.2	51.3	29.7	66.7	33.9	65.0	73.0	0.0	54.4	0.0	60.7
N11	54.3	71.5	72.2	34.3	63.8	26.7	60.0	70.0	0.0	66.0	100.0	52.2	0.0	2.0	0.0	18.1	27.8	7.7	51.1	50.9	75.6	2.3	16.7	0.0	53.0	95.2	21.7	2.4	26.9	0.0	6.3	58.3	8.7	0.0
N12	46.7	67.1	61.2	64.7	61.8	55.4	0.0	100.0	61.0	62.3	62.5	50.5	50.0	56.2	57.8	65.6	51.0	54.9	46.3	49.2	71.4	100.0	64.2	0.0	46.7	56.1	59.6	36.4	63.8	69.5	56.0	73.5	69.8	56.6
N14	45.3	68.0	68.6	25.0	61.7	57.4	0.0	0.0	69.8	66.7	63.5	50.0	0.0	57.7	60.3	67.1	54.2	57.5	48.5	50.8	100.0	68.8	66.6	0.0	50.5	58.3	60.3	0.0	65.8	70.6	58.7	0.0	71.2	59.2
N15	100.0	72.2	71.2	0.0	62.0	58.8	57.7	68.1	64.2	66.4	100.0	53.0	65.0	57.9	60.7	68.5	54.4	65.0	55.5	53.2	33.3	100.0	66.0	0.0	54.1	83.3	55.6	62.0	64.5	72.0	61.2	56.1	66.7	100.0
N16	59.7	0.0	68.0	80.0	62.8	45.5	59.2	100.0	68.7	21.9	40.0	49.1	18.5	88.9	50.0	17.4	51.4	0.0	50.6	52.0	38.0	52.6	59.5	31.4	20.0	15.3	100.0	58.3	63.4	72.1	33.3	53.8	27.3	6.7
N17	55.8	47.6	0.0	50.8	7.1	78.6	56.7	70.5	100.0	60.3	2.9	48.1	20.0	0.0	27.4	34.9	25.0	0.0	54.8	53.9	48.1	19.7	40.0	23.1	0.0	14.1	70.0	86.4	75.0	72.1	65.3	0.0	53.3	100.0
N18	51.7	65.3	66.5	100.0	57.7	52.5	48.7	54.7	67.8	53.5	59.0	33.5	62.3	56.2	51.0	50.0	44.1	52.3	0.0	0.0	66.8	57.2	60.2	43.2	0.0	50.0	62.8	53.5	59.6	70.4	0.0	52.6	60.2	43.7
N19	52.5	31.3	65.6	38.8	37.7	0.0	20.0	0.0	68.0	4.3	17.6	0.0	35.6	22.6	50.0	65.5	25.0	37.9	48.7	49.9	56.3	37.1	25.0	11.7	0.0	18.4	41.7	53.3	12.5	71.3	30.8	14.8	41.2	42.9
N20	26.7	83.3	72.3	69.4	60.9	9.1	57.5	67.9	27.6	65.1	100.0	49.8	13.5	0.0	6.3	95.0	50.5	10.4	51.1	50.2	78.5	0.0	62.1	0.0	50.2	0.0	45.0	10.0	60.5	67.1	58.1	53.8	48.1	60.0
N21	0.0	69.9	100.0	0.0	59.7	0.0	58.5	69.4	66.5	54.9	39.7	49.6	0.0	20.0	15.0	40.7	22.2	50.0	54.1	53.6	4.3	20.0	63.4	21.3	49.0	0.0	16.7	0.0	33.3	69.6	57.3	0.0	70.4	59.9
N22	55.8	77.8	67.5	21.7	62.3	60.6	56.3	64.8	66.2	29.4	33.6	0.0	59.7	85.3	40.5	5.9	49.4	58.7	0.0	33.3	62.1	35.7	62.8	23.8	0.0	33.1	91.1	40.2	30.4	100.0	3.0	54.0	33.3	0.0
N24	47.9	64.0	61.7	68.7	59.5	57.2	54.8	69.1	60.8	60.6	62.7	50.1	62.6	57.7	20.0	64.9	48.1	0.0	47.1	46.5	0.0	60.6	62.8	0.0	0.0	56.3	65.3	59.0	60.7	71.6	54.6	49.7	67.7	56.4
N25	29.0	68.5	66.0	67.6	25.0	27.3	54.2	63.5	46.4	59.0	62.4	0.0	44.9	16.1	55.2	61.4	0.0	66.7	47.0	45.8	67.5	58.2	58.3	48.7	0.0	13.3	37.8	26.2	56.4	66.5	54.3	49.0	100.0	55.1
N26	57.2	66.9	64.2	68.4	59.2	53.1	54.9	56.5	68.6	54.2	59.7	0.0	65.0	54.5	55.4	0.0	44.7	56.8	37.1	0.0	70.6	60.6	59.9	47.1	42.4	0.0	62.5	56.1	63.9	75.7	48.7	52.3	62.9	48.3
N27	57.8	68.4	68.1	50.0	59.1	55.5	53.6	58.5	69.3	55.5	60.9	0.0	64.9	57.4	58.9	0.0	52.1	56.9	0.0	42.9	71.1	61.2	60.7	49.9	44.7	0.0	64.6	56.3	60.5	76.3	50.8	53.3	64.9	50.7
N28	55.4	72.4	62.5	80.2	61.2	25.7	56.8	0.0	62.5	56.1	73.6	46.7	58.4	6.7	24.1	55.0	16.7	59.1	33.3	0.0	51.2	34.5	52.5	20.3	28.6	65.0	33.3	13.3	63.0	38.1	42.1	100.0	19.2	23.3
N29	55.1	39.4	69.0	64.3	61.9	25.0	97.0	100.0	64.5	62.5	25.0	49.9	51.4	52.8	28.6	33.3	0.0	59.6	52.0	51.8	43.8	18.4	35.7	37.3	52.0	17.8	65.6	72.3	0.0	46.9	13.3	54.7	50.0	28.6
N32	56.6	82.7	70.4	50.4	38.4	14.3	60.6	70.2	64.3	22.0	46.6	50.8	20.3	61.1	100.0	15.7	0.0	61.5	52.8	52.5	56.0	30.3	18.0	53.8	51.8	23.3	15.8	40.0	54.2	10.2	13.6	56.2	22.2	25.0
N33	52.5	0.0	68.3	47.4	62.0	50.0	18.2	69.9	66.0	35.8	35.8	100.0	19.5	60.3	30.8	24.1	0.0	58.4	52.2	52.9	14.6	33.8	36.4	8.1	0.0	0.0	33.3	1.2	0.0	0.0	0.0	0.0	85.7	6.3
N34	55.1	0.0	65.2	69.7	59.3	56.7	55.4	67.8	70.5	0.0	0.0	0.0	90.9	58.3	58.6	0.0	0.0	0.0	47.0	47.9	100.0	66.7	62.3	11.1	0.0	0.0	65.4	0.0	75.0	69.6	0.0	0.0	68.3	0.0

The Nation Pairing Recommendation Report suggests which **countries should conduct testing together** for better coverage and efficiency while avoiding repeated testing.

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Failed Test Cases Analysis Report

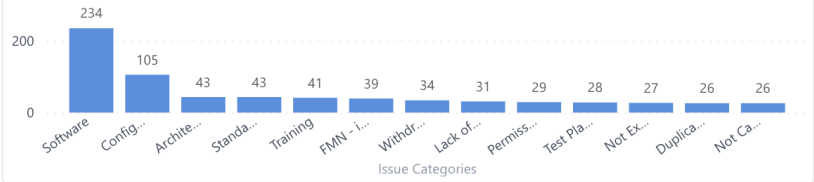
FAILED TEST CASES ANALYSIS

CWIX 2021 | CWIX 2022

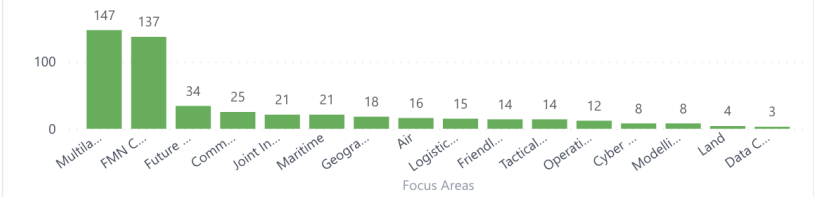
Failed Test Cases Details

Id	Number	Title	Exercise Cycle	Has Standard	Overall Result	Test Participants
1197	TC-00929	**********	CWIX 2021	1	Interoperability Issue	5
6405	TC-04199	**********	CWIX 2021	1	Interoperability Issue	5
12106	TC-07032	**********	CWIX 2021	0	Interoperability Issue	5
12654	TC-20006	**********	CWIX 2022	1	Interoperability Issue	5
13535	TC-20391	**********	CWIX 2022	0	Interoperability Issue	5
13737	TC-20594	**********	CWIX 2022	0	Interoperability Issue	5
1271	TC-01018	**********	CWIX 2021	0	Interoperability Issue	4
1272	TC-01020	**********	CWIX 2021	0	Interoperability Issue	4
1274	TC-01022	**********	CWIX 2021	0	Interoperability Issue	4
13539	TC-20395	**********	CWIX 2022	0	Interoperability Issue	4
24324	TC-13237	**********	CWIX 2021	1	Interoperability Issue	3
24332	TC-13245	**********	CWIX 2021	0	Interoperability Issue	3
30892	TC-62863	**********	CWIX 2022	0	Interoperability Issue	3
46	TC-00058	**********	CWIX 2021	0	Interoperability Issue	2
1680	TC-00871	**********	CWIX 2022	1	Interoperability Issue	2
1910	TC-01118	**********	CWIX 2022	1	Interoperability Issue	2
1972	TC-01197	**********	CWIX 2022	0	Interoperability Issue	2
5160	TC-03311	**********	CWIX 2021	0	Limited Success	2
6020	TC-03712	**********	CWIX 2021	0	Interoperability Issue	2
6897	TC-03803	**********	CWIX 2022	0	Interoperability Issue	2
7585	TC-04052	**********	CWIX 2022	0	Interoperability Issue	2
7591	TC-04058	**********	CWIX 2022	1	Interoperability Issue	2
8164	TC-04959	**********	CWIX 2021	0	Interoperability Issue	2
Total						571

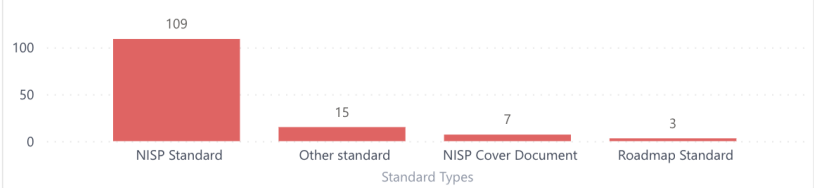
Failed Test Cases by Issue Categories



Failed Test Cases by Focus Areas



Failed Test Cases by Standard Types



The Failed Test Cases Analysis Report evaluates test cases that have consistently failed over time, identifying which cases should be reconsidered or recreated to improve overall testing effectiveness.

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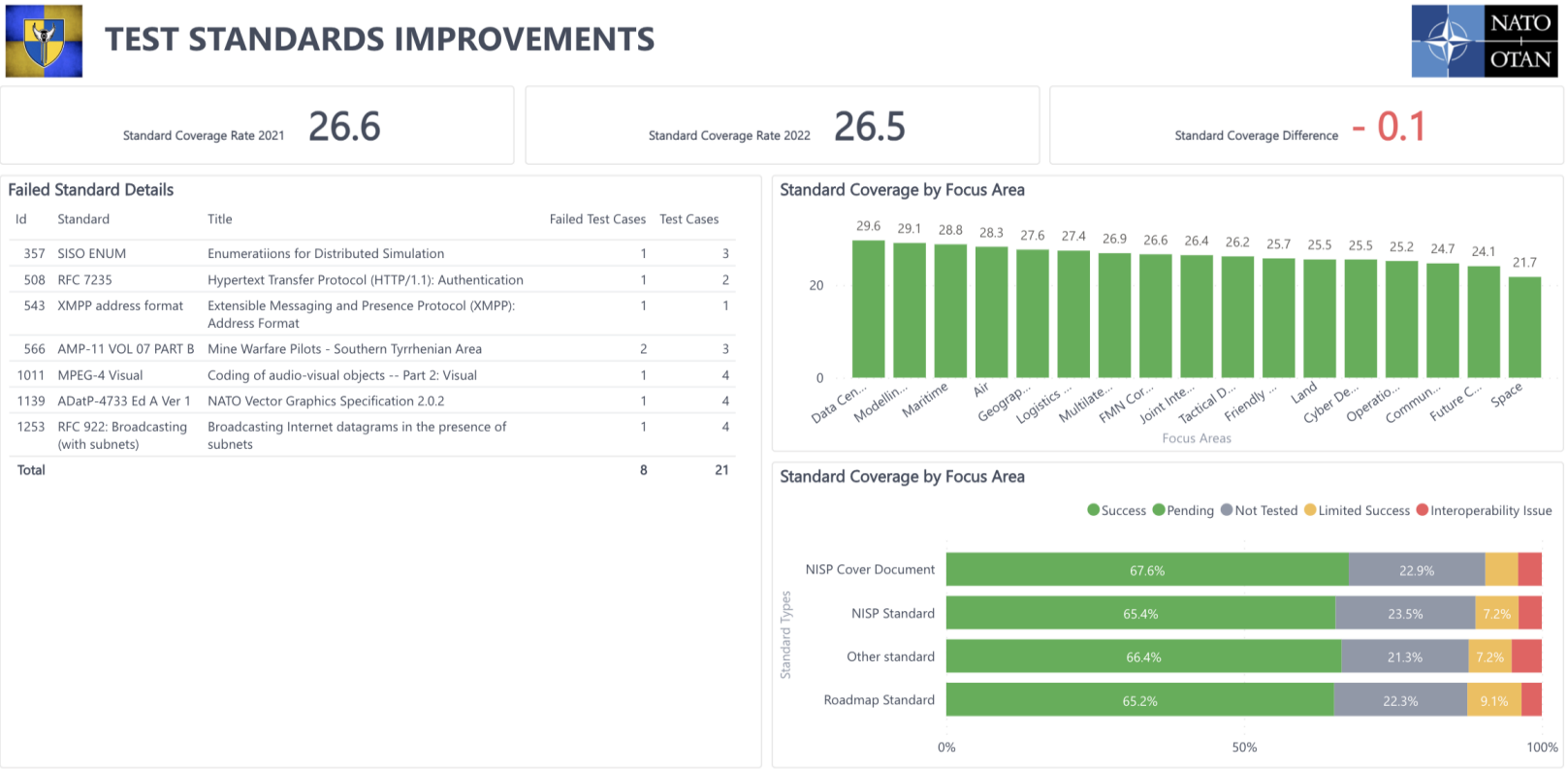
Test Standards Improvement Report



The Test Standards Improvement Report identifies which **standards caused issues during testing and need improvement**. It helps to ensure that tests are more effective and efficient, leading to better overall results.

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Publicly Available Dashboard

http://metabase.valkyrie.org.ua/public/dashboard/47a3ce1b-752f-40ef-b40c-ba3fd6fc6fa7

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Any Questions?

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