Major Global Digital Policy Frameworks in Cybersecurity

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Introduction

- **Purpose of the Study :** To analyze cybersecurity effectiveness across countries using various indices (GCI, CEI, NSCI).
- To explore the relationship between digital development and cybersecurity readiness.

Dataset Overview

- **Dataset Description:**

1. **Country:** The name of the country being analyzed.
2. **Region:** The geographical region (e.g., North America, Europe).
3. **CEI (Cybersecurity Effectiveness Index):** A score indicating the effectiveness of a country's cybersecurity policies.
4. **GCI (Global Cybersecurity Index):** An index ranking countries based on their cybersecurity measures across various dimensions.
5. **NSCI (National Cybersecurity Index):** Measures a country's preparedness to protect its digital infrastructure.
6. **DDL (Digital Development Level):** Represents the overall digital maturity and technological adoption of a country.

- **Source:** This dataset is sourced from Kaggle

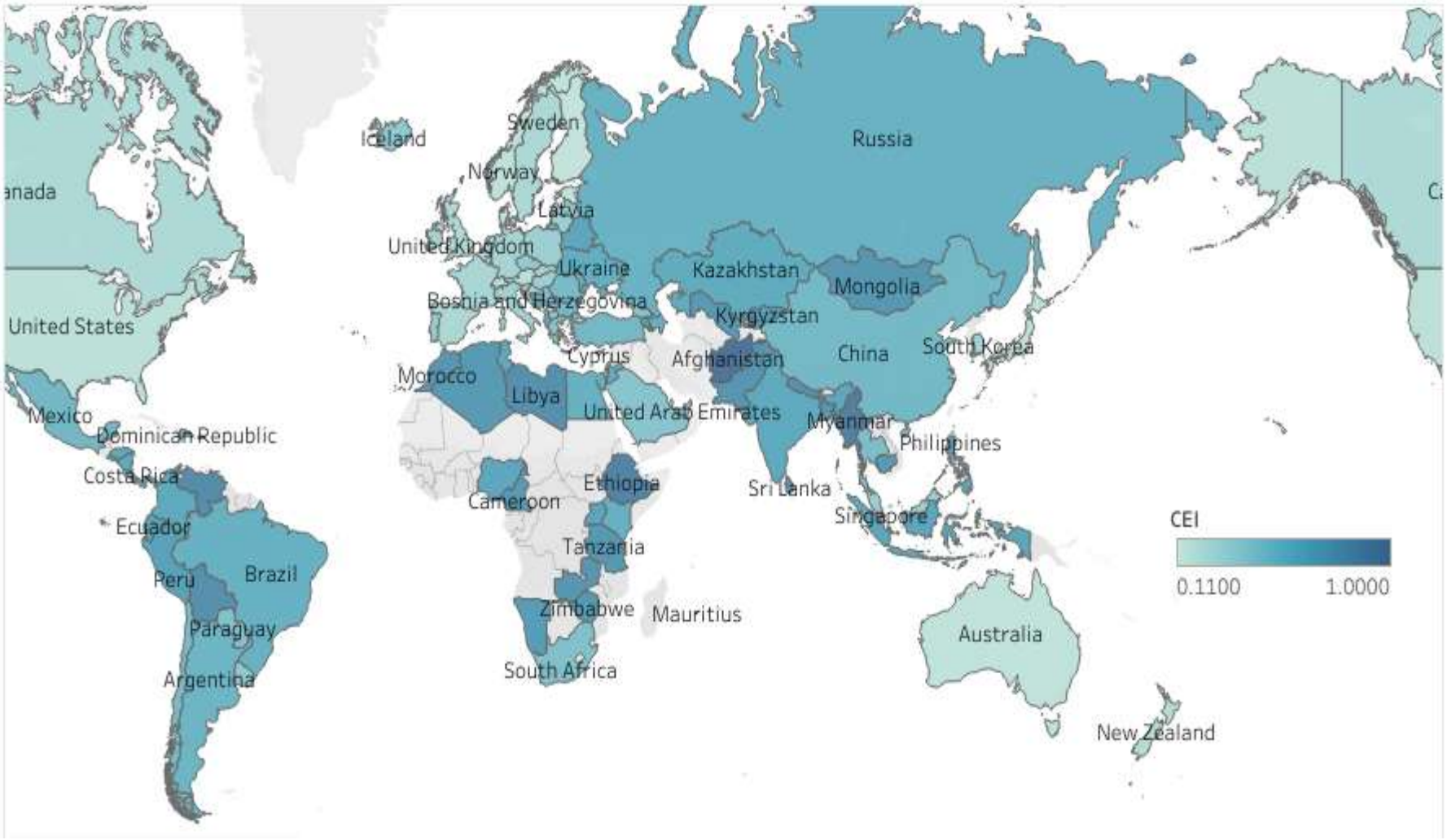
Cybersecurity Readiness Across Countries

- **Description:** A filled map visualization that displays the Cybersecurity Effectiveness Index (CEI) for each country.

- **Insights:**

1. Countries like Afghanistan , Myanmar have the highest scores, indicating strong cybersecurity policies and infrastructure.
2. Countries like India, Singapore need improvement in their cybersecurity measures.
3. Countries like Australia , Canada are lagging in cybersecurity readiness.

Heatmap

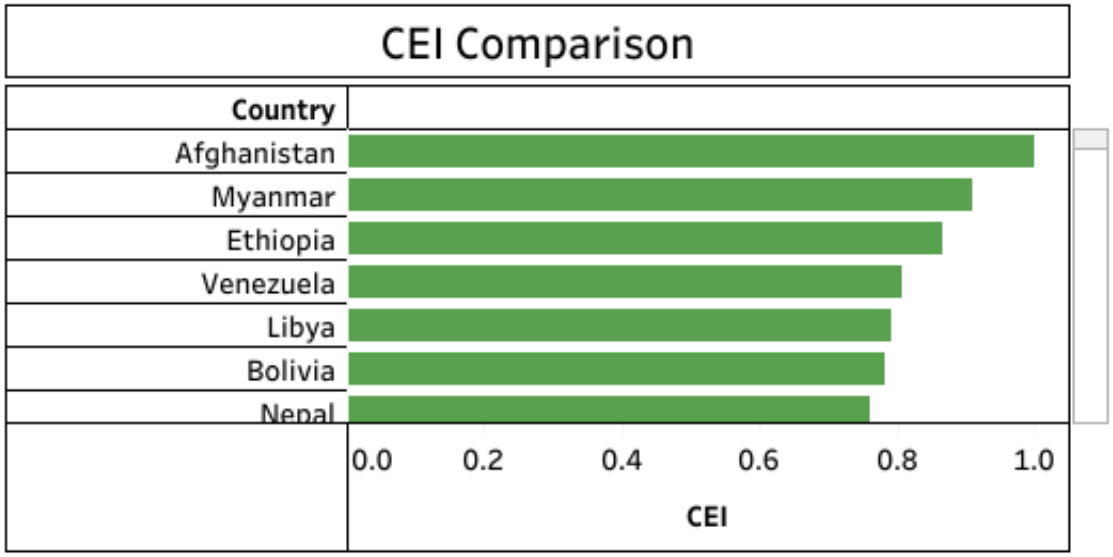

Iceland
Sweden
Norway
Latvia
Russia
United Kingdom
Ukraine
Kazakhstan
Mongolia
Boshnia and Herzegovina
Kyrgyzstan
United States
Cyprus
Afghanistan
China
South Korea
Morocco
Libya
United Arab Emirates
Myanmar
Mexico
Dominican Republic
Philippines
Costa Rica
Ethiopia
Sri Lanka
Cameroon
Singapore
Ecuador
Tanzania
Peru
Brazil
Zimbabwe
Mauritius
Paraguay
Australia
South Africa
Argentina
New Zealand
CEI
0.1100
1.0000

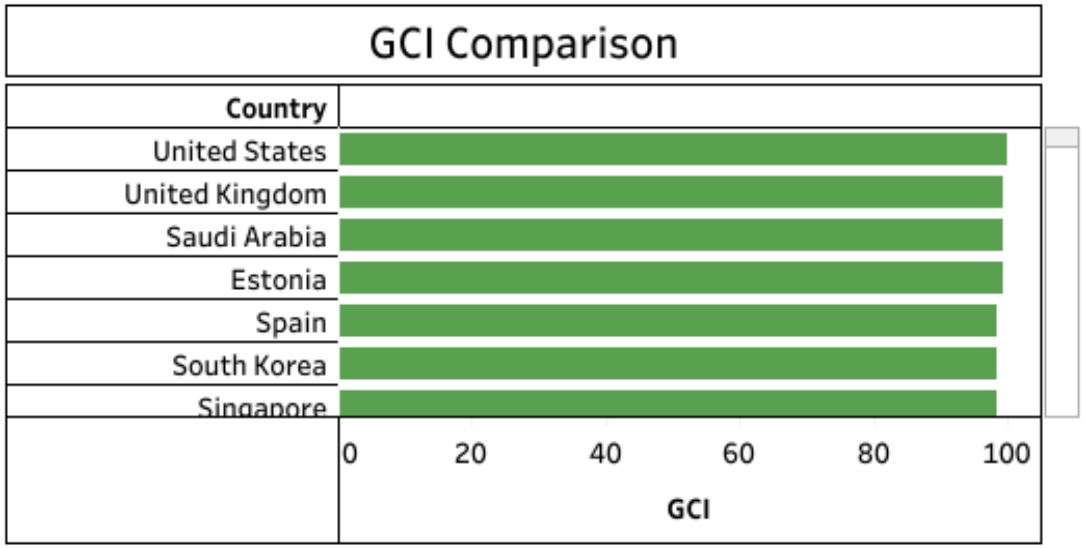
Comparison of Cybersecurity Indices

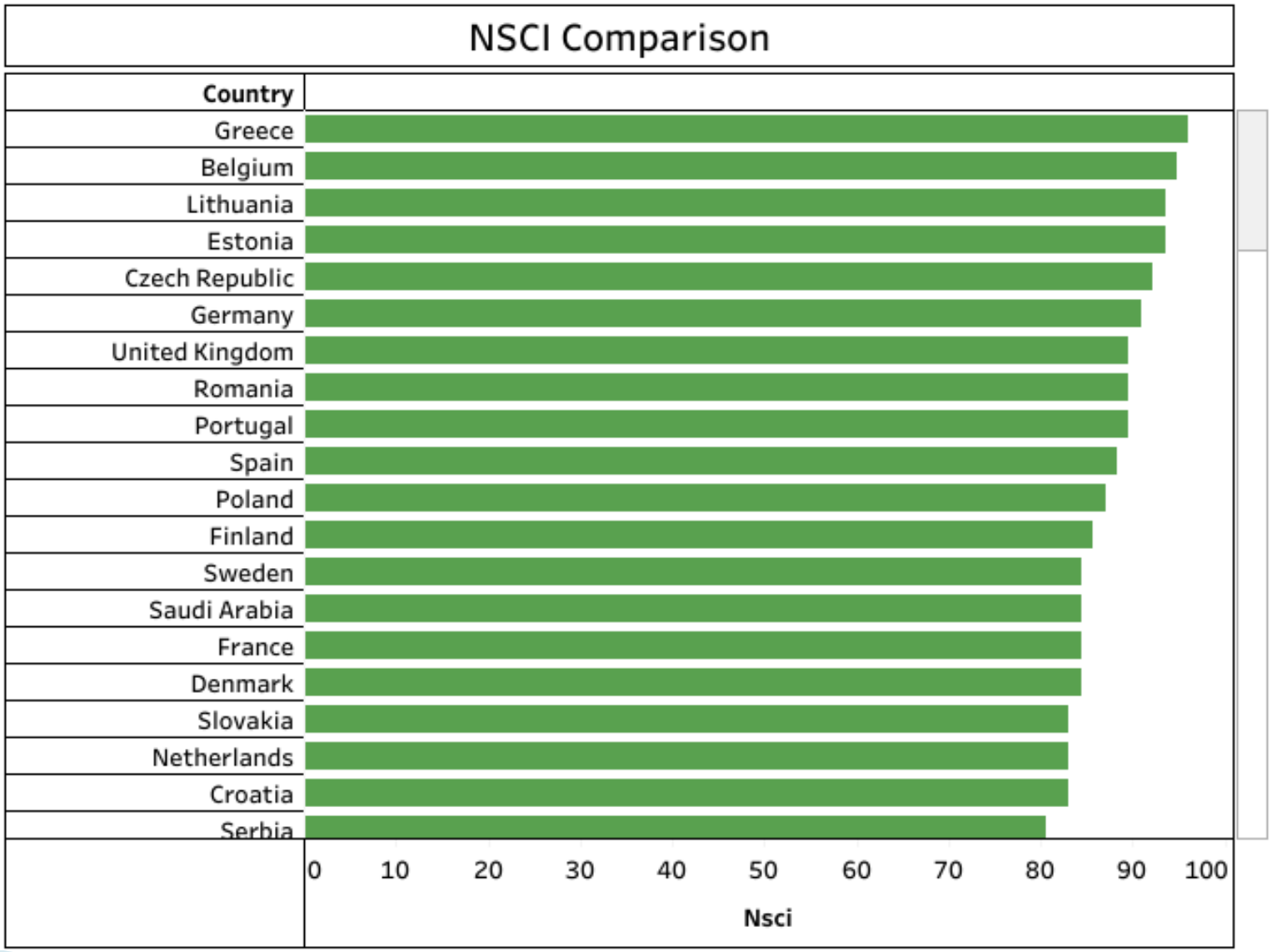
- **Description:** A bar chart that compares the three key cybersecurity indices—GCI, CEI, and NSCI—for selected countries.

- **Insights:**

1. **Comparative Rankings:** The bar chart reveals that countries like Afghanistan, Myanmar, and Ethiopia have high CEI scores, indicating effective policies despite broader challenges.
2. **Discrepancies:** In contrast, nations with GCI scores, such as the US, UK, and Saudi Arabia, showcase strong legal and technical frameworks but may not reflect operational effectiveness as seen in CEI.
3. **Top Performers:** Countries with high NSCI scores include Greece, Belgium, and Lithuania, highlighting their preparedness and resilience in protecting digital infrastructure.
4. **Implications:** These disparities suggest that effective cybersecurity is multifaceted, and investments in policy, technology, and operational capacity must align to enhance overall cybersecurity effectiveness globally.


CEI Comparison
Country
Afghanistan
Myanmar
Ethiopia
Venezuela
Libya
Bolivia
Nepal
0.0
0.2
0.4
0.6
0.8
1.0
CEI

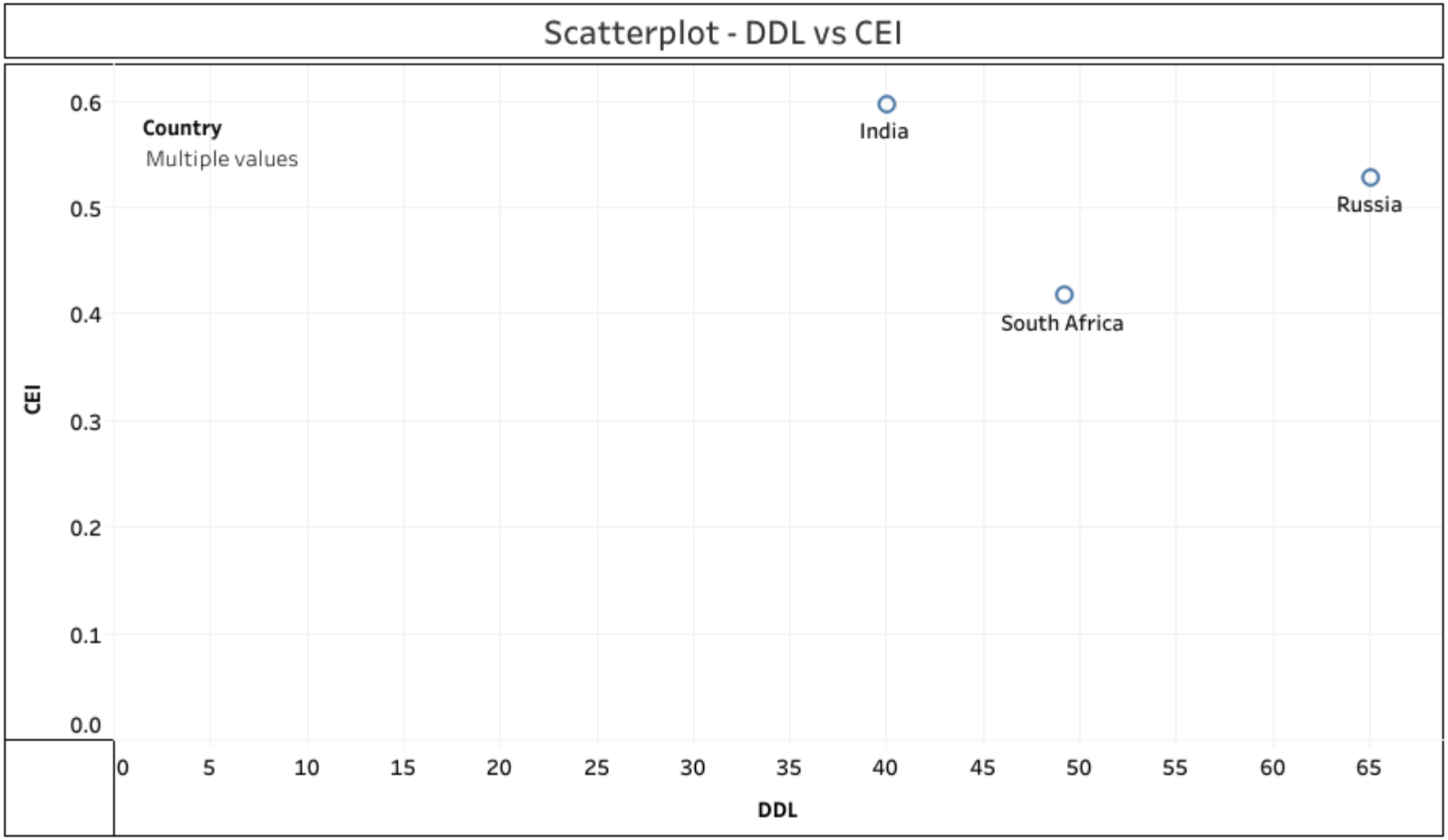

GCI Comparison
Country
United States
United Kingdom
Saudi Arabia
Estonia
Spain
South Korea
Singapore
0
20
40
60
80
100
GCI


NSCI Comparison
Country
Greece
Belgium
Lithuania
Estonia
Czech Republic
Germany
United Kingdom
Romania
Portugal
Spain
Poland
Finland
Sweden
Saudi Arabia
France
Denmark
Slovakia
Netherlands
Croatia
Serbia
0
10
20
30
40
50
60
70
80
90
100
Nsci

Cybersecurity Effectiveness vs. Digital Development

- **Description:** A scatter plot displaying the relationship between the Cybersecurity Effectiveness Index (CEI) and the Digital Development Level (DDL) for each country.
- **Insights:**

1. **Relationship Exploration:** The scatter plot illustrates a general trend where countries with higher DDL tend to have more effective cybersecurity measures (CEI).
2. **Outlier Identification:** Notable outliers include Mauritius, Belgium, and Denmark, which exhibit low CEI scores despite high DDL. This discrepancy suggests that high digital maturity does not always equate to effective cybersecurity practices, prompting further investigation into the factors at play.
3. **Policy Implications:** Countries with high DDL should focus on strengthening their cybersecurity measures to ensure that their technological advancements are secure.
4. **Strategic Focus:** Encourage policymakers to recognize the importance of aligning digital development with robust cybersecurity strategies, emphasizing that technological advancement must be accompanied by effective security policies and practices.


Scatterplot - DDL vs CEI
Country
Multiple values
India
Russia
South Africa
CEI
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
DDL

Key Cybersecurity Indices Comparison

- **Table:** A comparative summary of key cybersecurity indices for selected countries, showing their scores in a structured format.

- **Insights:**

1. **Side-by-Side Comparison:** The table facilitates a straightforward comparison of key cybersecurity indices (GCI, CEI, NSCI, DDL) across selected countries, making it easy to assess their performance.
2. **Trend Identification:** Viewers can quickly spot trends, strengths, and weaknesses in each country's cybersecurity effectiveness, helping to highlight best practices and areas for improvement.
3. **Informed Discussions:** This consolidated view serves as a valuable tool for discussions on international cybersecurity strategies, collaborations, and resource allocation among countries.

Tabular Representation

Region	Country	CEI	Count ..	DDL	GCI	Nsci
Africa	Algeria	0.72	1.00	42.81	33.95	33.77
	Cameroon	0.71	1.00	28.28	45.63	32.47
	Egypt	0.55	1.00	46.93	95.48	57.14
	Ethiopia	0.87	1.00	20.70	27.74	32.47
	Kenya	0.55	1.00	37.14	81.70	41.56
	Libya	0.79	1.00	41.10	28.78	10.39
	Mauritius	0.20	1.00	53.57	96.89	44.16
	Morocco	0.75	1.00	46.88	82.41	70.13
	Namibia	0.68	1.00	37.28	11.47	15.58
	Nigeria	0.61	1.00	31.76	84.76	54.55
	South Africa	0.42	1.00	49.24	78.46	36.36
	Tanzania	0.73	1.00	26.96	90.58	24.68
	Tunisia	0.61	1.00	46.26	86.23	53.25
	Uganda	0.63	1.00	26.71	69.98	50.65
	Venezuela	0.81	1.00	43.14	27.06	28.57
	Zambia	0.75	1.00	29.66	68.88	55.84
	Zimbabwe	0.72	1.00	28.97	36.49	15.58
Asia-Pacific	Afghanistan	1.00	1.00	19.50	5.20	11.69
	Australia	0.13	1.00	77.61	97.47	66.23
	Bangladesh	0.76	1.00	33.11	81.27	67.53
	Cambodia	0.70	1.00	34.59	19.12	15.58
	China	0.48	1.00	62.41	92.53	51.95
	India	0.60	1.00	40.02	97.50	59.74

Conclusion

- **Summary of Findings:**

1. The analysis highlights significant variations in cybersecurity effectiveness across countries, as indicated by the GCI, CEI, and NSCI scores.
2. Countries with higher Digital Development Levels (DDL) generally exhibit better cybersecurity effectiveness.
3. Regional trends reveal that some areas are significantly better prepared than others, suggesting targeted improvement opportunities for underperforming regions.
4. The findings underscore the importance of comprehensive cybersecurity strategies that consider both technical capabilities and overall digital maturity.

Future Work

- **Suggestions for Further Research:**

1. Investigate additional factors that may influence cybersecurity effectiveness, such as economic stability, education levels, and international collaborations.
2. Analyze longitudinal data to observe trends in cybersecurity preparedness over time.
3. Explore the impact of emerging technologies, like artificial intelligence and machine learning, on enhancing cybersecurity measures.
4. Consider conducting case studies on countries that have significantly improved their cybersecurity indices to identify best practices.