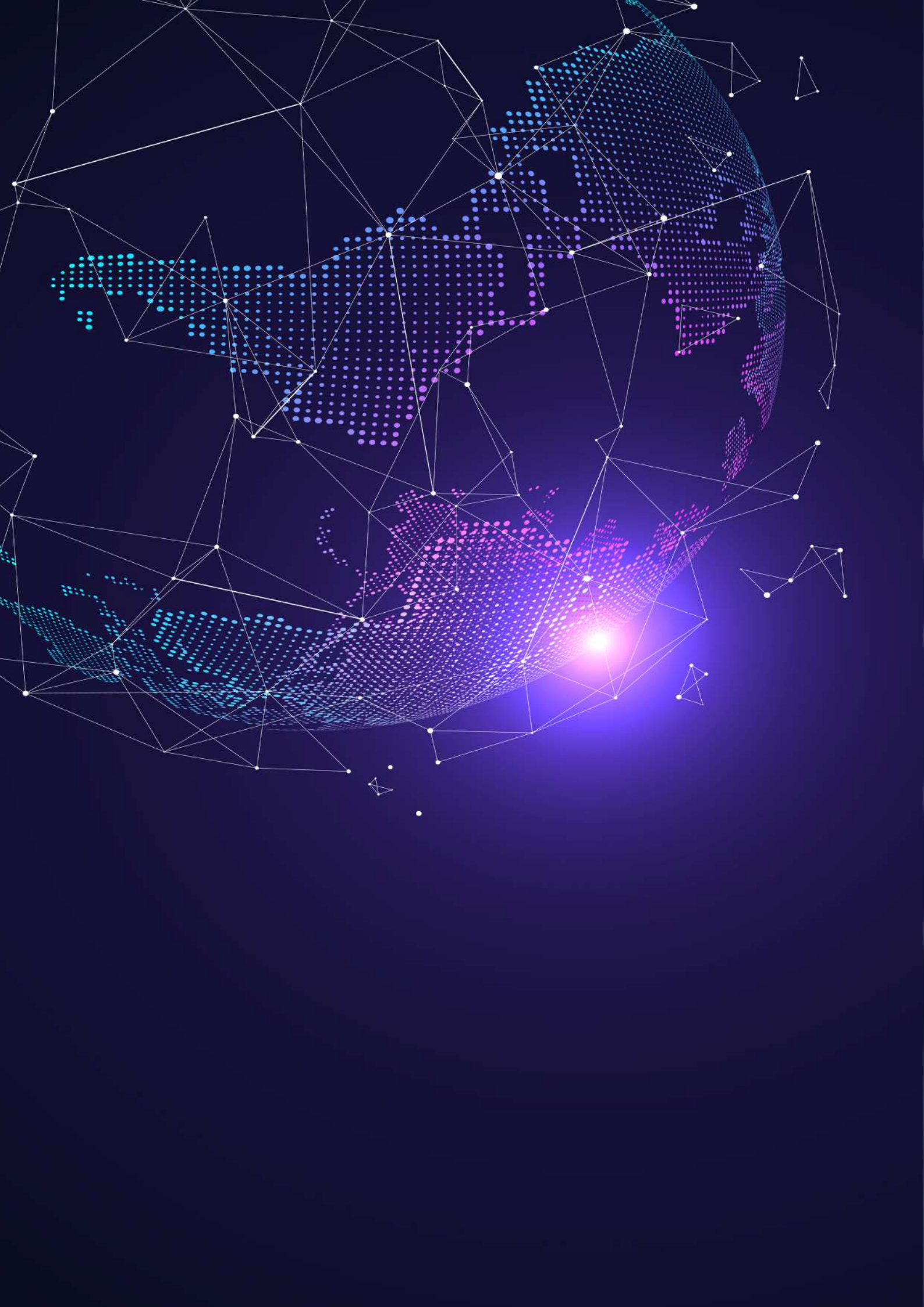


ESTIMATING THE ECONOMIC IMPACT OF  
**NATIONAL OPEN  
DIGITAL ECOSYSTEM**



**CENTRE FOR DIGITAL ECONOMY POLICY RESEARCH**  
2023



# BACKGROUND



# Background

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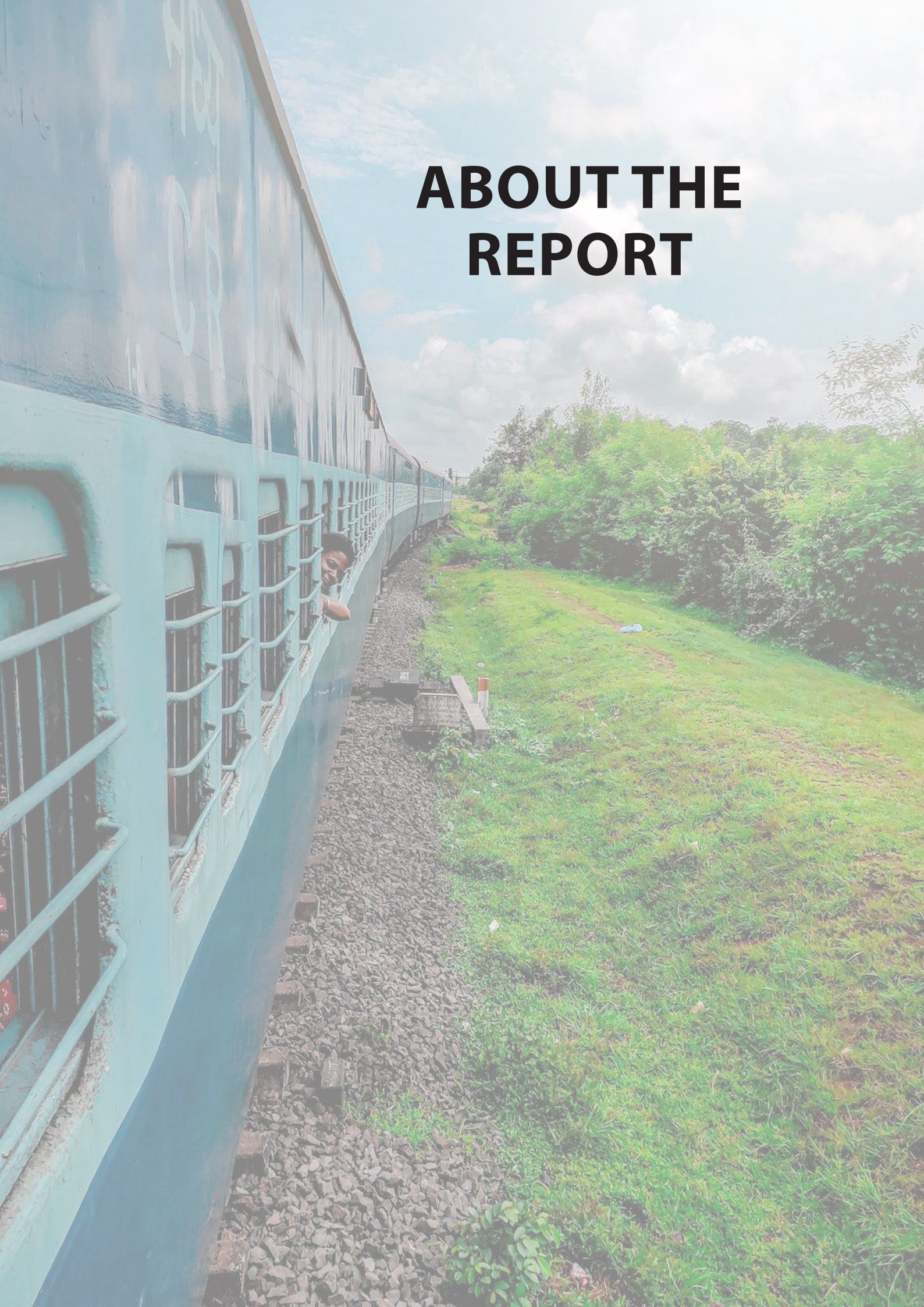
Government digital infrastructure can potentially transform into digital platforms by opening up the systems to innovative startups and private sector. Such a path to platformization of existing Government digital systems would unlock very significant economic value. There are already existing government systems that have opened up to the private sector, to provide value-added GovTech services to citizens and businesses. Such systems include IRCTC, PAN card, Vahan etc.

India also has a declared policy on Open Applications Programming Interface (API) which mandates government systems to support API's. An accelerated opening up of existing government systems and aligning them to the API Policy would enable citizens and businesses to significantly benefit from innovative GovTech solutions.

This report estimates the potential economic impact of open digital ecosystems and is based on a published research paper by the Centre for Digital Economy Policy Research.



# ABOUT THE REPORT



# About the Report

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The report is based on a peer-reviewed research paper “Estimation of Economic Impact of National Open Digital Ecosystems” in “ICT with Intelligent Applications, Smart Innovation, Systems and Technologies,” vol 248. Springer, Singapore. [https://doi.org/10.1007/978-981-16-4177-0\\_4](https://doi.org/10.1007/978-981-16-4177-0_4) u, by the Centre for Digital Economy Policy Research. The report analyzes and extrapolates the case of open systems of the Indian Railways Catering and Tourism Corporation (IRCTC).

*The study estimates that open digital ecosystems would have added an economic value of USD 147.59 b to the Indian GDP in 2019, which is approximately 5% of the GDP.*



# **EXECUTIVE SUMMARY**

# Executive Summary

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The open digital ecosystems enable innovative services to be developed over the base systems that have already been developed by the government, thus generating economic value.

The more government digital systems are opened and accessible, more they will be used by industry for creating innovative offerings that would lead to further economic growth.

Analyzing the open systems of the Indian Railways Catering and Tourism Corporation (IRCTC), an estimate has been made of the economic value addition that open systems can contribute to.

**The study indicates that the economic value is around USD 147.59 billion for year 2019, approximately 5% of GDP.**

The report thus provides a strong foundation for policy making in investing taxpayer money into opening up of existing national digital ecosystems.

Open access to government's digital ecosystems can potentially lead to new innovations and creation of new systems that benefits businesses and consumers and increases the efficiency of economy.

## Digital public services have enormous potential.

**24/7  
accessibility**

even during a  
pandemic



**~50% less  
time spent**

interacting with public  
administration



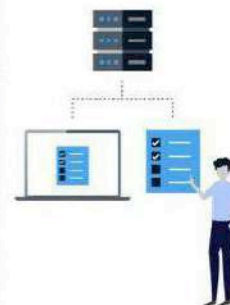
**>50%  
lower costs**

for companies when  
interacting with the  
public administration



**~60% less  
case-handling  
effort**

through automated  
processing



Source: German National Regulatory Control Council





# **OPEN GOVERNMENT DATA IN INDIA**

# Open Government Data In India


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India started its 'Open Government Data' initiative by opening up government owned shareable information in machine-readable formats for use of common public in October 2012.

According to the Digital India Initiative of Open Government Data(OGD) Platform there are 173 (87 central and 86 State) departments that have contributed to open data across 35 sectors.

The Indian govt provides various datasets and certain datasets are updated regularly. 68 organizations in India have been able to utilize data from this platform to create services as per Open Data Impact Map.



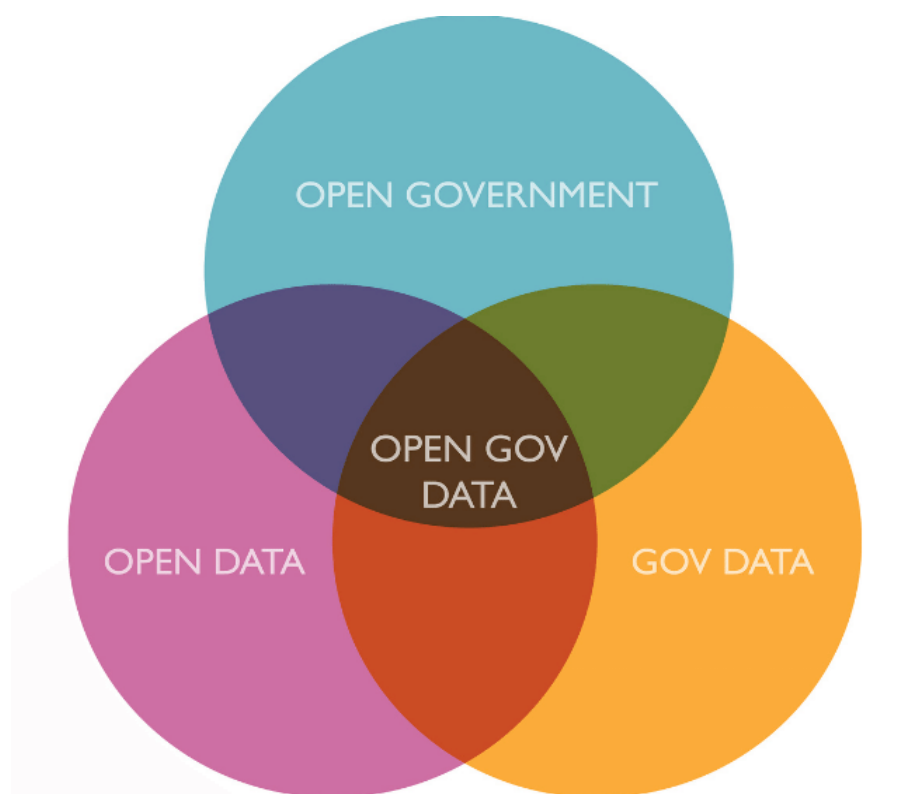
# **PRIOR STUDIES ON OPEN DIGITAL ECOSYSTEM**

# Prior Studies on Open Digital Ecosystem

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Government of India's position on the issue is captured in the white paper on the national open digital ecosystem (NODES) of the Ministry of Electronics and Information Technology (Meity). To take forward the policy direction of the report, it is essential to do a cost-benefit analysis and thus estimate the economic benefit of having a national open digital ecosystem.

Prior studies indicate that India can create \$500 billion in new economic value via open digital ecosystems by the year 2030. However, such projections were based on subjective assumptions on the impact of open digital ecosystems on the economy, and not on empirical analysis.



# **METHODOLOGY**

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# Methodology

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In this study, the Indian Railways was taken as a proxy sector and the revenues generated by start-ups that have leveraged data from Indian Railways Catering and Tourism Corporation (IRCTC) was used to extrapolate and compute the impact on India's GDP, if all government systems were made open.

IRCTC is a government run platform which has already opened up its system to the private sector, with real-time data exchange.



# **STARTUPS WHICH HAVE INTEGRATED TO IRCTC**

# Startups which have integrated to IRCTC

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# ANALYSIS



# Analysis

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We found total annual revenues,  $S$ , for the year FY 2019, from publicly available data for these companies.

$S = \sum(s_i)$  where 's' is the revenues from start-ups and 'i' refers to all the start-ups listed. Based on the above-computed annual revenues, the ratio ( $r$ ) of revenues from start-ups ( $S$ ) that use IRCTC data to the total revenue ( $I$ ) of IRCTC in Catering and Ticketing domains is computed ( $r = S/I$ ). Using the ratio  $r$ , we estimate the gross economic value,  $R$ , that will accrue from startups that can potentially be based on the open digital systems of the government ( $R=r * G$ ).

$G$  is the total government revenues in India, summed up across the central government, 28 state governments, and 3 Union territories

That is  $G = \sum(g_j)$ , where 'g' comprises the revenues of each state government and central government in India and 'j' refers to the revenues of the central government, 28 state governments, and 3 Union territories.

The  $G$  was calculated as USD 65.4 million.

To compute the value of value of  $I$ , we take the revenue of IRCTC from food (Catering and Rail Neer) and Internet ticketing for the year ended.

Therefore,  $I = \text{USD } 0.19 \text{ billion}$ .

By using these values, we get the value of  $r$ .

$r = 0.0654/0.19 = 0.344$  (approximately).

To calculate  $G$ , the revenues of States, Union, and Central government for FY 2019 have been totaled. Total revenue for States and Union Territories for FY 2019 come out to be USD 167.93 billion, while total central government revenue was USD 260.87 billion.

Therefore,  $G = \text{USD } 428.8 \text{ billion}$ .

Using these values, the value of  $R$  was computed as below:

**$R = r * G = 0.344 * 428.8 = \text{USD } 147.59 \text{ Billion}$ .**

# RESULTS



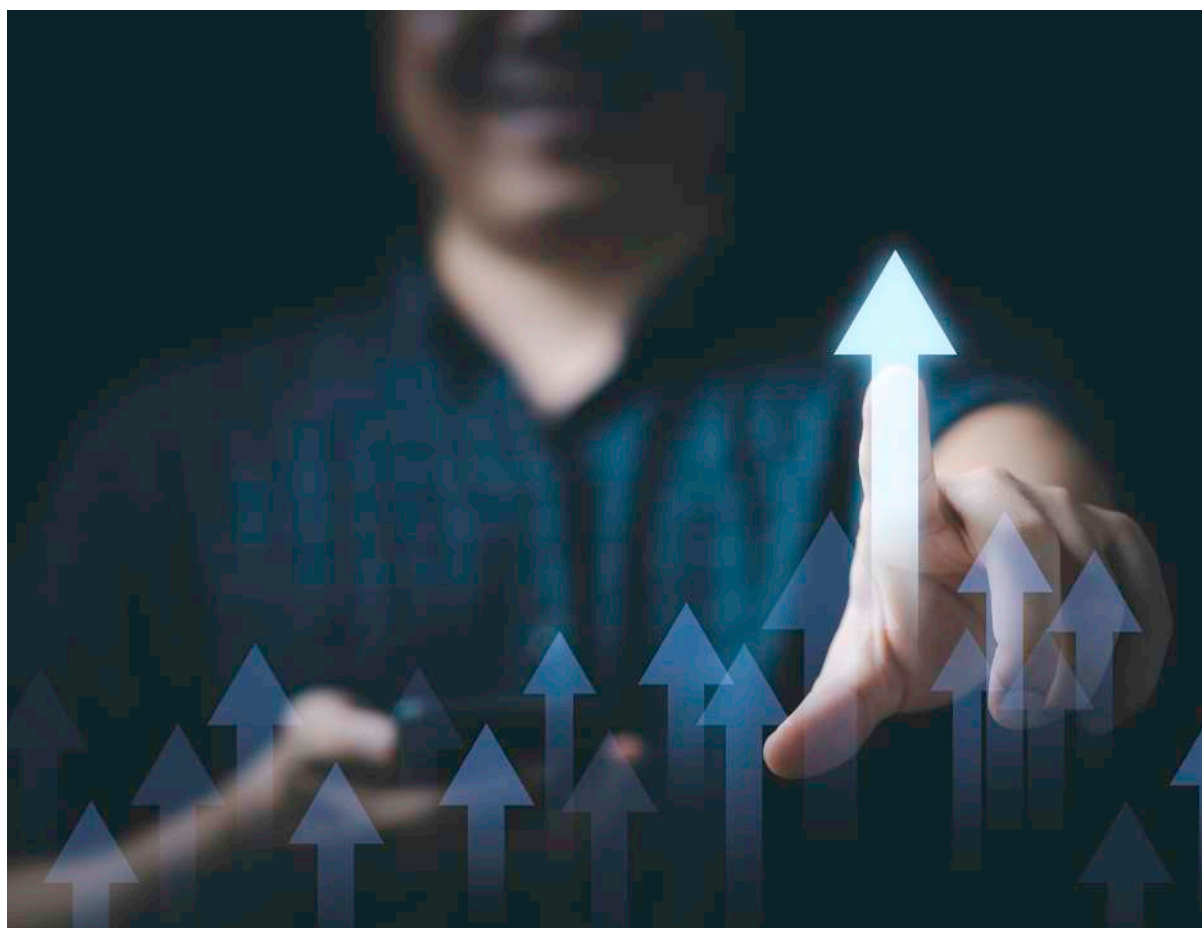
# Results

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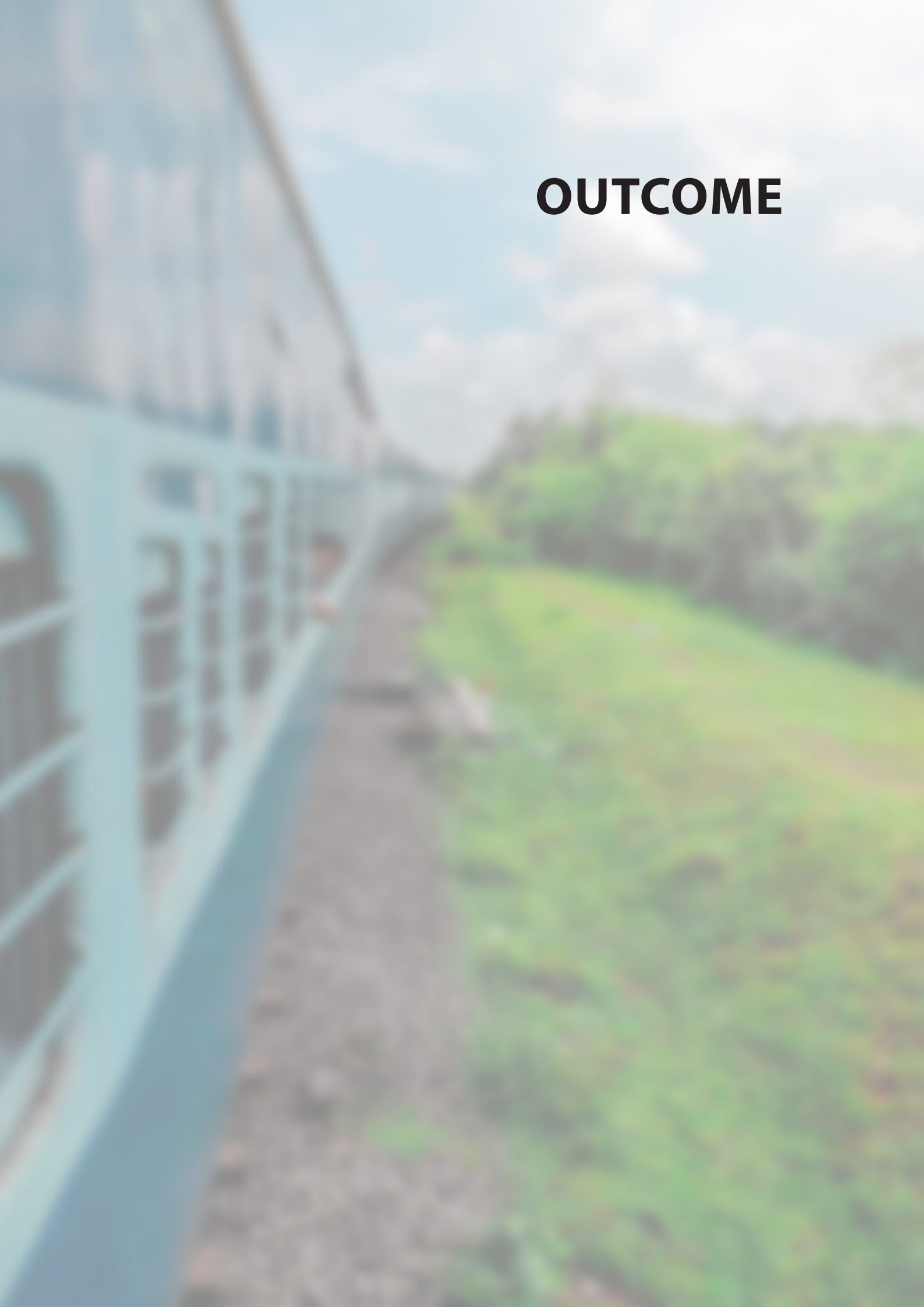
The total revenue of start-ups using IRCTC data on Ticketing and Catering domain was USD 0.0654 billion in 2019.

The IRCTC revenue (I) is USD 0.19 billion. Therefore the ratio,  $r = 0.344$  indicates that, start-ups have a potential to generate approximately 34% of the IRCTC revenue using IRCTC data. Extrapolating this to the government revenues (G), we find that the estimated value of start-ups leveraging open digital ecosystems is USD 147.59 billion. GDP for India in 2019 was USD 2875.14 billion.

Therefore, from an empirical standpoint, the potential additional economic value that could have been obtained by opening up of government digital ecosystems is  $(147.59/2875.14) * 100 = 5.1336\%$  or approximately, 5% of GDP in 2019.



# OUTCOME



# Outcome

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As per the trading economics forecast, India's GDP is expected to be approximately USD 3250 billion in 2025, under normal circumstances (this excludes the additional initiatives of the government to propel the economy to USD 5000 billion by 2025).

Therefore, by 2025, the potential additional economic value of opening up of government digital systems is 5% of USD 3250 billion = USD 162.5 billion.

The GDP is expected to grow at a faster rate due to government's focus on trying to achieve a USD 5 trillion economy by 2025. Therefore, the actual economic benefit from opening up of government's digital systems would be higher than USD 162.5 billion by 2025.

# COMPARATIVE ANALYSIS

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# Comparative Analysis

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We also estimated for different sectors following the McKinsey study. The formula used was:

Economic impact for each Industry Segment of India = ((Global Open Data Value of the Industry Segment)/(Global GDP Value in 2013)) \* India's GDP Value in 2013.

Upper value of economic impact for each Industry Segment of India = ((Upper Value of Global Open Data Value of the Industry Segment reported by McKinsey Study)/ (Global GDP Value in 2013)) \* India's GDP value in 2013. Similar calculation was made for lower values as well.

Table 1 indicates that in 2013, the potential economic value-add of open digital systems for sectors within the Indian economy was in the range of USD 77.34 -129.46 billion in 2013. This was approximately, 4.17–6.97% of the country's GDP for that year. This is in line with the estimation made in this paper; i.e., opening of government digital systems has a potential economic value add of around 5% GDP.

Similarly, the study conducted by Omidyar Network and BCG guesstimates that the potential value add due to opening up of government digital ecosystems in India is about 5.5% of GDP. These guesstimates of the Omidyar Network and BCG paper are in line with our findings that are based on figures of actual economic value-add emanating from opening up of current government digital systems.







# **ESTIMATIONS TO ADDITION TO INDIAN GDP**

# Estimations to Addition to Indian GDP



Domain	Lower Value	Upper Value	India's Lower Value	India's Upper Value
Education	890	1180	21.38	28.34
Transportation	720	920	17.29	22.10
Consumer Products	520	1470	12.49	35.31
Electricity	340	580	8.17	13.93
Oil and Gas	240	510	5.76	12.25
Health Care	300	450	7.21	10.81
Consumer Finance	210	280	5.04	6.73
<b>Total</b>	<b>3220</b>	<b>5390</b>	<b>77.34</b>	<b>129.46</b>

Based on extrapolation of the McKinsey global guesstimates for 2013



# **ESTIMATIONS OF VALUE-ADD GLOBALLY**

# Estimations of Value-add Globally

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\*Other studies estimate that open data systems has the potential to enable more than \$3 trillion of additional economic value-add, which would be around 4% of global GDP;

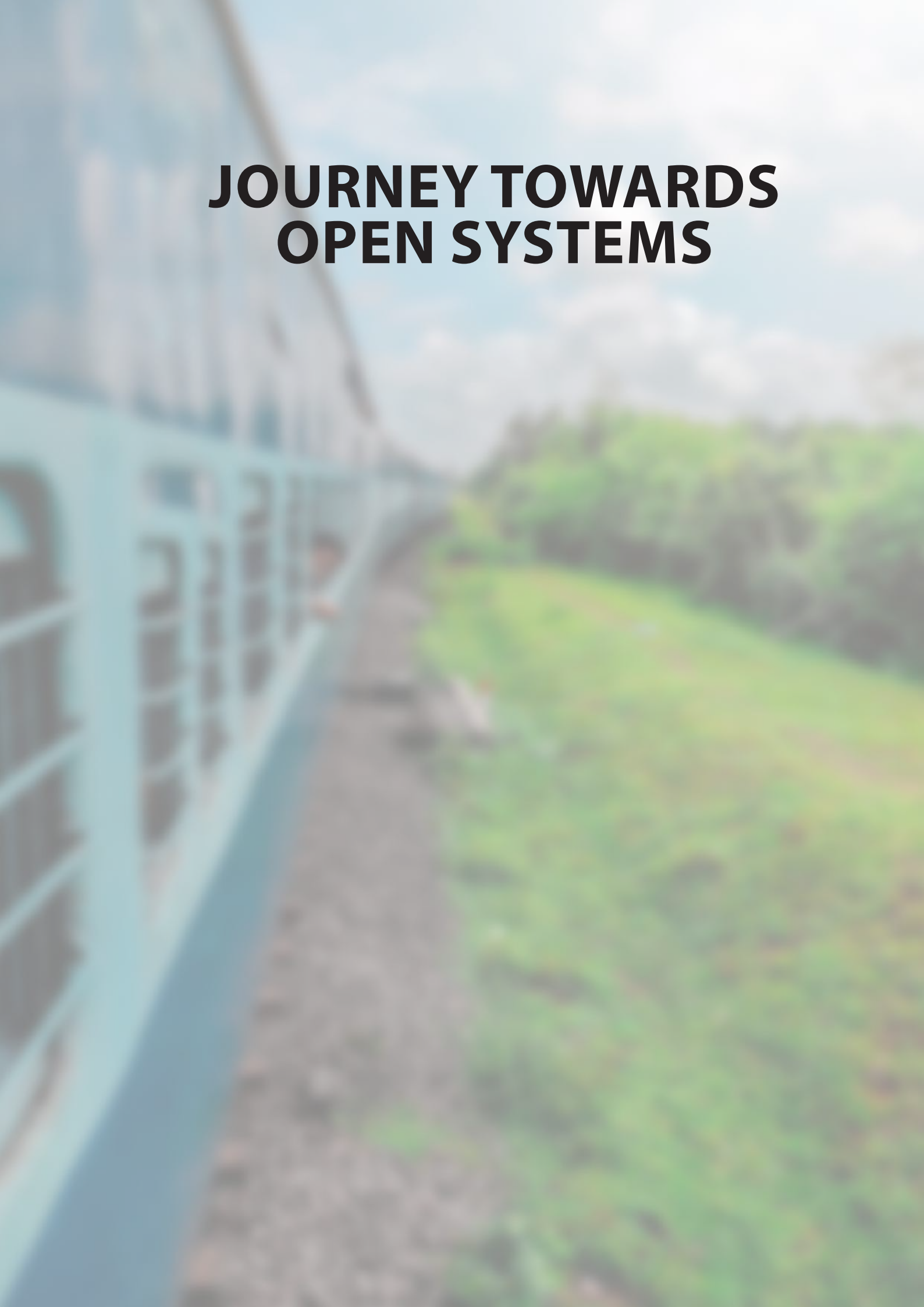
The US would contribute to US\$1.1 trillion to this value-addition

The European Union would contribute to US\$900 billion to this value-addition.

The rest of the world would contribute to only US\$1 trillion, unless they adopt open digital systems more aggressively.

\* Report published by McKinsey Global Institute (James Manyika Michael Chui Peter Groves Diana Farrell, October 2013). The analysis focuses on seven domains of the global economy, namely: Education, Transportation, Consumer Products, Electricity, Oil and Gas, Healthcare, and Consumer finance, which stand to benefit from utilizing open-data.



The background of the slide is a blurred photograph. On the left side, there is a blue metal railing, likely from a bridge or walkway, which is out of focus. The rest of the image shows a bright, green landscape, possibly a park or a field, under a clear sky. The overall image has a soft, bokeh effect.

# **JOURNEY TOWARDS OPEN SYSTEMS**

# Journey towards Open Systems

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More National Open Digital Systems can be created through the steps below:

- Identification of national digital systems that can be opened up and turned into platforms.
- Enabling these systems to provide accessibility of data through nondiscriminatory licenses.
- Generating awareness about the open systems.
- Incentivizing organizations that explore the open digital ecosystems for business creation and public good.

# CONCLUSION



# Conclusion

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By opening up government systems to private players, the Indian government has the potential to unleash transformative impact at scale, tapping into the innovation, deep technology and capital from the private sector. It would replicate the success of the UPI platform of NPCI.

There is a clear return on investment for opening up of more national digital systems, with a potential positive impact of over 5% on the GDP.

The Indian government has already taken an important step by adopting a policy framework for open digital ecosystems through the Open API policy.

Many of the national digital systems of the government have evolved to have excellent SLA's (Service Level Agreement) for system response and can follow the IRCTC, PAN and ITR model of opening up to the private sector for innovative services. Other systems may be strengthened before being platformized.

Such steps would also lead to job creation and further increase in revenue generation for the government, creating a virtuous cycle.





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