Comparative Study on Digital Economy Development Level in Seven Asian Countries

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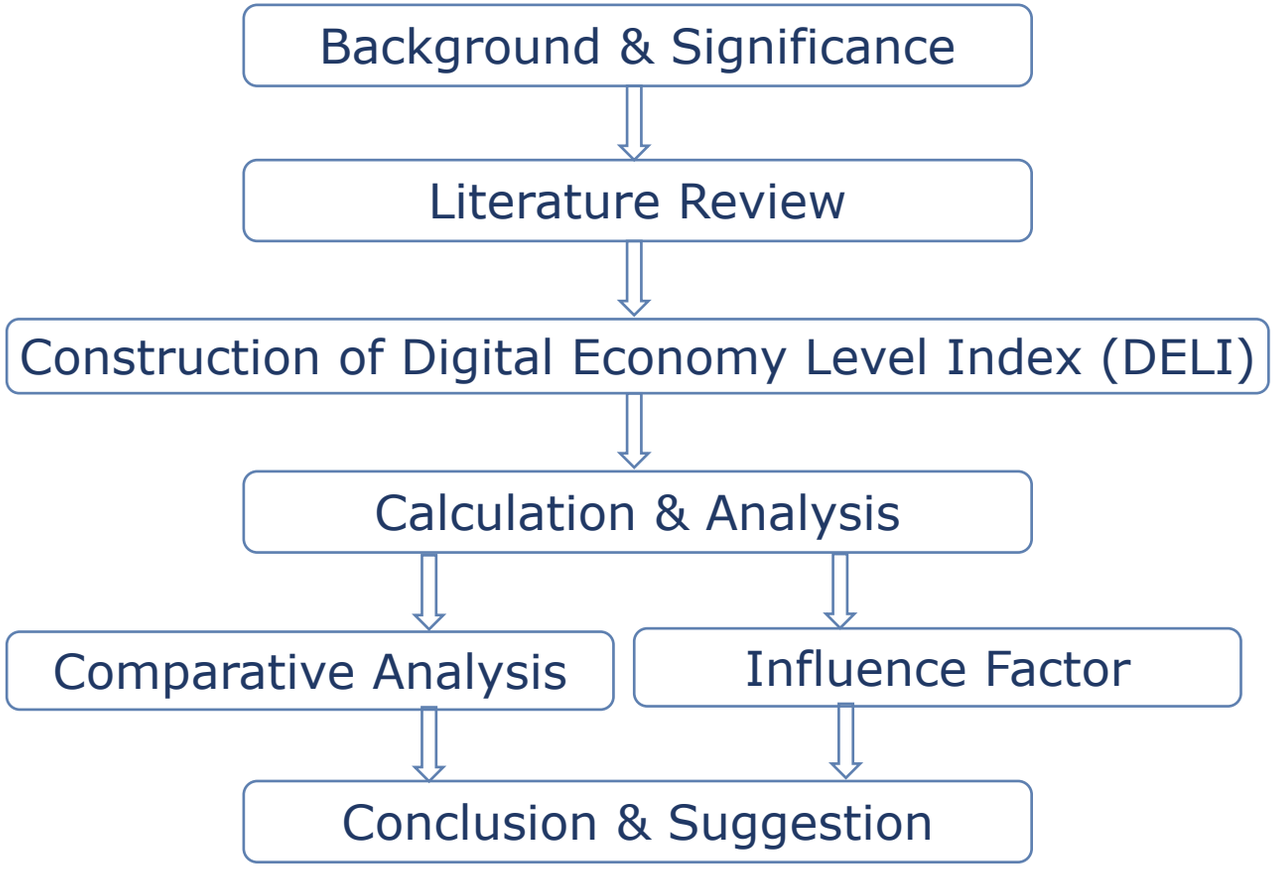

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Research Process

Research Background

01 Digital Economy

02 Digital Economy has caused widespread concern

03 Evaluation index system for Digital Economy should be proposed

Research Process

Significance

01

- **Quantitatively assess** the development of Digital Economy in the seven countries

02

- **Compare** the level of Digital Economy development in China and other Asian countries

03

- **Explore** the influence factors of Digital Economy

04

- **Put forward** policy suggestions to develop Digital Economy

Literature Review

	Institution or scholar	Index	Evaluation aspect						
1	WEF	NRI	Environment	Readiness	Usage	Impact			
2	EU	DESI	Connectivity dimension	Human Capital Dimension	Digital Public Services	Use of Internet	Integration of Digital Technology		
3	UNCTAD	-	Integration of Digital Technology	The ICT Sector	The Growing Role of E-Commerce	Trade Aspect of Digital Economy	Aspects of Evolving Digital Economy		
4	OECD	DEI	Framework conditions for the digital transformation	Access to digital infrastructures	Business uptake of digital technologies	Use of digital technologies by Internet users	Digital skills, tertiary education and training	ICT-related innovations	Digital security and trust
5	HUAWEI	GCI	Foundation	Broadband	Data Center	Cloud Computing	Big Data	Internet of Things	
6	CAICT	DEI	Leading Indicator	Consistent Indicator	Lag Indicator				

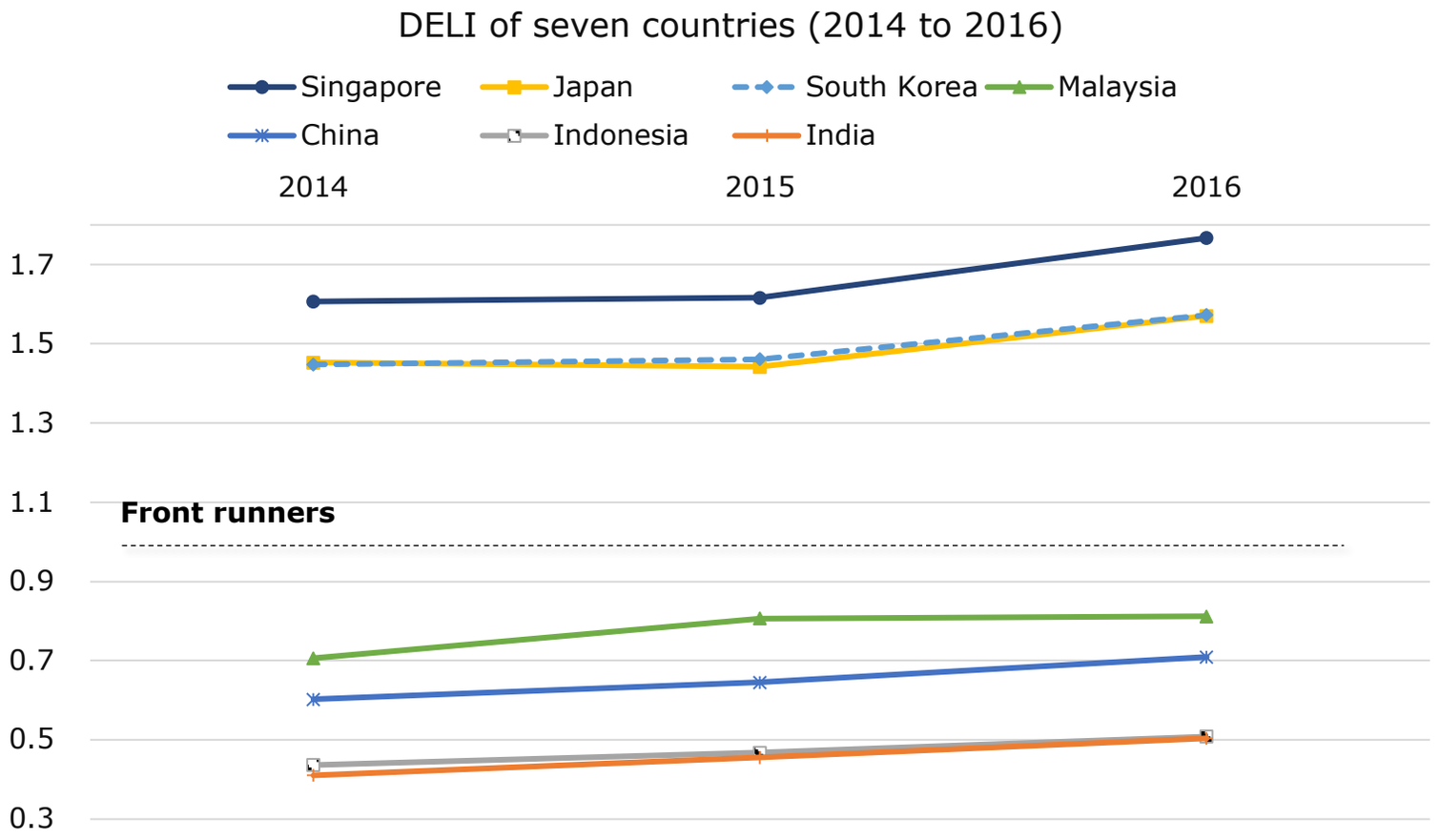
Digital Economy Level Index

First-Class indexes	Weight	Second-Class indexes	Third-Class indexes	Weight
Digital Infrastructure	0.206	Network Access Level	Fixed broadband subscribers per 100 people	0.0757
			Number of mobile broadband Internet users per 100 people	0.0536
		Network Connection Rate	Broadband average connection speed	0.0764
Digital Skills Training	0.210	Resident Cultural Diathesis	Gross enrolment ratio of higher education	0.0525
			Average years of schooling	0.0247
		ICT Talents	Number of IT practitioners	0.0686
			Number of software developers	0.0646
Digital Technology Use	0.169	Digital Service Export	ICT service export	0.0400
		Digital Application	E-commerce (online) transaction volume	0.0750
			App downloads	0.0541
Digital Technology Capital	0.309	Digital Technology Investment	Investing in Big Data	0.0537
			Investing in the Cloud	00479
			Investing in the IoT	0.0464
		Digital Technology Resources	The Cloud usage	0.0363
			Big Data generation	0.0768
			Total amount of the IoT	0.0477
Economic Development	0.106	Economic Development Level	GDP Per Capita	0.0911
		Consumption Ability	Final consumption expenditure percentage	0.0150

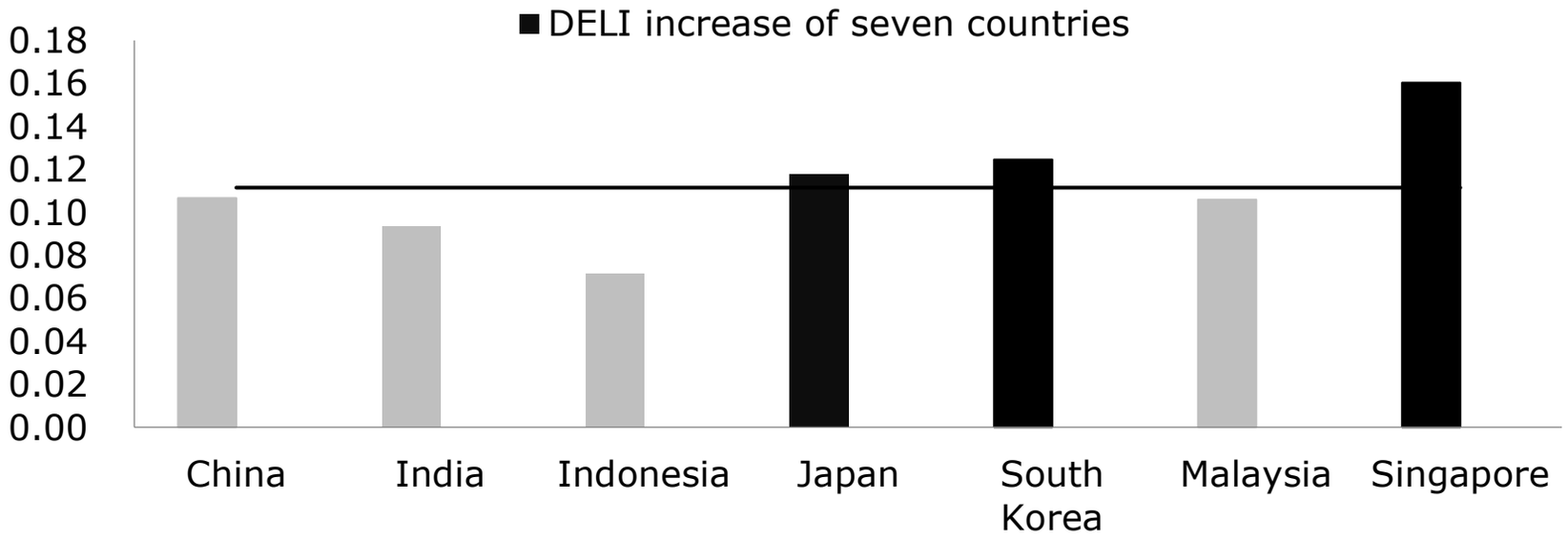
DELI

	Digital Economy Level Index		
	Year 2014	Year 2015	Year 2016
China	0.6026	0.6450	0.7093
India	0.4105	0.4558	0.5040
Indonesia	0.4365	0.4674	0.5082
Japan	1.4528	1.4421	1.5705
South Korea	1.4476	1.4608	1.5722
Malaysia	0.7062	0.8067	0.8121
Singapore	1.6067	1.6162	1.7670

General Overview



General Overview



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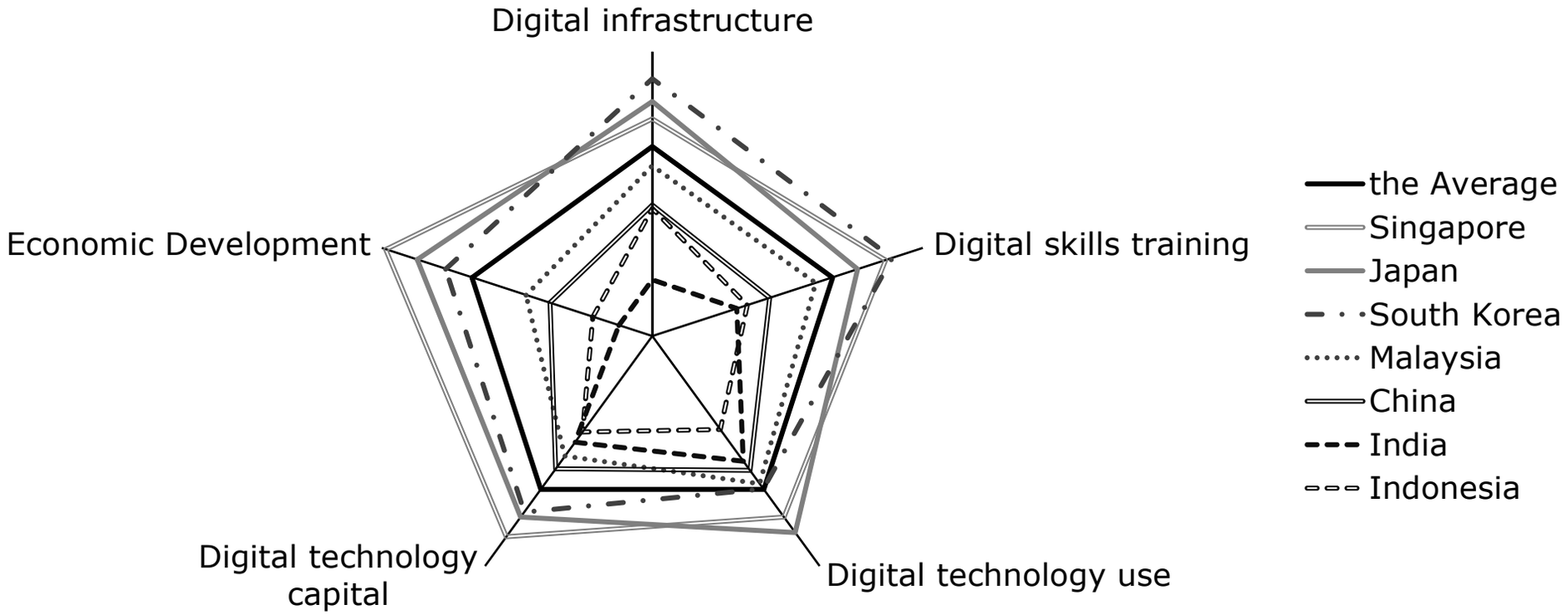
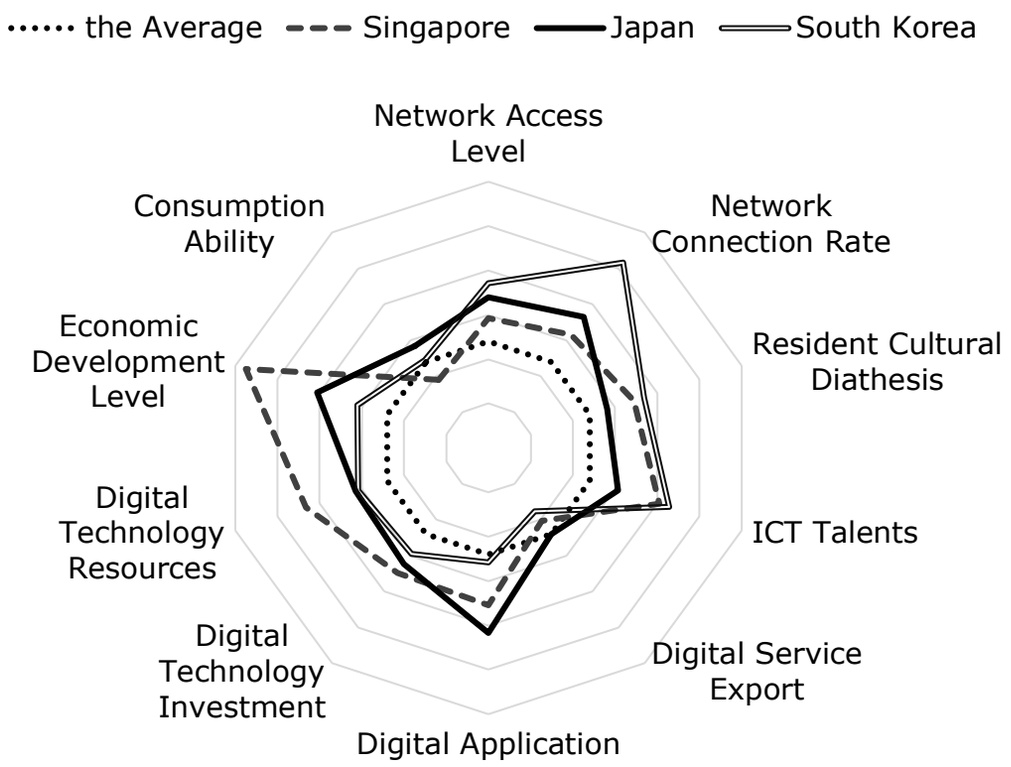
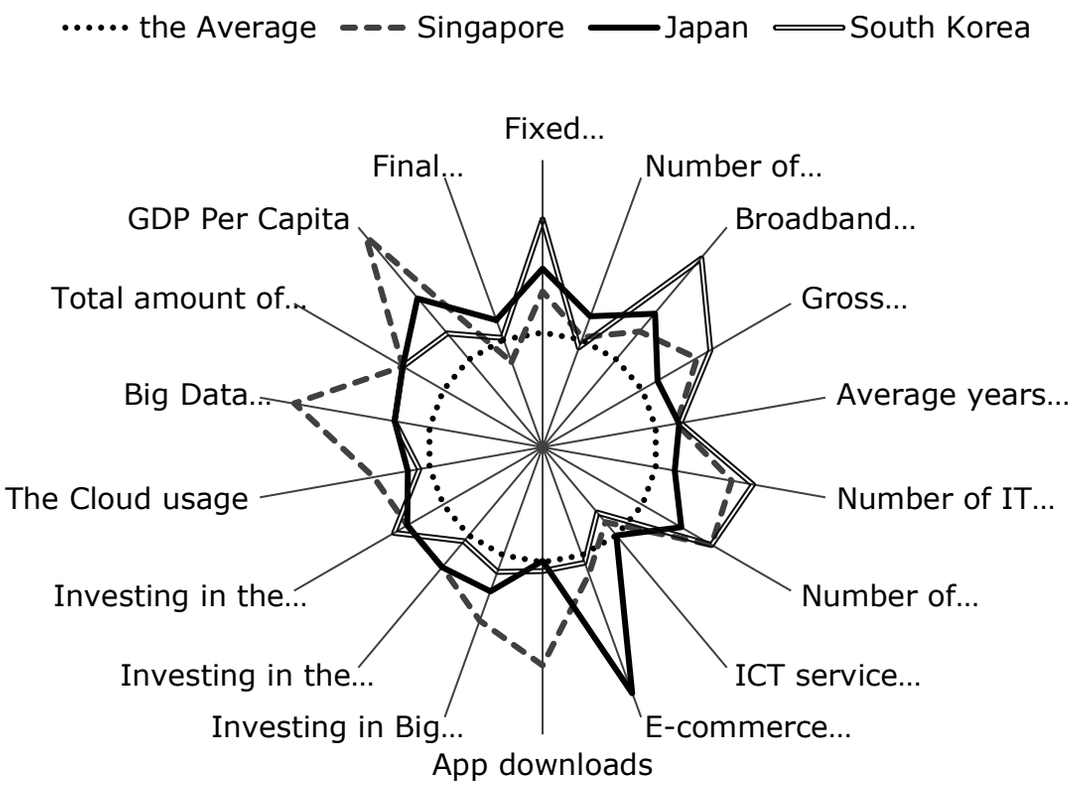
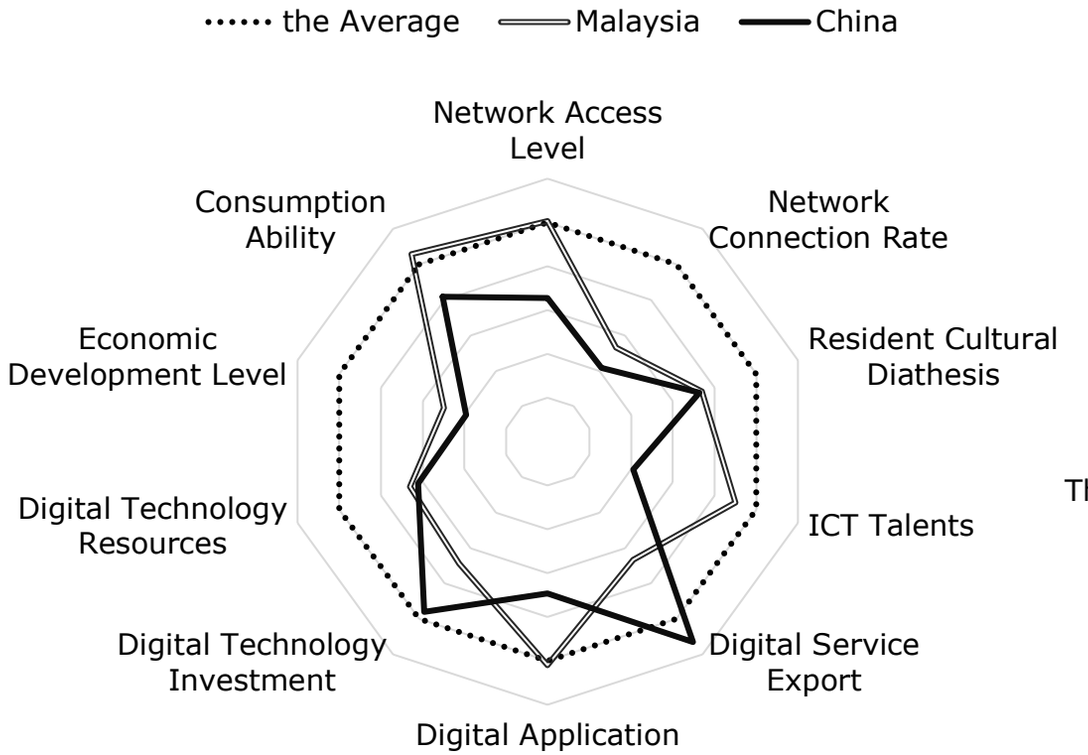


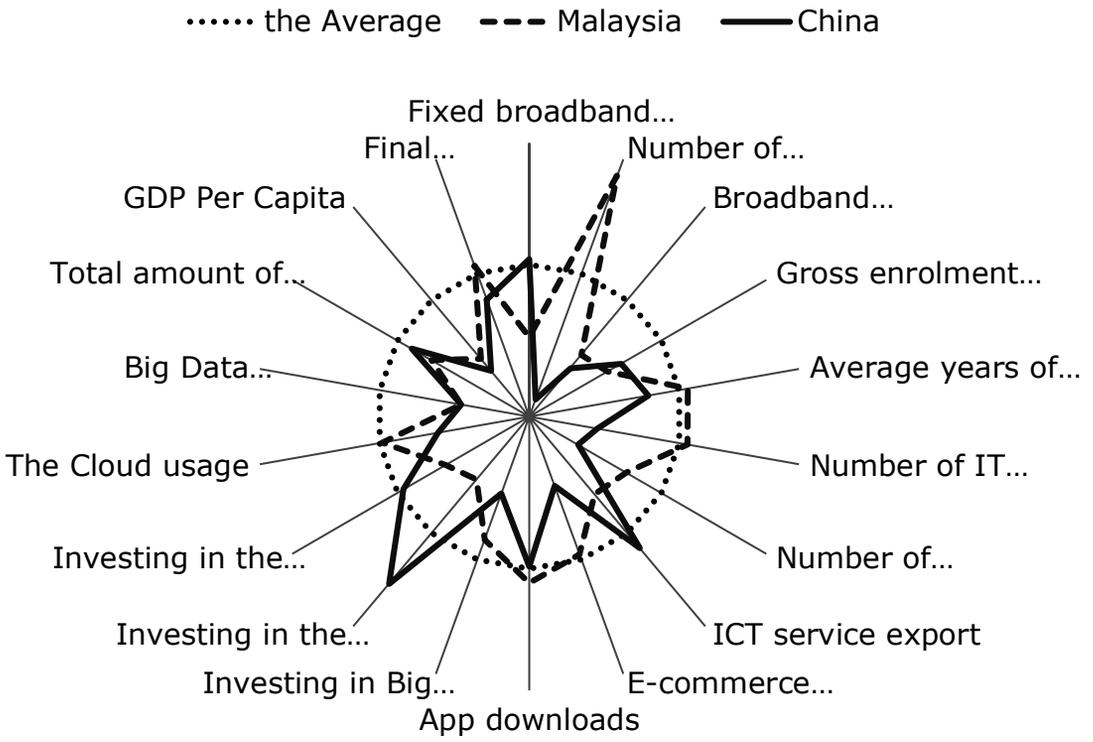
Front Runners' DELI Comparison



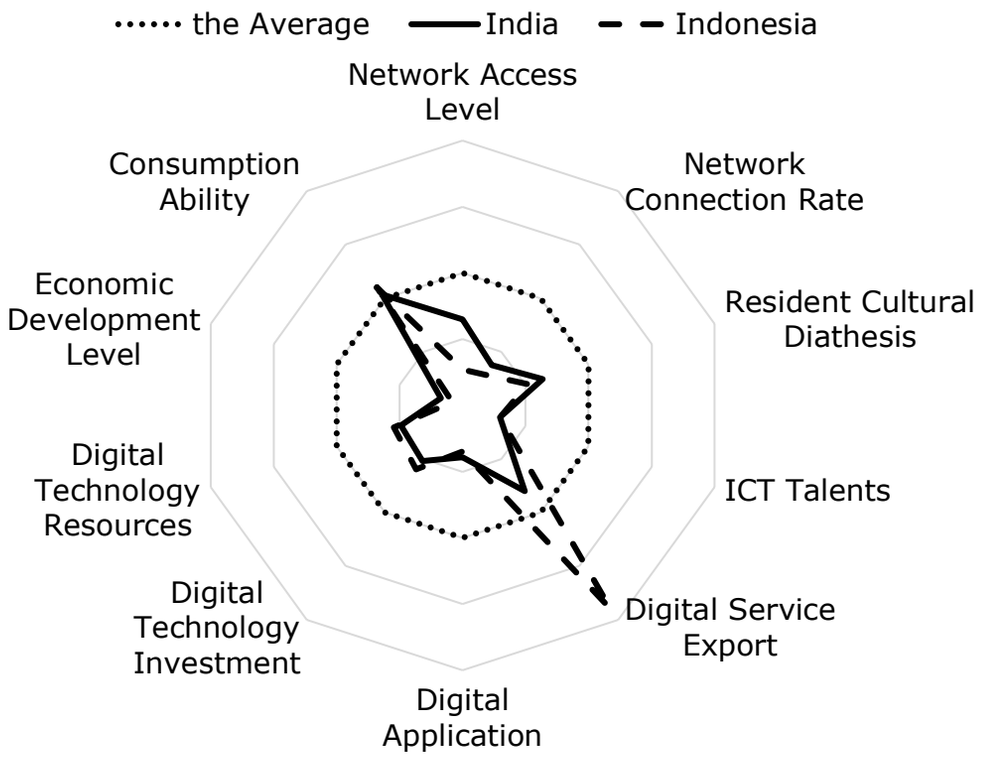


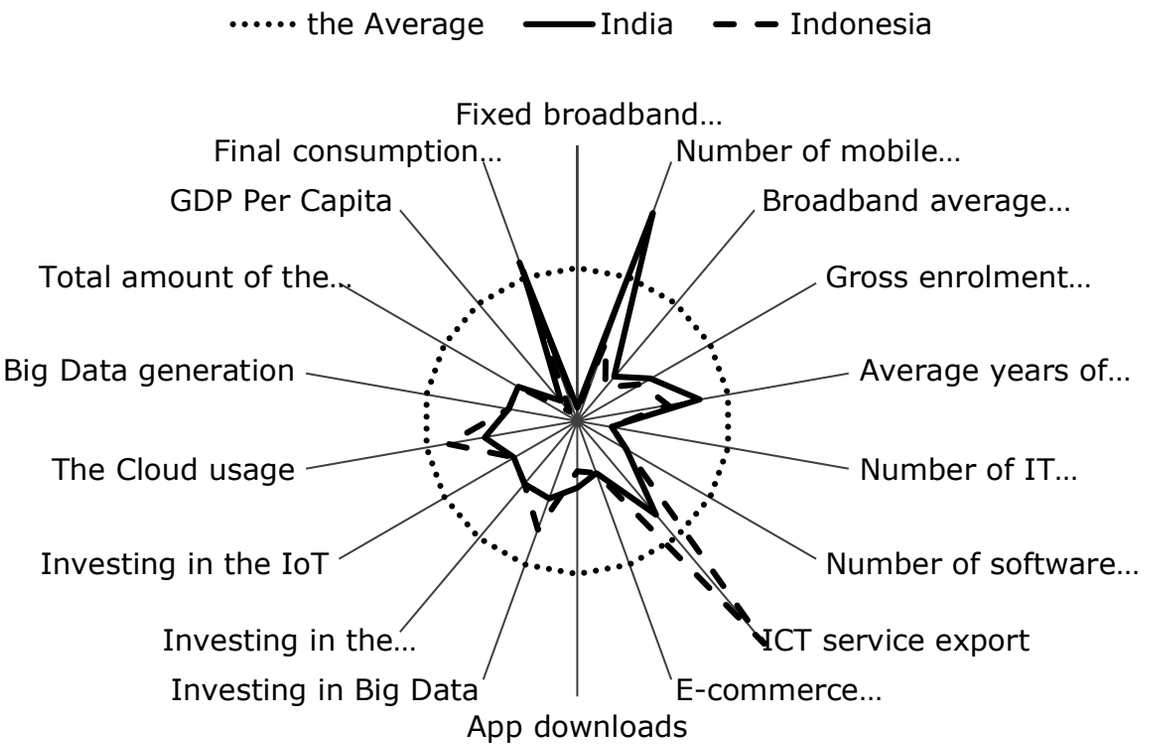
Pursuers' DELI Comparison





Beginners' DELI Comparison





Data Envelopment Analysis

$$Min\theta = \theta_0 - \varepsilon\left(\sum_{r=1}^{s} s_r^+ + \sum_{i=1}^{m} s_i^-\right)$$

$$s.t.\begin{cases} \sum_{j=1}^{n} \lambda_j x_{ij} + s_i^- = \theta_0 x_{i0} \\ \sum_{j=1}^{n} \lambda_j y_{rj} - s_r^+ = y_{r0} \\ \sum_{j=1}^{n} \lambda_j = 1 \\ \lambda_j, s_i^+, s_r^- \geq 0, \quad i = 1,2,...,m, r = 1,2,...,s, j = 1,2,...,n. \end{cases}$$

EFFICIENCY SUMMARY				
firm	crste	vrste	scale	
1	1.000	1.000	1.000	
2	1.000	1.000	1.000	
3	0.839	0.871	0.964	irs
4	1.000	1.000	1.000	
5	1.000	1.000	1.000	
6	1.000	1.000	1.000	
7	1.000	1.000	1.000	
Note: crste = technical efficiency from CRS DEA vrste = technical efficiency from VRS DEA scale = scale efficiency = crste/vrste				

Data Envelopment Analysis

Results for firm: 5
Technical efficiency = 1.000
Scale efficiency = 1.000 (crs)
PROJECTION SUMMARY:

variable		original value	radial movement	slack movement	projected value
output	1	1.130	0.000	0.000	1.130
output	2	0.693	0.000	0.000	0.693
output	3	0.622	0.000	0.000	0.622
output	4	0.982	0.000	0.000	0.982
input	1	0.418	0.000	0.000	0.418
input	2	0.728	0.000	0.000	0.728
input	3	0.411	0.000	0.000	0.411
input	4	0.959	0.000	0.000	0.959

LISTING OF PEERS:

peer	lambda weight
5	1.000

Results for firm: 3
Technical efficiency = 0.871
Scale efficiency = 0.964 (irs)
PROJECTION SUMMARY:

variable		original value	radial movement	slack movement	projected value
output	1	0.687	0.000	0.120	0.807
output	2	1.089	0.000	0.000	1.089
output	3	1.345	0.000	0.000	1.345
input	1	1.932	-0.250	-0.746	0.936
input	2	2.382	-0.308	-1.114	0.960
input	3	1.645	-0.213	-0.283	1.150
input	4	1.940	-0.251	-0.497	1.192
input	5	1.277	-0.165	0.000	1.112

LISTING OF PEERS:

peer	lambda weight
1	0.577
4	0.025
7	0.398

Pearson Coefficient Analysis

Correlations

		Digital infrastructure	Economic Development
Digital infrastructure	Pearson Correlation	1	.748**
	Sig. (2-tailed)		.000
	N	21	21
Economic Development	Pearson Correlation	.748**	1
	Sig. (2-tailed)	.000	
	N	21	21

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Digital skills training	Economic Development
Digital skills training	Pearson Correlation	1	.874**
	Sig. (2-tailed)		.000
	N	21	21
Economic Development	Pearson Correlation	.874**	1
	Sig. (2-tailed)	.000	
	N	21	21

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Digital technology use	Economic Development
Digital technology use	Pearson Correlation	1	.826**
	Sig. (2-tailed)		.000
	N	21	21
Economic Development	Pearson Correlation	.826**	1
	Sig. (2-tailed)	.000	
	N	21	21

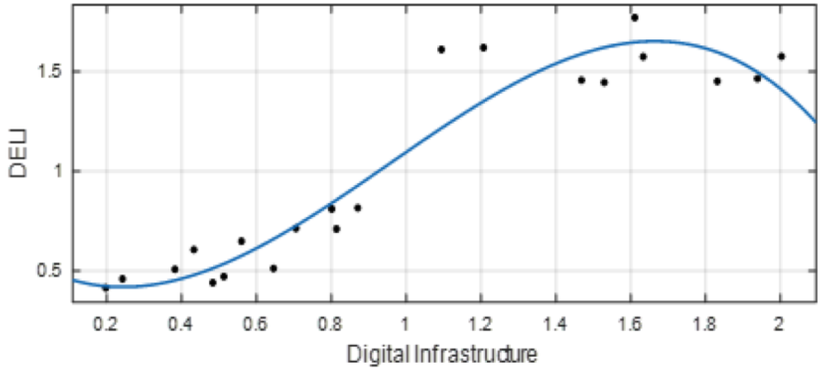
**. Correlation is significant at the 0.01 level (2-tailed).

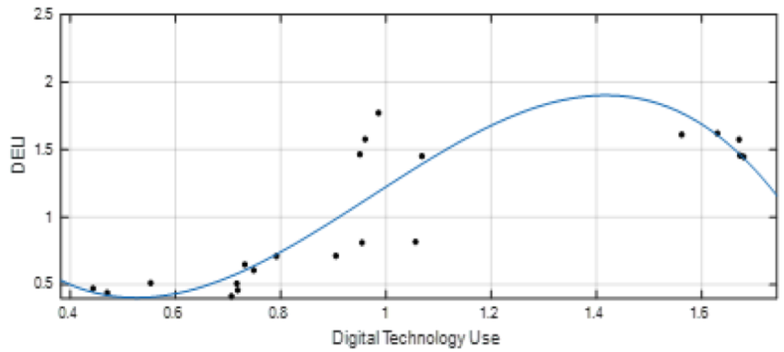
Correlations

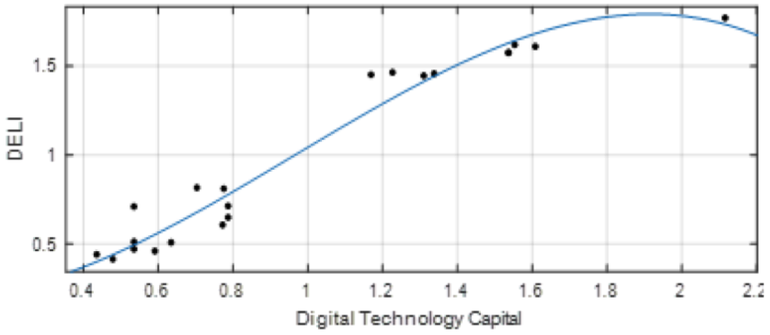
		Digital technology capital	Economic Development
Digital technology capital	Pearson Correlation	1	.943**
	Sig. (2-tailed)		.000
	N	21	21
Economic Development	Pearson Correlation	.943**	1
	Sig. (2-tailed)	.000	
	N	21	21

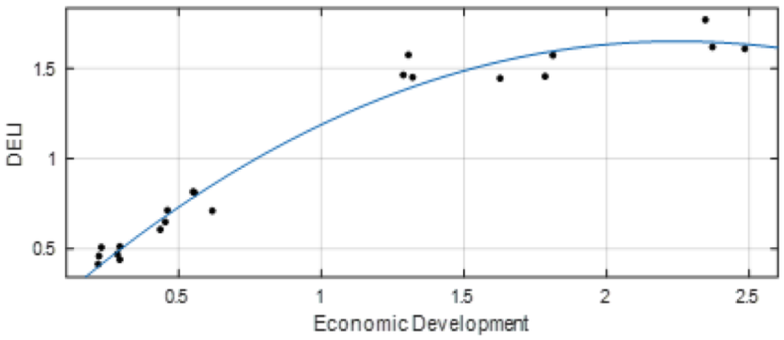
**. Correlation is significant at the 0.01 level (2-tailed).

Fitting Curve Analysis by MATLAB









Conclusion and Suggestion

Conclusion

- Digital economy divide: front runners & pursuers & beginners.
- The development of digital technology can promote the national economy.
- For pursuers: digital infrastructure, digital skills training and digital technology use are more beneficial to promoting digital economy level.
- For all: digital technology capital and economic development are key to improving digital economy.

Policy and Suggestion

1. Infrastructure improvement
2. Talent education and employment
3. Investment in technology and deeper integrated development
4. Enhanced international cooperation and exchange
5. Popularized digital applications and promoted digital life

Thanks for listening

Q & A