从论文到数据

王敏杰

2024-02-26

从一篇论文开始

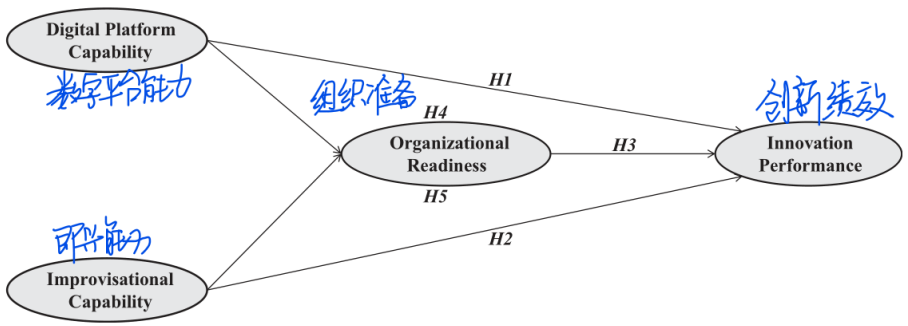
论文

Innovation performance in digital economy: does digital platform capability, improvisation capability and organizational readiness really matter?

Wen Jun, Muhammad Hamid Nasir, Zahid Yousaf, Amira Khattak, Muhammad Yasir, Asad Javed, Syed Hamad Shirazi

European Journal of Innovation Management
ISSN: 1460-1060
Article publication date: 11 May 2021
Permissions
Issue publication date: 1 December 2022

论文



Path Details	Coefficient	*t*	SE	Sig
Path a (DPC→ Org Readiness)	0.508	15.316	0.033	0.000
Path b (Org Readiness→ IP)	0.686	18.786	0.037	0.000
Path c (DPC → IP)	0.312	8.845	0.353	0.000
Path c' (DPC→ IP)	0.037	1.129	0.033	0.259

Model details (R^2 = 0.4969; F = 243.4244; p = 0.000
Bootstrap with indirect effect test for H4 (Path ab)

Model Detail	Data	Boot	Bias	SE	Lower	Upper
DPC→OR→IP	0.3489	0.3481	0.001	0.038	0.2736	0.4201

Soble Test Z Score = 4.875

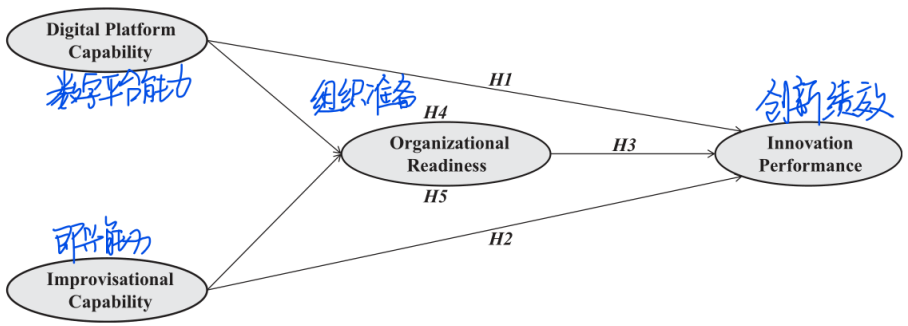
Details	Coefficient	*t*	SE	Sig
Path a (Imp cap→ Org readiness)	0.668	15.230	0.044	0.000
Path b (Org readiness→IP)	0.568	15.890	0.036	0.000
Path c (Imp cap→IP)	0.579	13.525	0.043	0.000
Path c' (Imp cap→IP)	0.199	4.723	0.042	0.000

Model details: R^2 = 0.5174; F = 264.2717; p = 0.000
Results of H5 (Path a, b, c and c')

Model Detail	Data	Boot	Bias	SE	Lower	Upper
IC→OR→IP	0.3792	0.3758	0.003	0.047	0.2931	0.4782

Soble test Z score = 4.125

论文



Path Details	Coefficient	*t*	SE	Sig
Path a (DPC→ Org Readiness)	0.508	15.316	0.033	0.000
Path b (Org Readiness→ IP)	0.686	18.786	0.037	0.000
Path c (DPC → IP)	0.312	8.845	0.353	0.000
Path c' (DPC→ IP)	0.037	1.129	0.033	0.259

Model details (R^2 = 0.4969; F = 243.4244; p = 0.000
Bootstrap with indirect effect test for H4 (Path ab)

Model Detail	Data	Boot	Bias	SE	Lower	Upper
DPC→OR→IP	0.3489	0.3481	0.001	0.038	0.2736	0.4201

Soble Test Z Score = 4.875

Details	Coefficient	*t*	SE	Sig
Path a (Imp cap→ Org readiness)	0.668	15.230	0.044	0.000
Path b (Org readiness→IP)	0.568	15.890	0.036	0.000
Path c (Imp cap→IP)	0.579	13.525	0.043	0.000
Path c' (Imp cap→IP)	0.199	4.723	0.042	0.000

Model details: R^2 = 0.5174; F = 264.2717; p = 0.000
Results of H5 (Path a, b, c and c')

Model Detail	Data	Boot	Bias	SE	Lower	Upper
IC→OR→IP	0.3792	0.3758	0.003	0.047	0.2931	0.4782

Soble test Z score = 4.125

想复现，但没数据

鼓起勇气给作者发邮件

Dear Professor Zahid Yousaf ☆

发件人：王敏杰 <wangmj@sicnu.edu.cn>
时　间：2023年12月21日(星期四) 中午12:11
收件人：muhammadzahid.yusuf <muhammadzahid.yusuf@gmail.com>

翻译全文 |

Dear Professor Zahid Yousaf,

I hope this email finds you well. I am writing to you as a teacher at sichuan normal university in China, and I recently came across your published paper titled [Innovation performance in digital economy] in [European Journal of Innovation Management Vol. 25 No. 5, 2022]. I was intrigued by the research conducted in your study, particularly regarding the data analysis section.

I am currently learning structural equation model (SEM) using R language. After carefully reviewing your paper, I believe that the data presented in your research would greatly contribute to the advancement of my study.

Therefore, I kindly request your assistance in obtaining the dataset used in your research. I guarantee that the data will only be used for teaching and learning purposes.

Thank you for considering my request, and I look forward to hearing from you soon.

Sincerely,
Wang Minjie

鼓起勇气给作者发邮件

Dear Professor Zahid Yousaf

发件人：王敏杰 <wangmj@sicnu.edu.cn>
时　间：2023年12月21日(星期四) 中午12:11
收件人：muhammadzahid.yusuf <muhammadzahid.yusuf@gmail.com>

翻译全文 |

Dear Professor Zahid Yousaf,

I hope this email finds you well. I am writing to you as a teacher at sichuan normal university in China, and I recently came across your published paper titled [Innovation performance in digital economy] in [European Journal of Innovation Management Vol. 25 No. 5, 2022]. I was intrigued by the research conducted in your study, particularly regarding the data analysis section.

I am currently learning structural equation model (SEM) using R language. After carefully reviewing your paper, I believe that the data presented in your research would greatly contribute to the advancement of my study.

Therefore, I kindly request your assistance in obtaining the dataset used in your research. I guarantee that the data will only be used for teaching and learning purposes.

Thank you for considering my request, and I look forward to hearing from you soon.

Sincerely,
Wang Minjie

Re: Dear Professor Zahid Yousaf

发件人：Zahid Yousaf <muhammadzahidyusuf@gmail.com>
时　间：2023年12月21日(星期四) 中午12:21
收件人：王敏杰 <wangmj@sicnu.edu.cn>

翻译全文 |

Dear Wang

I can not provide you data as it is primary data and highly confidential.

Regards

鼓起勇气给作者发邮件

Dear Professor Zahid Yousaf

发件人：王敏杰 <wangmj@sicnu.edu.cn>
时　间：2023年12月21日(星期四) 中午12:11
收件人：muhammadzahid.yusuf <muhammadzahid.yusuf@gmail.com>

翻译全文 |

Dear Professor Zahid Yousaf,

I hope this email finds you well. I am writing to you as a teacher at sichuan normal university in China, and I recently came across your published paper titled [Innovation performance in digital economy] in [European Journal of Innovation Management Vol. 25 No. 5, 2022]. I was intrigued by the research conducted in your study, particularly regarding the data analysis section.

I am currently learning structural equation model (SEM) using R language. After carefully reviewing your paper, I believe that the data presented in your research would greatly contribute to the advancement of my study.

Therefore, I kindly request your assistance in obtaining the dataset used in your research. I guarantee that the data will only be used for teaching and learning purposes.

Thank you for considering my request, and I look forward to hearing from you soon.

Sincerely,
Wang Minjie

Re: Dear Professor Zahid Yousaf

发件人：Zahid Yousaf <muhammadzahidyusuf@gmail.com>
时　间：2023年12月21日(星期四) 中午12:21
收件人：王敏杰 <wangmj@sicnu.edu.cn>

翻译全文 |

Dear Wang

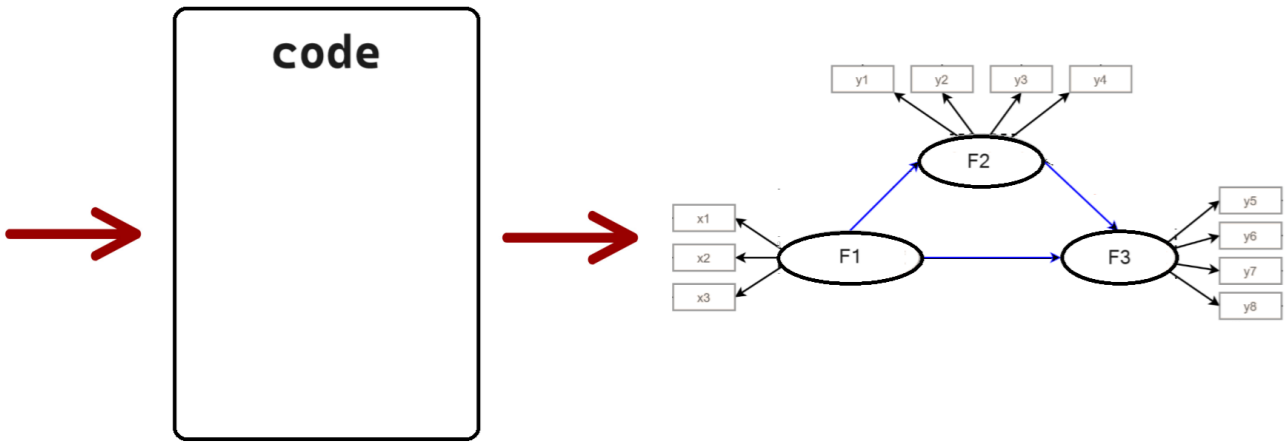
I can not provide you data as it is primary data and highly confidential.

Regards

思考

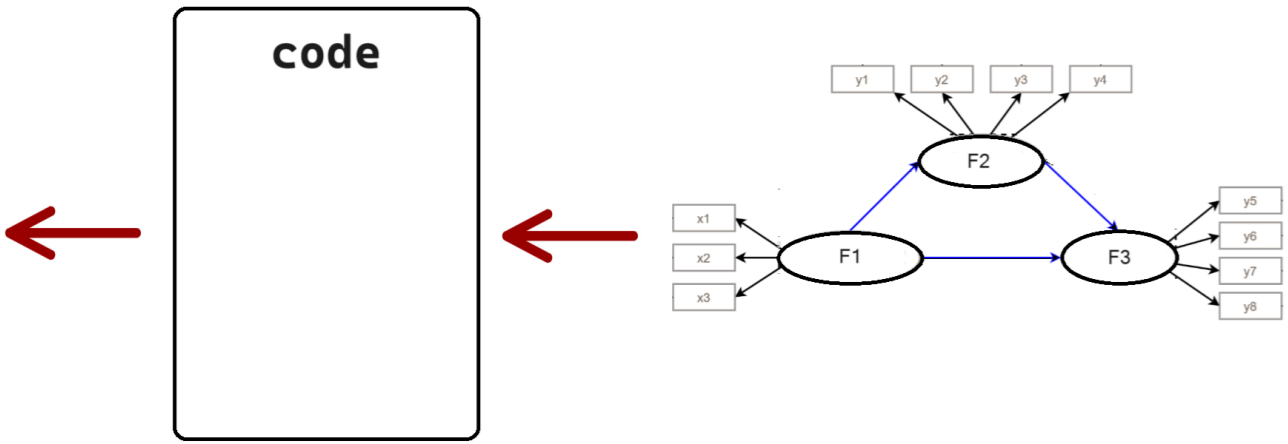
正向思维

x1	x2	x3	y1	y2	y3	y4	y5	y6	y7	y8
3	2	3	4	3	3	3	3	3	2	2
3	3	4	3	4	3	3	4	4	4	3
3	3	3	4	3	4	4	3	2	3	4
3	4	4	3	3	3	3	4	4	5	4
3	3	3	3	3	3	3	3	3	3	3
4	3	3	4	3	3	4	3	3	3	3
4	3	3	3	2	3	3	2	1	2	3
3	2	3	3	3	3	3	4	3	3	3
4	3	4	3	5	3	3	3	3	4	3



逆向思维

x1	x2	x3	y1	y2	y3	y4	y5	y6	y7	y8
3	2	3	4	3	3	3	3	3	2	2
3	3	4	3	4	3	3	4	4	4	3
3	3	3	4	3	4	4	3	2	3	4
3	4	4	3	3	3	3	4	4	5	4
3	3	3	3	3	3	3	3	3	3	3
4	3	3	4	3	3	4	3	3	3	3
4	3	3	3	2	3	3	2	1	2	3
3	2	3	3	3	3	3	4	3	3	3
4	3	4	3	5	3	3	3	3	4	3



从论文到数据

人口信息

4. Analysis

Questionnaire of 647 firms were included for the analysis. Demographic statistic shows that 345 SMEs were working from last 10 years, 237 SMEs from last 15 years, and 65 SMEs working from last 20 years and above. From size perspective, more than 50 employees were working in 298 SMEs, more than 100 employees were working in 129 SMEs. More than 150 employees in 117 SMEs, and more than 200 employees were working in 103 SMEs.

	Variable	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1	Business Age	7.47	1.01	–	1.00							
2	Business Size	14.85	1.08	–	0.04	1.00						
3	Respondent Experience	12.31	2.03	–	0.12	0.12	1.00					
4	Respondent Education	4.52	1.12	–	0.11	0.11	0.08	1.00				
5	Digital Platform Capability	4.34	0.67	0.84	0.09	0.09	0.11	0.11	1.00			
6	Improvisational Capability	4.71	0.58	0.89	0.05	0.02	0.08	0.09	0.59**	1.00		
7	Organizational Readiness	4.62	0.61	0.86	0.01	0.06	0.09	0.07	0.57**	0.56**	1.00	
8	Innovation Performance	4.13	0.58	0.76	0.11	0.05	0.04	0.05	0.37**	0.52**	0.70**	1.00

Note(s): Sig level: **0.001

相关系数矩阵

Table 3.
Mean, SD and correlations

人口信息

4. Analysis

Questionnaire of 647 firms were included for the analysis. Demographic statistic shows that 345 SMEs were working from last 10 years, 237 SMEs from last 15 years, and 65 SMEs working from last 20 years and above. From size perspective, more than 50 employees were working in 298 SMEs, more than 100 employees were working in 129 SMEs. More than 150 employees in 117 SMEs, and more than 200 employees were working in 103 SMEs.

	Variable	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1	Business Age	7.47	1.01	–	1.00							
2	Business Size	14.85	1.08	–	0.04	1.00						
3	Respondent Experience	12.31	2.03	–	0.12	0.12	1.00					
4	Respondent Education	4.52	1.12	–	0.11	0.11	0.08	1.00				
5	Digital Platform Capability	4.34	0.67	0.84	0.09	0.09	0.11	0.11	1.00			
6	Improvisational Capability	4.71	0.58	0.89	0.05	0.02	0.08	0.09	0.59**	1.00		
7	Organizational Readiness	4.62	0.61	0.86	0.01	0.06	0.09	0.07	0.57**	0.56**	1.00	
8	Innovation Performance	4.13	0.58	0.76	0.11	0.05	0.04	0.05	0.37**	0.52**	0.70**	1.00

Note(s): Sig level: **0.001

相关系数矩阵

Table 3.
Mean, SD and correlations

```
mu <- c(7.47, 14.85, 12.31, 4.52)
SD <- c(1.01, 1.08, 2.03, 1.12)

corrMatrix <- matrix(c(   1, 0.04, 0.12, 0.11,
                       0.04,    1, 0.12, 0.11,
                       0.12, 0.12,    1, 0.08,
                       0.11, 0.11, 0.08,    1),
                     ncol = 4, nrow = 4)

Sigmas <- colorednoise::cor2cov(SD, corrMatrix)


d1 <-
  MASS::mvrnorm(n = 647, mu = mu, Sigma = Sigmas) %>%
  as.data.frame() %>%
  set_names(c("Age", "Size", "Experience", "Edu")) %>%
  as_tibble() %>%
  mutate( across(everything(), round)  )
```

Age	Size	Experience	Edu
8	14	10	5
8	17	13	5
10	15	14	5
8	14	9	6
8	15	12	5

人口信息

4. Analysis

Questionnaire of 647 firms were included for the analysis. Demographic statistic shows that 345 SMEs were working from last 10 years, 237 SMEs from last 15 years, and 65 SMEs working from last 20 years and above. From size perspective, more than 50 employees were working in 298 SMEs, more than 100 employees were working in 129 SMEs. More than 150 employees in 117 SMEs, and more than 200 employees were working in 103 SMEs.

	Variable	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1	Business Age	7.47	1.01	–	1.00							
2	Business Size	14.85	1.08	–	0.04	1.00						
3	Respondent Experience	12.31	2.03	–	0.12	0.12	1.00					
4	Respondent Education	4.52	1.12	–	0.11	0.11	0.08	1.00				
5	Digital Platform Capability	4.34	0.67	0.84	0.09	0.09	0.11	0.11	1.00			
6	Improvisational Capability	4.71	0.58	0.89	0.05	0.02	0.08	0.09	0.59**	1.00		
7	Organizational Readiness	4.62	0.61	0.86	0.01	0.06	0.09	0.07	0.57**	0.56**	1.00	
8	Innovation Performance	4.13	0.58	0.76	0.11	0.05	0.04	0.05	0.37**	0.52**	0.70**	1.00

Note(s): Sig level: **0.001

相关系数矩阵

Table 3.
Mean, SD and correlations

```
mu <- c(7.47, 14.85, 12.31, 4.52)
SD <- c(1.01, 1.08, 2.03, 1.12)

corrMatrix <- matrix(c(   1, 0.04, 0.12, 0.11,
                       0.04,    1, 0.12, 0.11,
                       0.12, 0.12,    1, 0.08,
                       0.11, 0.11, 0.08,    1),
                     ncol = 4, nrow = 4)

Sigmas <- colorednoise::cor2cov(SD, corrMatrix)


d1 <-
  MASS::mvrnorm(n = 647, mu = mu, Sigma = Sigmas) %>%
  as.data.frame() %>%
  set_names(c("Age", "Size", "Experience", "Edu")) %>%
  as_tibble() %>%
  mutate( across(everything(), round)  )
```

Mean, SD and correlations

Variables	M	SD	Age	Size	Experience	Edu
Age	7.45	1.03	1.0000			
Size	14.82	1.15	0.0394	1.000		
Experience	12.26	2.02	0.0754	0.121	1.000	
Edu	4.56	1.17	0.0738	0.173	0.104	1

研究变量

Details	F-L >0.7	*t*-value	Alpha >0.7	CR >0.6	AVE >0.5
Digital platform capability			0.84	0.93	0.77
DigPC1	0.78	15.22			
DigPC2	0.75	14.32			
DigPC3	0.76	15.66			
DigPC4	0.82	14.56			
DigPC5	0.83	14.22			
DigPC6	0.85	14.56			
DigPC7	0.72	15.66			
DigPC8	0.72	15.21			
Improvisation capability			0.89	0.94	0.74
ImpC1	0.78	15.22			
ImpC2	0.81	14.33			
ImpC3	0.82	15.44			
Organizational readiness			0.86	0.96	0.75
OrgR1	0.78	15.44			
OrgR2	0.82	14.55			
OrgR3	0.81	13.22			
OrgR4	0.85	15.78			
OrgR5	0.86	14.66			
OrgR6	0.84	13.31			
Innovation performance			0.78	0.95	0.76
InnP1	0.73	13.24			
InnP2	0.78	14.25			
InnP3	0.81	15.44			
InnP4	0.83	16.23			
InnP5	0.85	16.58			
InnP6	0.86	14.56			
InnP7	0.74	13.29			
InnP8	0.75	13.45			
InnP9	0.76	14.11			
InnP10	0.83	15.44			
InnP11	0.84	15.66			

Note(s): F-T = Factor loading; CR: Composite reliability; AVE: Average variance extracted; Alpha = Cronbach's alpha

研究变量

Details	F-L >0.7	*t*-value	Alpha >0.7	CR >0.6	AVE >0.5
Digital platform capability			0.84	0.93	0.77
DigPC1	0.78	15.22			
DigPC2	0.75	14.32			
DigPC3	0.76	15.66			
DigPC4	0.82	14.56			
DigPC5	0.83	14.22			
DigPC6	0.85	14.56			
DigPC7	0.72	15.66			
DigPC8	0.72	15.21			
Improvisation capability			0.89	0.94	0.74
ImpC1	0.78	15.22			
ImpC2	0.81	14.33			
ImpC3	0.82	15.44			
Organizational readiness			0.86	0.96	0.75
OrgR1	0.78	15.44			
OrgR2	0.82	14.55			
OrgR3	0.81	13.22			
OrgR4	0.85	15.78			
OrgR5	0.86	14.66			
OrgR6	0.84	13.31			
Innovation performance			0.78	0.95	0.76
InnP1	0.73	13.24			
InnP2	0.78	14.25			
InnP3	0.81	15.44			
InnP4	0.83	16.23			
InnP5	0.85	16.58			
InnP6	0.86	14.56			
InnP7	0.74	13.29			
InnP8	0.75	13.45			
InnP9	0.76	14.11			
InnP10	0.83	15.44			
InnP11	0.84	15.66			

Note(s): F-T = Factor loading; CR: Composite reliability; AVE: Average variance extracted; Alpha = Cronbach's alpha

Variable	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1 Business Age	7.47	1.01	–	1.00							
2 Business Size	14.85	1.08	–	0.04	1.00						
3 Respondent Experience	12.31	2.03	–	0.12	0.12	1.00					
4 Respondent Education	4.52	1.12	–	0.11	0.11	0.08	1.00				
5 Digital Platform Capability	4.34	0.67	0.84	0.09	0.09	0.11	0.11	1.00			
6 Improvisational Capability	4.71	0.58	0.89	0.05	0.02	0.08	0.09	0.59**	1.00		
7 Organizational Readiness	4.62	0.61	0.86	0.01	0.06	0.09	0.07	0.57**	0.56**	1.00	
8 Innovation Performance	4.13	0.58	0.76	0.11	0.05	0.04	0.05	0.37**	0.52**	0.70**	1.00

Note(s): Sig level: **0.001

相关系数矩阵

Table 3. Mean, SD and correlations

研究变量

Details	F-L >0.7	*t*-value	Alpha >0.7	CR >0.6	AVE >0.5
Digital platform capability			0.84	0.93	0.77
DigPC1	0.78	15.22			
DigPC2	0.75	14.32			
DigPC3	0.76	15.66			
DigPC4	0.82	14.56			
DigPC5	0.83	14.22			
DigPC6	0.85	14.56			
DigPC7	0.72	15.66			
DigPC8	0.72	15.21			
Improvisation capability			0.89	0.94	0.74
ImpC1	0.78	15.22			
ImpC2	0.81	14.33			
ImpC3	0.82	15.44			
Organizational readiness			0.86	0.96	0.75
OrgR1	0.78	15.44			
OrgR2	0.82	14.55			
OrgR3	0.81	13.22			
OrgR4	0.85	15.78			
OrgR5	0.86	14.66			
OrgR6	0.84	13.31			
Innovation performance			0.78	0.95	0.76
InnP1	0.73	13.24			
InnP2	0.78	14.25			
InnP3	0.81	15.44			
InnP4	0.83	16.23			
InnP5	0.85	16.58			
InnP6	0.86	14.56			
InnP7	0.74	13.29			
InnP8	0.75	13.45			
InnP9	0.76	14.11			
InnP10	0.83	15.44			
InnP11	0.84	15.66			

Note(s): F-T = Factor loading; CR: Composite reliability; AVE: Average variance extracted; Alpha = Cronbach's alpha

Variable	Mean	SD	Alpha	1	2	3	4	5	6	7	8
1 Business Age	7.47	1.01	–	1.00							
2 Business Size	14.85	1.08	–	0.04	1.00						
3 Respondent Experience	12.31	2.03	–	0.12	0.12	1.00					
4 Respondent Education	4.52	1.12	–	0.11	0.11	0.08	1.00				
5 Digital Platform Capability	4.34	0.67	0.84	0.09	0.09	0.11	0.11	1.00			
6 Improvisational Capability	4.71	0.58	0.89	0.05	0.02	0.08	0.09	0.59**	1.00		
7 Organizational Readiness	4.62	0.61	0.86	0.01	0.06	0.09	0.07	0.57**	0.56**	1.00	
8 Innovation Performance	4.13	0.58	0.76	0.11	0.05	0.04	0.05	0.37**	0.52**	0.70**	1.00

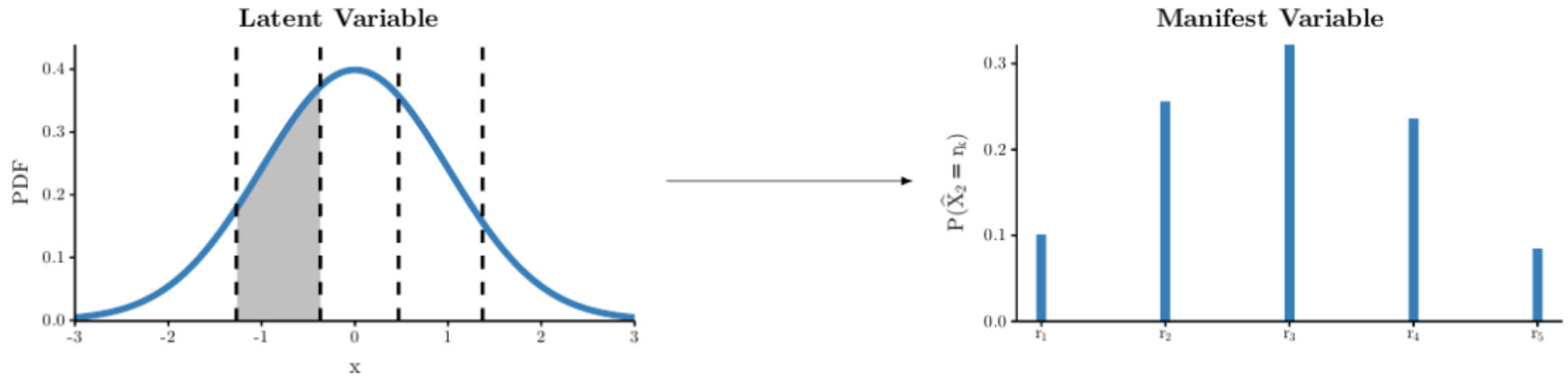
Note(s): Sig level: **0.001

相关系数矩阵

Table 3. Mean, SD and correlations

```
library(lavaan)

model <- '
  DigPC =~ 0.78*DigPC1 + 0.75*DigPC2 + 0.76*DigPC3 + 0.82*DigPC4 +
           0.83*DigPC5 + 0.85*DigPC6 + 0.72*DigPC7 + 0.72*DigPC8

  ImpC  =~ 0.78*ImpC1 + 0.81*ImpC2 + 0.82*ImpC3

  OrgR  =~ 0.78*OrgR1 + 0.82*OrgR2 + 0.81*OrgR3 + 0.85*OrgR4 +
           0.86*OrgR5 + 0.84*OrgR6

  InnP  =~ 0.73*InnP1 + 0.78*InnP2 + 0.81*InnP3 + 0.83*InnP4 +
           0.85*InnP5 + 0.86*InnP6 + 0.74*InnP7 + 0.75*InnP8 +
           0.76*InnP9 + 0.83*InnP10 + 0.84*InnP11


  OrgR  ~  0.508*DigPC + 0.668*ImpC
  InnP  ~  0.37*DigPC + 0.7*OrgR + 0.52*ImpC


  DigPC ~~ 1*DigPC
  ImpC  ~~ 1*ImpC
  OrgR  ~~ 1*OrgR
  InnP  ~~ 1*InnP

  DigPC ~~ 0.59*ImpC
  DigPC ~~ 0.57*OrgR
  DigPC ~~ 0.37*InnP

  ImpC  ~~ 0.56*OrgR
  ImpC  ~~ 0.52*InnP

  OrgR  ~~ 0.70*InnP
'

dt <- simulateData(model = model,  sample.nobs = 647)
```

李克特量表的模拟


Latent Variable
PDF
0.0
0.1
0.2
0.3
0.4
-3
-2
-1
0
1
2
3
x
Manifest Variable
$P(\hat{X}_2 = r_k)$
0.0
0.1
0.2
0.3
r_1
r_2
r_3
r_4
r_5

完整代码

https://github.com/perlatex/from-paper-to-data

感谢 R 和 Stan 语言之美!

本幻灯片由 R 包 **xaringan** 和 **flipbookr** 生成