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# Innovation and Entrepreneurship Research Peak- Workshop

12th September 2024

Reddi Kotha, Cheong Wei Yang, Senghoon Kim, Ge Xu

SMU

The focus of the entrepreneurship research peak is to develop interdisciplinary collaboration within the business school areas (and across SMU's schools) that leads to impactful academic research.

In addition, the research peak aims to galvanize faculty for tier II or III grant applications in the research area.

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# Tier II grant application submitted

- Interdisciplinary Research on Future Skills for Mid-Career Individuals in an Aging Society
- Co-PI and collaborators: Prof. Kim Seonghoon, Prof. LIM Ee-Peng, Dr. Cheong Wei Yang, Prof. Tsai Ming-Hong, Prof. Abolfathi Niloofar, Dr. Ge Xu
- Dr. Cheong Wei Yang provided feedback and assisted with the letter of support from SkillsFuture SG

# Intended grant application November

# Agenda

- Welcome
- Dr. Ge Xu introduce the release of the LKY Business Plan data to SMU researchers.
- Prof. Ted Tschang share the research project on innovation and entrepreneurship.
- Dr. Cheong Wei Yang, Vice Provost Strategic Research Partnerships, share on potential opportunities with government partners.
- Any other matters & Discussion

# Welcome

**Hosts and invited speakers for the workshop**

- Reddi Kotha, Professor of Strategy & Entrepreneurship, Innovation & Entrepreneurship Research Peak Lead, Associate Editor Academy of Management Journal
- Cheong Wei Yang, Vice Provost (Strategic Research Partnerships)
- Senghoon Kim, Associate Professor of Economics; Deputy Director, Centre for Research on Successful Ageing (ROSA)
- Prof. Ted Tschang, Associate Professor of Strategic Management
- Ge Xu, Innovation & Entrepreneurship Research Fellow

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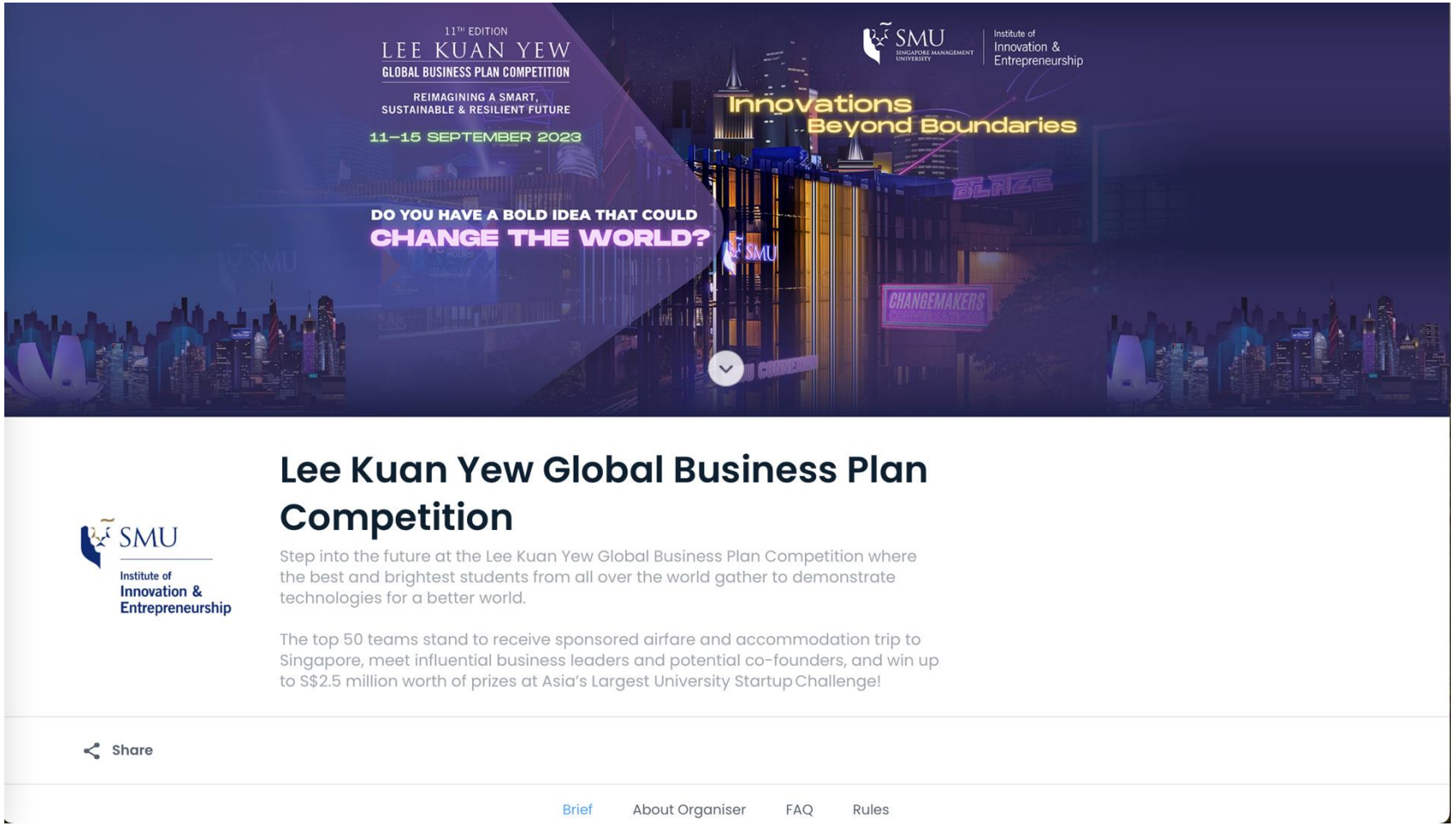
# LKY Business Plan Data

Professor Reddi Kotha, School of Business

Dr. Ge Xu, Post Doctoral Fellow Innovation & Entrepreneurship

# Lee Kuan Yew Global Business Plan Competition




**Competition website: [https://lkygbpc.smu.edu.sg](https://lkygbpc.smu.edu.sg)**

# LKY business plan data structure

Sample: 527 startups with English pitch decks and judge scores

**Independent Variables**

**Dependent Variables**

## Single row datasets

527 startups (rows)
startup level

1. Start-up Application
2. LIWC
3. Constructed Variables

Startup level

Link by team_id →

4. Judge Scores
5. Pitchbook Performance

Startup level

## Multiple row datasets

Can be used to generate more variables

6. Team

Team member level

7. Advisor

Advisor level

Link by team_id →

8. Judge Scores Raw

Judge level

All datasets can be linked by team_id

# Data analysis example - team member with a doctoral degree

Whether startups with any team member of doctoral degree are more likely to get higher judge score/investments

Independent variable: whether the startup has any team members with a doctoral degree or who are PhD student
Constructed using the variable 'CurrentEduDoctoral' in multiple row datasets '6. Team'

Dependent variable1: total amount of investment given by judges

```
. ttest judge_invest_sum, by(d_team_PhD)

Two-sample t test with equal variances
```

| Group | Obs | Mean | Std. err. | Std. dev. | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| 0 | 410 | 223903.7 | 12991.73 | 263062.5 | 198364.8 | 249442.6 |
| 1 | 117 | 371787 | 32250.3 | 348840.3 | 307911.3 | 435662.8 |
| Combined | 527 | 256735.5 | 12657.36 | 290568.6 | 231870.3 | 281600.7 |
| diff | | -147883.4 | 29793.66 | | -206412.8 | -89353.92 |

```
    diff = mean(0) - mean(1)                                  t =  -4.9636
H0: diff = 0                     Degrees of freedom =       525

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Dependent variable2: whether there is VC investment received, source Pitchbook

```
. ttest d_vc_invest, by(d_team_PhD)

Two-sample t test with equal variances
```

| Group | Obs | Mean | Std. err. | Std. dev. | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| 0 | 410 | .2682927 | .0219084 | .4436121 | .2252255 | .3113599 |
| 1 | 117 | .4529915 | .0462182 | .4999263 | .3614505 | .5445324 |
| Combined | 527 | .3092979 | .0201531 | .4626433 | .2697075 | .3488883 |
| diff | | -.1846988 | .0478637 | | -.2787268 | -.0906708 |

```
    diff = mean(0) - mean(1)                                  t =  -3.8588
H0: diff = 0                     Degrees of freedom =       525

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0001         Pr(|T| > |t|) = 0.0001          Pr(T > t) = 0.9999
```

# Data analysis example - patents

## Whether startups mentioning patents in pitch decks are more likely to get higher judge score/investments

Independent variable: whether the startup mentioning the word 'patent' in pitch deck, generating by LIWC

- LIWC calculates the percentage of the word 'patent' among the total words within a pitch deck.
- For example, 4.2 means that 4.20 percent of all the words in the pitch deck is 'patent'.
- We generate the binary variable 'd_patent' to indicate whether pitch decks mentioned 'patent' based on LIWC calculation.

Dependent variable1: total amount of investment given by judges

```
. ttest judge_invest_sum, by(d_patent)

Two-sample t test with equal variances
```

| Group | Obs | Mean | Std. err. | Std. dev. | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| 0 | 433 | 220938.9 | 12618.29 | 262569.6 | 196138 | 245739.8 |
| 1 | 94 | 421628.2 | 36295.32 | 351896.2 | 349552.9 | 493703.5 |
| Combined | 527 | 256735.5 | 12657.36 | 290568.6 | 231870.3 | 281600.7 |
| diff | | -200689.3 | 31914.68 | | -263385.5 | -137993.2 |

```
    diff = mean(0) - mean(1)                                  t =  -6.2883
H0: diff = 0                     Degrees of freedom =       525

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Dependent variable2: whether there is VC investment received, source Pitchbook

```
. ttest d_vc_invest, by(d_patent)

Two-sample t test with equal variances
```

| Group | Obs | Mean | Std. err. | Std. dev. | [95% conf. | interval] |
|---|---|---|---|---|---|---|
| 0 | 433 | .2771363 | .0215344 | .4481021 | .234811 | .3194615 |
| 1 | 94 | .4574468 | .0516595 | .5008572 | .3548613 | .5600323 |
| Combined | 527 | .3092979 | .0201531 | .4626433 | .2697075 | .3488883 |
| diff | | -.1803105 | .0521026 | | -.2826657 | -.0779554 |

```
    diff = mean(0) - mean(1)                                  t =  -3.4607
H0: diff = 0                     Degrees of freedom =       525

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0003         Pr(|T| > |t|) = 0.0006          Pr(T > t) = 0.9997
```

# Data sharing timeline

LKY business plan datasets will be shared within SMU through library end of September.

We will share the datasets and a code book explaining how the variables were constructed. There will be a reference doi for citing.

We will share the link of the LKY business plan data through email.

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# Research Project on Innovation and Entrepreneurship

Prof. Ted Tschang, Associate Professor of Strategic Management

YAO Xiaoxia (Shine), Doctor Business Administration

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# Potential Opportunities with Government Partners

Dr. Cheong Wei Yang, Vice Provost Strategic Research Partnerships

# Any other Matters?

- Prof. TSAI Ming-Hong (SOSS), research proposal
- Measures of prosocial behaviors using archival data and how they might be related to the Singapore Government's records
- Potential data:
  - Volunteer Work
  - Donation Records
  - Blood Donation

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# Thank you!
# See you next time!