

Entrepreneurial Ecosystem and University Spinoffs in Singapore

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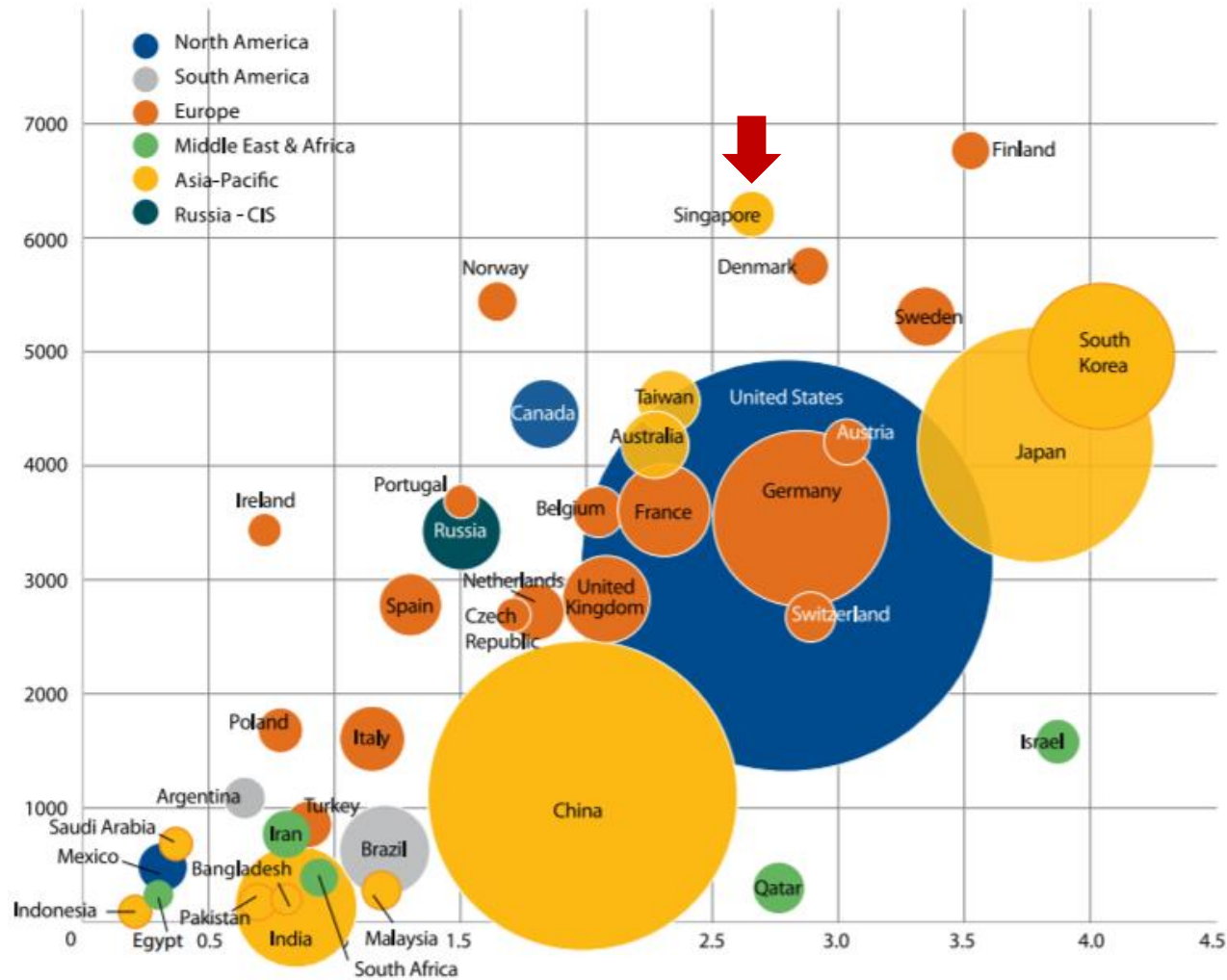
- Nanyang Business School, Nanyang Technological University (2011–present)
- Innovation Centre, Nanyang Technological University (2010-2011)
- Corporate Strategy, Samsung Electronics (2005-2008)
- Technology and Policy Program, Massachusetts Institute of Technology (2002-2005)
- Electrical Engineering, Korea Advanced Institute of Science and Technology (1997-2001)

Index

- **Overview on entrepreneurial ecosystem in Singapore**
- **Current practices within Singaporean universities**
 - National University of Singapore
 - Nanyang Technological University
 - Singapore Management University
- **Discussion**



World R&D Scene



Source: Batelle R&D Magazine, Winter 2016

THE BUSINESS TIMES

Singapore is most innovative economy in Asia

It also ranks 6th in the world, up from 7th last year

AUG 16, 2016 5:50 AM



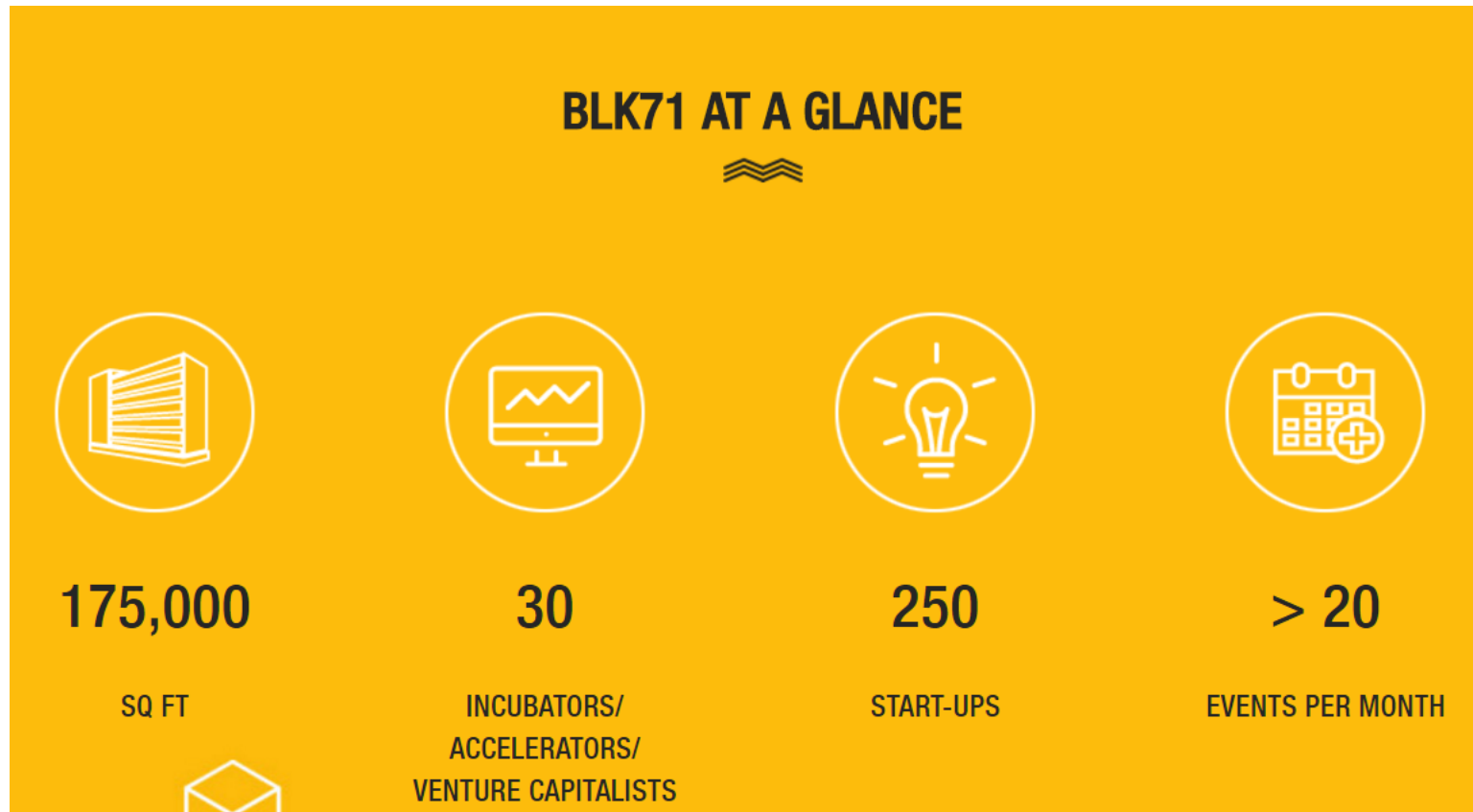


Lead by Singapore Government

NATIONAL
RESEARCH
FOUNDATION



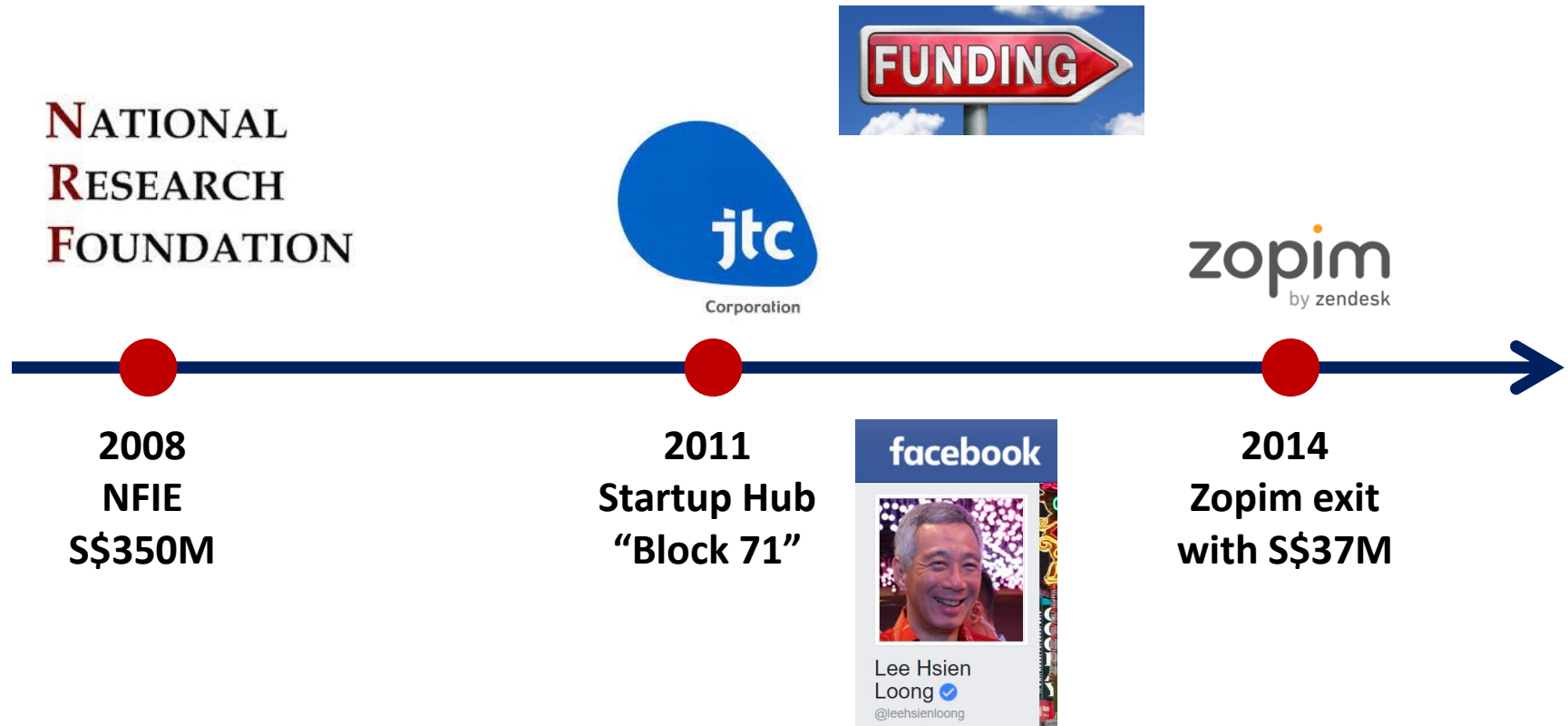
Startup Hub: Block 71



Startup Hub: Block 71 (and 75, 79..)



Lead by Singapore Government



ENTREPRENEURSHIP

How Singapore Became an Entrepreneurial Hub

**Harvard
Business
Review**

by Scott Anthony

FEBRUARY 25, 2015

SAVE SHARE COMMENT 6 TEXT SIZE PRINT \$8.95 BUY COPIES



BUSINESS



CHANNEL NEWSASIA

Starting up: The rise of the Singaporean entrepreneur

By Angela Teng, TODAY Posted 16 Jan 2016 15:04 Updated 16 Jan 2016 17:05



Forbes

Three Entrepreneurs Trade The Ivy League For Singapore's Startup Scene

**Casey Hynes, CONTRIBUTOR***I write about the intersection of tech and social progress in Asia. [FULL BIO](#) ✓*

Opinions expressed by Forbes Contributors are their own.

AUG 18, 2016 @ 12:58 PM



Top countries for launching a start-up

FT

Rank	Country	Entrepreneurship (%)					
		Inflow of entrepreneurs	Outflow of entrepreneurs	Equity	Still operating	Main source of income	Recruited employees
1	UAE	47	21	59	81	35	94
2	Singapore	53	20	46	75	39	82
3	Hong Kong	62	35	34	90	37	78
4	China	22	18	40	86	49	97
5	Switzerland	34	23	58	79	37	89
6	Spain	40	37	74	74	36	89
7	Brazil	31	19	30	86	38	97
8	Germany	32	33	70	79	39	81
9	UK	39	36	48	75	41	78
10	US	14	10	55	75	38	76

Source: Global MBA & Executive MBA rankings 2016

FT

FT

Top entrepreneurs by citizenship

Rank	Citizenship	Entrepreneurship (%)					
		Started company	Female entrepreneurs	Equity	Still operating	Main source of income	Recruited employees
1	Mexican	34	26	38	84	36	95
2	Spanish	23	8	76	80	51	94
3	South African	39	41	36	74	31	75
4	Hong Konger	32	27	44	79	40	86
5	Russian	29	23	47	81	41	84
6	Chinese	17	9	38	88	49	98
7	French	23	22	62	71	38	84
8	British	30	21	48	70	34	73
9	Singaporean	22	19	40	74	51	88
10	Swiss	18	19	47	82	28	87

Source: Global MBA & Executive MBA rankings 2016

FT

Top countries of study for entrepreneurship

FT

Rank	Country	Entrepreneurship (%)					Motivation & support (out of 10)		
		Started company	Female entrepreneurs	Equity	Still operating	Main source of income	Motivation	School support	Alumni support
1	Spain	26	18	61	80	38	9.1	6.8	7.3
2	Switzerland	19	25	53	83	39	9.0	7.4	7.8
3	US	19	12	54	77	37	8.9	7.4	7.8
4	France	23	15	51	71	39	9.0	6.8	7.7
5	UK	24	17	53	79	42	8.9	6.1	6.8
6	Hong Kong	22	18	38	85	39	8.6	6.7	7.4
7	Singapore	23	15	41	80	50	8.6	6.0	6.7
8	China	16	10	36	89	53	8.4	6.7	7.1
9	Australia	23	7	43	71	44	8.7	6.5	7.4
10	Germany	18	14	58	69	49	8.8	6.0	6.6

Source: Global MBA & Executive MBA rankings 2016

FT

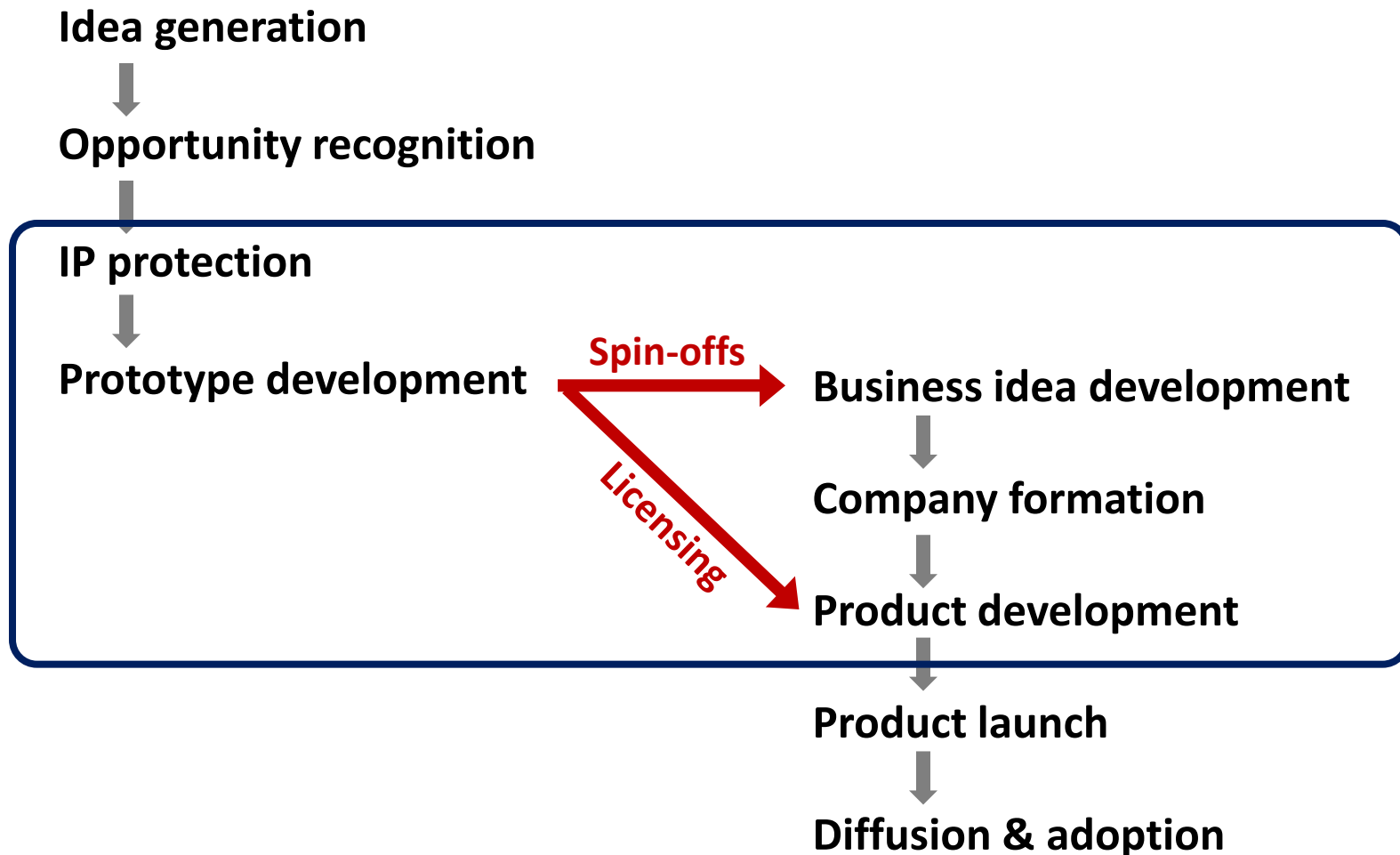
Singapore Entrepreneurial Ecosystem



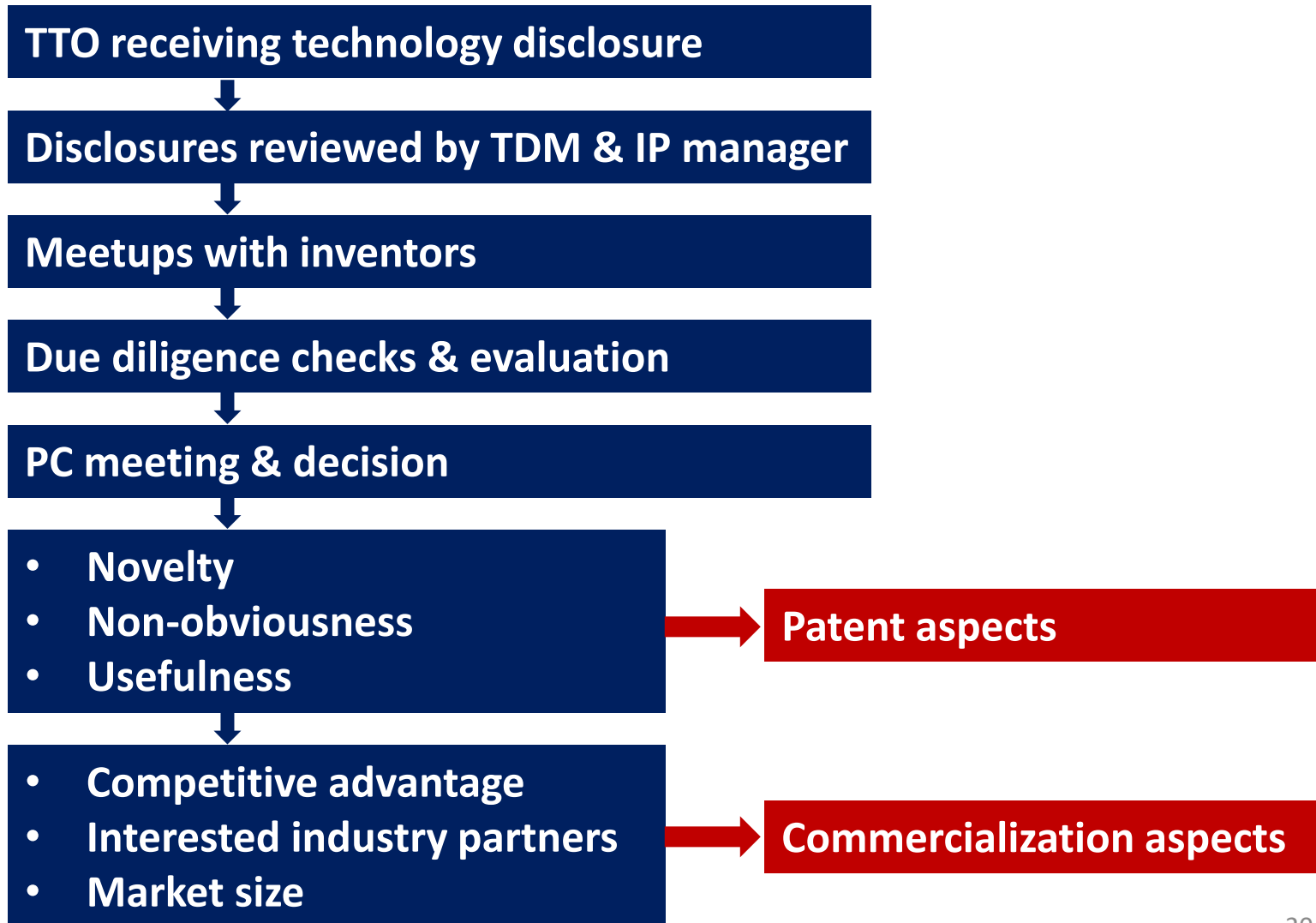
Singapore Entrepreneurial Ecosystem



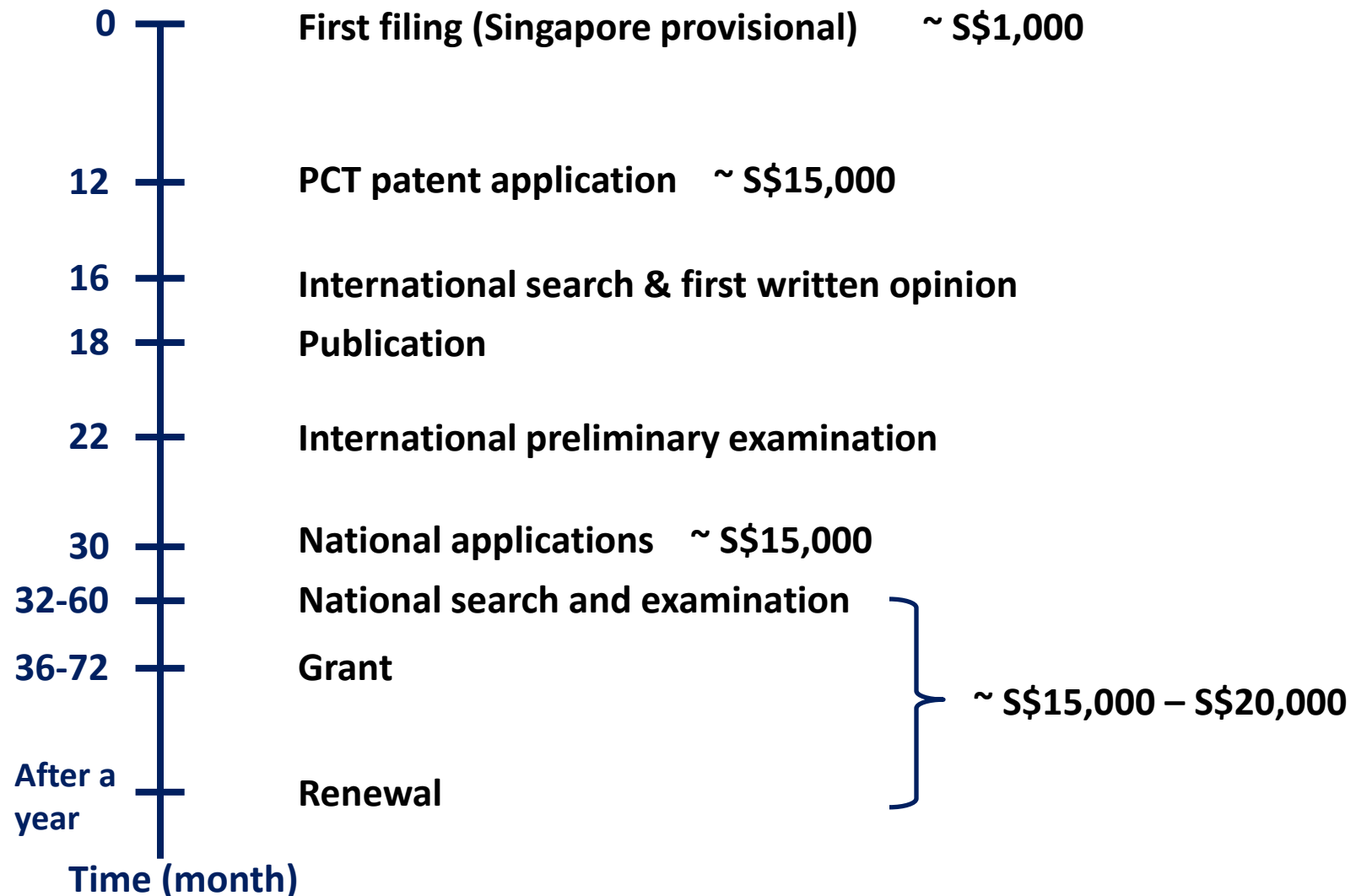
Innovation to Commercialization



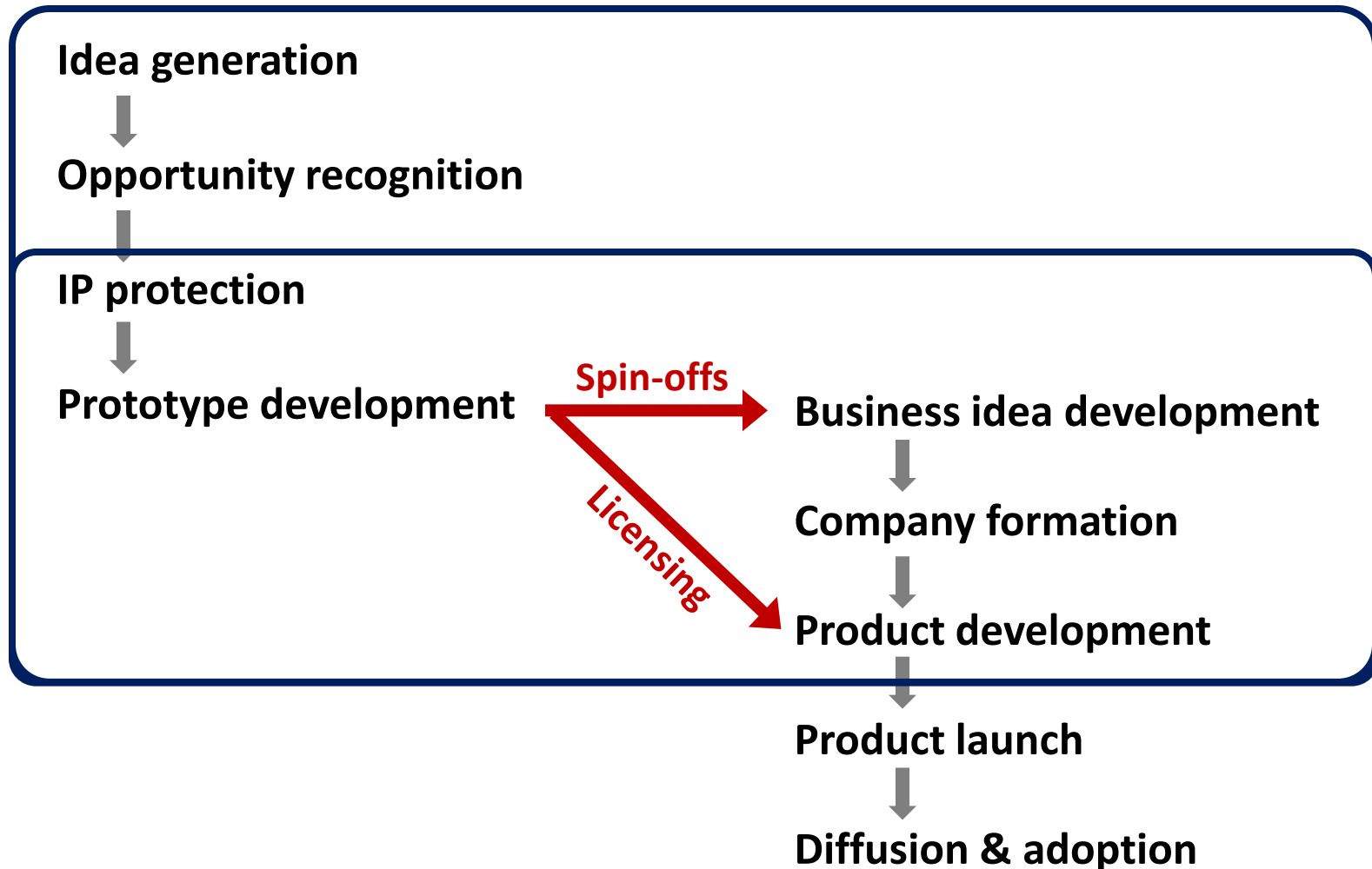
IP Filing Process



IP Filing Process: Timeline & Cost



Innovation to Commercialization



National Univ of Singapore



Education

Support as TTO

NUS
OVERSEAS
COLLEGES
experience > entrepreneurship

Lean Launch
@ PAD
SINGAPORE

NUS
START-UP
RUNWAY

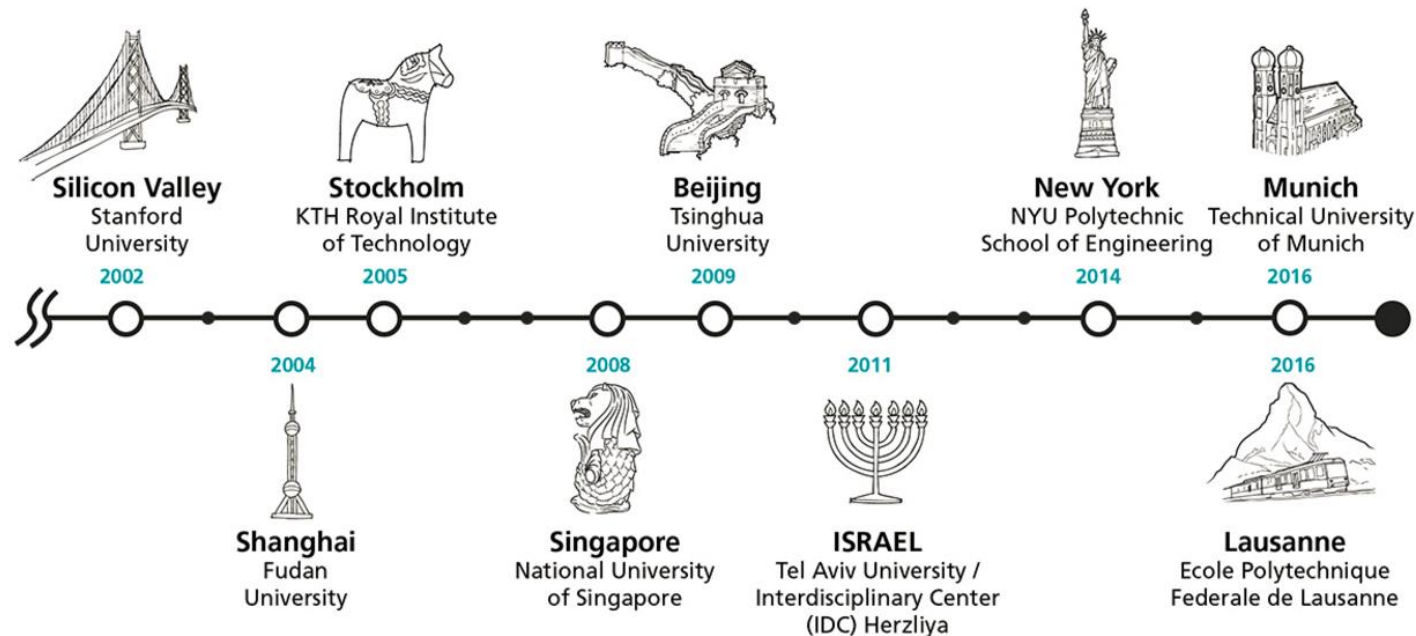
TECHSG

NUS Overseas College



NUS
Enterprise

- 9 entrepreneurial hotspots; 350 students per year
- Half/full-year program working at startups and studying at partner universities



Lean LaunchPad



NUS
National University
of Singapore

NUS
Enterprise

- 1st entrepreneurial program for researchers (June 2013)
- Modeled on the U.S. NSF I-Corps program
- Promoting experiential learning

Lean Launch
PAD
@ SINGAPORE



NUS Startup Runway



NUS
National University
of Singapore

NUS
Enterprise



- Helping pre-incubation phase: market validation, user testing, gathering customer feedback, market-product fit
- Startup Validation Program, legal consultation, accounting consultation, hotdesking, and co-working space

Tech SG



NUS
Enterprise



Explore the Tech Startup Ecosystem of Singapore

Search for startups, investors, and others.



2003

Startups



2598

Founders



231

Investors



42

Incubators



45

Other
Facilitators

InnovFest Unbound



NUS
National University
of Singapore

NUS
Enterprise



Financial Support



NUS
Enterprise

- **NUS Alumni Startup Catalyst**
 - Pre-seed funding up to S\$10,000
 - Validation package: 6-mo coworking space, mentorship, and legal consultation

**NUS Alumni
Start-Up Catalyst**
An initiative by NUS Enterprise

Do you have a tech-related product or idea that you would like to validate and further develop? Submit your idea to us, and stand a chance to receive a validation award as well as a validation package to take your innovation off the ground.

The NUS Alumni Start-Up Catalyst is a new initiative by NUS Enterprise for pre-seed start-ups founded by NUS Alumni.

A circular diagram illustrating the Build-Measure-Learn cycle. It consists of three arrows forming a circle: a blue arrow labeled 'Build' at the bottom, an orange arrow labeled 'Measure' at the top, and a yellow arrow labeled 'Learn' on the right. In the center of the circle, the text 'Validate Your Idea' is written.

Corporate Partnerships



Singapore's First Commuter Experience Hackathon

COMMUTHON

Bringing smiles through service innovation • 29-31 August 2014

Register NOW!

- Winning ideas qualify for funding of up to \$120,000 for implementation
- Attractive gifts & prizes
- Exclusive Insider Tour

[Click here to Register](#)

powered by eventbrite

A black and white silhouette illustration of a commuter journey. It starts with a train on tracks on the left, followed by a person walking, a person pushing a stroller, a person with a shopping bag, a shop with an "OPEN" sign, a person with a stroller, a person with a shopping bag, a bus, a car, a person in a wheelchair, and a person walking on the right. The background is a light blue gradient.

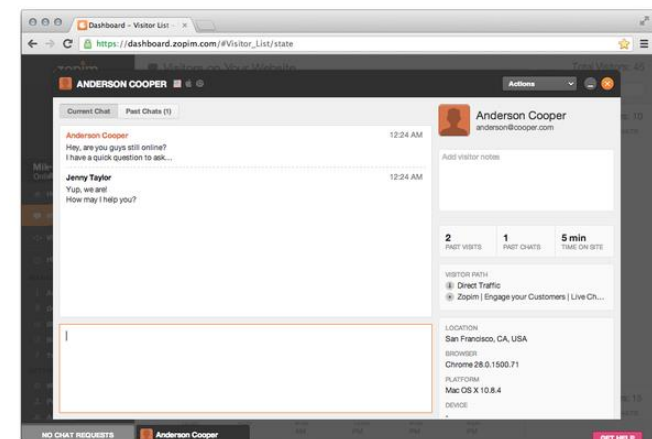
Organised by:

Current Scores

- **Total no of startups incorporated through NOC: 200**

Current Scores

- Total no of startups incorporated through NOC: 200
- NUS Startup Hall of Fame: **zopim**
by zendesk
 - Founded in 2008 by 4 NUS undergraduates on NOC at Stanford
 - Acquired by Zendesk in 2014 for S\$37M



Nanyang Technological Univ

**NANYANG
TECHNOPRENEURSHIP
CENTER**



Education

Undergraduate Programmes	
Gain a Competitive Edge: Develop an Enterprising Mindset	
Minor in Entrepreneurship (16 AUs)	ET9121 Introduction to Entrepreneurship (3 AUs)
BS 402 Bioentrepreneurship (3 AUs)	ET9122 E-Startups and Social Media Strategies (3 AUs) NEW



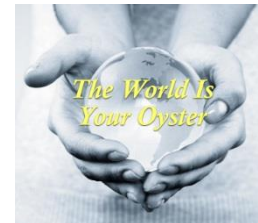
KAUFFMAN
FASTTRAC
Certified Affiliate



Education



Support as TTO



Nanyang Technopreneurship Center



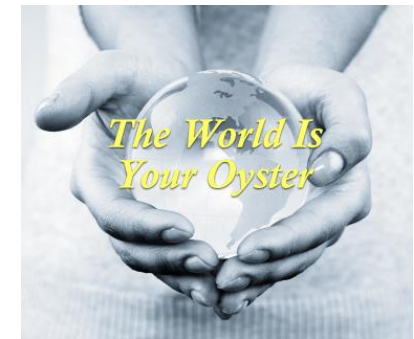
- **Degree Program (for students)**
 - Undergraduate program
 - Minor in entrepreneurship
 - Courses: Bioentrepreneurship, E-startups & social medial strategies, and Intro to entrepreneurship
 - Graduate program
 - MS in Technopreneurship & Innovation
- **Development Program (open to public)**



NTUitive



- **Overseas Entrepreneurship Program**
 - 1-year internship at startups and studying at partner universities
 - London, Beijing, and Shanghai
- **Innovation Centre**
 - Open Innovation Lab for quick-and-dirty prototyping
 - Monthly workshop and meet-ups



NTUitive



- **Tech Development & IP Management (TTO)**
 - Grant facilitation: NRF POC, MOE TIF, NMRC B&B
 - IP management: disclosures and evaluation
 - Licensing or collaborating with industry partners
- **Incubation Support**
 - Incubation manager and mentors
 - Coworking space @Blk 71
 - Legal support

Financial Support

- **No monetary support** for student startups except *ad-hoc* business plan competition
- **NTUitive Gap Fund** for faculty members up to S\$250K
- **ideasinc** by NTC
 - Cash awards up to S\$10K
 - Grant access to ACE, S\$50K
 - Equity funding by VCs up to S\$300K

Current Score

- **Total no. of startups incorporated since 2011: 163**
- **No. of startups incorporated in 2015: 48**

Singapore Mgt Univ



Institute of Innovation & Entrepreneurship

Education

Support as TTO



Entrepreneurial Education

- **Undergraduate Degree Program (Aug. 2016)**
 - Innovation
 - Design thinking
 - Social entrepreneurship
 - Technological entrepreneurship

Entrepreneurial Education

- **Undergraduate Degree Program (Aug. 2016)**
 - Innovation
 - Design thinking
 - Social entrepreneurship
 - Technological entrepreneurship
- **Educational Program**
 - Full day workshops for founders or entrepreneurs
 - Startup 101
 - Entrepreneurship Immersion Program
 - Study Mission: Technopreneurship (School of Info Systems), Business (School of Business)

Incubation Service

- **Sandbox**

- Pre-intake and intake process of incubation program
- Training founders in the knowledge of pitch and proposal development



- **Business Innovations Generator (BIG)**

- 1-year incubation program for students and alumni
- Business model validation, innovation development, go-to-market strategy, and business plan and financial modeling stages



INNOVATIVE IDEAS TAKE FLIGHT AT INAUGURAL P.A.K. ENTREPRENEURS' CHALLENGE

22 Jun 2016



Current Scores

- **Total no of startups incorporated through IIE since 2009: 145**
- **Total amount of seed investments raised: S\$12.8M**

Current Scores

- Total no of startups incorporated through IIE since 2009: 145
- Total amount of seed investments raised: S\$12.8M
- SMU Startup Hall of Fame: DingGo



Entrepreneurship Education & Spinoffs



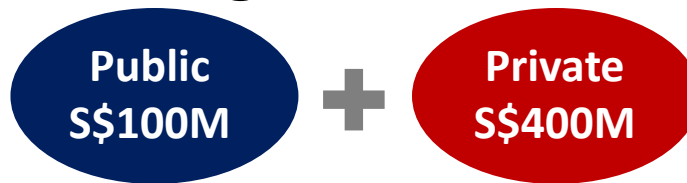
How do they do it?

How does government do it?

- **By starting with identifying a problem**
 - NRF's initiative, "National Framework for Innovation and Enterprise" since 2008

How does government do it?

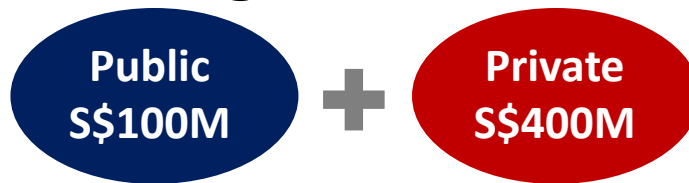
- **By starting with identifying a problem**
 - NRF's initiative, "National Framework for Innovation and Enterprise" since 2008
- **By mobilizing resources** *"Nurturing 'grantpreneurs'?"*



How does government do it?

- **By starting with identifying a problem**
 - NRF's initiative, "National Framework for Innovation and Enterprise" since 2008

- **By mobilizing resources** "Nurturing 'grantpreneurs'?"



- **By creating a strong nation-wide ecosystem**
 - Hospitable environment for startups "Nurturing 'expatpreneurs'?"
 - Consistent government supports
 - Use of soft power to address hidden barriers to entrepreneurship

How does government do it?



Economy	Ease of Doing Business Rank ▲	Starting a Business	Dealing with Construction Permits	Getting Electricity	Registering Property	Getting Credit	Protecting Minority Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Resolving Insolvency
Singapore	1	10	1	6	17	19	1	5	41	1	27
New Zealand	2	1	3	31	1	1	1	22	55	15	31
Denmark	3	29	5	12	9	28	20	12	1	37	9
Korea, Rep.	4	23	28	1	40	42	8	29	31	2	4
Hong Kong SAR, China	5	4	7	9	59	19	1	4	47	22	26
United Kingdom	6	17	23	15	45	19	4	15	38	33	13
United States *	7	49	33	44	34	2	35	53	34	21	5
Sweden	8	16	19	7	11	70	14	37	17	24	19
Norway	9	24	26	18	13	70	14	14	45	8	6
Finland	10	33	27	16	20	42	66	17	32	30	1

How do universities do it?

- **By NOT providing financial supports directly**
 - Universities lacking expertise in picking out good ideas

How do universities do it?

- **By NOT providing financial supports directly**
 - Universities lacking expertise in picking out good ideas
- **By creating strong ties to domestic entrepreneurial ecosystem**
 - Focusing on consultation service on government fundings
 - Designated coworking space and offices at Block 71

How do universities do it?

- **By NOT providing financial supports directly**
 - Universities lacking expertise in picking out good ideas
- **By creating strong ties to domestic entrepreneurial ecosystem**
 - Focusing on consultation service on government fundings
 - Designated coworking space and offices at Block 71
- **By creating weak ties to international entrepreneurial ecosystems**
 - Launching exchange internship/student program with partner startup hubs and universities

Can we do it?

Q&A



Extra Slides



Startup Hub

COMPASS

	Ranking		Performance	Funding	Market Reach	Talent	Startup Exp.	Growth Index
Silicon Valley	1	◀	1	1	4	1	1	2.1
New York City	2	▲ 3	2	2	1	9	4	1.8
Los Angeles	3	◀	4	4	2	10	5	1.8
Boston	4	▲ 2	3	3	7	12	7	2.7
Tel Aviv	5	▼ 3	6	5	13	3	6	2.9
London	6	▲ 1	5	10	3	7	13	3.3
Chicago	7	▲ 3	8	12	5	11	14	2.8
Seattle	8	▼ 4	12	11	12	4	3	2.1
Berlin	9	▲ 6	7	8	19	8	8	10
Singapore	10	▲ 7	11	9	9	20	9	1.9
Paris	11	◀	13	13	6	16	15	1.3
Sao Paulo	12	▲ 1	9	7	11	19	19	3.5
Moscow	13	▲ 1	17	15	8	2	20	1.0
Austin	14	NEW	16	14	18	5	2	1.9
Bangalore	15	▲ 4	10	6	20	17	12	4.9

Singapore Entrepreneurial Ecosystem

NRF Approved Incubators

- Clearbridge Accelerator
- I2G Tech Accelerator
- Neoteny Labs
- Plug & Play
- Social Singshot
- Small World Group
- Stream Global
- Get2Volume
- Golden Gate Venture
- Incuvest
- Jungle Ventures
- Red Dot Ventures
- The Biofactory
- The Network Fund
- WaveMaker Labs

SEED Investors

- BioVeda Capital
- Nanostar Asia
- Raffles Venture Partners
- Tamarix Ccapital
- Upstream-Expara
- Walden International

Grants for IHLs

Funding Scheme	Amount (K)	Duration (yr)	Eligibility	Remarks
NRF POC	250	1	All staff, researchers, & students of IHLs	<ul style="list-style-type: none"> • 2 calls per year • Development of fully functioning prototype • Validity for commercialization • Industry participation
NRF TIF	500	2	All full time polytechnic & IHL researchers	<ul style="list-style-type: none"> • Development of commercial products using IP from IHLs & RIs • 2 calls per year • Proposals to polytechnics, evaluate technical feasibility & novelty, then TRD panel, and selected products going translational work

Grants for IHLs

Funding Scheme	Amount (K)	Duration (yr)	Eligibility	Remarks
SMART Innovation Grant	250	2	SMART, MIT, NUS, NTU, faculty & researchers	<ul style="list-style-type: none"> De-risk technology & develop go-to-market strategy Early projects: ignition grant of up to S\$50K POC in 18 months Medical device, biotech, environment, transportation, energy, IT, and nanotech
SMART Explorer Grant	50		Full-time under/graduate students at MIT, NUS, NTU, SIM, SMU, SUTD, and polytechnics	<ul style="list-style-type: none"> Development & commercialization of innovative work originated by students Development of commercial prototypes, go-to-market strategies, & de-risking project Electronic games, web applications

Grants for IHLs

Funding Scheme	Amount (K)	Duration (yr)	Eligibility	Remarks
SPRING POC	250	1	Conceptualization stage	<ul style="list-style-type: none"> Scientific/technical ideas Ability to successfully finish project Commercial viability & economic impact Scope: ICD, electronics, photonics, biomedical, chemical, advanced materials, micro/nano tech Stage 1: eligibility screening Stage 2: focus on technical & commercial aspects Stage 3: presentation to panel
SPRING POV	500	2	R&D on a technology project	<ul style="list-style-type: none"> Scope same as SMART POC No RSE working in public sector Stage 1: eligibility screening Stage 2: evaluation

Grants for IHLs

Funding Scheme	Amount (K)	Duration (yr)	Eligibility	Remarks
SPRING YES! (Young Ent'ers Scheme for Startups)	50		<ul style="list-style-type: none"> Singaporean/PR < 26 yrs First-time ent'er Incorporated & in Singapore < 6 months Applicant holding min. 50% equity Not received funding from iJAM 	<ul style="list-style-type: none"> Youths to set up their innovative startups Criteria: innovativeness, feasibility, market opportunity, management team, etc
IDM iJAM (Jumpstart & Mentor)	50		<ul style="list-style-type: none"> Individuals or companies Registered legal entity & incorporated in Singapore Min. 1 full-time local founder with min. 20% of project stake Not received YES! 	<ul style="list-style-type: none"> Projects must be rooted in innovative R&D and technology Must exhibit IDM R&D in either technology, creativity, social or business model

Entrepreneurship Education & Spinoffs

