

INDUSTRIES OF THE FUTURE

Do we have the right mix?
Can we generate enough innovation and productivity growth?



Our infrastructure is being built by foreign contractors

Forecasting is notoriously difficult...



success depends on many factors; IMAGINING isn't the hard part

Ecosystem: can we stitch things together?

Positive Spiral:
compete based on quality and innovation

- Funding for research to flow through to application
- Levy schemes for workforce development, technology adoption

personal development

make \$, make friends, learn skills ... what's not to love?

productive activity

Productive Ageing

Crowdsourcing

Sg retirees: close to 1 mil by 2030

Micro-angel investors

so serious meh?...

Not industries, but growth model?

Vacuum for small SMEs, and single-person companies

Hub to promote manufacturing tech to the masses, like we have libraries for learning

We'll still rely on multinationals, to access large markets.

Mix of internationals, and large local companies.

Foreign workforce: threat? opportunity?

Crowdsourcing could mean big shift away from multinationals to individual providers



- Build industries that can transform other industries
- Circular economy beyond reuse and recycle
- High value added manufacturing "a diff type that's returning home"
- Ageing = opportunity of longevity
- Niche in "smart nation"
- Scale-ups
- Think in "combination" of industries



Next Boom: Customised Products

Design
Manufacture
Sell

ME Lab

open/closed systems? the human operator?

AME: culture of capturing engineering value

4th Industrial Revolution

EIE hub

silver career engineers



Med-Tech in Sg (2011): \$4.3 bil, and 9000 jobs; Sg also distribution hub for the region

Cybersecurity: a key enabler in a Smart Nation

The ones we don't see...



Quality Cost ↓

Value?

This should drive the tech

Maintaining a right ecosystem is key

ECOSYSTEM OF THE FUTURE ECONOMY

the mysteries of the trade are in the air...

the whole is larger than the sum of its parts

What are our Science Parks and hubs really about?

Need a CURATOR
an organic process of urban in-migration...

Actually... I don't want to work in hi-tech

High Tech AND High Touch

Do we really want robots to bring up our children??

- R&D labour**
 - diverse but predominantly home-grown
- Relational contracting**
 - the need for alliances, ties with other firms
 - in practice, more firm-gov than B2B
- Formal contracting**

Spatial What space do we have for the unplanned?

Entrepreneurial
Intrapreneurial
SMES new engine of growth
Mee pok → Ramen?

Mentors for students and SMEs
The 3rd wave: ASEAN
Draw people to come in
Encourage students to go out

- Predictive Tech
 - Mobility Lifestyle
 - Education-as-a-Service
- Room to grow regionally

At the moment, Sg has a net IP trade deficit.

they have the manpower, and consumer base

ASEAN's skills gap: "can create graduates, but are there jobs for them?"

TRUST
It's like I really know you!
A system that runs on reputation and reviews (peer regulation)

Internet-enabled intimacy
Focus on enabling, not controlling

Vocational Skillsets
Academic Knowledge
What does it take to be an INVENTOR?

Headaches for governments, delight for consumers

Sharing Economy

Using underused assets at closer to full capacity

on-demand services: affordable, meet people,

Techshops
Skills, Knowledge, Facilities on DEMAND

- Infrastructure
- Institutions
- Implementation

industries innovation individuals

- Connecting multi-purpose nodes, considering interfacing
- Integrate research, education, practice; stop competing in a negative sense; seamless PET & CET
- Renew land use policy; future-ready Sg Public Service

Make Making a part of our culture

People do get excited about this; almost every Uni has a makerspace... end up with bizs competing with Gov?!

Non-monetary aspects:

- family bonds
- the depth of thinking & research
- time we have to be quiet
- what about those who are left behind?

Whole-of Gov & Society, not Hole-of-Gov!

An effect of Gov too effective & responsible?!

Bizs & Gov come together → synergistic

FUTURE WORK

We are already well-placed, in fastest growing region. What do we do about that, in terms of our skills, productivity, innovation?

Work & talent - inextricably linked

- The influence of culture → risk taking?
- Economic devt
- Labour market trends → sense of entitlement; expectations
- Policy intervention → overreliance on state for solutions

characteristics we want?



7.1 mil jobs lost, 2 mil jobs created! and shrinking workforce

"Success"?

As we transit sectors, need more safety nets

No one person has ALL core skills

- Collaborate
- Think critically
- Communicate
- Being creative



Do we know how tech has changed the way organisations are run?

Biological, physical, digital all coming together at the same time

Opportunities will come & go quickly



Tech

Conn-plety REPLACED!!

Does technology really destroy jobs?

- New forms of jobs
- New platforms for different income streams

Are policies, social attitudes synchronised, aligned?



Bless thy Neighbour

Turn the pyramid



BEST IDEAS: from the cleaning lady!

Rigorous disciplinary foundation

- and align such education with industry needs; plus literacy, quantitative, and 21st skills

2.2 score only?!

From STEM to STEAM

ARTS

Stretch our minds to consider the whole person, facilitate such conversations

eg. Strong competency in math, statistics for data science in other disciplines

Seachange in non-tech skills?

Around ethics

What do we do with the tech?

New leadership approaches

Trust building

Changing the ways SMEs do business

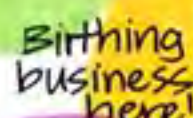
alignment with large corporates (not sub contracting); with each other



let's do this together!

Desire to change must be greater than desire to stay the same

ROOTS & WINGS



Birthing business here!

Identifying skills gap

for specific industries - challenging



Adult learners S.C.A.L.E@NUS



Young & old partnering

Acquiring tech

more trust

co-created solutions

sharing economy ✓

② No one is an Island

more experimental policy environment → initiatives led by community

cultivate learning agility

optimal use of road infrastructure

③ Fortress Singapore

more ownership

① Steady as she goes

Some scenario narratives:

New Frontiers

IPS-CFE Conference on the Future Economy of Singapore

Lee Kuan Yew School of Public Policy National University of Singapore

IPS Institute of Policy Studies

COMMITTEE ON THE FUTURE ECONOMY

13 July 2016

Wendy. weleniastudios.2016.

PRODUCTIVITY AND INNOVATION

Productivity growth has stalled; can't write it off as global issue. Innovation index - at bottom 120. Why is this the case?

What's going on??

Info-comm, construction, manufacturing - scope to close productivity gap, in a cyber-physical world

Industry 4.0

- Harness tech
- Reach next horizon
- Adapt biz modes
- Transform into digital cog

along product life cycle, end to end

From goods to services

\$(IP)\$

Eg. monetise IP?

Where to start?

ecosystem to collaborate in inter-disciplinary manner

Did you know that most IoT data is still not used?

accelerate adoption, open avenues, new biz models

90th percentile: 1.9 x productivity of 10th percentile

Macro Solution: Competition to drive out laggards

What were those 15,000 people doing?!

Design for maintenance

lower the water level, expose the rocks

Micro Solutions: many, for many industries, companies

Cui bono?

Who benefits? Who bears cost?

or the incumbent? Inertia favours the innovator. Problem solvers dispersed.

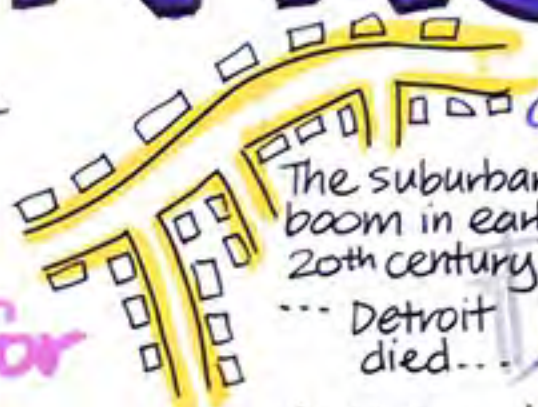
What?

Behavioural challenges

Why two machines, two receipts?

summer sale for winter wear - made for NUS!

how to surface local knowledge when it goes against individual interests?



compare with other turning points; The suburban boom in early 20th century ... Detroit died... this isn't such a unique time. comms revolution -> great urban revival?

Can see the end state, but how to get there?

Second Mover approach? Or run more nimble, agile experiments, second swing of the bat. Some industries - still need to be 1st mover

Status quo bias ↔ Cocreation Hubs

What's in it for each of them? When their interests can be met, they can collaborate.

permissionless innovation

Follow the roach, not the Rex

Talent Tech Treasures

What kind of NATION do we want to be?

- Don't believe the experts
- unintended consequences
- Danger: being locked into wrong tech

Allow organic growth

Second Mover Advantage

I need to get her NOTES...

GLOBALISATION AND REGIONALISATION

Do we know our region?
Are we connected to it?
At local levels: do we have the social skills,
know the politics?

Risks

People Rules



First kopi, then the sandbox?

TPP

APRIL 2018

- Broader → covers all goods, services, e-commerce...
- Deeper
- Shared norms → same rules for ALL, in full, completely

What may be in play now?
What will the rest do/need to do?

Significant trade diversion for some non-TPP countries

FULL OPEN

services & investment

Customs harmonisation

Advanced rulings

!! VERY !! EXCITING !!

The Near Abroad: pool of Urbanised labour, and consumer base

SIJORI

(phases)

1st - linked to neighbourhood

2nd - decoupled
3rd? - regional economic integration

Unanticipated headwinds for the TPP; good reason to think it will come into force

Tell Congress why TPP matters!

Full throttled defence of trade!

In anything multi-lat, we'll have to come to terms with China



only a website for SMEs to understand? NOT ENOUGH!



have to watch local regulations

* Not just 2 bilat relationships; 2 multi-level bilat

* Their motivations?

- Growth corridors → Iskandar
- Growth corridors → Riau not so important

Who's my friend now?

* How do they perceive success?

- Iskandar: disenchanted with electronics
- Riau: interested in a bit of everything

JB, Batam

little change in composition of firms; firm stagnation

* Johor-Riau relationship

* Economics isn't everything
Greater investment welcomed. But, concern about water, inflation, house prices, migration...

to Johor for healthcare

Post oil, gas, hydrocarbon world - quite challenging

Move away from big govt.

North east shift of global centre of gravity

Consider Malayan hinterland

- linking more, anchor the Malacca Straits diagonal

counter NE

the neighbourhood is our frontier



- (1) High speed Rail - stops along the way?
- (2) Freight

Issues of equity, effects on society

Global, else, TPP-like FTAs - is the future for S'pore.

Healthcare sector is open in most of the TPP-12. What it means on the ground? Not sure yet. (Doesn't mean foreign doctors will flood Sg; Opportunities outbound in services delivery)

RESPONDING TOGETHER

Leave no one behind

measure KPIs, or real outcomes?

How does industry see the role of gov?
"different strokes for different folks"



The Insight Economy

Accelerate the Build of the ecosystem

Innovate early and fail fast

Agile policy (but the machinery is huge! Hence, tech)

When abroad, fight as a pack

LEAD; and to S'pore MNCs too

The system won't tell you the cure, but skill up the physician who can and will

Heng she explain! I was wondering...

Blockchain

multi-party biz networks

TRUST

new fabric for transaction services

88% that is dark - now light!

Cognitive Systems

machine Learning; Understand - Reason - Learn unlocks the potential in all data

IoT

new value creation

Associations & chambers are multipliers

- know exactly what companies do, how to help them and bring them out

Voice of industry

SE industry growing; \$10 bil investment expected

- staying relevant to members
- being financially sound
- staking claim as voice & go-to
- Knowledge devt, capability building; thought leadership
- Market devt
- Incubate & start new Sg bizs
- Industry-relevant training for members, even policymakers



Go to the root of the problem

and deal with the crevices, dark places

High touch professions will stay

Meaningful

Jobs and skills of the Future

The IT folks say they need IT (skills)!

Bringing jobs, skills & passion together

Society's role: embracing demographic change



Ageing



71% layoffs - PMES

PMES expected to grow to be 2/3 of workforce



170,000 FSEs

Be inclusive

Gov: can do more as curator, orchestrator

- platforms for all to come together a bit of push, for acceleration to happen not do everything! and don't throw away what we've done well (which others are copying)

Foreign workforce: 1/3 - 2/3

They are within the scope of unions' cover. - Migrant Workers' Centre, a tripartite initiative

Raising image & professionalism of many meaningful jobs that aren't as well regarded now (SkillsFuture)

I know that you know what to do

DIALOGUE

with CFE members

13 July 2016

Thank you for your participation in conversations



Every new idea should get a fair hearing



Promoting innovation: costly and risky

PACT

fostering deep partnerships

compete as a system. Key is in execution.



Learning instincts early in school

Need more hands on deck.

- 1 Transitions - meeting digital flows
- 2 Innovation & tech - deep & broad capacity
- 3 Collective response in PET and CET; working with industry & associations

In what space?

informed; not picking winners

optimising the strategy, by looking for the intersections

prioritise application

artisan skills

Regulation

infrastructure that supports the one-man shops

sharing facilities

scale up? move away from hedgehog mentality



Compromised such that industry is affected vis-a-vis voice of people?

CFE - a wide range of interests represented

a path that works for both

Rise above differences and see it as collective enterprise

- whilst acknowledging valid concerns

Human Capital

3,100 from 43 nationalities

Innovation - new energy sources



Gov is not agnostic in resource allocation; private sector makes a commercial decision

flexible & dexterous

safe & stable



Sg right in the middle of Asia

- where it's all happening! Don't need to change biz altogether, but use digital tech



We don't like unpredictability



Fitbit for cars??



This roti is flying really high!

S'pore companies collaborating for some low-hanging fruits [TPP]

