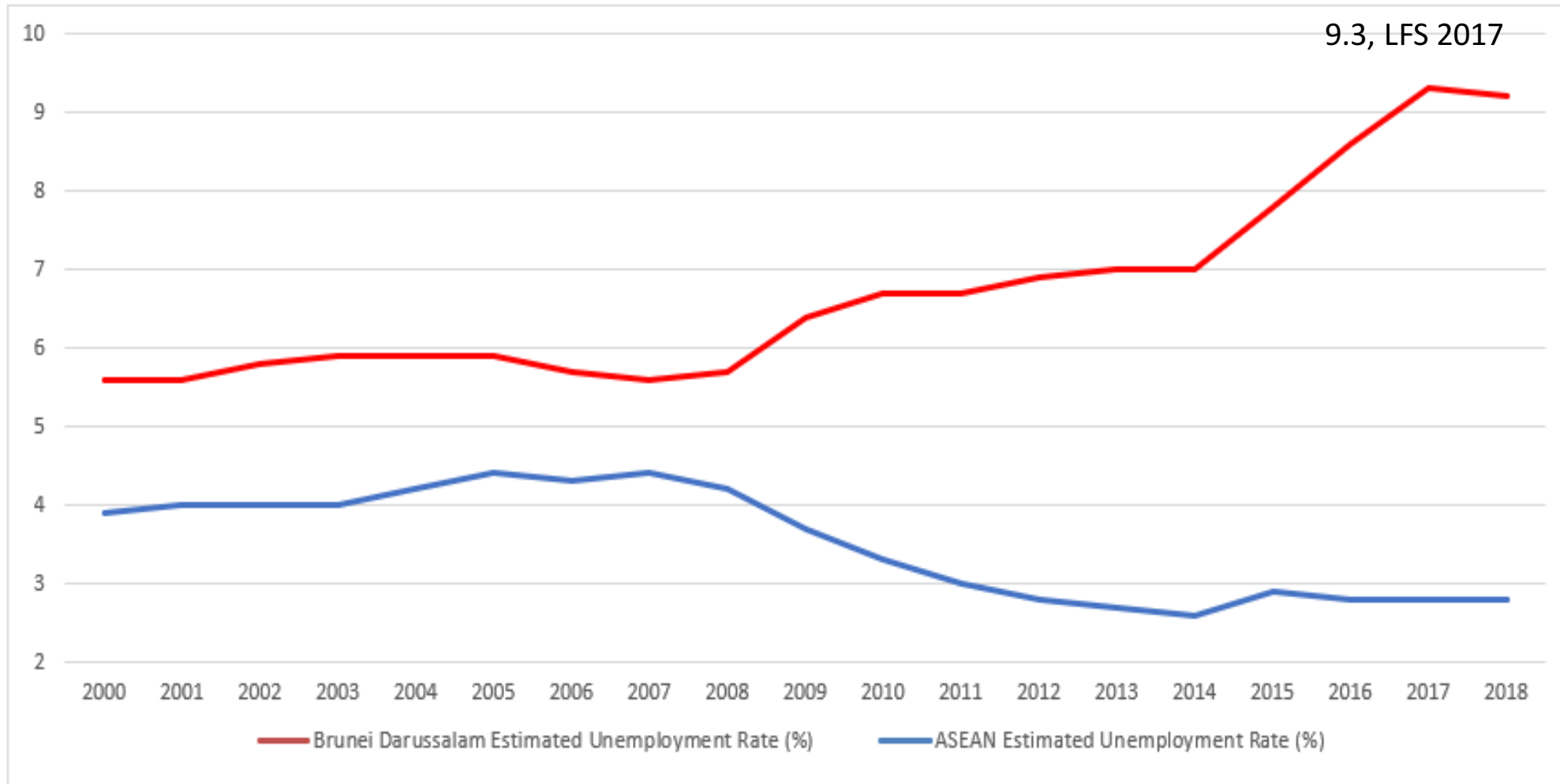


The 4 IR and Employment Futures: What are the key challenges and their implications for HROD? The Brunei Context

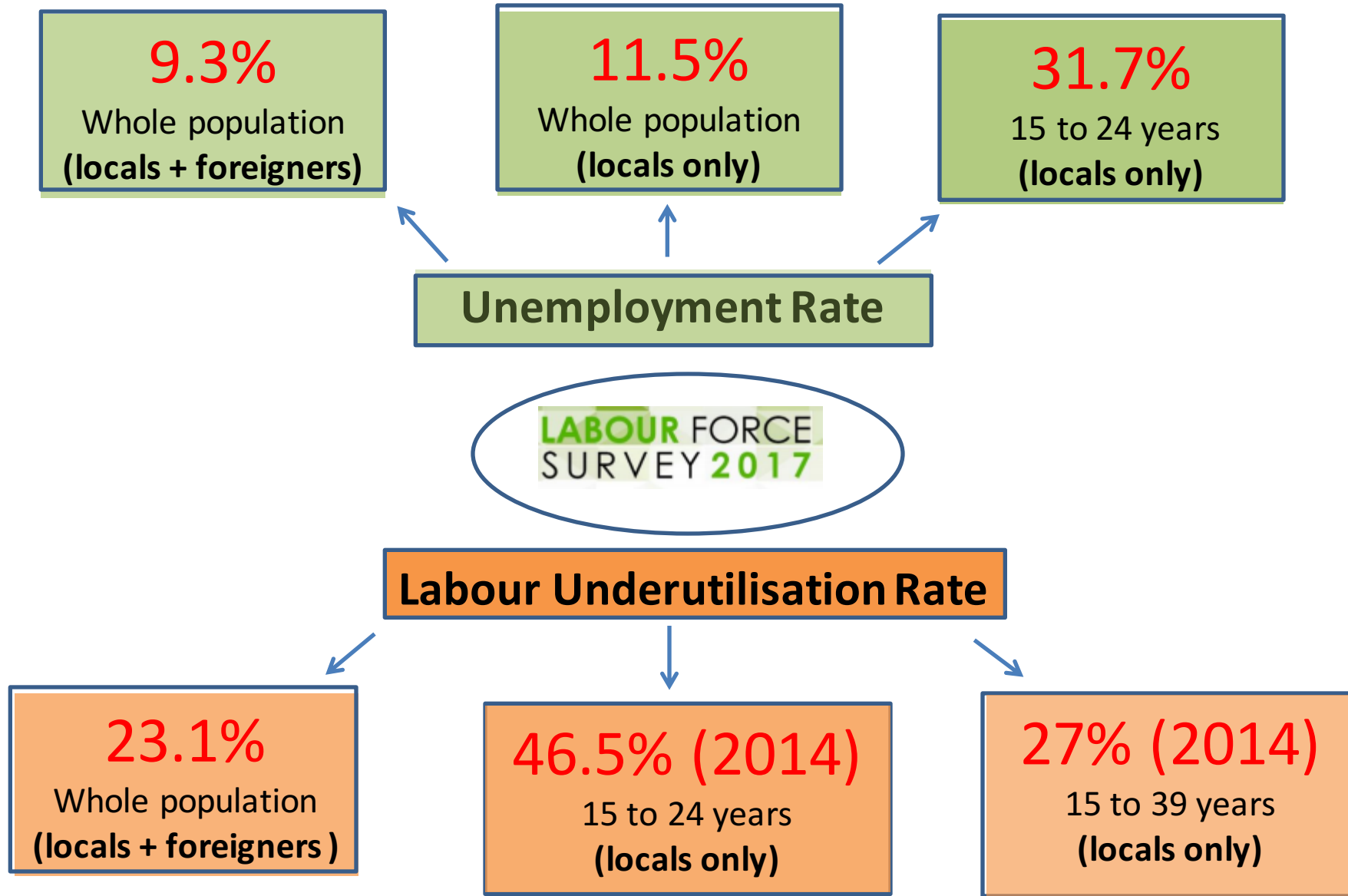
Diana Cheong
Chief Researcher, CSPS

Brunei Unemployment Figure



Source: ILO; Brunei 2017 data is from LFS 2017 and individual country figures..

Brunei Unemployment Figures



Why do we have an quite a serious unemployment problem amongst our local youth when a large % (nearly 30%) of our workforce consist of foreign labour at all levels?

Main Finding: Early school leavers with only 2-3 'O' levels who do not have enough vocational skills for available jobs. Mainly interested in clerical and lower white collar office jobs, especially in Government. High mismatch between available skills and desired employment. Private sector jobs are not attractive and can lack in good HR practices.

Policy Recommendations:

1. Increase VTE, expansion of tertiary pathways and reduce early school drop outs.
2. Our young people need to have a mindset change, be more productive and professional.
3. Encourage Bruneians toward more manual, semi-skilled and skilled jobs especially in the private sector as these are the sectors which have available job opportunities (given appropriate employment policy on foreign labour).
4. Private sector and non office jobs must be made more attractive to Bruneians, better HR Practices esp in terms of better financial remuneration, job status, career progression and working conditions (Nb: Reservation wage)
5. Professionalization of manual/crafts jobs like electrician, plumber and drivers through better training, certification of skills and standards, therefore leading to higher salaries. As the status of such jobs increases, more locals will be encouraged to go for such jobs and compete with foreigners.

“As the status of such jobs increases, more locals will be encouraged to go for such jobs and compete with foreign labour”

Study No.2: Unemployment Issues among University Graduates in Brunei Darussalam (2014)

- Mismatch between university degrees and labour demand: graduates in Arts and Humanities are more likely to remain unemployed
 - Implications regarding scholarship decisions
- Graduates from top universities are more likely to find a job (also compared to local universities)
 - Implications regarding scholarships and development of local universities
- Significant differences between ethnic groups: Malays are more likely to wait for Govt jobs and do passive job search
 - Implications regarding mindset change and incentive structures
- Married women are more likely to be unemployed
 - Implications regarding working mother policies (creches, nurseries, childcare)
- Delayed employment and long unemployment spells affect subsequent employment probability
 - Need for active labour market policies aimed at increasing early participation and improving job search efforts

Summary of manpower planning/HRD policies to reduce unemployment

1. Improvement of childcare facilities for women to enter the labour force.
2. Improvement of public infrastructures (eg transport/connectivity) for ease of going to work.
3. Improvement of HR practices/ employment regulations.
4. Relevant education and expansion of VTE
5. Reducing mismatch between job preferences and actual available jobs
6. Reducing the disparities in the labour market by improving the attractiveness of the more manual private sector occupations
7. Change mindset and mentality
8. Need to provide more sustainable and attractive job opportunities.

Sustainable HROD

- HROD consists of putting right people, at the right place, right time, doing the right things for which they are suited for the achievement of goals of the organization.
- Who do we hire and how do we retain our workers?
- What kind of work environment to create to attract and retain talents that we need?
- Main Factors for a sustainable work culture:
 - (i) type and strategy of organization
 - (ii) environmental uncertainties
 - (iii) time horizons
 - (iv) labor market.

Sustainable HROD: What are our job and skills futures?

(i) National economic strategy:

Diversification, 10 industrial clusters, niche in energy, biodiversity, specialized health, halal. Which economic path?

(ii) Environmental uncertainties

Technological uncertainties, resource potentials, environmental challenges policy uncertainty.

(iii) Time horizons

5y, 10y and 15y?

(vi) Labor market

Small labour force, reliance on foreign labour, Negative mindset & mentality at ALL levels, low levels and mismatch of education for 4.0 IR

STEEP

- Social
- Technology
- Education
- Economy
- Politics

Educational Scanning

| Educational Attainment | Brunei | Singapore | OECD Countries |
|---|--|---|----------------------|
| 5 O-Levels and more (2016) | 34.09% ¹ | 84.1 % ² | - |
| 2 A-Levels and more (2016) | 79.76% ¹ | 92.6% (3 A-Levels & more) ² | - |
| Tertiary Enrollment Rate % of Gross | 30.862% (2016) ¹ | 70% (2013) ² | 72.776% ³ |
| ICT/STEM Education Enrollment (2016) | 10% enrolled HE: 36% STEM enrolled ¹ | 12.5% enrolled (2018) ⁵ 50% STEM enrolled (2011) ⁶ | - |

Source: 1. MOE Brunei (2016) Brunei Darussalam Education Statistics and Indicators Handbook. P220

2. MOE Singapore (2018) Education Statistics Digest 2018. P62

3. UNESCO Institute for Statistics (2018) School enrollment, tertiary (% gross). <https://data.worldbank.org/indicator/SE.TER.ENRR?locations=BN-OE-85>

4. MCYS – CSPS (2018) Youth Policy Survey

5. Singapore MOE (2018) Education Statistics Digest, Singapore

6. Center on International Education Benchmarking. (2012, July 31). NCEE statistic of the month: investigating the skills mismatch. Retrieved from www.ncee.org/2012/07/statistic-of-the-month-investigating-the-skills-mismatch/

Global Competitiveness Index (GCI) Measurement

12 Pillars of Competitiveness

Stage 3

Innovation and sophistication factors

- Business sophistication
- Innovation

Key for innovation-driven economies

Stage 2

Efficiency enhancers

- Higher education and training
- Goods market efficiency
- Labor market efficiency
- Financial market development
- Technological readiness
- Market size

Key for efficiency-driven economies

Stage 1

Basic requirements

- Institutions
- Infrastructure
- Macroeconomic environment
- Health and primary education

Key for factor-driven economies

Brunei Target and Strategy

Wawasan 2035

Medium to Long Term Economic Target
(Examples: Hong Kong, Singapore and Denmark)

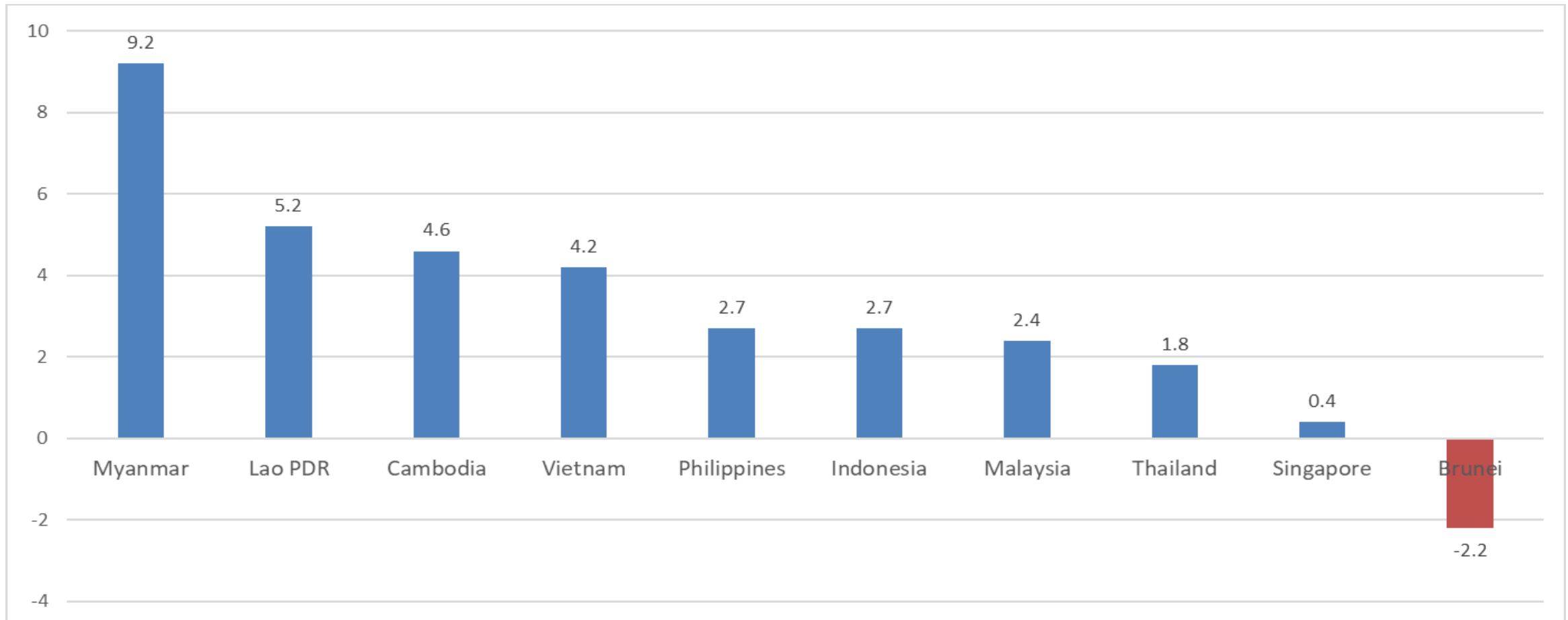
Immediate Economic Target
(Examples: Thailand, Malaysia)

Brunei – Transition from Stage 1 to Stage 2

Labour Productivity



ASEAN Labour Productivity Growth (%) by Countries 2005-2010



Source: APO Productivity Database

- R&D in Brunei = 200 Million (Singapore = SGD 19 billion)
- Is Brunei still stuck in the 1st and 2nd Industrial Revolution?

Key HROD issues to consider for job futures

- Manpower planning, HROD and forecasting is not linear and fail proof.
- Globally and inevitably locally, the nature and types of jobs have and will change dramatically.
- **Automation (including new technology-digitalization)** will cause a loss of 40% of current jobs performed by humans within the next 15 years (OECD).

Catalogue of Fears (Frey & Osborne, 2013)

Catalogue of fears

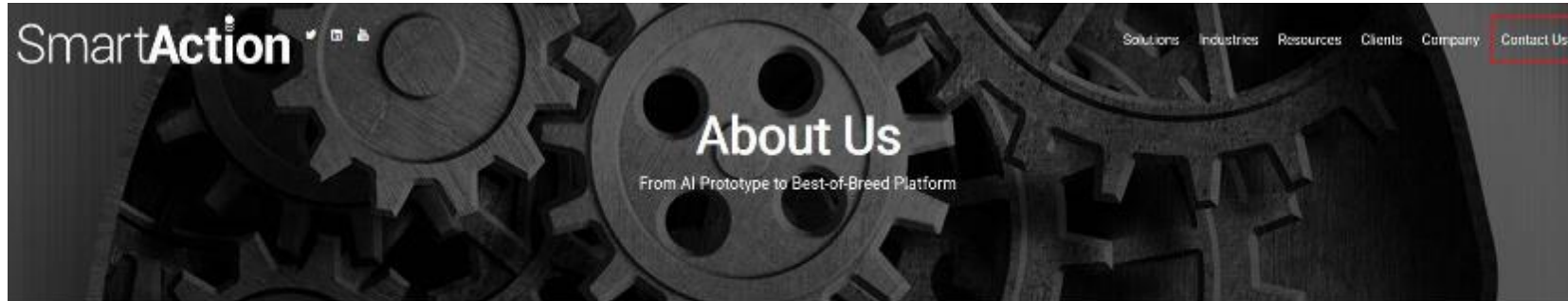
Probability of computerisation of different occupations, 2013
(1 = certain)

| Job | Probability |
|-----------------------------|-------------|
| Recreational therapists | 0.003 |
| Dentists | 0.004 |
| Athletic trainers | 0.007 |
| Clergy | 0.008 |
| Chemical engineers | 0.02 |
| Editors | 0.06 |
| Firefighters | 0.17 |
| Actors | 0.37 |
| Health technologists | 0.40 |
| Economists | 0.43 |
| Commercial pilots | 0.55 |
| Machinists | 0.65 |
| Word processors and typists | 0.81 |
| Real-estate sales agents | 0.86 |
| Technical writers | 0.89 |
| Retail salespeople | 0.92 |
| Accountants and auditors | 0.94 |
| Telemarketers | 0.99 |

Automation of Jobs

- **47% of jobs in OECD countries** are highly automatable or will significantly change as a result of automation. (OECD)
- **137 million workers in Cambodia, Indonesia, Philippines, Thailand, and Vietnam** (or 56% labor force) could lose their jobs to automation in the next 2 decades. (ILO)
- By 2030, as much as **30% of work done globally** could be automated. (McKinsey Global Institute)

SmartAction uses ML technology and advanced speech recognition to improve upon conventional interactive voice response systems, realising cost savings of 60 to 80 percent over an outsourced call center consisting of human labour



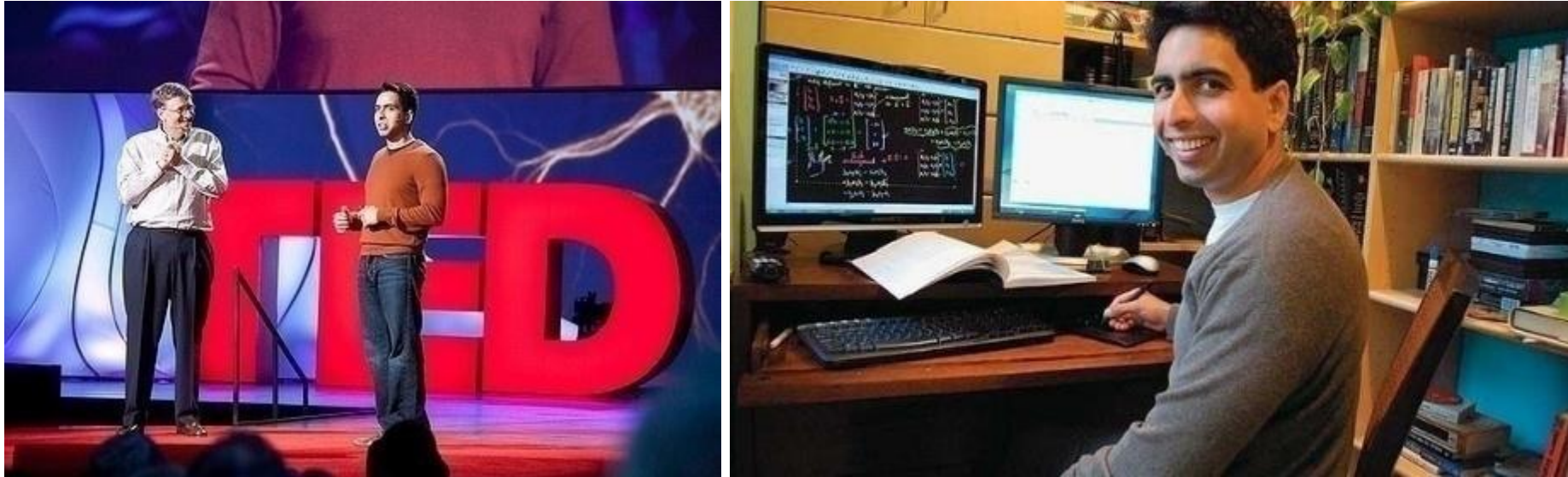
SmartAction was founded as an artificial intelligence research company and has since evolved into the leading provider of AI-powered customer self-service solutions.

Our cloud-based platform is built for enterprises to satisfy growing expectations for self-service. We focus on building an environment where intelligent virtual agents are handling complex customer requests in every medium – voice, SMS text, chat, social media, and mobile. This leaves call center agents with time to focus on more meaningful, human-only conversations. It is our goal to fundamentally improve the way customers communicate with the brands they love.



Industries: Financial Services, Healthcare, Insurance, Life Sciences, Retail, Services, Travel & Hospitality, Utilities

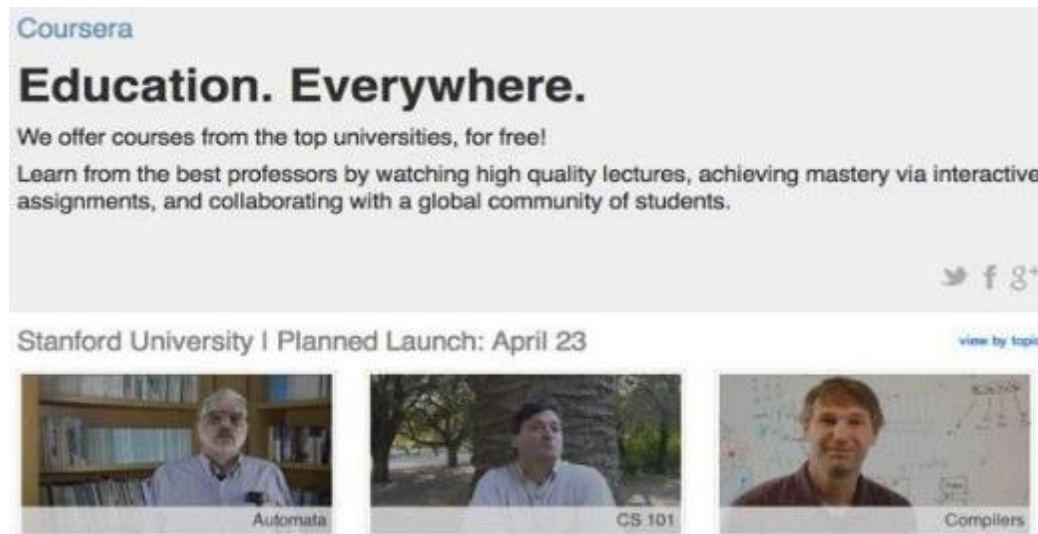
A global classroom – Salman Khan সালমান খান



From a small office in his home: Khan academy (2006), produced 4800 video lessons, all free, over 2 million subscribers on YouTube. 492 million views. By 2013 it has 10 million students per month. Gamification of learning.

*The One World Schoolhouse: **Education Reimagined.***

- Sebastian Thrun, Professor of Artificial Intelligence opens up his Stanford Artificial Intelligence class. (normally for 200 students). 160,000 students signed up and 23,000 graduated. Top 400 were all on line students.
- Coursera “provides universal access to the world’s best education, partnering with top universities and organizations to offer courses online.” It currently has 25 million learners, 149 university partners, over 2,000+ courses, 180+ specializations and 4 degrees
- Coursera, Udacity and edX are increasingly moving away from universities and building job-relevant ‘nanodegrees’ for various industries
- Coursera, Codecademy, edX and Udacity have now (2017) **over 60 million users**, up from 24 million in 2015.



Coursera

Education. Everywhere.

We offer courses from the top universities, for free!

Learn from the best professors by watching high quality lectures, achieving mastery via interactive assignments, and collaborating with a global community of students.

Stanford University | Planned Launch: April 23

Automata CS 101 Compilers



Jobs that already disappeared

- Telephone and Switchboard Operators, Typists, Type-setters, Bowling Alley Pinsetters, Human Alarm Clocks, Lamplighter, Factory Lectors, Aircraft Listeners, Elevator Operators, Lady's Companions, ...
- Almost 200 entries under “obsolete occupations” Wiki entry



Compositor: They were though of as hi-tech (Photo: Getty)

Jobs that are currently disappearing

- Meter Readers (water & electricity companies), Travel Agents, Gas Station Attendants, Cashiers, Postmen/Postal Service Mail Sorters/Carriers/Clerks, Film Projectionists, Farmers/Ranchers/other Agricultural Managers, Agricultural Workers, Fast-food Cooks, Sewing Machine Operators, Data Entry Clerks, Door-to-Door Sales Workers, Street Vendors, Electrical and Electronic Equipment Assemblers, File Clerks, Pre-press Technicians/Workers, ...



Preliminary Findings

- Emerging jobs due to automation and technology will require new skills in established fields of work (e.g. blockchain in finance, logistics, and accounting services; AI for lawyers; biotechnology & enterprise in medicine & agrifood).
- Future jobs will be knowledge intensive and will require a wide range of skills- substantive, cross disciplinary, soft skills & practical/work experience
- Repetitive and non creative/critical thinking jobs will be automated, most manual labour and middle skilled jobs will disappear.
- VTE graduates and undergraduates need progress to higher education levels.
- Broad undergraduate courses that provide a holistic understanding of subject field plus potential disruptors of the field are indispensable.

The Future of Work Beta v1

Connectivity

- Information availability
- Globalized access
- Mobile work

Machine capabilities

- Processing power
- Artificial Intelligence
- Spatial cognition
- Robotics

UNDERLYING DRIVERS

Demographics

- Ageing
- Country divergence
- Migration
- Pension funding

Social expectations

- Opportunity
- Gender equity
- Flexibility
- Meaning
- Potential

Modularization

- Unbundling
- Work fragmentation
- Specialization
- Distributed processes

Globalization

- Product
- Innovation
- Service

ECONOMIC STRUCTURE

Productivity

- Factor shifts
- Technology impact
- Capital efficiency
- Industry divergence

Value polarization

- Commoditization
- Expertise
- Innovation
- Relationships

Remote work

- Telepresence
- Collaboration
- Virtual worlds
- Machine operation

Work marketplaces

- Participation
- Availability
- Pay pressure
- Access to expertise

LABOR DISPLACEMENT

Crowdsourcing

- Open innovation
- Labor pools
- Managed crowds
- Enhanced mechanisms

Worker replacement

- Automation
- Robots
- Service
- Judgment

Economy of individuals

- Independence
- Entrepreneurship
- Collaboration
- Reputation

Polarization of work

- Pay
- Opportunity
- Affiliation

EMERGING LANDSCAPE

High-performance organizations

- Internal markets
- Ad-hoc networks
- Social technologies
- Distributed value creation

Education

- Available
- Open
- Continuous
- Peer learning

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- “The world is experiencing an unprecedented acceleration in technological advancement and implementation. Indeed, profound shifts are taking place – entire sectors are accommodating these innovations, rendering several human-performed occupations redundant. In the near future, these positions may be eliminated entirely”
 - International Labour Organization (2016). *Asean in Transformation. The Future of Jobs at Risk of Automation.*

- “New technology adoption drives business growth, new job creation and augmentation of existing jobs, provided it can fully leverage the talents of a motivated and agile workforce who are equipped with future-proof skills to take advantage of new opportunities through continuous retraining and up-skilling”
 - World Economic Forum (2018). The Future of Jobs Report 2018

- “IQ is the minimum you need to get a job, but AQ is how you will be successful over time”
 - Natalie Fratto, Goldman Sachs

AQ: Adaptability Quotient, a subjective set of qualities loosely defined as the ability to pivot and flourish in an environment of fast and frequent change.

- “Technological advancement as a result of this Fourth Industrial Revolution, however, will challenge our conventional skills, and that requires the enhancement of existing skills and lifelong learning”
 - Titah Kebawah Duli Yang Maha Mulia Paduka Seri Baginda Sultan Haji Hassanal Bolkiah Mu'izzadin Waddaulah Ibni Al-Marhum Sultan Haji Omar 'Ali Saifuddien Sa'adul Khairi Waddien, Sultan And Yang Di-Pertuan Of Negara Brunei Darussalam, in conjunction with the New Year 2019

- “The meaning of work to people and what type of work they will be willing to accept in the future is important to national well-being and productivity. There is little consensus on likely future job quality and limited discussion in current policy debates”

➤ Hogarth, T. & Bosworth, D.L. (2008) *Future Horizons for Work-life Balance*

- “...depend(s) crucially on the ability of all concerned stakeholders to instigate reform in education and training systems, labour market policies, business approaches to developing skills, employment arrangements and existing social contracts”

➤ World Economic Forum (2018). The Future of Jobs Report 2018

Beyond Automation: Key Trends or Challenges for Job Futures

1. Job/Market Polarization?
2. A Jobless Future?
3. The Millennials
4. New Types of Jobs?
5. Portfolio Careers?
6. Flexible and Freelance work ?
7. Flexible Working Hours?
8. Universal Basic Wage?
9. New Skills and Education
10. Change Mindset & Mentality?

Challenges impacting Brunei Jobs Future by 2040 and beyond

| STEEP | Critical Issues |
|------------|--|
| Social | <ul style="list-style-type: none"> • Low fertility rate • Negative mindset and mentality at ALL levels • Lack of youth empowerment • Rising aspirations • Increasing consumerism • Lack of meritocracy at work • Increasing globalisation • Rising political dissatisfaction • Millennial /Gen Z culture • Massive brain drain |
| Technology | <ul style="list-style-type: none"> • Increasing automation / AI/ digitalization • Need for extreme acceleration towards 4IR • Lack of awareness of 4IR |
| Economy | <ul style="list-style-type: none"> • Negative economic growth • Lack of viable economic blueprint/direction • Diminishing productive resources • Small state constraints • High unemployment rate • Low work productivity/efficiency |

| STEEP | Critical Issues |
|-----------|--|
| Education | <ul style="list-style-type: none"> • Lack of 4IR/Future ready skills and knowledge capacity • Lifelong education (4IR upskilling, reskilling, continuous education) • Need to expand (>50%) tertiary/ university enrollment • Lack of relevant and high quality graduates |
| Politics | <ul style="list-style-type: none"> • Lack of whole of government/nation approach. • Lack of policy certainty and commitment |

Thank You!