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More than just numbers

Empowering an ageing workforce

A GovLab report
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Empowering an ageing workforce

Across the globe, Smart Cities are sprouting at exponential rates on the back of the increasing adoption of information and communication technologies (ICT). Singapore, too, is hard at work – but it is building a Smart Nation, one that functions beyond the capabilities of a Smart City, with ultra-high speed, pervasive, intelligent and trusted ICT infrastructure, as well as a vibrant ecosystem with flourishing talent.

With an expected one in five aged 65 years and above in 2030, the Smart Nation vision has placed helping older Singaporeans age-in-place as one of its three main priority areas. After all, Singapore's most precious, if not only, resource is its people. It is thus imperative that every individual, regardless of age, is able to contribute to the economy and society at large to the fullest of his or her ability. An important enabler of this is the empowerment of older workers to live financially independent and active lives with rewarding careers.

This is an ambitious goal in and of itself. Making it even more challenging is the increasing automation of both skilled and unskilled jobs. The most vulnerable group – older workers aged 50 years and above – is likely to bear the brunt of the inevitable transition. Currently, 63% of them hold low-skilled jobs, and if displaced, will find it especially difficult to move to a new role without sufficient upskilling and training.

This publication presents a predictive model for identifying jobs that are at risk of automation over the medium-term. As a proof of concept, the model has been applied to the context of Singapore's food and beverage sector. Nevertheless, its general five-step methodology can similarly be applied to other industries to identify vulnerable segments of the workforce so that no one gets left behind in our inclusive, Smart Nation.

Job competition is heating up

Machines cannot think. But increasingly, they can do things only humans were able to do. It is now possible to automate tasks that require human perceptual skills, such as recognising handwriting or identifying faces, and those that require cognitive skills, such as planning, reasoning from partial or uncertain information, and learning[1].

By breaking down "cognitive" activities into smaller, well-defined tasks, it becomes possible to specify the many contingencies that a machine must manage in order to be an adequate substitute for human labour. The increasingly prevalent use of Big Data, due to its significant price decline, also enables the production of objective and quantifiable measures of an algorithm's success and, consequently, more effective machine learning.

Understandably, this process is easier for some activities than others, and jobs that consist predominantly of such activities are likely to be taken over by machines. Yet, studies have shown that even tasks that remain difficult to automate might still be transformed by machines, for instance, in enabling firms to do more with fewer employees.

1 "Cognitive technologies: The real opportunities for business". Deloitte University Press. 26 January 2015. http://dupress.com/articles/cognitive-technologies-business-applications

A pre-emptive approach

In order to identify areas where pre-emptive interventions could be made to improve employability of the older workers, a predictive model was developed to provide a definitive approach for identifying jobs that are at risk of automation over the medium-term. It also provides a broad overview of specific job profiles and their positioning relative to each other in terms of required skill levels and probabilities of automation.

Step 1: Understanding the current situation

To begin the study, it is important to first gain an understanding of the current situation. For instance, by examining the current causes of unemployment in Singapore, we can identify job automation as one of its greatest disrupters. At this juncture, it would also be appropriate to analyse future technology trends and their potential impacts on the employment landscape for a more holistic view.

Step 2: Identifying indicators

The next step involves identifying indicators that might affect the ease of job automation. While there is currently no definitive tool which can be used to accurately identify jobs at risk of automation, we have streamlined a list of six indicators with their respective traits after a review of secondary literature.

Step 3: Gathering and analysing data

This step entails conducting primary research, specifically, in the form of stakeholder interviews. Using the indicators identified in the previous step, survey questions can be developed to gain a better understanding of the cognitive and physical requirements of the various occupations within the F&B sector.

Step 4: Testing the model

Next, the data gathered during the data collection phase is incorporated into the predictive model in a process of reiteration, distillation and validation in order to ensure accuracy and robustness of the model's output. It should be emphasised that such a model and its data should be updated on a regular basis in order to maintain its predictive power and to ensure that it is robust or sensitive enough to respond to the changing dynamics of the environment over time.

Step 5: Providing recommendations

Using the outputs from the model, a series of action plans can be developed for various key stakeholders.

Proof of concept

In order to gain a deeper understanding of the likelihood of automation in Singapore's F&B sector, we designed a survey based on a set of job automation indicators identified to gather more information about the cognitive and physical requirements of the various F&B occupations. The data gathered was incorporated into the predictive model in a process of reiteration, distillation and validation in order to ensure accuracy and robustness of the model's output. Individual occupations were then analysed for their probabilities of automation based on their respective ratings for each of the six indicators.

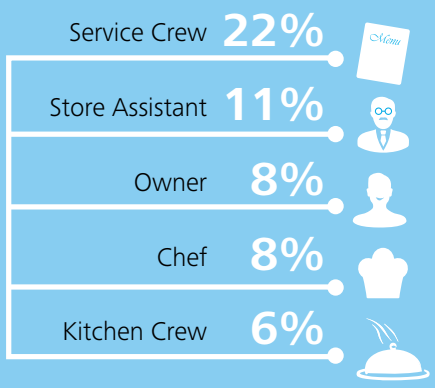
At a glance

307 respondents

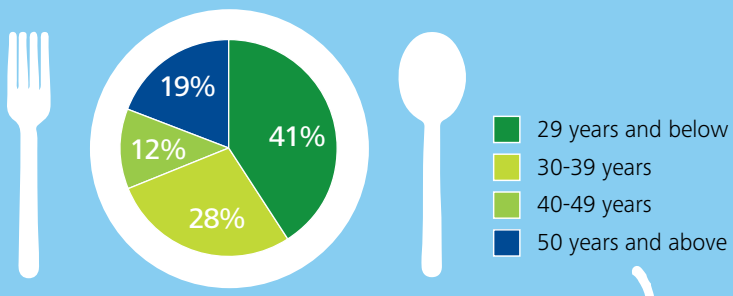
39 occupations

8 types of establishments (bar, café, coffee shop, dessert shop, fast food, hawker centre, restaurant, and snack counter)

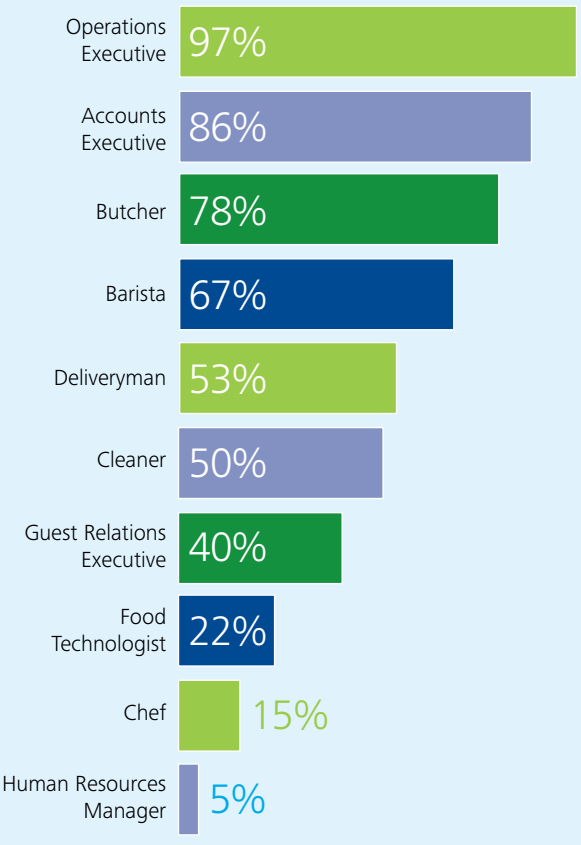
Top 5 occupations represented



Breakdown by age



Probabilities of automation*



* Determined based on an identified set of job automation indicators

Reshaping the workforce

As Singapore continues to accelerate towards its Smart Nation vision, technology is likely to continue to impact work, workers, and organisations in profound ways. By enabling the automation of certain tasks, these technologies can and will be used to eliminate work. But they will also make it possible to redesign work, create growth opportunities for individuals, and greater value for businesses. Yet not everyone will benefit equally: older workers, many of them holding low-skilled jobs, are likely to be the most affected.

To mitigate this, pre-emptive intervention will be necessary. The predictive model presented in this paper has the potential to aid governmental agencies and businesses alike in identifying vulnerable individuals, so that they can be equipped with the tools and skills to succeed despite the challenges. At the individual level, the model also aims to provide workers with an assessment of their current job profiles and a benchmark of their positioning relative to other jobs in the industry.

Perhaps the next step is for the key stakeholders in the public and private sectors to pursue a full impact study and develop a roadmap to work with potential partners to enable longer working lives, while supporting Singapore's vision to build the world's first Smart Nation.

Did you know?

- Of the current resident workforce in Singapore, 63% of the older workers aged 50 years and above hold low-skilled jobs.
- With increasing job automation and machine learning, a significant number of workers in this age group have been made redundant in the workplace[2].
- Furthermore, statistics have shown that the rate of re-employment within 12 months of redundancy is the lowest for older workers[3].

2 Workers can be made redundant as a result of retrenchment or when released prematurely from term contracts

3 "Redundancy and Re-Entry into Employment 2014". Ministry of Manpower. 2014. http://stats.mom.gov.sg/Pages/Redundancy-and-Re-entry-into-Employment-2014.aspx

Contact us

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