

# IT and the 4th Industrial Revolution: Identifying and Selecting the Right Talent

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# IT and the 4th Industrial Revolution: Identifying and Selecting the Right Talent

## Executive Summary

This paper aims to look at the changing landscape of skills necessary in the information and communication technology field, especially given the transformations that businesses and industries are going through due to the digitisation and AI trends of the 4<sup>th</sup> Industrial Revolution. The paper aims to understand the changing skill-needs that are emerging in this landscape and the implications for identifying and selecting the right talent to meet the fast-paced changes that are now the norm.



Figure 1 Future Work Skills<sup>1</sup>

<sup>1</sup> (Davies, Fidler, & Gorbis, 2011)

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## Introduction

### What is the 4<sup>th</sup> Industrial Revolution?

The Fourth Industrial Revolution (4IR) is the fourth major industrial era since the initial Industrial Revolution of the 18th century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres. It is marked by emerging technology breakthroughs in several fields, including robotics, artificial intelligence, blockchain, nanotechnology, quantum computing, biotechnology, The Internet of Things, 3D printing and autonomous vehicles. Klaus Schwab has associated it with the "second machine age" in terms of the effects of digitization and artificial intelligence (AI) on the economy but added a broader role for advances in biological technologies. It is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.<sup>2</sup>

This has key impact even with initiatives like Industry 4.0 which is how this revolution is affecting the manufacturing industry.

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<sup>2</sup> (Wikipedia, n.d.)

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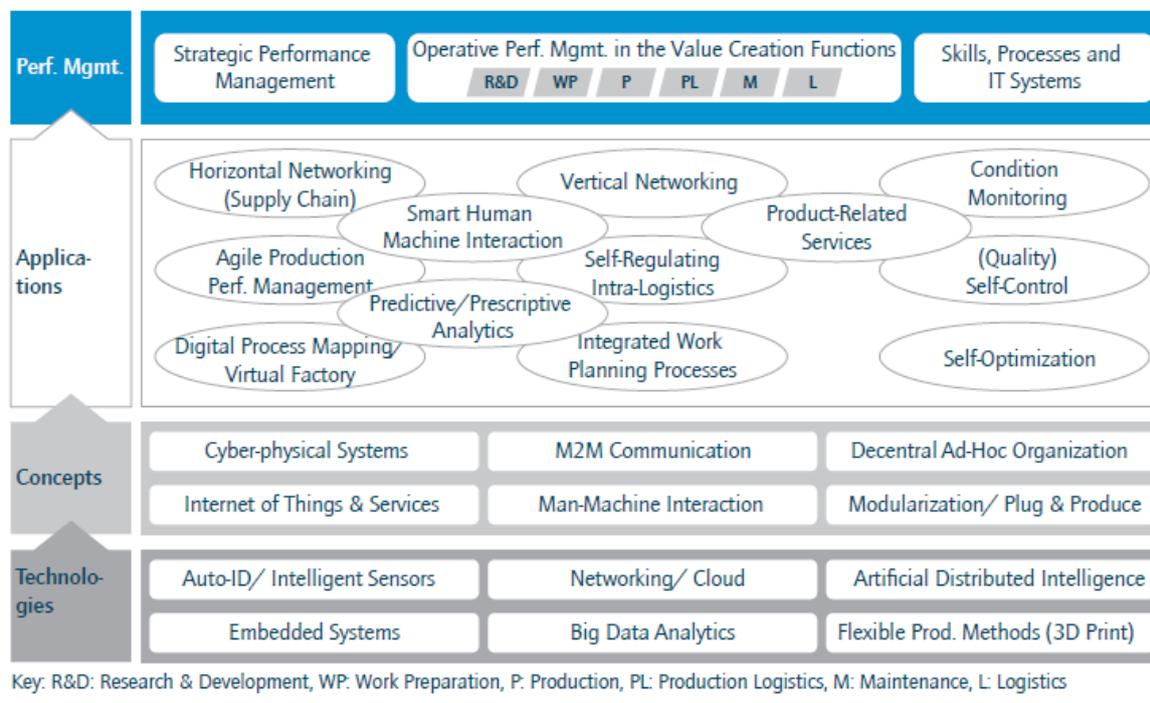


Figure 2: Technologies, concepts, and applications of Industry 4.0<sup>3</sup>

## The Digital Era<sup>4,5,6</sup>

The Fourth Industrial Revolution is identified by the emergence of a basket of technologies, however the main characteristic of all of these is the digitisation of the workplace, be it a business office or a manufacturing plant. Organisations and Businesses are moving to an age where digital technologies drive almost every aspect of industry. This rapid digitisation of industry and business environments introduces new technologies at a rapid pace. The key drivers of the changes to how businesses use skills are automation, mobile and cloud computing, and the broad availability of the internet.

<sup>3</sup> (Sauter, Bode, & Kittelberger, 2015)

<sup>4</sup> (Macht, n.d.)

<sup>5</sup> (Sepp, n.d.)

<sup>6</sup> (Leopold, Ratcheva, & Zahidi, 2016)

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These technologies need people with different skills and mindsets to the traditional technology-oriented roles. The digital era, the fourth industrial revolution, industry 4.0. All these refer to the changes happening in how industries and businesses function. What do people need to create successful careers amidst these rapid changes? What do organisations need to acquire the right people to carry them through these changes?

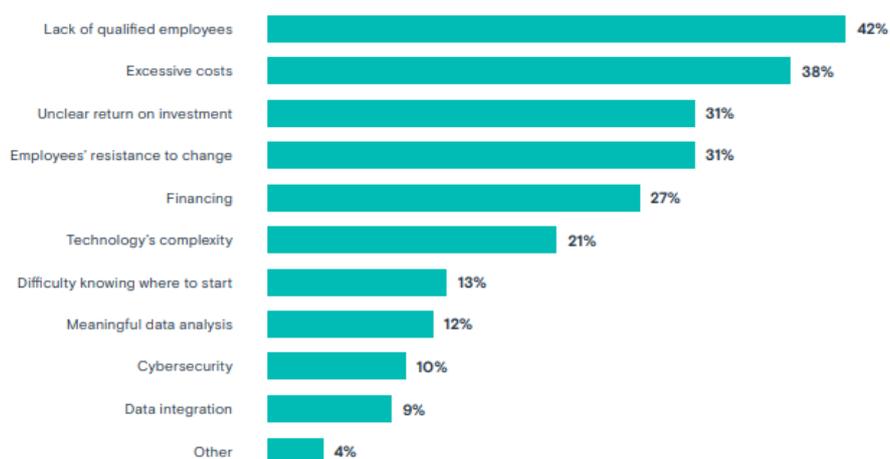


Figure 3 Biggest challenges in implementing solutions for the Fourth Industrial Revolution<sup>7</sup>

### Skills in the Digital era

As shown in Figure 4 *Distribution of US employment according to its probability of increased demand*, there is a move towards the service occupations. This move is happening quickly and will continue to keep changing at a more rapid pace. The technologies and systems that drive businesses and industry in the current era change too fast for skills to be fleshed out and coalesce into defined roles across the industry. Role definitions are far more nebulous and dynamic. Skill matrices need constant updates. Human resources teams need to be exceptionally agile and responsive besides needing to be closer in step with business operations.

<sup>7</sup> (Bedard-Maltais, 2017)

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The distribution of US employment according to its probability of future increased demand. Note that the total area under all curves is equal to total US employment.

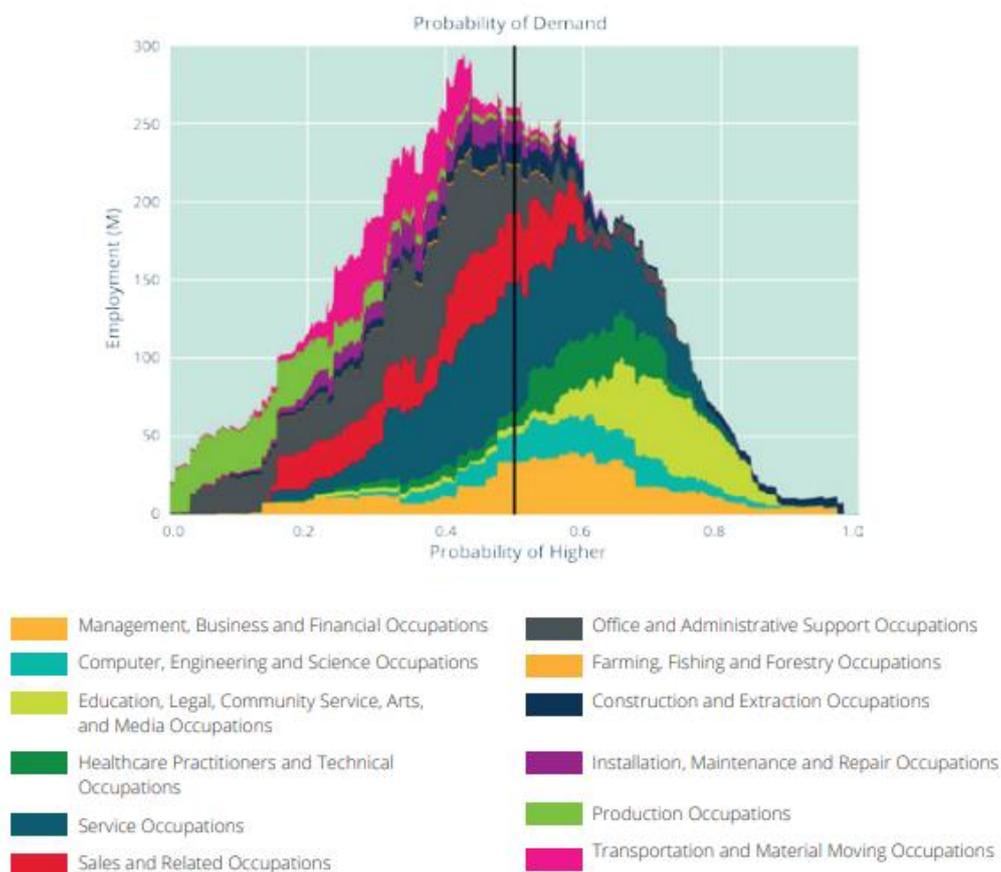


Figure 4 Distribution of US employment according to its probability of increased demand<sup>8</sup>

### Composition of a high performer<sup>910</sup>

In today's workplace, most of the time, the performance of a person at any given role has less to do with their technical knowledge/skill and more to do with other factors.

<sup>8</sup> (Bakhshi, Downing, Osborne, & Schneider, 2017)

<sup>9</sup> (Sepp, n.d.)

<sup>10</sup> (Maddox, 2014)

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## The relative importance of skills, abilities and knowledge as assessed by Pearson correlation coefficient



Figure 5 Relative importance of skills, abilities, and knowledge<sup>11</sup>

There are 4 facilities for each person that have emerged as being important to these changes:

1. Workplace skills
2. Awareness of business context
3. Ease of learning new technologies
4. Technique vs process

### 1. Workplace Skills

Organisations are waking up to the realisation that people need base skills which are not technology specific. Such skills will keep their employees relevant through the changes. The importance of what often used to be bunched under 'soft skills' is increasing as these skills (e.g. Critical thinking, Creative problem solving) are driving

<sup>11</sup> (Bakhshi, Downing, Osborne, & Schneider, 2017)

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people to success irrespective of the technology they choose to work in. Calling these 'soft skills' however would give room for misinterpretation that these are mere language and communication skills. These go well beyond that into what really matters at the workplace.

### 2. Awareness of business context

Employees today cannot afford to be insulated from the business. Each person needs to be aware about the business context of their role and then be smart about the value that they contribute to the organisation. Organisations are moving towards assessing people on the value they bring to the organisation rather than traditional performance measures.

### 3. Ease of learning new technologies

The technology landscape is changing fast today. However, accompanying these rapid changes is the improved ease with which the skill to work with these technologies can be acquired. Learning systems and material have come a long way since a decade or two ago. Access to skilled professionals, forums and interest groups has improved manifold.

### 4. Technique vs. Process

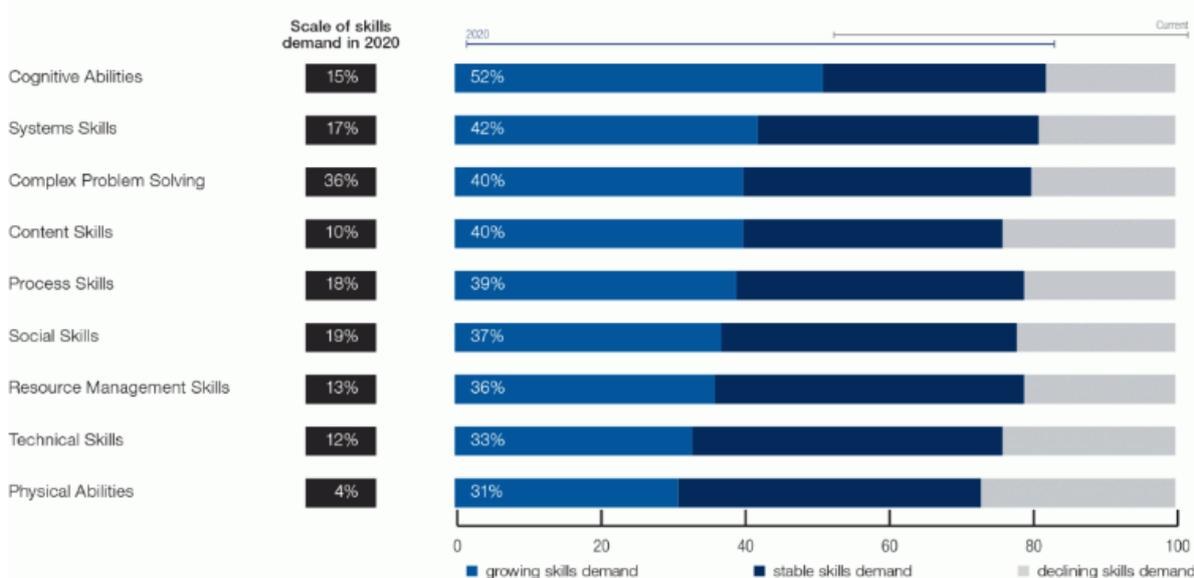
The last couple of decades has been spent on businesses becoming process oriented. However, with the industry finding maturity of functioning in how dynamic the evolution of technologies is, what matters to success at a job is a good balance between technique and knowledge / understanding of a process. The ability to apply any learning and any capability effectively across new and changing environments is of critical importance to a person's success.

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Figure 6 Change in demand for work related skills describes in greater detail, what in this paper has been broken down into the 4 facilities above

Change in demand for core work-related skills, 2015-2020, all industries

Share of jobs requiring skills bundle as part of their core skill set, %



Source: Future of Jobs Survey, World Economic Forum.

Figure 6 Change in demand for work related skills<sup>12</sup>

### Traditional assessment systems

Traditional assessment systems are mostly geared towards assessing technology or process skills. As mentioned earlier, skills like critical thinking and creative problem solving were labelled ‘soft skills’ and hence diluted in importance and subsequently left to be assessed based on the ability of the person(s) conducting the interview/assessment. Some of these skills were at times considered ‘leadership’ or ‘manager’ requirements but now are being recognised increasingly for their necessity in each employee. Every employee is now expected to take accountability and be able to own, manage and even drive their responsibilities on

<sup>12</sup> (Leopold, Ratcheva, & Zahidi, 2016)

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their own. Organisations need each employee to take ownership of regular deliverables and understand overall business context.

Given this scenario, these assessment systems are unable to be effective in identifying the right talent and people with the new age skills and mindset that are currently required.

### Business Needs to Manage the Changing Skills Requirements<sup>13</sup>

Businesses today, need a way to cope with this fast-paced environment that needs a completely different and dynamic set of skills. It is not sufficient to just put a new assessment system in place. Business need a holistic way to define, manage and adapt to these skills requirements. For these skills, organisation leaders need systematic approaches to

- **Define** the skills in a structured format but ensure that the system is extensible and dynamic enough to maintain relevance through rapid changes and innovations in the industry
- **Manage** the skills that emerge as requirements across the organisation
- **Identify & Assess** with a reasonable confidence level, the right people with the appropriate skills who will be able to truly contribute value to the organisation
- **Build** these skills and keep pace with how they evolve over time

### Challenges in Effective Identification and Management of Skills

There are multiple challenges for each organisation to be successful in this dynamic environment.

- **Systems** – Systems and frameworks to manage this environment. Existing systems are rendered ineffective

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<sup>13</sup> (Moran, 2017)

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- **Staff** – Staff who can understand and respond to these changes. Staff who can adapt to work with and ensure success in this environment
- **Speed** – The speed at which the organisation can evolve to keep abreast of the changes and remain relevant

Any attempt at solving this overall problem must address all the 3 factors above to a reasonable level of confidence.

### Solution

Although, the objective of this paper is not to arrive at a complete solution in itself, there are some key factors that can be understood right away. The system to solve this will amalgamate concept from the academic/education field for classifying and assessing skills in general, the human resources field to ensure this would be in line with overall people management principles and from the technology industry operations field to ensure this is fit for purpose and fit for use.

The system needs to focus on skills that are innate and inherently more valuable in a person rather than those that can be learnt from a book. This is needed while maintaining a certain level of simplicity so that it can be easily deployed and used to maximise effectiveness.

### Value

The assessment of the value of such systems will take some time but some initial proof points exist in initial tests in niche environments needing advanced skills. Suitable identification and effective utilisation of the skills that are now being seen as basic requirements is critical to realise the full potential and benefits that are envisioned as part of the Fourth Industrial Revolution.

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The value of these systems needs to be measured along multiple downstream points as contribution to business value.

<b>Cost Optimization</b>	<ul style="list-style-type: none"> <li>&gt; Reduce manpower cost</li> <li>&gt; Boost labor productivity</li> </ul>
<b>New Opportunities</b>	<ul style="list-style-type: none"> <li>&gt; Adapt to changing demographics &amp; customer demands</li> <li>&gt; Adopt mass customization</li> <li>&gt; Identify new value-generating services</li> </ul>
<b>Greater Operational Efficiency</b>	<ul style="list-style-type: none"> <li>&gt; Improve process visibility and quality of products</li> <li>&gt; Reduce variability in operations</li> <li>&gt; Allow remote monitoring and maintenance through networked systems</li> </ul>
<b>External Factors</b>	<ul style="list-style-type: none"> <li>&gt; Develop competitive pressure on other companies</li> <li>&gt; Derive benefits from government mandates and incentives</li> </ul>

Source: Roland Berger

Figure 7: Benefits of the Fourth Industrial Revolution<sup>14</sup>

<sup>14</sup> (Aulbur, Arvind, & Bigghe, 2016)

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