

COVER PAGE

Essay Topic: Role of technology. *Discuss the impact and opportunities of disruptive technologies on the service sector.*

Essay Title: Disruptive technologies: Shaking up the status quo in Singapore

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Innovations abound, rapid technological progress has quickly evolved into a mega-trend that helped ignite the Fourth Industrial Revolution. This new wave threatens the status quo of many business models, as well as the relevance of skill sets in the labour market. The term “disruptive technologies” is now the latest buzzword. While there may be different definitions that label a technology as “disruptive” based on various technicalities, this paper shall adopt the definition of “disruptive technologies” suggested by the McKinsey Global Institute; “disruptive technologies” should demonstrate a quick rate of change or breakthroughs, have a potentially wide scale of impact, be able to influence large economic value, and have the ability to transform life, businesses and the economy (Manyika, et al., 2013).

Singapore is not isolated from, nor oblivious to, disruptive technologies. In fact, the Singapore government has been an active enabler to help the country keep up with, and even strive to be a leader in, this new playing field of technological advancement. With government initiatives, such as creating Industrial Transformation Maps (ITMs), rallying the Smart Nation vision, and working with industrial partners in the SkillsFuture movement, Singapore is readying to meet future challenges and opportunities that may arise, especially in the face of disruptive technologies. Many, if not all, sectors in the country would be impacted by these disruptive technologies; the services sector is of no exception.

The services sector has been an important driver of the Singapore economy, strongly contributing to Singapore’s employment and GDP (i.e. Gross Domestic Product) indicators. According to the Ministry of Manpower (Singapore), the services sector broadly involves 6 principal business activities - Financial, insurance, real estate and business services; Transport, storage and communications services; Commerce (retail and wholesale trade); Community, social and personal services (excluding domestic workers); Hotels; Restaurants, coffee shops, food courts and other approved food establishments (excluding food stalls or hawker stalls) (Ministry of Manpower, 2016).

The impacts of disruptive technologies on the services sector are many, and could be viewed from 3 main perspectives – (1) Business processes, (2) Consumer's preferences, and (3) Regulatory concerns. These impacts are not necessarily detrimental, only if businesses could adapt to exploit arising opportunities.

Firstly, business processes would be impacted as businesses undergo organisational restructuring to reposition themselves in light of disruptive technologies. In the financial services sector, the emerging trend of financial technologies (FinTech), such as robo-advisors and cryptocurrencies, could potentially obviate some services that banks and financial institutions provide. In the retail services sector, e-commerce is gaining traction, often at the expense of brick-and-mortar stores. Businesses must therefore adapt to survive; business processes must be revised where the benefits outweigh the upgrading costs of doing so. In the process, human workers are displaced as some jobs are taken over by robots, while other jobs are made redundant. Simultaneously, jobs would be redesigned or newly created to support the strategies needed for businesses to navigate through this time of change, thereby spurring the focus on human resources management as well.

With evolving job requirements, human capital is under the threat of skills obsolescence. Technical skills may be outdated and inapplicable to the workings of disruptive technologies. Training becomes crucial for employees to stay relevant. The mindset of employees is equally important. Employees need to embrace new changes, unlearn and learn new knowledge, as well as to keep themselves abreast of latest developments. Work is going digital, and more data are being collected by businesses. Employees thus need to appreciate the vulnerability of cybersecurity, and the sacredness of data privacy; tweaking their working styles to identify, promote, and safeguard their employers' and clients' interests in the face of new risks and opportunities brought about by disruptive technologies.

Secondly, consumer's preferences would be impacted by disruptive technologies. Disruptive technologies offer new options to consumers, and businesses who do not keep up would lose market share. For instance, in the financial services sector, some consumers may prefer to use the services provided by a robo-advisor, which may be more attractively priced than that of a human financial adviser. However, businesses that readily embrace disruptive technologies as a first mover, may not necessarily be at an advantage if consumer acceptance is poor. For instance, in the healthcare services, even if there is a fully-automated robo-surgeon, some patients may still prefer and trust a human surgeon to operate on them instead.

In the areas of F&B (i.e. Food and Beverage) services and hotel services, face-to-face interactions with customers frequently play an important part in keeping customers satisfied. Staff often go through emotional labour to provide the quality service that appeals to a customer's mood and requests. Currently, Artificial Intelligence (AI) does not possess strong social and emotional capabilities (Lubin, 2017). Some businesses are successful in using robots to pull in crowds, such as using robot waiters as a novelty factor to attract curious diners (Ang, 2016). In other cases, where the human touch is a sustainable competitive advantage for businesses, such as luxury hotel chain The Ritz-Carlton Hotel Company, L.L.C., businesses must be highly selective when replacing human workers with automated robots. It is of great importance that businesses assess their customer's preferences to disruptive technologies before deciding to adopt them, regardless of their capacity as a first-mover or as a follower.

Lastly, businesses in the services sector must be aware of the legal implications of disruptive technologies, especially where some technologies venture into the grey or unexplored areas of the law. In the accommodation services sector, home-sharing facilitator Airbnb is a prominent disruptor of the hotel industry internationally. However, the Singapore government has recently passed a new law to illegalise short term home rental, thereby representing a major hurdle to the Airbnb business model in the country. In the logistics services sector, autonomous vehicles

and delivery drones could potentially disrupt the jobs of human drivers. Contrastingly, the Singapore government welcomes these new technologies, and have passed new laws to regulate autonomous vehicles and drones in a way that does not detrimentally curb their prospects in Singapore. Evidently, political and legal developments have the potential to change the competitive landscape of businesses. A disruptive technology that is banned in a market is merely a paper tiger to local businesses. Yet, businesses should also not grow complacent, especially when the regulations may change to welcome the disruptive technologies instead.

Furthermore, the laws define the legal boundaries of businesses. With disruptive technologies, huge datasets are often collected by businesses. These businesses have the legal obligations to protect the confidentiality of these data, or risk facing legal sanctions which could damage a business' reputation and cash flow expectations. As defined from the start, disruptive technologies should demonstrate a quick rate of change or breakthroughs. Correspondingly, the laws are expected to be updated rapidly to stay relevant. Businesses must therefore keep up with the momentum of legal changes, and re-examine their strategies to avoid legal pitfalls while capitalising on freshly legalised opportunities.

Despite the impacts that the services sector is experiencing due to disruptive technologies, these double-edged disruptions present new opportunities for the sector to be more effective and efficient. These opportunities could arise from 3 main aspects - (1) Learning through big data, (2) Developing new service offerings, and (3) Enhancing manpower management.

Firstly, disruptive technologies could introduce great learning opportunities. Disruptive technologies often capture a large amount of data. An autonomous vehicle receives traffic data from its sensors, which are useful for transport authorities and companies to analyse travel patterns. Devices related to the Internet of Things (IoTs) store user data, which are useful to help service providers understand consumer behaviour. With disruptive technologies serving

as good data-collection platforms, the big data harvested could be further analysed to derive insights and predictions. For instance, smart homes powered by IoT sensors could now transmit distress signals to social workers in an elderly fall. In addition, these data could be aggregated to policy makers, who may derive key learning points that the community and social services would need to raise public awareness on fall prevention.

The information, obtained through the increasing use of disruptive technologies, could also be shared with other organisations after data anonymization. Sharing data would allow the wisdom of the crowd to take place. Businesses could utilise the open data to collectively learn, identify, and solve difficult problems that the sector or industry faces, opening up many opportunities for intra- and inter-sectoral collaboration and co-creation. The Singapore government has been an effective catalyst, with its open data portal that publishes datasets from 70 public agencies. The private sector version of the data portal is in the pipeline. Learning from big data helps to build knowledge in Singapore, potentially propelling the nation to be a leader or expert in various domains, such as being one of the fintech leaders in the world.

Imagine a project to set up a databank with live information transmitted directly through sensors that register, for example, hourly footfall of a shopping mall (*retail*) or daily passenger movements of an airport (*transport*). These statistics, widely monitored by economists, marketers and investors, are usually published by major companies, but only at the end of each month. However, with this live databank enabled by IoTs and cloud technology, the time delay for information could be shortened, allowing executives in the services sector and beyond, to make swift decisions in areas ranging from routine business affairs, to business crisis management in a terror attack.

Secondly, disruptive technologies could provide monetisation opportunities. With predictive analytics of the big data, businesses could better identify the needs of their customers, and

market new services to them. In addition, as the disruptive technologies constantly shake up the digital economy, the related ecosystem changes as well. More engineers and technicians are required to support infrastructure growth, especially in the information and communication services. Data protection officers and cyber security experts are also expected to be in hot demand. The demand translates into business opportunities, where businesses, such as consultancy firms, could develop specialised expertise and create new service offerings.

Lastly, disruptive technologies present an attractive solution for businesses to satisfy their manpower needs. In the tight labour market, businesses are having difficulty filling up job vacancies. In fact, many local businesses, especially the SMEs (i.e. Small and medium-sized enterprises), have faced manpower shortages (Chong, 2017). Based on the Singapore Ministry of Manpower's Job Vacancies 2016 Report, more than 80% of the respective vacancies in both PMET (i.e. Professionals, Managers, Executives and Technicians) and non-PMET jobs came from the services sector (Ministry of Manpower, 2017). Strict foreign worker quota and rising labour costs have worsened manpower woes in the sector. Automation and robotics technologies could bring relief to this manpower crunch.

In the transportation services sector, automated ships could potentially replace manned cargo vessels. Automated ships are expected to reduce labour and fuel costs, while enhancing safety with less room for crew errors (Wainwright, 2017). In the accommodation and food services sector, robot waiters, auto-cooking machines, robot receptionists and automated cleaners are already in use by some businesses. Jobs that are routine and predictable could be automated easily, thereby freeing up staff for other higher-value adding jobs. These technologies help businesses improve manpower productivity. With the manpower constraint unshackled, along with the added advantage of a more effective cost management measure, businesses are better positioned for growth and expansion with the use of disruptive technologies.

In conclusion, the role of disruptive technologies has a huge influence on the services sector. Disruptive technologies could trigger impacts such as business process changes, consumer's preference changes, and regulation changes. Yet, with change comes opportunity. Disruptive technologies could also bring new learning opportunities, opportunities to expand service offerings, and opportunities to break out of current manpower constraints. Businesses that are pursuing their strategic objectives should adapt dynamically and innovatively in this inevitable march towards disruptive technologies. As the status quo of life, businesses and the economy is transformed with disruptive technologies, it is an exciting time for the services sector to hold greater promise for its future contributions to Singapore.

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