

**ANL201**

**Data Visualisation for Business**

**Tutor-Marked Assignment**

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**References**

Microsoft Corporation. (2019). *Annual Report 2019*. <https://www.microsoft.com/investor/reports/ar19/index.html>

Microsoft Corporation. (2017). *Annual Report 2017*. <https://www.microsoft.com/investor/reports/ar17/index.html>

Question 1(a)

Microsoft’s mission statement is “to empower every person and every organisation on the planet to achieve more”. The company set its target audience on “every person and every organisation on the planet”. This encompasses individuals from all walks of life without discrimination, and to serve their needs whether in their personal daily tasks or professional work assignments. The company strives to be present in various industries, such as retail, technology, manufacturing, education, healthcare, and environment nature resources, regardless of the size of the organisation.

The verb “empower” used in the mission statement shows the company’s aim to give its target audience the ability and the control, to deal and manage task responsibilities with confidence in achieving their success. Beyond attaining what is asked of them, the company also sets out to “achieve more”. The company wants to enable individuals and organisations to achieve greater innovation results, higher efficiency, increased productivity and even expansion of new businesses on the technological front. The company emphasizes on its commitment in partnership and trust in the company and its products.

Question 1(b)

Microsoft sets its mark to be a global company being visible around the world and achieving greater heights in various communities, at both individual and organization level. It strives to provide technological solutions to benefit organisations of different sizes across various industries, to achieve improvement in productivity and efficiency. Beyond providing primary assistance to individuals and organisations in benefiting from the company’s wide range of technological software tools and hardware devices, Microsoft encourages digital transformation and wants to unleash the maximum potential of its customers and partners. In addition, it envisions future possibilities in creating big new technological breakthroughs alongside their customers and partners in the exploration of new innovations and business expansion.

Microsoft highlights tech intensity as an important key driver in bringing the company to the next level. It is going beyond digital transformation and cloud technologies, combining new innovative mindset with cutting edge technologies to create and develop new insights and intelligent service solutions to solve complex business issues.

For the new fiscal year 2020, Microsoft continues to enhance and influence the way people think and remodel in finding and constructing solutions. It builds upon innovation to keep up and be above competition venturing into unchartered waters. Its focus ranges from applications and infrastructure to data and artificial intelligence, to business applications, and to gaming. The company stays committed to ensure confidence in product trustworthiness of the underlying technology in terms of privacy, data cybersecurity and responsible artificial intelligence. It continues to strengthen its core in its people, supporting inclusion and diversity in workplace opportunities and development. On society front, it continues to stay rooted in their corporate social responsibility in giving back to local communities and taking part in philanthropic causes. The company continues to work on associating their products with environmental sustainability through the efforts of reducing carbon footprint and using renewable energy.

Question 1(c)

Strategic Theme 1) Technological Breakthroughs and Progress

Microsoft has a broad range of product offerings and captures innovation opportunities in applications and infrastructure, data and artificial intelligence, business applications, modern workplace, and gaming. These products can be used by customers ranging from individuals to small-to-large organisations. An example of applications is GitHub, acquired by Microsoft, which is a development platform for developers and companies to build and maintain their software. The company continues to build its global-scale cloud service named Azure and aims to be the world’s computer which extends to new cloud-to-edge services and devices. Under data and artificial intelligence, the company expanded capabilities to its relational database services and cloud analytics. In business applications, it looks beyond not to only transform digital business processes but to also connect physical world in a mixed-reality services, such as the HoloLens 2. It also involves integrating different software platforms to establish new experiences for customers. An example is the integration of LinkedIn and Dynamics 365. In modern workplace, Microsoft enabled businesses an integrated system through Microsoft 365 to improve communication and collaboration in driving transformation and productivity. In the gaming segment, the company continues to transform and remodel the mode of game play and distribution with new technology in areas of game streaming and game development for gamers and game developers.

The products form the core technological research and development infrastructure (as part of the company’s learning and growth perspective), linking to improvement of the ease of use (internal business process perspective), linking to improvement of customer experience (customer perspective), linking to increase in revenue and profit (financial perspective).

Strategic Theme 2) Trust

As a product and service provider, customers’ trust in the underlying technology is fundamental and core to Microsoft’s business success. There are three aspects – privacy, cybersecurity, and responsible artificial intelligence. With the company’s establishment that privacy is a human right, it commits to transparency in their data storage and processing privacy practices. The company states that they are the only company that offers integrated end-to-end security across their products and services. This serves as an assurance to its customers on its preventive efforts against cybercrime. Microsoft takes the responsibility when building artificial intelligence in asking the right questions to ensure proper and beneficial use for the society.

Trust in the underlying technology forms the content infrastructure (learning and growth perspective), linking to information services (internal process perspective), linking to development of customer trust relationship and customer loyalty (customer perspective), linking to linking to increase in revenue and profit (financial perspective).

Strategic Theme 3) Environmental and Corporate Social Responsibility

Microsoft, as a global company, has the capability to play a part in environmental sustainability. It has commitments to reduce their carbon footprints and associates their products to carbon-neutrality. It aims to build sustainable datacentres powered from 100 percent renewable energy with zero-waste operations. On top of their own efforts, the company also work with their customers and partners to create solutions in reducing their own environmental footprints. Microsoft also engages the local community by volunteering skills training, using mixed-technology to serve the underserved communities and supporting philanthropic causes.

The company’s commitment to environmental and corporate social responsibility involves employee skills and time spent (learning and growth perspective), linking to CSR recognition award program (internal process perspective), linking to improvement of corporate brand reputation score (customer perspective), linking to profits arising from sustainable products (financial perspective).

Strategic Theme 4) Culture

Microsoft cares for the well-being of their employees and provides comprehensive social benefits to them. The company creates and embraces a diverse ethnicity and gender representation within the inclusive workplace where employees focus and succeed in serving the diverse customers around the world.

The company’s culture gives high employee motivation and ownership (learning and growth perspective), linking to diversity and inclusion recruitment programs (internal process perspective), linking to widening of talent pool and talent attraction (customer perspective), linking to maximise return on employee (financial perspective).

Question 1(d)

Challenges faced in Data Collection and Storage stage:

* Missing data entry in data set. This could be due to human error during data collection.
* Data inconsistency in data set. For example, during customer membership sign-up, gender entry could have been keyed as “Female” or “F”.
* Lack of experience in conducting qualitative interviews and collection of data. For example, in the survey or research in the study of customers’ needs.
* Quantity amount of data collected. Too much information collected may lead to complexity, but too little information may lead to insufficient data points.
* Data collection privacy regulations varies in different countries. For example, Singapore has the Personal Data Protection Act (PDPA).
* Data storage security issues. For example, potential loss of data on the cloud storage infrastructure due to data breach.
* Governance and control on access rights to the data information. For example, potential data leak exposing the vulnerability of the data stored.
* Data storage format to address requirements of user. For example, tabular format versus transactional format.

Challenges faced in Data Pre-processing stage:

* Different regional formats of date and time. For example, date in United States of America follows format of Month-Day-Year whereas in United Kingdom, it is Day-Month-Year. This is important to note for global companies, such as Microsoft, who have offices around the world. An example of time record difference could be in 12-hour or 24-hour format.
* Clarity on the currency used. For example, sales figures recorded are in USD$ dollars or SGD$ dollars.
* Accurate interpretation of thousands and decimals separators used in sales figures. For example, organisations in United States of America use a comma as thousands separator and a period to indicate decimal place. However, organisations in Italy use a period as thousands separator and a comma to indicate decimal place.
* Clarity on the numerical units used. For example, sales figures recorded are in thousands or millions.

Challenges faced in Graphics Engine stage:

* Filter data that is not relevant and does not provide beneficial insights to users.
* Availability of resources and expertise to perform data mining and data statistics to make sense of the large data set.
* Choice of visual graph that best represent and convey data information.
* Design of visualisation tool, dashboard as an example, that allows users to control, interact and explore the data.

Challenges faced in Human Visual and Cognitive Processing stage:

* Differing levels of understanding and interpreting graphs. Users without prior exposure to visualisation tools may require training.
* Different interpretation of colour usage owing to different organisation culture. For example, red and green coloured bar charts can be used to indicate negative and positive values respectively. On the contrary, an organisation may choose to use red to highlight their achievements as red is their corporate colour branding.
* Colour blindness condition may cause inconvenience to the user from interpreting and visualising the data information.

Question 1(e)

Interesting point 1: Revenue mix of the three operating segments.

*Figure 1: Microsoft’s three operating segments’ revenue mix from FY2015 to FY2019.*

Figure 1 shows the change in revenue mix of Microsoft’s three operating segments over the past 5 years from FY2015 to FY2019. In FY2015, More Personal Computing comprised 47% of the company’s revenue but has decreased 11 percentage point to 36% in FY2019. In contrast, Intelligent Cloud increased 6 percentage point from 25% to 31%, while Productivity and Business Processes increased 5 percentage point from 28% to 33% over the past 5 years. This reflects the shift in revenue driver from More Personal Computing in FY2015 to Intelligent Cloud in FY2019.

*Figure 2: Intelligent Cloud Revenue Growth Percentage Year-on-Year from FY2015 to FY2019.*

Figure 2 shows a continual revenue growth in Intelligent Cloud segment, reaching a strong revenue growth at 21% in FY2019 compared to FY2018.

This is a good affirmation that the company is investing resources in the right direction with their cloud business from infrastructure to applications, and the cloud business could be the future of the company. Microsoft should continue engaging and empowering their customers with their strategic digital transformation platform offering trusted security and compliance in their cloud products.

Interesting point 2: Research and Development operating expenses.

With the company’s strong emphasis on pushing boundaries through research and development efforts to address the dynamic changing demands of customers, industry trends, and competitive forces, I would expect research and development operating expenses to increase as the company’s business expands. However, research and development operating expenses remained consistent at 13% of revenue for past three years (FY2017 to FY2019) while operations revenue increased 14% in FY2019 compared to FY2018 and increased 14% in FY2018 against FY2017. The consistent percentage of money going into research and development may reflect good management of operating expenses and may be viewed as being effective and productive. However, I will take a cautious approach towards this practice. There is intense competition in the technology industry and for that reason, every technology brand invests heavily in research and development.  Microsoft has shown impressive results with its large suite of software and hardware product offerings reaching out to and meeting the needs of different groups of customers. Apart from the need to keep generating a competitive advantage in its products, it also needs to find ways to retain their edge over competition. In addition to its product innovation efforts, Microsoft must also continue managing strong relationships with customers, retaining customer loyalty with its strong and reliable brand image.