

**ANL201**

**Data Visualization for Business**

**Tutor-Marked Assignment**

**January 2021 Presentation**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PI Number: W0402449

Name: Yan Yoke Khuan

Submission Date: 17th February 2021

**Question 1(a)**

Microsoft has set its mission “**to empower every person and every organization on the planet to achieve more**”. This mission statement emphasizes in empowering all people and organizations on our mother Earth to achieve more in their lives and their businesses respectively.

In order to achieve its mission, Microsoft has to ensure the technology it creates could benefits every person on our Earth. Besides, it also has to ensure the platform it builds and the tools it provides could assist the small businesses to increase productivity, the multinationals to strengthen their competitiveness, the non-profit organizations to improve their system to manage their funds and enhance their services effectiveness, and the governments to develop their efficiencies in services provision, infrastructure development, data collection and etc.

Microsoft empowers the people and organizations to build-up their own digital capability to allow all people on this planet to achieve further, and the organizations to innovate and create new business opportunities. In addition, Microsoft also has to ensure its technology could benefit our planet Earth to protect the ground for growth sustainability.

**Question 1 (b)**

Besides, developing products for individual use, Microsoft is also partnering with organizations to build technologies to help them to expand and further develop their business. Below are the few applications that Microsoft has developed:

* With Azure-powered Backpack, Phulukisa Health Solutions is now able to introduce basis healthcare screening to far-off areas in South Africa.
* With Microsoft 365, the lecturers at UNSW Sydney is able to conduct his class to both his classroom and online student at the same time and allow them to interact and engage with each other seamlessly.
* Azure ML along with Power BI enable a family-owned restaurant in Japan to digitally transform its business. These two applications give the owners the capability to forecast its sales to tailor their menu more effectively to meet customers’ taste.
* GitHub is a software development platform that Ford Motor Co in Detroit is using to innovate much faster pace to build future cars.
* Microsoft Teams allows every worker in the respective organizations to share any updates, schedule shift and meetings. Besides, this application also enables the colleagues to meet up together remotely from various locations. This new application has created a new work culture by providing communication convenience to better gather all workers together.

The above-mentioned achievements show Microsoft’s efforts in helping the people and organizations to provide outstanding business insight to further attaining their goals. Through Microsoft’s effort, its vision should be “helping the people and businesses to realize their potential to achieve further” in my opinion.

**Question 1 (c)**

To achieve its vision and mission, Microsoft has established the strategy themes to its main strategies and sub-strategies plans respectively.

**Technology Breakthroughs and Progress**

“***To empower our customers and investing in large and growing markets to help them digitally transform – today and long into the future***.”

Theme description:

To assist the organizations and growing markets to have the capabilities to digitally transform their businesses, including management, production, internal control, data collection, etc, to meet their today and future requirement.

* **Application and Infrastructure**

“***To build the most complete toolchain for developers***.”

Theme description:

As the developers are increasingly playing the vital role in value creation and growth across all industries, it is critical to provide them most complete toolchain. For example, the current most popular code-editing tool, Visual Studio Code and one of the fastest-growing programming languages, TypeScript. These two tools could enhance the developers’ efficiency and effectiveness in their programming progression.

* **Data**

“***To offer the most comprehensive cloud analytics***.”

Theme description:

Microsoft is providing limitless data and analytics capabilities to all its customers across the entire data estate to meet the increasing requirement of data volume, variety and velocity.

* **AI**

“***Any developer can embed the ability to see, hear, respond, translate, reason, and more into their applications***.”

Theme description:

The users of applications are expecting more features and functions in any applications in use. Thus, by providing the most comprehensive portfolio of AI tools to the developers would allow them to embed more features into the applications.

* **Business Application**

“***To enable data to be exchanged and enriched across systems to provide unparalleled business insight***.”

Theme description:

By converting the record and engagement into intelligence would largely optimize the results that could help the business to further analyst the business performance and adjust its strategy to meet the market development trend.

* **Modern Workplace**

“***To empower everyone – enterprises, small businesses, and frontline workers – with an integrated, secure experience that transcends any one device***.”

Theme description:

In order to ensure business growth, every organization will need to continually improve their system of communication and collaboration to enhance its productivity and corporate transformation.

* **Gaming**

“***To empower game developers – from independent creators to the biggest game studios***.”

Theme description:

Microsoft’s Game Stack is an application that could bring its tools and services together to assist the game developers to develop, operate, and stretch the cloud-first game across personal computer, mobile phone and console.

**Trust**

“***Trust begins with our commitment to shared success and prosperity****.*”

Theme description:

No one or organization would want to work with any provider that sells them the technology and competes with them. To build the trust with its customers, Microsoft is ensuring those who employ its products and services have the confidence in its underlying technology.

**Environment and Corporate Social Responsibility**

“**To foster a sustainable future where everyone has access to benefits and opportunities created by technology**.”

Theme description:

To ensure all people has the access to benefit and opportunities that created by technology, Microsoft is well-positioned now to enable ad speed-up digital transformations that channel to a low-carbon future.

**Culture**

“***Microsoft’s strength lies in our talented people***.”

Theme description:

Microsoft recognize the contribution of the talented employees in its business growth. Thus, in order to attract and retain the talented employees to work for Microsoft, it is prioritizing the physical, emotional, as well as the financial welfare of both its employees and their families, by providing industry-leading benefits.

**Question 1 (d)**

Followings are some of the challenges that each of the four stages of data visualization process may face:

1) **Data Collection and Storage**

Collecting only relevant and true data is one of the challenges in data collection. Information overload requires the users to input times to filter it. In addition, it is easy to justify the validity of the data provided from internal source but not for those obtained from external source. The users may provide fake personal information, to protect their own privacy. For example: age, academic level, professional, etc. Besides, the data obtained three years ago may not be useful for current requirement, for instance, market trend, customers behavior.

Storage of huge volume of data is a big challenge to many organizations as space is always limited. Even if limitless space for storage, the cost to manage it will be high also. Besides, the effectiveness in stored data’s organization is also challenging as every people has his own way of naming the files. This will make future retrieving very challenging.

2) **Data Pre-processing**

To transform the data from alphabets or numbers to something the readers or users can easily understand is another big challenge as every individual has his own approach to dealing with the data. The result from the process in filtering and mining of the data depends very much on the statistical method used. If wrong method is used, the representation may not reflect the results that is useful for communication.

3) **Graphics Engine**

After the data is processed, the graphic engineer has to select the right display hardware and the graphics algorithms to produce Data Visualization on screen. For instance, if the data is representing the aged group of a population, the pie chart should be used; if the data is to show the sales performance in various countries, the bar chart should be selected. Thus, if wrong visual model is used, the representation may not be meaningful.

4) **Human Visual and Cognitive Processing**

To better interpret the result to the reader, the engineer will have to improve the basic representation to make it more focus and visually engaged. For example, if the data is about comparing the market shares of its various product with the competitors. The engineer could colour the bar that represent the organization’s share and leave the bars that represent the competitors’ share in grey. If the engineer colored all the bars, the reader would need to take more times to capture the desired information. Besides, the engineer could also manipulate the data and arrange the order of the data visualization. Hence, it is a challenge for the engineer to project a clear and easily understandable representation.

**Question 1 (e)**

Microsoft’s operating income has been highly increased by 21% in financial year (FY) 2018 and 23% in FY2019, however, the revenue only increased by 14% for both financial years. This is because Microsoft has working to reduce the operating cost of its products.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **In $ Millions** | **2019** | **2018** | **2017** |  |  |
| **Revenue** |  |  |  |  |  |
| Productivity and Business Processes | **41,169** | 35,865 | 29,870 | **15%** | 20% |
| Intelligent Cloud | **38,985** | 32,219 | 27,407 | **21%** | 18% |
| More Personal Computing | **45,698** | 42,276 | 39,294 | **8%** | 8% |
|  | **125,852** | **110,360** | **96,571** | **14%** | 14% |
| **Operating Expenses:** |  |  |  |  |  |
| Productivity and Business Processes | (24,950) | (22,941) | (18,481) | **9%** | 24% |
| Intelligent Cloud | (25,065) | (20,695) | (18,280) | **21%** | 13% |
| More Personal Computing | (32,878) | (31,666) | (30,479) | **4%** | 4% |
| Corporate and Other | 0 | 0 | (306) | **0%** | -100% |
|  | **(82,893)** | (75,302) | (67,546) | **10%** | 11% |
| **Operating Income (Loss)** |  |  |  |  |  |
| Productivity and Business Processes | **16,219** | 12,924 | 11,389 | **25%** | 13% |
| Intelligent Cloud | **13,920** | 11,524 | 9,127 | **21%** | 26% |
| More Personal Computing | **12,820** | 10,610 | 8,815 | **21%** | 20% |
| Corporate and Other | **0** | 0 | (306) | **0%** | -100% |
|  | **42,959** | 35,058 | 29,025 | **23%** | 21% |

Although “More Personal Computing” has the highest revenue among the three categories, but “Productivity and Business Process” has earned the highest profit. The data shows that the operating cost for “Productivity and Business Process” the cost is only 61% of the revenue but for “More Personal Computing” is relatively high at 72% of the revenue. However, the three years data showing a reduction of “More Personal Computing” cost from 78% to 72% at the rate of 3% per year. This implies that Microsoft is working towards the right direction in the cost reduction of this product category and the stakeholders shall expect further decrease of this cost in the coming years.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Productivity and Business Process** | **2019** |  | **2018** |  | **2017** |  |
| Revenue | **41,169** | **100%** | 35,865 | 100% | 29,870 | 100% |
| Operating Expenses | **24,950** | **61%** | 22,941 | 64% | 18,481 | 62% |
| Operating Income | **16,219** | **39%** | 12,924 | 36% | 11,389 | 38% |
|  |  |  |  |  |  |  |
| **Intelligent Cloud** | **2019** |  | **2018** |  | **2017** |  |
| Revenue | **38,985** | **100%** | 32,219 | 100% | 27,407 | 100% |
| Operating Expenses | **25,065** | **64%** | 20,695 | 64% | 18,280 | 67% |
| Operating Income | **13,920** | **36%** | 11,524 | 36% | 9,127 | 33% |
|  |  |  |  |  |  |  |
| **More Personal Computing** | **2019** |  | **2018** |  | **2017** |  |
| Revenue | **45,698** | **100%** | 42,276 | 100% | 39,294 | 100% |
| Operating Expenses | **32,878** | **72%** | 31,666 | 75% | 30,479 | 78% |
| Operating Income | **12,820** | **28%** | 10,610 | 25% | 8,815 | 22% |

Although cost reduction for both “Productivity and Business Process” and “Intelligent Cloud” did not show much improvement, but for any expenses below 65% of the revenue implies good cost control.

The above data show Microsoft’s effort and capability in cost management and its prudential for future business growth. So long as the quality of the product and services are not affected, this good cost management performance will raise investors’ confidence in Microsoft’s management to invest more to the organisation.

The other interesting point that we could see in this Annual Report is the figure in Provision of Income Taxes. The tax amount for FY2018 is the unusually high.

|  |  |  |  |
| --- | --- | --- | --- |
| **In $ Millions - Year Ended June 30** | **2019** | **2018** | **2017** |
| **Income before Income Taxes** | **43,688** | 36,474 | 29,901 |
| Provision for Income Taxes | **4,448** | 19,903 | 4,412 |
| **Net Income** | **39,240** | 16,571 | 25,489 |

Chart, pie chart

Description automatically generated Chart, pie chart

Description automatically generated

Chart, pie chart

Description automatically generated

The Provision for Income Taxes in Financial Year 2017 and 2019 were respectively 15% and 10% of the Income before Taxes, however, for Financial Year 2018, the Income Taxes was provided at 55% of the income before taxes. Such unusual high tax provision may raise investors and creditors’ doubtfulness in Microsoft’s management as it likely to imply the requirement for tax adjustment or penalty due to past years non-compliance financial reporting. If tax penalty is the cause of this high value, it will sure to impact Microsoft’s reputation.

|  |  |  |  |
| --- | --- | --- | --- |
| **In $ Millions - Year Ended June 30** | **2,019** | **2,018** | **2,017** |
| **Current Taxes** |  |  |  |
| U.S. Federal | **4,718** | 19,764 | 2,739 |
| U.S. State and Local | **662** | 934 | 30 |
| Foreign | **5,531** | 4,348 | 2,472 |
| **Total Current Taxes** | **10,911** | 25,046 | 5,241 |
| **Deferred Taxes** |  |  |  |
| U.S. Federal | **(5,647)** | (4,292) | (554) |
| U.S. State and Local | **(1,010)** | (458) | 269 |
| Foreign | **194** | (393) | (544) |
| **Total Deferred Taxes** | **(6,463)** | (5,143) | (829) |
| **Provision for Income Taxes** | **4,448** | **19,903** | **4,412** |

The annual report further show the high tax provision was payable to U.S. Federal and the underlying reason for this adjustment was due to the enactment of Tax Cuts and Jobs Act (TCJA) into U.S. tax law on 22-December-2017. Microsoft has illustrated the impact of this significant change of existing tax law to its organisation in Note 12 of this Annual Report. Microsoft has also explained the election of deferring method for this one-time imposed tax transition settlement. Besides, Microsoft also illustrate the result of the tax benefit from its cost saving strategy for FY2019.

Although, the high taxes provision may shock the stakeholders but Microsoft’s effort in tax saving and cash flow management should be recognized. The detail explanation in note 12 regards to the change of U.S. tax law is also sufficient to clear our doubts. All these efforts shows Microsoft’s responsibility in managing the investors’ fund and make every possible effort to increase shareholders’ value.

**Appendix A**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Comprehensive Income Statements** | **2019** | **2018** | **2017** |  |  |
| **Year Ended June 30, 2019** | **$'m** | **$'m** | **$'m** |  |  |
| **Revenue:** |  |  |  |  |  |
| Product | **66,069** | 64,497 | 63,811 | **2%** | 1% |
| Service and Other | **59,774** | 45,863 | 32,760 | **30%** | 40% |
|  | **125,843** | 110,360 | 96,571 | **14%** | 14% |
| **Cost of Revenue:** |  |  |  |  |  |
| Product | **16,273** | 15,420 | 15,175 | **6%** | 2% |
| Service and Other | **26,637** | 22,933 | 19,086 | **16%** | 20% |
|  | **42,910** | 38,353 | 34,261 | **12%** | 12% |
| **Gross Margin** | **82,933** | 72,007 | 62,310 | **15%** | 16% |
| **Operating Expenses:** |  |  |  |  |  |
| Research and Development | **16,876** | 14,726 | 13,037 | **15%** | 13% |
| Sales and Marketing | **18,213** | 17,469 | 15,461 | **4%** | 13% |
| General Administrative | **4,885** | 4,754 | 4,481 | **3%** | 6% |
| Restructuring | **0** | 0 | 306 | **0%** | -100% |
|  | **39,974** | 36,949 | 33,285 | **8%** | 11% |
| **Operating Income** | **42,959** | 35,058 | 29,025 | **23%** | 21% |
| **Other Income (Expense), Net:** |  |  |  |  |  |
| Interest and Dividens Income | **2,762** | 2,214 | 1,387 | **25%** | 60% |
| Interest Expense | **(2,686)** | (2,733) | (2,222) | **-2%** | 23% |
| Net Recognized Gains on Investments | **648** | 2,399 | 2,583 | **-73%** | -7% |
| Net Gains (Losses) on Derivatives | **144** | (187) | (510) | **-177%** | -63% |
| Net Losses on Foreign Currency Remeasurements | **(82)** | (218) | (111) | **-62%** | 96% |
| Other, Net | **(57)** | (59) | (251) | **-3%** | -76% |
|  | **729** | 1,416 | 876 | **-49%** | 62% |
| **Income before Income Taxes** | **43,688** | 36,474 | 29,901 | **20%** | 22% |
| Provision for Income Taxes | **4,448** | 19,903 | 4,412 | **-78%** | 351% |
| **Net Income** | **39,240** | 16,571 | 25,489 | **137%** | -35% |
| **Other Comprehensive Income (Loss), Net of Tax:** |  |  |  |  |  |
| Net Change related to Derivatives | **(173)** | 39 | (218) | **-544%** | -118% |
| Net Change related to Investments | **2,405** | (2,717) | (1,116) | **-189%** | 143% |
| Translation Adjustment and Other | **(318)** | (178) | 167 | **79%** | -207% |
| Other Comprehensive Income (Loss) | **1,914** | (2,856) | (1,167) | **-167%** | 145% |
| **Comprehensive Income** | **41,154** | **13,715** | **24,322** | **200%** | -44% |

**Reference**

Yau, N. (2013). Data Points: Visualization That Means Somethin. John Wiley & Sons.