



FACULTY OF COMPUTING

SEMESTER 1 2023/2024

SECP1513 – TECHNOLOGY & INFORMATION SYSTEM

SECTION 2

ASSIGNMENT 3 – REPORT ON INDUSTRY TALK 2 (SYSTEM DEVELOPMENT)



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GROUP 6

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1. Description of System Development

System Development is a six-phase approach to problem-solving used to analyze and enhance information systems. Firstly, a **preliminary investigation** was conducted to determine whether a new information system was required. **System analysis** is the following stage, which collects data on the existing system and evaluates it to figure out its requirements going forward. After that, **system design**, which involves identifying the options, choosing the most suitable system, and preparing a report on the process. Next, is the **system development** stage, which involves the system's creation (new or upgraded) based on the specifications planned in the earlier stage. The development is done using programming languages such as C++ and Python. During the **System Implementation** stage, the system build will be implemented onto computers and training sessions will be given so that users can utilize the system properly. Finally, in the **System Maintenance** phase, the system is monitored to ensure it meets the user's expectations. If the system fails to do this, it needs to be modified using SDLC processes again until it finally meets all the user's expectations.

2. History of System Development

The term was first coined in the 1960s when there was a demand for large business systems, and it was necessary to first plan and define the processes required to build the system. However, because teams were small and users were not given much importance in building systems, there was no need for refined methods. As time passed and technology advanced, systems became more complex, and users became more involved in the technologies. Alternative approaches and frameworks have been created to guide the system creation process. Throughout the history of system development, the waterfall model has been one of the most popular development models. Winston W. Royce developed the first iteration of the waterfall model in 1970 (Massey and Satao, 2012). It was popular for its strictly defined model, including testing the system and providing high-quality documentation. Despite its advantages, it also has defects that lead to modifications of the original model some of which are the Sashimi model, Prototype model, and Spiral model. The most popular methodology currently is the Agile model, and the Agile Manifesto was created in 2001 along with 12 principles to explain the values of the Agile methodology (Ashmore and Runyan, 2014). This manifesto was a set of accepted principles for the development of

contemporary software. Overall, system development has undergone and will continue to undergo many modifications and advancements to mitigate potential project failures and minimize costs.

3. Technology and Tools

- Database/OLAP

PostgreSQL is a free, open-sourced database service that emphasizes extensibility and SQL compliances. Other services such as ClickHouse and Druid are also commonly used in the everyday life of a software developer. Clickhouse is an open-sourced database management system that is column oriented used for online analytical processing. On the other hand, Druid is a NoSQL, high performance, real time analytic database, which will be used when real-time ingestion, fast query performance, and high uptime are required.

- Visualization Tools

Visualization tools such as Tableau, PowerBI, Metabase and Superset are used to comprehend and present the existing data in a more readable way, for example, visualization tools turn graphs and flowcharts for a better view of data. Tableau is a more beginner friendly tool for data visualization as it does not require the user to have knowledge of programming. Conversely, PowerBI is tightly integrated with Microsoft products and tends to be easier to use when connected with a large dataset.

- ETL/ELT

Apache Airflow is an open-source workflow management platform used to build pipelines. It initially focused on distributed data processing and allowed system developers to develop, plan, and monitor ETL / ELT processes. Apache Spark is one of the most popular big data open-source frameworks. It leverages in-memory caching and optimized query execution to enable fast analytical queries against data of any size.

- Programming Language

Structured query language (SQL) enables programmers to store, retrieve and manipulate data in database system. SQL uses statements that start with a command to manage the data. Bash is one of the common shells used in Unix\Linux to prepare, sort, filter, clean and update precise data especially when there are large quantities of data that need to be processed.

Reflections:

Chua Jia Lin

To be a system developer in the next four years, I must master the programming languages and tools needed to develop a system. Besides, I should also get more experiences of developing a system by doing some projects with my teammates in university and internship.

Teh Ru Qian

In the next four years, I want to discover more about new development processes, programming languages, and technologies. Not only in school, but also participate in online forums and webinars about system development. Therefore, I'll become a well-rounded developer one day.

Goe Jie Ying

I will be strengthening my programming skills, keeping myself updated on the latest technologies, and practicing lifelong learning to become a proficient system developer in the next four years. I will work with teammates on various projects to enhance my teamwork and system development skills.

Tan Yi Ya

In the next four years, I shall work hard to become a system developer. I want to explore new fields about system development by trying to learn little by little every day. I will also practice teamwork and gain experiences along my study.

Najma Shakirah binti Shahrulzaman

For these four years to come, I'll focus on building relevant skills and finding experience that is related to becoming a system developer. I'll also improve my soft skills such as communication and teamworking to become a splendid developer.

The skills are required to be data engineer in the future

Understanding the different abilities needed for today's data analytics employment is essential if we want to become a data engineer. An article show that examines prospective developments in the industry and adjusts one's skill set accordingly. For instance, data engineering can benefit from some of the database technologies' abilities.

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