**Unit 2: Reviewing Modelling Languages and Socket Programming**

Welcome to Week 2. This week we shall gain some hands-on experience of working with the Unified Modelling Language (UML), which is important when documenting a system design and using it to communicate with project stakeholders. You will also be introduced to the UML alternative, SysML. We will also implement a distributed communication system using Python. You will also be required to carry out some research this week, by investigating academic literature to become aware of the challenges involved in converting a monolith into a set of microservices.

**On completion of this unit, you will be able to:**

Discuss the steps involved in evolving a monolith system to a microservice system.

Create a flow chart using UML or SysML notation within an open-source modelling tool.

Implement the sockets which support distributed computing using Python, with a client enabled in one process and a server enabled on the other.

**Reflection:**

Among the key drivers behind adopting a microservice architectural style is the need to improve scalability. The following are the stages that are often involved in the migration process when moving from a monolithic system to one that is based on microservices (FRYE, 2020):

1. Analyze logical components.
2. Consolidate and rework the individual components.
3. Analyze components interconnections.
4. Determine component groupings.
5. Develop an application programming interface for a distant UI.
6. Transform component groups into macro services (move component groups to separate projects and make separate deployments).
7. Convert macro services to microservices.
8. Repeat the steps 6-7 till finished

**Systems Modeling Language:** System architecture and functional specification modeling are two of the primaries uses for SysML. To draw the flowchart in SysML you have to follow these steps User, S. (n.d.):

1. Start Modelio
2. Launch a new project
3. To access Modules, go to Configuration.
4. Click the "Add module to project" button, then select the SysML Architect module that you want to add to the project.
5. Then select the flowchart and make it.

On the other hand in UML its just a simple to make flowchart just select the file from menu and select the flowchart.

It's possible to refer to the process of creating and using sockets as "**socket programming,"** as sockets are a form of software. The program in question enables for bidirectional communication between two sockets. Connecting two sockets (also called nodes) and allowing them to communicate in real time makes it a great option for the creation of a wide range of applications (Bavosa, A., 2019).

We also implemented the socket programming in which implement the sockets which support distributed computing using Python, with a client enabled in one process and a server enabled on the other.

Graphical user interface, text, application

Description automatically generated

**References:**

Bavosa, A. (2019, January 11). Socket Programming in Python: Client, Server, and Peer Examples. Retrieved from PubNub website: https://www.pubnub.com/blog/socket-programming-in-python-client-server-p2p/

FRYE, B. (2020). *8 Steps for Migrating Existing Applications to Microservices*. [online] SEI Blog. Available at: <https://insights.sei.cmu.edu/blog/8-steps-for-migrating-existing-applications-to-microservices/>.

User, S. (n.d.). How to create a SysML diagram. Retrieved August 20, 2022, from Modelio Open Source website: <https://www.modelio.org/tutorials/how-to-create-sysml-diagrams-in-modelio.html>.