**Assignment Activity Unit 8**

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CS 1111-01

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October 29, 2025

**Question 1: Machine Learning**

Machine Learning (ML) is a type of machine intelligence that enables machines to learn from patterns in data in order to predict outcomes (IBM Technology, 2021; Rahman, 2020). ML would have a significant impact on a community center in multiple ways. One way is to optimize how various resources, rooms, and even staff are allocated. To expound, an ML model could analyze attendance patterns so as to predict which events or programs tend to attract more participants, and then automatically suggest time slots and accurate room sizes.

ML superpowers data analysis and creates endless possibilities for applications. A simple one could be an ML-driven scheduling program that analyzes past booking data to minimize conflicts, ensuring that activities such as after-school programs, fitness sessions, and educational classes do not overlap.

**Question 2: Cloud Computing**

Huawei (2022) describes Cloud Computing as a way of delivering computing services such as data storage, networking, and applications over the internet rather than relying on local infrastructure. In the context of a community center, this means enhanced communication, smoother collaboration, and reduced operational costs.

Cloud-based platforms will benefit not just community members, but staff as well. Things like file sharing, tracking attendance, and even real-time communication when off-site are made possible. An apt example is using Google Workspace or Microsoft 365 to collaborate on managing documents and calendars. This would encourage coordination, better delivery of service, and timely access to updated information among the staff, especially those working different programs.

Another benefit of Cloud Computing is scalable storage. This would allow the center to securely store large amounts of digital records without having to figure out the logistics of server maintenance.

**Question 3: Big Data**

Segal (2025, fig 1) succinctly defines Big Data as “large, diverse sets of information that grow at ever-increasing rates”. They are not easily processed with traditional tools due to their sheer volume, scope, and speed of creation/collection. When analyzed properly, though, these datasets can reveal valuable insights such as customer behaviour.

On the other hand, Blockchain technology is simply, according to MIT, Cryptography + Human Logic (Banafa, 2020). It is a literal (virtual) chain of blocks that record the details of every transaction, hence the name. Since it is a distributed database that resides on multiple computers simultaneously, it is impervious to alterations.

In the community center, Big Data can be utilized to better understand community members, their various demographics, and what appeals to them, the success rates of different programs offered at the center, etc. These datasets can be gathered via surveys, registration forms, posts on community cloud platforms, etc.

In this vein, blockchain could complement this implementation by ensuring transparency in financial operations like grants, subscriptions, and donations. Each transaction would be verifiable and secure, which is valuable for maintaining trust and accountability.

**Question 4: Internet of Things**

The Internet of Things (IoT) refers collectively to devices that are connected to the internet and may collect, store, process, or share the real-world data they interact with (Kapoor, 2019; Simplilearn, 2019).

In robotics, sensors, as the name implies, receive stimulus from the environment, detecting changes. Actuators, on the other hand, interact with the world, converting electronic signals into physical motion (Miner, 2023).

IoT is being adopted in many industries, like manufacturing and healthcare. It is fortuitous that it has a variety of applications in casual locations. Within the community center, it would be very effective at regulating temperature, lighting, ait conditioning. Even tiny details, such as automatically opening doors, would improve the experience at the community center. More importantly, these uses can optimize energy usage and ensure safety. A very good example would save utility costs if sensors were installed in rooms to detect human presence and dim lighting or disable temperature controls when the room is empty.

Service robots may be used to provide mobility assistance for elderly care or simply for delivering items (H.V, 2023). The possibilities are even more when Virtual Reality (VR) is added to the mix. VR could be applied in educational programs, recreation, or even rehabilitation (Thompson, 2022). This could be illustrated by a program that integrates virtual reality to simulate the experience of kayaking. Paired with robotics, where sensors detect participants’ movements and actuators adjust a platform accordingly, this makes for a truly immersive experience, almost comparable to the actual activity. This would be very useful for instances where the terrain does not allow for certain activities that community center members may enjoy. **References**

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