**6-1 Assignment: Memory and Storage Management**

**Memory and Storage Management for "Draw It or Lose It"**

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The gaming application "Draw It or Lose It" from The Gaming Room, currently available for Android systems, aims to expand to other operating platforms. This game, reminiscent of the 1980s television show "Win, Lose or Draw," involves teams competing to guess what is being drawn from a library of stock images. Each game consists of four one-minute rounds, with images revealed steadily and completed in 30 seconds. As a multi-user application requiring concurrent game instances, effective management of memory and storage is crucial. This paper explores the considerations and approaches for managing memory and storage for the game's expansion across multiple platforms.

In an online game, teams compete to guess what is being drawn. The system uses images from a 1600-megabyte library as clues for guessing. One crucial consideration is how to store the two hundred photos within the file system. The photo upload process significantly impacts the game's stability; too many uploads can slow down the system, and large photo sizes can hinder the process. To address this issue, using compressed photos and image caching can alleviate memory strain, avoiding re-uploading pictures when a user logs out and logs back in. Implementing persistent memory to store images on the server can prevent unnecessary reloading, while utilizing a virtual memory stack method can effectively manage memory. As Yiu explains, "Stack memory is a memory usage mechanism that allows the system memory to be used as temporary data storage that behaves as a first-in-last-out buffer" (Yiu, 2015). Additionally, virtual memory ensures the client has sufficient available memory for storing the application and accommodating future updates.

Cloud storage is the most efficient method for managing storage for “Draw It or Lose It.” While physical storage alternatives may be more costly, cloud storage is more cost-effective for the customer. By using cloud storage, clients can trust that the cloud server will securely protect their data and space. This approach provides customers with peace of mind. Additionally, if clients need to add more data or photos to the program but lack storage space, they can quickly obtain more storage space from the cloud. The following quote shows the application of the Cloud in this situation, “Cloud users can store and share data on a cloud server, reducing the burden of local storage and ensuring data integrity, even with multiple users accessing it” (Selvamani et al. 2015).

Memory and storage utilization in this game application varies depending on whether the developer or the client changes the application. These modifications are temporarily stored in memory for future use. The stack memory enables the developer to add, rearrange, or remove elements from the stack. Changes made by the developer are stored in RAM until they are saved and transmitted back to the data servers. Memory forms main memory and cache, with main memory consisting of two types: RAM (random-access memory) and ROM (read-only memory). RAM is volatile, while ROM is nonvolatile (Sherry, 2021). Data in RAM originates from storage devices. When accessing a file, it is copied from storage devices, allowing for viewing and editing in memory. The memory device manufacturer writes data stored in ROM and remains unchangeable, making it stable and persisting even when the computer is powered off (Sherry, 2021).

**References**

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