**DATA STRUCTURES IN BACK-END DEVELOPMENT**

Name

Institutional Affiliation

Course

Professor

Date

# **Introduction**

PayPal is an online system used daily to make payments for items and receive and send money. When developing an online system there has to be a front-end and a back-end (Gonnet & Baeza-Yates, 2017). The back-end is an application in a computer with limited access to users and allows operations through program code. Application data is stored in the back-end because it consists of a database (Weiss, 2019). During the back-end development of PayPal, various data structures were used, and they included the following;

**Arrays**

In the back-end development of the PayPal system, arrays were used to hold data of the same type. Arrays can be an array of integers, floating numbers, or even an array of arrays. The operations done by the array in the back-end development include; traversing, which is going through elements and printing, searching for elements in the array using its index and value, and updating the value of an existing array.

**Linked Lists**

The back-end development of PayPal involved linked lists which are sequential structures consisting of several items in a linear order and linked to each other. With this, a user in the front-end can access data sequentially (Wirth, 2019). This applies when signing in, where specific steps have to be covered to be granted access.

**Queues**

Amongst the data structures used in the development of PayPal, a queue is one of them. It means that an element that is placed first will be executed first. The operations executed under queue include en queue, which is inserting an element at the end of the queue and de queue, deleting an element from the beginning of a queue (Tenenbaum & Augenstein, 2016).

**Trees**

This is a hierarchical structure that is used to organize data and is linked together. Trees were used in the back-end development of PayPal to ensure that data was organized. Binary search trees store data values in an arranged order (Samet, 2020). If a user wants to check the payment history, the details will be arranged from the latest payment to the oldest; this is achieved by using trees in the back-end.

**Graphs**

Graphs are also used in the development of the platform only that the admin can observe the curve. If there is an abnormal change in the curve, a user needs to explain, or the account gets closed.

**Conclusion**

Data structures form a crucial role in the development of Paypal. This is so because data storage is made efficient by a storage device found in the data structure. Retrieving information is also convenient when there is the usage of data structures. Large chunks of data and small data amounts require processing that should be reliable and very efficient, which is made possible by the data structure in the back end (Tarjan, 2018). With the effective use of data structures, it is also evident that disk storage space is available due to the minimization of data redundancy. Paypal is, therefore, a good online system that users can confidently utilize in the day to day activities.

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**References**

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