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10/22/17

ICT 4300

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Module 7 Discussion Questions: ICT 4300

1. Discuss the advantages and disadvantages of two tier and three tier architectures
   1. The difference between building and using a two tier versus a three-tier system in your company is outstandingly different, yet shares many similarities. There is not one that is a decisive winner in the long run. It comes down to preference and what will work best within your company. Software Testing Class’s website in basic terminology states that two tier architectures is a client and server application, where the GUI and many of the logic is processed on the client side, where data and server scripts are accessed over the server and then provided to the client. Three tier architectures standardly is known to be the composition of the web applications that we use today. There is a client layer, a business logic layer and finally a data layer. The middle layer is also sometimes referred to as the application server. For a two ties system to work properly, the communication is direct between the client and the server, ensuring a faster run time for data and GUIs (Graphical User Interfaces) to load into the application window or browser window. The article gives a scenario of a two-tiered system where two employees selling train tickets at two separate counters are accessing the application and database at the same time. As each of the employees interacts with the GUI, they are also accessing the SQL database which holds all of the available ticket information. On a larger scale, if this happens at the same time from multiple employee entries, the system can be compromised with load times and database confusion. In the two-tier system layout, the server cannot respond with multiple requests of fata at the same time and therefore and result with data integrity issues to the client’s application and GUI. The advantages of such a system is that it is easier to maintain and the modification is easier with faster communication. The disadvantages are the two-tier systems will see stronger performance with less users and weaker performance with more connected users to the system. This is also a very expensive method for building and maintaining, due to the fact that integration of other components to the system is not easy and scripts have to be written to work with both the client and server layers at the same time. Three tier systems are a little different. Having the middle business logic layer can be crucial for many companies with a large number of users. The client layer which can also be called the presentation layer contains the UI/GUI of the application and will simply display the data or take user input as the user acts and utilizes the application. The second layer, the Business Logic Layer, is used for data validation and insertion. This is the bridge between the client and server layers. It performs all of the necessary logic and algorithms from the data that the server is sending to the client or the data that the client has entered and sending to the server or database. The last layer of the system is the data or server layer. This layer cannot be directly seen or interacted with from the client layer. However, it allows the business logic layer to interact with the database and the server. This data layer contains methods to connect with the databases in your system and allows the insertion of data, as well as updating, deleting, and retrieving data from the database. Most of this will be based on the input data from the user. Some of the advantages are that it is high performance and easily scalable because of the differentiation of each of the layers in the system. It performs better with the ability to perform and cache data calculation and logic in the middle business logic tier. The network utilization is minimized which will also ensure faster load times for the data and the client layers. It is very flexible and more secure. This is because the client cannot view or directly manipulate the database in the system. It is also easier maintained with modifications only affecting the layer they are being implemented on. The only true disadvantage to this system is that there is increased complexity and effort when understanding or using this system.
      1. <http://www.softwaretestingclass.com/what-is-difference-between-two-tier-and-three-tier-architecture/>
   2. Personally, if I had to select one of the system architectures out of the two-tier and three-tier choices, I would most likely choose to go with the three-tier system architecture. This is because I would prefer the security and scalability that the middle tier of business logic would provide for the business or organization that I would be working in. Unfortunately, with two-tier systems, the client and the server/database layer have a direct correlation. The middle business logic tier of the three-tier architecture allows for the user and the server or database to be completely separated. Yes, calls to the database or server are completely going to be made and manipulated from the user. However, the user will not be able to physically view the database and or make direct changes to the database or server, which in turn, will allow for beefier security. Also, all of the logic will be performed by the second tier and will require less computing power and time for the client and the browser or application on the computer. Now, cloud computing, which is similar, is causing a very similar action. In this instance, not only data is being stored on the cloud, but also much of the hardware. Therefore, any data processing and UI rendering will be loaded from the server and quickly displayed on the client. Using two-tier systems can be easier to understand with little experience, but they are not scalable and the source code to the system will directly affect either system. When in three-tier architecture, the source code separates each module. There are always positives and negatives to anything, but in the sense of a larger corporation or business, three-tier provides faster loading, more security, and easier scalability with the company growth. That is why I personally would choose three-tier system architectures for my company.