Assignment #06 - Software Engineering

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Chapter 13. Exercise 13.8 - Answer

In general, input validation alone can never prevent all attacks, but it can reduce the effects of an attack and minimize the impact of any successful attacks. Validation is also crucial for the performance, stability and usability of the software. When submitting incorrect or corrupted data, the application may return incorrect results, fail to load, or even cause a server-side crash. Therefore, it is important to check user input data before performing any procedure.

Chapter 14. Exercise 14.2 - Answer

There are three main types that have to be considered in resilience planning.
First is threats to the confidentiality of assets. In this case, data is not damaged, but it is made available to people who should not have access to it.
Second is threats to the integrity of assets. These are threats where systems or data are damaged in some way by a cyberattack. This may involve introducing a virus or a worm into software or corrupting organizational databases.
Third is threats to the availability of assets. These are threats that aim to deny use of assets by authorized users.
To counter these threats, organizations should put controls in place. Examples of such controls are: Authentication, where users of a system have to show that they are authorized to access the system; Encryption, where data is algorithmically scrambled so that an unauthorized reader cannot access the information; Firewalls, where incoming network packets are examined, then accepted or rejected according to a set of organizational rules.

Chapter 15. Exercise 15.2 - Answer

There are benefits of software reuse as more rapid deployment of a reliable system, avoidance of risks by using existing software, focus on the core activities without having to devote a lot of resources to IT systems development, simplified updates as these are the responsibility of the application system vendor rather than the customer, bringing a system to market as early as possible.
Maintainability and scalability are the highest prioritizations when you develop a long-lifetime system. Over its lifetime, you will have to adapt the system to new requirements, which will mean making changes to parts of the system. If you do not have access to the source code of the reusable components, you may prefer to avoid off-the- shelf components and systems from external suppliers. Therefore, it will be more reliable to use ready-made components for large-scale and long-term systems.

Chapter 16. Exercise 16.4 - Answer

First of all, this allows different companies to create components that can interoperate with the components of other companies without either having to know in advance exactly which components it will be working with.
The standard component model is like a skeleton, it has default parameters and functions. And we, in turn, add the functions we need to the standard components. Nature has conceived so that the skeleton of all people is the same, and the physique is different.

Chapter 17. Exercise 17.9 - Answer

There are some beneftis.
The use of distributed components facilitates interaction across machine boundaries, and this allows the system to harness the resources of multiple computers.
Distribution of components may result in increased system availability, with multiple instances of each object residing on machines in the network.
It is intended that distributed components be constructed to supports reuse. This means that the components should be carefully designed so that they are useable in different contexts and systems.