Chapter 2

Performance Testing: Factors that Impact Performance

It is an accepted fact that no system is perfect from the viewpoint of performance. Problems pertaining to performance affect all types of systems, regardless as to whether they are client/server or Web application systems. It is imperative to understand the factors affecting performance of the system before embarking on the task of tackling them. The constraints affecting the performance may be many but can be broadly classified into (i) technical and (ii) project related factors. The former is very much pronounced in the case of Web-based systems, as the relevant technology has not attained the stage of maturity to address the issues on its own. On the other hand, the project managers struggle to develop an optimal system within the existing technology framework. This in turn, generates many project related factors sub optimizing the performance. Likewise, many factors affecting the performance of the system are discussed in this chapter. The subsequent chapters deal at length with the methods and strategies to tackle these factors.

Project Peculiarities

Management of projects broadly encompasses planning activities during the phases of development and implementation of a system. For instance, the planning at the systems development stage calls for selection of appropriate technology, skill sets, and software.
Defective planning at this stage would have a severe impact on the performance of the final product. The planning stage includes understanding various techniques available for development, skill sets required as well as the use of effective software tools. Therefore, the sooner these peculiarities are understood and addressed, the lesser the possibility of severe performance problems.

**Rapid Application Development Approach**

The fast changing technology coupled with ever increasing competition had a radical change in the perception of customers toward the product under development. They want to have a feel of the product as it evolves during the development. They would like to be involved in the development phases, and more importantly, they desire to launch the product in the market at an earliest point in time. This, in turn, leads to a pressure on the software development team to reduce the development cycle time for the product. Rapid Application Development (RAD) approach is now increasingly applied for rapid prototyping. Although RAD is based on the typical classic life cycle model of software engineering, its emphasis is more on prototyping and involves iterative design and development phases.

RAD approach follows traditional SDLC steps, but the phases are combined. Since the product has to be released in a tight time interval, thorough involvement of dedicated and well trained developers is required. Some of the issues that need to be addressed in RAD approach, particularly from the angles of performance, are (see Ames, 2005):

- Shorter development time in development may lead to release of low quality product due to lack of concentration on performance.
- Chances of missing information due to the rapid approach may disqualify the performance objectives.
- Inconsistent internal designs like too much of cluttering of objects, sequence of screen navigation (for instance, navigating from one screen to another screen, out of which one screen may be having connections with a database and another screen may contain the presentation of data which is retrieved from the database [filling a combo box, etc.]) may be observed over time, after the product is deployed.
- High possibility of violating coding standards, and unoptimized code may consume too many resources.
- Module reuse for future projects may not be possible due to the project specific design.
- Module may not be flexible for graceful scaling.
- System may collapse for sudden surge in user base.

In RAD, the importance is given to the functionality of the system, rather than to its performance, presumably due to the short development cycle time (see *Software
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www.igi-global.com/article/image-recognition-of-rapeseed-pests-based-on-random-forest-classifier/182260?camid=4v1a