

## Software Engineering 2

### 05 Task Performance 1

1. Read the case study entitled "Hudsonbanc Billing System Upgrade" below.

Two regional banks with similar geographic territories merged to form HudsonBanc. Both banks had credit card operations and operated billing systems that had been internally developed and upgraded over three decades. The systems performed similar functions, and both operated primarily in batch mode on mainframe computers. Merging the two billing systems was identified as a high-priority cost-saving measure. HudsonBanc initiated a project to investigate how to merge the two billing systems. Upgrading either system was quickly ruled out because the existing technology was considered old, and the costs of upgrading the system were estimated to be too high. HudsonBanc decided that a new component-based, Web-oriented system should be built or purchased. Management preferred the purchase option because it was assumed that a purchased system could be brought online more quickly and cheaply. An RFP (request for proposal) was prepared, many responses were received, and after months of business modeling and requirements activities, a vendor was chosen. Hardware for the new system was installed in early January. The software was installed the following week, and a random sample of 10 percent of the customer accounts was copied to the new system. The new system was operated in parallel with the old systems for two months. To save costs involved with complete duplication, the new system computed but didn't print billing statements. Payments were entered into both systems and used to update parallel customer account databases. Duplicate account records were checked manually to ensure that they were the same. After the second test billing cycle, the new system was declared ready for operation. All customer accounts were migrated to the new system in mid-April. The old systems were turned off on May 1, and the new system took over the operation. Problems occurred almost immediately. The system was unable to handle the greatly increased volume of transactions. Data entry and customer Web access slowed to a crawl, and payments were soon backed up by several weeks. The system wasn't handling certain types of transactions correctly (e.g., charge corrections and credits for overpayment). Manual inspection of the recently migrated account records showed errors in approximately 50,000 accounts. It took almost six weeks to adjust the incorrect accounts and update functions to handle all transaction types correctly. On June 20, the company attempted to print billing statements for the 50,000 corrected customer accounts. The system refused to print any information for transactions more than 30 days old. A panicked consultation with the vendor concluded that fixing the 30-day restriction would require more than a month of work and testing. It was also concluded that manual entry of account adjustments followed by billing within 30 days was the fastest and least risky way to solve the immediate problem. Clearing the backlog took two months. During that time, many incorrect bills were mailed. Customer support telephone lines were continually overloaded. Twenty-five people were reassigned from other operational areas, and additional phone lines were added to provide sufficient customer support capacity. System development personnel were reassigned to IS operations for up to three months to assist in clearing the billing backlog. Federal and state regulatory authorities stepped in to investigate the problems. HudsonBanc agreed to allow customers to spread payments for late bills over three months without interest charges. Setting up the payment arrangements further aggravated the backlog and staffing problems.

## 2.) Answer the following questions:

a.) What type of installation did HudsonBanc use for its new system? Was it an appropriate choice?

- The type of installation that the HudsonBanc used for its new system is the parallel deployment in which they both maintain the old and new system while installing the new system. For the approach of parallel development, the old and new systems are executed for a certain period. It was an appropriate choice as the old system will be running continuously until the new system is implemented and tested in the machine. However, running both systems required extra effort, with staff managing duplicate entries and ensuring accuracy, which added complexity. While parallel deployment helped smooth the transition, the unexpected performance bottlenecks and data errors later revealed that more extensive stress testing could have made the switch more efficient. A targeted stress testing with real-world data could have helped see weaknesses at an early stage, which allows HudsonBanc to improve the new system before terminating the old one

b.) How could the operational problems have been avoided?

- HudsonBanc could have avoided the problems by testing the new system more thoroughly before switching. They should have checked for errors to make sure everything worked properly. Having a backup plan would have helped them fix issues faster without disrupting customers. If employees had been trained well, they could have handled the system better and avoided mistakes. Instead of rushing, they could've introduced the new system step by step to catch problems as soon as possible. They also could have checked for issues to make sure everything worked exactly as expected, like running stress tests in real world conditions, prevent bottlenecks once the system deploys or goes live. Also, they could have planned a backup plan where you can switch back to the old system if potential major issues show up. Lastly, if employees had enough training using the new system to avoid data entry errors, delays in transactions, etc., they might have anticipated and resolved issues effectively.