

**Solution Manual for Project Management Process Technology  
and Practice 1st Edition Vaidyanathan 0132807181  
9780132807180**

Full link download

Solution Manual: <https://testbankpack.com/p/solution-manual-for-project-management-process-technology-and-practice-1st-edition-vaideyanathan-0132807181-9780132807180/>

Test Bank

<https://testbankpack.com/p/test-bank-for-project-management-process-technology-and-practice-1st-edition-vaideyanathan-0132807181-9780132807180/>

## **Chapter 1**

### **Projects and Project Management**

#### **NOTES for the Instructor:**

1. The study projects and the cases are posed as challenging assignments to students. This study guide elaborates all the material needed to teach those study guides and cases. The study projects can be assigned in two different ways:
  - a. If you want to evaluate the ability of the students to form assumptions, research materials, and understand the study projects, you can ask the students to work on the study project without any additional information. In this case, the students should be encouraged to obtain necessary information using the Internet.
  - b. If you want to provide all the information, you can provide that information shown in the following pages to solve the study projects.

#### **Objectives**

- Understand what a project is, provide examples of projects, and understand different types of projects pertaining to various industries
- Classify projects based on technology uncertainty and system scope
- Identify project lifespan in various industries and explain the basic six phases of a project
- Describe project management and its benefits
- Identify factors for project success and project management success and understand how these factors affect either the success or failure of projects as well as how each one of these factors affects the other five factors in project success
- Identify project management components and understand how these components can be used to realize project success

### **Cases**

- Information Technology Case: SAP Project at NIBCO, Inc.
- Healthcare IT Case: Memorial Hospital of South Bend: Computerized Physician Order Entry Project
- Financial Services IT Case: Syndicated Community Bank: Core Banking Systems Replacement Project
- General Construction Case: Craig Constructions, Inc.: A Home Improvement Project

### **Review Questions**

1. A project is a unique activity that adds value, expends resources, has beginning and end dates, and has constraints and requirements that include scope, cost, schedule performance, resources, and value.
2. Uniqueness, start and end times, resources, scope, constraints and requirements.
3. Projects are unique activities. Non-projects are mundane activities. Projects have a beginning and an end. Non-projects have a beginning but people do those activities over and over again.
4. Construction typically can be classified as residential housing, institutional and commercial buildings, specialized industry such as oil refineries or nuclear power plants, and infrastructure and heavy construction such as highways, mass transit systems, dams, and bridges. Computer-aided design and construction robots have

automated many tasks in modernized construction. Adoptions of these technologies and technological innovations in materials and construction have resulted in significant reductions in construction cost.

5. Healthcare projects will typically be varied in their nature depending upon the needs of the client and the hospital. Healthcare projects focus on improving patient care and service delivery while increasing innovation and efficiency. In healthcare projects, a considerable amount of time will be spent working on-site and liaising with process-owners. Common trends include the adoption of advanced technologies— information technology solutions including clinical information systems, Computerized Physician Order Entry, and Electronic Medical Records (EMRs).
6. IS projects include computer-related hardware and software projects, networking, infrastructure, and software design and development projects. Mobile enterprise applications, successful business social network applications, new exciting products, cloud computing and virtualization, new business intelligence tools hosted in the cloud, building virtual trade shows and e-seminars, online contractor services, and hosted services are some of the latest trends in this industry.
7. New product development projects bring a new product or service to market. Some of the unique features include the project manager’s tasks in these types of projects. A project manager needs to coordinate deployment of a product or new releases, coordinate testing of such new products and releases, and coordinate pilots with potential product users.
8. We can classify projects using technology uncertainty and technology complexity as two dimensions.  
Projects based on technology uncertainty:  
There are four types: A, B, C, and D. SAP implementation can be considered as Type C as the project integrates with other exiting technologies.  
  
Project based on complexity:  
There are three types: low, medium, and high. DVDs can be considered a Low complexity classification.

9. Project life span is a progression through a series of differing stages of development of a project. A phase is a group of activities. The project lifespan is the total of the phases through which a project passes from the time.
  
10. In general, there are six phases in a project.
  
11. IS projects, R&D projects, and new product development products seem to have a long lifespan.
  
12. It is hard to say what types of projects have short lifespans.
  
13. Project management is the act of collaboration among people and other required resources such that a project is planned, organized, and controlled effectively to accomplish its goals and objectives. The benefits of project management are:
  - Project management will make sure that the scope of a project as required by a customer is completely met.
  - Project management provides a process that can be followed to the successful completion of projects.
  - The first successful project management process will lead the way to successfully complete many more projects.
  - Success from project management will inspire individuals and organizations to perform efficiently in the future.
  - The project management process will help individuals and organizations map a clear strategy to complete a project successfully.
  - The project management process will help projects support the organizational goals by aligning them to the organizational strategy.
  - Project management will force individuals and organizations to identify and assess all perceived risks and exposures so that they know the problems before they surface.
  - Project management will help individuals and organizations to know when goals and objectives cannot be achieved.
  - Project management will make individuals and organizations understand and work toward their customers' requirements, thus increasing quality of the output.
  - Project management will create a structure and process that enables a project to be kept under control.
  - Project management will motivate individuals and organizations to ensure a quality output.

- Project management will help deliver projects successfully.
  - Project management will help measure goals and objectives.
  - Project management will help individuals and organizations save time and money.
14. Project success deals with the impacts of a project's final product on stakeholders. Project management success focuses on the processes of a project including successful accomplishment of cost, time, and quality aspects.
  15. Scope, cost, schedule, resources, performance, and value.
  16. Completion of project within scope or customer requirements; Completion of project within allocated budget; Completion of project within allocated schedule or period of time; Completion of project using allocated resources; Completion of project within established performance and technology standards; and Completion of project to maximize project value for stakeholders

### **Teaching Points - Discussion Questions**

1. Anyone can become a project manager in a company.  
Yes. A project manager need not be a technology or subject expert, but trained in project management. However, it depends upon the abilities and personality of the person. There are certain behavioral and personal characteristics that define a competent project manager and unless those traits are exhibited, it will be a risk to place a person as a project manager for a critical project. To reduce such risks, an inexperienced person wanting to be a project manager can head up a simple project, show the results, and depending on the results may be hired as a project manager.
2. A very complex and very unique task can be made into a number of smaller manageable tasks.  
It can be made into a number of smaller manageable tasks to a point. You can break down the job into smaller components but there is a point where you have to stop. There is a point where a task cannot be made any simpler. It is also important to note that taking up smaller jobs and delivering them successfully and tackling complex jobs later leads to better project team morale. However, there may be instances that this is not possible and at that time, the project risks have to be evaluated meticulously and those risks have to be mitigated well before

attempting complex and unique tasks. Many companies may opt to outsource their projects at this juncture.

3. Do power and authority contribute to project success?  
To control the strategy, project managers need to have the proper authority to make decisions. Poor communications and lack of synergy can ruin projects. Too much power and authority may create turbulence among the project stakeholders. A project manager needs to have the necessary authority in order to complete a project successfully. Power by itself cannot make a projects successful; only if and when used properly, can power contribute to project success.
4. Is project management important in firms? Why? Why not?  
Yes; organizations need someone to manage projects and communicate to stakeholders. A project manager is needed to control scope and other success factors and to manage resources effectively even in small firms and small projects. Project management should be fully incorporated into the corporate culture, even when undertaking small projects. Project management is important due to the benefits it offers as discussed in this chapter. While it may be difficult to hire and engage a project manager in many small and medium sized firms, it is highly recommended to make sure that projects are implemented successfully through the use of project management techniques.
5. Can all benefits of project management be realized? How? Why? Why not?  
Yes, it is possible to realize all of the benefits of project management but that is not always the case. It greatly depends on the experience of project management in a firm. It certainly depends upon how projects are structured. There are a lot of factors that can influence a project manager and the project management to reap all benefits including power, authority, accountability, responsibility, and reliability, culture of the firm, the complexity of the project, the project knowledge, risks, etc.

### **Answers to Chapter Problems**

#### ***Problem 1:***

Although hiring an individual for a company would be considered a routine part of the company's HR department, this may be a project. A project has four characteristics. First, it must be a unique activity. Finding a test engineer may be a unique situation. Second, a project has to have a beginning and an end. The hiring process of one individual has a beginning and an end, starting with the listing of the criteria needed for the position to the actual hiring of the person. Third, a project has constraints and requirements that include scope, budget, schedule, resources, performance factors, and creation of value to stakeholders. This activity adds value to the company, probably has

a deadline, and probably has a budget to find the right person. Fourth, a project needs resources. The hiring of an employee requires time from HR, Finance, and Testing departments. To summarize, this activity does add value to the company, it has a beginning, as well as a deadline with constraints and requirements, and it could also be defined as having a goal or objective.

***Problem 2:***

This may not qualify as a project because it is not a unique activity to the department's process particularly if this is an ongoing activity every month. However, if this is not an ongoing process every month in this particular department, and if this department was asked by the company to select the employee of the month from their team of employees, this could be considered a unique project. In this case, this may not be a part of the operational activities of the manager or the department. This process would have a definite beginning and end as required by a project (i.e., a timeline in which to ascertain which employee deserves the award). This contains constraints and requirements as the employee must be chosen from the qualified candidates and a list of selection criteria would have to be compiled before the beginning of the selection process. This process would add value as it increases the morale and the productivity of the workforce. The process would have a goal or objective, selecting the most deserving person for the award.

***Problem 3:***

- A. For a *complex task* to be considered a project, we need more information. Without additional information, a complex task would not have any influence on the decision for a project or non-project. The fact that the task is complex tells us nothing. If the task had a beginning and an end, had constraints and requirements such as a scope, timeline, budget, cost and resources allocated, as well as performance review to determine the success, thus adding value as well as a definitive goal or objective, we could classify it as a project. Moreover, a complex task can be considered a routine chore in the process of completing an everyday job. A project can be complex or not complex at all, and we need more detail to categorize the situation as a project or a non-project.
- B. A task *with low complexity and is not unique* is not a project. The complexity of the task has no influence on our decision to categorize the situation as a project or a non-project. The fact that the task is not unique tells us that it is probably an operational task and therefore not a project. An example of a low complexity task that is not unique, and is not a project would be an accountant entering weekly data. This task is not complex and is done frequently by the accountant making it an operational task.
- C. A task *with low complexity, but is unique in nature* might be defined as a project due to it fulfilling the unique criteria. The fact that the task is unique tells us that it is not an operational task, and probably could be considered a project. An example of a low complexity and unique task that could be considered a project

would be a person purchasing a computer for personal use. This task is not done very often and is not a very complex task.

- D. To define a task *with high complexity, but very low in uniqueness* as either a project or non-project we would need to have more information to influence our decision. The complexity of the task has no influence on our decision to categorize the situation as a project or a non-project. The fact that the task is unique, albeit low uniqueness, tells us that it may possibly be an operational task or something that the firm does less often. Hence, to consider whether a project or non-project, more information about the firm and the task would be needed such as whether the task has a beginning and an end, constraints and requirements, adds value and has a goal or objective.
- E. The very unique aspect of a task *with high complexity that is very unique* would influence us to define the task as a project. The fact that the task is very unique tells us that the firm does not do the task often and it could be considered a project. As long as the project has a beginning and an end, constraints and requirements, adds value and has a goal or objective, we would classify this as a project. An example of a high complexity and very unique task that could be considered a project would be building a city. This task is not done very often making it unique, and the task is very complex in nature with a lot of details and intertwined steps.
- F. A *very unique task* is a project. The fact that the task is unique tells us that the firm does not do the task often and it could be considered as a project. Again, as long as the project has a beginning and an end, constraints and requirements, adds value and has a goal or objective, we would classify this as a project. An example of such a project is an individual building a computer as a hobby. If this person does not do this for a living, it is safe to say that they do not do this very often, making it unique. It is also a very complex task that involves a lot of sub processes such as assembling the case, researching, installing the hardware and software, etc.

**Problem 4:**

- A. Time is one factor that will impact the project the most. The unsatisfactory lumber has to be returned and it will take possibly three or more days to get replacement lumber. By the time the project manager is almost two weeks into the one month project, he or she is still waiting on materials. Even the replacement lumber may arrive late and be unsatisfactory, causing more delays.
- B. The unsatisfactory lumber may affect project success in following ways:

*Increased Cost*— The lumber has to be returned and re-delivered which increases the cost to the project due to delays. Normally the lumber company incurs the cost of the unsatisfactory lumber, but the time delay may cause additional labor to be hired to ensure that the project is completed according to the time constraints outlined by the customer, hence adding to the cost of the project. This cost in most situations is absorbed by the sub-contractor and should not be attributed to



the customer per initiation of the contract, but the sub-contractor's profit margin may decrease if these costs cannot be made up elsewhere within the project.

*Reduced Performance* – To eliminate costs, the sub-contractor may decide to cut corners to finish the project on time. This will lead to poorer quality construction thus reducing the performance metrics established at the beginning of the project.

*Reduced Value* – Value is measured through the satisfaction of all stakeholders. The value in this project is the customer's happiness of owning a deck according to agreed upon specifications. So if the deck is not finished on time or at all; or constructed of poor quality, the customer's value could be reduced.

*Increased Resources* – The additional labor is due to delay in order to compensate for time requirements. The sub-contractor may have to increase the number of resources originally planned for by bringing in extra labor to finish the project on time.

- C. Scope; right from the inception of a construction project, contractors and sub-contractors alike generally allow for time delays within projects. Delays are a part of the construction process and are generally normal within the course of business. The sub-contractor in this case should have communicated from the beginning of the project to the customer that the time constraint may have been a little tight and asked for additional time in the contract. If this was not an option, the sub-contractors should have ensured that the other factors of the project should not have been affected as in the resources and the possibility of additional labor. The contractor should have planned the resources well in order to make sure that the project was a success. Obviously, inspection of the lumber was not in the scope process of the project. By including this process in the project, the sub-contractor could have avoided this delay by doing a number of things such as allowing more time for inspection, or letting the customer pick out or even purchase his own lumber. The other factor of additional labor needed could have been provided for in the initial contract. To ensure scope was met, the contractor could have included a discount clause to the customer by finishing the deck within the parameters of the agreed upon and clearly defined scope from the beginning.
- D. The stakeholders of the project are:
- Homeowners who want a nice deck finished on time and within budget;
  - Lumber company who has to pick up and deliver more lumber;
  - Sub-contractors who want to get paid for a completed job; and
  - Any help the sub-contractor may bring in who also want to get paid for the completed job.

Communication of the project progress is essential in every phase of a project. By communicating to the lumber company of the sub-standard materials immediately and the cost to the project, the lumber company has the chance to remedy the situation within the organization as well as the prospect of being able

to expedite the correct materials to the sub-contractor to ensure return business in the future. The lumber company is in the business of lumber and should know how to remedy the situation as best possible. The sub-contractor also needs to keep the communication lines open to the customer as well by explaining as soon as he knows of possible delays. The sub-contractor should also know where to pull additional resources such as labor if needed before the project begins. If labor resources are restricted elsewhere, the sub-contractor may not be able to remedy the time constraint as provided in the project completion. Open communication lines between all the stakeholders can equal success to a project even if a few constraints and requirements are a bit overstretched. And as stated before, the sub-contractor should already have provided for contingencies in the contract for a situation like this.

- E. Project success depends upon project management success. Project success is also dependent upon having a competent understanding of the scope of the project as well as maintaining control of its constraints. Success and failure of the project are dependent upon the following projects success factors if the project was completed on time despite the problem:
- a. Completing the project within scope or customer requirements
  - b. Completing the project within the allocated budget/costs
  - c. Completing the project within schedule
  - d. Completing the project using allocated and available resources
  - e. Completing the project within established performance metrics
  - f. Completing the project with maximization of project value to the stakeholders
  - g. Defining the project clearly with a good rationale
  - h. Aligning the sub-contractor's goals with the customer's goals
  - i. Developing a project organizational structure with associated channels of communication, accountabilities, responsibilities, and reporting facilities
  - j. Defining project requirements from the customer and establishing scope for success
  - k. Planning the project to include analysis of activities, defining and developing a major task within milestones
  - l. Estimating time, costs, resource requirements and defining performance measures and project value
  - m. Scheduling all activities effectively to reflect available resources and within the communicated schedule
  - n. Continuously monitoring and controlling scope, time, cost, performance factors, and project value
  - o. Implementation of the project
  - p. Procuring items and materials within allocated time

***Problem 5:***

Project lifespan is a progression through a series of differing stages of development of a project. The project lifespan is the total length in time of these phases that a project passes through: conception, planning, design & development, implementation, launching or termination or closure, and post implementation review. The reasons some project lifespans are longer than others varies due to scope from project to project. Management can measure achievement toward the project goals at any phase in the life span, thus making adjustments and corrections that can alter the lifespan. A number of factors could determine the length of the lifespan including project scope, goals, the industry, the nature of the project, the complexity of the project, available resources, available budget, litigation issues, management issues, customer satisfaction, upper management support, and conflicts among the various organizational departments and team members within the project. There is no way to point at one particular variable as the determining factor of lifespan. For example two different contractors could be building two identical houses with one project taking weeks and the other taking months to complete. The house with a shorter lifespan could have twice the amount of people working on it, while the other house could be waiting on permits, or the person funding the slower house could have run out of money, or there could have been a fire in the slower house. There are a number of inputs that determine the lifespan, and it would be very difficult to point to one particular cause.

## **Study Projects**

### ***Information Systems:***

#### **A. Major success factors**

##### ***Johnson Industries, Inc.:***

- Selecting the right consulting firm to implement the ERP software
- Strong support from top management
- Good communication between the company and other stakeholders in the sense of defining clear goals and implementation strategies for the project
- Meeting the high expectations and satisfaction of the customers
- Having enough resources to complete the project without sacrificing resources from other ongoing projects

##### ***NIBCO:***

- Adequate planning for each step along the way
- Thorough evaluations for the alternatives that led to the right choice of ERP package
- Good communication between top management, ERP implementers, and project team regarding the definition of clear roles
- Top management's full commitment to the project

- Realistic goal and expectations without ignoring potential problems
- Whole organization's involvement in the project which reduced user resistance to the change

*Opto-Electronics Co., Ltd.:*

- Choosing experienced and honest supplier of the ERP package and also the consulting firm
- Good communication between the enterprise, supplier and consulting firm in regards to the scope of the project and the expectations between each relationships
- Well-written planning guidelines for each task of the ERP project and a good team structure

B. Major failure factors

*Hershey:*

- Sacrificing systems testing and personnel training for the sake of expediency
- Forcing an ERP implementation project into an unreasonable timeline and scheduling cut-over during busy seasons

*Waste Management:*

- Not meeting the requirements, leading to customer dissatisfaction
- Poor communication between the company, ERP vendors and consulting firms
- Lack of consultant experience in the ERP project
- Unclear scope of work and inadequate project planning and implementation strategies
- Underestimating the complexity of the project
- More customizations in project than what was expected

*Whirlpool:*

- Sacrificing performance for the sake of getting more sales.
- Unreasonable time and schedule for the project

C. Difficulties

*Johnson Industries, Inc.:*

- Lack of definition of clear implementation strategies such as whether business processes should be centralized or distributed
- Not understanding the final solution of what the project would look like when it was completed
- Without clear strategies and goals costs and time delays increased

- Increased demand for resources to meet the deadline
- As the final solution was not defined clearly, the project managers had no direction to control and monitor how the project should be done and what the final goal should accomplish
- The project managers did not have any idea if the activities they were doing is what the company really wanted in the end
- The company did not meet its expectation right from the beginning

*NIBCO:*

- Initially, problems finding an implementation partner that would buy into their Big Bang approach
- Turned down by many potential partners because Big Bang approach was believed to be impossible
- Doubts during the implementation, even from the partner that agreed to carry on with the project (IBM), as ERP implementation was at its infancy stages
- Employees taking on additional work and overloading daily work performance
- Compensating employees for adding the project to their already difficult workload
- Delivering incentive pay bonuses to employees if the project was successful and finished on budget and on time

*Opto-Electronics Co., Ltd.:*

- Lack of satisfactory management communication to front line staff of ERP implementation value
- Lack of change management, resulting in front line staff resistance

*Hershey:*

- Cut deadlines in an effort to finish project sooner
- Poor training, resulting in poor resource performance especially in testing phase

*Waste Management:*

- Poor relations and communication with its ERP vendor when defining its business requirements
- Ambiguous requirements resulted in huge changes in the project and the company receiving an unsuitable ERP product
- Increased costs and time
- Inexperienced ERP consultants and project managers, who underestimated the project's complexity

*Whirlpool:*

- Lack of realistic goals and timeline
- Wrong main focus to catch the sales rather than making sure the system actually worked
- Unreasonably enforced schedule
- Bad and incompetent consultants

#### D. Performance features

##### *Johnson Industries, Inc.:*

- Comparisons of performance measurements before and after the project implementation
- Factors to make us understand in which ways and how the company has improved
- Information of the tangible and intangible costs to the company
- Benefits the company gained from the project implementation

##### *NIBSCO*

- Measurement of how exactly change was managed
- The number of employees trained at a time as well as how many hours they spent training to be able to run the system
- How ERP implementation affected the organization in terms of profit and number of employees

##### *Opto-Electronics Co., Ltd*

- Quantitative/qualitative measurement of the results
- Comparison with the set goals
- Variances and tweaking processes or resources to achieve short-term goals

##### *Hershey's*

- Cost measures
- Schedule measures
- Performance measures

##### *Waste Management*

- Performance evaluation and reviews on the project related to the project scope to answer questions such as which requirements the company could/ could not fulfill and why
- Total costs
- Performance evaluation/reviews can help the company for future projects

##### *Whirlpool*

- Approximate loss of failed implementation
- Approximate number of lost customers
- Estimated amount of revenue if the project had been a success after the implementation

#### E. Classification

##### *Johnson Industries, Inc.:*

C: a high-tech classification because implementation of an ERP system is integrating many new, but existing technologies.

3: ERP system is a collection of different systems that work together to achieve a common purpose

##### *NIBCO:*

C: a high-tech classification because it is integrating many new, but existing technologies.

3: ERP system is a collection of different systems that work together to achieve a common purpose

##### *Opto-Electronics Co., Ltd*

C: a high-tech classification because ERP systems are newer but already existing technology at the time of implementation in a fast-moving industry.

3: ERP system is an array of systems that work together

##### *Hershey's*

C: a high-tech classification, similar with other ERP implementation this is a newer system using existing technologies

3: ERP system is an array of systems that work together

##### *Waste Management*

C: a high-tech classification because ERP implementation uses new technologies to get the new system by using existing technologies in the market.

3: ERP system is a collection of different systems that work together to achieve a common purpose

##### *Whirlpool*

C: a high-tech classification because it is integrating many new, but existing technologies.

3: ERP system is a collection of different systems that work together to achieve a common purpose

#### F. Lifespan

The projects of Opto-Electronics Co., Ltd, Johnson Industries, Inc, and NIBCO should have the usual eight phases of MIS projects. Although the projects of Hershey's and Whirlpool were unsuccessful, they still had to go through all eight phases because their ERP implementations went all the way to the go live date. Waste Management had four phases because it stopped during the implementation phase.

#### G. Benefits

##### *Johnson Industries, Inc.:*

The company benefited from this project by being able to centralize many processes including financials, pricing, purchasing, supplier payment, and invoicing. With this centralization, the company can increase its inventory returns, improve cash flow, update information regularly, present the single systems to all customers and suppliers, track inventory activities efficiently, and lower costs to the company.

##### *NIBCO*

The company received major benefits from the ERP project. First, NIBCO got rid of its legacy system in a short time. Second, it connected all the departments and businesses in one system using a shared database. This integration improved NIBCO's services and revenues. Most importantly, the ERP project helped NIBCO reduce its operating costs by lowering inventory levels and increasing fulfillment rates.

##### *Opto-Electronics Co., Ltd.*

The company benefited by providing the ability for departments and management to easily check and manage the most updated status of orders received and arrange enterprise resources accordingly. This ability to manage resources in real-time can cut cost and improves the efficiency of company processes.

##### *Hershey's*

The company did not benefit from their ERP implementation but other companies can study and learn from the lessons of their failure.

##### *Waste Management*

Waste Management did not benefit from their ERP implementation project. However after completing the reviews and evaluation of its failure, they learned from their mistakes and use that knowledge to gain benefits in future projects.



### *Whirlpool*

Although the initial project was a failure, the company had to re-implement SAP again to gain benefits. At present, SAP is used in many functions.

## H. Implications

### *Johnson Industries, Inc*

One implication is that the requirements have to be gathered very well. In order to get the clear understanding on the project, the project managers, the consulting firm, and the ERP vendor needed to spend a large amount of time to define their requirements and the constraints of the project to make it successful. Even though spending time in making a project plan is important, it can lead to more costs and resources. Also, if the project managers spend too much time on the planning phase, the project implementation phase can be delayed. Of course, it can also lead to spending less time during implementation.

### *NIBCO*

One implication that can be drawn from the NIBCO case is that planning is the most important phase in IS implementation. Spending more time in planning means less time spent in solving implementation problems. NIBCO spent almost one year in planning. Their implementation went smoothly without facing major problems. Another implication is that flexibility during the “go live” day does not necessarily mean exceeding budget or schedule. Sometimes, a little delay in the “go live” day can save the company a large amount of money later.

### *Opto-Electronics Co., Ltd.*

An implication of this project is planning the project well. The company had many success factors; one of them was taking extra time to plan the implementation. Another one is execution of testing during the testing phase. User documentation is essential since consultants are involved as it will help to transfer knowledge after the consultants leave the project. However, all these activities will add up to more project cost, especially when employing consultants.

## ***New Product Development***

### Brief overview of Stage-Gate Process

In the table, we see a Stage-Gate system as the phases of a new product development project. The Stage-Gate system is a conceptual and operational road map for developing a new-product project from idea to launch. Each stage has a similar structure having a set of activities or processes that a team performs according to project plan. This involves an integrated analysis of the results of all

the functional activities based on the cross-functional teams. Each stage has deliverables, the team's presentation of the results of the analysis, which in turn are used by the gatekeepers at the next gate or decision point. At the gate or decision point, the determination is made to either proceed or terminate the project aiming to discriminate between the mediocre and the best projects in efforts to allocate resources to more successful projects. Gates deal with three quality issues: quality of execution; business rationale; and the quality of the action plan. The gates have outputs and the output decision must also clarify the next path forward and clearly define the goals and objective for the next stage.

#### A. Success factors

**Scope:** The requirements of the projects should be clear as to their goals and objectives that seek differentiated, superior products with the homework of each project proposal done before implementation of project. The demand of each process for a sharp, stable and early product definition should emphasize the need to plan and resource the market launch early in the game.

**Time:** There should be definite beginning and end dates, along with the critical steps specified for each of the projects, thus disciplining an ordinarily chaotic process by ensuring a complete process where no critical steps are omitted.

**Cost:** Budgets should be carefully planned ahead of time. Using this model, the firm can find that the impact of a failure which is a measure of their value is smaller or bigger when they are developing other projects for the same market as the failed project, hence keeping costs to a minimal when there is a failure and allocating the knowledge and technology to the similar market projects.

**Resources:** This seems to be one of the strongest of the success factors because the projects do create a value to the pharmaceutical companies by patenting process to protect its resources against their competitors. When a determination is made to terminate a project, resources should be reallocated to the strongest projects as they are prioritized, hence reinforcing the objective to use the knowledge, technology, and processes with the more successful projects.

**Performance:** Each project should be evaluated periodically to determine the quality of their results for the ready to market drug. The knowledge of their employees, the knowledge possessed by past experiences with other projects, the organizational knowledge, and the technology possessed by the companies should be used in the processes of all projects. The process possesses the ability to value the individual products, as well as the portfolio overall. Overall the performance metrics increases likelihood of product success.

**Value:** The accelerated pace of "ready to market drugs" have a direct effect on their stakeholders. Customer's voices should be heard and they should directly benefit from the drug for health issues. Stockholders should see the benefit from

the increased stock prices. Employees should see the benefits from the success of a completed project.

B. Difficulties

- The project manager's decision on when to end a project and consider it a "dead project" for fear of the project failure stigma
- Outside pressures to continue a project even though the project manager may consider terminating the project
- The value of a pharmaceutical company falls when a drug fails in the phase III clinical trials potentially influencing decisions to kill projects in earlier stages
- The probability of developing one successful drug, given that it is a crucial metric related to the financial value of the product development pipeline; a decision to terminate one project may be made too soon on a potentially successful project
- The power to influence the company's stock value as relating to exercising stock options and decisions not to terminate projects that may show a reduction in earnings related to CEO and other management bonuses

C. Average total value of the projects

Average total value of ALL Projects should be at least the average cost of all projects. This should be the minimum value of the projects before some of the products enter the market to make real profits for the company.

$$\begin{aligned} & \Sigma(\text{Avg cost per compound} * \text{Avg no of compounds per year} * \text{Avg duration}) \\ & = (20*10*6)+(25*6*2)+(30*4*2)+(60*2*2)+(120*2*2)+(80*1*2)= \\ & \$2,780,000,000 \text{ or } \$2.78 \text{ BB} \end{aligned}$$

Average cost of 1 unit out of 10 units to reach market = \$ 2.78BB/10 = \$ 278 MM

D. Average output rate

$(1/10) * 200 = 20$ ; An average of 20 compounds would successfully pass FDA review.

E. Performance features

- A performance feature that rewards management's decision for deciding when to terminate a project, hence saving valuable resources and costs
- Linking cost savings (decisions to terminate wasteful projects) as well as successful ventures to CEO and management bonuses

## *Healthcare*

A. Success factors

The performance (quality of services) and value are the success factors in this project because in these types of projects, people use a checklist to ensure the quality of the staffing, the best practices, and the outcome (saved lives and money) that will lead to the project extension.

B. Difficulties

The difficulties of this project are

Scope: hard to estimate clients' expectation and the outcome

Cost: there may be additional costs

Performance: the most important factor in this project because the practice of the staff in hospitals is the key to preventing patients from infection. The process of ensuring standard and consistent measurements of infection rates is a challenging task in this project.

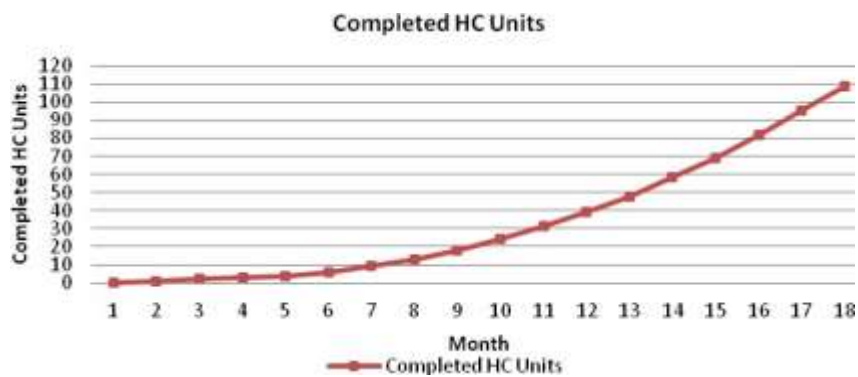
C. Value

Saved money (\$200 mm) and lives (1500).

D. Average cost of healthcare

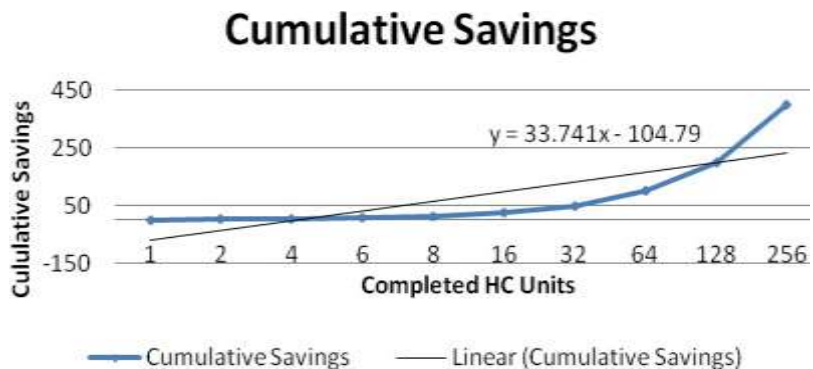
The average total cost is \$ 30.5 billion for 2 million patients or \$15,250/per patient.

E. Completed HC Units by month



To complete 64 HC units, it took 14.93 months from the graph.

F. Slope



G. The slope is 33.741

H. Cumulative Savings in the 5<sup>th</sup> month

$5 * 6.25 / 4 = \$ 7.8125$  MM cumulative savings on the 5<sup>th</sup> month

I. Cumulated savings for extension

$300 * 200 / 128 = \$ 468.75$  MM cumulative savings for 300 HC units.

### ***Financial Services***

A. Success factors

The factors that are most important for success are scope and performance as these factors can be reasonably adjusted as compared to time, cost, resources, and values for this particular type of project.

B. Difficulties

The biggest difficulty for this project is maintaining sufficient supplemental resources from external parties such as foreign aid and global markets. Because of their crucial role in achieving the long term objective, they are desired to be controllable. However, their uncertain and unmanageable nature generates major risks which cannot be completely eliminated.

C. Performance Features

One of the performance features might be to maintain major indicators such as reduction of poverty and GDP growth over a period of time. The performance features should positively persist over a long duration and provide lasting benefits and values to the stakeholders.

D. Classification

This project would be classified as a low complexity mature project since it uses existing technologies and requires synchronized systems in a nation-wide extent to achieve the proposed goal.

E. Lifespan

One of the project's lifespans is from 2011 through 2015. The benefits of the project could last far beyond the year 2015. The WB project cycles consist of: (The World Bank Group, 2012)

- a. Project Identification - Propose financial and advisory services to help countries identify priorities and developmental goals.
- b. Project Preparation - Create ideas and evaluate objectives, risks, alternatives and timetables.
- c. Project Appraisal/Approval - Conduct studies and prepare project documentation. Project is assessed and terms of loans or credit is established. Executive board presentation for approval.
- d. Project Implementation - Project is implemented and World Bank supervises and audits the disbursement.
- e. Project Completion - At end of disbursement period (1-10) year's project report identifying results, lessons learned are presented to board.

- f. Project Evaluation - Final evaluation is done by Independent Evaluation Group to see if goals were met and if results can be maintained long term.

F. Benefits

The benefits of this project are long-term steady GDP growth, reduction in poverty, economic diversity and more competition in private sector.

G. Implications

First, each country has a unique political system and economic characteristics. As a result, the scope is not only derived from the problem but also has to be aligned to comply with a country’s specific regulations and legislative structure. Second, the performance of this project is measured by indicators such as GDP, inflation, and export growth which can be affected by several unpredictable and unmanageable factors such as foreign direct investment, exporting revenue, global business climate, natural disasters, political changes etc. For example, an abnormal weather effect and natural disaster could damage cotton exports and reduce GDP performance before diversification can take hold and flourish.

**Construction**

The following are some of the projects in Chicago, IL.

Sector	City	Start/ Bid Date	Value (\$M)	Project Type	Created/ Last Updated
Private	Chicago		1	Hotels/Motels/Resorts	1/25/2012
Private	Chicago		350	Cultural/Social, Athletic Facilities, Green Buildings, Residential - Multifamily...	2/12/2009 1/24/2012
Private	Chicago	2013	462	Hospitals/Clinics	5/27/2011 1/24/2012
Private	Chicago	7/2012	5-25	Hospitals/Clinics	1/17/2012 1/20/2012
Private	Chicago		5-25	Hospitals/Clinics	1/20/2012

Sector	City	Start/ Bid Date	Value (\$M)	Project Type	Created/ Last Updated
Private	Chicago		< 1	Retail (Shops/Restaurants)	1/18/2012 1/19/2012
Private	Chicago	Q1 2011	12	Hotels/Motels/Resorts, Retail (Shops/Restaurants)	3/29/2010 1/17/2012
Private	Chicago		5-25	Hotels/Motels/Resorts	1/17/2012
Private	Chicago	2012	1-5	Cultural/Social, Athletic Facilities	1/17/2012
Private	Chicago	Q1 2012	1-5	Retail (Shops/Restaurants)	1/17/2012
Private	Chicago	4/2008	915	Green Buildings, Hospitals/Clinics , Parking Structures	2/24/2004 1/17/2012
Private	Chicago		< 1	Retail (Shops/Restaurants)	1/16/2012
Private	Chicago	Q3 2012	67.5	Hotels/Motels/Resorts	1/13/2012 1/16/2012
Public	Chicago	Q1 2012 1/25/2012	1-5	Green Buildings, SCHOOLS (K-12)	1/12/2012
Public	Chicago	Q1 2012 1/18/2012	1-5	Green Buildings, SCHOOLS (K-12)	1/12/2012

Sector	City	Start/ Bid Date	Value (\$M)	Project Type	Created/ Last Updated
Public	Chicago	Q1 2012 1/23/2012	5-25	Green Buildings, Schools (K-12)	1/12/2012
Private	Chicago		< 1	Office Buildings	1/11/2012
Private	Chicago	2/2012	< 1	Retail (Shops/Restaurants)	1/11/2012
Private	Chicago		22.7	Parking Structures, Retail (Shops/Restaurants)	1/10/2012
Private	Chicago		5-25	Hotels/Motels/Resorts	1/9/2012
Private	Chicago		30	Residential - Multifamily (Apartments/Condos), Universities/Coll eges	1/6/2012
Private	Chicago	3/2012	5	Cultural/Social, Athletic Facilities, Retail (Shops/Restaurants)	1/5/2012
Private	Chicago	4/2012	< 1	Cultural/Social, Athletic Facilities, Hotels/Motels/Re sorts	1/4/2012 1/5/2012
Private	Chicago		5-25	Hotels/Motels/Re sorts	1/4/2012



Sector	City	Start/ Bid Date	Value (\$M)	Project Type	Created/ Last Updated
Private	Chicago	11/2011	8	Mfg./Industrial/ Warehouse	12/22/2011 1/3/2012

A. Success factors

All the six success factors are expected in these types of projects. These projects are expected to be within scope, budget, resources, and schedule; quality is expected as a performance factor and the projects should fetch maximum value. Safety is another important factor of performance.

B. Difficulties

Most of these are construction projects. You can expect scope creep, limited budget, less than anticipated resources, delays, and quality problems. If the project is constructed completely, the value of the project depends upon the market.

C. Performance features

Performance features include good quality buildings with all amenities. Environmental sustainability is also an important factor. A zero safety record is expected in these types of projects.

D. Classification

Most of these projects are Type A Scope 1 projects.

E. Lifespan

Most of the projects have an average lifespan of 1 to 2 years depending upon resource availability.

F. Benefits

Increased value to the stockholders under good market conditions; increased living space for Chicago residents.

G. Implications

If the scope can be controlled and monitored with good project management practices, and with the availability of necessary ample resources, the project can be successful. The value, however, is dependent upon market conditions.

### Case Teaching Notes

#### Teaching Points – Use to open the case

- Information about the company, the situation, and the scenario is important in a case

- A summary of project and project management definitions
- Why do a project?
- Project Task Inventory and the project components in a nutshell.

### ***NIBCO, INC.: SAP Project***

1. ERP stands for Enterprise Resource Planning. ERP is a process of managing existing resources across an enterprise. This is usually accomplished with a modular integrated information system that connects all aspects and all departments of an enterprise in a single system with a single database.
2. The essential principle in this project is consolidation. The idea is to consolidate all business units, all existing databases, and existing software packages into a single system with a single database so that all business decisions in the enterprise can be made and shared quickly and effectively.
3. Typical MIS project phases may be applied to this project. The first phase is prefeasibility. Here the idea to replace all of the systems with a single ERP system is made. The second phase is planning where software vendors are evaluated. The third phase is the design where a vendor is chosen and the implementation strategy along with “to-be” processes is determined. The fourth phase is the implementation where the “vanilla” ERP system purchased from a vendor is configured and tested to meet the design objectives. The fifth phase is launch where the system is used for real business data and management and the last phase is a review and closure of the project where the results are evaluated.
4. There are several key issues in the project. One is the big bang approach. This approach is risky because any problems at launch could result in the shutdown of the enterprise. This could have a negative effect on customer relations and overall revenue. Another key issue is that ERP software is developed using business best practices. This means that business practices can change and can cause issues if proper change management procedures are not followed. Changing the software to reflect current business practices can be very expensive and requires rigorous testing to make sure the changes work well and do not affect any core functionality.
5. We would classify this project as a medium Type C system because there are integrations to existing systems using some familiar and some new technologies.
6. The success factors of this project are value and performance. The ERP implementation project not only brought an integrated system to NIBCO but also offered NIBCO best practices to improve their business processes. Through implementation of SAP R/3 modules (SD, CO, FI, MM, PP), business processes at NIBCO were redesigned to provide higher efficiency. For example, centralizing account payable entries in Financial and Controlling (FI/CO) helped NIBCO gain better control on their financial transactions during daily business operations.

Standardizing business processes in Material Management (MM) and Production Planning (PP) made production data available to other departments. Unifying customer accounts from Sales and Distribution (SD) reduced errors in customer accounts due to internal processing. In addition to value, the project was completed and the ERP system performed as smoothly as it was planned. An initial drop of productivity was planned and managed. To achieve the promised performance and values, other success factors of this project were adjusted thoroughly. Specifically, the scope in the final plan was adjusted to produce feasible implementation. They also increased the budget by 30%. For project resources, NIBCO also had to set aside part of their employees and seven directors to work almost full time seven days a week to complete the implementation. To prepare for an optimized go-live, the schedule of the project was extended to finalize all the required tests on the implemented system.

### ***Memorial Hospital of South Bend: Computerized Physician Order Entry***

1. Computerized physician order entry (CPOE) is a process of electronic entry of medical practitioner instructions for the treatment of patients and is a large scale Electronic Medical Records (EMR) Information Systems project at MHSB that was implemented in 2001. Ideally, CPOE standardizes physician orders across the entire organization, as well as provides for individualization among its various users by employing order sets. These order sets are communicated to all departments and caregivers of a patient by the medical practitioner via a computer network. The medical staff and other departments such as the pharmacy, laboratory, and radiology who are responsible for fulfilling the orders have access to the network enabling them to fulfill orders in a more efficient and effective manner. The ordering process includes a display of the patient's medical history, current results, and evidence-based clinical guidelines to support treatment decisions. CPOE also provides patient safety features by allowing for real-time patient identification, drug dose recommendations, adverse drug reaction reviews, checks on allergies, and test or treatment conflicts. All involved caregivers are able to review orders immediately for confirmation. The workflow of the order entry is similar to the original paper-based system which makes the system an intuitive human interface, hence more user-friendly. CPOE is designed according to regulatory compliance and security, meaning access is secure and electronic signatures are used in the creation of permanent records. CPOE's portability, the system's acceptance and management of orders for all departments at the point-of-care, from any location in the health system (physician's office, hospital or home) through a variety of devices, including wireless personal and tablet computers is conceptually one of its more beneficial features. The system's ability to generate online statistical reports enhances management's abilities by being able to analyze reports and make decisions regarding resources such as staff, inventory, and productivity

issues, as well as for both internal and external audits. Lastly, CPOE improves billing by linking diagnoses to orders at the time of order entry, thus showing the supporting documentation related to the charge.

In summary, CPOE eliminates paper records, as the records can be stored and transferred electronically. These records will be easier to back up, and have less chance of getting lost in the shuffle from one provider (*doctors, hospitals, care providers, etc.*) to the next. The standardization of caregiver orders will result in higher collaboration between a patient's care providers. These providers will have the ability to more easily share a patient's medical records when a patient moves or seeks out a new care provider. The system improves response time, reduces and/or eliminates scheduling problems; reduces and/or eliminates conflict with existing orders, provides faster, more efficient, and more accurate diagnosis for the patient; provides faster, more efficient, and more accurate billing for the care provider; and creates a patient-centered decision support system.

2. CPOE will benefit all stakeholders involved. The customer/patient directly benefits from the efficiency of the new system by allowing for nurses, caregivers, and physicians to spend more "hands-on" time with patients, thus providing enhanced quality care. CPOE also enhances the quality care of a patient by allowing easy navigation through the healthcare system and providing a much safer and more efficient process for the patient by keeping their entire medical records and history accessible to the stakeholders involved. The easily retrievable records not only, decrease delay in order completion, but also reduce errors related to handwriting or transcription and allow for order entry at point-of-care or off-site.

CPOE also provides error-checking for duplicate or incorrect doses or tests, and simplifies inventory and posting of charges. Care providers will benefit from the faster, more efficient system by the enhanced communications between colleagues and departments from the order entry system and backed up patients medical records. The enhanced communication will enable faster and more accurate diagnosis for the patient by allowing for all caregivers involved access to patient records. Other departments will also benefit from the cross department communication by receiving more legible orders thus increasing efficiency and effectiveness through immediate receipt of information. For example, as order entry is created, billing codes are generated, thus providing faster and more efficient billing for services rendered at the point-of-care for the accounts receivable department. The pharmacy department benefits by receiving accurate and legible prescriptions for patients. Laboratory and Radiology orders are received immediately and again, in legible format, as well as their diagnosis from the tests being readily available to the primary caregiver.

Management also benefits from this system. By being able to generate reports immediately, they are better able to plan for budgets regarding anything from staffing to expansion. They can determine inventory levels and communicate to the vendors their present and future needs, thus enabling vendors to plan and

- budget production needs. Online reports of patient illnesses can also spark innovation of what research needs are imminent to produce drugs specific to patient needs. CPOE benefits many people, departments, and supply-chain vendors, as well as research and development needs.
3. MHSB's CPOE project has four major essential principles including:
    - To improve patient care by providing more accurate diagnoses.
    - To improve patient care by providing faster access to medical records and more collaboration between providers.
    - To increase innovation by implementing new and high-tech tools and processes.
    - To increase efficiency by streamlining various processes such as internal processes like patient billing, and prescription entry.
  4. MHSB's CPOE project lifespan follows through six different phases.
    - Phase 1: Conceptualization  
This is the phase where the CPOE project is conceived. The organization recognizes a problem and proposes a solution. In MHSB's case, technology was moving at such a fast pace, that to remain competitive and give the best possible care to the patient, it was determined that a solution was needed to remain in the market. Future drug and Medicare Legislation was being written mandating the adoption of the technology. The fact that the proposed system could reduce patient doctor visits by 50% probably contributed to the many factors that led to the CPOE project conceptualization. MHSB determined the problem, medical records, and the solution, to switch to electronic medical records.
    - Phase 2: Planning or Feasibility Stage  
This is where the approved CPOE project from phase 1 is planned. In this phase, MHSB sets the goals, develops the strategies, and the tasks and schedules are outlined to accomplish project goals. A feasibility study may even be done to identify potential problems, cost, risks, and opportunities to ascertain the economic viability of the CPOE project. In this stage, MHSB performs the research and gathers the data needed to support project planning and reduce costs.
    - Phase 3: Design/Development stage  
The CPOE project scope is realized in this phase. The project goals begin to progress towards implementation. The network and other blueprint plans are designed, models are built, and software/hardware vendors are chosen. A pilot release of the software or system may even be released at this stage.
    - Phase 4: Implementation  
The software and hardware is installed and tested. Thorough testing is done and any issues that are found are corrected through refinement of the system. Also at this stage user (nurses and doctors) training is done and

training materials are created. This is the most vital step in the success of the project.

- Phase 5: Launch

MHSB brings the CPOE project to completion and the system is rolled out to the entire staff of nurses and doctors. Customers will also get the first taste of the new system at this point. A formal acceptance of the project by the stakeholders will also be completed within this phase.

- Phase 6: Post Implementation Review

MHSB officially closes the CPOE project. Documentation is archived, lessons learned are captured, and project success is measured. This stage allows Memorial to step back and look at the processes and results of the project to determine where and if adjustments need to be made; make note of the most effective processes; and provide pertinent action items for the execution of future projects.

5. MHSB encountered several key issues with the project including:

- The expense of upgrading to the EMR including software, hardware, and infrastructure
- Difficulty in integrating other processes
- Difficulty in integration with legacy systems and other computer software;
- Extensive training for the new system
- Security measures in keeping information private, safe, and accurate.
- Patient privacy to protect a patient's sensitive medical data to satisfy both customer expectations and governmental legislation
- Rules and regulations to ensure that any entity that touches a patient's data must protect it from intrusion by the highest means possible
- Economic Incentives and nation debate as to whether or not care physicians using EMR's should receive compensation
- Cooperation from the doctors and nurses regarding the CPOE project
- Physician approval
- Technological challenges: software and hardware compatibility, interoperability and scalability with legacy system and infrastructure
- Rollout Strategy: regional or national

6. MHSB's CPOE project would be classified as a "medium-tech" based on the technology uncertainty. Although electronic record storage and transmission is new to the medical industry, it is a proven and familiar technology in other industries. In the manufacturing industry for example, companies have been storing, sending, and receiving product orders and other electronic documents with EDI (*Electronic Data Interchange*) for years. The project would also be classified as a level 2 (*system*) based on scope. This project for MHSB is a collection of smaller systems that will work together to provide services to the

doctors and customers. Although this is a large project, it would not be considered a level 3.

7. The success factors of MHSB's CPOE project are related to the six factors as described in the text, Scope, Time, Cost, Resources, Performance, and Value.

Scope:

- MHSB determined the scope of the project, based on the customer and organizational requirements of the CPOE project.
- A CPOE project that experiences an increase in scope (known as scope creep) could also lead to an increase in time, increased cost, better or worse performance, increase in resources, and an increase or decrease in value.
- Having a clear definition of their scope by including rationale and alignment with the organizational goals contributed to the success of MHSB's CPOE project. Structuring the scope to include open lines of communication between top management; and establishing accountability, responsibility, and reporting facilities were defined from the beginning of the project.
- MHSB's project requirements defined in the scope led to the success of the CPOE project.

Time:

- MHSB needed to ensure that enough time was allocated to complete the project.
- If the CPOE project experienced problems with meeting time constraints, it could lead to an increase in cost, an increase in resources, reduced scope, reduced performance, and reduced value.

Cost:

- A comprehensive budget needed to be allocated for the project.
- MHSB needed to foresee all possible costs to complete the project.
- Running over budget could lead to an increase in time, increase or decrease in resources, reduced scope, reduced performance, and reduced value.

Resources:

- MHSB also needed to ensure the proper Resources were allocated to the project. This was to include skilled human resources, facilities to complete the project, and funding.
- Analysis of the human resources activities needed to be made along the way by implementing milestones.
- Having unskilled and inadequate resources in the project could potentially lead to increased scope, increased time, increased cost, demand for better resources, and better or worse performance.

Performance:

- Completion of the project is dependent upon establishing both performance and technology standards.
- Missed performance from the CPOE project could potentially lead to increased time, increased scope, increased cost, an increase or decrease in resources, and increase or decrease in value.

Value:

- The project had to maximize value to all stakeholders involved.
- Failing to add value in the CPOE project could lead to increased scope, increased time, increased cost, demand for better resources, and better or worse performance.

By far, the continuous monitoring and controlling of scope, time, cost, resources, performance, and value will lead to the success of the project as a whole, making adjustments along the way.

### ***Syndicated Community Bank: Core Banking Systems***

1. CBS is the heart of any banking organization but it usually becomes outdated over a period of time due to changes in customer and organizational requirements. It is a system that helps organizations in many areas, such as loan processing, ATM transaction, Internet banking, and maintenance of customer accounts.
2. COTS is an existing, market proven, and vendor supported products system. An organization needs to spend less development time by adapting it, and it will help organizations to reduce overall system costs.
3. This project is a type-C, scope 2 level. It is high-tech because COTS integrates many new but existing technologies. It is scope 2 level because COTS is like a subsystem for a bank that contains interactive elements to perform various functions and activities.
4. This type of project only has five phases as COTS is a fully developed system. If we compared COTS and other development projects in information systems or new product development, the crucial part of the COTS project would be the selection of the product itself. Once the system is selected, the next challenge is how to configure and implement COTS, how to train employees, and how to maintain/attract current/new customers.
5. The benefits of this project are :
  - Costs are lower than custom development since organizations need not contract a large expert knowledge base to develop a system from scratch.
  - Costs are also lower as the product development cost is shared by many users of the system.
  - Manufacturers of COTS can provide a reliable, bug-free system.
  - Acquiring new technology without going through the learning curve is possible.
  - Development risks are mitigated as organizations can procure the needed features.



6. SCB might not be able to convince its executives, stakeholders, stock holders, and employees. Because if the project fail, there will be a bad influence on the whole bank.
7. An organization might lose potential customers if they do not implement the new system. If the project fails or takes too long to implement the new system, current customers might switch to other banks for lack of features. And if the overall profit is not realized, the bank might either become bankrupt or lose its reputation.
8. The leadership team needs to adapt the new system successfully. The new system increases the overall performance, maintains previous customers, and attracts new customers and stockholders.

***Craig Constructions, Inc.: A Home Improvement Project***

1. According to the case's description, the *pros* of Nash and Myra's decision are as follows:
  - They can reduce costs since building an additional room is cheaper than buying a new property or building a new house.
  - They can have full control over the design.
  - Their personal life is not interrupted because they are going to live with the same neighbors and friends. There is no need to move to a new place.
  - They can have a new area to host friends and family.
  - They can extend to a larger kitchen and dinette area for utility purposes at a later stage.
  - The additional room adds value to the house.

The *cons* of Nash and Myra's decision to build the additional room are as follows:

- Cost of building the additional room can be high and reduce their cash reserves.
- Monthly expenditures can be increased such as increases in utilities and taxes as well as long-term expenditures such as maintenance costs.
- An additional room as well as a new construction needs additional repair and maintenance.
- If the home loan is approved, Nash and Myra need to pay the loan back, which will increase their monthly expenditures.
- They need to sacrifice their valuable time to contribute to the project.

- There are lots of complicated and time-consuming works to do before starting the project such as obtaining permits, building the foundation, shopping for flooring and other building materials.
2. The construction project can have five phases in the life span:
    - *Phase 1: Market or perceived needs* - have an idea or a thought or an initial plan for the project. Nash and Myra have an idea to build the additional room to serve their utility purposes.
    - *Phase 2: Conceptual planning and feasibility study* - define project's objectives and scope. Nash and Myra may conduct the economic feasibility to find whether building an additional room adds value to the house or not. They may plan to apply for home loans from banks and start making a project schedule—when the project will be started and finished. Also, at this phase, they should develop a clear scope, the project's goals and strategies.
    - *Phase 3: Design and engineering* - conceptual plan or preliminary design. After Nash and Myra approve the project, the detailed engineering design should provide a blueprint for construction and the cost estimation which will be served as the project baseline for cost control.
    - *Phase 4: Procurement and construction* - construction plan and specifications. The general contractors receive the delivery of material and begin to construct the additional room as per the requirements of the Nathans.
    - *Phase 5: Startup for occupancy* - completion of construction. Nash and Myra occupy the additional room.
  3. The key issues in this project are neighboring home market values, home additional costs, architectural plans, financing, personal disruption threshold, and sweat equity commitment level.
  4. The construction project can be classified based on uncertainty and system scope. Building the additional room can be classified as a low-tech (Type A) Scope 2 project. This is because construction is using existing technologies (type A) and is building a collection of subsystems and interactive elements that perform a wide range of functions or activities (Scope 2).
  5. This project's success factors are as follows:
    - *Scope* - Even though Nash and Myra have a clear requirement for the house project to build an additional room in their house, we cannot say the project has a clear scope yet because we need more information about their requirements. For example, how much is the budget for this project? What is the expected quality of this additional room? When would they like to start and finish the project? Who is the construction team for this project?

- *Time* - They have not discussed this with a general construction company, so there is no time schedule. A time schedule suitable to their needs may become a success factor for this project.
- *Cost* - They have not estimated the initial cost of the house project, but they know the project will be pricey.
- *Resources* - They would like to select a general construction company owned by Craig Daemon as the contractor for this project. Because Nash has prior dealings with Craig, there may be an assumption that Craig's company is the right choice. They have not decided whether they are going to use their own money for this construction project or obtain a loan from a bank, so we cannot tell which financing method is right for them and we need more information.
- *Performance* - Although Nash and Myra have defined the project's objective, which is to build the additional room, they have not defined the quality standards and project strategies.
- *Value* - The project is to build an additional room to have a new room area to host friends and family, larger kitchen and dinette area for utility purposes, and to add value to the house.

These factors impact other factors:

- *Scope* - If the scope becomes too wide, it can lead to increased time and costs for buying a variety of material, better or worse performance, increase in resources to make the project done, increase or decrease the value.
- *Time* - No time schedule is set.
- *Cost* - No information of an initial cost estimation and available budget
- *Resources* - The option of Craig's construction company brings the required skills and familiarity. This might lead to decreased time, increased performance, increased value, lower costs, and completion of work within the scope.
- *Performance* - No information about the performance standards
- *Value* - Expecting more value from the project can increase scope, increase time, increase cost, demand for better resources, and better or worse performance.

The following are some of the perceived risks:

- The complexity of the project can be time-consuming and eat up all resources. Because of that, Nash and Myra may have less contribution to the project.
- Poor project planning, unclear scope, and unsuitable assignment of responsibilities can lead to over-budgeting, delays, and project dissatisfaction for Nash and Myra.

- The additional room may not increase value to the house as Nash and Myra expect
- Nash and Myra may not be able to pay back the home loan on time if the project goes over the budget.
- The cost estimation may not be accurate enough, which might lead to going over budget and may result in terminating or abandoning the project.
- Delays or unavailability of materials can lengthen the project schedule and changes to project scope. All of Nash and Myra's requirements may not be satisfied.

**Teaching Points – Use to close the case**

- Importance of project lifespan
- Importance of understanding the benefits and risks of projects
- How every project is different from one another?