

Course Learning Outcomes for Unit VII

Upon completion of this unit, students should be able to:

3. Evaluate the process of developing an information system for an organization.
 - 3.1 Assess the core activities and methodologies involved in building information systems.
 - 3.2 Explain how organizations can align information systems development projects with business strategies and goals.
 - 3.3 Analyze the role of project management in developing information systems.

Reading Assignment

Chapter 13: Building Information Systems

Chapter 14: Managing Projects

Unit Lesson

Developing Information Systems

Why do we develop new systems? The answer to this question is pretty evident if you think about it. No organization will remain the same for too long if it wants to be effective, efficient, and competitive. The concept of organizational change goes hand in hand with implementing new systems—regardless of whether you purchase new systems or develop them in-house. There is a whole discipline of quality management based on organizational change, process improvement, and business process redesign that supports the use of technology to improve business processes. For many organizations, the concept of business process redesign is never-ending due to the continual need for evaluating current processes, designing new processes, implementing new processes, and seeking to optimize processes (Laudon & Laudon, 2016).

Let's look at an office environment as an example. An office environment is not generally set up to be process efficient like an assembly line in an automobile assembly plant. However, people in office environments often get new information systems. Why is that? There are always ways of being more efficient in every type of workplace. There are always new ways to automate manual tasks—even just being able to access data faster is a plus. Most systems development comes from a desire to solve a problem. For example, how can we gather some specific data, manipulate it somehow, and output it into information that makes sense to us or that we can use to make good business decisions?

What is involved in the process of developing a new information system? There are some core activities involved in systems development. These activities or steps in the process might actually be common sense to some of us. Different theorists can break the systems development process into different steps, but for the purposes of this course, we will say that there are six basic activities.

1. *Systems analysis* – How do you know how to solve the problem unless you do some analysis first? What is the exact problem? What are the causes? What are the requirements? What are some potential solutions? Are these solutions feasible? Based on many factors including time, cost, benefits, and impacts, management will choose a solution.
2. *Systems design* – How do you get written user requirements into technical requirements? What are the system specifications? What is the functionality? What should the user involvement be? The systems design document should lay out the entire solution so that the developers can create the new system.
3. *Programming* – This is where a lot of the work happens because the developer has to take the technical document and create an operational system. In many cases, organizations will purchase

software packages from a vendor. If the tasks are standard or customizable, then purchasing a system may be a good option.

4. *Testing* – There are different forms of testing. The developer will test as they go, making sure there is functionality in the system. Then, the developer or a quality assurance (QA) representative will perform unit testing on the applications or modules one at a time. The next step would be to test the whole system to make sure everything works in unison. There will also likely be some regression testing, which means the tester will make sure no other systems are harmed by what this new system is doing. The final step is to test with the user to make sure the system is functional.
5. *Conversion* – This involves the process of *going live* with the new system. There are many ways of doing this. Two popular ways involve a phased approach or direct cutover. Many times, organizations can even run systems in parallel until they are ready to turn off the old system.
6. *Production and maintenance* – This step involves a review process over a period of time to make sure that there are no bugs that need to be addressed.

So, how does one manage all of this? Just like any process, there are ways to manage the software development process to make sure that the rules are followed and that the process is as efficient as possible. Depending on the size of the project, managers may need some tools to help document and manage the process. First, it is important to note that there are different methodologies for developing systems. Structured methodologies are top-down, step-by-step methodologies that use data entities whereby progress flows from one logical step to the next. Object-oriented development methodologies are more iterative and incremental. They use objects that are data accompanied with information/instructions concerning that data.

To manage the software development process, most development shops use a software systems development life cycle (SDLC) program. The original SDLC was called the *waterfall* method and was characterized by having formal stages where one stage had to be completed before the next one began. That sounds a bit rigid, does it not? It works well for smaller, less complex software projects, but it does not work well for larger, more complex projects. Since the development of the waterfall SDLC, there have been many other approaches that have been developed. For example, prototyping is a popular method where parts of the system are created and presented to the user for use and approval. If the user does not approve, then adjustments can be made and presented again. This method can be used in conjunction with the waterfall method and adds an iterative element. More recently, several methods have been developed that are more versatile and iterative in nature. One of the more popular methods is called agile development, which focuses on the quick delivery of small subprojects, each treated as a full project. Agile is used in many software development shops.

Just as technology has adapted over time to answer the needs of organizations, so have the methods and processes been used to support technology advancement and information systems development.

How does project management fit into this? You might ask yourself if you have an SDLC, why do you need project management? Broadly speaking, a project is a set of activities that work together to achieve some business objective. That business objective might be to build a new warehouse or it might be to build a new system. Either way, the project has to be managed. Nowadays, most complex systems go outside the boundaries of just software development. There may be hardware, network, server, database, and security considerations. You may even have prominent involvement from the business side of the organization. For the actual software development portion of the project, you can use an SDLC methodology to manage that process and project management to manage the overall project.

There are some higher-level considerations for organizations and project management as well.

How can you align your systems projects with business goals? The organization's business strategy drives the selection of projects. Many organizations will have a steering committee or similar facsimile to drive this selection process.

How can organizations link their information systems projects to their business plan? An information systems plan will help make the link between specific technology and corporate goals. The plan will list the corporate goals and specify how the information technology will support the achievement of those goals through current systems and new development and acquisitions.

How can you assess a business value to the information systems that you are developing? The value of a system is based on whether it provides enough returns to justify its cost. However, remember that there are always tangible and intangible benefits when discussing value.

All of these are important considerations in the process of developing information systems for organizations.

Reference

Laudon, K. C., & Laudon, J. P. (2016). *Management information systems: Managing the digital firm* [VitalSource Bookshelf version] (14th ed.). Retrieved from <https://bookshelf.vitalsource.com/#/books/9780133898309/>

Suggested Reading

The following articles explore the factors of information system development project success which is relevant information to the subject in this unit. Our unit's chapters cover both systems development and project management.

In order to access the resource below, you must first log into the myCSU Student Portal and access the Business Source Ultimate database within the CSU Online Library.

Haron, H., Gui, A., & Lenny, M. (2014). Factors influencing information technology project success: A case of university information system development division of Bina Nusantara University. *International Journal Of Organizational Innovation*, 755-765.

Learning Activities (Nongraded)

For this activity, you will create a 5-10 minute video presentation.

Imagine that you are the owner of your own software development company. You have been asked by the local school board to provide a video tutorial for career day at the local high school. Your video will explain the steps involved in the information systems development process.

To create a viewable video, you will need a device with video capabilities and an account set up with www.youtube.com.

Once you have set up your Youtube account, you will need to create your video. You can create your video using any laptop w/webcam, smartphone, or tablet with video capabilities. Once you have created your video, you will upload it to Youtube via the device's own capabilities or the Youtube website.

As you view your newly uploaded video on Youtube via your computer, there will be a **Share** button directly underneath the viewing panel. When you click on the Share button, a new set of options will display including Facebook and Twitter links. Beneath those links is the web URL for your video. Copy and paste that link into a Word document with a brief summary description of your video.

As this is a nongraded activity, this work cannot be uploaded to Blackboard. If you would like your professor's feedback on your work, send this document to them in an email with a note that you would like to receive feedback on your non-graded activity.