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Learning Resource

Enterprise Architecture and Information Technology Infrastructure

Enterprise Architecture

While the growth of IT provides opportunities for new business models and processes, management teams face many challenges in making sound IT investments. Investments in technology do not guarantee the viability and profitability of an organization. Too often, firms adopt a solution just because it uses the latest technology and then find that is not a good fit for the organization.

The financial impact of a failed IT project can include not only the expenditures for hardware and software but also the time spent implementing a failed solution, including the time spent redefining business processes and training employees.

In previous weeks, we focused on how organizations analyze their environment, seek competitive advantage, and set business strategy. Now it's time to begin focusing on how information systems fit into that picture. Organizations analyze their business and identify processes for opportunities to improve profitability and performance with the use of information technology.

Enterprise Architecture is the management practice of identifying an overall design to help organizations with understanding, managing, and expanding their IT infrastructure and systems. This is a strategic high-level design that looks at the organization's business vision, strategy and goals, and identifies how information technology fits into that design.

Enterprise architecture is composed of three major components: the application architecture, the information architecture, and the technical architecture. The **application architecture** is a breakdown of the business processes and shows which processes are supported by which application systems and how these applications integrate and relate to each other. The application architecture also has functional applications, such as finance, human resources, etc.

The **information architecture** defines where and how the important information is maintained and secured. Frequently, the information architecture includes information about all the data, how the data relate to each other, and how data flows throughout the organization and its systems.

The **technical architecture** (sometimes referred to as the IT infrastructure) describes the hardware and software used to design and build the systems. The technical architecture describes what is already in place in an organization and how the organization wants to evolve technically. You could think of the technical architecture as a blueprint, much like a blueprint of the architecture of a building. The blueprint shows where everything is located and how it fits together. If a system were developed without consideration of the technical architecture, the chances are very high that it would not work in the environment. For example, if a web-based system were developed or acquired for an organization with no internet access, the effort would be futile. Technical architecture also defines the standards and protocols for the organization, including security requirements.

A fully developed enterprise architecture should be able to tell us anything we need to know about the business processes, the data used, and the underlying technology and how it supports the business strategy. A solid enterprise architecture includes everything from documentation to business concepts to the components discussed above.

IT Infrastructure

The major components of the IT infrastructure are:

1. **Services**—the people or organizations that run, support, and manage the other infrastructure components; can be internal staff or external contractors or service providers.
2. **Hardware**—devices that perform the input, storage, processing, and output functions.
3. **Software**—instructions that enable the hardware to perform its functions, enabling these assets to meet the needs of the business; includes (1) operating systems that control the hardware, (2) data management software that stores and provides access to data, and (3) application software, which supports the business processes.
4. **Telecommunications**—the tools that provide connectivity and communication among individuals, companies, governments, or hardware assets; includes networking hardware and software and telecommunications services (audio, video and data). This includes internet access.
5. **Facilities**—the buildings or spaces that house the equipment and staff that provide service and support.

Individuals need to understand the basics of these components to help the organization recognize what is necessary to effectively implement and maintain information systems. Because a business IT infrastructure can be regarded as the "nervous system," it is imperative that it be stable, robust, secure, and flexible so that it can support business requirements reliably, especially in times of heavy usage. Consistency with the infrastructure and enterprise architecture is an important consideration in making IT decisions. The infrastructure must be able to accept both changes in the business and radical changes in technology. Because of the constant changes in technology, an infrastructure must change to take advantage of those changes that will provide a business benefit to the company. This must be part of the IT plan so that transitions to newer technology can be integrated smoothly, with no disruption or degradation of service.

Suppose a new computer is under evaluation to replace an aging computer to gain the advantages of increased speed and more storage. The impact on all of the components of the infrastructure must be considered:

- Will our existing peripherals operate with the new computer?
- Will our existing software work on the new computer?
    - If it does, will it still permit us to achieve the benefits of the new computer?
    - If not, will new software have to be purchased?
- Will our applications run on the new computer, or will changes have to be made?
- Will our communication protocols work?
- Will our networks support the higher volume of data, or will there be a bottleneck that will prevent the new computer from functioning as well as we planned?
- Will users or the technical staff require training to support the new computer hardware and software?
- Will our physical facilities (may or may not be a dedicated data center) have the power, cooling and space capacity and space required by the new computer?
