

SESSION -01

System modeling:

System modeling is the process of developing abstract models of a system, with each model presenting a different view or perspective of that system.

Models can explain the system from **different perspectives**:

- An **external** perspective, where you model the context or environment of the system.
- An **interaction** perspective, where you model the interactions between a system and its environment, or between the components of a system.
- A **structural** perspective, where you model the organization of a system or the structure of the data that is processed by the system.
- A **behavioral** perspective, where you model the dynamic behavior of the system and how it responds to events.

System engineering:

- Systems engineering encompasses all of the activities involved in procuring, specifying,
- designing, implementing, validating, deploying, operating, and maintaining
- sociotechnical systems. Systems engineers are not just concerned with software but
- also with hardware and the system's interactions with users and its environment.

3 stages of system engineering are:

- 1. Procurement or acquisition:

During this stage, the purpose of a system is

decided; high-level system requirements are established; decisions are made on

how functionality will be distributed across hardware,

software, and people; and

the components that will make up the system are purchased.

2. Development

During this stage, the system is developed. Development processes include all of the activities involved in system development such as requirements definition, system design, hardware and software engineering, system integration, and testing. Operational processes are defined and the training courses for system users are designed.

3. Operation

At this stage, the system is deployed, users are trained, and the system is brought into use. The planned operational processes usually then have to change to reflect the real working environment where the system is used.

Over time, the system evolves as new requirements are identified. Eventually, the system declines in value and it is decommissioned (**Decommissioning** is a process by which a business application (or **system**) is removed from use in an organization.) and replaced.

These stages are not independent.

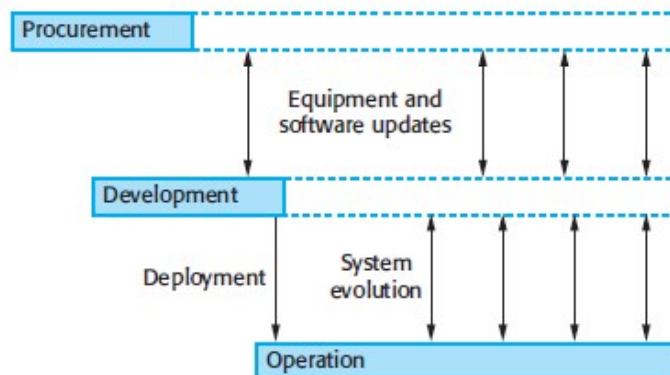


Figure 10.4 Stages of systems engineering

System procurement:

- The initial phase of systems engineering is system procurement (sometimes called system acquisition). At this stage, decisions are made on the scope of a system that is to be purchased, system budgets and timescales, and the high-level system requirements. Using this information, further decisions are then made on whether to procure a system, the type of system required, and the supplier or suppliers of the system.

- The drivers for these decisions are:

1. *The state of other organizational systems* If the organization has a mixture of systems that cannot easily communicate or that are expensive to maintain, then procuring a replacement system may lead to significant business benefits.

2. *The need to comply with external regulations*

3. *External competition* If a business needs to compete more effectively or maintain a competitive position, investment in new systems that improve the efficiency of business processes may be advisable

4. *Business reorganization* Businesses and other organizations frequently restructure with the intention of improving efficiency and/or customer service.

Reorganizations lead to changes in business processes that require new systems support.