

Knowledge Management

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IT 383
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Lecture 2



Knowledge Management Lifecycle

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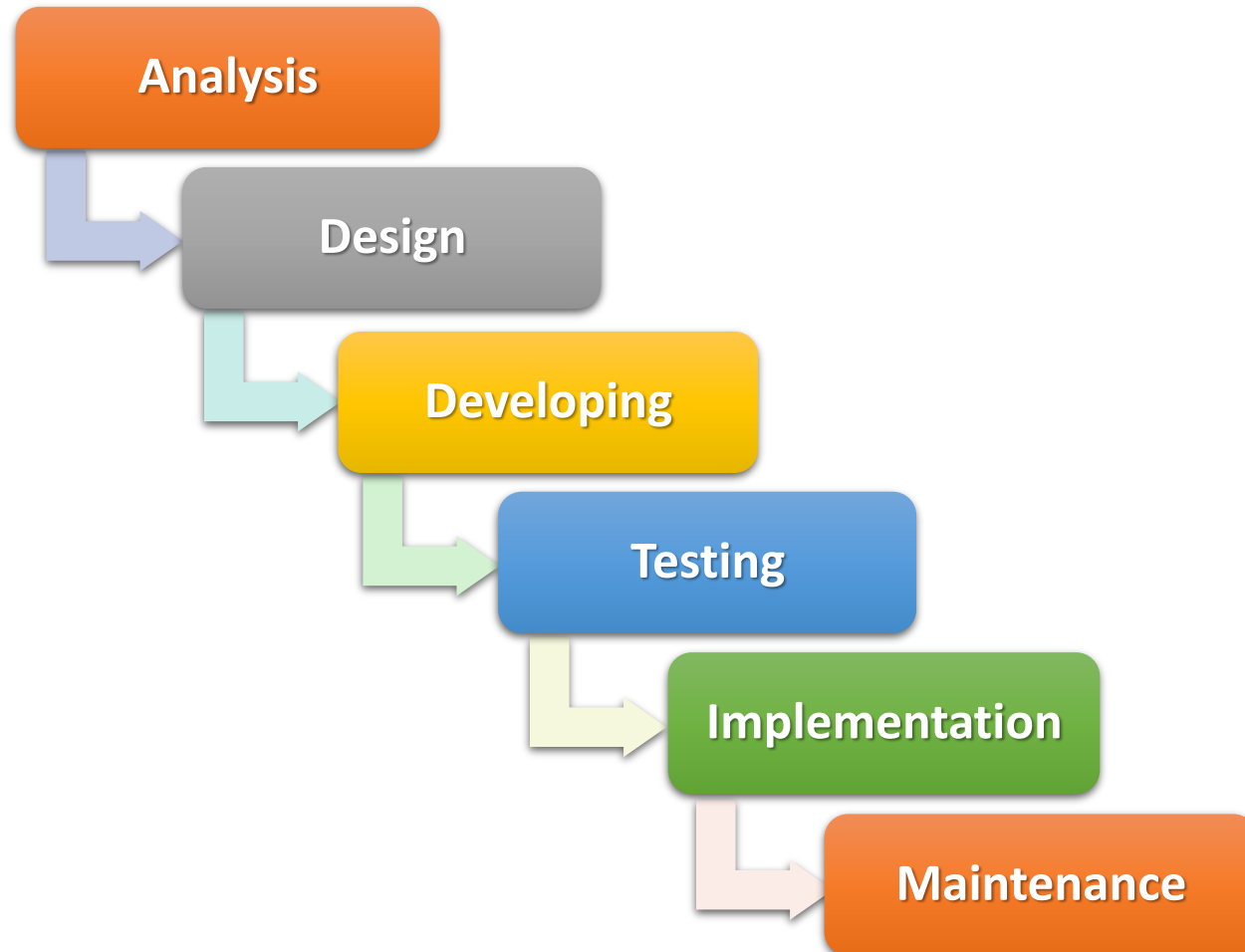
Knowledge Management Lifecycle



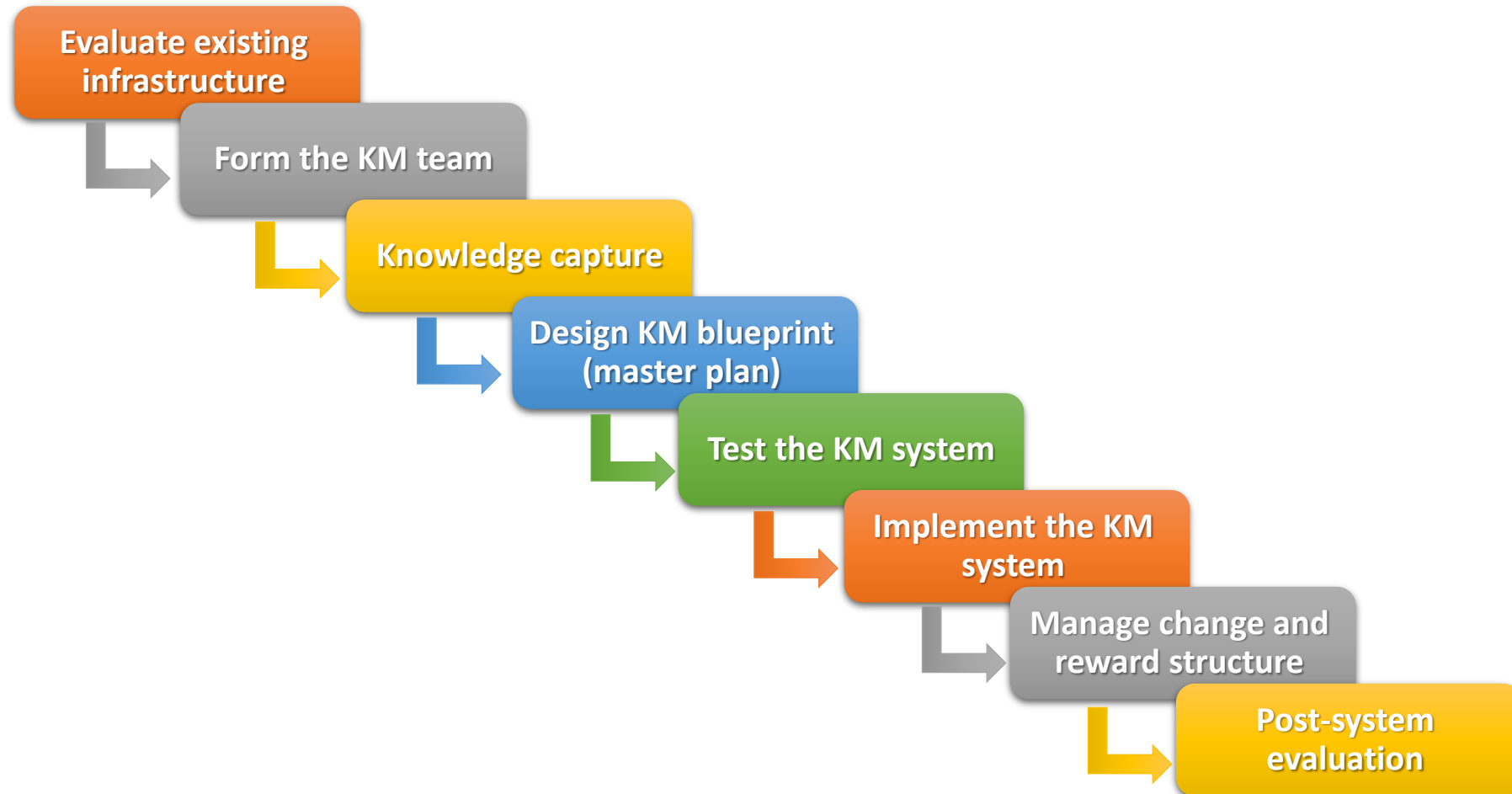
Chapter Objectives

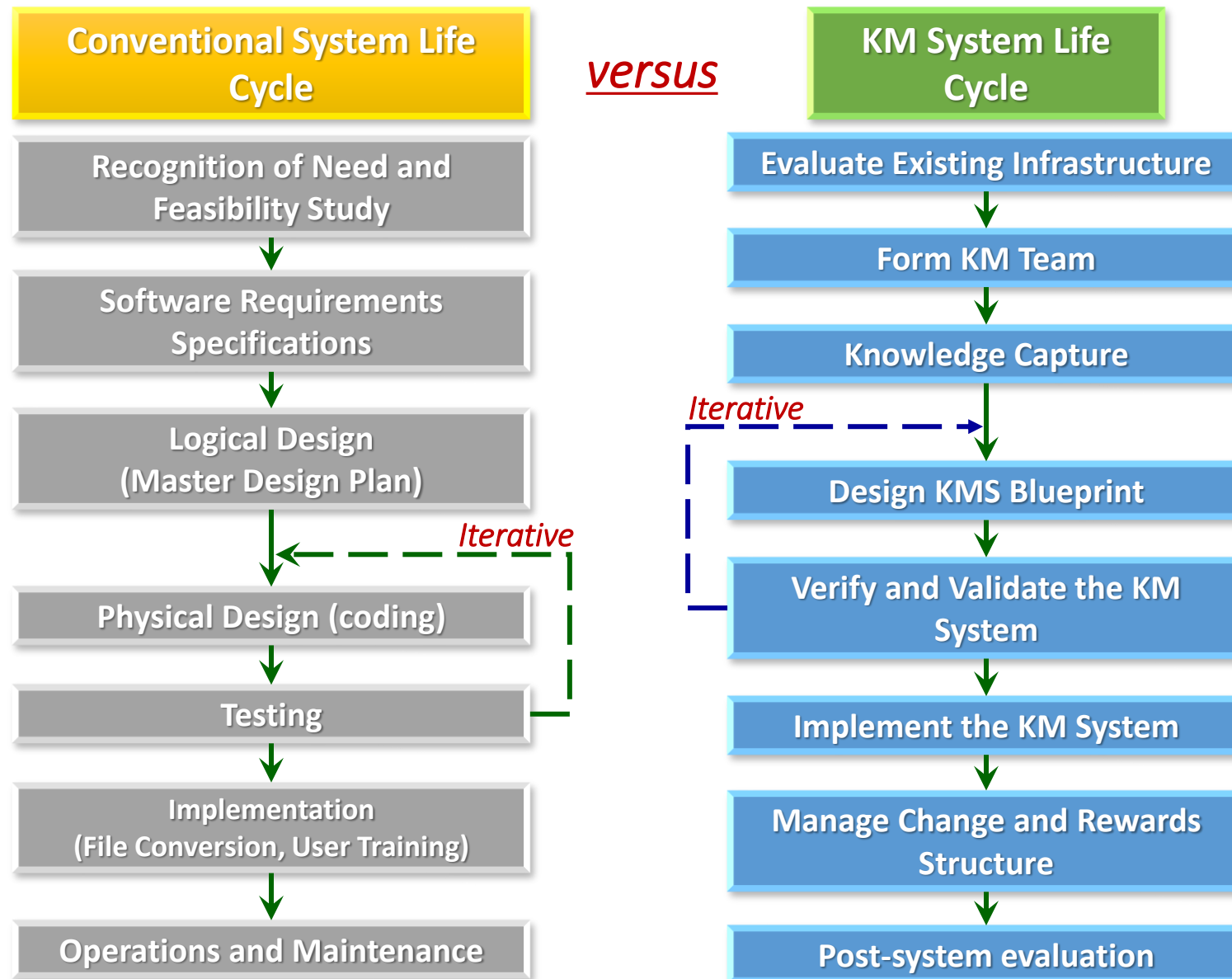
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- Identify the differences and similarities between traditional IS and KMS Lifecycle.
 - Understanding knowledge management system developing lifecycle.

➤ Traditional IS Development lifecycle



➤ Knowledge Management System (KMS) lifecycle





➤ Key Differences:

Conventional Systems	KM Systems
Systems analysts deal with information from the user.	Knowledge developers deal with knowledge from domain experts.
Users know the problem but not the solution.	Domain experts know both the problem and the solution.
System development is primarily sequential.	System development is incremental and interactive.
System testing normally at end of system life cycle.	KM system testing evolves from beginning of the cycle.
Specify then build.	Start slow and grow.

➤ Key Similarities:

Conventional Systems	KM Systems
Both begin with a problem and end with a solution.	
Both begin with information gathering or knowledge capture.	
Testing is essentially the same to make sure the system is right and it is the right system.	
Both developers must choose the appropriate tool(s) for de-signing their respective systems.	

Evaluate existing infrastructure

➤ Evaluate existing infrastructure:

Identifying and evaluating the current knowledge environment and organization culture makes it easier to point out the critical missing Knowledge gaps and justify the formation of a new KM environment.

➤ System justification.

➤ Scoping and evaluating.

➤ System feasibility.

Evaluate existing infrastructure

➤ System justification:

The goal of this step for the knowledge developer is to justify whether it is worth doing the system.

➤ Will current knowledge be lost through expert retirement, transfer, or departure to other firms? Or, Is the proposed KM system needed in several locations?

If the company has only one expert to handle a particular problem at a given time, similar problems in other locations have to wait for the expert's attention. In such case a KM system can be used to distribute application expertise throughout the company.

Evaluate existing infrastructure

- **Are experts available and willing to help in building a KM system?**

Without reliable knowledge or knowledge workers there can be no knowledge-based system.

- **Does the problem in question require years of experience to solve?**

If the knowledge can be learned in a few weeks and the pattern of solution is routine, then the problem is probably not to be qualified for a KM system application.

Evaluate existing infrastructure

- **When undergoing knowledge capture, can the expert articulate how problem will be solved?**

The ability to explain a procedure or illustrate how a problem is to be solved is not a skill everyone possesses.

- **Is there a champion in the house?**

- The Organization must have a champion who believes that a KM system can be beneficial for the company and is willing to support its development aggressively.
- The champion is often in a good position and usually has credibility with the employees, understands their concerns, speaks their language, and knows the key people in the organization.

Evaluate existing infrastructure

➤ Role of Strategic Planning:

Risky to plunge into a KMS without strategy, Knowledge developer should consider:

Vision; Foresee what the business is trying to achieve, how it will be done, and how the new system will achieve goals.

Resources; Check on the affordability of the business to invest in a new KM system.

Culture; Is the company's political and social environment amenable to adopting a new KM system?

Scoping and evaluating

- **Boundaries of the KMS.**
- **Limits breadth and depth of the project** within financial, HR, sales, marketing and operational constraints.
- **Project must be completed quickly** enough for users to foresee its benefits. Experts and users lose patience and interest in projects that take months and years for completion.

System feasibility

A feasibility study of the KMS project addresses several questions:

➤ **Is it doable?**

Can it be completed within reasonable time?

➤ **Is it affordable?**

Do the system potential benefits justify the cost of development?

➤ **Is it appropriate?**

Just what can the firm expect to get out of it?

➤ **Is it practicable?**

How frequently would the system be consulted?

System feasibility

Areas of feasibility:

➤ Economic feasibility:

Determines to what extent a new system is cost-effective. It is the cost/benefit analysis.

➤ Technical feasibility:

Evaluating hardware and supportive software within company's IT infrastructure. Check to see how current technology (Internet connections, Intranet, Extranet, LAN, WAN ...etc.) will match technical requirements of the proposed KM system.

➤ Behavioral feasibility:

Includes training management and employees in the use of the KM system.

Form the KM team

➤ Team success depends on:

- **Caliber of team members** (personality, communication skills and experience, problem solving, and conflict resolution).
- **Team size.** In a large multinational firms where there are hundreds of departments or divisions, a representative from each area make teamwork not convincible. *Team size is manageable up to 20 members.* Beyond that, a team must be divided into subcommittees with particular assignments.
- **Leadership and team motivation.**

Knowledge capture

➤ **Explicit Knowledge:**

Explicit knowledge captured in repositories from various media and documentation.

➤ **Tacit Knowledge:**

Tacit knowledge captured from company experts using various tools and methodologies.

Knowledge capture

- Knowledge developers capture knowledge from experts in order to build the knowledge base.
- Knowledge capture and transfer often carried out through teams, not just individuals.
- The team performs a specific task, After the outcome is achieved, the knowledge developer examines & explores with the team the relationship between team action and outcome.
- If the team agrees that common knowledge has been gained, it becomes ready to be transferred to the Knowledge base.

Design of the KM Blueprint

Key layers
are “7 layers”

- User interface.
- Authentication/security layer .
- Collaborative agents and filtering.
- Application layer.
- Transport Internet layer.
- Physical layer.
- Repositories.

Design of the KM Blueprint

➤ User interface:

- Is what the user sees and works with in terms of accessing the KB.
- Without effective user interface, even the best KM system is bound to fail
- User interface design focuses on the following:

Design of the KM Blueprint

➤ User Interface:

Consistency: Menus, icons, buttons should have the same meaning or representation through the KM system.

Visual clarity: All information should be presented –as possible- in one screen.

Navigation and Usability: How easily a user moves through the KMS and the speed to access the KB.

Relevancy: Design should match with the topic.

Design of the KM Blueprint

➤ Authentication/security layer:

➤ Procedures to prevent the unauthorized access to the system.

Firewalls: (S/W & H/W device) that enforces an access control policy between networks.

Biometric devices: Security authentication device for verifying the identity of the user based on fingerprints, facial images, and voice recognition.

Encryption: The process of encoding a message or information in such a way that only authorized parties can access it.

Design of the KM Blueprint

➤ Collaborative Agent and Filtering Layer :

- Designed to provide near personalized presentation of knowledge meet with the user requirements.

Intelligent Agent: Specialized software is employed to do intelligent search in knowledge base and display the right information.

- Intelligent agents reduce the overall network load since they reduce the number of interactions between clients and servers.

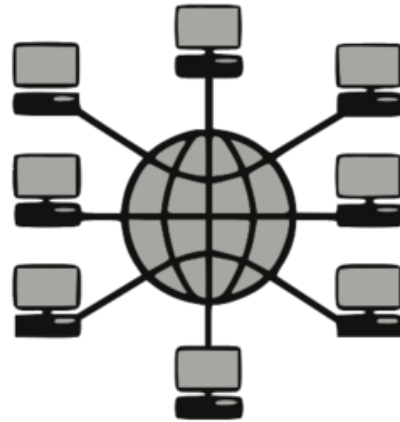
Design of the KM Blueprint

➤ Application Layer :

➤ It is used to communicate with the actual application in use.



User



Intranet / Internet



KB Server



Knowledge Base

Design of the KM Blueprint

➤ Transport Layer :

- The function of the transport layer is to manage the transmission or the flow of data between two computers or across a network using TCP/IP protocol.
- Most technical layer to implement the KMS architecture, Ensures the electronic transfer of knowledge throughout the organization.

Design of the KM Blueprint

➤ Middle ware:

- Contains a cluster of programs to provide connections between legacy applications and existing and new systems.
- Makes it possible to connect between old and new data formats.

Design of the KM Blueprint

➤ Physical Layer :

- It is the lowest layer in the journey of a message from source to destination. How do I use (cables, modems, routers) for transmission.
- It converts data into signals for outgoing messages and signals into data for incoming messages.

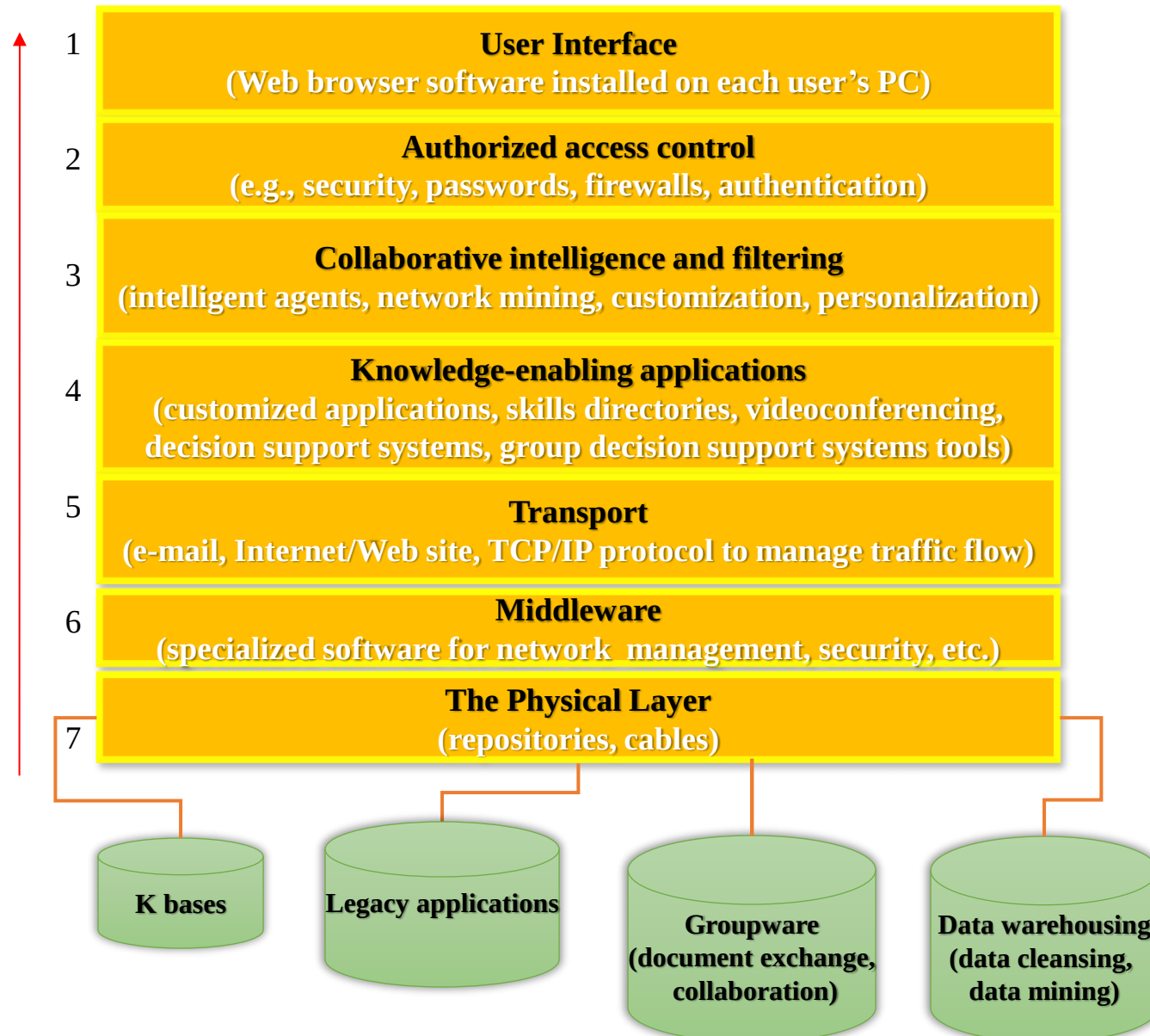
Design of the KM Blueprint

➤ Repositories:

- **Hard disks or storage devices that hold explicit and tacit knowledge and the rules associated with them. As well as other DB and traditional applications.**

Design of the KM Blueprint

KMS Blueprint



Testing the KM System

➤ **Verification procedure:**

Ensures that the system is right that the programs do what they are designed to do (*Are we building the product right?*)

➤ **Validation procedure:**

Ensures that the system is the right system that it meets the users expectations (*Are we building the right product?*)

➤ **Human experts must monitor system performance continually.**

➤ Approaches to Logical Testing:

➤ Circular Errors:

Carelessness often results in rules that employ circular reasoning. A circular rule tends to be contradictory in meaning or logic.

If $A > B$

If $B > C$

If $C > A$

Then rule 3 is circular and contains an error in logic. The best solution in this case is to remove rule 3

Testing the KM System

➤ Approaches to Logical Testing:

➤ Unusable Knowledge :

An unusable knowledge in the form of a rule is one that only “fires” (executes) if the conditions succeed or fail.

If stud- attendance = 0 and stud-grade = A

Then action.

this rule can never succeed (action will never happen).

➤ Approaches to Logical Testing:

➤ Subsumption Errors:

In subsumption, if one rule is true, one knows the second rule is always true.

R1 : If A and B, THEN D

R2 : IF A and B or C, THEN D

If R1 is true, then R2 is useless, cause R2 contains an additional (and thus unnecessary) premise clause.

Implementing the KM System

- **Converting a new KM system into actual operation.**
- **This phase includes updating the existing H/W & network infrastructure to match with the new requirements of the system.**
- **This phase also includes user training; training must be given to users based on capabilities, experience, and system complexity.**

➤ Roles of Quality Assurance:

➤ Reasoning Errors:

Reasoning is the action of constructing thoughts into a valid arguments (comprehensive on the foundation of fact or logic).

Deductive reasoning; The conclusion necessary follows from the premises is facts and then is true (if the premises is true the conclusion must be true.)

Inductive reasoning; The conclusion is supported (but not proven) by the premises.

Implementing the KM System

➤ Roles of Quality Assurance:

➤ Ambiguity:

A statement is ambiguous when it has more than one meaning such as “Sell the bad stock.” which stock is “bad”? What is meant by “bad”? How bad is “bad”?

➤ Incompleteness:

A statement that represents sum but not all pieces of knowledge is incomplete. **For example**, Does “adjust the air conditioner” mean to make it cooler or warmer?

➤ Roles of Quality Assurance:

➤ False representation:

A statement that incorrectly represents pieces of knowledge.

“the small key will open the door.”

False positive error, a rule is accepted when it should be rejected.

“the small key will not open the door ” when it should

False negative error, a rule is rejected when it should be accepted. “the small key will open the door when it should not”

Manage change and reward structure

- Implementation means change, and people in general resist change.
- People become anxious when they do not know what the new system will offer and how it will affect their current jobs and decision making quality. The result is stress and resistance to change.
- The resisters include: **Experts** (have doubts about the impact of sharing knowledge of their jobs), **Users**, **Narrow-minded superstars** (IT staff resist any change that they did not initiate or approve in advance).

Post system Evaluation of Change

- After the KM system has been deployed and the operation is “up and running” the effect of the new system on the organization should be carefully evaluated.
- System impact must be assessed in terms of its effects on the people, and performance of the business processes.
- The KM system must be continuously set under maintenance (making corrections to always meet the initial system requirements) and enhancement procedures (upgrading the system and refines it to meet the new set of requirements).



Thank You