Chapter 4

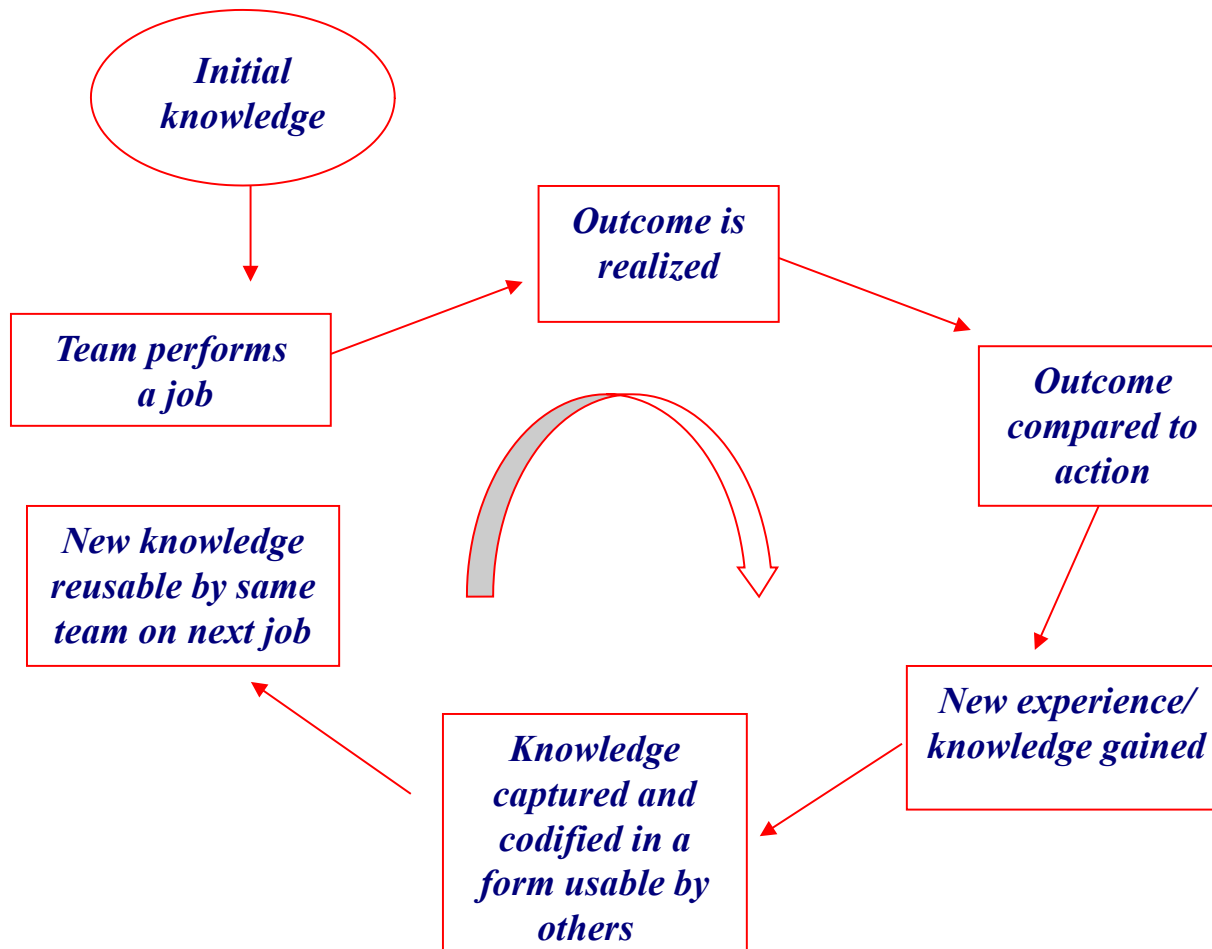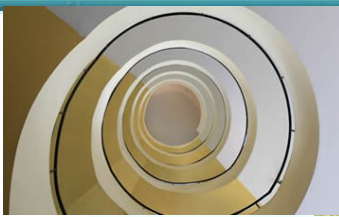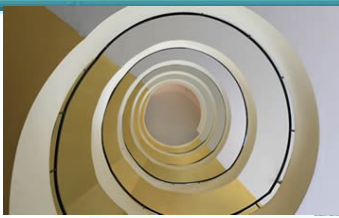# Knowledge Creation
&
Knowledge Architecture

- A team compares job experience to job outcome—translates experience into knowledge

- Such newly acquired knowledge is carried to the next job

- Maturation over time with a specific job turns experience into expertise

- KM is not a technology; it is an activity enabled by technology and produced by people

- An alternative way of creating knowledge is via teamwork

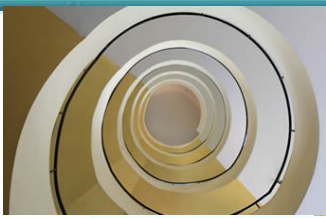# Knowledge Transfer Via Teams

Initial knowledge

Team performs a job

Outcome is realized

Outcome compared to action

New experience/ knowledge gained

Knowledge captured and codified in a form usable by others

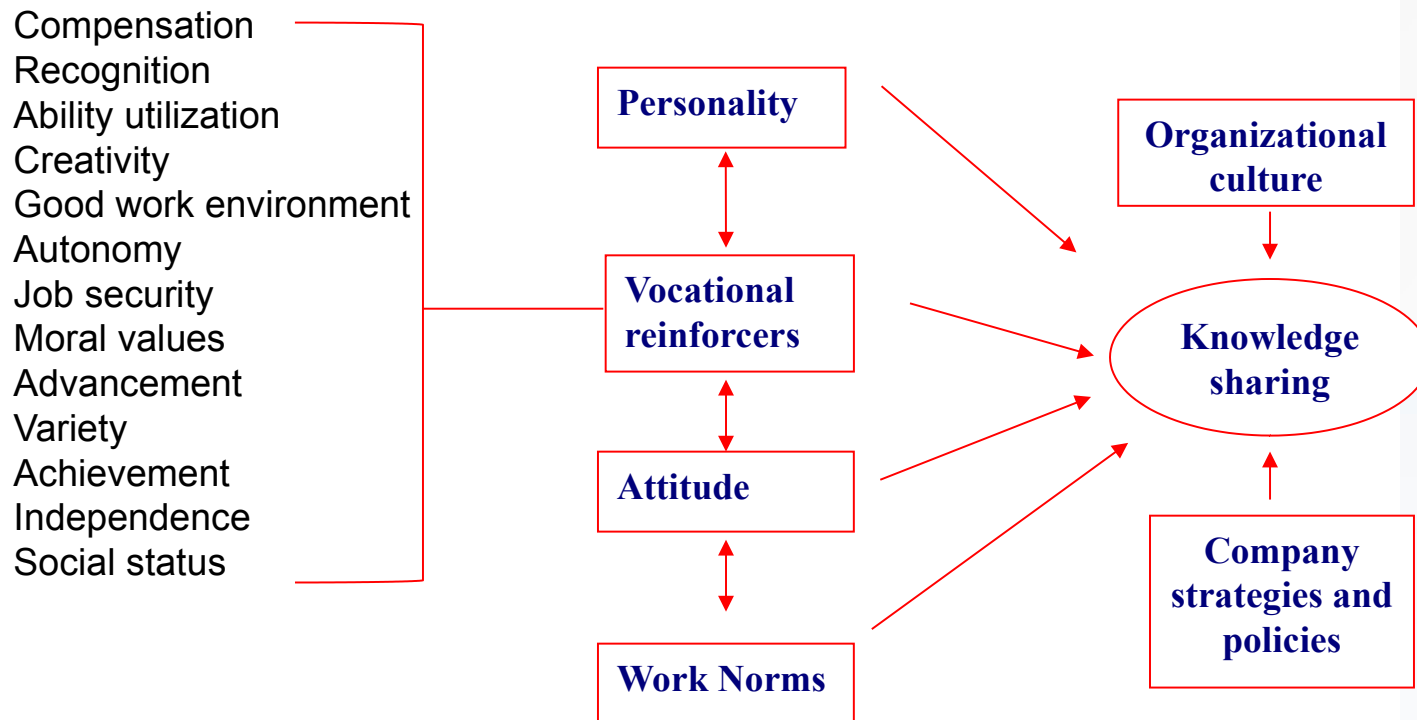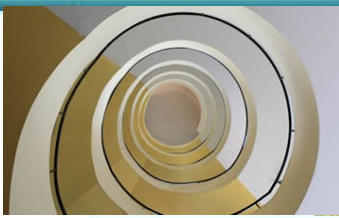New knowledge reusable by same team on next job

Impediments to Knowledge Sharing

- Personality
- Attitude based on mutual trust
- Vocational reinforcers
- Work norms

Impediments to Knowledge Sharing

Compensation
Recognition
Ability utilization
Creativity
Good work environment
Autonomy
Job security
Moral values
Advancement
Variety
Achievement
Independence
Social status

Personality

Vocational reinforcers

Attitude

Work Norms

Organizational culture

Knowledge sharing

Company strategies and policies
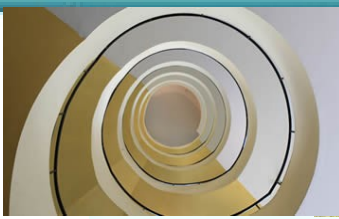
Nonaka's Model

- **Tacit to tacit communication** (socialization). Experience among people in face-to-face meetings

- **Tacit to explicit communication** (externalization). Articulation among people through dialog

- **Explicit to explicit communication** (combination). Best supported by technology

- **Explicit to tacit communication** (internalization). Taking explicit knowledge and deducing new ideas. One significant goal of knowledge management is to create technology to help the users to derive tacit knowledge from explicit knowledge.

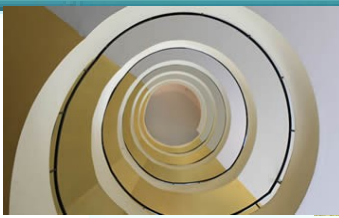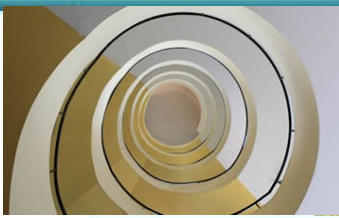|	
TACIT TO TACIT *(SOCIALIZATION)* E.G., TEAM MEETINGS AND DISCUSSIONS	**TACIT TO EXPLICIT** *(EXTERNALIZATION)* E.G., DIALOG WITHIN TEAM ANSWER QUESTIONS
EXPLICIT TO TACIT *(INTERNALIZATION)* E.G., LEARN FROM A REPORT	**EXPLICIT TO EXPLICIT** *(COMMUNICATION)* E.G., E-MAIL S, REPORT
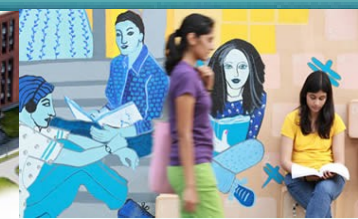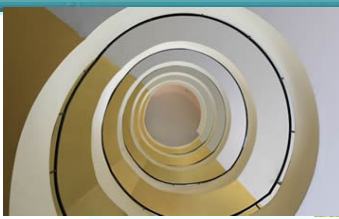
- Knowledge architecture can be regarded as a prerequisite to knowledge sharing.

- The infrastructure can be viewed as a combination of people, content, and technology.

- These components are inseparable and interdependent.

People

Content

Technology
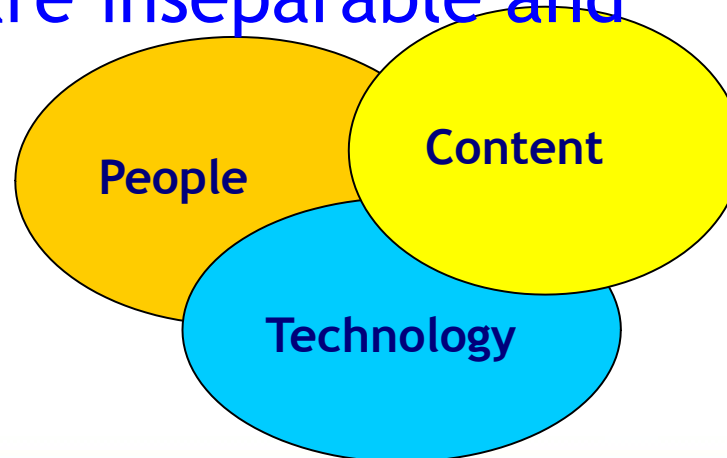
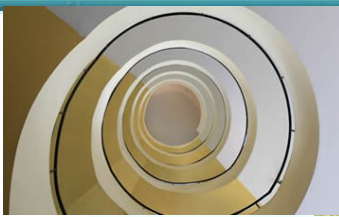- People core: Evaluate the existing information/ documents which are used by people, the applications needed by them, the people they usually contact for solutions, the associates they collaborate with, the official emails they send/receive, and the databases they usually access

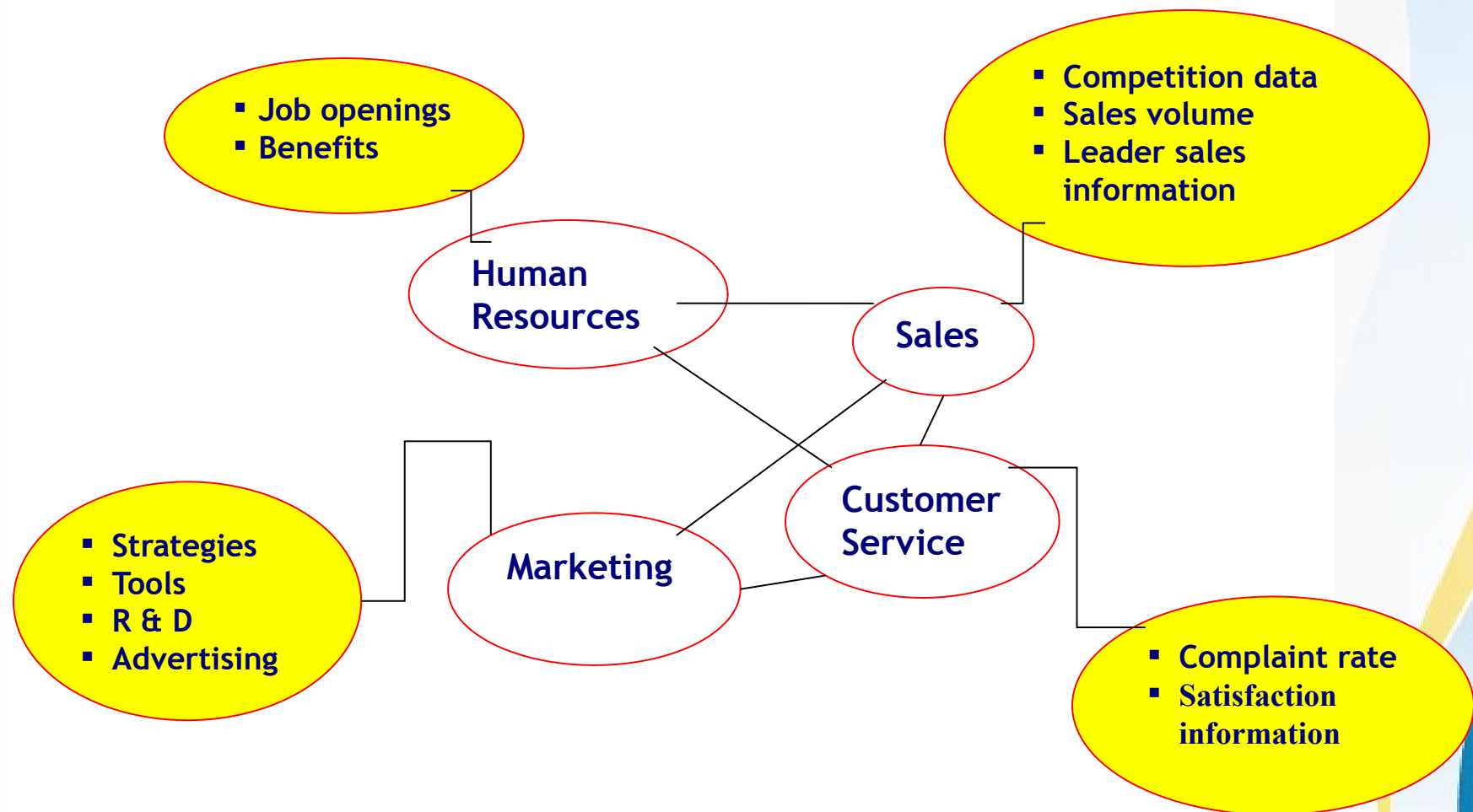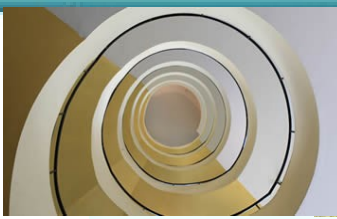- Identify knowledge centers

- Activating knowledge content satellites

- Assigning experts for each knowledge center

Identifying Knowledge Content Centers

- Job openings
- Benefits

- Competition data
- Sales volume
- Leader sales information

Human Resources

Sales

- Strategies
- Tools
- R & D
- Advertising

Marketing

Customer Service

- Complaint rate
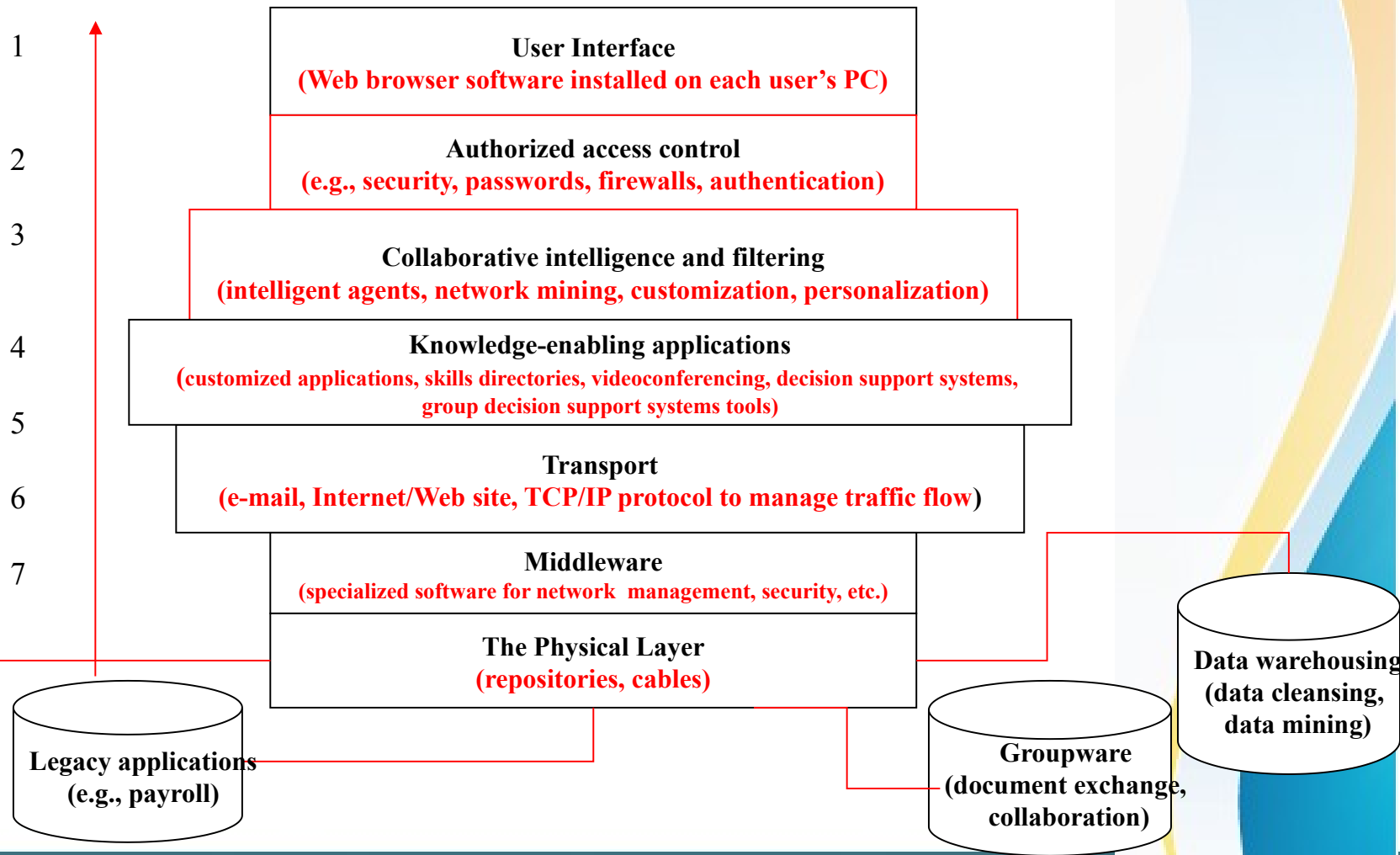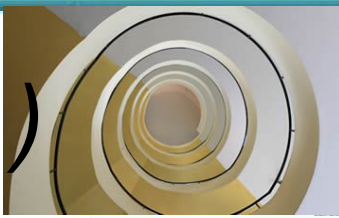- Satisfaction information

Knowledge Architecture

- The technical core: Enhance communication as well as ensure effective knowledge sharing

- The total technology (hardware, software, and the specialized human resources) required to operate the knowledge environment

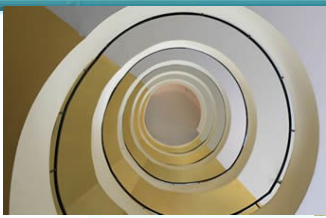- Accuracy, speed, reliability, security, and integrity

Technical Layers of the KM System

1

User Interface
(Web browser software installed on each user's PC)

2

Authorized access control
(e.g., security, passwords, firewalls, authentication)

3

Collaborative intelligence and filtering
(intelligent agents, network mining, customization, personalization)

4

Knowledge-enabling applications
(customized applications, skills directories, videoconferencing, decision support systems, group decision support systems tools)

5

Transport
(e-mail, Internet/Web site, TCP/IP protocol to manage traffic flow)

6

7

Middleware
(specialized software for network management, security, etc.)

The Physical Layer
(repositories, cables)

Databases

Legacy applications
(e.g., payroll)

Groupware
(document exchange, collaboration)

Data warehousing
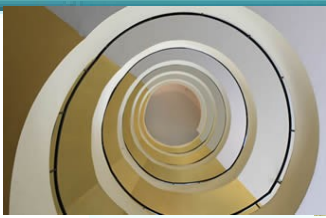**(data cleansing, data mining)**

The User Interface Layer (Layer 1)

- Tacit knowledge should be made available face-to-face, e-mail, or by other media

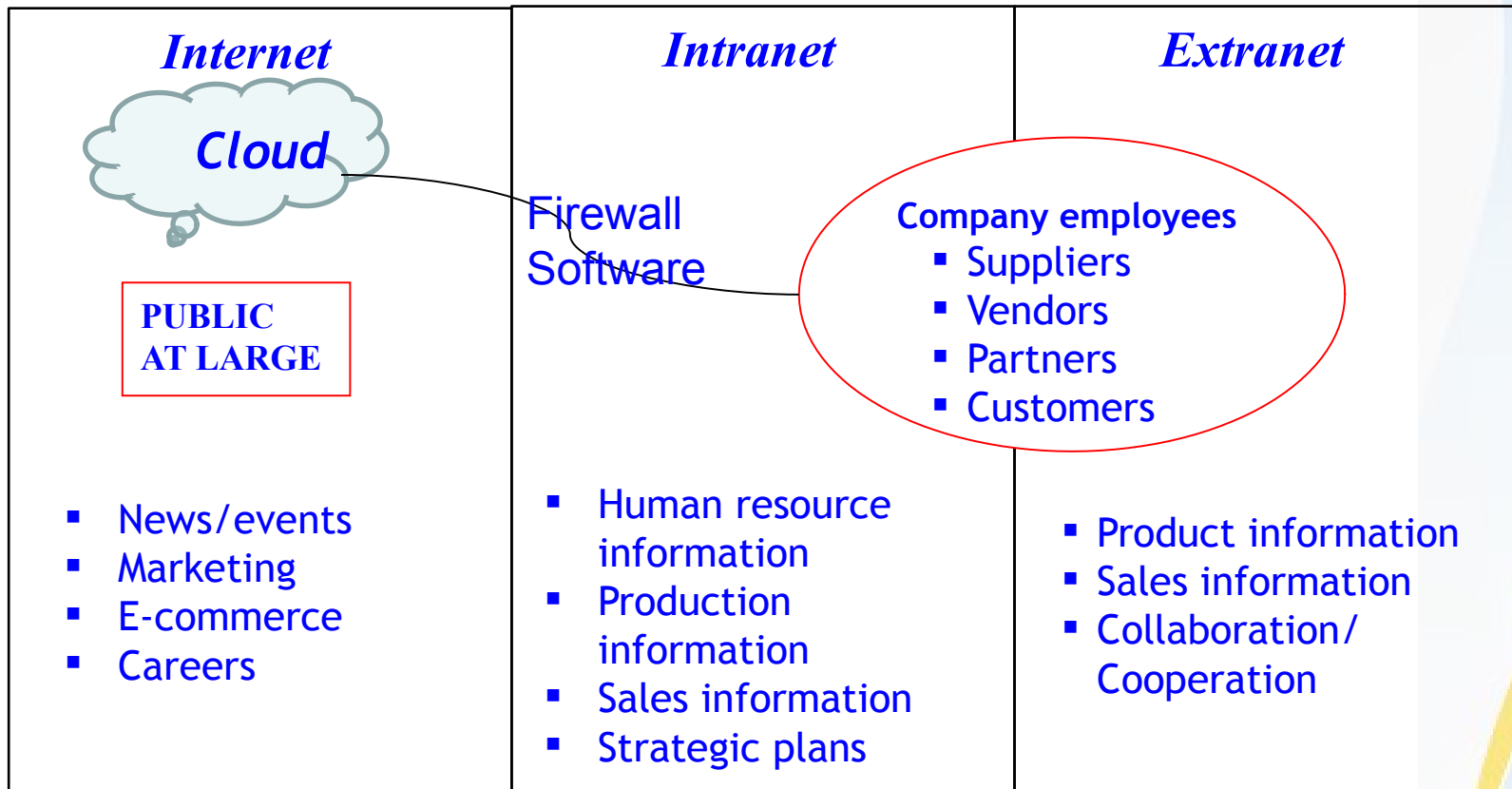- User interface design focuses on *consistency, relevancy, visual clarity, navigation, and usability*
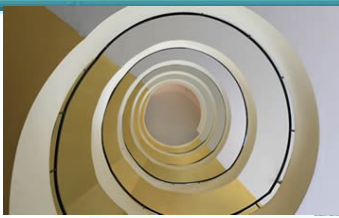
- *Intranet*: The internal network of communication systems modified around the Internet

- *Extranet*: An intranet with extensions that allow clearly identified customers or suppliers to reach company-related technical educational information

Technical Access Layer (Layer 2)

Internet	*Intranet*	*Extranet*

Cloud

PUBLIC AT LARGE

Firewall
Software

Company employees
- Suppliers
- Vendors
- Partners
- Customers

- News/events
- Marketing
- E-commerce
- Careers

- Human resource information
- Production information
- Sales information
- Strategic plans

- Product information
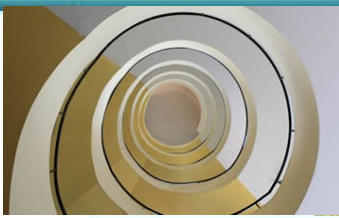- Sales information
- Collaboration/ Cooperation

Protects against:

- E-mail services known to be problems
- *Unauthorized interactive log-ins from outside firm*
- *Undesirable material coming in/leaving firm*
- *Unauthorized sensitive info. leaving firm*
- *Limitations include:*
- *Attacks that do not go through the firewall*
- *Weak security policies*
- *Viruses on floppy disks*
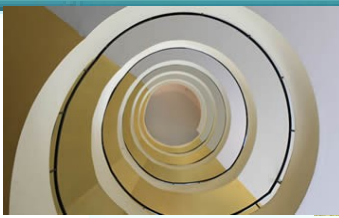- *Traitors or disgruntled employees*
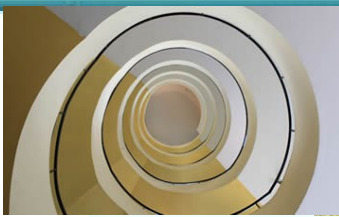
Collaborative Intelligence & Filtering Layer (Layer 3)

- Provides personalized views based on stored knowledge

- Reduces search time for information

- Intelligent agents search across servers to find the information requested by the client (user)

- Intelligent agents arrange meetings, pay bills, and even wander through virtual shopping malls, suggesting gifts and so on
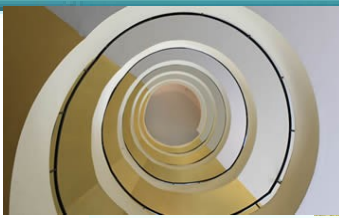
Criteria for an Effective Collaborative Layer

- Security—very critical

- Portability across platforms

- Integration with existing systems
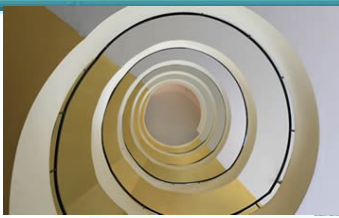
- Scalability, Flexibility and Ease of Use

- Emulate the reasoning of a human expert in a problem domain

- Can help a person become wiser, not just better informed

- Components include:

  - **Justifier**: explains how and why an answer is given

  - **Inference engine**: problem-solving mechanism for reasoning and inferring

  - **Scheduler**: coordinates and controls rule processing

Knowledge-Enabling Application Layer (Layer 4)

- Often referred to as *value-added layer*

- Creates a competitive edge for the learning organization

- Provides knowledge bases, discussion databases, sales force automation tools, imaging tools, etc.

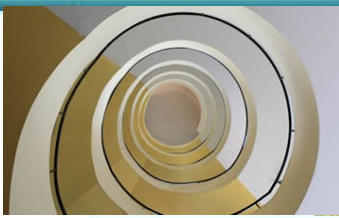- Ultimate goal: show how knowledge sharing could improve the lot of employees

- Most technical layer to implement

- Ensures that the company will become a network of relationships

- Includes LANs, WANs, intranets, extranets, and the Internet

- Considers multimedia, URLs, graphics, connectivity speeds and bandwidths
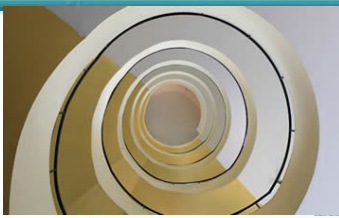
Middleware Layer (Layer 6)

- Focus on interfacing with legacy systems and programs residing on other platforms

- Designer should address databases and applications with which KM system interfaces

- Contains a cluster of programs to provide connections between legacy applications and existing systems

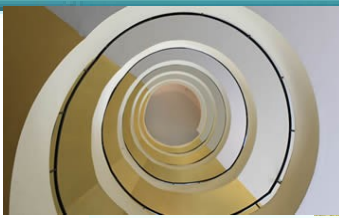- Makes it possible to connect between old and new data formats

- Bottom layer in the KM architecture

- Represents the physical layer where repositories are installed

- Includes intelligent data warehouses, legacy applications, operational databases and special applications for security and traffic management
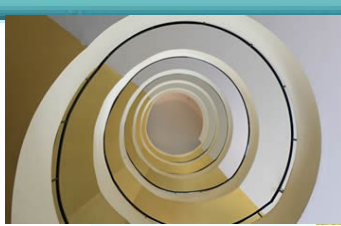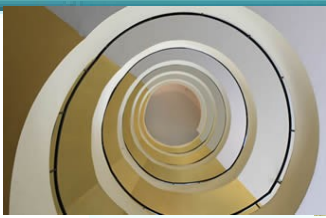
Build In-House, Buy or Outsource

- Trend is toward ready-to-use, generalized software packages

- Outsourcing is also a trend, releasing technological design to outsiders

- Regardless of choice, it is important to set criteria for the selection

- Question of who owns the KM system should be seriously considered

- What advantages are accrued by purchasing KM software instead of developing it in-house?

- Access to knowledge is based on profiles derived from the knowledge base. What technology would you recommend to provide access? Who will manage such access?

Chapter 4

Knowledge Creation
&
Knowledge Architecture