

Managing Knowledge

Power up knowledge with intelligence technology

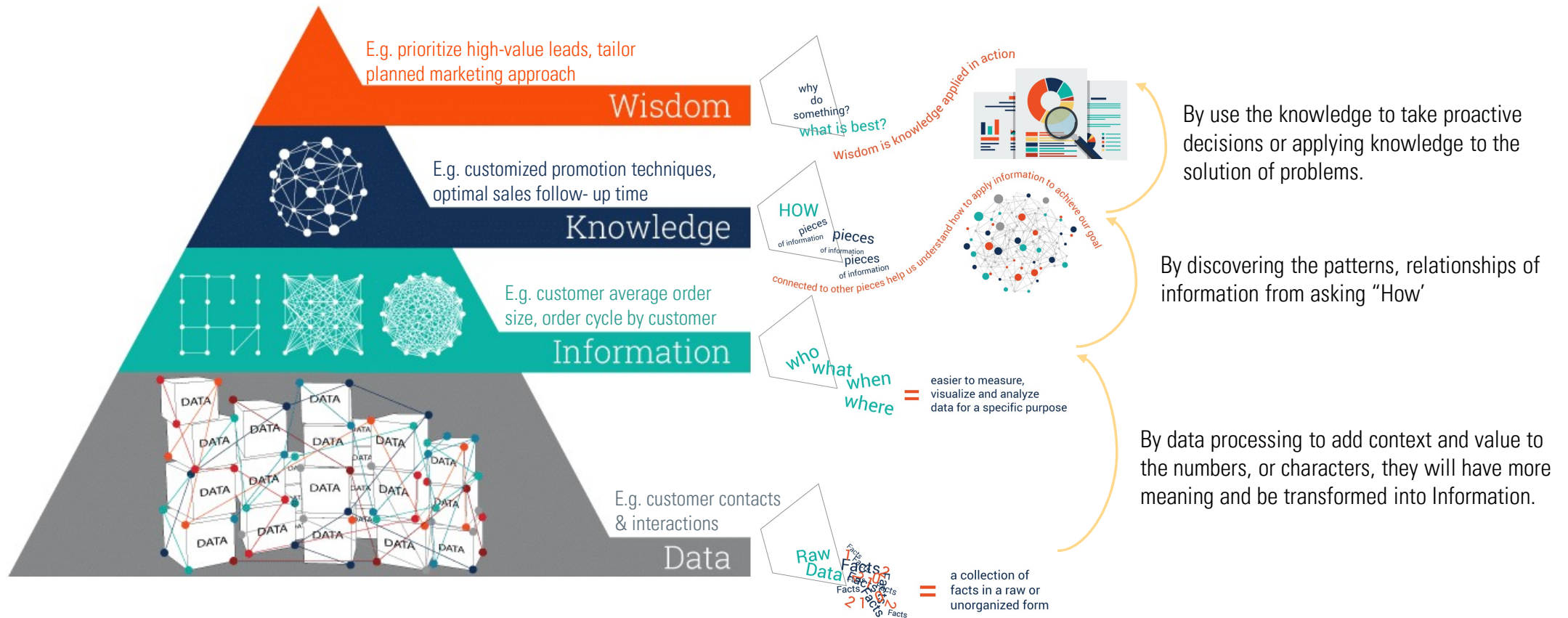


Session overview

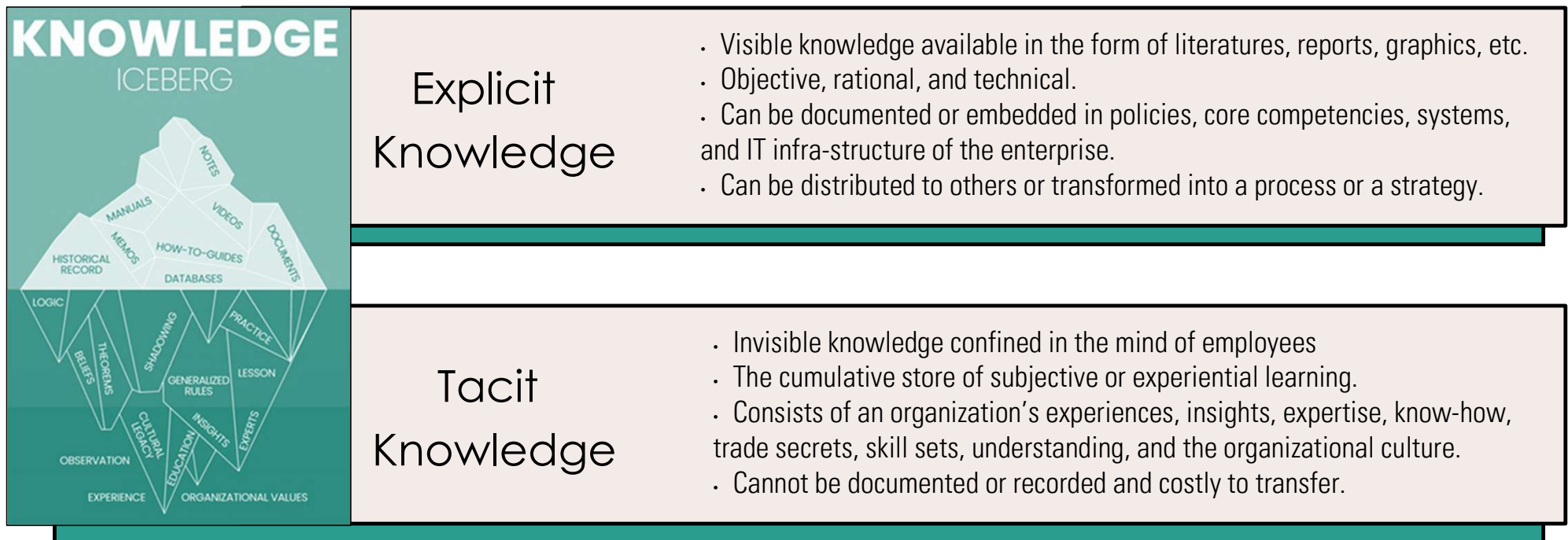
- Concepts & types of knowledge
- Why we need to manage knowledge
- Value chain of managing knowledge
- Categories of knowledge management systems
- Examples of knowledge management systems in supply chain & Logistics
- Challenges of knowledge management applications



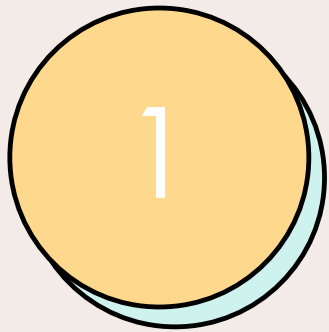
DIKW Pyramid



Types of Knowledge



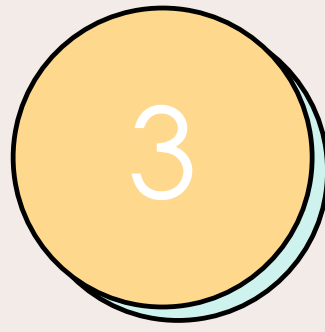
Important dimensions of knowledge



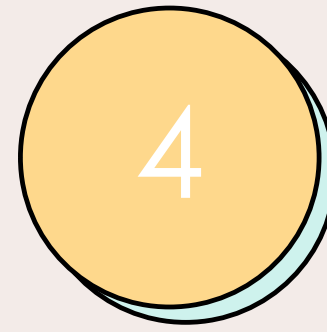
Organization
intellectual
asset



Has many
forms



Has a
location



Transferable



Contextual

Knowledge management

The processes necessary to generate, capture, store, integrate, apply and transfer knowledge across the organization to achieve competitive advantage.

For an organization to be successful, knowledge, as a form of capital must exist in a format that can be exchanged among persons.

It must also be able to grow, to obtain the full value of knowledge, it must be captured and transferred across the organization.



Objectives of knowledge management



Increase
competitive
advantage

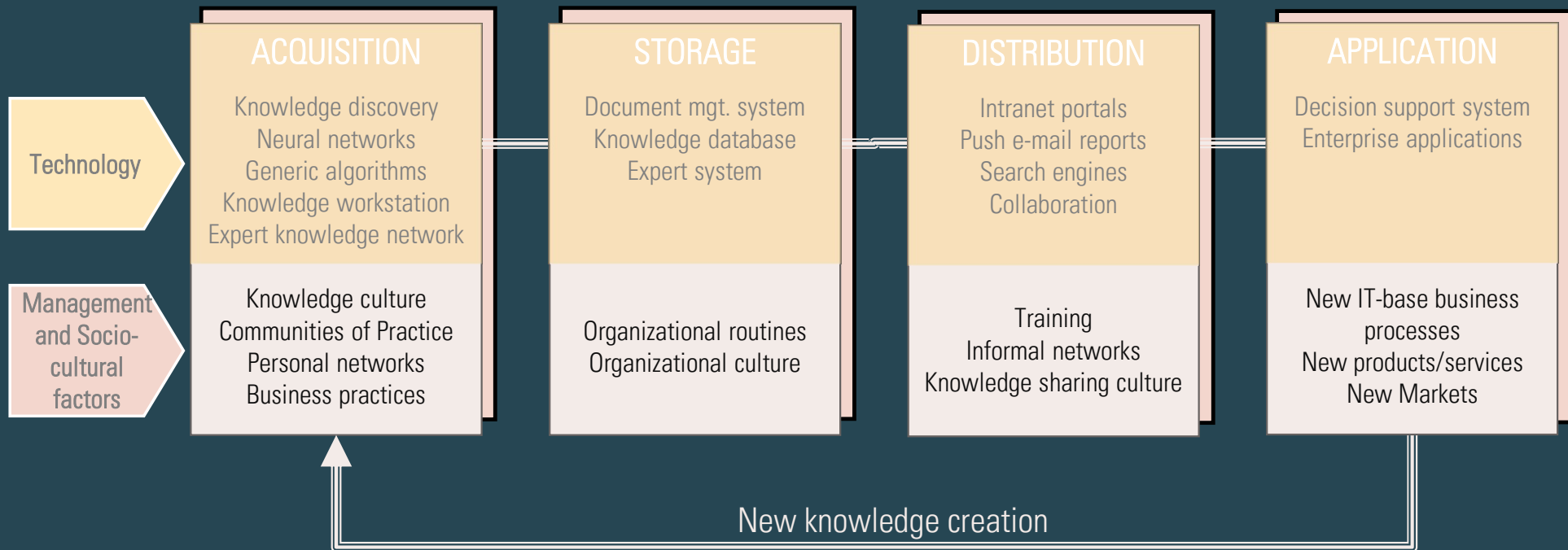
Enhance
employee's
competency &
mobility

Improve
customer's
satisfaction

Retain key
talent/
expertise

Effective use
& preserve of
existing
knowledge

The knowledge management value chain



1

Knowledge Acquisition: Identify the required knowledge and which sources it can be acquired, internally sources or externally sources.

- Organizations acquire knowledge in many ways, depending on the type of knowledge they seek.
- KMS sought to mine knowledge in corporate repositories of both structured & unstructured information.
- Online expert networks can be developed for easily search company's experts
- Knowledge workstations can support engineers to discover new knowledge within corporate data repository.
- Communities of practice (COPs) are informal social networks of professionals and employees within and outside the firm who have similar work-related activities and interests.

ACQUISITION

Knowledge discovery
Neural networks
Generic algorithms
Knowledge workstation
Expert knowledge network

Knowledge culture
Communities of Practice
Personal networks
Business practices

2

Knowledge Storage: Store & organize acquired knowledges into knowledge database so they can be retrieved and used by organization's human resources.

- The objective is to preserve the knowledge acquired or discovered.
- Knowledge storage generally involves the creation of a database.
- The storage acts as a central repository of knowledge with output interface for retrieving knowledge and input interface for adding knowledges.
- Document management systems that digitize, index, and tag documents according to a coherent framework in the database.
- Expert systems also help organizations to preserve the knowledge & provide easy retrieval once required.
- Management must support & encourage employees for indexing, updating and storing documents properly.

STORAGE

Document mgt. system
Knowledge database
Expert system

Organizational routines
Organizational culture

3

Knowledge Distribution: Set up appropriate channels for knowledges can be transferred or shared across organization.

- Intranet portals, push e-mails, instant messaging, social business tools, and search engines technology can support distribution of knowledge across the organization.
- E-training programs help incorporate knowledge development as individual and as teams.
- Management must support & must cultivate a knowledge sharing culture or informal social network.
- Knowledge collaborative culture will improve the productivity of each individual employee, teams and the entire organization.
- Knowledge sharing culture will encourage and enable the free exchange of knowledges, insights and experience to benefit individuals and the organization as a whole

DISTRIBUTION

Intranet portals
Push e-mail reports
Search engines
Collaboration

Training
Informal networks
Organizational culture

4

Knowledge Application : Apply the knowledge acquired, stored and distributed across the organization into running business.

- Knowledge will not add any value to the company if it is not shared or applied when running the business.
- Knowledge can be applied and become situated in systems for decision supports
- New knowledge should be built into company's business processes and key application systems e.g. ERP or CRM for operation excellence.
- If management built the right culture for their employee, they will be motivated to continuously find new knowledge to improve their works.

APPLICATION

Decision support system
Enterprise applications

New IT-base business
processes
New products/services
New Markets

Knowledge management system

KMS refer to the use of modern information technologies - the Internet, intranets, extranets, and databases - to systematize, enhance, and expedite knowledge management both within one firm and among multiple firms.

KMS is intended to help an organization cope with turnover, rapid change and downsizing by making the expertise of the organization's human capital widely accessible.



Types of KM systems

Enterprise-wide KM

Integrated, general-purpose system to collect, store, distribute and use digital content & knowledge across the entire organization.

Knowledge work

Specialized management system designed for engineers, scientists, and other knowledgeable workers to create & discover new knowledge.

Intelligence techniques

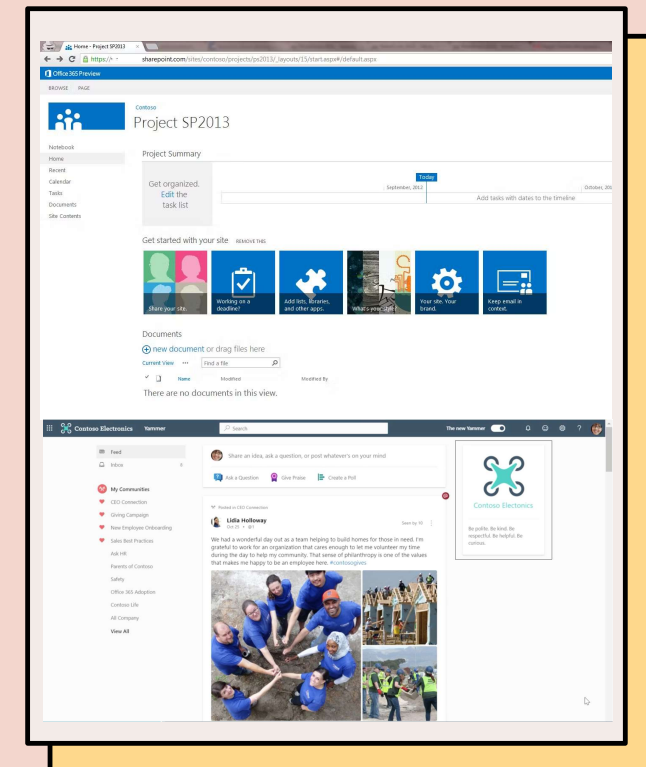
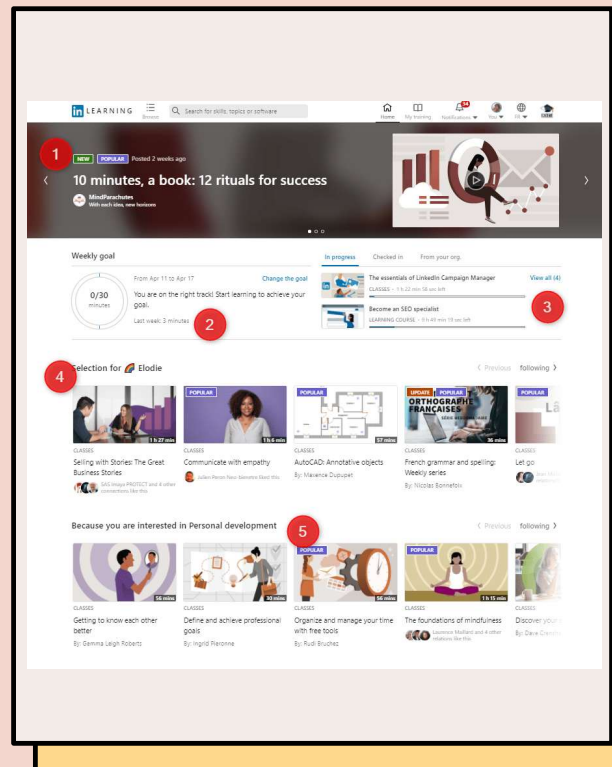
Tools for discovering patterns and applying knowledge to discrete decisions. It involves collecting, storing, dealing with particular and predictable tasks with smart strategic things.

1. Enterprise-wide KM systems

Enterprise-wide KM

Integrated, general-purpose system to collect, store, distribute and use digital content & knowledge across the entire organization..

Examples are portals, Search Engines, Learning Management systems (LMS), Content management system, Collaboration & social tools.



Learning Management systems

Refer to any type of online platform that provides the tools required publish online courses and manage virtual classrooms. Companies can set up an online e-learning hub via intranet for employees' self-learning.

Features of LMS includes;

- The ability to set up multiple learning courses
- Classroom based training, booking management
- Course request and approval
- Publish & download training materials
- Create evaluations, tests and certificates
- Real-time reporting, observation and record tracking
- On-boarding and implementation included
- Accessible from desktop or mobile devices
- Intuitive user interface
- Payment processing

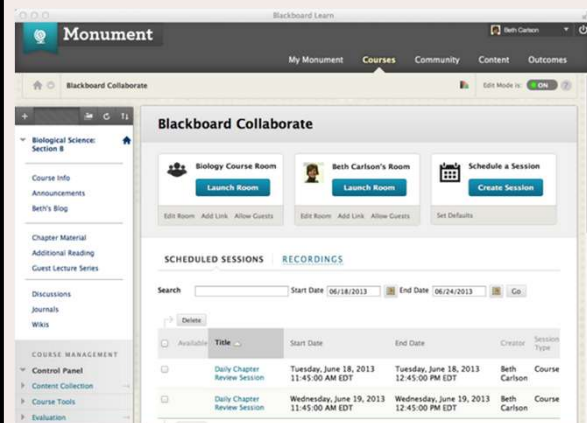
Benefits

- Centralized learning hub to manage the full curriculum, both online and offline learning
- Easy access to learning 24/7, no geographical limit
- Track learners' training and progress
- Produce management reports and analysis
- Securely store learning evidence, historical learning, test results, evaluation records and certifications
- Reduce administration resource through automation
- Maximise internal expertise through collaborative features

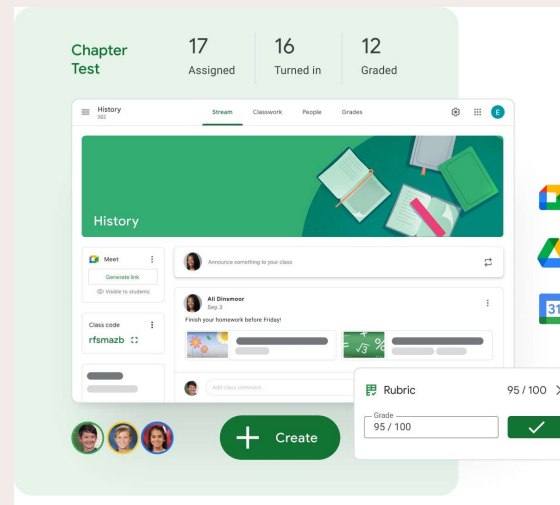
Learning Management systems

Examples of LMS

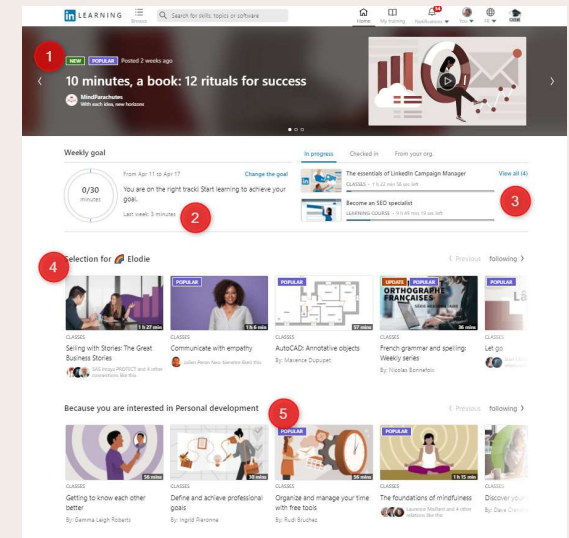
Blackboard Learn



Google classroom



LinkedIn Learning



Content management system

A digital application for managing content and letting multiple users create, format, edit, and publish content, on the company's intranet, stored in a database, and presented in some form, like with a website.

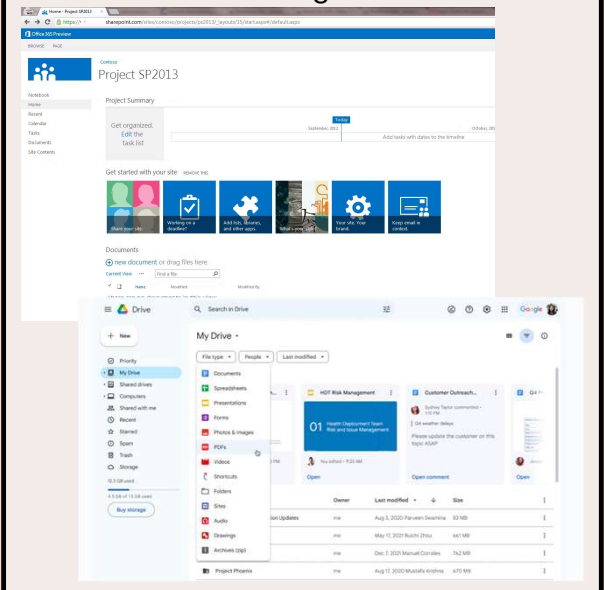
Features of CMS

- Intuitive indexing, tagging, search and retrieval
- Content storage & organize
- Update and edit content after publication
- Conversion of documents into HTML or PDF documents
- Permission control
- Documents protection

Benefits of CMS

- Easy content creation & publish
- Streamline collaboration & workflow
- No coding knowledge is required
- Secured with permissions
- Scalability and Extensibility
- Budget-friendly

Examples: SharePoints, Google drives



2. Knowledge work systems

Knowledge work

Specialized management system designed for engineers, scientists, and other knowledgeable workers to create & discover new knowledge.

Examples are 3D visualization, computer-aided design (CAD) systems, virtual reality, augmented reality



Computer-Aided Design

CAD is the computer software supporting the creation, modification, analysis, or optimization of a product design. CAD is a way to digitally create 2D drawings and 3D models of real-world products before they're ever manufactured.

Features of CAD

- Support generative 2D designs or 3D solid modelling
- Allow virtual interaction visualization & in-depth analysis
- Allows API integration with spreadsheets, document editors and other sharing outputs
- Allowing design development, alteration and optimization
- Allow real-time associative designing

Benefits of CAD

- Reducing design lead time by enabling collaboration between developing teams
- Reducing errors and rework cost with endless digital scenarios & modifications
- Ensure compliance and quality with industry standards
- Reduce wastes & material utilization in product development

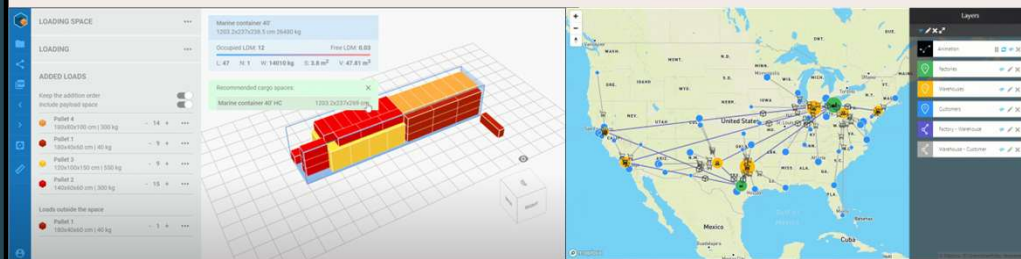
Limitations of CAD

- Small-batch production size makes 3D printing more costly and slower than mass production
- Security concerns that digital design templates stored on cloud
- Needs a skilled workforce with sufficient technical & designing knowledge

CAD in practices

Examples of CAD usage can be seen in logistics & supply chain industry are;

- Warehouse layout designs
- Vehicles design
- Warehousing Robotics design
- Conveyor layouts assembly
- Operation motion studies
- Transport network simulation
- Container/vehicle loading customization



ORIGINAL CAD SCREENSHOTS

Virtual Reality (VR)

VR is an application for simulating 3D environment that lets users explore and interact with a virtual surrounding in a way that approximates reality, making the user feel they are immersed in their surroundings

Features of VR

- Immersion in a computer-generated world
- Allow interaction & engagement in activities within the virtual
- Provide realistic visuals 360-degreed view
- Provide multi-sensory haptic feedback like vibrations
- Allow virtual collaboration among connected VR devices

Benefits of VR

- Cost savings from reducing reliance on expensive physical prototypes environment
- Faster time to market by enabling collaboration and communication between teams
- Increased sales by presenting products in compelling ways beyond traditional multimedia formats
- Immersive training experience

Limitations of VR

- Investment in VR hardware & software
- Ergonomic concerns for long-period using VR devices
- Sufficient bandwidth for multiple devices lives connection & streaming
- Time and effort to create fully immersive content and workflow content

VR in practices

VR mostly for trainings to simulate a real-world situation, allowing people to have immersive learning experience and take decisions in a safe environment

VR can be used in warehouse layout designing or visit tours.



Augmented Reality (AR)

AR is an application technology that instantly inserts virtual objects, information, or elements into the real world, using software or a device to add new sights, sounds or sensory stimulation in actual vision.

Features of AR

- Overlaying visual, auditory, or other sensory information onto the real world
- Connect ability with wearable devices
- Partially immerse user into actions
- Users still in touch with the real world
- Provide virtual simulations on actual presence environment

Benefits of AR

- Enhance user engagements
- Enhance sensory development & memorization in trainings
- Safe & affordable training
- Support decision making with interactive navigation and scene analysis
- Enable collecting data on customer's preference
- Workflows guided by AR minimize human errors

Limitations of AR:

- Maintenance cost
- Learning curves of operational workers
- Health concerns for long-period using AR devices
- Sufficient network for multiple devices lives connection & streaming in large facilities

AR in practices

Key instances of how to use AR in logistics;

- Support order picking and fulfilment
- Enhanced navigation & guide optimal paths
- Dynamic inventory management
- Loading and unloading assistance
- Delivery route enhancement
- Shipment tracking and visualization
- Operational training & onboarding
- Maintenance and support of vehicles or MHEs
- Remote troubleshooting
- Customer involvement
- Cooperative administration for decision making



Imagine hands-free working with
Augmented Reality Glasses

VISION PICKING
AUGMENTED REALITY SUPPORTED PICKING IN WAREHOUSES

In partnership with Google, Vuzix and Ubimax, DHL Supply Chain is rolling out its global augmented reality program with vision picking pilots across several markets and industries.

HIGHLIGHTS OF THE TECHNOLOGY

- AGILE, QUICK FULFILLMENT
- REDUCED ERROR RATES
- USER FRIENDLY, INTUITIVE
- HANDS-FREE
- HIGH APPROVAL AMONG EMPLOYEES

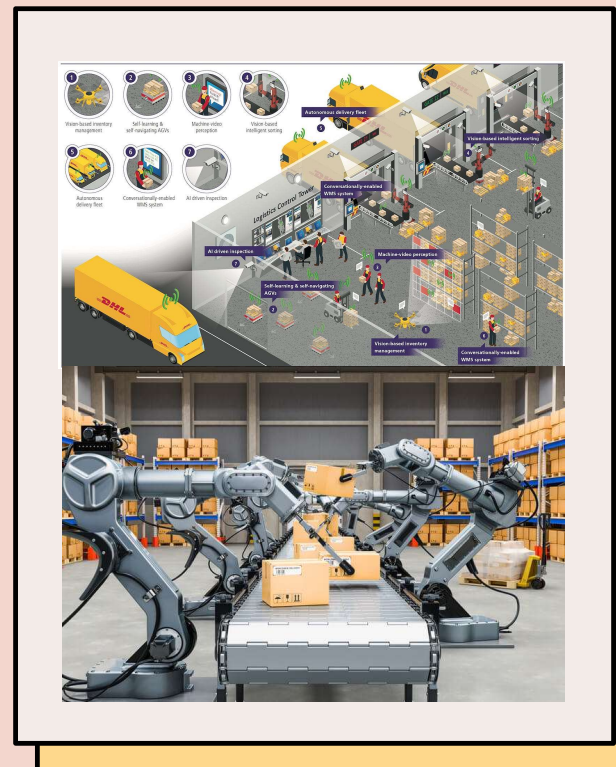
HOW IT WORKS

1. PICK & SCAN TROLLEY
2. FIND, PICK AND SCAN ORDER ITEMS
3. PLACE ORDER ITEMS IN THE CORRECT TROLLEY BOXES

PILOTS

RETAIL, CONSUMER, TECHNOLOGY

3.Intelligence techniques



Intelligence techniques

Tools for discovering patterns and applying knowledge to discrete decisions. It involves collecting, storing, dealing with particular and predictable tasks with smart strategic things.

Examples are data mining, expert system, neural networks, machine learning, robotics, AI, internet-of-things.

Characteristics of ES includes;

- Infinity reproduceable
- Operate at peak performance
- Generate best possible opinion
- Base on availability & convenience
- No bias
- No personality
- Deal with problems that have limited knowledge domains & all possible alternatives are known

Main components of ES;

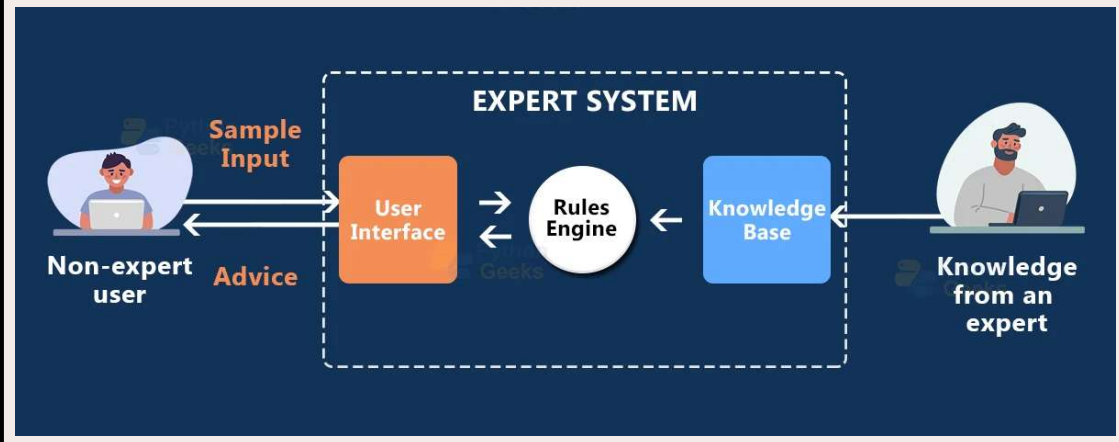
1. Knowledge base – Database containing all information & knowledge
 - Object → The conclusion of its associated rules
 - Attribute → a specific character to define an object
2. Rules engine – Processing strategy to search through the knowledge base to find conclusion
3. User interface – Display of program inputs & outputs

Limitations of ES include;

- Lack of robust & general human intelligence
- Cannot support unstructured problems
- Require high cost & efforts in development
- Require continually modification since the knowledge environment constantly change.

Expert System

Expert System refers to an intelligent computer program that represent or reasons with experts' knowledge and inference to solve complex problems that are required a specific expertise to get the solution. It simulates the decision-making abilities of human experts.



Artificial intelligence

Capabilities	Natural Intelligence	Artificial Intelligence
Preservation of knowledge	Perishable from an organizational point of view	Permanent
Duplication and dissemination of knowledge in a computer	Difficult, expensive, time consuming	Easy, fast, and inexpensive
Total cost of knowledge	Can be erratic and inconsistent, incomplete at times	Consistent and thorough
Documentation of process and knowledge	Difficult, expensive	Fairly easy, inexpensive
Creativity	Can be very high	Low, uninspired
Use of sensory experiences	Direct and rich in possibilities	Must be interpreted first; limited
Recognizing patterns and relationships	Fast, easy to explain	Machine learning still not as good as people in most cases, but in some cases better than people
Reasoning	Making use of a wide context of experiences	Good only in narrow, focused, and stable domains

What is Artificial intelligent?

AI refers to the development of computer systems that can perform tasks which normally require human intelligence.

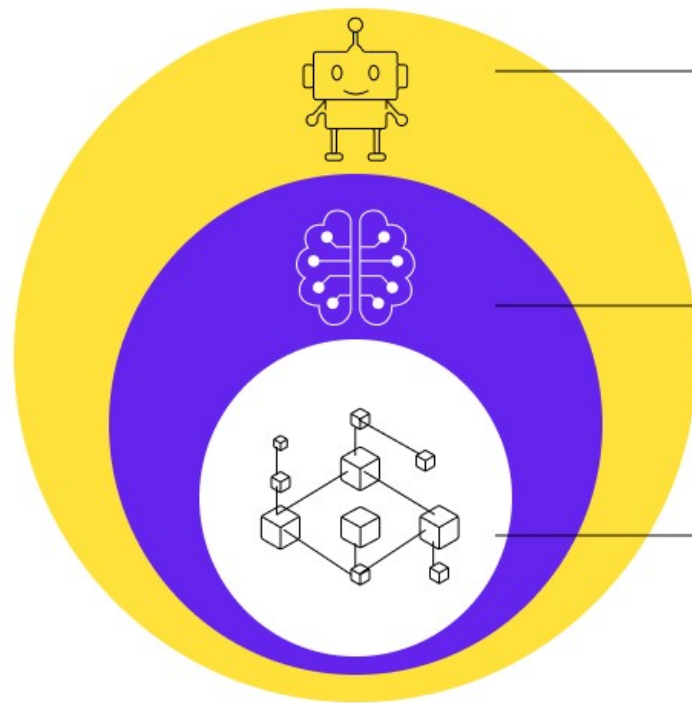
What is intelligent behaviour?

- Problem-solving
- Decision-makings
- Learning or understanding from experience
- Making sense of ambiguous or contradictory messages
- Responding quickly and successfully to new situations

Distinguish Strong AI vs Narrow AI

- **Strong AI** : Copy or exceed human abilities & intelligence, have consciousness like human.
Example : Deep Blue, Sophia
- **Narrow AI** : Perform simulation of human intelligence for specific functions such as text/speech or face recognition, robotics, machine vision, big data mining.

Relationship of AI, ML and DL



Artificial Intelligence

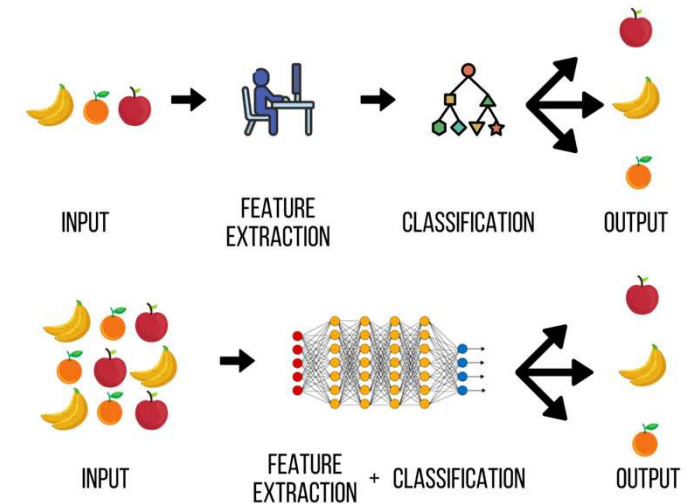
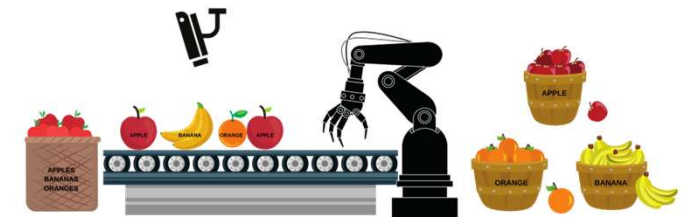
Computers that can imitate human intellect and behavior.

Machine Learning

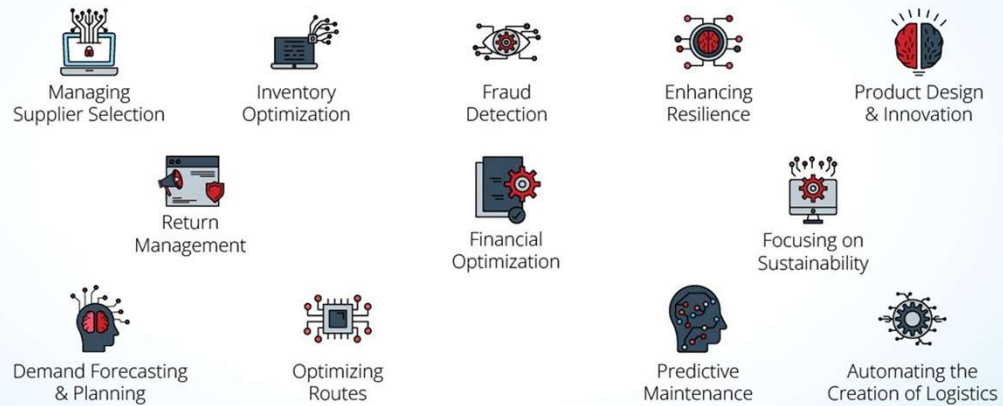
Statistical algorithms that enable AI implementation through data.

Deep Learning

Subset of machine learning which follows neural networking.



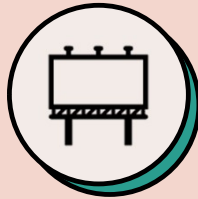
Use cases of **Generative AI** in Supply Chain



Network based Route Optimization

with **nuVizz**

Challenges of knowledge management system for Supply chain & Logistics



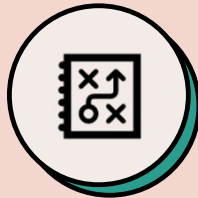
Lack of user-friendly interface

Significantly deter employees to participate in knowledge sharing & reluctance to use the knowledge base.



Poor quality knowledge repository

Outdated data, unreliable data sources, insufficient metrics lead to unusable system.



Overwhelming information overload

Risk of critical insights get buried under big data from limited searchability of KM system, or from poorly maintain KM system functionalities.



Security risks

Implementing system without solid data protection measures, company is risk of valuable insights being exposed to data security breaches.



Lack of management buy-in

Managements have crucial part in sustaining culture of knowledge sharing & continuously development of knowledge management systems.

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THANK YOU

Q & A

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