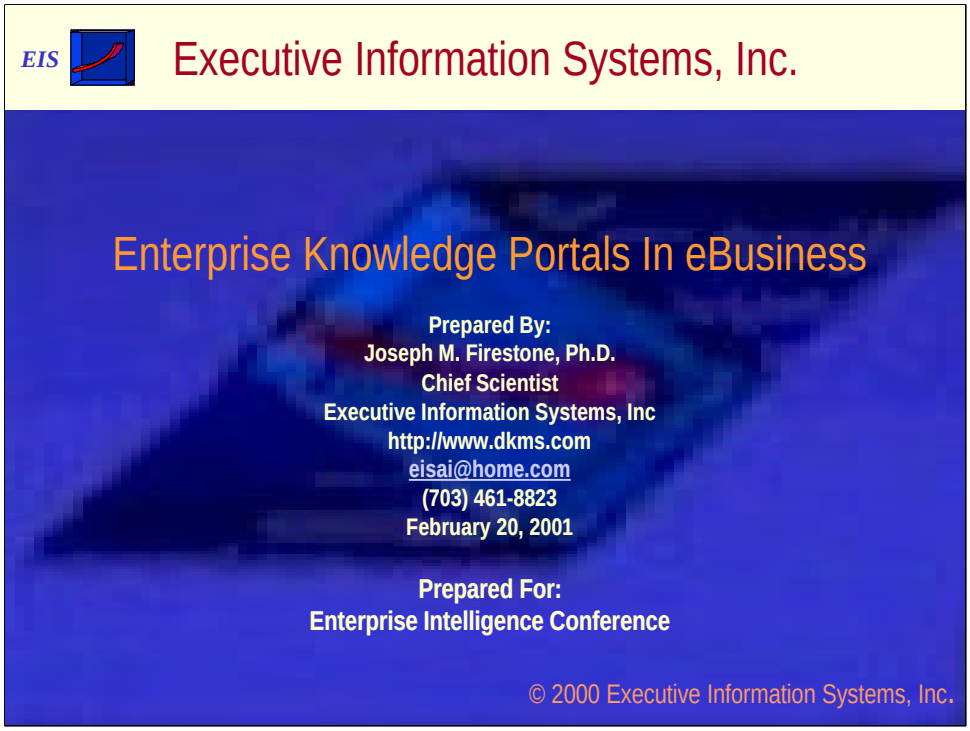
EIS
Executive Information Systems, Inc.
Enterprise Knowledge Portals In eBusiness
Prepared By:
Joseph M. Firestone, Ph.D.
Chief Scientist
Executive Information Systems, Inc
http://www.dkms.com
eisai@home.com
(703) 461-8823
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Prepared For:
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IT Applications Are Purposeful

- They Support and Partially Automate Human Participation In Business Processes
- Portals are No Different
- So Let's Talk About eBusiness and Knowledge Processes Before We Talk About Knowledge Portals

eBusiness

- eBusiness is not the same as eCommerce
- eCommerce is about selling over the Internet, while ebusiness is about using web technology to support a set of related business processes including Sales
- Examples of other e-business processes are:
  - eCRM (web-enabled Customer Relationship Management),
  - eSCM (web-enabled Supply Chain Management),
  - eERP (web-enabled Enterprise Resource Planning),
  - eKP (web-enabled Knowledge Processing, and
  - eKM (web-enabled Knowledge Management)

Types of Web Enablement in eBusiness

- Custom
- EIP Technology
  - EIPs
  - eIPs
- EKP Technology
  - EKPs
  - eKPs

What is an Enterprise Information Portal?

- According to Merrill Lynch's Shilakes and Tylman:
- "Enterprise Information Portals are applications that enable companies to unlock internally and externally stored information, and **provide users a single gateway to personalized information** needed to make informed business decisions."

What is an Enterprise Information Portal? (TWO)

- ". . . an amalgamation of software applications that consolidate, manage, analyze and distribute information across and outside of an enterprise (including Business Intelligence, Content Management, Data Warehouse & Mart and Data Management applications)."

What's An eIP?

- An eIP is an ebusiness Information Portal, that is, it uses EIP technology to support e-business processes that transcend the enterprise.
- There are two basic types of eIPs:
  - Extraprise Information Portals (ExIPs); and
  - Interprise information Portals (IIPs)

Extraprise Information Portals

- An ExIP is an Information portal supporting an extended enterprise usually consisting of a community of trading partners having a mutual interest, ***revolving around a common host enterprise,*** who do business with one another on a fairly predictable and repetitive basis. The enterprise at the center of the system usually hosts the "extended Intranet" (aka, the "Extranet").

Interprise Information Portals

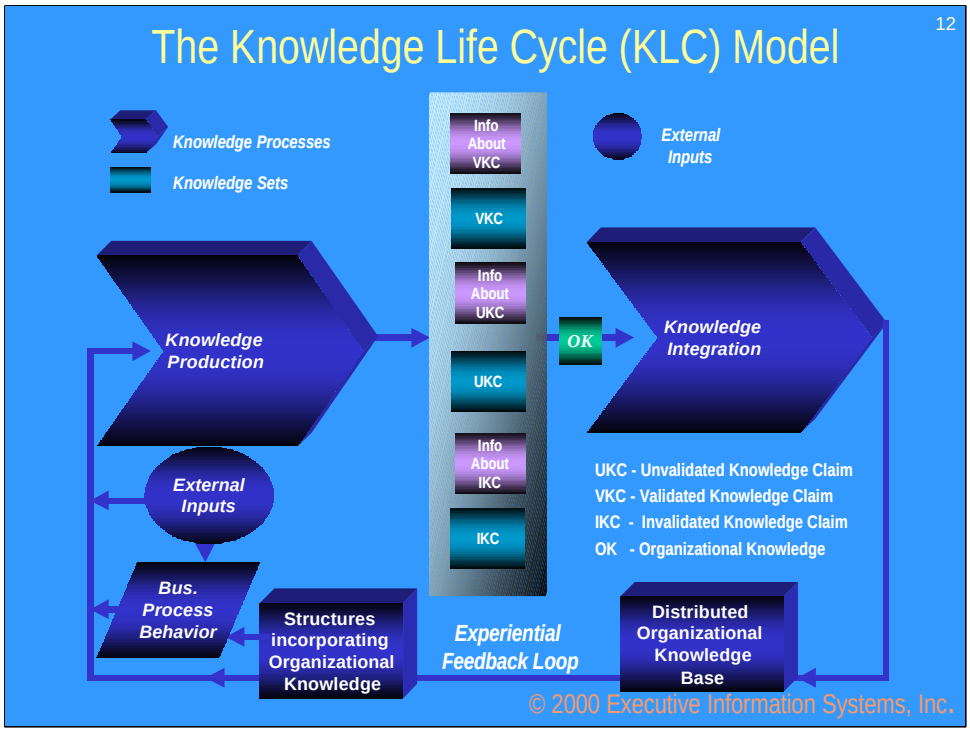
- An Interprise Information Portal (IIP) is an Information portal supporting web-like federations of otherwise independent companies with no “network host” at the center.
- The members of the interprise do business with one another through the IIP on a fairly unpredictable and irregular basis in response to individual expressions of demand in marketplaces of mutual interest.

Problems and Solutions in the Enterprise

- Every individual, team, or group within the enterprise encounters problems in the course of the work day as they attempt to make decisions. A problem is created by an attempt to make a decision followed by a realization that one can't make it because one can't predict the outcome
- Every problem has alternative solutions
- And every alternative solution is subject to criticism and to replacement if it performs less well than its competitors.
- The best problem solution is the competitive alternative that best survives criticism

The Enterprise is a “Swirl” of Knowledge-related Interactions

- The set of problem-solving interactions in an enterprise constitutes a continuous, dynamic “swirl” from which knowledge is produced and integrated with the business processes of the enterprise
- For a given problem, it is useful to abstract from the swirl and to conceptualize an iteration of a knowledge life cycle targeted on solving that problem.


The Knowledge Life Cycle (KLC) Model
12
Knowledge Processes
Knowledge Sets
Info About VKC
VKC
Info About UKC
UKC
Info About IKC
IKC
External Inputs
Knowledge Production
OK
Knowledge Integration
External Inputs
Bus. Process Behavior
Structures incorporating Organizational Knowledge
Experiential Feedback Loop
Distributed Organizational Knowledge Base
UKC - Unvalidated Knowledge Claim
VKC - Validated Knowledge Claim
IKC - Invalidated Knowledge Claim
OK - Organizational Knowledge
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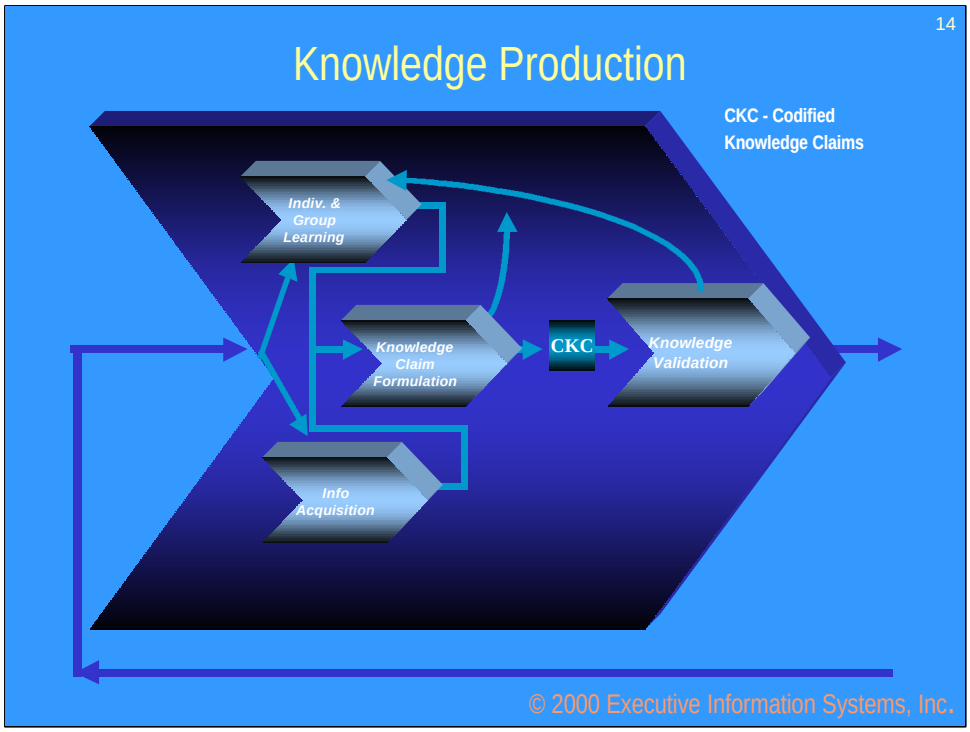
Structures Incorporating Organizational Knowledge

- Business Processes
- Organizational Culture
- Organizational Strategy
- Organizational Teams
- Formal Org. Sub-divisions
- Individuals
- Policies
- Procedures
- Products
- Services
- Codified Organizational Knowledge
  - Information Systems
  - Paper documents
  - Images
  - Art
  - Other Organizational Cultural Artifacts


14
Knowledge Production
CKC - Codified
Knowledge Claims
Indiv. &
Group
Learning
Knowledge
Claim
Formulation
CKC
Knowledge
Validation
Info
Acquisition
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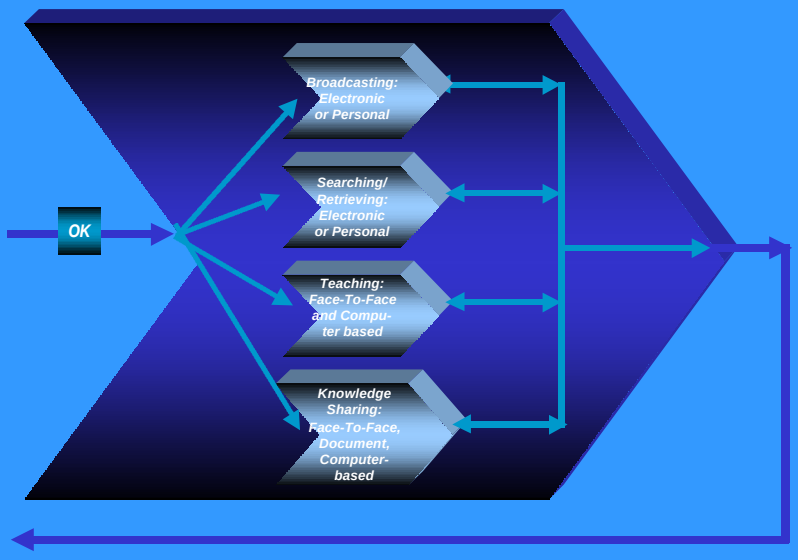
Knowledge Integration



What is Knowledge Management?

- It is handling, directing, governing, controlling, coordinating, planning, and organizing agents, components, and activities participating in the basic knowledge processes (knowledge production and knowledge integration)
- That is, it is managing the KLC -- its processes and its products (outcomes)
- Such management occurs through a range of activities

KM Task Clusters and Task Patterns

- There are three KM task clusters: interpersonal behavior; knowledge processing behavior; and decision making
  - Interpersonal behavior includes three task patterns:
    - figurehead,
    - leadership, and
    - external relationship-building activity.
  - Knowledge processing behavior includes two task patterns:
    - KM knowledge production; and
    - KM knowledge integration.

KM Task Clusters and Task Patterns (TWO)

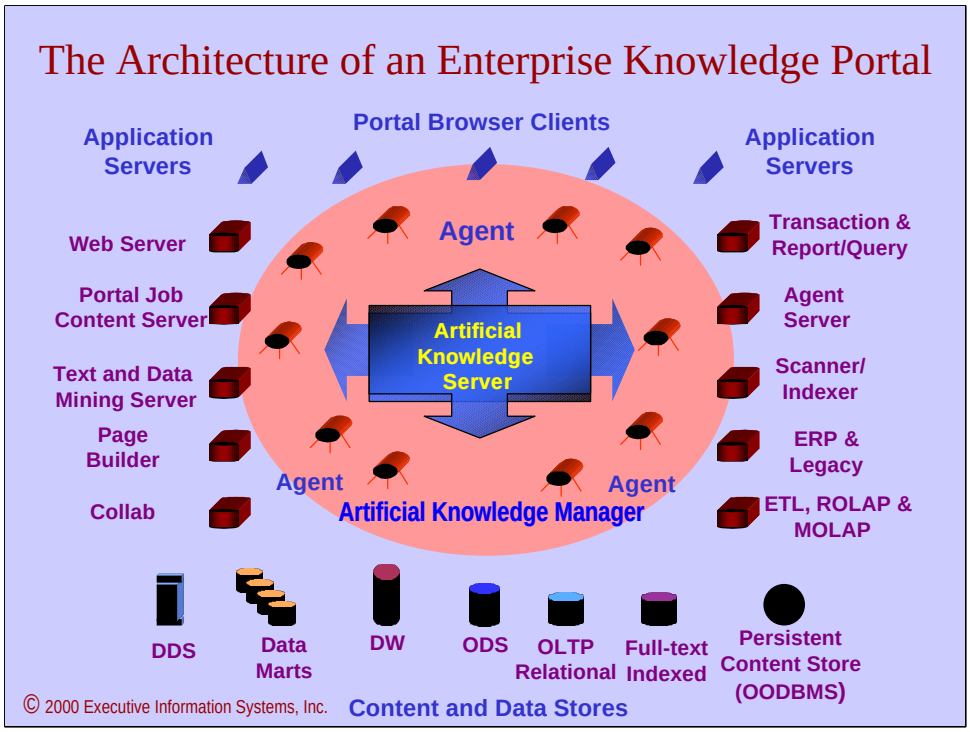
- Decision Making includes four task patterns:
  - changing knowledge process rules;
  - crisis handling;
  - allocating KM and knowledge processing resources; and
  - negotiating agreement with representatives of other business processes.

What is an Enterprise Knowledge Portal (EKP)?

- An EKP is an enhanced Enterprise Information Portal (EIP)
- It is an EIP that supports knowledge production, knowledge integration, and knowledge management
- It is an EIP that supports individuals, groups, and teams in the swirl of problem-solving activities permeating enterprise business processes

Enterprise Knowledge Portals

- focus upon, provide, produce and integrate information about the validity of the information they supply
- provide information about your business and meta-information about the degree to which you can rely on that information,
- distinguish knowledge from mere information,
- provide a facility for producing knowledge from information
- orient one toward producing and integrating knowledge rather than information


The Architecture of an Enterprise Knowledge Portal
Application Servers
Portal Browser Clients
Application Servers
Web Server
Portal Job Content Server
Text and Data Mining Server
Page Builder
Collab
Agent
Artificial Knowledge Server
Agent
Agent
Artificial Knowledge Manager
Transaction & Report/Query
Agent Server
Scanner/ Indexer
ERP & Legacy
ETL, ROLAP & MOLAP
DDS
Data Marts
DW
ODS
OLTP Relational
Full-text Indexed
Persistent Content Store (OODBMS)
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Content and Data Stores

EKP Generic Application Components

- Browser and e-mail clients
- The Avatar -- a client-based intelligent agent
- The portal application server(s),
- The access management system
- Knowledge Claim Objects
- The enterprise Artificial Knowledge Server(s) (AKSs),
- Complex adaptive system (cas) mobile intelligent agents
- The formal knowledge production application server(s) and its associated clients supporting analytical and statistical modeling, KDD and Data Mining, Simulation, impact analysis and forecasting,
- The collaborative processing application server, and
- A persistent storage component.

EKP User Interface: Start-up and the Avatar

- The EKP provides a personalized user interface for each knowledge worker to use the portal.
- The organization of this interface is at first determined by an initial profile of desires and interests determined by a knowledge worker dialog with the portal upon first use. This dialog serves to program an intelligent agent serving the portal interface.
- On initial programming, the intelligent agent becomes the knowledge worker's avatar, representing it to the portal system.
- Thereafter, the avatar will modify the portal's content and organization based on preferences expressed in actual patterns of use of the portal by the knowledge worker.

EKP User Interface: The Avatar

- The avatar uses these patterns of use to learn the knowledge worker's interests and preferences over time.
- The avatar also learns the changes in the knowledge worker's interests and preferences. Eventually the avatar uniquely represents the knowledge worker and ensures that the EKP is entirely personalized to the knowledge-centric work flow patterns of the knowledge worker.
- The EKP then becomes a desktop environment keyed to the knowledge worker's cognitive map and work flow and the "islands of automation" characteristic of today's desktops are replaced by desktops supporting integrated work flows defined in the context of the knowledge worker's cognitive map.

What is the Purpose of the Avatar in the EKP?

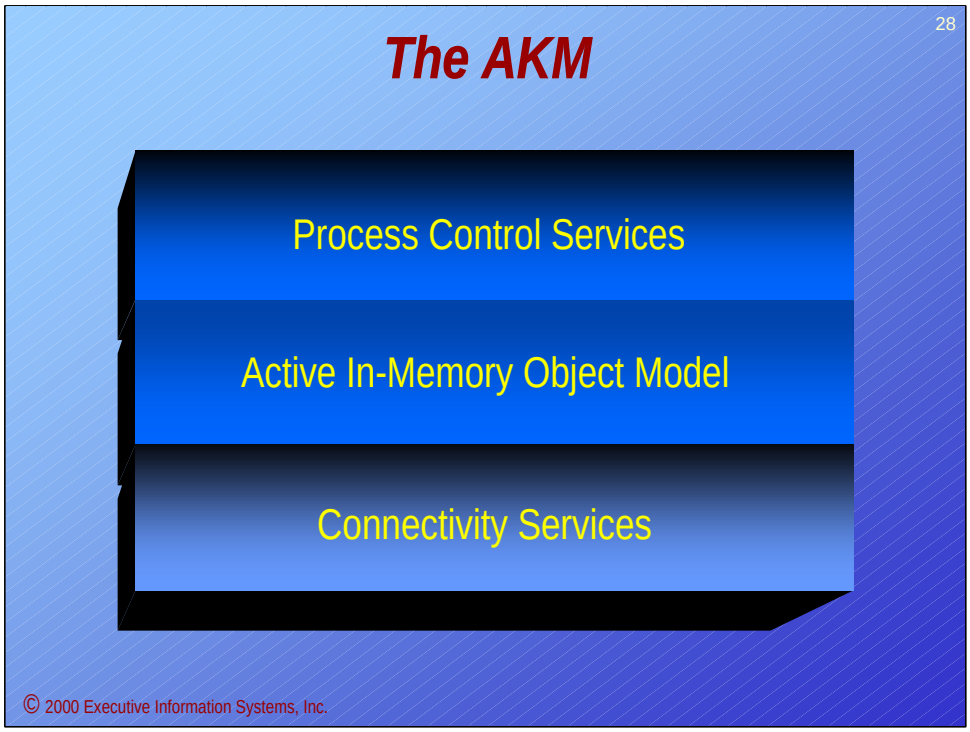
- Creating a highly automated, enterprise knowledge-enabled, self-learning/adaptive interface that is personally and dynamically tailored to each user. The types of automation involved here include:
  - assimilation of the user's local environment, personal preferences & cognitive patterns
  - learning from, interacting with, and utilizing enterprise knowledge communicated by the Artificial Knowledge Servers

What is the Purpose of the Avatar in the EKP? (Two)

- supporting personal and collaborative workflows, by providing workflows retained in memory, and accessible from the portal interface
- adapting according to anticipated needs of users, determined through the Avatar's access to user cognitive maps
- producing knowledge claims and submitting these to the EKP system. These knowledge claims of the Avatar represent local knowledge, in contrast to the rules that have been validated by the EKP system's network of Artificial Knowledge Servers
- providing the user with autonomous negotiating capabilities with the rest of the EKP system

Knowledge Claim Objects

- An important class of objects in the EKP system is the knowledge claim object (KCO)
- A KCO is distinguished from an ordinary business object by the presence of validity metadata encapsulated in the object
- Such metadata compares the KCO to alternative, competing KCO's, and may be expressed in many different forms. The "metadata" may be qualitative or quantitative or it may be in the form of textual content. In relatively infrequent but important special cases, the metadata may involve quantitative ratings of a knowledge claim compared to its competitors.
- When the KCO is accessed by a user, data, metadata, and methods are all available, so the user can evaluate the KCO as a basis for decision against competing KCOs. This capability is not available in EIPs, which express knowledge claims as data or business objects only.



Process Control Services:

- In-memory proactive object state management and synchronization across distributed objects
- Component management and Workflow Management
- Transactional multithreading
- business rule management and processing, and
- metadata management.

In-memory Active Object Model/Persistent Object Store is characterized by:

- Event-driven behavior
- EKP-wide model with shared representation
- Declarative business rules
- Caching along with partial instantiation of objects
- A Persistent Object Store for the AKS and
- Reflexive Objects

Connectivity Services are:

- Language APIs: C, C++, Java, CORBA, DCOM
- Databases: Relational, ODBC, OODBMS, hierarchical, network, flat file, etc.
- Wrapper connectivity for application software: custom, CORBA, or COM-based.
- Applications connectivity including all the categories mentioned above, whether these are mainframe, server, or desktop - based.

The Artificial Knowledge Server

- The distributed AKS provides Process Control Services, an Object Model of the EKP system, and connectivity to all enterprise information, data stores, and applications
- Process Control Services:
  - In-memory proactive object state management and synchronization across distributed objects
  - Component management and Workflow Management
  - Transactional multithreading
  - business rule management and processing,
  - KCO management and processing and
  - metadata management
- In-memory Active Object Model/Persistent Object Store is characterized by:
  - Event-driven behavior
  - EKP-wide model with shared representation

The Artificial Knowledge Server (Two)

- Declarative business rules
- Caching along with partial instantiation of objects
- A Persistent Object Store for the AKS and
- Reflexive Objects and KCOs
- Connectivity Services are:
  - Language APIs: C, C++, Java, HTML, XML, CORBA, DCOM
  - Databases: Relational, ODBC, OODBMS, hierarchical, network, flat file, XML, etc.
  - Wrapper connectivity for application software: custom, CORBA, or COM-based
  - Applications connectivity including all the categories mentioned above, whether these are mainframe, server, or desktop - based

The Intelligent Agent Platform

- The second type of component comprising the EKP's AKM is the intelligent agent (IA).
- EKP IAs are lightweight, intelligent, efficient, specialized Business Process Engines that provide some memory and a small amount of processing power at almost no cost.
- Agents alone cannot yet create the virtual enterprise. For complex processing and an enterprise wide view, the AKS is also indispensable.
- But IAs provide distributed load balancing to processing in the AKM.
- They are necessary partners in providing the processing power needed for implementing the EKP as a virtual enterprise.
- When we add agents to the AKS to create the AKM, we provide software wiring for the enterprise that connects its central brain components (the AKSs) to its sensors (the agents). The result is a flexible and scalable AKM that can integrate the various components of the EKP into a virtual enterprise.

The Intelligent Agent Platform

- Lightweight expert system w/rule-based inference engine supporting forward/backward chaining and ‘what if’ scenarios
- Lightweight high-performance multi-threaded SNMP engine that provides two-way communication between agents and other components of the EKP system
- Component for modeling cycle time, blockages in a system, work flows, and interpersonal, and semantic networks
- Complex Adaptive Systems agents (agents interact with local environment and external components to automatically formulate local knowledge and submit knowledge claims to the next higher level in the system hierarchy which automatically tests and validates them. This process produces automated knowledge production and automated adaptation to local and global environments)

Some Claimed Benefits of EIPs

- Competitive Advantage
- Increased ROI
- Increased Employee Productivity
- Increased Effectiveness
- Decreased Cost of Information
- Increased Collaboration
- Universal Access to Enterprise Resources
- A Unified, Dynamically Integrated and Maintained View of Enterprise Data and Information
- Accelerated Innovation

Benefits of EKPs

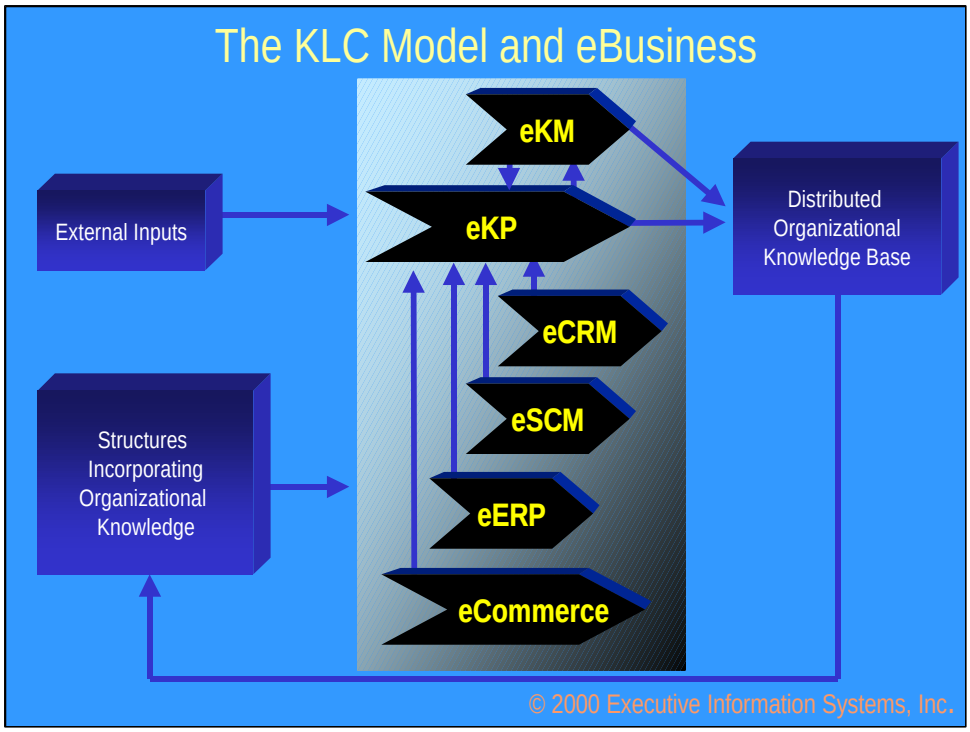
- While these are benefits claimed for Enterprise Information Portals:
  - Competitive Advantage
  - Increased ROI,
  - accelerated innovation and
  - Increased Effectiveness -- the four most important benefits
- tacitly assume that the information produced or supplied by an EIP is correct information
- **Risk:** If that's not the case, these four benefits are lost
- An overriding justification for implementing an EKP, rather than an EIP, is to **secure** these four benefits and to minimize decision making risk by increasing the **quality/validity** of information supplied by the portal

What's an eKP?

- An eKP uses EKP technology to support e-business processes that transcend the enterprise.
- There are two basic types of eKPs:
  - Extraprise Knowledge Portals (ExKPs); and
  - Interprise Knowledge Portals (IKPs)

The EKP/eKP and e-Business

- The use of EIPs in eBusiness is an accelerating trend
- EKPs provides all the support for eBusiness provided by EIPs. In addition, EKPs provide unique support for:
  - eCRM
  - eSCM
  - eERP
  - eCommerce


The KLC Model and eBusiness
eKM
eKP
eCRM
eSCM
eERP
eCommerce
External Inputs
Structures Incorporating Organizational Knowledge
Distributed Organizational Knowledge Base
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The EKP/eKP and eCRM

- Knowledge-based Personalization of CRM web clients
- Customer individual and group learning
- Knowledge worker individual and group learning
- Knowledge validation in such areas as:
  - Strategic and Tactical CRM planning
  - Customer acquisition
  - Customer retention
  - Customer lifetime Value
  - Monitoring and evaluating CRM initiatives

The EKP/eKP and eSCM

- Knowledge-based Personalization of SCM web clients
- Knowledge worker individual and group learning
- Knowledge validation in such areas as:
  - SCM planning and process modeling
  - Raw material development
  - Ingredient forecasting
  - Manufacturing process control
  - Inventory forecasting and control

The EKP/eKP and eERP

- Knowledge-based Personalization of ERP web clients
- Knowledge worker individual and group learning
- Knowledge validation in such areas as:
  - Budgeting
  - Accounting
  - Asset Management
  - Human Resources
  - Shipments

The EKP/eKP and eCommerce

- Knowledge-based Personalization of eCommerce web clients
- Knowledge worker individual and group learning
- Knowledge validation in such areas as:
  - eCommerce planning
  - Sales forecasting
  - Billing
  - Collection
  - Orders
  - Deliveries

The EKP/eKP Is A Vision, Not a Reality

- Though there are vendors who claim to sell EKPs (IBM/Lotus, Hyperwave, Practicity, Comintell, Unisys, etc.), there are no EKPs or eKPs yet.
- There are no portal products that focus on a concept of the knowledge life cycle and on a specific set of activities that are recognizably KM activities. And there are no portal solutions that do this either.
- Instead, products and solutions that carry the name "knowledge portal" seem to use it for its marketing value rather than because it is descriptive of the business processes that the portal product or solution supports.

Why Seek the Vision

- Once again, because competitive advantage, increased ROI, accelerated innovation and Increased effectiveness -- the four most important benefits claimed for EIPs -- tacitly assume that the information produced or supplied by an EIP is correct information
- If that is not the case, these four benefits are lost
- So, to implement an EIP is to place these benefits at risk.
- If we are to seriously pursue them, we must implement the EKP to minimize decision making risk by increasing **quality/validity** of information supplied by the portal


The End
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Portal Segments

- Decision Processing (Viador, CA, Brio One)
- Content Management (Plumtree, Autonomy, Verity, Oracle, IBM, KnowledgeTrack, SageMaker, DataChannel, Sequoia Software)
- Collaborative Processing (Practicity, Engenia, Intraspect, OpenText)
- Decision Processing/Content Management (Hummingbird, Sybase, Iona)

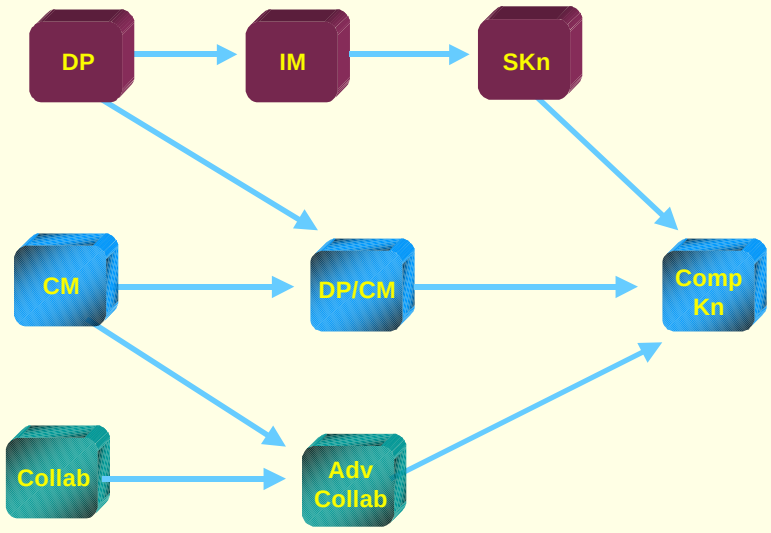
More Portal Segments

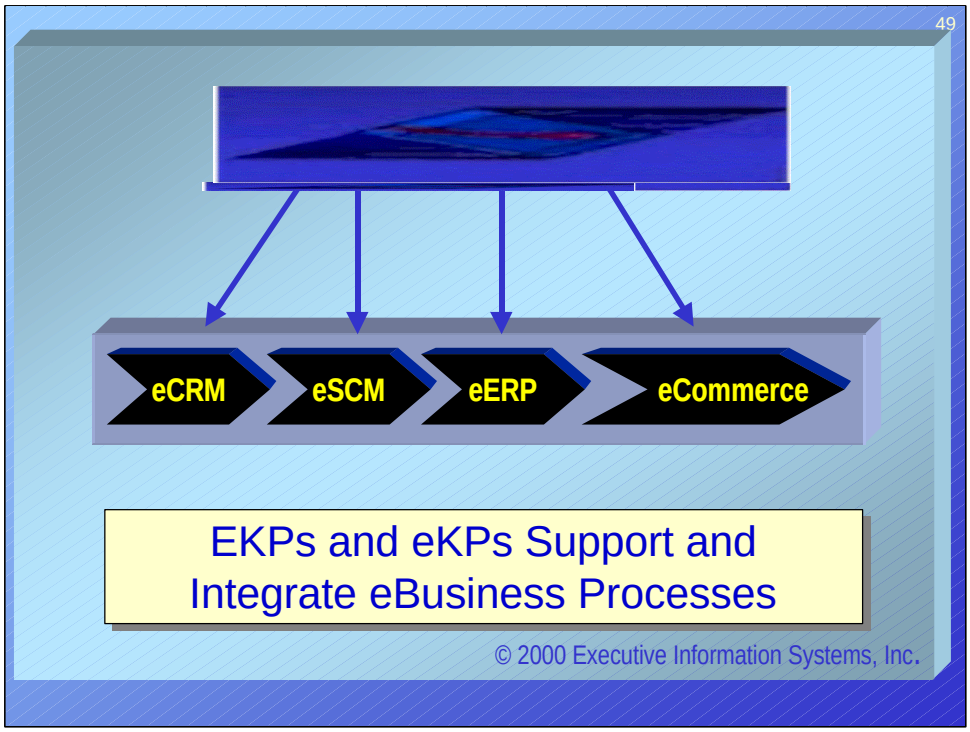
- Advanced Collaborative Processing (DP/CM + Collaborative + some Knowledge Production + additional features)
- Structured Information Management (ACP minus Most CM features of ACP)
- Structured Knowledge Processing (ACP minus- Most CM features of ACP + Knowledge Processing and KM)
- Comprehensive Knowledge Processing (ACP + Knowledge Processing and KM)

How to Seek the Vision: The Incremental Road to the EKP

- Begin with a contemporary portal type, e.g., Content Management, Decision Processing, Collaborative, or Decision Processing/Content Management portal
- Construct the portal solution using an architecture that includes:
  - Browser and e-mail clients
  - The portal and other necessary application server(s),
  - The access management system
  - An enterprise Artificial Information Manager (AIM), and
  - A persistent storage component.
- Add Application Servers, the Intelligent Agent Components, and Knowledge Claim Objects integrating them using the AIM

Pathways of Portal Evolution




49
eCRM
eSCM
eERP
eCommerce
EKPs and eKPs Support and Integrate eBusiness Processes
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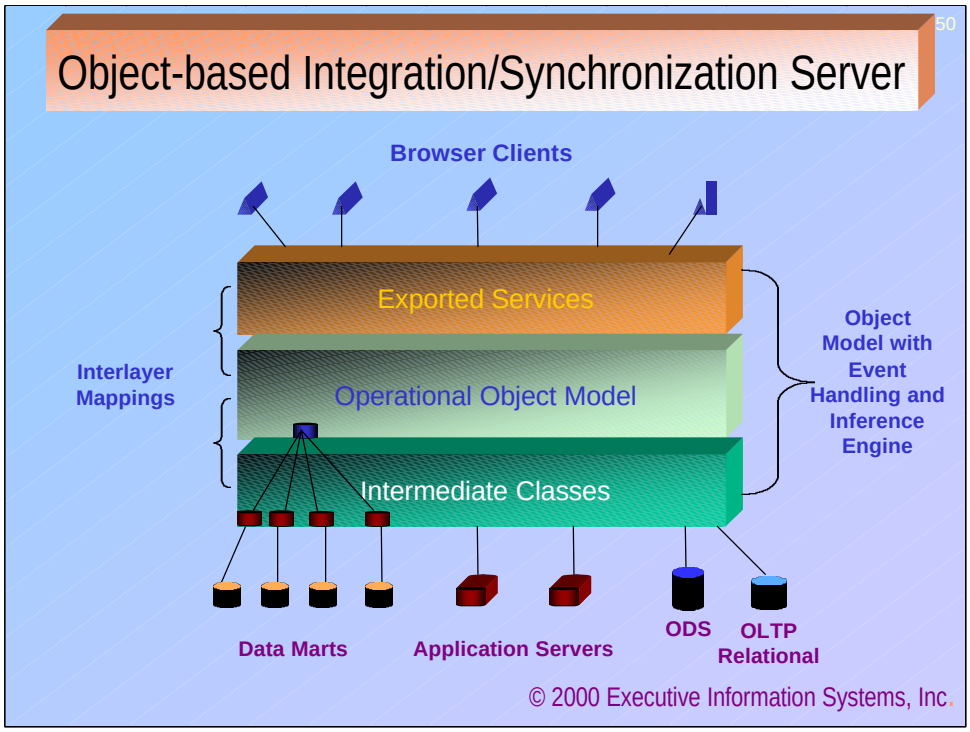
50
Object-based Integration/Synchronization Server
Browser Clients
Exported Services
Operational Object Model
Intermediate Classes
Interlayer Mappings
Object Model with Event Handling and Inference Engine
Data Marts
Application Servers
ODS
OLTP Relational
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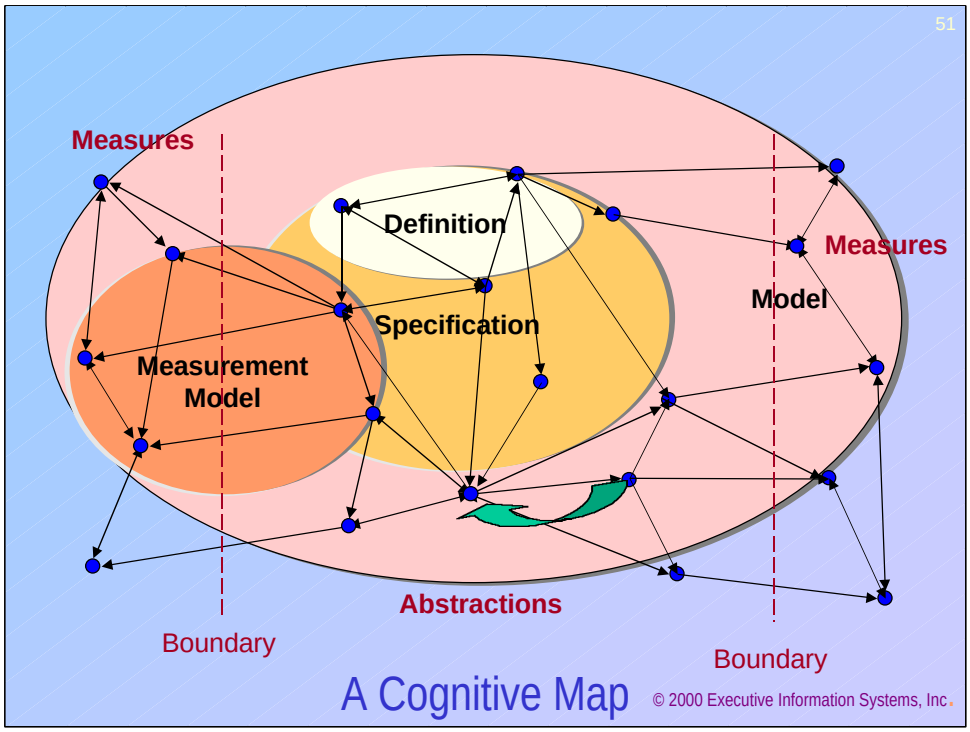
51
Measures
Definition
Measures
Model
Specification
Measurement
Model
Abstractions
Boundary
Boundary
A Cognitive Map
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