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## Enterprise Knowledge Portals: What They Are and What They Do

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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 Knowledge Processes Before We Talk Knowledge Portals

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## Problems and Solutions in the Enterprise

- Every individual, team, or group within the enterprise encounters problems in the course of the work day
- 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

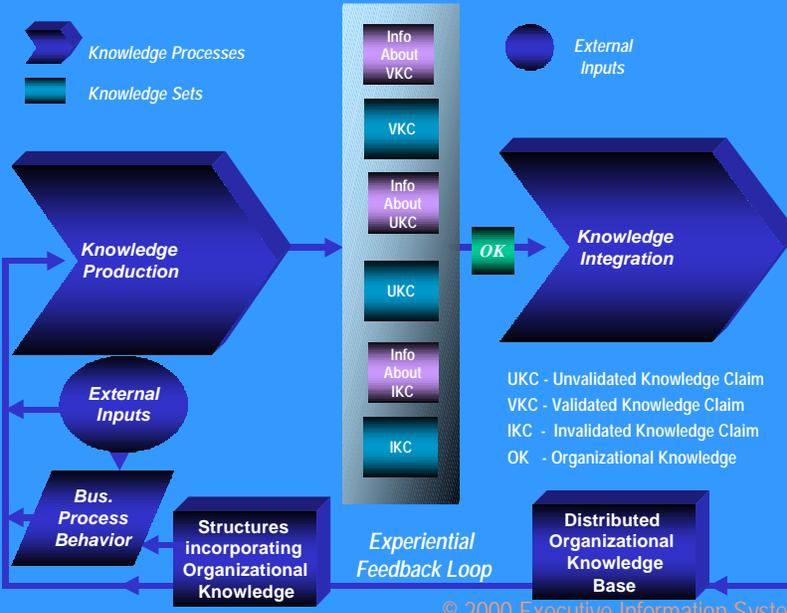
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## The Enterprise is a "Swirl" of Knowledge-related Interactions

- 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.

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# The Knowledge Life Cycle (KLC) Model

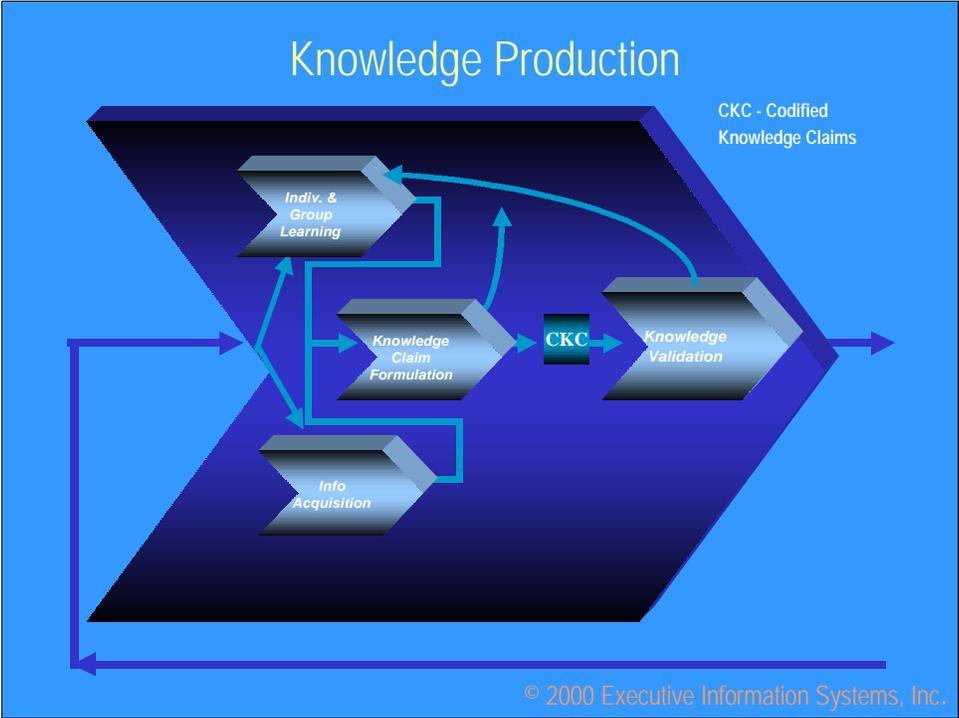


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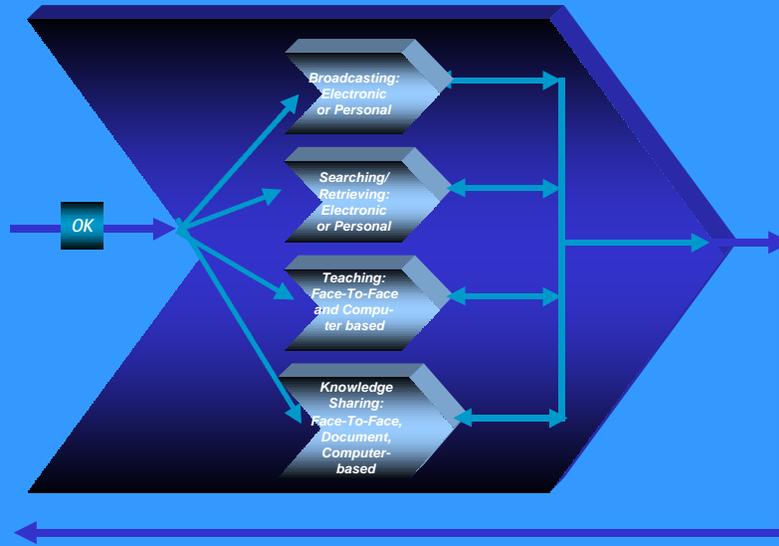
## Structures Incorporating Organizational Knowledge

- 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

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# Knowledge Integration



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## 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

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## 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.

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## 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.

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## What is a Business Portal?

- According to Wayne Eckerson a Business Portal is an application that “provides business users one-stop shopping for any information object they need inside or outside the corporation.”
- It also provides shared services such as “security, metadata repository, personalization, search, publish/subscribe,” etc., as well as a common look and feel to the portal gateway

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## 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. "

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## 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)."

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## Essential Characteristics of EIPs

- Use "push" and "pull" technologies to transmit information through a standardized web interface
- Provide "interactivity" -- the ability to " 'question' and share information on" user desktops.
- Exhibit trend toward verticalization in apps
  - Packaged apps with targeted content toward industries or corporate functions

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## Essential Characteristics of EIPs (TWO)

- Integrates disparate applications and data/content stores into a single system
- Accesses both external and internal sources
- Supports bi-directional info exchange from sources
- Uses data and info acquired for further processing

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## 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

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## 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

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## EKP Functionality, Architecture, and Other Matters

- More specifically, the EKP in operation provides a wide range of functionality, a wide range of data and content stores as sources of previously developed information and knowledge, and an integrative object/component-based portal architecture.
- The next few slides list the functionality and types of data and content encompassed by the EKP, and discuss EKP architecture

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## EKP Functionality

- Structured Data Management
- Unstructured Content Management
- Collaborative Processing
- Information Processing
- Information Management Processing
- Knowledge Processing
- Knowledge Management Processing

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## EKP Data and Content Sources: Databases, Document Types, Other

- Hierarchical, Relational, ODBC, OODBMs, Flat File, Inverted File, Multi-dimensional, XML
- Text, Word processing documents, e-mail, SGML, HTML, XML
- Business Intelligence (BI) Reports, Program Files, and Data Feeds

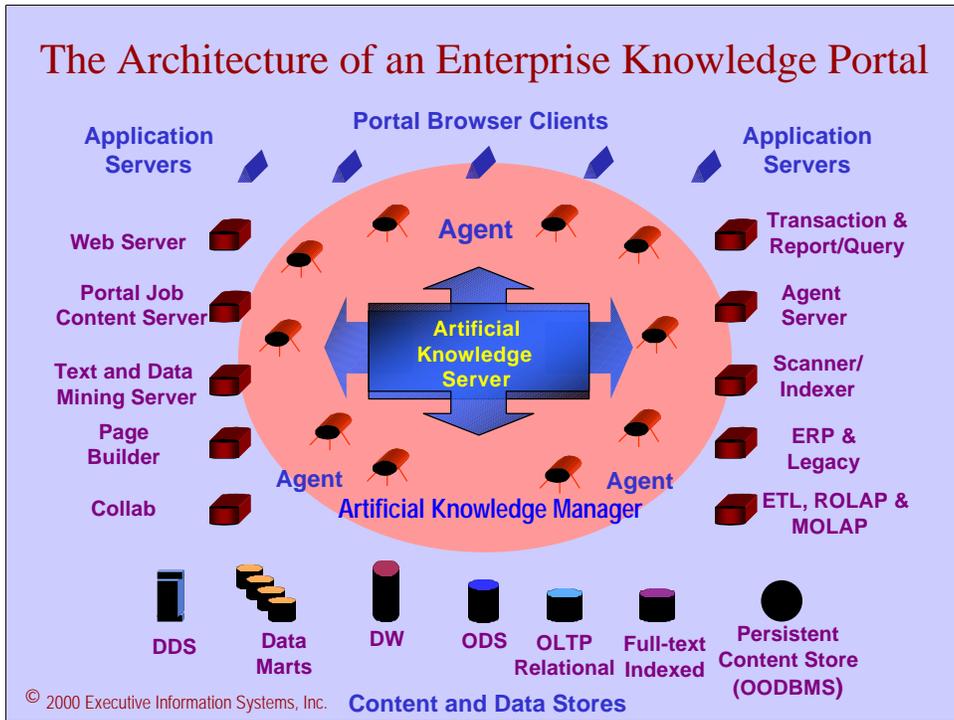
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## EKP: Type of Architecture/Integration

- Portal Interface-based Integration (PII)
- Data Federation-based integration (DFI)
- Work-flow-based Integration (WFI)
- Object/Component-based Integration (OCI)
  - Structured Application Integration (SAI)
  - Distributed Content Management integration (DCM)
- Portal Application Integration (PAI)

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# The Architecture of an Enterprise Knowledge Portal



## 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.

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## What is the Purpose of the Avatar in the EKP?

- Creating a highly automated, enterprise knowledge-enabled, self-learning/adaptive virtual reality 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

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

- supporting performing personal and collaborative workflows, by providing workflow memory, accessible from the portal interface
- adapting in accordance with anticipated needs of the user, by providing 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 autonomous negotiating capabilities with the rest of the EKP system

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## Knowledge Claim Objects

- An important class of objects in the EKP system is a 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.

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## *The AKM*

Process Control Services

Active In-Memory Object Model

Connectivity Services

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## 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

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## The Artificial Knowledge Server (Two)

- Declarative and procedural 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 applications in the enterprise whether these are mainframe, server, or desktop - based

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## 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.

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## Some Benefits of EKPs

- 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

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## Benefits of EKPs (Two)

- These are also benefits claimed for Enterprise Information Portals, but:
  - 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
- 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 by increasing the quality of information supplied by the portal

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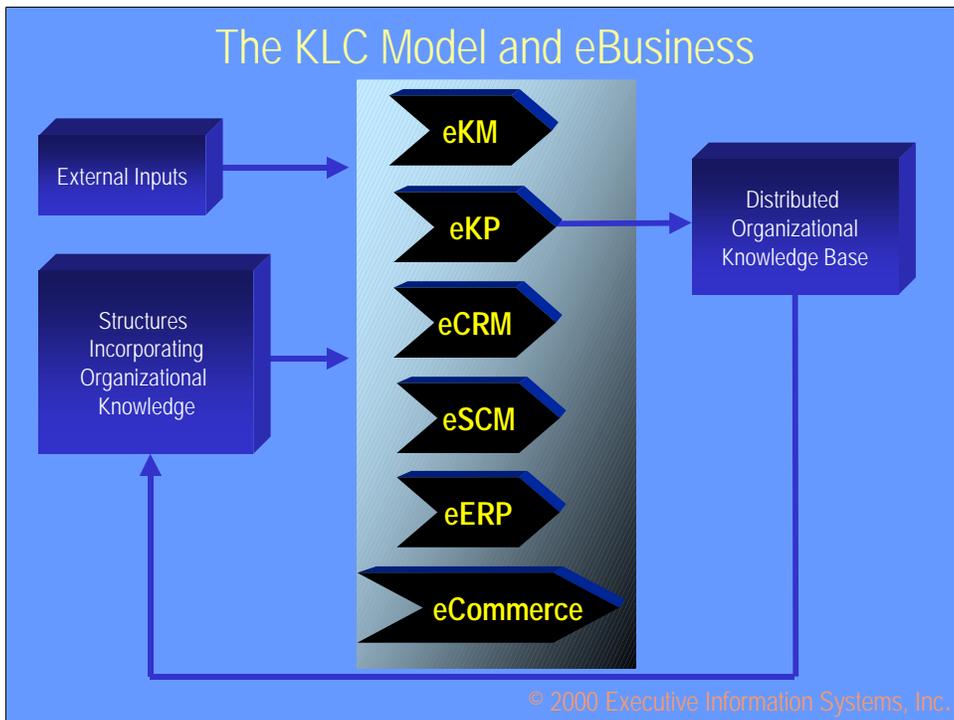
## Evolution Towards The EKP

- DP/CM Portals
- XML Portals
- Advanced Collaborative Portals
- Incorporation of EAI capabilities
- Automated, updated personalization of content
- Interface integration around cognitive maps and workflows
- Data and Content Store Integration through universal connectivity
- Application Integration through Business Process Engines and intelligent agents

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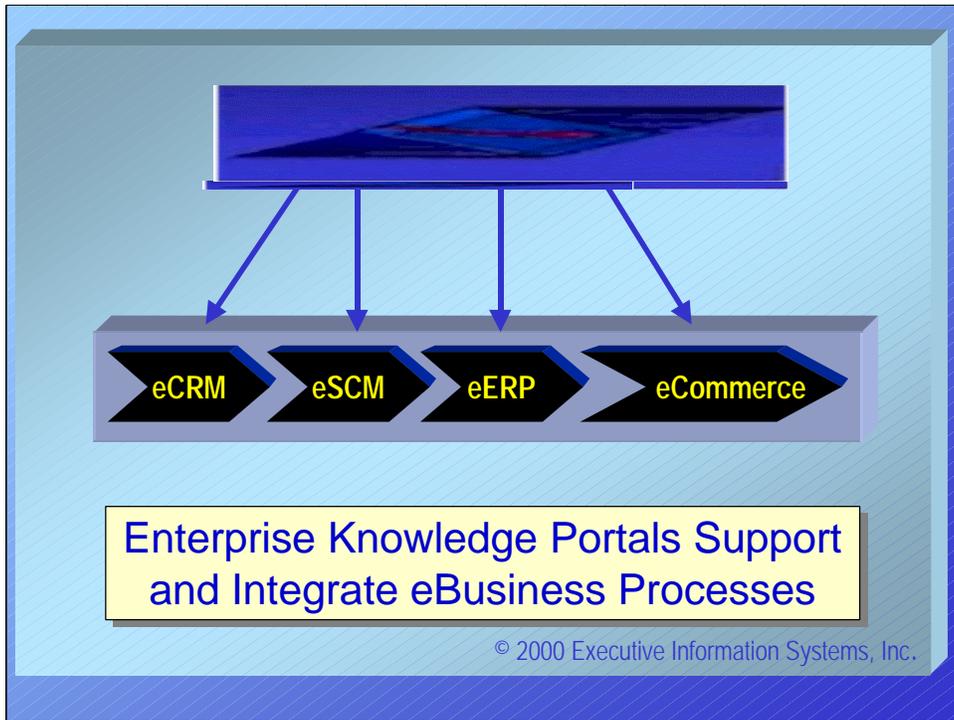
## The KLC Model and eBusiness



## The EKP and e-Business

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

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## The 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

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## The 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

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## The 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

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## The 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

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