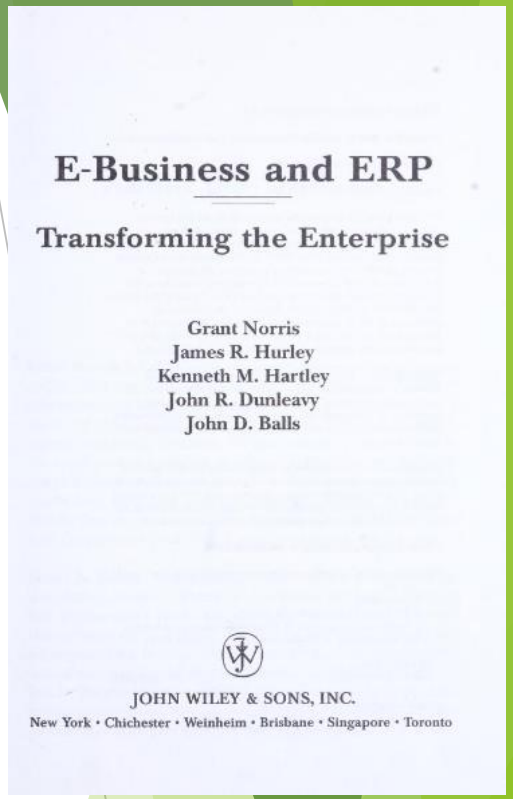
E-business and ERP



Norris, G., Hurley, J.R., Hartley, K.M., Dunleavy, J.R. and Balls, J.D. (2002), "E-business and ERP: Transforming the Enterprise", *International Journal of Quality & Reliability Management*, Vol. 19 No. 4, pp. 486-487. https://doi.org/10.1108/ijqrm.2002.19.4.486.2

ERP - definition

- A structured approach to optimizing a company's internal value chain.
- Connects the components of the enterprise through a logical transmission and sharing of common data
  - When data such as a sale becomes available at one point in the business, it courses its way through the software, which calculates the effects of the transaction on other areas, such as manufacturing, inventory, procurement, invoicing, booking etc.
- An ERP organizes, codifies, standardizes an enterprise's business process and data
  - Transforms transactional data into useful information and collates data so that it can be analyzed.

Implementing ERP requires changes…

- … to organizational, cultural and business processes.
- ERP products in the 1990s caused companies to redesign their business processes to eliminate non-value adding work, freeing employees to focus on value adding activities.
- Among key drivers of process redesign is the need to improve the company's financial performance by improving operational performance
- Organizational resistance to ERP has often been strong; key to change is the willingness to adopt new ways of working.

ERP/e-business Matrix

	No e-business capabilities	Channel enhancement	Value-chain integration	Industry transformation	Convergence
Greenfield (no back-end systems)					
Non-integrated systems					
Limited single-function ERP					
Integrated business unit ERP					
Integrated enterprise ERP					

- ERP = deals with the internal value chain. E-business = the exploitation of the virtual value chain.
- if ERP and e-business are jointly utilized ➔ scope of business broadened; performance enhanced.
- To be effective, an organization must know both its current position in terms of ERP and e-business implementation and its desired position, relative to the various strategic possibilities and options.
- To facilitate the transformation, an e-business/ERP position matrix is designed.
  - For the ERP, there are five possible positions: greenfield, nonintegrated systems, ERP by function, ERP by business unit, and fully integrated ERP.
  - As for the e-business dimension, there are five possibilities: no e-business capabilities, channel enhancement, value-chain integration, industry transformation, and convergence.

ERP/e-business Matrix

- Channel enhancement
  - Point solutions: on-line selling, customer self-service, online indirect procurement
  - Web technologies modify existing business processes and create new processes targeted at improving business performance. In so doing, they are engaging in e-commerce.
- Value-chain integration
  - eCRM, eSCM capabilities: link operations seamlessly with customers and suppliers.
    - eCRM – personalized web sites to simplify transaction processing and capture customer information.
    - eSCM – companies are sharing design, planning and forecasting info with suppliers, to increase velocity of bidirectional info flow.
- Industry transformation:

Vendor choices

- (a) Fully integrated ERP or (b) best-in-breed portfolio assembly model
- (a) single-vendor: easy to implement, less cost, functionality and features not always best in class
- (b) multi-vendor: for each functional module, best functional ERP module. Increased implementation costs and greater resources.
- The line between portals and application service providers is vague.

E-business + ERP

- ERP
  - internal technological hub of a singly enterprise
  - Internal process efficiency and effectiveness
  - Internal enterprise data, information, knowledge.
- E-business
  - extends each enterprise’s internal info infrastructure into the external environment.
  - Focus on external, cross-enterprise process efficiency and effectiveness and on process promotion
  - External data, information, knowledge: coming from customers, R&D, Service Providers, Business Partners, Distributors, Suppliers, Customers etc.

ERP: the hub of a single enterprise

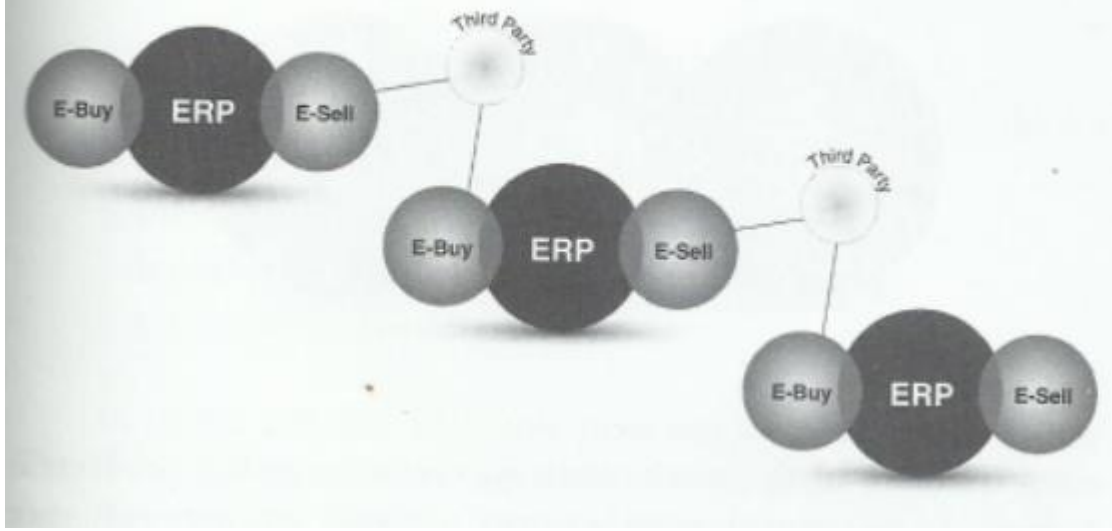
- Supports existing business processes. Provides consistency of info across enterprise
- Improves
  - customer responsiveness
  - management of production needs and inventory
  - Control over info and decision support
- Integrates:
  - *Resource planning*: forecasting, planning, purchasing, material management, warehouse and distribution management, product distribution and finance & accounting
  - *Supply chain management*: scheduling capacity to meet demand. Reduction of cycle time and inventory levels, improves cash flow.
  - *demand chain management*: production configuration, quotes, pricing, contracts (better negotiation), promotions and commissions
  - *Knowledge management*: data warehouse, a central repository for enterprise's data

ERP modules

- *Finance*: Significant reduction of cost for financial record keeping. Transactions have an immediate financial effect
- *Manufacturing*: better order-to-production planning, real-time visibility of customers orders and demand; modelling of anticipated orders.
- *Logistics*: supports strategic purchasing and materials only costing. Customer-focused, cross-functional and process-driven logistics and distribution.
- *Sales and marketing*: profitability analysis per segment; complex pricing; accurate delivery times
- *Human resources*: integration of time allocation to cost objects (eg. Project/ sales orders)

Value-chain partners: 3 Interactive relationships

Figure 2-4 Extended Value Chain with Third-Party Portals



- 3rd parties: market-places (aggregators of e-buyers/e-sellers) organized as e-auctions, bid-and-ask market or 3rd party marketplace.

Figure 2-6 Extended Value Chain: ERP to ERP Connections

- EDI type of standards for ERP-to-ERP connections
- EDI technology is one-to-one connections, Web-based technology is many-to-many.

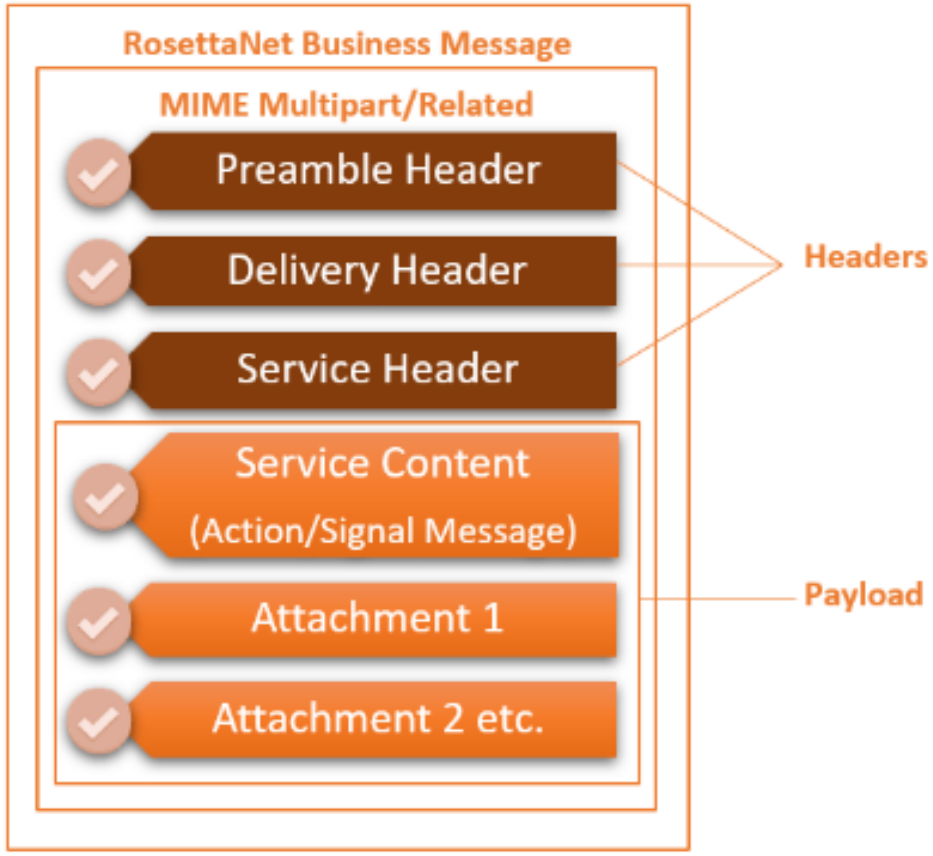
Figure 2-5 Extended Value Chain: Buy-Side Front End Connects to Sell-Side Front End

ROSETTAnet

- RosettaNet: group of Technology corporations that have created and implemented B2B protocol standards. Define the exchange of electronic business documents which allows different businesses to communicate electronically over a network.
- RosettaNet it is one of the **EDI** (Electronic Data Interchange) standards for exchanging business messages using HTTP(S) with MIME headers. As Identifiers RosettaNet uses DUNS numbers. RosettaNet messages contain a Preamble, Delivery Header, Service Header, and Service Content. RosettaNet Standards are free and open to the public as well as private organizations and individuals. You can have access to standards on RosettaNet website.
- RosettaNet is used in the IT Supply Chain by (3) main industries: Electronic Components, Semiconductor Manufacturing, Information Technology
- The RosettaNet Implementation Framework **(RNIF)** is an open, common networked-application framework generated to allow trading partners to exchange RosettaNet PIPs. **RNIF** defines how to build, parse, secure, and send RosettaNet messages (PIPs).

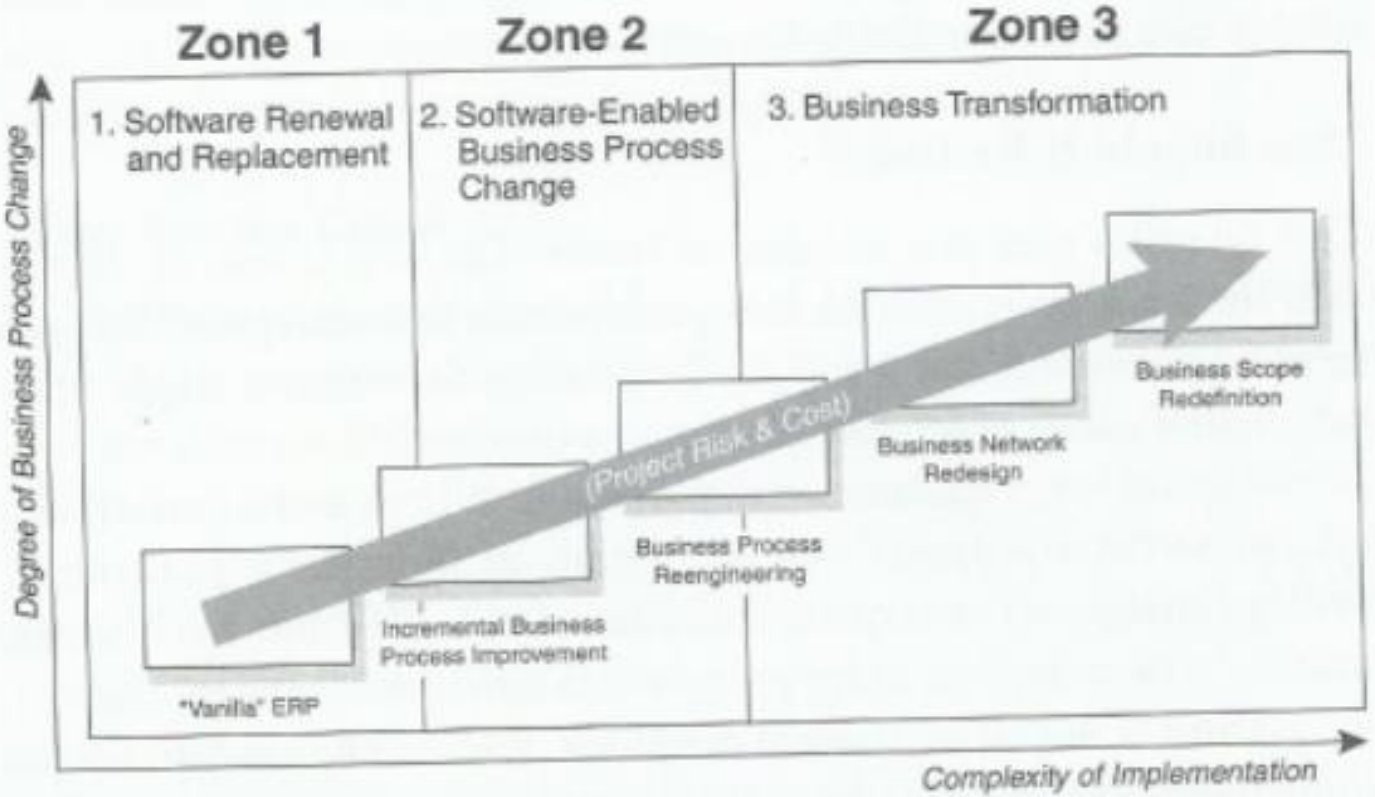
- RosettaNet web site: http://www.rosettanet.org

Structure of a RosettaNet Business Messages



Why implement an ERP?

Figure 3-2 Complexity Increases with Increased Process Change



Business Complexity	Business Degree Process Change: Zone 1 Low	Zone 2 Medium	Zone 3 High
High	12–18 months	18–36 months	24–48+ months
Medium	6–9 months	12–18 months	18–36 months
Low (Vanilla ERP)	3–6 months	6–9 months	12–18 months

Costs and benefits of ERP implementation

- Reengineering 43%
- Hardware 12%
- Software 15%
- Training and change management 15%
- Data conversions 15%

- Quantitative
  - Revenue enhancement
  - Cost reduction
- Qualitative
  - Business Process alignment (financial consolidation)
  - IT alignment (consistency)

SCM

- Simple Value Chain
  - Planning – Procurement – Manufacturing – Order fulfillment – Service & support
- eSCM
  - The collaborative use of technology to enhance business processes and improve speed, agility, real-time control and customer satisfaction

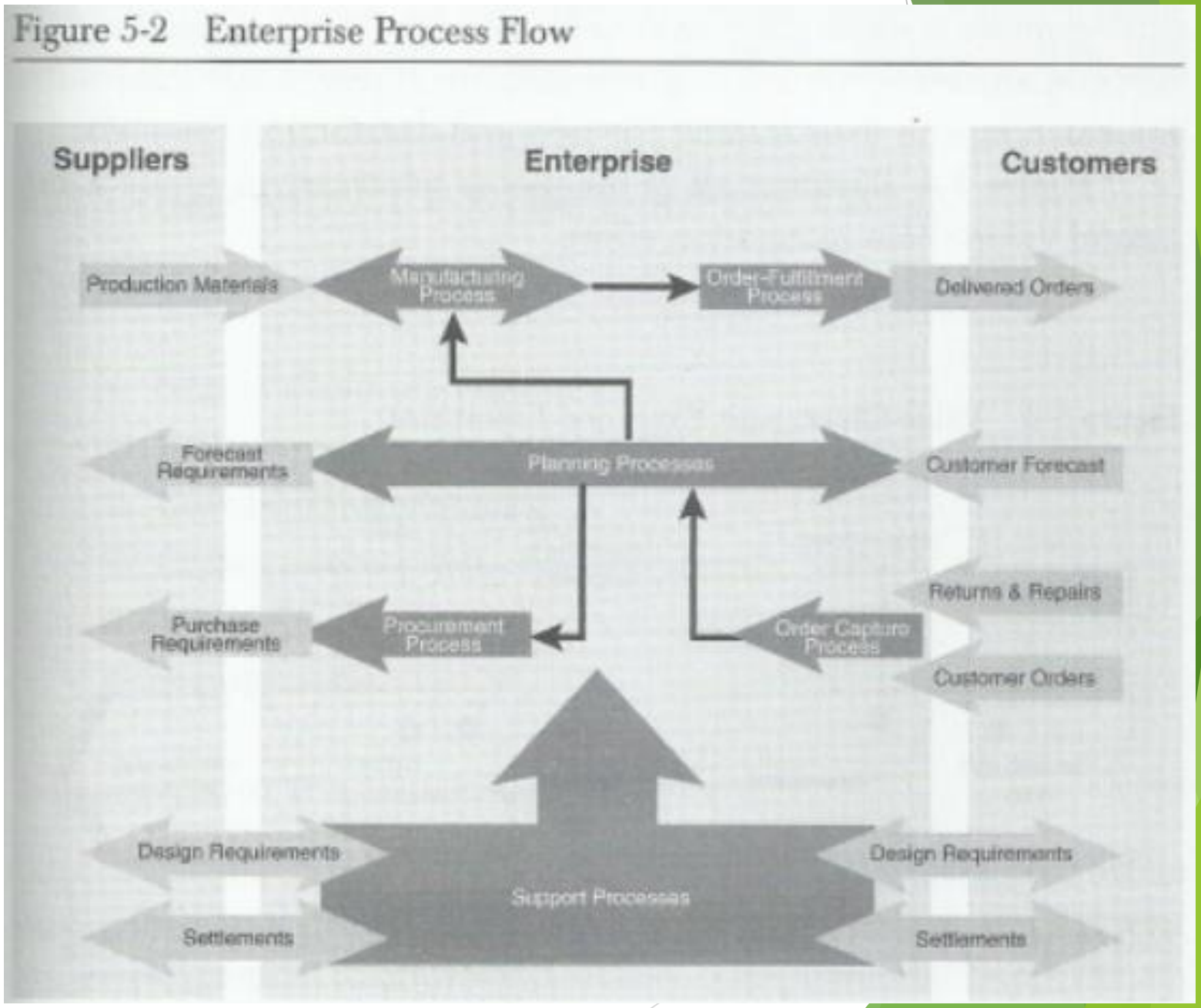
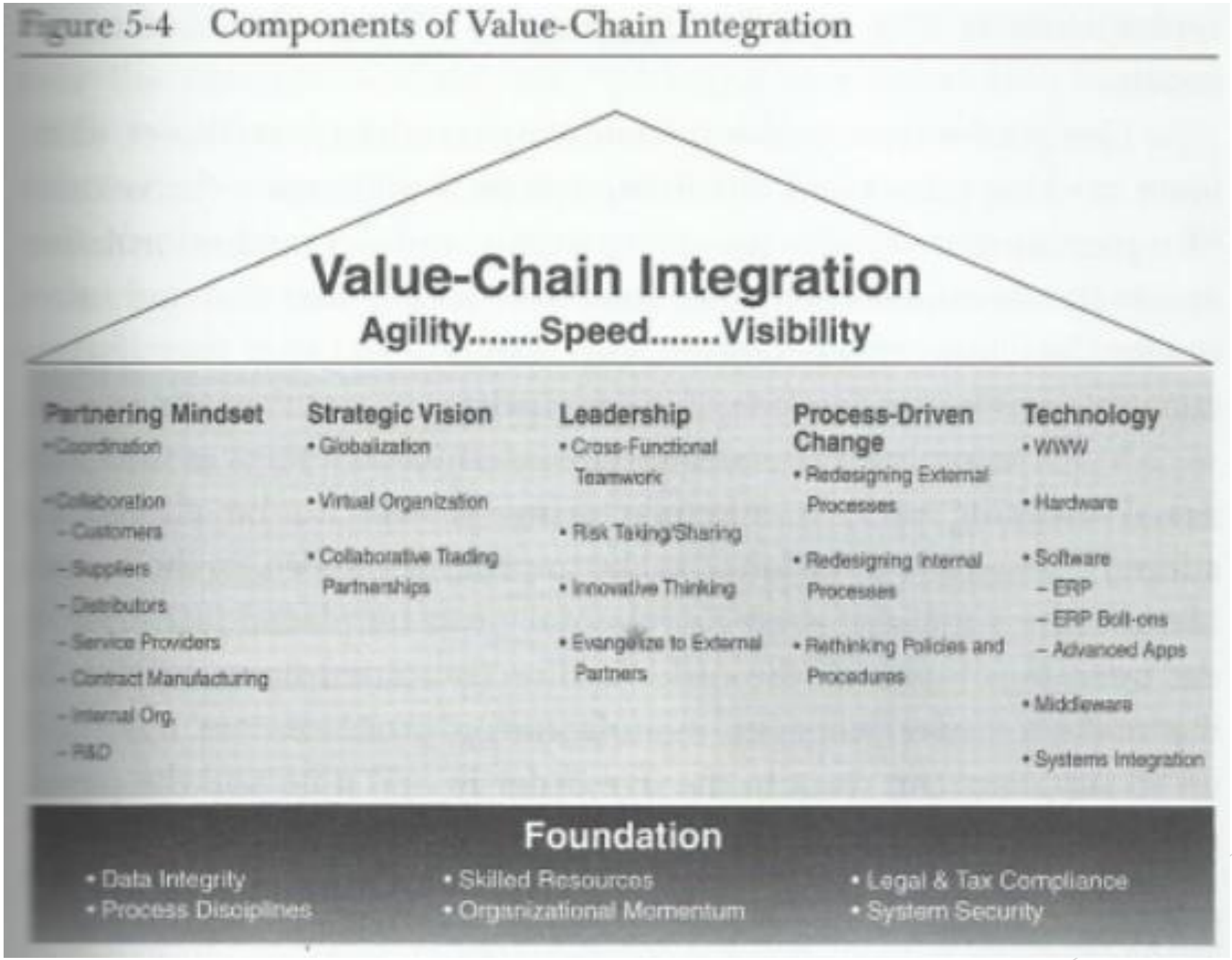


Figure 5-4 Components of Value-Chain Integration



6 components of the eSCM

1. Supply chain replenishment
2. E-procurement
3. Collaborative planning
4. Collaborative product development
5. E-logistics
6. Supply webs

Supply Chain Replenishment

- Integrated production and distribution processes that utilize real-time demand and strategic partner alignment to improve customer responsiveness
- Using SCR companies: reduce inventories, eliminate stocking points, distribution steps, increase velocity. Facilitates make-to-order and assemble-to-order workflows

E-procurement

- Requisitioning
- Sourcing
- Contracting
- Ordering
- Payment

- Benefits: reduced processing costs, purchase price leverage, contract compliance, improved delivery and quality

Collaborative planning

- Buyers and sellers develop a single shared forecast of demand and a plan of supply to support this demand, to update it regularly.
- Designed to synchronize production plans and product flows, optimize resource utilization, increase customer responsiveness and reduce inventories

Collaborative product development

- Use of product-design and product-development techniques across multiple companies
- Once a product has been identified and defined, web-search engines can be used to identify existing technologies that fit the need.
- During development, engineering and design drawings can be shared
- Other techniques include sharing specifications, test results, design changes, online prototyping for user feedback etc.

E-logistics

- Digital technologies to support the warehouse and transportation management processes.
- Distribution routing info, inventory tracking and tracing info

Supply webs

- Trade exchanges or portal to serve industry sectors by integrating supply-chain systems of various buyers and sellers creating virtual trading communities

3 phases of supply-chain integration

- INTEGRATION
  - Link ERP and legacy/ back-end systems
  - Datasets feed advanced planning systems that enable a company to respond rapidly to change in supply or demand.
- EXTENSION
  - Companies work in bi-directional real-time data sharing arrangements with suppliers, trading partners and logistics providers
- EXPLOITATION
  - Technology standards reduce both info-sharing costs and cost of switching partners.
  - Suppliers compete continually on price and service

Advanced Planning and Scheduling (APS)

- Strategic: network optimization
- Tactical: supply planning
- Operational: line scheduling

- APS use linear programming to identify optimal solutions to complex planning problems bound by constraints such as materials, labour, capacity resources

- APS systems focus on critical constrains (eg machine capacity); run scenarios; highlight exceptions: Decision Support Systems designed to develop an optimization plan for a production line, plant, or overall supply chain. (MRP II)

APS benefits

- Inventory reduced 20 – 70%
- Cost lowered up to 12%
- Sales increase 2-15% due to better customer service
- Production throughput increase 2-6%

Customer Relationship Management: CRM

- The CRM application focuses on sales, marketing, customer service.
- Combination of people, processes and systems.
- Aim: enhance customer experience

- TES – technology enabled selling: Point of Sale/Self-service, web, ubiquitous
- Contact (ex-call) centers: speech/voice portals, on-line chatting, bots, calls
- E-business: field service (eg. Medical reps), cyber-physical,
- Data warehousing/ mining: pre-processed operational data extracts from company's databases, related on the basis of inference and knowledge discovery.

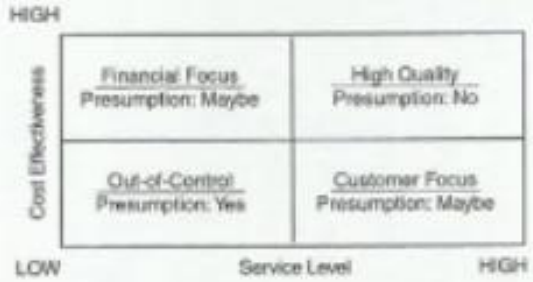
Shared Service Centers

- Offload support processes from all company's business units: transactions found in finance, human resources, supplies.
- SSC concept:
  - *The concentration of company resources performing like activities, typically spread across the organization, in order to service multiple internal partners at lower cost and with higher service levels, with the common goal of delighting external customers and enhancing corporate value.*
- British Airways
  - Consolidation all of its customer service activities into 3 global customer service centers (Asia, Europe, US).
- E-procurement
  - Corporate catalogue of office supplies and equipment. MRO (maintenance, repair and operations) supplies. 90-95% of the process automated.

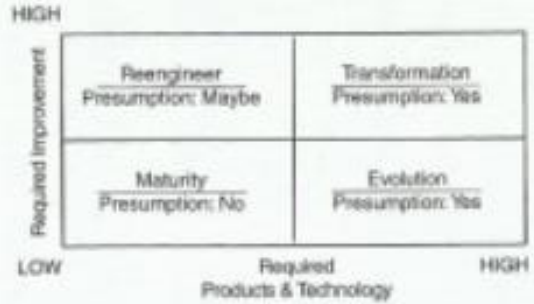
Figure 7-2 Deciding Whether to Outsource

1. What is the strategic relevance and impact of the service?
   - Operational dependence on existing capability
   - Importance of sustained, innovative capability development

2. What is the current performance of this service?
   - Cost effectiveness
   - Service level



3. What will the future requirements of this service be?
   - Required improvement
   - Required new services, products, technologies



Shared Service Center: typical centers

- Regional Back Office
  - Back-office finance, Call Center, Customer Management, Transaction processing, ERP Management
- Integrated Front and Back Office
  - Call Center, Customer Management, Knowledge Management, Query handling, ERP Management, e-Business management, Data maintenance, Security, Transaction processing/ Finance, HR etc.
- Separated Front and Back Office
  - Front Office (customer center): call center, customer management, knowledge management, query handling
  - Back Office (technology center): ERP management, e-business management, Data maintenance, Security, Transaction processing/ Finance, HR etc.
- Virtual office
  - No physical building, automated language routing

Figure 8-1 ERP/E-Business Organizational Issues Domain and Level Matrix

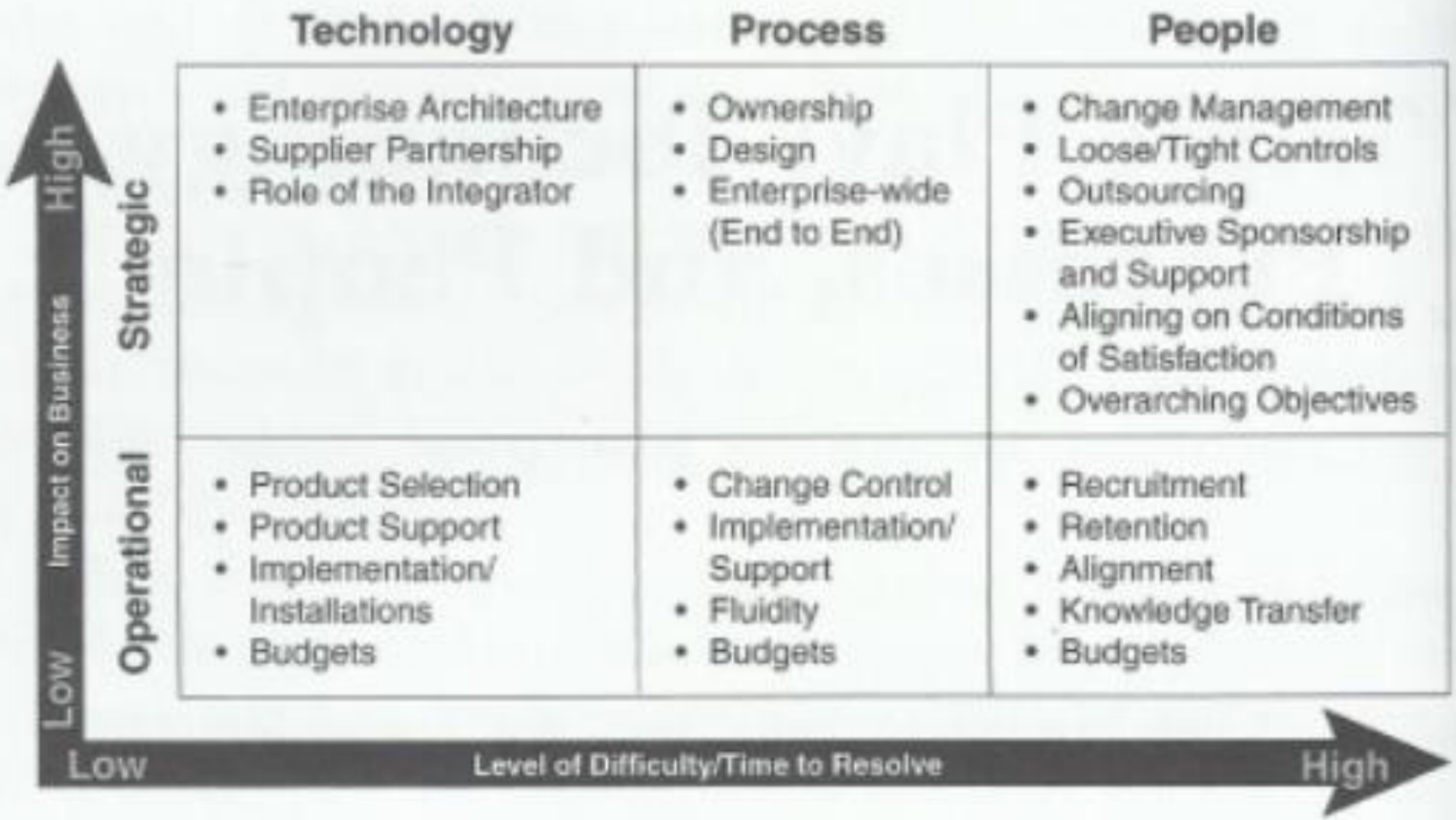


Figure 12-2 ERP Vendors' E-Business Capabilities