هُوَالْحَقُّ

5

IS/IT Strategic Analysis: Determining the Future Potential

GP 4.1.0.9

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برنامه های کاربردی از دید استراتژیک

Figure 5.1 *Developing the application portfolio from a strategic perspective*

d Nazemi

برنامه ریزی استراتژیک سیستمهای اطلاعاتی

توسعه برنامه های کاربردی از دید استراتژیک

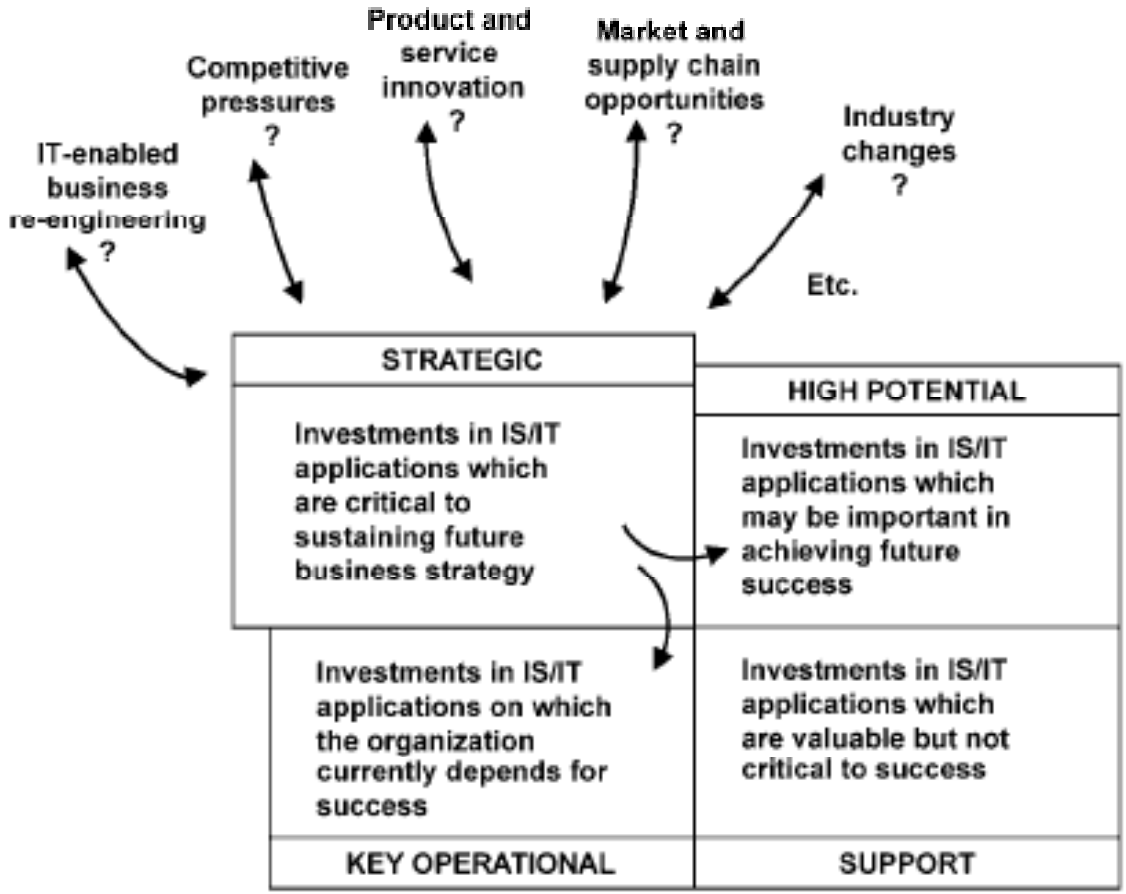


Figure 5.1 *Developing the application portfolio from a strategic perspective*

دیدگاه استراتژیک – توجه به محیط

Figure 5.2 *Advantage and disadvantage—dimensions of competency (source: after M. Treacy and F. Wiersma,* The Discipline of Market Leaders: Choose Your Customers, Narrow Your Focus, Dominate Your Market, *HarperCollins, London, 1995)*

دیدگاه استراتژیک – و ابعاد تجارت الکترونیک

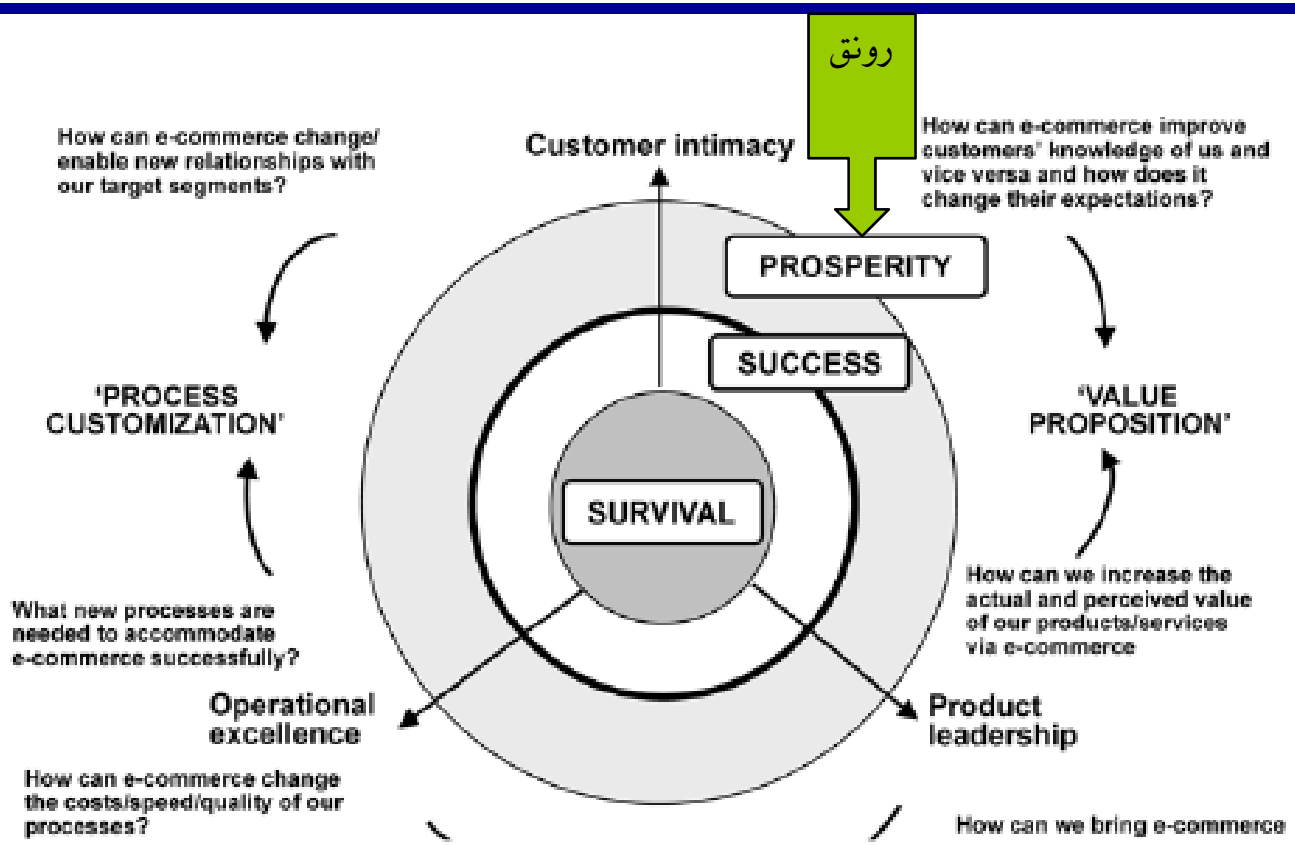


Figure 5.3 *E-commerce and the dimensions of competence*

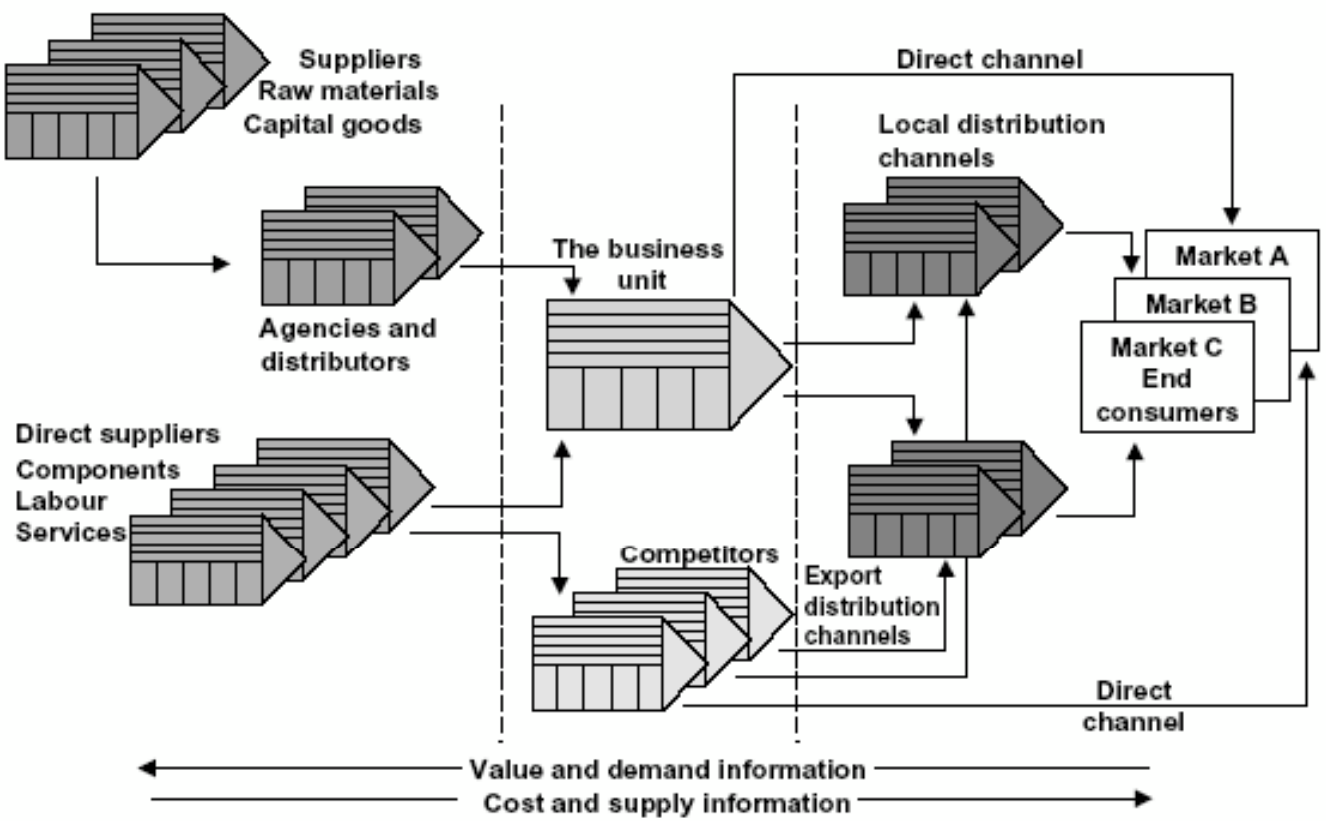


Figure 5.4 *The external value chain*

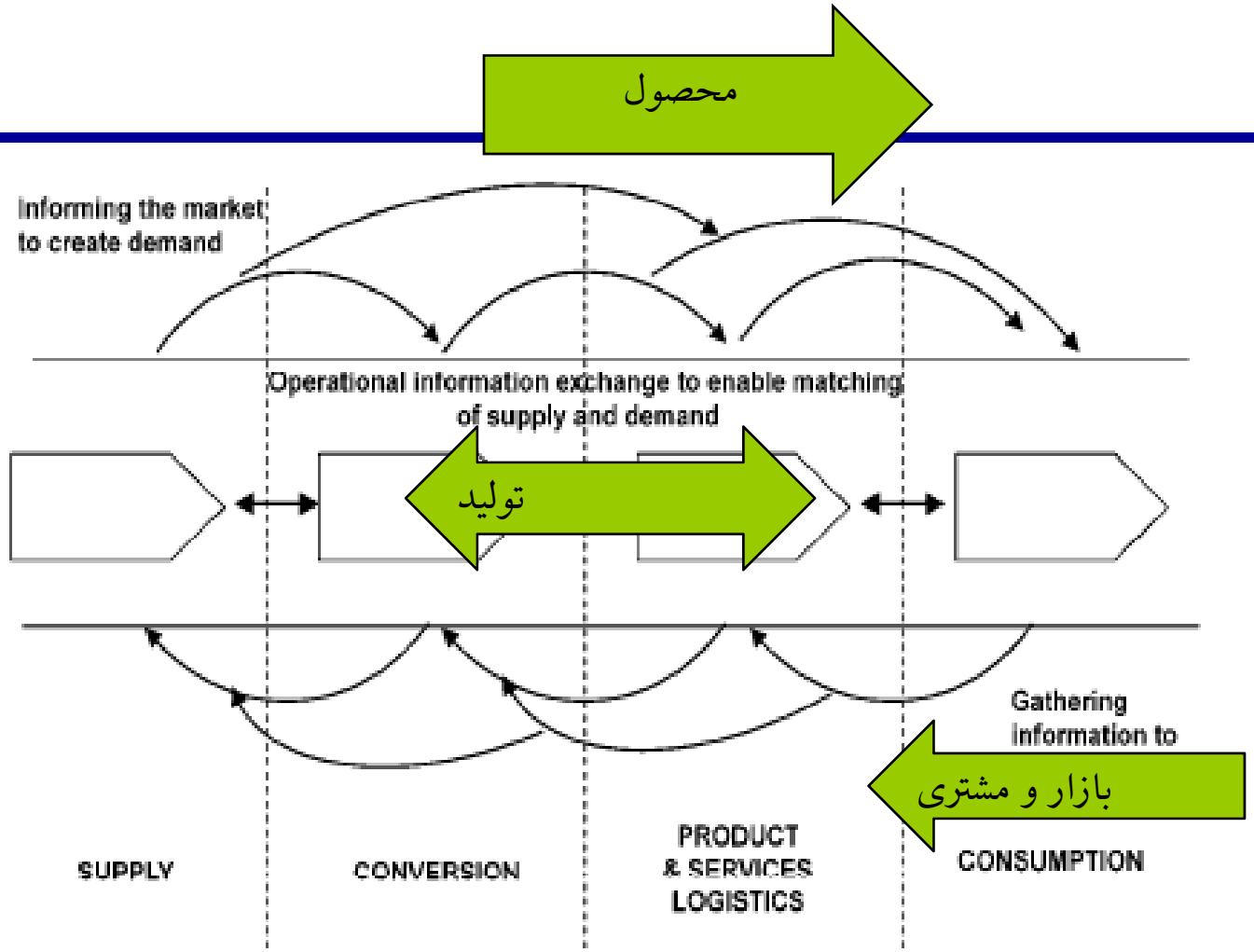
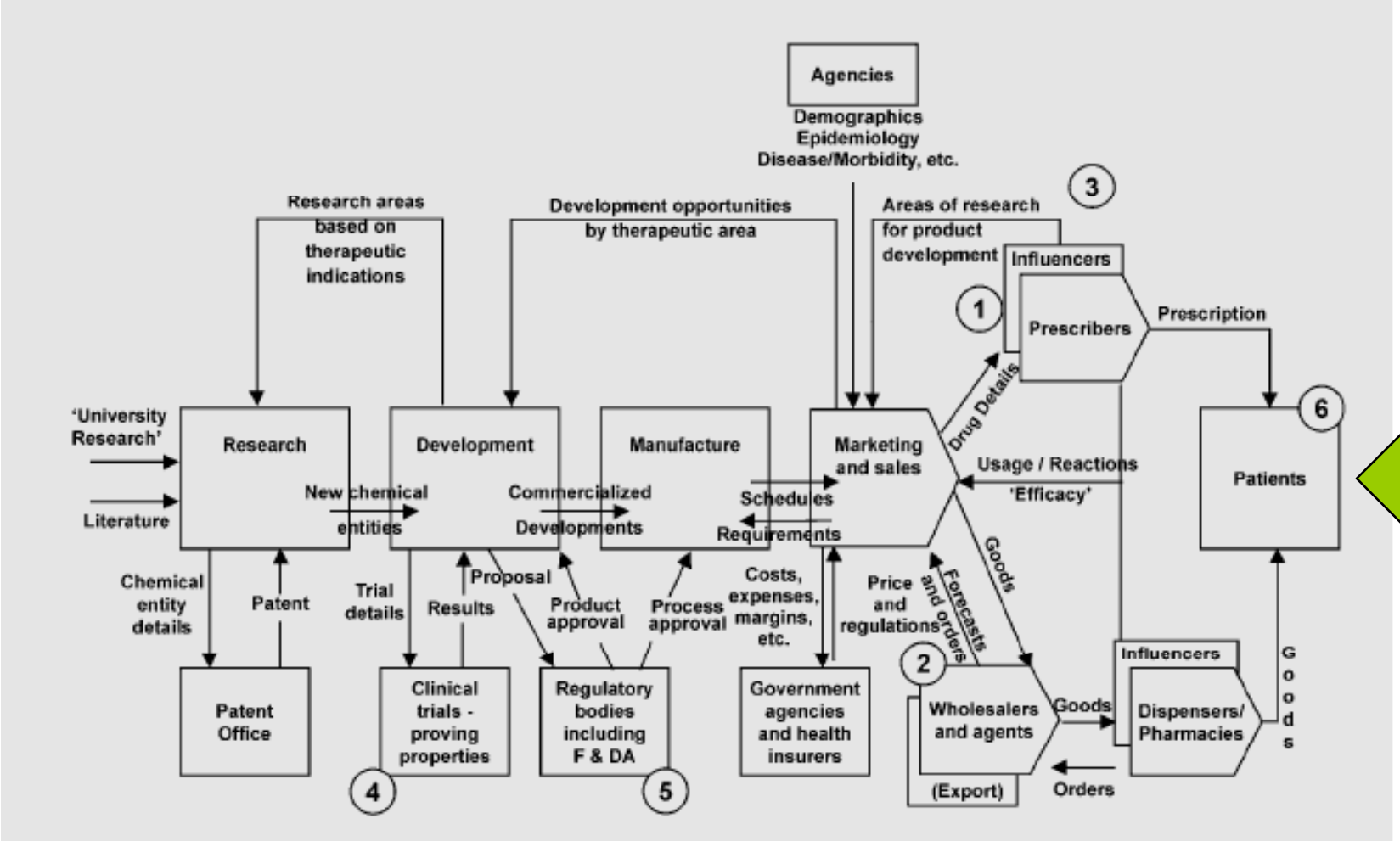


Figure 5.5 *Understanding the information issues in the value chain (source: after Rayport and Sviokla)*

Table 5.1 *Reduction of intercompany costs due to better information exchange along the value chain—examples*

Cost	*Potential e-commerce impact*
1. *Administration*	Electronic transmission of orders and invoices, etc. directly between customers and suppliers
2. *Inventory*	Sharing information on stocks and demand to avoid both companies carrying unnecessary stock
3. *Transport/storage*	Optimizing delivery to ensure transport or storage space is utilized effectively to meet agreed service levels
4. *Design*	Sharing product design data interactively to enable faster development of a better product and less 'rework'
5. *Financing*	Electronic payments to improve cash flow and reduce the need for working capital and reduce Accounts Receivable and Payable costs
6. *Capacity*	Matching the use of resources across firms to avoid idle resources in one part of the chain and/or overload in another
7. *Services*	Linking third-party service suppliers to service requests to reduce delays in delivering and costs of administration


Agencies
Demographics
Epidemiology
Disease/Morbidity, etc.
Research areas based on therapeutic indications
Development opportunities by therapeutic area
Areas of research for product development
3
Influencers
1
Prescribers
Prescription
'University Research'
Literature
Research
Development
Manufacture
Marketing and sales
Drug Details
Usage / Reactions
'Efficacy'
Patients
6
New chemical entities
Commercialized Developments
Schedules
Requirements
Goods
Chemical entity details
Patent
Trial details
Results
Proposal
Product approval
Process approval
Costs, expenses, margins, etc.
Price and regulations
Forecasts and orders
2
Influencers
Goods
Patent Office
Clinical trials - proving properties
Regulatory bodies including F & DA
Government agencies and health insurers
Wholesalers and agents
Goods
Dispensers/ Pharmacies
(Export)
Orders
4
5

A similar technique for generating information systems ideas during value chain analysis—the 'strategic option generator'—has also found renewed favour with the rapid developments in e-commerce. The approach was described by Rackoff *et al.*[12] and is explored in great detail by Wiseman.[13] It considers the impact of IS/IT in relation to:

- *Suppliers*—anyone supplying essential resources. It may be necessary to subset them either by the nature of what they supply or their strength, or their ability to exert pressure on you and other customers.
- *Customers*—this could include the consumers as well as direct customers if the latter are essentially distributors. The customers should be segmented in terms of what (and what else) they buy or how much leverage they exert.
- *Competitors*—obvious competitors who sell very similar products or services should be supplemented by actual or potential new entrants into the market and 'threatening' substitute products and services should be included as competition. Consideration should also be given to the threat of new intermediaries or options for disintermediation by others.

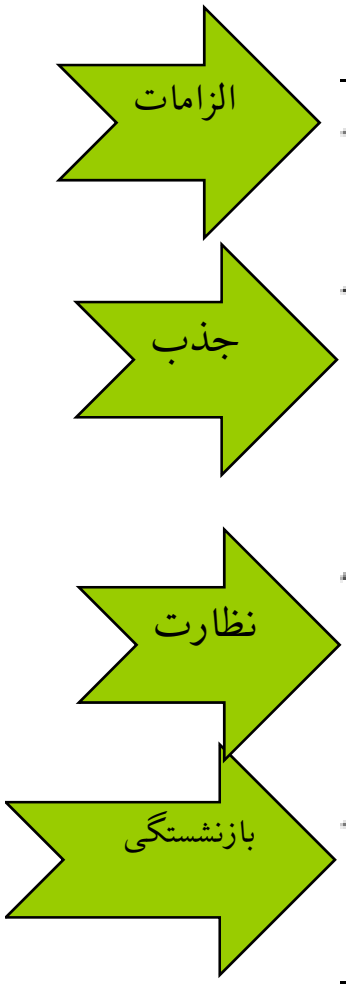


Table 5.2 *Resource life-cycle analysis (source: after Ives and Learmonth)*

Requirements	
Establish requirements	To determine how much of a resource is required
Specify	To determine a resource's attributes
Acquisition	
Select source	To determine where customers will buy a resource
Order	To order a quantity of a resource from the supplier
Authorize and pay for	To transfer funds or extend credit
Acquire	To take possession of a resource
Test and accept	To ensure that a resource meets specifications
Stewardship	
Integrate	To add an existing inventory
Monitor	To control access and use of a resource
Upgrade	To upgrade a resource if conditions change
Maintain	To repair a resource, if necessary
Retirement	
Transfer or dispose	To move, return or dispose of inventory as necessary
Account for	To monitor where and how much is spent on a resource

نیروهای محرک استراتژیک

For each of them, alternative 'strategic thrusts'—offensive or defensive moves—can be made by the firm:

- *Differentiation*—ensuring that superior quality is delivered and perceived, leading to obtaining a premium price. It could also imply being a 'preferred customer' to obtain preferential service.
- *Cost*—being cheaper or enabling suppliers or customers to reduce their costs (sharing the benefit) and thereby preferring to conduct business with the firm (ways may also be found to increase competitors' costs!).
- *Innovation*—introduce a new product, service, process or way of doing business that transforms the relationships and competitive forces in the industry. This may require the active involvement and cooperation of suppliers and/or customers.
- *Growth*—enable volume or expansion in geography or increased flexibility of production and distribution to meet different segments needs.
- *Alliance*—forging agreements, joint ventures or joint investments in systems to prevent new entrants or competitors achieving advantage.

تحلیل و شناسایی فرصت ها

Table 5.3 *IS/IT opportunity analysis—questions*

1. *Suppliers*—Can we use IS/IT to:
   Gain leverage over our suppliers (improving our bargaining power or reducing theirs)?
   Reduce buying costs?
   Reduce the suppliers' costs?
   Be a better customer and obtain a better service?
   Identify alternative sources of supply?
   Improve the quality of products/services purchased?
   etc.
2. *Customers*—Can we use IS/IT to:
   Reduce customers' costs and/or increase their revenue?
   Increase our customers' switching costs (to alternative suppliers)?
   Increase our customers' knowledge of our products/services?
   Improve support/service to customers and their needs?
   Identify new potential customers?
3. *Competitors*—Can we use IS/IT to:
   Raise the entry cost of potential competitors?
   Differentiate (or create new) products/services?
   Reduce our costs/Increase competitors' costs?
   Alter the channels of distribution?
   Identify/Establish a new market niche?
   Form joint ventures to enter new markets?
   etc.

اجزا زنجیره ارزش

The value chain approach first distinguishes between two types of business activity.

(a) *Primary activities*—those that enable it to fulfil its role in the industry value chain and hence satisfy its customers, who see the direct effects of how well those activities are carried out. Not only must each activity be performed well, they must also link together effectively if the overall business performance is to be optimized.

(b) *Support activities*—those which are necessary to control and develop the business over time and thereby add value indirectly—the value being realized through the success of the primary activities.

عناصر زنجیره ارزش

1. *Inbound logistics*—obtaining, receiving, storing and provisioning the key inputs and resources in the right quality and quantity to the business. This may include recruiting staff as well as buying materials, components and services and dealing with subcontractors and acquiring equipment.
2. *Operations*—transforming the inputs into the products or services required by the customers. This involves bringing the resources and materials together to make the 'product' (e.g. a car) or provide the service (e.g. a banking current account).
3. *Outbound logistics*—distributing the products to the customers either direct to the consumer or to the appropriate channel of distribution, so that the customer can obtain the product or service and pay for it appropriately (e.g. a car could go via a dealer to the customer, although it is possible for the customer to buy direct from the manufacturer and have the car delivered from the factory; or the delivery of cash to a bank customer via an Automatic Telling Machine (ATM) installed in a grocery retailer).
4. *Sales and marketing*—providing ways in which the customers and consumers are aware of the product or service and how they can obtain it, including how to induce them to buy or use the product or service. This would apply to a new car model, or a bank account, but also to cancer screening in the Health Service, for instance.
5. *Services*—adding further value by ensuring the customer gets full benefit or value from the product once purchased (e.g. car warranty, or information on how to use a bank account to avoid unnecessary charges).

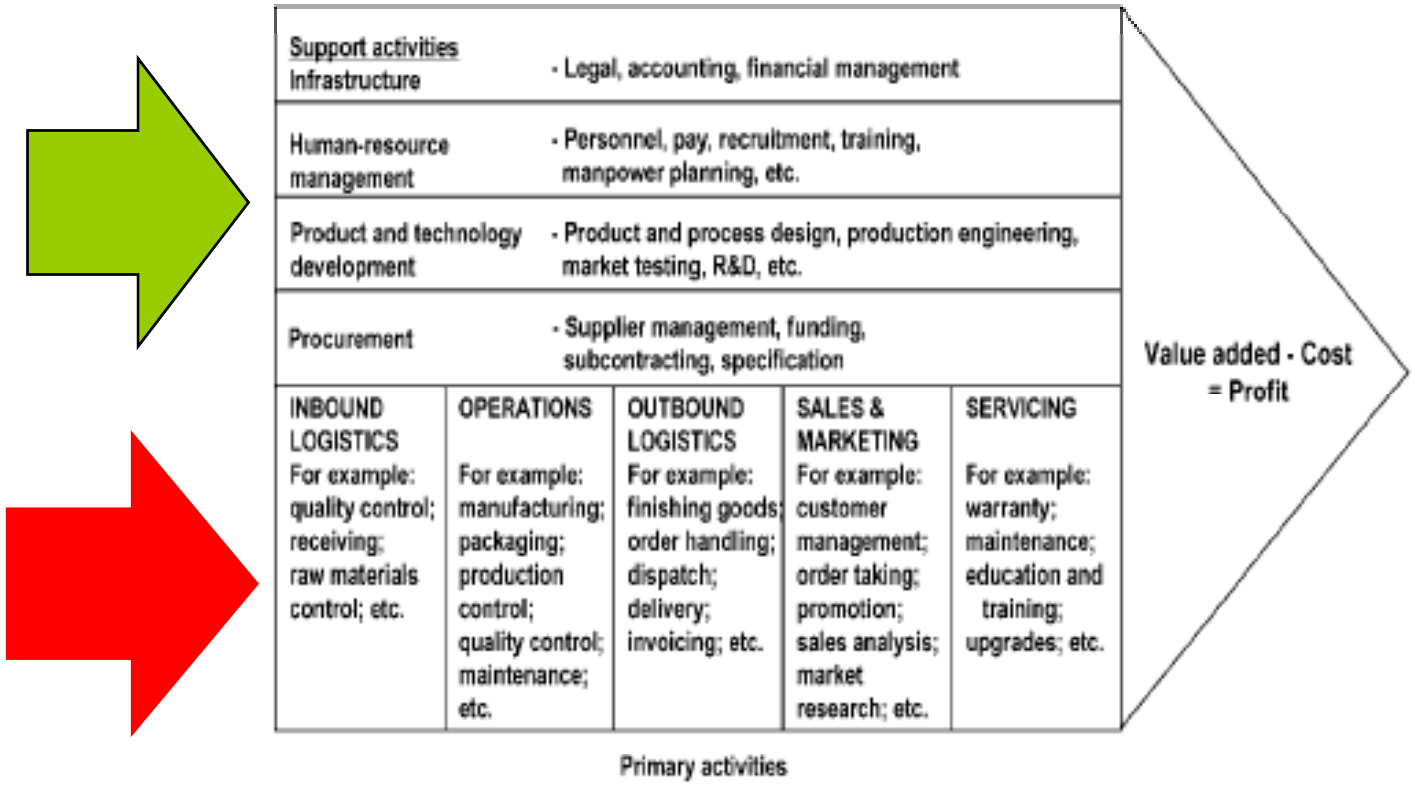


Figure 5.6 *Firm's value chain—manufacturing example*

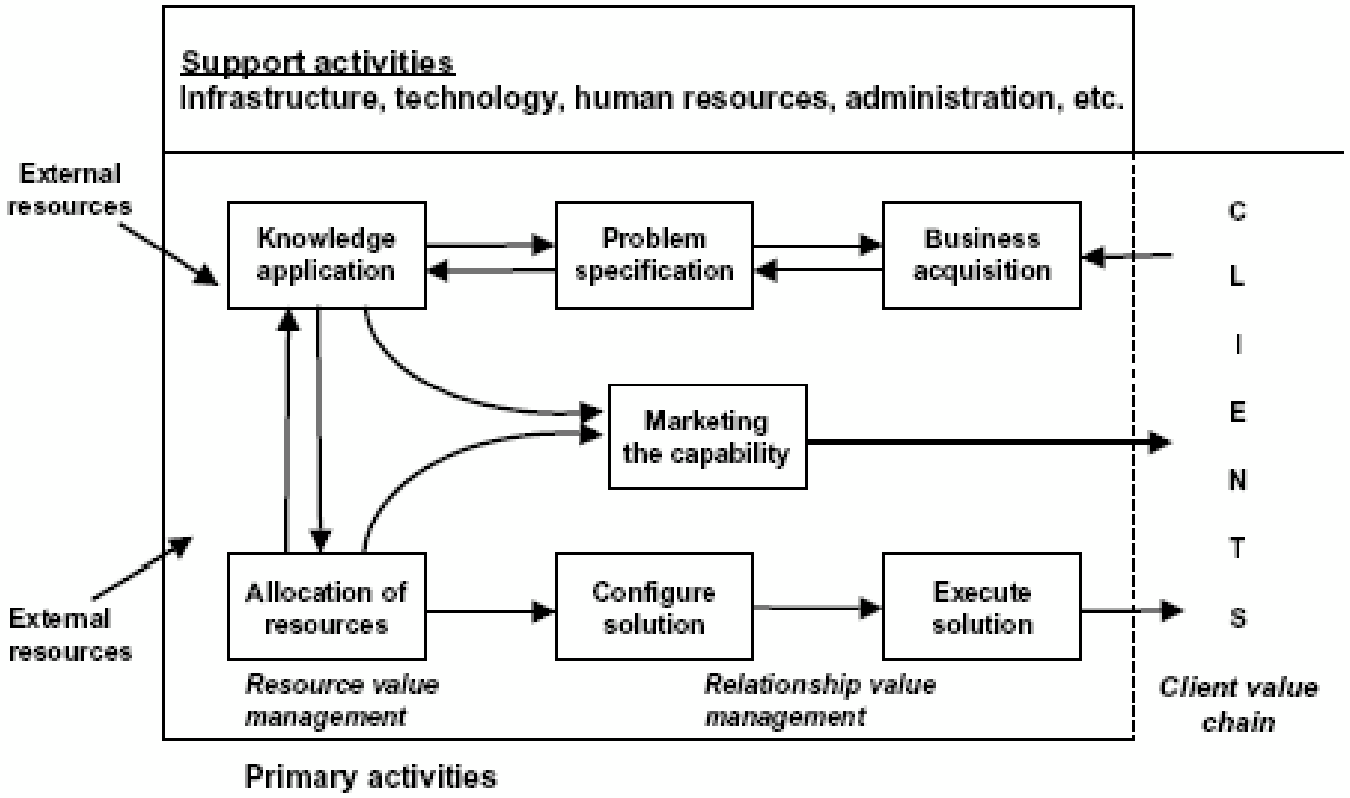


Figure 5.7 *Value chain: service businesses ('Value Shop') (client is actively involved in and affected by the processes)* (source: *after Stabell and Fjeldstad*)

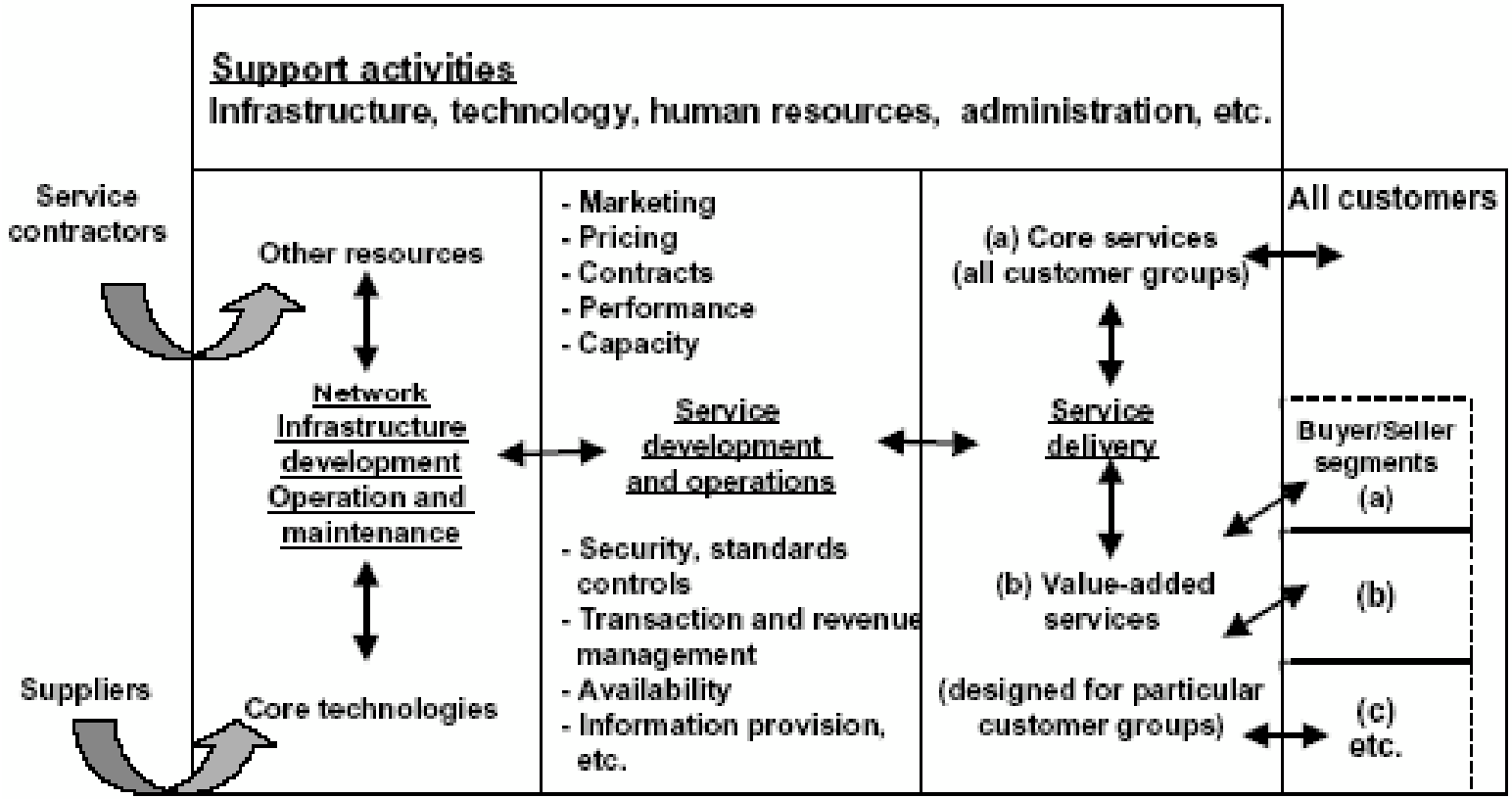


Figure 5.8 *Value chain: service businesses ('Value Network') (source: after Stabell and Fjeldstad)*

Table 5.4 *Natural versus contrived value chains*

Contrived value chain represents *how* things are done by resources in the industry/ organization:

- driven by organization structures, historical evolution and compromise
- is often very complex, confused and 'messy', and poorly understood
- contains many reconciliation activities and reacts slowly
- can take many forms, is continuously being modified to meet business changes

Natural value chain represents *what* has to be done to succeed in market requirements:

- based on value-adding activities and the resources needed to carry them out
- defines essential interrelationships and dependencies and the ideal way to achieve business purposes
- contains few reconciliation activities and responds quickly
- usually only one ideal exists, and it does not change significantly or frequently

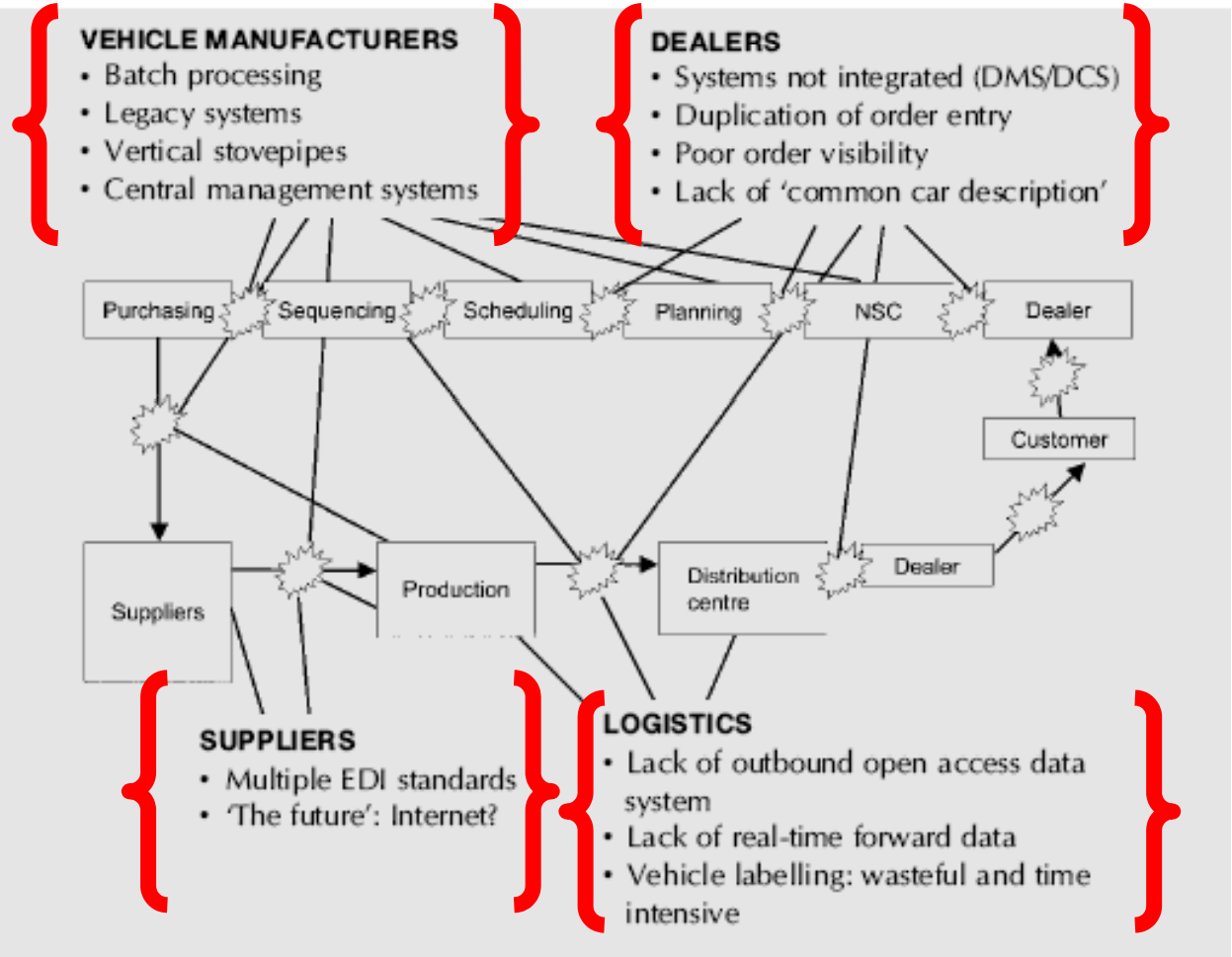
مثال

Box 5.1 Information problems affecting the performance of the automotive industry value chain (*source:* M. Howard, R. Vidgen, P. Powell and A. Graves, 'Planning for IS related industry transformation: The case of the 3DayCar', in *Proceedings of the 9th European Conference on Information Systems, Bled, Slovenia, June 2001*, pp. 433–442, used with permission of the authors)

The automotive industry operates a sophisticated but complex IS/IT throughout the supply chain. However, current systems act as a major inhibitor both to time compression in the order-fulfilment process and to organizational change. For example, a customer order entered into a system at a car dealership must complete five overnight updates on existing IS, involving batch processing and code conversions, before it is released into vehicle production.

Problems and issues include:

- The lack of integration between Dealer Management Systems (DMS) and Dealer Communication Systems (DCS) causes high levels of typing and information duplication. For example, when an order is placed, significant levels of duplication of information occur, with identical data such as vehicle description and owner details typed into both systems.
- Many DCSs do not give a delivery date or have significant time delays in confirming them—a particular problem for


VEHICLE MANUFACTURERS
• Batch processing
• Legacy systems
• Vertical stovepipes
• Central management systems
DEALERS
• Systems not integrated (DMS/DCS)
• Duplication of order entry
• Poor order visibility
• Lack of 'common car description'
Purchasing
Sequencing
Scheduling
Planning
NSC
Dealer
Customer
Suppliers
Production
Distribution centre
Dealer
SUPPLIERS
• Multiple EDI standards
• 'The future': Internet?
LOGISTICS
• Lack of outbound open access data system
• Lack of real-time forward data
• Vehicle labelling: wasteful and time intensive

- There is an unwillingness among dealerships to share information.
- The current configuration of vehicle manufacturers systems typically results in individual mainframe systems updating overnight, processing batches or buckets of orders in time-intensive cycles that add four to five days to the order lead time. As information flow through the batch-processing systems is largely unsequenced, it is possible for the output of one process to miss the start of the next window, adding further time into the process.
- Poor business process integration. Within vehicle manufacturers, systems were developed within separate functions and not driven by a true customer order fulfilment philosophy and inhibit smooth order flow—production push rather than customer pull.
- Suppliers perceive the major IT barrier as a lack of adherence to EDI standards by vehicle manufacturers, in terms of protocol (language used during transmission) and format (the label

مثال 2

Box 5.2 Value chain for pharmaceutical company

N.B. This is for an 'ethical' drug company where the whole strategy is based on differentiation of the product and its treatment efficacy. Key areas where information flows/relationships are critical to success and provide opportunity to gain advantage or achieve significant performance improvements:

1. Provision of drug information to clinicians/doctors who will prescribe the treatment and the influencers—either eminent people in the field and/or 'panels' of experts who advise hospitals, etc. Traditionally, these were medical people, but now they include health economists and insurers who decide on the financial aspects of the treatment's effectiveness in relation to alternative uses of funds. The same influencers also determine

2. The pharmaceutical company relies on forecasts of requirements and then orders from third parties (wholesalers may be the distribution channel for 80% + of drugs to dispensers) in order to set schedules, etc. for manufacturing. This is a particular problem with new drugs where forecasts rather than orders drive the production scaling/economics. Underestimates lead to lost sales, overestimates to significant waste and cost. The quality of forecasts and, then, consistency with order patterns are key, making online demand and supply information exchange crucial to both parties.

3. The skill in pharmaceutical market research is to establish both the nature and size of the market from a variety of particular and statistical data and to determine a development opportunity in a therapeutic area where the company has distinctive skills/ competency. Often, today, the opportunities arise from gaps in current treatments, which are known to influencers mentioned in Item 1 above. Collecting data from diverse sources and interpreting them can be greatly assisted by electronic data input.

4. Testing of a drug during development can take many years, and reducing the development time from, say, 8–12 years to maybe 5–6 means more of the patent life is unexpired for production, and this affects drug profitability dramatically over its patented life (hundreds of millions of pounds). Much testing is in-house and controllable, but clinical trials by doctors must be done outside the organization and can take many years. The key to success is organizing the trial—getting the right clinicians to test it on the right population, which requires good information on the test population, etc. to avoid delay and wasted effort. Equally, getting the results in is a major data collection/logistics exercise where 'e-commerce' is essential both for speed and gathering comprehensive/valid trial data.

5. To be able to produce the drug, regulatory approval must be obtained by submitting all the evidence about the drug—this can run to 120,000 pages! The most demanding agency is the US FDA (Food and Drug Administration). Once the proposal is submitted, endless questions will be asked and if the information is not well organized the queries can take months to resolve. Most drug companies use IT to develop/store/submit the package of information and enable the regulatory authority to enquire into it electronically. This again can save considerable time and reworking of data to satisfy the regulators and speed up the time to market the drug.

6. With the increasing access consumers have to information via the Internet, many 'patients' now inform their doctors of the treatment they think they require! In the USA, 'self-prescription' is now an option for some drugs, although, in the UK, the doctor still has to prescribe the drug. However, as information is increasingly available to the public, it is likely the value chain will have to include the patients more effectively, rather than leave them isolated as suggested in this model.

Information systems have always been part of the value-adding processes that comprise any enterprise, whether it be a commercial company, a public service or a charitable body. Historically, though, IS/IT has been mainly deployed to improve individual component processes or activities of the enterprise. Initially, this improvement was targeted at reducing the costs of the supporting activities rather than improving the performance of the primary activities of the business. Even when systems became focused on primary activities, they tended to be aimed at optimizing the performance of the main operational activity of the business, and only then on activities that directly interact with suppliers and customers, but with a view to not compromising or jeopardizing the effectiveness of internal operations. Historically, the emphasis has been on:

- internal operations and control;
- key processes in the organization;
- internal critical success factors;
- the firm not the industry.