



Chapter 4

Organizational Impacts of Knowledge Management

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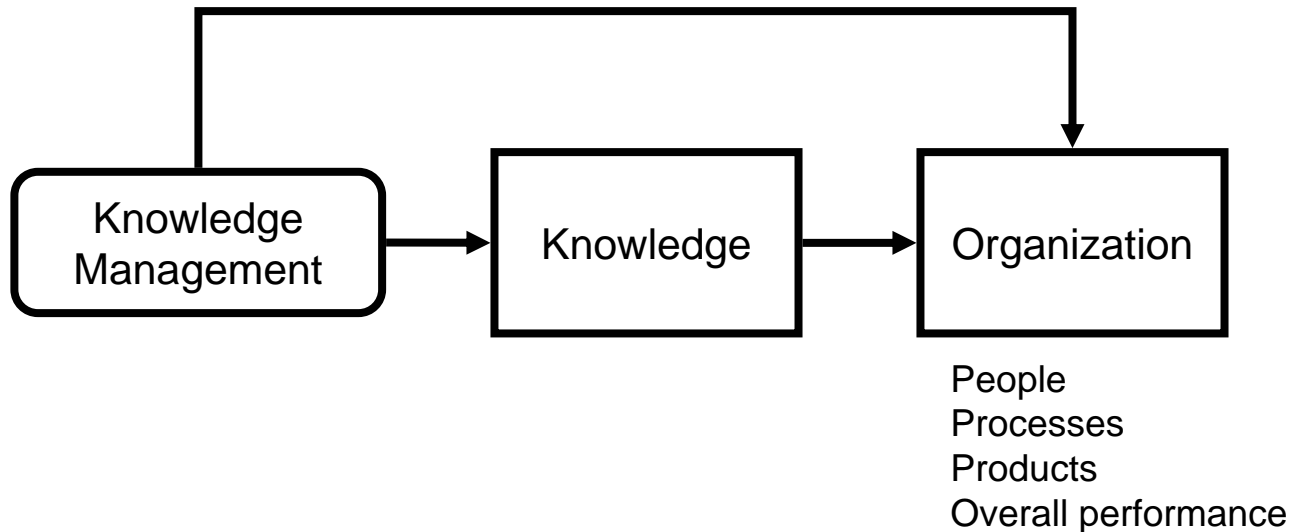


Chapter Objectives: Key Questions

- What various kinds of impact does knowledge management have on organizations and organizational performance?
- At what levels does the impact occur?
 - ◆ People
 - ◆ Processes
 - ◆ Products
 - ◆ Overall performance



How Knowledge Management Impacts Organizations?



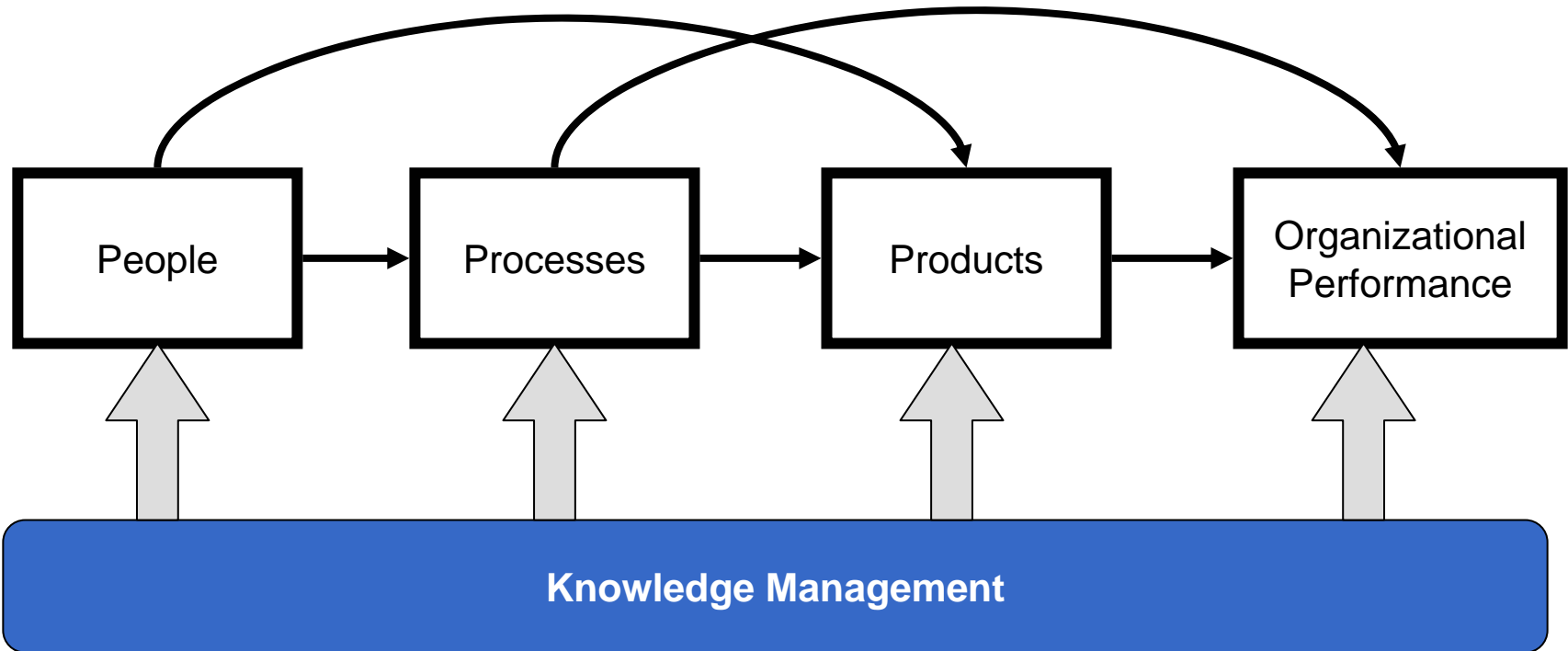


Why US Firms adopt KM?

- Retaining expertise of employees
- Enhancing customers' satisfaction with the company's products
- Increasing profits or revenues.

IDC and *Knowledge Management Magazine* joint survey on KM practices in US companies [Dyer & McDonnough 2001]

Dimensions of Organizational Impacts of KM





Impact on People

- KM can facilitate employee learning
- KM also causes employees to become more flexible, and enhances their job satisfaction



Impact on Employee Learning

- This can be accomplished through
 - ◆ Externalization
 - eg, writing a report on lessons learned from a project...
 - ◆ Internalization
 - eg, when employees preparing for a later project read it
 - ◆ Socialization
 - eg, through joint activities such as meetings or informal chats
 - ◆ Communities of practice
 - ie (recall), an organic and self-organized group of individuals who are dispersed geographically or organizationally, but communicate regularly to discuss issues of mutual interest



Xerox case study: Communities of Practice

- Focus area: management of technology infrastructure
- Membership: large group of IT professionals
 - ◆ Provided leading-edge solutions
 - ◆ Addressed unstructured problems
 - ◆ Stayed in touch with latest developments
- Unusual: Top management deliberately established this COP
 - ◆ Typically COPs are voluntarily formed by individuals
 - ◆ This kind of COP is sometimes called a “strategic community” [Storck & Hill 2000]
- About 2/3 of the COP’s value resulted from face-to-face networking at the group’s meetings
- Helped Xerox in its global services push



Xerox case study: Communities of Practice

- “It is about understanding where knowledge is and how it is found. By working with human elements of this, there are real things you can do to help people embrace the technology and incorporate it into the workflow.”
[Jim Joyce, Xerox executive, quoted in Moore 2001]
- “At the core of Xerox’s heritage of innovation is a deep understanding of how people, processes and technology interact with each other in the creation of great work. As a result, our practical, results-oriented, knowledge management solutions can help businesses streamline work processes, enable better customer service and grow revenue.” [Business Wire 2002]



Impact on Employee Adaptability

- Employees are likely to adapt when they interact with each other
- They are more likely to accept change
- They are more prepared to respond to change...
 - ◆ ... and less likely to be caught by surprise!



Impact on Employee Adaptability

- Case study: Buckman Laboratories
 - ◆ Privately owned US specialty chemicals firm (1,300 employees)
 - ◆ Named “Most Admired Knowledge Enterprise” by Business Wire [2000]
 - ◆ According to Chairman Bob Buckman:
 - Company’s KM efforts were intended to continually expose its employees to new ideas and enable them to learn from these ideas
 - Employees were prepared for change as a result of being in touch with the latest ideas and developments – and consequently, embraced change instead of fearing it
 - Increased employee adaptability enabled the company to become a very fast changing organization around the needs of its customers



Impact on Employee Job Satisfaction (1)

- Recent study found that in organizations having more employees sharing knowledge with one another, turnover rates were reduced, thereby positively affecting revenue and profit [Bontis 2003]
- Employees feel better because of their knowledge acquisition and skill enhancement
- Employees' market value is enhanced relative to other organizations' employees



Impact on Employee Job Satisfaction (2)

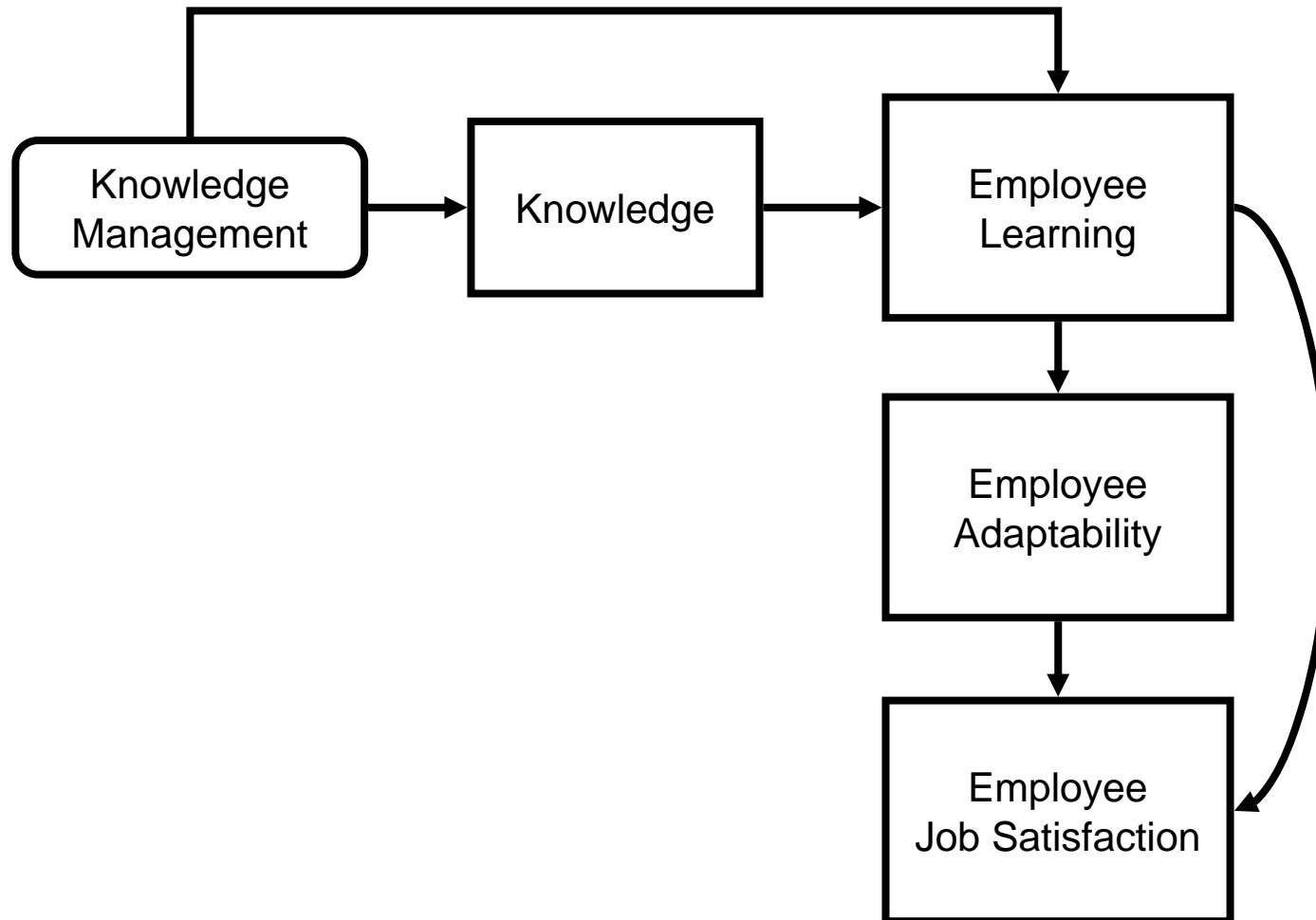
- KM also provides employees with solutions to problems they face in case those same problems have been encountered earlier, and effectively addressed
- Providing tried-and-tested solutions (eg, via the direction mechanism) amplifies employees' effectiveness in performing their jobs
- Also helps keep employees motivated
 - ◆ Employees facing problems in performing their job rapidly become demotivated



Impact on Employee Job Satisfaction (3)

- Additional increases in employee job satisfaction derive from KM practices:
 - ◆ Mentoring and training are excellent motivators
 - ◆ Communities of Practice provide intimate and socially validated control over their own work practices [Brown & Duguid 1991]

How KM Impacts People





Impact on Processes

- KM enables improvements in organizational processes such as marketing, manufacturing, accounting, engineering, and public relations
- These impacts can be seen along three major dimensions
 - ◆ *Effectiveness*
 - ◆ *Efficiency*
 - ◆ Degree of *innovation* of the processes



Effectiveness, Efficiency and Innovation

- *Effectiveness* is performing the most suitable processes and making the best possible decisions
- *Efficiency* is performing the processes quickly and in a low-cost fashion.
- *Innovation* is performing the processes in a creative and novel fashion, that improves effectiveness and efficiency—or at least marketability.



Impact on Processes: Effectiveness (1)

- KM can enable organizations to become more effective by helping them to select and perform the most appropriate processes
- Case study: Ford and Firestone [Stewart 2000]
 - ◆ Firms *did* possess the necessary information to warn them about the mismatch of Ford Explorer and Firestone tires
 - ◆ However, the information was *not* integrated across the two companies – so neither company had the “full picture”
 - ◆ Ironically, Ford *did* actually have a good KM process, but it was not used to manage the knowledge relating to the Ford Explorer and Firestone tires
 - ◆ Results:
 - significant loss of lives for customers
 - unprecedented legal liability



Impact on Processes: Effectiveness (2)

- KM enables organizations to quickly adapt their processes according to the current circumstances, thereby maintaining process effectiveness in changing times
 - ◆ On the other hand, organizations lacking in KM find it difficult to maintain process effectiveness when faced with turnover of experienced and new employees.
- Case study: Reorganization of a large firm's engineering department in 1996
 - ◆ Achieved a 75% reduction of workforce
 - ◆ An external vendor absorbed many of the displaced engineers
 - ◆ Company failed to institutionalize any KM mechanisms to capture knowledge of department employees
 - ◆ Subsequently, a 2-month review of results showed key quality indicators not met



Impact on Processes: Effectiveness (3)

- Case study: KM at Tearfund
 - ◆ Large UK-based relief and development agency
 - ◆ Regularly responds to natural and humanitarian disasters
 - Floods, hurricanes, typhoons, famine, displacement, ...
 - ◆ Recognizes that learning for successes and failures during responses to disasters in general improves responses to later ones
 - ◆ Has identified, consolidated, and utilized lessons learned in response to floods in Bangladesh, the Orissa Cyclone in India, the Balkan crisis, ...
 - ◆ 2 main components in KM efforts:
 - Utilize learning opportunities that arise during and after any major activity
 - Involve key participants to perform after-action reviews describing lessons learned
 - They participate in a structured, facilitated process to identify key lessons learned, and retrieve them again when next required
 - Create COPs to connect people with similar roles, issues, challenges, and knowledge needs
 - Enables Tearfund employees to share knowledge with 350 partner organizations, both UK-based and overseas



Impact on Processes: Effectiveness (4)

- Case study: KM at Tearfund (cont)
 - ◆ Has been consciously learning different disaster responses
 - In each case, identifying specific and actionable recommendations for future application
 - Provides Tearfund with the confidence and shared understanding needed to implement some of the lessons its many individuals had learned
 - Outcome: a more proactive and integrated response to disasters, providing help to the beneficiaries more effectively
 - ◆ Example:
 - Tearfund modified its processes so that someone would be in the field no later than 48 hours after a disaster
 - Tearfund identified 300 specific and actionable recommendations
 - ◆ Success depends on not simply identifying the lessons, but actually implementing them on the next occasion.
 - ◆ Should be a part of someone's job to ensure that learning occurs and lessons are embedded in the processes we follow in subsequent disaster responses [Wilson 2002]



Impact on Processes: Efficiency (1)

- Managing knowledge effectively can also enable organizations to be more productive and efficient
- Case studies:
 - ◆ Toyota
 - ◆ BP



Impact on Processes: Efficiency (2)

- Case study: Toyota [Dyer & Nobeoka 2000]
 - ◆ Toyota's ability to effectively create and manage network-level knowledge sharing processes helps explain the relative productivity advantages of both Toyota and its suppliers
 - ◆ Knowledge diffusion found to occur more quickly within Toyota's production network than in competing automakers
 - ◆ Reasons: Toyota's network had solved 3 fundamental dilemmas with regard to knowledge sharing, by devising methods to:
 - Motivate members to participate and openly share valuable knowledge (while preventing undesirable spillovers to competitors)
 - Prevent free riders (ie, individuals who learn from others without helping others to learn)
 - Reduce the costs associated with finding and accessing different types of valuable knowledge



Impact on Processes: Efficiency (3)

- Case study: BP [Echikson 2001]
 - ◆ A BP exploration geologist located off the coast of Norway discovered a more efficient way of locating oil on the Atlantic seabed in 1999
 - Involved a change in the position of the drill heads to better aim the equipment and thereby decrease the number of misses
 - ◆ The geologist posted a description of the new process on BP's intranet for all employees' benefit
 - ◆ Within 24 hours, another BP engineer working on a well near Trinidad found the posting and emailed the Norwegian employee for additional details
 - ◆ After a quick email exchange, the Trinidad team successfully saved 5 days of drilling – amounting to US\$600,000
 - ◆ Use of KM via internet saved BP US\$300M in 2001 alone, while also enhancing innovativeness.



Impact on Processes: Innovation (1)

- Organizations can increasingly rely on knowledge shared across individuals to produce innovative solutions to problems as well as to develop more innovative organizational processes
- KM has been found to enable riskier brainstorming [Storck & Hill 2000], thus enhancing process innovation
- “The power of intellectual capital is the ability to breed ideas that ignite value” [JP Morgan Chase annual report, quoted by Stewart 2001]

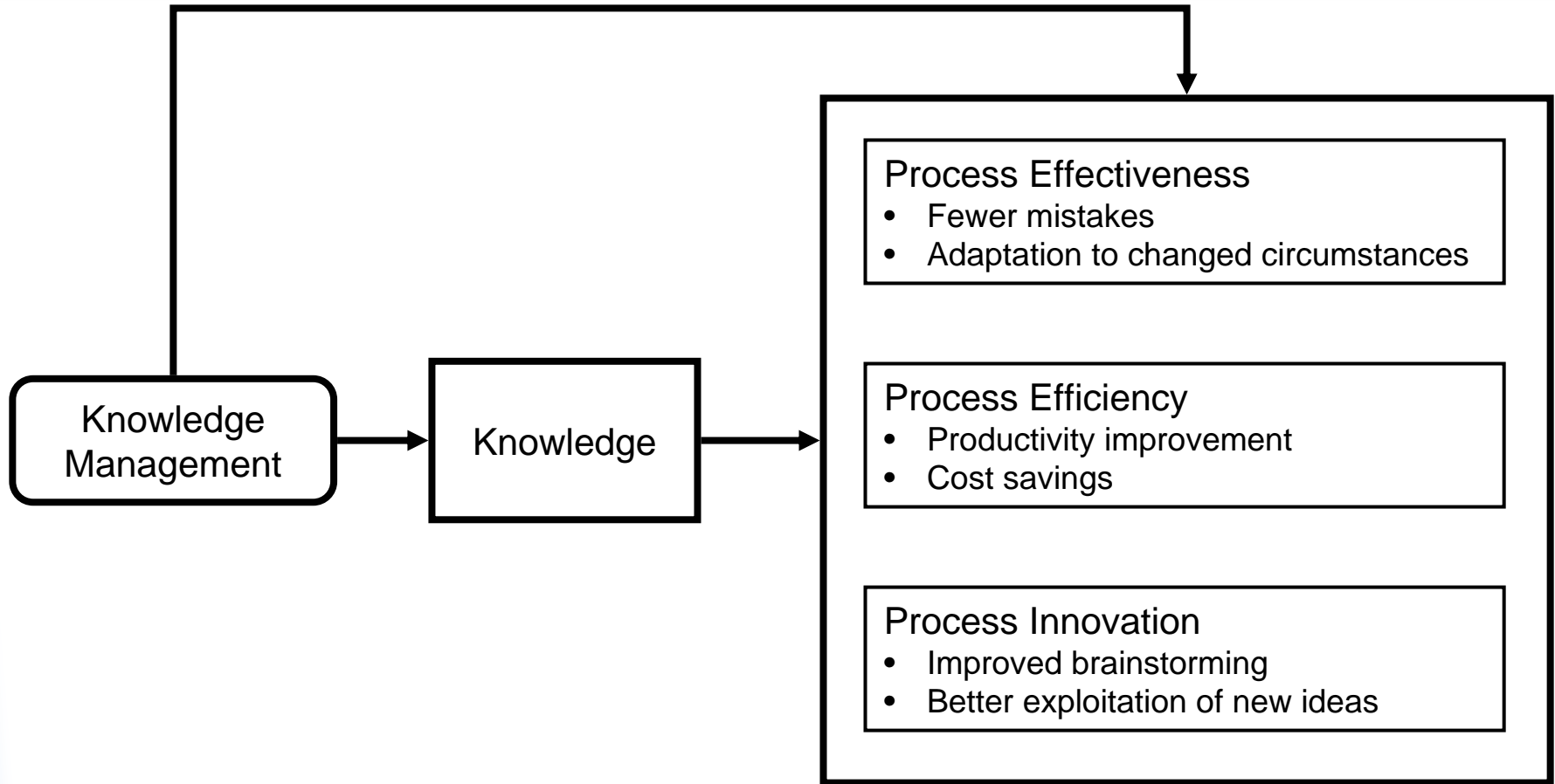


Impact on Processes: Innovation (2)

- Case study:
 - ◆ Buckman Laboratories (see earlier) linked its R&D personnel and technical specialists to its field-based marketing, sales, and technical support staffs
 - ◆ Ensured that new products were developed with customers' needs in mind, and that customers' needs were quickly and accurately communicated to the product development group [Zack 1999]



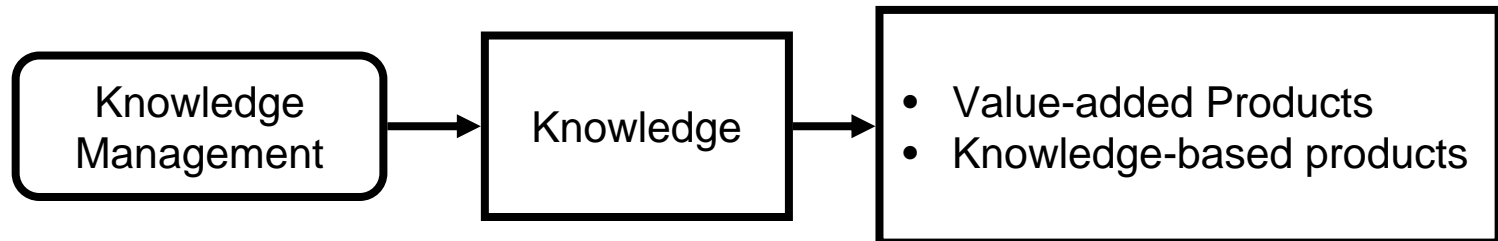
How KM Impacts Organizational Processes?





Impact on Products

- Impact on products can be
 - ◆ Value added products
 - ◆ Knowledge based products





Impact on Value-Added Products (1)

- KM processes can help organizations offer new products or improved products that provide a significant additional value as compared with earlier products
- Case study: Ford
 - ◆ Best practices replication process in manufacturing
 - ◆ Every year, headquarters provides a task to managers, requiring them to come up with a 5%, 6%, or 7% improvement in key measures, eg:
 - throughput improvements
 - energy use
 - ◆ When managers receive their task, they check the best practices database to seek knowledge about prior successful efforts
 - ◆ Ford tracks the system in meticulous detail
 - ◆ Estimates it saved the company US\$245M from 1996-97 [Anthes 1998]
 - ◆ In 4.5 years from 1996-2000, over 2,800 proven superior practices were shared across manufacturing operations
 - ◆ Documented value of shared knowledge in 2000 was US\$1.25B (from US\$850M + another US\$400M of value anticipated from work in progress)



Impact on Value-Added Products (2)

- Value-added products also benefit from KM due to the effect the latter has on organizational process innovation
- Case study: Buckman Laboratories
 - ◆ Innovative processes resulting from KM enable the sales and support staff to feed customer problems into their computer network, to access relevant expertise throughout the company in developing innovative solutions for the customers.
- Case study: Steelcase [Skyrme 2000]
 - ◆ Uses information obtained through video ethnography from its customers (the end users of office furniture) to understand how its products are used, and then to redesign the products to make them more attractive to customers.
 - Ethnography = the branch of anthropology that deals with the scientific description of specific human cultures [*American Heritage Dictionary of the English Language*, 4th Edition, 2000]



Impact on Knowledge-Based Products

- KM can have a significant impact on products that are knowledge based, eg:
 - ◆ consulting
 - ◆ software development
 - ◆ ...
- Case study: ICL (now Fujitsu Consulting and Fujitsu Services)
 - ◆ Consultants can quickly access and combine the best available knowledge and bid on proposals that would otherwise be too costly or too time-consuming to put together
- In knowledge-based industries, KM is often *necessary* just for mere survival.



Impact on Knowledge-Based Products

- Knowledge based products can sometimes play a significant role in traditional manufacturing firms, too
- Case study: Matsushita [Nonaka & Takeuchi 1995]
 - ◆ Design of an automatic bread-making machine
 - ◆ Matsushita sought a master baker
 - Observed the master baker's techniques
 - Incorporated them into the machine's functionality
- Case study: Sun (and now Microsoft and many others)
 - ◆ Place solutions to customer problems in a shareable knowledge base
 - ◆ Let customers download software patches based on their answers to an automated "wizard" system that prompts customers with a series of questions aimed at diagnosing the customer needs



Impacts on Organizational Performance (1)

- “Ideas are capital. The rest is just money.”
 - Deutsche Bank ad, *Wall Street Journal*
- Reflects the belief that investments in KM should be viewed as capital investments – to produce long-term benefits to the entire organization – instead of assets providing value only at the present time.



Impacts on Organizational Performance (2)

- Direct Impacts
 - ◆ Knowledge is used to create innovative products that generate revenue and profit
 - ◆ In theory, relatively straightforward to measure in terms of improvements in ROI (return on investment)
- Case study: British Telecom
 - ◆ BT Account Director indicated that his sales team generated about US\$1.5M in new business based on briefings from a new KM system [Compton 2001]



Impacts on Organizational Performance (3)

- Case study: Chevron Corporation
 - ◆ “Of all the initiatives we’ve undertaken at Chevron during the 1990s, few have been as important or as rewarding as our efforts to build a learning organization by sharing and managing knowledge throughout our company. In fact, I believe this priority was one of the keys to reducing our operating costs by more than \$2B per year – from about \$9.5B to \$7.4B – over the last seven years.”

[Kenneth T. Derr, Chairman & CEO, speaking to the *KM World Summit*, San Francisco, 11 Jan 1999]



Impacts on Organizational Performance (4)

- Indirect Impacts
 - ◆ Use of KM to demonstrate intellectual leadership within the industry, which, in turn, might enhance customer loyalty
 - ◆ Use of knowledge to gain an advantageous negotiating position with respect to competitors or partner organizations
 - ◆ Unlike direct impact, cannot be directly associated with transactions and therefore cannot be easily measured



Economy of Scale

- A company's output is said to exhibit *economy of scale* if the average cost of production per unit decreases with increase in output
- Reasons:
 - ◆ Large setup cost, making low-scale production uneconomic
 - ◆ Possibilities for specialization increase as production increases
 - ◆ Greater likelihood of discounts from suppliers when production is large-scale
 - ◆ ...



Economy of Scope

- A company's output is said to exhibit *economy of scope* when the total cost of that same company producing two or more different products is less than the sum of the costs that would be incurred if each product had been produced separately by a different company
- Reasons:
 - ◆ Joint use of production facilities
 - ◆ Joint use of marketing
 - ◆ Joint use of administration
 - ◆ Joint use of distribution channels



Indirect Impacts on Economy of Scale and Scope

- KM can contribute to economies of scale and scope
 - ◆ By improving the organization's ability to create and leverage knowledge related to products, customers, and managerial resources across businesses
 - ◆ By enabling sharing of products designs, components, manufacturing processes, and expertise across businesses – thus reducing development and manufacturing costs, accelerating new product development, and supporting quick response to new market opportunities
 - ◆ By enabling cross-selling of existing products or development of new products, by sharing knowledge of customer preferences, needs, and buying behaviors
 - ◆ By enabling the deployment of general marketing skills and sales forces across businesses



Indirect Impacts on Sustainable Competitive Advantage (1)

- Knowledge can enable an organization to develop and exploit other tangible and intangible resources better than the competitors can
 - ◆ Even when the resources might not be unique!
- Knowledge (especially context-specific tacit knowledge) tends to be unique and therefore difficult to imitate.
 - ◆ Unlike most traditional resources, knowledge cannot easily be purchased in a ready-to-use form.
- To obtain similar knowledge, competitors have to engage in similar experiences
 - ◆ But obtaining knowledge through experience takes time
- So competitors are limited in the extent to which they can accelerate their learning through greater investment

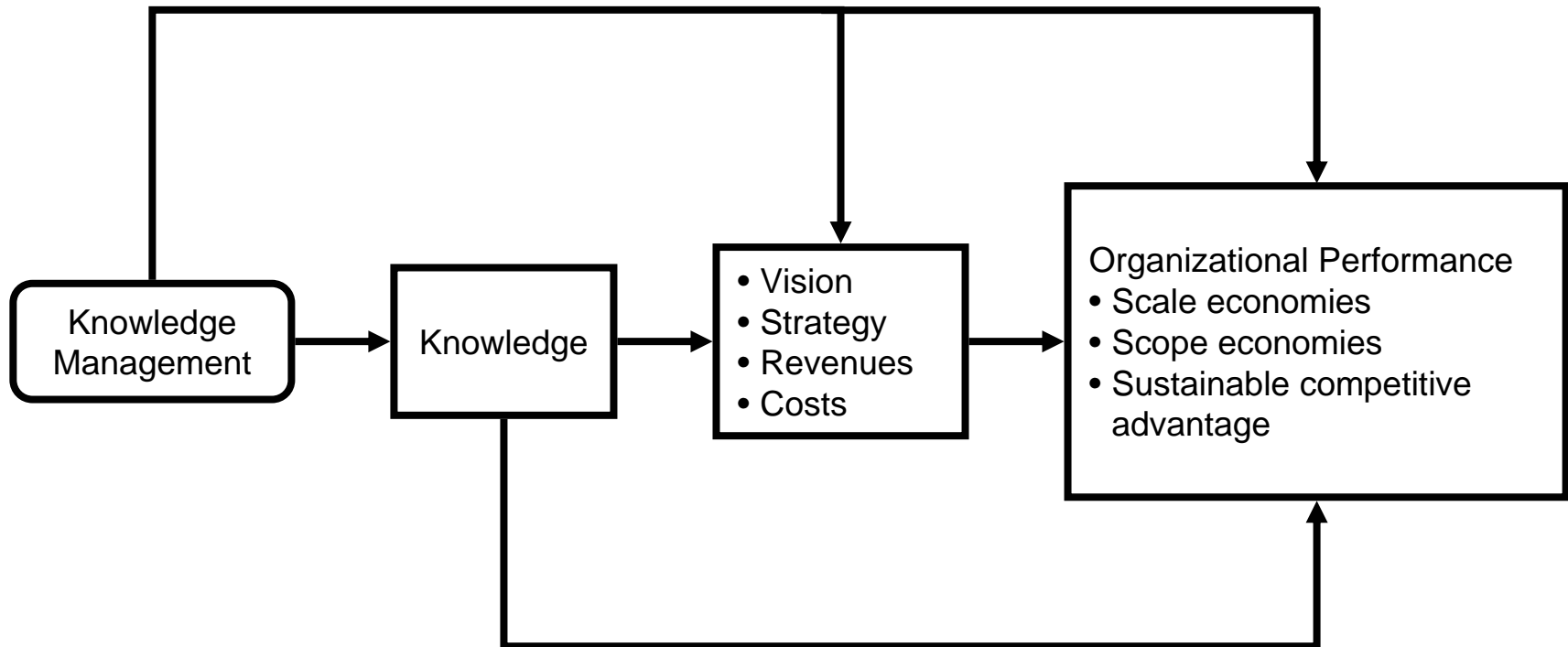


Indirect Impacts on Sustainable Competitive Advantage (2)

- Case study: LeaseCo [Zack 1999]
 - ◆ Industrial garment and small equipment leasing company
 - ◆ Strategy involves occasionally bidding aggressively on complex, novel, or unpredictable lease opportunities
 - ◆ These bidding and subsequent negotiation experiences provided LeaseCo with unique and leverageable knowledge
 - At the same time, reducing opportunity for competitors to gain the same knowledge
 - ◆ Resulted in two significant sustainable competitive advantages:
 - Investing in its strategic knowledge platform
 - Learning enough about particular clients to competitively and profitably price leases for future opportunities with the same client
 - ◆ Often, sufficient mutual learning occurred between LeaseCo and the client that the client contracted the company for future leases without even going out for competitive bids
 - ◆ LeaseCo created a sustainable (or renewable) knowledge-based barrier to competition



How Knowledge Management Impacts Organizational Performance





A Summary of Organizational Impacts of Knowledge Management

Levels of Impact	Impacted Aspects
People	Employee Learning Employee Adaptability Employee Job Satisfaction
Processes	Process Effectiveness Process Efficiency Process Innovativeness
Products	Value-added Products Knowledge-based Products
Organizational Performance	Direct Impacts Return on investment Indirect Impacts Economies of scale and scope Sustainable competitive advantage



Conclusions

- Explained the interrelated impacts of KM on organizations at several levels
 - ◆ People
 - ◆ Processes
 - ◆ Products
 - ◆ Overall performance
- The impact on one level might lead to synergistic impacts on another level as well



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