The Importance of Information Systems Management

Chapter 1
Information Systems Management In Practice 7E
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Introduction

• (Finally) Information Technology (IT) - computers and telecommunications - is having the kind of revolutionary, restructuring impact that has been expected and promised for years
• Rapid advances in speed and capacity + pervasiveness of Internet, wireless, portable devices etc. = making major changes in the way we live and work

Introduction cont.

• Due to the growth and pervasiveness of IT, organizations are operating in a different environment from just a few years ago
• Themes this unit emphasizes:
  – Globalization
    • The world seems to be getting smaller
    • Backlash – local needs Vs. ‘standard’
    • Jobs to stay ‘local’
    • IS executives need ‘balancing act’
  – E-enablement
    • Internet has become a hub for conducting business
    • Interconnectivity plus
  – Knowledge Sharing and Knowledge Management
    • Between people
    • Out of people’s heads and into ‘lasting’ things e.g. systems, policies and procedures etc.

Introduction cont.

• Management of Information Systems
  – 3 Major Trends
    1. Governance of IT = a collaborative effort from IS executives and all other members of Senior Management
    2. Role of IS is shifting from application delivery to system integration and infrastructure development
    3. Outsourcing -Developing and managing contracts and relationships

Introduction cont.

• Historically, managing IT has been the job of ‘technical managers’
• NOW = increasingly becoming an important part of the responsibilities of:
  – Senior executives
  – Line managers
  – Employees at all levels of an organization

The ‘Key’ (What’s it all about?)

Technology is configured into systems that help manage information to improve organizational performance
A Little History

- U.S. passed from the industrial era to the information era as early as 1957
  - The number of U.S. employees whose jobs were primarily to handle information surpassed the number of industrial workers
- In the late ‘50s / ’60s IT to support “information work” = largely non-existent (except telephone)
  - Information work = mostly done in general offices without much support from technology

A Little History cont.

- 70s = it all ‘started’ with many of the foundations of IT today invented and costs starting to fall
  - Typewriters, fax, ‘smaller’ computers
- 1980s = number of US information workers surpassed the number in all other sectors (>50%)

The Organizational Environment cont.

- The External Organizational Environment
  - IT allows information to move faster, thus increasing the speed at which events take place and the pace at which individuals and organizations respond to events.
  - The Internet Economy
    - B2C, B2B etc.

A Little History cont.

- Information Technology:
  - Initially used to perform existing information work more quickly and efficiently
  - Then = used to manage work better
  - Now = well into the 3rd stage of technology assimilation
  - IT makes pervasive changes in the structure and operation of:
    - Work
    - Business practices
    - Organizations
    - Industries
    - The ‘Global Economy’

The Organizational Environment cont.

- The External Organizational Environment cont.
  - Global Marketplace
    - The entire world has become the marketplace
    - The Internet allows companies to work globally
    - Globalization is a ‘two way street’
    - Internet allows small firms to have a global reach
    - Business environment is now global, but local tastes still matter
The Organizational Environment cont.

- The External Organizational Environment cont.
  - Business Ecosystems
  - Decapitalization
    - Tangible items, such as capital, equipment and buildings were the tenets of power in the industrial age.
    - Today = power of ‘intangibles’ such as ideas and knowledge
      - Managing talent = as important as e.g. managing finance

The Organizational Environment cont.

- The External Organizational Environment cont.
  - Faster Business Cycles
  - Accountability and Transparency
    - Many business plans could not make $$$
    - Debacle in Telco and business shenanigans have shaken investor confidence
  - It will play a significant role in implementing the ensuing regulations and fostering transparency

The Organizational Environment cont.

- The External Organizational Environment cont.
  - Rising Societal Risks of IT
    - IT has negatively affected millions of people
      - Network shutdowns
      - Computer viruses
      - Identity theft
      - Email scams
      - Movement of white collar jobs offshore
    - Led to increasing calls for Government regulation and for vendors and corporations to take action

The Organizational Environment cont.

- The Internal Organizational Environment cont.
  - Self- Service
    - ATMs = early example
    - 1990s saw an increase in systems that let consumers access corporate computer systems to:
      - Learn about products
      - Purchase products
      - Inquire about orders
      - Communicate and ‘do business’ with the firm
    - Now = heaps e.g. FedEx parcel tracking

The Organizational Environment cont.

- The Internal Organizational Environment cont.
  - Real-Time Working
    - Sales people have up-to-the-minute information about customers
    - Knowing e.g. inventory and cash levels as the are NOW -- not as they were a week or a month ago
    - Being able to reach someone when you need them
      - Instant messaging?
  - Team-Based Working
    - Working together on projects

The Organizational Environment cont.

- The Internal Organizational Environment cont.
  - Anytime, Anyplace Information Work
The Organizational Environment cont.

- The Internal Organizational Environment cont.
  - Outsourcing and Strategic Alliances
    - To become more competitive, organizations are examining types of work that should be done internally or externally by others.
    - Ranges from a simple contract for services to a long-term strategic alliance.
    - The thinking is: We should focus on what we do best and outsource the other functions to people who specialize in them.

The Organizational Environment cont.

- The Demise of Hierarchy
  - Traditional hierarchical structure groups, several people performing the same type of work, overseen by a supervisor.
  - No longer the most appropriate in factories or offices.
  - Hierarchical structures cannot cope with rapid change.
  - Communications up and down the chain of command takes too much time for today's environment.
  - IT enables team-based organizational structures by facilitating rapid and far-flung communication.
  - Note: = some of the time. Still has its place in many organizations.

Goals of the New Work Environment

- Leverage Knowledge Globally
  - Tap tacit knowledge by fostering sharing and supporting sharing through technology.
  - Note: driving force is culture!
  - Happens through organizational pull (people needing help) rather than organizational push which overloads people with information.

- Organize for Complexity

Goals of the New Work Environment cont.

- Work Electronically
  - Taking advantage of the Internet and networks in general = 3rd major goal of enterprises today.
  - Requires different organizing principles, management tenets, compensation schemes, structure etc.
  - Changes how organizations interact with others including customers.
  - The microchip moved power within companies.
  - Bandwidth moves power all the way to consumers.
  - Will increase exponentially as bandwidth capability increases and costs decrease.

The Technology Environment

- Hardware Trends
  - '50s – '60s + - Batch processing predominant; on-line systems emerged later.
  - Mid '70s processing power began to move out of the central site (at the insistence of users!).
  - 1980s: Advent of personal computers.
  - Client-Server computing: "Client" machine user interfaces with "Server" on the network holding the data and applications.
  - Major current development = hand-held devices, wireless etc.
  - Further distribution beyond organizational boundaries to suppliers, customers etc.

The Technology Environment cont.

- Software Trends
  1. In 1960s = Improve the productivity of in-house programmers who created transaction processing systems.
     - ‘Problem’ = memory $.
  2. Later, programming issues:
     - First = Modular and structured programming techniques.
     - Then = Life cycle development methodologies and software engineering.
     - Goal = Introduction of rigorous project management techniques.
The Technology Environment cont.

• Software Trends cont.
3. Prototyping: quick development of a mock-up
4. Purchasing software became viable alternative to in-house development
5. Paying attention to applications other than transaction processing
   • Decision support systems (DSS), report generation, database inquiry
6. End users develop their own systems

• Push for ‘open systems’
   • Purchasers were tired of being “locked in” to proprietary software (or hardware)
7. 1990s – trend towards Enterprise Resource Planning (ERP) e.g. SAP, PeopleSoft
   • Expensive and troublesome, especially for companies wanting to modify the ERP software to fit their ‘unique’ processes
   • A fundamental organizational change!

The Technology Environment cont.

• Data Trends
   • At first = File management
     • Organizational techniques for files that served individual applications
   • Then = Corporate databases
     • Serving several applications
     • Led to concept of establishing a data administration function

The Technology Environment cont.

• Data Trends cont.
  • Late ’70s / early ’80s = 4th generation languages and PCs:
    • Employees directly access corporate data
    • Users “demanded it”!
  • Also = Distributing data from data resources to information resources
    • Information management focuses on concepts
      • Contains a much richer universe of digitized media including voice, graphics, animation and photographs (digitized media)

The Technology Environment cont.

• Data Trends cont.
  • Managing this expanded array of information resources requires new technologies
    • Data warehousing
      • Stores huge amounts of historical (not ‘live’) data from systems such as retailers Point-Of-Sale systems
    • Data mining
      • Uses advanced statistical techniques to explore data warehouses looking for previously unknown relationships in data e.g. which customers are the most profitable
  • Knowledge management (intellectual capital)
  • Web has broadened ‘data’ to mean ‘content’
    • Text, graphics, animation, maps, photos, video etc.
The Technology Environment cont.

- Data Trends cont.
  - Two major data issues are now facing CIOs:
    1. Security – protecting data from those who should not see it
    2. Privacy – safeguarding the personal data of employees, customers etc.

The Technology Environment cont.

- Communications Trends
  - Final core technology = Telecommunications.
  - This area has (is?) experienced enormous change and is now taking ‘centre stage’
  - Early use = online and time-sharing systems
  - Then = interest in both public and private (intra-company) data networks blossomed
  - Internet = changed everything!
  - Today the Internet’s protocol has become the worldwide standard for LANs and WANs

The Technology Environment cont.

- Communications Trends cont.
  - Telecom opened up new uses of IS so it became an integral component of IS management
    - Communications-based information systems link organizations to their suppliers and customers
  - Explosion of wireless
    - 2nd generation, instant messaging, Wi-Fi, 3rd generation (3G)
    - Doesn’t just enable mobility = changes how people communicate, how they live and how they work
  - EXCITING TIMES!!!

The Mission of Information Systems

- Early days: “paperwork factories” to pay employees, bill customers, ship products etc.
  - Objectives of information systems defined by productivity measures
- Later = MIS era: produced reports for “management by exception” for all levels of management
- Today = Improve the performance of people in organizations through the use of information technology
  - Improving organizational performance is accomplished by the people and groups that comprise the organization
    - One resource for this improvement is IT

The Mission of Information Systems

The mission is to improve the performance of people in organizations through the use of information technology

A Simple Model (Fig. 1-2)

In the early days of Information Systems, the ‘translation’ between IT and users was performed almost entirely by systems analysts
Systems Professionals Bridging the Technology Gap (Fig. 1-3)

- Over the last 50 years technology has become increasingly complex and powerful
- Users have become increasingly sophisticated
- Information systems are now viewed as ‘products’ and users have become ‘customers’
- More specialization is required of systems professionals to bridge this wider gap

Users Bridging the Technology Gap (Fig. 1-4)

- Technology has become sophisticated enough to be used by many employees and consumers
- Today, some of the technology is truly user-friendly, and some applications such as Web page development, database mining and spreadsheet manipulation, are handled by non-IT staff
- Transaction systems, however, are still ‘developed’ by professional developers, either inside or outside the firm

Why talk about the ‘Technology Gap’?

- The main point of this discussion is that technology is getting more complex, applications are becoming more sophisticated, and users are participating more heavily in the development of applications
- The net result is that management of the process is becoming more complex and difficult as its importance increases
A Better Model (Fig 1-6)

- Expanding the simple model gives us more guidance into managerial principles and tasks
- We suggest a model with four principal elements:
  1. A set of technologies that represent the IT infrastructure installed and managed by the IS department
  2. A set of users who need to use IT to improve their job performance
  3. A delivery mechanism for developing, delivering and installing applications
  4. Executive leadership to manage the entire process of applying the technology to achieve organizational objectives and goals

1. The Technologies

- Several forces contribute to the increased importance and complexity of IT:
  1. Growth in capacity + reduction in cost & size
  2. Merging of previously separate technologies of computers, telephones/telecom/cable TV, office equipment and consumer electronics
  3. Ability to store and handle multiple forms of data
- Information systems now fill major roles in management reporting, problem solving and analysis, office support, customer service and communications

2. The Users

<table>
<thead>
<tr>
<th>Clerical?</th>
<th>Managerial?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure-Based</td>
<td>Knowledge-Based</td>
</tr>
<tr>
<td>High volume of transactions</td>
<td>Low volume of transactions</td>
</tr>
<tr>
<td>Focus on efficiency</td>
<td>Focus on effectiveness</td>
</tr>
<tr>
<td>Focus on accuracy</td>
<td>Focus on productivity</td>
</tr>
<tr>
<td>Examples: Bank teller, mortgage servicing</td>
<td>Examples: Managers and professionals</td>
</tr>
</tbody>
</table>

Note: the distinction between manager and worker is blurring!

3. System Development and Delivery

- Systems development and delivery bridge the gap between technology and users
- Systems for procedure-based (clerical) activities differ from systems for knowledge based information work (managerial)
- Systems are built based on technology resources. Three main categories (essential technologies):
  1. Hardware and software
  2. Telecommunications
  3. Information resources
- Management of these is called infrastructure management

4. IS Management

- Chief Information Officer (CIO)
  - Must be high enough in the enterprise to influence organizational goals
  - Must have enough credibility to lead the harnessing of technology to pursue those goals
- Must work with all the other CXOs
  - IT has become too important to be left to one individual
- Executive team must work together to govern it and leverage it well
A Better Model - Summary

• This model has four major components:
  1. The technology – which provides the electronic and information infrastructure
  2. Information workers who use IT to accomplish their work goals
  3. System development and delivery – which brings the technology and users together
  4. The management of the IS function
     • Overall responsibility = to harness IT to improve the performance of the people and the organization

Organization of this Book/Unit

• Part I - Leadership
• Part II - Technologies
• Part III - Delivery
• Part IV - Supporting work
• Part V - Looking ahead

Case Example: MeadWestvaco Corporation

• Ps. read the above case study.

A ‘Final Thought’

“It is not the strongest species that survive, nor the most intelligent, but the ones responsive to change”

- Charles Darwin