CIS (21-774)
Computer Information Systems
in
Industrial Engineering

Department of Industrial Engineering

Sharif University of Technology

Session # 12

Course Description *(Continued..)*

- *Contents:*
  - *The role of managers in Information Technology (IT)*   *(3 sessions)*

  - *Organizational Issues*   *(3 sessions)*

  - *Information Technology*   *(9 sessions)*

  - *Operational and enterprises systems*   *(4 sessions)*

  - *Exciting directions in systems*   *(3 sessions)*

  - *E-Business and E-Commerce*   *(3 sessions)*

  - *Issues for senior management*   *(2 sessions)*

Course Description (Continued..)

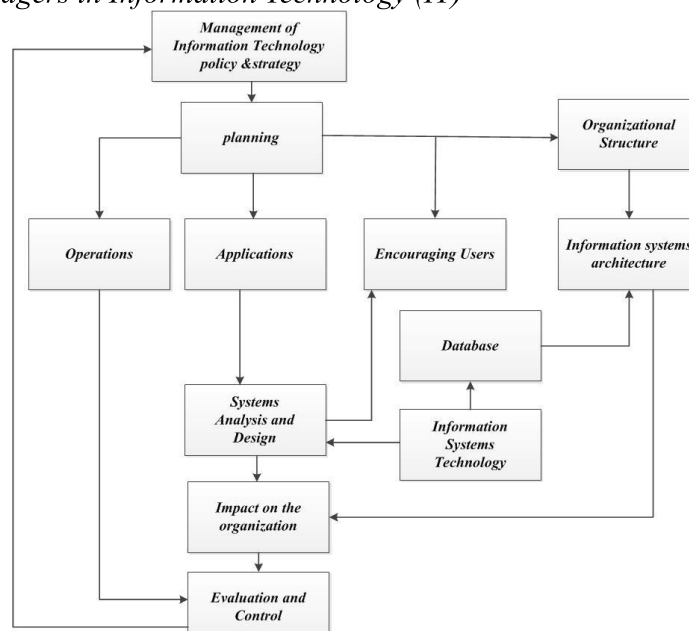- *Contents:*
  - *Organizational Issues*   *(3 sessions)*
    - *The impact of Information Technology on the organization*
      - *Modern organization*
      - *Building a T-form organization*
    - *Strategic issues of Information Technology*
      - *Information Technology and Corporate Strategy*
      - *Integrating technology with business technology*
      - *Managing Information Technology*
    - *International business and Information Technology*
      - *The impact of globalization on business*
      - *Key issues in international environment*
      - *Managing Information Technology internationally*

The role of managers in Information Technology (IT)

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Organizational Structure and Design*
    - *There are many factors that influence the structure and design of modern organizations.*
      - *Uncertainty*

      - *Specialization*

      - *Coordination*

      - *Interdependence*
        - *Pooled interdependence*
        - *Sequential interdependence*
        - *Reciprocal interdependence*

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Organizational flexibility*
    - *A flexible organization defends quickly against threats and moves rapidly to take advantage of opportunities.*

    - *Flexibility provides the organization with the ability to adapt to change and respond quickly to market forces and uncertainty in its environment.*

    - *In general, technology speeds up the pace of work and increases the capacity of the organization to process information*

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Organizational flexibility*

ORGANIZATIONAL FLEXIBILITY IN THE AIRLINE AND SECURITIES INDUSTRIES

Boundaries	Time	Nature and pace of work	Responsiveness
Airline CRS stage 1*			
Remove boundary of manual centralized processing; make reservation from anywhere	Make reservation anytime	Confirmed reservation made instantaneously	Alter schedules in response to loads
Airline CRS stage 2			
Boundary for making reservation shifts from airline to agent; airport boarding pass moved to travel agency	Extra service by agent, e.g., 24-hour assistance	Travel agent becomes more productive	Yield management programs allow instantaneous adjustment to demand for seats

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Creating new types of organizations*
    - *Information Technology makes it possible to create new forms of organizations through the use of different design variables.*
      - *Structural*
        - *Virtual components, Linking mechanisms, Electronic linking, Technological leveling*
      - *Work Process*
        - *Production automation, Electronic workflows, Virtual components*
      - *Communications*
        - *Electronic communications, Technological matrixing*
      - *Inter-organizational relations*
        - *Electronic customer/ supplier relationships, Electronic linking*

Organizational Issues
- *The impact of Information Technology on the organization*
  - *Creating new types of organizations*

CONVENTIONAL AND *IT* DESIGN VARIABLES

Class of variable	Conventional design variables	IT design variables
Structural	Definition of organizational subunits	Virtual components
	Determining purpose, output of subunits	Linking mechanisms
	Reporting mechanisms	
	Linking mechanisms	Electronic linking
	Control mechanisms	
	Staffing	Technological leveling
Work process	Tasks	Production automation
	Workflows	Electronic workflows
	Dependencies	
	Output of process	
	Buffers	Virtual components

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Creating new types of organizations*
    - *Technology makes it possible to create new forms of organizations through the use of different design variables.*

Communications	Formal channels	Electronic communications
	Informal communications/collaboration	Technological matrixing
Interorganizational relations	Make versus buy decision	Electronic customer/ supplier relationships
	Exchange of materials	Electronic customer/ supplier relationships
	Communications mechanisms	Electronic linking

IT DESIGN VARIABLES AND FOUR PROTOTYPICAL ORGANIZATIONS

Organization variable	Virtual	Negotiated organizations	Traditional	Vertically integrated conglomerates
Virtual components	Substitute electronic for physical components	Substitute electronic for physical components	Use to replace isolated components	Force component onto electronic subsidiary
Electronic linking and communications	Essential part	Essential part	Optional	Essential part
Technological matrixing	Participate in matrixed group	Use for coordination	Use for various groups	Use for coordination and task forces
Technological leveling	Use to supervise remote workers and groups	NA	Use to reduce layers of management	Use to reduce layers of management
Electronic workflows	Crucial part of strategy	Crucial part of strategy	Use where applicable to restructure work	Key to coordinate work units
Production automation	NA	Communicate designs	Use where applicable	Coordinate production among work units
Electronic customer/ supplier links	Used extensively	Used extensively	Potentially important	Key to operations

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Creating new types of organizations*

Mercedes Benz

...egan selling ...tility vehicle ...s Mercedes ...nore than a ... Explorer; it ... reviewers. ...beyond just- ...here suppli- ...ts weeks in ...ew days or ...ercedes is ...cturing. ...h the paint ...er to a sup- plier, like Johnson Controls in Wisconsin, to deliver a dashboard within a few hours.

The plant assembles cars in which other suppliers manufacture 70 percent of the components. The objective of just-in-sequence manufacturing is to dramatically reduce inventory management costs. The company contracted with IBM to develop the system for its 2 million-square-foot plant; IBM has installed enterprise resource planning software from The Baan Company.

In this example, information technology provides electronic linking and communications and ties Mercedes to its suppliers. The objective is to reduce inventory management effort and costs while maintaining scheduled production.

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Building a T-form organization*
    - *The pure T-Form organization operates with the assumptions about people found in the virtual and negotiated agreement organizations, where managers base supervision on trust in employees and their self-control.*

    - *The T-Form organization is a generic model for a technologically enabled organization.*

    - *The same IT design variables can be used in a variety of ways to create very different types of organizations, all of which have some of the characteristics of the T-Form.*

Organizational Issues

- *The impact of Information Technology on the organization*
  - *Creating new types of organizations*
    - *Technology makes it possible to create new forms of organizations through the use of different design variables.*
      - *Structural*
        - *Virtual components, Linking mechanisms, Electronic linking, Technological leveling*
      - *Work Process*
        - *Production automation, Electronic workflows, Virtual components*
      - *Communications*
        - *Electronic communications, Technological matrixing*
      - *Inter-organizational relations*
        - *Electronic customer/ supplier relationships, Electronic linking*
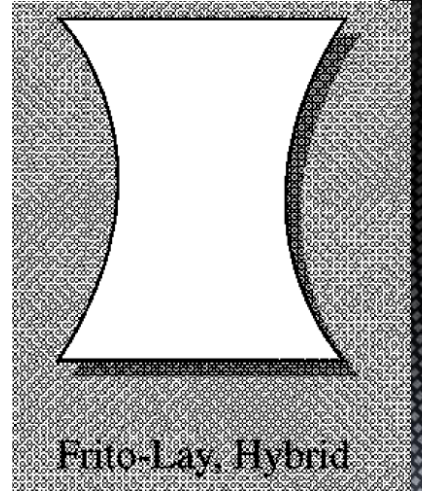
Organizational Issues

- *The impact of Information T...   on*
  - *Building a T-form organizati...*
    - *Frito-Lay is a major prod...   Corn Chips.*
    - *The company invested hea...   its drivers and a satellite con...   it transactions data to headq...*
    - *The firm developed a data...   on-support tools for district n...   r operations*

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Frito-Lay, Hybrid

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Organizational Issues

- *The impact of Information Technology on the organization*
  - *Building a T-form organization*

Companies/IT design variables	Frito-Lay
Virtual components	
Electronic linking and communications	Extensive with route sales force, district managers, factories, distribution centers
Technological matrixing	
Technological leveling	At headquarters
Electronic workflows	
Production automation	
Electronic customer/ supplier relationships	

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Organizational Is...

- *The impact of Inf...*
  organization
  - *Building a T-for...*
    - *Mrs. Fields C...*
      systems to gui...
      of the busines...

    - *The company...*
      communicate...

    - *It also has a v...*
      controllers at...
      sales results f...

Organizational Issues

The impact of Information Technology on the organization

- *Building a T-form organization*

Companies/IT design variables	Mrs. Fields
Virtual component	Presence of Mrs. Fields in each store
Electronic linking and communications	E-mail and voice mail; PCs in stores
Technological matrixing	
Technological leveling	For store controller organization
Electronic workflows	
Production automation	In store systems
Electronic customer/ supplier relationships	

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Organizational Issues
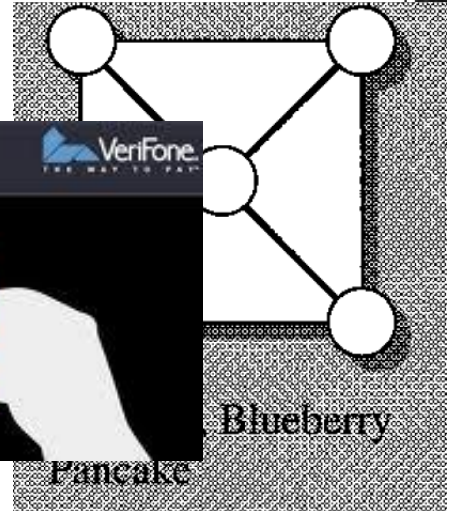
- *The impact of Information Technology on the organization*
  - *Building*
    - *VeriFo... credit ... comme...*

    - *The fir...*

    - *The ch... all the...*

    - *Verifone uses technology extensively for communications and coordination in the firm*

Blueberry
Pancake

Building a T-form organization

The impact of Information Technology on the organization

Organizational Issues

Companies/IT design variables	Verifone
Virtual components	Extensive use of teams and alliances
Electronic linking and communications	Extensive within company
Technological matrixing	Global teams to solve problems
Technological leveling	Minimum structure and hierarchy
Electronic workflows	
Production automation	
Electronic customer/ supplier relationships	

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Organizational Issues

- *The impact of Information*
  organization
  - *Building a T-form organi...*
    - *Oticon is a Danish ma...*
      underwent a major res...
      considerable market sh...
    - *The chairman created...*
      which an executive con...
      the firm must complete...
      leader.
    - *The leader must put to...*
      task; technology facilit...
      teams.

Completely In The Canal (CIC)

In The Canal (ITC)

Half Shell

Invisible In the Canal (IIC)

Receiver In The Ear (RITE)

mini RITE

mini RITE

Behind The Ear (BTE)

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Organizational Issues

The impact of Information Technology on the organization

Building a T-form organization

Companies/IT design variables	Oticon
Virtual components	Project teams
Electronic linking and communications	Within firm
Technological matrixing	Project teams
Technological leveling	
Electronic workflows	
Production automation	Redesign of factory
Electronic customer/ supplier relationships	

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Organizational Issues

The impact of Information Technology on the organization

- *Building a T-form organization*

Companies/IT design variables	Frito-Lay	Mrs. Fields	Verifone	Calyx & Carolla	Oticon
Virtual components		Presence of Mrs. Fields in each store	Extensive use of teams and alliances	Growers, FedEx, and credit card companies	Project teams
Electronic linking and communications	Extensive with route sales force, district managers, factories, distribution centers	E-mail and voice mail; PCs in stores	Extensive within company	With growers	Within firm
Technological matrixing			Global teams to solve problems		Project teams
Technological leveling	At headquarters	For store controller organization	Minimum structure and hierarchy		
Electronic workflows				With growers, credit card companies	
Production automation		In store systems			Redesign of factory
Electronic customer/ supplier relationships				With growers, credit card companies	

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