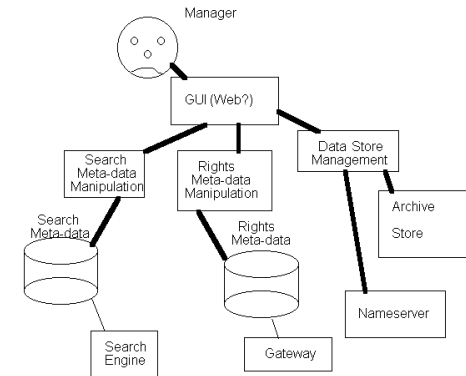


# Redesigning the Organization with Information Systems

# Manager's View

- Understanding Information System planning methods help you plan and organize resources.



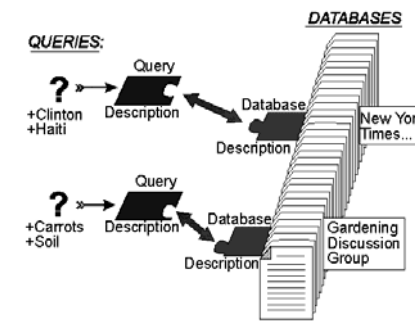
# Information Systems Planning Strategies

- Familiarize with the methods used to specify Information System requirements.
- Take a proactive role in defining your Information System requirements so the systems analyst can produce the Information System you need.



# Problems with Determining Information Requirements

- Failure to understand information needs from a cross-functional perspective.
- Limited use of joint application design during system user interviewing and data collection.



## Managing by Wire in a Complex Business Environment

- **Manage by Wire** means being able to respond to changes in market conditions by using information as feedback.
- Flexibility, responsiveness, and sensitive to changing customer needs are critical for competitive survival.

## Systems as Planned Organizational Change

- The introduction of a new Information System involves much more than new hardware and software.
- It also includes changes in jobs, skill, management, and organization.
- When we design a new Information System, we are redesigning the organization.
- Systems can be technical success but organizational failures because of a failure in the social and political process of building the system

## Linking Information System to Business Plan

- Deciding what new system to build should be an essential component of the organizational planning process.
- Organizations need to develop an Information System plan that supports their overall business plan and that incorporates strategic systems into top-level planning.

## Information Systems Plan

- It is a road map indicating the direction of systems development, the rationale, the current situations, the management strategy, the implementation plan, and the budget.
- To develop an effective Information System plan, the organization must have a clear understanding of both long & short-term information requirements. It can be done by
  - ◆ Enterprise Analysis
  - ◆ Critical Success Factors

# Enterprise Analysis (Business Systems Planning)

- It was developed by IBM in 1960s.
- It is an analysis of organization-wide information requirements by looking at the entire organization in terms of organizational units, functions, processes, and data elements.
- It helps identify the key entities and attributes in the organization's data.

# Enterprise Analysis (Business Systems Planning)

- It assists a business in developing an Information System plan that support both short-terms and long-terms information needs.
- This method provides a formal, objective way for management to establish Information System priorities that support business needs.
- One of the objective of BSP method is to develop a data architecture that support Information System development activities – as most organization build their Information System one piece at a time, it is later necessary to develop a data architecture to improve management of the dozens of databases.

# Method used in Enterprise Analysis

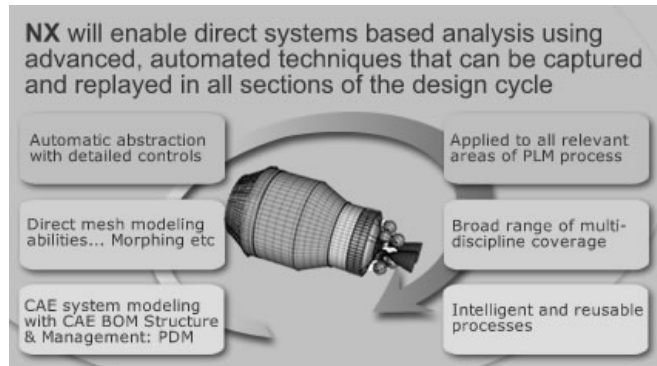
- Ask Managers
  - ◆ How they use information?
  - ◆ Where they get the information?
  - ◆ What their environment is like?
  - ◆ What their objectives are?
  - ◆ How they make decisions?
  - ◆ What their data needs are?

# Output of Enterprise Analysis

- The shaded boxed indicate a logical application group – a group of data elements that supports a related set of organizational processes.

## Strength of Enterprise Analysis

- It gives a comprehensive view of the organization and of systems/data uses and gaps.



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## Weakness of Enterprise Analysis

- It produces an enormous amount of data that are expensive to collect and difficult to analyze.
- Questions focus on existing information, result is a tendency to automate whatever exists.
- New approaches to how business is conducted are not addressed.

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## Critical Success Factors (CSF)

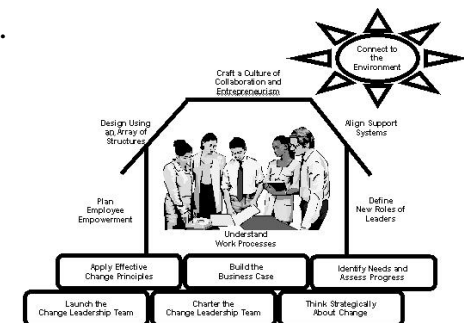
- **Critical Success Factors (CSF)** method is developed by Rockart at MIT.
- CSF is a small number of easily identifiable operational goals shaped by the industry, the firm, the manager, and the broader environment that are believed to ensure the success of an organization.
- CSF is used to determine the information requirements of an organization.
- CSF are operational goals. If these goals can be attained, the success of the firm or organization is ensured.

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## Method used in CSF

- Interview top managers to identify their goals and the resulting CSF.
- Aggregated personal CSF to develop firm's CSF.
- Build systems to deliver information on these firm's CSF.



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## Strength of CSF

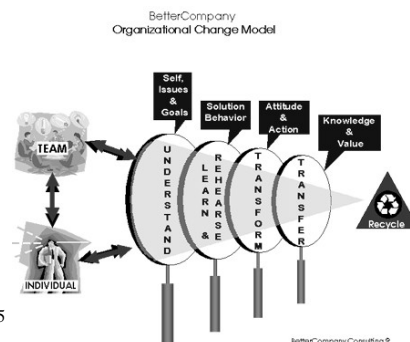
- It produce a smaller data set to analyze than Enterprise Analysis.
- Questions focus on a small number of CSF rather than a board inquiry into what information is needed.
- Can be tailored to different industry, with different competitive strategies producing different Information System.
- Take into account of changing environment.
- It explicitly asks managers to look at the environment and consider how their analysis of it shapes their information needs.

## Weakness of CSF

- There is no rigorous way in which individual CSF can be aggregated into a clear company pattern.
- Individual CSF and organizational CSF not necessary the same. What critical to manager not necessary critical to the organization.
- Biased to top managers.
- Does not overcome the impact of changing environment. Environment changes rapidly, Information System must adjust accordingly.

## Organizational Change

- Information System can be powerful instruments for organizational change, enabling organizations to redesign their structure, scope, power relationships, work flows, products, and services.



## How IT Transform Organizations?

- Global Networks
- Enterprise Networks
- Distributed Computing
- Portable Computing
- Graphic User Interface (GUI)

## **How IT Transform Organizations: Global Networks**

- International division of labor: Operations of a firm are no longer determined by location.
- Global reach of firms is extended.
- Costs of global coordination decline.
- Transaction costs decline.

## **How IT Transform Organizations: Enterprise Networks**

- Collaborative work and teamwork.
- Customer and product orientation emerges.
- Widely dispersed task forces become the dominant work group.
- Costs of management decline.
- Business processes are changed.

## **How IT Transform Organizations: Distributed Computing**

- Empowerment.
- Business processes are redesigned & streamlined.
- Management costs decline.
- Hierarchy and centralization decline.

## **How IT Transform Organizations: Portable Computing**

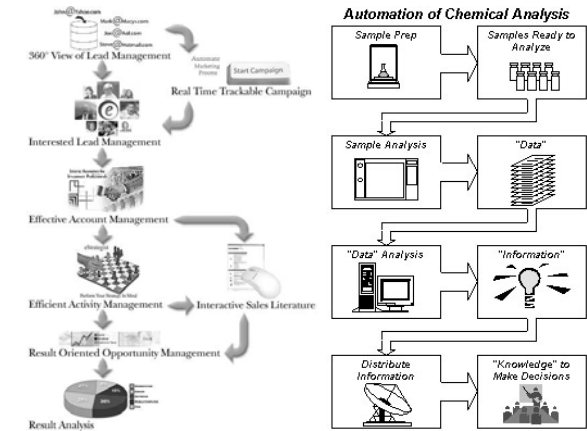
- Virtual organizations.
- Knowledge & information can be delivered anywhere & anytime.
- Work become portable.
- Organizational costs decline as real estate is less essential for business.

## How IT Transform Organizations: Graphic User Interface (GUI)

- Everyone in the organization can access information & knowledge.
- Work flows can be automated.
- All can contribute from remote locations.
- Organizational costs decline as work flows move from paper to digital image, documents and voice.

## Automation

- Using the computer to speed up the performance of existing tasks.

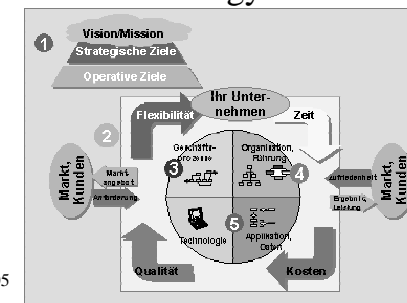


## Rationalization of Procedures

- Streamlining of Standard Operation Procedure (SOP), eliminating obvious bottlenecks, so that automation makes operating procedures more efficient.

## Business Reengineering

- The radical redesign of business processes, combining steps to cut waste and eliminating repetitive, paper-intensive tasks to improve cost, quality and service and to maximize the benefits of Information Technology.



## Paradigm Shift

- Radical reconceptualization of the nature of the business and the nature of the organization.
- Paradigm shifts and reengineering often fail because extensive organizational change is so difficult to manage.
- Organizations are interested in it because the rewards can be very high.



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## Business Process Reengineering

- Transactional
- Geographical
- Automation
- Analytical
- Informational
- Sequential
- Knowledge management
- Tracking
- Disintermediation

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## Business Process Reengineering: Transactional

- Transform unstructured processes into routine transactions.

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## Business Process Reengineering: Geographical

- Transfer information with rapidity and ease across large distances, making processes independent of geography.

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## **Business Process Reengineering: Automation**

- Replace or reduce human labor in a process.

## **Business Process Reengineering: Analytical**

- Bring complex analytical methods to bear on a process.

## **Business Process Reengineering: Informational**

- Bring vast amounts of detailed information into a process.

## **Business Process Reengineering: Sequential**

- Enable changes in the sequence of tasks in a process, often allowing multiple tasks to be worked on simultaneously.

## Business Process Reengineering: Knowledge Management

- Allow the capture and dissemination of knowledge and expertise to improve the process.

## Business Process Reengineering: Tracking

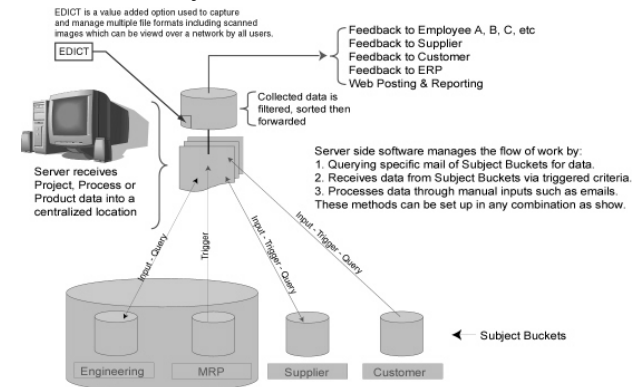
- Allow the detailed tracking of task status, input and outputs.

## Business Process Reengineering: Disintermediation

- Used to connect two parties within a process who would otherwise communicate through an intermediary (internal or external).

## Work Flow Management

- The process of streaming business procedures so that documents can be moved easily and efficiently from one location to another.



## Steps in Business Process Redesign

1. Develop business vision and process objectives (e.g. time and cost reductions, quality improvement)
2. Identify processes to be redesigned.
3. Understand and measure existing processes.
4. Identify Information Technology levers (e.g. opportunities to use Information Technology to support business processes)
5. Design/build a prototype of the process

## Strategies in Business Process Redesign

- Figure out how people will have to modify their behaviors and attitudes to make the change work.
- Deal with potential resistance to change by attempting to understand who stands the most to lose under the new system.
- Allow managers to experience the problem. For example, create opportunities for managers to deal directly with service problems.
- Solicit as much feedback from individuals as possible.

## Strategies in Business Process Redesign

- Effective communications. People can deal with transition more effectively if they understand what is going on and how it may affect them.
- Managing the transition resulting from business process redesign requires an understanding of organizational changes that occur.
- The organizational impacts include less reliance on hierarchy, more cross-functional communication and cooperation and more decision making in middle and lower-level management.

## Guidelines to Business Process Redesign

- Create task forces with representatives from key line groups, across functional lines.
- Have redesign team work closely with managers and staff in the units to be affected.
- Build a new team of industrial engineers. The members should have strong interpersonal skills; an understanding of multiple functional areas; and an understanding of process measurement, systems analysis and business process redesign.

## System Development

- The activities that go into producing an Information System solution to an organizational problem or opportunity.

## Activities of Systems Development

- Systems Analysis
- Systems Design
- Programming
- Testing
- Conversion
- Production & Maintenance

## System Analysis

- The analysis of a problem that the organization will try to solve with an Information System.
- Consists of
  - ◆ Defining problem
  - ◆ Identifying causes
  - ◆ Specifying solution
  - ◆ Identifying information requirements
  - ◆ Identifying new opportunities for using Information Technology.

## Feasibility Study

- Systems analysis involves a feasibility study to determine whether that solution is feasible, given the organization's resource and constraints.
- Technical feasibility
  - ◆ whether a proposed solution can be implemented with the available hardware, software and technical resources.
- Economic feasibility
  - ◆ whether the benefits of the proposed solution outweigh the costs.
- Operational feasibility
  - ◆ whether the proposed solution is desirable within the existing managerial and organizational framework.

## Information Requirements

- A detailed statement of the information needs that a new system must satisfy; who needs what information; when, where and how the information is needed.

## Systems Design

- Details how a system will meet the information requirements as determined by the systems analysis.

## Logical Design

- It lays out the components of the IS and their relationship to each other as they would appear to users.
- It describes I/O, processing functions, business procedures, data models, and controls.

## Physical Design

- It is the process of translating the abstract logical models into specific technical design for the new system.
- It produces the actual specifications for hardware, software, physical databases, I/O media, manual procedures, and specific controls.

## Programming

- The process of translating the system specifications prepared during the design stage into program code.

## Testing

- The process that determines whether the system produces the desired results under known conditions.
- Test data must be carefully prepared, results reviewed, and corrections made in the system.
- Three types of activities
  - ◆ Unit testing
  - ◆ System testing
  - ◆ Acceptance testing

## Unit Testing

- The process of testing each program separately in the system.

## System Testing

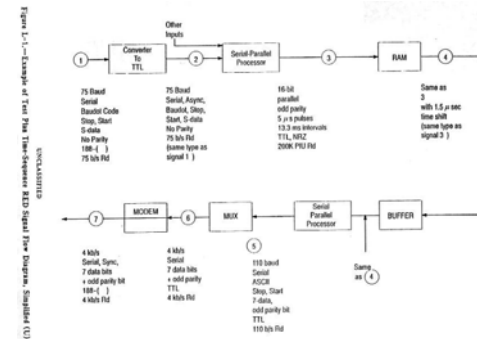
- Tests the functioning of the Information System as a whole to determine if discrete modules will function together as planned.

## Acceptance Testing

- Provides the final certification that the system is ready to be used in a production setting.

## Test Plan

- Prepared by the development team in conjunction with the users.
- Includes the preparations for the series of tests to be performed on the system.



## Conversion

- The process of changing from the old system to the new system.
- Four main conversion strategies
  - ◆ Parallel
  - ◆ Direct Cutover
  - ◆ Pilot Study
  - ◆ Phased Approach



## Parallel Strategy

- A safe & conservative conversion approach in which both the old system and its potential replacement are run to gather for a time until everyone is assured that the new system function correctly.
- Very expensive, additional staff is required.

## Direct Cutover Strategy

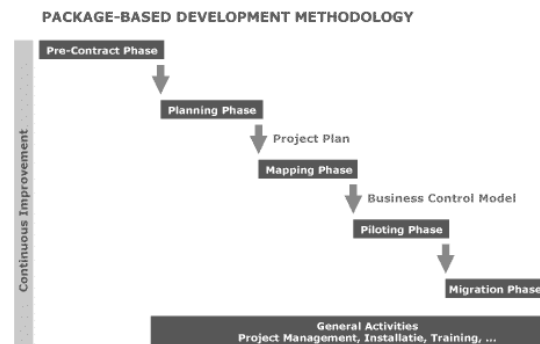
- A risky conversion approach in which the new system completely replaces the old one on an appointed day.
- Less costly if no problem, otherwise more costly.

## Pilot Study Strategy

- Introduce the new system to a limited area of the organization until it is proven to be fully functional; only then can the conversion to the new system across the entire organization take place (either simultaneously or in stages).

## Phased Approach Strategy

- Introduces the new system in stages either by functions or by organizational units.



## Conversion Plan

- Provides a schedule of all activities required to install a new system.
- Data from the old system must be transferred to the new system and carefully verified for accuracy and completeness.
- It is a very time-consuming activity.



## Production & Maintenance

- Production is the stage after new system is installed and the conversion is complete.
- During this time the system is reviewed by users and technical specialists to determine how well it has met its original goals.
- Maintenance is the changes in hardware, software, documentation, or procedures to a production system to correct errors, meet new requirements, or improve processing efficiency.

## Costs of Information System

- Hardware
- Telecommunications
- Software
- Services
- Personnel

## Benefits of Information System

- Tangible
  - ◆ Benefits that can be quantified and assigned monetary value; they include lower operational costs and increased cash flows.
- Intangible
  - ◆ Benefits that are not easily quantified but may lead to quantifiable gains in the long run; they include more efficient customer service or enhanced decision making.

## Tangible Benefits of IS

- Cost savings
- Increased productivity
- Lower operational costs
- Reduced workforce
- Lower computer expenses
- Lower outside vendor costs
- Lower clerical & professional costs
- Reduced rate of growth in expenses
- Reduced facility costs

## Intangible Benefits of IS

- Improved asset utilization
- Improved resource control
- Improved organizational planning
- Improved organizational flexibility
- More timely information
- More information
- Increased organizational learning
- Legal requirements attained
- Enhanced employee goodwill
- Increased job satisfaction
- Improved decision making
- Improved operations
- Higher client satisfaction
- Better corporate image

## Capital Budgeting

- The process of analyzing and selecting various proposals for capital expenditures.
- Capital Budgeting Models
  - ◆ Payback method
  - ◆ Accounting rate of return on investment (ROI)
  - ◆ Cost-benefit ratio
  - ◆ Net present Value (NPV)
  - ◆ Internal rate of return (IRR)
  - ◆ Profitability index

## Cash Flows

- All capital budgeting methods rely on measures of cash flows into and out of the firm.
- Investment cost is a cash outflow.
- Increased sales and reduction in costs are cash inflows.
- Difference between cash outflows and cash inflows is used for calculating the financial worth of an investment.

## Payback Method

- A measure of time required to pay back the initial investment of a project.
- Simple to use.
- Good for high risk projects.
- Ignores time value of money and the amount of cash flow after payback period (profitability of investment).
  - ◆ **Payback period = Original Investment / Annual net Cash Inflow**

## Accounting Rate of Return on Investment (ROI)

- It calculates the rate of return from an investment by adjusting the cash inflows produced by the investment for depreciation.
- ROI ignore time value of money
  - ◆ **Net Benefit = (Total benefit - Total cost - Depreciation) / Useful life**
  - ◆ **ROI = Net Benefit / Total Initial Investment**

## Cost-Benefit Ratio

- Can be used to rank several projects for comparison.
  - ◆ **Cost-Benefit Ratio = Total Benefits / Total Costs**

## Net Present Value (NPV)

- Money received several years later is NOT worth as much as money received today.
- Money received in future has to discounted by some appropriate rate, called the cost of capital.
- Present value is the current value of a payment (or stream of payments) to be received in future.
- NPV is the amount of money an investment is worth, taking into account its cost, earnings, and the time value of money.
  - ◆ **Npv = Present Value of Expected Cash Flows - Initial Investment Cost**

## Internal Rate of Return (IRR)

- IRR is the rate of return that an investment is expected to earn.
- IRR is the discount rate that make  $NPV = 0$

## Profitability Index

- It is used to compare the profitability of alternative investments.
  - ◆ **Profitability Index = Present Value of Cash Inflows / Investment**

## Information System as a Capital Project

- Financial models do not express the risks and uncertainty of the costs & benefits estimates.
- The difficulties of measuring intangible benefits give financial model a an application bias:
  - ◆ Transaction systems that displace labor always produce more measurable, tangible benefits than MIS, DSS or CSCW systems.