• **Four kinds of structural organizational change enabled by IT:**
  1. **Automation**: Increase efficiency, replace manual tasks.
  2. **Rationalization**: Streamline standard operating procedures.
  3. **Business process reengineering**: Analyze, simplify, and redesign business processes.
  4. **Paradigm shifts**: Rethink nature of business, define new business model, change nature of organization.

• **Business process reengineering (BPR):**
The radical redesign of business process, combining steps to cut waste and eliminating repetitive, paper-intensive tasks in order to improve const, quality, and service, and to maximize the benefits of information technology.

• **Work flow management**: Process of streamlining business procedures so documents can be moved easily and efficiently.

**STEPS IN EFFECTIVE REENGINEERING:**

• **Determine which business processes should be improved [2]:**
  - **Strategic analysis**: senior managers identify the business processes are most important for the firm's success and focus efforts on these processes.
  - **Pain points**: senior managers indentify the processes which produce the most complaints from vendors, customers, or employees and fix those first.

• **Identify and describe existing process [7]:** Identify inputs and outputs, flow of products, network of activities and buffers, resources, information structure and flow, process owners, process actors and decision makers.

• **Understand how much process costs and how long to perform [4]:** Process cost, process time, process quality, process flexibility

• **Determine which methods can improve process [6]:**
  - Replace sequential steps with parallel.
  - Enrich jobs by enhancing decision making and concentrating information.
  - Enable information sharing throughout to all participants.
  - Eliminate buffers (decision delays and inventories).
  - Transform batch processing and decision making into continuous flow processes.
  - Automate decision tasks wherever possible.

• **Business process management (BPM):** Helps firms manage process changes through use of process-mapping tools to:
  - Identify and document existing processes.
  - Create models of improved processes that can be translated into software systems.

• **It includes:**
  - Work flow management.
  - Business process modeling notation.
  - Quality measurement and management.
  - Change management.
  - Tools for standardizing business processes so they can be continually manipulated.
  - Process monitoring and analytics to verify process performance has improved and measure impact of process changes on key business performance indicators.
Quality management: Fine-tuning business processes to improve quality in their products, services, and operations. The earlier in the business cycle a problem is eliminated, the less it costs the company.

- **Total Quality Management (TQM):** Achievement of quality control is end in itself, everyone is expected to contribute to improvement of quality.
- **Six sigma:** A specific measure of quality, representing 3.4 defects per million opportunities; used to designate a set of methodologies and techniques for improving quality and reduction costs.

Information systems support quality improvements by helping firms:

- Simplify products or processes.
- Make improvements based on customer demands.
- Reduce cycle time.
- Improve quality and precision of design and production.
- Meet benchmarking standards

**Benchmarking:** Setting strict standards for products, services, and other activities, and then measuring performance against those standards.

**SYSTEM DEVELOPMENT:** Activities that go into producing an information system solution to an organizational problem or opportunity.

- Systems analysis.
- Systems design.
- Programming.
- Testing.
- Conversion.
- Production and maintenance.

**Systems analysis:** the analysis of a problem that an organization will try to solve with an information system.

**It consists:**
- Defining the problem and identifying causes.
- Specifying solutions: Written systems proposal report describes costs and benefits of each alternative solution.
- Identifying **information requirements** to be met (Who needs what information where when, and how).
- Includes **feasibility study** (Is solution a good investment? Is required technology, skill available?)

**Systems design:** Describe system specifications that will deliver functions identified during systems analysis. It should address all managerial, organizational, and technological components of system solution.

- **Role of end users**
  - User information requirements drive system-building.
  - Users must have sufficient control over design process to ensure that system reflects their business priorities and information needs.
  - Insufficient user involvement in design effort is major cause of system failure.

**Programming:** System specifications from design stage are translated into software program code. Software may be purchased, leased, or outsourced instead.

**Testing:** to ensure system produces right results.

- **Test plan:** All preparations for series of tests.
- **Unit testing:** Tests each program in system separately.
- **System testing:** Tests functioning of system as a whole.
- **Acceptance testing:** Makes sure system is ready to be used in production setting.
Conversion: the process of changing from old system to new system, it requires end-user training

Four main strategies:
- Parallel strategy: both old and new system running.
- Direct cutover: replace it at an appointed time, it is very risky.
- Pilot study: introduces the new system to only a limited area of the organization.
- Phased approach: introduces the new system on stages.

Documentation: showing how the system works from both a technical and end-user standpoint.

Production and maintenance: System reviewed to determine if any revisions needed
- May prepare formal post-implementation audit document.

Maintenance: Changes in hardware, software, documentation, or procedures to a production system to correct errors, meet new requirements, or improve processing efficiency
- 60 percent of maintenance work:
  - User enhancements.
  - Improving documentation.
  - Recoding system components for greater processing efficiency.

Summary of Systems Development Activities:

<table>
<thead>
<tr>
<th>CORE ACTIVITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems analysis</td>
<td>Identify problem(s)</td>
</tr>
<tr>
<td></td>
<td>Specify solutions</td>
</tr>
<tr>
<td></td>
<td>Establish information requirements</td>
</tr>
<tr>
<td>Systems design</td>
<td>Create design specifications</td>
</tr>
<tr>
<td>Programming</td>
<td>Translate design specifications into code</td>
</tr>
<tr>
<td>Testing</td>
<td>Unit test</td>
</tr>
<tr>
<td></td>
<td>Systems test</td>
</tr>
<tr>
<td></td>
<td>Acceptance test</td>
</tr>
<tr>
<td>Conversion</td>
<td>Plan conversion</td>
</tr>
<tr>
<td></td>
<td>Prepare documentation</td>
</tr>
<tr>
<td></td>
<td>Train users and technical staff</td>
</tr>
<tr>
<td>Production and</td>
<td>Operate the system</td>
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<tr>
<td>maintenance</td>
<td>Evaluate the system</td>
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<tr>
<td></td>
<td>Modify the system</td>
</tr>
</tbody>
</table>