DSS Development Process

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Traditional Systems Development Life Cycle (SDLC)

- Four phases
  1. Planning
  2. Analysis
  3. Design
  4. Implementation
- Cyclical
- Can return to other phases
- Waterfall model
DSS Project Management

- Establish a time plan
- Define scope of project and expected outcomes
- Get support from senior management
- Identify milestones and budgets based on realistic goals
- Involve users (internal and external)
- Document everything (all steps)
Skills for Project Managers

☐ Technology and business knowledge
☐ Judgment
☐ Negotiation
☐ Good communication
☐ Organization
Implementation Failures

- Lack of stakeholder involvement
- Incomplete requirements
- Lack of scope
- Unrealistic expectations
- Project champion leaves – process transformed
- Lack of skill or expertise
- Inadequate human resources – continuous training is key
- New technologies adaptation and inclusion
Evolutionary Disruptors

- Development environment
  - Organizational cultural factors
  - Loss of top management support
  - User and analyst attitude
  - User experience
  - Development team capability

- Development process
  - User education, support, involvement, training
Alternative Development Methodologies

- Rapid Application Development
  - Prototyping
    - Rapid development of portions of projects for user input and modification
    - Small working model or may become functional part of final system
  - Throwaway prototyping
    - Pilot test or simple development platforms
Prototyping

- Performing analysis, design, and implementation phases concurrently, and repeatedly
- Users see system functionality quickly and provide feedback
- Decision maker learns about problem
- Problems are semi structured or unstructured
- Managers and developers may not completely understand problem
Prototyping Terms

- Iterative design
- Evolutionary development
- Adaptive design
- Incremental design
Prototyping the Development Process
Throwaway Prototyping the Development Process

- Analysis phase is thorough
- Design prototypes assist in understanding the system
DSS Prototyping

☐ Short steps
  1. Planning
  2. Analysis
  3. Design
  4. Prototype

☐ Immediate stakeholder feedback

☐ Iterative
  1. In development of prototype
  2. Within the system in general
  3. Evaluation integral part
DSS Prototyping

- **Advantages**
  - User and management involvement in every phase and iteration
  - Learning explicitly integrated and part of the design
  - Short intervals between iterations
  - Low cost
  - Improved user understanding of system

- **Disadvantages**
  - Changing requirements
  - Poorly tested
  - Security is an issue
  - High uncertainty
  - Reduction in quality
  - Higher costs due to multiple productions
Change Management

☐ Lewin-Schein change theory steps

■ Unfreeze
  ☐ Create awareness of need for change
  ☐ People support what they help create

■ Move
  ☐ Develop new methods and behaviors
  ☐ Create and maintain momentum

■ Refreeze
  ☐ Reinforce desired changes
  ☐ Establish stable environment
DSS Technology Levels

- DSS primary tools
  - Fundamental elements
    - Programming languages, graphics, editors, query systems
- DSS generator (engine)
  - Integrated software package for building specific DSS
    - Modeling, report generation, graphics, risk analysis
- Specific DSS
  - DSS application that accomplishes the work
- DSS primary tools are used to construct integrated tools that are used to construct specific tools
Development Steps

1. Planning
2. Analysis
3. Design
4. Implementation
1. Planning
Why Build the System?

<table>
<thead>
<tr>
<th>Minor Step</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify business value</td>
<td>System request</td>
</tr>
<tr>
<td>Analyze feasibility</td>
<td>Feasibility study</td>
</tr>
<tr>
<td>Develop work plan</td>
<td>Work plan</td>
</tr>
<tr>
<td>Staff project</td>
<td>Staffing plan, project charter</td>
</tr>
<tr>
<td>Control and direct project</td>
<td>Project management tools, CASE tools, standard lists, project binders and files, risk assessment</td>
</tr>
</tbody>
</table>
2. Analysis
Who, What, When, Where?

<table>
<thead>
<tr>
<th>Minor Step</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyze problem</td>
<td>Analysis plan</td>
</tr>
<tr>
<td>Gather information</td>
<td>Information</td>
</tr>
<tr>
<td>Model processes</td>
<td>Process model</td>
</tr>
<tr>
<td>Model data</td>
<td>Data model</td>
</tr>
</tbody>
</table>
3. Design
How will the system work?

<table>
<thead>
<tr>
<th>Minor Step</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design physical system</td>
<td>Design plan</td>
</tr>
<tr>
<td>Design architecture</td>
<td>Architecture design, infrastructure design</td>
</tr>
<tr>
<td>Design interface</td>
<td>Interface design</td>
</tr>
<tr>
<td>Design database and files</td>
<td>Data storage design</td>
</tr>
<tr>
<td>Design programs)</td>
<td>Program design</td>
</tr>
</tbody>
</table>
## 4. Implementation

### System Delivery?

<table>
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<tr>
<th>Minor Step</th>
<th>Deliverable</th>
</tr>
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<tbody>
<tr>
<td>Construction</td>
<td>Test plan, programs, documentation</td>
</tr>
<tr>
<td>Installation</td>
<td>Conversion plan, training plan</td>
</tr>
</tbody>
</table>
DSS Tools

- Three Levels of DSS Technology
  - Specific DSS (the application)
  - DSS integrated tools (generators-Excel)
  - DSS primary tools (programming languages)
- Web tools (Graphical User Interface)