

Design and Development of DSS

*Focus on the decision,
then build or buy?*



8/21/04

Design and Development of DSS,
D. J. Power

1

Overview of Design and Development Approaches

- Traditional systems analysis and design, SDLC
- An iterative, rapid prototyping, or “quick-hit” approach
- Managers develop their own personal DSS, End-User DSS Development

8/21/04

Design and Development of DSS, D. J. Power

2

Investigate Alternative Design and Development Approaches

- Building effective DSS is important and expensive
- Choose an approach that increases the chances the DSS will be used
- Building a DSS is a difficult task; people vary so much in terms of their personalities, knowledge and ability, the jobs they hold, and the decisions they make

8/21/04

Design and Development of DSS, D. J. Power

3

A Decision-Oriented Design Approach

- Pre-design description and diagnosis of decision making
- Diagnosis of current decision-making
 - Identification of problems or opportunities for improvement in current decision behavior
 - Determine how decisions are currently made

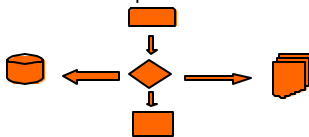
8/21/04

Design and Development of DSS, D. J. Power

4

Decision-orientation is the Key

- Specify changes in decision processes
 - Determine what specific improvements in decision behavior are to be achieved
 - Flowchart the process



8/21/04

Design and Development of DSS, D. J. Power

5

3 Diagnostic Steps

- Collect data on current decision-making
 - Use interviews, observations, and historical records
- Establish a coherent description of the current decision process
- Specify a norm for how decisions should be made

8/21/04

Design and Development of DSS, D. J. Power

6

Decision Process Audit Plan

- Step 1: What will be audited and by whom
- Step 2: Examine and diagram process
- Step 3: Observe and collect data
- Step 4: Assess performance
- Step 5: Reporting and recommendations

8/21/04

Design and Development of DSS, D.J. Power

7

Reaching a Diagnosis

- Focus on identifying what is assumed by decision-makers in the decision situation
- Focus on what is defined by decision-makers as the range of available remedial actions
- How can decision-making be improved?

8/21/04

Design and Development of DSS, D.J. Power

8

Conduct a feasibility study

- Issues
 - Objectives
 - DSS Scope and Target Users
 - Anticipated DSS Impacts
 - Major Alternatives
- Conclusions
- Build versus Buy

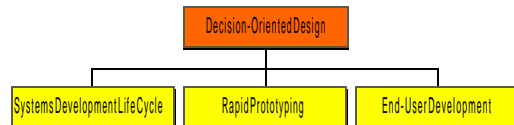
8/21/04

Design and Development of DSS, D.J. Power

9

If build, then choose a DSS Development Approach

- SDLC
- A rapid prototyping approach
- End-user DSS development



8/21/04

Design and Development of DSS, D.J. Power

10

7 Step SDLC Approach

- Confirm user requirements
- Systems analysis
- System design
- Programming
- Testing
- Implementation
- Use and Evaluation

8/21/04

Design and Development of DSS, D.J. Power

11

SDLC

- Project plans must be carefully prepared
 - Determine the needs of potential users
 - Identify the outputs that fulfill those needs
 - Technical requirements should follow logical requirements and design steps
 - If in-house development is not chosen, a request-for-proposal [RFP] may be required

8/21/04

Design and Development of DSS, D.J. Power

12

SDLC

- In many situations a full-scale SDLC is too rigid for DSS, especially a DSS where requirements are changing rapidly
- User requirements agreed upon at the first stage of the process are hard to change

8/21/04

Design and Development of DSS, D.J. Power

13

5 Step Rapid Prototyping Process

1. Identify user requirements
2. Develop a first iteration DSS prototype
3. Evolve and modify the next DSS prototype
4. Test and return to step 3 if needed
5. Full-scale implementation

8/21/04

Design and Development of DSS, D.J. Power

14

How is a prototype developed?

- DSS analyst sits down with potential users and develops requirements
- Analyst develops a prototype
- Users use the prototype, react to, comment on, and eventually approve
- Missing features are added later

8/21/04

Design and Development of DSS, D.J. Power

15

More on Prototyping

- Once approved, the prototype can be expanded in the development environment or used as a specification for a DSS developed in a language like C++
- Compared with the SDLC approach, prototyping seems to improve user-developer communication
- Rapid Application Development

8/21/04

Design and Development of DSS, D.J. Power

16

End-User DSS Development

- Puts the responsibility for building and maintaining a DSS on the manager who builds it
- Major advantages 1) person who wants computer support will be involved in creating it; 2) fast; 3) lower cost

8/21/04

Design and Development of DSS, D.J. Power

17

End-User Development Concerns

- End-users may select an inappropriate software development product
- End-user may have limited expertise in the use of the product and the IT group may have limited ability to support End-user development
- Errors during End-user DSS development are common

8/21/04

Design and Development of DSS, D.J. Power

18

End-User Development Concerns

- Unnecessary databases are sometimes developed by the end-users for their DSS
- DSS may have limited testing and limited documentation
- End-user databases may be poorly constructed and difficult to maintain
- End-users rarely follow a systematic development process

8/21/04

Design and Development of DSS, D.J. Power

19

DSS Project Management

- Assign DSS project manager
- Tasks include diagnosis, a feasibility study, and a definition of the objectives and scope of the proposed project
- The larger the scope of the project the more important it is to receive widespread agreement and sponsorship of the project

8/21/04

Design and Development of DSS, D.J. Power

20

DSS Project Management

- Once the project is approved then a methodology and project plan needs to be developed
 - Outsourced - process needs to be developed for creating RFP's and then evaluating proposals
 - In-house - development and technical tools need to be resolved

8/21/04

Design and Development of DSS, D.J. Power

21

DSS Project Management

- DSS project manager should identify tasks that need to be completed, resources that are needed and project deliverables
 - Deliverables are especially important for monitoring the progress of the project

8/21/04

Design and Development of DSS, D.J. Power

22

DSS Project Management

- A complex DSS built using either an SDLC or a rapid prototyping approach requires a systematic development approach
 - Some large-scale DSS are built with teams of 2-3 people or with a larger group of 10 or more
 - 1-2 people may work on a prototype

8/21/04

Design and Development of DSS, D.J. Power

23

DSS Project Participants

- DSS Project Manager or DSS Analyst
 - Expert who makes the technical decisions about the software and hardware to use
- Executive Sponsor
 - Senior manager who has the influence to help resolve major resource issues and potential problems
- Potential DSS users

8/21/04

Design and Development of DSS, D.J. Power

24

DSS Project Participants

- Technical Support Staff
 - DW Architect, Data Quality Analyst
- Toolsmith/Specialist
 - Focus on the tools and technologies that will be used in the construction of the DSS
 - Networking Specialists, Database Administrator

8/21/04

Design and Development of DSS, D.J. Power

25

Matching DSS and Development Approaches

- Model-Driven and Knowledge-Driven built using Rapid Prototyping
- Data-Driven and Document-Driven built primarily using SDLC
- Communications-Driven and GDSS purchased and installed

8/21/04

Design and Development of DSS, D.J. Power

26

Questions

- What is rapid prototyping? What is SDLC? What is end-user DSS development?
- Who participates in a DSS Project?
- Should DSS be built in-house or purchased off-the-shelf?
- Who should design and develop DSS? Is this an IS department task? Is a design team needed?

8/21/04

Design and Development of DSS, D.J. Power

27