STEVENS
INSTITUTE of TECHNOLOGY
THE INNOVATION UNIVERSITY

SSW-555: Agile Methods for Software Development

Dynamic Systems Development Method (DSDM)
Week 8

Instructor: Prof. Lu Xiao
School of Systems and Enterprises
Stevens Institute of Technology

Thanks to Prof. James Rowland for his slides

Today's topics

Rapid Application Development (RAD)

Dynamic Systems Development Method (DSDM)

Core techniques of RAD and DSDM

Rapid: the precursor to Agile (1970s)

The traditional software development model was based on a Customer-Supplier relationship

Used a traditional engineering model

- Create design, construct solution, and deliver to customer

Fixed contract between customer and supplier

- E.g. big government agency and software supplier
- Fixed schedule, e.g. 1-2 years
- Requirements negotiated up front
- Customers and developers were independent and frequently didn't trust each other

Rapid: the precursor to Agile (1980s)

Companies created in-house IT departments

e.g. create new reports from an existing database or automate manual processes

Customers and suppliers work for the same company

In-house development could use a different model

- Schedule could trade features for speed
- Requirements could be changed during development
- No need to renegotiate contract terms and conditions
- Customers and developers could work together

Rapid Application Development (RAD)

Originally developed in the 1970s by Dan Gielan at New York Telephone Co's Systems Development Center

Later codified by James Martin at IBM in his book *Rapid Application Development*, 1991

Reduces development time by:

- Substituting prototypes for requirements specifications
- Using existing databases, data models, and tools
- Trading features for speed
- Implementing most important features first
- Adding more features incrementally

RAD Process

1. **Requirements Planning phase** – Users, managers, and IT staff members discuss requirements
2. **User design phase** – Users interact with systems analysts and develop reusable (evolutionary) prototypes
3. **Construction phase** – Users continue to participate and can still suggest changes or improvements as actual screens or reports are developed
4. **Cutover phase** – Data conversion, full-scale testing, system changeover, user training
5. Repeat until done

RAD Techniques

- Facilitated joint workshops (JAD)
  - Customers and developers
- Evolutionary prototyping evolving into finished products
- Time boxed incremental delivery
  - Strict schedules that can't be changed
  - Drop features rather than miss the deadline
- Small teams including users (6-12)
- CASE tools:
  - Rapid GUI development, e.g. Visual Basic
  - Assumes simple data models

Dynamic Systems Development Method (DSDM)

Developed in England in the 1990s

Formalization of Rapid Application Development (RAD)

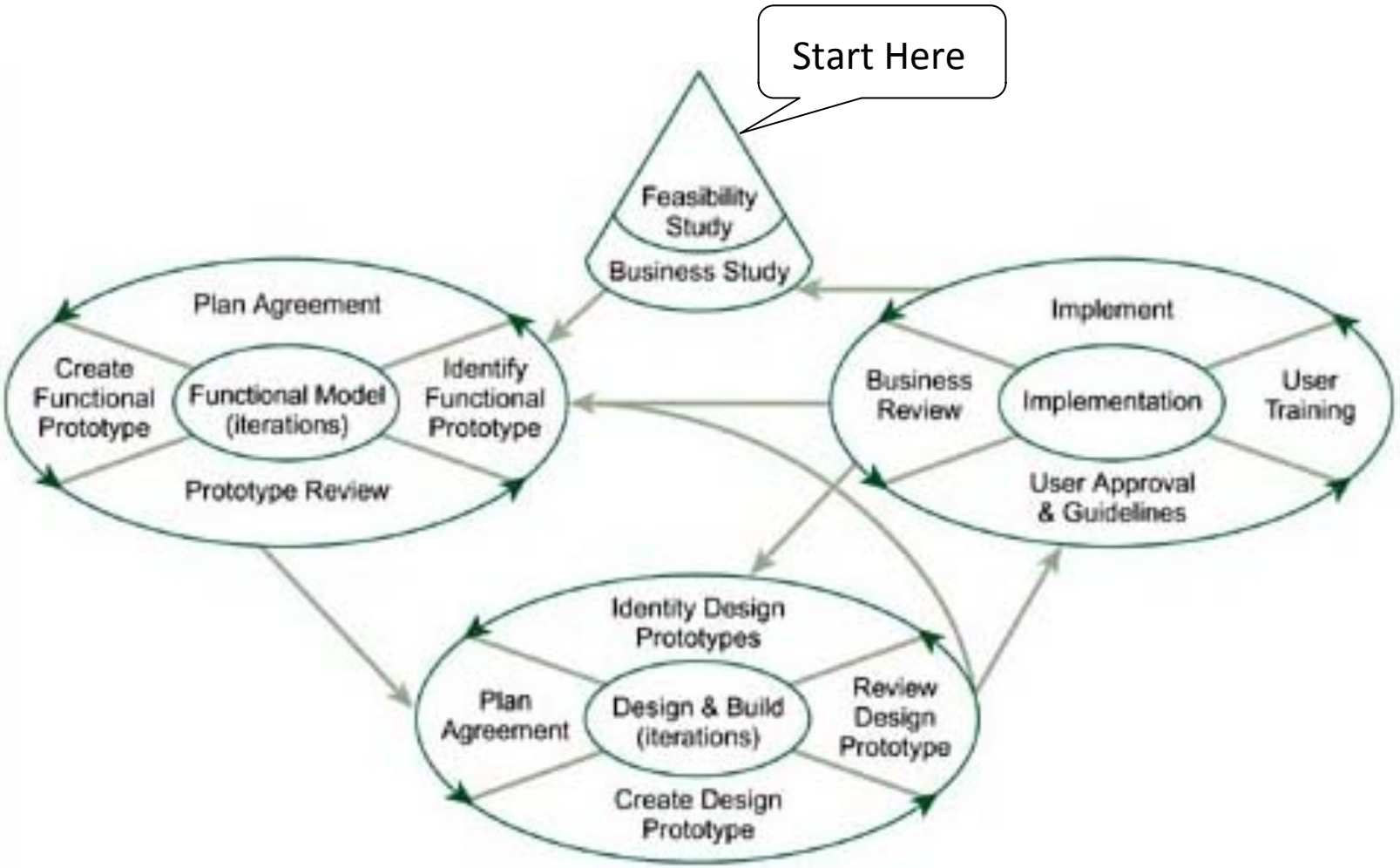
DSDM Consortium:

- Created in 1994 by 16 European companies
- Purpose: "jointly developing and promoting an independent RAD framework" by combining their best practice experiences
- Publishes standards and supporting material

DSDM Principles

1. Active user involvement is imperative
2. DSDM teams must be empowered to make decisions
3. The focus is on frequent, incremental delivery of products
4. Fitness for business purpose is the essential criterion for acceptance of deliverables, i.e. meet the business need
5. Iterative and incremental development is necessary to converge on an accurate business solution
6. All changes during development are reversible
7. Requirements are base lined only at a high level
   - Use prototypes to define the details
8. Testing is integrated throughout the lifecycle
9. A collaborative and co-operative approach between all stakeholders is essential, i.e. customer and supplier are on the same team

DSDM Process



Source: Highsmith chapter 18

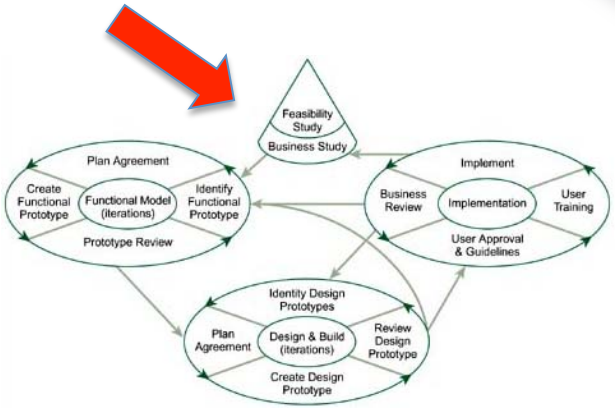
Pre-project phase

Decide whether to start project

Identify stakeholders, especially:

- Visionary
- Project Manager – manages the project and the people

Plan feasibility study



Feasibility Study

Starts with a Facilitated Joint Workshop
- Includes users and developers

Produces a Feasibility Report:
- Short business case
- Suitability of DSDM
- Early investigation of requirements

Also produces:
- Outline plan with schedules and budget
- Risk log

May produce a first prototype

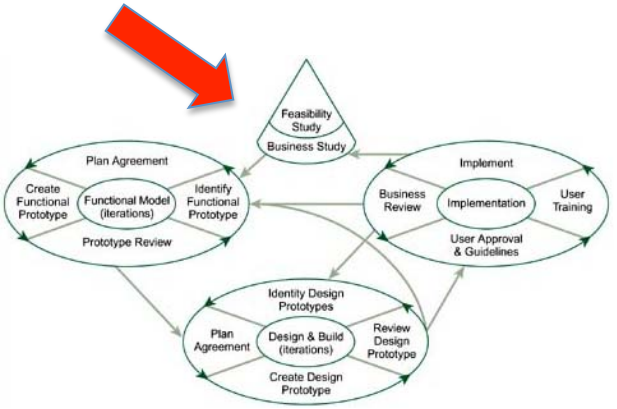
Business Study

Another Facilitated Joint Workshop

- Go down to the next level of detail

Produces:

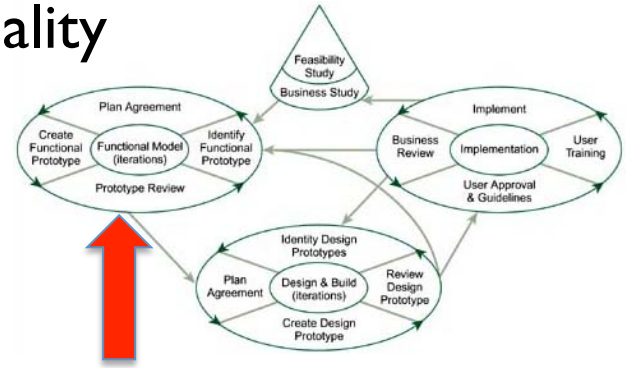
- Business Area definition
- Prioritized requirements List
- Development plan
- System architecture definition
- Updated risk log



Functional model iteration

Produce functional model of system:

- Prototypes
  - Early versions of the system's functionality
- Documentation



4 activities:

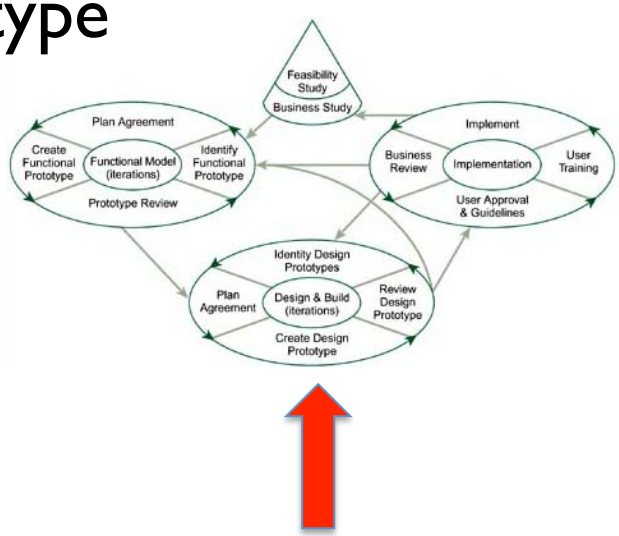
1. Identify what is to be produced
2. Agree how and when to do it
3. Create the product
4. Check that it has been produced correctly

Design and build iteration

Continue to refine the current prototype

Test often

Result is current release of system



Implementation

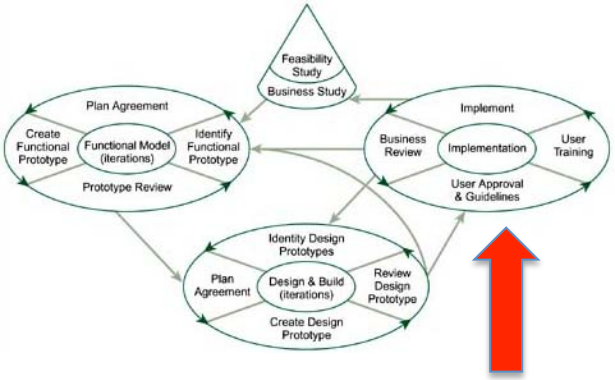
Installation and Deployment

Represents cutover to operations

- Installation of the completed code

Produce documentation

Train users



Post-project phase

Support and maintenance of product

Post-project review

- DSDM waits until the end of the project to review
- eXtreme Programming reviews throughout the project

Core techniques of DSDM and RAD

MoSCoW

Time boxing

Evolutionary prototyping

Facilitated Joint Workshops (JAD)

MoSCoW

Prioritization of requirements

Must have: system is useless without these features

Should have: important requirements, but there is a work-around so that these can be left out for now

Could have: consider for future iterations

Want to have (**W**aiting list/**W**on't have): least important

At each iteration the team decides which requirements to include

focus on must-haves (60%)

Must include some others (20% should-haves, 20% could-haves)

Time boxing

Set deadlines and adjust requirements and resources

Each increment has a ***fixed*** deadline

Each increment should deliver something useful

Development team may drop some deliverables in order to meet deadline

- Drop requirements
- Acquire third party solution for requirements
- Add resources

Prototyping

Rather than spend all the effort to develop a complete system, build a quick prototype to test its feasibility

Prototypes are widely used in most forms of engineering

Low-fidelity (throwaway) prototyping

- Quick demonstration of a feature
- Result is not useful for development into a product or service

Evolutionary (rapid) prototyping

- Rapid construction of a simple feature, often done with special tools
- Result may be modified to evolve into the final product or service

Joint Application Design (JAD)

Developed by Chuck Morris and Tony Crawford at IBM in late 1970s

- IBM owned 90% of the computing market in the early 1970s

Bring users and developers together to solve a problem

Facilitated joint workshops:

- Small team of users and developers work offsite for 1-5 days
- Focus on most important features
- May create low-fidelity prototypes
- May produce detailed specifications of features and functions

Questions?