

The background of the slide is a grayscale image of a circuit board. It features a complex network of black lines representing traces, with several circular pads and vias. The layout is symmetrical and technical in appearance.

CST226-3

Rapid Application Development

Introduction to Rapid Application Development

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Today's Outline

- What is RAD?
- Why was it introduced?
- When to Use RAD?
- Core Elements of RAD
- RAD Stages
- Advantages & Disadvantages of RAD

What is RAD?

- Software development methodology
- Focuses on building applications in a **very short amount of time**
 - Designed and developed within 60-90 days

A process of development that involves
application prototyping and iterative development

What is RAD?...

- Prototyping:
 - A feature light version of the finished product, which build in a short amount of time
- Iterative Development:
 - A way of breaking down the software development of a large application into smaller chunks
- Start development as **early as possible**
 - Clients can review a working prototype and offer additional direction

The Problem

The development of applications that did not meet client needs

Applications took **so long to build** and **requirements had changed** before the system was complete

complete, but unusable systems

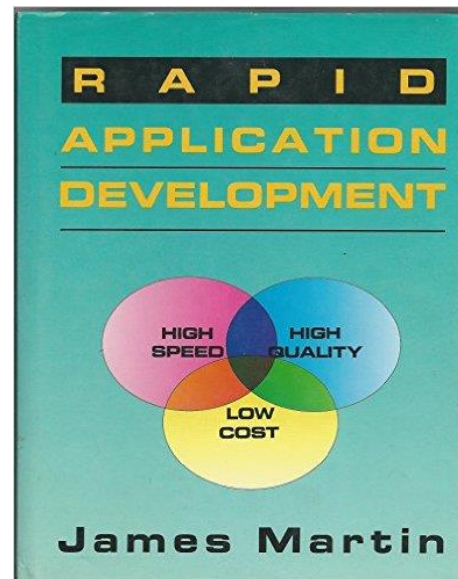


History of RAD

- In 1986 **Barry Boehm** wrote **A Spiral Model of Software Development and Enhancement**
 - Initially defined the concepts of prototyping and iterative development
- During the late 1980's **Scott Shultz** and **James Martin** refined the ideas of prototyping and iterative development into a methodology
 - Named as, **Rapid Iterative Production Prototyping (RIPP)**
 - Focused on developing systems in a short timeframe with small teams of highly qualified, motivated, and experienced staff

History of RAD...

- James Martin further expanded and formalized Rapid Iterative Production Prototyping and in 1991 published the book **Rapid Application Development**



Problem Addressed

- With conventional methods, there is a long delay before the customer gets to see any results
 - Requirements got changed before the system was complete
 - Resulting in inadequate or even unusable systems



Only RAD can address these problems???

Noooooooooooooooooo...

When to Use RAD?

- Not appropriate for all projects
- Works best for projects when,
 - The **scope is small** or **work can be broken down** into manageable chunks
 - The **project teams are small** (2-6)
 - The **team must have experience** with **all technologies** that are to be used
 - **Business objectives** will need to be **well defined**
 - Should not have a **broad or poorly defined scope**

When to Use RAD?...

- There should be very few client decision makers, preferably only one
 - Decisions must be able to be made quickly
- Client should be willing to accept a product that is less full featured
- Client should be willing to accept higher development cost
 - Due to the emphasis on purchasing reusable components over building them

Core Elements of RAD

- Prototyping
- Iterative Development
- Time Boxing
- Team Members
- Management Approach
- RAD Tools

Core Elements of RAD...

- Prototyping
 - Objective is to build a feature light version of the finished product in as short an amount of time as possible (in days)
 - Initial prototype serves as
 - A proof of concept for the client
 - A talking point and tool for refining requirements
 - CASE tools can be used to develop prototypes quickly

Core Elements of RAD...

- Iterative Development
 - Creating increasingly functional versions of a system in short development cycles
 - Each version is reviewed with the client
 - Process is repeated until all functionality has been developed
 - Ideal length of iterations is between one and three weeks
 - Each cycle provides the user an opportunity to provide feedback, refine requirements, and view progress

Core Elements of RAD...

- Time Boxing
 - Process of putting off features to future application versions in order to complete the current version in as short amount of time as possible
- Team Members
 - Recommends the use of small teams that consist of experienced, versatile, and motivated members that are able to perform multiple roles

Core Elements of RAD...

- Management Approach
 - Active and involved management is vital to mitigate the risks of lengthened development cycles, client misunderstandings, and missed deadlines
- RAD Tools
 - One of the primary objectives of the RAD methodology was to take advantage of the latest technology available to speed development

RAD Process

- RAD process consists of **four lifecycle stages**:
 - Requirements Planning - Concept Definition
 - User Design - Functional Design
 - Construction
 - Implementation - Deployment

RAD Process...

- Requirements Planning
 - Consists of meetings between a requirements planning team and key client users
 - Focus on initial requirements and the project scope
 - Identifies primary business functions and breaks them into business entities
 - Use of available tools will be more efficient
 - Rational Rose
 - Microsoft's Visio

RAD Process...

- User Design
 - Analyze the requirements in more detail
 - Core requirements should be identified and targeted for the initial prototype
 - Secondary requirements should be identified and targeted for future development iterations
 - Develops the entities into a data model
 - E.g: Entity Relationship Diagram (ERD)
 - Formalizes business rules
 - Develops test plans and creates screen flows and layouts for essential parts of the system

RAD Process...

- Construction
 - Develops the application in iterative cycles of development, testing, requirements refining, and development again, until the application is complete
 - Convert the Data Model into a functional database
 - Once the prototype has been developed, the team tests the initial prototype using test scripts
 - The team and customer reviews the application
 - Finally the team and customer meet to determine the requirements for the next iteration

RAD Process...

- Implementation
 - Integrating the new system into the business
 - Helps the users transfer from their old procedures to new ones that involve the new system
 - Trouble shoots after the deployment
 - Identifies and tracks potential enhancements

RAD Advantages

- Increased Speed
 - Increased development speed and decreased time to delivery
 - Use of CASE tools to converting requirements to code as quickly as possible
 - Time Boxing to push out secondary features to future releases in order to complete a feature light version quickly

RAD Advantages...

- Increased Quality
 - Quality is defined as
 - The degree to which a delivered application meets the needs of users
 - The degree to which a delivered system has low maintenance costs
 - Deliver on quality through the heavy involving of users in the analysis and particularly the design stages

RAD Advantages...

- Increases reusability of components
- Quick initial reviews are possible
- Encourages customer feedback
- Flexible and adaptable to changes
- Iteration time can be short with use of powerful RAD tools

RAD Disadvantages

- Reduced Scalability
 - Focuses on development of a prototype that is iteratively developed into a full system
 - Delivered solution may lack the scalability of a solution that was designed as a full application from the start
- Reduced Features
 - RAD may produce applications that are less full featured than traditionally developed applications

RAD Disadvantages...

- Depends on strong team and individual performances for identifying business requirements
- Required highly skilled developers/designers

Factors Influence RAD

- Several factors contribute to the success of rapid development process by improving both the quality of the delivered system and the speed of delivery
 - Use of prototyping
 - Helps users visualize and make adjustments to the system
 - User involvement in the Construction stage
 - Allowing the details to be adjusted if necessary

Things We Covered Here

- What is RAD?
- Why was it introduced?
- History of RAD
- When to Use RAD?
- Core Elements of RAD
- RAD Stages

Things We Covered Here...

- Advantages of RAD
- Disadvantages of RAD
- Factors Influence RAD