SOFTWARE ENGINEERING-I

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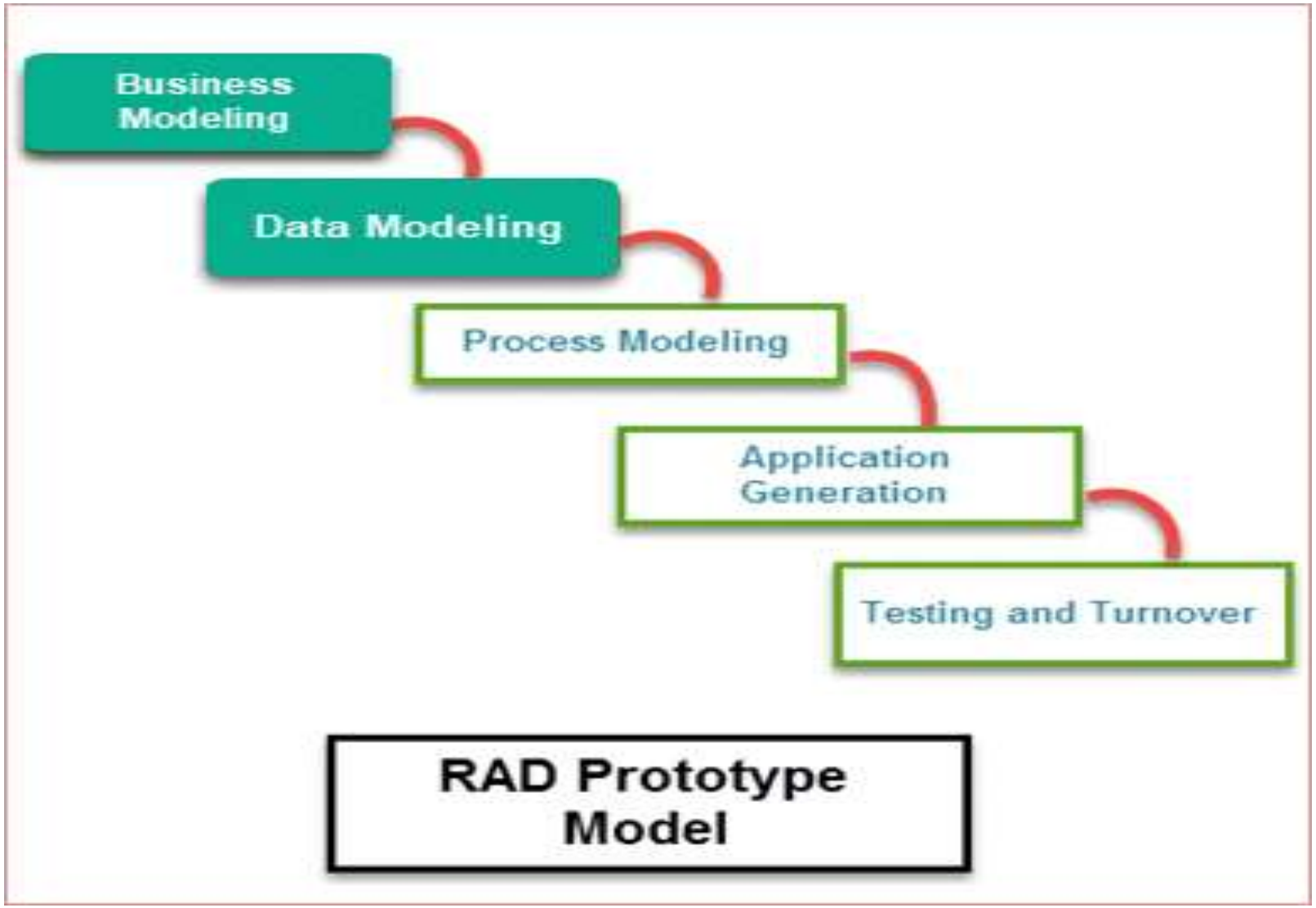
Week 5 Rapid Model

-Rapid Application Development

-Agile Process Development

Rapid Model

- RAD model is Rapid Application Development model. It is a type of **incremental model**.
- It based on prototyping without any specific planning.
- In RAD model, there is less attention paid to the planning and more priority is given to the development tasks.
- It targets at developing software in a short span of time.
  - SDLC RAD modeling has following phases
    - Business Modeling
    - Data Modeling
    - Process Modeling
    - Application Generation
    - Testing and Turnover



It focuses on input-output source and destination of the information.
The main features of RAD modeling are that it focuses on the reuse of templates, tools, processes, and code.

RAD Model Phases

- **Business Modeling**
  - On basis of the flow of information and distribution between various business channels, the product is designed
- **Data Modeling**
  - The information collected from business modeling is refined into a set of data objects that are significant for the business
- **Process Modeling**
  - The data object that is declared in the data modeling phase is transformed to achieve the information flow necessary to implement a business function
- **Application Generation**
  - Automated tools are used for the construction of the software, to convert process and data models into prototypes
- **Testing and Turnover**
  - As prototypes are individually tested during every iteration, the overall testing time is reduced in RAD.

Advantages of RAD Model

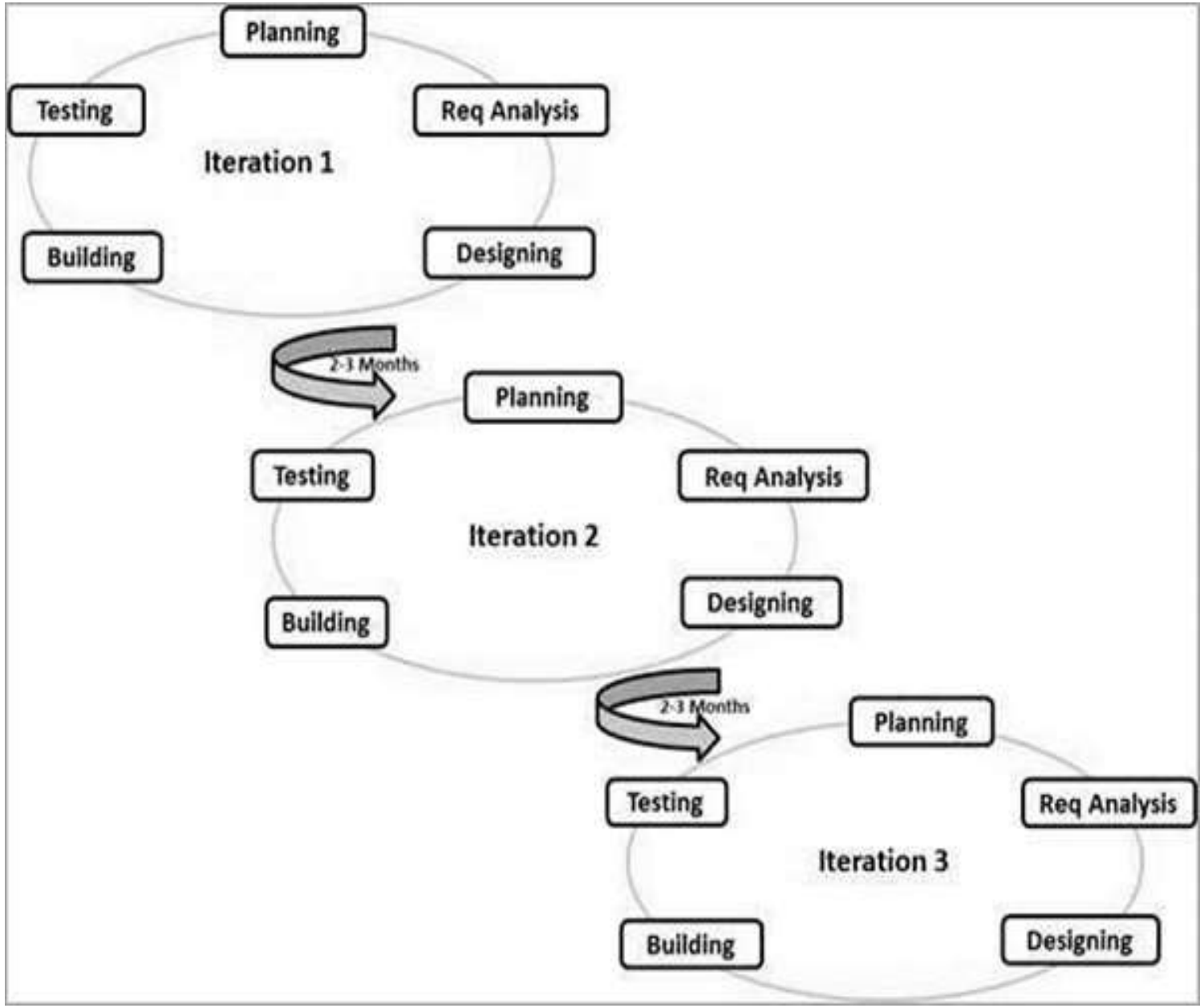
- Flexible and adaptable to changes
- It is useful when you have to reduce the overall project risk
- It is adaptable and flexible to changes
- It is easier to transfer deliverables as scripts, high-level abstractions and intermediate codes are used
- Due to code generators and code reuse, there is a reduction of manual coding
- Due to prototyping in nature, there is a possibility of lesser defects
- With less people, productivity can be increased in short time

Disadvantages of RAD Model

- It can’t be used for smaller projects
- Not all application is compatible with RAD
- When technical risk is high, it is not suitable
- If developers are not committed to delivering software on time, RAD projects can fail
- Reduced features due to time boxing, where features are pushed to a later version to finish a release in short period
- Reduced scalability occurs because a RAD developed application begins as a prototype and evolves into a finished application
- Progress and problems accustomed are hard to track as such there is no documentation to demonstrate what has been done
- Requires highly skilled designers or developers

Agile Process Development

- Agile model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction.
- Agile Methods break the product into small incremental builds. These builds are provided in iterations. Each iteration typically lasts from about one to three weeks. Every iteration involves cross functional teams working simultaneously on various areas like −
- Planning
- Requirements Analysis
- Design
- Coding
- Unit Testing and
- Acceptance Testing.
- At the end of the iteration, a working product is displayed to the customer and important stakeholders.


Planning
Testing
Req Analysis
Iteration 1
Building
Designing
2-3 Months
Planning
Testing
Req Analysis
Iteration 2
Building
Designing
2-3 Months
Planning
Testing
Req Analysis
Iteration 3
Building
Designing

Following are the Agile Manifesto principles

- **Individuals and interactions** − In Agile development, self-organization and motivation are important, as are interactions like co-location and pair programming.
- **Working software** − Demo working software is considered the best means of communication with the customers to understand their requirements, instead of just depending on documentation.
- **Customer collaboration** − As the requirements cannot be gathered completely in the beginning of the project due to various factors, continuous customer interaction is very important to get proper product requirements.
- **Responding to change** − Agile Development is focused on quick responses to change and continuous development.

Advantages of the Agile Model

- Is a very realistic approach to software development.
- Promotes teamwork and cross training.
- Functionality can be developed rapidly and demonstrated.
- Resource requirements are minimum.
- Suitable for fixed or changing requirements
- Delivers early partial working solutions.
- Good model for environments that change steadily.
- Minimal rules, documentation easily employed.
- Enables concurrent development and delivery within an overall planned context.
- Little or no planning required.
- Easy to manage.
- Gives flexibility to developers.

Disadvantages of the Agile Model

- Not suitable for handling complex dependencies.
- More risk of sustainability, maintainability and extensibility.
- An overall plan, an agile leader and agile PM practice is a must without which it will not work.
- Strict delivery management dictates the scope, functionality to be delivered, and adjustments to meet the deadlines.
- Depends heavily on customer interaction, so if customer is not clear, team can be driven in the wrong direction.
- There is a very high individual dependency, since there is minimum documentation generated.
- Transfer of technology to new team members may be quite challenging due to lack of documentation.