SOFTWARE DEVELOPMENT LIFECYCLE

AN OVERVIEW OF THE WATERFALL AND AGILE METHODOLOGIES

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About Me

Ola Ifidon, BSC. (Hons) CBAP®, PMP®, MBA

Education:

- BSc. Honors graduate of Economics
- Certified Business Analysis Professional (CBAP®)
- Project Management Professional (PMP®)
- MBA from Cornell-Queens Executive Program
- Certified Information Management Professional (CIMP)

Work Experience

- An entrepreneur and Strategy and Business Solutions professional with over **18** years experience in Management, Business consulting and Transformational projects
- An Ex-Accenture Senior Consultant in the Strategy and Business Architecture service line.
- International experience in Africa and North American markets leading and facilitating Business solutions by aligning strategic goals with solution options to deliver business value.
- Experienced in client engagement across across various industries including consulting, oil and gas, utilities, and banking.
- Core area of focus include **Business Analysis**, **Strategy and Enterprise Analysis, Requirements Elicitation, Business Value & KPIs, Business Consulting, Facilitation, Business Architecture and Transformation.**
- Currently, Engagement Partner, Strategy and Business Solutions in ValCon Inc., a Canadian management and business consulting company (www.valconsult.com)

Interests

- **IIBA:** Active member of the International Institute of Business Analysis (IIBA®):
  - Advisory Board Committee Member, Calgary IIBA Chapter Nov 2015- Date
  - IIBA 2015 BBC Delegate
  - Vice President, Member Services, IIBA Calgary Chapter Board. 20017-2013
  - Contributor, IIBA Managing Business Analysts Book (Rick Clare, @2011)

- **Facilitation and Motivational Speaker:**
  - 17 years experience as instructor and facilitator with endorsed educational providers in Canada, USA and Africa.
  - Featured speaker at IIBA events.

Review of Key Terms

Requirements:

- A usable representation of a need.
- Need: Opportunity or Problem

Solution:

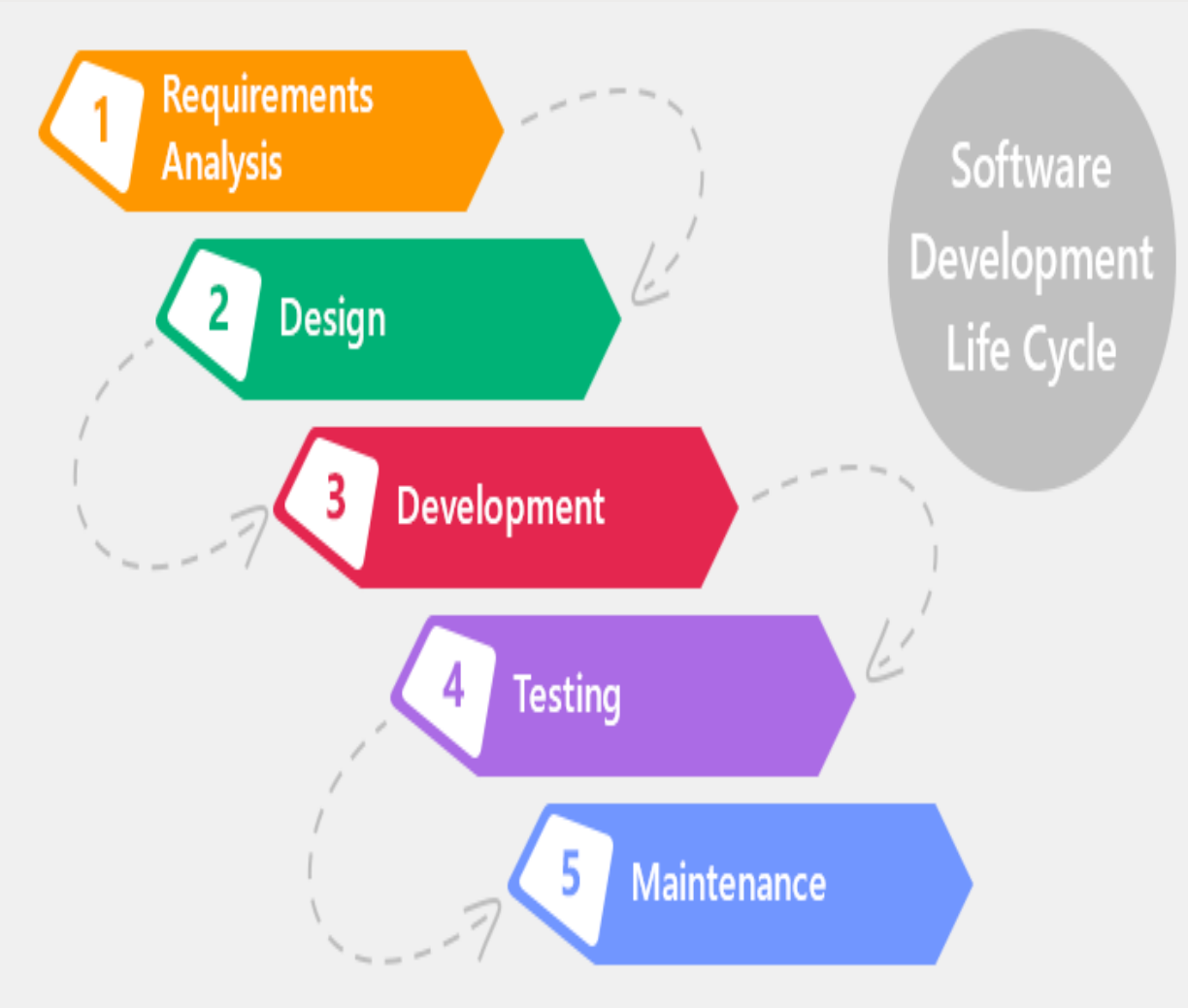
- A specific way of satisfying one or more needs in a context.
- A solution satisfies a need by resolving a problem faced by stakeholders or enabling stakeholders to take advantage of an opportunity.

Solution Suites

- A combination of solution options or paths to resolving a need or addressing an opportunity. Includes Information Technology/Automation, Change Management, Business processes, Organisation restructuring, etc

Overview of the SDLC

- The **systems development life cycle** (**SDLC**), also referred to as the **application development life-cycle**, is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying an information system.
- The systems development life-cycle concept applies to a range of hardware and software configurations, as a system can be composed of hardware only, software only, or a combination of both.



Source: Wikipedia

SDLC Methodologies

1

Waterfall Model:

- Oldest and most straight forward.
- Sequential non iterative process
- Progress is seen as steadily flowing downwards (i.e. waterfall)
- Basically it ensures one phase is finished before the next one is started, i.e. It is Linear
- Each state relies on information from previous stage and it is treated as a plan on its own.
- Easy to understand and simple to manage

RISKS

- Early delays can throw project off timeline
- Not responsive and flexible

2

V-Shaped Model

- Derived from the Waterfall model
- Also known as verification and Validation model.
- Characterised by a corresponding testing phase for each development stage
- Good for where there are no unknown requirements

RISKS

- Risk: Changes requires constant testing

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Agile Model

- Considered a realistic approach to development
- Breaks products into cycles.
- Delivers a working product quickly
- Ongoing releases with small incremental changes from previous releases
- Emphasises customer interaction and collaboration
- Iterations are referred to as Sprints

RISKS

- Project can be easily swayed from goals where customer is unsure of direction
- Prone to gold platting

SDLC Methodologies

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Spiral Model:

- Flexible SDLC.
- Derivation of Iterative Model.
- Repetitive in nature
- Project passes through the four phases in spiral/repetitive manner
- Allows for multiple rounds of refinement.
- Useful for highly customised product where user feedback is required to be incorporated in the process.

RISKS

- Analysis Paralysis- Unending Spiral

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Big Bang Model

- Big Bang Model
- No specific process and very little time spent on planning
- Majority of resources are thrown towards development
- No solid grasp of requirements
- Typically used for small Projects with one or

RISK:

- Highly risky model especially if requirements are not clearly understood at the beginning of the project
- Not a recommended model for large and complex project

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Iterative Model

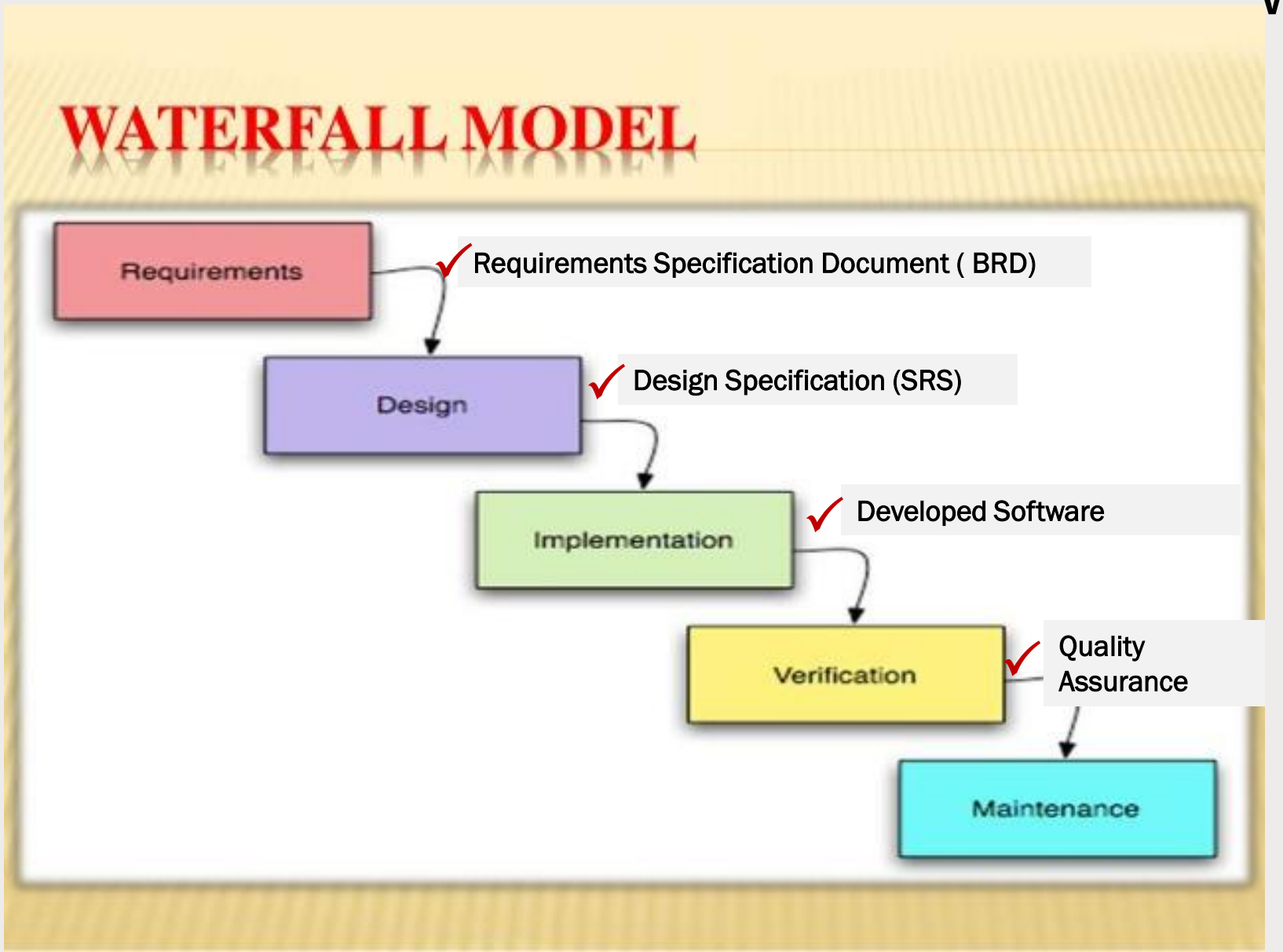
- A highly repetitive model.
- Starts typically with partially fully known requirements,
- implement set of software requirements, test , evaluate and pinpoint further requirements
- New version of software is produced with each phase or iteration until the system is ready
- Gives a working version early in the process and makes it less expensive to implement.

RISK

- Resource intensive

WATERFALL METHODOLOGY- AN OVERVIEW

Waterfall Artefacts



Sequential design process,, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of Conception, Initiation, Analysis, Design, Construction, Testing, Production/Implementation and Maintenance

Also known as Linear-sequential life cycle model.

The Waterfall Methodology Appeal- When to Use

This model is used only :

- When the requirements are very well known, clear and fixed.
- Product definition is stable.
- Technology is understood.
- There are no ambiguous requirements
- Ample resources with required expertise are available freely
- The project is short.

Typically used in government projects or projects requiring regulatory or audit compliance

Source: http://istqbexamcertification.com
Modified by Ola Ifidon

Advantages of The Waterfall Methodology

- This model is simple and easy to understand and use.
- It is easy to manage due to the rigidity of the model – each phase has specific deliverables and a review process.
- In this model phases are processed and completed one at a time. Phases do not overlap.
- Waterfall model works well for smaller projects where requirements are very well understood or for large complex projects broken into small manageable phases.

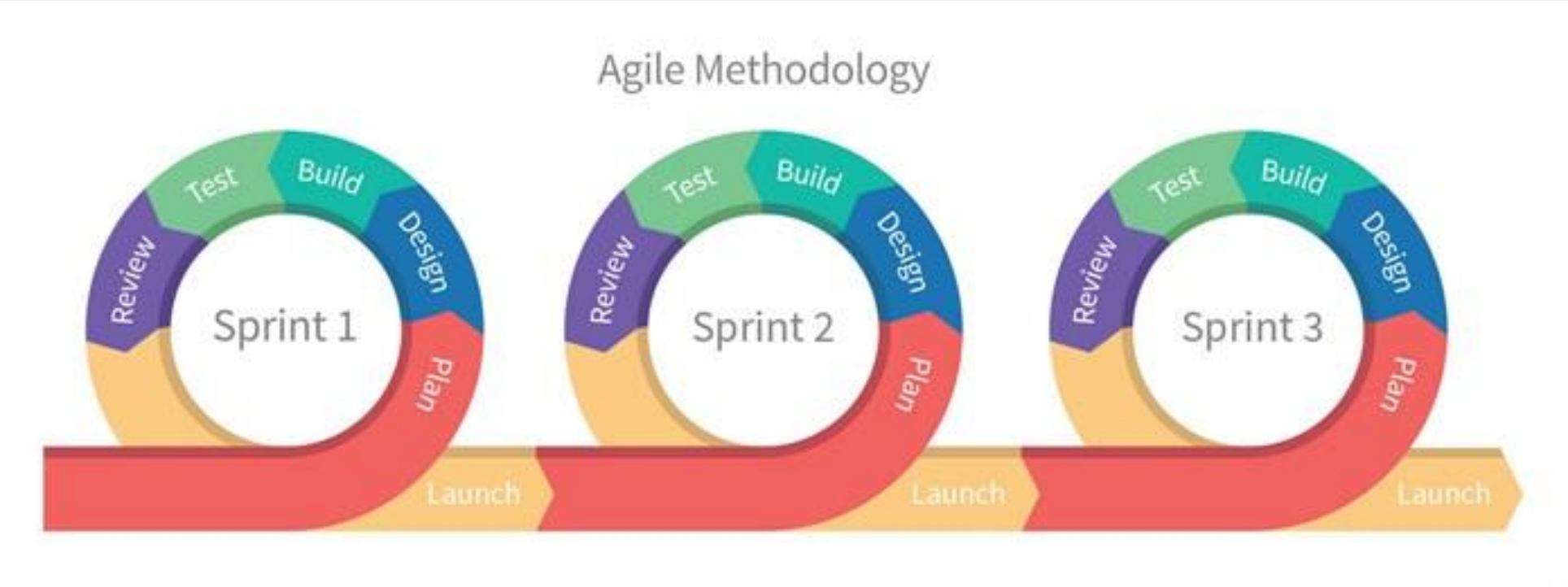
Source: http://istqbexamcertification.com

Disadvantages of the Waterfall Model

- Once an application is in the testing stage, it is very difficult to go back and change something that was not well-thought out in the concept stage.
- No working software is produced until late during the life cycle.
- High amounts of risk and uncertainty.
- Not a good model for complex and object-oriented projects.
- Poor model for long and ongoing projects.
- Not suitable for the projects where requirements are at a moderate to high risk of changing.
- Poor or low interaction with business stakeholders

AGILE METHODOLOGY- AN OVERVIEW

Agile Methodology



Agile software development is a group of software development methods in which requirements and solutions evolve through collaboration between self-organizing, cross-functional teams. It promotes adaptive planning, evolutionary development, early delivery, continuous improvement, and encourages rapid and flexible response to change.

It is a type of incremental delivery model

Source: http://www.screenmedia.co.uk

Agile Methodology Appeal

Agile is from the word "Agility": ability to move quickly and easily.

- Quick in responding to and delivering products to customers
- Highly collaborative so easy to capture business needs as it is changing.
- Very dynamic
- Thrives on excellent communication skills
- Has ability to demonstrate value quickly to business
- Value is delivered in small incremental phases/iterations

Common Agile Terms

SPRINT	• Sprint is the scrum term for an iteration • Sometimes called iterations, typically last between one and four weeks. • Can last as little as one day, but should not be longer than four weeks
SCRUM	• Sprint is the scrum term for an iteration • Sometimes called iterations, typically last between one and four weeks. • Can last as little as one day, but should not be longer than four weeks
SCRUM MASTER	Scrum master is responsible for daily standup meetings and tracking the overall progress. It is the duty of scrum master to make sure team is not blocked at any point of time due to external or internal issues
PRODUCT OWNER	• Primary business representative who also is the voice of customer to the development team. • Responsible for communicating the product vision to the team, take decisions on official releases, monitoring project progress and ROI and leading the team.

REFERENCES FOR OTHER COMMON AGILE TERMS:
https://blog.taiga.io/agile-terms-you-must-know.html

Agile SCRUM Process

Source: www.ppmstudio.com/Agile-Software-Development.aspx

Capturing Requirements in Agile

- **Requirements captured using User stories**
  - *is a simple description of a product requirement in terms of a what that requirement must accomplish for whom*
  - *small, concise statement of functionality or quality needed to deliver value to a specific stakeholder*

- **User Story Format**
  - ***Title** describes the activity the stakeholder wants to carry out with the system – <a name of the user story>*
  - ***WHO**: As a – <user or persona>*
  - ***WHAT**: I want to – <take this action>*
  - *WHY: So that – <I get this benefit>*
    - **When I** <take this action>, **this happens** <description of action>

Agile Backlog Management

Backlog:

- A backlog is a collection of user stories and tasks that the team needs to work upon in future.
- May sometimes even mean the current sprint or upcoming sprints.
- Backlog can be classified as product backlog and sprint backlog.
- Product backlogs are related to the tasks to be done for the overall product while sprint backlogs are the ones that need to be completed in the current sprint.

The Agile Methodology Appeal- When to Use

- **When new changes are needed to be implemented.**

  Agile promotes and encourages change. New changes can be implemented at very little cost because of the frequency of new increments that are produced.

- **Limited time to produce tangible product**
  - Both system developers and stakeholders alike, find they also get more freedom of time and options than if the software was developed in a more rigid sequential way.
  - *To implement a new feature the developers need to lose only the work of a few days, or even only hours, to roll back and implement it.*

- **Need to Demonstrate Business Value quickly and Gauge Value delivery**

  Agile allows delivery in small incremental stages. This gives the business the opportunity to interact with the products and evaluate if the eventual product will deliver the desired value before completion.

- **Limited Planning and rapid changes**

  Unlike the waterfall model in agile model very limited planning is required to get started with the project. Agile assumes that the end users' needs are ever changing in a dynamic business and IT world. Changes can be discussed and features can be newly effected or removed based on feedback. This effectively gives the customer the finished system they want or need.

- **Business Prioritisation and delivery is critical**
  - Having options gives them the ability to leave important decisions until more or better data or even entire hosting programs are available; meaning the project can continue to move forward without fear of reaching a sudden standstill.

Source: http://istqbexamcertification.com
Modified by Ola Ifidon

Advantages of the Agile Model

- Customer satisfaction by rapid, continuous delivery of useful software.
- People and interactions are emphasized rather than process and tools. Customers, developers and testers constantly interact with each other.
- Working software is delivered frequently (weeks rather than months).
- Face-to-face conversation is the best form of communication.
- Close, daily cooperation between business people and developers.
- Continuous attention to technical excellence and good design.
- Regular adaptation to changing circumstances.
- Even late changes in requirements are welcomed

Source: http://istqbexamcertification.com

Disadvantages of the Agile Model

- In case of some software deliverables, especially the large ones, it is difficult to assess the effort required at the beginning of the software development life cycle.
- There is lack of emphasis on necessary designing and documentation.
- The project can easily get taken off track if the customer representative is not clear what final outcome that they want.
- Only senior programmers are capable of taking the kind of decisions required during the development process. Hence it has no place for newbie programmers, unless combined with experienced resources.

Source: http://istqbexamcertification.com

THANK YOU

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