

Mohamed Sami Personal website – Software Engineering & Architecture Practices

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Introduction

Software development life cycle (**SDLC**) is a series of phases that provide a common understanding of the software building process. How the software will be realized and developed from the business understanding and requirements elicitation phase to convert these business ideas and requirements into functions and features until its usage and operation to achieve the business needs. The good software engineer should have enough knowledge on how to choose the SDLC model based on the project context and the business requirements.

Therefore, it may be required to choose the right SDLC model according to the specific concerns and requirements of the project to ensure its success. I wrote another article on how to choose the right SDLC, you can follow this link for more information. Moreover, to learn more about Software Testing life cycles and SDLC phases you follow the links highlighted here.





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In this article, we will explore the different types of SDLC models and the advantages and disadvantages of each one and when to use them.

Types of Software developing life cycles (SDLC)

- Waterfall Model
- V-Shaped Model
- Evolutionary Prototyping Model
- Spiral Method (SDM)
- Iterative and Incremental Method
- Agile development

Waterfall Model

Description

The Waterfall Model is a linear sequential flow. In which progress is seen as flowing steadily downwards (like a waterfall) through the phases of software implementation. This means that any phase in the development process begins only if the previous phase is complete. The waterfall approach does not define

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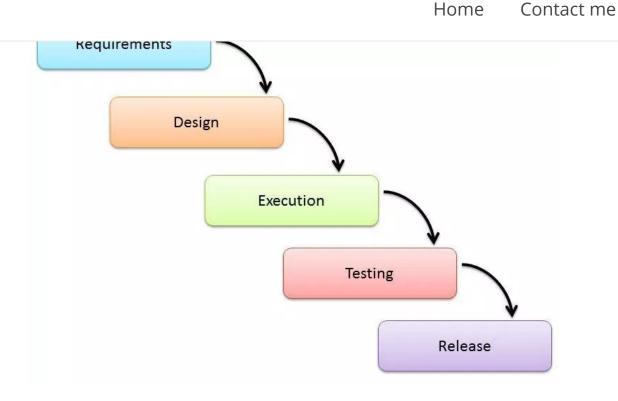






Tags





The usage

Projects which not focus on changing the requirements, for example, projects initiated from a request for proposals (RFPs), the customer has a very clear documented requirements

Advantages and Disadvantages

Advantages	Disadvantages
Easy to explain to the users.	 Assumes that the requirements of a

(4) Programming (4) Quotes (4)
Requirements (4) Requirements

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elicitation (5) Requirements Engineering

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(4) Ruby on Rails (4) SDLC

(22) SDLC Model Selection (4) SDLC

Phases (4) SDLC Process (4) SDLC Stages

- (4) Security (6) Security SDLC
- (8) Security Testing (7)
 Security Testing Techniques
- (7) Software Analysis (5) Software Architecture (6) Software Design
- (5) Software

development (16)

software

development life

cycle (14) Software

development methodology

(7) Software development process (11)





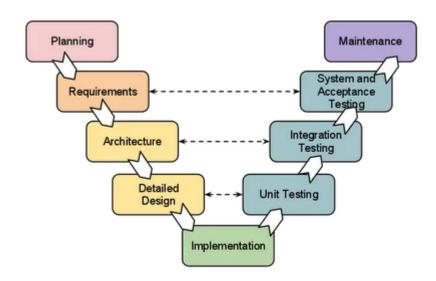
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- early detection of errors/misunderstanding.
- Each phase has specific deliverables.
- Costly and required more time, in addition to the detailed plan.

V-Shaped Model

Description

It is an extension of the waterfall model, Instead of moving down in a linear way, the process steps are bent upwards after the implementation and coding phase, to form the typical V shape. The major difference between the V-shaped model and waterfall model is the early test planning in the V-shaped model.



(8) Software Testing Life Cycle (4) Spiral (4) STLC (6) Systems

Development Life Cycle (7)

System Software Development (5)

Testing (6) The Best SDLC model (5) The right SDLC model (5)

Waterfall Model (5) WhiteBox Testing (4)

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Auvantages and Disauvantages			2018	

 Simple and easy to use Each phase has specific deliverables. Higher chance of success over the waterfall model due to the development of test plans early on during the life cycle. Works well for where requirements are easily understood. Verification and validation of the product in the early stages of product development. Disadvantages Very inflexible, like the waterfall model. Adjusting scope is difficult and expensive. The software is developed during the implementation phase, so no early prototypes of the software are produced. The model doesn't provide a clear path for problems found during testing phases. Costly and required more time, in addition to a detailed plan 		
 Each phase has specific deliverables. Higher chance of success over the waterfall model due to the development of test plans early on during the life cycle. Works well for where requirements are easily understood. Verification and validation of the product in the early stages of product development. model. Adjusting scope is difficult and expensive. The software is developed during the implementation phase, so no early prototypes of the software are produced. The model doesn't provide a clear path for problems found during testing phases. Costly and required more time, in 	Advantages	Disadvantages
	 Each phase has specific deliverables. Higher chance of success over the waterfall model due to the development of test plans early on during the life cycle. Works well for where requirements are easily understood. Verification and validation of the product in the early stages of 	 model. Adjusting scope is difficult and expensive. The software is developed during the implementation phase, so no early prototypes of the software are produced. The model doesn't provide a clear path for problems found during testing phases. Costly and required more time, in

Prototyping Model

Description

It refers to the activity of creating prototypes of software applications, for example, incomplete versions of the software program being developed. It is an activity that can occur in software development and It used to visualize some component of the software to limit the gap of misunderstanding the customer

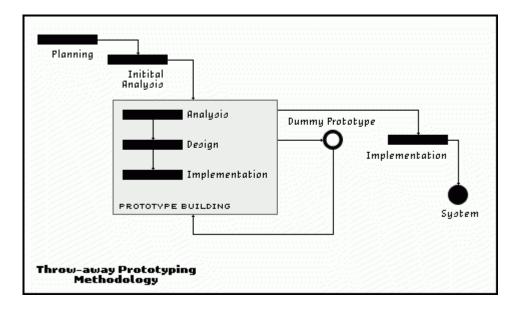




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It has some types, such as:

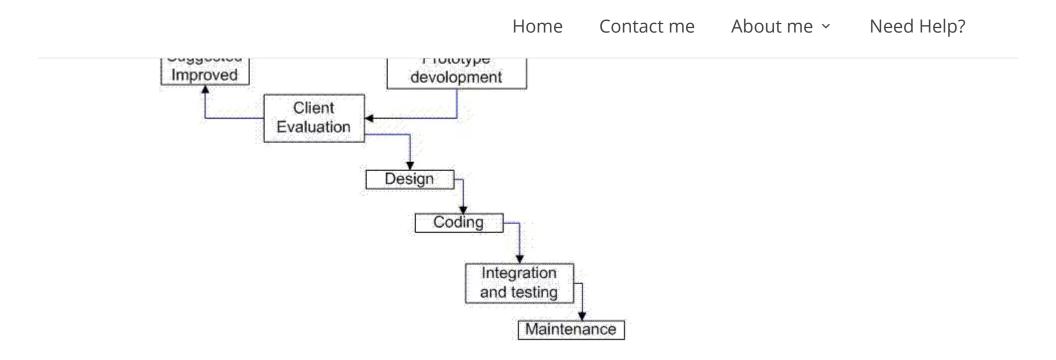
■ Throwaway prototyping: Prototypes that are eventually discarded rather than becoming a part of the finally delivered software



■ Evolutionary prototyping: prototypes that evolve into the final system through an iterative incorporation of user feedback.





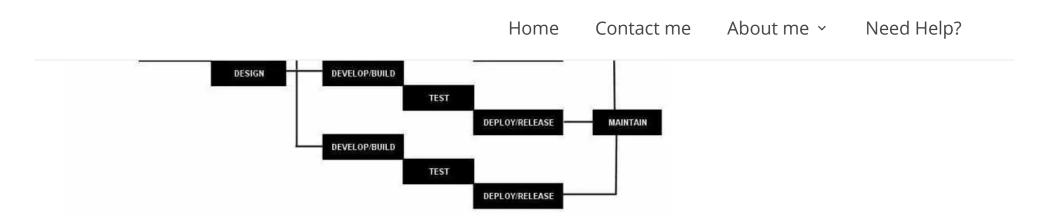


Evolutionary Prototyping Model

Incremental prototyping: The final product is built as separate prototypes. In the end, the separate prototypes are merged in an overall design.







Extreme prototyping: used in web applications mainly. Basically, it breaks down web development into three phases, each one based on the preceding one. The first phase is a static prototype that consists mainly of HTML pages. In the second phase, the screens are programmed and fully functional using a simulated services layer. In the third phase, the services are implemented

The usage

This process can be used with any software developing life cycle model. While this shall be chosen when you are developing a system has user interactions. So, if the system does not have user interactions, such as a system does some calculations shall not have prototypes.

Advantages and Disadvantages

Advantages	Disadvantages	
 Reduced time and costs, but this can 	Insufficient analysis. User confusion	
be a disadvantage if the developer	of prototype and finished system.	



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prototypes				

Spiral Model (SDM)

Description

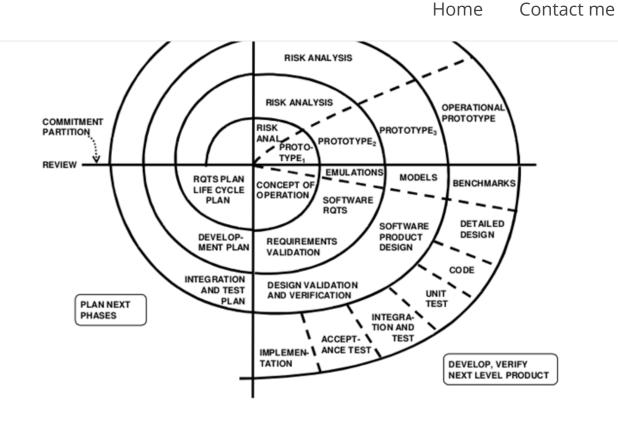
It is combining elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts. This model of development combines the features of the prototyping model and the waterfall model. The spiral model is favored for large, expensive, and complicated projects. This model uses many of the same phases as the waterfall model, in essentially the same order, separated by planning, risk assessment, and the building of prototypes and simulations.





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The usage

It is used in the large applications and systems which built-in small phases or segments.

Advantages and Disadvantages

Advantages	Disadvantages
Estimates (i.e. budget, schedule, etc.)	 High cost and time to reach the final



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system into phases.				

Iterative and Incremental Model

Description

It is developed to overcome the weaknesses of the waterfall model. It starts with an initial planning and ends with deployment with the cyclic interactions in between. The basic idea behind this method is to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental), allowing software developers to take advantage of what was learned during the development of earlier parts or versions of the system. It can consist of mini waterfalls or mini V-Shaped model



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The usage

It is used in shrink-wrap application and large system which built-in small phases or segments. Also, can be used in a system has separated components, for example, ERP system. Which we can start with the budget module as a first iteration and then we can start with the inventory module and so forth.



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Advantages and Disadvantages

Advantages	Disadvantages
Produces business value early in the	 Requires heavy documentation.





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- requests between increments.
- More focused on customer value than the linear approaches.
- We can detect project issues and changes earlier.
- approaches.
- Partitioning the functions and features might be problematic.
- Integration between iteration can be an issue if this is not considered during the development.

Agile Model

Description

It is based on iterative and incremental development, where requirements and solutions evolve through collaboration between cross-functional teams.



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Scrum Agile Model

The usage





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Advantages and Disadvantages

Advantages	Disadvantages
 Decrease the time required to avail some system features. Face to face communication and continuous inputs from customer representative leaves no space for guesswork. The end result is the high-quality software in the least possible time duration and satisfied customer. 	 Scalability. The ability and collaboration of the customer to express user needs. Documentation is done at later stages. Reduce the usability of components. Needs special skills for the team.

Agile Project Management Tool	Software Testing Test Case
Software Development Tools	Cyber Security Awareness
Agile Modeling	Best House Security Systems
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Mohamed Sami

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Advantages and Disadvantages,
Agile, Agile Model, agiledevelopment, Application Development Process, Development
Models, Different Development Methodologies, Different SDLC Stages, Extreme
programming, Incremental Model, Iterative and incremental development, Iterative Model,
Process Models, Project Life Cycle Models, Prototyping, Prototyping Model, Scrum, SDLC,
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Stages, SDLC Steps, SDM, Security SDLC, Software Deployment, Software development,
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290 thoughts on "Software Development Life Cycle Models and Methodologies"

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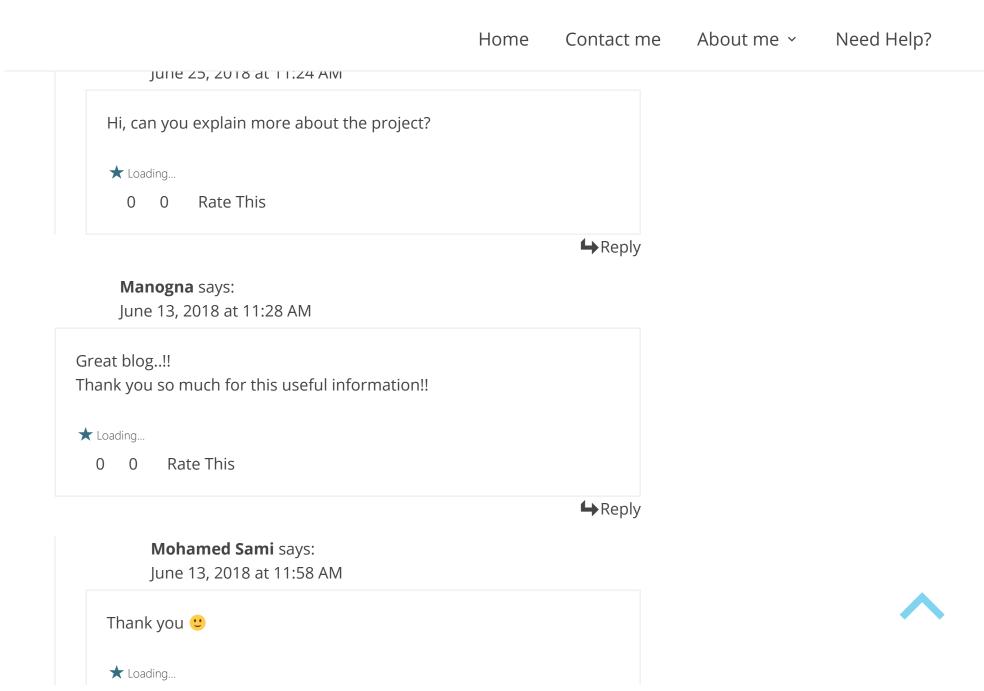
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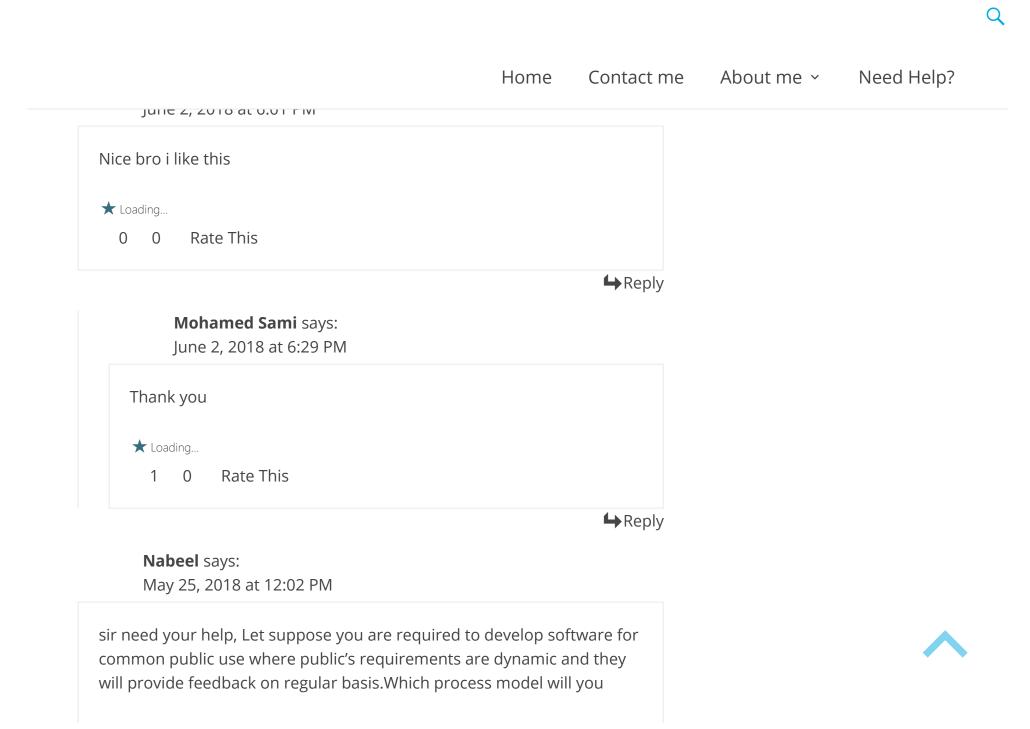
Aravindh says:

June 28, 2018 at 8:46 AM

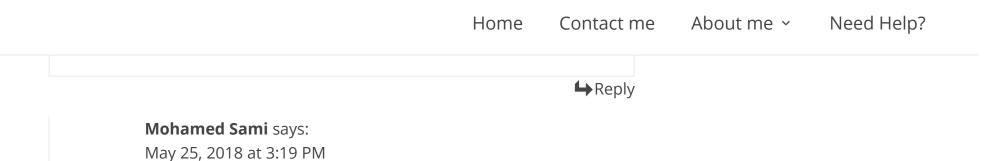


Home Contact me About me ~ Need Help? Rate This 0 0 Reply Mohamed Sami says: June 28, 2018 at 9:43 AM Hi Aravindh, Thank you. Actually, I did not write a separate article for Agile, but I will write a separate article for each model. I hope to have the time for that 🧐 Have a good day ★ Loading... Rate This 0 Reply Jahangir Yasin says: June 20, 2018 at 5:42 AM Sir can you tell me which SDLC is best For agriculture And Irrigation..?? ★ Loading...









Agile will be very good at this case because it deals with the unclear requirements and for other reasons as well



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umieypqah says:

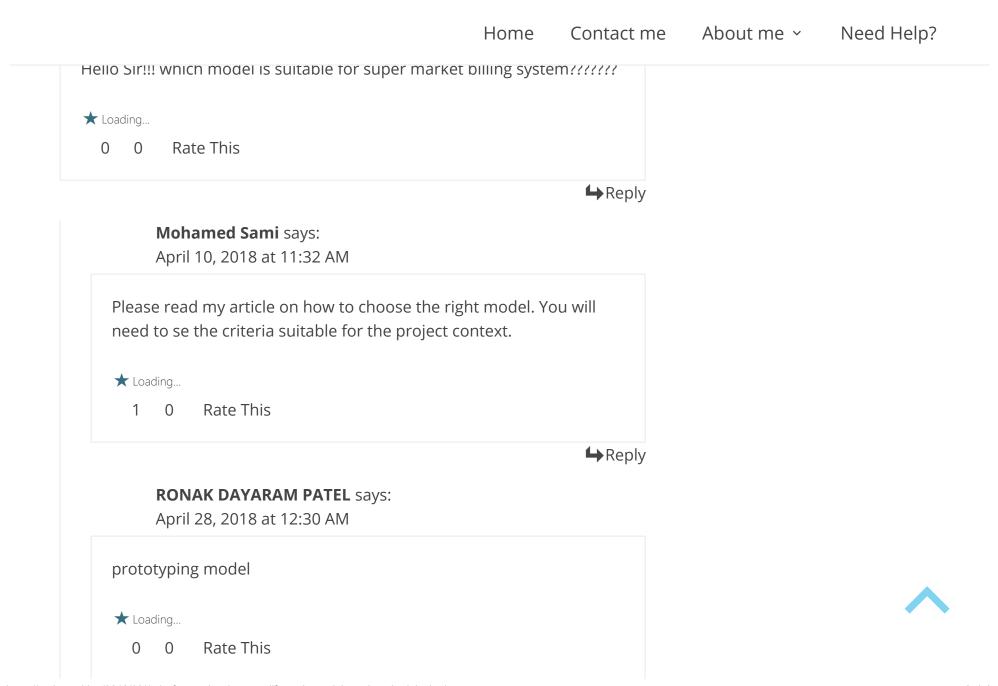
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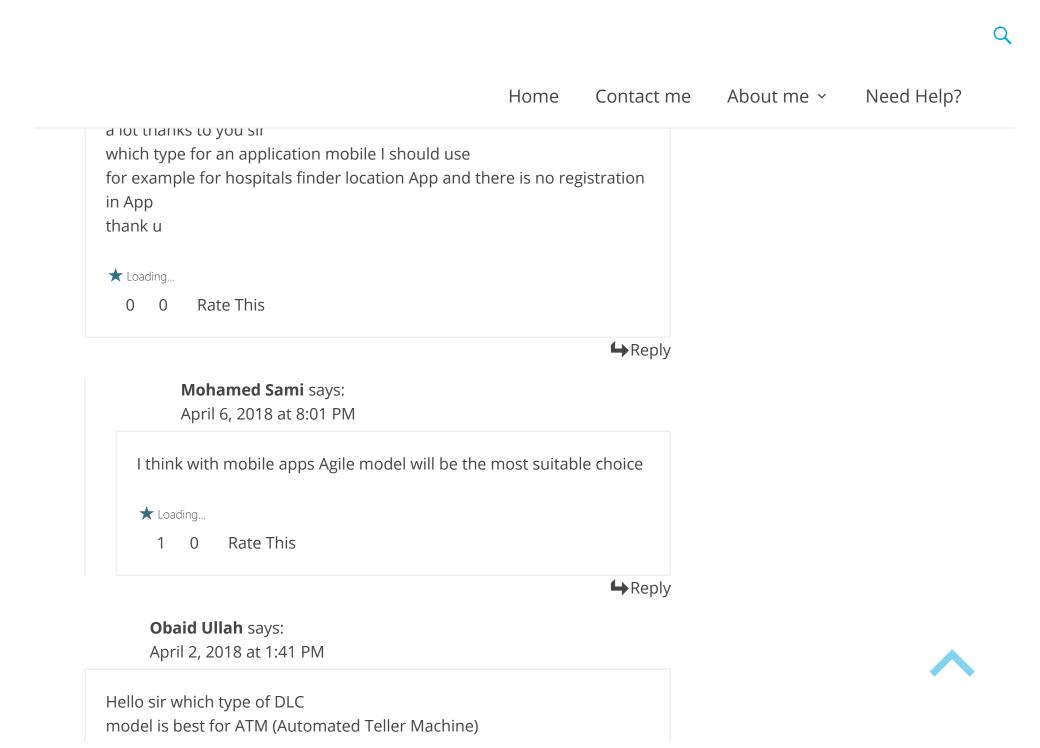
hai sir. i would like to ask your opinion. now, i am going to develop a mobile application using Augmented Reality. so, i choose an ADDIE model as a guideline. so now i want to ask if you can give me idea which model should I use to make a combination of the methodology? thank you sir $\ensuremath{\mathfrak{C}}$



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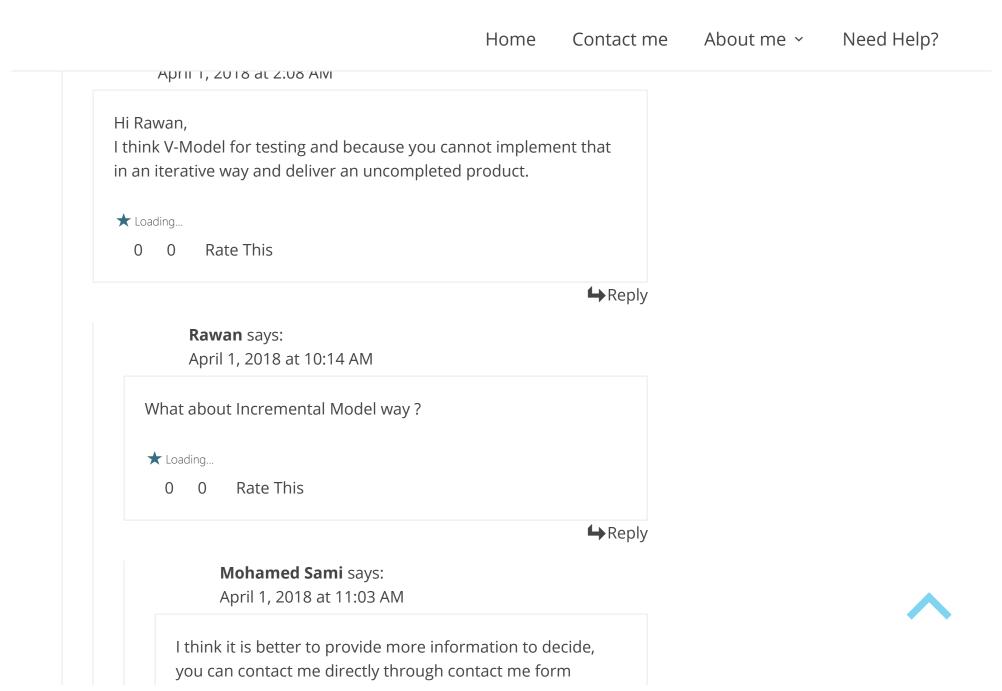






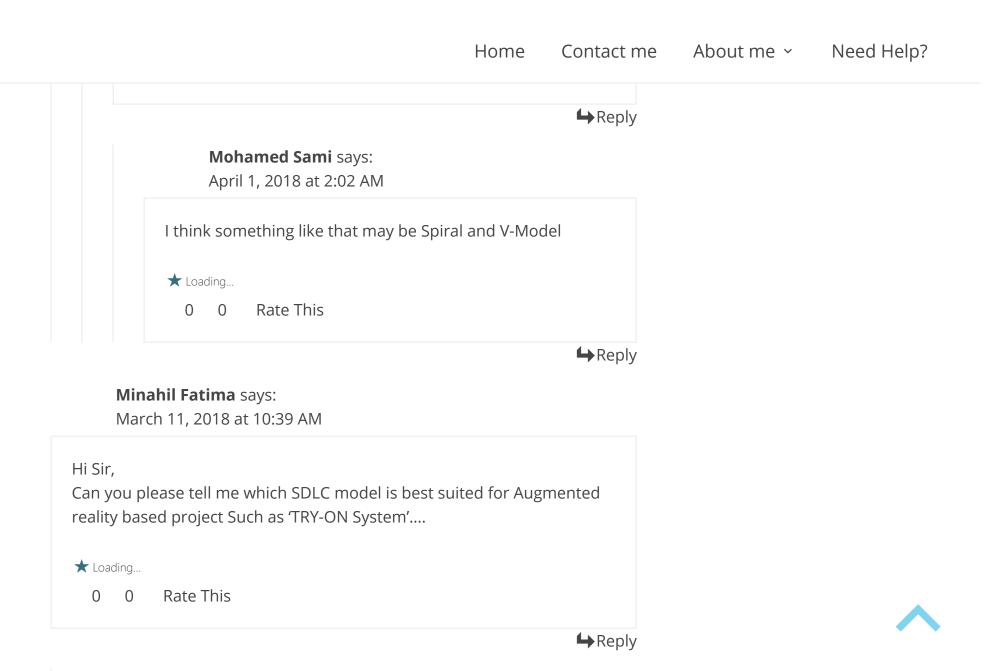
Home Contact me About me ~ Need Help? **UDAIU UIIAII** Says. April 2, 2018 at 1:42 PM hello sir which type of SDLC model is best for ATM (Automated Teller Machine) ★ Loading... 0 Rate This 0 Reply Mohamed Sami says: April 2, 2018 at 1:46 PM I think depends on the features and functions will be implemented, if it is the simplest teller machine, then you can use waterfall or V model. ★ Loading... 0 Rate This Reply says: شبير البلوشي April 2, 2018 at 7:49 AM

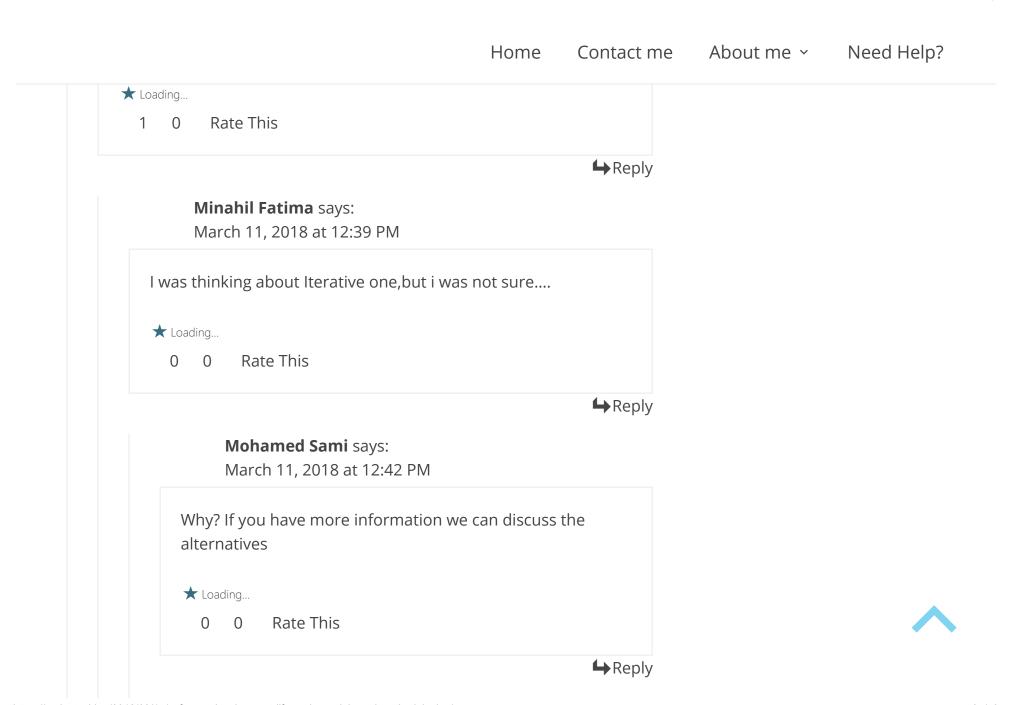
Home Contact me About me ~ Need Help? proceed with iterative and incremental model? or you have any other suggestion in this scenario? ★ Loading... Rate This 0 Reply **Mohamed Sami** says: April 2, 2018 at 9:02 AM Yes, continue with the iterative model, it suits your case ★ Loading... Rate This Reply Rawan says: April 1, 2018 at 1:42 AM Hi Mohammed, Can you please tell me which SDLC model is the best suited for "smart door lock using RFID card "project? And why? ★ Loading...





Home Contact me About me ~ Need Help? Daibir Kumar Says. March 21, 2018 at 1:10 PM Thanks for the information. I really enjoyed reading this. As a professional software developer service, I must say that it really helps people who start their own career as a developer and advise you to read an article on ★ Loading... Rate This Reply **Mohamed Sami** says: March 24, 2018 at 10:11 PM Thank you ★ Loading... 0 Rate This Reply **Sridhar** says: April 1, 2018 at 1:41 AM







Home Contact me About me ~ Need Help? iterative but i was not sure that's why i put a question up Sir... ★ Loading... Rate This 0 0 Reply **Mohamed Sami** says: March 11, 2018 at 5:40 PM You can this article as well, It will enhance your understanding for the selection process of SDLC https://melsatar.blog/2012/03/21/choosing-theright-software-development-life-cycle-model/ ★ Loading... 0 Rate This Minahil Fatima says: March 11, 2018 at 7:10 PM Well.. Thanks Sir..



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uivya i nakur says.

March 8, 2018 at 7:25 AM

Thanks for sharing such a knowledge about the types of Software developing life cycles that is Waterfall Model, V-Shaped Model, Evolutionary Prototyping Model, Spiral Method (SDM), Iterative and Incremental Method, Agile development that really helpful to understand the life cycle model and methodologies of the software development.

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Mohamed Sami says:

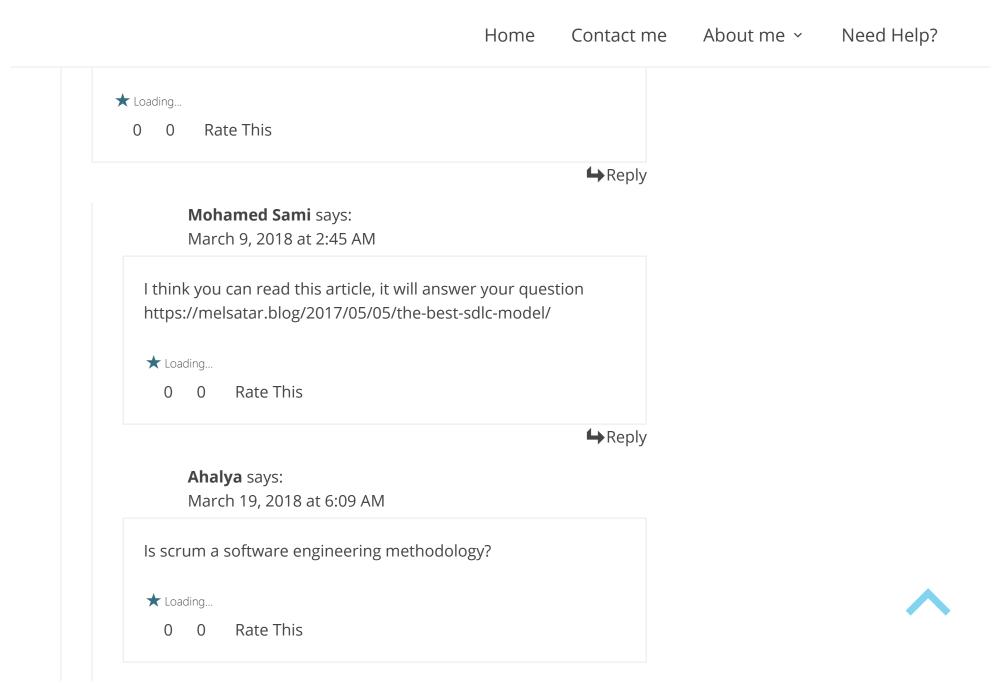
March 8, 2018 at 5:04 PM

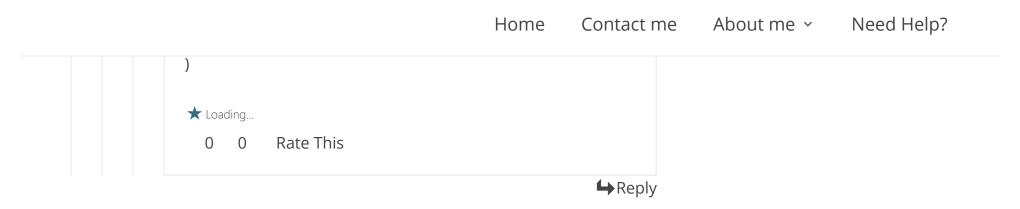
Thank you Divya for your comment, but it is better without advertisement for your company $\stackrel{\bullet}{\cup}$



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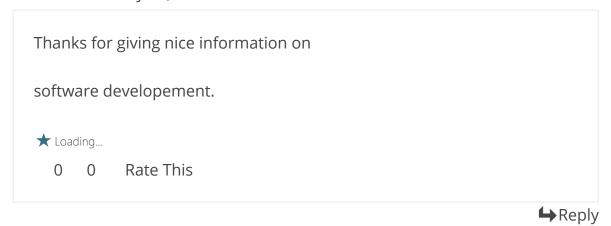


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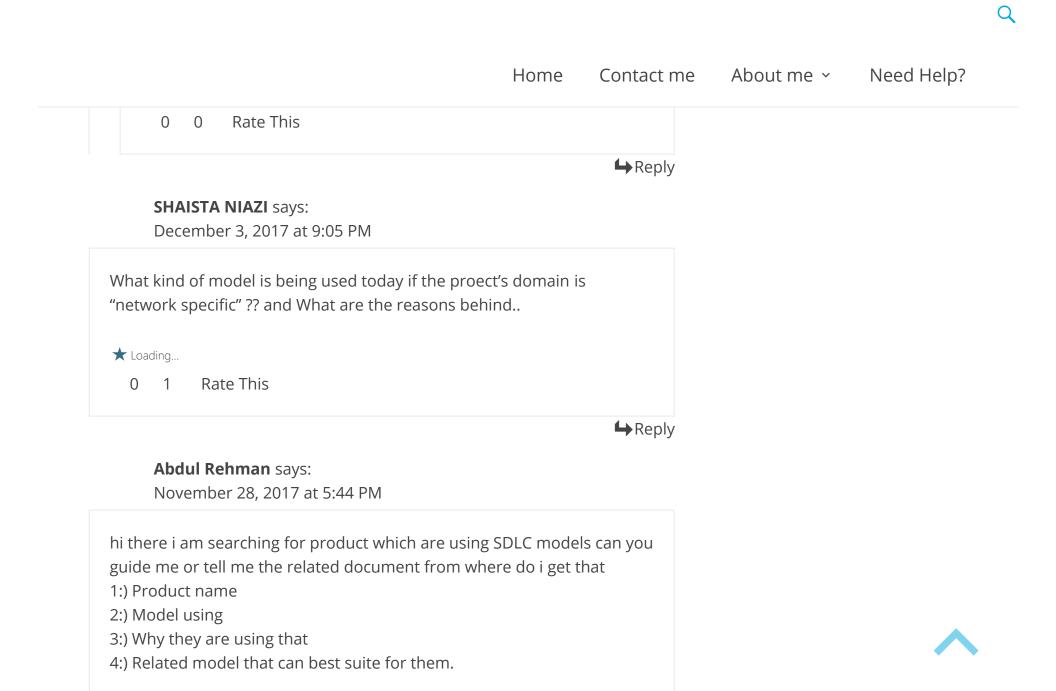
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snaseema says:

February 16, 2018 at 1:51 PM



Mohamed Sami says:





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Mohamed Sami says:

November 28, 2017 at 6:13 PM

Hi Abdul Rehman, I cannot understand your question however what is the objective of this search?



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abdulrehmansite says:

November 28, 2017 at 6:28 PM

i have to write about 10 product which are using SDLC models. following data is required about those products....

- 1:) Product name
- 2:) Model using
- 3:) Why they are using that
- 4:) Related model that can best suite for them.







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I think Software Products in general, do not have only one cycle of development. There are always improvements and other cycles to add extra features. What is inside each cycle can be one of the know SDLCs.

Actually, I do not have some references to all models, but most of the social products are agile based, for example, Facebook, Instagram, ...etc.



1 0

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mansi says:

January 11, 2018 at 8:08 PM

cn u hlp me pplz in these questions

Q1. Which SDLC will be most suitable for each of the following scenarios and why?

1.

The product is a custom made product for a specific customer, who is always available to give feedback.



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A general purpose product, but with a very strong marketing team who understand and articulate the overall customer requirements very well

4.

A product that is made of a number of features that become available sequentially and incrementally.

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Mohamed Sami says:

January 11, 2018 at 8:22 PM

Hi mansi,

- 1- agile will be good
- 2- agile and prototype will be good
- 3- iterative and waterfall will be good
- 4- iterative will be good



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Dear Sir,

Thank you, your article is informative. To the best of my understanding a SDLC consist of following stages.

- 1. Communication
- 2. Requirement gathering
- 3. Feasibility study
- 4.System Analysis
- 5. Software design
- 6. Coding
- 7. Testing
- 8. Integration
- 9. Implementation
- 10. Operations & Maintenance
- 11. Disposition.

For a medium scale project like Inventory Management System, what is the amount of time one should spent for each above mentioned stages. Kindly guide.



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and also project scope, for example, your requirements can be to implement a full inventory system, but the project scope and time is limited to specific part of these requirements. Moreover, it will depend on the SDLC model you will choose for the implementation, for example, if you selected the incremental model, some of these phases will be split into small increments.

Please read this article for more information about SDLC phases https://melsatar.blog/2017/06/13/what-do-you-need-to-know-about-the-eight-software-development-phases/

Thank you

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Meme says:

November 26, 2017 at 5:58 PM

Please suggest a model for LAN network project



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Home Contact me About me ~ Need Help? Please suggest a model for LAN network project ★ Loading... Rate This Reply Mohamed Sami says: November 26, 2017 at 5:56 PM I think this is not related to software engineering but I think you will need to setup the network in phases as well besides the central control servers for the network. I think you need some project planning skills mainly not a software development life cycle. ★ Loading... Rate This 0

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Naveen says:

November 3, 2017 at 7:36 AM

Dear Melsatar, Having the most suitable process model alone would not justify success.





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Mohamed Sami says:

November 4, 2017 at 2:25 AM

Hi Naveen,

That's true. I agree, there are a lot of factors need to be considered to have successful software project, for example, requirement analysis is the most critical phase of the SDLC, the skills of the project team and project manager, the quality of the deliverables, the used technologies, ...etc.

I hope this explained the reasons $\underline{\mathbf{e}}$

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Nguyễn Trọng Toàn says:

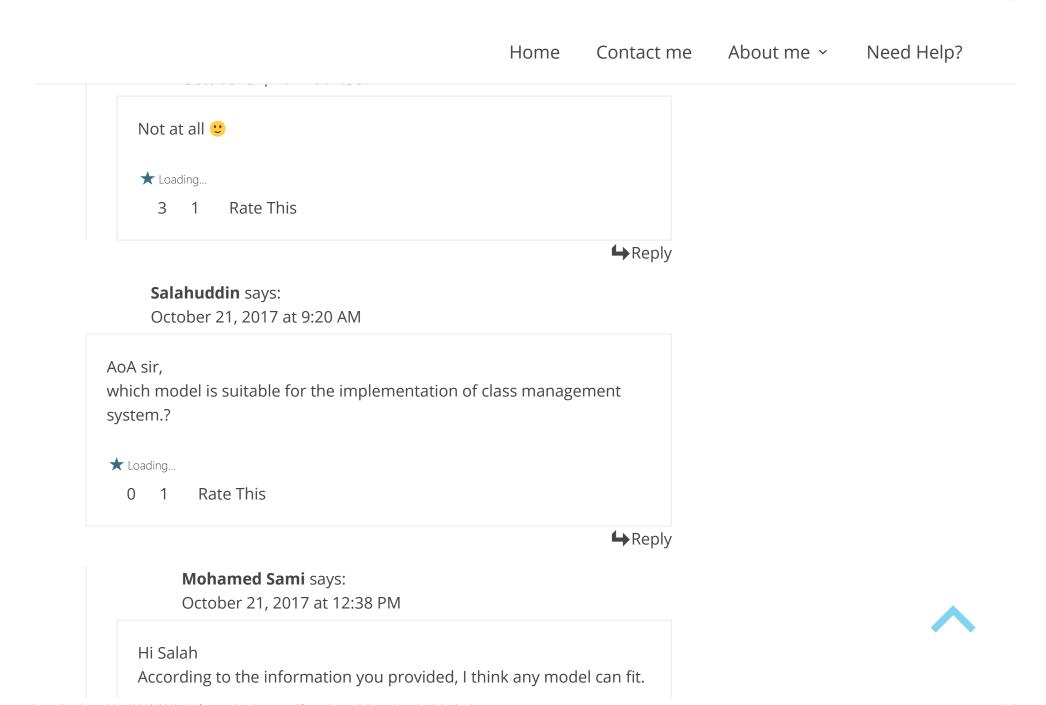
October 31, 2017 at 4:55 AM

Thanks so much!











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narunanga woses says.

October 12, 2017 at 12:12 PM

For sure the information i have got good and educative on my side and was that notes i was researching on it, thanks alot



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Mohamed Sami says:

October 12, 2017 at 8:47 PM

Thank you



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Hamed Saleh says:

October 7, 2017 at 6:05 PM

I would like really appritiate your hardwork, It is helpful, I want to design a Food Management System, Which SDLC is the best for my project.



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Mohamed Sami says:

October 7, 2017 at 6:11 PM

Hi Hamed,

Thank you for your comment, I think you can use the Iterative model for Food Management system, what do you think?

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