Analysis of Factors Involved in Choosing Requirement Elicitation Techniques For Agile Methodology

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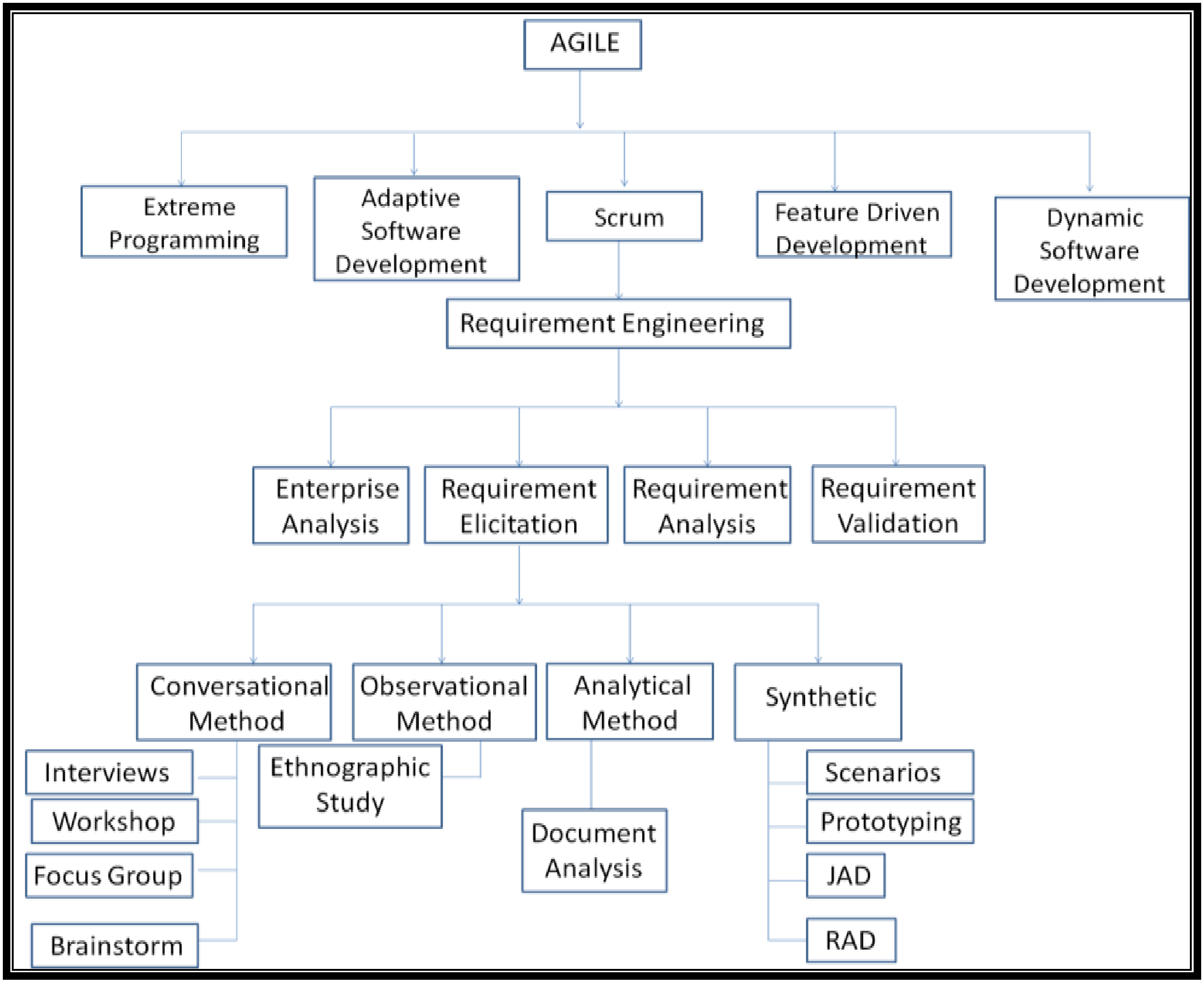
Abstract:
Requirement Elicitation is an important process in Requirement Engineering, an important stage in the early part of IT Project Management. In Requirement Elicitation the analyst would collect the client requirements which are then analyzed and validated. In doing so the analyst may use different methods depending upon the situation on hand. The objective of the study is to map the various situations faced by analysts and suggest appropriate Elicitation technique.

Statement of Problem and Goal:



The principles of Agile Manifesto (Beedle, 2001) are,

- Conveying information to and within development team using face – face interaction.
- Welcomes changing requirement even late in development
- Deliver working software frequently from a couple of week to couple of months.

The Agile methodology(C.R & Thomas, 2011) prefer

- Customer collaboration and communication over contract negotiation
- Responding to change over following a plan
- Individuals and interactions rather than tools and documentations

There are different types in agile methodology. The most popular type is Extreme Programming, Scrum, Adaptive Software Development, Dynamic System Development Method, and Feature Driven Development.

Agile methodology's Vs Traditional Methodology(C.R & Thomas, 2011)

Traditional Methodology	**Agile Methodology**
Focused on processes	Focused on people
Flexible only in the beginning of the project	Emphasizes the communication, collaboration, rapid exchange of information
Help deliver projects on time and budget but not suitable when you are moving to a new technology or for changing requirements	Uncertain budgets and unclear milestones
Use single model (like waterfall)	Involves lot of different methods that work in a similar way.

Agile methodology works in a different manner than the traditional method. There are different types in Agile Methodology. Each type requires different Requirement Engineering technique. As agile methodology is a new way of developing the software, there is no standard method for Agile Methodology.

Requirement Engineering is defined as
"The science and discipline concerned with analyzing and documenting software requirements. It involves transforming system requirements into a description of software requirements, performance parameters, and a software configuration using an iterative process of definition, analysis, trade-off studies, and prototyping." (Thayer, 2003)

There are 4 different phases in Requirement Engineering. They are Enterprise Analysis, Requirement Elicitation, Requirement Analysis, and Requirement Validation. Our area of research is restricted to Requirement Elicitation.

"The process through which the software acquirers (customers or users) and the suppliers (contractor) of a software system discover, review, articulate, understand, and document the users' needs and the constraints on the software system and the development activity."(Thayer, 2003)

Choosing appropriate Elicitation technique is important task. These techniques are used to maintain a continuous interaction with customer so as to ensure that changing requirements and changing priorities in requirement are considered.

Most of the survey report shows that software project fails (projects were cancelled) to meet quality, cost and time constraint of the project. According to Standish Group Report, 18% of the software projects failed at different software development stage (El Emam & Koru, 2008).

Research conducted by Standish report for the year 2004 to 2012 is as follows

	2004	**2006**	**2008**	**2010**	**2012**
Failed	18%	19%	24%	21%	18%
Challenged	53%	46%	44%	42%	43%

(Source:(Standish Group, 2013))

Consider the related literature of past few years,
“*Mishandled requirements can torpedo a project at any time, from inception to delivery. Start down the wrong road and you arrive at the wrong destination. And even if you're heading in the right direction, making fumbling changes midstream can be almost as deadly*”.(Lindquist, 2005)

“Defining requirements is a complex and difficult process, and defects in the process often lead to costly project failures”(Boehm, 2001).

“Almost all Requirements specifications being developed in industry today contain many poorly specified requirements. Far too many requirements are ambiguous, incomplete, inconsistent, incorrect, infeasible, unusable, and/or not verifiable”(Firesmith, 2003).

There are different Elicitation techniques such as:

1. Conversational Method: Interviews, Workshop, focus groups and Brainstorming
2. Observational Method: Ethnographic study
3. Analytical Method: Document study
4. Synthetic Method: Scenarios, prototyping, JAD (involving end users, developers, observers and facilitators), Rapid Application development

Choosing appropriate Elicitation technique is important task. Selecting an appropriate Requirement Elicitation Technique depends on many factors. These techniques are used to maintain a continuous interaction with customer so as to ensure that changing requirements and changing priorities in requirement are considered. In Practice an Analyst chooses a particular Elicitation technique due to following 4 reasons(Goguen & Linde, 1993)

1. It is the only technique the analyst knows
2. It is his favorite technique for all situations
3. Analyst follows same methodology for developing the software every time because of which the same elicitation technique is being used
4. Analyst in most of the cases use a requirement Elicitation technique based on his intuition.

Same Requirement Elicitation Techniques cannot be applied for every project because there are different factors involved in deciding the Requirement Elicitation technique. Particularly it is important whether the project is of Agile nature or traditional nature (Waterfall). Our focus of research is restricted to agile projects.

There are different types in Agile Methodology. Each type requires different Requirement Elicitation technique. As agile methodology is a new way of developing the software, there is no standard method for Agile Methodology.

This research was inspired by primary drivers:

1) Agile Methodology is a new approach of developing software and there is no standard method of Eliciting Requirement

2) There is possibility for researchers to propose an Elicitation technique for a given Agile Methodology.

Below model indicates different factors for choosing appropriate Requirement Elicitation technique for Agile projects.

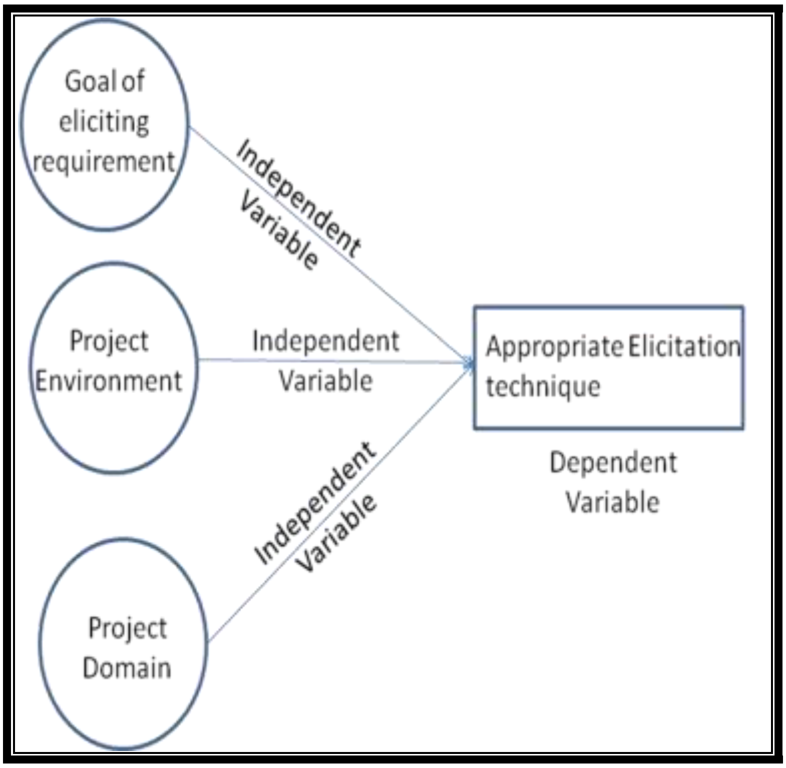


Figure 1

Figure 1 states relationship between Dependent and Independent Variable.

There can be sub-factors to Goal of Eliciting requirement, Project Environment, and Project Domain as below(Ayalew, 2006)

Goal of Eliciting Requirement	Project Environment	Project Domain
Identification of organizational context	Stakeholder size	User Groups involved in project
Identification of boundaries	Purpose of the project (existing or new project, mission critical project)	
Identification of features of a system	Analyst and Client relationship	
Detail investigation of a given feature	Experience of Analyst	
Identification of rationales for Requirements	Documentation culture of client organization	
Clarification of uncertainty	Availability of key stakeholders	
Requirement conflict resolution	User expressiveness	
Ambiguities in Requirements	Computer skill levels of users	
	Degree of project schedule constraints	
	Degree of financial constraints	
	Availability of communication technology	
	Availability of reusable Requirement	
	Availability of information resources	

Conclusion:

The aim of the study is to find how popular and prevalent agile practices are. The study also aims at bringing out different factors which influences the agile project. The result of this research indicates that Goal of Eliciting requirement, Project Environment, and Project Domain are the different factors involved in choosing Requirement Elicitation Technique for Agile Methodology.

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