# THE RASHOMON EFFECT ON SOFTWARE DEVELOPMENT REQUIREMENT GATHERING PROCESS

## I de Silva[1], BMTN Rathnayaka, and M Wickramatunga

Department of Information Technology, Southern Campus,
General Sir John Kotelawala Defence University of Sri Lanka

*[1]gifindgif@gmail.com*

**Abstract**- A software project, whatever the size must go through defined stages which known as the Software Development Lifecycle (SDLC). Among five phases of the SDLC the first phase: Requirement Definition needs certain technique to gather requirements and identify functional and non-functional specifications. When conducting a requirement gathering method naturally occurs conflicts. The cause for the conflicts can define as: in single occurrence can be found multiple ideas with different viewpoints. Likely this situation can be called as Rashomon effect. By discussing what are the conflicts occurs when conducting a requirement gathering technique and how Rashomon Effect play on these identified problems, through this paper will discuss about effect and the relationship between Software Development Requirement Gathering Process and Rashomon Effect. Finally, this paper concludes that how to overcome the Rashomon Effect in Software Development Requirement Gathering Process.

**Keywords–** Rashomon Effect, Requirement gathering process, Interview

## I. INTRODUCTION

The Rashomon effect has been defined by Robert Anderson as "the naming of an epistemological framework—or ways of thinking, knowing, and remembering — required for understanding the complex and ambiguous moments" [1] When considering Software requirement gathering, there are different techniques such as; Interviews (one-to-one or group), workshops, Questionnaires, Observation, Feasibility study, Surveys, Document Reviews, Use cases, Prototyping, Current system documentation, Requirements gathering tools like Axia's RFI/RFP Templates, JRD (Joint Requirements Development), Brainstorming. Among mentioned requirement gathering methods here chosen the easiest yet most powerful technique; Interview, because

Interview is a technique which several people will attend to the same event for a certain task. So, the response to the questions asked may be differ from each other. So, the Rashomon effect can be clearly identified.

## II. SOFTWARE REQUIREMENT GATHERING PROCESS

This is the main technique used to collect requirements from the end users of a certain system. This is done between the system analyst and the end users of the system. A document which is prepared in technical language be get as the final output. This is one of the most important document which is used by the software development team in any kind of a company. This explains about the main features and the functionalities as functional and non-functional requirements of the system. Simply all the requirements and the expectations of the end user about the system is mentioned through this. Clear communication is the most important thing during this process. Lack of communication may occur misunderstanding between the analysts and the end users. And that will affect to the final output of the system.

Document which is made by gathering the requirements from the user is called as Software Requirement

Specification. Although the document is finally written in a technical language, first the communication is happening with the use of natural language between the analyst and the stakeholder because that will be easy for the understanding of the end user as they may be not very much familiar with the technical languages. The stakeholder should clearly explain their requirements with the analysts as it will affect to the final output of the system. And the requirement explanation on both software and hardware separately is very important.

Software Requirements are mainly two types as Functional and Non- functional. Functional requirements are known as the main functionalities which is in a system and how the system should mainly act through the process. "Functional requirements are the interactions between the system and its environment independent from implementation. Sometime functional requirements are also stated as system constraints (Lauesen, 2002)" [6] These are the main functions which should be accomplished by the system. Non- functional requirements are known as the characteristics of the system which can be used to have a judgement regarding the system. "These requirements define system properties like reliability of the system, response time and storage requirements" [6] This will show the quality of the system to the users.

## III. RASHOMON EFFECT

The Rashomon effect occurs when the same event is given contradictory interpretations by different individuals involved in that sense Rashomon effect can be simply defined as a how a group of people react to the same incident in a different way. The reaction of them differ from one to another in the very same incident. This effect was introduced by the movie 'Rashomon' directed by Akira Kurosawa in 1950 and the plot based on a short story named "In a Grove" by Ryunosuke Akutagawa.

Under this observation of any incident is different from each other. This will happen mainly because of different reasons. Absence of proper evidences regarding a certain thing or incident will occur this. Because of lack of the evidences the people related to that incident may have different perspectives regarding that.

The incident, people involved, place, time are in the same event but the story which each participant involved are telling is completely different from each other. There is no connection with story among themselves. Everyone tries to make their own story highlighted among the rest of others. Even if the same story narrated the confessions are differ one to another. This event occurs because of human's multiple ideas with different viewpoints.

## IV. WILL RASHOMON EFFECT PLAY ON SOFTWARE REQUIREMENT GATHERING?

As mentioned above in this paper mainly focused on the requirement gathering technique 'Interviews'. Interview is a conversation between more than two people which is happening in an organized way. Most of the time it will happen under a fixed date, time and place. The number of people who are participating to the interview depends on the situation and purpose. The very first thing you have consider before conducting the interview is to identify the nature of the clients which you are going to deal with. The whole other part of the interview depends on that. As a requirement analyst that is a must before the interview.

There are different ways in which the Rashomon effect will play on Interviews when using as a requirement gathering technique.

The pressure given by the society to that incident may also have a lead to this. This is mainly based on the psychological view of the participant. Because everyone cares about how the society look at you in different kind of situations. So, the desires of them may change from one to another with the society they live. Sometimes people avoid telling the truth because of the control and the limits made by the society. That limits may come from their social status, company policies and legal backgrounds or even by the traditional aspects. And if all the participants of that incident want to make themselves to be highlighted they will have different kind of attitude regarding that incident. They will say whatever they want to make themselves important among the rest of participants. This can be identified mainly in lots of companies as many of the employees try to make themselves highlighted among the others and they try to make lots of points to get the attention of the rest. By that the facts they present may be wrong also. Some are trying just to make themselves important and highlighted among others, not to tell the truth.

Interest level on a certain incident may also be a reason for this. The interest level of something can change the content of the whole story. If we have a good interest on the situation the facts, we present to the others are most probably positive. But if we don't have a good intention towards that situation we will not give a good care of what we talk. The facts may be correct or incorrect. Imagine there is an interview with a group of employees, sometimes the information given by them is not what we expected and not much related with the questions asked. So, this may occur because of the lack of interest on that certain topic. And also, some may have a very good intention with this. This all depends on the interest level of the participants.

Lack of communication may also influence on this. One of the main thing that should be clear and confident during an interview is communication. If there is no good communication between the people who participate in the interview problems may arise. If the questions asked were not clear enough the receiver is unable to answer the question in a better way. So that the clients will not give a proper response as they did not get the question in a clear way. Sometimes the answer may not be related to the question and problems may occur. Different participants may answer to the questions asked in a totally different way as they have different communication skills.

Poor communication skills will also have a relation to this. If the participants have no proper communication skills to communicate among them the whole story will be different from each other. The language is very important. All the participants in that communication process should be familiar to a certain language. Both parties should use a language which they are comfortable with. Otherwise the communication may not be successful. And if there is a group of people who can't understand the way they talk with each other the message given through the process is not understandable. So, the communication skill is very much important to get a certain idea without any obstacle.

For an example sometimes after the first interview development team may provide a document which mentioned the requirements given by the client and they will say that mentioned requirements are not the expected and required once. The root of such an incident can be a poor communication.

Mental and physical condition in that moment will also have an effect on this. If the participants of the interview are not in a good mental health at that instance, they will not express the ideas in a better way. Sometimes they will be not in a mood to express their ideas, but they have to do it anyhow because of the rules and regulations of the company. And also, the participants should be physically fit to express the ideas. Otherwise it will badly affect to the whole communication process.

In some interviews the interviewer (narrator) tries to highlight themselves saying the high position of their company, previous and ongoing success projects, how do they complete projects. Those details are not necessary for the interviewee (Client/ End user) because they have come to give a project get done and before coming they already search the basic background information about the company. Giving unnecessary information may lead to boredom of interviewee. In this situation they also do not expose themselves and naturally skip explaining requirements from their viewpoint.

## V. POSSIBLE PROBLEMS OCCUR IN AN INTERVIEW AND HOW TO AVOID THEM

Using Observation method, gathered the possible problems occur in an interview and through them figured the possible methods to avoid them. For the observations made, we used some interviews which we had for the requirement gathering process in some of our projects that we have done. To make observations created a constitute interview to gather information to build an Online Leave management system and Online Booking System for KDU Staff Accommodation for KDU Southern. The software development team were act as interviewers and said to gather information needed through interview. Randomly chosen interviewees who directly have connection with the manual leave management system and the staff accommodation booking system were interviewed under different environments and predefined facts (ex: interviewers talking about development team's achievements and capacity to do this work, hold interviews in heavy rainy or humidity environment, use patterns to recognize interviewees who have phobias in patterns) which are directly affects to the software gathering process. As the interviews were done under different people and different situations, the observations done simultaneously when conducting these interviews and figured following problems and by doing discussion with development team got the possible methods to avoid them.

### A. Conflicting Requirements

These requirements received from group of end users/ stakeholders or from one stakeholder at different times. Requirements become problematic because they are not match each other. For an example if one stakeholder requires a simple UI and another requires fancy UI. In such cases occurs conflicted requirements and software development team cannot take a straight decision on the problem. This fact clearly effects on identifying Functional and Non- functional requirements of requested system.

Business Analyst can get all stakeholders in the same room and hold a group interview to gather requirements and show them documented requirements in front of them. Then development team can gather requirements without conflictions.

### B. Understand the Requirements

Many stakeholders think that they understand the requirements and they said them clearly to the team. But when conducting actual interview, they do not present actual requirements and them self's they do not understand what they need. This lack of understand of the requirements brings problematic moment to the software development team. In other hand if development team did not get the clear idea in requirements result in they will develop a failure system.

The Business Analyst can say to stakeholders list out their requirements before the interview and if there are not clear parts in requirements development team should question them and clear the doubts.

### C. Culture and Geographical Area Differences

When conducting interview among different culture and geographical area stakeholders they might be not expose very well to the development team and not say their actual requirements because of the culture, norms or ethics barriers on their own or they ask not matching retirements to be done to the system. Also, some companies may have their own cultures and policies which will limit the exposure to the event. Business Analyst should do a company background checkup before the interview and make sure without violating issues make questioner accordingly.

### D. Infinity of Choice

Some stakeholders may present many choices and give hard time to decide what option to select. There might be high percentage of missing important requirements because of the many choices presented and cannot identify the true options needed. These missing facts can affect to the whole system developing process and at the same time less satisfaction to the same stakeholders and decision makers.

A Business Analyst can give limitations to choices and do not give more options to choose.

### E. Unclear Feedback

Not having clear understanding of asked questions in interview leads stakeholder to give unclear feedback and they may change their feedback time to time. Result in development team cannot think of options should add to system and decision makers cannot make decisions upon unclear feedback.

This shortcoming can cause because of two parties. One is the development team who make interview questions and those questions may be unclear. The other party is the stakeholder who does not pay attention or not having proper understanding of his own subject area.

As a solution, can suggest that firstly development team need to check out their interview question's clearness and are they directly relate to the particular subject being use in software project. Then they can give an event coverage and inform interviewee to prepare themselves according to the subject. Also, team should select right person to interview. For an example a company needs an automated account system and team should interview people from that department not from HR department even if some of them have known the processes of accounts department.

### F. Cliques, Groups and Friendships

Tightly coupled group of individuals or friends may not give requirements properly. Considering a clique or a group they will change their opinions, choices occasionally because of non-stabilized behavior or let arise personal tastes and cause conflicts in information provided. Furthermore, there can be group of stakeholders with sub groups under one company.

Suppose that there is this interviewee group consisting six members; two from HR, two from finance and two from accounts. If HR and finance members are foes each other, they will not communicate each other well even if it is a business-related event. They will surely give different requirements for needed system.

In other hand if they are friends someone with development team they will not take it as a serious task and go out of the topic or think can present whatever they want, change requirements timely and finally development team will filter, wrap up things for them. These above-mentioned facts clearly show giving different ideas for same event.

To minimize this problem development team can observe the situation and say for groups or cliques to pay attention to the business not the personal tastes, ego. In friendship, clear them the idea that works, and friendships are two different things and convince them to give full support to the project in a professional manner.

### G. Participation of unlimited number of stakeholders will cause an information overload

When a huge number of clients are participated for the interview, there will be a real mess. So much of people is hard to control. If there are a huge number of participants most of them are not even related to that subject. So that will be a disturbance for the whole process. When there is an unlimited number of stakeholders present in the interview unwanted details and information is presented all the time. And also, some people may not have enough time to express their ideas within the given period of time. That may cause arguments among the participants. Some may express their own ideas which are not even related to the interview. Some may express more than enough. So, the main requirements presented by the stakeholders may hide because of this. The main points which should be highlighted are going down because of the information overflow. Information overflow means the difficulty of understanding the real matters because of the excess of information regarding a certain thing. So, the information overflow may cause bad results in an interview. Because the requirements cannot be clearly identified because of that. When the number of participants in an interview is high both necessary and unnecessary information is collected together. And then an information overload is occurred. So, the requirements cannot be identified clearly among all of them.

As the solution for this problem the number of participants should be limited in an interview. Before the interview is going to hold the clients should be informed about the number of participants that can attend the interview and that will reduce the rush during the interview. And also, the stakeholders should be previously informed about the time period which each of them will get during the interview. That will help not to make any arguments within the interview. When the time duration is previously mentioned the stakeholders can get ready to present the requirements of them within that certain period of time. And also, there may some situations where the interview is included with a huge number of clients with the nature of the interview. So, in such cases, time management is very much important. Everyone should consider more about how much time that they will get during the interview. They should manage the time very carefully. And also, the participants should not be afraid to get the assistance from the people who have effective communication skills.

### H. Some people may appear even if the situation is not related to them.

This can be mainly identified in the situations where an interview is holding with the participation of clients in different fields. In this kind of situation some people are trying to express their ideas other than in their own field. As an example, if the situation is gathering of requirements from the HR department, the stakeholders which present the requirements at that moment should be from the HR department. But there are some instances where some people trying to interfere other fields when presenting the requirements. There are instances where the clients in the HR department is presenting their requirements and in the same time some participants from the Accounting department also express their ideas during that. That is a huge disturbance for the clients in the HR department because within that time period they are unable to express their requirements. Even though that time period is not related to them some people try to interfere and express the ideas in other fields. When this kind of situation appears, each field may unable to present their requirements with the given period of time. In this kind of situation some people might say 'this is not my area, but this is how it works'. Even the related clients are available some people try to make their own decisions and that will cause arguments within them. So, this kind of situation will badly affect to find the correct requirements in the relevant field.

As the solution for this problem, the interviews must hold separately with each field at one time. Otherwise some conflicts may arise. If the interview is happening with the participation of the stakeholders from the same field, that can avoid the problems, arguments and the misunderstanding which will arise within them.

### I. Feedback from the client may change with environment, time and personal problems

The place where the interview is going to happen is very important because the comfortableness in that environment will lead to a good communication among the participants. But if that environment is not ready to a communication process, a lot of problems may occur. If the environment is too hot or cold that may cause the participants in a bad way. They may not focus in the interview as the environmental condition is bad. And if the environment is too noisy that may also affect to the communication process. If there are problems in the background of where the interview is holding the questions asked and the answers given may not be much clear. If the participants are not satisfied with the environment that they are in, they may not try to give a proper feedback for the questions asked. And the time which the interview is going to happen is also important because different people are comfortable with different time periods. So, if the time is bad the clients may not act to in a better way or may not give a proper feedback. And there may cause another problem. If the clients are running with their own personal problem at that moment, they are not ready for the interview. They may no present their needed requirements clearly because of that. They may physically present in the interview, but they are not mentally ready for the interview. And that will badly affect for the success of the interview. So, the expected results may not come from the participants. So, the whole process and the time will be wasted.

As the solution to this problem the ones who organize the interview should previously consider about the condition of the place where the interview is going to happen. They should choose a place which will be comfortable to anyone. And also, when selecting the clients who are going to participate, they should be informed earlier about the place and the nature of the interview. So, if the participants may not ready with those conditions should be replaced. And also, the participants with bad health and mental condition at that right moment should not attend to the interview. Everyone who are going to attend

to the interview should be well informed and ready for the flow of the interview. Sometimes the clients with special needs within that time may appear in the interview. So, the environment must be ready for them too. And also, if any client need any special requirement or have any hardships also should inform to the organizers earlier.

### J. Communication Problems

Communication problems are the most critical problem in interviews. This includes: miscommunication, language barriers, wrong assumptions, unclearly defined vocabulary, notation differences. Also, poor communication skills give unclear and ambiguous requirements.

1) Language barriers causes Miscommunication: Unclearly defined vocabulary, subject related words, use of technical words, use of different languages will lead occurrence of misunderstanding and through that stakeholders will do miscommunication.

   Minimizing use of subject, technical words and define vocabulary before interview may help to reduce language barrier in interview.

2) wrong assumptions: Stakeholder's lack of understanding in needed requirements will cause expressing wrong assumptions.

3) Environmental issues: Environmental issues such as noise: conducting an interview in machinery factory or other noisy place or time. And also, other unenviable fact is weather conditions. For an example have to conduct an interview in heavy rainy day, room is not having great sound blocking environment may cause misunderstanding and at the same time miscommunication because cannot hear clearly through the background sounds. Some mental or phycological issues also affect to the communication under the environment. For an example some phobias in patterns: if the environment or room has strips or circles then the interviewee has a phobia in patterns he or she may not give proper response to the questions. Same situation occurs when interviewee do not like some certain colors and the environment have them. These facts will distract the attention of the event.

   As a solution Business Analyst can do an environmental checkup whether the place is suitable for an interview or not, if interviewee have a phobia

what is it and find comfortable place to conduct the interview and last but not the least make sure to stay alert on weather forecasting. If weather is not good for interview the alternative solution is not to postpone the interview but to find better place which reduce the weather barriers.

### K. Expressing of requirements may change with the managerial level

There are different types of managements in any company who are participating in an interview. The way employees express their requirements change with their management level. When we talk about the high-level management, they are in the superior level of the company. They are the ones who consider more about the fame in their company. Because of that, under some situations they avoid expressing the real requirements to the business analysts. That is because of some reasons. One reason is they have some privacy issues within the company and avoid giving the sensitive data to the outsiders. Because that may cause bad security issues to them. Sometimes the high-level management is not ready to put their company into a lower level by presenting some needed requirements because that shows the company came up to this level without those facilities up to now. That will decrease the demand of the company. So, they avoid revealing the real nature of their needed requirements. That is not a good fact within an interview. And when we talk about the middle and the lower level employees, they do not consider much about the privacy policies of the company as the high-level management. So, they are expressing their requirements very freely and sometimes they exceed their limits. And that will affect badly for the policies in their company. They will give unnecessary information and the requirements may be difficult to identify clearly. So, when the management level changes with their positions, the way they express the requirements about the same thing may be changed.

As the solution for this the interview in a same company should not be done according to different levels of positions. A group should be made with the combination of all levels of employees as the stakeholders. So that will avoid the hiding of some requirements and also the expressing excess information. All the requirements will be presented to a right scale. As every level of positions are included as the clients the requirements can be clearly identified with them. And also, when the stakeholders are selected only within the high-level management some

requirements will not appear within them as the low level and middle level employees are the ones who work and move much with the working process of the companies. So, having a combined group with different working levels are very much important when presenting the requirements in an interview.

### L. Bad Requirements

Requirements are becoming bad when they are: incomplete, ambiguous, cannot verify. This may lead to an incomplete system. Using a checklist of requirements, their characteristics and test each one of them to ensure all the requirements are good enough to get into work.

## VI. CONCLUSION

This paper described the Rashomon effect, Software Requirement Gathering Process and the connection between them. Finally, through findings concluded the consequences of Rashomon effect on interview as a software gathering technique and describe how to overcome the problems occurred.

## ACKNOWLEDGMENT

## REFERENCES

Anderson, Robert, "The Rashomon Effect and Communication", Canadian Journal of Communication, Simon Fraser University, Vancouver Canada, 2016. (41(2)): 250–265

Wendy D. Roth and Jal D. Mehta, "The Rashomon Effect: Combining Positivist and Interpretive Approaches in the Analysis of Contested Events", Department of Sociology and Social Policy Harvard University, Sociological Methods and Research, 2002. 31(2):131-173.

Makinster David (2015). A Preface to Rashomon. [Online] Available at: https://www.youtube.com/watch?v=0vVETFktVNQ [Accessed 20 April 2018]

Gordon Briggs (2012). Rashomon in 9 Minutes. [Online] Available at: https://www.youtube.com/watch?v=BP2MhghDal4 [Accessed 22 April 2018]

Shaen McMurtrie (2016). The Rashomon Effect. [Online] Available at: https://www.youtube.com/watch?v=m0ySnhiI1hw [Accessed 22 April 2018]

Umar Sajjad, Muhammad Qaisar Hanif, "Issues and Challenges of Requirement Elicitation in Large Web Projects", Master Thesis Computer Science, School of Computing Blekinge Institute of Technology, Sweden, January 2010