Advance Topics in Software Engineering

Topic: Requirement Elicitation Techniques

Case Study:

Online Vehicle Trading

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Abstract:

Requirement Elicitation is very beneficial in developing any new application. Most of systems fail just because of wrong elicitation practice. Without the elicitation techniques it is impossible to find out requirements and the needs of the developing system. It provides base to the developer to construct a structure of proposed system keeping in view the wish list of stake holders. This research paper is based on understanding elicitation techniques and their usage in real time applications, by implementing the Elicitation techniques for knowing the needs of stakeholder so that system developer can get clear view of requirement for the developing system. Moreover this research paper covers the gap between knowing the elicitation techniques and how to use them.

Keywords:

Elicitation Techniques, Online Trading, Vehicles, Stakeholders
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1-Introduction

An introduction is basically a briefing about what we are doing, what is purpose of our research and what tools and techniques we are using, what is our aim and what are targets and limitations of our research. It is a summary of whole research which will give description about our objectives.

1.1-What is Requirement Elicitation

Requirements elicitation is recognized as the first stage in many requirements engineering (RE) process definitions.

“The success of the requirements elicitation activity gives high impact on the achievement of the goals set for RE, which leads to the development of correct application. Hence, the development of any application is indispensable from incorporating good practices of requirements elicitation. Infact the consideration has an impact to the usability of the application”[1].

“Requirements elicitation is defined as a process to understand a problem and its application domain. The problem and the application domain are given in a form of statement of organizational needs and other inputs from various different sources to establish user requirements. The goal of requirements elicitation is to identify as many requirements as possible as to enable alternates to be presented for the stated problem. This activity will define initial input statements of desired functions and features that the user expresses in some way, usually referred to as requirements. These requirements may not be complete and may be expressed in a vague and unstructured way. However, they will be written in a user requirements document (URD) as the output of the requirements elicitation activity”[1].

![Figure 1](image-url)“Process of requirement Engineering"

1.2-What are Elicitation Techniques

“Requirements elicitation techniques are the means by which systems analysts determine the problems, opportunities, and needs of the customers, so that systems developer can construct systems that actually resolve those problems, leverage those opportunities, and/or address customers’ needs” [2]. Elicitation techniques are tools of finding & exact understanding. The goal of Elicitation technique is to find out as many problems as possible so that it could become easier for stake holder to get the best suitable application according to the requirements. Requirements can be derived by interacting with stakeholder and other resources. The process should be in this way that it should represent all the thought and requirements of stakeholder and all those involve in system and it could only be done by adopting the elicitation techniques which is a difficult and intensive task. Requirements elicitation is performed by analysts (also known as systems analysts, requirements engineers, and requirements analysts) using elicitation techniques. In 1996, Capers Jones estimated that there would be approximately 12 million software developers worldwide by 1998. Assuming 5% growth per year, and assuming that 1 out of every 15 developers is an analyst, there were approximately 1 million practicing analysts in 2003; so it is clear that there are many potential users of requirements elicitation techniques. To better understand elicitation techniques, and why they are so
important to product success, in response to a less-than-acceptable rate of failure of systems, hundreds of elicitation techniques have been created by researchers. But the majority of these techniques are rarely, if ever, used by practitioners [2].

1.3-What are we doing with ET

Main purpose is implementing elicitation technique to find out the problems in a system which is in developing stage. For this a domain chosen is an online trading system of vehicles which is new concept in some of under developing countries. The reason for chosen domain is that we want to go into the system and find out what sort of problems faced by stakeholders’ by using elicitation techniques. The system currently used by the stakeholders is manual and it is requirement of stakeholders to convert it into online vehicle trading system. Because of a new concept of online trading of vehicles there are many points of objection and uncertainties in stakeholders mind. What we are going to do is to find out the needs and requirements of stakeholders and this will be done by using elicitation techniques. Some time it’s hard to extract all the problems from one resource. To get the maximum output of requirement, we will get information from other companies and organizations who are already working with online vehicle trading system. We will use some of elicitation tools to find out requirements of an under developing system according to wish list of stakeholders.

1.4-Introduction to problems

Most of people are unaware of the concept of online trading of vehicles in some of underdeveloped countries. New means of auto finance and leasing services have been introduced in the market which makes it easier for customer to buy vehicles for private and commercial use. The company with which we are going to work is in Pakistan and is engaged in auto dealing business for last 15 years. It has very good reputation in the market. Company is situated in a metropolitan city and because of this the business is expanding rapidly. A large number of customers and other auto dealers have to keep in touch continuously with the company on daily basis for usual business routine. Secondly the ratio of vehicle trading is growing and it make difficult for the company to give equal response to each at every customer.

Analyzing this owner of company is interested in making online platform where they provide best services to their customers and other auto dealers. Customers can contact the company while sitting at home or office without the any prior appointment and can check the market price and all the latest updates regarding auto industry. The owner of the company want to increase his number of customers and interested in adopting new marketing policy which could possibly help to generate more revenue as well.

1.5-Aim

Our aim is to work in field of requirement engineering with emphasis on elicitation techniques. For this purpose we are using a domain in which we will search out the need and problems which could possibly come in the way of implementing online trading system of vehicles. We are finding out the trading styles of people which they are currently using and how can they get better services with a new online trading system. We are finding out the demands of stakeholders and how an analyst gets the clear vision about the needs and demands of stakeholders.

There are many stages involve in making a system from elicitation requirements to system deployment. In this research we are going to work with elicitation techniques only and after finding the requirement and need of stakeholders they will be forwarded to next stage for more practical work on that. We will explain about most universally used elicitation techniques, how they are used and how can analysts or developers get the best possible result by using appropriate elicitation techniques.

1.6-Target

In this research report, elicitation techniques have been discussed with practical implementation of them. For real time implementation, an example of online trading system has chosen which is in developing stage.

1.7-Limitations

Report’s focal points are elicitation techniques and their real time implementation, problems faced by analyst during implementing these techniques, collection of information and how to extract problems from the provided information. Among the verity of elicitation techniques only those have been selected and discussed in detail which is implemented in case study except prototype. Because of an important elicitation technique prototype has been discussed but not implemented in the case study because other techniques use in case study which fulfils all the requirements. According to Soren Lauesen book, Software requirement, style and techniques page 331 “Choose the one that serve the purpose in the specific project. If two techniques serve the same purpose and you have little time, choose the less expensive one”.

1.8-Layout of thesis

The first section of thesis contain basic introduction of elicitation requirements and elicitation techniques, the domain used in this case, what are the problems, what is aim of this research, what target group it covers and in the last its limitations.

Second section consists of methodologies. What are methodologies, what methodologies will be used in elicitation requirements, interviews, questions asked in interview and their outcome, questioners and there result, observation and what was observed from that, documentation and its analysis and in the end result of methodologies used.

Third Section is about empirical research. In this section we will work on the techniques which we have used in our research. These include interview, questionnaires, observation, document analysis, studying similar companies.

Fourth Section is analysis of result obtained after the implementation of elicitation techniques.

Fifth Section consists of conclusion.

Sixth Section contains references.

Seventh Section is appendix.

2-Methodologies

In this section those methods are discussed which are used in finding the elicitation requirements. These methods are elicitation techniques which are used in present circumstances to find out the needs of stake holder. These elicitation techniques are than discussed on by one.

2.1-What are Elicitation Methodologies

Methodology is a process of reaching the goals which are set up for the study and achieving the objectives. In methodology, the information helps the researchers to approach the results and it also helps other researcher to get benefit from experiences of your research. There are many method which can be used for gathering information that how the current system is running, how it can be improve and how can we reach to the exact problems.

2.2- Types of Elicitation Techniques

There are different ways to get the required information and approach problem. One is direct approach, second is indirect approach. First one classifies the methods by whom we interact with the domain expert and second one classifies them by what type of information is obtained.

2.3- Direct Approach: In direct approach the purpose is to enhance the understanding of the problems of system that is currently in used. Most common techniques used are Interviews, case study, Prototyping. With these tools a comprehensive
and comprehensive analysis of total procedure can be done. In this loom it is good to get the more knowledge about system and genuine data. In order for these methods to be victorious, the domain expert has to be reasonably coherent and willing to share information [3].

2.4- Indirect Approach: Indirect methods are used in order to obtain information that cannot be easily articulated directly. Questioners, documents analysis are its examples. Important thing in this approach is, how thing are clarify by using figures and statistics. In it a large quantity of data can be gathering from analyzing the documents. The results acquire from this type of investigation are easy to measure and an applicable test suggestion can be driven from them [17].

2.5- Methods by Interaction Type [3]

Table No. 1  Methods by Interaction Type. Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Ser. No.</th>
<th>Category</th>
<th>Example</th>
<th>Type</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interview</td>
<td>Structured, Unstructured, Sami structures</td>
<td>Direct</td>
<td>Varies depending on questions asked</td>
</tr>
<tr>
<td>2</td>
<td>Case Study</td>
<td>Critical Incident Method Forward Scenario Simulation Critical Decision Method</td>
<td>Direct</td>
<td>Procedures followed, rationale</td>
</tr>
<tr>
<td>3</td>
<td>Protocols</td>
<td>Protocol Analysis Wizard of Oz</td>
<td>Direct</td>
<td>Procedures followed</td>
</tr>
<tr>
<td>4</td>
<td>Critiquing</td>
<td>Critiquing</td>
<td>Direct</td>
<td>Evaluation of problem solving strategy compared to alternatives</td>
</tr>
<tr>
<td>5</td>
<td>Role Playing</td>
<td>Role Playing</td>
<td>Indirect</td>
<td>Procedures, difficulties encountered due to role</td>
</tr>
<tr>
<td>6</td>
<td>Simulation</td>
<td>Simulation Wizard of Oz</td>
<td>Direct</td>
<td>Procedures followed</td>
</tr>
<tr>
<td>7</td>
<td>Prototyping</td>
<td>Rapid Prototyping Storyboarding</td>
<td>Direct</td>
<td>Evaluation of proposed approach</td>
</tr>
<tr>
<td>8</td>
<td>Teachback</td>
<td>Teachback</td>
<td>Direct</td>
<td>Correction of Misconceptions</td>
</tr>
<tr>
<td>9</td>
<td>Observation</td>
<td>Observation</td>
<td></td>
<td>Procedure followed</td>
</tr>
<tr>
<td>10</td>
<td>Goal Related</td>
<td>Goal Decomposition Dividing the Domain</td>
<td>Direct</td>
<td>Goals and subgoals, groupings of goals</td>
</tr>
<tr>
<td>11</td>
<td>List Related</td>
<td>Decision Analysis</td>
<td>Direct</td>
<td>Estimate of worth of all decisions for a task</td>
</tr>
<tr>
<td>12</td>
<td>Construct Elicitation</td>
<td>Repertory Grid Multi-dimensional Scaling</td>
<td>Indirect</td>
<td>Entities, attributes, sometimes relationships</td>
</tr>
<tr>
<td>13</td>
<td>Sorting</td>
<td>Card Sorting Multi-dimensional Scaling</td>
<td>Indirect</td>
<td>Classification of entities (dimension chosen by subject)</td>
</tr>
<tr>
<td>14</td>
<td>Laddering</td>
<td>Laddered Grid</td>
<td>Indirect</td>
<td>Hierarchical map of the task domain</td>
</tr>
<tr>
<td>15</td>
<td>Questions</td>
<td>Questions</td>
<td>Indirect</td>
<td>Information used to solve problems, organization of problem space</td>
</tr>
<tr>
<td>16</td>
<td>Document Analysis</td>
<td>Document Analysis (usually)</td>
<td>Indirect</td>
<td>Varies depending on available documents, interaction with experts</td>
</tr>
<tr>
<td>17</td>
<td>Study similar companies</td>
<td>Process checking</td>
<td>Indirect</td>
<td>Get knowledge form similar companies atmosphere</td>
</tr>
<tr>
<td>18</td>
<td>Brain</td>
<td>Get together meeting of all</td>
<td>Direct</td>
<td>Ideas, information and requirements form</td>
</tr>
</tbody>
</table>
2.6- Methods by Knowledge Type Obtained

“Besides being grouped into direct and indirect categories, KE methods can also be grouped (to some extent) by the type of knowledge obtained. For example, many of the indirect KE methods are best at obtaining classification knowledge while direct methods are more suited for obtaining procedural knowledge. This does not, however, mean that the techniques cannot be used for other knowledge types. Some designers may not be able to directly express how they perform a design task; it might be useful to use an indirect method in conjunction with a direct method to obtain this information” [3].

Information types used here are:
- Procedures
- Problem solving strategy/Rationale
- Goals, sub-goals
- Classification
- Relationships
- Evaluation

Many methods fit into more than one category and are listed more than once. Also, this classification shows the information most commonly extracted using a method and does not imply that only that type of information can be elicited [3].

Table No. 2 Methods by Knowledge Type Obtained Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Ser No.</th>
<th>Categories</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Procedures</td>
<td>Procedures are methods that can be used to determine the steps followed to complete a task. They can be done by interviews, Concept Mapping, Interruption Analysis, Problem discussion, Tutorial interview etc.</td>
</tr>
<tr>
<td>2</td>
<td>Problem solving strategy/Rationale</td>
<td>These methods attempt to determine how the expert makes their decisions. Like interviews, critiquing, On-site observation etc.</td>
</tr>
<tr>
<td>3</td>
<td>Goals, sub-goals</td>
<td>These are methods that are concerned with extracting the goals and subgoals for performing the task. These methods are listed separately from procedures since ordering is not necessarily provided. Examples are Task action mapping, Distinguishing goals</td>
</tr>
<tr>
<td>4</td>
<td>Classification</td>
<td>These methods are used to classify entities within a domain. E.g. Data flow modelling, Object oriented modelling</td>
</tr>
<tr>
<td>5</td>
<td>Relationships</td>
<td>Methods that obtain relationships between domain entities. Examples Questionnaire, Object oriented modelling</td>
</tr>
<tr>
<td>6</td>
<td>Evaluation</td>
<td>Examples are teachback, System examination, System validation, Decision analysis</td>
</tr>
</tbody>
</table>

3-Requirements Elicitation Technique Selection

“Requirements elicitation is generally performed using elicitation techniques. Many such methodologies and techniques exist, all with the common aim to assist analysts in understanding needs. Although some of the analysts think that just one methodology or just one technique is applicable to all situations, one methodology or technique cannot possibly be sufficient for all conditions. Analysts select a particular elicitation technique for any combination of four reasons:

(1) It is the only technique that the analyst knows.
(2) It is the analyst's favourite technique for all situations.
(3) The analyst is following some explicit methodology and that methodology prescribes a particular technique at the current time.
(4) The analyst understands intuitively that the technique is effective in the current circumstance. Clearly the fourth reason demonstrates the most "Maturity" by the analyst. A hypothesis show that such maturity leads to improved understanding of stakeholders’ needs, and thus a higher likelihood that a resulting system will satisfy those needs. Unfortunately, most
practicing analysts do not have the insight necessary to make such an informed decision, and therefore rely on one of the first three reasons” [4].

“Many requirements problems are due to poor requirements elicitation, including the resulting requirements being ambiguous, incomplete, not verifiable, inconsistent, irrelevant, and not correct because they do not reflect the stakeholders’ needs and objectives. These problems stem from issues of scope, communication, and requirements volatility. There are elicitation techniques which address some of these issues. However, no technique is comprehensive enough to adequately cover all of these issues in detail. Rather than advocating one technique over the others, a better approach to requirements elicitation is to synthesize the various methods and techniques into a methodology, which then can be instantiated based upon a target system’s attributes” [5].

3.1- Techniques used in the report

In online trading system we have used both direct and indirect techniques to find out the entire requirement and for gathering all the possible information which could be suitable for making new system. Some of the selected elicitation techniques which are used in this research are as follows, List of these techniques is give below

3.2- Interview

“Interviewing consists of asking the domain expert questions about the domain of interest and how they perform their tasks. Interviews can be unstructured, semi-structured, or structured. The success of an interview session is dependent on the questions asked (it is difficult to know which questions should be asked, particularly if the interviewer is not familiar with the domain) and the ability of the expert to articulate their knowledge. The expert may not remember exactly how they perform a task, especially if it is one that they perform automatically”. Some interview methods are used to build a particular type of model of the task. The model is built by the knowledge engineer based on information obtained during the interview and then reviewed with the domain expert. In some cases, the models can be built interactively with the expert, especially if there are software tools available for model creation” [3]. Table 3 shows a list of interview methods.

Table No. 3-Interview Methods Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Method</th>
<th>Type</th>
<th>Output</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewing (structured, unstructured, semi-structured)</td>
<td>Direct</td>
<td>Procedures followed, knowledge used (easily verbalized knowledge)</td>
<td>[Hudlicka, 1997], [Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>Interruption Analysis</td>
<td>Direct</td>
<td>Procedures, problem-solving strategy, rationale</td>
<td>[Hudlicka, 1997]</td>
</tr>
<tr>
<td>Cognitive Structure Analysis (CSA)</td>
<td>Direct</td>
<td>Representational format of experts knowledge; content of the knowledge structure</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>Problem discussion</td>
<td>Direct</td>
<td>Solution strategies</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>Tutorial interview</td>
<td>Direct</td>
<td>Whatever expert teaches!</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>Uncertain information elicitation</td>
<td>Direct</td>
<td>Uncertainty about problems</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>Data flow modelling</td>
<td>Direct</td>
<td>Data flow diagram (data items and data flow between them – no sequence information)</td>
<td>[OTT, 1998], [Gane &amp; Sarson, 1977]</td>
</tr>
<tr>
<td>Entity-relationship modelling</td>
<td>Direct</td>
<td>Entity relationship diagram (entities, attributes, and relationships)</td>
<td>[OTT, 1998], [Swaffield &amp; Knight, 1990]</td>
</tr>
</tbody>
</table>
Entity life modelling | Direct | Entity life cycle diagram (entities and state changes) | [OTT, 1998], [Swaffield & Knight, 1990]  
Object oriented modelling | Direct | Network of objects (types, attributes, relations) | [OTT, 1998], [Riekert, 1991]  
Semantic nets | Direct | Semantic Net (inc. relationships between objects) | [OTT, 1998], [Atkinson, 1990]  

3.3- Questionnaires

“Questionnaires are very important technique in requirement elicitation techniques, questionnaires helps to get the information from many peoples, analyst can gather opinions from two ways: to get statistical evidence for an assumption, or to gather opinions and suggestions. The first twelve questions express the views of the people about the company, Online Vehicle Trading and results of the questions. After each question a short analysis about question express the actual theme about the people views” [3].

Table No.4- Questionnaires Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Method</th>
<th>Type</th>
<th>Output</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>questioners</td>
<td>Indirect</td>
<td>Amount and type of information used to solve problems; how problem space is organized, or how expert has represented Task-relevant knowledge.</td>
<td>[Cordingley, 1989], [Geiwitz, et al., 1990]</td>
</tr>
</tbody>
</table>

3.4- Observation

“In Observation methods, the knowledge engineer observes the expert performing a task. This prevents the knowledge engineer from inadvertently interfering in the process, but does not provide any insight into why decisions are made.” [3].

Table No.5- Observation Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Method</th>
<th>Type</th>
<th>Output</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourse analysis</td>
<td>Direct</td>
<td>Taxonomy of tasks/subtasks or functions</td>
<td>[OTT, 1998], [Belkin &amp; Brooks, 1988]</td>
</tr>
<tr>
<td>Active participation</td>
<td>Direct</td>
<td>Knowledge and skills needed for task</td>
<td>[Geiwitz, et al., 1990], [Cordingley, 1989]</td>
</tr>
</tbody>
</table>

3.5- Documents Analysis

“Document analysis involves gathering information from existing documentation. It may or may not involve interaction with a human expert to confirm or add to this information” [3]. It’s an indirect method and varies depending on available documents, interaction with experts. In it we find out how expert organizes and processes task information and how it is compiled to present to others.

Documents have a vital role in any organization, documents like an organizational chart is a diagram that illustrate the structure of an organization in terms of relationships among personnel or departments. Moreover with the help of manuals of existing system gathering of information about existing system and its functions can be analyze that how it work and how it can perform different functions.

An organizational chart also represents lines of authority and responsibility of the personnel working in an organization. An organizational chart is a horizontal or vertical tree like shape that contains different geometric shapes to represent staff working in an organization. The lines that connect the shapes illustrate the relationships between the positions. An
organizational chart indicates the proper structure of a business or company. “Document analysis involves gathering information from existing documentation. May or may not involve interaction with a human expert to confirm or add to this information” [3]. Table 6 shows documentation analysis methods.

Table No.6- Document Analysis Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Method</th>
<th>Type</th>
<th>Output</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect artifacts of task performance</td>
<td>Indirect</td>
<td>How expert organizes or processes task information, how it is compiled to present to others</td>
<td>[Geiwitz, et al., 1990], [Cordingley, 1989]</td>
</tr>
<tr>
<td>Document analysis</td>
<td>Indirect (Usually)</td>
<td>Conceptual graph</td>
<td>[OTT, 1998], [Gordon et al., 1993]</td>
</tr>
</tbody>
</table>

3.6- Studying similar companies

According to Soren Lauesen “One of the best sources of realistic is to see what other companies do to handle problems similar to your own. A study of their procedures and comparison with you own can give you many ideas. They may also have experience with the specific product you are considering. Most importantly, a visit to their site makes it easier to imagine how the new system could work. Are not other companies reluctant to share such knowledge? Yes it may happen particularly if they are competitors, but often the study is mutually beneficial, and they are willing to share experiences. There are other ways to get information about the competitors’ procedures. Some international auditing and consultancy companies have huge benchmark database with performance figures for other companies in your field. Performance is measured for much kind of internal processes such as recruitment, internal IT support etc. At least analyst can find out how one performance compare to others” [6].

3.7- Prototyping

Prototyping has been used for elicitation where there is a great deal of uncertainty about the requirements, or where early feedback from stakeholders is required [13]. Actually prototyping is the process to build the model about the system, prototypes help the system designers to build the information system according the requirements and easy to manipulate for end users. Prototyping is an iterative process and it is also part of the analysis phase of system development life cycle.

During the requirement demonstration portion of the analysis phase, system analysts collect the information about the current work of the organization and also highlight the current problems in the organization. To collect all these information, system analysts use different elicitation techniques like interview, questioners, observations etc. This helps the analysts develop an initial set of system requirements.

Prototyping can extend this process, because prototyping can convert the basic things (indefinable requirements into definable requirements). With the help of the prototyping we can get feedback from the users, users can see facilities and provide the response and then system analysts can evaluate the response and also modify the existing requirements as well as developing new ones. Prototyping save the cost and ambiguous work. Developers use the prototyping and conceive the idea that how it would work in real life. Prototyping experiment provides the two kinds of requirements.

Product level requirements: In this level, prototyping define the required functionality is realistic and useful [6].

Design-level requirements: In this level, prototyping define such an interface statistics for goals of the system [6].

Prototyping technique has some advantages and disadvantages in development of the system.

Some Advantages:
- Helps the developers and reduce the development time.
- Reduce the development costs.
- Invite the users to contribute.
- System analysts and developers receive the productive feedback.
- Prototypes may demonstrate progress at an early stage of development.
- Prototypes clear the many things in front of the users.
- Provide the high contentment of the users.
Some Disadvantages:

- May be follow insufficient analysis.
- After see the prototype, users expect the same performance of the system, but some time it is too difficult.
- Mostly Developers too attached with prototypes and it is possible they contain wrong information.
- Sometimes leads to incomplete documentation.

In practical sense, prototyping increase the quality and communication between the user/analyst and the end users, how to make good software according to the requirements. With passage of time, importance of the software prototyping is increasing rapidly in development. Prototyping is the demo before the actual software. Instead of software prototyping, several information systems consultants and researchers use “low tech” prototyping tools (paper prototypes) especially for initial system analysis and design. Among prototyping benefits, best approach in lowers the cost, allows for more iteration and also provide the immediate user response to update the requirements.

In Prototyping, the expert is asked to evaluate a prototype of the proposed system being developed. This is usually done iteratively as the system is refined. Table 7 shows prototyping methods.

Table 7. Prototyping Methods Ref. Janet E. Burge [3]

<table>
<thead>
<tr>
<th>Method</th>
<th>Type</th>
<th>Output</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>System refinement</td>
<td>Direct</td>
<td>New test cases for a prototype system</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>System examination</td>
<td>Direct</td>
<td>Experts opinion on prototype’s rules and control structures</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>System validation</td>
<td>Direct</td>
<td>Outside experts evaluation of cases solved by expert and protocol system</td>
<td>[Geiwitz, et al., 1990]</td>
</tr>
<tr>
<td>Rapid prototyping</td>
<td>Direct</td>
<td>Evaluation of system/procedure</td>
<td>[Geiwitz, et al., 1990], [Diaper, 1989]</td>
</tr>
<tr>
<td>Storyboarding</td>
<td>Direct</td>
<td>Prototype display design</td>
<td>[OTT, 1998], [McNeese &amp; Zaff, 1991]</td>
</tr>
</tbody>
</table>

3.8- Case Study

Pakistan is country with overall population of more than 160 million. As a large country both in terms of population and area the means of transportation are growing at high rate. According to government of Pakistan statistics review from 1994 to 2007, the total number of vehicles registered increased from 3.5 to 6.5 million in Pakistan, including 2.5 million motorcycles, 1.3 million Automobiles, and 178000 trucks. There are 25 vehicles manufacturing and assembling facilities in Pakistan [7] with or without joint ventures that shows the vital increase in the production of automobiles and the business sectors related to automobiles. Automobile industry in Pakistan has set the target of manufacturing half a million cars and one million motorcycles by 2010. That is three years from now and that would amount to more than doubling the existing capacity. Automobile imports within first nine months of the last financial year exceeded one billion dollars and if the new target is to be achieved, the automobiles imported parts will exceed two billion dollars. [8]. There are approximately 45000 auto dealers in Pakistan, both large and small companies and their daily business is in millions of dollars.

There are 53 private and commercial banks operating in Pakistan [9] nearly all of them provide auto leasing facility. This didn’t include private financial and leasing organizations and companies. Concept of e-business is getting boost in Pakistan. According to survey it was noted that online trading in Pakistan has one of the fastest inception rates in the world [10]. Pakistan has more than 20 million internet users as of 2005. The country is said to have a potential to absorb up to 50 million mobile phone internet users in the next 5 years thus a potential of nearly 1 million connections per month [11].

Under these conditions where a large number of trading taking place in field of auto industry and all means of information technology are available plus a large population have the concept of online trading there are hardly 25 to 35 online trading web site are available where one can get complete information about the automobile industry. In this website information available is very limited. Under the above mentioned line of facts its need of time to have a good website which cover all the aspects of the auto dealing industry and also be beneficial for stakeholders.
4- EMPIRICAL RESEARCH

This chapter includes implementation of elicitation techniques used in reports for getting the required information.

This portion includes practical exercise of all the elicitation techniques which are use in research report to get more specific approach toward elicitation techniques. The tools selected are examined and discussed that did they fulfils the current requirement and fits on situation? After a brief analysis some to techniques are selected for this research report which covers nearly all the circumstances of current scenario.

Interview

It’s a company for customers to buy the used vehicles of their choice from a wide variety at the best possible price. Management team comprises of well qualified and experienced people who have joined this venture as a challenge. It is thus a meeting place for the sellers and buyers of used vehicles where buyers and sellers can compare and contrast different options by sitting and get the best possible deal. Customer can buy or sell used vehicles of your own choice from different cities. Company also provides the guide and help (during meetings, phone call, e-mails) to customers about the buying/selling procedure of the used vehicles. Company objective is to provide auto trading solution with comprehensive services including trading of vehicles of all models from different cities all over at customer desktop with cutting-edge technology.

4.1- Interview with the Stakeholders

“To continually deliver and improve our services to meet the expectations of our valued customers by emphasizing the employee teamwork and their involvement in identifying problems and implementing the new programs to save time and lower the services cost while maintaining the highest quality.”

Our company is a customer focused. It takes the possible steps in delivering the good condition used vehicles and best services to its customers. Currently company has manual records of the customers and the vehicles, due to manual records company face many problems like that to search the specific customer to update latest news about the vehicles or get the feedback about the last deal, to search the specific information about the previous sold vehicles or new vehicles because customer wants to get the complete information about the specific vehicles so at the spot, some time it is very difficult for staff members to inform the customer about the vehicles details. Vehicles information is:

- Vehicles Make
- Model year
- Price
- Colour
- Millage
- Condition
- Displacement
- Chassis number
- Transmission
- Fuel Type

Customers live in different cities around the Pakistan, some time they feel some hurdles (like that long distance, busiest schedule, cost, security, etc) to contact with company for vehicles sale and buy. The company needs fast, reliable and secure contact with their customers. Online plate form will be user-friendly (easily convey message with easy navigation). Online platform where buyers and sellers can get the update information about the used vehicles and new vehicles by using different searching techniques. Searching techniques are:

- Search by maker
- Search by model
- Search by maximum price or minimum price
- Search by cities

Customers can see the number of pictures or videos of the vehicles, with the passage of time list of used vehicles and new vehicles will be update for the customers to get correct information (availability) about the vehicles. Technical team of the company will update the database of the vehicles. This team wills also needs pictures and videos of the vehicles to upload.
Company will provide the directory of dealers, where customers can get the nearest dealer to buy the vehicles. Company will provide the opportunities to the dealers to advertise about their company but advertisement must be in specific time period and dealers can also give the advertisements about the vehicles for sale, these dealers must be register to get different facilities from the company. Company provides the plate form where buyers and sellers can contact with each other to buy and sale the vehicles. Dealer information is:

- Dealer Name
- Address
- Phone, Mobile
- Email
- Website

Some time seller wants to sale his/her vehicles but he/has doesn’t efficient and effective way to sale his or her vehicles. An individual can directly contact with the company for vehicles advertisement and if he/she can they will be welcome for the use of online plate form of uploads the vehicles pictures or videos with detail information. Staff members of company will validate his or her vehicles detail and then vehicles detail will be added into the database to sale. Private person will also register to get different company facilities.

Company is providing many services to the customers in sense of vehicles sale and purchase but due to communication gap some time it is difficult for the company to access all customers to provide latest information and advices about the vehicles. But by using new technology company will provide more informative instructions and programs to the customers about the vehicles security, vehicles crime and fraud awareness (like that warning signs, buyers and sellers advice, informative videos).

Finally, in a business oriented way the company wants to invite more customers (to advertisement about their companies for visitors and buyers, for vehicles advertisements and consultancy about vehicles for sale and purchase) through online platform. The company also wants to facilitate the staff members in a daily work (like that maintaining the records of vehicles, records of buyer and seller) by using new technology features.

### 4.2- Questionnaire with Stakeholders

Questionnaires are very important technique in requirement elicitation techniques, questionnaires helps to get the information from many peoples, analyst can gather opinions from two ways: to get statistical evidence for an assumption, or to gather opinions and suggestions. The first twelve questions express the views of the people about the company, Online Vehicle Trading and results of the questions. After each question a short analysis about question express the actual theme about the people views.

**Question 1:** Are you satisfied with the company current services?

<table>
<thead>
<tr>
<th>Question 1</th>
<th>No. of People Reply</th>
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<tbody>
<tr>
<td>No Reply</td>
<td>3</td>
</tr>
<tr>
<td>Yes</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
</tr>
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</table>

Majority of people response in no, because they said, they want to see more cars to buy but there are limited range of cars so we are unable to see more cars to buy. Some buyers are more conscious about car prices. They want, company inform to them about the update information of available cars to buy. Minority of people response in yes, they are satisfied with the company current services and management, they think company provide best services. Actually some people have limited range to avail the company services, but the company has potential to provide more services to the customers.

**Question 2:** Do you want an Online Vehicle Trading?

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<thead>
<tr>
<th>Question 2</th>
<th>No. of People Reply</th>
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<tbody>
<tr>
<td>No Reply</td>
<td>5</td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
</tbody>
</table>

Majority of people response in yes, because they said, it is very good idea to provide the online information about the cars. Some time they can’t go cars show rooms, so due to online vehicle trading customers can get the online information about the cars. Minority of people response they don’t need Online Vehicle Trading, because they don’t know how to use Online Vehicle Trading, or they have no access of the internet, so online trading vehicle is not fruitful for them. Some people did not reply they said that they don’t understand what the actual purpose of the online trading vehicles is.

**Question 3:** If Online Vehicle Trading provides you online car buy and sale, how helpful is it?

<table>
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<th>Question 3</th>
<th>No. of People Reply</th>
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<tr>
<td>No Reply</td>
<td>5</td>
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</tbody>
</table>
In question 3, different people reply different opinion about the question, some people reply online sale and purchase of car is helpful, but some reply online vehicle trading is more help full because they live in different cities some time it is very difficult for them to sale the car from the dealer’s show room, they said it is more help full for them when they give pictures or video and car detail to the company for upload, with the help of this opportunity they will save time and cost and chances for sale the cars will be increase. But some people reply may be Online Vehicle Trading more risky to upload the car video or picture with car detail.

Question.4: If Online Vehicle Trading provides you opportunity to upload the pictures and videos is it helpful?

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<th>Question 4</th>
<th>No. of People Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>No reply</td>
<td>4</td>
</tr>
<tr>
<td>1 =not helpful</td>
<td>4</td>
</tr>
<tr>
<td>2 = helpful</td>
<td>4</td>
</tr>
<tr>
<td>3= very helpful</td>
<td>6</td>
</tr>
</tbody>
</table>

In response of this question, dealers said this will be very helpful for them to upload the cars pictures or videos with detail because some time it will be very difficult for them to provide complete detail about the cars to upload, so due to this opportunity they can upload the cars detail when they want. Some private person said this opportunity is great to upload the car detail, but some time that will be difficult to upload due to lack of knowledge or some problem in internet feasibility or etc.

Question.5: If Online Vehicle Trading provides you update information of cars, how helpful is it?

<table>
<thead>
<tr>
<th>Question 5</th>
<th>No. of People Reply</th>
</tr>
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<tbody>
<tr>
<td>No Reply</td>
<td>6</td>
</tr>
<tr>
<td>1 = helpful</td>
<td>4</td>
</tr>
<tr>
<td>2= very helpful</td>
<td>6</td>
</tr>
<tr>
<td>3= somewhat helpful</td>
<td>4</td>
</tr>
</tbody>
</table>

Some people have no reply about this question. But majority of people reply in yes, they said update information will be very helpful because every time they will receive update information (which one is available to buy) about the cars. It is also very good for the company to make the good repute. But minority of people reply in somewhat helpful, they said, every buyer must contact with the company or dealer to buy the car so it may or may not necessary to update the cars.

Question.6: Is it helpful, if online Vehicle Trading suggest some buying and selling advises?

<table>
<thead>
<tr>
<th>Question 6</th>
<th>No. of People Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Reply</td>
<td>2</td>
</tr>
<tr>
<td>1= very helpful</td>
<td>12</td>
</tr>
<tr>
<td>2= somewhat helpful</td>
<td>6</td>
</tr>
</tbody>
</table>

Majority of people responses show that advices and suggestion from the company about the cars during buying and selling are the good approach. Customer will be more educate to buy and sale the car, because mostly customers don’t know important factors about the cars before buy or sale, buying advices before buy the car:

- What is the condition of the interior?
- Are there any dents or scratches on the body?
- How often has oil been changed?
- When were the brakes last serviced?
- Has the vehicle had its scheduled maintenance?
- Has the timing chain or belt been replaced (only on cars with over 96,000 KM)?

These buying advices are more important for those people who buy the car privately rather then dealer. Private person be aware about the car chassis number, alignment, tones, shades, engine, window, sunroof, seat position, anti brake system, etc. Many people also feel, these advices are also very helpful when they go for sale the car like that: seller checklist (Wipe engine with degreaser, check oil, Check transmission fluid, Gather service records and receipts, Check power-steering and brake fluids, etc), preparing the car, pricing you the car, meeting with perspective, buyer for test drive an finalizing the sale.

Question.7: If Online Trading provides additional information (cars security, rental and crime centre), is it helpful?

<table>
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<tr>
<th>Question 7</th>
<th>No. of People Reply</th>
</tr>
</thead>
</table>
Majority of people reply, this is very good approach to educate the customer about the car security, car crime and fraud awareness. Most of the time buyer don’t know during car buying about the registration book is original or not, car checking because it is very most dangerous thing that can happen when selling a car, cut and shuts are the most hazardous of all kinds of vehicle fraud. Minority of people reply, it is somewhat helpful because it is more responsibility for the dealer to sale the car after confirm the all important factors of the car, then sale it, because most of the time customer is unaware about the important factors of the car but these factors are more important for the private persons.

Question 8: What is your opinion, if Online Vehicle Trading provides Ex-Price of new cars to sale?

<table>
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<th>Question 8</th>
<th>No. of People Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Reply</td>
<td>4</td>
</tr>
<tr>
<td>1= very helpful</td>
<td>10</td>
</tr>
<tr>
<td>2= somewhat helpful</td>
<td>6</td>
</tr>
</tbody>
</table>

Majority of people reply, some time dealers or other companies hide the Ex-price of the new car, so it is very unlike for the buyer to buy the car on the display price and actual price. It is more helpful for the customer if he know the ex-price of the car. Online Ex-price may be creating competition between the dealers and that will be very help full for the customers. Some people reply it is not much important to highlight the ex-price of the cars. Sometime this price is understood or this price may be varying in some range, so it is somewhat helpful.

Question 9: Is it good, if different facilities provides to private person and Traders (e.g. Advertisement or Direct contact).

<table>
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<tr>
<th>Question 9</th>
<th>No. of People Reply</th>
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<tbody>
<tr>
<td>No Reply</td>
<td>3</td>
</tr>
<tr>
<td>1= very helpful</td>
<td>11</td>
</tr>
<tr>
<td>2= somewhat helpful</td>
<td>6</td>
</tr>
</tbody>
</table>

Majority of dealers’ reply, which will be very beneficial for them if Company give us advertisement opportunity, with the help of this facility our companies can advertise about their companies and also about their products. Because some time our customers don’t know our current product or current offer, so from this offer our customers may be more touch with us. Many private persons reply, it is very good for us if Online Vehicle Trading provides contact information about the dealers or owner contact detail. Minority of people reply it may be helpful that sense when buyer personally interested to buy the car from the private person.

Question 10: Is it helpful, if Online Vehicle Trading provides Dealer Directory?

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<th>Question 10</th>
<th>No. of People Reply</th>
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</thead>
<tbody>
<tr>
<td>No Reply</td>
<td>3</td>
</tr>
<tr>
<td>1= very helpful</td>
<td>9</td>
</tr>
<tr>
<td>2= somewhat helpful</td>
<td>8</td>
</tr>
</tbody>
</table>

Majority of dealers reply, that’s very good about their information on Online Vehicle Trading, with the help of this, customers can contact with us directly and this approach also very good to create the competition in the market between the dealers. Customers will be more facilitate with the dealers directory. Many people said it will be more help full if Online Vehicle Trading provides the different searching criteria (by Zip Code) to search the nearest dealer to buy the car. But some people reply it may be helpful because they already have direct contact with their dealers to buy the car.

Question 11: Is it helpful, if Online Vehicle Trading provides the information about cars spare parts?

<table>
<thead>
<tr>
<th>Question 11</th>
<th>No. of People Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Reply</td>
<td>1</td>
</tr>
<tr>
<td>1= very helpful</td>
<td>10</td>
</tr>
<tr>
<td>2= somewhat helpful</td>
<td>9</td>
</tr>
</tbody>
</table>

Majority of people reply, that’s very good approach, because some time they don’t know the information about car spare parts and they also don’t know form where they can get. That will be very beneficial for the customers, if Online Vehicle Trading provides the information about that, because some time it is difficult to get the information about the spare parts from the local market. Minority of people reply it may be helpful, some time there is no much need to get information about the care spare parts, it is necessary for mechanic to get the knowledge about car spare parts.
Question 12: Is it helpful, if Online Vehicle Trading provides update news and reviews about the cars?

<table>
<thead>
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<th>Question 12</th>
<th>No. of People Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Reply</td>
<td>4</td>
</tr>
<tr>
<td>1= very helpful</td>
<td>10</td>
</tr>
<tr>
<td>2= somewhat helpful</td>
<td>6</td>
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</tbody>
</table>

Majority of the people reply, this will be very helpful to get update information about the car, because usually some time, news paper miss important news and reviews about the cars. To get the update news from the online plate form will be very helpful, cheap, and more effective than other resources. It will be more informative, if registered users automatically get the update news (like cars auction, cars registration, cars show, etc) through email or regular mail. Minority of people reply, this is good approach but most of the time, we have no much time to spend on these activates.

Results of Open Ended Questions:
Next six questions get the suggestion and opinions from the peoples. These questions were open ended. People were very interested to give own opinions about the Online Vehicle Trading. Company can cover many aspects of the business and can also get the attentions of the customers in customer oriented and business oriented way. In next six question short analysis of people suggestion express what is more require from the company and Online Vehicle Trading.

Question 13: What is your opinion, if Online Vehicle Trading provides you easy and fast searching techniques of cars?
This question focuses on the searching techniques. Many people reply it will be more help full for them when they search specific type of car. They can search specific car by different techniques like search by maker, search by model, search by maximum or minimum price and search by city. So for these searching criteria’s more facilitate the visitors search. Visitors can search require car which he or she wants. It will be more helpful if Online Vehicle Trading provide maximum possibilities to search the cars. More searches will invite the more visitors.

Question 14: What is your opinion, if Online Vehicle Trading provides you different offers to buy and sale of cars with the passage of time?
This question focuses on different services from the company like that advertisement, car ads, auto responder for register users, credit card or etc. Many dealers reply they want some facilities when they apply for car ads, charges for more than five ads must be different from two or three ads. Some private persons reply, company must inform them with latest news about the cars through email or regular mail, because due to busiest schedule private persons cannot attend the regular visit on show rooms. It is more beneficial if Online Vehicle Trading provides, buy the care through credit card.

Question 15: What is your opinion, if Online Vehicle Trading provides you facility to write the message, advice or views to company?
This question focuses on email or views from the customers or visitors to company by using Online Vehicle Trading. Majority of people reply, that will be very good approach when we will have any query or inquiry we just write the message to company or some views from our side. Visitor’s opinions and advices are more important when your business public oriented. You much care about the customer; company can in touch with the customers and visitors through email, survey and feedback.

Question 16: What is your opinion about the car loans and insurance?
A car loan is the good way to invite the more customers on the Online Vehicle Trading to sale the cars. Customers want to buy the car but some time they have not enough money to buy the best car. So for car loans will be good service to customers. Loan taker will follow the terms and conditions about the car. Car Insurance is insurance consumers can purchase for cars. Its primary use is to provide protection against losses incurred as a result of traffic accidents. An insurance company may declare a vehicle totally destroyed ('totalled' or 'a write-off') if it appears replacement would be cheaper than repair.

Question 17: What is your opinion about the privacy policy?
People replies, to describe the personal information is very risky. Privacy policy must focus on the customer’s personal information and do not describe to any unauthorized person for misuse. Always use the personal information for the important aspects (buy for car, sale for car, registration, important services from the company or Online Vehicle Trading, tracking information, email newsletter or email messages, for cars ad, advertisement, etc). Online Vehicle Trading will avoid children to get their personal information over the internet. So Online Vehicle Trading will protect the privacy of children as well.

Question 18: What is your opinion, to develop the better relation with the customers?
People replies, Company provide the possible services (guide and help) to customers about the buying and selling procedure of the new and used cars. Company management and staff always focus on the customers to provide the solutions of automobile related problems. Always provide the update information about the cars for sale and buy by using different
searching criteria’s, interface of Online Vehicle Trading must be user friendly (easy to access and easy to use). Credit cards, car loans, car insurance, cars advertisements, information about cars spare parts are the best examples to provide the facilities to the customers. In future Company also focuses to get the information about the other vehicles (Bikes, Vans/Buses, Trucks, Agriculture and construction) on the Online Vehicle Trading for buying and selling.

4.3- Observation Analysis

Analysts observe how target users perform duties in daily official timings. Observing the users performing in their duties can give us very important information on performance of daily tasks, tasks links, and surrounding effects (such as speed of response, work pace or etc) which might relate to the performance levels. This method elicits users’ knowledge from the way of users’ deals with the system. It can be direct method, this tends to utilize video cameras for observational videos and note down the steps of users performing actions. Observer should discuss with the staff members that how the work is being done in the company, make sure they understand and then set the goals for the observation.

Observer finds out how the users are retrieving, maintaining and compiling the information from the manual system during the daily office tasks.

1. When the company is purchasing vehicles from a private person/dealer.
2. When the company is selling vehicles to a private person/dealer.
3. When a company is acting as a consultancy provide to a private person/dealer.

![Figure 3: Task Procedure](image)

**Purchasing:**

When the users get the information of the vehicles, they write down the detail of the vehicle. Information of the vehicles varies from type to type, mostly vehicle detail in a manual system:

**Vehicle Info:**
- Vehicle Maker
- Model
- Price
- Colour
- Model Year
- Mileage
- Condition
- Displacement
- Chassis Number
- Transmission
- Fuel Type

Users also note down other vehicle detail (about the vehicle security, vehicle loan and insurance, registration, documents, etc), they write all these information for each vehicle. Users write and use this information in different situation again and again. With the vehicle detail users also get information of the vehicle owner or vehicle seller:

**Owner Info:**
- Owner Name
- Address
Due to manual system it is possible, users write down wrong information of the actual vehicle or wrong vehicle, so it is difficult for them to retrieve and maintain the data. When the users receive any query or inquiry about the vehicle, they sometime provide wrong information about the vehicle and owner due to problems in data entry. This is creates bad impact in business oriented way. It will be very ideal situation when users provide in short period of time and write down the exact vehicle information against owner. Use the vehicle detail in different situation again and again is the record redundancy and time wasting process to create low performance of the users in the daily tasks.

**Selling:**
When the users get the information of the vehicle and buyer, they write down the detail of the vehicle and buyer. Some time they receive conflict data, because current information of the vehicle is different from the recorded information of the vehicle and owner. So lot of time is expending to compare the data of vehicle and owner. After retrieve the information of vehicles and buyers, it is more difficult task to maintain the record of vehicles and users. It may be possible buyer contact again with the company about the purchased vehicle for any inquiry, so in this situation users must have the maintained and compiled data about the vehicles and owner to provide the best response to buyer. During the maintaining entries manually, users get the problems to put the records of vehicle and owner where it requires.

**Consulting:**
When users gets the information of the vehicles for sale from the different dealers and private persons that time users write down the detail of the owner and complete information of the vehicle. Consultancy is very complex field; in this situation company focus many important factors to maintain the best deal with buyer and sellers. At a time user’s focus on buyer and seller detail with the vehicle detail. Company work as a middle man to successful deal, unfortunately It may be possible due to manual system users inform the wrong data of vehicles and owner to seller for the require vehicle. In this situation maintain the data of vehicle and owner is very complex work.

We have to observe are tasks dependent or independent on other tasks? And how long a specific task take, like when the company is selling a vehicle/vehicles to a private person /dealer it is dependent on the task when the last deal of that vehicle/vehicles were made and this is the most difficult task for the users to find out the previous data related to that specific vehicle or group of vehicles because organizing and compiling manually different information about the vehicles and then retrieve the data from manual system can be very confusing for the users in a business oriented organization like vehicle trading company. We have to observe the situations in below picture where users of the company feel hard to achieve the exact information like in the security issues when the situations is very confusing, time is very short and the customer need information in a very short period of time like looking up the data for a particular vehicle or group of the vehicles, concerning the date and other related information when the vehicle/vehicles were purchased by the company.

**Close Look:**
It has been observed that the situations in which users of the company feel easy to achieve the exact information like when the users enter the information about the vehicles/group of vehicles. These observations support in finding the situations when the staff feels comfortable or uncomfortable. Furthermore We have to see what seems most important in performing a tasks like when the company is selling, buying or consulting vehicles the most important tasks for the staff is to manage, compile and retrieve a data from manual systems at the time when it is needed like for checking the company’s monthly or yearly profile its is very confusing to find out the required data and then compile it. Another thing observed is that all the surrounding effects like speed of response and workplace etc. are factors which might influence the performance rate of the users

**4.4- Documentation Analysis:**
Documentation of company can assist understanding and improve the quality of communication. Documents have a vital role in any organization, documents like organizational chart is a diagram that illustrate the structure of an organization in terms of relationships among personnel or departments. Moreover with the help of manual of existing system we can gather information about existing system and its functions that how it work and how it can perform different functions in the company.

**Flow Charts:** Flow charts used specifically for a process. Flow charts describe the company flow in graphic representation, describing a progression being studied or even used to plan stages of a company tasks.

**Organization Chart:** An organizational chart also represents lines of authority and responsibility of the personnel working in an organization. An organizational chart is a horizontal or vertical tree like shape that contains different geometric shapes to represent staff working in an organization. The lines that connect the shapes illustrate the relationships between the positions. An organizational chart indicates the proper structure of a business or company.
CEO: is the senior manager who is responsible for overseeing the activities of an entire company. The CEO usually also holds a position on the board of directors, or also holds the title of president.

Marketing Manager: To effectively design compelling marketing campaigns that present cars and services to customers and new prospects.

Finance Manager: The financial monitoring and control, and regulatory compliance, in addition to internal administration, of the company.

Operations Manager: Perform different functions, activities according to the organization sales, purchase and consultancy.

Sale Representative: Establishes the duties, authority, responsibilities and measurements of performance of the position of Sales Representative. Sales Representative is to relay information about the company, and its services, to prospective customers in a professional manner.

Accountant: The Accountant is responsible for the fiscal and monetary management functions of the Foundation. The Accountant shall be responsible for effective, open and timely communications with the manager. The Accountant shall manage financial data, reconcile bank and investment accounts, generate reports, make bank deposits and issue checks.

Assistant Sales Manager: Leads team members engaged in sales work, taking of inventories, reconciling cash with sales receipts, keeping operating records, and preparing daily sales reports for accounting, or performs work of subordinates as needed in the store manager’s absence.

Assistant Purchase Manager: Is concern with purchasing for organization.

Data Entry Operator: Receive and register documents for data, Enter data according to specified format, Verify accuracy and completeness of data, Update and maintain databases.

Process Model: A Process model is concern with the organization overall processes or that could be targeted towards specific process in organization like its selling process, buying process, consulting process and all the related processes. the buyers that include both the private persons and dealers and the sellers that also include private persons and dealers are also connected with the whole selling buying and consulting process and the data can be retrieved at any time but it could be time consuming because of the manual system because its hard to manage, compile and retrieved data within a required period.
We can find out Job descriptions of the peoples working in an organization like their authorities, duties, relationships, information needs, like the job description of marketing manager is to find the best possible ways to sale out the company’s product that are cars and increase the demand. The job description of finance manager is to find out the way to fulfil the financial needs of the company moreover the job description of the data analyst is to track the data furthermore the data entry operator enters all the necessary data like information about buyers and sellers and the information regarding when company acts as an consultancy agency for the private persons and dealers when then private persons and dealers wants to make a deal with the help of company.

4.5- Comparing & Studying similar companies

One best open source of studying and comparing the performance and getting the new ideas is internet especially if system is like web portals. According to (Edifact Transport AB 1999) Internet has been called “the last step in computerization”, which can be discussed, but it sure indicates how great the expectations from Internet are. The Internet is today one of the most popular and efficient ways to communicate with people all over the world and to find out the latest information and sharing the information. Internet is introduced everywhere, e.g. in homes, schools and workplaces. Since IT and Internet were introduced, the ways of handling information and how we communicate have dramatically changed.

The advantages with Internet are many and one which I helpful for us is analyzing other online vehicles trading websites. By checking these website it is analyze that nearly all the website are performing same function. By registering company provide facilities to the customers but almost all of them have one or two things missing. Very few website are available which provide all facilities to the customers while rest of them has missing features. By search the websites through internet it’s been noticed that there is no update of data in most of the web site and some of them have even no specific searching criteria. When the user explores the website they didn’t get result according to requirement which definitely creates bad impression of the company. Most of websites are without latest news of new products introduce in the market and spare parts information of vehicles.

8- Result

The results are actual statements of observations. It is extract of methodologies used. Results indicate information on range of variation. Results show positive as well as negative points. Result should not be interrupted but discuss during discussion session.

8.1- Analysis of Results:

After conducting the requirements elicitation techniques (interview, questionnaires, observation, documentation analysis and case study) analyst analyse the result. Analysis of results focus on the actual requirements (deciding the boundary of the system and avoiding unnecessary information, communication between different processes, what requirements evolve over time) for the company activities, operations, services and conceptual technical solutions in business oriented way and in customer oriented way.

Online Plate Form: Online Plate form is requiring providing the facility to get the enough knowledge about the used cars and new cars in any time and in anywhere on a single click.

Communication gap: There is communication gap between buyers and sellers. Some time it is very difficult for both customers and traders to communicate with each other due to many hurdles (busiest schedule, weekend, availability, etc) for car matters.

Marketing: There are many problems in car marketing, according to the interview and observation there is no best way for the car marketing. Car marketing only available on Sunday magazines so many customers are unaware about the best information about the cars. Online Vehicle Trading provides the best opportunities for dealers and their company advertisement with car ads.

Information resources: Customers wants more information about the used and new cars, but they have no good and reliable resources. To search the particular and good used car buyer search the used car from different show rooms and unfortunately some time that buyer is unsuccessful to buy the require car, so Online Vehicle Trading will provide the one online plate form where buyer can get the information about new and used cars from different dealers and private persons.

Searching criteria: If buyer wants to get the particular information of particular cars, then it is very difficult for staff members to provide information to buyer at the spot, because some time it is difficult to search the car by city, mode, and maker, maximum or minimum.
Accessibility: Most of the buyers and sellers are from different cities so some time it is very hard for them to check the market on daily or weekly basis and they miss many good opportunities to sale or buy the car.

Security Matters: Most of the time, private persons don’t know about security matter (car security, car crime, fraud awareness, registration book, cut and shuts) and they fall in problems.

Less consultation available: Mostly private persons have low knowledge about the cars and they don’t know what is better for them to buy the car and sale the car, so they require educate consultant to help but unfortunately some time customers cannot get the good consultancy for buy and sale the car.

No update news and reviews: Due to communication gap and lack of information resources many customers unable to update the latest news and reviews (cars auction, cars registration, cars show).

Market price comparison: Most of the time it is very difficult for the buyers or sellers to compare the actual price of the cars due to scattered markets or bad response from the dealers, private persons get the lose and other party gets the benefits.

Ex-Price: Mostly buyers don’t know the ex-price of the new cars. So due to unawareness of the buyers traders earn the more profit and buyers get the losses.

Car loans and insurance: Some time buyers want to get the car loan and insurance facility, but unfortunately they are unable to get the facility and proper information about these. None insured car owner face the loss after any traffic accident.

Credit Cards: Many customers also want to avail the facility of credit card, but they are unable to avail this. It is best approach to provide the credit card facility.

Online Verification: Customers unable to get the online verification, so Online Vehicle Trading can provide the online verification about the cars.

Update Database: There is no proper secure database of buyers and sellers is available in most of auto dealing industry. Most of companies write it manually by entering the name on registers. There is very good opportunity to update the records of the customers and cars to business and customers point of view.

Feedback: There is no proper feedback facility to the buyers and sellers. Most of the time company unable to get the opinions and suggestion from the customers to company services.

9- Conclusion

With the research report and by implementing elicitation techniques it has been observed in requirement engineering, requirement elicitation is like and backbone. It is initial process and towards creativity and based for making any software. Requirement elicitation techniques are of great importance in all aspect because these techniques are keys to success of any developing system. Requirement elicitation deals with fact-finding, information gathering and getting the requirements. There is no single techniques which fulfil all the demand of requirement elicitation and information gathering but it is necessary to keep in mind that success of requirement elicitation didn’t depend upon number of techniques used but how these techniques are used and how exact the approach is to meet the stakeholder demands. One can use 3 or 4 go achieve the goals and other can use 8or 10 to do the same work. If two techniques serves the same purpose and you have little time, choose the less expensive one but you should be sure that it will cover everything. Elicitation techniques can never be good or bad but how they are implemented. Many of the requirement problems are just because of wrong implementation of elicitation techniques which leads the whole concept of system towards incomplete, misunderstanding, confusion, inconsistent because they do not project stakeholder’s goals and objectives.

Benyon and Skidmore summarize it as

[Benyon 87, p. 7]:
We feel that it is unlikely (if not impossible) that a single methodology could prescribe how to tackle the great variety of tasks and situations encountered by the systems analyst...The desire to produce ‘one best way’ is leading to elaborate and bureaucratic methodologies.

10-References

[2] ANN M. HICKEY, ALAN M. DAVIS, and DENALI KAISER Comparative Technology Transfer and Technology Use
While preparing the research report we learn a lot and we also explore many aspects of requirements elicitation as a part of requirement engineering and this is the most crucial and sensitive part of system development with so many challenging and learning opportunities. Requirements Elicitation Techniques are not the limited area for research and to get the requirements for system. In doing research we believe Requirements Elicitation Techniques provide the best knowledge of real time execution of system and analyzing the need and problems faced during requirements retrieving.

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Consultation Book

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2- Software Requirement Style and techniques. Soren Lauesen