Requirement Engineering and ML

The software industry has changed and grown remarkably over the last decades. Software system are developed over million lines of code, number of modules and documents. The primary goal of the software system is to satisfying the users by developing the software that can meet up their needs and expectations. This goal is achievable by applying different methodologies and engineering techniques. One of the key factor is understanding the needs of users aka software requirements. Requirement Engineering (RE) is the key phase in the development of the software. RE is the first complete phase in the proposed literature e.g. waterfall model. As time passed software development models gets a different vision now the RE is the part of the life cycle from the beginning until the end of the project e.g. agile model. In simple words determining and managing the users needs related to the software and hardware is requirement engineering. Software requirement engineering is the process that helps to determine the requirements in a systematic way to know what functionalities the targeted system obtain to fulfil user needs. Formally RE can be defined as [1]:

“Requirements engineering is the branch of software engineering concerned with the real-world goals for, functions of, and constraints on software systems. It is also concerned with the relationship of these factors to precise specifications of software behavior, and to their evolution over time and across software families."

Software requirements play key role in the success of the project. In USA a survey over 8380 project by 350 companies was conducted to know the project failure rates. The report overall results showed only 16.2 % projects were completed successfully and one half ( 52.7%) of project were challenged and completed with partial functionalities, time delays and over budgeted. While 31 % projects were never completed. The main cause told by the executive managers was the poor requirement. The major problem were the lack of user involvement (13%), requirements incompleteness (12%), changing requirements (11%), unrealistic expectations (6%), and unclear objectives (5%). [5]

Software requirement engineering has four mainly phases [2] requirement elicitation, requirement analysis, requirement documentation and requirement verification.

Requirement elicitation helped to understand the stakeholders needs e.g. what features he wants in the software? .Requirement elicitation techniques are mostly derived by the social sciences, organizational theory, knowledge engineering and practical experience. For requirement elicitation different techniques exist in the literature that includes interviews, questioners, ethnography etc. [3, 4]

Requirement analysis is the next step after requirement elicitation. In this phase, software requirements are analyzed to check the conflicts and consistency of requirements. It is also make sure that requirements are clear and unambiguous.

**References:**

[1] Zave, P. (1997). Classification of Research Efforts in Requirements Engineering. ACM Computing Surveys, 29(4): 315-321.

[2] [Kotonya, Gerald](http://www.research.lancs.ac.uk/portal/en/people/gerald-kotonya(47dfa00c-3154-4732-8969-24eb56e8768b).html); Sommerville, Ian (1998). [Requirements Engineering: Processes and Techniques.](http://www.research.lancs.ac.uk/portal/en/publications/requirements-engineering-processes-and-techniques(f9a48c9f-e3b1-4373-a7f4-72491f858091).html) Chichester : John Wiley & Sons, 282 p.

[3]Goguen, J.A., Linde, C. (1993): Techniques for Requirements Elicitation, Proceedings of the IEEE International Symposium on Requirements Engineering, pp. 152-164, January 4-6, San Diego, CA. 24.

[4] Zowghi D., Coulin C. (2005) Requirements Elicitation: A Survey of Techniques, Approaches, and Tools. In: Aurum A., Wohlin C. (eds) Engineering and Managing Software Requirements. Springer, Berlin, Heidelberg,

[5]The Standish Group, "Software Chaos",https://www.projectsmart.co.uk/white-papers/chaos-report.pdf. 2014.