

# Insights on Algorithmic and Non-algorithmic Cost Estimation Approaches Used by Current Software Industries across India

Praveen Naik

Department of CSE, CHRIST (Deemed to be University), Bangalore, Karnataka, India

## ABSTRACT

The survey comprises excellent effort on cost estimation of algorithmic and non-algorithmic approaches of current software industries. Current industry datasets are gathered and investigation is done from the current datasets. The data gathered from the industries, which are located in Indian cities like Bangalore, Chennai, Hyderabad and Pune. Objective of this paper was to identify the cost estimation practices used in the current software industries.

**Keywords:** Cost Estimation, Data sets, Cost Drivers.

## I. INTRODUCTION

Online survey was conducted on cost estimation used in the software industries mainly in Bangalore Mysore Chennai Hyderabad Pune etc. contacted more than 143 companies. We use several techniques used to approach such that phone calls emails and through friends reference in that mainly contacted industries through our friends who is working in software industries. We sent a mail with the Google form containing 10 questionnaires. The decision was made Limited number of question are used in initial stage in order to engage participation from as many companies as possible, the response questionnaires had the contact number of research, mail ID ,University such that they can contact back if they have difficulties in understanding the questionnaires from this exercise got reply from 72 companies in that 43 companies were willing to participate in the further rounds of interviews the main reason low participation were that they were too busy or they were not interested . Next round of the interviews was open discussion with industries was on cost estimation methodology.

## II. METHODS AND MATERIAL

The response was large/medium/ small scale industries with the number of employees. In our survey 27 companies were in to start-up or small scale industries , 12 medium scale industries and 4 large scale industries participated the literature contains excellent work what cost estimation on soft match up the research work do not study all current industry data only on existing data set in our paper we try to communicate with the industries which are located in India, our main objective of this paper was to identify the cost estimation practices in the software industry the survey was carried out in India, mainly Bangalore Chennai Hyderabad Pune etcetera. This survey helps identify the differences between cost estimation techniques in the literature and currently used by the software industries .

we sent a mail with the Google form containing 10 questionnaires, the decision was made limited number of questions are used in initial stage in order to engage participation from as many companies as

possible. Response had the contact number of research, mail ID ,University such that they can contact if they any have difficulties in understanding the questionnaires from this exercise, we got reply from 72 companies in that 43 companies were willing to participate in the further rounds of interviews the main reason low participation were that they were too busy or they were not interested. Next round of the interviews was open discussion with industries was on cost estimation methodology [1] .

### III. RESULTS AND DISCUSSION

Type of the application developed by the organization are E-Commerce application and the website. Typical size of the team involved in developing a software or application may be four to five.

So many researchers are did survey on the different approaches which they used to find out the estimation of software cost [1][3][4]. The below figure.1 shows the different approaches towards the cost estimation methods [1].

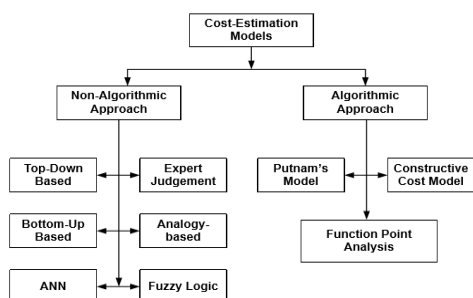


Figure 1. Different approaches of cost estimation

Figure 1 gives an idea about the classification of cost estimation models and its different approaches. After the interaction done from the current industries across India, we came with a clear picture that what approaches are used currently by the industries. Most of the companies said that they are using non-algorithmic approaches, in that majority of the organization said that they are using expert

judgement. In algorithmic approaches they are using Functional point analysis.

The analysis of finding out the estimation methods used by the different scale of the industries is given one answer that they are following the expert suggestions[2].

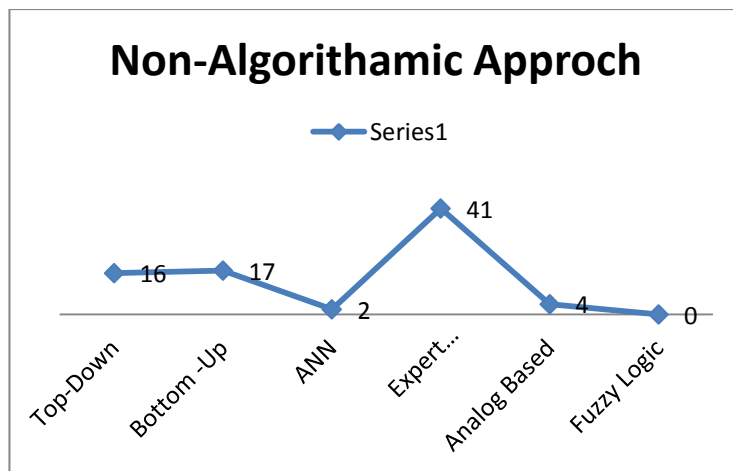


Figure 2. Non-Algorithmic Cost Estimation Approaches

Figure 2 gives the clear picture of the non-algorithmic approaches used by the current industries. Figure 3 gives the clear idea about the algorithmic approaches.

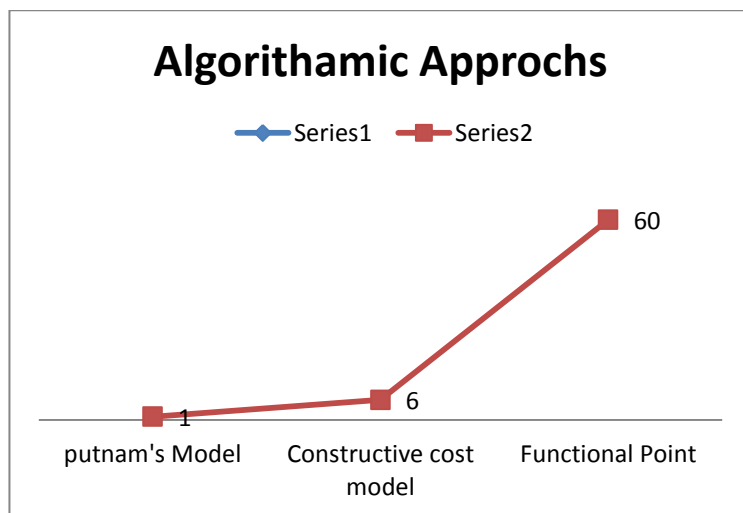
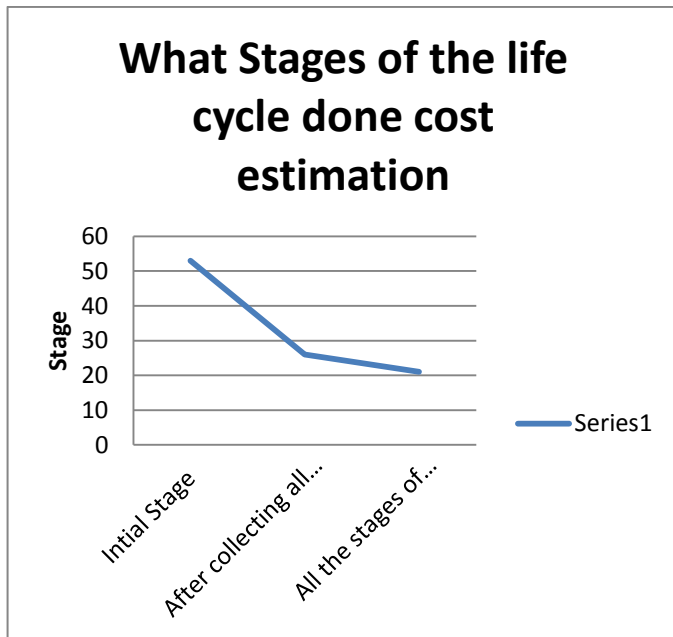


Figure 3. Algorithmic Cost Estimation Approaches.

When we asked about the stages of the estimation most of the organization said that the estimation will be done in the initial stage of the plan,

some industries reply that after getting all the requirements of the project, and other companies said that in all the stages of the software life cycle.



**Figure 4.** Cost estimation done at the stage of the life cycle.

#### Cost drivers used for the estimation:

In survey even concentrated on cost drivers [2] used by the software industries. Its totally depending on what type of software or application developed by the software industries. Cost drivers like employee experience in domain ,technology and number of team members involved in the project[5][6] etc., duration of the project like long term project or short term project, total efforts made by the team etc.

#### IV. CONCLUSION

The analysis are projected that software industries which is participated in the survey is most of the startup companies, in start-up companies cost estimation decision made by director , large scale companies project manager will be involved in cost estimation. From the analysis we found that most of the organization will follow the expert judgment cost estimation and few of the companies were using the tools and they says that compare to manual method tools give accurate cost estimation.

#### V. REFERENCES

- [1] Praveen Naik, Dr.Shantharam Nayak, "Insights on Research Techniques towards Cost Estimation in Software Design," in International Journal of Electrical and Computer Engineering (IJECE), vol.7, no.5, pp. 2883-2894, 2017.
- [2] Sudhakar, "Software Development Teams: Performance," productivity and innovation, phi learning pvt. ltd, 2015.
- [3] E. Kocaguneli, T. Menzies, A. Bener and J. W. Keung, "Exploiting the Essential Assumptions of Analogy-Based Effort Estimation," in IEEE Transactions on Software Engineering, vol. 38, no. 2, pp. 425-438, 2012
- [4] P. Phannachitta, J. Keung, A. Monden and K. i. Matsumoto, "Improving Analogy-Based Software Cost Estimation through Probabilistic-Based Similarity Measures," 20th Asia-Pacific Software Engineering Conference (APSEC), Bangkok, pp. 541-546, 2013
- [5] H. Azath and R. S. D. Wahidabanu, "Efficient Effort Estimation System Viz. Function Points and Quality Assurance Coverage," in IET Software, vol. 6, no. 4, pp. 335-341, 2012
- [6] E. Kocaguneli, T. Menzies, J. Keung, D. Cok and R. Madachy, "Active Learning and Effort Estimation: Finding the Essential Content of Software Effort Estimation Data," in IEEE Transactions on Software Engineering, vol. 39, no. 8, pp. 1040-1053, 2013