Utilize Software Engineering to Develop Statistical Estimation Software Strategy

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Abstract— This paper present the road map adopted a software to implement a procedure to determine the best away to choosing best estimation methods according to the data and the distribution that is follow it . We apply this strategy by Spiral model(we suggest to use C# language or C++ or MATLAB) to get best results.

Keywords— Software Engineering , Spiral Model , Statistical Procedure , Estimation .

I. INTRODUCTION

Software systems come and go through a series of passages that account for their inception, initial development, productive operation, upkeep, and retirement from one generation to another. This article categorizes and examines a number of methods for describing or modeling how software systems are developed. It begins with background and definitions of traditional software life cycle models that dominate most textbook discussions and current software development practices. This is followed by a more comprehensive review of the alternative models of software evolution that are of current use as the basis for organizing software engineering projects and technologies. (Scacchi W., 2001).

The process development models like spiral model statistical estimation model are adopted by statistical center as a reference for software process improvement . Many benefits are observe by statistical center that adopted such models . for instance, increase in software development team productivity, reduction of projects schedule and costs, and increase in software product quality (Travassos and Kalinowski 2012).

Some researchers get frustrated with the assessment of process performance by using statistical process control mainly because they start using these powerful techniques to measure large processes, composed of a great variety of subprocesses (Florac et al. 2000) and since The strategy of statistical estimation process has many problems and its hart applied so we will suggest a new software to reduce these problems .

Statistical process focus in controlling key processes and process components Moreover, in order to be effective certain requirements must be satisfied, such as reasonable amount of observations, existence of controlled processes and performance objectives aligned to business strategy, definition of measures associated to activities that produce tangible results ,and product quality characteristics defined by the clients should be used to select and define measures. Moreover, a process or process component should be easy to control, i.e., should be defined appropriately and of short duration (Sargut and Demirors 2006; Weller et al. 2008).

This paper present the roadmap adopted by statistical center to overcome critical success barriers of the implementation of process area of quarter three of Spiral Model . In quarter 1 and quarter 2 determine the aims and risks respectively . In quarter 3 and quarter 4 the software process control shall design and coding and testing and determine if this software needs another iteration .

II. CASE DESCRIPTION

An Estimation is the process of finding an estimate, or approximation, which is a value that is usable for some purpose even if input data may be incomplete, uncertain, or unstable. The value is nonetheless usable because it is derived from the best information available.

Typically, estimation involves "using the value of a statistic derived from a sample to estimate the value of a corresponding population parameter". (Raymond A., 2001) .

The sample provides information that can be projected, through various formal or informal processes, to determine a range most likely to describe the missing information. An estimate that turns out to be incorrect will be an overestimate if the estimate exceeded the actual result ,and an underestimate if the estimate fell short of the actual result.(Simoes and Monotoni , 2014) .

The problem is to find the best estimator for any chosen population regardless of the data of population is regular or contaminated according to the methods of estimation . So this a new software will reduce the time , efforts and cost because it give us the best results in the particular method in little time . We will use this strategy of software by Spiral Model .

III. ESTIMATION SOFTWARE BY SPIRAL MODEL

The *spiral model,* originally proposed by Boehm [BOE88], is an evolutionary software process model that couples the

iterative nature of prototyping with the controlled and systematic aspects of the linear sequential model. It provides the potential for rapid development of incremental versions of the software ,(Roger S. , 2001) .

Using the spiral model, software is developed in a series of incremental releases. During early iterations, the incremental release might be a paper model or prototype. During later iterations, increasingly more complete versions of the engineered system are produced ,(Sommerville I.,2011) .

Fig. 1 : Boehm's spiral model of the software process

1. Determine Objectives ,Alternatives, and Constraints . The main objective for this software is suggest method of estimation that it be appropriate for input data .
2. Determine the risks , for example this program suggests a certain methods but they are not suitable for the study sample like suggest a wrong estimation method (classical method) for a contaminated data . In other hand , suggest a robust method for regular data .
3. Development and validation, after risk evaluation, a development model for the system is chosen . For example , the throwaway prototyping give the best method for estimation so the best development approach if user interface risks are dominant.

Prototype 1 :
      i.   Data analysis of the input population .
     ii.   After above step the software will start to suggest the appropriate method according to data and the distribution that is follow it.

Prototype 2 :
      i.   Design the software as the following diagrams :
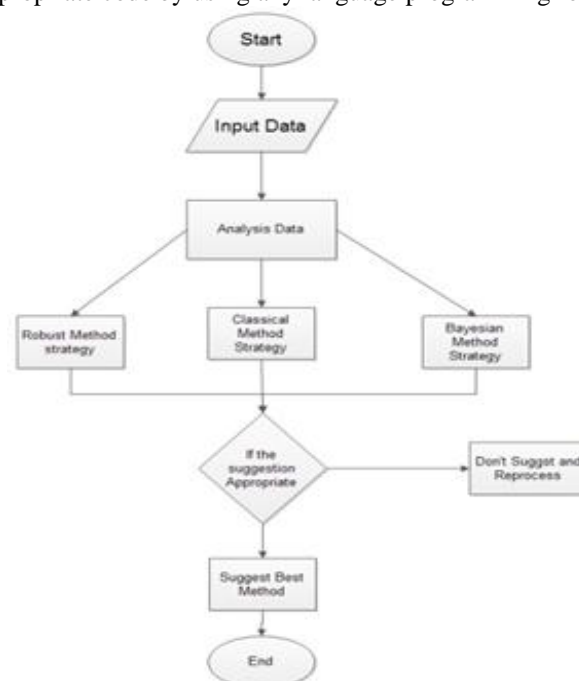   ii.   Identify the appropriate code by using any language programming for example C# , C++ or MATLAB .

Fig. 2 : Flowchart Diagram for Software Strategy

Prototype 3 :

    i.   Test for classical , Bayesian and robust method .

    ii.   Integration test for all software system .

    iii.   Acceptance the results.

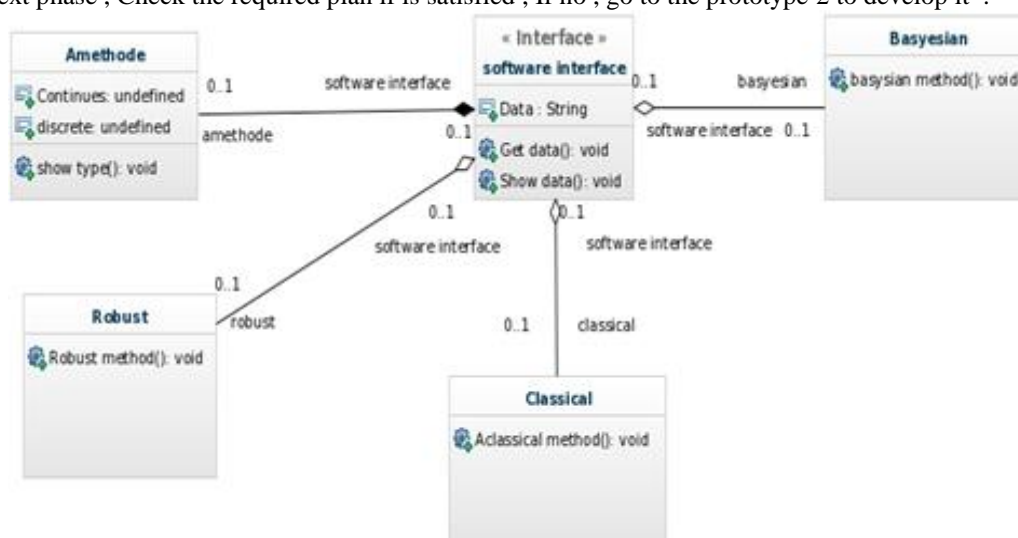4.   Plan next phase , Check the required plan if is satisfied , If no , go to the prototype 2 to develop it .

Fig. (2) : Class Diagram for Estimation Software

IV.   CONCLUSIONS

We have presented a new approach to estimating software , which is based on operational testing and which uses estimation strategies to reduce the error that is occur when we use the manually estimation methods . suggested results were reported that suggest this approach is computationally feasible, can isolate failures, and can significantly reduce the cost of estimating software estimation .

REFERENCES

[1] Scacchi W. , " **Process Models in Software Engineering** " . Encyclopedia of Software Engineering, 2nd Edition, John Wiley and Sons, Inc, NewYork, December 2001**.**

[2] Travassos GH, Kalinowski M (2012)iMPS 2011 Performance Results of Organizations that Adopted the MPS Model from 2008 to 2011 (in Portuguese). SOFTEX, Campinas/SP, p 36.

[3] http://www.softex.br/wp-content/uploads/2013/08/iMPS-2011-Resultados-de-Desempenho-das-Empresas-que-Adotaram-o-Modelo-MPS-de-2008-a-2011.pdf .

[4] Florac WA, Carleton AD, Barnard JR Statistical process control analyzing a space shuttle onboard software process. IEEE Software 17:97–106. n 4, July/August. IEEE Computer Society Press Los Alamitos, CA, USA , 2000 .

[5] Sargut KU, Demirors O." Utilization of statistical process control (SPC) in emergent software organizations: pitfalls and

[6] suggestions" . Software Quality Journal. Kluwer Academic Publishers 14(2):135–157 , 2006 .

[7] Weller E, Card D, Curtis B, Raczynski B" Point/counterpoint applying SPC to software development: where and Why, software. IEEE Software 25(3):48–51. May-June. IEEE Computer Society Press Los Alamitos, CA, USA.2008 .

[8] Raymond A. Kent, "Estimation", Data Construction and Data Analysis for Survey Research , p. 157. 2001 .

[9] Simoes C. and Monotoni M. , " Applying statistical process control in small sized evolutionary projects: results and lessons learned in the implementation of CMMI-DEV maturity level 5 in Synapsis Brazil " , Journal of Software Engineering Research and Development, 2014.

[10] Roger S. , " Software Engineering , A practitioner's Approach " , 5th Edition , McGraw-Hill Higher Education, 2001.

[11] Sommerville I. , " Software Enginerring " , 9th Edition , Addison-Wesley, ISBN 10: 0-13- 703515-2 , 2011.