

Software Engineering: An instrument for inclusive growth, sustainable development and co-existence

Apart from software architecture, software design and development, software engineering is a discipline for software developers and managers too. They practice it to deliver impeccable software service by some following some strict guidelines and applying engineering techniques within process frameworks in order to create positive and exciting developments. Otherwise it becomes an impediment to progressive development.

Globalization and technological revolutions have created huge demand for knowledgeable people in various domains. Moreover there is requirement for partnerships and collaborations too. Simplifying complexities is another big challenge to be tackled. Dealing with them requires a systematic and professional approach.

Software can either succeed or fail. When it succeeds, it implies that it meets the need of the people who use it. It performs smoothly over a longer period of time. It is easy to modify and even easier to use. It can also

change things for better. And when it fails it means that its users are dissatisfied and it becomes error prone. It is difficult to change and even harder to use. This may happen due to the ignorance or avoidance of software engineering practices right from software development to meeting any change requirements. Software in itself has its inherent characteristics which are echoed in the statement by Mr. Howard Baetjer as:

“Because software, like all capital, is embodied knowledge, and because that knowledge is initially



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dispersed, tacit, latent, and incomplete in large measure, software development is a social learning process.

The process is a dialogue in which the knowledge that must become the software is brought together and embodied in the software.

The process provides interaction between users and designers, between users and evolving tools, and between designers and evolving tools [technology].

It is an iterative process in which the evolving tool itself serves as the medium for communication, with each new round of the dialogue eliciting more useful knowledge from the people involved”

A systematic and constructive approach using appropriate methodology and technology can help. If not done systematically, it may lead to stress, mistrust, unhappiness and frustration that may adversely affect progress and subsequently retard our growth. Approach to software development is frequently adhoc. Although adhoc approach sometimes works for a small project but does not work for large critical projects.

Ideas and technological discoveries have been the driving engines for economic growth. And software has its profound impact on society and culture. We are all concerned with our future and we do seek to answer what risks might cause the software project to go awry? Change is our concern and how will changes in customer requirements, development technologies, target computers, computing environment etc. affect timeliness and overall success? We must also grapple with choices regarding methods and tools we should use, how many people should be involved, how much emphasis on quality is “enough”?

Basically we look forward for a positive and progressive development. This is achieved by way of a discipline that can scale up for large systems and that can be used consistently to produce high quality software at low cost and within a specified time. Managers and practitioners

do alike recognize the need for a more disciplined approach to software development but they continue to debate the manner in which discipline has to be applied.

So a number of standards e.g. IEEE software engineering standards, ISO 9000 standards, SEI-CMM, CMMI, SPICE etc have been in use. They recommend about the application of a systematic, disciplined, quantifiable approach to the development, operations and maintenance of the software that results into repeated performance even with different people.

In this context we also have a number of guidelines, standards and frameworks. Some of them are e-Gov Standards, National Portal of India Content Management Framework, Guidelines for Indian Government Websites, IntraNIC, Quality and Documentation etc with an objective of system approach and their pervasiveness. Further standards for ICT applications are also in the offering. Regarding their implementation, idea is if a framework is complemented with meticulously designed in-built mechanism of finer details of rules and procedures within process frameworks, so that the triggering effects can ensure its automatic compliance. And it can become our day-to-day experience and that will work smoothly and transparently.

To achieve this do we require some sort of professional governance with management techniques or practicing of professional ethics will suffice? Whatever may be the choice, it requires rooting in personal experience. Let assets be created for re-use and minimize reinventing the wheel for the needed growth and change for sustainable development. Let innovative leaders nurture and develop the system but in a framework with configuration management in place. Let the practitioners focus on what they need to do to improve the human conditions at large. Let passion, compassion and mutual respect spread through system approach with progressive led developments and inclusive growth.

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