Whitepaper

Estimation/Costing Techniques for the Software Services Industry

Abstract

A whitepaper that discusses the boom of the software services industry, the future that is beckoning at this Industry and highlights some of the lessons that could be learnt from other parallel industries. This whitepaper discusses some of the best practices of the parallel industries in the area of estimation, costing and provides insights into the adaptability of these techniques to the Software Services Sector.

see beyond technologies (Bangalore) Pvt Ltd
www.seebeyondtech.com

'Estimation/Costing Techniques for the Software Services Industry'

The market of today and yesteryears

India is today branded as the Global hub for the Software Services market. It is also poised very well to take on the next league of Services, 'Engineering Services', among many other derivatives of the Services paradigm. Having established its credentials over the last decade as the software services hub of the world, India has a secure future considering the upcoming services markets in areas other than software development.

A distinguishing fact of the upcoming market and the ongoing business is the competitive edge that India has to offer based on its pool of knowledge workers. With a young workforce that is equipped to take on the Globe by storm in these areas, organizations today are faced with the challenge of quality, timely deliveries, attrition and accurate effort estimation. While most organizations are striving and deriving methods to face these challenges, it would be a good idea to go back in time and see how certain markets/industries both in India and in other parts of the Globe have raced to be the 'leaders' in their fields.

A key competitor and a fierce one indeed on the manufacturing sector has been close, yet not so close neighbor of India, China. If we carefully analyze the way in which China took the world by storm in the manufacturing sector, there is quite a bit of inputs for all of us to learn, imbibe and put to practice in what we are good at today, Software Services.

The biggest advantage that the two bigwigs of Asia, India and China have to offer to the global markets is the price on their specific strength areas and the quality of commitment to race ahead. It was no so long ago, that a 'made in China' brand was welcome in the overseas market. Today, the ratio of acceptance is to unimaginable levels, in the overseas market, including the quality conscious markets of the Globe. A similar situation exists on the Software Services arena as well, where the acceptability has reached its peak and outsourcing software services has probably become the order of the day for most business sectors.

A point of argument that I would like to take here are the experiences that manufacturing had and the race which India gave up some time back. In the mid 80's, there used to be a wave of manufacturing outfits in India and each of them had their products so well architected and priced that it was difficult for the common man to look at options elsewhere. The economic policy of the Government, regulations and the Import policy also added to this boom and the manufacturing sector could have lured the Global customers by focusing in improving the overall quality of manufacturing, like what China did, a few years later. With the focus shifting from time to time and like any other developing nation, India had its problems, where she missed the bus and India Inc, so to say, did not repent. It was probably waiting for the next wave to catch on and this time around it carved a niche for itself in the 'Software Services' sector. From 'body shopping' to 'offshore services', to 'BPO' to 'KPO', name it, the Indian Services Organizations, were quick to react to the business opportunity and created a name that is appealing today to the Global Markets.

Shrinking Budgets

If you look at the Software Services segment today, the budgets and rates are shrinking and the cost advantage is a matter of yesterday. Indian knowledge workers are paid on par with most other developed countries and now Indian organizations are poised with the challenge of retention, controlling attrition rates and motivating talent, among other challenges of managing

customer expectations on quality. Isn't it time that we realize that we are becoming a victim of our own success?

It is now time to sit back and introspect and inspect the various findings, and many organizations are already looking at alternative mechanisms to find their niche, and 'Quality' is one of the mantra on which most organizations have zeroed in. So, what is this quality and what are we trying to do and achieve the same, especially from a Software Services perspective? The constant challenge that is posed to software houses in the Services market are the changing requirements, shrunken deadlines and the shortage of a skilled workforce. The demand and supply on skills, the level of maturity in very many areas, is surely a miss.

Budgeting and estimating a project is usually done by the 'Business Development Executives' of Services companies, in conjunction with the 'Delivery Team'. However well defined the process, there are always scenarios of scope creep, improper requirement elicitation, misjudgment on estimation, poor management of expectations, which ultimately add to the woes of the quality barometer.

Innovative methods

In the recent years, Software Services Organizations have incorporated constant evaluations, agile development practices, controlled project environments, and a few other initiatives and techniques to overcome the adrenaline rush and have a sustained business model. Ideally, the Indian Services market by this time could have had data with which it would have been possible for most organizations to estimate projects, right the first time and every time. The challenges highlighted above and various other limitations posed by external factors have been a deterrent. It would be good for us to step back a little and think how other industries, like Manufacturing, Engineering Services use techniques to estimate cost. One of the earliest methods used in this area has been the 'Activity Based Costing (ABC)', which was based on an important aspect of the growing complexity of Industrial systems, which gradually led to a situation, where joint costs constituted an increasing part of the total cost mass. Earlier, the lion's share of cost was attributed to direct material and labor, the overhead costs were allocated, which was then differentiated to the method used in ABC. This method found its way very well into the manufacturing industry and a large degree into the services industry as well, when it was introduced in the late 80's.

ABC is a method of systematic allocation of common costs to products and services on the basis of their consumption of resources activity by activity. The principles of cost allocation were based on products or services generating a need for activities, which in turn created a need for resources and themselves generating costs.

Software Services Industry has followed this model as well, but by and large it has been associated mainly to the 'mythical man month' theory. It was mainly a matter of convenience and the rigidity of the ABC model to be directly applied to Software Services, which led to this popular use of the man month based effort estimation. Added to this, effort estimation techniques like 'Function Point Analysis (FPA)' among others have also proven to be effective and there is always a continuous improvement happening on this arena. However, the gap that is visible is the frequent cycle of inspection of the past data, by the organizations. Though the inspection happens, it happens at a level that is not minute enough to derive vital statistics.

One of the other popular concepts called the Deming Wheel or the 'Plan, Do, Check and Act' (PDCA) wheel has been in vogue for a long time and has been used widely in a majority of industries. This method was initially used to analyze and develop processes, including software development processes. The concept was well established to improvise maturity of processes, especially when the software teams were poised to grow from the initial strengths that were a few to a few hundreds.

The combination of various costing methodologies and using the process as a feedback mechanism to arrive at the accuracy of the costing helped some organizations score over their competitors and could bid for projects with realistic estimates.

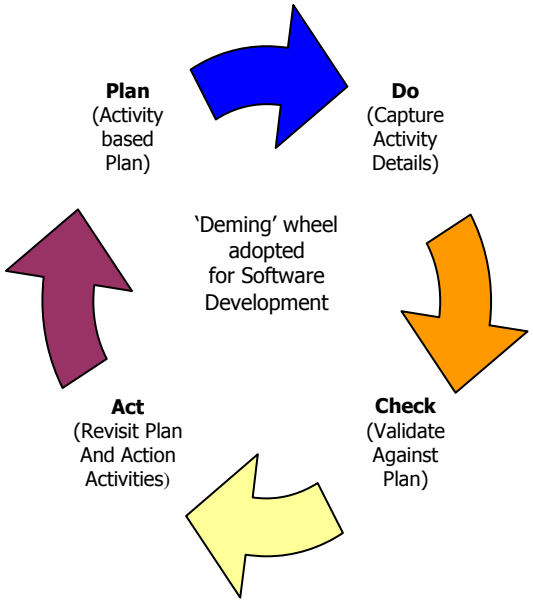
Lessons to learn and way forward

It is now our endeavor to see if we could map these techniques to the services industry, more so in specific to the Software Development Services segment.

A lot of projects that are in the offing to the Services sector are based on a host of technologies. The technological advancement is catching on at a pace that is impossible for many software services organizations to put together a plan for an effective way of utilizing any of these methodologies. In fact, by the time a project is delivered on a specific technology, the customer wants to upgrade the features to a newer and better technology. The financial services sector is a perfect example of this. The invention and popularity of the World Wide Web and mobile connectivity have only substantiated this point further.

Today's project managers in these services outfits are striving to make ends meet of the estimation and the delivery schedules. Most project managers, when challenged with the reasoning for the delay are usually lost to answer in detail and pinpoint the root cause of the delay, which is again a challenge as the requirement changes, technological challenges and the quality prescription are conflicting with each other more often than not.

Imbibing these techniques to the software development arena is a mammoth effort and a step towards this direction can probably take the industry to the next league where estimations are accurate and the data assimilated can be put to extensive use.



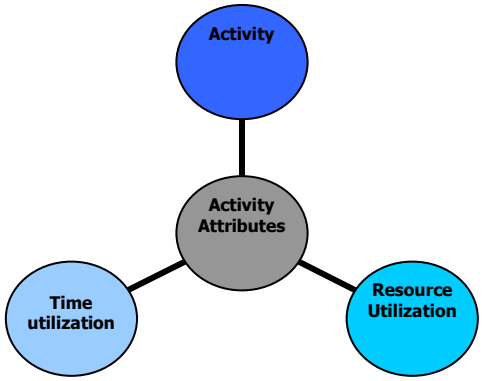
Projects have a planning stage, the execution stage, the evaluation stage and the delivery stage. This can be mapped back to the PDCA cycle easily, replacing the execution stage with the 'Do' and the Delivery stage to the 'Act' of the PDCA Cycle. Costing is established usually at the beginning of the project and the PDCA cycle along with the costing methodology of ABC can be effectively put to use to measure the costs of the project on a daily basis.

The diagram above actually explains the 'Deming' wheel adopted for software development projects.

Let us now see how the other key parameter, 'Activity Based Costing' of the project on a daily basis, could help the project managers identify the cost implications. In the 'Do' phase of the wheel depicted above, all activities are put under a microscope to capture the data from this phase and the same data can be used in the other phases to provide for continuous improvement.

The resource utilization, activity analysis, the costing for the cost object, which is the combination of the resource utilization and the activity analysis, could be one of the methodologies adopted to establish this.

The diagram below explains this concept mapped to the ABC way of collecting data related to the time spent and resources utilized on various activities carried out towards the implementation and completion of a project.



An example of using Activity based Analysis of software development efforts

Each activity that is a part of the 'Do' phase has attributes of the activity, to describe the activity in further detail. It also has attributes of the resources utilized. For instance the resources used could be one application or a multitude of applications; thus along with resources, the time utilized can be also be captured.

If this methodology is used, it would be possible for us to pinpoint the time spent; resources utilized at every phase and then plan corrective actions. Also, it would be possible to do a 'root cause analysis' in case of any slip from the original plan. However, asking the project teams to do a detailed analysis as above could be counter-productive, as it might be asking for a little too much from the delivery teams as they are already hard pressed with time deadlines.

On the positive side, if for instance every project that is executed uses this well oiled mechanism, the data collected from each of these projects, would be more meaningful to arrive at the total cost incurred, which includes the direct costs, like salaries and overheads of the knowledge workforce, the costs of the resources utilized and thereby providing a holistic viewpoint of the actual time and cost spent in the execution of projects.

Summary

The Indian Services Industry is poised for the next leap of growth. It is time for the Industry to pick the best of the methods, rather than reinventing the wheel to ensure a speedy, effective and qualitative way of estimating projects accurately. Use of the ABC and PDCA strongly with an automated toolset could help in the process of accurate software estimation methods for the future.

see beyond technologies have adopted the concepts of ABC and PDCA and have built a product called STREAM, based on this concept, which can be put to use for deriving 'Business Intelligence Data' from software development projects and thus help in more accurate effort estimations. Visit www.seebeyondtech.com for further details about STREAM.