Three New Dimensions to People, Process, Technology Improvement Model

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Abstract. People Process Technology is a holistic model for Process Improvement known and used cross industries. Introduced on a large scale about thirty years ago, the model is still used as is, without major changes. There were several attempts to update the triangle to the new realities of the market, with rather limited success. Through this article, the authors are aiming to bring additional dimensions which will ensure stronger business results through an increased focus on customer requirements and innovation.

Keywords: people, process, technology, improvement model, innovation, six dimension model, innovation, management functions, customer focused.

1 Introduction

People, process and technology (PPT) have been widely recognized as the three elements which are key for process improvement. This holistic approach was considering that to improve the overall organization, the efforts need to be focused on these three areas.

Although famous and largely used by companies from various industries and sizes, the roots of this concept are not very clear. The oldest trace could be in 1964 in Leavitt's model. [1]. In IT industry, one of the first appearance of this concept is in Information Technology Infrastructure Library (ITIL) framework launched in the 1980s. ITIL is focused on aligning IT with business, being a set of practices in IT with the sole purpose of delivering value to the business. [2]

Although been around for many years now, there are still situations where it is not perceived correctly. Even so, we must notice that the model and principles have been embraced by a large number of companies.

There are also cases in which the model was wanted to be improved. For example Pearson model [3] includes a fourth dimension - Information. Pearson view Information independent from Technology. Another case has been presented by Buttles-Valdez, Svoulu and Valdez [4]. They view Organizational Culture as the other important dimension. This is because the Organizational Culture is the environment in which process, people and technology interact. Strategy is one of the dimensions for some companies, for example US Storage Centers [5].

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We have put ourselves the questions: is it enough to look just after PPT? Are there any other areas which, by focusing on them, will ensure long term success? The take away from the previous cases is that adding a new dimension will increase the focus on that specific direction.

Looking at the roots of the problems many companies are facing today, there are some which seem they were not touched by PPT:

- Not knowing what customers want or that the expectations have changed are making customers going to a different supplier. An increased focus on client satisfaction and on collaboration will enhance quality of the service and will make customers loyal;
- Unprecedented level of pace of innovation is disrupting entire industries, especially in the Technology areas. Companies need to stay ahead of competition, so they need to be more innovative than ever;
- Challenges like: facing uncertainty, regulations, lacking problem solving capability could be faced from a better position through an increased focus on how efficient management is. Lot of waste could be eliminated and resources use to valuable activities.

So, we found another three areas: Customer Focus, Innovation and Management Functions.

2 People, Process, Technology

In this section we propose to describe briefly the three dimensions, while in the next section we are introducing additional three, which, in authors' vision, are completing the process improvement model. The authors have the purpose to use the new model in practice in Software Maintenance service.

People, Process, Technology are intensively known and used, therefore we'll not insist much on them, rather just highlighting some of the key things that need to be known about them.

2.1 People

"Right time, right place, right people equals success" [6] it's a short statement that describe perfectly the "Human" dimension of the Process Improvement Model. This dimension look after:

- People know what and how to perform activities
- They have the right skills and knowledge for the job
- They are motivated and engaged to achieve higher performance
- They are encouraged to improve day by day and they are involved in improvement projects.

People are the most important asset a company has.

2.2 Process

According with American Society for Quality (ASQ), a process is "A set of interrelated work activities characterized by a set of specific inputs and value added tasks that make up a procedure for a set of specific outputs."[7]

Looking at the end to end process, from suppliers all the way to the output delivered to the customers, it's essential to analyze the process, identify waste and eliminate it in order to have a solid process. Deliver what is expected at the expected moment is the goal.

2.3 Technology

Technology address the tools and techniques used to communicate and to make work efficient [3]. This area includes: information management systems and their architectures, hardware and software [8]. Technology is facilitated by people and is supporting the processes to run smoothly. There has been a lot of emphasize on technology in IT industry due to the fast pace with which it's innovating.

In a world in which disruptive technologies like Cloud, Mobile applications and Big Data are rapidly transforming the way business is being done, technology is becoming more and more important and visible. It is becoming one of the most important areas to stay ahead of the competition.

3 What Customers Want?

A service need to answer customer needs. But what do the customers really want? According with Harvard Business Review [9] based on Convergys Corporation studies, the top three attributes that customers want are: knowledgeable employees, addresses my needs on first contact, treats me like a valued customer (Fig. 1).

In other orders, a customer wants to know that his problem is treated fast, by somebody he can rely on, while in the same time, care is shown for him.

Another study on the same Harvard Business Review [10] support the idea that customers loyalty is built on reducing clients effort, the work they need to perform and not on delighting customers. The percentage of satisfied customers who were considering switching the service provider was about the same with the percentage of dissatisfied customers who were considering to keep the same provider. Things that are causing satisfaction are different than the things which are causing dissatisfaction.

Although there are no insides on the reasons the customers are considering when they decide to keep or change the supplier, this study is helping us to understand that there is more beyond customer satisfaction.

Another study of Williams and Visser [11] also suggest that customer satisfaction is not very important on retaining the clients; what has more impact is to bribe not satisfied customers with free offers or gifts as compensation.

Customer are different, services are different and so are the expectations. To add more complexity, customer expectations are changing over time. What once was

considered as delighting, is now considered basic need (for example Wireless connection in a hotel).

This means that an increased focused is required on understanding customer expectations and adapt the delivery of services accordingly. One way to do this is to consider Customer Focus, embedded in Process and People dimensions, an entire new dimension.

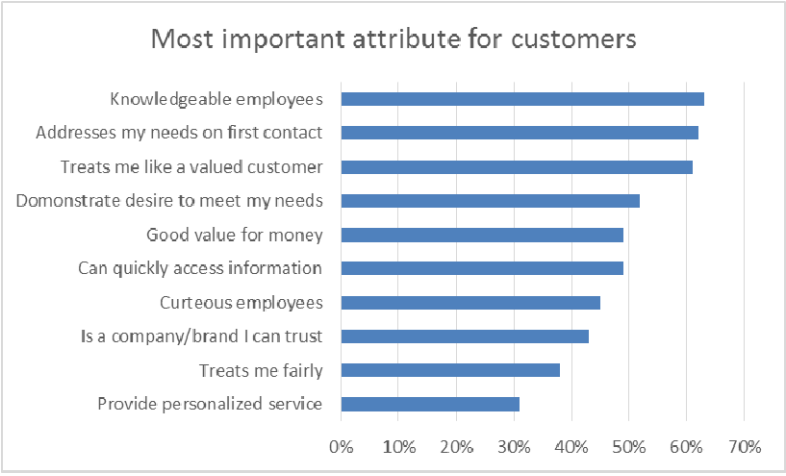

Fig. 1. Most important attribute for customers (Source: Convergys Corporation, 2008)

Striving for a better service, faster, higher quality is not something new. There was always a focus on process improvement and on innovation. What is different is that customers are asking their service providers to be innovative. The customers are involved in the innovation process.

Companies need to innovate in order to stay relevant, ahead of the competition. Due to all these, we consider Innovation as one of the dimensions of the process improvement model. A dimension is basically an eyeglass to look at the business or organization from that specific point of view.

The third new dimension is Management Functions. A common definition of management is the achievement of an organizations goal through people and other resources.

Basic management functions identified by Fayol: Forecasting, Planning, Organizing, Commanding, Coordinating, Controlling. More recent views [12] are seeing these as four functions: Planning, Organizing, Leading and Controlling, while there are some new functions in relation with people: Energize, Empower, Support, Communicate.

Our view is that through mastering these functions will ensure integrating as a whole the other 5 dimensions. This is why this is important. Processes cannot work unless they are followed by People, cannot be improved if there is no Innovation, Technology is used to transform inputs in required outputs, and all is in vain if no customer is buying the service. These can smoothly work together if management is efficient.

4 Three New Dimensions: Customer Focus, Innovation and Management Functions

In addition to the three consecrated areas, the authors identified three other dimensions which are complimentary, completing the model. These three dimensions are:

- Customer focus
- Innovation
- Management Functions

The 6 dimensions improvement model for Software Maintenance are presented in Figure 2, enclosed intro a circle, through which we intended to show the unity of the model. Each dimension has equal importance in order for the whole to run smoothly. However, in practice we will observe that some of the dimensions are more pronounced due to the conditions and environment of each particular case.

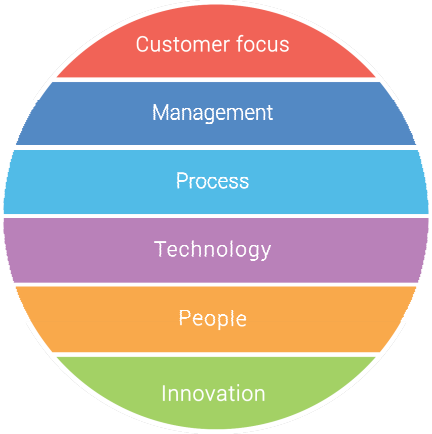

Fig. 2. Six Dimension model for improvement: Customer focus, Innovation, People, Process, Technology, Management Functions

4.1 Focus on Customer

All companies aim to satisfy customer expectations in order to retain them and ensure sustainable financial performance.

What is interesting is that in the case of a service, the customer is deeply involved in the process. In fact, some of the researchers like Gallouj and Djellal [13], Ettlie [14], Gustafsson and Johnson [15], just to name a few of them, are considering customers as co-producers of the service. This happens because the clients are providing ideas, specific requirements, are validating and consuming the service in the same time as the service supplier is producing it.

Customers are one of the most valuable sources of innovative ideas, and in this regards is ensuring the connection with the second new dimension, Innovation.

The reason why we believe this dimension is required is because, all too often, in services, teams involved tend to forget about the customer. They are focused on delivering the service or solving a problem and meeting the Service Level Agreement (SLAs) and forget that behind each request for service lays a problem or situation which can become an opportunity to do more business.

So, with this dimension, we are aiming to give back to the customer the place where he belongs, while also promoting a collaborative relationship between the two parties.

In services, like software maintenance, this can be achieved through:

- Really understand Customers, types of Customers and their expectations by all team members
- Direct interaction between teams providing the service and users, facilitate forums for exchanging ideas
- Develop right skills to interact with Customer
- Customer feedback and satisfaction collection and capitalize from them
- Customer relationship management
- Understand Customer industry and Customer specifics

4.2 Innovation

Innovation is defined as "*the act or process of introducing new ideas, devices, or methods*" [16]. Van Zyl [17] alleged more than ten years ago that innovation will become the differentiator in the IT market and he was right.

Many big companies are requesting that suppliers not only deliver the service and meeting the SLAs, but also to bring forward innovative ideas for the benefit of the business.

All these reasons made us consider Innovation as one of the key areas of the model.

To spur innovation a process has to be put in place. Drucker [18] was suggesting that Innovative ideas can appear accidentally or may be a genius spark, however most often is the result of hard work, research directed to solve customer issues.

Scott Anthony [19] propose four stages in an innovation program (Fig 3):

Fig. 3. The Four Stages in an innovation program (Scott Anthony)

Fuglsang [20] splits the process in two: first part is concerned with generating the idea, while the second part is about exploiting the idea. First part is the creative part, the second is more about execution.

In our view, an idea is going through the following stages (Fig. 4):

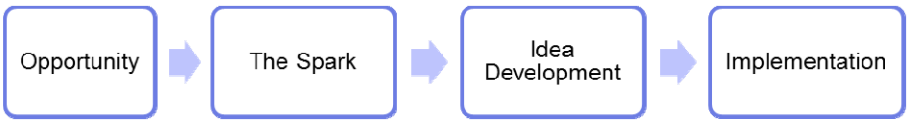

Fig. 4. Innovation Stages

i. Opportunity: Customer business is known, problems are known
ii. Spark: Many sources exist to generate ideas. In the end one or more ideas on how to solve the problem aroused. This is what we call "the spark", the breakthrough idea which is going to solve the problem.
iii. Idea Development: Generated ideas are developed, evaluated and piloted (if required)
iv. Implementation: Ideas are prioritized and best ones will be implemented.

What is interesting is that only one of the four stages, Spark, can be pure creative, the rest are or should be structured processes.

The main differences between our model and Scott Anthony's model are:

- In our model, the undiscovered idea is the first stage
- The steps "Idea Modelling" and "Evaluation and Testing" we view them as a singular step : "Idea Development"

Sources for ideas are multiple:

- Customer feedback
- Business reviews
- Industry knowledge
- Market – benchmarking
- New technologies
- Brainstorming Sessions
- Random
- Forums, Conferences, Meetings outside organization.
- Root Cause Analysis
- Lesson learned

Many of the ideas can come from outside the organization [13]. This need to be taken into account by maintenance teams and act accordingly.

In order to have an efficient innovation process, the team has to be focused on the result wanted by the customer, rather than looking at the requirements and specifications [19]. In addition to this, customer needs to be asked only about the outcome, and not to come up with solutions [21].

As previous presented, involving the customer in this process is the key to success. This can be achieved in various ways:

- Forums to allow teams to interact with users
- Brainstorming sessions with service users and various types of clients
- Encourage people to bring new ideas, new concepts and technologies
- Witness user experiences in using the service or products supported by the service
- End to end improvement projects with advantages for both customer and supplier
- Thorough analysis of problem description of the requests

4.3 Management Functions

Management as science and as a role has a crucial role on how the process is run, on its performance. There are still debates whether there are four or five basic management functions, however they are a representation of the same. These basic functions are: Planning, Organizing, Directing and Controlling.

Planning function is concerned with defining strategy, setting objectives and create a plan to achieve them.

Organizing function is taking care of resourcing allocation and organizing them to support achieving the goals.

Directing (sometimes also called Leading) is about leading the employees and motivate them towards goals achievement.

Controlling is about measuring what has been achieved compared with the plan.

A closer look at how the four functions are used to manage the service is presented below.

PLANNING

- Planned or forecasted volume of activities (expected volume of requests/tickets)
- Planned resources according with expected volume of activities
- Development plans for team members
- Key Process Indicators(KPIs) and Service Levels Agreement definition
- Define strategy, action plans

ORGANIZING

- Activities and tasks are well defined
- Process is defined and well known by the team
- Resources have been allocated (staffing)
- Resources have the right skills
- Documentation creation and update
- Organization layout

LEADING

- Roles and responsibilities defined
- Governance processes
- People motivation, manage attrition
- Leadership style
- Corrective and Preventive actions

CONTROLLING
- Milestones, KPIs and SLAs measurement and reporting
- Ensuring Control points are in place
- Effective reporting

5 Conclusions

We started from the consecrated People, Process, Technology, improvement model which for about 3 decades has been used specially in IT just to understand if there are some missing pieces in the puzzle. We have identified three other dimensions which are completing the model: Customer Focus, Innovation and Management Functions.

This is a theoretical model which need to be tested in practice, on real processes, however we sustain that focusing on customer and innovation, while looking at how management functions are applied can boost the performance of the overall system. In our future study we are going to evaluate a real service from all six dimensions views. The result we expect to be a list of recommendations which will enhance the service. Comparing after implementation results with before (current state) will finally validate the model.

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References

1. Cooper, W., Leavitt, H.J., Shelly, M.W.I.: New Perspectives in Organization Research. John Wiley, New York (1964)
2. Office of Government Commerce: The Introduction to the ITIL Service Lifecycle, The Stationery Office (2007)
3. Pearson, J. blog, http://deconstructingitsm.wordpress.com/2009/02/17/people-%E2%80%93-process-%E2%80%93-technology-the-eternal-triangle/ (accessed on August 29, 2014)
4. Buttles-Valdez, P., Svolou, A., Valdez, F.: A Holistic Approach to Process Improvement Using the People CMM and the CMMI-Dev: Technology, Process, People, & Culture, The Holistic Quadripartite, Carnegie Mellon University, https://resources.sei.cmu.edu (accessed on August 30, 2014)
5. US Storage Centers, http://www.usstoragemanagement.com/depth-scale-real-options/ (accessed on August 30, 2014)
6. Shah, I.: Reflections. Octagon Press (1968)
7. American Society for Quality, http://asq.org/glossary/p.html (accessed on August 30, 2014)
8. Sorensen, P., Ing, B.: Balancing Investment in People, Process and Technology and Building the Capacity to do so in Developing Economies, The International Council of Management Consulting Institutes, http://unctad.org/sections/dite_dir/docs/dite_pcbb_stdev0031_en.pdf (accessed on December 5, 2014)

9. Dougherty D., Murthy A.: What Service Customers Really Want, Harvard Business Review, Issue September, Boston (2009)
10. Dixon M.,Freeman K., Toman N.: Stop Trying to Delight Your Customers. Harvard Business Review, Issue July, Boston (2010)
11. Williams, R., Visser, R.: Customer satisfaction: it is dead but it will not lie down. Manage Service Quality 12(3), 194–199 (2002)
12. Nelson, B., Peter, E.P.: The Management Bible. John Wiles & Sons (2005)
13. Gallouj, F., Djellal, F.: The handbook of innovation and services. Edward Elgar Publishing Limited, USA (2010)
14. Ettlie J.E.: Managing Innovation, 2nd edn. Elsevier Butterworth-Heinemann (2006)
15. Gustafsson A., Johnson M.D.: Competing in a Service Economy. How to Create a Competitive Advantage Through Service Development and Innovation. John Wiley & Sons Inc., San Francisco (2003)
16. Merriam Webster Dictionary, http://www.merriam-webster.com/dictionary/innovation (accessed on August 2, 2014)
17. Zyl, J.V.: Process innovation imperative [software product development organisation]. In: IEMC 2001 Proceedings of the Change Management and the New Industrial Revolution, New York, pp. 454–459 (2001)
18. Drucker, P.F.: The Discipline of Innovation, Harvard Business Review, pp. 67–72, Issue May–June, Boston (1985)
19. Anthony S.D.: The Little Black Book of Innovation: How It Works, How to Do It. Harvard Business Press, Boston (2012)
20. Fuglsang L.: Innovation and the Creative Process: Towards Innovation With Care. Edward Elgar Pub., Northampton (2008)
21. Ulwick A. W.: Turn Customer Input into Innovation, Harvard Business Review. Issue January, 91-97, Boston (2002)