Cross Functional Process Analysis and Improvement

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Most product and service defects are controlled through process analysis. A cross functional process map displays the tasks and decisions that are carried out during a process by all the contributing workers. Process maps can be inspected visually, they can be analyzed with the value added criteria, and they can be modeled with software. The complexity of process analysis tools varies greatly. Process drawing tools automate the documentation of the flow of task steps in a single process; process modeler tools capture cost and time data to provide simulations of 'as is' and 'to be' process models for the enterprise.

INTRODUCTION

Contrary to common opinion, most people try very hard to do their jobs correctly and follow the standard company processes. According to the 85:15 rule (1), 85% of the problems encountered at work are due to the processes used to guide and regulate the work, and only 15% are due to workers. Over time a standard process loses its efficiency as modifications are made to accommodate new workers, suppliers, materials, tools, regulations, and customers.

Therefore most product defects and substandard services can be controlled through process analysis (2). In addition to the obvious benefit of quality control, process maps also help workers focus on the customers needs, assist management in tracking the use of their resources, and provide excellent training materials for new employees.

CROSS FUNCTIONAL PROCESS ANALYSIS

A process map is a tool used to identify and analyze problems and opportunities. It is a graphical representation of the tasks and decisions that are carried out during the process. A cross functional process map displays all the workers that contribute to a process, even though they may work in different departments and apply different types and levels of skills.

Process analysis usually begins with a high level process map, sometimes called a relationship map or a structure diagram. This is used to scope out the limits of the analysis for the process improvement team. Fig. 1 is a structure diagram for a hiring process.

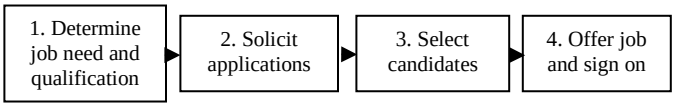

Fig. 1: Structure Diagram of the Hiring Process

Each of the high level tasks is then expanded, as shown in the cross functional map in Fig. 2. (3,4)

Note the common features of a cross functional process map:

- Process Name: Job Offer and Sign On is one portion of the overall process.
- List of Key Players: Each of the positions in each department involved or who will be impacted by the changes.
- Swim Lanes: Horizontal paths that track each player's involvement in the process.
- Customer: In this example the Candidate is the customer for the process. The Line Manager is the internal customer.
- Start and End Points: This example starts with Choose Best Candidate. It ends with connectors to the appropriate step.
- Process Tasks: Each process task is placed in a rectangle and starts with a verb, and is connected to preceding and subsequent tasks. Each task consists of numerous smaller steps which are not included in a process map.
- Decisions: Decisions are stated as questions and placed within a diamond shape. All choices are labeled.
- Connectors: May connect processes on separate pages or provide a means to loop back.

PROCESS IMPROVEMENT

Once the 'as is' process is documented, a visual inspection of the map can proceed. (5,6,7) It is relatively easy to spot many types of potential problems and opportunities for change from the cross functional map.

- Who is responsible for each step?
- When handing off work to another department (crossing the swim lanes), do you know their expectations or needs? (your internal customers)

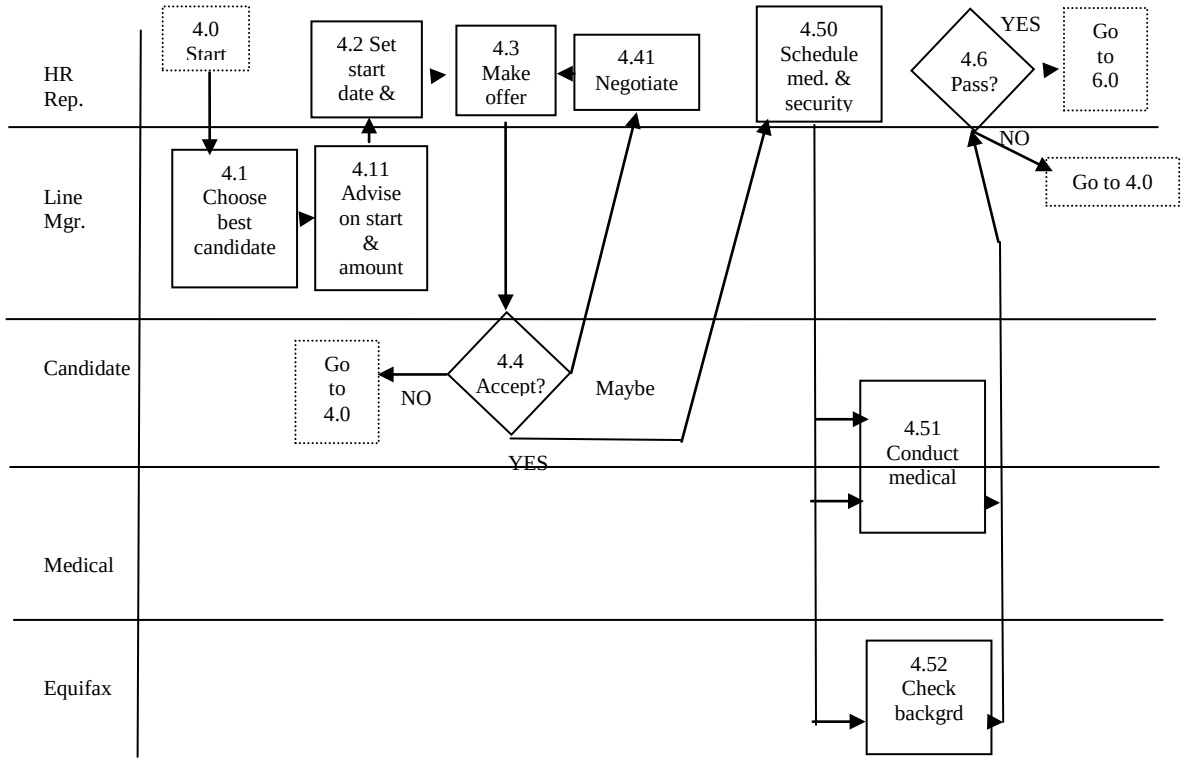

Fig. 2: Cross Functional Process Map of Job Offer and Sign On

- What opinion does the customer form of you and your company at each transaction? (moment of truth)
- What steps are done by the customer to do business with your company? (service cycle)
- What is the critical path of the tasks: (linear and parallel processing)
- Where do most of the errors occur?
- Which steps hold potential for health risks and large monetary loss?

Value Added Analysis

Value added activities are those that, if the customer knew that the task occurred, would be willing to pay for the effort. There are three steps to follow when doing a value added analysis of a business process after it is mapped.

1. Eliminate activities that do not add value to the customer. Apply customer criteria to each task and decision on the process map to determine which steps could be eliminated. Examples include duplicate activities, extra reviews and unused data.
2. Simplify the remaining activities. Reduce the cost or time taken for the value added activities that could not be eliminated.
3. Focus on providing customer needs. Marketing and sales can suggest additional features or values to increase customer satisfaction, and they may not be costly to implement in a new process.

Table 1 illustrates how a value added analysis might be applied to a consulting business, focusing on the project set up and tracking activities.

		Original Process		Redesigned Process	
Tasks	Value Added ?	Process Time (hrs)	Cycle Time (hrs)	Process Time (hrs)	Cycle Time (hrs)
Create workplan	yes	4.0	8.0	4.0	8.0
Set up time tracking		1.0	2.0		
Provide schedules/ forms		0.5	24.0		
Record time and expenses		2.5	360	2.5	8.0
Input to system		0.25	0.5		
Report on chargeable hrs		2.0	4.0		
Report to		5.0	48.0	1.0	16.0

		Original Process		Redesigned Process	
Tasks	Value Added ?	Process Time (hrs)	Cycle Time (hrs)	Process Time (hrs)	Cycle Time (hrs)
staff					
Print prelim bill		0.25	4.0		
Compare bill to workplan	yes	1.0	8.0	1.0	2.0
Revise bill		2.0	3.0	0.5	2.0
Print billing reports		0.5	1.0		
Prepare bill		0.5	24.0	0.1	0.25
Send bill		0.25	96.0		
Mail check		0.5	720	1.0	8.0
Credit client account	yes	0.25	6.0	0.1	24.0
Totals	3	20.0	1308	10.2	68.25
% cycle time	20%	1.5%		15%	

Table 1: Value Added Analysis Example

From this simple example the efficiency of the process was increased by a factor of 10 (percentage process time of cycle time increased from 1.5% to 15%), as process time was reduced by half (20.0 hours in the original process, vs 10.2 hours in the redesigned process). These type of results are not uncommon when the cross functional process map is inspected and the value added analysis is applied. As process teams deal with more processes and more complex business situations, software tools become useful to identify the problems and opportunities contained in the process maps.

TOOLS FOR PROCESS ANALYSIS

Eight years ago a review (H) was conducted of available software tools that supported process analysis. At that time there were not many software tools being used to document and analyze business processes, and they were easily divided into four groups: graphical (drawing) programs, integrated programs (drawings and then spreadsheets for each task), simulations and collaboration tools. According to a recent series of reports by Business Process Trends (9,10), there are more software tools available now but grouping is difficult because their functionality overlaps. The Business Process Trends reports displayed their understanding of the relationships in Figure 3: The Business Modeling Software Product Market (taken from Hall and Harmon).

Business Process Management (BPM) Suites are software products used to automate and control process as they are executed in ongoing business situations. Within these categories, this paper is concerned with

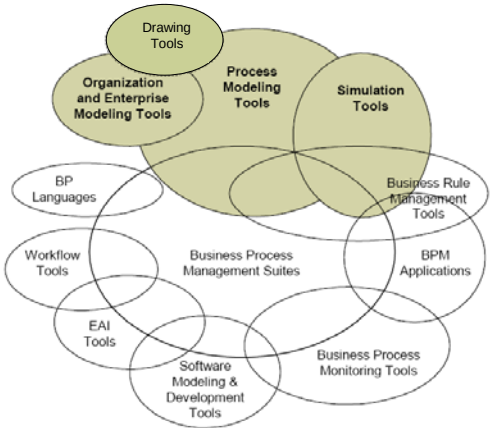

Figure 3: The Business Modeling Software Product Market

the Drawing, Enterprise Architecture, Process Modeling and Simulation tools used by practitioners to understand how the processes in their organization work, and how to design a new process or improve (redesign) a current process.

Process Drawing Tools

Drawing tools automate the work needed to create a diagram of the process flow. They do not create a database or repository of data on the tasks or the process, such as costs, time, or resources. Drawing tools can be used to capture or summarize preliminary discussions of process flow.

One of the more popular drawing tools is Visio Professional, which assembles diagrams by dragging predefined symbols. It supports many diagram types, such as block diagrams, charts and graphs, flowcharts, directional map shapes and organizational charts. Shapes in Visio can be enhanced with custom properties to contain and display additional information to ensure that key information is presented in context. Visio diagrams saved on a Windows SharePoint Services workspace can be opened directly in Visio from the workspace (through a drop-down list box). When a diagram is opened from a Windows SharePoint Services workspace, Visio opens a Shared Workspace task pane that contains all of the information in the workspace, including other files, members, tasks, and links.

Import and export capabilities for Visio include support for a variety of formats, such as Scalable Vector Graphics (SVG) and computer-assisted-design (CAD). Visio provides data-driven diagramming capabilities and a programming model for building custom solutions from SQL Server or Access. Interfacing Technologies Corporation provides Charter, an add-on to Visio, which creates a process knowledge base, such as linking procedures, forms, spreadsheets and URLs

together. Prices: Visio Professional 2003 – New $499, Upgrade $249; Charter add-on from $CAN 595 to $CAN 975 for a Professional version.

There are several other drawing tools that are easy to use and less expensive than Visio Professional:

- Flowcharter 2005 by Corel iGrafx, $354
- ActionWorks Business Process Builder by Action Tech, $ NA
- BizFlow Process Designer by HandySoft, $ NA
- SmartDraw 7 by SmartDraw, $179 online

Process Modeling Tools

Modeling tools use the graphic representation to populate a database, thus saving the information across multiple process maps. Gradually the model accumulates data about processes and sub-processes, their costs, their management structure, the activity costs, the personnel involved, etc. The integrated information can provide an enterprise view of the data and allow for simulations of process capabilities. That being said, the capability of the modeling tools vary since each were created with different audiences in mind.

Some modeling tools are designed for use by business managers to track process measures, while others are for IT analysts; an example of the latter is JBoss jBPM, an open source workflow and BPM engine. Two mid-range modeling tools are described here, Holocentric Modeler and iGrafx Process 2006, and two high end tools, Casewise Corporate Modeler and TIBCO Staffware Process Suite. Descriptions of similar products can be found in the BP Trends report (Hall and Harmon, 2005).

Holocentric Modeler enables organizations to build the "as is" model to include all or part of the organization structure, roles, people, business processes, information and IT systems; the process team can include organization structures and new work practices or define the requirements for IT systems. Holocentric Modeler enables the analysis between the "As is" and the "To be" models, allowing team members to simulate alternative approaches to narrowing the gap and model a solution before building and implementing expensive solutions.
www.holocentric.com Price: $1.550 single seat

iGrafx Process 2006 supports integrated reporting, hierarchical process maps, intelligent swimlane diagrams, user definable modeling data, multiple scenario analysis, and importing and exporting of actual process data. Collaboration is possible through instant web and Microsoft Office publishing.
www.igrafx.com/ Price: $395-$1895 single seat

The Casewise Modeler is a higher end modeling suite of tools, enabling the modeling, documentation, and analysis of an organization's Enterprise Architecture, which include the actual business processes, the resources that perform these processes, and the data that support each process. Organizational, process and technology modeling are linked together through a central repository, provides a view of the total enterprise. Object types can be chosen to represent these business components:

- The Process – any business, automated, or IT process
- Organization – the people and resources who perform a process
- Location – where a process occurs
- Data – the information that is read or recorded during a process
- Application – the IT applications that are used to perform a process
- Technology – the hardware and IT infrastructure that are used during a process

Casewise Modeler facilitates collaboration between process teams during process modeling by transforming the models to hyper-linked web pages, preserving the levels and associations between processes, organizations and data. The Modeler also generates reports and procedure manuals for support staff, implementation teams, and IT software development teams.
www.casewise.com Price: NA

TIBCO Staffware Process Suite consists of several open architecture modules that provide end-to-end process management services. It is designed to allow organizations to create an IT infrastructure based on the business processes. TIBCO Staffware Process Suite allows non-IT staff and business specialists to model business processes through a user-friendly, graphical modeling environment, with complete support for version control. The resulting process map is the guide to integrating people, processes and applications.

The Staffware Process Suite employs a spreadsheet-like decision table metaphor, enabling management to establish and continuously measure Key Performance Indicators (KPIs) for ongoing process performance and improvement, giving teams a common measurement to gauge how well they are doing. TIBCO has developed a number of Process Frameworks, such as Claims Management, which speeds up the documentation and modeling of standard processes.
www.tibco.com Price: about $400,000 and up

While the drawing tools are sufficient for smaller process improvement efforts, most teams opt for more

sophisticated tools as they tackle all levels of the core processes throughout the enterprise.

SUMMARY

At its simplest, process analysis is an effective tool for saving time, reducing cost and improving quality. A single facilitator with a group of workers from each of the departments that contribute to the process can map and visually analyze the results in a few days. When the same basic cross functional process map is created for multiple activities across the enterprise, its properties can be captured by sophisticated software so the operations of the entire company can be examined and fine tuned. In either case, the cross functional process map is the fundamental activity that unlocks the potential for discovering new opportunities and for fixing nagging problems.

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