Agris on-line Papers in Economics and Informatics

Volume II Number 3, 2010

WCA Framework

T. Rain, I. Švarcová

Czech University of Life Sciences Prague, Faculty of Economics and Management, Department of Information Technology

Abstract

This article deals with subject-matter and components of WCA Framework. Authors clarify individual elements of WCA. Article is being coupled with explaining of WCA Framework. Authors furthermore introduce differences between WCA Framework and additional analytical methods. Authors pay attention to relation among information technology, information system, work system, firm and business environment.

Key words

WCA Framework, customer, product, business process, information, participant, information technology.

Anotace

Tento článek pojednává o významu a prvcích analýzy WCA Framework. Autoři komentují prvky analýzy WCA. Článek je doplněn vysvětlením WCA Framework. Autoři dále uvádějí rozdíly mezi WCA Framework a dalšími analytickými metodami. Pozornost je též věnována vztahu mezi informačními technologiemi, informačním systémem, pracovním systémem, firmou a okolím podniku.

Klíčová slova

WCA Framework, zákazník, produkt, obchodní proces, informace, účastník, informační technologie.

Introduction

Topical IT specialists, copyreaders, teachers, students and readership use many methodical (formal) and analytical shells for understanding, describing and analyzing information systems and factors of using IS/IT in particular organizations. Some methodologies describe information systems as separated instrument (without system aim behavior, business environment, information requirements etc.). Nevertheless successful appreciation of information occasions of enterprise (employees, managers, users) result from understanding enterprise business processes sequence, enterprise environment, employee's mission in each process, competence and responsibility in analyzing subject.

S. Alter says in [1] about WCA framework: "…The WCA framework summarizes the elements any business professional should look at when analyzing an existing or potential system in an organization. The framework says that the system is much more than just technology. Instead, the system is actually a work system consisting of a business process performed by human participants using information and technology. Unless the purpose of the analysis is to improve the way the system operates internally without changing anything about what it produces or why it exists, the analysis of the system needs to include the product it produces and the customers it serves..."

Department of Information Technologies (Czech University of Life Sciences Prague) gives lessons from WCA Framework. This analytical framework supplements student's knowledge in all stage of building and implementing information systems to organization. WCA Framework is being instructed in lectures and seminars (presenting and discussing case studies).

Material and methods

Authors describe WCA Framework, present differences between WCA Framework and others methodologies and discuss reasons of instructing WCA Framework. Authors use method of studying literature resources.

The aim of this article is to present WCA Framework as relatively new, complex, modern and useful shell for analyzing information requirements and describing information systems. Authors show extended approach to using WCA Framework in pedagogical practice to prepare students for applying complex analyzes (economics and informatics).

Results and discussion

Work-Centered Analysis (WCA) by Steven Alter is a framework for thinking about business processes and the information systems that support them. It focuses on the work being done.

Work is the application of human and physical resources such as people, equipment, time, effort, and money to generate outputs used by internal or external customers. It ideas from several prominent management theories including Total Quality Management, business process reengineering, and systems theory. WCA framework result from Alter's definition of information system:

Alter (1992): An information system is a combination of: work practices, information, people, and information technologies organized to accomplish goals in an organization. [1]

Alter (1996): An information system is a system that uses information technology to capture, transmit, store, retrieve, manipulate, or display information that is used in one or more business processes.

Term **Business processes** define Alter as: A business process is a related group of steps or activities that use people, information, and other resources to create value for internal or external customers. Business Processes consist of steps related in time and place, have a beginning and end, and have inputs and outputs. Core processes are themselves divided into subprocesses, and the typical business unit might have seven to twenty core business processes.

For explanation of WCA Alter use term **Work system**. Alter defines it: A work system is a system that produces products for internal and external customers through a business process performed by human participants with the help of information technology.

The early focus on IS was for the support of operations, management, analysis and decision-making in organizations. A significant emphasis was on models of planning and control. The late 1980's and early 1990's saw IS expand from the support not only of decision-making, but for improved communication support as well. The explosion of the Web has added the important characteristic of providing information access. Today the emphasis in organizations is on the support of business processes.

Alter use terms: Information Technology, Firm and Business Environment. **Information Technology** means the hardware, software, and networks that make Information systems possible.

Firm (or organization): Consists of a large number of interdependent business processes that work together to generate products of services in a business environment.

Business environment: Includes the firm and everything else that affects its success, such as competitors, suppliers, customers, regulatory agencies, and demographic, social, and economic conditions.

The WCA framework implies that although people sometimes speak of computers as systems, the system business professionals should focus on is the system performing the work. The system performing the work is much broader than the technology. It includes the business processes, the participants, any information used, and any technology used. All elements create "pyramid" (the base create participants, information and technologies, second level is being created by business process, third stage represents products and on the top is position for customers).

The links are two-way, implying that the elements should be in balance. Also, changes in one place may result in changes in other elements.

This "pyramid" describes Work-centered Analysis (WCA), a conceptual framework developed, for "thinking about business processes and the systems that support them." WCA framework is an element of the business process reengineering. [3]

The product / service is provided by process. This can be either tangible or intangible and may include

services performed or information provided in conjunction with the physical product (e.g., status information, instructions for use).

In this model there are the internal and also the external customers. Those who use the outputs of a business process who may be either internal or external to the firm.

Special element represent human enablers – participants: According to Alter, these are the "people who enter, process, or use the information within the system."

All above mentioned elements is considered in first determining the scope of the study and then in looking at the system from a number of perspectives. These include:

- **Measuring** - the performance of the process being investigated. Performance analysis is central to business process reengineering. Unfortunately, many organizations fail to capture performance information on their processes. In examining the existing system it may be necessary to estimate performance metrics or to put in place temporary processes for measuring them.
- **Understanding the context of process:** The context within the system exists will shape both its design and its effective use. According to Alter, context includes things such as external stakeholders, organizational policies and practices, personal incentives, organizational culture, resource availability, business pressures, and laws and regulations.
- **Identifying the infrastructure:** Infrastructure, according to Alter consists of essential resources shared by many otherwise independent applications. Infrastructure related to technology, as in communications networks or shared computers are fairly easy to identify. New information systems themselves become candidate infrastructure for subsequent systems. For instance, a database developed to support an internal help line may be later made available to customers.
- **Examining the architecture of the various components:** Architecture, according to Alter "focuses on the components of the business process, how those components are linked, and how they operate together mechanically to produce business process outputs." Architecture is revealed through an interactive process of hierarchical decomposition in which, like pealing an onion, more and more detail is revealed as we bore further and further down into the hierarchy.
- **Assessing the Risks:** Information systems always are accompanied by some elements of risk. These can fall within each of the elements of the WCA framework and apply both to the current system and the system being envisioned. Risk is attached both to the system itself, as with machine malfunctions, software bugs, or undetected computer crime. But it may also come in failures in the process used to create the system - so called project management failures. The following are the kinds of risks that Alter has identified for the various stages of the framework. Customers: Customers may be dissatisfied with aspects of the current system or may become more dissatisfied as the system produces service that is inferior to competitors or the customer's typical expectations. But inattentive customers may also fail to reveal existing failings in the current system. New systems also can impact customers in unfavorable ways, particularly if they do not perform as anticipated. Products or Services: Systems can produce products that are wrong, fraudulent, or inadequate. For instance, a check writing system that prepares an insufficient check or a billing system that duns a customer for a bill that was already paid. Fraudulent activity, such as collusion, can also result in erroneous payments and so on. Business Processes: Processes often have elaborate controls built in to limit exposure. Still, many risks often are either unidentified or ineffectively planned for. Among those Alter identifies, are inadequate procedures for gathering and protecting data, unauthorized access to computers, programs, and data, inadequate skills to properly participate in the process, or

inadequate attention to backup and recovery.

Tomorrow's successful business professionals need more than the ability to do personal work on a computer and general familiarity with business and technical terms. Contributing fully to current organizations requires an ability to participate in systems, evaluate them, and contribute to system development efforts. This requires an organized approach for thinking about systems, an approach that can be used successfully today and will still be valid five or ten years from now when today's technical and business terms are no longer at the cutting edge.

The work system method was developed to address a void in established systems analysis and design approaches. The goal was to provide a set of ideas and a method that business professionals might use with or without the help of consultants or IT professionals in order to evaluate a system from a business perspective, think about system improvements, and communicate about realities faced by new or improved information systems. Successive versions of the work system method were developed based on direct and indirect feedback from hundreds of MBA and EMBA students writing papers about systems in their own organizations. [2]

The main difference between the usual IT models and the WCA approach is that the usual IT models are the frameworks for teaching about information systems, whereas the WCA approach is the basis of a method for analyzing a particular information system as an integral part of a work system it supports. The WCA approach recognizes the overlap between information systems and work systems and views the elements of the work system as the starting point for analyzing any particular information system.

We use WCA Framework in teaching subjects Strategy of IS and Enterprise IS. In teaching process we explain all WCA Framework components. Then we continue with applying this theory to case studies. Alter's case studies allow us to apply principles of WCA Framework to particular business situations. Students prepare own semestral team projects to exercise WCA Framework algorithm.

We lead students to considering about one particular business situation in context of cost, enterprise strategy, information requirements, IS architecture and schedule of implementation. Informatics considers usually only about architecture and information requirements. Cost and "manager´s dimension" solve usually accountant or economist. In point of wives Service Science theory choosing and implementing right information system needs to consider about all above issues. Managers need for right decisions general knowledge about technical and economic issues.

We build up student's capability to summarize all relevant information to understanding initial situation in enterprise. Students continue with describing of information requirements, with analyzing initial situation and the last chapter contains student's suggestions for changing applications / buying new SW and services. On last seminar students presents semestral project and defense own works.

We extend and combine WCA Framework theory with Cost Benefit Analyze and with others relevant methods. We perceive WCA Framework for shall not only for real business situations but also as a pedagogic shall for formation of student's analytics and decisions capabilities. WCA Framework can be used as shall for teaching about general process oriented view (describing workflow as a static structure of task and resources). Next possible approach is organization view. This view defines the enterprise roles, each role has links to particular set of tasks there are also links to information and resources. Next dimension is being created by performance view that is characterized by the objective structure and relations between tasks and goals.

Corresponding author:
Ing. Tomáš Rain Ph.D.
Czech University of Life Sciences Prague, Department of Information Technologies
Kamýcká 129, 165 21 Praha 6 – Suchdol,
tel.: +420 777 630 839, e-mail: rain@pef.czu.cz.

Doc.Dr.Ivana Švarcová,CSc., e-mail: ***svarcova@pef.czu.cz***
Czech University of Life Sciences Prague, Department of Information Technologies
Kamýcká 129, 165 21 Praha 6 – Suchdol,

References

[1] Alter Steven: Information Systems, A Management Perspective. 3rd Edition. Prentice-Hall :1999.- ISBN 0-201-35109-9

[2] Alter, Steven: The Work System Method: Progress to Date, Extensions Related to Service Concepts and Challenges for the Future .*AMCIS 2010 Proceedings.* Vol.26,Paper 356.- ISSN: 1529-3181

http://aisel.aisnet.org/amcis2009/356

[3] Server publishing house Pretince Hall: http://www.prenhall.com/divisions/bp/app/alter/, 10. 3. 2006