Advanced Logistic Systems, Vol. 7, No. 1 (2013), pp. 43–50.

SERVICE LOGISTICS: LOGISTIFICATION OF SERVICE PROCESSES

ÁKOS GUBÁN[1]–RICHÁRD KÁSA[2]

Abstract: The demand for improving business processes has a very wide range of literature and even very popular not only in academic life, but also among business experts. The topic is particularly actual even today as there is a lot of debate and confusion regarding to the boundaries and scope of techniques and methods. The concept of restructuring dysfunctional processes and process elements still exist and evolve, though with more and more sophisticated tools than before, but on the old, proven principles. The narrowing markets, the increased competition and the economic crisis all forcing companies to gain a comparative advantage through increasing efficiency. This constraint provides a basis for the development of methods which have two directions: specialization and generalization. In this recent paper we show this two concept: the universality of methods on the one hand, and the opportunities of specialization on the other hand.
Keywords: service management, global services, mass customization, logistics, logistification, fluid.

1. Introduction

Nowadays' economic trends have gone through significant changes over the last century. Production and service activities have become faster and more easily available. This change is due to the globalization, which is basically a political-economic process, in which the strongest actors of world economy standardize and generalize political and economic rules based on their own interests through major international institutions.

National borders have blurred as a result of globalization. Both production and service processes, including distribution will no longer be confined within borders. With the development of transportation and the revolution of information technology inaccessible areas have become potential markets. Globalization has accelerated the flow of information, which able to operate business and financial processes faster and better than ever. In this market environment, large companies quickly seized the opportunity to develop and extend their processes to obtain huge market share.

The internationalization of services is different from the globalization of products. In the case of service activities only the uniform systems can be transposed to countries with different cultures. The most difficult task of globalization of services is bridging the cultural, demographic and behavioural differences. However, two basic models definitely have successfully accomplished this difficult mission and become contemporary a major determinants in services and production.

Studying a process in logistical aspect means analysing the flow of information, materials, resources or emissions and in this regard it can be modelled, either by mathematical or information technology methods. If it is possible to contemplate a service process from a logistical point of view, the previously available assessments, modelling and

[1] college professor, Budapest Business School
guban.akos@pszfb.bgf.hu
[2] research fellow, Budapest Business School
kasa.richard@pszfb.bgf.hu
H-1149 Budapest, Hungary

simulation methods could be transferred to them after a counterpart tuning [1]. Therefore, hereinafter by the logistification of service processes or by any other not clearly defined process we mean the analysis of the flow of materials, information, etc. through the processes. In order to do that, we briefly introduce relevant global service models.

2. Globalized service models

Manufacturing and service companies differ mainly in the communication and interaction with customers. It would still result in a new approach, that in case of production firms' corporate activity produce tangible, clearly identifiable and manifested goods [2]. It is also very often, that service companies are trying to establish traditions based on frequent interactions. As a consequence of this attitude 'moment of truth' experiences multiply and front office employees will face with increased conflicts [3].

The standardized global market expansion is called McDonaldization, based on Ritzer [4]. The system in this case follows the work organization principles of Fordism and Taylorism. The company acquire competitive advantage from the productivity cost-benefits. The service providers standardize their processes so the output is constant and always equal to the consumers' expectations. In this case the higher volume of sales is crucial to reduce costs. This provides comparative advantage for the company. Consumers have pretty much and accurate information on the standard service due to advertisements, their own and their acquaintances experiences. McDonaldized business processes can be repeated and thus problems and errors arising in business activity can be effectively solved. However, the reparability assumes the existence of trust, meaning that the provider will not commit an error again. The operating logic of McDonaldization as a system is basically divided into four dimensions: efficiency, predictability, reliability and control by technology [5, 6].

Through the extreme extremes of standardization of service processes, McDonaldised companies are getting increasingly similar to production-like companies.

In the early 80s, the production approach related to the classical and neoclassical economic theories was dominant in the organization of work and corporate marketing. According to this dominant approach the value is located in the material and generated through the manufacturing process, (value added, utility, exchange value), and therefore goods and products should be considered as standardized output [2, 7].

Customization is the exact opposite of McDonaldization, based on the foundations of marketing and service management. The user of the service expects to receive adequate service that meets his or her demands. The main difference from McDonaldization that its objective is to satisfy the requirements and quality need of customers as accurate as possible. However, this needs special knowledge. In most of the cases at the beginning of the process there is no known patterns to fulfil such requirements, since neither the provider nor the customer do not know which solution will lead to the desired result. As the consumer does not have a certain idea about the service's output, thus he will accept the service process as a result. Further difference, that the methodology of the customization is based on special knowledge and high professional qualifications.

Workaround for the above mentioned two opposite approaches is the modularization [8].

In this case the venture that provides the service combines standardization and customization methods. Namely products are manufactured and sold in large quantities, and on a fairly high price. The viability of the system requires that the company's process shall build up by standard modules and these small changes create a sense of personal, customized service to consumers [5]. These services are in reality only partially tailored; their preparation is standardized, and only become personalized when the consumer enters into the process. This model greatly relies on the evolving information technologies which allow the perfect functioning of the system. Apparently Disneyalization [9] is the opposite of McDonaldization, however, the productivity-based service providers are increasingly place their services at a physical and human environment, resulting in a unique perceived consumption. The challenge of organizational operation and management is to make the service unique while productivity-based economic logic also can be observed [5]. Disneyalization is not based on the principles of customization, but rather on the above-mentioned modularization. It re-packs such standardized service modules with some peripheral service combinations which has low unit costs due to frequent use, thus providing a sense of customization [5].

A Disneyalized service gives the impression of uniqueness to the consumers. Thus it combines the features of a productivity-based economic activity and customization. With the rethinking of traditional products the company can sell successfully in new industries as well, with low unit costs of the extra activities due to frequent usage. However, the perform of such complete services require highly qualified workforce - in contrast to McDonaldization.

3. Logistification

The logistical aspect analysis of processes shall provide assistance when we are not curious about what the elements of the processes do or how they work in sequences, but about the connections and cooperation of the processes of the whole system as well as the observation of the flow of materials related to processes (certificates, documents, components, semi-finished products, or the people themselves, or any other abstract elements such as information etc.).

This type of substance flow can be found in processes of all systems, such as the patients' flow in a hospital requires the same examination as the contract documents systemic movement of a bank. Of course, this would be a very simplistic way of analysing processes. It has become also very important to analyse the information flow which takes part in the same time and in a competing way with the substance flow. Sure in many cases, these two basic processes cannot be separated, because a paper-based order is a substance in its own and information as well.

Reviewing the above, processes cannot be examined individually or isolated in a system, they have to be analysed together, their effect have to measured simultaneously, and thus no longer shall be distinguished material, substance or information (etc.) flow process, it is enough just to talk about process, and thus their handling will be uniform. Hereinafter we mean by logistification the temporal and spatial changes and changes in related data of the processes of any kind of system as well as the combined modelling and analysis in terms of efficiency, sensitivity and optimality. The generalized substances, materials, information (etc.) flowing in the processes shall be called fluid.

4. Logistification of Service Processes

The above-defined logistification will be used for service and other business processes as a modelling and analysing application. It is important to always select the exact boundaries of the system, as the mapping of the processes should be conducted in this well-defined system. The analysed processes should be modelled in a flow perspective, defining the initial inputs and final outputs of the processes, such as the location and type of interfaces with other processes. The system may include only a finite number of processes, otherwise – if possible – we must choose the most important finite set of processes. (In case of business systems this is not a problem.)

Models carried out as a result from this type of analysis can be skeletonized about confusing and not relevant items supplied by the economic environment.

Furthermore we need to specify the parameter sets of the system that will be used in the model.

Let

P_i identified process of the system, and:

D: finite set of flowing fluid through the system as generalized above;

τ: fluid type set occurring in the system, or the role that it entrust in a certain test section, for example a document on the input of a process, a data on a certain connection point or it can be a waiting element as well. Typesets has general elements as well as specific components regarding to the system or subsystems of the processes.

$[t_s;t_f]$: system test time intervals

$R[r_{ij}]$: hyper-matrix show, that P_i process somehow supplies fluids to P_j process

$r_{ij} = \{((d;\ T) \mid d \in D; T \in \tau)\}$ is the fluid relationship set. (Obviously the matrix is non-symmetric.)

It is important to define inputs, outputs and interfaces of the processes as well as all significant flow features.

$I(P_i) = \{(d;\ T;\ t) \mid d \in D; T \in \tau;\ t \in [t_s;\ t_f]\}$ is an input fluid set of a process (meta-process) where we mark the input fluid, type and time of appearance on the input which may be sub-intervals.

$O(P_i) = \{(d;\ T;\ t) \mid d \in D; T \in \tau;\ t \in [t_s;\ t_f]\}$ is an output fluid set of a process (meta-process) where we mark the input fluid, type and time of appearance on the output which may be sub-intervals.

$C(P_{ij}) = \{(d;\ T;\ t) \mid d \in D; T \in \tau;\ t \in [t_s;\ t_f]\}$ is fluid set of the j^{th} interface of a process where we mark the fluid, type and time of appearance which may be sub-intervals. Here may be specific fluid, such as: 'waiting for … time', 'connection without waiting' etc.

These definitions give us the opportunity to analyse the processes. The analysis of the system is starting with the exploring of processes, detailed in chapter 5. An important output of this is the $R[r_{ij}]$ matrix. Then we find those test points of the system that are connected with fluids. The determination of these test points will be a subsequent research study. Unlike previous researches we are not starting from the primary structure of activities but exploring the test points, examining the set of triple junction fluid with the help of the identified $R[r_{ij}]$ matrix. That means that for the process $I(P_i)$, $O(P_i)$, and $C(P_{ij})$ sets are a set of three due to its role in the time structure of the process. Our further goal is the classification of processes by parameter lists. Unfortunately classical cluster-based methods are not suitable for this, so we are to use and adopt in the system the association-based ‘shopping-basket’ theories [10]. Then we would like to classify the services by process systems based on these previously classified processes. As these tasks are performed, it is possible to use BPA methods [1] to explore critical points and bottlenecks regardless to the type of service, and simulate the whole system to force it to an optimum.

5. Mapping service process

One of the most sophisticated and promising approaches to service design is a mapping technique called blueprinting [11], where a kind of snapshot is developed from the process. Like process flow diagrams, blueprints document all the processing steps required and handle them dextrorotary: A flow line follows the service path, or process route, from left to right connecting the discrete processing steps chronologically. Unlike straightforward process flow diagrams, service blueprints separate activities that can be seen or experienced by the customer from those that cannot [11]. After identifying the processes and vulnerabilities, and building in fail-safe measures, blueprints are used to study execution. Since all services depend on time and time is usually a major cost determinant, a standard service execution time should be calculated to check economic and operational feasibility [11]. As we have explored all the processes of the service system, BPA can be established and implemented.

There is no doubt about the importance of the continuous amelioration of business processes. The driving forces of theses radical changes can be interpreted as the extension of Porter’s competitive advantages [12] summarized by Hammer and Champy [13] and reinforced by O’Neil and Sohal [14]:

- customers who can now be very diverse, segmented, and are expectant of consultation,
- competition that has intensified to meet the needs of customers in every niche
- change that has become pervasive, persistent, faster and in some markets a pre-requisite,

The evolution of BPA dates back to the first appearance of rudimentary process orientation between 1750–1970 with the beginning of industrial period (Table I.). The main focus of this embryonic process improvement phase was on labour division, cost reduction and productivity with technologies such as mechanization, standardization and depth records. Their main tools were PDCA improvement cycle and financial modelling. Rightsizing and restructuring were also used for achieving changes in formal structural relationships and their focus on business processes are pretty low [15].Their orientation is mainly functional, the improvement goals are usually incremental, and the frequency of application is isolated in time [15].

Table 1

The evolution of BPA

Evolution phase	Orientation	Tools	Customization for services
Industrial period (1750–1970)	functional	PDCA	Highly suitable
	functional	Financial modeling	
	functional	Rightsizing, downsizing	
	functional	Restructuring	
First phase of information period (1970–1990)	procedures	computer automation	Highly suitable
	procedures	SPC	
*Second phase of information period with business process improvement (**BPI**) (1990–2000)*	procedures/processes	TQM	Well suited most components of TQM on various fields
	processes	Six Sigma	Transactional Six Sigma for IT services, banking and healthcare
	processes	Lean concept	Principle adaptation to IT services, hotel and healthcare services, libraries and project men.
	processes	BPR	in financial services and maintenance management
	processes	BPB	none/not distinguished
*Third phase of information period with business process management (**BPM**) (2000–)*	processes	IDBF	none
	processes	BOPR	none
	processes	EAI	For e-governance and commerce
	processes	SOA	
	processes	ECA	Low, mainly for web services
	meta processes	BPS	

Source: [1]

The next generation of process improving is the first phase of information period dated from 1970–90. This is the era of quality management and work efficiency with such technologies as material requirements planning (MRP) and management information systems (MIS). The main tools of this period were computer automation and statistical process control. These tools refer to the typical application of technologies where the application focuses mainly on automating existing procedures without questioning their appropriateness [15].

The third generation is the second phase of the information period with business process improvement (BPI) dating back in the ‘90s. This is the era of process innovation and best practices with such slogans like better, faster and cheaper. At this time technologies such as ERP, CRM, supply chain models and enterprise architecture models were introduced. New tools were developed and used, like Six Sigma, TQM, BPR and best practice benchmarking (BPB). These tools and techniques have their focus on processes, and bottom-up improvements in many places with continuous and incremental scope.

The fourth generation is the third phase of information period with business process management (BPM) dating from the 2000s. The main focus of this era was continuous transformation, flexibility and modularity. Enterprise application integration (EAI), service oriented architecture (SOA) and semantic object model (SOM), performance management systems (PMS) and BPM systems are the major technologies of this era. Tools also vary from customization to BPM procedures like integrated design-build framework (IDBF), benchmarking-orientated process reengineering (BOPR), business process standardization (BPS) and event-condition-action (ECA) computing. Some of these tools have a very intensive service orientation (especially SOA and ECA), others tend to be adapted to services with more or less success.

6. Summary

The purpose of this paper is to show the first steps and logical framework of a recently started research at Budapest Business School, Department of Economic Informatics. The aim of the research is evaluating a methodology to ameliorate service processes via mapping and simulating. It would serve the analysis and fine-tuning (in simulation environment) of interventions that could be resulted in harmless changes in order of more effective operation of the whole system. This research is implemented in several phases. The first task is the elaboration of the feasible BPA method. Thereafter the process analyse tool should be set up (indicated by the above mentioned formal elements), and the process segmentation should be performed. Thenceforth, those elements of the BPA tool should be imposed that can explore and locate critical points and bottlenecks of the system. Finally the service-independent simulation should be work out.

References

[1] Gubán, Á.–Kása, R. (2013): *A Literature Based Review of Business Process Amelioration Methods and Techniques Regarding Service Orientation*. Journal of Advanced Managemet Science, Vol. 1, No. 2, pp. 230–235.

[2] Réthi G.–Illés B. (2012): *Holonikus belső ügyfél – A termelő szolgáltató McDonald’s*. GÉP, Vol. 58, No. 6, pp. 29–33.

[3] Heidrich B. (2006): *Szolgáltatásmenedzsment.* Budapest Human Telex Consulting.

[4] Ritzer, G. (1993): *The McDonaldization of Society*. Thousand Oaks: Pine Forge Press.

[5] Heidrich B. (2008): *A szolgáltatások vezetésének dilemmái: elméleti modellek és empirikus tapasztalatok.* MTA Szegedi Területi Bizottság Gazdaságtudományi Szakbizottság, pp. 438–450.

[6] Ritzer, G. (2004): *The McDonaldization of Society*. Revised Ne. Thousand Oaks: Pine Forge Press.

[7] Vargo, S. L.–Lusch, R. F. (2004): *Evolving to a New Dominant Logic for Marketing*. Journal of Marketing, Vol. 68, No. 1, pp. 1–17.

[8] Sundbo, J. (2002): *The Service Economy: Standardisation Or Customisation?* The Service Industries Journal, Vol. 22, No. 4, pp. 93–116.

[9] Bryman, A. (2004): *The Disneyization of Society*. Thousand Oaks: Sage Publications.

[10] Demetrovics, J.–Hua Nam, S.–Gubán, Á. (2012): *Logical Representation of Dependencies of Items and the Complexity of Customer Sets*. In: Fifth Balkan Conference in Informatics. BCI, pp. 5–10.

[11] Berkley, B. J. (1996): *Analyzing service blueprints using phase distributions*. European Journal of Operational Research, Vol. 88, No. 1, pp. 152–164.

[12] Porter, M. E. (1985): *Competitive Advantage*. New York: Free Press.

[13] Hammer, M.–Champy, J. (1993): *Reengineering the corporation: A manifesto for business revolution.* Business horizons, Vol. 36, No. 5, pp. 90–91.

[14] O'Neill, P.–Sohal, A. S. (1999): *Business Process Reengineering.* A review of recent literature. Technovation, Vol. 19, pp. 571–581.

[15] Grover, V.–Malhotra, M. K. (): *Business process reengineering: A tutorial on the concept, evolution, method, technology and application*. Journal of Operations Management, Vol. 15, No. 3, pp. 193–213.