

The Relations between Service Science and IT

Introduction

The world of services is very interesting and dynamic at all. It is well known that services represents more than 70% of global GDP and the same of EU GDP. Manufacturing industries include more and more services to their production. The most of tangible production can not be sold without services or without support of services.

Moreover, service become more a more information and knowledge intensive. The source of innovation moved definitely from industry and tangible products to services. Services become the key for the economic growth and competitiveness.

Providing of services, complexity of the services were more popular than before. It was clear the services become more knowledge and information intensive.

Upon those fact the industry recognized lack of necessary skills of new employees and graduates of the universities. Already was to enough that graduates were experts in their field. The problems and tasks, solved by organizations and companies, become more complex. It was necessary to build new teams to solve such a problems, teams consisted from members with different education, different point of view – heterogeneous teams.

Those teams needed experts, equipped by other skills, especially in soft skills and in legal and economic framework – to be able to communicate effectively to technical and non-technical audience. Members who are willing to risk, experiment, have innovative thinking and can find new solutions. And nowhere else the situation was so obvious like in IT industry, where the history of Service Science begun.

The idea that there ought to be a new scientific discipline called service science had its genesis in a phone conversation in September of 2004. Jim Spohrer, who was starting up the IBM® Research Service Research department, was on the line with Henry Chesbrough, a professor of business and innovation at the University of California at Berkeley. Spohrer complained to Chesbrough that he was having trouble finding job candidates who had the right mix of knowledge, including computer science, engineering, management and social science.

Chesbrough pointed out that in the 1940s and '50s IBM had boosted the development of computer science as a discipline by donating computers to universities and then helping them create curricula for teaching students how to use the machines. "IBM started computer science. You should start service science," Chesbrough told Spohrer. The two men were so excited at the prospect that they immediately dialled in Paul Horn, then director of IBM Research, who blessed the idea.

And – to be more accurate, we must mention the definition of Service Science from U.S. National Innovation Investment Act, 2007:

Service Science means curricula, training, and research programs that are designed to teach individuals to apply scientific, engineering, and management disciplines that integrate elements of computer science, operation research, industrial engineering, business strategy, management sciences, and social and legal sciences, in order to encourage innovation in how organizations

create value for customers and shareholders that could not be achieved through such disciplines working in isolation.

During last decade Service Science came long way. From just an idea of multidisciplinary to the independent discipline, acknowledged by a lot of scientists in whole world. But there was still a question – the relation between IT and Service Science. Is IT (or computer science) just one of the disciplines, mentioned in the definition above, with no special role? Or can we find special features of the relation between Service Science and IT. And if yes, does it mean something for education, service research and analysis?

Parent – Child relation

Service Science was born on IT field. It was IBM as the leader of providing IT services that recognized (by Jim Spohrer) the gap on labour market and started new approach of education – multidisciplinary.

Unfortunately this idea was mostly taken by economics universities and faculties. Service Science featured ideal platform to develop new marketing approaches and new ways of analysis of customers' behaviour. They saw very easily the potential of the new science.

The answer of IT related faculties and universities were very lukewarm. There is still part of academics staff (IT or computer science oriented) that do not consider Service Science as a true science.

If there is something more than just like “beginning line” of the service science, how it can be discovered and why it is so important? It is obvious nobody is able to provide knowledge and information intensive services without IT. First of all it means the parent – child relation cannot be easily broken.

The main feature of the Parent – Child relation between Service Science and IT is that Service Science gives to IT the purpose of existence. Service Science gives to it very precious and still developing methodology how to analyse, develop and provide IT services. Even IT itself is the service!

If you are well educated expert in any IT related discipline – like databases, programming, big data analysis – you can be absolutely needless if you do not know for what purpose you can use your skills and knowledge.

Service Science or better to say Service Science, Management and Engineering is the type of the study program that shows the future of IT education. Based on solving real problems, educating students in IT disciplines as well as in soft skills, communication skill, marketing and management knowledge, financial and economics perspective and ability to work in heterogeneous teams.

Without those skills the graduates risk to become just “workers” of development, not involved into the analysis of the real problems.

There is one more argument why Service Science should be taught on IT faculties and universities and on economics or marketing related. If we analyse the basic economics or marketing principles, they change approximately every 10 – 20 years. Accounting principles are the same for more than 300 years. In opposite – IT is the most dynamic branch ever. Technology, media, possibilities are changing all time. The hot news of the last year are desperately up to date in the presence and today's actual findings will be called old after a week. Therefore providing services needs a knowledge about the most actual IT tools, techniques and their optimal usage and this can be guaranteed only by IT related faculty.

To prove this we can compare the data from two faculties of Masaryk University – Faculty of informatics and Faculty of economics and administration. Faculty of informatics provides from 2008 the master study program Service Science, Management and Engineering (SSME). The number of the students is following:

Semester	No. of enrolled students
2014 autumn	208
2014 spring	196
2013 autumn	187
2013 spring	197
2012 autumn	227
2012 spring	225
2011 autumn	232
2011 spring	164
2010 autumn	129
2010 spring	73
2009 autumn	56
2009 spring	19

Moreover, the SSME study program created the network of internship companies that hire more than 30 students every semester! And in autumn 2014 the companies offers more positions than students were able to accept. For more details see []

The faculty of Economics and Administration (FEA) provides the bachelor study program Enterprise information systems that has a several signs of multidisciplinary study program. As it seems in the table, the interest of the students is very low and this study program is only marginal in whole offer of the FEA.

Semester	No. of enrolled students
2015 spring	42
2014 autumn	58
2014 spring	41
2013 autumn	48
2013 spring	48
2012 autumn	44
2012 spring	38
2011 autumn	42
2011 spring	47
2010 autumn	49
2010 spring	50
2009 autumn	53
2009 spring	54
2008 autumn	58
2008 spring	50
2007 autumn	60
2007 spring	44

Source of the tables: <http://is.muni.cz/studium/statistika>, in Czech only.

It is clear the Parent – Child relation is very important and if it is used properly, it creates competitive advantage for the IT related faculty.

Cooperative relation

Moreover development of information technology is the main condition for the development of services and vice versa. If the services are more and more information and knowledge intensive, the service providers and service customers need better and better tools to:

- better value proposition
- analyse services
- develop better services
- communicate with all involved parties
- provide more services

On the other side, development of better, faster and more complex IT solutions creates space for the creation of the new services or improving of existing ones.

As an example we can mention:

- clouds and their applications (Google Docs, OneDrive)
- Software as a Service
- Infrastructure as a Service
- Network as a Service
- Mobile applications
- Etc.

The ways of development of IT applications and providing IT services changed rapidly during the last decade. While in 90-ties IT related companies developed a product and customers simply had to accept the configuration and features of such a product, now the main role is played by the service consumers. According the idea of Service Science, they are involved into the process of value creation from the very beginning and the character of the need leads into the choosing of particular IT solution.

Cooperative relation is very close to the Parent – Child relation, described in the previous chapter. But it is more complex – whereas Parent – Child relation has been linked to origin of Service Science and its influence to IT expert's education, Cooperative relation focuses to using IT services for creating value or value propositions.

Emerging the idea the information and knowledge intensive services cannot be provided without properly developed IT tools, IT services have power to support other activities more than any other else.

Relation to information

There is one more aspect in the relation between Service Science and IT – their relation to information. Using basic methodology of economics of information we can show that Service Science is nothing else, than simple reaction of the on side of the market to the information asymmetry.

There is a special situation on the market, called moral hazard. Moral hazard is defined as a tendency to take undue risks because the costs are not born by the party taking the risk. To clearly explain – the entity is in the situation of moral hazard when it is paying the action of the provider without and useful tools to control, if those actions are really necessary and for its sake.

Typical for that is the situation, when some organization (firm or similar) has problem that can be solved by IT tools. That IT tools is offered by several companies on the market, and every company declare only their solution is the best one.

The organization is in the desperate situation – how can they choose the right offer? How do they recognize the best solution?

But there is also problem on the other side of the market – the offering company has also very difficult situation. Their problem can be described in the following way:

How do we know that the customer is describing real problem? How do we recognize the information they gave us are relevant?

They are in the risky situation – if they will offer bad solution or fail during providing the service, their reputation falls down and their future business might be in danger. This situation is called double moral hazard to solve that needs cooperation of both subjects.

The Service Science with the simple idea of value proposition and value co-creation is nothing else, than reaction to this situation. Through process of negotiation, communication and value creation both parties solve their moral hazard situation.

The solution, based on this can be more general and can be used for all situations of information asymmetry. If the subject is in the situation of information asymmetry, let's call it is facing of information gap. How we can cope with such a gap?

First way is to fill it – what can be defined as distribution of information from the favoured party to unflavoured one. This process is similar to the value co-creation process, when the information are really moved from one subject to another.

But sometimes this way is not possible. The subject are not willing to share the information or they are on the opposite side of the market – like banks or insurance companies and their clients. If the person has risky behaviour, he or she has very low motivation to inform about that bank or insurance company – to get worse conditions of the loan or insurance. When particular bank or institution recognizes risky client and change the conditions of the business (higher rate or insurance payment), the client simply change the bank or insurance company to the new one that has no information about him or her.

But the banks and insurance companies know about that risk and identify that as very dangerous for their profitability. But solution is not to re-distribute the information, but to prevent the risk. The clients are not willing to tell the bank negative information about himself. Then, as the protection of this risk, banks as well as the insurance companies agreed to share the information about their clients – to know their payment discipline or potentially bad behaviour. This situation is another example how to fill the gap – but not by cooperation of the client and provider, but by the cooperation of all providers.

Both described situations are very similar – both represent the example of information asymmetry and both were solved by providing a service. In the first case it is simple communication during value co-creation, in the second case it is kind of the database application where the data about clients are stored and secured.

Of course, there can be the third situation, when the filling of the information gap is not possible. Then it depends on the subjects how they can protect themselves against this danger. For example the client of the travel agency can check if the travel agency is insured – to be sure he will return home in case of travel agency's bankrupt.

Generally speaking, the service science is the methodology that shows how to solve the situation of information asymmetry using proper IT tools.

Conclusion

The relation of Service Science and IT has three main attributes:

- Parent – Child relationship – defining approach to education of service science
- Cooperating relationship – speaking about ways how to solve particular problems
- Relation to information – analysing the view of asymmetric information and perception of reality

This article tried to analyse link between Service Science and IT. The dispute if Service Science is IT independent or not can be answered in following way – IT and Service Science have very strong unique relationship. Existence of Service Science without IT consequences is possible, but not useful. Service Science needs IT as one of the main channels to distribute services.

Also IT cannot exist without Service Science – it gives the purpose of existence to IT, defines new challenges and requests. Both are connected together and the separation of them in nonsense.

References:

1. Philips, Louis: The economics of imperfect information, Cambridge Press, 1988
2. WALLETZKÝ, Leonard. Is it possible to teach Service Science? In Gummesson, E., Mele, C., Polese, F. (Eds.). Service Dominant Logic, Network and Systems Theory and Service Science: Integrating three Perspectives for a New Service Agenda. Napoli: Giannini, 2013. 7 s. ISBN 978-88-7431-684-7.
3. WALLETZKÝ, Leonard: Economics of information, PhD. Thesis, 2008
4. The Invention of Service Science [online]. [date. 2015-05-12]. Available from: <http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/servicescience/>
5. Study program of the Faculty of informatics, Masaryk University 2014, at is.muni.cz and fi.muni.cz