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Dominant Logic approach for health service information system: value creation and co-creation through asynchronous communication

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ABSTRACT

This paper uses the approach known as Service Dominant Logic (SDL) and Co-creation of value to introduce the basic concepts of Service Science and SDL in the health information system area. Then the article shows that interaction through asynchronous communication may produce value. In this approach, one should not separate product attributes from service attributes, since they are complementary. Some Marketing concepts are present in our daily routine and can be applied to several service domains such as Education, Transport, Public Services, Health and Information and Communication Technology. Users of Health Systems have already been ranked in the context of Service Science. As part of an ongoing research that explores the use of virtual forums, the article presents an example - using the Forum DATASUS - to show the importance of interaction via asynchronous communication tool between users and service providers, in the development and implementation of Health Information Systems.

Keywords: Services, ICT; Datasus; Forum; Health

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Service Science, also known as Service Science, Management, Engineering and Design (SSMED), aims to be a new, interdisciplinary approach to study, prove, create, and innovate in service (SPOHRER and MAGLIO, 2008). In this context, Service Dominant Logic (SDL) was originally proposed by Vargo and Lusch (2004) in the publication 'Evolving to a New Dominant Logic for Marketing'. This new approach suggests that one should not split product attributes

from service attributes, since they are complementary. For example, the purpose of an auricular prosthesis is to provide better hearing functions, which requires monitoring, testing, adaptation. A set of vaccines (which "serve to" immunize) considers a number of key elements related to the service, as its application, the local, qualified individuals for the execution, the best moment for the application of vaccines. Co-existence of product and service in one context provides value to the consumer. In this context, the role of the consumer, who is involved in co-creating the service value which usually occurs through interaction, should be considered.

Health area and Information and Communication Technologies (ICT) have several similarities. Both areas have professionals that provide services in a specific environment, which can be in person or virtual. A service is perceived by "service consumers", also known as "users". The quality of service provision is perceived and evaluated according to subjective and individual criteria. This means it may consider much more than the functionality offered through the service. For example, when evaluating the health-care clinic, a patient may consider the cleanliness, the style and organization of the lounge and rooms as important as having the right diagnosis for his disease. Likewise, the user might evaluate the quality of the ICT considering some system analyst skills, like communication or even the way he dresses, as criteria in addition to the desired functionality in the system. These aspects make up the environment of the service, which has been adopted by research groups as specific study object.

This work covers part of a postdoctoral research that has been conducted since January 2012 at the Centre for Service Research, Manchester Business School, University of Manchester, England. The research aims to study the use of asynchronous communication (i.e. online forums) to help on delivering service considering the management of information and of knowledge. As an interdisciplinary research developed in a Service Research Centre, the main areas involved are Service Science, Computer Science, Information and Communication Technology in Education.

This paper presents some key-elements of Service Science domain that have strong influence in Health and ICT applied to Health delivery. It also aims to show the importance of interaction through ICT for value creation and co-creation, in Health.

This article is part of an ongoing research that aims to discuss the use of asynchronous communication to assist on better educational service delivering. Studies about asynchronous communication has been large explored in ICT and Education context (ZUMBACH, HILLERS; REIMANN, 2003; MORA et. al. 2012). The proposed approach in this article is founded in Service Science conception (SPOHRER ; MAGLIO, 2008).

Although some service approaches come from long time ago (for example, SHOSTACK, 1977), Service Science is seen as relatively new (MAGLIO.; KIELISZEWSKI.; SPOHRER, 2010). Sometimes entrepreneurs, health and ICT professionals does not consider some aspects that are concerned to service delivery and that have been already exposed through service approach.

For a better understanding about the importance of interaction in the co-creation of value it is essential to review some concepts. Brambilla and Damacena (2011) exploit the Service Dominant Logic and present some directions:

> "As a central pillar of SDL, the idea is working together product and service, unlike the service remainder proposal, as service is what product is not. Integrating logical product and service complementarily is a way to regain understanding, especially of the service as a marketing activity which, besides

generating additional value to the product, serves as a strategy to build sustainable competitive advantage "(BRAMBILLA ; DAMACENA, 2011; translated by the authors)

Table 1 shows some of the concepts presented by Brambilla and Damacena (2011) which allow a better understanding of the Service Dominant Logic:

Product and service are complementary	Product and service should be considered as complementary, not excluding any of the categories (product + service). This theoretical line is presented in the article "Evolving to a New Dominant Logic for Marketing" by Vargo and Lusch (2004), published in the Journal of Marketing, a leading journal in the field of marketing.
Service is more than Product support	Product is an application for Service provision. Service comprises generated benefits from products, so that it consists in much more than supporting a product (VARGO; LUSCH, 2004).
consumers co-creates value	One of the most relevant foundational premises of SDL emphasizes the consumer not only consuming, but collaborating with other consumers and with providers for better service provision. In other words, the consumer assumes the role of "value co-creator" (PAYNE; STORBACKA; FROW, 2008, p.84).
The service encounter	For Payne et Al (2008), the service encounter (which is the co-creation *locus*) represents the set of interactions and transactions during company and customer relationship.
Value	The value according to Prahalad and Ramaswamy (2003) is a positive result derived from the consumer individual experience, for a specific time and in a specific space.
The individuality of the consumer and value	The value must include interest or utilities desired, emphasizing the individuality of each client / consumer (DEBNATH; TANDON; POINTER, 2007).
The overall perception of the quality	Value is a variable influenced "by the overall perception of service quality", and has an impact on customer satisfaction (ALVES; RAPOSO, 2007, p.574).

Table 1 - Some concepts in SDL, adapted from Brambilla and Damacena (2011)

Service Science is understood as an interdisciplinary approach that comprises the study, design, and implementation of services systems (complex systems with specific arrangements of people and technologies that provide value for others). From Service Dominant Logic primary concepts, it is understood that Service Science is originated from existing interactions; Interactions result in co-creation of value; this process occurs whenever service systems create, propose and execute value propositions; this may include objects, actions, and other information resources. Value propositions are built upon the notion of sharing between suppliers and users: one can share assets, labor, risk and information.

The quality of service has been investigated also considering the possibility of co-creation of value. Brambilla and Damacena (2011) conclude in their work:

> "Perceived Performance was identified as a result of proper value co-creation strategy, and may configure as a final result or even a moderate satisfaction of consumer. Satisfaction, in turn, is a direct result of the co-creation of value, or is generated by the perception of value. ". (BRAMBILLA ;DAMACENA,2011; translated by the authors)

The value perception for Service and the concepts related to this area are present in our daily routine and involve very close scenarios, in the segments of Transport, Education, ICT, Public Management, and also Health.

Co-creation value in Health is becoming an interesting area for research, since patient's collaboration may result in better perception of service provision. As a Service segment, ICT delivery has some similar concepts and behaviors that can be also found in Health area. Thus, some health finding on Health Care Value Co-creation can be applied to ICT services, as well.

McColl-Kennedy and others (2012) have recently explored in-depth activities that are performed by users of health and result in the co-creation of value. It shows that users of health systems may also contribute to the creation of value in their own ways, through their own initiative in activities in order to deal with their health. The work suggests that a good level of interaction tend to be associated with higher quality of life.

The interaction is essential for co-creation and it can be improved by the use of ICT. For example, technology can assist patients in exchanging information with their peers and with doctors, especially when it is used asynchronously, with more flexibility for time and space. Examples of patients using asynchronous communication, e-mail and also discussion forums in healthcare are widely disseminated in social networks on the Internet, in virtual courses or even in virtual communities.

Just as patients can co-create value in health, technical information systems users may interact in order to co-create value in internet virtual environments that support health services. The forums are virtual tools that allow asynchronous interaction and can support patients, physicians, managers and health professionals for service value co-creation.

A forum can be defined as a specific place where a group gets together and debate, with more or less defined goals (CHAMOVITZ, 2010). Corporate environments often have a virtual location on the web, a website where messages are exchanged, experiences disclosed and questions resolved. Examples of these environments can be found for Brazil government: We can cite the CATIR - Portal of Public Sector Virtual Communities (http://www.catir.gov.br) and in the area of Health, the Forum DATASUS (http://forum.datasus.gov.br).

A discussion forum is a virtual instrument that can be used for Knowledge Management (AUTHOR, 2010) through collective knowledge construction. This tool, quite widespread in the field of Information Systems and Education, has been used both for clarifying doubts and monitoring of educational processes, especially in distance activities. (GEROSA et. al. 2010).

The virtual DATASUS Forum was created in 2003. This environment is used as a tool for knowledge management in educational, political and Information Systems' projects.

Generally a forum exists as a place for a group of people to organize ideas, build knowledge, share information and / or make decisions. For example, in 2012 occurred in Brazil a large international forum, Rio +20. The ICTs facilities and software allows this environment to be virtually developed and used. A virtual forum uses the Internet as a vehicle for communication and a computer system that stores and organizes messages. In some networks, texts can now

be accompanied by digital files, photos or drawings. In more advanced ones, transcripts of videos can be found.

Some experts believe that virtual communities and social networks are an evolution of virtual forums. However, a virtual community can contain several features and one of them is the Forum. This is the case of Facebook, which now enables one to create a page with "Discussion". From this point of view, the discussion forum becomes an available tool to the virtual community.

Datasus forums environment (http://forum.datasus.gov.br) was created in 2003. It works in DATASUS own computer servers, not on private servers, differently from some social networks installed in private companies computers.

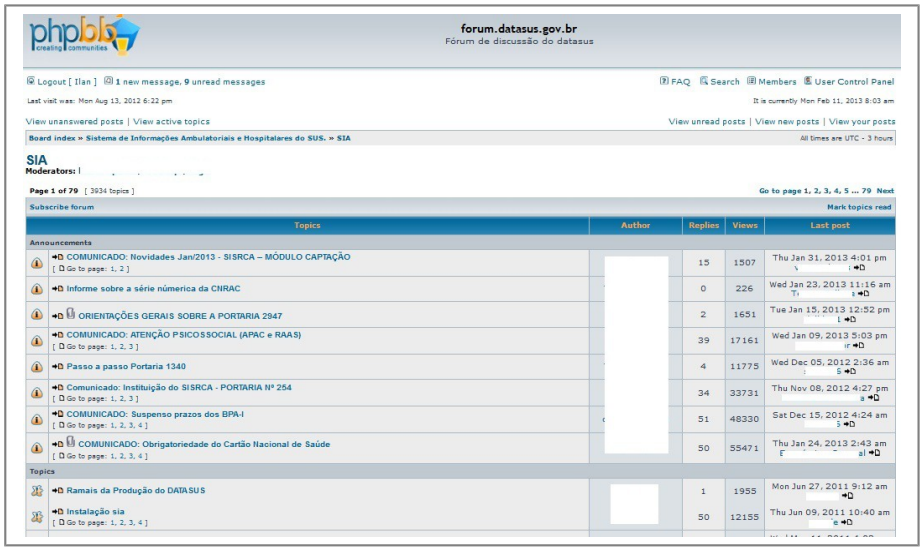

Figure 1 - Some discussions of the Forum Datasus

Source: http://forum.datasus.gov.br

Figure 1 was captured on February 11th, 2013. It shows the screen of one of the available forums to support the Ambulatory Information System (in Portuguese known as *SIA - Sistema de Informação Ambulatorial*). User names have been deleted to preserve their identities.Besides serving as a tool for Knowledge Management, Datasus Forum supports optimization for hosted and developed systems. For this to happen, user participation and interaction is crucial. As seen in the first section, the interaction is the basis for the co-creation of value.

Figure 2 shows the translation of interactions occurred in June 2012, in a forum created to support the Ambulatory Information System.

MESSAGE1

Post subject: New version SIA0301 site and BBS Sent: Wed Jun 06, 2012 2:40 pm

Moderator Joined: Wed Nov 19, 2003 1:13 pm Posts: 3499

Location: DATASUS - APAC CIS BPA faces - RJ

Dear Users ,

It is available on site and in the CIS area BBS version 3 to SIA0301

VERSION NOT COMPULSORY

Corrected the importation of BPA, was having problems with file names under 8 positions, as SISCOLO / SISMAMA, 32-bit system looks for spaces in the filename and the 16-bit version this does not happen.

It was also swapped the CTRL + DEL on the exclusion of BPA and BPA-C-I for the F10! This is because in APAC and RAAS-AD are with F10 for the exclusion, and also because with NumLock active, the system does not recognize the 32-bit key "del" numeric keypad, which can be "," or "." decimal, depending on the configuration of the Windows keyboard.

[]'S

MESSAGE 2

Post subject: Re: New version SIA0301 site and BBS Sent: Mon Jun 18, 2012 11:03 am

Advanced Member Joined: Thu Dec 16, 2010 10:53 am Posts: 64

Location: MARINGÁ - PR Good morning!

In issuing the report "BREAKDOWN OF PAYMENT SERVICES" (R504-all establishments) in version 03.01 I noticed it is incomplete. If I issue it in version 03.01 and comes with 784 kb already in version 02.66 comes with 1856 kb report. From what I observed are not being generated reports and the City Colleges of providing service.
I am awaiting.

Att.

MESSAGE 3

Post subject: Re: New version SIA0301 site and BBS Sent: Mon Jun 18, 2012 1:54 pm

Moderator Joined: Wed Nov 19, 2003 1:13 pm Posts: 3499

Location: DATASUS - APAC CIS BPA faces - RJ

Hello xxxx,

with the base I have here, this difference was not observed!

could you zip back up before the credit and put the BBS?

[]'S

MESSAGE 4

Post subject: Re: New version SIA0301 site and BBS Sent: Mon Jun 18, 2012 3:28 pm

Moderator Joined: Wed Nov 19, 2003 1:13 pm Posts: 3499

Location: DATASUS - APAC CIS BPA faces - RJ

zip with a password, then put the BBS area 1 and let me know what was the password (I'll delete the topic with the password, after!)

[]'S

MESSAGE 5

Post subject: Re: New version SIA0301 site and BBS Sent: Mon Jun 18, 2012 4:01 pm

Advanced Member Joined: Thu Dec 16, 2010 10:53 am Posts: 64

Location: MARINGÁ - PR

xxxx!

It is there, just for the record to get into that version 1.3 SIA32.exe and I click to enter I click SIA.EXE version 02.66.

Thanks.

MESSAGE 6

Post subject: Re: New version SIA0301 site and BBS Sent: Tue Jun 19, 2012 1:01 pm

Moderator Joined: Wed Nov 19, 2003 1:13 pm Posts: 3499

Location: DATASUS - APAC CIS BPA faces - RJ

xxx,

This will be fixed in the next version! thanks for the help!

[]'S

Figure 2 - Posts for Ambulatory Information System (translated from forum in Portuguese by authors)

We can clearly see how a user helps Datasus staff team to identify a problem in the system. User names here have been erased to preserve their identities, as well. The content of each message is displayed in bold.

Although the corpus was not extensive enough to have the whole technique applied with quantitative aspects, preliminarly the messages were categorized and analyzed based on Content Analysis technique (BARDIN, 1977). The messages (*corpus*) contain four elements: The first line below the message ID, has the subject of the topic and date. On the next line, the status of the issuer (moderator or advanced user), the date of their first registration in the forum and quantity total messages sent already in the environment. In the third line appears the user's location and in the following lines, in bold, the message content.

When analyzing the exchange of messages in Figure 2, one can see that, initially, the exchange of messages aimed at informing users about a new version, and any changes made from errors found. From this message on error correction, the user classified by the system as

Advanced (users who participate less are classified as Beginners and those who participate more, are Advanced) advises that a system issued report is incomplete. From there the messages exchanged aim to make a clearer understanding of the problem and its definition. Finally, message 6 presents the promise of improvement and gratitude expressed by Datasus system analyst – the service provider. The information system will have in its next version the Value that results from co-creation, evidenced by the interaction of users and suppliers from the messages exchanged Forum Datasus.

As preliminary results, the work shows some characteristics of the Dominant Logic of Service - approach proposed in 2004 by Vargo and Lusch that can be explored more intensively for 3 areas: Health, ICT, and ICT applied to Health.

According to McColl-Kennedy et al.(2012), users in healthcare can work in co-creating value through the following behaviors. The study suggested that types of practices that have interaction seem to be more suitable for healthcare users.

The service domain takes place both in health and ICT applied to health. This work presents the use of Discussion Forums as a possible asynchronous communication instrument to support the co-creation of value for the Health Information System.

Although the virtual forums have been initially seen as an optional tool to support groups, Knowledge constructed collectively in a forum is an intangible asset: for example, researchers may explore the ideas discussed at the forum, use the messages as an information source that can be analyzed.

Forum Datasus is being used to assist those involved in the development and deployment of software (users, developers, managers). It can be understood as a place for organizing ideas that will be used in future processes regulation or decision making. Moreover, the forum can be used to support groups in specific situations, such as training in a particular system. Forums can be seen as strategic environment for co-creating value in service.

For the next steps of this study, several other aspects that exist in forums messages used for training and monitoring processes can be used as study objects. Some examples involve the study of how the participants structured information, the reaction and behavior expressed through messages sent during a hot discussion with contrasting ideas, the way or structure used to communicate thoughts and feelings, the motivation to share experiences and knowledge.

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