

SD-Logic in computer mediated environments: identifying resources.

Abstract

Service-dominant logic (SD-logic) has a focus on intangible resources, the co-creation of value, and relationships. Lusch et al. (2007:11) suggest that 'Information technology is a pivotal force in enabling more collaboration and consequently innovation throughout the entire value network'. Despite this emphasis, how SD-logic may apply in computer mediated environments (CME) has not been investigated. Operant resources, those which can act on other resources, are fundamental to the SD-logic view of the service process. This paper aims to identify and understand the operant resources in CME from the customer perspective. The virtual world, Second Life was chosen as the CME to be investigated as it has been described as "an exemplar of firm-consumer cocreation in action" Bonsu & Darmody (2008:356). A methodology adapted for the virtual world uses semi structured interviews to identify the resources used from the customer perspective. We conclude by demonstrating that:- 1. Operant resources can be identified in this case of CME, 2. They are different in certain respects from real world resources and 3. We propose a preliminary classification of operant resources

Introduction

Lusch et al. (2007:11) suggest that "Information technology is a pivotal force in enabling more collaboration and consequently innovation throughout the entire value network". Recently Bolton & Saxena-Iyer (2009:91) have proposed a wide range of research directions for interactive services which they define as, "services that have some form of customer-firm interaction in an environment characterized by any level of technology (i.e. a high or low technology environment)". However, despite such attempts to better understand the role of IT within the context of services marketing, how SD-logic might operate in computer mediated environments has not been addressed

"Service provision implies the ongoing combination of resources, through integration, and their application, driven by operant resources – the activities of actors" (Vargo & Lusch2010). How can we identify the operant resources? Using Resource-Advantage theory Hunt (2004) proposes, "while operand resources are typically physical (e.g. raw materials), operant resources are typically human (e.g. the skills and knowledge of individual employees). Organizational (e.g. controls, routines, market segments, competitors and technology), and relational (e.g. relationships with competitors, suppliers and customers) However in CME everything is an intangible there are no physical resources. Does that mean there are no operand resources? SD-logic posits that operant resources act on other resources and are typically competences such as skills and knowledge. Resource-Advantage theory takes the company perspective rather than the consumer perspective. From a consumer to consumer perspective Donnenworth & Foa (1974) proposed six resources categories: - money, goods, status, services, information and love. Further research by Brindberg & Wood, (1983) recommended that scarcity, norms and money should be included as constraints. Operand and operant resources were not identified, however goods may be seen as equivalent to physical and therefore operand resources, while operant resources may be information, and love if interpreted as relational. Which of these categories of resources will be found in CME? As Lusch et al (2007:14) argue that, "One of the hallmarks of S-D logic is the superordination of operant resources in relation to operand resources in their relative roles in competitive strategy". In order to understand how SD-logic may apply in CME, first we need to answer the question, what are the operant resources?

Selection of CME.

Virtual worlds such as Second Life have been identified as a valuable research location for social science research (Bainbridge 2006, Novak 2010). Bonsu & Darmody (2008:356) describe Second Life as “an exemplar of firm-consumer cocreation in action”. Thus as an intangible co-creation environment Second Life is particularly appropriate for SD-logic research.

Virtual worlds combine social networking with 3D game style environment technologies allowing thousands to interact in real time. The user is represented as an avatar a 3D representation of themselves which they may control and customise. These worlds are no longer used just for gaming, but for medical research, military training, running businesses, socialising and even political campaigning. Second Life is an example of a paidiaic virtual world which is focused on social interaction and activities, compared with ludic, goal orientated roles play games such as World of Warcraft (Pearce, 2009). Residents (avatars) are part of an international community and can purchase land, build houses, run businesses, hold conferences, attend lectures, or just socialise. Maffesoli (2008) in discussing Second Life proposes there is a “digital culture”, which he describes as, “Little tribes networked together, create the foundation for the growth of the postmodern ‘being together’”. Second Life has differentiated itself by allowing residents to keep the intellectual property of anything they create in-world. Virtual worlds have created a new place to enact the social (after Law & Urry, 2004) blurring the distinctions between work and play (Yee, 2007) leading to the idea of playful consumption (Molesworth, Denegri—Knot, 2006).

This paper aims to identify the operant resources used in Second Life from the customer perspective. The structure of the paper is that the research objective and methodology follow. The findings review the exploratory interviews and as a result a preliminary classification of operant and operand resources in Second Life is proposed. This is discussed and we conclude by with the implications of this research.

Methodology

This exploratory study addresses two key research questions:-

1. What are the operant resources in CME from a customer perspective?
2. Which service related resources are experienced and integrated in CME by the customers?

A Qualitative approach was chosen to allow in-depth analysis of the individual customer perceptions and experiences. We have developed a methodology for researching within a virtual environment, which is based on an interpretivist approach. One issue in adapting methodology is that the interviewer also needs to take avatar form and have sufficient experience of the world to operate efficiently within it. This then raises issues about co-location. Recently Beaulieu (2010:454) has proposed the concept of co-presence as an approach to doing fieldwork. She suggests that “Co-presence decentralises the notion of space without excluding it. It opens up the possibility that co-presence might be established through a variety of modes...Not only does this enable the researcher to take mediated settings very seriously (insofar as they are a means or a resource for being co-present), but it does not excludes face to face treatment of forms of interaction.

Semi structured ‘in-world’ interviews were designed to create an ongoing discussion with participants who were offered the option of text based interviews or voice based interviews. The avatar interviewer was virtually co-present on the resident’s land or the author’s Second Life Island. At the start of the interview electronic note cards were passed to the individual

explaining the nature of the interview and also requesting research permissions to record both text and video. The video was recorded using a software package. A series of interviews are on-going in Second Life at present. It is intended to end the interviews when the no further new information emerges. Three of these interviews have been selected for analysis in the next section to demonstrate how different resources were used depending on the activities of the resident (Table 1). All of these were text based interviews and with permission from the interviewees the text chat was recorded and saved to a computer file. The transcripts were printed off and were manually coded to identify all resources, key themes, and similarities/differences between interviewees.

Table 1 Profile of interviewees

Profile/Avatar	Interview 1- John	Interview 2 -William	Interview 3 - Julia
Male/Female	Male	Male	Male
Age Range	26-35	18-25	56-65
Educational level	Masters in Applied Mathematics	First degree – Multi-media degree	Ph.D.
Job/Study	Postgraduate	Postgraduate	Computer professional
Nationality	Russian	Greek	UK
Time in Second Life	October 2010	October 2010	January 2007

Sample limitations – The main limitation is that all respondents were male in real life, although of different ages and backgrounds. It is interesting to note that one was using a female avatar they had ‘borrowed’ from another colleague.

Findings

The results from three interviews were selected to give an overview of the resources mentioned by residents for different types of activities. The examples and discussion of the text interviews here are structured around four questions. All quotes are verbatim and as such have typing and spelling errors made by the respondent within them. A summary table shows the types of resources reported in all three interviews.

1. How did you learn to create objects in Second Life?

“Well, Second Life has quite a good and detailed wiki...especially on LSL (Linden Scripting Language). So, I just browsed it and studied the scripting language and such as I’ve been in game development career previously, there are a lot of similarities and the concepts weren’t hard to grasp.” John

“Actually I had some seminars according the creation of objects..after all it is not hard since you can use other tools such as Photoshop the seminars were enough to get the basics – additionally I used some of my personal time to get better ”.William

2. How would you describe your computing skills?

“well..I’ve first got to the keyboard when I was five...) And was fascinated with IT since very childhood. However, lately there are too many new technologies to follow and it takes a lot of

effort to keep a good level of everything... so I'd say I'm very good at programming and general understanding of how IT works". John

"very, good the computer was my best friend during my first degree. I had to use it for all my projects... (Do you have programming/scripting skills?) ..Yes, I do, I am not a professional though". William

Interviewees 1 & 3 had accessed information sources provided by Second Life to learn LSL, as they had existing programming experience, while interviewee 2 had had some external training first. This seems to justify Terranova's (2000) point regarding the necessary skills and competence being a prerequisite for customers to be able to co-create in virtual or computer worlds. It appears that a high level of computer competence is required to produce relatively simple items in Second Life. This is echoed by Ludlow & Wallace (2007:194) "A rich virtual existence can be had in Second Life without ever creating any content of one's own, of course but for those who want to explore the tools, the learning curve in Second Life is steeper than that of most virtual worlds."

3. What did you need to create objects/landscape environments?

"Well, first I've got the sample vehicle script-Second Life has templates for vehicles – such as boat, car, bike, airplane and balloon...Then I reworked it, changing the dynamics. Second Life basic airplane can fly backwards, up and down, doesn't need acceleration to take off and so on. So I introduced more "real" physics in the script, changing the controls, so you need to accelerate before taking off. That was actually most of my work – in the end I wanted just to take some good model – for example from free Google Sketch Up library and add it to the object. However, - as I found a tool to import objects from Sketch Up into Second Life – it was paid, and I decided to keep the model simple". John

"I used my digital camera, adobe photoshop and illustrator. The cards were just designs...the customer(island owner) preferred to add animations and import them by himself". William

"Just some basic landscaping on the south side, I did not invest a lot of time in programming because the development environment, access to code examples and reward is poor.... There was a house and a shack on an island ... I built one object from scratch the rest (about 20) were copied... The objects were collected by visiting other islands – I picked what I thought looked good in their various layouts. I then built my own layout and planted the objects. Sometimes that prompted me to go looking for other objects to fit in the context I was building....It would be nice if you could save a backup of the layout and topography – that's what takes so long (and is so personal)" Julia

It seems according to the situation the resources may vary and that both internal and external resources may be used. Julia used on resources available within Second Life including the environmental and building tools. She also copied objects (which could be copied) from other areas of Second Life. Interestingly she sees the layout/topography as a resource. As this is composed of a number of different resources could this be considered as a higher level resource which Madhavaram and Hunt(2008) call composite operant resources?

Whereas William used external resources and the design was imported to put on the object card in world. While the island owner could be considered an operant resource as he had the capability to import and animate the card. Finally John used a mix of internal and external

resources the script could be considered as operant resource as this then acts on the object to make it move. Interestingly none of the interviewees described their avatar as a resource, in fact John seemed to feel it was a hindrance:-

“To be honest, I’d prefer to work through decent coding tool and 3D editor”

4. How much control by Second Life?

“ Guess...a bit more than I wish it to have... I mean that it’s good to have sample primitives, but importing models from 3D editors might have been easier..

(So have you found LSL Linden scripting Language easy to use?)

Well... it does have a few complexities and strange concepts... I mean - guess if it wasn't my.... 13... 15th langage? I might have had trouble with it... Well, the thing I had trouble most - are the coordinates... Meaning that LSL has very-very weird way of working with vectors and directions. it took quite some effort to "explain" to the script where is "up" and "down" of the plane. John

“Second Life didn't "open" the technology sufficiently for people to commit their time and effort to the technology. This is true of both the object design, programming tools and the (possibility) of intra-world standards..... Without the confidence that peoples efforts could be rewarded outside of the single model (\$L) that LL offered people are reluctant to commit teh effort needed for it to "take off"The consequences of various permissions need to be muuch easier to understand and manage (that's another issue with Second Life I guess!)”. Julia

Lusch et al(2007) specifically discussed open standards suggesting “open standards deal with co-production and collaboration”. LSL is the open code of Second Life, however as our respondents suggest it is not fully open allowing Linden Labs overall control of the object creation process. Similarly they control the permissions as to which items/resources can be imported into the world.

“Since Second Life is the platform that gives you the opportunities i guess it also controls the whole process. on the other hand though it lets you free to create whatever you want .. its tools are quite powerfull and user friendly”. William

Interviewees 1 & 3 both give examples of how Linden Labs., are in overall control while this Interviewee 2 apparently agrees, perhaps because he has been able to produce what he wanted, he feels he can create whatever he wants.. This links to the observation by Bonsu & Darmody (2008:357) that, “although the choices available on Second Life are notionally limitless, the fulfilment of consumer creativity and social desires are narrowly channelled to primarily develop and reinforce what the platform allows” Whereas William has produced items which fit within the model that interviewee 3 criticises. Table 2 summarises the feedback from the whole interviews of the items mentioned by the interviewees.

Table 2 Summary of resources discussed in interviews.

Resource	Interview 1 Created model plane	Interview 2 Created greetings card	Interview 3 Developed area of land on SL island.
Users computer competence	Expert programmer – game development experience	Some programming experience	Computing professional with programming experience
Users other existing skills		Design experience	
New skill learnt LSL	LSL		LSL
Skills of other users		Land owner added own animations	Via copies of objects and looking at other SL islands to get ideas for topography/layout
SL wiki	Used to learn LSL etc.		Yes
External SL seminars/computing sessions		Yes – had basic knowledge	
SL sample vehicle scripts	Aeroplane vehicle script used		
SL sample primitives – basic building blocks		Yes design imported and added to card	Yes to build object
Pre made objects from within SL			Yes copied to use in layout
SL environmental controls			Yes to landscape area
Topography/layout design			Yes
Time	4 hrs approximately	4 hrs approximately	Several days
External resources used	3D model from Google Sketcher	Digital camera, Adobe Photoshop &	None
Importing objects &/ or scripts	Imported 3D model + adapted vehicle script	Design imported and added to card(object) with animation	None
Combining internal & external resources	Yes	Yes	No

Discussion

The resources identified in Table 2 were then compared with the two resource category schemes previously discussed. With some modifications, the Hunt (2004) classification was used to provide the overarching categories. The first category Human was the most directly transferable as while these were originally organizational i.e. employees we have adapted them to the customers/residents of Second Life. As these are based on competences/capabilities which Madhavaram & Hunt (2008) state “can be viewed as operant resources” any resources identified as being capabilities are classified as operant resources. For all other resources we have applied the SD-logic rationale of an operant resource being one that can act on another resource, whereas an operand resource is acted upon. They have then been fitted into the appropriate category as to if there were informational or organizational, which has been interpreted as being controlled by Linden labs. Owners of Second Life. The preliminary classification of operant v operand resources in Second Life based on the four types of operant resources identified by Hunt (2004) is shown Table 3.

Table 3 A Preliminary Classification of Operant & Operand Resources in Second Life.

Classification	Operand or Operant Resource	Comment
Human		
Existing computer capabilities of resident	Operant	Capability
Existing other capabilities of resident e.g. design skills	Operant	Capability
LSL – new skill developed by residents	Operant	Capability
The Lindens	Operant	
Time	Operand	
Informational		
SL wiki	Operand	
SL.com	Operand	
Sample scripts e.g. vehicle	Operant	Can act on objects
External information(not supplied by SL):- Seminars Computing sessions Web pages	Operand	
Organisational		
Sample primitives – basic building blocks	Operand	
Building tools	Operant	Act on objects
Environmental tools	Operant	Change environment
End user agreement EULA - Rules	Operand	
SL Community Standards	Operand	
Open source code	Operant	
Import object permissions	Operant	Allow certain objects to enter
Relational		
Other residents capabilities	Operant	Capability

The first category is Human. Because different residents have a variety of capabilities and competences, we have separated these out. For instance the level of computer competence will affect the residents' capability of learning LSL or not.

The second section is Informational resources. Only the sample scripts have been classified as operant resources in this environment as they may act on objects to create scripted objects that may move, light up, and make sounds etc. If SD-logic is to hold in CME then there need to be operant resources that create the competitive advantage by their superordination of operand resources. Therefore it is important that some operand resources have been identified.

The third category is the Organizational category, these are items controlled by Linden Labs, the owners of Second Life. Here the building/environmental tools that act on either objects or the environment to change them are classified as operant resources. The sample primitives

are classified as operand resources. The justification is these are items e.g. sample primitives – the basic building blocks of Second Life which are acted on by others, similar to physical resources such as bricks in real life.

Brindberg & Wood (1983) suggest that “Within the general domain of economics, the scarcity of a resource is instrumental in understanding a consumer’s behaviour”. However scarcity within virtual worlds is a complex issue. It can be argued that both physical environments and CME are similar in the sense that they are a) deliberately constructed and b) have impact on the perception, imagination and behaviour of service actors. According to Poster (2006:112) “digital cultural objects *resist* market mechanisms”, as they are not scarce and therefore do not become commodities. However Malaby (2006:150) reminds us that scarcity is imposed in many virtual worlds and suggests, “So in the generation of these commodities we already see multiple kinds of resources at play as players in Massively Multi-player Online Role Play Games (MMORPG’s) leverage them to generate commodities that can be exchanged for money”. When CopyBot was launched and potentially could copy any item in-world Linden Labs., acted promptly to ban its use in-world. Martin (2008:9) explains, “When any commodity can be copied, including rare or custom-made items, the potential for losing the aura of individuality and status is very real, and is therefore a threat to those who create and sell virtual products”. William had a special mark added to his design to protect his work in Second Life. Therefore we have also included the End User Agreement(EULA) which are effectively the rules for the virtual world within this category. These are seen as enforceable by courts (Klang, 2005) and give virtual world owners considerable autonomy in how they operate (Lastowka, 2010). Similarly the community standards link to the EULA and are the norms that residents are expected to operate within.

Finally in the Relational category we have only other residents which we class as operant resources due to their capabilities. Potentially other categories could include in-world or out of world communities. However the residents interviewed did not identify these as a resource. Similarly the avatar was not mentioned as a resource and so is not included. Potentially this could be the point of some debate as ultimately the human user cannot operate in world without an avatar. Authors such as Castronova (2005) suggest that avatar capital exists in the skills and capabilities, social capital, status etc. developed. While others such as Malaby (2006) suggest this only resides in the human user. Further interviews will allow the development of this classification.

Research implications –This paper contributes to developing and adapting existing research methodology within computer mediated environments, such as Second Life. The results show that this virtual world example of CME is also a co-creation environment. If SD-logic applies in CME there need to be operant resources that create competitive advantage by their superordination of operand resources. Based on research with Second Life customers, we have examined these resources from their perspective. This enabled us to identify a number of operant resources within the CME as well as some operand resources. A preliminary classification of the operant resources has been developed by modifying the Hunt (2004) categories which provided the best fit.

Our findings provide evidence that CME can be viewed through the SD-lens consistent with the Lusch et al. (2007:12) quote that “the customer is a primary integrator of resources in the creation of value through service experiences that are interwoven with life experiences to enhance quality of life”.

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