

Service Management as a Means to Organizational Assimilation of ICT: A Case Study

Roberto Osorno Hinojosa

Professor and researcher in the Department of Electronics Systems and Computer Science at the ITESO, the Jesuit University of Guadalajara. Mexico.

Lucinio González Sabaté

Professor and researcher in the IQS School of Management at Ramón Llull University in Barcelona. Spain.

Antoni Olivé i Tomàs

Professor and researcher in the IQS School of Management at Ramón Llull University in Barcelona. Spain.

rosorno@iteso.mx, lucinio.gonzalez@iqs.edu, antoni.olive@iqs.edu

Received: April, 2016.

Accepted: June, 2018.

Published: June, 2018.

Abstract

Information and Communications Technology (ICT) is essential in the development and competitiveness of Small and Medium Enterprises (SMEs). Its assimilation for better use appears as a recurring theme in the academic literature. Learning has been identified as a means of assimilating ICT in organizations. Learning and intensive knowledge exchange are components of service, according to Service Dominant Logic (S-D logic). The goal of our work is to understand how an organization learns to use ICT in an environment influenced by service management. To accomplish this, we present a case study of a Mexican SME, which has applied service management principles and shows ICT assimilation based on learning processes. The contribution of our research is the identification of service factors, which may be related to the reduction of learning barriers. The identified relationship has allowed us to propose an organizational intervention model that helps ICT assimilation in SMEs.

Key words

Service Dominant Logic, Organizational Learning, Information Technology assimilation, Service Level Agreement

How to cite this article

Osorno Hinojosa, R., González Sabaté, L., & Olivé i Tomàs, A. (2018). Service Management as a Means to Organizational Assimilation of ICT: A Case Study. *Harvard Deusto Business Research*, VII(1), 19-36. <https://doi.org/10.3926/hdbr.118>

.....

Our contribution lies in the influence of service on the learning to use technology

1. Introduction

The use and assimilation of Information and Communications Technology (ICT) in small and medium companies (SME) is a widely addressed topic in literature, due to the importance of this sector in the economy and the impact that technology has in the processes and the competitiveness of these organizations (Matthews, 2007; Tarutè & Gatautis, 2014). As technology is considered an influential asset that is incorporated into organizational practices, learning is a means for its assimilation (Akaka & Vargo, 2014; Hock-Hai, Xinwei, Kwok-Kee, Choon-Ling & Lee, 2006). This learning may present barriers, one of them known as *defensive reasoning*, which has been proposed and studied in depth by Argyris (1977; 1985; 1994; 2002). Since the intensive exchange of knowledge and competences is an intrinsic element to services (Grönroos, 2012; Vargo & Lusch, 2016), there are proposals that suggest that when clients and suppliers interact, they are exposed to learning, both between people and organizations. Service Dominant (S-D) Logic proposes to observe the world from a perspective in which products and services are ways of exchanging knowledge and competences between actors (Akaka & Vargo, 2014; Greer, Lusch & Vargo, 2016). Organizational service and organizational learning are moving increasingly closer to one another in the literature and in practice, which invites us to continue with this investigation.

Different proposals have been developed to reduce the learning barriers in the organizations (Argyris, 2002; Holmer, 2014). In addition, there is a growing theoretical contribution concerning the way in which the service's features promote organizational learning. The above notwithstanding, there are few proposals addressing organizational learning when the organization is exposed to the service phenomenon, specifically, the way in which learning barriers are reduced when the actors are interacting within the service logic.

The aim of this paper is to understand the way in which an organization uses ICT with the influence of the S-D logic, with the purpose of proposing intervention strategies to reduce learning barriers. To reach this goal, case study methodology is used with multiple units of analysis in a Mexican SME. The principles of S-D logic are applied and it shows an assimilation process focused on learning.

The contribution of our research consists of the identification of the relationship that S-D logic may have with the reduction of learning barriers, which appears in the changes in evaluation and use that members of the organization implement during the Service Level Agreement process. The identified relationship has led us to propose an organizational learning model based on that proposed by Argyris (1977; 2003). Its core idea is the satisfaction of a client's needs, mitigating the evaluation of the results of the action. This reduces defensive reasoning, identified as an important learning barrier.

2. Review of the literature

2.1. Use and assimilation of ICT in SMEs

The use and assimilation of ICT in SMEs is a topic that has been widely addressed in literature, due to the importance of this sector in the economy (INEGI, 2016; Vandenberg, 2006) and the impact that technology has on the processes and competitiveness of organizations (Matthews, 2007; Tarutè & Gatautis, 2014).

Interesting studies have been conducted on the factors that have an impact on the assimilation of ICT in SMEs and competitiveness. Research by authors such as Pérez Pérez, Martínez Sánchez, De Luis Carnicer & Vela Jiménez (2006) and Hoyos & Valencia (2012) have identified

ICT is essential; its use must be oriented towards organizational purposes

some barriers to assimilation, such as failing to identify the return on investment to the company and potential resistance by personnel, for example. In addition, Harindranath, Dyerson & Barnes (2008) and Khuong, Harindranath & Dyerson (2014) agree, based on a case study, that the lack of knowledge leads people to experience uncertainty that becomes a barrier to the assimilation of these technologies. Finally, Taylor (2015) deals with the detailed study of the factors of assimilation from two theoretical models that he incorporates into his own proposal: firstly, he takes into account leadership and internal and external factors of the organization, and secondly, he considers the characteristics of technology, as well as the state of the market and the organization. The author encourages us to keep exploring the factors and strategies surrounding the adoption of technology. Interesting studies address the relationship that exists between internal innovation and technological progress (Sánchez-Sellero, Sánchez-Sellero, Sánchez-Sellero & Cruz-González, 2015) and the impact the investment has on regional technological advances (Sánchez-Sellero, Rosell-Martínez & García-Vázquez, 2014). Even though investments focused on R&D may have an impact on competitiveness, a key factor is to increase the productivity of companies (Pampillón Olmedo & Pampillón Albert, 2017); here is where the assimilation of ICT is relevant.

Among the assimilation factors, we find that organizational learning is relevant when the company is in a process of technological assimilation. The reduction of learning barriers in organizations during the process of assimilating technology thus becomes an interesting research topic.

2.2. The relationship between ICT and organizations

ICT and its relationship with organizations has been a topic of interest for researchers for some time now (Orlikowski & Iacono, 2001; Shaikh & Karjaluo, 2015). To interact with technology, people must find some meaning in its use. The reference frameworks are definitions of the organizational reality, and at the same time, they are vehicles for understanding, action and purpose of use (Orlikowski & Gash, 1994; Young, Mathiassen & Davidson, 2016). When the members of the organization share their mental structures and these are oriented towards what the organization wishes to be the product of the use of technology, it can be said that they are engaged in a learning process to use this technology in the desired manner.

As we can see, the use of technology is addressed from different perspectives and we find that there is agreement on the need for this use to be framed in a process of management that provides consistence and alignment with the organization's interests (Laudon & Laudon, 2016; Loh & Venkatraman, 1992; Luftman, 2004; Luftman, Lyytinen & Ben-Zvi, 2015). There are two management proposals that have been most recognized in the literature:

- Governance, understood as a combination of politics and organizational agreements that represent a reference framework to provide accountability (De Haes & Van Grembergen, 2009; Van Grembergen & De Haes, 2016).
- Service management, which has its greatest applications in the practices proposed in ITIL¹ or the management standard for technology services ISO/IEC 20000 (Iden & Eikebrokk, 2013).

Therefore, it is appropriate that the use of technology be framed according to the organization's interests, not only because the decisions and evaluation of the use correspond to

¹ Information Technology Infrastructure Library. Consists of the combination of best practices for the management of information technology services.

this framework, but also because the change in the members of the organization in relation to what they perceive might correspond more closely to these interests.

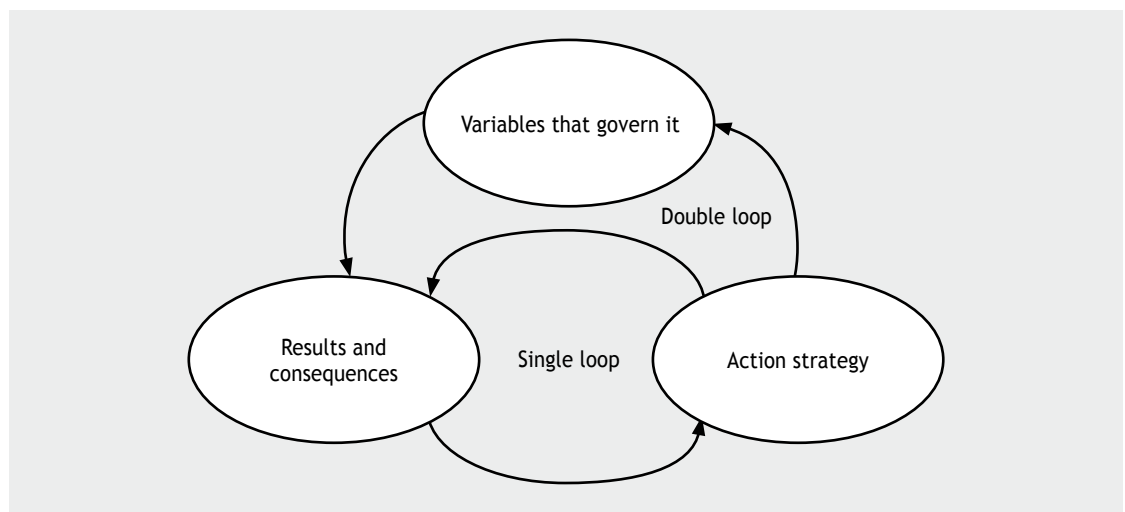
2.3. Organizational learning

Organizational learning, understood as the result of the learning by its members (Senge, 2014), is related to the transformation of people's framework of reference (Argyris & Schon, 1974), and it is manifested in the changes that the actions undergo and the way of evaluating its results (Dodgson, 1993; Levitt & March, 1988; Simons, 1995). Depending on how people adjust their actions, they learn from the results and, eventually, they can even challenge the evaluation reference, either in terms of the performance indicators or the expected objectives. The identification of gaps or differences in performance is a catalyst of learning.

In his seminal work, Argyris (1977) introduces a recognized learning model based on two process: the one that people perform in an attempt to reach the goals of their daily actions, recognized as single-loop learning, and the one that people perform when they identify the need to question and adjust measurement indicators and the policies that regulate them, known as double-loop learning (See Table 1).

Table 1

Double-loop learning



Defensive reasoning is one of the main barriers to learning (Argyris, 1985), since people develop a series of mechanisms directly related to the resistance to recognize the mistake or the failure to fulfill the goals established by the organization. Therefore, if it is not possible to recognize the gaps between what people expect and what people achieve, it will not be possible to learn.

If we contemplate the model by Argyris, we will realize that the second learning cycle (the most relevant of the model) depends on the completion of the first cycle, which at the same time, is based on the evaluation of the results. This evaluation is also the trigger of defensive reasoning, which is an important learning barrier. The model thus has as a learning barrier the same activity that triggers it: the evaluation of the results. It is here, in this coincidence, where we find an opportunity for intervention that has not yet been explored.

**Double-loop
learning
questions
the policies
and variables
that govern
the action**

The double cycle learning has continued to be an important line of research developed by Argyris (1977; 1985, 1991, 2002, 2003) and studied more recently by Kim, MacDonald & Andersen (2013).

2.4. The service, logic, science and applications

The growth and impact of the services sector in the economy make it a central player on a global level, and in recent years this has generated great academic interest in an aim to understand them in a deeper manner (Fitzsimmons & Fitzsimmons, 2013; Grönroos & Voima, 2013; Gummesson, 2014a; Lovelock, Patterson & Wirtz, 2015; Reynoso, Kandampully, Fan & Paulose, 2015; Spohrer, Maglio, Bailey & Gruhl, 2007).

The lines of research in services have an inflection point in the well-known proposal by Vargo and Lusch (2004; 2008; 2016), called Service-Dominant (S-D) Logic, in which they establish first eight, and then eleven, premises that introduce a new research perspective: products can contain the knowledge and competence of a manufacturer, and are used and evaluated by a client. Among the premises, it is established that the service includes intensive interactions in which there is an exchange of knowledge and in which the participants will necessarily place the focus on the client.

The exchange of knowledge and competences and the client focus are intrinsic elements of the service that stand out and invite us to explore the opportunities that they might offer in the process of organizational learning. It should also be noted that, over the past ten years, the way in which these elements work during the service provisioning has begun to be studied, which offers new perspectives that are interesting for us to explore.

While we find conceptual proposals about the relationship S-D logic might have with learning and innovation (Lusch & Nambisan, 2015), about the interaction and transference of knowledge among the actors that participate in the systems of service (Baldwin & Von Hippel, 2011) or about the way in which organizations learn to adapt in a service environment (Vargo, Wieland & Akaka, 2015), there is little about S-D logic, knowledge management or the reduction of barriers to organizational learning.

We find an interesting opportunity to explore the relationship that might exist between the components of the services and the reduction of organizational learning barriers, drawn from the double loop model proposed by Argyris. For this reason, we focus our subject of study on the search for an intervention model that allows organizations to learn to use ICT, reducing barriers through service.

3. Methodology

We situate our research question in the use of technology mediated by learning in Mexican SMEs: How do organizations learn to use ICT influenced by S-D logic?

This question situates us in the qualitative paradigm with a realistic focus, according to the recommendations of Creswell (2007) and Miles & Huberman (1994). Following the recommendations by Yin (2009; 2012), we used the tradition of the case study, embedded with multiple units of analysis. The author recommends that this methodology is suitable for cases that can be considered extreme or unique. He also argues that the use of units of analysis that behave like embedded crossover cases in a unique context that is difficult to replicate provides for sounder methodology. Gummesson (2014b), for example, makes the well-founded argument for the appropriateness of using case studies as a means for generating new knowledge in the service sector.

The client focus, interaction and knowledge exchange are service components

Strictly following the methodological recommendations, the research question is based on the following theoretical constructs, identified in the analysis of the literature: the use of technology and its evaluation in organizations, organizational learning reflected in the change in how technology is used, and finally, the relationship that the elements of S-D logic can have with the organizational learning process. The three theoretical constructs are built based on the systematic construction of the theory presented in the previous section. From them are derived three proposals for study²:

- **Proposal 1.** The expected value for ICT use is reflected in the way in which the results are monitored and evaluated.
- **Proposal 2.** Organizational learning is reflected in the change in the way ICT are used and in the change in their evaluation.
- **Proposal 3.** S-D logic has an influence on the organizational learning in terms of ICT use.

Yin (2009) recommends that in case studies, the learning paths be established that are to be explored instead of hypotheses to be validated, in order to avoid, as much as possible, the deviations an observer might have had throughout the research.

As a case study, a Mexican SME was selected that falls within the 5% of the organizations of this type interested in technology management and that have gradually incorporated service management practices. Mercantil Doméstica de Guadalajara is an SME founded in 1991 that began operation with eight employees in the furniture marketing industry. Its credit-based business model emphasized the need to maintain collection processes and the technologies that support them. The general director has dedicated attention to the planning, monitoring and control processes, particularly to those related to information systems. Given the nature of the business model, the use of information and technology is important for senior management, as the systematic application of practices is derived from it, which can support information system management. To date, the company has 120 employees and is characterized by the consistent application of ICT in its processes and for the novelty of using technology to offer new services to its clients.

The area of computer science, responsible for systems management, has demonstrated an interesting evolution in the way in which service is provided to the different areas and service management practices are applied. While instruments are available that enable it to design, monitor and control the services provided to the different user areas, their application has been less than homogeneous: in some cases, they have only been partially applied, and in others, not at all. Furthermore, there seems to be a heterogeneous use and evaluation of the technology within companies. The above led us to select four different areas (Sales, Internal Auditing, Customer Service and General Administration), which were identified as units of analysis (UA). This gave us the information we needed for a maximum variance analysis.

To conduct the research, we collected data at two different moments; first, we retrieved the history of the use of technology and services from the years 2009 to 2012, which was then contrasted with the period 2013-2016. The data collected focused primarily on the processes and the results of the planning of each of the areas involved, on the way in which the ICT was applied to meet their objectives, on the methods and practices used to decide the adjustments and improvements in the ICT and on the relational mechanisms the users employed with the

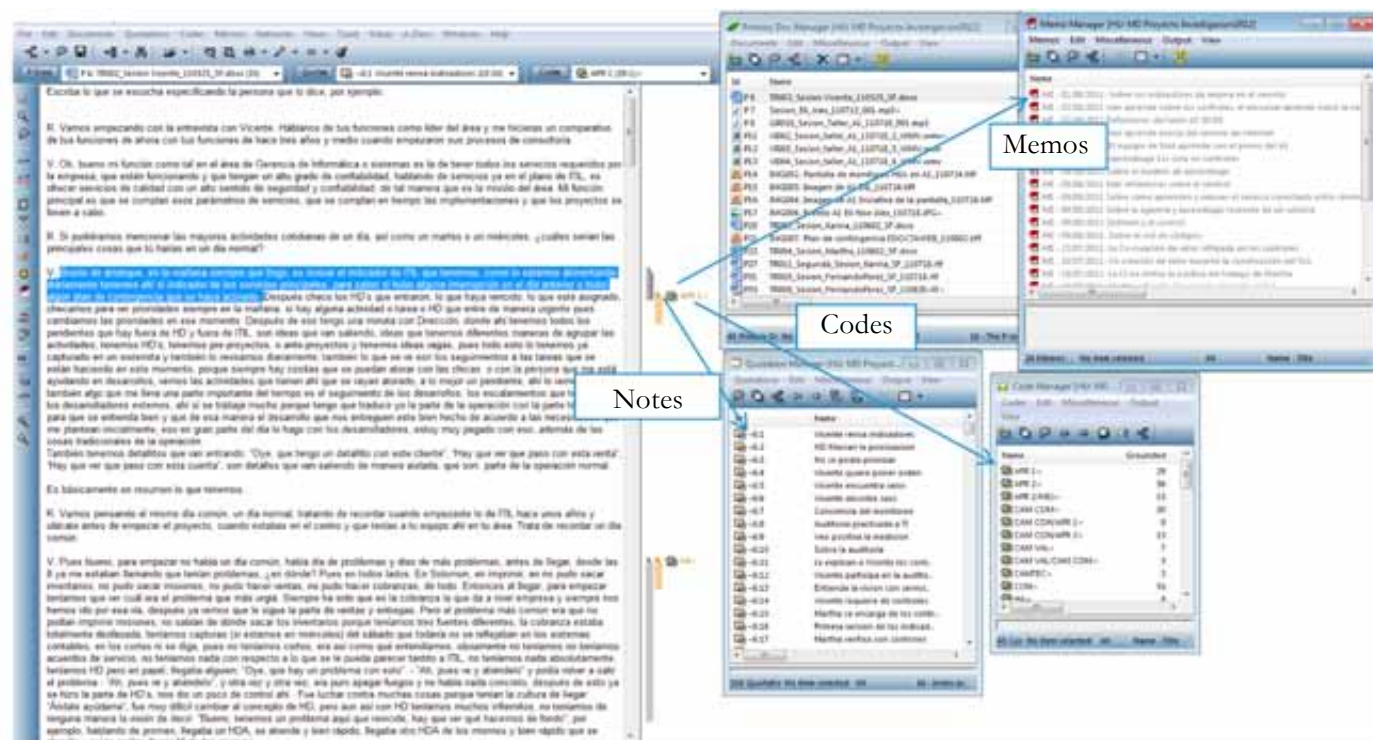
² While we might be more familiar with the validation of hypotheses, the case study methodology is clear in that its design is based on what is known as “proposals for study”.

IT department. Included were planning documents, processes for requesting services and changes in the ICT, meetings, workshops and performance reviews.

Following the methodological recommendations, information-gathering instruments were designed: interviews, documents to analyze, data to search for and events to record; all of this using as a reference the research question, the research proposals and the first and second level question design. The information from 26 recorded and transcribed interviews was systematized, as were 14 team work and planning sessions, 94 work documents, 48 photographs and 40 hours of video recordings. All evidence was analyzed and coded using ATLAS.ti software (www.atlasti.com), which enabled us to discover the relationships and variance through queries of the codes, notes and memos recorded (see Table 2).

Table 2

Systematization and analysis of the evidence using the ATLAS.ti system



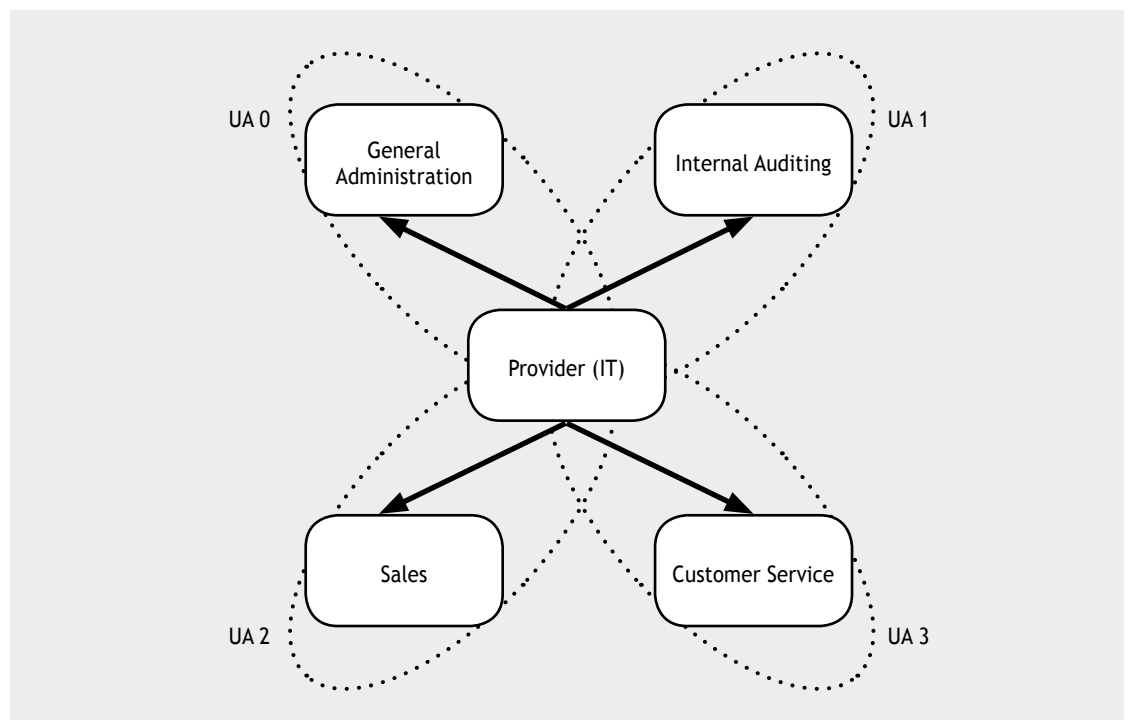
Once the information was systematized, different instruments of reduction and analysis were created, one of which is known as the “event status network,” which shows us some of the events that were decisive in the changes in use within the company. Three additional systematization and analysis techniques were added to this instrument: an analysis of the status of the units of analysis, which described the variations in the evidence on the technological use among the different company departments, an analysis of the IT department support trends, and finally, a matrix with the most significant intervention events over the years. The evidence was processed through two stages: the first simply described the events, while the second sought to explain them as the result of the patterns, coincidences and discrepancies found. The explanatory analysis produced the results that were compared with the theoretical framework to then suggest our contribution to the field of knowledge.

4. Results

As indicated, we decided to study the relationship that exists between the department responsible for managing the information technologies (or IT) and four different departments of users of these technologies: General Administration (UA 0), Internal Auditing (UA 1), Sales (UA 2) and Customer Service (UA 3) (See Table 3).

Table 3

The units of analysis (UA) are comprised of the provider (IT) and four user units



4.1. Result 1

We observed that the units of analysis present plausible differences in the way in which the expected value for the technology use was established. These differences stem from two different aspects (see Table 4):

1. **The identification strategy.** While the units of analysis UA 2 and UA 3 independently establish the expected value of use, both UA 0 and UA 1 do so jointly, i.e., both units collaborate to identify what is expected from the use of the technology. This evaluation is related to the single-loop of organizational learning.
2. **The reference used to identify the value.** While units of analysis UA 2 and UA 3 use as a reference their own indicators and needs, the units of analysis UA 0 and UA 1 use an external reference, reflected in a client we have called the “third party in question.” In this case, the expectation compliance and client satisfaction indicators become the reference to be used. This evaluation is related to the double-loop of organizational learning.

**The qualitative
research
(case study)
paradigm was
applied**

Table 4
Differences in establishing the expected value for technology use

Aspect	Unit 0	Unit 1	Unit 2	Unit 3
Strategy to identify the technology use value	Jointly	Jointly	Independently	Independently
Reference used to identify the technology use value	Client needs (third party in question)	Client needs (third party in question)	Department's own indicators	Department's own indicators

The results of the information analysis showed us a plausible difference in the way in which the departments evaluate the use of technology: using references linked to internal objectives of each unit versus using references linked to the service objectives to a client, i.e., the indicators established in the Service Agreement and that are aligned with fulfilling client expectations and satisfaction. In the latter case, the participating departments jointly established the criteria to evaluate the use of technology (Result 1).

4.2. Result 2

We observed that the units of analysis also present plausible differences in the way in which the change in the technology use was decided. These differences stem from two different aspects:

1. **The strategy to decide changes in use.** While the units of analysis UA 2 and UA 3 independently decide the changes in the use of technology, UA 0 and UA 1 do so jointly and in agreement with one another; i.e., both units collaborate in decision related to the changes to be implemented in the technology. This variation is related to the double-loop of organizational learning.
2. **The reference used to decide changes in use.** While the units of analysis UA 2 and UA 3 use their own needs as a reference, UA 0 and UA 1 do so according to the needs of a third party in question. As mentioned in Result 1, these needs are documented in the Service Agreements and their objectives, which are aimed at fulfilling the expectations and ensuring client satisfaction. This variation is related to the double-loop of organizational learning.

In this case, we could observe a plausible difference in the way in which the departments decided on changes in technology. On the one hand, we found criteria linked once again to the internal objectives of each department involved; on the other hand, we found that the departments involved decided on the corresponding changes together. In the latter case, the reference used to decide was in the compliance with the agreements established with an external client (Result 2).

The factors that show a variation in the units of analysis are, on the one hand, the evaluation criteria (of use), and on the other, the change criteria (of use). These factors coincide with those that are considered in the double-loop model of organizational learning. This suggests to us that the units of analysis are learning to use the technology in different ways within the organization.

4.3. Result 3

The teams observed participated in a set of events characterized by containing elements and tools for service management. Said events are described in Table 5.

Table 5
Intervention events

Name of the event	Description	Elements of S-D logic present
Training on services	Training of participants in service-related concepts and practices.	Not observed.
Quality standard in the service.	Application of service architecture design tools.	Minimal presence of interaction among the participating departments, joint client focus and knowledge exchange.
Service Level Agreement (SLA).	Application of design tools for service deliverables, with stress on compliance with internal objectives.	Plausible presence of interaction among the participants. Knowledge exchange, depending on the negotiation.
Agreement A1	Application of design tools for service deliverables, with stress on an external client (third party in question).	High level of interaction and knowledge exchange. A strong focus on the external client (third party in question).

We can note that in the table above, the events are arranged from less to more according to the elements of S-D logic identified in them: interaction, knowledge exchange and client focus (See Table 6).

Table 6
Participation of the units of analysis in the intervention events

Event	Unit 0	Unit 1	Unit 2	Unit 3
Training on services	Computers and Accessories	Computers and Accessories	Computers and Accessories	Computers and Accessories
Quality standard in the service	Computers and Accessories User	Computers and Accessories User	Computers and Accessories User	Computers and Accessories User
Service Level Agreement (SLA)	Computers and Accessories User	Computers and Accessories User	No participation	Computers and Accessories User
Agreement A1	Computers and Accessories User	Computers and Accessories User	No participation	No participation

We could see that the units of analysis that show changes in the evaluation or in the use of ICT and thus best meet the company's expectations are those that have taken part in the S-D logic and A1, in which interaction, client focus and knowledge exchange are present in a service environment. The units UA 0 and UA 1, the same ones that have intensively participated in these events related to S-D logic, are those that jointly set strategies for evaluation and change in the use of technology.

Our observations suggest that the components of S-D logic (interaction, client focus and learning) could be related to the behavior of the units of analysis UA 0 and UA 1 in terms of the use of and evaluation of ICT.

Our results show that, in cases in which people are exposed to events that meet S-D logic criteria, the way in which they evaluate, change and make decisions about technology abides by an external reference. This is related to plausible improvements in the use of information systems and in the changes necessary to take better advantage of it. Using the Argyris model as

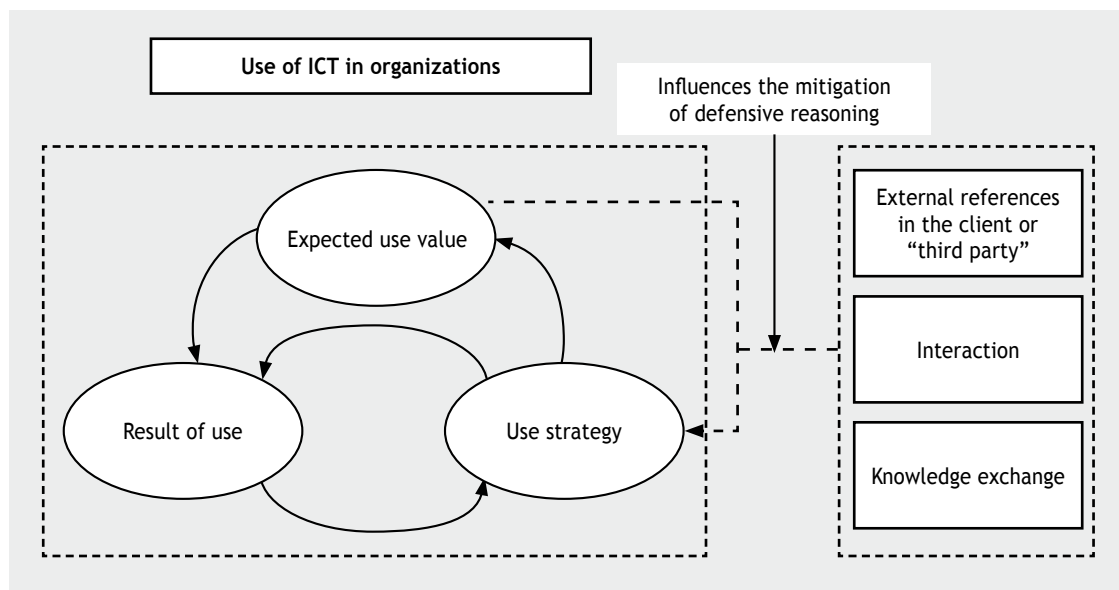
The units of analysis evaluate and decide on the change in ICT in a different manner

the basis, the units of analysis are demonstrating this learning when they are subjected to events involving S-D logic.

The lessons learned from studying this proposal constitute our result number 3 (R3). The mechanisms of agreement that arise during the service agreement process are related to the external references and strategies that the members of the organization use during the evaluation and change in the use of ICT (see Table 7).

Table 7

The results indicate that the learning process demonstrates the influence of S-D logic



After reviewing the lessons provided by the study proposals, we can say that, in light of our results, the units of analysis that participate in the events related to S-D logic demonstrate double-loop learning with regard to ICT use.

Since the evaluation of the results is, according to the Argyris model, a crucial element in double-loop learning, we encounter the unexpected finding that the units of analysis are manifesting this type of learning during the Service Level Agreement, without the intervention of the assessment of the action results. This does not necessarily go along with double-loop learning, and it thus suggests that this organization is learning without the evaluation of the results playing a predominant role.

The results shown in Table 8 represent the most significant finding of our work, which leads us to propose a model to reduce barriers to organizational learning.

5. Discussion

Results R1 and R2 suggest that the units of analysis change the evaluation and the use of ICT, which, following the Argyris model (1977), might mean double-loop learning. This learning is characterized by the joint identification of the change in use and its expected value, both based

**There is
a relationship
between
the service
components
and learning**

on a reference that is external to the participants. The above leads us to our first theoretical proposition:

An organization can learn to use ICT when it jointly establishes the expected value and the strategy of use, with its members having an external reference to decide.

We observe that when the participating departments make it a requirement to satisfy a client's needs, they jointly establish the value of technology and the better way in which it can be used to reach their goals.

Our result R3 suggests that interaction, a client focus and learning, which are essential components of service (Vargo & Lusch, 2016), might be related to the observed learning. This leads us to formulate our second theoretical proposition:

The features of the Service Dominant Logic might be related to the learning that an organization manifests surrounding the use of ICT.

That is to say, the departments that displayed biggest changes in the use and evaluation of technology were those that were exposed to events related to Service Dominant Logic.

The double-loop learning model has as its central concept the evaluation of results and the consequent adjustment in daily actions (which constitutes single-loop learning) or in policies that regulate the evaluation of the result of these actions (which constitutes double-loop learning). Since the evaluation process might have negative consequences for the participants, there is the possibility of the appearance, during the double-loop learning, of the so-called "defensive reasoning", characterized by concealment, self-referential logic and uncertainty. This behavior is identified as a learning barrier (Argyris, 1977). Thus, if evaluation is the central concept of learning, it is at the same time the trigger of the processes that limit it.

We have also described in the theory that the service features are related to learning, and this is backed by the interaction and the knowledge exchange. In addition, we have seen from the perspective of S-D logic that this exchange has as focal point the satisfaction of a client's needs (Vargo & Lusch, 2016). The Service Level Agreement is identified as a starting point in the service delivery process, in which one participant requires the knowledge of the other to negotiate the terms of the exchange (Chesbrough & Spohrer, 2006).

The results of our research show us that the members of the organization are learning to use ICT without any evaluation. This has been revealed thanks to the changes that they decided together about how they are going to use technology and how to evaluate the results of this use.

Moreover, we find that people who manifest learning like that described above have participated in events in which they identify and negotiate services supported by technology. These events are known as the Service Level Agreement. The foregoing suggests that the features of this process might be related to the manifested learning.

The service components reduce defensive reasoning that limits learning

Our theoretical proposition number one, seen in light of the literature, shows us a change in the reference frameworks that might mean learning, but this does not concur with the initial theoretical model, since in the studied organization, the evaluation of the results is not the trigger of the changes. This behavior does not agree with what was pointed out in Argyris' model. If we consider that the evaluation of the results to which we allude might lead to defensive reasoning, and that we have observed double-loop learning with no apparent barriers, we can deduce that these barriers were reduced.

In addition, we find in the initial theory that the Service Agreement processes have, among other components, interaction, client focus and knowledge exchange. Our theoretical proposition number two and our results coincide with the literature, since in the interaction in which the members of the organization engage to satisfy a client's needs, they learn together around the service and its components.

We can thus state as a contribution of this work that, in line with Argyris (1977) regarding the double-loop learning and Vargo & Lusch (2016) regarding the characteristics of S-D logic, the elements that characterize the Service Level Agreement process may be related to the reduction of the barriers to learning within the organization in the following manner:

- The interaction leads the members to jointly establish the evaluation and the use, as mentioned in the results.
- Knowledge exchange results in the parties learning about the client, the service and its components (among them, ICT).
- The client focus provides those involved a reference to decide upon the use and evaluation that goes beyond their own goals.

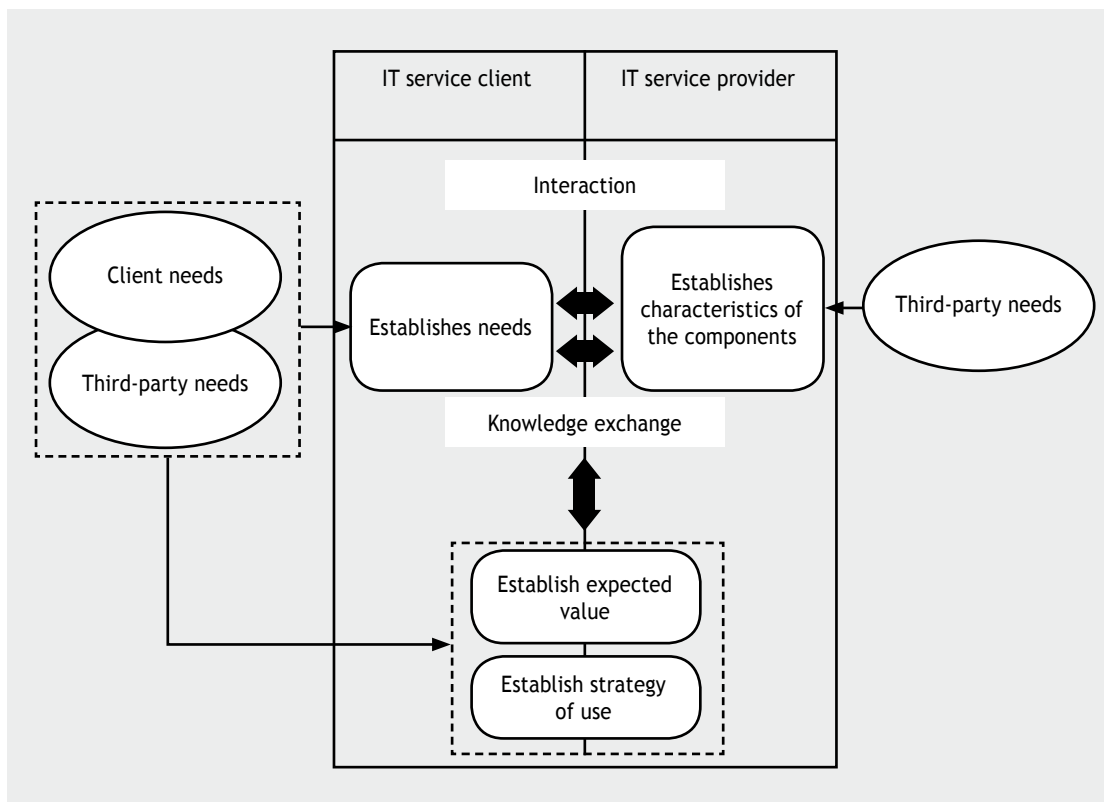
The evaluation of the results is not the focal point of the learning process, which suggests to us that the barrier of defensive reasoning is mitigated by the following reasons:

- The risk of protecting and concealing malfunctions is reduced, since without evaluation, there is no exposure to the consequences that the participants could perceive as being negative.
- Self-referential logic is reduced, since the evaluation policies are established jointly.
- Uncertainty is reduced and transparency is increased when the participants know the conditions of evaluation and measurement of results.

All of the above leads us to propose a new model in which, through an interaction among the people who provide a service to a third party, they can exchange knowledge in the interests of meeting the needs of the latter (the third party in question) and participate in a double-loop learning process (See Table 8). We can see that, during the Service Level Agreement process, the IT service client expresses their needs and those of its own client (the third party in question), while the provider establishes the service components, their characteristics, possibilities and rules for use. Both interact and exchange knowledge, establishing or changing the expected value and strategy of use.

In the initial theory, we already saw proposals for organizational intervention aimed at reducing the barriers to learning. We also find a description of the service characteristics; among them, knowledge exchange. In spite of this, until now, no model like the one described here has been proposed, which relates these characteristics to the double-loop learning processes, with the aim of reducing the barriers inhibiting them.

Table 8
Learning model in an environment influenced by S-D logic



ICT, the use of which is related to the processing of information, is of special interest in the development of SMEs in Mexico, as it has a plausible impact on the productivity, management and competitiveness of the organizations. It is for this reason that the use and assimilation of technology constitute the focal point of our investigation.

Furthermore, the service is identified as a process that has characteristics related to learning, focused on meeting the needs of a client.

Our theoretical proposition can be summarized in the following terms: the intrinsic characteristics of S-D logic, such as interaction, client focus and knowledge exchange, can

Our model offers organizations the means to assimilate ICT

influence the learning process in which an organization engages in terms of ICT use when it mitigates defensive reasoning by leaving the evaluation of results as a secondary process.

Our findings give us a new model of intervention to reduce barriers to learning with regard to the use and assimilation of ICT. This model mitigates defensive reasoning, shifting the evaluation of results to a secondary plane, placing the emphasis on interaction, client focus and knowledge exchange, using a third party in question as a reference.

Our work presents a model that can be useful in organizations, especially in SMEs, so that they can successfully assimilate ICT in the most effective manner, thus increasing their competitiveness.

6.1. Limitations

Our research has been framed within a study of an SME, following the case study methodology with multiple units of analysis, the same units which have played a part in intervention events related to S-D logic. The foregoing leads us to identify certain limitations. The first refers to the possible impact that another kind of non-observed interventions might have on the members of organization learning; the second is the generalization of the results to geographically distant organizations, in which the negotiation is asynchronous.

6.2. Pending research lines

Our future lines of research will focus on the use of the proposed model in other contexts and applications. We mention three that we believe are interesting to explore:

1. Our model is based on the learning of individual technological elements (hardware or software) and could be applied to more complex and interconnected elements that promote learning centered around the technological architecture of an organization.
2. Our model could apply to other technological elements, such as practices and processes. In particular, we refer to the learning that an organization could manifest in the area of objectives, plans and strategies.
3. The exploration of the plan proposed in lines 1 and 2 could lead us to set out a management model for ICT based on organizational learning.

7. Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

8. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

9. References

- Akaka, M., & Vargo, S. L. (2014). Technology as an operant resource in service (eco)systems. *Information Systems and e-Business Management*, 12(3), 367-384. <https://doi.org/10.1007/s10257-013-0220-5>
- Argyris, C. (1977). Double loop learning in organizations. *Harvard Business Review*, 55(5), 115-125.
- Argyris, C. (1985). *Strategy, change and defensive routines*. England: Pitman Publishing.
- Argyris, C. (1991). Teaching Smart People How to Learn. *Harvard Business Review*, 69(3), 99-109.
- Argyris, C. (1994). Good communication that blocks learning. *Harvard Business Review*, 72(4), 77-85.

- Argyris, C. (2002). Double-Loop Learning, Teaching, and Research. *Academy of Management Learning & Education*, 1(2), 206-218. <https://doi.org/10.5465/amle.2002.8509400>
- Argyris, C. (2003). A Life Full of Learning. *Organization Studies*, 24(7), 1178-1192. <https://doi.org/10.1177/01708406030247009>
- Argyris, C., & Schon, D. A. (1974). *Theory in Practice: Increasing Professional Effectiveness*. Jossey-Bass.
- Baldwin, C., & Von Hippel, E. (2011). Modeling a Paradigm Shift: From Producer Innovation to User and Open Collaborative Innovation. *Organization Science*, 22(6), 1399-1417. <https://doi.org/10.1287/orsc.1100.0618>
- Chesbrough, H., & Spohrer, J. (2006). A Research Manifesto for Services Science. *Communications of the ACM*, 49(7), 35-40. <https://doi.org/10.1145/1139922.1139945>
- Creswell, J. W. (2007). *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*. California, USA: Sage Publications, Inc.
- De Haes, S., & Van Grembergen, W. (2009). An Exploratory Study into IT Governance Implementations and its Impact on Business/IT Alignment. *Information Systems Management*, 26(2), 123-137. <https://doi.org/10.1080/10580530902794786>
- Dodgson, M. (1993). Organizational Learning: A Review of Some Literatures. *Organization Studies*, 14(3), 375-394. <https://doi.org/10.1177/017084069301400303>
- Fitzsimmons, J. A., & Fitzsimmons, M. J. (2013). *Service Management: Operations, Strategy, Information Technology*. McGraw-Hill Higher Education.
- Greer, C. R., Lusch, R. F., & Vargo, S. L. (2016). A service perspective: Key managerial insights from service-dominant (S-D) logic. *Organizational Dynamics*, 1(45), 28-38. <https://doi.org/10.1016/j.orgdyn.2015.12.004>
- Grönroos, C. (2012). Conceptualising value co-creation: A journey to the 1970s and back to the future. *Journal of Marketing Management*, 28(13-14), 1520-1534. <https://doi.org/10.1080/0267257X.2012.737357>
- Grönroos, C., & Voima, P. (2013). Critical Service Logic: Making Sense of Value Creation and Co-Creation. *Journal of the Academy of Marketing Science*, 41(2), 133-150. <https://doi.org/10.1007/s11747-012-0308-3>
- Gummesson, E. (2014a). Productivity, quality and relationship marketing in service operations: A revisit in a new service paradigm. *International Journal of Contemporary Hospitality Management*, 26(5), 656-662. <https://doi.org/10.1108/IJCHM-01-2014-0017>
- Gummesson, E. (2014b). Service Research Methodology: From Case Study Research to Case Theory. *Revista Ibero-Americana de Estrategia*, 13(4), 8-17. <https://doi.org/10.5585/riae.v13i4.2180>
- Harindranath, G., Dyerson, R., & Barnes, D. (2008). ICT Adoption and Use in UK SMEs: A Failure of Initiatives. *The Electronic Journal of Information Systems Evaluation*, 11(2), 91-96.
- Hock-Hai, T., Xinwei, W., Kwok-Kee, W., Choon-Ling, S., & Lee, M. K. O. (2006). Organizational learning capacity and attitude toward complex technological innovations: An empirical study. *Journal of the American Society for Information Science and Technology*, 57(2), 264-279. <https://doi.org/10.1002/asi.20275>
- Holmer, L. L. (2014). Understanding and Reducing the Impact of Defensiveness on Management Learning. Some Lessons from Neuroscience. *Journal of Management Education*, 38(5), 618-641. <https://doi.org/10.1177/1052562913505568>
- Hoyos Chaverra, J. A., & Valencia Arias, A. (2012). El papel de las TIC en el entorno organizacional de las PYMES. Trilogía. Ciencia, Tecnología y Sociedad, 7, 105-122. <https://doi.org/10.22430/21457778.155>
- Iden, J., & Eikebrokk, T. R. (2013). Implementing IT Service Management: A systematic literature review. *International Journal of Information Management*, 33(3), 512-523. <https://doi.org/10.1016/j.ijinfomgt.2013.01.004>
- INEGI (2016). Se difunden estadísticas detalladas sobre las micro, pequeñas y medianas empresas del país. *Boletín de prensa*, núm. 285/16. Aguascalientes: Instituto Nacional de Estadística y Geografía.
- Khuong, L.-N., Harindranath, G., & Dyerson, R. (2014). Understanding knowledge management software-organisational misalignments from an institutional perspective: A case study of a global IT-management consultancy firm. *International Journal of Information Management*, 34(2), 226-247. <https://doi.org/10.1016/j.ijinfomgt.2013.11.003>
- Kim, H., MacDonald, R. H., & Andersen, D. F. (2013). Simulation and Managerial Decision Making: A Double-Loop Learning Framework. *Public Administration Review*, 73(2), 291-300. <https://doi.org/10.1111/j.1540-6210.2012.02656.x>
- Laudon, K. C., & Laudon, J. P. (2016). *Management Information Systems: Managing the Digital Firm*. Pearson Education.
- Levitt, B., & March, J. (1988). Organizational Learning. *Annual Review of Sociology*, 14(3), 319-338. <https://doi.org/10.1146/annurev.so.14.080188.001535>

- Loh, L., & Venkatraman, N. (1992). Determinants of Information Technology Outsourcing: A Cross-Sectional Analysis. *Journal of Management Information Systems*, 9(1), 7-24. <https://doi.org/10.1080/07421222.1992.11517945>
- Lovelock, C., Patterson, P., & Wirtz, J. (2015). *Services Marketing*. Pearson Australia.
- Luftman, J. (2004). Assessing Business-IT Alignment Maturity. In Grembergen, W. V. (ed.), *Strategies for Information Technology Governance*, 99-128.
- Luftman, J., Lyytinen, K., & Ben-Zvi, T. (2015). Enhancing the measurement of information technology (IT) business alignment and its influence on company performance. *Journal of Information Technology*, 32(1), 26-46. <https://doi.org/10.1057/jit.2015.23>
- Lusch, R. F., & Nambisan, S. (2015). Service Innovation: A Service-Dominant Logic Perspective. *MIS Quarterly*, 39(1), 155-175. <https://doi.org/10.25300/MISQ/2015/39.1.07>
- Matthews, P. (2007). ICT assimilation and SME expansion. *Journal of International Development*, 19(6), 817-827.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Thousand Oaks: Sage.
- Orlikowski, W. J., & Gash, D. C. (1994). Technological frames: making sense of information technology in organizations. *ACM Transactions on Information Systems (TOIS)*, 12(2), 174-207. <https://doi.org/10.1145/196734.196745>
- Orlikowski, W. J., & Iacono, S. (2001). Research Commentary: Desperately Seeking the "IT" in IT Research – A Call to Theorizing the IT Artifact. *Information Systems Research*, 12(2), 121-134. <https://doi.org/10.1287/isre.12.2.121.9700>
- Pampillón Olmedo, R., & Pampillón Albert, R. (2017). In Spain, is the expenditure on R&D a determining factor in its external competitiveness? *Harvard Deusto Business Research*, VI(3), 143-152. <https://doi.org/10.3926/hdbr.186>
- Pérez Pérez, M., Martínez Sánchez, Á., De Luis Carnicer, P., & Vela Jiménez, M. J. (2006). Las TIC en las pymes: estudio de resultados y factores de adopción. *Economía Industrial*, 360, 93-106.
- Reynoso, J., Kandampully, J., Fan, X., & Paulose, H. (2015). Learning from socially driven service innovation in emerging economies. *Journal of Service Management*, 26(1), 156-176. <https://doi.org/10.1108/JOSM-11-2013-0313>
- Sánchez-Sellero, P., Rosell-Martínez, J., & García-Vázquez, J. M. (2014). Spillovers from Foreign Direct Investment in Spanish Manufacturing Firms. *Review of International Economics*, 22(2), 342-351. <https://doi.org/10.1111/roie.12115>
- Sánchez-Sellero, P., Sánchez-Sellero, M. C., Sánchez-Sellero, F. J., & Cruz-González, M. M. (2015). Effects of Innovation on Technical Progress in Spanish Manufacturing Firms. *Science, Technology and Society*, 20(1), 44-59. <https://doi.org/10.1177/0971721814561396>
- Senge, P. M. (2014). *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization*. Crown Business.
- Shaikh, A. A., & Karjaluo, H. (2015). Making the most of information technology & systems usage: A literature review, framework and future research agenda. *Computers in Human Behavior*, 49, 541-566. <https://doi.org/10.1016/j.chb.2015.03.059>
- Simons, R. (1995). *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal*. Harvard Business Press.
- Spohrer, J., Maglio, P. P., Bailey, J., & Gruhl, D. (2007). Steps Toward a Science of Service Systems. *Computer*, 40(1), 71-77. <https://doi.org/10.1109/MC.2007.33>
- Tarutè, A., & Gatautis, R. (2014). ICT impact on SMEs performance. *Procedia – Social and Behavioral Sciences*, 110, 1218-1225. <https://doi.org/10.1016/j.sbspro.2013.12.968>
- Taylor, P. (2015). The Importance of Information and Communication Technologies (ICTs): An Integration of the Extant Literature on ICT Adoption in Small and Medium Enterprises. *International Journal of Economics, Commerce and Management*, 3(5), 274-295.
- Van Grembergen, W., & De Haes, S. (2016). Introduction to the IT Governance and Its Mechanisms Minitrack. *49th Hawaii International Conference on System Sciences (HICSS)*, 4890. <https://doi.org/10.1109/HICSS.2016.606>
- Vandenberg, P. (2006). *Poverty reduction through small enterprises: Emerging consensus, unresolved issues & ILO Activities*. SEED Working Paper No. 75. International Labour Organization.
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68(1), 1-17. <https://doi.org/10.1509/jmkg.68.1.1.24036>
- Vargo, S. L., & Lusch, R. (2008). Service-dominant logic: continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1-10. <https://doi.org/10.1007/s11747-007-0069-6>

- Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: an extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5-23. <https://doi.org/10.1007/s11747-015-0456-3>
- Vargo, S. L., Wieland, H., & Akaka, M. A. (2015). Innovation through institutionalization: A service ecosystems perspective. *Industrial Marketing Management*, 44, 63-72. <https://doi.org/10.1016/j.indmarman.2014.10.008>
- Yin, R. K. (2009). *Case Study Research: Design and Methods* (fourth edition). London: Sage.
- Yin, R. K. (2012). *Applications of Case Study Research* (third edition). London: Sage Publications, Inc.
- Young, B. W., Mathiassen, L., & Davidson, E. (2016). Inconsistent and Incongruent Frames During IT-enabled Change: An Action Research Study into Sales Process Innovation. *Journal of the Association for Information Systems*, 17(7), 495-520. <https://doi.org/10.17705/1jais.00432> 