

Business Model as a Cloud Services-based Movility Strategy That Allows to Diminish the Number of PYMES Closures in Ecuador

Cristina Pesántez, Freddy Tapia and Jorge Edison Lascano

Department of Computer Science, Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador

Keywords: Business Model, Small and Medium Enterprises SME, Innovation and SMEs' Mortality.

Abstract: Nowadays, enterprises face big problems in a global market, especially small and medium-sized enterprises (PYMES), they are required to innovate the way they offer their products/services, without affecting their limited financial resources. In consequence they need to find new business opportunities, also cloud services trend could complement the business models promoted by PYMES, providing them competitive advantages. Here we propose the development of a business model based on data mobility and ease of access. This model contributes to reduce PYMES mortality causes, and at the same time to increase their growth projection rates.

1 INTRODUCTION

With the intention of having competitive and innovative advantages when enterprises offer and acquire products or services, they are adapting their traditional business models to a different model that focuses on the optimization of technological resources (Sánchez and González, 2017), this model would simplify timely and adequate decision making, allowing continuing innovation new business opportunities discovery (Burgos and Herrera, 2018).

Small and Medium-sized Enterprises (SMES) in Latin America are part of the involution, mainly at internal and external level regulations, and to certain technical flaws that prevent their development. This causes that many of them have a very short life time (Cardoza et al., 2016).

The average life time of a SME is approximately five years, depending on the structural and political conditions of a country in terms of financing resources.

According to data provided by the National Institute of Statistics and Geography and Informatics (INEGI) of Mexico, in 2014 a large percentage of enterprises considered SMEs were developed in low productivity sectors and value added (Sánchez and Vargas, 2018).

Small businesses' mortality rate is presented in terms of the ease or difficulty of overcoming obstacles such as: Level of competence, technology, market knowledge (saturation or not, market

dispersion), production capacity (excess or full), variety of products, and levels of service (Zaridis and Mousiolis, 2014)

In Ecuador, SMEs are very important for its productive sector, specially because of the employment generation. According to the National Economic Census of 2010 issued by the National Institute of Statistics and Census of Ecuador (INEC), three out of four positions jobs, were generated by SMEs (Chávez, 2016).

Nowadays, enterprises are in need of having valid information in real time, receiving analysis results, notifications, projections, share data, among others; not only among their executives, but also among employees from different areas. New trends help reach these targets of increasing productivity and facilitating proper decision making, one of these trends is Cloud Services.

The present research work was guided by the design science research methodology, which will display techniques such as: An exploratory and descriptive study that focuses on the development of a model that optimizes its scope or business strategies, then surveys will help discover results and possible real benefits from implementing this business model proposal. In section 2, we explain the research methodology. Section 3 explains the development of the business model, and section 4 presents conclusions, specifically from the survey answers.

2 RESEARCH METHODOLOGY

As mentioned before, this study uses the design science research methodology. It presents the design process as a fundamental part and defines it by means of a sequence of logical activities that generate a product (result): here are the steps revised for our case study

Knowing the Problem: It is essential to detail and determine the problem that is going to be investigated, to establish the causes and guidelines of possible solutions. This is detailed in the introduction.

Suggestion: Based on a literature review, it identifies what the main technological trends are. They can be used to propose a business model or technological trends according to the case study and place it as the main strategy within the model.

Development: A business model based on technological trends extracted in the previous phase is proposed. It provides support for stakeholders. It will also be necessary to investigate and identify the main causes of mortality of SMEs in Ecuador, hereafter it is possible to develop a business model that is articulated altogether with the technological section, allowing to contribute with the reduction of SMEs mortality in Ecuador.

Evaluation: A case study will be used to verify the results of the proposed model; surveys are used as validation techniques.

Conclusions: The contribution provided by the proposed business model for SMEs in Ecuador will be detailed and alternatives for technological solutions will be proposed.

As part of the initial phase of the research project, the following questions were proposed:

- What type of studies do contribute in the selection of a technological trend as a business strategy? (¿Qué tipo de estudios aportan en la selección de una tendencia tecnológica como estrategia de negocios?)
- What are the characteristics of the technological trends that could be used as a business strategy in SMEs? (¿Cuáles son las características de las tendencias tecnológicas que podrían ser usadas como estrategia de negocios en las PYMES?)
- What is the selected technological trend and what are the characteristics that motivated its selection? (¿Cuál es la Tendencia Tecnológica seleccionada y cuáles son las características que motivaron la selección de la misma?)
- Is it possible to leverage a business model with the selected technological trend? and does that allow to assist and / or diminish the main causes of SMEs mortality? (¿Es posible apalancar un

Modelo de Negocios con la Tendencia Tecnológica seleccionada y que permitan atender y/o disminuir las causas principales de mortalidad de las PYMES?

- Is it possible to validate the proposed business model by studying a case? (¿Es posible validar el Modelo de Negocios propuesto mediante el estudio de un caso?)

2.1 Literature Review

To continue with the research methodology, the sustainability or suggestion phase is developed through a Systematic Literature Mapping (SLM), following the next activities:

2.1.1 Inclusion and Exclusion Criteria

Inclusion criteria:

- Works from 2012 and beyond.
 - Books, journals, and articles, that are available and indexed.
 - Works related to technology and business models.
- Exclusion criteria
- Works that are written in languages different than English or Spanish.
 - Blogs.

2.1.2 Search Strategy

Within this section, it is necessary to develop other stages such as: Search for candidate studies, conformation of the search chain and selection of primary studies, i.e., the selection of studies that are going to be used to answer the research questions.

Search for candidate studies: The search for books, journals and scientific articles published in databases such as Springer, ACM, IEEE, Science Direct, and Google Scholar is performed. They must meet the inclusion and exclusion criteria described above. To facilitate this search, some terms were used according to the research questions and the objectives of this project, finally, we obtained a list of 36 candidate studies. From the search chain and after the necessary cross validations were executed, 8 studies were selected. They are listed in table 1.

After attaining the primary studies, it is possible to answer the three research questions determined in the initial literature review, as follows:

What type of studies do contribute in the selection of a technological trend as a business strategy?

The selected studies include researches of the technological situation in different countries, the same studies that have been analyzed and compared

Table 1: Primary studies list.

Item	Selected study
1	How Hybrid IT Is Transforming Enterprises.
2	Top five trends for cloud computing in 2017.
3	Business Intelligence Solutions for SME's
4	Contextualizing BYOD in SMEs in developing countries.
5	Mobile business intelligence adoption (case of croatian SMEs).
6	Mobile Adoption in Collaborating Supply Chains: A Study of Indian Auto SMEs.
7	Influence of the computing cloud on the economic development of SMEs in El Salvador.
8	La implementación del Cloud computing y Big data como herramienta para incrementar la productividad de las Empresas en el Ecuador.

with Ecuador reality. In addition, we extracted recommendations related to innovation and the use of technology as support in SMEs.

What are the characteristics of the technological trends that could be used as a business strategy in SMEs?

After each primary study analysis (See Table 1), we present a summary and comparative table of the influential technological trends useful in a business model, they are based on the reality that Ecuador is experiencing and they are compared with the success cases from other countries with similar characteristics (See Table 2):

Table 2: Characteristics of selected technology trends.

Item	Cloud services	BI	BYOD	MBI
Implementation costs decrease	x			
More efficiency	x	x	x	x
More performance	x	x	x	x
Add value to the business	x	x	x	x
Processing, storage and distribution of big amounts of data	x	x	x	x
Increase productivity	x	x	x	x
Help in customer loyalty	x	x	x	x
Flexibility and scalability	x			
Improves decisions making	x	x	x	x

Generation of facts-based reports	x	x	x	x
Generation of real time data reports	x	x	x	x
Analysis and visualization of real time data	x	x	x	x
Reduction of decisions making costs	x	x		
Accessibility independent of time and place	x	x	x	x
Offer competitive advantages	x	x	x	x
Use of mobile devices for working activities	x	x	x	x
Employees workflow is done within the comfort, flexibility and portability of their devices	x		x	x
Access to organization resources from anywhere	x		x	x
Acquisition and interchange of knowledge among employees	x		x	x

After reviewing the characteristics of each technological trend that could be used as a business strategy, according to what has been presented in the primary studies (See Table 1) and taking it to the reality of Ecuador, we conclude that:

The use of cloud services, if applicable in Ecuador, can be used as a technology strategy, according to the results gotten in countries with similar SME's, such is the case of El Salvador (Cerritos, 2015).

The last research question about the technological trend:

What is the selected technological trend and what are the characteristics that motivated the its selection?

Enterprises face a very common problem, which is, insufficiency of resources in terms of technology, finance and knowledge. Technologies and information systems can help overcome this problem

by providing better communication and a collaborative environments for their users. Exchange of information in real time further improves the performance and efficiency of their processes.

For the proposed business model development, we selected cloud services as a strategy according to the analysis performed on each technological trend (see Table 2). The following are the characteristics that motivated that selection:

- Cloud Services help enterprises manage large amounts of data through a shared infrastructure, acquiring in this way, advantages such as: Cost reduction, scalability and flexibility in terms of implementation and technology, as well as improving data production and ease of access. To achieve the success of an organization, you need a combination of services that adapt to the changing needs of enterprises. This adaptability is due to the need for greater efficiency and lower cost.
- Cloud Services, also have the potential to allow improved and more effective communication environments with its partners, and better access to useful and necessary information in real time, thus improving the scope and collaborative work.

3 BUSINESS MODEL DEVELOPMENT

In this phase, we develop a business model as a mobility strategy based on cloud services, this model offers an alternative solution to the high number of SMEs closures. For this purpose, we need a detailed current situation of Ecuador’s PYMES.

3.1 Current Situation of PYMES in Ecuador

EKOS magazine, in one of its publications, using information provided by the Superintendencia de Compañías, and Security and Insurance agencies, presents a summary of the evolution of small businesses (See Figure 1). They identified that 30.56% of the enterprises had disappeared. It is also worth to note that 16.66% of these enterprises stopped being small enterprises and became micro businesses, also 7.38% of small enterprises managed to ascend to medium or large enterprises (EKOS, 2017).

Furthermore, EKOS magazine presented an analysis of medium-sized enterprises from 2012 to

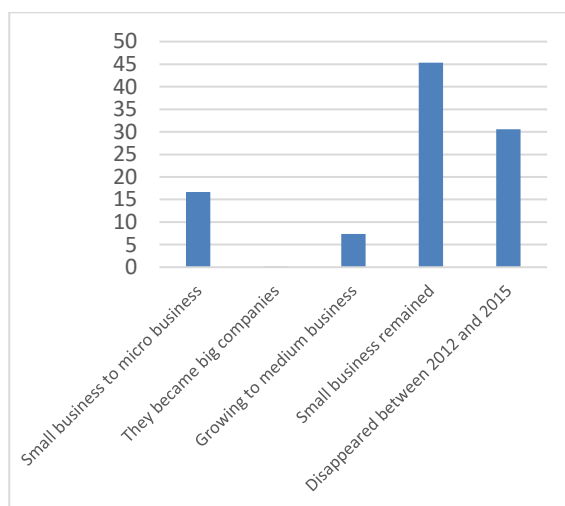


Figure 1: Evolution of small enterprises: 2012–2016.

2016 (See Figure 2), it can be seen that 24.75% of the enterprises constituted in this interval were closed, 3.04% of them grew and 18.98% became small or micro enterprises.

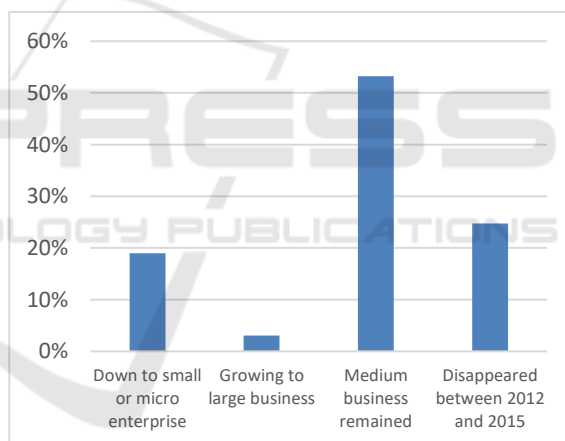


Figure 2: Evolution of SEMs 2012–2016.

According to analyzes presented by EKOS magazine and the National Institute of Statistics and Census - INEC (Labor and Business Panorama of Ecuador 2017) (INEC, 2017), maintaining a SME in Ecuador is a complex task, which depends on many factors, most of which have to do with the operation environment and market.

According to the Global Entrepreneurship Monitor database (GEM 2017), the main causes for enterprise closures since 2016 are: "Business was not lucrative and had financing problems" (Global Entrepreneurship Monitor, 2017).

Also, GEM 2017 highlights that behind these causes are found 14 pillars that offer a broader

analysis of the Quality of Entrepreneurship and its Ecosystem. To find those pillars that would help reduce the causes for enterprises closure, they identified those reasons, that managed in a suitable way, will allow a business to improve its production, offer innovative products / services, be more competitive, digitize its internal processes, allow businesses to develop in a highly competitive market. 4 out of 14 causes were selected due to the following analyzes based on the studies conducted by GEM 2017 (Global Entrepreneurship Monitor, 2017):

Technology Absorption: this pillar is under development in Ecuador. According to GEM2017 statistics, it represents 21% of consideration in the enterprises and place itself in position 8 in 2018 and in position 11 in 2017 (1 is the lowest value, and 14 the highest), this points out that its application decreased.

Competition: this pillar has not been fully exploited by the enterprises, it takes third place, besides representing 29% of application in the enterprises.

Product Innovation: this pillar is key when encouraging a SME to be more competitive, encouraging it to focus on delivering a product with value added to its customers, however it is ranked 4, this means that its implementation is scarce and has 29% of attention in enterprises.

Process Innovation: according to GEM 2017 studies, most enterprises still perform their processes manually, this pillar is placed 9th, and has a 19% application in enterprises.

Based on these 4 pillars, the present business model proposes the bases on which an SME should be directed to create, provide and capture value in the market. For this, it is necessary to guide their strategies towards the mobility offered by cloud services.

Continuing with the resolution to the research questions proposed above, we proceed to analyze the following question:

Is it possible to leverage a business model with the selected technological trend? and does that allow to assist and / or diminish the main causes of SMEs mortality?

After the previous analysis, it was determined that the technological trend to be used is Cloud Services, based on it, a business model is designed.

The business model based on cloud services will address the 4 pillars: Technological absorption, competition, product innovation, and process innovation. Thus, it becomes a fundamental part of the strategy for an enterprise to excel, achieving a reduction in the causes of business closures. This will contribute to have quality, innovative, and

competitive businesses that will be on par of technological advances.

The use of cloud services within the business model becomes the new ally or strategic partner to drive innovation at the enterprise level, mainly offering cost reduction in information technology (IT) resources and ease of data access, helping managers take the right decisions in the right time and with real time information.

3.2 Business Model

Our study is also based in Hamels' proposal (Hamel, 2000), whose model is focused on one strategy, that in our case is data mobility.

The business model based on cloud services is composed by four elements:

3.2.1 Basic Strategy

It is essential to align the IT area with business objectives, to specify this component, some questions must be asked, they will define what the current situation is and where you want to go, with this in mind, the competency pillar will be developed. Some of the questions that should be asked are:

- How big is the identified market segment?
- How will the offered product/service be?
- What clients' problems will be solved with my product/service?
- Where (geographic area) will my business be developed?
- What makes my product different from others that offer the same product?
- What is the proposal of value added that I offer to my clients?
- Can the competency imitate my value added proposal?

3.2.2 Strategy Resources

Once business strategies are identified, it is necessary to recognize the areas of the SME in which it is necessary to intervene: streamline processes, production, corporate image, decision-making, obtaining data of current situation in real time, etc.; here it is needed to create and identify competitive advantages, exploiting the pillars of: technological absorption, product innovation and process innovation.

An IT elements inventory of the SME must be made, whether they are hardware, software or network connections.

3.2.3 Interface with the Client

It represents the way the SME will enter the market, what services it will use to reach customers, and the channels that it will use looking for a different distribution chain. Within this component, several alternatives for the use of cloud services are presented.

For correct operation of services in the cloud, it is necessary to have internet connectivity, for which the Ley Orgánica de Telecomunicaciones (LOT) promulgated in 2015, considers Internet access as a basic service. With this, the Ministry of Telecommunications and Information Society (MINTEL) has among its objectives the plan of connectivity 2016 - 2021 to prioritize the deployment of infrastructure that offers connectivity to most of the population. According to surveys by MINTEL, 8 out of 10 SMEs use Internet, this data favors and drives the implementation of this business model.

The services in the cloud have 3 different options, everything depends on the business of the SME, its budget and its competitive strategy, below are the main cloud service options:

IaaS Infrastructure as a service,
SaaS Software as a service,
PaaS Platform as a service,

3.2.4 Value Network

For the definition of this component, it is necessary to identify the suppliers with whom we are going to work, they will be the strategic partners. In addition, it will be possible to carry out coalitions with competitors with common interests, although this may represent risks, it is part of the innovation of the SME.

Regarding technology service providers, below are some providers that stand out among others for certain characteristics of the technological services they offer, which also include those that will allow an adequate Internet connectivity according to the proposed strategy.

For Internet connection providers, there is a wide range of different plans for SMEs starting at \$ 35 per month.

A number of international enterprises offer services in the cloud: IBM, Microsoft, Google, Amazon. In addition, there are other providers that offer specific services.

After proposing a business model based on cloud services, the last research question is opened:

Is it possible to validate the proposed business model through a case study?

To validate the proposed business model, two case studies exist, we verified that the model represents an

improvement in SMEs competitiveness within its environment using the survey technique (detailed in Appendix A), the results are synthesized as follows:

- We got a perspective that enterprises, even if they have a great trajectory at some point, had a crisis that forced their managers to look for alternatives to stay in the market and not closure.
- It was possible to corroborate that the pillars that were taken into account influenced determinately on closure of SMEs and that the proposed business model can help them successfully pass this type of crisis.
- It was confirmed that knowledge and application of these services are gradually increasing.
- It was possible to determine that most enterprises make use of cloud services despite not having solid knowledge in this type of technology.
- There is evidence that the more knowledge you have of the services in the cloud, the more the application of them increases the benefit to the enterprise.
- It is evident, with the results, that nowadays people in charge of enterprises have an open mind ready for change to empower themselves in their markets.
- We could conclude that the service level agreements between the client and the provider should be able to increase user confidence in cloud services.

4 CONCLUSIONS

Once our research is complete, we can conclude that the first three months after the creation of an enterprise are critical and therefore must be well founded with solid grounds such as structure organization and planning, allowing to redirect all its resources to meet every objective, and even going beyond the level of competitiveness in the market they work.

Through a business model, it is possible to assist each of the pillars that determine the quality of enterprises, this allows to reduce enterprise mortality causes. In the present study, the proposed model is mainly based on the following pillars: technological absorption, competition, product innovation and process innovation, making them a fundamental part of the proposed strategy, in this way we will get a quality, innovative and competitive business that will be on a par with technological advances.

The use of cloud services within a business model becomes the ally to drive innovation at the enterprise level, offering IT cost reduction and data ease of

access, supporting managers in the decision-making process. Right decisions at the right time and with real-time information.

According to the interviews with executives of two Ecuadorian SMEs, we learned that there is a lack of knowledge about cloud services, their benefits, advantages and applications within an enterprise, all that can contribute to improve their productivity, innovation and competitiveness as well as keeping them at the technological forefront.

The proposed business model will transform the current way of managing SMEs, it highlights the use of technology to turn it into a competitive and innovative enterprise, thus decreasing the main causes of mortality of SMEs.

REFERENCES

Burgos, M., Herrera, J. (2018, Febrero). *Investigación cualitativa para establecer las principales causas que limitan el crecimiento de las PYMES*. Retrieved from Universidad de Guayaquil: [http://repositorio.ug.edu.ec/bitstream/redug/29422/1/In v.%20Cuali.%20Factores%20que%20Limitan%20el%20Crecimiento%20de%20las%20Pymes.pdf](http://repositorio.ug.edu.ec/bitstream/redug/29422/1/In%20Cuali.%20Factores%20que%20Limitan%20el%20Crecimiento%20de%20las%20Pymes.pdf)

Cardoza, G., Fornes, G., Farber, V., Gonzalez, R., Ruiz, J. (2016). Barriers and public policies affecting the international expansion of Latin American SMEs: Evidence from Brazil, Colombia, and Peru. *Journal of Business Research* , 2030-2039.

Cerritos, V. (2015, Marzo). *Anuario de Investigación Universidad Católica de El Salvador*. Retrieved from Influencia de la nube de cómputo en el desarrollo económico de las PYMES en El Salvador: <http://repositoriounicaes.catolica.edu.sv/bitstream/123456789/104/1/24CloudAnVol4.pdf>

Chávez, D. (2016). *Repositorio Universidad Simón Bolívar*. Retrieved from Diseño de un modelo de gestión para la aplicación del cloud computing enfocado a la productividad de las PYME ecuatorianas: <http://repositorio.uasb.edu.ec/bitstream/10644/5686/1/T-2326-MBA-Chavez-Dise%C3%B1o.pdf>

EKOS. (2017, Octubre 17). *EKOS NEGOCIOS*. Retrieved from <http://www.ekosnegocios.com/negocios/verArticuloC ontenido.aspx?idArt=9813>

Global Entrepreneurship Monitor. (2017). *ESPAE - Graduate School of Management ESPOL*. Retrieved from <http://espae.espol.edu.ec/wp-content/uploads/documentos/GemEcuador2017.pdf>

Hamel, G. (2000). *Liderando la Revolución*. Bogotá: Ediciones Gestión 2000.

INEC. (2017). *Ecuador en Cifras*. Retrieved from <http://www.ecuadorencifras.gob.ec/documentos/web-inec/Bibliotecas/Libros/Panorama%20Laboral%202017.pdf>

Osterwalder, A., Pigneur, Y. (2010). *Business Model Generation*. España: Centro Libros PAPP, S. L. U.

Sánchez, C., Vargas, J. (2018). Crecimiento en PYMES en base a sus recursos: Caso Gasticom. *Revista de la Agrupación Joven Iberoamericana de Contabilidad y Administración de Empresas (AJOICA)* , 33-45.

Sánchez, J., González, G. (2017). Estrategias de Comercio Electrónico para Implantar un Modelo de Marketing por Internet. *Revista Mercados y Negocios por Departamento Mercadotecnia y Negocios Internacionales - Universidad de Guadalajara* , 32-41.

Zaridis, A., Mousiolis, D. (2014). Entrepreneurship and SME's Organizational Structure - Elements of a successful Business. *Procedia - Social and Behavioral Sciences* , 463-467.

APPENDIX A

Survey to measure the contribution of using a business model as mobility strategy based on cloud services

Estimado empresario, la información proporcionada en la presente encuesta tiene fines estrictamente académicos, la cual permitirá recabar información que permita evaluar el aporte de un Modelo de Negocios basado en Servicios en la Nube para el desarrollo de las PYMES en el Ecuador.

DATOS INFORMATIVOS:

Nombre de la empresa: _____
 Nombre del encuestado: _____
 Puesto que ocupa en la empresa: _____
 Número aproximado de empleados: _____

PREGUNTAS:

- Selección la respuesta que más se ajusta a la realidad de su empresa.
- ¿Su empresa ha presentado por lo menos una crisis que le haya hecho pensar en cesar sus actividades?
 SI
 NO
 - Si su respuesta anterior fue afirmativa. ¿La crisis por la que atravesó su empresa tuvo que ver con alguno de los siguientes aspectos: i) Tecnología Obsoleta; ii) Competitividad; iii) Falta de Innovación de un producto/servicio o falta de innovación en los procesos internos?
 SI
 NO
 - ¿Qué nivel de conocimientos tiene sobre los servicios en la nube?
 MUCHO
 POCO
 NADA
 - ¿Su empresa ha utilizado o está utilizando algún servicio en la nube?
 SI
 NO

5. Si su respuesta anterior fue afirmativa. ¿Qué servicio está utilizando?

- Infraestructura como Servicio (Ejemplo: servidores virtualizados o centro de datos)
- Software como Servicio (Ejemplo: correo electrónico, sistema de facturación, ERP, CRM, etc.)
- Plataforma como Servicio (Ejemplo: plataforma que le permita desarrollar aplicaciones como Zimbra)

6. ¿Sabía que el uso de servicios en la nube puede ayudarle a reducir costos en tecnología, además de permitir a su empresa innovar y ser más competitiva?

- SI
- NO

7. ¿Sabía que su empresa puede mantenerse a la vanguardia tecnológica, acceder a aplicaciones que le permiten fidelizar a sus clientes, digitalizar sus procesos internos, entre otros beneficios haciendo uso de los servicios en la nube y pagando de acuerdo a sus necesidades?

- SI
- NO

8. ¿Su empresa cuenta con un Modelo de Negocio, es decir tiene una estrategia planteada que le permite cumplir los objetivos de su negocio?

- SI
- NO

9. ¿Estaría dispuesto a implementar un Modelo de Negocio basado en servicios en la nube dentro de su empresa, si este le ofrece: modernizar su tecnología, ser más competitivo, innovar su producto/servicio e innovar sus procesos internos?

- SI
- NO

10. Si su respuesta anterior fue afirmativa. ¿Cuál sería su principal preocupación sobre la implementación del Modelo de Negocios planteado?

- La seguridad y confidencialidad de los datos.
- Pérdida de control.
- Dependencia de un proveedor.

Firma