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Journal-Public Economy

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The works must be unpublished and refer to topics of Structure and scope of government; Taxation, Subsidies, and Revenue: Efficiency, Optimal taxation, Incidence, Externalities redistributive effects, Environmental taxes and subsidies, Personal income and other Nonbusiness Taxes and subsidies, Business taxes and subsidies, Tax evasion; Fiscal policies and behavior of Economic Agents: Household, Firm; Publicly provided goods: Public goods, Publicly provided private goods, Project evaluation, Social discount rate; National government expenditures and related policies: Government expenditures and health, Government expenditures and education, Government expenditures and welfare programs, Infrastructures, Social security and public pensions, National security and war, Procurement.

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Presentation of the content

In the first article we present, *High availability solution*, by ROJAS, Ángel, with adscription in the, Universidad Iberoamericana, in the next article we present, *Technological innovation*, by GALICIA, Ricardo, with adscription in the Universidad Iberoamericana, in the next article we present, *Automotive cluster in Coahuila*, by SALAZAR, Karina, with adscription in the Universidad Iberoamericana, in the last article we present, *Financial analysis Twitter, Inc.*, by GALVÁN, Gabriela, with adscription in the Universidad Iberoamericana.

Content

Article **Journal-Public Economy**
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High availability solution

Solución de alta disponibilidad

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Abstract

High Availability (High availability) is a system design protocol and associated implementation that ensures a certain absolute degree of operational continuity during a given measurement. Availability refers to the ability of the community of users to access the system, submit new work, update or alter existing work, or collect the results of previous work. If a user cannot access the system is said to be unavailable. The term downtime (downtime) is used to define when the system is not available.

High availability, Downtime

Resumen

La alta disponibilidad (High availability) es un protocolo de diseño de sistemas y su implementación asociada que garantiza un cierto grado absoluto de continuidad operativa durante una medición determinada. La disponibilidad se refiere a la capacidad de la comunidad de usuarios para acceder al sistema, presentar nuevos trabajos, actualizar o modificar los existentes, o recoger los resultados de trabajos anteriores. Si un usuario no puede acceder al sistema se dice que no está disponible. El término tiempo de inactividad (downtime) se utiliza para definir cuándo el sistema no está disponible.

Alta disponibilidad, Tiempo de inactividad

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Introduction

High availability

High availability is essential for any organization interested in protecting its business against the risk of a system outage, loss of transactional data or incomplete data. Whatever the reason, when a server goes down, the applications and business processes that depend on those applications come to a halt. For a business interested in being available at all times, HA clustering is a practical solution.

Two or more servers are joined or clustered to back up each other. If the primary server goes down, the clustering system restarts the application on one of the other servers in the cluster, allowing the business to continue operating normally.

Servers are connected via a network or serial interface so that they can communicate with each other. Scheduled downtime events can include patches to system software that require a reboot or system configuration changes that only take effect on a reboot. Unscheduled downtime events typically arise from some physical event, such as a hardware or software failure or environmental anomaly. High availability cluster (HA cluster) implementations that attempt to use redundancy of cluster components to eliminate single points of failure.

HA cluster implementations attempt to build redundancy into a cluster to eliminate single points of failure, including multiple network connections and data storage that is redundantly connected across storage area networks.

Load balancing is a computer networking method for distributing workloads across multiple computing resources, such as computers, a cluster of computers, network links, central processing units or disk drives.

This is implemented with a high availability cluster and incorporated with the load balancing infrastructure of servers. This technology not only improves availability, but also affects requests security and performance of application services. (Katterman, 2013)

Most of today's tricks and techniques for extending service availability originated in the telecommunications industry. Over the years, telecom equipment manufacturers devised multiple schemes to provide uninterrupted service despite hardware and software failures. Unfortunately, most of these schemes are expensive to maintain, and difficult to upgrade as requirements evolved. They also require long development cycles. (Webb, 2008) The advantage of this approach is that subsystems are hot-swappable, just like blade servers or hot-swappable disk drives. One system cannot be easily replaced while the other continues to operate and the replacement now becomes the slave or hot-swappable. It usually takes some time to get the new system in a condition to be the slave since it minimally has to boot up.

Another advantage of this approach is that while the subsystems should run the same applications and have the same I/O, internally there may be hardware differences. That said, most systems tend to be very similar or identical. In contrast, software-based solutions provide greater flexibility in the implementation of different synchronization and error checking systems. (Saggurti, 2015)

Node failures of a high availability cluster are not visible from clients outside the cluster. Combines with load balancing and shared storage technology (Moniruzzaman & Hossain, 2014).

Increasingly unstructured data is being produced and consumed over the network. How to maintain this data and improve the availability and scalability of storage systems has become a considerable challenge. (Jiang, Zhang, Liao, Jin, & Peng, 2014)

In today's competitive business world, companies are open 24 hours a day, seven days a week and increasingly rely on technology to do business and to help sustain profits. As business dependence on technology increases, so does the cost of downtime. With technology so strongly related to business processes and escalating outage costs, companies today are demanding the shortest downtime and rapid recovery for critical applications. Information is a company's strongest business asset, and business success is tied directly to continuity and reliable access to information.

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E-business and ERP systems are simple examples where any significant disruption will directly affect a company's operations and revenues and, worse, possibly lead to its own demise.

Conclusions

Implementing a high availability (HA) solution can protect your business from costly downtime. (Dolewski, 2010)

Virtualization is booming. But as an increasing number of companies incorporate the technology, it's important to remember that consolidating servers onto fewer physical machines comes with certain risks. Yes, companies of any size may realize the benefits of fabulous resources, but the cost of server failure can be high.

Since the server can become quite valuable as it has more and more virtual machines (VMs): if it goes down or experiences problems, business operations can be severely affected. For this reason, you need a powerful high availability/disaster recovery solution.

Disaster recovery solution. Microsoft and VMware offer this functionality within their industry-standard products, and those features provide good, basic protection. However, for ease of use or more granular functionality, you should consider third-party products such as those covered in the Buyer's Guide. (Bovberg, 2010)

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Technological innovation

Innovación tecnológica

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Abstract

Technological innovation occurs when technology is used as a means to introduce change. The process of technological innovation is essentially continuous nature. The essence of the process of technological innovation is the accumulation of knowledge over time. The assumption that the innovation process is subject to historical conditions plays a central role in the evolutionary approach and represents the fact that the evolution of a technology depends critically on the path it has followed in the past. The technological innovation process is partially irreversible. The development of technology in the context of a particular technological trajectory, generates new knowledge through a series of feedback mechanisms that improve their performance. These mechanisms strengthen this dominant technology over other alternative technologies with which it competes. The technological innovation process is affected by different types of uncertainty. Reflects the ignorance that has a priori what is the solution of the technical problem to be solved and if, indeed, you can find within the time and cost projections: What is the best technical solution is feasible?, will it work?

Technological innovation, Development of technology, Technological trajectory

Resumen

La innovación tecnológica se produce cuando se utiliza la tecnología como medio para introducir cambios. El proceso de innovación tecnológica es esencialmente de naturaleza continua. La esencia del proceso de innovación tecnológica es la acumulación de conocimientos a lo largo del tiempo. El supuesto de que el proceso de innovación está sujeto a condiciones históricas desempeña un papel central en el enfoque evolutivo y representa el hecho de que la evolución de una tecnología depende críticamente del camino que ha seguido en el pasado. El proceso de innovación tecnológica es parcialmente irreversible. El desarrollo de la tecnología en el contexto de una determinada trayectoria tecnológica, genera nuevos conocimientos a través de una serie de mecanismos de retroalimentación que mejoran su rendimiento. Estos mecanismos refuerzan esta tecnología dominante frente a otras tecnologías alternativas con las que compite. El proceso de innovación tecnológica se ve afectado por diferentes tipos de incertidumbre. Refleja el desconocimiento que se tiene a priori de cuál es la solución del problema técnico a resolver y si, efectivamente, se puede encontrar dentro de las previsiones de tiempo y coste: ¿Cuál es la mejor solución técnica es factible?, ¿funcionará?

Innovación tecnológica, Desarrollo tecnológico, Trayectoria tecnológica

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Introduction

Innovation is a process of turning a creative idea into a solution to a problem or a need, innovation can be realized through improvements and not just the creation of something completely new. New can mean in this sense a real world novelty or a subjective novelty from the perspective of a single company or a single worker. A number of categories of innovation are currently distinguished. Some of the relevant thematic areas are mentioned here:

- Technical innovation.
- Service innovation.
- Innovation of business models.
- Design innovation.
- Social innovation.

Innovations can be distinguished according to the form of their emergence:

- Closed Innovation, where innovators are found only within an organization.
- Open Innovation, where organizations in an increasingly diversified world with internationally dispersed knowledge can no longer rely solely on their own innovative strength, but are increasingly dependent on the integration and utilization of external information and competencies).

To streamline the entire innovation management process in the company, a series of software tools have been developed to simplify this process:

- Technology watch tools: they help the company or organization that uses them to know the latest technological trends in their field.
- Patent management tools: help to keep an inventory of all patents being worked on or acquired by the company.
- Idea management tools: they allow the collection and subsequent management of ideas from customers and company employees to turn them into innovation.
- Knowledge management tools: document the internal knowledge of companies, so that it can then be studied and applied to new business and/or product ideas. In some cases these tools focus on documenting the capabilities of internal employees and external consultants.
- In recent years, the management of technological innovation has become one of the most attractive and promising areas of study in business management.

Innovation characteristics

Most entrepreneurial efforts bring some novelty or innovation in their product or service. Customers adopt innovations depending on their perception of the advantages and risks they see in them. An innovation can be a product, a process, an idea, a new service that is perceived as something new, a new way of doing things, among potential buyers. An innovation presents a potential user with a new alternative to solve a problem, but it also represents the uncertainty of whether it will be better or worse than the existing solution.

Innovations are not always adopted quickly

- Some innovative ideas can take many years to spread and be adopted by consumers. The diffusion of an innovation depends on consumers' perception of five characteristics:
- Relative advantage - the perceived superiority of an innovation compared to an existing product or solution. This advantage can be of an economic or efficiency nature.
- Compatibility - how well the innovation fits with a potential buyer's existing values, systems and practices.
- Complexity - how much the innovation is perceived in terms of difficulty to understand or use. The more difficult it is perceived to be, the slower its adoption will be.
- Experimentation - how much a potential buyer can experiment with the innovation before adopting it. The more you can experiment and test, the faster it will be adopted in the marketplace.

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- Visibility - how visible the innovation and its benefits are to potential buyers. The greater the visibility, the greater the adoption.

Key elements of innovation and technology management

The concepts of management and innovation are closely related, Luhmann (1997 p. 89) suggests that innovation is -...a counter-inductive decision process, a decision process that decides differently from what was expected and thus, changes expectations‖, which, associated with the definition of management that Albomaz and Fernandez (1997) previously pointed out, denote an interest in changing paradigms in action. Lundvall (1992) suggests that innovation management could then have two denotations:

1. Disciplinary area that in specific regions, has as its object the study of strategies, conditions and systems for managing resources and opportunities that allow stimulating creativity, promoting it, linking it with the environment and introducing the results to the dynamics of organizations with rationality and effectiveness.

2. A series of activities carried out by a manager or specialized team of managers, aimed at accelerating the transformation of ideas into innovations, linking at all times sufficient stakeholders in a regional framework and seeking that such innovations provide satisfaction to each participant without generating conflict in the variables of environment, public opinion, institutional, commercial, consumer and regulatory interests.

Innovation models and processes

The perceived model of the innovation process and its practice have evolved, and these changes are summarized in the five generations (Rothwell, 1994). First generation. Technology push. From 1950 to the second half of the 1960s, the dominant model of innovation was the so-called technology-push. It is a linear model that assumes an orderly progression from technological discovery, through applied research, technological development and production activities, to conclude in new products to the market.

Second generation. The pull of necessity or the market. Third generation. Linkage model.

Fourth generation. Integrated model Although the third generation model of the innovation process contained feedback loops, it remained essentially sequential. The fourth generation model is characterized by being parallel but integrated,

Fifth generation. Integration of systems and networks. It consists of the use of sophisticated electronic tools that increase the speed and efficiency of product development throughout the entire innovation system, i.e. inside the firm, but also outside, suppliers, customers and partners, essentially the fifth generation of the innovation process is the fourth generation but with a new technology of technological change to increase the speed and efficiency of innovation.

Miller and Morris (1999, pp.281 and 282) propose an innovation process consisting of four phases:

Phase 1. It is the transformation of the initial idea into the conceptual definition of the family of applications, driven by the technology, products, services or distribution platform, or the combination of platforms.

Phase 2. The improvement community takes responsibility for the project. The objective is the definition of a validated dominant design for new platforms or new platforms for existing dominant designs.

Phase 3. Development of new products, services, distribution families and method development.

Phase 4. Development of market activities for a product family, specifically for new products, services and processes.

Another innovation model is the one proposed by Utterback (2001) which has an engineering approach where technological and economic factors determine the feasibility of innovation. He proposes a model for the innovation process consisting of six stages:

1. Initiation of the process. The stock of existing technological knowledge, i.e. the state of the art, suggests the possibility of an innovation capable of satisfying a present need of society. Or this need provokes the search for the knowledge and technologies that allow us to achieve an innovation with which the detected need is eliminated.

2. Formulation of the idea. A pre-design is made and submitted for evaluation. This is a fundamentally creative stage, in which it is essential to recognize both the technical and economic feasibility of the future innovation. The evaluation of the cost of the process is of great importance, since the company will have to commit the necessary resources for the development of the subsequent stages.

3. Formulation of the problem. Sometimes the information is available to solve the problem immediately. On other occasions the information has to be obtained through research and development activities. At this stage, unforeseen problems arise and new solutions appear that need to be evaluated and decided upon. Sometimes the difficulties that arise cannot be solved, and the process has to be suspended temporarily or permanently.

4. Problem solution. This can be original, in which case we find ourselves with an invention that will increase the stock of available technological processes. Or it can solve the problem by adapting an existing invention, in which case it is an imitative invention.

5. Refinement and development. During this stage, prototypes or small quantities are manufactured according to the planned specifications. The necessary tests and technical evaluations are carried out to determine the possibilities of manufacturing or use of the new product or process.

6. Use and diffusion. Innovation does not take place until the product, whether a good or a service, has been introduced or the process has been applied for the first time in the market, at which point diffusion begins.

The culture of innovation

Like people, companies have a personality that distinguishes them from one another and gives them their own identity. At the organizational level it is known as organizational culture and can be defined as a set of meanings, ideas, values, beliefs, behaviors and concepts shared by its members that determine their behavior. Beliefs and other elements of culture inhibit or encourage development, that is, they hinder or support a person, an organization or a people to grow, progress and develop. Changing what exists in order to feel better is the result of a culture that implies modifying beliefs, practices, behaviors and processes. Different studies (Banegas, 1999; Garcia, 1999, Angel, 2006) on the subject define characteristics of a culture of innovation, among which we find: greater creativity, ubiquitous and permanent education, cultural mosaic, passion applied to a project, development of trust, social recognition, incentives, risk acceptance, anticipation of needs, project control, acceptance of change, etc. Innovation for innovation's sake is meaningless, its product does not measure its social, legal, ecological impact and is not coherent with people, organizations and peoples; a culture of innovation that does not measure and control the consequences is not ethical.

He points out that innovative culture is not merely legal or economic institutions. It has a deep social background that needs to be stirred up and promoted and that requires continuity and vehemence.

The sources of innovation

Peter Drucker (2002) explains in -The Discipline of Innovation‖ a number of sources that can give rise to an innovation process, four of them within a company or industry:

1. Surprise: the unexpected success or failure, the unexpected event produced externally, but within the immediate environment.

2. Inconsistencies or dissonances: Observing in depth the reality of what customers and society need is an infallible source of innovation.

3. The needs in the internal processes of the company and the presence of weak steps in the same.

4. Changes in markets as a result of product life cycles and rapidly changing customer needs.

Add three additional sources of opportunity outside a company, in its social and intellectual environment:

1. Changes in the values and perceptions of individuals and society.

2. Changes in demographics: This is one of the most important changes, the results of which will affect societies, the economy and business.

3. New knowledge and new technologies, which affect most of the processes of industrial service and agricultural companies.

Strategic management of technology. The problem addressed by innovation management is clear. In order to remain in the marketplace, the company requires that its offer and the way it is created and supplied remain in a continuous state of change and, in order to do so, the company must:

- Monitoring the environment for signs of the need to innovate and potential opportunities that may arise for the company. Its purpose is to prepare the organization to face the changes that may affect it in the more or less near future and thus achieve its adaptation.

- Focus attention and efforts on a specific strategy to improve the business, or to provide a specific solution to a problem. Even the best-resourced organizations cannot consider covering all the innovation opportunities offered by the environment, and must select those that can contribute most to maintaining and improving their competitiveness in the market.

- Train the chosen strategy by dedicating the necessary resources to implement it. This training may involve simply purchasing a technology outright, exploiting the results of existing research, or conducting a costly search for appropriate resources.

- To implement the innovation, starting from the idea and following the different phases of its development until its final launch as a new product or service in the market, or as a new process or method within the organization.

- Learning from experience, which implies reflecting on previous elements and reviewing experiences of both success and failure. In this sense, it is necessary to have an evaluation system that feeds and ensures continuous improvement in the process of technological change itself.

Technological innovation process

The process of technological innovation is a process that encompasses the spectrum of activities that begins with the search for technological needs of organizations in the productive sector and extends to the commercialization, in the market of these organizations, of products, processes, equipment, etc., derived from research and development (R&D) efforts or other mechanisms.

In this way, the realization of technological innovations, among other conditions:

- It involves satisfying the demands of the productive sector, through the use of technical changes that, when placed in the market, produce economic and social consequences.

- It does not necessarily imply the execution of SDI projects. The generation of technical changes may be essentially based on technical information available in the literature, technical standards, patents, etc., or on the purchase of technology produced by third parties (innovation by Adoption).

- Necessarily requires the context of productive sector organizations that incorporate technical changes into their production systems and attribute economic and/or social significance to them.

Thus, for research and development projects to have economic/social consequences, they need to be linked to specific technological needs of existing organizations in the productive sector.

The correlation between technological functions, the different technological innovation alternatives and the development planning of productive sector organizations is discussed, under the concept that this development depends on specific innovation strategies which, in turn, are influenced by national policies and strategies.

According to Donald G. Marquis' study, there are three types of innovations:

Innovations that refer to the management of complex systems where technological change is present in the foreground. Example: space projects, defense projects, etc. It is characterized by the existence of long-term planning.

Radical (leapfrog) innovations are those that represent the most radical technological development and cause changes in the industry. Examples: the B.O.F. converter. (Basic Oxygen Furnace), xerography, etc. They originate from the application of gradual innovations from other sectors or areas of activity or from the application of new scientific knowledge, generated from basic research projects and require significant investments.

Incremental innovations are those that are essential to the survival of the company and derive from improvements that do not substantially change existing products, processes or equipment or from development that may involve development or research efforts. Development and engineering. This type of innovation is more involved as an economic factor than the other two innovations.

Innovation is not the product of a single action, rather it is the integration of several interrelated processes, such as the conception of an idea, the invention of a new item, the development of a new market, etc. Innovation can be developed from conception to implementation by a single organization. But it is often deduced from contributions from outside sources, made in other places and at different times.

The process model considers technology and the market as sources of initiation and supply, dividing it into different stages and events. These events may or may not be linear. The innovation process starts with a new idea, which includes the stage of recognition of the technical possibility and potential.

The innovator must have an updated knowledge of the state of the art and technical knowledge to support their estimates of technical feasibility. They must also be up to date with social and economic demands in order to be able to recognize a demand and differentiate it by determining whether it is potential or real.

Determining demand is important

The next stage is the formulation of the idea, which consists of the association and fusion of the concepts of the satisfied demand and the technical possibility, this fusion of knowledge gives rise to the design concept. This is a true creative act in which the association of both elements is essential. The idea or design concept is merely the identification and formulation of a problem in order to make a decision. If this is favorable and funds are allocated, the stage of the search for information for the solution of the problem posed is entered. If the problem-solving activity is carried out, a solution should be found.

The solution to the problem may be the verification of the initially stated problem.

Innovation management support tools

It is useful to know some of the most common innovation management tools or practices. Table 1 shows how certain tools can help in the management of the key elements of the innovation process, and for their use they can be combined in various ways and, since some of them have a dual or multiple purpose, it is not necessary to apply all of them.

Thus, for example, teamwork can solve many of the problems of interface management and good project evaluation will benefit portfolio management. These tools are not an end in themselves, nor are they chosen to be applied in isolation, but are intended to become an integral part of innovation management.

In principle, all the tools identified can be applied to any type of company, and it is mainly up to the management to adapt and adjust them to the particular needs and characteristics of each company.

Tools	Watch	Focus	Train	Implement	Learn
Market analysis	X	X		X	x
Technological perspective	X	X			
Benchmarking	X	x			x
Patent analysis	X	X			
Audits	x	X			x
Portfolio management		X			x
Project evaluation		X	x		x
Creativity	x	X	X	X	x
Management of intellectual and industrial property rights			X		
Interface management			X	X	
Project management			X	X	
Networking	x	X	X	X	x
Team operation		X	X	X	x
Change management				X	
Adjusted operation		X		X	x
Value analysis		X		X	
Continuous improvement				X	X
Environmental assessment	x	x			X
X Tool fully applicable at this stage x Tool with potential application at this stage					

Table 3
Source: COTEC Foundation (Ed. 2001). Book Innovación Tecnológica: Ideas Básicas. http://www.uca.es/recursos/doc/Unidades/consejo_social/1801800_1032010103532.pdf

IT stands for innovation and transformation

It's no secret that the IT professional has one of the toughest jobs in the technology industry. In today's mobile-first, cloud-first world, they are responsible for managing the tensions between public and private cloud, device pervasiveness and traditional management, and balancing data access with data protection.

Every IT professional faces these challenges and, as a result, it is understandable why these unsung heroes are often unsure about their future. As every organization in the world becomes increasingly reliant on software and technology, CIOs and IT professionals can drive business strategy and transformation.

They can help their companies launch new business capabilities with the cloud, intelligently leverage and use data to improve productivity across devices. IT can help very good companies become great companies.

Reasons for innovation failure

In market economies, innovation and investment are closely related, because it is not only that a potentially profitable innovation stimulates investment, but also that a high level of investment tends to stimulate innovation in order to take advantage of the latest technological advances. The main impetus for successful innovation comes from the market, from an existing or potential demand:

- Market factors.
- Administration.
- Capital.
- Regulations.
- Technology.
- Other aspects.

The main barriers to the innovation process are the following:

- Bureaucracy.
- Communication problems.
- Poor project formulation.
- Problems in technology transfer.
- Risk aversion (by tradition and custom).
- Absence of technology executives and managers.
- Poor relationship with and knowledge of the market.
- Lack of timely and adequate financing.
- Structure of the industrial sector.
- Lack of or inadequate management of critical roles.

Proposal for the process of successful innovations in Mexico

The development of a proper process for successful innovations requires the observation and analysis of existing information, and it is here where it should be pointed out that:

1. The fundamental innovation process is the one presented by Marquis and, depending on the particular conditions of each organization, the process must be adapted.

2. The innovation process is independent of geographical location; however, its most important constraint is the organizational system itself and its culture, since it will be these that promote innovative responses to the problems presented by the environment.

3. In our country the conditions for innovations are, as in the rest of the world, more propitious to the pull of the market and of these the gradual ones. Among other things, due to the size of the national market and the size of the organizations we have; without this meaning that we are exempt from radical innovations or the push of technology.

4. The fundamental condition is an administrative system with an orientation towards the client, innovations and their assimilation in the organization that allows the generation of new knowledge.

From the above it is to consider the need for the environment to help satisfy:

- The establishment of processes for organizational diagnoses, where existing technological capabilities are taken into account.

- The promotion and dissemination of endogenous knowledge, that is, knowledge developed within the organizations.

On the part of the organizations, it is necessary:

- Establish processes that help monitor the environment in both market (pull) and technological system (push) elements.

- Develop strategic alliances with systems external to the organizations themselves (colleges and universities) to assist in the development of innovative solutions.

- Development and establishment of quality programs, as these are largely responsible for continuous improvement or incremental innovation.

Conclusions

Innovation in our days is the starting point for companies and IT leaders to create value and when we talk about value I mean being a differentiator for our customers and users. Ideas to make the world more accessible, with opportunities for all, more open, digital and mobile, better connected, faster, secure, efficient, sustainable, intelligent, where innovation is the engine towards more advanced technology companies that help improve our society. But technological innovation is a conviction of the shareholders of the companies, it is dictated in the policies and embodied in the corporate strategy aligning the efforts of the entire company and the partners and stakeholders:

- Clients.

- Suppliers.

- Partners.

- Society.

- Universities (agreements).

And all available talent must be utilized by working in a collaborative, interdisciplinary and global network.

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Automotive cluster in Coahuila

Clúster automotriz en Coahuila

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Abstract

In this article we all consider as the strongest automotive cluster in the country in the state of Coahuila and was formed as the automotive cluster in Coahuila through SIECCA CIDIAC and put the cluster model for one of the best at the country level.

Cluster, Automotive, Coahuila

Resumen

En este artículo todos consideramos como el clúster automotriz más fuerte del país en el estado de Coahuila y se formó como el clúster automotriz en Coahuila a través de SIECCA CIDIAC y poner el modelo de clúster para uno de los mejores a nivel país.

Clúster, Automotriz, Coahuila

Citation: SALAZAR, Karina. Automotive cluster in Coahuila. Journal-Public Economy. 2021. 5-9:13-18.

† Researcher contributing as first author.

Introduction

Theory of automotive clusters

Cedillo-Campos, M.G. & Piña-Monarrez, M.R. & Noriega-Morales, S.A. (2007). A study of the Mexican automotive industry in Saltillo Coahuila. Where the basis of the research is the competitiveness seen from the supply chain, which is totally dynamic, since the demand is not predictable and the markets are too competitive. The central point is that the interaction of suppliers generates competitive advantages by covering needs in a complementary and specialized way. These advantages are not permanent, so the relationship and interaction between suppliers must be dynamic, in order to anticipate or adapt to changes in the market by integrating into the supply chain.

Cedillo-Campos, M.G. & Sánchez-Garza, J. & Sánchez Ramírez, C. (2006). They clearly define the existence of two types of clusters, which they call:

- Survival cluster composed of third grade companies with opportunistic behavior, little capital and no innovation.

- Transnational Cluster, composed of car manufacturers, first level, and foreign suppliers, second level.

Klepper, S. (2007) Develops research to explain the development of the Detroit area and the automotive cluster on parameters different from the agglomeration theories described in other articles. He makes an econometric model of the different indicators, to demonstrate the hypotheses, the contribution to the research, to learn how Detroit, one of the traditional clusters in the USA, developed and the model applied for its explanation. It is observed that this is a cluster in which Porter's theory is not fulfilled, Klepper explains that this is basically due to its age.

Barnes J. Kaplinski R. (2000) determined that globalization and its effect on the South African domestic automotive sector was based on the following development paradigms:

- Sustained growth in the sector would depend on preserving fixed assets, developing technological capacity and increasing production by raising economic scales.

- International competition would allow for growth in the economic scales and technological development of local companies.

Reality and counter-arguments:

- Growth has been achieved through foreign investment and international production chains where technology is developed.

- The global environment is developing to generate agreements, treaties and organizations on the basis of trade openness and growth based on foreign investment.

- Technology is generated within the international production chain.

- Foreign investment, among other aspects, is attracted mainly by the human factor.

The automotive sector, and especially the auto parts sector of local entrepreneurs, has been oriented to highly competitive niche markets with mature technology, in spare parts for old used vehicles.

Mexico has 12 states in the country with vehicle assembly plants, but Coahuila is the only one with 3 assembly plants. Mexico is one of the countries that supplies auto parts to the United States.

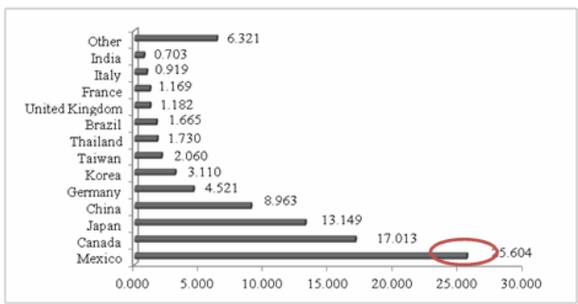

Figure 1

Imports of Auto Parts from EE UU

Although a couple of assembly plants have arrived in the center of the country, Coahuila continues to be the strongest automotive cluster in the country.

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Automotive Cluster in Coahuila

The cluster is located in the Saltillo-Ramos Arizpe metropolitan area, in the southeastern region of the state, surrounded by productive infrastructure and industrial parks.

In this area are located 10 of the most important industrial parks in the state that support the development of the automotive industry. More than 300 auto parts manufacturers are located in the Saltillo - Ramos Arizpe metropolitan area alone.

Automotive Cluster of Coahuila

Figure 2

The automotive sector accounts for 37.8% of the state's GDP, and 25 out of every 100 automobiles in the country are produced in Coahuila.

Coahuila has 2 vehicle assembly plants and 1 dedicated to the manufacture of tractor trucks. 70 thousand jobs depend on the automotive industry in the region, for this reason it can be said that it is a key point for the generation of jobs in the state of Coahuila for this industry. More than 200 companies installed in the Saltillo-Ramos Arizpe area and 40 thousand direct jobs make up the auto parts industry in the state.

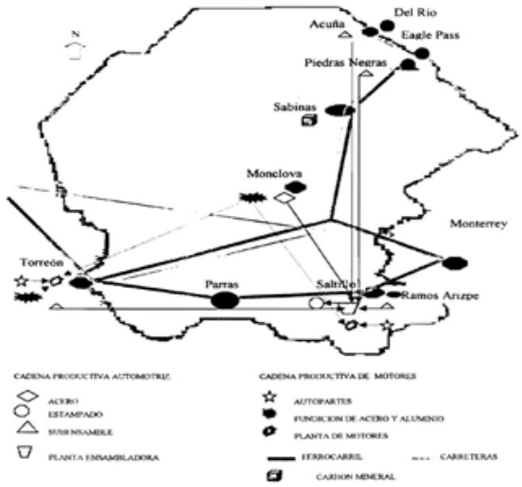


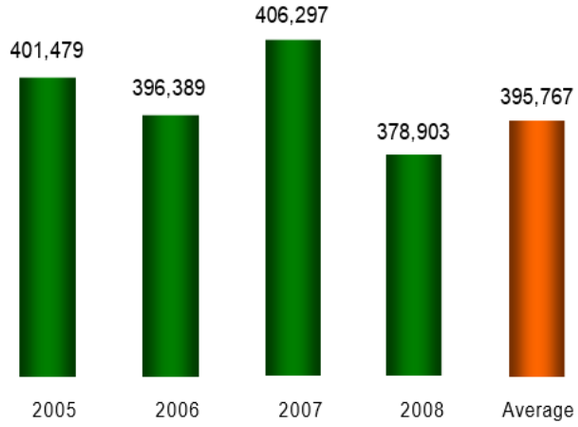
Figure 3

Production

Coahuila is one of the most representative states in the automotive industry.

400 thousand units per year and 25 out of every 100 automobiles are produced in the state of Coahuila. 27.9% of production corresponds to vehicle manufacturing.

72.1% to automobile and tractor-trailer assembly.



Graphic 1

Automotive production in Coahuila 2005-2008 (units).

The automotive products assembled in Coahuila are:

Figure 4

Competitiveness

The most outstanding competitiveness factors that support the automotive cluster are:

- Strategic location and significant access to global markets.
- Easy access to the main markets: to the North with the USA and Canada, to the East with Europe, to the West with Asia and to the South with South America.

Figure 5

Highly qualified human resources

First place nationally in manufacturing productivity.

Figure 6

- Competitive incentives applied to the industry.
- Wide availability of industrial parks: 52 industrial parks in the State.
- Suppliers with strong ties to the automotive sector.
- Adequate coordination between educational and research institutions and the automotive industry.
- Easily accessible road and rail infrastructure.
- Exceptional quality of life.
- Stable relationship with labor unions.

CIDIAC

Center for the Integration and Development of the Automotive Industry of Coahuila (CIDIAC)-Center for the Integration and Development of the Automotive Industry of Coahuila (CIDIAC)-Central node/cluster coordinator.

It was formally created on October 16, 2004.

Initial purposes of CIDIAC:

Figure 7

- Supplier development / increase of regional content.
- Mapping of the regional automotive cluster.
- Detect relevant projects to be developed.
- Find the most frequent needs of the sector.
- Designate the supplier that will solve the technological requirement.
- Conduct matchmaking events.
- Manage sources of financing and funding.

Operational difficulties and resurgence of CIDIAC:

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As CIDIAC fell into operational problems and lack of involvement of key business actors, it ceased operations in 2006-2007. It was retaken by Canacintra and presented again just 8 years after its initial foundation in the event called "13th Meeting of Productive Chains", coincidentally on October 16. On this second occasion, CIDIAC seeks to be supported by a board of directors that is more committed and representative of the industry.

The approach of the new CIDIAC.

Mission: To promote the automotive supplier industry in Coahuila to have certified capacity in material, finished product and manufacturing process.

Vision: To be the strategic center of information and technical analysis that facilitates the integration of regional and national companies in the automotive sector.

Renewed CIDIAC objectives:

- Consolidation of the supplier development process.
- Human development based on an analysis of the need for technicians, engineers and professionals.
- Boosting the sustainable development of the automotive industry.
- Promotion of technology and innovation.

The SIECCA model.

Innovation System of the State of Coahuila for the Automotive Cluster. SIECCA is made up of Research Centers, Higher Education Institutions, CONACYT and the Government of the State of Coahuila, which provide infrastructure, technological capabilities, human and financial resources to support the automotive sector with technology, innovation, technological services and human resources training in the areas of Materials, Foundry, Metal Forming, Tooling, Plastics Transformation and Manufacturing Systems.

Mission: To contribute to the development of the companies that make up the Automotive Cluster of the State of Coahuila, by working together with them in the search for innovative solutions to their problems.

Vision: To consolidate as a technological partner of the companies of the Automotive Cluster of the State of Coahuila, through the effective and integral response to their requirements, in the areas of its competence.

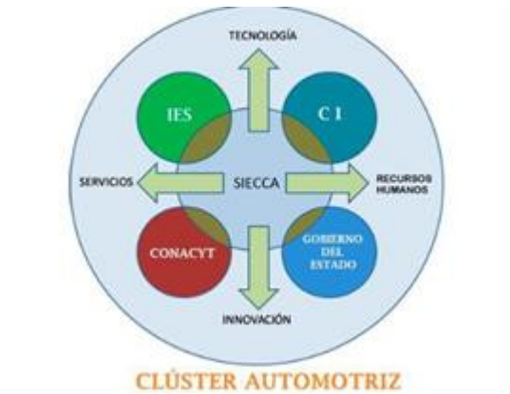

Figure 8

SIECCA Collaboration Model

Characteristics of SIECCA:

SIECCA is considered the Strategic Program of the State of Coahuila for the automotive cluster. It is inter-institutional and multi-stakeholder. In addition, it proposes specific actions in applied scientific and technological research, training of specialized human resources, as well as adoption, innovation, assimilation and technological development, seeking to find the best solutions to the challenges faced by the state's automotive industry.

The SIECCA seeks to meet a clear demand of the companies that make up the cluster, which is the formation of technological capabilities and human resources for the design of products and processes to compete globally. In this sense, and based on a previous study, this need was detected in three major areas for the automotive sector, which are:

Metal smelting.

Plastic transformation processes.

Metal forming.

Major Advances: INFRASTRUCTURE.

Design Unit and Forming Laboratory.

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Laboratorio de Prototipos Rápidos, reorientado luego a un Centro de reparación de Tooling.

Dimensioning Laboratory.

Virtual room for product development simulation.

Design Unit and Foundry and Casting Laboratory. Properties Analysis Laboratory for Plastics.

Manufacturing cells laboratory, metrology, automotive manufacturing processes.

Diffractrometry laboratory.

Conclusions

In conclusion, the automotive clusters determine that there are two elements that make up competitiveness and must be developed by third grade or survival cluster companies in order to integrate into production chains.

The analysis of the clusters reveals differences in the degree of specialization or integration with the productive chain that they achieve. Automotive clusters are still modest by international standards CIDIAC's work scheme allows for strict control and evaluation of the goals to be developed for each period. This is due to the fact that the Director is permanently accountable to the Committee entrusted by the Board of Directors. Likewise, the authority exercised in the Board by the main companies of the industry (as well as by the authorities of the economic development of the State and the country) and Funtec, allows concentrating efforts in the development of the same industry.

The state of Coahuila has a great automotive tradition and is a leading player in the production and export of vehicles as well as in the development of this industry.

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Financial analysis Twitter, Inc.

Análisis financiero Twitter, Inc.

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Abstract

Twitter, born nine years ago, is one of those web applications that has transcended the borders of the network and has passed into everyday life , is a global, public, real time platform, where any user can create a Tweet and any user can follow other users . The platform is unique in its simplicity; the tweets are limited to 140 characters of text. This limitation makes it easy for anyone to create, distribute and discover content and is optimized for mobile devices. The aim of this work is to base investment opportunities in the company, according to its stock market performance since the beginning of its operation based on performance and risk models.

Twitter, Tweet, Microbloging, Model risk

Resumen

Twitter, nacida hace nueve años, es una de esas aplicaciones web que ha trascendido las fronteras de la red y ha pasado a la vida cotidiana , es una plataforma global, pública, en tiempo real, donde cualquier usuario puede crear un Tweet y cualquier usuario puede seguir a otros usuarios . La plataforma es única en su simplicidad; los tweets están limitados a 140 caracteres de texto. Esta limitación facilita que cualquiera pueda crear, distribuir y descubrir contenidos, y está optimizada para dispositivos móviles. El objetivo de este trabajo es fundamentar las oportunidades de inversión en la empresa, en función de su comportamiento bursátil desde el inicio de su actividad en base a modelos de rendimiento y riesgo.

Twitter, Tweet, Microbloging, Modelo de riesgo

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† Researcher contributing as first author

Introduction

The objective of this article is to determine the feasibility of investing in Twitter Inc. considering its financial performance since the beginning of its operations and based on risk and return models.

The company was founded on March 21, 2006, its founders were Evan Williams, Noah Glass, Jack Dorsey and Biz Stone, it has been listed on the New York Stock Exchange (NYSE) since November 6, 2013 under the ticker TWTR and on the Mexican Stock Exchange (BMV) since February 26, 2014.

It is based in San Francisco, California, United States and has been under the jurisdiction of Delaware since 2007.

On the first day of trading on the New York Stock Exchange (NYSE), the initial price of the 70 million shares it brought to market was 26 dollars per share, and it closed its debut with a 72.69 percent increase in the value of its shares, with a price of 44.90 dollars per share.

Financial analysis on the New York Stock Exchange (NYSE)

Since the beginning of its operations Twitter has had a significant drop in the value of its shares, experiencing the lowest value in its history of $29.71 per share, which caused the resignation as of July 1, 2015 of Dick Costolo as CEO of Twitter, after a year in which some investors were calling for changes in the management of the company, since the growth of users had stagnated and the company had not achieved a good financial performance as shown in Figure 1.

Figure 1 Twitter bursatility since inception of operations
Source: (NYSE Oct 15, 2015)

It took only three months for entrepreneur Jack Dorsey to step down from his interim position, which now officially places him as Twitter's CEO.

The challenge is significant, the comparison of the last 2 years as of October 15, 2015 with its most important competitors is not encouraging (Figure 3.2), while Twitter shows a loss of 33.83 percent, its competitor, Twitter, has a 33.83 percent loss.The challenge is significant, the comparison of the last 2 years as of October 15, 2015 with its most important competitors is not encouraging (Figure 3.2), while Twitter shows a loss of 33.83 percent, its competitor.

The challenge is significant, the comparison of the last 2 years as of October 15, 2015 with its most important competitors is not encouraging (Figure 2), while Twitter shows a loss of 33.83 percent, its closest competitor LinkedIng shows a loss of 16.09 percent, followed by Google with gains of 18.82 percent and in the lead Facebook with gains of 93.86 percent.

Figure 2 Comparison of Twitter's most important competitors
Source: (NYSE Oct 15,2015)

The changes continue, less than a week after Dorsey returned to the presidency of the company and in an effort to revive the growth of that social network announces the layoff of 336 thousand employees, 8 percent of its worldwide workforce as part of a restructuring plan; a few days after the reduction in its workforce, it announces that former Google executive Omid Kordestani has been elected as the new executive chairman of the company's board of directors, noting that Kordestani is a "proven and experienced leader" who will "assist and teach" him and the entire management team directly as another important step in its restructuring plan.

The financial comparison shows that unlike its direct competitors, Twitter is the only one reporting a poor operating performance reporting a negative EBITDA of -285.91 Million dollars.

Comparación con el competidor directo					
	TWTR	LNKD	FB	GOOG	Sectores
Capitalización de mercado:	20,09MM	25,75MM	270,37MM	455,07MM	535,32Mill
Empleados:	4.100	8.735	10.955	57.148	314,00
Crecimiento de ingresos trimestral (interanual):	0,61	0,33	0,39	0,11	0,09
Ingresos (ttm):	1,78MM	2,56MM	14,64MM	69,61MM	110,04Mill
Margen bruto (ttm):	0,68	0,86	0,83	0,62	0,52
EBITDA (ttm):	-285,91Mill	216,68Mill	6,38MM	22,62MM	985,54Mil
Margen de explotación (ttm):	-0,30	-0,02	0,32	0,26	-0,01
Ingresos netos (ttm):	-599,92Mill	-111,56Mill	2,72MM	14,39MM	N/A
BPA (ttm):	-0,95	-0,89	0,98	21,22	N/A
Precio/Beneficio (P/E) (ttm):	N/A	N/A	97,52	31,18	30,29
PEG (estimado a 5 años):	1,29	2,29	1,61	1,31	1,19
Relación precio/ventas (P/S) (ttm):	11,04	9,93	18,10	6,41	6,83

Table 1 Comparison of Twitter is its direct competitors
Source: (NYSE Oct 15,2015)

Analysis based on Financial Engineering

Next, the company's performance will be analyzed from a Financial Engineering perspective based on risk and return models.

For modeling purposes, data from its trading on the Mexican Stock Exchange (BMV) on October 21, 2015 is considered.

The risk and return variables are as follows: Performance Variables

Variable	Description	Value
V_V	Sales Volume	20000
P_V	Selling position	490.61
V_C	Buy Volume	20000
P_c	Buy Bid	485.39
P^{Uh}	Last Done Price	491.61
V_o	Volume Traded	1241979
P_u	Price/Utility	0
P^{VL}	Price/Book Value	0
U_a	Profit for/Share	0
V^{La}	Book Value p/Share	0

Table 2 Performance Variables (BMV) for October 21, 2015

Risk variables

Variable	Description	Value
P_a^M	Maximum price	492
P_i^M	Min. price	475.5
MP_a^a	Max. Previous Year	744
MP_a^i	Min. Previous Year	391.36
PPP	PPP	0
V	Variation	-4.356031
Ac	Circulation Shares	654,774,000

Table 3 Risk Variables (BMV) as of October 21, 2015

Partitions

Variable	Description	Value
P_1	Partition 1	481.00
P_2	Partition 2	487.00
P_3	Partition 3	484.00
P_4	Partition 4	483.50
P_5	Partition 5	484.00
P_6	Partition 6	490.79
P_7	Partition 7	491.61

Table 4 Partitions (BMV) for October 21, 2015

Exchange Rate

Description	Value
TC –Fix	16.66
TC Interbank 48 hrs	16.57

Table 5 Bank of Mexico exchange rate as of October 21, 2015

Inflation index

Description	Value
CPI General Index	2.52
Underlying CPI	2.38
Non-core CPI	2.96

Table 6 Bank of Mexico Inflation Index for September 2015

Operations on October 21, 2015 show loss as shown in figure 3.

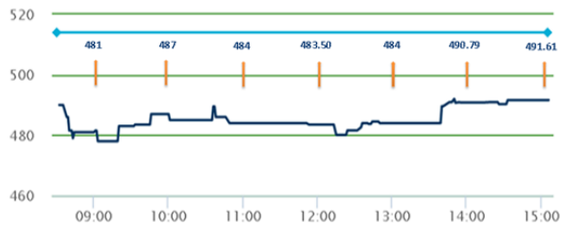

Figure 3 Stock Market Trend Graph
Source: (BMV Oct 21,2015)

Modeling under Stephen Turnovsky

Integral

$$\int_{\lim^{-1}}^{\lim^{1}} = \int \frac{lim^1}{lim^{-1}} = \left[\frac{1(-1)}{lim}\right]^2 = \frac{(0)^2}{lim} = \sqrt{lim} = 0 = 0 \to \infty$$

$$\int_{\lim^{-1}}^{\lim^{1}} = 1$$

Differential

$$\frac{d}{dx} \cdot \frac{d}{dy} \cdot \frac{d}{dz} = \frac{d\,(x.y.z)}{dxyz} \therefore \frac{dx+dy+dz}{dx} + \frac{dy+dz+dx}{dy} + \frac{dx+dz+dy}{dz} \therefore \frac{d}{x.y.z} =$$

$$\frac{d}{dx} \cdot \frac{d}{dy} \cdot \frac{d}{dz} = -1$$

Partial

$$\partial \rightarrow \frac{\partial_y}{dz} = \frac{\partial^{'}_y}{dz} = \frac{\partial^{'}}{dy} \cdot \frac{\partial^{''}}{dz} = \left[\frac{\partial}{y,z}\right]^2 = \frac{\sqrt{\partial}}{y,z} = 0.5 \quad \therefore \frac{1}{2}$$

$$\partial \rightarrow \frac{\partial_y}{dz} = \frac{1}{2}$$

Modeling

$$P = \frac{[V_Y - P_Y]^{1/2}}{V_{D\_P^{UR}}} + \frac{3}{4}\left[\frac{(P^{VL})}{(P_U)}\right] \rightarrow \int_{Y^{La}}^{U_R} = \frac{[20000-490.61]^{\frac{1}{2}}}{(1241979\_491.61)} + \frac{3}{4}\left[\frac{(0)}{(0)}\right] \rightarrow \int_0^0 = \frac{[19509.39]^{\frac{1}{2}}}{1241487.39} + \frac{3}{4}[1] + \int_0^0$$
$$= \frac{139.68}{1241487.39} + \frac{3}{4}[1] + 1 = 1.11\ x\ 10^{-4} + \frac{3}{4}[1] + 1 = 0 + (0.75) + 1 = 1.75 = \frac{1.75\ x\ 100}{100}$$
$$P = 1.75\%$$

Call

$$C = \left[\frac{V_C - P_S}{\left[\frac{V_R}{P^{UR}}\right]^{\frac{1}{2}}}\right]^{\frac{3}{4}} + \int^{P^{VL}} - [\int^{P_U} + \int]^{U^R + V^{La}} = \left[\frac{(20000-485.39}{\left[\frac{1241979}{491.61}\right]^{\frac{1}{2}}}\right]^{\frac{3}{4}} + \int^0 - [\int^0 + \int]_{n\infty+\frac{1}{1}}^{0+0}$$

Market Shares

$$= \left[\frac{(20000-485.39}{\left[\frac{1241979}{491.61}\right]^{\frac{1}{2}}}\right]^{\frac{3}{4}} + 1 - [1+1] = \left[\frac{(20000-485.39}{\left[\frac{1241979}{491.61}\right]^{\frac{1}{2}}}\right]^{\frac{3}{4}} + 1 - [2] = \left[\frac{19514.61}{[2526.35]^{\frac{1}{2}}}\right]^{\frac{3}{4}} + 1 - [2]$$
$$= \left[\frac{19514.61}{[50.36]^{\frac{1}{2}}}\right]^{\frac{3}{4}} - 1 = [388.27]^{\frac{3}{4}} - 1 = 87.47 - 1 = 86.47 = \log(86.47) = 1.93 = \frac{1.93\ x\ 100}{100}$$
$$C = 1.93\%$$

CDO Turnovsky

$$PM = \frac{\partial\left[\frac{Pu+\partial P^{VL}}{P^{UR}}\right] + \left(\frac{\partial P_Y}{\partial P_C}\right)^{\frac{3}{4}} - \left(\frac{\partial V_Y - 1}{\partial V_{C^+}1}\right)^{\frac{1}{2}}}{\int_{P_U}^{V_0}} = \frac{(0.5)\left[\frac{0+(0.5)(0)}{491.61}\right] + \left(\frac{(0.5)(490.61)}{(0.5)(485.39)}\right)^{\frac{3}{4}} - \left(\frac{(0.5)(20000)-1}{(0.5)(20000)+1}\right)^{\frac{1}{2}}}{\int_0^{1241979}}$$

Exchange Rate

$$= \frac{(0.5)\left[\frac{0+(0.5)(0)}{491.61}\right] + \left(\frac{(0.5)(490.61)}{(0.5)(485.39)}\right)^{\frac{3}{4}} - \left(\frac{(0.5)(20000)-1}{(0.5)(20000)+1}\right)^{\frac{1}{2}}}{1^{\log(1241979)}} = \frac{(0.5)\left[\frac{0}{491.61}\right] + \left(\frac{245.30}{242.69}\right)^{\frac{3}{4}} - \left(\frac{10000-1}{10000+1}\right)^{\frac{1}{2}}}{1^{6.09}}$$
$$= \frac{(0.5)[0] + (1.01)^{\frac{3}{4}} - \left(\frac{9999}{10001}\right)^{\frac{1}{2}}}{1^{6.09}} = \frac{0 + 1.00 - (0.99)^{\frac{1}{2}}}{1} = \frac{0 + 1.00 - 0.99}{1} = \frac{0.01}{1}$$
$$= 0.01 = \frac{0.01\ x\ 100}{100} = 0.01\%$$
$$PM = \mathbf{0.01\%}$$

Inflation

$$\pi = \frac{IPC^{\frac{3}{4}}}{IPC_S} = \left[\frac{2.96}{2.38}\right]^{\frac{3}{4}} = = [1.24]^{\frac{3}{4}}$$
$$\pi = \mathbf{1.18}$$

Risk Model Integration

$$MRI = \frac{(AM)^{TL-\pi}}{P-C} + \frac{\text{Lim } P_1 \rightarrow P_7}{PM} = \frac{(AM)^{TL-\pi}}{P-C} + \frac{\frac{\text{Log } P_1}{\text{Ln } P_7}}{PM}$$

Disaggregated Risk Model

$$MRI = \frac{\left\{\left[\frac{P_N^{\frac{3}{4}} + P_M^{\frac{3}{4}}}{\left[\frac{PPP^{\frac{3}{4}}}{V}\right]}\right]^{\frac{3}{4}} + \left[\frac{MP_{\$} + M_{\$}}{A_C}\right] + \xi^2\right\}^{\left(\frac{D_E - D_I}{\frac{1}{2}}\right) - \left(\frac{IPC^{\frac{3}{4}}}{IPC_S^{\frac{3}{4}}}\right)}}{\left(\frac{[V_Y - P_Y]^{\frac{1}{2}}}{V_O - P^{UR}} + \frac{3}{4}\left[\frac{(P^{VL})}{(P_U)}\right] \rightarrow \int_{Y^{La}}^{U_R}\right) - \left\{\left[\frac{V_C - P_S}{\left[\frac{V_R}{P^{UR}}\right]^{\frac{1}{2}}}\right]^{\frac{3}{4}} + \int^{P^{VL}} - [\int^{P_U} + \int]_{\infty\ldots}^{U^R + V^{La}}\right\}} + \frac{\text{Lim } P_1 \rightarrow \text{Lim } P_7}{\partial\left[\frac{Pu+\partial P^{VL}}{P^{UR}}\right] + \left(\frac{\partial P_Y}{\partial P_C}\right)^{\frac{3}{4}} - \left(\frac{\partial V_Y - 1}{\partial V_{C^+}1}\right)^{\frac{1}{2}}}$$

(A) (C)

$$= \frac{(2.00)^{(31.32-1.18)}}{0-87.46} + \frac{\frac{\text{Log } 481}{\text{Ln } 491.61}}{0} = \frac{(2.00)^{(30.14)}}{-87.46} + \frac{\frac{2.68}{6.19}}{0} = \frac{1}{-87.46} + \frac{0.43}{0} = -0.01 + 1.00$$
$$= 0.99 = \frac{0.99\ x\ 100}{100}$$
$$MRI = 0.99\ \%$$

Performance Model Integration

$$MRE = \frac{\frac{(AM)^{\pi}}{\left[\frac{P}{C}\right]^{TC}}}{PM} + \int_{P_7}^{P_1}$$

Disaggregated Performance Model

$$MRE = \frac{\left\{\left[\frac{P_N^{\frac{3}{4}} + P_M^{\frac{3}{4}}}{\left[\frac{PPP^{\frac{3}{4}}}{V}\right]}\right]^{\frac{3}{4}} + \left[\frac{MP_{\$} + M_{\$}}{A_C}\right] + \xi^2\right\}^{\frac{IPC^{\frac{3}{4}}}{IPC_S^{\frac{3}{4}}}}}{\left\{\frac{[V_Y - P_Y]^{\frac{1}{2}}}{V_O - P^{UR}} + \frac{3}{4}\left[\frac{(P^{VL})}{(P_U)}\right] \rightarrow \int_{Y^{La}}^{U_R}\right\}^{\left(\frac{D_E - D_I}{\frac{1}{2}}\right)}} + \frac{\partial\left[\frac{Pu+\partial P^{VL}}{P^{UR}}\right] + \left(\frac{\partial P_Y}{\partial P_C}\right)^{\frac{3}{4}} - \left(\frac{\partial V_Y - 1}{\partial V_{C^+}1}\right)^{\frac{1}{2}}}{\int_{P_U}^{V_0}} \int_{P_7}^{P_1}$$

(B) (D)

$$= \frac{(2.00)^{1.18}}{\left[\frac{0}{87.47}\right]^{31.32}} + 0\int_{491.61}^{481} = \frac{(2.27)}{[0]^{31.32}} + 0\frac{\text{Log}(481)}{\text{Ln}(491.61)} = \frac{(2.27)}{0} + 0\frac{2.68}{6.19} = 1 + 0(0.43)$$
$$= 1 = \frac{1\ x\ 100}{100}$$
$$MRE = 1\ \%$$

Risk vs. Return Model

$$MRR = \int_A^B + \frac{(\text{lim}C)^{\pi}}{(\text{lim}D)^{TC}} + \left|\frac{\log B}{\ln A}\right|^{3/4} + \frac{(\text{lim}D)^{TC}}{(\text{lim}C)^{\pi}} + \frac{\ln A + \log B}{C-D} + \xi^2$$

Disaggregated Risk vs. Return Model

$$MRR = \int_{-0.01}^{1} + \frac{(\text{lim}1)^{1.18}}{(\text{lim}0)^{31.32}} + \left|\frac{\log 1}{\ln(-0.01)}\right|^{3/4} + \frac{(\text{lim}0)^{31.32}}{(\text{lim}1)^{1.18}} + \frac{\ln(-0.01)+\log 1}{1-0} + 1$$

CDO Turnovsky

$$= 1^{+1} = 2 = \text{Log}(2) = 0.30 = = \frac{0.30\ x\ 100}{100}$$

$$MRR = 0.30\%$$

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Analysis with Consulting and Financial Management Software

Reliability of the company

The logarithm of the partitions is constant, so it is determined that the company is financially solvent, given that its R^2= 0.0229, which is < 0.5, as shown in Figure 4.

Income level

	Variable	Valor	LOG
Máximo	P M/a	492	2.691965103
Mínimo	P M/i	475.5	2.677150521
Max. Año Anterior	MP a/a	744	2.871572936
Min. Año Anterior	MP i/a	391.36	2.592576435
Variación	V	-4.356031	NA
PPP	PPP	0	N/A
Acciones de Circulación	A c/	654,774,000	9

P1	09:00	481.00	2.68
P2	10:00	487.00	2.69
P3	11:00	484.00	2.68
P4	12:00	483.50	2.68
P5	13:00	484.00	2.68
P6	14:00	490.79	2.69
P7	15:00	491.61	2.69

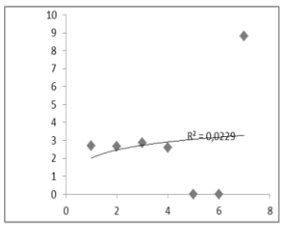

Figure 4 Logit values

Considering a sales volume of 20,000 and purchase volume of 20,000, it is determined that the company's net income is at risk with a negative income at -6.54% of its outstanding shares representing -$4,282,221,960 pesos.

Net income = 654774000 x (-6.54) = -$4,282,221,960 pesos.

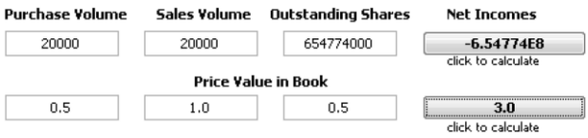

Figure 5

Days with stock/holding item

The company has 296 days of trading, so its holding period is 69 days, equivalent to 2.3 months. If it exceeds this parameter it will have to pay a fine between $72,025,140 and $78,572,880. 78,572,880, which corresponds to the range between 11 and 12% of its capital, which is $654,774,000 M.N.

Net Present Value (NPV)

SIM Annual rate = 48 %= 4 % * 12
Time limit = Time inicial + Operativity
Market-SIM = Time inicial * Val-Book *Asset

Activity	Operativity	Time inicial	Time limit	Val-Book *Asset
INICIO	0	8	8	.5
Proc A	460	16	476	1
Proc B	438	24	462	1.5
M 1*	2.59	32	0	2
Proc C	3.908046	40	43.91	2.5
M 2*	2.6	48	0	5
Proc D	744	56	800	3.5
Proc E	391.36	74	465.36	4
Final	0	0	0	4.5

Figure 6

The capital is 5%, the graph shows problems due to its sawtooth representation, which denotes that there is no continuity in the market.

Datos de Entrada		
Ac	Acciones en Circulación	654,774,000
L	Log (Ac)	8.81
N	Días tenedor	69
I	IPC no subyacente	2.96

Table 7

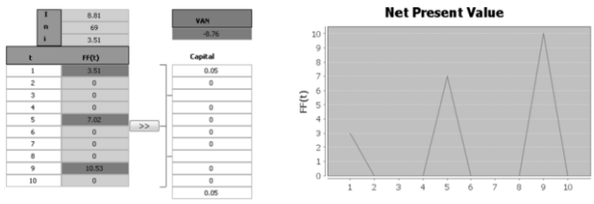

Figure 7

Internal Rate of Return (IRR)

The IRR is 1, the graph shows 2 cosines (loss) and 1 sine (gain), its absolute value is 1.

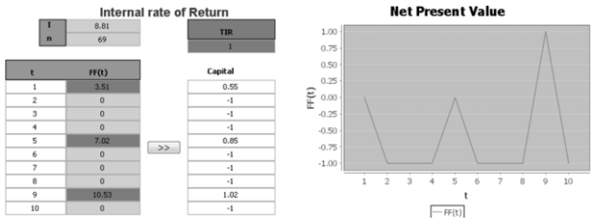

Figure 8

Acquisition Payout Ratio

Datos de Entrada	
Perido de gracias	2.3 meses
CETES	3.02

Adcquisitions

	2.3		0.023		
Bank payments	Monthly	By two months	By three months	By four months	Semiannual
	0.1917	0.3833	0.575	0.7667	1.15
	0.0019	0.0038	0.0058	0.0077	0.0115

Plazo	Tasa
Mensual	0.19%
Bimensual	0.38%
Trimestral	0.58%
Cuatrimestral	0.77%
Semestral	1.15%

Table 8

Government subsidy rate financing frontier

Datos de Entrada	
Perido de gracias	2.3 meses
CETES	3.02

Subsidies

	28	91	182
	0.17889	0.58139	1.16278
	0.00179	0.00581	0.01163

Covert months in days

Days	Months
30.0000	1

Plazo	Tasa
28 días	0.18%
91 días	0.58%
182 días	1.16%

Figure 10

The maximum loan that can be granted to the company is 3 years.

Datos de Entrada	
Perido de gracias	2.3 meses
CETES	3.02

PYME annual financing

	Num of years			
	3			
Monthly	By two months	By three months	By four months	Semiannual
36	18	12	9	6

Figure 11

Appendix

History

Twitter began as a research and development project within Obvious, LLC, a small San Francisco start-up, during March 2006.

The original name of the product was twttr, inspired by Flickr. It was initially used internally by the company until it was officially launched to the public in October of the same year. The service quickly began to gain followers and in March 2007 it won the South by Southwest Web Award in the blog category.

Jack Dorsey is the father of the web application and current Chairman of the Board of Twitter, Inc., a company that grew out of Obvious, LLC and the success of Twitter. At the beginning of 2008, the Twitter team consisted of 18 people, during 2009 they have quadrupled their staff and continue to grow.

Although Twitter was using advertising services such as Google's AdSense for a short time, they decided to discard advertising revenues until they had more users, financing themselves in the meantime with investments from venture capital firms. In September 2009, Twitter announced changes to its terms of service, leaving open the possibility of including advertising in its services. Twitter has more than 35 offices around the world.

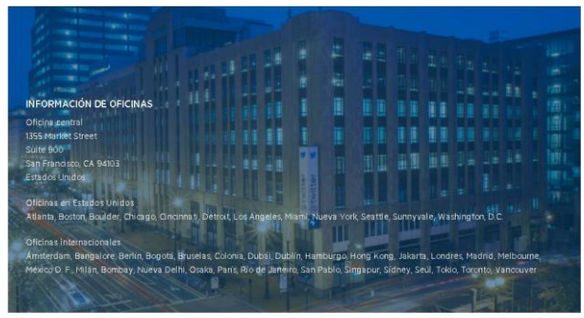

Figure 12
Source: https://about.twitter.com/es/company

Technology

The Twitter web interface is written in Ruby on Rails, and messages are maintained on a server that runs on software programmed in Scala and also has an open API for all types of developers, which is a great advantage for those who want to integrate Twitter as a service in other web applications as well as in desktop or mobile applications.

Ruby on Rails is basically an open source web application framework written in the Ruby programming language following the Model-View-Controller (MVC) paradigm.

Ruby on Rails technology tries to combine simplicity with the ability to develop real-world applications by writing less code than with other frameworks and with minimal configuration.

Twitter has been renewing its interface over the years and last September for both its website and mobile devices they launched version 5.0 which has been developed from scratch. New features include a new header image and better optimization of images for smartphones and tablets.

Business model

Twitter's business is quite simple and consists of 3 segments:

1. Users: the value proposition of Twitter consists of offering its critical mass of users microblogging services and the ability to keep up to date with what is happening in the world instantly through various channels such as its smartphone app, its website, and APIs that allow Twitter to be integrated into other websites. Twitter does not generate income directly from its users.

2. Companies: Taking advantage of the critical mass of existing users, and the information it has about them, Twitter offers advertising services to companies, which can show their advertising to those users most likely to buy products from those companies (Targeted Marketing). These marketing services include: promoted tweets (the advertiser pays to show the tweet to a defined segment of users), promoted accounts (the advertiser pays to acquire followers) and promoted trends (the advertiser pays to have more visibility as a "trending topic"). Twitter earns revenue from this customer segment.

3. Developers: Twitter also allows developers to connect to Twitter to generate tools related to web analytics, or other apps that help grow the critical mass of users that use Twitter.

This increases Twitter's revenues indirectly.

Twitter's business model is a bilateral business model, based on attracting users who generate activity and share information for its platform on the one hand, and attracting advertisers on the other, taking advantage of its platform and the information generated by its users to sell advertising services. In other words, Twitter acts as an intermediary, as if it were an advertising platform. Therefore, Twitter will be profitable to the extent that it is profitable for its advertisers.

Twitter needs the lifetime value of each user (Life Time Value) to be greater than its acquisition cost. It is as simple as that.

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Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

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Development of headings and subheadings of the article with subsequent numbers

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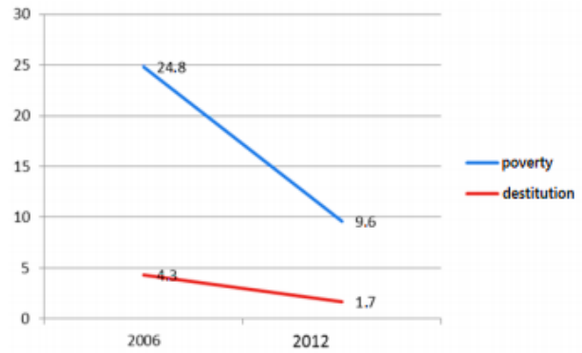

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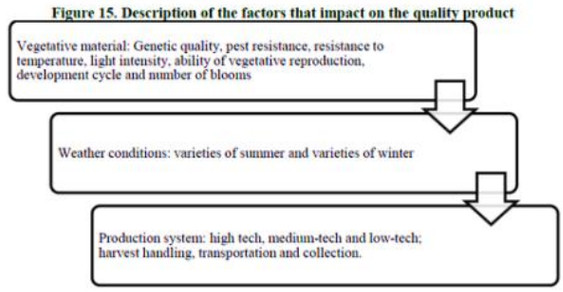

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	Mean square	df	Mean square	df		
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LIQUIDITY	77.182	4	.427	532	180.669	.000
SIZE	62.602	4	.537	532	116.616	.000
PROFITABILITY	68.655	4	.491	532	139.738	.000

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