

Business model for enterprise 4.0

Modelo empresarial para la empresa 4.0

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Abstract

In this paper we propose a business model for the company 4.0. The model is validated with the case study of the toy industry, focused on collecting figures. This domain was selected as it requires an intensive use of information systems and information technologies.

Resumen

Actualmente, se realizan esfuerzos para el desarrollo de la gestión de las empresas 4.0, donde la innovación y las tecnologías juegan un papel importante. En este trabajo se propone un modelo empresarial para la empresa 4.0. Se valida el modelo con el caso de estudio de la industria juguetera, enfocado al coleccionismo de figuras. Se selecciono este dominio ya que se requiere de un uso intensivo de los sistemas de información y las tecnologías de la información.

Business Model, Enterprise 4.0 and Value Circle

Modelo empresarial, Empresa 4.0 y Circulo de Valor

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Introduction

Antecedents

Toy industry

During the time of the third industrial revolution, the toy industry suffered a decline in sales. During this time, a new line of marketing was established that consisted of collecting action figures from the comics, movies, and video games of the time. Companies in the toy industry offered figures to the interested market, which led to an increase in sales in this industry.

The offer of figures was determined by the companies in this sector, the client chose the figures of interest from the existing offer. Toy companies were modeled after Porter's value chain. [1] This led to the massification of action figures that were offered to the customer.

From the Fourth Industrial Revolution onwards [2][3] Changes are made in the marketing processes, now the customer selects the action figure of their preference. To meet this new form of demand, the company is using the economic model of pre-sales. With this new model, toy companies are continuously detecting the demand for action figures that customers request in an individualized and personalized way. [4]

Currently, efforts are being made for the development of the management of 4.0 companies, where innovation and technologies play an important role. This paper aims to contribute to these efforts by proposing a circular model to maintain competitiveness in 4.0 companies. [5] [6]

For this new marketing scheme, Porter's value chain model presents problems for its implementation. Companies now require models based on a value cycle.

Companies now require models based on a value cycle

Porter's value chain is shown in Figure 1

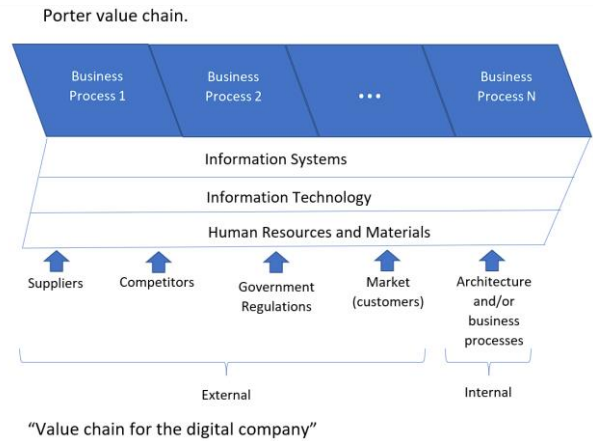


Figure 1 Porter's value chain
Source: Adapted from [4]

In this model the strategic part is represented by the order of the processes. This model is linear, as its name suggests, this model considers the impact market until the end of the process chain, does not consider it for the detection of the demand for products or services.

Value Circle Proposition

In order to respond to an individualized and personalized demand for goods and services, a business architecture is necessary to continuously detect market demand and generate knowledge to determine the production of products and services that are demanded.

In this paper, we propose a Value Circle model with a cyclical architecture. This model specifies the strategic, tactical, operational part and a new stage that is known as the knowledge generator. See Figure 2.

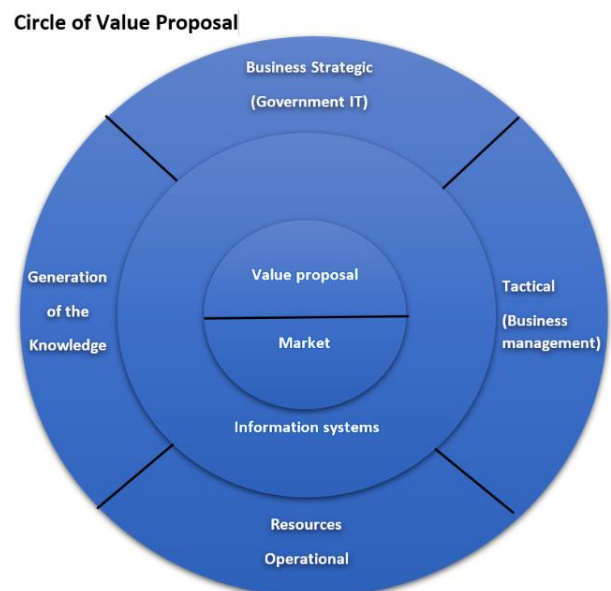


Figure 2 Proposal of a value cycle model
Source: Elaboration by the authors.

In the strategic part, knowledge governance is considered, that is, business architecture, innovation policies and the definition of business processes to make the company competitive. The tactical part consists of the business processes both in series and in parallel that the company requires for the management of the information it needs to meet the goals and objectives of this.

The operational part consists of the technical resources, financial resources, human resources and infrastructure for the operation of the company.

The innovative stage is the generation of knowledge, in this stage a large amount of data is stored, behavioral patterns are generated and with them the necessary knowledge is generated to adjust strategies and maintain or increase the competitiveness of the company.

Case Study: Applying the Value Cycle to the Toy Industry

Currently, the toy industry, in particular figure collecting, is characterized by the following aspects:

- a) An individualized demand for figures
- b) A continuous detection by the company of the demand for figures
- c) Personalized delivery of the figures directly to the customer

From the above, it follows that the client is directly involved in the supply and demand of the figures. For this situation, the value chain presents drawbacks since the customer is at the end of the chain.

In this case the value circle proposed presents advantages, since the customer is at the center of the value circle, with this model the demand is detected, which, at a strategic level, plans the production to satisfy the demand of customers. Another aspect is that it allows the commercialization of the figures in a programmed way. See Figure 3.

- (1) Production planning
 - Defining Roles and Processes

- (2) Development of Processes and Services
 - Supply of Materials
 - Production
 - Marketing
 - Sales
- (3) Instrumentation of an Information System: ERP, CRM, SCM.
 - Enterprise Resource Planning Systems
 - Supply Chain Management
 - Customer Relationship Management Information Technology
 - Internet
 - Application Servers
- (4) Development of the System for the Generation of Knowledge.
 - Data Warehouse.
 - Data Mining.
 - Big Data.
 - Data Visualizers.
- (5) Value Proposition
 - Manufacturing Quality.
 - Quality of Finishes.
 - Packaging Quality.
 - Competitive Price.
- (6) Customers
 - Segmented customer marketplace with offers to action figure collectors
- (7) Operability
 - Human Resources.
 - Financial Resources.

- Equipment & Materials.
- Infrastructure.

[6] Haleem, A., Javaid, M., Singh, RP, Suman, R. y Khan, S. (2023). Management 4.0: Concept, applications and advances. Sustainable Computers & Operations, 4 , 10-21.

Circle of Value Proposal

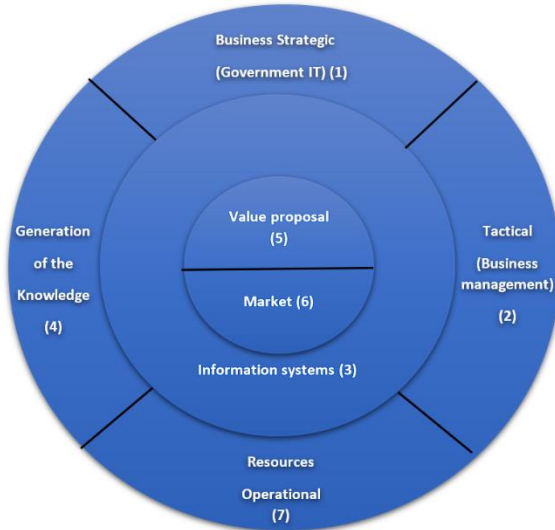


Figure 3 Proposed model for the toy industry

Conclusions

This work fulfills the objective of generating a model for the intelligent company to be competitive in the globalized world, this work proposes a model of value circle to develop in future works a more solid model for the intelligent company.

References

- [1] Porter, M., (1987) “Competitive advantage. Creating and sustaining superior performance” Mexico: Editorial Compañía Editorial Continental 1982.
- [2] Schwab K., (2016), The fourth industrial rebolution, World economic forum.
- [3] Joyanes Aguilar, L., (2018), Industry 4.0 The Fourth Industrial Revolution, Alfaomega.
- [4] Meier A. and H. Stormer, (2009), eBusiness and eCommerce Managing the Digital Value Chain, Springer.
- [5] Lepore, D., Vecciolini, C., Micozzi, A., & Spigarelli, F. (2023). Developing technological capabilities for Industry 4.0 adoption: An analysis of the role of inbound open innovation in small and medium-sized enterprises. Creativity and Innovation Management, 32(2), 249–265.