Predicting new business models with TRIZ

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Abstract:

The view of systems is not exclusive to TRIZ, however the integration of system vision, functions described as s-fields interactions and the ideality law of evolution are about TRIZ, and these bundled together can help organizations to value better its business model and so try to go one step beyond by easily defining new business models and assessing better the new technologies that may enable them.

The author tries to show this approach by analysing several cases, two known cases plus a still existing case which is yet to evolve. The known cases

Introduction

Firstly the author would like to stress that the model proposed in this article relates to invention and not to innovation which the author acknowledges as a broader term implying the successful introduction of inventions or changes in the market and thus creating value. Whereas invention is an intellectual activity, innovation is a social one.

The structure and direction that TRIZ elements can bring to business models may help to 'invent' new business models. It is the task of the inventors and developers to transform it into an innovation.

1. Business Models

The importance of Business Models

Business models have been and are attractive to industry leaders and business researchers because there is probably no other so breakthrough key element for a particular company whose change can transform totally the incumbents of the same industry. Schumpeter (1) when defining innovation as a creative destruction, it is implicitly considering a change either in a breakthrough technology, architectonic innovation (2) capable of sweeping an entire industry to bring in another, or change of the game, of a company or of an industry, i.e. in the business model.

Business models are also important because the concept helps to understand more comprehensively the success of some of the recent innovations. Many people may think Apple's Ipod and Iphone are successful product innovations but as other competitors also brought similar products without success, product innovation alone cannot explain the success. It has been very often reported that Apple's innovations went farther as business model innovations which were not followed by any other product competitor and so this fact helps to explain better the unique success of Apple.

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[1] This article should be cited as follows: Vicente-Gomila, J.M.,(2009) Predicting new business models with TRIZ

In a time where research points toward short term and market application, technology breakthroughs are the exception more than the rule and so the key innovative movements are being business model innovations. New business models that cannot easily be imitated.

Changes in the business model are difficult for competitors to follow because it requires considerable organizational changes and because the business model of a company, as its strategy, involves creating an own fit or system among company activities (3) which is or should be, different from competitors.

It is interesting therefore to find ways to invent and to innovate with new business models that make sense and are affordable to companies. Yet a company pursuing to change or invent a new business model finds also difficulties because it implies a supersystem change and pursuing innovation at a supersystem level is a more difficult task (4) But focusing in the conceptual phase of a business model innovation, that is inventing a new one is the first difficulty a company might face. It has been studied (5) that companies need a defined method, a roadmap to organize their thinking, and see the benefits of changing a business model into a new one.

What is a business model

Realizing the importance of a good and new business model, the questions start by asking what a business model is and how this articles defines it. The author starts by the simple definition of 'a formula for doing business', this implicitly includes the creation of value otherwise the company would not produce benefits. It is interesting to notice more detailed definition of Margretta (6) describing a business model as system in which the pieces of a business fit together. Also to notice that several articles even reviews (7)(8) although differently, use a group of common features comprising value proposition, resources, profit model, customers, providers, etc. Recently a good definition of Johnson, et.al.(5) offer a detailed yet holistic view of a business model which comprises the customer value proposition (customer, offering and need to be satisfied), the key resources, a profit formula (how the money can be made) and the key processes.

2. TRIZ

In the study of the vast technical literature of patents documents, an invaluable source for the Theory of inventive Problem Solving TRIZ, Altshuller (9) brilliantly realized, among other key facts, that technology, as well other elements in our Universe, is grouped in systems, a relation of components that together bring more value than the addition of the values of that components unrelated. Altshuller identified as well that inventions could take place at different levels of a system. In that sense, solutions for problem solving and invention should be sought in the subsystem (components) then in the system (relation of such components) and finally in the supersystem (the environment world).

Altshuller and his collaborators, also identified the importance of functions and interactions in a system, and developed a model of substance-fields (S-fields) to represent the interactions within systems and so functions. Later on S. Litvin extended the usage of s-fields as functions to relate subsystems into a system and at the same time with supersystems, appearing in the Invention Machine's software Techoptimizer.
SAO's

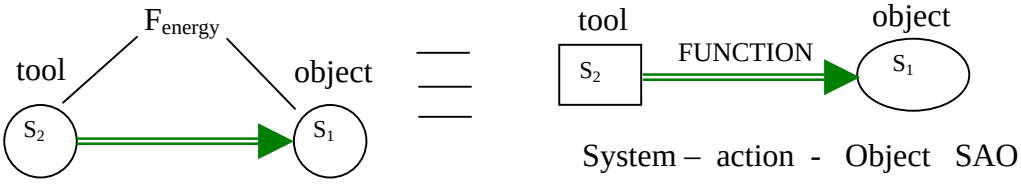


Fig 1 Representation of S-field as system-action-object

In this article the notation of s-fields as SAO elements will be used for representing business models, although related to the time dimension.

In studying systems and technology Altshuller identified the evolution of technical systems, identifying clear patterns repeatable through different technical domains. Such patterns are considered as laws of the evolution of technical systems and can be applied to better understand the potential progress of any technical domain.

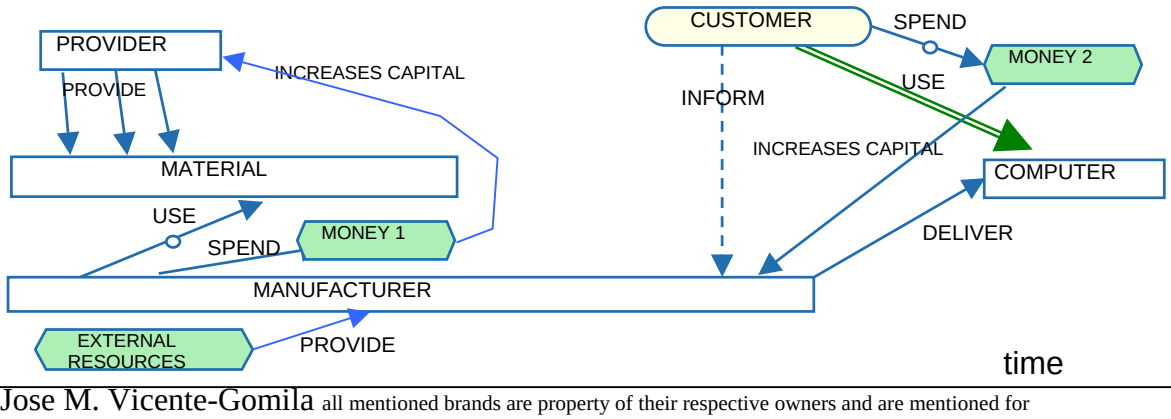
Some TRIZ practitioners as well as other observers may argue that technological inventions, in the last years seem to start focusing more in the subsystem level, materials and particles (e.g. nanoparticles, genetic engineering, spintronics), rather than in technical systems or even higher in social isues as Altshuller states (9).

Although the author does not disagree with this opinion, it should be noticed that such new elementary particles or materials are increasingly being applied to existing systems enhancing their properties and performance to new levels or generating new systems by themselves as in the molecular manufacturing of nanosystems development.(10)

3. New representation of business model

The representation of business models proposed in this article retains the concept of Margretta (6) but having in mind the elements of Johnson et al.(5) By combining the systemic view of TRIZ represented by the relation-interaction of components and taking into account the course of time as in a Gantt diagram, to represent flows or processes and assuming that the value proposition (customer, job to be done and offering) is covered by the functions or interaction surrounding the customer. The Gantt diagram helps the SAO diagram since it lays out the order in which tasks need to be carried out.

A basic example of the new representation is presented in fig. 2



In figure 2, the flow is represented by either the length and or the position in the horizontal axis. Differences in the horizontal axis when the firm pays or when it earns matter for the profitability. For the sake of a clearer representation the parameters modified in each of these functions are not depicted. For instance, the element 'Manufacturer' has as parameters its key internal resources to operate in the market. It is internally decomposed in all the key processes. It should be noticed however that this model is a conceptual model for the conceptual phase of the innovation, the time for thinking, visualizing and realizing. Costs can be also included although it is not an exact accountable model. Elements as resource velocity (5) and revenue model are easily represented by distance along the horizontal axis and parameters of money earned or expended. The author is working in further studying variations for better representation and is open to collaboration in such sense.

An aspect that should be well represented is the value proposition (5). Taking into account the example of figure 2 and focusing in the main function, the figure 3 shows the customer, the offering and, although not depicted, the parameters of the main function represented by the green arrow, represent the job the customer is trying to achieve (11) i.e. the main function is not directly produced by the system but rather by the customer. However it is the usage and the parameters that govern such usage what the customers interact with the business system for. In searching for how the business system may improve its products and services, it should study how to improve all the functions and elements interacting with the customer. Of course to be considered as a system, it cannot be forgot that energy conductance and transmission are in all the elements and actions of this system (12)

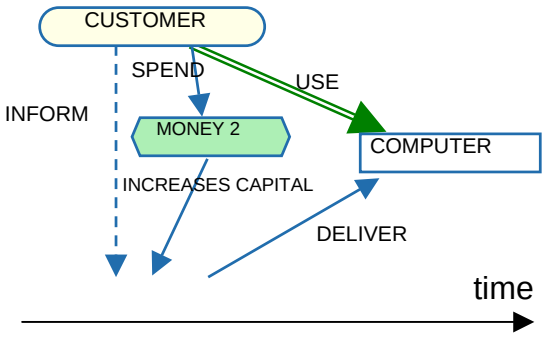


Fig 3 Representation of the value proposition in terms of SAO's

Functions diagrams which do not use resources and do not identify components, the system and the supersystem (13) may represent process (14) but are not enough to represent business models . Barkan (15) states, that despite this process representation, a better modelling should include system operator and other TRIZ elements.

By using the representation proposed by the author, companies as well as business researchers and analysts can have a simpler yet comprehensive view which depicts

most of the elements and which allows to see changes quickly and systemically as will be showed later.

4. Trends for existing business models

It is not new that being the business model a system, several of the laws and trends of system evolution analysed and stated in TRIZ can be applied to predict possible evolutionary paths

In this article the author uses as example the trend of increasing idealness although other laws and trends can be applied. The idealness law states that systems evolve by using more efficiently the resources and consuming and impacting the environment less and less. The other law used as example but not limited to is the law of transition to a supersystem

5. Examples with the new representation (how the next business model was achieved)

The following cases try to show how the new representation and specially the tools of TRIZ help to visualize and to explain the shifts that led from an existing business model to another one that has been successful.

The case of Apple is showed in figure 4

FIG 4 Mp3 player business model and Ipod business model

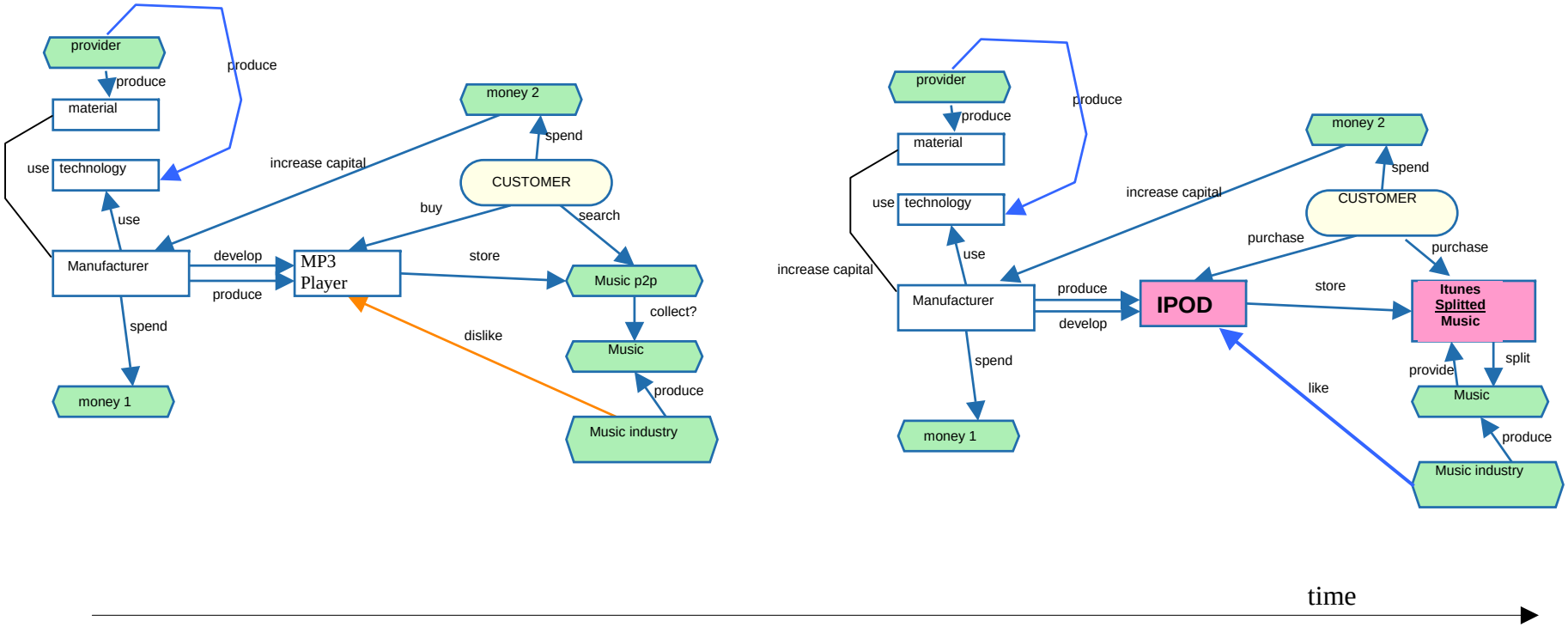
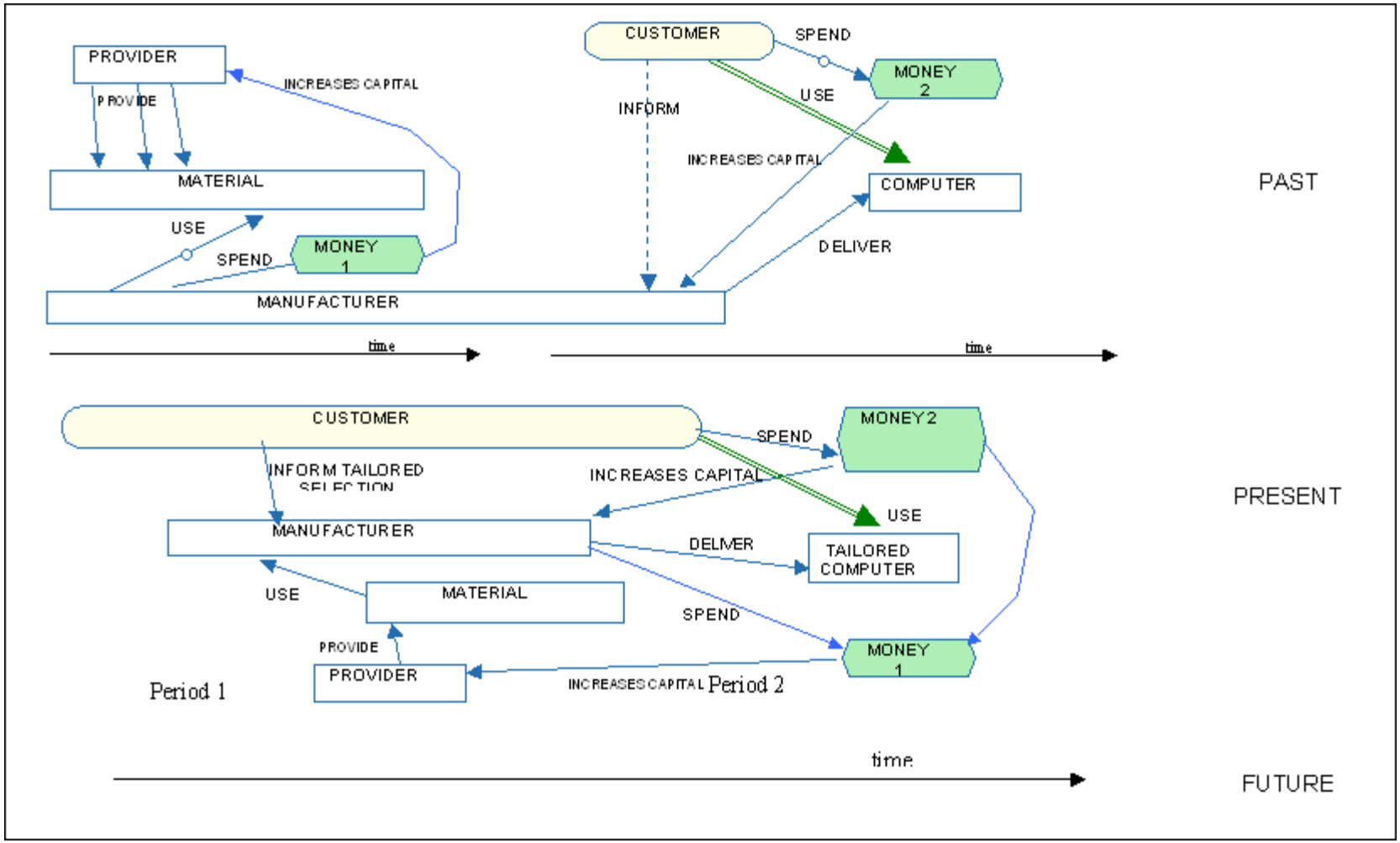


Figure 4 shows how the model integrates the product apple into a super-system by creating a new component, the ITunes system according partially to the law of transition to super-system. Every company should think whether its products can be integrated into a super-system which includes part of the job the customer is trying to get done.

The following case is the Dell Computer Corp. case known for its direct sales plus pre-order assembly just in time. The figure 5 shows in a different representation art where the SAO-Gantt diagram has partially been embedded within a transposed 9 windows frame (subsystem-system-supersystem; past-present-future).
From the two models it can be clearly seen that applying the inventive principle nº 13 'The other way around' invert the actions, make it the opposite way, to some of the key elements and actions of the prior business model, the new one can be outlined. It is the application of this principle that makes the real difference. Of course the new business model has to be supported by enabling technologies and superior performance, but these are operational effectiveness, whereas the shift of turning upside down the order of actions is a strategic choice.(5)

Fig 5

FIG 5 Dell simplified business model in the transposed 9 window-Gantt graph



The last example is the known case of photography whose diagram will not be depicted for the sake of making simpler to the conference proceeding editors and because it is a well known case. The film industry was wealthy until middle of 90's when the digital photograph, paradoxically already adopted by film makers as Kodak, Agfa Gevaert and Fuji, became popular and the film labs and film large numbers of jobs were lost.

Here the idealness law of evolution has come to scene due to a technological change. The first to trim all the steps, and do simplifying resources and time devoted to develop the negative film and make the positive copies (photos) was Edwin Land in 1947 when he demonstrated his instant camera.

Similarly, in 1970, Smith and Boyle had built the CCD into the world's first solid-state video camera and five years later, they demonstrated the first CCD camera with image quality enough for broadcast television. It should be noticed that although Sony was also a pioneer with its Mavica camera in 1981 and that Kodak invented and developed the first megapixel sensor with 1,4 million pixel in 1986 (16)

Any existing business model can study how increasing the idealness for example, by trimming some of the steps or more interestingly trimming the steps of the job the customer has to do, may result in new business models. By doing so it is also advisable to look for technologies that may enable such increase in idealness. The business model represented in this article allows for a detailed trimming taking care of the functions and allowing to explore more rationally the resulting scenarios.

6. Case: The Cement tile industry

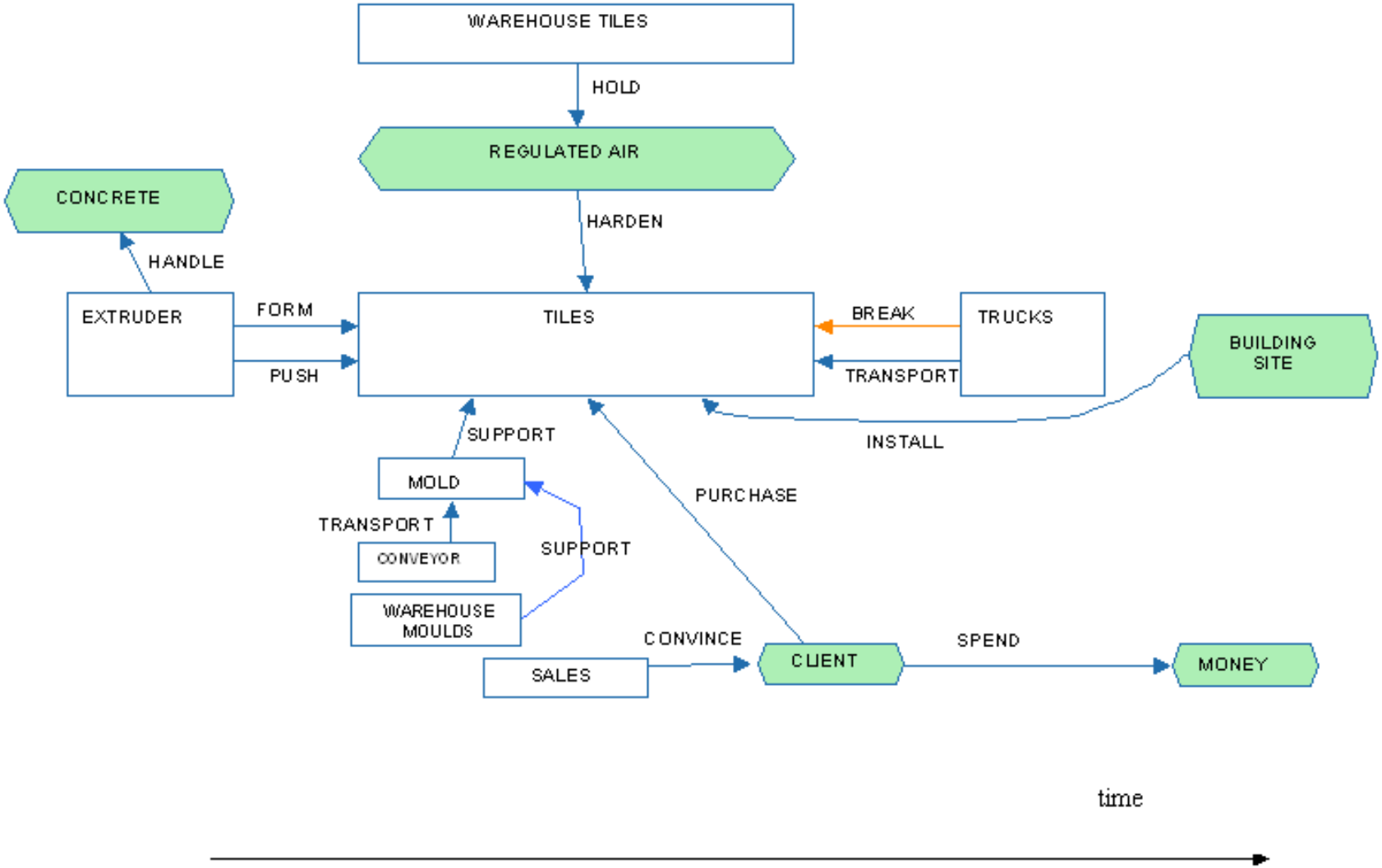
The next case has not yet changed of business model yet but applying the law of increasing idealness and the law of transition to a super-system, a new business model can be planned and so start looking for technologies capable of enabling the new business model.

There is a manufacturer of concrete roof tiles in Spain in the region of Avila, capable of extruding from one single installation near to 130 tiles per minute, weighting 4,3 Kilos each tile and working in two shifts totalling 16 hours production per day. As the concrete tiles freshly extruded are still very soft, each tile needs an aluminium metallic support shaped as the wavy tile. Such metallic mould will support each tile for the next four days. After the four days, the tiles must harden and rest for almost 28 days before being able to be transported.

Therefore, the existing business model needs to maintain a stock of moulds nearing half a million of moulds which needs a large almost unproductive infrastructure for such moulds (cleaning after each use, storing in a proper warehouse, and finishing since concrete is abrasive)

Fig 6 existing current business model

Fig 6 Cement tiles business model and new possible business model in the SAO - Gantt

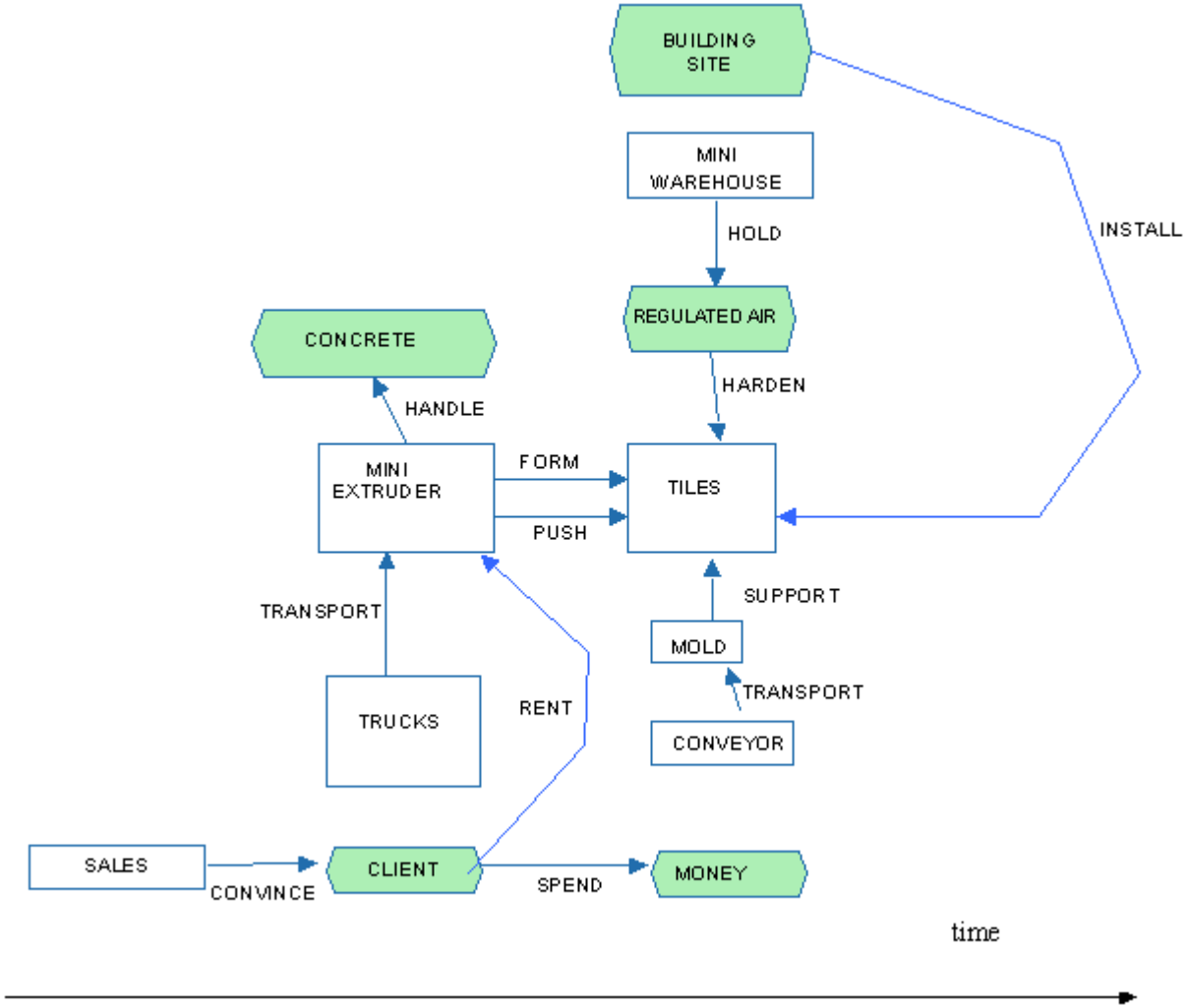


By trimming some of the operations and transferring other functions to the super-system, a new business model can be devised. By trimming transportation of tiles, such long storage is no longer needed so the special regulated atmosphere warehouse for the tiles can be drastically reduced. But if transport is eliminated, how could the tiles arrive to the customer. Here the transference to the super-system can be applied. In the new scenario, the customer, a construction facility beside the house or buildings or near a small quarter with several buildings under construction can have a small version of the extruder and manufacture at small scale its own tiles. The manufacturer rents the new manufacturing miniplant to the customer who manufactures its own tiles, and the supports can be adapted to be fitted in the roof permanently. The new business model is partially represented in figure 7. Of course new technologies and changes in the processes should be made but these are being studied and the author knows from the end of 90's of already existing manufacturing plants the size of one container cargo to be shipped everywhere where the manufactured material is needed.

Fig 7

FIG 7 New cement tile business model

In the SAO-Gantt representation



7 Conclusion

Despite not few analysts and researcher are not sure on what a business model should or should not contain, the author proposes a model that not only gives a view of almost all the elements of the business model with a visual representation but shows clearly the value proposition and makes easier to apply the different tools of TRIZ. The proposed representation has been used by the author in different industrial cases and is should evolve.

On the other hand, the laws of evolution as well of other tools of TRIZ offer a good approach for companies to step by step exploring new scenarios for new business models which can produce a profound impact in their current industries. In times where firms as Google are closing existing leaders of other industries as Microsoft (17) companies should revise and study different alternatives for new business models.

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Jose M. Vicente-Gomila an industrial superior engineer of background, learned about TRIZ in 1995 and translated the book of Altshuller in 1997. He has got an original letter of congratulations signed by G.S. Altshuller. Since that year is teaching to Spanish and Spanish speaking technicians of Countries as Spain, Mexico, Colombia, Brasil, Chile and Costa Rica. Is TRIZ specialist level four MATRIZ certified, and has applied TRIZ to a very diversified group of leading companies.

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