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The future of the future: Strategic foresight in Latin America

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ABSTRACT

With few differences in timing, future studies in Latin America were initiated with a linear conception of reality. Orchestrated with techniques such as the Delphi, future studies were supported by mathematical principles of probability. Several countries have surpassed this stage while moving into strategic foresight. Strategic foresight analyzes the future as a multiple reality. In other words, it means thinking differently and not reading reality in a linear manner. It means accepting that there is not one future but several futures and that one question could have more than one answer.

This change has demanded a shift in mentality. The presence of the disciplines in universities is of vital importance. For example, the Technological Institute of Monterrey (Mexico) and the Universidad Externado de Colombia (Bogota) offer foresight and strategy programs at the graduate level.

This article describes how different individuals, groups, agencies and institutions in Latin America have emerged thanks to the support provided by the science and technology governmental agencies of each country. The author provides examples from different countries including Colombia, Brazil, Chile and Mexico. Currently, strategic foresight is slowly gaining recognition and acceptance as a compass for productive sectors and as a generator of competitiveness.

However, despite the contributions of strategic foresight, Latin American countries, with the exception of some of the above-mentioned countries, have struggled to take off into the future. The role of strategic foresight can become the driving force behind this awakening, if the challenge of linking global trends with local contextualization through scenarios is accepted.

1. Introduction

French philosopher Gaston Berger, well known as the 'father' of French forecasting, pointed out that if current events reflect decisions of the past, future events will be the result of decisions of the present; [1] however, this mental attitude which enables one to prepare for the future, is not always in the mind of people and institutions. People and organizations may have a vague idea of the importance of the future which they generally define based on conceptual structures and primary management terms.

To strengthen the understanding and implementation of strategic foresight and its use in exploring the future of organizations, businesses and territories, some Latin American higher education institutions have timidly introduced future studies. In fact, only two Latin American Universities offer Programs at the Graduate level in this field: The Monterrey

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Institute of Technology in Mexico with a Master's degree program in strategic foresight,[1] and Externado of Colombia University, in Bogota which offers a Master's degree program on strategic thinking and foresight.[2] It also has a specialization program plus an MBA option with emphasis on foresight and strategy. It is estimated that between these universities more than 1000 students have graduated as professionals in Mexico, Colombia and Latin America.

Education plays a critical role in this situation. Latin American education has taught people to think in a linear form for many years. However the emergence of models such as the theory of chaos, the theory of complexity, fractal geometry, among others, has helped many to recognize the importance of strategic foresight in order to accept that the future can have different expressions.

Now, most of those who grant some importance to the future still conceive it as a single reality and only a few dare to think of it as multiple realities. By definition, foresight thinking assumes that the future is multiple; in other words, that we can imagine various images representing either evolutions or ruptures of a current situation.

It is not easy to break up the linear way of thinking and adopt a different perception of future reality. But, to not do so might mean that Latin American businesses either go back to the past or remain stuck in the present, ignoring important developments such as innovation, competiveness and creativity.

2. Forecasting behavior in Latin America: strengths and weaknesses

Let us look at some examples of Latin American experiences which reflect the dichotomy of reading reality in these two different ways: linear versus multiple.

The study conducted by *"Convenio Andrés Bello"*[3] in 13 countries is a good example of technological foresight analysis. Using a multiple reading of the future, it also identified world technological trends and articulated them within the Latin American reality.

The same study begins by recognizing the following sectors as the most relevant for the future development of the countries [2]:

- Energy
- Environment
- Agriculture and food
- Information Technologies and communications (TICs)

The outstanding aspects of the Convenio Andres Bello study are reflected in the analysis of the scenarios which follows in Fig. 1.

In Fig. 1., the scenarios for the future are framed between two axes. The horizontal axis is the level of research in the countries, where the plus (+) sign indicates an optimal state with studies close to the frontier of knowledge. The minus (−) sign shows an incipient situation where very basic and traditional theories are used. The vertical axis shows the strengthening of productive sectors where the plus (+) sign shows the transformation of productive sectors such as information technologies, airplane manufacture, new forms of energy, and the minus (−) sign shows production in traditional sectors such as farming and agricultural, mining, fishing, and woodlands.

The future of these countries is framed within four scenarios as a result of the only four mathematical combinations possible from the plus and minus signs above.

"The vicious circle". This scenario reflects the current situation: a combination of light research centered on traditional products (farming, agricultural, mining) a result of low quality education levels. These three variables: products, research and education are interrelated.

"With foreign hand". Goods are produced assuming high technology but without local research. This is the case of the 'maquilas'[4] which use local labor and international know-how.

"More of the same but improved". Goods are produced coming from natural resources with high technology which assumes sophisticated research.

"World class". This scenario assumes the arrival of information technologies, new forms of energy, etc., and consequently local research in those areas.

The countries we are studying have four avenues from now into the future:

1. Go towards the 'maquila', as was initially done in Mexico;
2. Take the route of sophisticated research for its natural resources, farming, agriculture and environment as an example;
3. Explore using research and industrial products such as information technologies, energy, airplane manufacture, and robotics;
4. Remain in the vicious circle: a mediocre college education which generates mediocre research which in turn generates low quality production.

Strategic foresight has not only penetrated regional topics as stated previously, but it has explored small businesses as well. The program "Designing scenarios for your enterprise" promoted by the Bogota Chamber of Commerce [3], for small businesses, makes

[1] ITESM, the Instituto Tecnológico y de Estudios Superiores de Monterrey. Itesm (México) http://www.mty.itesm.mx/dhcs/deptos/ri/maestrias/prospectiva/Plan_estudios.html.

[2] Universidad Externado de Colombia. http://portal.uexternado.edu.co/.

[3] The "Convenio Andrés Bello" was formed by Argentina, Bolivia, Colombia, Cuba, Ecuador, Spain, Mexico, Panama, Paraguay, Peru, the Dominican Republic and the Bolivarian Republic of Venezuela.

[4] The 'maquila' is the industry that produces goods for export using foreign technology but local labor.

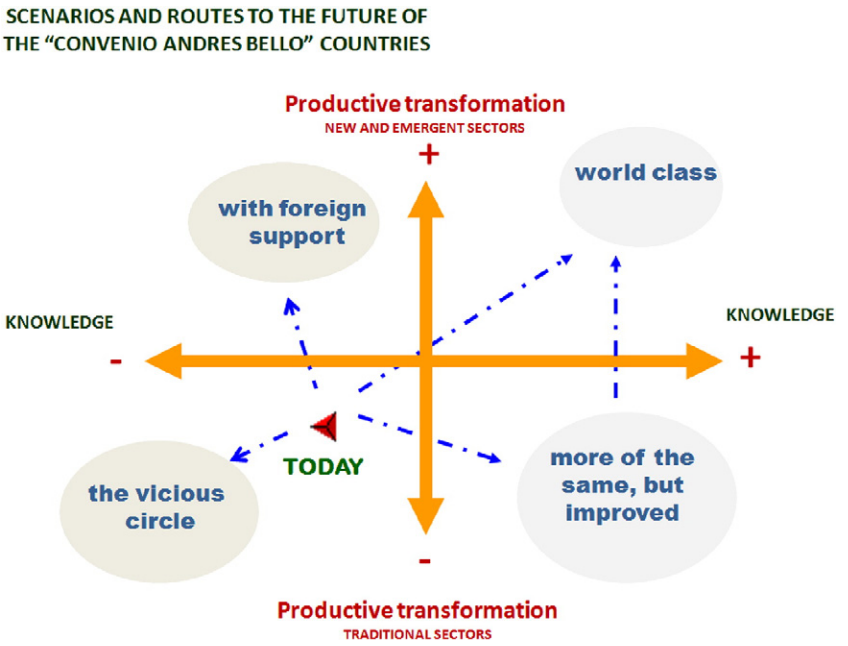

Fig. 1. Scenarios and routes to the future in the Convenio Andres Bello countries.
Source: Survey data "Educación Superior para la Transformación productiva y Social con Equidad en los países del Convenio Andrés Bello" sponsored by CAB and Colciencias, Bogota, 2007.

a case for the exploration of a range of futures but less demanding than the previous one as it relates to the presence of world technological trends.

Using a very simple model of scenarios, business people learn to design options for the future of their businesses by organizing images that visualize the ideas they have for the future of their business.

2.1. Two cases (Colombia and Mexico)

What follow are two cases where participants were anxious to explore the future but fearful of departing from the single concept of the future.

The first is "Visión Colombia 2019" which projects the main economic and social trends of the country and obtains a linear future without much creativity. This program is the proposal of former President Álvaro Uribe Vélez who was looking to construct "the country we want by 2019". That year will coincide with the 200th anniversary of the Independence of Colombia [4].

The study starts with a historical analysis and diagnostic of the outstanding economic, social and political issues of the country comparing each of them with the other Latin American countries and the world. This information allows the authors to set out two key principles:

1. To consolidate a political model deeply democratic and based on principles of freedom, tolerance and fraternity.
2. To solidify a non-exclusive socioeconomic model, based on equal opportunities with a State guarantying social equality.

From there, objectives and goals on the economy with political and social aspects are proposed:

- increase growth rate to 6% — currently running at 4%
- increase GDP *per capita* to US$3.811 (today $2.208[5])
- increase exports share to 25% of GDP—today 17%
- reduce the Gini index to 47.7%—current 56.7%
- increase to 40% the coverage rate in higher education (today at 25.7%)

This program has a futuristic horizon, the year 2019. Yet the approach has only one track: Improve today's situation in the future. This linearity obstructs innovation and the generation of new and different scenarios; consequently, new and different imaginative alternatives to those existing today are not generated.

Another good example is "The Futures of the World: Alternatives for Mexico" conducted by the Mexican Chapter of the World Future Society (WFS) in 2003. This was directed by Julio Millán, President of the Mexican Chapter of World Future Studies. The project summoned more than 400 participants including presidents, chief executive officers of companies, directors of strategic

[5] US dollar of 2004.

planning and foresight, staff in charge of formulating public policies and representatives of academic institutions and social organizations.[5] The study had the following objectives:

- analyze the country's past and then focus on strengths and weaknesses at the present;
- examine the most important mega trends[6] responsible for global change and measure their impact in the country;
- propose a scenario with a horizon of the year 2030.

It 'saw' for the future:

- the construction of a second republic and the empowerment of civil society;
- by then, Mexico will have a population of 127 million people;
- a growth rate in their economy of between 6% and 7%;
- an index of human development placing it among the 15 nations with the best quality of life;
- it would be generating energy 60% of which, will come from fossil fuels and a 40% from sustainable energy [6].

These challenges are underscored by the phrase: "Mexico, at the historic point of change and no return". Within this vision of the Mexico of tomorrow a single linear reading of reality stands out. Yes, the desirable future contrasts with the current situation but it is not presented explicitly as one of the various options for this nation in the future.

3. A review of the patterns and influences in Latin America

In any event, what has taken place in Latin America only reflects patterns established in the United States and Europe with regard to future studies and foresight. Beyond Berger, some of the same pioneers influenced this part of the world. They include Olaf Helmer, Ted Gordon and Norman Dalky with techniques like the Delphi, which may be valid for identifying trends when there is abundant information on the topics being discussed, mainly in the technological field. Of course for Herman Kahn, the future could be seen from the configuration of trends and mega trends. In this part of the southern hemisphere, Pierre Wack's works were successful because of his perception of alternate futures during the oil crisis of the 1970s. Other analysts of the crisis limited their forecasts to linear predictions which eventually proved to be wrong. Wack was exploring the future while the others were trying to predict it.

In short, those who bet on several futures (Berger and Wack) have better chances of getting it right than those who bet on a single future (the Delphi of Helmer and Gordon and the megatrends of Kahn), and those who try to explain the future (Berger and Wack) by the strategy of the present have even a better chance of winning.

All these ideas and approaches have left trails in Latin American future studies signaling a valuable combination between linear models, e.g., the Delphi type, and multiple/alternate approaches. Great promoters of either of the two approaches have been those entities in charge of scientific and technological developments of each country. These state agencies found future studies an appropriate and usable tool to prioritize and recommend research, development and innovation.

Such is the case of Argentina, where an important technological foresight project was undertaken by SECYT (The Secretary of Science, Technology and Innovation) since 2003 [7].

In Brazil, *Embrapa* (Brazilian Agricultural Research Corporation) which was looking for competitiveness in the farming and agricultural sector, did the analysis of the future of the agro businesses from production chains [7, p 82]. A very important case in this country is the project "Brazil 3 times" [7, pp 107–109]. This project sought to define a vision of the country in different dimensions and outlined specific objectives to be attained in three time frames: 2007, 2015 and 2022. The study began with a retrospective vision whose objective was to find the reasons for the Brazil of today. From there, it identified 1300 'fact bearers of the future'. It is a remarkable combination of the Delphi technique and the manufacture of scenarios. One of the main achievements of the Delphi survey was the identification of "the quality of the basic education in public schools". The study closes with a message which may be paraphrased as one of seeking a long-term strategy allowing people to take hold and advantage of opportunities, to transform the Brazilian reality through a new model of social development based on the economy of knowledge, able to generate sound change in the society, and to alter meaningfully the way Man sees himself and interacts the environment, society, with himself and the cosmos [7].

In Colombia, foresight has been strongly linked to science and technology in which *Colciencias*[7] has played a substantial roll financing studies of several economic sectors and also promoting the Agendas of Science and Technology in various parts of the country. The objective of these 'Agendas' was to design the scientific development scenarios of each region in order to construct the most convenient, as selected by academic and state representatives.

In Cuba, the 1980s was the decade of high technology and of the island's incursion into biotechnology as well as the strengthening of foresight studies overall.

In Peru, sponsored by the regional Program of UNIDO,[8] the first approach was 'technology foresight' like that initiated in the United Kingdom.

[6] A trend is a general direction in which a phenomenon tends to move towards the future assuming it does not change its regular past conduct. This statement has a high margin of error as it deals with local phenomena. However, its probability of occurrence is higher if it deals with world phenomena such as globalization, the economy of knowledge, the information society, or technological change. In this case we would be talking of megatrends.

[7] *Colciencias*: The Colombian Government's Department of Science, Technology and Innovation in charge of Research and Development.

[8] UNIDO is the acronym for the United Nations Industrial Development Organization.

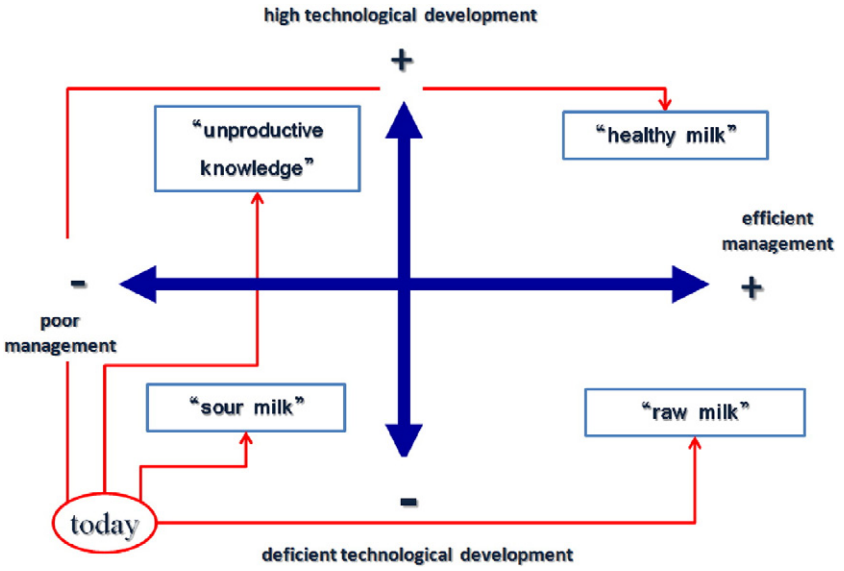

Fig. 2. Roads from present to future in dairy.
Source: Based on the study on the future in dairy, sponsored by the Agricultural Ministry, Bogota, 2007.

In summary, we can say that in the previously mentioned countries the presence of the Delphi spirit has been very meaningful in supporting technological studies. Also, the French school of *prospective* has made a significant impact in countries like Colombia, Argentina, Brazil, Mexico, Peru and Cuba.

The following programs have influenced the Delphi development: *Program for Technological Foresight* from Chile; the project *Prospectar,* initiated in 2000 by the Council of Science and Technology and the *Brazilian Program for Technological and Industrial Foresight.* The latter had the support of UNIDO (The United Nations Industrial Development Organization) admitted under the aegis of the Ministry of Industry and Foreign Commerce [7, p 22]. With this methodology, Chile was able to identify relevant and viable economic sectors for the future such as: wines, aquaculture and fishing, agricultural production, info-farming, technological mining and TICs.

Studies conducted in Colombia, Cuba, Argentina and Mexico, have also had ample influence from the French anti-deterministic thinking. In Brazil we must mention the work of Embrapa,[9] the State University of Sao Paulo and the GetulioVargas Foundation in Río de Janeiro.

The mark left by the French school of foresight over the past 20 years should not be underestimated. In his work, Michel Godet points out four attitudes towards the future: *Passive* (absence of breakdowns), *Reactive* (short term), *Pre-active* (the future depends on the past); *Proactive* (the future may be modifiable) [8]. But if future events cannot be recognized because continuous branching (chaos theory) and the dissipative structures of Prigogine; then the only way to ensure the occurrence of an event in the years ahead is to undertake its construction from the present.

This attitude takes hold in studies like those conducted by the Center for Strategic Thinking and Foresight in Colombia in which major technological changes expected for the future were contextualized in future scenarios and their comparison can make the best decision.

4. Colombian cases from the dairy industry and the publishing industry

With the support of the Ministry of Agriculture and the participation of businessmen from the sector, the study entitled "The Future of the Dairy Industry" was conducted in 2007. The exploration of world trends in technologies indicated significant numbers of patents with applications in the following areas: milk production increases through enzyme or mechanical procedures, which involve the harmlessness, durability and conservation of the products (milk, cheese, and yogurt). For this reason the technological variable was chosen as one of the indicators of the future (Axis *y*), in order to construct Fig. 2, roads from present to future in dairy. The second indicator (Axis *x*) selected was management and education levels of personnel. Each indicator has two hypotheses marked with the positive and negative signs. High technological development goes with positive sign (+) while deficient technological development goes with negative sign (−).

The combination of hypotheses allows participants to imagine four appropriately titled scenarios:

1 "Raw milk". There is good management and good education of personnel, but the technology used is not the latest. This scenario is not to be ruled out totally at least mid range, due to the importance of management and education.

[9] The acronym for the Brazilian Agricultural Research Corporation.

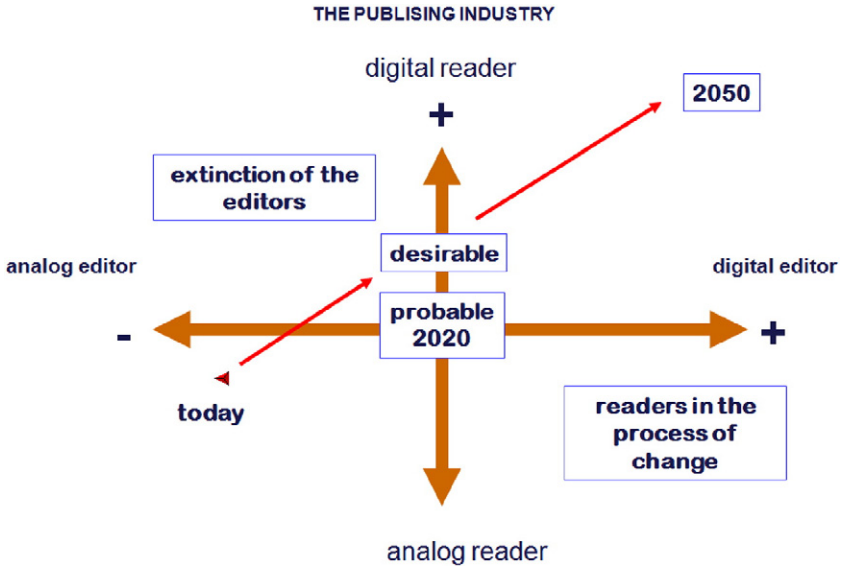

Fig. 3. Roads from present to future.
Source: CERLAC, 2009 Bogota, based on "Study on the future of the publishing industry".

2 "Unproductive knowledge". This scenario went for the latest technology but management and education were neglected. The consequences would be disastrous because it would be falling into the stereotype where "technology does it all".
3 "Sour milk". This would be the future of the losers: deficient technology and bad management.
4 "Healthy milk". This scenario reflects the hopes of the dairy industry: top technology plus optimum management and education. This is the scenario for businessmen because it has equilibrium between two indicators. Therefore the road to the future should be constructed in the direction dictated by this scenario.

The second case was about the future of the publishing industry.[10] This study indicated the change from analog (paper book) to digital products and moved businessmen to get ready for this irreversible situation in their business. As in the previous case, the process started by participants identifying world trends. Patents that could be in the market middle range (five years) or long range (five or more years) were identified, especially those technologies geared to generate products such as "e-paper" and the "e-book".

The workshops with experts concluded that if the trend was indeed the digital product, there was a parallel variable which was the publisher's job. Scenarios were designed as follows in Fig. 3, roads from present to future.

Both publisher and reader allow for two hypotheses for the future each: analog or digital. We are currently living a situation of a certain superiority of analog over digital according to both publishers and readers. But the strong trend towards digital will cause that surely in 40 years, if not before, both publishers and readers will generate and use digital products.

This is Scenario 2050. But middle range, Scenario 2020 could be identified by the presence of digital and analog in similar proportions. From this conflict, the winner will be the digital product. This scenario of coexistence of both options, with a small advantage by digital, would be the *desirable* situation for many publishers, who see with some nostalgia the forthcoming departure of paper.

It can be seen that Scenario 2050 shows a clear balance between the digital version and its acceptance by the reader. This is the most probable scenario.

Therefore the scenarios that would allow combinations of positive and negative signs could only occur exceptionally. That is the case of the scenario called "Extinction of the editors" which corresponds to a reader oriented basically to the digital product but surrounded by editors obsessed with analog productions. The failure of these publishers could be expected and the acquisition of digital material via imports and internet purchases a fact. [NB *editors* used rather than *publishers* in original study and in diagram.].

The other case is the scenario "Reader in the process of change". This describes an analog reader by nature but facing publishers who are totally digital. This is a very unlikely scenario. If it were to occur, it would show a displacement of readers caused by the publishers.

Curiously the arrival of digital technologies and the displacement of materials such as paper will favor longer life for the forests and therefore a more respectful attitude toward the environment.

This topic has been the battle horse of the Club of Rome since its creation in 1968. It is worth mentioning the impact of this organization on Latin American foresight.

[10] This analysis is part of the study on the future of books and the publishing industry sponsored by Center for Book Development in Latin America and the Caribbean (CERLAC), Bogota, 2009.

The Club of Rome's success is due to the strength of the megatrends with which it works (environmental degradation and population growth), but the weaknesses are due to its linear approach that leads to guessing rather than to posing different hypotheses or conjectures of the future.

In fact, the concerns generated by the report, *The Limits of Growth*, were active catalysts for foresight to take off in Latin America, especially in Argentina.

These concerns were expressed in what was called the Latin American answer to the Club of Rome approach or "Latin American World Model" also known as the *Bariloche model* [7, p24] because in 1970 the *Bariloche foundation* in Argentina, assumed the review of the basic assumptions of the report.

Instead of starting from the analysis of trends to conclude with physical growth limits, the *Bariloche Foundation* deduces that the world's most relevant problems are not physical but sociopolitical based on the uneven distribution of power both locally and internationally.

The *Bariloche model* did not intend to throw a veil over the problem of the exhaustion of resources but rather to give relevance to the presence of sociopolitical structures forgotten by the famous Club of Rome report.

5. Conclusion

In conclusion, foresight in Latin America has been germinating for as long as it has been nurtured by the seeds of future studies conducted in the United States and Europe.

Foresight has been successful when faithful to the alternate vision of reality that is, when it has explored scenarios for the future that were innovative both in design and creativity.

It has been less successful when seeking to preserve the linear approach which leads to prediction—with the exception of technological analyses, where there have been positive results basically due to the good quality of information available.

Towards the future, strategic foresight has a fine road ahead given the interest it generates, most likely due to the uncertainty this part of the world currently faces. All in all, we can expect glorious days ahead if global trends are integrated into the analysis without losing perspective of the spirit of reading reality in a multiple way.

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