

# THE CONTRIBUTION OF SCIENCE FICTION AND DESIGN TO THE MATERIALIZATION OF SCENARIOS

Jean Paul Pinto, Doctoral Student, Universidad del Valle, Cali (Colombia)

jean.pinto@correounivalle.edu.co

Javier Medina Vásquez, Professor, Universidad del Valle, Cali (Colombia)

javier.medina@correounivalle.edu.co

## **Abstract**

Lately, there has been a greater use of Science Fiction and Design tools when imagining and materializing the future, complementing the traditional ways of constructing future scenarios. The current doctoral research seeks to demonstrate their contribution to the field of *La Prospective* by establishing how they facilitate the identification of new services. To this end, an innovation model that combines tools from both worlds is proposed to strengthen the processes of strategic conversation and the future literacy, for the benefit of a better materialization of future scenarios. This would mean that the ultimate goal of *La Prospective* would not be limited to anticipation but, would include the materialization of scenarios that transform future images into future projects.

**Keywords:** Science Fiction, Design, Materialization, Strategic Foresight

---

## **1. Introduction**

The future is perceived as intangible, for it is not felt as something concrete, it lives in the world of abstraction and is perceived as something very far away; so, one would have to imagine how it could be materialized to make it present. This would involve developing skills to imagine the future in the present (Garrido, n.d.). The purpose is to create fissures, through design, so that the future can be inserted into the present (Brassett & O'Reilly, 2015).

Future narratives (storytelling) do not arouse much interest among decision-makers, thus diminishing the possibility of making strategic decisions based on sets of built-up scenarios, especially taking into account that the best set of scenarios contain those futures against which the decision maker considers worthwhile to prepare (Concheiro, 2016; Godet, 2007; Van der Heijden, 2009). This means that the implementation of Strategic Foresight is still limited, due to

the doubts that may exist regarding the return on investment and the value generated by Foresight activities in organizational environments (Rohrbeck & Schwarz, 2013).

In order to innovate or building the future is necessary to demonstrate the need for change, to argue that something must be transformed and taken to a completely different state than what has been experienced up to now. A *prospectiviste* must be constantly interested in changes and in generating the ruptures that are considered necessary to reach a desired future (Godet, 2007). The more agile the reaction capacity of an organization, the greater the chances of growth and survival (Van der Heijden, 2009).

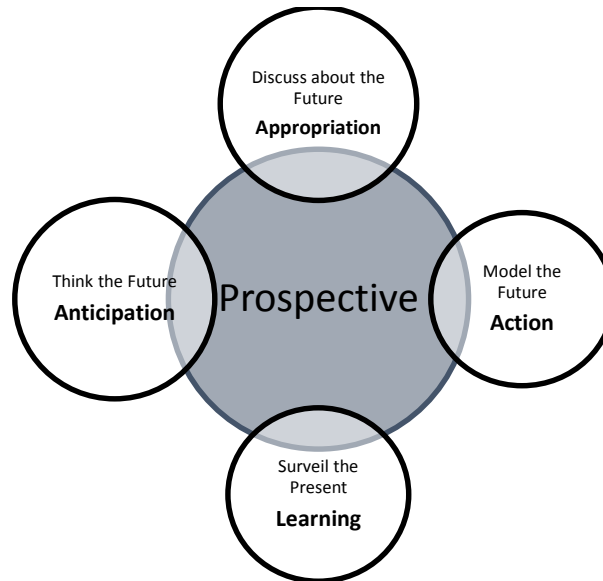
It is important to consider that the quality of a scenario is not measured by the possibility of being successful, but by its ability to stimulate intuition, improving knowledge of the environment, thus leading to effective action (Schwartz, 1995; Van der Heijden, 2009). If the scenario does not lead to making the future project operative, its effectiveness is reduced and the reflection about the future will not have any value. The aim of *La Prospective* is not so much to guess the most probable scenario as to prepare the desired scenario and ultimately to make the desired scenario more probable (Bourbon-Busset, 2008).

*La Prospective* needs to strengthen its processes of generation of images and visions of the future. Instead of looking for more answers within the discipline itself, it is relevant to incorporate tools from other fields of knowledge to understand how these images and visions are created and materialized. In this case, one could recourse to the field of Design (Candy & Dunagan, 2017) and head towards the field of Science Fiction (Lombardo, 2015).

The ultimate goal of this cross-fertilization is not exclusively focused on improving the ability to anticipate possible futures as on the materialization of new services that organizations can market and / or implement in the short, medium and long term. Thus, one moves away from a logic where the most important thing is to anticipate to another complementary logic, where the fundamental issue is to materialize. It is not enough to build scenarios now, it is necessary to imagine and materialize them through Science Fiction and Design.

Doing *La Prospective* does not only mean anticipating but also dealing with other tasks within the organization; it also implies acting, appropriating, and learning (Medina, 1998, 2000, 2003). With Science Fiction and Design, this *Prospective* cycle is fulfilled, because both used in tandem allow to fill in each of its components. Science Fiction is responsible for anticipation and action, while Design generates a high level of appropriation and learning. This implies that, if

they are not used in tandem, the full cycle of *La Prospective* reflection would not be carried out (Medina, Castaño, & Steven, 2014; Medina & Ortégón, 2006).



**Graphic 1** The Complete Prospective Cycle. Source: Medina et al., 2014, p. 55

Therefore, the purpose of this paper is to determine in what ways Science Fiction and Design facilitate the materialization of scenarios for the identification of new services in an organization. Formatted as a question: In what ways do Science Fiction and Design lead to the identification of innovations through the materialization of scenarios?

In order to answer this question, first, it is discussed the way in which Science Fiction helps the materialization of scenarios, then it is analyzed the role of Design in that process; subsequently, the result generated by the simultaneous use of both tools is studied and some of the new ways of materializing scenarios are described. Finally, synthesized examples of four experiences carried out by one of the authors are presented, where the contribution of both fields to the identification of new services for different types of public and private organizations is evident.

## **2. The Contribution of Science Fiction and Design to the Materialization of Scenarios**

### *a. The contribution of Science Fiction*

Science Fiction makes an important contribution to *La Prospective* as it allows the construction of visions of the future in clear rupture with the tendencies in course. Therefore, organizations are increasingly turning to Science Fiction writers in order to devise really different scenarios and to identify surprises and events that are considered impossible or unthinkable, the same ones that have become more frequent (Baena, 2016). In this sense, Science Fiction can be considered an important Foresight tool, since it involves the imagination of other possible worlds, which encourage the generation of transformations in various aspects of society (Medina, 2003).

Between Prospective and Science Fictions there is a two-way pollination, on the one hand, Science Fiction writers are nourished by current trends and, on the other, engineers and scientists are nourished by the uses and evolutions that are given to them in the books and fiction films, to later create real products and services (Bell, Fletcher, Greenhill, Griffiths, & McLean, 2013). This means that Science Fiction produces an inspiration phenomenon deemed useful when generating future services and products. The pollination between Science Fiction and Prospective can be evidenced in several books, films, and series, e.g., *Blade Runner*, *Minority Report*, *Black Mirror*, *Do Androids Dream of Electric Sheep?* If, for instance, we consider the contributions made to the future studies by Stapledon in his works, *Last and First Men* and *Starmaker*, it can be demonstrated that several methodological concepts used in the field of *La Prospective* are present in these books and represent an interconnection between Science Fiction and future studies. Some examples are the projection of trends, intentions and aspirations for a preferred future, the existence of alternative futures and the presence of Wilds Cars or Black Swans (Markley, 2015).

Science Fiction, through its narrations, allows to close the gap between images of futures and actions necessary to materialize futures (Von Stackelberg & McDowell, 2015). In this sense, Science Fiction Prototyping leads to the creation of detailed concepts on what seems uncertain, aiming that planners, public policy managers and project managers, to use them routinely (Corsi, 2015). Coupling Science Fiction with the structuring of prototypes (which are part of the design world), enables generating more concrete results, introducing real physical objects, which require the participation of users, thus facilitating their emotional and intellectual commitment (Graham & Mehmood, 2014). The prototype is a story where a product is fictionally described, which is not the one that is to be built at the present time, but an example of what is expected to be built someday (Bell et al., 2013).

This cross-fertilization between *La Prospective* and Science Fiction, enables the actors of an innovation process to interact among other, generating spaces where engineers can think in a more human way about the future technologies they are developing, and connect with the imagination of the service manufacturers as well as with potential users (Burnam-Fink, 2015); among them, a conversation will be established about the possible implications and effects of these innovations in the future, process enriched by the description of the affective and emotional states of fictional characters impacted by the new services or materialized products (Draudt et al., 2015).

Even though Science Fiction has prioritized speculation about future technologies, numerous writers have also been interested in the future of society, as in cultural, social, ethical, security, and gender issues. Accordingly, Science Fiction creates multidimensional visions of the future, insofar as it deals with technological, social, ethical, psychological, and religious issues (Lombardo, 2015).

The *prospectiviste* goes from being an expert focused on forecasting, based on quantitative methods, to be an inclusive expert who works with others, where he assumes a role of a facilitator of contents. This person creates value by generating processes that lead to the materialization of desired products, for which he must guide participants to the futures they want. Until now the reflection about the future was usually controlled by the results of the forecasts and the community fulfilled the passive role of a student or consumer who listened to the expert who talked about the future. In the new ways of doing *La Prospective*, the reality is mix up with the imagination, the serious, and the amusing; games, for instance, are used to challenge realistic descriptions of reality through the generation of alternatives; this allows us to make the futures more real and the alternatives more legitimate (Inayatullah, 2017).

Changes are not completely delimited in the fiction texts and the user must materialize them through his reading. This means that an active relationship will be created between the reader and the text, a creative connection. This connection is key because the text should suggest things, inspire and stimulate the creation of objects that, in this moment, do not exist. The best anticipations are the ones that sow the seed that later germinates and ends up producing a fruit later. Science Fiction could be, in this sense, a source of inspiration for solutions to some problems, where innovators and creative innovations intertwined (Bell et al., 2013).

When scenarios are structured under a Science Fiction process, this process is perfected thanks to more creative inputs, greater detail, the increase of alerts, deep reflection, extensive

criticism, and a broad commitment to action (Bina, Mateus, Pereira, & Caffa, 2017). This leads to a holistic awareness of the future, which facilitates the embodiment of the vision of the future in a project that can be quickly materialized by engineers, product or service developers and end users.

Science Fiction, therefore, must be treated as a significant component of futures studies, and overcome the dilemma that *prospectivistes* do not use it for fear of being stigmatized; however, it is evident that through anticipations science comes to make its discoveries (Graham, Greenhill, & Callaghan, 2013).

#### *b. The contribution of Design*

In the last decade, futures' construction and Design have grown in a more intimate and collaborative relationship. On the one hand, designers have become more aware of the future, integrating long-term thinking and *Prospective* tools into their work; while *prospectivistes* are increasingly involved in prototyping issues and preparing future experiences using Design (Candy & Dunagan, 2017).

Futures studies and Design have initiated a mutual interest for each other, geared towards the creation of alternative futures, using different tools to deal with uncertainty. Both can learn from each other to balance and work on the development of responsible and creative decisions regarding the future (Celi & Rudkin, 2016).

A cross-pollination work is evidenced; it allows to benefit from the full potential of the other to generate a more complete final product. This shows that *La Prospective* needs looking into other areas to generate scenarios greater in impact and more effective in terms of generating actions and projects to modify future events (Candy & Dunagan, 2017).

The purpose is to elaborate better scenarios and to use them to improve the effectiveness and interest for the designs. A transdisciplinary collaboration is evidenced between *La Prospective* and Design (Selin, Kimbell, Ramirez, & Bhatti, 2015), where both scenarios and designs benefit; on the one hand, the scenarios materialize and take a more concrete form and, on the other, the scenarios guide and direct the work of the designer, facilitating the visualization and elaboration of new objects of the future (which will later be transformed into new services and products).

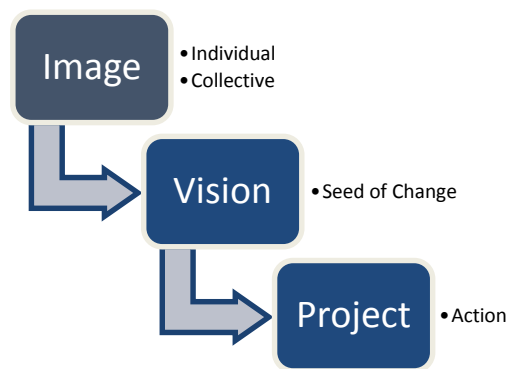
In this sense, the quality of the strategic conversation (Van der Heijden, 2009) is pivotal in the process of building scenarios, which allows greater openness for controversy and provides a platform for immersive learning and learning-by-doing. When people are in a strategic

conversation, they actively listen to others, build on the ideas of others and develop new meaning and understanding. The future is a story to be imagined, communicated, and shared through different processes such as theater, role plays, gaming, etc. (Wilkinson, 2017)

*c. Why coupling Science Fiction and Design at the time of materializing services?*

For an image of the future to become a vision of the future, it must meet several conditions: It must be structured, innovative, transformative, and feasible (Medina, 2003). In the case of Science Fiction, it enables the generation of structured and transformative visions. However, it does not meet the requirement of feasibility because it generates utopian and dystopian visions. That is why Design is needed, to bring about comprehensive visions, where concrete solutions are generated, characterized by prototypes that are tried out in real life, meeting the requirement of feasibility.

It is evident that Science Fiction makes possible to go from the image to the vision of the future, because it establishes much creative, detailed and inspiring scenarios that allow to steer, in a better way, the actions to be implemented to operationalize the future project (Bina et al., 2017). On the other hand, Design is primarily concerned with the future project, since it includes stages of ideation, co-creation and prototyping (Design Council, 2007), making more tangible what was identified in the Science Fiction scenarios. This would mean that both tools should be used in tandem, since if only one of them is used, there is a risk that the future image will not materialize into a project (Medina, 2003).



**Graphic 2** The Social Construction of the Future. Source: Medina, 2003. Masini, 1999

On the other hand, in recent years there has been more emphasis on using more creative techniques when developing scenarios, as evidenced by the work carried out by Johnson with his Science Fiction Prototyping or Bleecker with his Design Fiction (Burnam-Fink,

2015). Added to this, are the works developed by Candy with respect to the construction of interactive scenarios, based on experiences (Candy & Dunagan, 2017).

In the case of Design Fiction, this has given an anticipatory turn to the practice of traditional design, prioritizing thinking and doing; it is a bridge between facts and imagination and this can be applied to near futures as to more distant relationships, related to design and fiction. This implies two possibilities, either fictionalize through design (materializing through design) or design with fiction (fiction helps design). In this sense, the fictional has much to offer to the practice of design (inspiring and guiding) and, vice versa, the design helps materialize the fictional. On the other hand, Design Fiction is related to other currents such as critical, speculative and discursive design (Hales, 2013).

*d. New ways of materializing scenarios thanks to the pollination among Prospective, Science Fiction and Design*

Scenarios are increasingly based on experiences, playful and artistic expressions. The construction of scenarios is being complemented in written text mode with other types of scenarios, where it is important that the user lives, feels and experiences the scenario first-hand, thereby giving it life (Bina et al., 2017; Lombardo, 2015).

In this sense, there is a flourishing field of futures construction methods that combines art, design, technology, and Design Fiction. To this end, games, artifacts, monuments, images, and stories are used in an effort to reveal the texture and feel of emerging futures. Accordingly, this demonstrates the importance of imagining future scenarios in full color, with images, performances, and stories (Selin, 2015). This means that, to avoid falling into a scenario that is only aesthetic or pleasing to the sight, Design fulfills the task with the materializing of objects or services, which have been previously identified in storytelling.

There are different tools to help materializing scenarios such as storyboards, prototypes, fictional news, future advertisements, interviews from the future, artifacts, etc. Physical objects are used to generate discussion and debate regarding what could be generated in the future; this is what is called the prototype of diegesis (prototypes with narratives), which allows people to believe that this is feasible, going from the impossible to the possible (Rijkens-Klomp, Baerten, & Rossi, 2017).

Likewise, materializations can be created through living themes with live musical presentations or short films (Candy & Dunagan, 2017); postcards, posters, packaging and newspapers can be used (Candy, 2013); people can be asked to write letters about the future, to



sculpt some object from the future (using mud or clay), or to simply draw on a board. Another alternative could be Guerrilla Futures, with the use (authorized or not) of public spaces where announcements or graffiti with futur messages are placed (Candy, 2010).

Another alternative is to venture into reverse archeology, where objects are created from the future; the work is carried out in the opposite direction of the traditional, since there is an object that comes from the future and it is necessary to build a narrative; people must identify what it was created for, what uses it was made, in what context, who used it, etc. (Candy, 2017)

### **3. Methodological approach**

Between March and April 2018, pilot experiences were carried out in different public and private organizations aiming at checking whether the combination of Science Fiction and Design leads to a better materialization of the future and to the identification of new services.

These pilot cases will take the form, in the future, of collective case studies (Stake, 2000). The interest in using case studies is the possibility of analyzing in depth a situation in a real context. Cases allow answering questions like What happened? or How and why did it happen? (Collazos, 2009; Martínez, 2006; Yacuzzi, 2005; Yin, 2004). On the other hand, they allow to make a direct observation of the phenomenon that is being studied and to collect data in a natural environment; the researcher can assume the role of a detective, who simultaneously collects and analyzes data, drawing preliminary conclusions, which does not happen with other methods (Yin, 2004).

For the management and execution of the tests (Collazos, 2009), we worked under the modality of workshops, following this methodological process:

- To elicit the input for the scenarios, empathy and value maps were filled in (Osterwalder, Pigneur, Bernarda, & Smith, 2014).
- To construct the fiction scenarios, the guidelines set up by Bina et al. (2017) were followed. They suggest that the scenarios should be creative and in greater detail; bearing increasing alerts, eliciting deep reflection, extensive criticism and commitment to action.
- To materialize scenarios, posters and markers were made available to the participants; in some cases, the working groups generated videos or images of what

they sought to materialize. These procedures are in line with the guidelines of the archeology of the future (Candy, 2017).

#### 4. Results, discussion and implications

The experiences were carried out (i) in a military academy, (ii) in a workshop with entrepreneurs, (iii) in a Nonprofit Organization that promotes knowledge and personal growth, and (iii) in a citizen's security workshop organized by the government of the city of Santo Domingo; all of them in Ecuador. Briefly, some of the results obtained will be presented.

A first result is related to the use of value and empathy maps that enabled, above all, to consolidate strategic conversation processes.



**Figure 1** Strategic conversation around value and empathy maps



**Figure 2** Use of value and empathy maps for the identification of key variables for fiction scenarios

A second result is linked to the establishment of key variables for the scenarios, in the form of solutions and new services that participants would like to find in real life.



**Figure 3** Use of tools to strengthen participation and democratize the prospective

A third important result is related to the prospective process, which could be worked out by a large number of participants, democratizing the reflections about the future. Usually, Foresight works with a small number of experts and the tools (crossed impacts, Morphological Analysis,

etc.) are designed for small groups; however, with the tools of Design Thinking, the inputs for scenarios can be worked by groups of 100 or 200 people.

A fourth result is connected to the ability to build much detailed scenarios, generating emotions, placing characters with which readers can identify, including goals and indicators, critical of what is lived in the present, inviting immediate action. These fiction scenarios are different from the traditional *Prospective* context scenarios or from those represented by figures or abstract formulas.

---

El martes 22 de marzo de 2022, el director del hospital Crnl. DE SND. Vinicio Domínguez, inicia sus actividades con la reunión programada para las 08:00 horas, que se llevará a efecto en el Auditorio del Hospital, con capacidad para 400 personas, contará con la presencia de delegados del MSP, COMACO, Ejército, se tiene previsto enlazarse mediante video conferencia con hospitales de la región andina con la finalidad de transmitir la primera cirugía robótica realizada en el hospital, la misma que se desarrolló sin complicaciones, existiendo gran interés por la instituciones en conocer cómo se implementó esta tecnología en el hospital.

El Jefe de Talento Humano del COMACO, comunica que la encuesta realizada días atrás por el sobre clima laboral, tiene un 90% de aceptación de la gestión que realiza la dirección, que el trabajo en equipo alcanza un 75%, que el compromiso y pertenencia de los trabajadores se encuentra al 80%, existiendo un adecuado ambiente laboral, por lo que es felicitado por alcanzar niveles aceptable de liderazgo.

El delegado del MSP, acude para realizar inspección de las diferentes áreas previo al licenciamiento, pasando con 95% en manejo de desechos infecciosos, superando los estándares requeridos, alcanzando la certificación, posteriormente el delegado se reúne en la dirección para felicitar la gestión realizada al modificar las observaciones de inspecciones anteriores.

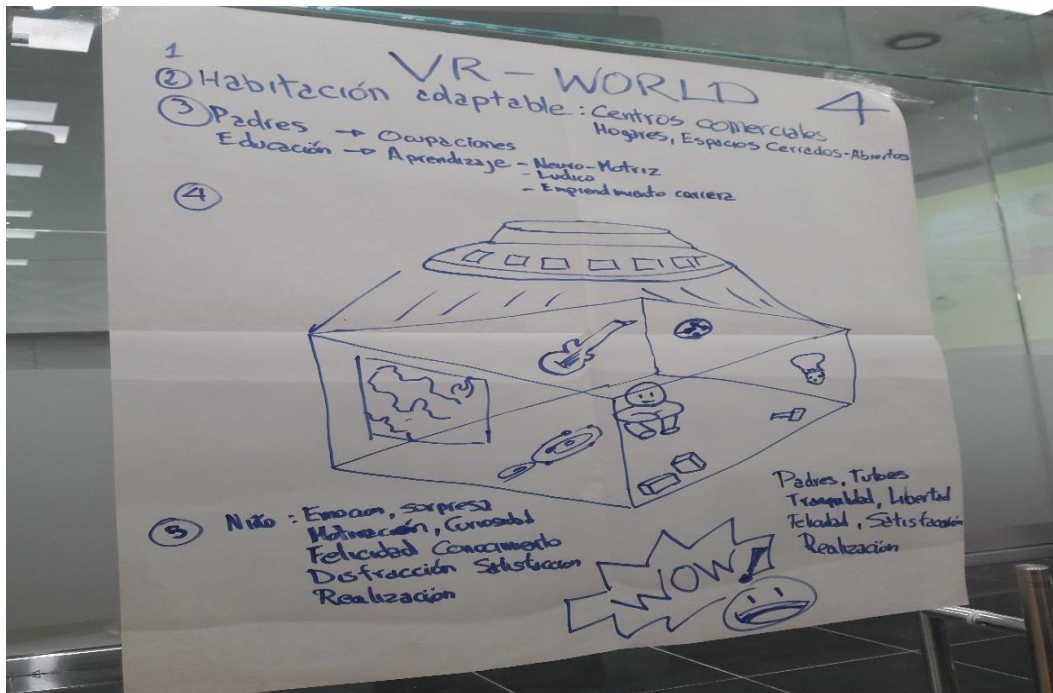
Siendo las 12:00 horas, mientras caminaba por los pasillos de consulta externa de cirugía, se acerca una paciente, quien le manifiesta todo su agradecimiento por la atención y amabilidad del personal médico y enfermería, en atender a su esposo que se encontraba con una pancreatitis y fue intervenido de forma inmediata, con buenos resultados, a lo que el manifiesta que esa es la función del hospital.

Siendo las 15:00 horas, le dan parte que se encuentra listos los temas de investigación que serán publicados en la revista médica del hospital, la que será lanzada el día 28 de mayo con motivo de las fiestas de aniversario de ésta casa de salud.

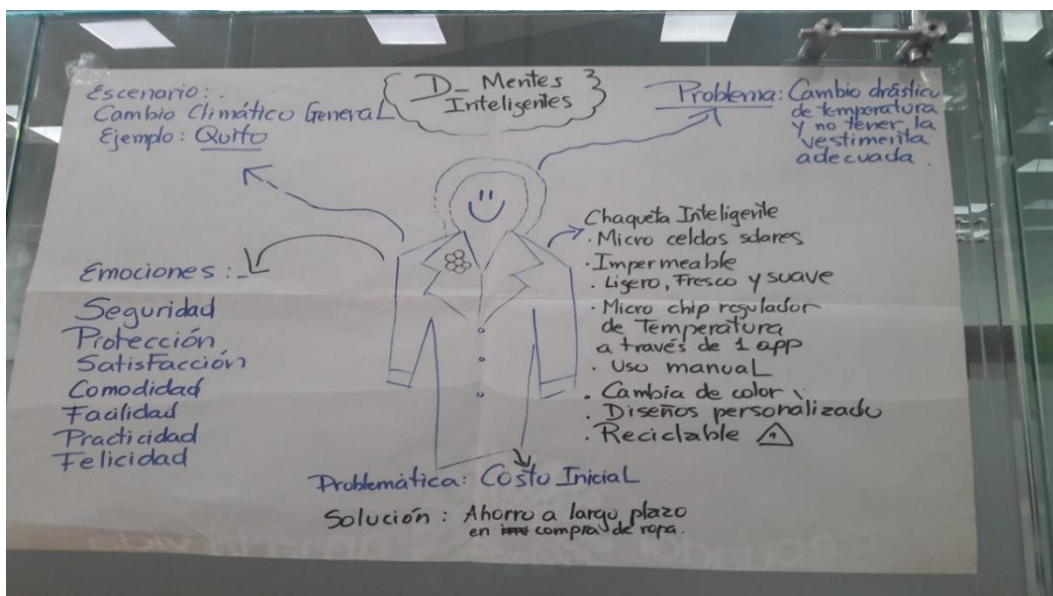
#### Figure 4 Fiction scenario for a military hospital

A fifth result is related to the ability to materialize what has been described in the scenario. The participants in the entrepreneurs' workshop put into play elements of the Design World, and with cards and markers they shaped the new services they narrated on the scenarios. On the other hand, the military officers of the academy preferred to materialize it with a graphic design tool, structuring a video of a new medical services unit.





**Figure 5** Materialization of a new service created by entrepreneurs



**Figure 6** Materialization of a new service created by entrepreneurs



**Figure 7** Materialization of a hospital with new medical services

## 5. Conclusions

The experiences carried out allowed to establish that Science Fiction and Design strengthen the processes of generation of images and visions of the future; which would enable to move, more easily, from the image to the project of the future. The strategic conversation is enriched, the whole process is democratized and the scenarios become more inspiring and orientating towards the generation of innovations (normative role). With these processes, the benefits of Strategic Foresight in the organizational areas are better evidenced, demonstrating that the value generated lies in the enrichment of a services portfolio.

The reflection outlined here will open a debate about whether the fundamental issue is to anticipate for the sake of anticipating or move forward until a stage where the designed scenarios are fully materialized, especially when innovation processes are concerned. It could be claimed that anticipation is no longer enough, for it is limited to the construction of scenarios, but that we must move on to a stage of materialization of futures. This would imply not only an interest to explore the future but also to materialize it working hand-in-hand with current and

potential users, constituting a transdisciplinary team made up of designers, engineers, Science Fiction writers, among others.

In these processes, the *prospectivistes* would assume the role of facilitators and the scenarios would no longer be exclusively manufactured by them, but would be engendered through a process of co-creation (crowdsourcing); which would imply transcending a *prospective* based on experts, giving a priority to the exploration and materialization of the future with more participatory and democratic tools (futures literacy).

Based on the analysis, a debate could begin in the *prospective* community regarding the indicators that would allow measuring the quality and effectiveness of a *prospective* scenario; because it would be necessary to incorporate new indicators related to the capacity to materialize new services or products.

It seems that it will be more interesting to take in account scenarios based on experiences, playful and artistic expressions. This would unleash a change of paradigm since it would complement the construction of scenarios in text mode with other types of more experiential scenarios, which can be seen, touched, felt and therefore come to life in front of potential users and decision makers.

## References

- Baena, G. (2016). *Escenarios de ciencia ficción*. México DF: Proyetcto Papime UNAM.
- Bell, F., Fletcher, G., Greenhill, A., Griffiths, M., & McLean, R. (2013). Science fiction prototypes: Visionary technology narratives between futures. *Futures*, 50, 15–24. <https://doi.org/10.1016/j.futures.2013.04.004>
- Bina, O., Mateus, S., Pereira, L., & Caffa, A. (2017). The future imagined: Exploring fiction as a means of reflecting on today's Grand Societal Challenges and tomorrow's options. *Futures*, 86, 166–184. <https://doi.org/10.1016/j.futures.2016.05.009>
- Bourbon-Busset, J. (2008). Reflexions sur l'attitude prospective. In *De la Prospective*. Paris: L' Harmattan.
- Brassett, J., & O'Reilly, J. (2015). Styling the future. A philosophical approach to design and scenarios. *Futures*, 74, 37–48. <https://doi.org/10.1016/j.futures.2015.07.001>
- Burnam-Fink, M. (2015). Creating narrative scenarios: Science fiction prototyping at Emerge. *Futures*, 70, 48–55. <https://doi.org/10.1016/j.futures.2014.12.005>
- Candy, S. (2010). the Futures of Everyday Life: Politics and the Design of Experiential Scenarios, (October), 1–371. <https://doi.org/10.1111/j.1467-9248.2010.00836.x>

- Candy, S. (2013). Time Machine / Reverse Archaeology, (November 2013).
- Candy, S. (2017). Gaming futures literacy : The Thing From The Future. *Transforming the Future: Anticipation in the 21st Century*, (January).
- Candy, S., & Dunagan, J. (2017). Designing an experiential scenario: The People Who Vanished. *Futures*, 86, 136–153. <https://doi.org/10.1016/j.futures.2016.05.006>
- Celi, M., & Rudkin, J. (2016). Drawing food trends: Design potential in shaping food future. *Futures*, 83, 112–121. <https://doi.org/10.1016/j.futures.2016.05.002>
- Collazos, W. P. (2009). El Estudio De Caso Como Apropiado a La Investigación En Ciencias Sociales. *Revista Educación Y Desarrollo Social*, 3(2), 180–195.
- Concheiro, A. (2016). Prospectiva: una visión crítica y algunas preguntas abiertas sobre sus posibilidades y limitaciones. In *El futuro a debate*. Mexico DF: Limusa.
- Corsi, P. (2015). Forcing the design of fictional futures: From theory to cases implementation. *Journal of Futures Studies*, 20(2), 81–104. [https://doi.org/10.6531/JFS.2015.20\(2\).A81](https://doi.org/10.6531/JFS.2015.20(2).A81)
- Design Council. (2007). A Study of the Design Process. *Design Council*, 44(0), 1–144. Retrieved from [http://www.designcouncil.org.uk/sites/default/files/asset/document/ElevenLessons\\_Design\\_Council\\_\(2\).pdf](http://www.designcouncil.org.uk/sites/default/files/asset/document/ElevenLessons_Design_Council_(2).pdf)
- Draudt, A., Hadley, J., Hogan, R., Murray, L., Stock, G., & West, J. R. (2015). Six Insights about Science Fiction Prototyping. *Computer*, 48(5), 69–71. <https://doi.org/10.1109/MC.2015.142>
- Garrido, L. (n.d.). El Futuro como Anticipación en el Presente Enfoque de Capacidades Laboratorios de Alfabetización en Futuros, 1–14.
- Godet, M. (2007). *Manuel de Prospective Strategique, Une indisciplinée intellectuelle*. Paris: Dunod.
- Graham, G., Greenhill, A., & Callaghan, V. (2013). Exploring business visions using creative fictional prototypes. *Futures*, 50, 11–14. <https://doi.org/10.1016/j.futures.2013.04.001>
- Graham, G., & Mehmood, R. (2014). The strategic prototype “crime-sourcing” and the science/science fiction behind it. *Technological Forecasting and Social Change*, 84, 86–92. <https://doi.org/10.1016/j.techfore.2013.10.026>
- Inayatullah, S. (2017). Gaming, Ways of Knowing, and Futures. *Journal of Futures Studies*, 22(2), 101–106. [https://doi.org/10.6531/JFS.2017.22\(2\).E101](https://doi.org/10.6531/JFS.2017.22(2).E101)
- Lombardo, T. (2015). Science fiction: The evolutionary mythology of the future. *Journal of Futures Studies*, 20(2), 5–24. [https://doi.org/10.6531/JFS.2015.20\(2\).A5](https://doi.org/10.6531/JFS.2015.20(2).A5)
- Markley, O. (2015). Olaf Stapledon: Personal reflections on cosmic inspiration from a pioneering visionary. *Journal of Futures Studies*, 20(2), 123–132. [https://doi.org/10.6531/JFS.2015.20\(2\).E123](https://doi.org/10.6531/JFS.2015.20(2).E123)
- Martínez, P. C. (2006). El método de estudio de caso: Estrategia metodológica de la investigación científica. *Pensamiento Y Gestión: Revista de La División de Ciencias Administrativas de La Universidad Del Norte*, (20), 165–193. <https://doi.org/10.1055/s-0029-1217568>
- Medina, J. (1998). La Prospectiva humana y social: alternativa de la nueva generación para América Latina. In *Segundo Encuentro Iberoamericano de Estudios Prospectivos*. México DF: ILPES.



- Medina, J. (2000). La construcción social del futuro. Anotaciones desde la previsión humana y social. In *Cuarto Encuentro Iberoamericano de Estudios Prospectivos*. La Habana.
- Medina, J. (2003). *Visión compartida de futuro*. Cali: Fondo Editorial Universidad del Valle.
- Medina, J., Castaño, P., & Steven, B. (2014). *Prospectiva y política pública para el cambio estructural en América Latina y el Caribe para el cambio estructural en América Latina y el Caribe*. Santiago de Chile: Cepal.
- Medina, J., & Ortegón, E. (2006). *Manual de prospectiva y decisión estratégica: bases teóricas e instrumentos para América Latina y el Caribe*. Insituto Latinoamericano y del Caribe de Planificación Económica y Social. Santiago de Chile: Cepal. Retrieved from <http://www.eclac.cl/ilpes/publicaciones/xml/3/27693/manual51.pdf>
- Osterwalder, A., Pigneur, I., Bernarda, G., & Smith, A. (2014). *Diseñando la propuesta de valor*. Barcelona: Deusto.
- Rijkens-Klomp, N., Baerten, N., & Rossi, D. (2017). Foresight for debate: Reflections on an experience in conceptual design. *Futures*, 86, 154–165. <https://doi.org/10.1016/j.futures.2016.11.008>
- Rohrbeck, R., & Schwarz, J. O. (2013). The value contribution of strategic foresight: Insights from an empirical study of large European companies. *Technological Forecasting and Social Change*, 80(8), 1593–1606. <https://doi.org/10.1016/j.techfore.2013.01.004>
- Schwartz, P. (1995). La planificación estratégica por escenarios. *Cuadernos de La Administración*, 21.
- Selin, C. (2015). Merging art and design in foresight: Making sense of Emerge. *Futures*, 70, 24–35. <https://doi.org/10.1016/j.futures.2014.12.006>
- Selin, C., Kimbell, L., Ramirez, R., & Bhatti, Y. (2015). Scenarios and design: Scoping the dialogue space. *Futures*, 74, 4–17. <https://doi.org/10.1016/j.futures.2015.06.002>
- Stake, R. (2000). Case Studies. In *The handbook of Qualitative Research*. London: Sage.
- Van der Heijden, K. (2009). *Planejamento por cenarios, a arte da conversacao estrategica*. Porto Alegre: Artmed Editora.
- Von Stackelberg, P., & McDowell, A. (2015). What in the world? Storyworlds, science fiction, and futures studies. *Journal of Futures Studies*, 20(2), 25–46. [https://doi.org/10.6531/JFS.2015.20\(2\).A25](https://doi.org/10.6531/JFS.2015.20(2).A25)
- Wilkinson, A. (2017). Strategic foresight Primer.
- Yacuzzi, E. (2005). El Estudio De Caso Como Metodología De Investigación: Teoría, Mecanismos Causales, Validación. *Universidad Del CEMA*, 1–37. <https://doi.org/Article>
- Yin, R. (2004). Case studies methods.