Futures Triangle 2.0: integrating the Futures Triangle with Scenario Planning

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Abstract

Purpose – *The purpose of this paper is to introduce the Futures Triangle 2.0, a methodological advancement of the Futures Triangle method (Inayatullah, 2008), which better integrates the original method with Scenario Planning by visually representing scenarios against the three dimensions of the Triangle, i.e. pulls, pushes and weights.*

Design/methodology/approach – *The paper explains the theoretical rationale behind the creation of the method, outlines the steps required to use it in a futures workshop or in a futures research project with a step-by-step procedure and reports a case study of its application in practice.*

Findings – *The Futures Triangle 2.0 encourages a deliberate and systematic discussion on the three dimensions of the Futures Triangle in each scenario and on whether scenarios differ in these attributes. The method allows the foresight researcher/practitioner to capture the valuable tensions between weights on the past on one hand and pushes of the present/pulls of the futures on the other hand, and to make sure that the scenarios differ substantially in these three attributes.*

Originality/value – *The method integrates the Futures Triangle and Scenario Planning in an intuitive, easily reproducible and visually pleasant graphical procedure.*

Keywords *Futures Triangle, Visualization, Scenario Planning, Graphic, Futures method, Foresight method*

Paper type *Research paper*

1. Introduction

The Futures Triangle (Figure 1) is a simple yet powerful futures method introduced by Inayatullah (2002, 2008). It has three dimensions, corresponding to the three angles of the figure: the pulls of the future, the pushes of the present and the weights of the past. The pulls are possible visions and images of the future; the pushes are present trends or driving forces affecting the direction of future change; the weights are obstacles and barriers to achieve different futures. Deliberation on these three dimensions is used as a brainstorming technique to encourage a discussion about possible futures produced by the interaction of these three forces.

In six pillars, a seminal foresight framework, Inayatullah (2008) identified the Futures Triangle as a mapping tool, clearly distinguishing it from more complex futures methods such as Scenario Planning and giving it temporal precedence over scenarios. Indeed, although the Futures Triangle can be used independently from scenarios, it can be inferred from the paper that "mapping" is fruitfully used before and in combination with scenarios as it is part of the same overarching step-by-step framework. This is in fact the way the Futures Triangle has been applied in a number of futures workshops (Inayatullah *et al.*, 2013; Sheraz *et al.*, 2013; Inayatullah and Elouafi, 2014; Inayatullah and Milojevic, 2016).

Yet, if the Futures Triangle can be integrated with Scenario Planning during the foresight process, how this can and should be done is still unclear. Indeed, there is a lack of methodological literature on how to use this tool in practice. We are, therefore, in need of

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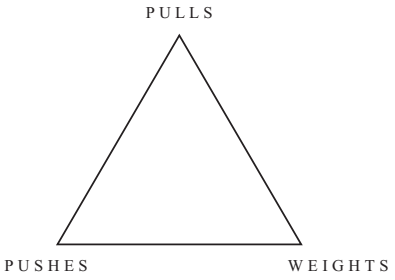
Figure 1 Futures Triangle template



Source: Inayatullah (2008)

more literature clarifying how to systematically integrate the Futures Triangle with Scenario Planning.

Moreover, recent literature has suggested that visualization of scenarios is fruitful for an intuitive and facilitated understanding of scenario content (Lederwasch, 2012; Fergnani, 2019a), which might otherwise be left unutilized due to the inherent difficulties in scenario dissemination (Sarpong *et al.*, 2018). Although the Futures Triangle in its present form fails at graphically capturing different possible scenarios, it is a simple and intuitive visual mapping futures method and constitutes an opportunity, if well visually integrated with scenarios, to represent key facts about scenarios in graphical form.

In view of the above, this article introduces an advancement of the Futures Triangle method named Futures Triangle 2.0 which contributes to foresight methodological literature and foresight practice by:

- successfully integrating the Futures Triangle tool with Scenario Planning; and
- generating an intuitive and easy to understand visualization that represents scenarios against the three Futures Triangle dimensions, graphically depicting several possible futures in the same figure.

Futures Triangle 2.0 therefore encourages the incorporation of the three dimensions, i.e. pulls, pushes and weights, as well as the tensions between them, into Scenario Planning, which could be otherwise overlooked, as well as scenarios' understanding and dissemination.

The article is organized as follows. Section 2 elaborates on the importance of the methodological integration of the Futures Triangle with Scenario Planning. Section 3 introduces Futures Triangle 2.0 as a methodological advancement in this direction and outlines the steps required to use Futures Triangle 2.0 in a futures workshop or in a futures research project. Section 4 reports a case study of the application of Futures Triangle 2.0. The article then concludes by discussing the contributions as well as limitations of this methodological advancement to futures research and practice.

2. Theoretical background: the Futures Triangle and its relation with Scenario Planning

2.1 The Futures Triangle

The Futures Triangle was first formally introduced by Inayatullah in the book *Questioning the Future* (Inayatullah, 2002). The same author first used the method in a journal article to study the futures of genetic and disabilities (2003). However, the Futures Triangle became widely

known in the foresight literature only later, thanks to its inclusion into a seminal sequential foresight framework called six pillars (Inayatullah, 2008). Specifically, the Futures Triangle is used in the first and most basic pillar of foresight: mapping. Inayatullah created this method by drawing inspiration from the seminal and pioneering work by Polak (1961) on images of the future. The value of the Futures Triangle is that deliberating on the interaction between its three dimensions, i.e. pulls, pushes and weights encourages a discussion about possible futures. As such, the future appears as a "contested space" between three forces (Inayatullah, 2003a) which surfaces the epistemological stance behind the method: the future is to be challenged, rethought and created. This episteme is in line with the critical approach of futures studies (Inayatullah, 2013) that clearly distinguishes Inayatullah's contribution to futures research from more reactive viewpoints about the future (Inayatullah, 2003a).

The method has been heralded as simple while powerful because it is fungible to be used in various futures pedagogical settings and futures workshops and has minimal resources requirement, i.e. pen and paper. This tool has is in fact amenable in situations where individuals are introduced to foresight for the first time.

In principle, this tool can be used to explore the futures of a relevant focal issue of interest in three ways:

1. Each of the three dimensions of the triangle is linked to multiple and possibly competing images of the future/scenarios. This usage is akin to brainstorming several possible pushes, pulls and weights of several possible futures (Hoffman, 2013).
2. The three dimensions of the triangle are used to develop three scenarios, where the "weights" scenario is the no change scenario, the "pull" scenario is the radical or visionary scenario and the "push" scenario is the adaptive scenario.
3. The three dimensions of the triangle are used to study a single image of the future/scenario. This usage requires determining a vision (pull), the supportive drivers of that vision (pushes), as well as the barriers to that vision (weights). A subtype of this usage is that the three dimensions of the triangle are used to study change in an organization, where the three dimensions represent the hoped change, the drivers of change and the barriers to change (Fan and Khang, 2014).

However, the vast majority of foresight practitioners and researchers using the Futures Triangle have done so in the first above reported way, i.e. as linked to multiple images of the future/scenarios. This can be gauged by reviewing the extant literature on previous empirical applications of this methods, which include the study of the futures of genetics and disabilities (Inayatullah, 2003a), of the role of the global South in global governance (Cruz, 2015), of conflict between economic ideologies globally (Fergnani, 2019b), of health care in Australia (Russo, 2019), of universities in 2037 in Taiwan (Chen and Hoffman, 2017), of China from a macrohistorical perspective (Hoffman, 2013) and with a focus on the relationship between its people and the environment (Anthony, 2009), of higher education in Vietnam (Pham, 2006) and of transport (Inayatullah, 2003b), among the most notable ones.

This is likely because the Futures Triangle, as part of the six pillars foresight framework, is almost always used before and in combination with more complex foresight tools such as Scenario Planning or CLA[1], as the original framework dictates. As such, the process of brainstorming about possible futures benefits the subsequent scenario creation via Scenario Planning (or scenario deepening via CLA).

However, although the triangle is so fundamental for creating scenarios, unfortunately there is a scarcity of formal methodological guidance in the foresight literature explaining how to integrate the Futures Triangle and Scenarios in practice. Indeed, Inayatullah in more than one occasion explains that analyzing the three dimensions of the triangle helps to "create a/the plausible future" (Inayatullah, 2002; Inayatullah, 2003b; Inayatullah and Milojevic, 2014),

but the details on how this is to be done are unclear. Moreover, that this method is often used in foresight practice rather than in futures research does not help, as substantiated by the many reports of futures workshops where the six pillars approach, including the triangle, has been used, but without revelations of the methodological details beyond the common explanation that the insights generated during the Futures Triangle's brainstorming are used to build scenarios (Inayatullah *et al.*, 2013; Sheraz *et al.*, 2013; Inayatullah and Elouafi, 2014; Inayatullah and Milojevic, 2016).

Indeed, a more detailed theoretical explanation of the three dimensions of the triangle reveals that this method is not only closely theoretically intertwined with Scenario Planning, but also that knowing how to systematically integrate the tensions between its three dimensions into scenarios is desirable and required.

2.2. The Futures Triangle vis-a-vis Scenario Planning

The three dimensions of the Futures Triangle are pulls/pulls of the future, pushes/pushes of the present and weights/weights of the past.

The pulls/pulls of the future are images and visions of the future. Archetypal images of the future are likely partly hardwired in human brain for evolutionary reasons (Fergnani and Jackson, 2019). The salience of positive/negative images of the future in a society as a whole drives the emergence and decline of civilizations (Polak, 1961). Unsurprisingly, archetypal images of the future are used as predetermined plots in a seminal deductive scenario method, the Scenario Archetypes method/four generic futures (Dator, 2009). But inductively thinking about possible images of the future is also a non-discountable step scenario planners need to go through when creating scenario plots in the intuitive logics scenario planning tradition (Schwartz, 1996). Images identified in the pulls are neutral and can be read as positive or negative according to context and subjective interpretation. Inayatullah (2008) mentions some examples of pulls: a world of continuous evolution and progress, where human beings control the natural world; a world of crisis due to resources limit and systematic collapse; a world of global interconnection and intercultural understanding; a transformational green world or Gaia, and a world of regression to a simpler and less technological developed society.

The pushes/pushes of the present are presently identifiable quantitative patterns and trends in the environment that affect future change, such as aging population or technological development. Inayatullah (2002) makes the distinction between pushes and pulls clear: the former are quantifiable, whereas the latter, as images, are visual in nature and not easily expressed in data.

The pushes are the very building blocks of scenarios. Indeed, Scenario Planning methods require the identification of either unidirectional trends, such as in Shell's approach (Schwartz, 1996) and in the Scenario Archetypes method (Dator, 2009) or driving forces, i.e. dimensions varying between two extremes, such as in 2 $\times$ 2 scenarios, (Chermack, 2011; van der Heijden, 2005). Although Inayatullah instructs that the pushes include only unidirectional trends, these can be a clear source of inspiration for identification of both trends and driving forces in a Scenario Planning exercise.

The weights/weights of the past are forces of resistance that stand in the way of future change. These can be technological and environmental, i.e. lack and scarcity of resources to achieve a vision, environmental constraints or slowness of technological diffusion, but are most often ideological in nature, i.e. hidebound and retrograde mindsets and worldviews of stakeholders in positions of power and who lobby against change. Indeed, as Inayatullah explains (Inayatullah, 2003a), weights are the deep structures of what is problematic to change.

The weights of the past are perhaps the most unique aspect of the Futures Triangle that differentiates this method from other futures techniques. Indeed, the conflict between future progress and the barriers to progress, wittingly captured by the weights dimension, is often not taken into account in established Scenario Planning methods. However, social or ideological conflict is central in the creation of alternative futures and should be systematically integrated into scenarios. In particular, the various tensions between the weights on one hand and the pushes and pull*s* on the other hand could add richness of details in scenario narratives. The contested futures emerged from the Futures Triangle analysis is dialectical in nature, and each future originates from conflict between multiple forces. This conflict, if transferred into Scenario Planning, can potentially make scenarios more plausible, detailed, evocative and sophisticated.

From the above analysis, it is clear that three dimensions of the Futures Triangle are central for the creation of scenarios as they constitute their building blocks, and that a systematic methodological integration of these dimensions into Scenario Planning is required. Moreover, it is also clear that this integration should pay particular attention to preserving the valuable tensions between the weights, on one hand, and the pushes and pulls, on the other hand, from the Futures Triangle analysis into scenarios. Yet unfortunately, methodological literature on the integration between these two methods is lacking. The methodological advancement introduced in this article, which is the subject of the next section, is meant to primarily address this concern.

3. The Futures Triangle 2.0

3.1 Method rationale

Futures Triangle 2.0 integrates the Futures Triangle and Scenario Planning by representing the scenarios generated in a Scenario Planning exercise against the three dimensions of the Futures Triangle in the same figure on a scale from 0 to 5 where 0 indicates no resemblance and 5 indicates full resemblance and where scenarios are represented by lines of different colors (see Figure 4 for an example). This figure allows foresight researchers/practitioners to understand at a glance where scenarios stand and how they compare on the three original Futures Triangle's dimensions It encourages explicit researcher's deliberation/ dialogue between foresight participants on how the three dimensions of the Futures Triangle can be integrated in the scenario narratives through an iterative process, with particular focus between the tension between the weights of the past on one hand and the pulls of the futures/pushes of the present on the other, which could be otherwise overlooked. The step-by-step procedure on how to use this method is treated in more detail in the following subsection.

3.2 Step-by-step method application

Using Futures Triangle 2.0 requires a procedure similar to that of the original Futures Triangle, with the addition of the Futures Triangle 2.0 figure, which is produced after future scenarios are generated. The Futures Triangle 2.0 figure allows the foresight researcher/ practitioner to reiterate the scenario narratives based on the figure's graphical outcome. The application procedure of the method in a futures workshop types as follows:

- *Framing the future*: Futures workshop participants are divided in groups according to common interests and asked to define the scope of the future to be explored, i.e. the focal issue, time horizon and geographical boundaries of the future are defined.
- *Mapping the future with the Futures Triangle*: Futures workshop participants/the groups are asked to brainstorm on possible future visions/images, present trends and barriers/ obstacles using the Futures Triangle tool (Inayatullah, 2008).

- *Generating future scenarios*: Scenario Planning is undertaken with a method of choice. The specific steps required depend on the method used and time constraints, but generally include identifying and evaluating driving forces, choosing critical uncertainties, writing scenario narratives (inductively or deductively), naming the scenario and graphically illustrating them. Futures workshop participants/the groups are encouraged to draw inspiration from the brainstorming work previously done at Step 2 and to incorporate the thinking process of the Futures Triangle into the creation of scenario narratives. Specifically, they are asked to respond to the following two questions:

  Q1. Is the tension between weights of the past on one hand and pulls of the future/pushes of the present on the other hand sufficiently treated in each scenario narratives?

  Q2. Are the outcomes of this tension significantly different between the scenarios generated?

- *Generating the Futures Triangle 2.0 figure*: Futures workshop participants/the groups are asked to generate a figure representing the scenarios generated at Step 3 against the three dimensions of the Futures Triangle. An example of this figure is found on Figure 4. This is done by ranking the extent to which the scenarios resemble each of the three dimensions previously identified, i.e. pulls, pushes and weights, on a scale from 0 to 5 (0= no resemblance at all, 5= full resemblance). Workshop participants in each group rank each dimension for each scenario individually. Then, in each group, the scores of all group members are averaged to achieve consensus and the resulting scores are then plotted on the Futures Triangle 2.0 figure, which can be created either manually or digitally. In the figure, scenarios are intuitively represented with lines of different colors. A template to facilitate the ranking process is provided in Table I (example with three group members and four scenarios).

- *Iterating scenario narratives using the Futures Triangle 2.0 figure*: Futures workshop participants/the groups are asked to use the Futures Triangle 2.0 figure to determine whether the scenarios generated substantially differ in their joint configurations of the three dimensions of the Futures Triangle. If they do, the foresight exercise is terminated. If they do not, i.e. the scenario lines are close or congruent, the workshop participants/ the groups are asked to reiterate the scenario narratives creation process by making the scenarios more polarized and then to repeat Step 4, i.e. to redo the ranking and to

Table I Template for ranking scenarios against futures triangle dimensions (example of three group members and four scenarios)

	Scenario	*Dimension*	*Score*		*Scenario*	*Dimension*	*Score*		*Scenario*	*Dimension*	*Score*	*Average*
Group member 1	Scenario 1	Pulls	xx	Group member 2	Scenario 1	Pulls	xx	Group member 3	Scenario 1	Pulls	xx	xx
		Pushes	xx			Pushes	xx			Pushes	xx	xx
		Weights	xx			Weights	xx			Weights	xx	xx
	Scenario 2	Pulls	xx		Scenario 2	Pulls	xx		Scenario 2	Pulls	xx	xx
		Pushes	xx			Pushes	xx			Pushes	xx	xx
		Weights	xx			Weights	xx			Weights	xx	xx
	Scenario 3	Pulls	xx		Scenario 3	Pulls	xx		Scenario 3	Pulls	xx	xx
		Pushes	xx			Pushes	xx			Pushes	xx	xx
		Weights	xx			Weights	xx			Weights	xx	xx
	Scenario 4	Pulls	xx		Scenario 4	Pulls	xx		Scenario 4	Pulls	xx	xx
		Pushes	xx			Pushes	xx			Pushes	xx	xx
		Weights	xx			Weights	xx			Weights	xx	xx

generate a new figure. This iterative process is repeated until the Futures Triangle 2.0 figure shows substantially different scenarios.

4. Case study

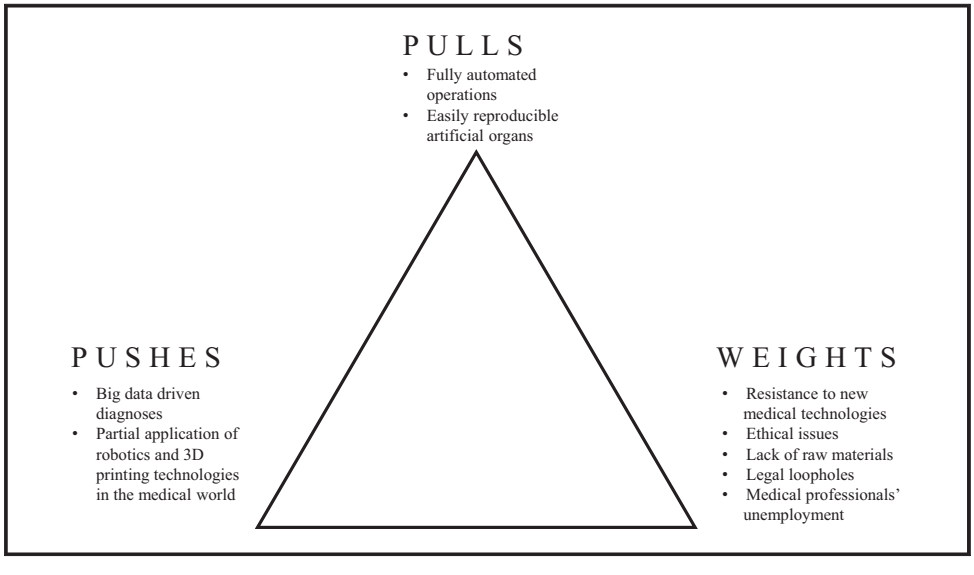
The Futures Triangle 2.0 was tested in the occasion of a full-day futures workshop that the author has given in September 2019 in the Department of Management and Economics of the University of Electronic Science and Technology of China (UESTC) in Chengdu, China. Workshop participants were 28 management faculties as well as local and international graduate students majoring in management, human resources management and management and construction engineering, some of whom were graduating from other universities in the city of Chengdu and other universities in China. The nationalities represented were China, Nepal, Thailand and Ghana. A total of 21 out of 28 participants were women.

The participants were divided in groups of three to five members according to common interests and walked through the procedure outlined in Section 3 as above. The different groups focused on different currently relevant focal issues including the futures of medical operations globally, the futures of transportation in China, the futures of payment in China, the futures of female leadership globally and the future of work in China. The 2 × 2 intuitive logic Scenario Planning approach was used (Chermack, 2011; van der Heijden, 2005).

It is here reported the output of a group that used 2 × 2 scenarios along with the Futures Triangle 2.0 to explore the futures of medical operations globally in 2050. The group performed traditional Futures Triangle mapping (Step 2), identifying fully automated operations and easily reproducible artificial organs as pulls; big data driven diagnoses, partial application of robotics and three-dimensional printing technologies in the medical world as pushes; and resistance to new medical technologies, ethical issues, lack of raw materials, legal loopholes and medical professionals' unemployment as weights (Figure 2).

The group then built four scenarios based on the two critical uncertainties: penetration of artificial intelligence (AI) in medical surgery and number of new diseases. The four scenarios generated were *Doctors sacked* (high AI penetration, low number of new diseases), a future where AI can effectively operate current human ailments and diseases,

Figure 2 Futures Triangle of the futures of medical operations in 2050



human lives are substantially extended, research and development decreases and the medical profession is almost completely inexistent barring the scholarly world, where it turns into philosophical inquiry and detaches itself from medical practice; *AI-doctors assembly line* (high AI penetration, high number of new diseases), a future where AI can effectively predict new diseases' outbreaks a well as their geographical locations, whereas medical professionals are still employed in brick and mortar surgeries; *Crisis* (low AI penetration, high number of new diseases), a collapse future where several new outbreaks endanger the survival of local communities, while the medical profession and policymakers are unable to cope with these new problems due to political, ethical and legal constraints; and a *Business as usual* future (low AI penetration and low number of new diseases). The 2 × 2 matrix along with the respective scenarios, is pictured in Figure 3.

The group finally created the Futures Triangle 2.0 figure (Figure 4) using the ranking procedure outlined is Step 4 as above, where the dotted lines in four different colors represent the average score (from 0 to 5) given by the group members on the resemblance of the four scenarios to the respective three dimensions of the Futures Triangle. In the figure, it is understandable at a glance that scenarios 1 (Doctors sacked) and 2 (AI-doctors assembly line) are closest to the visions/images of the future, i.e. the pulls; that scenario 3 (Crisis) is the furthest away from these while being mostly affected by the weights of the past and that scenario 4 (Business as usual) is unsurprisingly the closest to the pushes of the present. As the Futures Triangle 2.0 figure that the group generated showed that the scenarios are sufficiently different on the three Futures Triangle dimensions, the group did not reiterate the scenario narratives (Step 5).

The tensions between weights of the past and pushes of the present/pulls of the future that this group identified were many: the tension between the power of technological advancements and the prospect of medical professionals' unemployment; the tension between medical advancements and old worldviews about what the medical profession should and should not do, and the tension between new diseases outbreaks and slow legal and policymaking response systems, among the others. The Futures Triangle 2.0 method allowed the group to surface and discuss about these tensions in each scenario in a systematic manner.

Figure 3 2 × 2 scenario matrix of the futures of medical operations in 2050

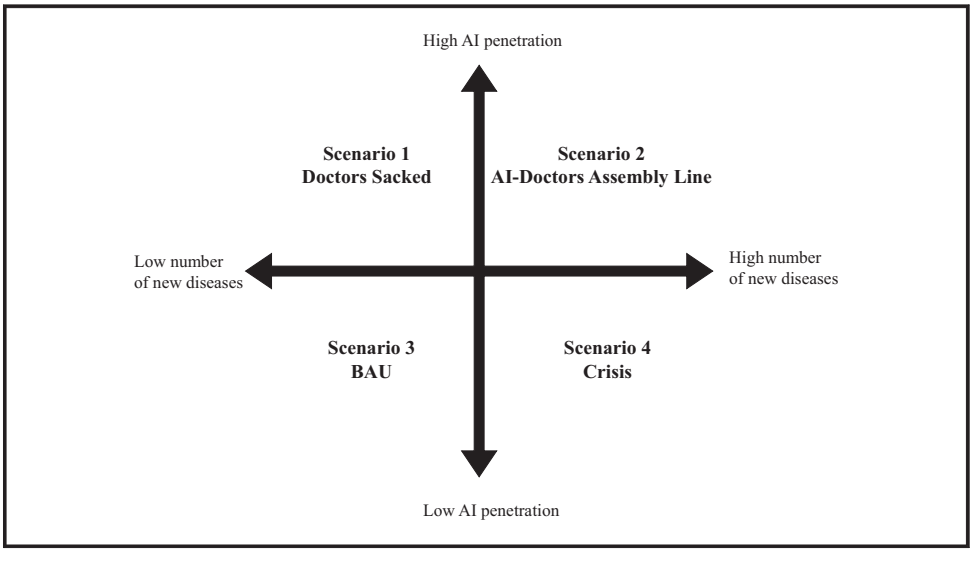
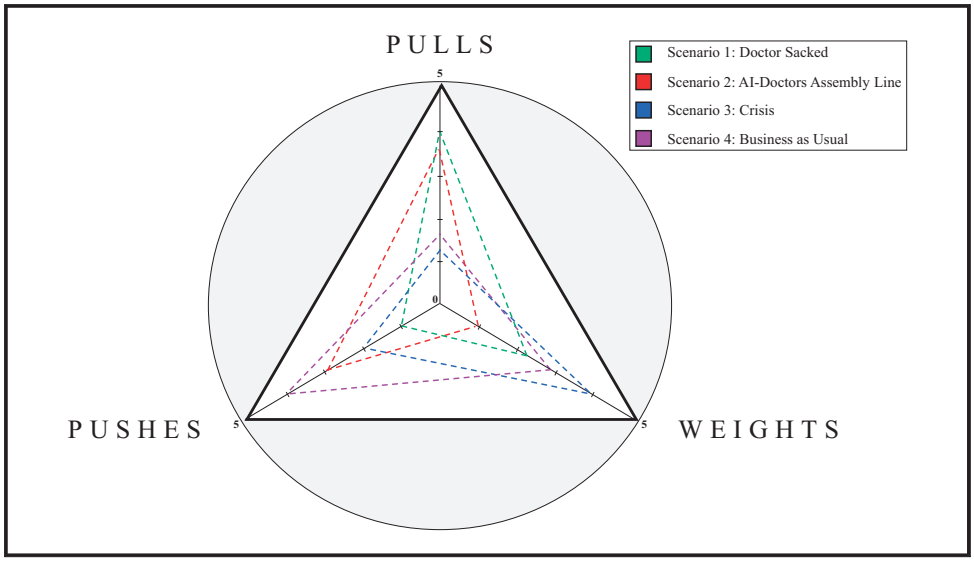


Figure 4 Futures Triangle 2.0 of four scenarios of the futures of medical operations in 2050



5. Discussion and conclusion

In a single figure, the Futures Triangle 2.0 presents a direct and intuitive visualization of three characteristics of scenarios generated in a futures workshop or futures research project: pulls of the futures, pushes of the present and weights of the past. The figure can be easily generated manually with pen and paper or digitally (interested readers can contact the author for a modifiable Futures Triangle 2.0 PowerPoint template).

The primary contribution of this methodological advancement to foresight scholarship and practice is the fruitful integration of the Futures Triangle with Scenario Planning via the iterative process of looking at the Futures Triangle 2.0 figure to improve scenario narratives. This allows the futures researcher/practitioner to understand how scenarios relate to each other on the three Futures Triangle dimensions at a glance, thereby quickly surfacing whether the scenarios are too similar and in need of change, or substantially different as they are ought to be. As such, this method encourages the systematic incorporation of the three dimensions, i.e. pulls, pushes and weights, into Scenario Planning, which could be otherwise overlooked, as well as a thorough discussion on these dimensions in each scenario, with particular focus on the valuable tensions between weights on the past on one hand and pushes of the present/pulls of the futures on the other hand.

A secondary contribution of Futures Triangle 2.0 to foresight scholarship and practice is its visual value. This involves two aspects. First, engaging and visually pleasant futures mapping tools are fundamental in conveying the importance of futures studies to new communities. Second, following the increase in impact of futures research and in number of scenarios produced by futures researchers and practitioners, it is paramount to develop mapping techniques to allow future researchers and practitioners to understand and compare previously produced scenarios without the need of reading through several scenario narratives. In the long run and once the futures literature will have reached a substantial body of knowledge, visual futures research will be of great help to researchers wishing to “meta-analyze” past scholarship.

It would be remiss not to mention that the methodological advancement here proposed has a limitation. Pulls, pushes and weights are in the plural form. As such, some of these could be in substantial conflict between each other while under the same dimension. When ranking scenarios against dimensions, the Futures Triangle 2.0 is a simplification and does

not take into account this subtlety. This problem could be overcome by generating several triangles, one for each subcategory of pulls/pushes/weights, when these happen to differ substantially.

Future research could find new ways to overcome this limitation, perhaps with the introduction of more refined advancements of the method. Future research should also focus on the systematic integrations of the Futures Triangle with CLA, a combination also often found empirically but lacking methodological literature.

Note

1. Causal Layered Analysis, or CLA, is a seminal foresight method introduced by Inayatullah (1998), which allows the analysis of a future-relevant issue of interest throughout four levels of understanding: *Litany, System, Worldview* and *Myth/Metaphor*, thereby deepening and problematizing the study of the futures.

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