Combining group decision support systems and participatory system dynamics to create strategic dynamic statements

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Abstract: The present research explores a Multi-method approach as a tool to support the strategic process. Since organizations' performance depends on the level of agreement between their daily-based decisions and their ultimate goals, create meaningful strategic statements is an important ingredient for organizations' success. Meaningful strategic statements summarize and communicate what are the priorities of the top management team and engage the staff in its consecration. However, the process to reach agreement about the priorities and the actions to reach them is not clear or straightforward. The present paper explores, as an alternative, at the design of this process by combining Group Decision Support Systems (GDSS) and System Dynamics.
In particular, this paper explores a modification of the scripts developed by Ackerman et.al.(2010) to combine two powerful and proved methods (SODA and System Dynamics as a framework to create a "dynamic strategic statement". This strategic dynamic statement aims to represent the real issues and goals of the management team at the same time it captures, at least on a high level, the dynamic of the business. The results of applying this Multi-method approach to the strategic analysis process are beyond their tangible outcomes and include the improvement of communication quality, change of participants preconceived ideas and the formation of consensus.

THE CHALLENGES OF IDENTIFYING STRATEGIES

Strategies are sets of decisions selected to achieve a desired state, usually a goal. Since many organizations recognize setting clear goals, developing coherent and innovate strategies and engaging the manager in the implementation as an important element for their success (Nutt, 2002), they create statements summarizing and communicating these goals and strategies to all their stakeholders. The strategic statements summarize where the organization wants to go and how it is planning to go there.

However, any relevant change in the organization only happens in practice when the strategic statements are used as reference point for daily-based decisions. In that sense, the strategic statements ultimate goal is to align priorities of individual with the goals of all organization as a whole. Since the strategies' success depends on its internalization by different organization levels, it is agreed that the successful impact of the strategic process can be evaluated assessing the degree of consistency between the strategic statements and the decisions regarding operations execution (Boyer & McDermott, 1999; Markóczy, 2001).

Unfortunately, in many organizations such consistency does not exist and daily decisions do not reflect the goals stated in the organizations' statement. Many managers perceive the strategic analysis process as disconnected from the real issues of the organization (Holland & Weathers, 2013; Ackermann and Eden, 2011). Therefore, the plans resulting from such process are, in many cases, meaningless for the top management team (TMT) and the staff in charge of implementing them (Ackermann & Eden, 2011). This disagreement between the strategic statements and the daily-based decision results in the formation of "silos" - groups with independent principles, priorities and systems inside the organization (Hennesey, 1999, p.34) – and in poor organization`s performance. Since the organization performance depends on the translation of strategic statements to practical decisions (Markóczy, 2001), this paper focuses on the question: *how to improve the organizations'' performance designing a process to align individual and organization priorities?*

In order to contribute to organizations' performance this research focuses on the process used to define the goals and strategies, stated in the strategic statements. The process of creating strategies, analyzing the organization and its environment is known as strategic analysis process. When the strategic analysis process is effectively conducted it is assumed the analysis process won't only produce good strategies, but also will engage the TMT and the organizations' staff in their implementation by aligning organizations' and individuals' interests. The present paper focuses its attention on how to design the strategic analysis process, particularly paying attention to some of it characteristics that can threat it performance. These characteristics are:

a) **Strategic analysis deals with wicked problems:** Strategic analysis deals with problems with vague definitions and high uncertainty regarding their solutions (Pidd, 2004) often labeled as "wicked problems" (Camillus, 2008). When manager face this kind of strategic problems, they have problems to agree about what is the problem or if it is a problem at all (Vennix, 1996). Wicked problems require intensive work from the managers, deliberating about "how to structure it before making quantitative analysis?" (Camillus, 2008). Moreover, the problem definition and the decision to tackle it will highly depend on the managers criteria and how they interpret the problem.

b) **Organization strategy takes place in complex dynamics systems:** Since organization performance depends on many factors, inside and outside the organization - detail complexity (Senge, 1990)-, interacting in many different ways - dynamic complexity (Senge, 1990)-, managers have troubles to accurately assess them. Complexity diminishes managers' abilities to make effective decisions because managers have troubles to accurately anticipate their possible consequences. In that sense, research has shown that due to cognitive limitations, human mind is unable to successfully predict the behavior of complex systems (Diehl & Sterman, 1995; Sterman, 1994). Therefore, trying to manage complex systems, policy makers can make decisions with unexpected and undesired results (Sterman, 2000).

Since this characteristics can threat the performance of the strategic analysis process if they are not properly managed, the present paper proposes to include the Multi-method intervention developed by Ackermann et.al.(2010) in the strategic analysis process. It is hypothesized the inclusion of this Multi-method intervention will contribute to:

a) foster consensus and reduce the inconsistency between strategic statements and real practice.

b) improve managers understanding of the complex systems where strategies will take place (Warren, 2008).

In addition, the inclusion of the Multi-method intervention can be used to produce a strategic dynamic statement. This paper understands strategic dynamic statement, as a strategic statement presented and communicated using a system dynamics model. Previous to present the process and results of the present study case, the Multi-method approach used in this paper is described.

A MULTI-METHOD APPROACH

This paper explores the Multi-method developed by Ackermann et.al.(2010) as alternative to support the strategic analysis process. In this Multi-method, Ackermann et.al.(2010) combines Strategic Option Development and Analysis (SODA), a traditional group decision support system (GDSS), with System Dynamics simulation models. The described benefits of combining these two traditional approaches are the creation of consensus and holistic perspective. Next, these two methods and the way they are integrated into the Multi-method are briefly presented.

Strategic Option Development and Analysis (SODA)

Strategic Options Development and Analysis (SODA) is an approach developed to "explore problematic situations" before making decisions, using cognitive maps as main tool (Ackermann & Eden, 2010, p.135).

SODA foundation is the integration of multiple perspectives in order to understand a situation (Ackerman & Eden, 2010). Colin Eden and colleagues at Bath University originally developed SODA as means of enabling a group to construct a graphical representation of a complex problem in order to understand it and explore possible solutions (Ackermann & Eden, 2010)

In that sense, SODA is based on the work of George Kelly, Prescriptive Constructive Physiology (PCP) theory (Eden, 1988). Kelly (1955) developed this theory as a way to help his patients to uncover their own "constructions" (the way they see the world). Kelly explicitly stated that each individual's "make sense of their world by comparing and contrasting events, experience and observations" (Ackermann & Eden, 2010, p.141). These interpretations, labeled by Kelly as "constructs" of the word, are used to make predictions of the expected consequences of actions and circumstances in the real world. To uncover the individuals' constructions, PCP theory uses a technique called The Repertory Grid Interview (Kelly, 1955). Eden and colleagues developed SODA

based on this technique and on the principles of the Prescriptive Constructive Physiology theory (Eden, 1988, p.2).

To help the teams understand each other's constructs, develop a joint construct and negotiate agreement on the further actions, Strategic Option Development and Analysis uses graphic representations known as cognitive maps. Cognitive mapping was designed to represent individuals' and teams' constructs about a problem (Ackermann & Eden, 2010). The maps are networks connecting nodes (constructs/statements) with links (causal arrows) (Ackermann & Eden, 2010).

Because cognitive maps not only capture the problem statements, but also their causes (explanations) and consequences (Ackermann & Eden, 2011, p.27), they are not only representations of the arguments about: *what to change?* and *why change it?* but also *how to do it?*.

Cognitive maps act as a powerful mechanism for portraying a comprehensive network of statements and relationships, which enables the development of a common understanding as participants make sense of perspectives of others (Ackerman, 2012, p.654). Ackermann and Eden (2011, p.27) claim that this process of exploring other's perspectives regarding the problem as well as many different options in the same picture helps to develop a common understanding.

System Dynamics

System Dynamics is a "method of dealing with questions about the dynamic tendencies of complex systems behavioral patterns they generate over time" (Meadows, 1976). System Dynamics uses concepts from servo mechanical engineering to represent complex systems in computer simulation models (Forrester, 1961). The main assumption of system dynamics is that the "persistent" patterns of behavior over time are results of the "causal structure" of the system (Meadows, 1976). Once this structure is understood, it is possible to find the leverage points of the system and modify them in order to improve its performance (Forrester, 1961).

Richardson (2011), summarizes the principles of System Dynamics presented by Forrester (1969):

Endogenous behavior and feedback loops: "feedback loops as the basic structural elements within the boundary" of the system (Richardson, 2011, p.220). System Dynamics approaches complex systems as endogenous and understands their behavior as the one arising from their internal feedback structure (Forrester, 1968, p. 4-1, 2). Feedback structures be simply defined as circular causal relationships (Figure 1). The feedback loops, usually involve at least one stock (level) representing an observable state and one flow (rate) representing an action over this stock based on its current state.

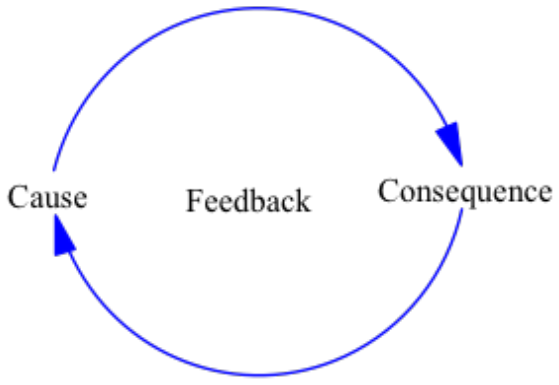


Figure 1. Feedback relationship.

Stock and Flows governing the system: System Dynamics made a clear distinction of two kinds of variables: stocks (levels) variables to represent accumulations and flows (rates) to represent activity (Richardson, 2011). Stocks represent the result of actions over-time; they can not change instantaneously and can only be affected by flows (Zock, 2004). The flows represent actions and can not be measured except as an average over a period of time. (Zock, 2004). The flows only change due to the effects of stocks or constants.

Integrating these two basic principles, feedback loops and stock and flows variables, System Dynamics is able to represent the causes behind the observable behavior of the complex systems. System Dynamics models are these causal representations in the form of diagrams, often, supported by computer simulations.

The present case uses Strategy Dynamics, one of the modes to conduct system dynamics (Andersen et al., 2007), to support the analysis of complex systems in the creation of strategic statements. In his books, Warren (2002, 2008), describes how the appropriate combination of graphs over time, causal diagrams and simulation models can help managers to gain understanding of their business and develop better strategies.

A dynamic strategy analysis seeks to answer at least three dynamic questions (Warren, 1999):

- Why the business performance has shown such behavior?
- How the current policies are driving the performance?
- How we can influence the performance?

In order to answer these questions, Warren (2005) proposes that formulation of strategies have to focus on: the relevance of the resources changing over time and the feedback structures. The future of the organizations depends not only of the decisions we make today but also of their "recent strategic history" (Warren, 1999, p.1). For this reason, to formulate effective strategies is important to understand why the organization is where it is now. This history of the organization's performance can be explained describing how it's strategic resources have overtime and how these resources influence each other (Warren, 2005). To represent and understand these explanations, Warren (1999) propose to use System Dynamics models and graphs over time. In this line, in this paper the model and it graphs over time constitutes the strategic dynamic statement created during the process.

Integrating methods

The idea of combining these two methods (SODA and system dynamics) is not new, in 1994 already proposed it and since them many practitioners have developed scripts with this purpose. Some examples are the scripts developed by Andersen et al. (2007), Howick et.al. (2006, 2008) and the scripts used in this paper developed by Ackermann et.al. (2010). The purpose of these scripts is combine the power of feedback loop structures, driving behavior, and computer simulations to

situations were problem definitions are poor and vague. In particular these scripts aim to: "(1) create a preliminary problem boundary using less than one hour of group time, (2) convene discussions with the group that explicitly link dynamic structure with system behavior, and (3) allow participants to 'zoom' between a micro and a macro view of system structure" (Ackermann et al. 2010, p.335).

To achieve these goals the Multi-method used in the present paper proposes to use SODA in the first stage of the process. In this stage SODA is used to bounder the problem and elicit participants' perspectives of the problem (Ackermann et.al.,2010). The workshop starts with an initial question about an organization issue and creates a causal map with the issues the participants find relevant to solve it. Participants link this issue in a means-ends network and refine it, excluding irrelevant issues and identifying goals and "most potent options" (Ackermann & Eden, 2010, p.166; Ackermann et.al. 2010, p.338). Ones the participants agree about the causal map, which represent the boundaries of the problem, participants draw graphs overtime (Andernsen & Richardson, 1997) of the issues they found more relevant (Ackermann et.al. 2010, p.340). Graphs overtime are used in this approach to link the traditional SODA causal with the dynamic perspective of System Dynamics (Ackermann et.al. 2010, p.340).

The second stage introduces System Dynamics model to help the team to analyze the problem and get insights of it structure (Ackermann et.al. 2010, p.338). To introduce help the team to analyze the complexity of the problem the facilitator roll-out a System Dynamics Model. This model elegantly introduce the participants to the "System Dynamics iconography and thereby fully grasp the insights from the diagram" (Ackermann et.al. 2010, p.340). These insights are supported of computer simulations that help participants to understand counterintuitive effects and change their initial assumptions.

Finally the participants work exploring hypotheses about possible alternatives and scenarios. To conclude they go back to the cognitive map to refine their previous perspectives and agree about the goals and means needed to achieve it. The result is a strategic statement that can be communicate and explain with a system dynamic model and graphs over time.

PROJECT BACKGROUND

Organization Background

Lisbonrooms[1] was founded in 2005 and is dedicated to provide housing solutions to international and exchange students in Lisbon, Portugal. Its' business goes beyond the supply of rooms and includes the arrangement of social and recreational activities. It´s owner and C.E.O. defined their goal as: "*provide a great experience of Lisbon to their customers"*. This small and agile company is organized in three hierarchical levels with a lot of empowerment among its staff.

After five years of successful growth Lisbonrooms[1] main strategic concern is how to continue growing in a sustainable way facing new competitors and expanding their operations to other cities. The quarterly free cash flow of the company is presented in Figure 2.

In order to improve their performance, the company C.E.O. wanted to create a clear and measurable strategy. To help the Lisbonrooms[1] to developed a successful strategy, the author invited them to participate in the present research and to include the Multi-method approach in their strategic analysis process. As result, the top management team of Lisbonrooms[1] participated in a series of two workshops to discuss: *"What are the strategic issues and opportunities we face for the upcoming three years?"*. In further sections more details about the process and the results of these workshops are presented.

Intervention team

The team participating in this intervention was designed considering the size of the group and the nature of the research. The team consisted of: one facilitator and two recorders.

In this context, the facilitator was responsible for leading the groups' discussion and the knowledge elicitation. "This person pays constant attention to group process, the roles of individuals in the group" (Andersen & Richardson, 1995, p. 114).

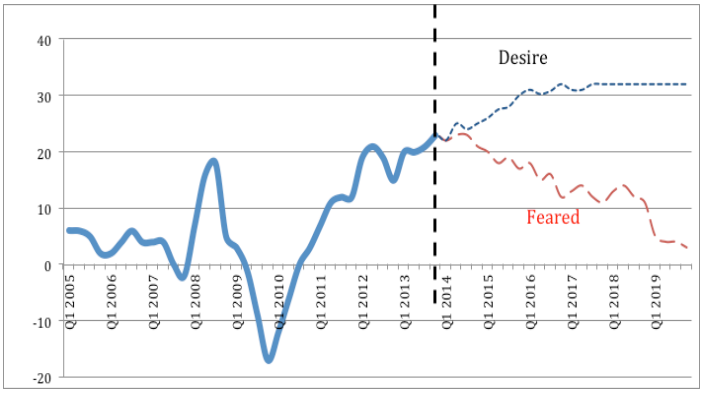


Figure 2: Quarterly free cash flow of Lisbonrooms[1] in '000 €

In this case the author served as facilitator and modeler. The author has broad experience working in strategic planning and system dynamics. Moreover, he has formal training in both methodologies (System Dynamics and SODA) with moderate experience conducting them with real clients.

The recorders were responsible for taking notes and documenting everything happening during the process (Andersen & Richardson, 1995). For this research two master students in system dynamics with previous experience in modeling performed this role. It is important to remark that the recorders were not aware of the final aims of this study in order to keep them neutral and objective in their notes.

Methodology

The current exploratory study case aims to assess the effectiveness of the Multi-method approach developed by Ackermann et.al. (2010) to help top management teams to formulate successful strategic statements. Effectiveness was evaluated in terms of the variables: (a) *Quality of Communication* during the process, (b) resulting *Cognitive Change*, and (c) *Consensus* about the resulting statement (Rouwette, 2011). These variables are identified as common and important contributions of different participative modeling methods (Rouwette et.al., 2009, Rouwette, 2011). In the present research, these variables are defined as:

Quality of communication: "quality of the conversational process between the various participants" (Akkerman & Vennix, 1997, p. 6).

Cognitive Change: understood as the change in participants previous believes about: a) how the system works and b) the organizational goals.

Consensus: general level of agreement about the organizational priorities (Markóczy, 2001, p. 1014).

Following the recommendations of the literature (Franco, 2007; Rouwette, 2011), this research used a triangulation in between different three data sources in order to evaluate those variables. These sources used were: observation of the process, questionnaires and interviews.

Observations

Two independent recorders took notes during the process paying attention to the patterns of communication during the process. To do so, recorders, classified the interventions of each participant based on its content as:

i) Taking initiative – e.g. attempted leadership, seeking suggestions, offering directions

ii) Offering positive ideas- – e.g. making helpful suggestions, attempting to problem-solve

iii) Being responsive to others – e.g. giving encouragement and support, building on ideas

iv) Being obstructive – e.g. criticizing, putting others down, blocking contributions

v) Clarifying/summarizing – e.g. linking ideas, checking progress, clarifying objectives/proposals

These observations were used to evaluate the discussion of the team during the process. These evaluations were useful to formulate hypothesis about how the elements in the model contribute to the final outcomes.

Questionnaires

The questionnaires were used to evaluate the perception of the participants regarding the variables (a) *Quality of Communication* during the process, (b) resulting *Cognitive Change*, and (c) *Consensus* about the resulting statement (Rouwette, 2011).

To do so, this research used a modified version of the questionnaires developed by Midgley et.al. (2013) to evaluate systemic problem structuring methods. This questionnaire was chosen because it constitutes a tool to objectively evaluate problem-structuring methods in terms of their perceived outcomes.

In addition to Midgley et.al.(2013) questions, the questionnaires also included questions regarding participants' ideas about:

a) the issues the strategic statement should be focusing on, and

b) relevant elements to consider during the workshop to solve the issue.

The presence and extent of Cognitive Change and Consensus was evaluated comparing participants' answers to these questions before and after the intervention.

Interviews

Finally, the research supports its findings with unstructured and semi structured interviews conducted before and after the intervention. The initial interviews of the process had the objective of get a general understanding of the company´s needs. The final interviews, on the other hand, were done to evaluate the Multi-method and its results.

Before the intervention, the author had an initial set of unstructured interviews and informal conversations with the C.E.O and staff of Lisbonrooms[1]. These pre-interviews helped the author to understand the current state of affairs and the company's experience of working with strategic process. Additionally, these interviews were also used to define the starting question of the workshop.

Project intervention outline

The intervention was designed based on the scripts of Ackermann et al. (2010), however some changes were done to adjust it to the purpose of the intervention. The general outline of the intervention is presented in Table 1.

Next, a brief description of the workshops and the work done by the team on each of them is presented.

Workshop 1 Definition of strategic statement

Five participants formed the group: the C.E.O, the commercial manager, the operations manager, the social media manager, the financial manager and the locations analyst.

The first workshop was based on the "issues management forum", developed by Ackermann and Eden (2011). The aim of this forum is to help the managers to build a strategic statement starting from the current issues in the organization, their causes, possible consequences and interactions. In particular, the scripts: "Getting issues and concerns out on the table" (Ackermann & Eden, 2011, p. 70) and "Issues as a Network" (Ackermann & Eden, 2011, p. 81) were used. Finally, a script, based on the original script of Ackermann et al. (2010), to build graphs overtime was used in the last part of the session.

Table 1

Project intervention outline

Stage	General Description	Product	Time devoted to it
Initial Interviews	The facilitator conducted the initial interviews with organization's staff and defined the start question of the workshop	Company background Start question	6 hours
Setting up	The facilitator and the organization's staff defined workshops, dates, participants and resources to use.	Workshops agenda Participants List	3 hours
Workshop 1	With support of the facilitator, participants built a cognitive map using Group Decision Explorer. This map included the main strategic issues identified for the future of the organization (Ackermann et al. 2011). Based on this map, the facilitator helped the group to formulate a preliminary strategic statement summarizing the issues represented.	Cognitive Map Strategic Statement	2 hours
Model construction	Working back-office the facilitator built a preliminary System Dynamics model based on the cognitive map built on the first workshop. The scripts of Howick et al. (2006) were used to transfer the cognitive map into a System Dynamics model.	System Dynamics Model	24 hours
Workbook iteration	In between the workshops, the participants worked on a workbook. The workbook is a "document with questions and diagrams regarding the content of the workshops" (Vennix, 1996, p. 128). The questions in the workbook included: closing loops, identifying variables, building graphical functions and providing numeric data. The information provided by the workbook was used to validate, modify and calibrate the preliminary model.	Workbook	12 hours
Workshop 2	With support of the facilitator, the team explored the assumptions of the preliminary strategic statement they built in a high level System Dynamics model (Ackermann et al. 2010). Working with the model, participants tested different assumptions, explored scenarios and decided to adjust the preliminary statement.	Quantitative simulations Policy alternatives Final strategic Statement	2 hours
Interviews	At the end of the intervention some of the participants in the workshops were interviewed to elicit their perspectives about the effectiveness of the Multi-method used.	Participants perceptions	6 hours.

The workshop started with a quick introduction by the facilitator and the introduction to the starting question:

"What are the strategic issues and opportunities we face for the upcoming three years?"

To answer this question participants provided issues they considered relevant to answer the questions while the facilitator clustered them (Figure 3). Then these issues were carefully analyzed by the group and connected to construct a means-ends network. These connections between issues represent relations like "this issue is consequence of " or "this issue may lead to". The final result is presented in the Figure. 4.

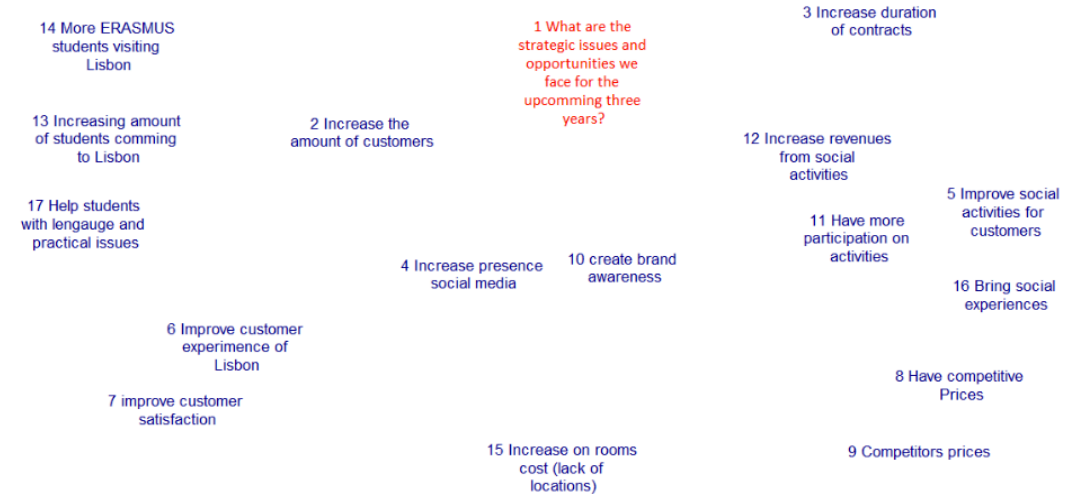


Figure 3. Issues causal map

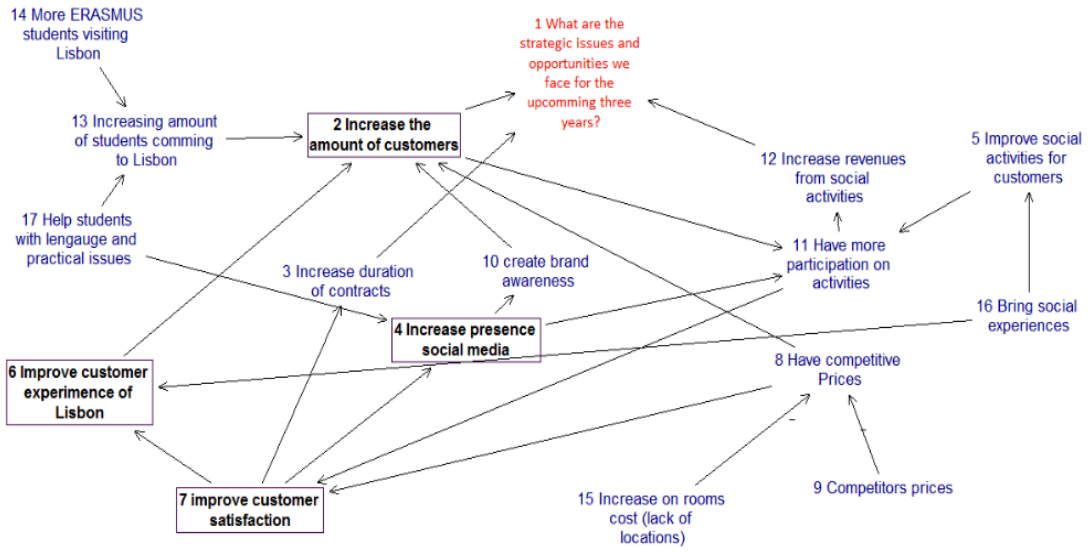


Figure 4. Issues network map and strategic priorities

The network created by the group was used to analyze which should be the organization's goals, which sere the central issues and which external factors could influence the expected results. Next the group draw graphs over time describing how the main issues have developed in the past five years and how they will expect them to develop in the next five years.

Finally the facilitator summarized the issues represented in the causal map on a strategic statement and discussed with the participant

Working behind scenes

A preliminary System Dynamic model was built with the information gathered during the first workshop and the scripts developed by Howick et.al. (2006). These model was presented to the participants before the second workshop using a workbook. A workbook in this context is a document containing information and questions about the model used to speed up and support the modeling process (Vennix, 1996).

Four of the six participants returned the workbook back with their comments and answers. Using participants' comments and information the preliminary System Dynamics model was completed. The final result is shown in the Figure 5.

Workshop 2 Adding dynamic to the strategic statements

The System Dynamics model built was presented and discussed in the second workshop. The model was unfolded during the session, explaining the assumptions and main findings to the participants.

Once participants understood the structure of the model they worked with help of the facilitator, testing different policies and scenarios in the model. During these process participants discovered some counterintuitive behaviors and realized some of the assumptions they made during formulation of the preliminary strategic statements were incomplete.

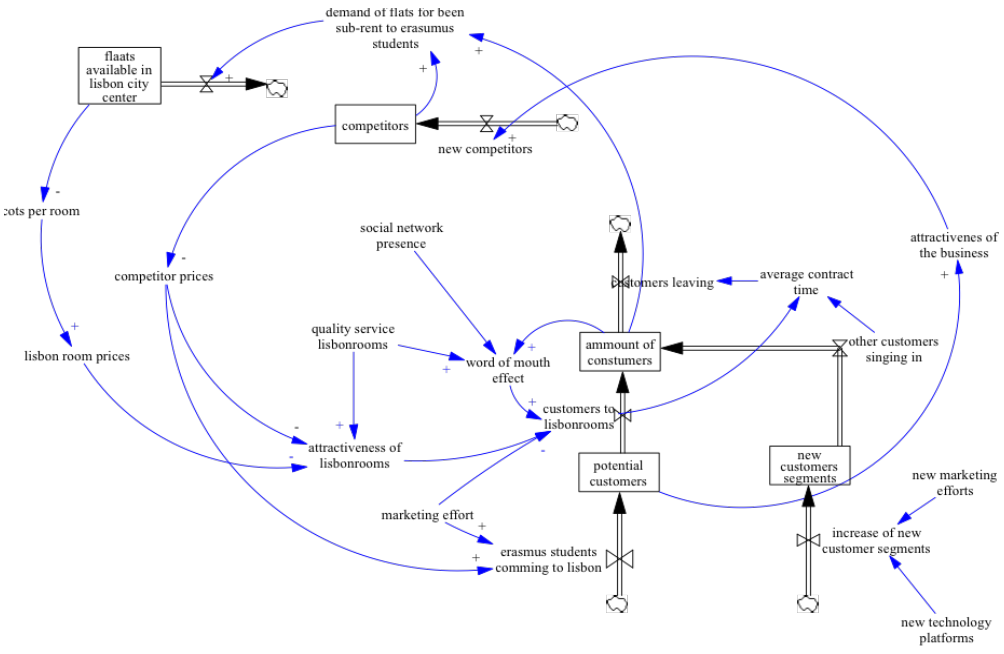


Figure 5. System Dynamics model presented at the beginning of the second workshop.

Finally the group went back to the original the group reshaped the preliminary strategic statement and formulated the definitive one. The changes in the strategic statement were included in the System Dynamics model transforming it into a formal representation of the strategic statement developed by the group, or in other words, into a "strategic dynamic statement".

RESULTS

The results of the intervention can be divided in tangible and intangible. The tangible results include the strategic statement, the System Dynamic model and the cognitive map the group built during the workshops. The intangible results include the achievements of the group in terms of (a) Quality of Communication (b) Cognitive change and (c) Consensus.

Tangible results: the strategic dynamic statement

The main insights of the model were the two feedback loops presented in the Figure 6. When the company invested in Marketing, the marketing initially was translated into more customers for Lisbonrooms[1], but in long term it increased the attractiveness of the business for other people increasing the amount of competitors and lowering the prices. Low prices mean more students decide to move to Lisbon because it is cheap, increasing even more the attractiveness of the business and producing more competitors. However, those students who want cheap rooms are not interested in Lisbonrooms[1] and are not going to rent from them. The reinforcing loop increasing the competition and lowering prices reduce Lisbonrooms[1] opportunities to continue growing and eventually can kill it business.

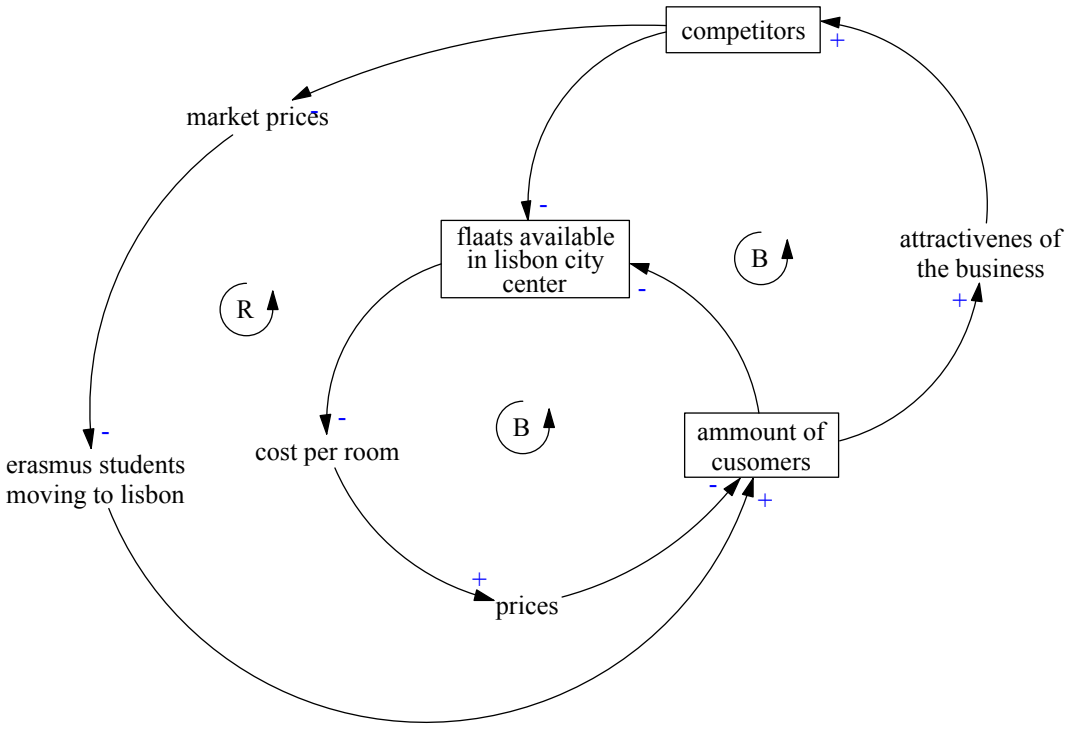


Figure 6 Main Loops in the model

In addition the short-term increase ofr the amount of customers of Lisbonrooms[1] and the growth in the number of competitors reduce the amount of new flats available in the zones Lisbonrooms[1] is interest in. Each time it is harder and more expensive to find flats to increase the amount of offered rooms. This balancing loop constraints continues growth of Lisbonrooms[1].

Intangible results

Quality of communication: participants agree that communication during the workshops was better than the one they usually have in their normal meetings (Table 3 Question 5.1). This result was validated by the results of the interviews where they indicated they perceived the communication in the group was open and free. However, the observations show the conversation was dominated by one of the managers, especially during the first workshop. This manager by himself contributed with the 37% of the interventions in the first workshop and 27% in the second one. These results are presented in the Figure 7.

Cognitive change: Four of the five participants reported a change on the issues they identified the strategic statement should be centered on. In addition, all the participants changed their mind about what issues were important to be included in the strategic statement. These results are presented in Figures 8 and 9.

These results were supported by participants' answers to the question 2.4 and 2.9 regarding the contribution of the workshops to change their previous ideas about the problem. In their answers to these questions all the participants agreed and 3 of 5 strongly agreed (Table 3) the workshops contributed to produce cognitive change.

Table 3

Aggregated results

Variable	Question			S.A	A	N	D	S.D	NA
Communication Quality	If you compare these meetings, using causal diagrams, with ***normal meetings or conferences*** in which you discuss *similar problems*, would you say these meetings:								
		5.1	Result in a better communication between participants?	1	**4**				
	To what extent do you agree or disagree that the workshop has helped you to …								
	Exchange of ideas	2.1	Propose forward ideas for discussion	1	**4**				
		2.2	Recognize that there are many different points of view	1	**3**	1			
	Openness	3.4	Workshop discussions were free and open	1	**3**				1
		3.5	My views were not listened to				**3**	1	1
	Common Language	4.5	Does the workshop help you to understand better colleagues from other areas of expertise?	1	**2**	**2**			
		4.6	Does the language used during the workshop was understandable and clear?		1	**2**	1	1	
	Verbal dominance	3.3	There was too much talk			1	**3**	1	
	Freedom	3.12	I felt pressured to agree with the group		1	1	**2**		1
Cognitive Change		2.4	Recognize that there are many different points of view	**3**	2				
		2.9	Challenge your previous way of thinking about the initial question of the workshop	**3**	2				
Consensus		4.4	To which extent did you agree with the final result of the workshop	1	**3**	1			

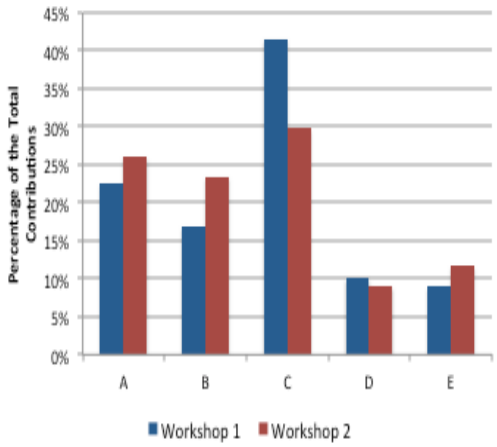
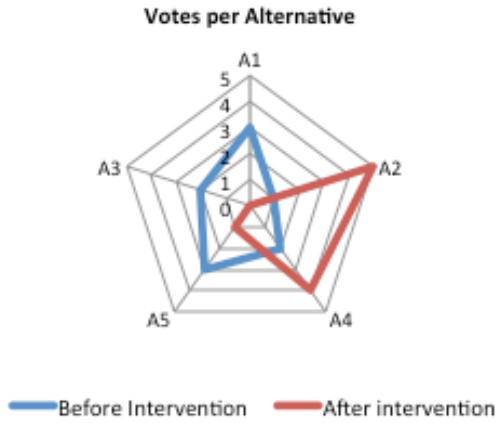


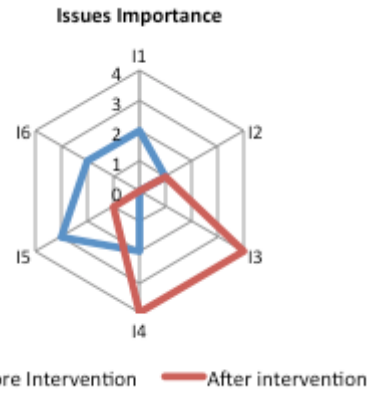
Figure 7 Percentage of contributions by



Note: (A1) Invest on Marketing (A2) Develop new markets and segments (A3) Improve the team work inside the organization (A4) Focus on real state market's opportunities (A5) Improve the service's level

Figure 8 Vote for each alternative proposed by the participants (2 votes by participant)

Consensus: in their answers to the Question 4.4 (see Table 3) participants stated have achieved agreement in the final strategic statement. These results are substantiated by the votes they gave to each solution proposed (Figure 8). Like Figure 8 present, participants agreed at the end of the workshop to focus the organization Moreover, inn two strategies. These strategies are closely related with the loops identified in the System Dynamics model and presented with the tangible outcomes.



Note: (I1) Team-work, (I2) Service's Quality, (I3) Real State Market, (I4) Expansion and internationalization, (I5) Governmental regulations, (I6) Attractiveness of Lisbon

Figure 9 Degree of perceived issues' importance in the discussion (2 votes by participant).

DISCUSSION

Why participants changed their mind? and about what they did it?

Almost all the participants change their original answer about the issues the strategic statement should be concentrated on. Before the intervention, almost everybody propose different and divergent ideas of which should be the focal point of the organization. More interesting, no one observed the need to focus on developing more products or alternative service. Nevertheless, after the intervention all the participants agreed to focus only on a) develop new markets and segments and b) focus on real state market opportunities. These two solutions are clearly supported by the simulation results produced by the feedback loops found in the model.

When participants tested their solution in the system dynamics model, it showed that continue investing in the same segment of customers will help and encourage competitors at the same time it cuts back the offer of cheap apartments to be rented by the company (see Figure 6). Based on those results, participants acknowledged the threat of focus their efforts on marketing strategies. The alternative suggested to tackle this threat was to expand the company customer bases and develop new markets.

Moreover, the other alternative high ranked by the participants was related with the real state market. Ignored at the beginning of the intervention this alternative gained participants' attention when the model showed the number of attractive and available apartments to sublease was a limited resource. Even thus far it has not been an important constraint, the model show it will become in the short term an important restriction to Lisbonroms1 objectives. In order to subdue this threat the group decided to create a special real state team devoted exclusively to search the best deals in the real state market.

In summary, like the change in participants'' proposed solutions can be clearly relate to the loops and dynamics discover in the model, can be concluded that the System Dynamics model contributed to change their mind. In that sense, participants change their mind because they find inconsistencies between their previous assumptions and the consequences presented by the simulation model.

Do participants agree with the final strategic statement?

Yes, they did and their answers to the questionnaires and the interviews support this conclusion. In the questionnaires, participants answered they have reached agreement about the resulted strategic statement. Figure 8 shows they actually did it and most of the participants selected independently the same strategies after the workshops.

Moreover, in the final interviews, participants reiterated their support to the strategies selected. For instance, some of the participants stated:

"We should find new markets, developing a real state strategy to capitalize the current economic crisis and rent or buy cheap flats in other areas of Lisbon" (Financial Manager)

"It is clear that we should expand to other markets… think the best way to do so is developing a new pricing strategy, our prices are competitive only among a reduce segment of customers and if we low the prices, we will be able to reach more people" (Location analyst)

To summarize, the Multi-method of Ackermann et al (2010) contributed to the strategic analysis process by the formulation of a strategic dynamic statement and the creation of consensus about the strategies and goals of the organization.

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NOTES

[1] The real name of the company was substituted by "Lisbonrooms", due to confidentiality

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