

# **SENSEMAKING OF REAL ESTATE MANAGEMENT USING REAL OPTIONS AND SCENARIO PLANNING**

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Presented at the HaCIRIC conference, 19-20 September 2012, Cardiff

## **ABSTRACT**

Healthcare across the world is facing many uncertainties. In Dutch healthcare, a recent policy change forces health organisations to deal more efficiently with real estate which makes flexibility more necessary. In order to support real estate managers in decision making in flexibility, we developed a method combining scenario planning and real options. This method is aimed to enhance sensemaking on both the consequences of future uncertainties on the organisation which influences real estate management, and on the types of flexibility needed to enable adapting to these changes. In this way, better real estate strategies can be developed. Through testing the method in one pilot case, this study shows sensemaking had taken place. Based on these results, propositions are developed focusing on the relation between real options, backcasting scenario planning and sensemaking.

## **KEYWORDS**

Backcasting, real estate management, real options, scenario planning, sensemaking

## **INTRODUCTION**

In various European countries, marketization has received a new impulse with new policies implying a more business-like operation of health organisations, resulting in an increasing importance given to efficient and professionalised real estate management. This implies a need for the strategic management of real estate in which current and future demands

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within the organisation are met from the viewpoint of the asset owner and the asset user, the investor and the operator. An important issue in real estate management of health care is flexibility, necessary because of the uncertainties surrounding healthcare (Blanken, 2008, de Neufville et al., 2008, Rechel et al., 2009). A promising approach to provide a more differentiated insight into how flexibility can be created, its' value and consequences is the real options theory (Gehner, 2008). A real option is defined as a right, not an obligation, to exercise an option, and derives from financial options (Black and Scholes, 1973). Myers (1977) applied options to *real* investments: so-called real options (McGrath et al., 2004, Adner and Levinthal., 2004, Dixit et al., 1994, Amram and Kulatilaka, 1999). Real options provide value, through the ability to be flexible, which increases as uncertainty increases. Scenarioplanning is another tool to gain insight into uncertainties and facilitate in developing strategies to deal with these. Although both concepts have been identified as useful within the scientific world, in real life construction and real estate projects one is very reluctant to use this approach. The methods have neither been institutionalized within organisations.

However, since the future is very uncertain and flexibility and risk management is a key strategic issue, developing tools to cope with these uncertainties is very important. Therefore we developed a tool with both real options and scenarioplanning. In this study we investigate how this tool can facilitate in awareness raising and sensemaking on uncertainties and the consequences for needed flexibility. These insights should aid in adopting the methods more in practice.

Barnett (2005) proposes a framework to identify real options. Considering the many uncertainties which health organisations face, the various stakeholders within organisations should determine what this means for their organisation and which types of flexibility are needed. Sensemaking is the process needed to turn awareness of needed flexibility into concrete real estate strategies, and 'involves turning circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action' (Weick et al., 2005, p. 409). Therefore we pose the following research question: Does scenario planning and real options enhance collaborative sensemaking of multiple stakeholders of a health organisation on dealing with future changes and developing a real estate strategy with flexibility to adapt to these changes?

The aim of our study is to explore whether real options and scenario planning enhance sensemaking on uncertainties affecting the organisation, and resulting in the development of real estate strategies to mitigate these uncertainties. The concepts of scenario planning, real options theory and sensemaking are elaborated in the theoretical framework. The method section elaborates on the variables which we derived from literature to measure sensemaking and addressed in interviews. The outcomes are presented in result section, as well as findings from the workshop itself. We conclude with design propositions for enhanced sensemaking.

## **THEORETICAL FRAMEWORK**

### ***2.1. Real options analysis***

Real options analysis (ROA) (Adner and Levinthal, 2004a and 2004b; Leiblein, 2003) is promising for three reasons. First, real options, as a way of thinking, helps real estate managers recognize that uncertainty is not inherently negative, and can even provide value. Secondly, many uncertainties in health are unpredictable and therefore unable to quantify. ROA provides a language on flexibility which facilitates communication between different decision making levels. Based on Fichman et al. (2005), Sommer and Loch (2004), Winch (2010) and Amram and Kulatilaka (1999), in Table 1 the various types of real options are described with examples of application in construction projects. Amram and Kulatilaka (1999) provide a taxonomy of real options within which we can place the abovementioned real options.

Table 1: Types of real options and examples of application in construction projects

<i>Type of real options (Amram and Kulatilaka 1999)</i>	<i>Real options e.g. Trigeorgis (1993) Sommer and Loch (2004), Fichman et al. (2005)</i>	<i>Project management (De Neufville 2008)</i>	<i>Examples of application in real estate construction projects in health</i>
<i>Waiting-to-invest option</i>	<i>Defer</i>	<i>'on' the project</i>	<i>When there is uncertainty on governmental regulation, the project might need deferral</i>
<i>Growth option of a market</i>	<i>Growth, switch function</i>	<i>'in' the project</i>	<i>Other demands can necessitate switch function of expansion/shrinking of the real estate</i>
<i>Flexibility options</i>	<i>Growth, scale up and down, switch function</i>	<i>'in' the project</i>	<i>When demands of the organisation change: expand the building, scale up or down and switch function</i>
<i>Exit options</i>	<i>Abandon</i>	<i>'on' the project</i>	<i>When finance cannot be obtained, the project should be able to abandon</i>
<i>Learning options</i>	<i>Select</i>	<i>'on' the project</i>	<i>Select multiple architects to obtain knowledge on the best one</i>
<i>Irreversible investments</i>	<i>Stage</i>	<i>'on' the project</i>	<i>A construction project is irreversible. By staging the project after each stage a g-no go moment is implemented</i>

## **2.2 Scenario planning**

Scenario planning is a management tool to develop strategies for uncertain futures (Schoemaker, 1993; Van der Heijden, 1996). Scenarios are plausible descriptions of the future, not predictions, which highlight critical sources of uncertainty which the organisation should be aware of and adapt by means of strategy development. We apply exploratory scenarios to describe the context in which organisations in the future might act and what consequences this will have for real estate. In our too, participants need to describe future images of real estate that would fit within the various scenarios. On the other hand, we also want to develop strategies, which can be done by means of normative scenarios, which describe how that future situation, described in exploratory scenarios, is reached. A method to develop strategies to reach a future situation is

backcasting. It is an approach which implies the reasoning back from a desired image of a future situation, and the identification of what changes are needed to create this image. Robinson (1982 in: Dreborg, 1996) defines backcasting as: "...a concern, ...with how desirable futures can be attained. It is thus explicitly normative, involving working backwards from a particular desirable future end-point to the present in order to determine the physical feasibility of that future and what policy measures would be required to reach that point" (Robinson, 1990). In case of real estate: which flexibility is needed to reach from the current lay-out to the potential future lay-outs.

### ***2.3 Sensemaking***

By means of sensemaking, people in an organization give meaning to the events and actions in an organization. By means of knowledge creation, performance can be improved (Choo, 1996, Wright, 2005). This implies that communication is important since this makes that 'situations, organizations and environments are talked into existence' (Weick and Sutcliffe 2005, p. 409). The aim of our method is such a means to make flexibility into existence, being a 'sensemaking support system', as called for by Weick (1993). Real estate managers can be in difficult situations since they have to meet all interests of the organisation while these interests can be conflicting. For instance, demands from users can mean an exceeding of the budget set by the financial department. When making these consequences explicit to the users, they might gain understanding why certain demands are not feasible. The definition of sensemaking implies that it occurs retrospectively. However, in this study we would like to apply the concept both retrospectively and on future decisions by means of scenario planning. The retrospective part is used to determine whether already real options have been created or that certain decisions have obstructed the opportunity to create certain options. Scenarioplanning should lead to sensemaking in the sense that participants make sense of their potential need for flexibility in the future, what type of flexibility and how it can be created. By means of backcasting, ROA should make sense of how real options can be created. Framing is an important concept in sensemaking, since decisions cannot be made independent of their context. Framing is the term for labelling the meaning that individuals hold for events, which is influenced by their context and experiences. The frame influences how individuals act: they make a map of events with cause and effects in which they have a role, interpret these and take action based on that map

(Drazin et al., 1999). The contextual scenarios function as the frame in which decisions have to be made. Examples of real options in other cases add to the sensemaking since they clarify the concept. They are presented in a structured way, in order that the way of thinking easily can be followed and applied to the own situation.

## ***2.4 Variables enhancing collaborative sensemaking support***

Based on the above, we identified various variables that show collaborative sensemaking (Table 2).

### **2.4.1 Sensemaking of flexibility**

Awareness of a certain problem is helpful to share knowledge on this issue and find solutions. Besides awareness, the definition of uncertainty might differ since each person derives its' necessity from their own perspective, i.e. frame. By means of discourse, facilitated by our workshop, frames on flexibility might shift and common understanding will take place, and eventually lead to collaborative sensemaking. The need for flexibility might be different before and after the workshop since perceptions change. If the need for flexibility is apparent for stakeholders, but also measures have been taken, then apparently sensemaking has taken place.

### **2.4.2 Sensemaking with real options**

Real options are thought to enhance sensemaking on flexibility further since it can give flexibility hands and feet because it implies various aspects which can be checked. The concept of real options should first be understood before it could be useful as a frame for sensemaking. By making participants of the workshop aware of the concept, they will be more likely to recognise real options and label them as such in other situations (Kahneman, 2011). Flexibility should then be labelled as real options. Besides, inherent to sensemaking with real options is that the participants understand the various aspects of the concept and its' implications for the organisation.

### **2.4.3 Sensemaking with scenarioplanning**

Exploratory scenarios act as a frame for the future: one first has to understand and agree upon which driving forces influence the organisation and thus real estate. Awareness of uncertainties that might

influence the organisations is a first step in sensemaking, i.e. taking action to deal with these uncertainties. Sensemaking should take place leading to an joined picture of real estate within these scenarios. Assuming that this future picture is different from the current situation, backcasting takes place by reasoning back from this picture to the current situation and determining which real options are needed to reach this future state. Collaborative sensemaking should lead to agreement on actions to be taken with regard to flexibility. Since there is no possibility to evaluate after a few years whether the real options have been applied, the most direct way to obtain information on sensemaking is to ask the participants for the opinion on these methods.

#### **2.4.4 Sensemaking support**

According to literature, real options are useful in understanding the value of flexibility, by making explicit the difference between having and not having an option. However, since its' application and thus action stays behind, apparently sensemaking has not happened. Above that, in real estate management in health it has not even been considered. Our workshop as a sensemaking support should first create understanding of flexibility, real options and scenarios and subsequently facilitate sensemaking.

Table 2: Variables enhancing collaborative sensemaking support on flexibility by real options and scenario planning

		<i>Independent variables enhancing sensemaking</i>		
		<i>Flexibility</i>	<i>Real options</i>	<i>Scenario planning</i>
<i>Dependent variables: operationalisation of influence on sensemaking</i>	<i>Awareness/ recognition</i>	<i>Shared definition of flexibility Shared perception of need for flexibility</i>	<i>Labelling of real option to events/ decisions/ measures</i>	<i>Awareness of consequences of uncertainties on flexibility</i>
	<i>Sensemaking</i>	<i>Measures taken for flexibility</i>	<i>Shared understanding of real options</i>	<i>Opinion on scenario planning</i>

## **METHOD**

### ***3.1 Interviews and workshop***

By means of a workshop we applied the concept of real options in combination with scenario planning. The subject of our workshop was a construction project of a Dutch hospital, called the Mountain hospital in this story. In order to test whether sensemaking had taken place and as part of the sensemaking process, we conducted interviews with all five participants before and after the workshop. We chose for interviews rather than surveys since there would be more chance that the researchers would receive response, and interviews provide room for clarification of the answers. The influence of the independent variables on the dependent variables listed in Table 2 were tested in the interviews. The way these variables were ‘measured’ is shown in Table 3. Questions before and after the workshop related to the various elements – flexibility, real options and scenarioplanning - of the workshop, in order to test whether these elements resulted in enhanced sensemaking, which was the goal of the workshop. Observations during the workshop also added to information on sensemaking. The workshop included nine people, of which five were employees from the hospital which are involved in the new construction project or the maintenance of real estate. Three

participants were facilitators and one participant was involved in the research as expert. Various interests of the hospital were represented in the workshop, since they fulfilled the following functions: construction coordinator, technical service employee, healthmanager, member of patient council and head finances. Their involvement with the project differed since only the construction coordinator and the financial controller were involved in decisionmaking concerning the new hospital, the other participants were sometimes involved when they were asked for advice.

### ***3.2 Subject of the workshop***

The current hospital was built in 1975 and during the course of time the building was extended on all sides. The current hospital was obsoleted and inefficient. It was a regional hospital with loyal patients who choose not to go to larger hospitals in the surrounding larger cities. However, the management fears that this situation will not hold much longer, also because these larger cities are constructing new and appealing hospitals. The initiative for the new hospital already dates from 2007, but because of problems with the financing of the project, the construction had still not been started. In the same time, various new developments forced the hospital organisation to rethink the design. During the time that the research took place, the project was still postponed since all strategies to obtain financing failed.

Table 3. Variables that contribute to the sensemaking support, as measured by the interviews

	<b>Sensemaking, operationalized by:</b>	<b>Pre-workshop measure</b>	<b>Post-workshop measure</b>	
<b>Workshop elements</b>	Flexibility	Shared definition of flexibility	Definition of flexibility	
		Shared perception of need for flexibility	Need for flexibility	
		Measures taken for flexibility	Questions on financial, in the process and physical measures taken	
	Real options	Labelling of real options	Degree of agreement with statement on real options considered in various potential situations	
		Shared understanding of real options*		Degree of agreement with statements on real options
		Ideas from respondents to enhance sensemaking		Tips from respondents to trigger people to think about real options
	Scenario planning	Awareness of uncertainties	Questions on consideration of changes in economy, governmental policy and technological changes	
		Opinion on scenario planning		Opinion on scenario planning for shared understanding for flexibility
		Opinion on real options and scenario planning		Opinion on usefulness of scenario planning and real options
	<b>Goal</b>	Sensemaking	More convergence of definitions	
Need for flexibility might have changed or might be more differentiated				
Increased insight in the concept of real options				

\* The participants of the workshop were not familiar with the concept of real options in advance of the workshop

## **RESULTS**

### ***3.1 Sensemaking of flexibility***

Since the aim of the method is to increase insight and thus sensemaking on the need for flexibility, we addressed various issues related to insight into flexibility of the respondents.

#### **3.1.1 Shared definition of flexibility**

In order to find out which types of flexibility are seen as most important by different stakeholders, and whether this would be influenced by the workshop, we asked for the definition of flexibility before and after the workshop. The answers reflected the discipline of each participant. The healthmanager mentioned the ability to change functions and target groups within the various departments. The location and logistics of departments is an important factor here. The co-worker technical services mentioned the ability to cooperate with all different stakeholders while the construction coordinator emphasised solutions for technical flexibility. The member of the patient council also referred to the ability to change and add functions, such as a desired location for revalidation near the hospital. The financial controller was the only participant that referred to the process, where she defined flexibility as the ability to adapt to changes by changing the strategy on the short term. This is recognised as one of the hurdles in the adoption of scenario planning (Burt and Van der Heijden, 2003). After the workshop, their definitions of flexibility had not been changed. There was a slight convergence on the definition in the sense that two respondents extended their definition of flexibility to which was also mentioned in the workshop.

#### **3.1.2 Awareness of uncertainties**

Most participants mentioned various measures that were taken to enable adaptability of the building as a result of economic changes. Adaptability would be enabled by designing a marketable building. Since the trend is a decrease in expenditures in health, the new building is constructed to deal with decreasing healthcare provision. Also measures to decrease energy costs are considered. Only the current governmental policy was considered and not potential policy changes. All respondents mention installations as a means to adapt to changes in ICT. Also additional heat and cold sources are made for expansion in energy consumption. All kinds of investigations had been taken place to find out about best ways to deal with issues such waste deposit. The ambition has been there to increase efficiency and reduce costs in the long run. Participants also mention that this inventiveness is a result of the location of the hospital; there had always been a lack of finance and the organisation needed to be creative. The opinion on the importance of flexibility was not changed after the workshop, except for the

member of the patient council for whom a lot of information provided in the workshop was new. The technical service co-worker mentions that in the first plans which were six years old, less flexibility was considered in the plans. In the new plans, there was more attention for demountable walls and the location of supporting walls which enables the changing of functions.

### **3.1.3 Shared perception of need for flexibility**

According to all respondents, the need for flexibility was high. The uncertainty of the amount of healthcare that can be provided by the hospital is so very uncertain that either departments might have to close, or additional floors should be built. The innovation of technologies is very rapid; within eight years the radiography department was renovated four times.

### **3.1.4 Measures taken for flexibility**

Technical measures been taken are related to technical installations and efficient logistics routes. This is connected to changes in the clinical process; it has been recognised that some interventions don't need to be done in a surgical room. Decisions are based on various researches and visits to other hospitals. Lay out of departments are such that parts can be separated and arranged as offices. In addition there will be flexible working places instead of individual consultation rooms. Working at home is another measure. Flexibility in the process was reached by means of a go-no-go decision moment after each phase. The healthmanager was on the assumption that the new outpatients department could be built in stages which would not influence the primary process. However, this was denied by the construction coordinator who said that this was impossible because of safety reasons.

## ***3.2 Sensemaking of real options***

### **3.2.1 Labelling of real options**

Respondents were asked to what extent certain options were possible, given certain situations. The answers and responses are shown in Table 4. The aim of this question was to trigger the participants to already think in real option terms. On the other hand, it gives insight into whether organisations already use real options, although perhaps unconsciously.

Table 4: Statements on real options already used and consequences for the primary process  
 Legend: 1= I do totally not agree, 2 = I do not agree, 3 = neutral, 4 = I agree, 5 = I totally agree

<b>Statement: Imagine that...</b>	<b>Question</b>	<b>Health manager</b>	<b>Technical service</b>	<b>Construction coordinator</b>	<b>Patient council</b>	<b>Controller</b>
1. ...if finance is not arranged yet than...	...defer the project	3	3	2	3	3
	...defer without negative consequences for the primary process	1	1	2	4	2
2. ...if it is impossible to obtain finance than...	...abandon the project in the agreement with contractor(s) against certain conditions	3	3	1	3	3
	...abandon without negative consequences for the primary process	1	1	1	2	2
3. ...if the bank has demands considering the realisation of the construction...	... speed up the project in the agreement with contractor(s) against certain conditions	4	4	2	3	3
	... speed up without negative consequences for the primary process	4	5	2	4	4
4. ...if the final design does not meet the demands...	...phase the project and implement go-no go moment in the agreement with contractor(s)	5	4	1	4	4
	...phase the project without negative consequences for the primary process	3	5		2	4
5. ...if extension is necessary in the future...	...extend the building in the agreement with contractors	4	4	5	5	4
	...extend the building without negative consequences for the primary process	2			5	3
6. ...if nursing departments have to be turned into offices...	...switch functions in the building in the agreement with contractor(s) against certain conditions	4	4	5	4	4
	...switch functions in the building without negative consequences for the primary process	3	4	4	4	5
Average answer		3,1	3,5	2,5	3,6	3,4

The construction coordinator is least optimistic on the real options applied, while he is most involved and therefore his answers are probably most accurate. The member of the patient council knows the least and is most optimistic, which shows his trust in the project team of the construction project. The answer to question 4 by the construction coordinator, the first question, is misinterpreted and therefore deviates from the other answers. The real options to switch and grow were considered to a large extent since the organisation is aware of the

uncertainties related to the amount of patients and types of healthcare that will be provided in the future. Options to defer and abandon are considered less which is understandable seen in the light that the urgency for a new hospital is high. These last two options also have negative consequences for the primary process. However, in order to keep control on expenses and the design, the option to stage is given high importance.

### **3.2.2 Shared understanding of real options and the sensemaking support**

Besides the controller, all respondents were not familiar with the concept of real or financial options. In order to find out whether respondents gained more knowledge on the concept, and to see whether sensemaking had taken place, the statements shown in table 5 were presented in an interview after the workshop.

Table 5: Statements on the applicability and knowledge of real options and scenario planning.  
 Legend: 1= I do totally not agree, 2 = I do not agree, 3 = neutral, 4 = I agree, 5 = I totally agree

Statements	Health manager	Technical service	Construction coordinator	Patient council	Controller
1. Scenario planning is a good method to estimate the need for flexibility of the organisation in the future	4	4	5	5	4
2. The workshop gave more insight in types of flexibility that can be used	2	4	2	5	3
3. The workshop made me think more on how the future organisation might look like.	5	4	4	2	4
4. Flexibility has value which increases when uncertainty increases	4	4	4	2	2
5. The concept of real options gave me more insight in types of flexibility which can be used	2	4	2	2	4
6. The concept of real options made me think (more) on conditions necessary to create and exercise real option	3	4	2	2	4
7. The workshop made me think (more) on the costs and benefits of flexibility	4	4	4	3	2
8. The workshop made me think (more) on tuning needed flexibility on the future instead of maximizing flexibility	2	4	2	4	4
9. The workshop made me think (more) on the consequences for various stakeholders when exercising real options	4	4	4	4	4
10. I think that real options are a necessary means to communicate on flexibility between various stakeholders within the organisation and cooperating parties when <u>designing</u> a new building	4	4	5	4	4
11. I think that real options are a necessary means to communicate between parties when <u>constructing</u> a new building	4	4	4	4	4
12. I think that real options are a necessary means to communicate between parties when <u>operating</u> a new building	4	4	5	4	4
13. I think that the use of real options makes negotiating on flexibility with contractors easier	3	4	2	5	4
14. The use of scenario planning and real options is complementing		4	4	4	4
15. The workshop didn't bring any new ideas in relation to the future of the organisations and flexibility	2	2	2	2	2
16. Flexibility has been considered too little in the plans for the new developments	1	2	3	2	3
17. There is too much flexibility in the plans	1	2	3	2	2
Average answer	3,1	3,6	3,4	3,3	3,4

In general, the respondents agreed on the usefulness of scenario planning and the workshop in general to discuss each other's assumptions on the project. Since the hospital is small and the development of the project already had been going on for several years, there had been a lot of consultation. Nevertheless, from the workshop it appeared that there were still some misalignments between assumptions between the construction coordinator and the health manager. Since the member of the patient council was not involved in the construction project, it made him aware what considerations and decisions had to be made by the project team. The controller realised that they themselves hadn't considered some things which they should. The answers on question four varied; one respondent for example thought that with less financial means, also less investments should be done in flexibility. This reflects the more short term view of only looking at investment costs and no long term costs. In contrast, another respondent thought that flexibility has always value, irrespective of the degree of uncertainty. Others agreed, although one respondent mentioned that the hospital will not be turned into an office tower since this is not very realistic. This remark is in congruence with the scenario planning method, which implies that flexibility should be applied to a certain limit: the range of plausible scenarios. Statement seven was answered in the same light: respondents were triggered to think more on costs and revenues of flexibility, which they already did according to the controller. The statement that the concept of real options provides more insight into various types of flexibility was neither unanimous. The dominating opinion was that various types of flexibility were well thought through and therefore real options had no additional advantage. The result of the workshop was that the consequences for various stakeholders when exercising real options had become more obvious for the respondents. Real options are recognised as a necessary means to communicate between stakeholders within all project phases, including the operation phase. Most respondents think that flexibility has been considered in the right amount in the new plans, although the controller has a more nuanced explanation: the needed flexibility differs between stakeholders and the design could have been more optimal. However, then the personnel management should have been adapted. Managing personnel can also be recognised as a real option (Husted, 2005, Wang and Lim, 2008) but we didn't go deeper into that. The controller also added that flexibility in financial terms can never be sufficient.

## **DISCUSSION AND CONCLUSION**

Flexibility is a broad term and various stakeholders have different demands regarding flexibility (Olsson, 2006), now and in the future. Shared understanding of these interests and the consequences for flexibility should enable the development of a real estate strategy in which flexibility is applied in the most

optimal way. Stakeholders have different frames on how to look at flexibility which means that they might have different definitions about it. Sensemaking is about 'labelling and categorizing to stabilize the streaming of experience' (Weick et al., 2005, p. 411). Therefore, we assumed that the categorization of flexibility by means of real options would create a common language to talk about flexibility. However, according to the respondents this categorization was not extra helpful. Perhaps because the need for flexibility 'in' the project, i.e. demountable walls, extra foundations, was already crystallized by the project team. On the other hand, it appeared to the researchers that real options 'on' the process were not all very clear; the phasing option was recognised as an important option, but the options to defer and abandon were less considered. Because of lack of time we could not continue to discuss the investment and exercising of these real options. For that reason, a workshop setting was useful to introduce the various concepts, but this was too short to provide enough time for participants to think them over and enable sensemaking. As Tversky and Kahneman (1974) state, people have limited processing capacity. Confirming this theory, one suggestion from the participants was to provide the participants before the workshop with information on concrete examples of real options as a preparation for the workshop, in order to learn on the concept and have time to have it 'sunk in' in the mind. This is also in accordance with research of Qu and Hansen (2008) on requirements for supporting collaborative sensemaking, who state that explicit representations are made by individuals to assist the sensemaking process. The concrete examples could fulfil this function for the various individuals to enhance collaborative sensemaking. This leads to the following design proposition for improvement of the method:

*Proposition 1: Concrete examples of real options from other cases, which are sent for preparation to the participants of the workshop, increases sensemaking on the concept of real options and makes it easier to apply these to the own situation for strategizing.*

One of the definitions of sensemaking is the understanding of events afterwards. The difficulty with future flexibility is that one has to deal with future uncertainties. We reasoned that the method of backcasting could imitate the process of sensemaking by the participants, by picturing an imaginative future hospital and reasoning backwards what could and should happen to reach this future situation. Unfortunately, there was lack of time to elaborate on this during the workshop. Although we could not test this proposition, reasoning from the purpose of backcasting and the concept of sensemaking, we have the following design proposition:

*Proposition 2: Backcasting is a method to artificially stimulate sensemaking in order to enhance strategizing.*

Since this was only the first test round of the method, we would like to have more test rounds to improve the method and develop more design propositions. Other test cases with different contexts would be interesting to investigate since it is expected that the amount of uncertainty these organisations face, influences the way they approach flexibility. Furthermore, since the ultimate phase in sensemaking is acting, an evaluation of real options being actually created and exercised should be done.

Options are embedded in an organizational context, and thus option valuation must consider behavioural factors and organizational design issues (Garud et al., 1998). In particular, future research should look more closely at how options are noticed, how they are pitched to upper management, how they are maintained in the organization, and, in general, how they make their way through the real option realization process.

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