REAL OPTIONS AND SCENARIO PLANNING AS A WAY TO GAIN INSIGHT INTO FLEXIBILITY IN HEALTH CARE REAL ESTATE MANAGEMENT, A FIRST EXPLORATION.

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ABSTRACT

Real estate management in health care faces many uncertainties, and more specific in the Netherlands even more because of changing regulations regarding the financing of capital costs. Therefore we propose, based on literature and a survey, to use scenario planning in combinations with the real option approach to deal with these uncertainties. The survey shows that limited use is made of future uncertainties and options for flexibility in the responded Dutch hospitals. Real options provide insight for real estate managers into opportunities for flexibility when making strategic decisions in real estate management, such as choosing for a building organisation form.

KEYWORDS

flexibility, project coalition, real options, scenario planning

INTRODUCTION

Real estate managers in health care often have little experience with building projects since for example a hospital has a lifecycle of 30 years. Besides, the primary process depends greatly on the building. Most health real estate is very specific in use, which increases the risk when the primary process changes or demand doesn’t meet the supply. Therefore, flexibility is needed. We propose to use a method that provides insight into the impact of choices made, such as the choice of the procurement of building projects. This method regards flexibility as real options. In combination with scenario planning, an organisation is able to develop robust real estate strategies. This method has been applied in several sectors, but is unknown in the management of health care real estate. The aim of this research is to discover how choices within real estate management can be

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regarded as real options. Our first exploratory action to answer this question is conducting a survey.

Our research focuses on the relationship between building organisation forms, contract forms and the real options that decision makers in healthcare have. The type of project coalition is strongly related to the contract form and the way collaboration between parties takes place. The attention for types of project coalition and contract form is a result of the attention it receives in literature, the so called “contractcentred approach” (Madhok 1995).

This paper first describes the professionalization trend of real estate, and then it explores literature on the real option theory, scenario planning and the application of these two. The results of the survey are presented and conclusions are drawn on the applicability and usefulness of the proposed method.

1.1. Uncertainties and the need for flexibility

As stated by Miller (1992), there are three areas in which businesses have to deal with uncertainties. These are external uncertainties, uncertainties within the sector and uncertainties within and specific to the organisation. In the Netherlands, the healthcare sector until recently could not be regarded as a private industry because it relied on governments’ finance. However, this all changed since the national government established a liberalisation policy. The new regulations implemented in 2008 were of major influence: the abolishment of remuneration for all capital costs by the national government. Capital costs include the interest rates and writing-off. Instead, all costs which are made by a health care organization are incorporated in the price of a treatment, paid by the health insurance companies. In this way, health organizations become dependent on their production and suddenly profit-making becomes important. The idea behind this is an increase in customer directness, more efficient management, and more efficient real estate management (Raad voor de Volksgezondheid en Zorg, 2006). However, the final content of these regulations is still uncertain. Besides, since the former Netherlands Board for Healthcare Institutions (Bouwcollege) doesn’t guarantee loans from banks, it becomes more difficult for healthcare organisations to obtain loans, or only against a high risk premium. The uncertain economic circumstances (credit crisis) add to this problem, which is an additional uncertainty.

Other uncertainties are more predictable, such as demography. Social trends can be recognised, such as individualisation, information and internationalisation, but how and to what extent these trends have influence on health organisations is difficult to predict. New insights into the healthcare profession as well as technical innovations have a major impact as well. Real estate that is flexible in
many ways is needed to deal with the problems resulting from uncertainties. The recent developments also demand more competences from real estate managers in health care. Especially when starting a building project. Decisions made then have a large impact on the real estate strategy during the lifetime of the building.

1.2. Corporate real estate management

The Dutch policy regarding health care liberalisation forces health organizations to make a professionalization step in real estate management. The professionalization of real estate took place in other sectors as well. Peter Krumm (1999) described this for multinationals and Pity van der Schaaf (2002) compared the development for public buildings in different countries. Corporate Real Estate Management is the management approach that deals more strategically with real estate. The main issue in CREM is that real estate is recognised as a fifth capital asset besides employees, capital, technology and information. This means that real estate is not simply a cost generating component of the organisation, but it also has to facilitate the primary process and can even create added value. An optimal real estate strategy is accomplished when the future and current supply and demand of real estate is met. De Jonge et.al. (2008) describe various methods to develop such a strategy, see Figure 1.

![DAS framework](image)

Fig. 1. DAS framework de Jonge et.al. (2008)
Besides costs, a knowingly taken decision on real estate considers the end-user and the organisational strategy (Evers, 2002). In order to do this, a long term real estate strategy has to be developed, which is aligned to the organisational needs and goals, expressed in the organisational strategy (Nourse, 1993). On a day to day basis the operational level should be considered as well, thus real estate strategies act on both the short and the long term. To cover these aspects CREM operates at the managerial levels of facility management, general management, asset management and cost control. Further, CREM looks at a complete portfolio instead of individual buildings. A hospital can be regarded as a portfolio of functions. CREM deals with issues such as the type of ownership of buildings (e.g. sell, rent or purchase) and outsourcing of services. Management of real estate becomes a more demanding task, leading to the appointment of real estate managers within the organisation.

Krumm (1999) and De Vries (2007) distinguish the various added values of real estate. One important added value is flexibility. However, it is questionable how flexibility can be improved. Flexibility is a broad concept with different definitions. One way to deal with flexibility is the real option theory, developed by Myers. The basic idea of the theory is that flexibility (the real option) is valued when trading stocks. Merton and Scholes won their Nobel price with real options, which have a financial background. Some authors explain that real options also can be used as a way of thinking to obtain insight into how opportunities for future flexibility can be created by current actions (Miller and Lessard, 2001; Ford et.al., 2002; Miller and Waller, 2003; Alessandri et.al., 2004; Cornelius, 2005; Winch, 2010). First, this paper proposes to view flexibility in health care real estate management from a real options perspective. Second, it gives an idea of how real options can be translated to the context of real estate management in health care. The theoretical background of the different concepts are elaborated further. The analysis of a small survey provides an inventory of what options are perceived by health organisations in the care. The paper concludes with a discussion on the applicability of real options, and recommendations for further research.

1.3. Project coalitions and flexibility

The management of real estate is roughly divided into three main topics, namely the realisation, maintenance and exploitation of a building. Within real estate management many actors play a role, where the role is dependent on the project coalition form and the contract form. The project coalition says something about the way in which the tasks in the building process are divided between the different participants in the building process. Project coalitions being distinguished are

- Traditional,
Design and Build (D&B),
- Design, Build and Maintain (DBC),
- Design, Build, Construct and Maintain (DBCM),
- Design, Build, Construct, Maintain and Operate (DBCMO)
- Design, Build, Construct, Finance and Maintain (DBCFM)
- Design, Build, Construct, Finance, Maintain and Operate (DBFMO)

The contract form includes the legal recording of the contractual agreements between the participants, based on the project coalition (Leidraad aanbesteden, 2010). The project coalition and the contract form under which the construction, maintenance and exploitation are defined, determines already what kind of flexibility can be realised in the project, since this is intrinsic in the type of collaboration. However, some types of flexibility can be additionally determined and might work out differently than in first instance was agreed upon.

Blanken (2008) identifies several types of flexibility that can be used when analysing the performance of a contract form. These are design, service and financial flexibility. They apply to the strategic, tactical and operational level. To improve the possibilities for contractors to have more flexibility, Blanken recommends making concession contracts more complete by considering contingency adaptability, as argued by Luo (2002). However, it happens that agreements made in contracts still do not result in the desired effects. Faems et.al. (2008) state that additional factors are important related to contracts. The first one is to consider, besides complexity, the actual content of a contract. Secondly, comparing the application of the contracts with the design of the contract shows that contracts can be applied in different ways. Lastly, in most researches only attention is paid to the relational processes at the managerial level while treating the operational level as a black box. Concluding from this, looking only at completeness of contracts is not sufficient to create flexibility. In relation to contracts other factors are important, but also the insight into how flexibility can be created by making certain decisions which are written down in contracts.

It is assumed in this research that flexibility is a result of decisions made before or during a building project. The research aims to obtain insight into what decisions enable flexibility and which factors influence the outcome of flexibility. This insight has two advantages: first, the client can better consider what options there could be and use these to anticipate on future developments. Second, Dewulf and Bright (2008) state that in the cooperation between client and contractor, “the incentives in public-private partnerships are easily quantifiable and able to be captured in terms of cost-containment over time for the private partner; and more nebulous and difficult to achieve in terms of quality gain-including asset flexibility-over time for the public authorities”(p. 136). Real options help to make flexibility more explicit for clients. It improves the position
of the client towards the other party. In the following paragraph the concept and applicability of real options is further elaborated.

### 1.4. Real options

Investments can be made now and in the future. However, future is uncertain. A real option is the opportunity to invest later on in an asset by doing a small investment now that is not higher than the potential value of the asset in the future. Real options can roughly be divided in call and put options: to invest or not to invest. Having these opportunities creates flexibility in the assets to invest in. Other options are the option to abandon, defer, alter scale, switch or compound options (Ford, 2002).

The idea of real options was first launched by Black and Scholes (1973) who applied them to finance. Trigeorgis (1996) and Dixit and Pindyck (1998) extended the idea to real options. The real option approach is used in a variety of industries, described both in financial as in management literature (Leiblein, 2003). A distinction can be made between a quantitative and qualitative approach. We argue in this paper for a qualitative use in the context of health real estate management for two reasons:

1. Real options as a relatively easy to use decision support aid.
2. Uncertainties with low predictability exclude quantitative methods.

These reasons are elaborated below.

Triantis and Borison (2001, p. 10) make a distinction between different ways in which real options are used in decision making. 1) as a way of thinking: ‘real options are used primarily as a language that frames and communicates decision problems qualitatively’, 2) as an analytical tool: they are used ‘primarily to value projects with known well specified option characteristics’, 3) as an organizational process: ‘real options is used, as part of a broader process, as a management tool to identify and exploit strategic options.’ Usability 2 has a quantitative application and its use requires specific knowledge on quantitative models, which is not always present in organisations. Since in first instance we think health organisations mainly need insight into their opportunities and the conditions to operationalise them, we find a useful application of real options by using it for the purpose of usability 1, ‘a way of thinking’, also called ‘the option lens’ (Bowman and Hurry 1993). We follow the approach of Miller and Lessard who state that in option literature often the risk is “priced”, while they see more usability in the ‘managerial process of recognizing, shaping, and realizing these options’ (p. 442).

The process of discussing and thinking about real options could also result in the (unintentional) use of real options ‘as an organizational process’, usability 3. The purpose is to obtain insight into what effects certain investments have on the
future use of real estate. Real estate management has close relation to the organisational strategy. Therefore thinking about real options and how to create these options in the collaboration within a project coalition also necessitates thinking about the organisational strategy.

Health organisations deal with uncertainties that have both a higher and lower predictability and a higher and lower impact. Knight (1921) makes a distinction between risks and uncertainties. Risks are predictable and quantifiable. The risk is defined as the multiplication of the probability times the effect of a certain event. Uncertainties however, cannot be predicted but only estimated. Alessandri (2004) illustrates the effect of the type of risk or uncertainty on the decision making process. In case of a high predictability quantitative methods are applicable. When the risk is high as well as the uncertainty, managers rely on judgment and experience to justify decisions that have acceptable outcomes. All methods are applicable, while the qualitative approach of real options is useful in case of uncertainties with a high impact and low predictability. Because of these uncertainties, the combination with scenario planning is useful, which is described in the following paragraph.

Fig. 2. Alessandri et. al. 2004

1.5. Scenario planning and decision making

Miller and Waller (2003) propose to use a combined method of real options in a qualitative way and scenario planning. The aim of their method is managing risks across ‘the full range of exposures across a firm’s portfolio of businesses’. The method prescribes the way to identify uncertainties that could affect all the businesses of a firm.

Due to uncertainties it is difficult to assess the future. Scenario planning is a method to cope with these uncertainties. The health assets have to facilitate the primary process of the organisation at all times. As a result of the aforementioned uncertainties, the primary process of health care is expected to change. Not only is it important to study various plausible scenarios in order to develop a strategy, the process of developing scenario is also important (Jonge, 2008). It is a guideline and a tool to support decision-making during the design and
implementation of the strategy for several reasons (Chermack, 2004): first, it limits the problem of bounded rationality in decision making. Second, in decision making there is a tendency to consider only external variables, while scenario planning implies that internal variables are encountered as well. Third, the stickiness of information transfer is reduced since much communication between decision makers is needed. Shared understanding is a result of this and a natural thinking tool for use in a strategic conversation (Van der Heijden, 1999).

Increased interaction between decision makers and the involvement of external, remarkable people increases original thinking and the eruption of new insights. Friction of information and knowledge is increased for the same reason. Finally, the aim of scenario planning is to change the mental models that include decision premises or policies. Changing mental models is necessary since strategies are developed based on scenarios, but the mental model lacks to comprehend uncertainties and their impact. By means of interaction mental models are changed. Van der Heijden calls these a strategic conversation, in which a shared language and understanding is developed among decision makers. This enables opening up their minds and considering new possibilities. An analogy can be made with the options reasoning- the sense making activities that cause decision makers within a firm- that are mentioned by McGrath et.al. (2004). The existence of a potential opportunity is called by Bowman and Hurry (1993) a shadow option within the bundle of resources tied to a firm. Shadow options could be converted into real options.

Scenario planning is a useful tool for real option planning for three reasons. First, scenarios can help to identify options in the future. Second, it gives insight in the moment to decide when a shadow options should be converted into a real option. Third, scenarios can provide an important input in the process of evaluating strategies (Cornelius, 2005).

The topic of scenario planning has not been incorporated in the survey that is presented in the next section. Since there was no need to consider future uncertainties before the changing regulation in 2008, scenario planning was not very common. An example of current application of scenario planning is provided in box 1. Gelre hospital is the first hospital being build under the new regulation and shows that scenario planning is a useful method. Its’ possibilities could be further explored when combined with the real option way of thinking and applied to real estate management. This could be done by linking health care concepts to the effects on real estate. Real estate strategies including project coalitions could be assessed in the different scenarios and evaluation criteria defined in terms of flexibility. This enables the formulation of the different real options under different scenarios.
Our research is aimed at exploring how real option strategies can be used for strategic decision-making in health care real estate management. The first question we have is in what way real options are applicable in real estate management of health organisations. For this purpose a survey was undertaken. Within literature the definition of real options can be found. However, the aim of the research is to discover how the analogy of real options can be applied to real estate management in a practical way. For this purpose workshops and surveys are useful. Within a workshop the focus is more on the process which has a learning effect for the participants. However, we start this research with a survey to inventorise the current situation regarding project coalitions and real options in the Dutch health sector. The results are presented in this paper.

Within the real option theory the following options can be distinguished: abandon, defer, alter scale, switch or compound options. The presence of these options gives insight into the flexibility in a project coalition and a contract.
the survey we asked whether these options were available during the realisation and exploitation phase of the project.

The survey was divided into four parts with the following subjects:

1. General questions about the organisation: size, turnover, number of beds, organisation of real estate management within the organisation, number of locations, age of the building(s)

2. Respondents were asked if they had plans for renovation or building development. We asked for the type of project coalition applied, for obtaining knowledge on the link with the real options. We asked if multiple buildings were combined in one project since this might create options. The option of changing function was investigated by asking if other functions can be located in the building. In order to know more about the background of the choices made, we asked for consideration made by the organisation on external level, industry level, organisational level and project level.

3. The third part contained questions related to real options within the project coalition. We asked whether the client made agreements with the contractor on options to stop, make adaptations to the design, expand, shrink and postpone the project, and extend and shorten the duration of the project. The respondents were asked to quantify the extent on a scale of 1 to 5. Whether and to what extent these options were exercised was also answered by the respondent on a scale of 1 to 5. The same scale was used for questions on options during the exploitation phase of the project. Respondents were asked to what extent they had considered the option to enlarge or diminish the building in technical sense, the option to change spaces within the building and the economic feasibility of the technical flexibility. We also asked for the extent of realisation of the options and the apparent feasibility.

The survey was spread out among hospitals. We will conduct the survey in the care sector as well. There were 14 respondents of which 8 were employed in a hospital. We collected data from 7 hospitals.

RESULTS

The hospitals that responded the survey were all planning or realising a building project. Most buildings date from 1980-1989 or older. Most buildings are being planned to be renovated or newly build and projects range from 14 to 80 million euro’s. One third of the buildings has ones been renovated. The project coalition most applied is traditional. Others are DB, DBM, BM for technical installations and the building itself traditional, DBM with optional F and O.
We asked how many locations the organisation owns, which range between 1 and 4. The questions were filled in with one specific location in mind. The following paragraphs present the results of the survey. The survey was divided in three parts, each representing a different potential real option. This same division is used under the headings. The first real option is the way in which building projects are procured: each building separate or within one project. The second type of option is the design of the building: the possibility to change the use of the building. The third type of option can be found in the collaboration with the contractor during the exploitation and realisation phase. In each paragraph the results are compared with findings from literature.

1.6. Options in a portfolio strategy

In literature we find that establishing a portfolio of construction projects in one project has advantages since it provides economies of scale (Bult-Spiering, 2006), and might offer the probability to negotiate more real options with the contractor. Bult-Spiering shows that in Germany in the education sector, projects of different organisations can be combined. However, the survey showed that this was rarely done within the cure. However, within the care this approach could be more evident since often these organisations have many locations. We want to investigate this during the following survey.

1.7. The option of marketable buildings

Another real option in real estate is the possibility to use the building for another use than it was meant for in the first place. An additional investment has to be made for this opportunity, but it prevents vacancy of the building which will cause even more costs. The survey showed that most buildings are suitable for other uses. These uses are other type of healthcare and research, hotel and/or care on commercial base, office, school, apartments, nursing departments, nursing home departments, birth-/carehotel, shop. These alternative uses serve the following goals: preservation of income, high ability to push off, increase of production and renting.

Respondents were asked what measures they had taken to change the function of the building, both technical and organisational. The measures from which they could choose were the footprint and foundation, the technical installations, the excess roads, organisational and financial. Measures to change the function were taken on technical installations. Organisational measures were taken in five cases while footprint and foundation, excess roads and financial measures were taken respectively in 2, 3 and 3 hospitals. Interesting for future research would be to
examine why other than technical measures are less taken, together with the potential real options of the measures.

1.8. Options in realisation and exploitation phase

We distinguished several options during the realisation and exploitation phase. To ensure that the understanding of buildings phases and project coalitions were equal among the respondents, we provided a scheme with buildings phases and a list of definitions of the building organisations forms. Based on the main real options described by Amram & Kulatilaka (1999) and Trigeorgis (1993), we asked to what extent, on a scale of 5, the client made agreements with the contractor on the following options during the realisation phase: option to stop, option to make adaptations to the design, option to make the project smaller or larger, postponing, and reducing or extending the duration of the project.

The survey also contained questions on planned outsourcing of facilities, which could be done in an integrated project coalition. In literature (Bult-Spiering and Dewulf 2006) is stated that more flexibility can be enforced within integrated contracts. Other advantages are cost reduction and more attention for life cycle costs. The real options in this are the added value of these advantages when investing in an integrated project coalition. Points of consideration are, amongst others, the output specifications, duration of the contract and consideration of which facilities to incorporate (Beek et.al. 2010).

The most often mentioned options agreed upon where the option to stop, to make adaptations to the design and the options to shrink the project. In most cases there was more opportunity for options, based on the extent to which agreements were made. However, these options only have been exercised to a small extent. The options which were exercised to a larger extent than agreed upon, were in some cases the option to make adaptation to the design and the option to extend the project. In three cases the reason for this was that the project was still in the initiative phase, so there had not been an opportunity to exercise the options. A reason for the difference in one case was a change in the management. Another hospital had adopted a traditional project coalition in which no agreements were made on these subjects.

It appeared that options in the operational phase were incorporated in a few hospitals. Respondents were asked to point at a scale of 1 to 5 to what extent they considered the following issues: 1) the option to expand the building in technical sense in case of an increased demand; 2) The option to make more ad hoc adaptations to the building; 3) the economic feasibility of the options. Most issues were ranged between 3 to 5. Also the cases with a traditional project coalition displayed this high consideration of flexibility. The high flexibility can be the
result of a very flexible design which is not necessarily dependent on a certain project coalition. Therefore additional investigation is necessary how adaptations can be made and what role the contract plays here. Although only 3 hospitals filled in the questions on realisation of options and economic feasibility, the rate was very positive.

Respondents were asked if they have their facilities outsourced or in house. Six have their facilities partly outsourced, while three have them in house. The same division can be seen between organisations that want to outsource more or want to retain the status quo, but these are not the same organisations. A wide range of reasons for outsourcing is mentioned in the survey. One interesting reason for not outsourcing at all are costs, which contradicts with literature. Therefore, it would be interesting to know what causes this reasoning by real estate managers. Another reason for not outsourcing is autonomy of organisation, an interesting reason that is not mentioned in literature. Others mention reasons which can also be found in literature (Leidraad aanbesteden 2010), namely focus on core tasks, financial transparency as part of DBM, competitive working, learning from market operators and quality.

CONCLUSION

In this paper we discussed the uncertainties that health care organisations have to deal with, which is reflected in the real estate strategy. We further showed how scenario planning can be useful to deal with uncertainties and to gain insight in opportunities that these uncertainties can create. We propose to use scenario planning in combination with real options theory as a way of thinking. This approach is not new, but in the context of real estate management in health care it has not been applied yet. An exploratory survey among hospitals was undertaken to find out what options are considered by health organisations or are already (unconsciously) present. For this purpose the survey questions included topics about type of project coalition applied and alternative usability of the real estate. Additionally we asked for plans regarding future building projects and if they considered sourcing out facilities when applying an integrated project coalition.

The real option of the marketability of buildings was widely recognised among the respondents. However, the advantage of the option to create more flexibility by outsourcing facilities was not perceived by all. Considerations relating to real options in the realisation and exploitation phase were made to a large extent. The survey shows that flexibility, as expected, is a big issue in real estate management. Still, many hospitals have a traditional project coalition, which might have less real options than for example integrated project coalitions. However, this should be learned from practice. Nevertheless, within the health
care much can be gained by more exploration of the possibilities of other project coalitions.

The use of scenario planning increases since banks demand business cases in which future demands should be incorporated. However, including real options could have added value by further supporting decision making on real estate. However, in order to become effective, scenario planning and real option thinking should be institutionalised in the organisation. This demands further development.

Further research should look for a more tangible method for applying scenario planning in combination with real options. In addition, there are probably more real options than defined in this paper. Further investigations should reveal what necessary conditions are for exercising real options.

REFERENCES


