Foreword

In the Netherlands we often see that secularization is followed by the replacement of existing rituals by alternative 'secular' ones. The burial of the Dutch folksinger André Hazes, was explicitly non-religious in nature, but tv-broadcasts of the farewell for the popular artist, show that people took a fervour in embracing new ways of expressing their sorrow. Singing along to songs produced by Hazes, in one of the Netherlands biggest venues, people were caught up in a shared expression of the loss they felt by the death of the singer, which was in days past only reserved for religious services.

Somewhere then, we need some kind of symbolization of feelings we have, such as grief, joy and pride. Pride, such as pride for locale, is interesting to consider in a country which in most other nations would rank as a region or province at most. The Dutch show a lot of location bound pride and identity.

This identity used to be bound or connected to the religion predominant in local society. The North and Centre of the Netherlands have been the feeding ground of many protestant Christian denominations, while the South of the country stayed predominantly Roman Catholic. This has led to severe religious conflicts, and the greater part of the 20th century found the nation divided along borders set by historic religious development.

Society has been changing, or evolving, rapidly in the past years, including disruptive trends such as globalisation, secularization, digitalisation, and the dropping influence borders pose on the lives of people. Many writers have considered the need for new ways of expressing identity, which is found to be very important for the well-being and self-identification of people in this era of change.

Why then, do we not use the remnants and heritage of the identity that we not so long ago started explicitly avoiding. The monumental churches we have left are often the physical centres of communities, while their functional use has diminished. The loss of these monuments is something that should be avoided, while a new symbolic use might be found in creating local identity.

Improving the re-use of these old buildings that formed and defined communities, the unique context in which this specific obsolescence occurs, and the often-beautiful outcome of adaptive re-use of churches, are the reasons I wanted to contribute to this field of research and practice.

The problems arising in the processes of re-use for these churches are often very case specific. Considering the aims goals and stated wishes and demands from all actors and stakeholders in these processes can lead to insights that can help solve these complex problems. In this way, adaptive re-use of obsolete churches might become more common. Then more of this heritage might be saved, and people would find a new appreciation for the identity their local community might have.

I hope that this research shows the value of adaptive re-use of these churches, the usefulness of considering these projects in a different way, and that the implications might lead to more beautiful instances of preservation through adaptive re-use.

As a last note I would like to thank all interviewees and my mentors, Ruud Binnekamp, Hilde Remøy and Philip Koppels, for helping me complete this research.

-Sander van Engelen

Please note that this version of the research report is classified as public. The reason for this will be elaborated on further in section 3.6.

Decision Modelling Adaptive Re-use of Religious Heritage (Summary)

Abstract – Because of increased secularization and decreased parish revenues, obsolete churches are being sold. Adaptive re-use could preserve the cultural heritage these buildings represent, while having many further benefits. Decision modelling helps view these problems with every actor and their viewpoints in context and in relation with one another and the goal function. The case of the [church name] in [village name] was modelled in the original situation as well as an extended case, where more choice options were added and the new position of the Diocese was considered. Then more situations and aspects from various cases were modelled. In this way the fitness for use of a decision model for choices to be made in adaptive re-use of obsolete churches was proven. The use of decision modelling in adaptive re-use of obsolete churches might in the future lead to more successful outcomes.

Keywords: Adaptive Re-use, Obsolete Churches, Cultural Heritage, Secularization, Decision Modelling

Introduction

Churches in the Netherlands have seen a decline in active worshipers and financial contributions. This leads to parishes merging and not being able to pay upkeep for all the churches they own. These churches then are functionally obsolete, which Mine (2013) defined as the prime targets for adaptive re-use. These churches are often valued as physical objects of cultural heritage, and the need to preserve them is broadly felt. Adaptive re-use can offer a solution towards this end, with Langston (2008) even stating that “adaptive reuse is the future of the construction industry.” In practice still churches are being demolished (Jonkers & Van Doren, 2017; Koenen, 2017; Sluiter, 2017; Van Schijndel, 2017). This implies that possibly improvements can be made in the process of adaptive re-use to provide for more successful projects.

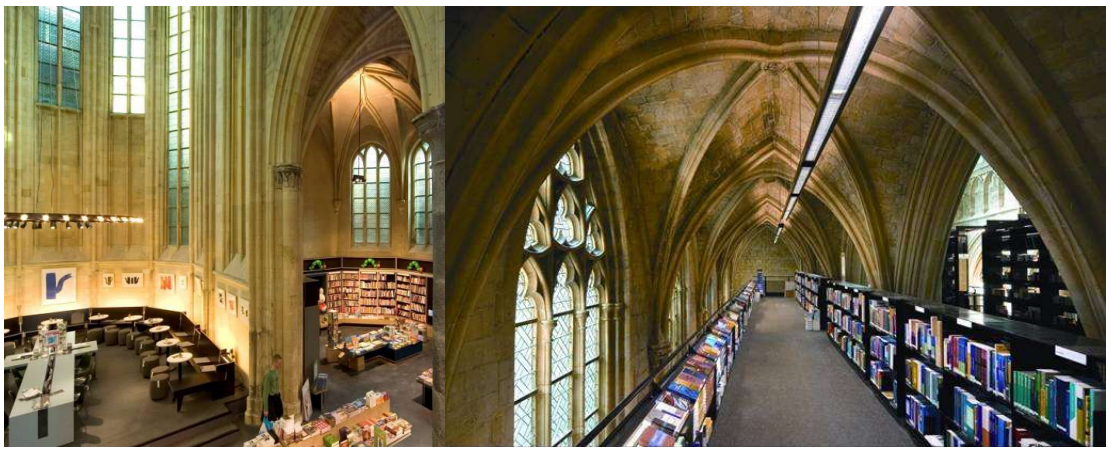

Figure 1. The Dominicanenkerk in Maastricht is in use as a bookshop. Image from (Herbestemming.nu, n.d.).

Considering multiple possible functions in future proposals for adaptive re-use, in order to provide options for all stakeholders, was recommended by (Mısırlısoy & Günçe, 2016). One way of doing this is considering options in relation to all wishes and demands stated by different stakeholders. The

method chosen to do this is by using decision modelling. Adaptive re-use of obsolete churches as a large group of involved actors, all setting different constraints on the solution of the problem posed. The individual constraint an actor might set, is meaningless when not regarded in the context of the problem as a whole. The relationships different constraints have to one another and their relation to the solution space in the problem are not defined by the constraint, but by their interaction. Solving this problem then asks for a starting point that does not consider loose parts, but rather the whole. Systems thinking is an expansionist view, wherein systems are always regarded as not being made of elements, but elements in a larger whole, with the connections being more important perhaps than the isolated elements (Binnekamp, Barzilai, & De Graaf, n.d.). The use of decision modelling is one approach of applying systems thinking to a problem and might provide for the relational perspective on the process of adaptive re-use to improve the number successful outcomes.

Figure 2. Student housing in a former church in Rotterdam. Image from (Stadswonen Rotterdam, n.d.).

The choice is made to narrow down religious heritage to consider only the churches of the Roman Catholic Dioceses in the Netherlands. One reason for this is that the Roman Catholic church, unlike other denominations, does not tolerate other religious use of its' obsolete churches (Task Force Toekomst Kerkgebouwen, n.d.) and does not allow selling obsolete churches for functions considered 'immoral', even though they may be profitable, such as nightclubs (Squires, 2009). This makes for more dynamic and complex adaptive re-use projects, for these extra constraints confine the solution space for the problem. A model able to improve the practice of adaptive re-use for these churches, will also then be able to deal with the "easier" cases, where re-use in a religious function for a different denomination might be possible. This research then aims to find a way in which decision modelling can be used to improve the process of adaptive re-use of obsolete Roman-Catholic churches in the Netherlands. This is translated into the research question: How can a decision model improve the practice of adaptive re-use of functionally obsolete Roman Catholic churches in the Netherlands?

The improvement of the practice of adaptive re-use of obsolete churches has two major benefits. The first benefit is contributing to the problem posed by vacant churches, and enabling their preservation as heritage. The second benefit consists of all positive outcomes of adaptive re-use. The use of decision modelling on complex problems is not new. The use of decision modelling through linear programming of adaptive re-use projects is. This research lends further insight into the applications of decision modelling and the contribution decision modelling might offer for solving societal issues.

Methods

Three main goals have to be reached. These goals are reached through different steps in the research methodology. The research, intended to produce a model for future use, is structured as a design problem, solved by prescriptive research. First the problem is analysed, through literature study, which is then synthesized with the aim of the research and the goal of the model, into the first model design, taking into account input given by the experts interviewed. This design is tested through simulation, which are evaluated and lead to a reflection on the fitness of the solution. This is done in three stages, first by modelling a known case in hindsight, the [village name] case. Secondly, this case is used for a new consideration by extending the model. Thirdly, other inputs are considered and proof is supplied that not only the case modelled extensively can be modelled, but the approach fits to different situations as well.

This modelling follows the process of modelling in operations research in which the steps from Ackoff & Sasieni (1968) are used; formulating the problem, constructing the model, deriving a solution, testing the model and evaluating the solution, and implementing and maintaining the solution. The last of these steps falls outside of the scope of this research, since the research aims to develop the model, for which the process from Ackoff and Sasieni is used, for testing the model design.

This design problem aims to translate the complex problem of adaptive re-use of obsolete churches in the Netherlands into a model, for which the [church name] in [village name] is taken as an example. In this problem, the physical constraints of the proposed construction and the existing object are combined with the constraints stemming from human sources, such as developers' profit, unallowable functions and preferences. Binnekamp (2015) defines these two as "physical variables" and "psychological variables" respectively. The point in the process that this decision model was designed for is the moment of sale, where different options are considered, such as re-development and adaptive re-use. In the [village name] case at this point three main soft constraints are posed on these options; the municipality disallows demolition of the building, the Diocese is opposed to adaptive re-use, and the parish cannot accept a negative net present value on their exploitation. The financial outcome of each option is taken into the goal function, but this does not imply that financial outcomes are the main goal of this consideration. The goal is to identify solution space, where one or more options lie within the constraints set.

There was no solution space in the [village name] case. It was then extended and reconsidered. The main changes were that more options of adaptive re-use were considered, and the position of the Diocese changed, which has happened in practice. These changes result in the finding of solution space. The option that was maximized, the adaptive re-use of the [church name] as a gym, was found to be an acceptable outcome for all three main stakeholders. This proves that reconsideration of the case [village name] using a decision model offers a viable solution. This however is of course a moot point, since the church has been demolished. It does show that the use of this tool could have proven helpful if reconsideration was still possible.

Findings

Three proofs are given that the use of a decision model can improve the practice of adaptive re-use for Roman Catholic churches in the Netherlands; proof that cases of potential adaptive re-use can be

successfully modelled in a decision model, proof that the way in which projects might fail can be identified in a decision model, and proof that (conflicting) constraints that have the largest impact on feasibility might be identified in a decision model.

Modelling the [village name] case and further cases proves that cases can be successfully modelled in a decision model. The information that is available on the case [village name] was successfully input into the model, and then successfully extended to make a new consideration. Then several other situations and constraints were modelled, to prove that not just the case [village name] can be modelled, but modelling of such problems is widely possible.

Proof for the second element was constructed by showing the unsolvable nature of the choice to be made by the parish in the case [village name] in the decision model. The constraints set were known at the time. The use of a decision model at the moment of making this decision would therefore have shown that no solution was possible, due to the conflicting nature of the demands set by the municipality, the Diocese and the involuntary constraint posed by the financial situation of the parish.

The third element was proven by using shadow pricing in both the original and extended case. This allows for identifying the impact that constraints have on the goal function. In the case [village name], the impact the constraints had on the net present value of the parish was identified.

Use in practice has not been proven. It was found that solution space was present in the reconsideration of the case [village name]. This was however dependent on a change of viewpoint from the Diocese. This means that possibly if the case was reconsidered, this might have been achieved, but is not proven. This however falls outside the scope of this research. According to the five steps in model production by R.L. Ackoff & Sasieni (1968), only the last step, that of implementation, is left. This has been plausibly proven, which is sufficient proof until implementation in practice has taken place and empirical evidence can be found.

Conclusions

The question this research aimed to answer was: How can a decision model improve the practice of adaptive re-use of functionally obsolete Roman Catholic churches in the Netherlands? It was found that three elements of proof required were obtained in this research, through the case [village name], extending the case [village name] and input of other case situation. Proving that use of a decision model might lead to the change of actors' positions was not empirically proven in practice. This can be further substantiated by using a decision model in a real-life case. The answer to the research question is then that decision models can be used in the practice of adaptive re-use of functionally obsolete Roman Catholic churches in the Netherlands in order to find solution space in the multi actor playing field. Ex post facto proof that use of the decision model improved practice is not sought or acquired in this research. But by proving that the model is fit for use in such cases, it is ensured that this evidence would be obtainable in future research.

One limitation of this research is that it heavily relies on the case [village name]. By reflecting the situation and results of the extended case with one of the involved actors, veracity was sought. Furthermore, proof for fitness for use in other cases was sought by inputting situations and factors from various other cases into the decision model. These two ways of proving fitness for use provide for a basis on which can be stated that the decision model might be applied to other instances of

choices to be made in adaptive re-use of Roman Catholic churches in the Netherlands. These situations are however always very case specific; therefore no conclusive generalisation can be stated. Fitness for use can only be stated to be extant until a case is found which cannot be modelled.

The last limitation applies to modelling and predicting in general. De Leeuw (2002) stated that knowledge from scientific study cannot be thoughtlessly applied to practical problems. The solution proposed by this research is therefore not a 'one-size-fits-all'-solution. Every application of the produced model should be viewed as utilising a helpful tool, with creativity required to enable sound output.

Decision modelling was chosen as a method for this study. This is not however the only method suitable for dealing with these problems. One of the main initial benefits that modelling in any way can bring towards solving problems in the process of adaptive re-use, is that goals, demands and interests are made explicit. This is done in order to be able to model them, but this in itself already offers big insights, and stimulates actors to explicitly phrase their wishes and expectations

Recommendations

A lot of information was obtained in interviewing on actors' demands, with some focus on the impact of the demands the Diocese sets. The difficult position the merged parishes are often put in was found to be a main influence on the possible success of adaptive re-use projects. Their legal independence, results in funds from the Diocese not being used for their exploitation. Their canonical dependence on the Diocese implies they cannot make totally independent decisions and are required in instances of church sale to often opt for the highest sale value. More insight into how the position of the parish influences the potential of adaptive re-use should be sought. Then possibly a change in this position might be proposed in order to increase viability of adaptive re-use and the resulting preservation of churches as cultural heritage.

The local community, including former churchgoers, may have different wishes for the obsolete church, but have no direct engagement in the decision-making process. To improve adaptive re-use practice for obsolete churches, the local community might be more intensively involved in the process, and possibly given the status of actor, instead of mere stakeholder.

Another party to be further considered is the municipality. It was found that a decision to award a listed status to the building brings along a lot of strain on the financial outcomes of a possible adaptive re-use project. If the preservation of the building is thought to be a public good, then possibly public funds should be allotted to the preservation of the building. In this way more projects of adaptive re-use might become financially feasible. How subsidies might be created, in light of the importance of preserving these churches, is an important consideration to make in the future, while still adhering to the separation of church and state.

In the coming decade a lot of Roman Catholic churches will become obsolete. It was found that preservation through adaptive re-use might prove to be the optimal solution for these problems. This research shows that decision models might be used to consider different choice options that exist at the time of sale. This might lead to more informed decisions, including the viewpoints of different actors in considerations. The urgency of the problem of church obsolescence asks for improvement

of the process in which the future of these obsolete churches is considered. If decision models are found to also be able to change actors' views and demands in practice, use of decision models might be the applied to increase the chance of adaptive re-use through considering the views all potential stakeholders have on the future of the church.

The decision model, as defined in this research, was produced for future use. In the coming decisions where sale of an obsolete church is considered, these steps might be taken in a decision model;

- Adding different choice options to the already considered options. By adding adaptive re-use for different functions (including (elderly) housing, offices, cultural centre, library, retail space, event space, gym and indoor playground), these can be taken into consideration. These choice options constitute the endogenous variables, of which one might be the outcome of the decision process.
- Calculating financial outcomes. The effect a sale of a church has on the exploitation of a parish is (one of) the most aspect of the sale decision. These calculations should always start with an end-user perspective, since financial value should be calculated in the opposite direction of transactions made between parties. The outcomes of these calculations constitute the value in the goal function for every endogenous variable.
- Scanning market conditions. By using information on local demography, competing present functions or developments, and commercial reasoning, decisions can be made on what function might or might not be feasible from a market perspective for the project. The (non-) inclusion of different factors are included in the model as constraints on the goal function.
- Defining actor constraints. By interviewing actors and other stakeholders, their wishes and demands on the project might be defined. These are set as constraints on the maximizable goal function.
- Find solution space. By using Microsoft Excel and WhatsBest! this problem then can be modelled. By doing this, solution space might be found, and the optimal solution in regard to the goal function identified. This can then be discussed foremost with the decision makers, then with other actors, to find if this solution is acceptable. If not, then more constraints are added to the model.
- If no solutions space is found, then shadow pricing might be used to find which constraints have the biggest impact on the goal function. Effective negotiation might start with the actors that placed the respective constraints.

By using this approach, more decision processes might lead to adaptive re-use of an obsolete church.

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