

# **MASTER**

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an ex	oloration into	o the politica	al and publ	ic suppoi	rt base	-			

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# THE OPPORTUNITIES AND OPTIMAL DESIGN OF SERIOUS GAMING IN A JOINT URBAN PLANNING METHOD AND AN EXPLORATION INTO THE POLITICAL AND PUBLIC SUPPORT BASE.

by

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#### **Preface**

This report is the final product of my graduation thesis which serves to complete my Master Real Estate Management & Development at Eindhoven University of Technology. My interest of public participation in urban planning, led me to the topic of serious gaming. This report describes the findings on the study I have conducted on these two scientific fields, and the attempt to aggregate them.

Traditionally, the Dutch government initiates new urban (re)developments, usually as a collaboration between several government bodies in various layers of government. They are tasked with the initiation, market analysis, design and the preparation of urban area (re)developments. In recent years however, multiple publications by governmental agencies have stated that the Dutch government is going to withdraw as initiator of large-scale spatial developments. The expectation is that this will leave a big void in the first phase of urban area (re)developments.

As new legislation and policies are designed and put into place, the Dutch government has past the point of no return. Urban area (re)developments will have to be initiated by society itself, including commercial parties. The processes and tasks that are necessary to realize new developments are vast and often complex, as will be explained later in this report. While it is quite easy to withdraw from these tasks, it is far from easy to transfer them to another party with no in-depth knowledge and no experience whatsoever in this field. Transferring these tasks and responsibilities while maintaining quality control would be a major challenge in itself. To make things even more complicated, the new initiator is not just one party to be guided. It is a broad spectrum of individuals and entities within society that are not used to work together, adding communication difficulties on top.

In the past, citizens have had little or no impact at all in the design and decision making of urban (re)developments. To partake in such a processes, in-depth knowledge is needed of, often complex, policies and legislation. This means that only a very small number of citizens are able to participate (and input creativity) in the traditional method of urban development. In the next few years especially, citizens are expected to take on the responsibility for their own quality of life and the quality of their living environment. To include large numbers of citizens, without any in-depth knowledge on the process, a fundamentally new urban planning method could be helpfull.

Currently, commercial parties (entrepreneurs and businesses) rarely take part in urban (re)development. Only real estate industry related companies might play a limited role at some point in the process. However, the path chosen by the Dutch government, will bring a completely different future. Once entrepreneurs and companies are presented with the opportunity to exert influence on the built environment, it will inevitably be used to increase revenue. Therefore, it might be expected that tactics will be deployed both to benefit their own enterprise and to disadvantage any competitors. We can also look forward to a future where urban development is an integral part of business models, resulting in a built environment created in part by the companies intending to offer their products or services. To include citizens and commercial parties in the same process, on an equal level for clear communication, a fundamentally new urban planning method is required.

In recent years, the area of serious gaming has been getting renewed attention from the scientific field of urban planning and the public participation therein. With only a small number of published studies including actual case studies, additional research is needed to explore the potential and the political and societal support base for serious gaming to improve public participation in urban planning.

With this study I hope to have contributed to the aggregation of two scientific fields, urban planning and serious gaming. By proposing a joint urban planning method, based on serious gaming, I hope to provide a foundation for subsequent research on this topic.

At this point, I would like to thank my academic supervisors Theo Arentze and Rianne Appel-Meulenbroek from the TU Eindhoven, who gave excellent academic support and guidance during my graduation. Countless hours have been spent focusing the research into its final form. Like all good things in life, it was not easily achieved, and I am grateful for the generous support throughout the entire process.

Furthermore, I would like to thank my supervisors Hans Wetzer and Henri Verbruggen from the municipality of Eindhoven for their support and guidance, together with everyone from the municipality for sharing their insights so willingly. Your contribution has resulted in a deeper understanding of the potential and possibilities of utilizing serious gaming in urban planning. Thanks to your contribution I was able to explore the political support base for the proposed joint urban planning method.

Last but not least, I would like to thank my family and especially my girlfriend Yvonne for their unconditional support throughout my graduation, providing me sufficient distraction during the moments of relaxation.

Paul Jansen

Eindhoven, Juli 2016

Thesis – Serious Gaming in Joint Urban Planning

# Summary article

The opportunities and optimal design of serious gaming in a joint urban planning method and an exploration into the political and public support base.

Traditionally, most urban (re)developments in the Netherlands are initiated by the government. In recent years however, the Dutch government decided to withdraw as initiator of large-scale spatial developments. Multiple publications by governmental agencies have stated that future urban area (re)developments will have to be initiated by society itself, possibly supported by or in collaboration with the municipality. This requires a fundamentally new urban planning method, capable of supporting hundreds, even thousands of participants. Serious gaming has the potential to join all parties on an equal level playing field to experiment, collaborate and negotiate with each other.

#### By Paul Jansen

There is a large body of research into urban planning, public participation therein and various major changes that these topics are going through the past decade (Hofstede G., 2001) (Krek, 2005) (Franzen & de Zeeuw, 2009) (Centraal Planbureau, 2010) (NEPROM, 2011) (Praktijkleerstoel Gebiedsontwikkeling Delft, 2011) (Planbureau voor de Leefomgeving; Urhahn Urban Design, 2012) (Wolting, 2012) (Ministerie van BZK, 2013) (Koomen, Westerink, & Nedkov, 2014). Research into decision- and group support systems is also readily available with publications stretched out over the 60-year lifetime since the scientific field arose along with computer technology. These studies have provided systems and instruments to support decision-making and negotiation across the urban planning process (Huber, 1984) (DeSanctis & Galuppe, 1987) (Dennis, 1988) 1990) (Nunamaker, (Jelassi, 1991) (Timmermans, 1997) (Arnott & Pervan, 2005). Serious gaming, although based on the older concept of constructivism, is widely viewed to have emerged in the scientific literature in 1970. Research into serious gaming contains studies into both traditional and computer based games, with the main purpose of the

games to educate the player(s) (Abt, 1970) (Mayer & Veeneman, 2002) (Klopfer, 2008) (Gray, Bulat, Jaynes, & Cunningham, 2009). There is however little research published on the design and use of serious games in the initiative phase of urban planning. In the Netherlands, this is mainly due to the fact that only fairly recently the Dutch government has announced that it will stop its role as initiator of new urban developments. Before this announcement the public was not really involved in the process of new urban planning. Only a few parties (government bodies and some branch related companies) were involved in the initiation and development of new urban plans, so there was no need for a tool for large groups of participants. In addition, all stakeholders had in-depth knowledge about all parts of the process, so there was no need for a designed environment to replace in-depth legislation knowledge. Now, in the new age of collaborative urban planning, these tools are needed. Some studies have been conducted on this topic (Mayer, Bueren, Bots, Voort, & Seijdel, 2005), including the design of some prototypes of board and computer based serious games (Mayer & Jong, 2004) (Krek, 2008) (Tan, 2014) (Poplin, 2014) (Poplin & Tóth, 2014), but far from enough to make definite conclusions about the best use and design of serious games in the initiative phase of urban planning. Even less research is published on the political support base for the implementation of serious gaming in the urban planning process. The further researching of these two topics are the focus of this study.

#### Serious gaming in urban planning

Initiating urban area development is complex. Private (citizens and end users) and the majority of commercial parties (entrepreneurs and businesses) can be creative thinkers using their own point of view to recognize unique local strengths and opportunities, but they lack the needed in-depth policy and legislation knowledge. This results in creative ideas and solutions that do not fit within established policies or overarching plans. The unnecessary loss of this creativity is not only a shame; it may discourage these stakeholders to join in subsequent or future (re)developments.

Some commercial parties, like real estate developers, do have in-depth policy and regulation knowledge, but are accustomed to communicate on a professional level (supported by Group Support Systems). There is a communication gap between professional stakeholders who have this in-depth knowledge and the rest of the stakeholders that do not.

Serious gaming has the potential to join all parties on an equal level playing field to experiment, collaborate and negotiate with each other ( (Abt, 1970) (Krek, 2008) (Mayer, Bueren, Bots, Voort, & Seijdel, 2005) (Tan, 2014) (Poplin & Tóth, 2014). All stakeholders are invited to join a virtual world, a simplified game based on reality, where policies and regulations have been incorporated into the design of the game environment. This ensures that in-depth knowledge is not needed, making the process accessible to everyone, while guaranteeing that all resulting ideas are

feasible and within policy and legislation boundaries.

#### Research methods

The proposed joint urban planning method aims to transform the current urban planning process into a massively multi-stakeholder, open-ended, transparent, approachable, educational and playful process. Developing and scientifically validating a new urban planning method is complex and will most likely require many years of subsequent research. This study is aiming to provide a solid foundation for that subsequent research, and has two goals: (1) to provide insight into the potential and optimal design of serious gaming to improve public participation in joint urban planning, (2) to explore the political and public support base for serious gaming in joint urban planning.

The study starts with the formation of a theoretical framework, supporting a joint urban planning method, by reviewing research on urban planning and serious gaming. This literature review includes previous research, as well as government statistics, to gain insight into the current state of urban planning in the Netherlands. In it, the main characteristics, trends and recent changes within the urban planning field are discussed. Extensive attention is paid to research on public participation in urban development. Also, the scientific field of serious gaming is studied by reviewing the literature in order to gain insight in the potential of serious gaming and the potential to improve an urban planning process.

The study subsequently gathers qualitative data, by means of a case study in Eindhoven with real stakeholders. After making a prototype of the Joint Urban Planning Game, it is then tested in a three month test period. During this test period, the political and public support for the joint urban planning method, and specifically for serious gaming therein, is

explored through studying policy documents, in-depth interviews and surveys.

#### Results

According to literature on urban planning there is currently no method with which large stakeholders different numbers with backgrounds can come together to collaborate. The key findings in public participation literature review is that participation is low, because stakeholders do not know enough about the process and therefore are not willing to invest their time in the community, and that different stakeholders do not communicate on the same level. One of the key conclusions on serious games, is that they have the capability to invite large numbers of participants and let them communicate with each other on a level playing field.

Applying the gained theoretical knowledge from the literature review, a clear 2 phase joint urban planning system is proposed (figure 1). The community building and idea generation is addressed in a playfull way in phase 1, utilizing serious gaming to lower the entry barrier for public participation. Only after likeminded stakeholder groups have been formed in phase 1, these group supported initiatives are actually developed in more detail in phase 2.

The thesis then outlines the optimal design for a serious game that can be utilized in phase 1 of the joint urban planning method. Starting with the core idea of a serious game; a game designed for learning about joint urban planning and motivating the public to take on a pro-active role. Because the players are, or represent, the actual stakeholders, we define it as an open game. In order to use the game in multiple locations, the game environment should be adjustable. The best way to achieve this is by making a digital game. Urban planning essentially never stops; cities are constantly changing. It is therefore necessary that the game environment is open-ended, in order to accommodate stakeholders at all times.

To form actual groups of like-minded people however, momentum is important, requiring game-sessions that have a specific duration and a clear ending. Matching with that characteristic, the focus of the players should be on the fun of playing, and not on winning or eliminating competition, making it a noncompetitive game. The game environment does not have to be exactly geo-referenced on a map, as the first phase is focused on informing, idea generation and grouping likeminded people. Because it is an urban planning instrument though, it does have to include some area specific characteristics to give the players a frame of reference to the real world. Current urban planning issues or plans are not discussed in the game. Idea generation is one of the main purposes of the game; existing issues or plans can only limit creativity. A simplistic representation of the geographical area and some key environmental descriptions constitute the game environment.

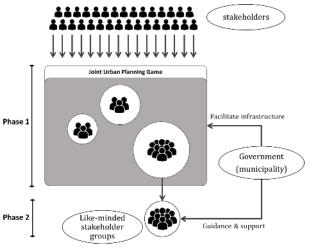


Figure 1 The Joint Urban Planning system

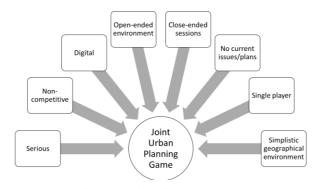


Figure 2 The Joint Urban Planning Game

Urban planning never ends; people are always looking for ways to improve their environment. That is why the game/learning environment has to be an open-ended platform, which is always accessible. Grouping likeminded people around an idea to develop it further however, requires a close-ended game session, after which the groups can further develop and actually implement these ideas. All these characteristics are merged in the Joint Urban Planning Game (figure 2).

The result from a game session is in essence a ideas/wishes collection of from stakeholders in the area. The municipality is tasked with supporting the public in the new age of joint urban planning. This means the municipality responsible is for implementation and maintenance of the proposed two phased joint urban planning infrastructure. When a game session is finished, the municipality will guide the 'groups of like-minded people' or 'like-minded stakeholder groups' to form organized project teams and support them in the further development and implementation of the groups ideas (phase 2).

#### **Joint Urban Planning Game prototype**

In order to test the proposed Joint Urban Planning Game, a prototype was built. After trying out several systems by Adobe, such as Adobe Flash and Adobe Captivate, the conclusion was that no standalone software could meet all necessary requirements. That is why the open-source content management system (CMS) Wordpress was chosen as the core system. Wordpress is installed on a web server and is based on coding languages PHP and MySQL (Wordpress, 2016). Wordpress provides system administration and content management. The Wordpress plugin architecture allows users to extend the features and functionality of a website by uploading and activating certain plugins. The plugin 'WordPress Form Builder' enables and electronic course management registration of the result and marks from

various assignments, tests and oversee group project. Another plugin called 'UserPro' implements a social platform onto the system, providing all users with a social profile and the interactive capability to form groups and communicate among each other by direct messaging. This total package provides all that is needed to create an online game environment in which players can learn about joint urban planning, get quizzed on their knowledge, earn rewards that are displayed in their profile and get in contact with other players, who are in fact all stakeholders within their community. The Joint Urban Planning prototype consists of 5 game components: user profiles, missions, scenarios, groups and ideas.

The purpose of the Joint Urban Planning Game is to increase public participation in the urban planning process. In order to fulfill that purpose, three goals are set: (1) resolving rational ignorance within stakeholders, (2) providing clear communication between them and (3) connecting them in like-minded stakeholder groups.

Resolving rational ignorance within stakeholders is achieved by adding play, through serious gaming methods and techniques. The missions and scenarios are specifically designed to motivate and reward the player during the learning process, providing entertainment and feelings of accomplishment, creativity and enjoyment.

Providing clear communication between stakeholders is accomplished by creating an online game environment in which all players are equal, independent of their role in real life. In the world of the Joint Urban Planning Game everyone starts as a junior city maker. By successfully completing missions, these junior city makers acquire the fundamental principles governing joint urban planning. Every new concept and each new term is first explained clearly during a mission, before it is ever used in a scenario. When the mission is completed

successfully, we know the player is familiar with the discussed concepts and terms. This way, everyone on the platform will use words from a shared vocabulary when describing their thoughts and ideas on future urban planning in their community. Focus is then shifting from differences to similarities. The Joint Urban Planning Game uses, and consequently repeats, clear terminology and descriptions, encouraging the players to adopt them in their own communications.

In order to connect stakeholders in like-minded stakeholder groups, the game is designed in such a way, that players are sorting themselves, by going through the missions and scenarios. During missions, each player gradually provides more and more personal characteristics and preferences. This data is stored the corresponding user profile in the database. During scenarios, the player is asked to provide advice on a specific challenge. This advisory report contains valuable stakeholderspecific information which is also saved to the user profile in the database. This results in a dynamic database, to which all players are constantly adding and updating their own information, in real time. That database is then used to classify stakeholders with shared characteristics and/or wishes into specific groups.

All three goals of the Joint Urban Planning Game are addressed in the developed prototype.

#### **Case study Genneper Parken**

Genneper Parken is a nature, sports and recreation area in the south of the city of Eindhoven. Surfacing over 200 hectare (or 2 square kilometers) and situated just 2 km from the center of the city, it is considered unique in the Netherlands. Genneper Parken met all the ideal requirements for a pilot project, and was selected as a case study. The actual prototype testing period extended over the months of March, April and May of 2016. In June of 2016, the results were collected, analyzed and presented in this thesis report.

Although too small to derive any quantitative conclusions on the public support for serious gaming in joint urban planning, the Genneper Parken case study group of 26 participant, did provide a number of insights into the public perception on the use of an online serious game and the public support base for such a tool in Genneper Parken:

- At the start of this case study, virtually no one (10 percent) knew of the existence of serious gaming, nor its potential applications
- Many (71 percent), feel that serious gaming can attract and engage certain people who are currently absent, like the youths, into the urban planning process
- Only a quarter, think that the current prototype will actually bring Genneper Parken stakeholders closer together
- A slight majority (67 percent) still considers the municipality responsible for initiating urban area developments in Genneper Parken

As a result of the Genneper Parken scenario, 3 like-minded stakeholder groups were formed manually, in order to limit and control the number of groups. However, this grouping of stakeholders can also be fully automated. Following six weeks of summer holidays, those stakeholders are invited by the municipality to meetup with their group offline, together taking the next step toward realizing their shared ideas.

Interviews with people in key positions in the municipality of Eindhoven show that serious gaming fits within the current policy and, based on a limited number of interviews, is likely to have political support in the current municipal organization.

#### Conclusion

The main aim of the thesis is to provide a scientific validation to develop a joint urban

planning method, utilizing serious gaming to improve public participation. This is achieved by providing insight into the potential and optimal design of serious gaming to improve public participation in joint urban planning. By proposing and prototyping the Joint Urban Planning Game, a serious game that is composed of 5 game components: user profiles, missions, scenarios, groups and ideas. This study shows that such a serious game for public participation in urban planning can be

created and which elements should be included to achieve the purpose of increasing public participation. Moreover, by testing the Joint Urban Planning prototype in a case study, it shows that is, based on a limited number of interviews, likely to have political support in the current municipal organization of Eindhoven. However, this study has yielded no clear view on the public support for joint urban area development based on serious gaming.

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# 1. Research

#### 1.1.Introduction

Initiating urban area development is complex. Private (citizens and end users) and the majority of commercial parties (entrepreneurs and businesses) can be creative thinkers using their own point of view to recognize unique local strengths and opportunities, but they lack the needed in-depth policy and legislation knowledge. This results in creative ideas and solutions that do not fit within established policies or overarching plans. The unnecessary loss of this creativity is not only a shame; it may discourage these stakeholders to join in subsequent or future (re)developments.

Some commercial parties, like real estate developers, do have in-depth policy and regulation knowledge, but are accustomed to communicate on a professional level (supported by Group Support Systems). There is a communication gap between professional stakeholders who have this in-depth knowledge and the rest of the stakeholders that do not.

Serious gaming has the potential to join all parties on an equal level playing field to experiment, collaborate and negotiate with each other ( (Abt, 1970) (Krek, 2008) (Mayer, Bueren, Bots, Voort, & Seijdel, 2005) (Tan, 2014) (Poplin & Tóth, 2014). All stakeholders are invited to join a virtual world, a simplified game based on reality, where policies and regulations have been incorporated into the design of the game environment. This ensures that in-depth knowledge is not needed, making the process accessible to everyone, while guaranteeing that all resulting ideas are feasible and within policy and legislation boundaries.

Stakeholders can propose specific projects or activities, as well as organizational or managerial ideas. More and more municipalities are encountering problems when trying to leave the position of primarily responsible within neighborhoods. Stakeholders lose their point of contact concerning the neighborhood because they consider that the role of the municipality. Now the municipality is stepping back from that role, stakeholders need to think about how they stay connected with other stakeholders in the area.

With the use of serious gaming, it is possible to invite a large number of players in the creative first phase. Within these games, promising ideas and opportunities can emerge. These ideas are then further elaborated in smaller focus groups with involved stakeholders. The smaller focus groups will be responsible for the actual decisions, supported by tools from GSS and NSS.

There is a large body of research into urban planning, public participation therein and various major changes that these topics are going through the past decade (Hofstede G. , 2001) (Krek, 2005) (Franzen & de Zeeuw, 2009) (Centraal Planbureau, 2010) (NEPROM, 2011) (Praktijkleerstoel Gebiedsontwikkeling TU Delft, 2011) (Planbureau voor de Leefomgeving; Urhahn Urban Design , 2012) (Wolting, 2012) (Ministerie van BZK, 2013) (Koomen, Westerink, & Nedkov, 2014). Research into decision- and group support systems is also readily available with publications stretched out over the 60-year lifetime since the scientific field arose along with computer technology. These studies have provided systems and instruments to support decision-making and negotiation across the urban planning process (Huber, 1984) (DeSanctis & Galuppe, 1987) (Dennis, 1988) (Jelassi, 1990) (Nunamaker, 1991) (Timmermans, 1997) (Arnott & Pervan, 2005). Serious gaming, although based on the older concept of constructivism, is widely viewed to have emerged in the scientific literature in

1970. Research into serious gaming contains studies into both traditional and computer based games, with the main purpose of the games to educate the player(s) (Abt, 1970) (Mayer & Veeneman, 2002) (Klopfer, 2008) (Gray, Bulat, Jaynes, & Cunningham, 2009).

There is however little research published on the design and use of serious games in the initiative phase of urban planning. In the Netherlands, this is mainly due to the fact that only fairly recently the Dutch government has announced that it will stop its role as initiator of new urban developments. Before this announcement the public was not really involved in the process of new urban planning. Only a few parties (government bodies and some branch related companies) were involved in the initiation and development of new urban plans, so there was no need for a tool for large groups of participants. In addition, all stakeholders had in-depth knowledge about all parts of the process, so there was no need for a designed environment to replace in-depth legislation knowledge. Now, in the new age of collaborative urban planning, these tools are needed. Some studies have been conducted on this topic (Mayer, Bueren, Bots, Voort, & Seijdel, 2005), including the design of some prototypes of board and computer based serious games (Mayer & Jong, 2004) (Krek, 2008) (Tan, 2014) (Poplin, 2014) (Poplin & Tóth, 2014), but far from enough to make definite conclusions about the best use and design of serious games in the initiative phase of urban planning. Even less research is published on the political support base for the implementation of serious gaming in the urban planning process. The further researching of these two topics are the focus of this study.

The 'joint urban planning' method consisting of two phases, each having a specific purpose (Figure 1-1). Phase 1 is to diverge the process, utilize maximum creativity to generate as much ideas as possible and stakeholder relationships, within the policy and legislation boundaries. Phase 2 is to converge the process, evaluating, selecting and developing these ideas into feasible plans. Negotiations and actual decision-making takes place in the second phase.

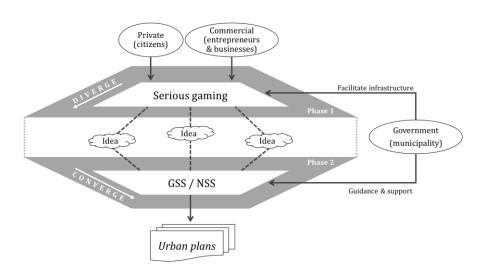


Figure 1-1 System concept for joint urban planning

Whatever the title or description used for this approach is something to worry about later. The same goes for the description of the system that is used (infrastructure, virtual environment, platform, digital counter, interactive portal, framework). First, it is necessary to validate its scientific added value and to explore the political and public support for serious gaming in urban development. This study therefore focuses on the serious gaming component in phase 1. Phase 2 will only be discussed briefly in chapter 3 and recommendations for further research are then made.

#### 1.2. Societal and scientific relevance

Within this study, the themes group support systems and serious gaming are discussed with respect to urban area development. These topics are currently experiencing a renewed interest and innovations are taking place in these decades-old fields. Mainly changes in the role of public parties in the initial phase of new area development is very topical and this will have major implications for urban planning in the future. In the Netherlands, public parties have always been initiators and leading in each new urban area development. Now the government has embarked on a path whereby public parties will discontinue this role and private and commercial parties are expected to take over the tasks involved. This introduces two societal challenges simultaneously. The first challenge is that private and commercial parties are new to this role and the related work, therefore guidance and transfer of knowledge is required. The second challenge is that a variety of private and commercial parties with different backgrounds must be able to communicate and work together on complex tasks. Not in the least to settle on an organizational model of their neighborhoods stakeholder community.

To address these challenges simultaneously, serious gaming (phase 1) can play an important role to bridge the gap between private and commercial parties. Using a web-based virtual environment as a level playing field, which functions as virtual place to meet other stakeholders and a stage for unbridled creativity. The government only facilitates the necessary infrastructure, a virtual environment bound by policies and legislation. After the creative first phase, the resulting ideas are evaluated, selected and developed in smaller groups using GSS and NSS (Phase 2). The government now provides guidance and knowledge transfer. This study describes why public participation is right now more important than ever from a social point of view and provides a tool and insights to improve this participation.

From a scientific point of view, there is a long way to go in the development of a web-based joint urban development platform based on serious gaming. At this point, the need for, and the characteristics of such a serious game will have to be researched further. There is hardly any research published concerning the political and public support base for serious gaming in urban development. By examining the local support base in a case study, this study contributes to the scientific literature that is crucial for the further development and use of serious gaming to improve public participation in area development.

#### Goals

The 'overarching' or 'ultimate' goal for a joint urban development approach is to transform the traditional urban planning process into a multiplayer, open-ended, well-informed, transparent, constantly learning and playful process. This overarching goal is a massive complex task that cannot and should not originate from just one study and/or one author. The best approach is by dividing it into separate sub goals, each sub goals being the topic of its own research. Multiple consecutive research studies combined are a lot more capable to deliver the best possible solution. This thesis focusses on two goals at the start of the development of a joint urban development approach, specifically aimed at serious gaming in the first phase as a tool to improve public participation:

- 1. Providing insight into the potential and optimal design of serious gaming to improve public participation in the initiative phase of urban planning.
- 2. Exploring the political and public support base to utilize serious gaming to activate private and commercial parties as initiators of new joint urban area (re)development.

#### Problem statements

Recent developments in the urban planning process in The Netherlands have increased the need for a joint urban planning method. Serious gaming could be an important piece to this puzzle but it is still unclear it what way or form. That is why this thesis will try to answer two specific questions:

- How can serious gaming be used and designed to increase public participation in the initiative phase of urban planning and what is its added value?
- To what extent is there political and public support to use serious gaming in order to activate private and commercial parties as initiators of new joint urban area (re)development?

To answer these two questions, five sub-questions are addressed first. The conclusions of these subquestions are then combined in order to answer both problem statements.

- What is serious gaming and how can it improve the initiative phase of urban planning?
- What is the potential added value of serious gaming in urban planning?
- What form(s)/designs do these serious games have to adopt to activate private and commercial parties as initiators of urban area development and to reinforce and support governments as facilitators of this process?
- Is there political support for joint urban area development based on serious gaming?
- Is there public support for joint urban area development based on serious gaming?

# 1.4. Research design

The study starts with the formation of a theoretical framework based on a summary of the most important and most recent scientific literature in chapter 2. Based on the findings from the literature, in chapter 3, a joint urban area planning approach and a system concept and prototype for a serious game are described. Also several examples of serious games are discussed. Next, in chapter 4, experts assess both the joint urban planning approach and the serious game prototype. Also, the prototype is tested in a case study. Reflecting on the reviews by the experts and the evaluation through the case study, all acquired knowledge is summarized. The gained knowledge and evaluation results up to that point are then presented to people in political positions and to public parties to explore the political and public support base for serious gaming in the initiative phase of urban development in chapter 5. Concluding, in chapter 6, with the results of this study and recommendations for further research. The research design is visualized in figure 1-2.

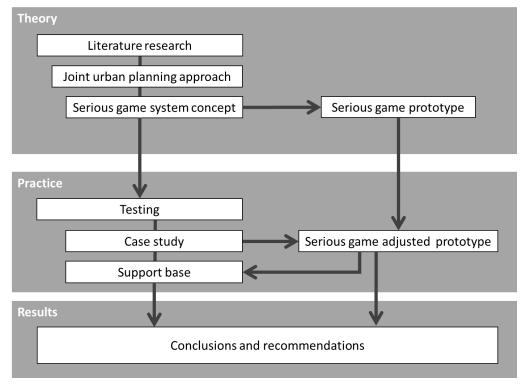


Figure 1-2 Research design

# 2. Theoretical framework: Urban planning & Decision support systems

The first theoretical chapter is dedicated to the introduction of several topics at the core of research into urban development methods. For each topic, the origin, current state and future applications are presented in a short summary. First, urbanization, urban planning and public participation therein are described to introduce the rising challenges in urban planning in the Netherlands. After a very basic description of the problem, decision support systems and negotiation support systems are introduced as scientific fields that are likely candidates to deliver the core ingredients/elements of the solution. Also, the multiple connections between the topics are pointed out and explained.

#### 2.1.Urbanization

A megatrend is clearly visible in every country across the world called 'Urbanization'. Humankind is moving on mass from rural environments to cities. In 1900, a mere 15 percent of Earth's population lived in cities. By 2008, half of the world's people were living in cities. And by 2050, 66 percent of the world's population is projected to be urban (United Nations, 2015). This trend is also visible in the Netherlands where as early as 1900 already half of the population was living in cities (Centraal Planbureau, 2010). When looking at the United Nations reported prospects, by 2014, 90 percent of the Dutch called the city their home and projections for 2050 indicate that 96 percent of the total Dutch population is living in cities (United Nations, 2015). This international approximation approach considers the largest parts of The Netherlands as one large urban area, which is a strong argument when compared with other countries.

Most cited numbers from Dutch publications claim a more conservative estimate of 83 percent of the population is living in urban areas in 2014, forecasting a steady increase towards 90 percent by 2050, as shown in figure 2.1 (Jaar van de Ruimte, 2015). This means that the pressure is on to prepare cities and their (re)development methods, for the challenges they face will increase in size and complexity along with their growing popularity.

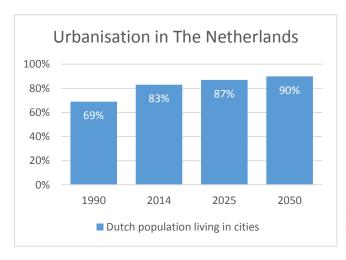


Figure 2-1 Urbanization in The Netherlands (Jaar van de Ruimte, 2015)

# 2.2. Urban planning

Traditional Dutch urban planning is described as a large-scale integrated approach, working out a definitive blueprint, determining the use and function of each square meter beforehand (Wolting, 2012). In this approach, the government is responsible for initiating and preparing new developments. During the preparation stage, private parties are invited to participate, resulting in a public private partnership. In this interconnected process, it is not possible to modify one part of the plan without influencing other parts. This leaves little room to empower citizens or interested parties to influence decisions or modify parts of the plan. Allowing many parties to participate in such a large-scale integral design makes the whole process far too complex and cause mayor delays to incur.

This traditional method of urban planning and development stopped working post the Global Financial Crisis of 2008. Large-scale area developments entail considerable risks and the willingness from the banking system to finance these increasing risks came to a near standstill. New legislative restrictions on the banking system as a direct consequence of the financial crisis will ensure all banks to adhere to stringent conditions in the near future, pressuring cities and its urban planners to change their modus operandi (Franzen & de Zeeuw, 2009).

Going forward, there will still be areas best developed with the comprehensive and integrated approach, such as central urban areas in high demand or areas with a dominant infrastructure challenge. In general however, the traditional urban planning method does not align anymore with the current state of economy and overall society. Urban planning in the Netherlands is going through mayor changes, with perhaps the biggest change, the realization that cities are complex open systems that cannot simply be organized top-down or bottom-up. This conceptualization of cities as complex systems whose influencing agents include citizens, business and government, calls for new collaborative city-making methods (Tan, 2014).

The self-organizing urban planning method is in many ways the exact opposite of traditional urban planning and appears to be the most fruitful approach, especially in times after a crisis. A self-organizing system has no masterplan that assigns uses to every square meter of land in advance. This loosely coupled system is often described as "a sum of relatively small-scale (re) developments with an open-ended process without a blueprint, in which development and management are intertwined, with a dominant role for end users and a facilitative role for government" (Planbureau voor de Leefomgeving; Urhahn Urban Design , 2012, p. 8). Examples of self-organizing cities are found all over the world, from the favelas in Brazil to the slums in China. The formation of slums is closely linked to urbanization (UN-Habitat, 2007). A sudden large influx of people in poverty combined with a lack of affordable low cost housing and poor planning first results into chaos. After a while however the community starts to self-organize the environment piece by piece. Primitive shops start to emerge, followed by very basic barbershops and coffeehouses. Where there is a demand, the self-organizing system provides.

# 2.3. Public participation

Involved citizens are important for a vibrant society. The past decades policymakers have tried many ways to involve citizens in urban planning but the overall outcome is disappointing. The general problem of public participation in urban planning is partly a lack of the citizen's interest for such

processes, which we call rational ignorance (Krek, 2008). People value their time and if the investment (energy, time, etc.) is greater than the expected gains from the whole process, they choose to ignore it altogether (Krek, 2005). This willingness to participate appears closely related to the national culture. Probably the most influential work trying to characterize culture is done by Hofstede (2001), by characterizing a national culture through a dimension of influence called the Power Distance Index. This index measures the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. Using this cultural dimension gives handles to explain the different type of behavioral patterns and reactions to situations (Dignum & Dignum, 2014). The Netherlands has a 38 on the cultural scale of Hofstede's analysis. Compared to Arab countries where the power distance is very high (80) and Austria where it very low (11), The Netherlands is somewhat in the middle. There is not a large gap between the wealthy and the poor, and there is a strong belief in equality for each citizen. The Dutch have an opportunity to rise in society, people question authority and attempt to distribute power (Hofstede, 2011). This tells us that the willingness to participate is not the underlying problem in public participation, the approach and the process itself are

The users and stakeholders in a new development should take on the tasks previously exclusively adopted by the government (initiating and preparing a viable plan). As governments are withdrawing from that role, the traditional top-down collaboration and decision-making models are no longer sufficient. A new model or instrument is needed which enables private and commercial parties to take action themselves in the initiation of new developments. A recent study into the development of a set of tools for public participation concluded that citizens and businesses are willing to engage constructively in shaping their environment, provided that they have easy access to decision making process (Koomen, Westerink, & Nedkov, 2014). Multiple studies in recent years have researched new ways, means and tools of communication between active citizens and government. New tools are developed to facilitate and streamline the exchange of information. These tools aim to bridge the gap between the professional Decision Support Systems used by government parties and collaboration platforms like mijnbuurtje.nl, buurbook.nl, verbeterdebuurt.nl and brickstarter.com used by citizens to organize themselves.

In a new age of joint urban development, relying on the public and private parties for new initiatives, a new communal development approach is needed. With this communal approach, it always starts with a large group of participants with a variety of ideas. In order to use methods and tools originating from group and negotiation support systems, it is essential to first analyze the large group of individuals, in order to unite likeminded participants into smaller groups. This first phase, visualized in figure 2-2, informs the public and registers all individual ideas, stakeholders and participants in order to sort them in stakeholder groups. This proposition is explained in more detail in next chapter.

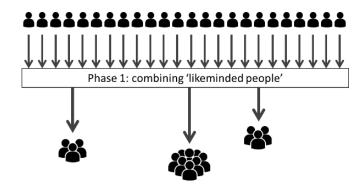


Figure 2-2 Phase 1 of the joint urban planning method

Grouping like-minded people occurs naturally, it is in our nature to be attracted to other people who think like us. Together we feel stronger, part of a bigger picture, more inclined to take action (Modani, et al., 2013). As social animals, we crave to belong in a group we identify with. However, without the right environment and guidance, this grouping process tends to be slow and easily stagnated (Correll & Park, 2005). There are several initiatives and platforms that are trying to speed up this grouping process and facilitate grouping of stakeholders, which are currently in use. In this thesis we divide them in four categories: *problem identification, idea creation, generating support* and *funding*. Even though some platforms combine multiple categories, it is usually focused on one. Next, an example for every category is shown in Figure 2-3 and explained in further detail below.

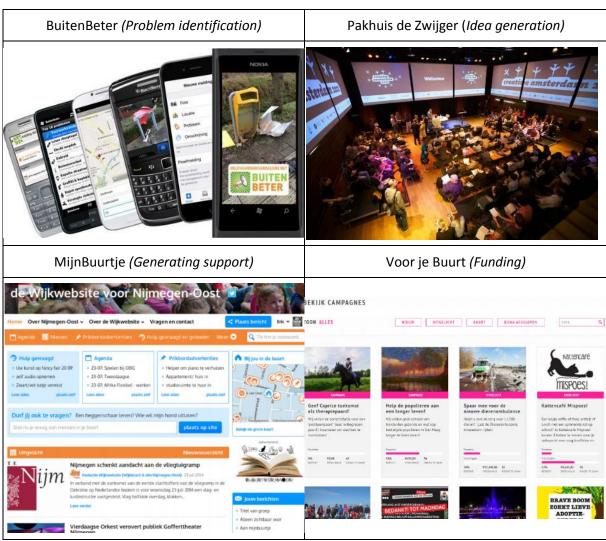


Figure 2-3 Examples of the four types of public participation platforms

#### Problem identification

In 2009, an open data platform emerged called Verbeterdebuurt (Improve-the-neighborhood). This cloud based application (both a web and smartphone app) gives inhabitants a tool to communicate problems in public areas, a direct line to the municipality. A similar initiative, named BuitenBeter (OutsideBetter), stimulates public participation and civil responsibility with a smartphone app that lets users take a photo, pinpoint the exact location via GPS, describe the problem, and send it directly to the municipality. The municipality maintains the infrastructure in which the complaint is delegated towards the appropriate sub-contractor to be solved.

# Idea generation

In Amsterdam as early as 2006, Pakhuis de Zwijger positioned itself as the leading independent platform for inhabitants to congregate, together searching for and implementing creative and innovative ways to improve their city. With a physical location, an old harbor warehouse, daily events and well over 72 thousand members, this community has earned the right to call themselves *Stadmakers* (*Citymakers*).

# Generating support

In 2011, the MijnBuurtje (MyNeighborhood) concept was launched in Nijmegen, aimed at connecting people within their own neighborhood to help each other out and to work together to build a beautiful and connected neighborhood. Within a few years, fifteen neighborhoods in seven cities across the country have their own neighborhood website with an agenda, newsfeeds, bulletin boards, stories, pictures and more. All in the name of connecting the neighbors, taking responsibility for their own living environment, improving it together.

# **Funding**

Often, when people have an idea to improve their neighborhood, they need funding to realize it. Sometimes the municipality can provide funds, but more often they can't. Crowdfunding is a method of financing that is increasingly popular, especially when it's aimed at local projects and supported by local stakeholders and ambassadors. One example is the Voor je Buurt (For the Neighborhood) platform. Anyone can initiate a crowdfunding campaign on their website and through the platform's many collaborations with municipalities and organizations they can support in many ways.

These platforms are online town squares to meet and connect with each other, a stage to present new ideas, a launching pad for new projects and collaborations, and a place to gather resources to make it all possible. Even though these platforms are mostly in the societal and social domain, this communal approach is the future of public participation in modern society. This gained knowledge and experience can be adopted in a joint urban planning method in order to acquire equal enthusiasm from the public to participate in urban area development.

# 2.4.Decision support systems

Decision Support Systems (DSS) are information systems (IS) to organize and speed up the decision-making process on complex issues. This is achieved by summarizing and increasing accessibility to relevant data from many different sources, such as raw data, documents, literature and personal knowledge of employees. In the 50's and 60's researchers at the Carnegie Intitute of Technology were already studying organizational decision making. The Massuchusetts Insitute of Technology (MIT) were working on the use of computers in decision-making processes in the 60's, this was focused on a single user. The term "decision support systems" first appeared in a paper by Gorry and Scott Morton (1971). In the 80's computers became accessible to a wider audience, which led to many new (complex) DSS theories and models, focused on group use. The scientific field of DSS include personal (PDSS) and group decision support systems (GDSS). In the past 40 years, the field branched out to increasingly specific theories and models. Haastrup (1994) distinguishes four dimensions for classification to decision support systems: a single or a group of users, a single or multiple criteria, decision support or decision-making, operational or strategic. DSS in urban development are for group use, with multiple

criteria, at the strategic level and decision supporting (Timmermans, 1997). Therefore, group support systems (GSS) and negotiation support systems (NSS) are used.

# 2.5. Group support systems

Group support systems (GSS) are a set of software, hardware and language components and processes that support a group of people involved in a decision-making process (Huber, 1984). GSS are usually implemented as Electronic Meeting Systems (EMS) (Dennis, 1988) or as Group Decision Systems (GDS) (Pervan & Atkinson, 1995). Group decisions can be classified by moment in time (synchronous or asynchronous) and by distance between participants (face to face or distributed) (DeSanctis and Gallupe, 1985). This results in four categories of time and distance: same time-same place, same timedifferent place, different time-same place and different time-different place. In the early 80's, GSS research focused on 'decision rooms' (same time-same place). Over time, GSS research and technology expanded to cover all four categories of the time / distance classification. Resulting in sub-fields like GDS, EMS, Computer-Supported Cooperative Work and Computer-Mediated Communication Systems, aimed at supporting decision-making processes in all kinds of situations (DeSanctis & Galuppe, 1987). GSS research is based on a framework to describe the characteristics of a group decision. The building blocks of this framework are; characteristics of the group, task, context and system. These characteristics influence the process, which in turn produces a result, as shown in Figure 2-3 (Nuamaker, 1991). In traditional urban planning, GSS are used to support the decision making process in small to medium sized groups (Thorpe & Albrecht, 2004). These tools allow all stakeholders to input their own wishes, review the wishes of others and communicate about them with each other.

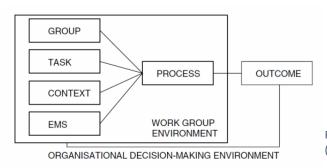


Figure 2-4 Framework GSS onderzoek (Nunakamer, 1991)

# 2.6. Negotiation support systems

With the development and implementation of group decisions support systems, a specific demand surfaced for a system to support negotiations within a group. Negotiation Support Systems (NSS) eventually evolved into a separate branch within GSS, after merging with other conceptual fundamentals (Arnott & Pervan, 2005), like game theory (Neumann, 1944), from which negotiation theory and many models of 'bargaining' and 'social choice theory are developed.

Both GSS and NSS are very useful in urban area development and are widely used. Especially inner city redevelopments are increasingly complex. New requirements and conditions are continuously added to existing regulations. This growing number of plan-technical, social, societal, legal and environment-related requirements and conditions add up to a very complex decision-making process.

The problem with GSS and NSS (developed for professionals) is that they are often too technical to be deployed in a group of non-professional users. When it is left up to private parties to initiate new urban developments, soon there will be hundreds of participants. These groups are too big to use existing GSS and NSS. In addition, current GSS and NSS in urban development either focus on the interaction between experts (mostly in the form of an expert panel), or between non-professionals (in the form of a "citizen jury"). Neither types are suited to support a mixed group of participants with a large variety in backgrounds and positions in society (Tan, 2014).

#### 2.7.Conclusion

The trend of urbanization is changing cities; specifically how the inhabitants of cities are changing the way they interact within their city. It is clear that the traditional urban planning approach in the Netherlands is going through mayor changes, with a government that is withdrawing from its role as initiator of new urban developments. The public is expected to take on this role in the (near) future, with support and guidance from municipalities. The difficulty lies in the actual design of this system concept for support and guidance to hundreds or even thousands of possible participants in a new urban planning method; municipalities currently are not equipped for this task. Decision support systems like GSS and NSS are designed to support small to mid-sized groups and are therefore not well suited.

By now, these individual topics and their connections are explained in enough detail to view them in the context of this thesis. Some topics are scientific fields of themselves, expanding ever more when looked at closer. Most have common ground and all are connected to each other in more than one way. When developing this study, these topics were in fact viewed as pieces to a puzzle. After these separate introductions, the next chapter will explain how and why these topics are all intertwined into the future of collaborative urban planning.

# 3. Theoretical framework: serious gaming in urban planning

As described in the previous chapter, a multidisciplinary scientific search is ongoing to find new ways to develop urban areas in a communal or a group setting. The main challenge therein is to let involved parties (citizens, entrepreneurs, businesses, etc.) communicate on an equal playing field and work together on one or more joint solution(s). This encompasses communication and negotiation facets from, among others, the scientific fields of GSS and NSS. Research shows however, that such systems and tools are great for small to middle-sized groups but are not well suited for large groups. In the new age of joint urban planning it is likely that hundreds or even thousands of participants will show up in the initiative phase of a new urban area development.

The first step in any new joint urban planning method must be sorting out the large group of participants, both in the number of people as well as the variety in backgrounds. This means putting a system in place to gather all ideas and combine 'likeminded people' into small to middle-sized groups. The government (Municipalities) should set up the needed infrastructure to this process and encourage its use by attaching incentives. Often times, when preceded by adequate preparations, these incentives are issued without necessarily incurring additional expenses. This chapter continues with the theoretical framework, focusing on the two main topics of this thesis, serious gaming and urban planning. In the first paragraph the scientific field of serious gaming is explained in more detail, including some important definitions. The second paragraph is focused on serious game design, relevant elements and design frameworks are analyzed in order to create a blueprint for a serious game prototype. The third paragraph is aimed at results from previous research studies, combining serious gaming and urban planning. These results are used to create a set of design guidelines for the development of a joint urban planning serious game prototype. Paragraph four recaps on the first three paragraphs, describing which framework and elements will be incorporated in the development of the prototype of the joint urban planning game. Closing off with the conclusions of this chapter.

# 3.1. Serious gaming, a scientific field

Constructivism, or learning by doing, is a classic approach to education. Children naturally use gameplay to learn new concepts from a very early age. Serious gaming emerged from the same idea, simulating real-world events or processes designed for the purpose of solving a problem. Although serious games can be entertaining, the main purpose is to educate.

Clark Abt discussed the idea in his 1970 book *Serious Games*, describing how the oxymoron of serious games unites the serious thoughts of solving problems with the experimental and emotional freedom of active play, offering a rich field for a risk-free, active exploration of serious intellectual and social problems (Abt, 1970). During the 1980's and 1990's, with the proliferation of computers in the classrooms, educational games became popular. The introduction of the internet in the 1990's however led to a change in the use of the limited computer resources, learning how to use the internet took precedence over playing games. The early 2000's saw a surge of different types of educational games, many not computer based, modelled on more traditional gaming systems both in console and handheld formats like paper- or card-based games (Klopfer, 2008) (Gray, Bulat, Jaynes, & Cunningham, 2009). Coinciding with these developments, a number of serious gaming initiatives and movements arose in multiple major organizations and research facilities like Microsoft, MIT (Massachusetts

Institute of Technology), CMU (Carnegie Mellon University) which resulted in the development of conceptual prototypes for interactive serious gaming. These prototypes introduced several forms of simulation games, games used to acquire and exercise skills in the context of simulated conditions or situations.

Regardless of a game's complexity and whether or not technology is used, games can aid in the learning process. Simulation-games provide a safe environment, based on reality, in which participants can experiment with decisions and negotiations (Mayer & Veeneman, 2002). The last couple of years, there has been an increasing interest in digital serious gaming by researchers studying urban development and civic engagement therein. Their value over other media and technologies is that "they are interactive, marrying the power of modern technology to the human desire for play" (The Economist, 2011). Although very few studies are available concerning the enjoyment and the feelings associated with the use of digital serious games in urban planning, findings in recent studies are promising (Mayer & Jong, 2004) (Poplin, 2011) (Reinart & Poplin, 2014). The use of a decision-support tool combined with serious gaming can support agenda setting and help create a shared understanding of problems and potential solutions in the field of sustainable urban renewal (Mayer, Bueren, Bots, Voort, & Seijdel, 2005).

There is some limited evidence of the user's experiences with digital serious games for civic engagement. For instance, Gordon and Schirra (2011) studied the user's experience with the game "Participatory Chinatown". Their research examined how a game based role-play can affect the way people understand local issues and engage with their community. The players responded that playing a character was a powerful element of the game experience; it created different expectations of what was to happen at the meeting, and it attracted a bigger variety of people to the meeting. The authors conclude that "This study of Participatory Chinatown demonstrates that an immersive, role-playing experience can give participants in a community meeting a strong feeling of connection to the neighborhood and a deep understanding of the issues in play." (Gordon & Schirra, 2011, p 183). Authors unilaterally agree that additional research on the benefits of creating serious games for urban planning is needed (Poplin, Digital serious game for urban planning: "B3 Design your Marketplace!", 2014) (Tan, 2014).

#### **Terminology**

While analyzing stacks of serious gaming literature, it immediately became apparent that clearly defined terminology would be one of the biggest challenges in the creation of a literature overview, as well as one of the most beneficial to the readers when done right.

It all starts with the concept of *constructivism* (learning by doing) (Abt, 1970). This is a classic approach to education where gameplay is used to learn new concepts. *Game Based Learning* (GBL) and *Serious Gaming* both emerged from that idea (Ifenthaler & Eseryel, 2012). Even though often used interchangeably, GBL focuses on education, while serious games have a broader range of goals such as business and policymaking. The term *Gamification* is used when referring to the theories and methods of this scientific field, and not the practical applications (Bringham, 2015).

Before going into the design stage, some game characteristics are described to improve understanding of the differences among games and their basic characteristics (Krek, 2008):

*Digital games and Non-digital games*. The main difference between Digital games and Non-digital games is the usage of computers in the creation of the game environment.

*Serious games* simulate real-world events or processes in order to solve a problem. Although serious games can be entertaining, the main purpose is to educate.

*Open-end games* can be played without an end. There are no rules for winning and every outcome represents only one of the possible solutions to the game. Other players can arrive to other solutions. In this sense there is no winner in the game.

*Non-competitive games* are games that shift the focus from winning to fun of playing. These games encourage playfulness, steering away from the concept of eliminating competition.

#### Classification

Serious games taxonomies or typologies are usually genre-based. However, genre definitions are always controversial (Breuer & Bente, 2010). To overcome the problem of static and either incomplete or redundant genre systems, the use of labels or tags is a viable alternative that has already been suggested for digital games overall (King & Krzywinska, 2002). This Label/Tag classification system (table 1) is flexible and open for additions and changes. It can be used not only by game designers to advertise their products, but also by researchers to describe and compare games and by educators and learners who use them to express their view of and experience with the game (Ratan & Ritterfeld, 2009).

As a general rule of thumb, the amount of complexity associated with a serious game will be directly correlated with the level of learning that you desire. Creating a serious game that only requires basic recall of information is quite easy to accomplish. However, to create a serious game that requires the player to come up with more complex answers or input, the instructional design has to be altered. Bloom's taxonomy is a classification of learning outcomes that was developed in 1956 and revised in 2000. The Bloom's taxonomy model is based around the idea that learning is divided into three main areas, the *cognitive* (knowledge), the *affective* (attitude) and the *psychomotor* (skills) domains (Anderson, et al., 2001).

<u>Gamification</u> is the use of game design elements and game mechanics in a non-game context to encourage engagement. Unlike a game, gamification is not a self-contained unit; it does not have a clear beginning, middle and end. Gamification uses game-based elements and strategies to increase

Label/Tag Category	Exemplary Labels
1. Platform	Personal Computer, Sony PlayStation 3, Nintendo Wii, Mobile Phone
2. Subject Matter	World War II, Sustainable development, Physics, Shakespeare's works
3. Learning Goals	Language skills, historical facts, environmental awareness
4. Learning Principles	Rote memorization, exploration, observational learning, trial and error, conditioning
5. Target audience	High school children, nurses, law students, general public, pre- schoolers, military recruits
6. Interaction mode(s)	Multiplayer, Co-Tutoring, single player, massively multiplayer, tutoring agents
7. Application area	Academic education, private use, professional training
8. Controls/Interfaces	Gamepad controlled, mouse & keyboard, Wii balance board
9. Common gaming labels	Puzzle, action, role-play, simulation, card game, quiz

Table 3-1 Classification of serious games (King & Krzywinska, 2002)

motivation, engagement, learning and solving problems (Bringham, 2015). (See figure 3-1 for examples of game-based elements enabling gamification.)

Broadly defined, <u>motivation</u> is separated into two different categories—extrinsic and intrinsic (Garris, Ahlers, & Driskell, 2002). Extrinsic motivation is often defined as behavior influenced by external reward or punishment. Intrinsic motivation is described as behavior driven by personal ambition or enjoyment. A key consideration in using gamification should be to include game elements that motivate individuals extrinsically and intrinsically (Bringham, 2015).

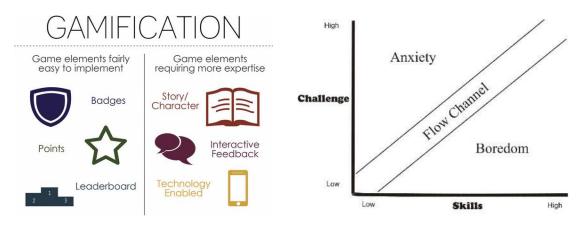


Figure 3-1 Game elements to encourage engagement (Bringham, 2015)

Figure 3-2 Flow State (Csikszentmihalyi, 1990)

<u>Engagement</u> is one of the most salient motivating components of gameplay. Motivation is necessary to create the initial action for a task, and engagement works to maintain the intrinsic motivation to keep playing. Therefore, a game is engaging when it continues to produce intrinsic motivation for the player. As engagement assists in creating intrinsic motivation, and intrinsic motivation is a key component of flow, the discussion of engagement is particularly meaningful to the understanding of *flow state* in games.

Flow is a mental state of extreme focus and attention, where you tune out everything except the task you're concentrating on. You become highly productive and your brain releases a shot of neurochemicals (Dopamine) that is pleasurable (Csikszentmihalyi, 1990). Being in flow state is a natural high and players who experience it are likely to represent their experience as positive (Helander & Tham, 2003). Simplifying it a bit, we know that to be in a flow state, an activity must be challenging. If it is too easy, then the brain has no reason to waste extraneous mental cycles, as a positive outcome is already assured. If it is too difficult, the brain still has no reason to try hard, because it knows it's just going to fail anyway. The goal is to hit that sweet spot where the player can succeed but only if they try hard (figure 3-2) (Csikszentmihalyi, 1990). For the purpose of examining how games create flow, we can identify six flow requirements: A task to complete, concentration on task, clear task goals, immediate feedback, sense of control over actions and deep but effortless involvement (Pavlas, 2010).

After analyzing these topics separately, it is possible to merge them in one overview (figure 3-3). This figure visualizes the connections between the crucial concepts behind learning and engaging gameplay. We can conclude that engagement is a direct result of specific game design elements.

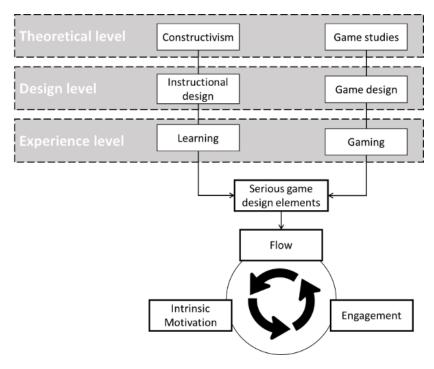


Figure 3-3 Overview of crucial concepts behind engagement

# 3.2. Serious Game Design

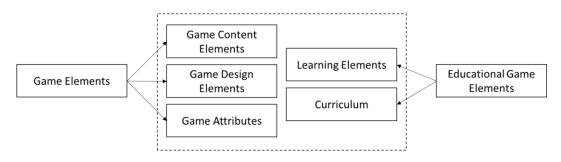


Figure 3-4 Game design elements in five categories (Roungas & Dalpiaz, 2015)

In 2015, a study into the structuring of *Game Design Documents* for educational games investigated the game design frameworks/systems described below. The proposed conceptual model identified and grouped educational game design elements into two categories and five sub-categories (figure 3-4) (Roungas & Dalpiaz, 2015). In the past two years a trend has been developing of focusing serious games as much on the learning elements as on the game elements. As a strategic view on the structure of game design documents, it provides clarity on how the scientific fields of *learning* and *gaming* congregate to bring about a balanced hybrid between the two.

As stated in the previous chapter, engagement is a result of specific game design elements. The first step is identifying all fundamental elements of game design. In this paragraph, the three best known and most cited theories/frameworks are analyzed. The first is the MDA Framework, which stands for Mechanics, Dynamics and Aesthetics (Hunicke, LeBlanc, & Zubek, 2004), its core elements. Mechanics are a synonym for the "rules" of the game. Dynamics describe the gameplay when the rules are set in motion. Aesthetics (in the MDA sense) do not refer to the visual elements of the game, but rather the player experience of the game: the effect that the dynamics have on the players themselves. One of

the key points of the MDA paper is that the game designer only creates the game mechanics directly. The dynamics emerge from the mechanics, and the aesthetics arise from the dynamics (figure 3-5). It is crucial to realize that a designer starts with the mechanics, followed by dynamics, ending up in aesthetics. The players however, see the aesthetics first. They may be aware of the underlying dynamics or mechanics, but the thing that makes an immediate impression is the aesthetics. This is why, even with absolutely no knowledge or training in game design, anyone can play a game and tell you whether or not they are having a good time.

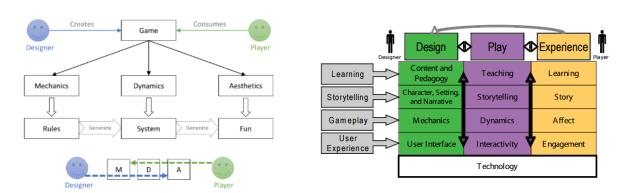


Figure 3-5 MDA Framework (Hunicke, LeBlanc, & Zubek, 2004)

Figure 3-6 DPE Framework (Winn, 2009)

Designing serious games however, offers a unique set of design challenges (Winn & Heeter, 2006) that are not all encompassed in the MDA framework. Extending the MDA Framework for game design, the DPE Framework (Winn, 2009) is developed specifically for the needs of serious game design. The authors elaborate that serious game design requires four layers: learning, storytelling, gameplay and user experience. Each of those layers represent a specific design process, consisting of the elements Design, Play and Experience. Similar to its predecessor, the MDA Framework, it is clearly focused on the relationship between designer and player (Winn, 2009).

The DPE framework is the most elaborate and detailed framework for serious game design (figure 3-6). In fact, it includes so many elements that it can be quite overwhelming and hard to grasp at first. To provide some clarity, the four layers of the framework are addressed individually. This way, all design elements within the layers can be explained in further detail, without causing too much confusion.

<u>The learning layer</u> is, quite self-explanatory, where the learning outcomes are defined. Using proven instructional design techniques the learning outcomes are built up the same way a teacher might do in their curriculum development. Bloom's Taxonomy (1956) is useful in this process, for it defines three type of learning: cognitive, psychomotor and affective learning (commonly simplified as knowledge, skills and attitude).

<u>The storytelling layer</u> can be divided in two, the designer's story and the player's story. The designer's story is designed into the game; it's the setting, characters, narrative, etc. The player's story is formed during gameplay by interactions with the game and players choices. The designers story combined with the player's choices define the player's story. The narrative and a dimension of fiction introduces a fictional context. The created fictional space should relate to the games purpose (Mitgutsch & Alvarado, 2013). As Charsky argues (Charsky, 2010), this fictional context involves "the setting, narrative, story, scenario, characters, back story, problem, and so on for the game play".

<u>The gameplay layer</u> essentially defines what the player 'does' in the game. It defines the choices a player can make and what ramifications those choices have within the game. The gameplay layer is broken down into mechanics, dynamics and affects. The designer can only directly control the mechanics. The dynamics are the result of the mechanics, and the affects represent the experience of the player during gameplay (Winn, 2009).

Even though game mechanics are complex, they are most often described as the rules of the game, the way of interacting with the game world (Sicart, 2008). These rules define the operation space within the game world (Hunicke, LeBlanc, & Zubek, 2004). The in-game goals of the game, the operation of the reward system, the main playfull obstacles/challenges, the difficulty balancing and the win condition. A widespread technique used by game designers consists of translating game mechanics into verbs (Winn, 2007). These verbs are actions that the player can perform within the game to achieve the purpose and the learning outcomes of the game.

While the purpose of entertainment games is focused on the gameplay experience, serious games are explicitly designed to reach a specific purpose, beyond the game itself. The purpose of the game is reflected in the aim of the game and its topic, but also in the designer's intentions to impact the players in a specific way. If serious games have no impact on the player in real life context, it has missed its pivotal purpose. That is why the purpose acts as the driving force that shapes the dynamics and the coherence of the game system as a whole (Mitgutsch & Alvarado, 2013).

The affects represent the player's experience during gameplay. These are the reasons why people engage with games, and what makes games 'fun'. Along with the DPE framework, Leblanc (2004) presented eight fundamental kinds of fun: *Sensation, Fellowship, Fantasy, Discovery, Narrative, Expression, Challenge,* and *Submission*. This is not a complete list of all kinds of fun, but these are most often used when describing the fun-factor of games. Even though some are centered on one kind, most games use several kinds mixed together to maximize an engaging gameplay.

<u>The User Experience layer</u> is all about designing from the perspective of the player. The purpose of the user interface is partly to make the gameplay accessible. For serious games however, the purpose of the user interface is also to create a vehicle to realize the learning outcomes. The game design manifests itself through the user interface, encompassing the information, facts and data offered and used inside the game. Nevertheless, not all content has to be relevant (Mitgutsch & Alvarado, 2013). The goal of the designer is to create a user interface that immerses the player in the game world and engages them in the experience (Winn, 2009). As stated by Brinckman:

"In the past, serious game development was mainly focused on the quality and seriousness of the games' content. The game mechanics were often simply built as an amusing topping to the serious content like "chocolate covered broccoli", which created a bad reputation of educational games as teaching instruments" (Brinckman, 1999, p. 4)

While the target group are often addressed as an important issue in serious game design, the play literacy of the target group is often overlooked. Questions about the target group arise such as: Do the players understand the controls and the interface? What skills are needed to play the game? Are they too difficult or too easy to acquire? Generally, serious games offer easy access to players, but they often lack an engaging gameplay experience (Brinckman, 1999).

Where the MDA and DPE frameworks encourage designers to see games from the perspective of players, the Elemental Tetrad turns it around and views games from the perspective of a development studio. The Elemental Tetrad model is also known as the Four Basic Elements of Game Design (Schell,

2008). The tetrad was actually the result of a study into the anatomy of games, and the basic elements that compose every game. Schell proposed four basic elements: Mechanics, Aesthetics, Story and Technology (figure 3-7). At first glance, two of the four elements seem to correspond with the MDA framework. More in-depth research reveals however, that mechanics and aesthetics within the Elemental Tetrad are different from mechanics and aesthetics in MDA. The story element refers to the sequence of events that unfold in the game. The technology element refers not exclusively to 'high technology', but to any kind of resource needed to make the game possible. No matter what kind of game is designed, decisions about all these four elements are made. None is perceived more important than the others and each one strongly influences each of the others (Schell, 2008). Again, The Elemental Tetrad is viewed as the development studio's perspective on game design.

Analyzing game design element frameworks is useful to identify crucial design elements. It provides the building blocks to develop a new game taking into account those elements. Another way to discover important game elements is to use an assessment tool, created to asses already realized games. Recent work from MIT Game Lab resulted in a conceptual serious games assessment framework. It is an attempt to offer a basis to study how the design elements are configured formally and conceptually in relation to the game's aim and purpose. They identified six essential components of the formal conceptual structure underlying a serious game. The driving force behind the Serious Game Design Assessment (SGDA) Framework (figure 3-8) is that serious games are purpose based game systems. Thus, the *purpose* should be reflected in all elements that support the game: the *content*, the *fiction/narrative*, the *mechanics*, the *aesthetics/graphics* and the *framing*. The relationships among these core components impact the coherence and cohesiveness of the formal conceptual design of the holistic *game system* (Mitgutsch & Alvarado, 2013). Even though this was initially proposed as an assessment tool to be used on existing games, it yielded crucial insights to be used in the development stage of new serious games.

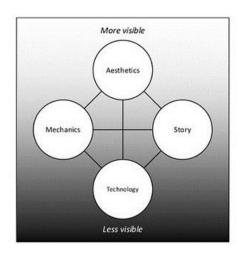






Figure 3-8 SGDA Framework (Mitgutsch & Alvarado, 2013)

When analyzing the best known and widely used game design theories and frameworks, it is clear that at the start of this millennium, there was a search for a *standard* or a *design framework* that could be used as a blueprint when designing digital (video) games. Specifically, fundamental research was still needed to merge the scientific fields of learning and digital gaming, scientifically substantiating serious gaming as a tool. The MDA framework emphasizes the crucial realization that the designer can only design the mechanics (rules) of the game. The player however, only experiences the aesthetics, which are an indirect result of the mechanics. The DPE framework was developed specifically for serious

game design by expanding the MDA framework with learning outcomes and engagement tactics. That is why this thesis will use the DPE framework as a blueprint for the design of the game prototype.

# 3.3. Developing serious games for urban planning

When developing a serious game to improve public participation in the initiative phase of joint urban planning, some important questions must be answered about the design. One of the first questions: how serious a serious game in urban planning can be? At least the following issues are related (Poplin 2011, 2012):

- <u>Environment</u>: How close to reality should the environment be presented in the game; shall the maps and 3D representation be geo-referenced or simply presented as a non-georeferenced space?
- <u>Urban planning topics discussed</u>: Shall they be taken directly from the current discussions about the changes in the city, or can this bring additional misunderstandings between the urban planners and citizens?
- Results of the participatory process: What should happen with the results of the game-based public participatory process? Should they be sent to the responsible urban planners or just saved on the server? In which formats and applications should they be saved?

Other questions depend on the potential players of the game, the main goals of the game and the public participatory process in which the game is used. Previous research into serious game systems/prototypes focused on urban planning have resulted in the following guidelines:

- Games used for strategic policy support are usually open games. Open games imply that the participants are, or represent, the actual stakeholders and face actual problems. The outcomes of these games are not predefined or controlled but discovered during interactions within the game. (Mayer, Carton, de Jong, Leijten, & Dammers, 2004).
- For a serious game to be successful, the overall structure of the game and the instructions provided to play it should be kept simple to minimize the time spent learning the rules of the game (Mitchell & Scavill-Smith, 2001).

Serious games are, just like any other type of game, simulations of the real world. Aldrich (2005) considers online digital serious games as online learning environments, which in fact, they are. Although combinations are possible, four basic types of online learning environments are referenced as "simulations" (Aldrich, 2005):

- <u>Branching stories</u>: Allow the learner to participate in a "Choose Your Own Story" scenario. In this type of scenario, the learner reads about a situation and then chooses which way the story will proceed. The story will consist of several questions that lead the learner to different endings, depending on their decisions. If the learner makes the correct decisions, they will successfully complete the challenges within the story. If they do not make the correct decisions, they will not complete it successfully and will have to go back and find out how they can complete the challenge. Feedback can be provided after each question or at the end of the scenario, depending on preference.
- <u>Interactive spreadsheets</u>: Are exercises that allow the learner to plug-in figures or information into a system and see the direct results of their actions. Interactive spreadsheets are used

- when it is important to show the effects of actions over time, or when it's needed to emphasize cause-and-effect relationships.
- <u>Game-based models</u>: Draws on information or knowledge the user already has. Learners
  engage simulations of a familiar and entertaining game in which educational content is
  embedded. This way, the learners is already familiar with the interface and the rules and
  environments within the game, making it easier to focus on the learning outcomes.
- <u>Virtual products and Virtual labs</u>: Offer the learner a simulated environment where they can safely interact with a product or setting. The learner should be able to attempt different actions and the product's (or environment's) response should mimic real-life as closely as possible. This is a much cheaper way to train learners, especially in scenarios where the real products/environments are expensive or difficult to obtain.

From this previous research we can conclude that in the development of a serious game for urban planning certain questions have to be answered. How the environment is presented, which topics are discussed and the handling of the results of the game determine how serious a serious game is (Poplin, 2012). Serious urban planning games are usually open games, which implies that the participants are, or represent, the actual stakeholders and face actual problems (Mayer, Carton, de Jong, Leijten, & Dammers, 2004). Also they are kept simple to minimize the time spent learning the rules of the game (Mitchell & Scavill-Smith, 2001). When viewing online digital serious games as online learning environments there are four basic types: branching stories, interactive spreadsheets, game-based models and virtual products or labs (Aldrich, 2005).

#### 3.4.Conclusion

In this chapter we continued to build up the theoretical framework of this thesis, focusing on the two main topics of the study: urban planning and serious gaming. The chapter starts off with a detailed exploration of the scientific field of serious gaming. Important terminology and definitions are explained, as well as classification methods and the differences between *games*, *game-based-learning*, *gamification* and *serious games*. One of the key conclusions is that serious games have the capability to invite large numbers of participants and let them communicate with each other on a level playing field, exactly what a joint urban planning method needs.

In the second paragraph, serious game design, relevant elements and design frameworks are analyzed. Resulting in the choice to use the DPE framework as a blueprint in the development of the serious game prototype. The third paragraph is focused on previous research into serious gaming in urban planning, resulting in detailed development guidelines. It is explained why serious urban planning games are usually open games, kept simple to use and can be viewed as online learning environments.

# 4. Joint urban planning system concept

After describing the theoretical framework of serious gaming in urban planning in chapter two and three, this fourth chapter is all about applying the gained theoretical knowledge and developing a joint urban planning approach. To restore confidence in the possibility of a true joint urban planning method, some stakeholder specific concerns have to be addressed. This chapter will describe these specific concerns and offer a possible solution in the form of a serious game system concept.

Starting this chapter, the proposed joint urban planning system concept is described, addressing specifically 'how' and 'why' it can improve urban planning in the near future. The second paragraph will describe how serious gaming can be the solution to the biggest challenge in future urban planning; attracting the local community to participate. The third and fourth paragraph describe the step-by-step development of the joint urban planning system concept. Starting off with the selection of game characteristics based on the literature reviewed in the last two chapters. Followed by a detailed explanation of the core game design elements, using the four layers of the DPE framework (Winn, 2009). Closing the chapter off with a program of requirements for the joint urban planning game prototype.

# 4.1. How serious gaming can increase public participation

To increase private party initiatives in urban development, two specific components have to be addressed. Stakeholders are not informed on the process of urban planning. People must first be willing to invest their time in getting to know this process, expecting to gain something in return (resolving rational ignorance). This can be achieved by adding play, through serious games. Thus making the learning process provide a part of the gains (entertainment). The actual use of the input is an added bonus, but no longer a prerequisite to a feeling of satisfaction afterwards.

The second component is for all participants to be able to communicate with each other at the same level. By creating a game environment in which all players are equal, or at least able to choose any role, it is possible to provide a level playing field for both professional and non-professional participants. By implementing the limitations of legislation into the simulated environment of the game, no in-depth knowledge is needed in order to join in the initiative and design process of urban planning. With such a simulated environment within a game it is possible to invite any amount of players.

This makes serious gaming the ideal tool for phase 1, combining likeminded people, in a joint urban planning method. It offers incentive and reward in the form of play and entertainment, it provides a level playing field for all participants and it has the capability to manage and support a large number of players. Poplin calls this Playfull Public Participation (Poplin, 2014). When phase 1 is at its ending, one, or several, group(s) have formed around an idea. These stakeholder groups now enter phase 2 of the joint urban planning method (figure 4-1). After combining all likeminded people into small to midsized groups, we can now use traditional methods and tools originating from the GSS and NSS fields. This thesis is

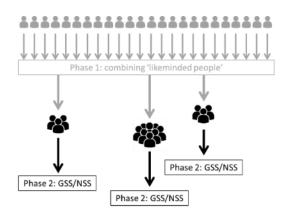


Figure 4-1 Phase 2 of the joint urban planning method

focused on serious gaming in phase 1 and will not go in further detail concerning phase 2. The biggest challenge in future urban planning is in finding out how to attract the public to participate in the initiative phase and how to manage this new communal approach. Once a large group of participants is divided into smaller groups, tools that are more traditional can be used to manage and support them.

# 4.2. Why serious gaming is a solution to urban planning challenges

When the biggest challenge in future urban planning is in attracting the local community to participate, it is smart to subdivide this challenge into smaller ones. The previous paragraph already touched on this. The first important challenge is informing the stakeholders in the community on the process of urban planning, specifically joint urban planning. Only when stakeholders are well informed on the process, will they actually invest their time. Serious gaming is a method of learning by play, making it fun to get informed about urban planning.

The second challenge is for all stakeholders to communicate with each other on an equal level. For example, it is important they use the same words when describing their thoughts and ideas concerning future urban planning in their community. Through clear communication within the community, stakeholders can find common ground faster. Focus is then shifting from differences to similarities. This clear communication can be provided by designing an online game environment that uses clear terminology and descriptions, encouraging the participants to adopt them.

So, why is serious gaming a solution to attract the local community in future joint urban planning?

- Stakeholders are not informed on the process of joint urban planning, but they should be in order to participate. Serious gaming is learning by play, making it fun to get informed.
- It is very important for stakeholders to have clear communication with each other, to find common ground as fast as possible. Serious games provide an environment that uses clear terminology, encouraging participants to adopt them.

In order to clarify this process, we construct the following example. A sports association is interested in participating in urban planning initiatives surrounding their sports fields and clubhouse. First they have to be informed on the process of communal urban planning. One or more board members use the online game environment to explore this process in a playfull learning way, achieving awards when successfully completing knowledge missions. Once informed, they need a clear platform on which they can view other ideas from within the community to collaborate with, or to present their own. The same online game environment provides this platform for showcasing and presenting new ideas. Stakeholders all have their own account with which they can vote ideas up or down, as well as contacting other participants directly. When they find likeminded stakeholders, they can meetup offline and collaborate on this new idea/initiative. Because they are informed on the urban planning process and have already formed a likeminded stakeholder group, the municipality can provide specific guidance and support where needed to develop and execute their idea/initiative.

# 4.3. Selecting the game characteristics

To design a system prototype, we start with the core idea of a *serious game*; a game designed for learning about joint urban planning and motivating the public to take on a pro-active role. Because the players are, or represent, the actual stakeholders, we define it as an open game. In order to use the game in multiple locations, the game environment should be adjustable. The best way to achieve this is by making a *digital game*. Urban planning essentially never stops; cities are constantly changing. It is therefore necessary that the game environment is *open-ended*, in order to accommodate stakeholders at all times.

To form actual groups of like-minded people however, momentum is important, requiring game-sessions that have a specific duration and a clear ending. Matching with that characteristic, the focus of the players should be on the fun of playing, and not on winning or eliminating competition, making it a *non-competitive game*. Figure 4-2 visualizes how these design elements come together in the Joint Urban Planning Game.

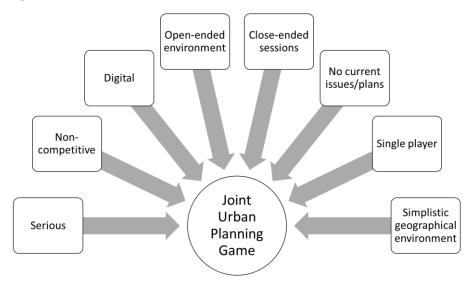


Figure 4-2 Design elements of the Joint Urban Planning Game

The game environment does *not have to be exactly geo-referenced* on a map, as the first phase is focused on informing, idea generation and grouping like-minded people. Because it is an urban planning instrument though, it does have to include some area specific characteristics to give the players a frame of reference to the real world. *Current urban planning issues or plans are not discussed* in the game. Idea generation is one of the main purposes of the game; existing issues or plans can only limit creativity. A simplistic representation of the geographical area and some key environmental descriptions constitute the game environment. Urban planning never ends; people are always looking for ways to improve their environment. That is why the game/learning environment has to be openended platform, which is always accessible. Grouping likeminded people around an idea to develop it further however, requires a close-ended game session, after which the groups can further develop and actually implement these ideas. This is visualized in Figure 4-3.

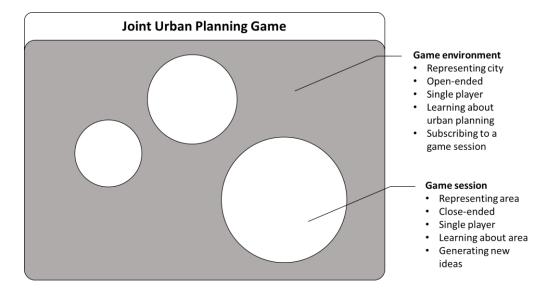


Figure 4-3 The game environment and game sessions within

The result from a game session is in essence a *collection of ideas/wishes* from real stakeholders in the area. The municipality is tasked with supporting the public in the new age of joint urban planning. This means the municipality is responsible for the implementation and maintenance of the proposed two-phased joint urban planning infrastructure (Figure 4-4). When a game is finished, the municipality will guide the *'groups of like-minded people'* or *'like-minded stakeholder groups'* to form organized project teams and support them in the further developing and implementation of the groups ideas (phase 2). This guidance and support consists of a dedicated member of the municipal staff and municipal GSS and DSS tools.

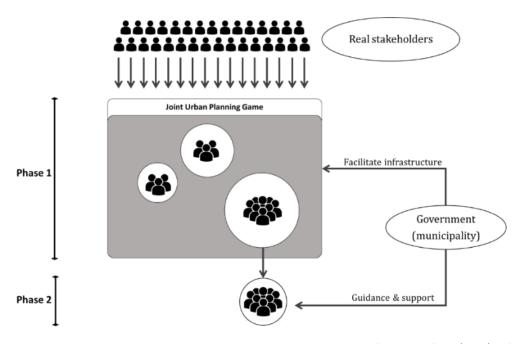


Figure 4-4 Joint Urban Planning system

# 4.4. Selecting game design elements

Based on the scientific literature described in the previous chapter (3.2), to develop the structure and design of the actual serious game prototype, the DPE Framework is used as a blueprint. The four layers of this framework (Learning, Storytelling, Gameplay and User Experience), each having a design, play and experience aspect. To gradually build up a prototype, the layers are addressed one at a time.

## Learning layer

We use the cognitive and affective domain (table 4-1) to define the learning outcomes for the Joint Urban Planning Game.

Cognitive domain	Affective domain
Remember	Receiving
Understand	Responding
Apply	Valuing
Analyze	Organization
Evaluate	Characterization by value
Create	

Table 4-1 The Bloom's Taxonomy (1956)

The Joint Urban Planning Game is focused on two cognitive processes, both are translated into a learning outcome. The first is understanding the urban planning process and how it is changing. The second is evaluating which role they would like to play in future initiatives. When looking to the affective domain, we identify three processes that are learning outcomes. Participants have to be open to the experience, be willing to receive information about urban planning. They also have to be willing to respond, by willingly participating. And finally, they have to value one thing over others, being able to choose an idea and commit to it.

We can now state the five learning outcomes of the Joint Urban Planning Game:

- 1. Receiving information about urban planning
- 2. Understanding the urban planning process and how it is changing
- 3. Responding by showing how they would like to participate
- 4. Evaluating which role they would like to take on in new initiatives
- 5. Valuating one idea over the others, and supporting it

The Joint Urban Planning Game provides data in text and image storyline form throughout the gameplay. This data entails characteristics and statistics on traditional urban planning, joint urban planning, the environment, stakeholders and future developments. Examples of content are names and stats of the participant or relevant stakeholder. Content entails all the data and words in the game that are visible to the player. Also, the earned badges are visualized and presented alongside the player's name and avatar. The user interface, at all times, provides the progress during specific challenges.

## Storytelling layer

The Joint Urban Planning Game's setting is a web-based virtual map of a city or region. At the start of the game the player creates a user profile by selecting an avatar picture and filling out some personal information such as their name, gender and age. The plot can be described as follows: "Players can explore the city freely, learning about interesting places and projects by clicking on the different sections on the city map. In some neighborhoods they can enter a challenge, a game-within-the-game designed specifically for that area." The prototype is such a local game-within-the-game challenge. The back story to this challenge is that the area is fragmented. Many inhabitants and stakeholders are unaware how large the area in fact is and which stakeholders are present. The narrative is that there is not a clear driving force, and that a quest is going on to create this driving force. The challenge to the player is to show that they possess the necessary knowledge of traditional and joint urban planning methods. They are quizzed on types of organizations and the roles that exist in joint urban planning. When they pass these quizzes, they can earn a number of badges. After proving they possess the necessary knowledge they're asked to advise on how their own area should be organized and managed in the future, and what role they would like to play therein.

### Gameplay layer

In the Joint Urban Planning Game, the goal is to introduce the players with joint urban planning and the roles they can play in the future developments within their own environment. The main challenge for the user is to gain points by correctly answering questions, earning badges. During this process they learn what roles they would like to play in the future development of their neighborhood. The feedback and reward mechanics within the game are all focused on engagement, one of the most salient motivating components of gameplay. Engagement, as explained in the previous chapter (3.2), assists in creating intrinsic motivation, described before as behavior driven by personal ambition or enjoyment (Bringham, 2015).

In the previous chapter (3.2) we also described what flow state is, and how to enter this state of mind, an activity has to be challenging (Cecchini, 1999). The Joint Urban Planning Game is challenging because it first presents crucial urban planning knowledge throughout the storyline and then tests the player on these matters during gameplay. Immediate feedback rewards success and steers players with wrong answer into the right direction. For example, in the beginning of the game, important steps in the joint urban planning method are described, before pitching ideas themselves, players must first pass a test to prove they are 'ready' to participate 'for real'. When passing the assessments, specific

content-related trophies are earned. These challenges are increasing in difficulty to adhere to the theory of flow state. While forming their own advice they are presented with clear task goals, subdividing them (place, time, involved stakeholders, etc.) in order to concentrate on the specifics. This combined with effortless controls (a point and click user interface) are in fact the recipe for flow state (Pavlas, 2010).

The purpose of the Joint Urban Planning Game is to engage the players to think about their real life environment and become active in initiating new ideas to improve it. Players should find it fun to play the game, and be intrinsically motivated to continue playing it. The aim is to introduce the player into a new way of thinking.

The Joint Urban Planning Game contains two affective goals: narrative and challenge. The narrative affect builds on our primal desire for stories that have a certain shape, a solid structure that takes us through new knowledge without anxiety. The structure of a story that is building towards a clear goal and satisfying ending gives a sense of closure and resolution. Looking at the challenge affect, the game is essentially a series of obstacles to overcome. When a player is presented with a fair obstacle, and the tools to overcome it, their brains reward them with feelings of accomplishment and happiness when they achieve those goals.

### User Experience layer

The Joint Urban Planning game is focused on real life stakeholders in the neighborhood's challenges. The target group within those neighborhoods is quite broad, mainly focused on real life stakeholders, of any age, who are interested in initiating new ideas and collaborating with other stakeholders. The play literacy needed to master the game has to be very basic in order to invite players of all ages and digital gaming experience levels.

Taking the game's target audience into account, a 3D-shooter-style navigation is not recommended (Mitgutsch & Alvarado, 2013). To be able to engage a broader user group, including less experienced digital game players, a point and click user interface is the best choice in terms of controls. When looking at the four types of online learning environments referenced as 'simulations' by Aldrich (2005), we see a combination of a virtual environment and branching stories therein. The Joint Urban Planning Game is a virtual environment to learn and experiment. The game-in-game neighborhood challenges however, are branching stories, letting the user decide how the story unfolds.

# Summary of the crucial game design elements

After a quite extensive description concerning the four design layers, table 4-2 summarizes the most important outcomes. This provides us with a brief overview of all crucial game design elements, to compare to the program of requirements drafted in the next paragraph.

Learning layer				
- Learning outcomes	Receiving (information about urban planning)			
	2. Understanding (the urban planning process and how it is changing)			
	3. Responding (by showing how they would like to participate)			
1	4. Evaluating (which role they would like to take on in new initiatives)			
1	5. Valuating (one idea over the others, and supporting it)			
- Content	Player data: avatar, name, age, achievement trophies, challenge outcomes			
Storytelling layer				
- Designers story	Setting (a virtual map and pictures of the city of Eindhoven)			
1	Characters (names and descriptions of real-life stakeholders)			
1	Narrative (back-story)			
- Player`s story	The player makes choices during gameplay which guides them towards one			
	of the possible story outcomes (branching story gameplay)			
Gameplay layer				
- Mechanics	Mastering (the process and characteristics of urban planning)			
	Solving (challenges and obstacles during gameplay)			
	Earning (achievement trophies)			
	Discovering (what role they would like to take on in real-life)			
- Dynamics	The aim of the gameplay is to introduce and invite the player into a new way			
	of thinking of how their real-life environment is developed			
- Affects	Narrative (game as an unfolding story)			
	Challenge (game as an obstacle course)			
User experience layer				
- User Interface	Very basic play literacy			
	Point and click interface			
	Virtual environment, with branching stories within			

Table 4-2 summary of chosen game design elements

# 4.5. Program of Requirements

To provide a Program of Requirements for the Joint Urban Planning Game we start with the functional requirements of such a system. The core system has to accommodate the following <u>functional aspects</u>:

### System administration

 The administration of the system shall include a full range of functions for the management and configuration of system parameters and attributes, data, users and courses.

### Course management

 This module should provide tools for synchronous and asynchronous e-learning, creating, editing, saving and deleting e-learning courses, encouraging user participation in the learning process and ensuring better interactivity within the teaching process. It should also provide an opportunity to test, assess and oversee the user's performance.

### Content Management

• This module should store and manage learning content of all users on the platform in order to facilitate work with the learning material.

### Electronic Register

 It stores the results and marks from various examinations, tests, assignments and group projects.

### Social Platform

 This provides all users with a social profile and the interactive capability of using groups and forums. Messaging and notifications can be very powerful and effective, letting users communicate with each other via private messages, as well as notifying them when a specific course has been updated or feature added.

The system should also meet the following quality requirements:

### Accessibility

 It should have a web-based user and administrative interface and, as a minimum, it should be compatible with the most popular Internet browsers, such as Internet Explorer v.8 and higher, Mozilla Firefox v.3.6 and higher, Safari v.3 and higher and Chrome v.10 and higher.

### Functionality and easy access

 The system should be designed for ease of access and use, including to people with low play literacy or technical abilities.

### Stability

o The system should guarantee a secure and reliable learning process.

### Scalability and flexibility

 The system should be able to expand and serve up 500 concurrent users, and to allow for additional settings in design and future content. There are also a number of baseline <u>requirements for the technology</u>:

#### Interface

 The system should be simple and easy to use with an intuitive point-and-click web interface, following web 2.0 trends.

### Architecture

• The system should have a standard three-layer model for web applications, consisting of database (1), application server system (2) and user interface (3).

### 4.6.Conclusion

Following the two theoretical framework chapters, this chapter was all about applying the gained knowledge from the scientific field of serious gaming into practice. Starting the chapter, the proposed serious game system concept is explained in the first two paragraphs. By introducing a clear 2 phase joint urban planning system, the community building and idea generation component is addressed in a playfull way in phase 1, lowering the entry barrier to public participation. Developing and executing actual urban planning initiatives will be addressed in phase 2, only after likeminded stakeholder groups have been formed in phase 1.

The inner workings of the proposed serious game system concept is explained in detail in the third and fourth paragraph. Starting off with an explanation of the chosen game characteristics. The reasoning behind developing the joint urban planning game as digital, non-competitive, single player and simplistic in use, is explained. As well as why the game is an open-ended environment with close-end sessions therein, and why current local urban planning issues or plans are not discussed. These game characteristics are followed up by a detailed description of the game design elements. Using the four layers (learning, storytelling, gameplay and user experience) of the DPE framework, all crucial game design elements are described extensively. Closing the chapter off with a program of requirements for the joint urban planning game prototype in which functional requirements, quality requirements and technological requirements are addressed.

# 5. Prototyping the Joint Urban Planning Game system

Prototyping new designs and systems is a practice that is found in almost every industry. The word is derived from the Greek 'prototypon', literally meaning a primitive or early release of a product built to test a concept. The chapter starts off with an explanation of the core system that serves as the foundation. This is followed up by a description of how the virtual game world is designed, and what game components can be distinguished. These game components are then each explained in further detail. The third paragraph describes how the prototype has been tested by carrying out a pilot project in collaboration with the municipality of Eindhoven and real stakeholders in the area. This pilot project, and the developed game prototype itself, are explained in detail. The results of the pilot project are discussed in the fourth paragraph. Followed by a reflection on the prototype and the case study in the fifth paragraph. Closing off with a number of conclusions in the final paragraph.

# 5.1. Developing the underlying system

In the development of the joint urban planning game, the program of requirements (presented in chapter 4.5) served as a guide to find the best system to meet all the stated requirements. After trying out several systems by Adobe, such as Adobe Flash and Adobe Captivate, the conclusion was that no standalone software could meet all necessary requirements. That is why the open-source content management system (CMS) Wordpress was chosen as the core system. Wordpress is installed on a web server and is based on coding languages PHP and MySQL (Wordpress, 2016). Wordpress provides system administration and content management. The Wordpress plugin architecture allows users to extend the features and functionality of a website by uploading and activating certain plugins. The plugin 'WordPress Form Builder' enables course management and electronic registration of the result and marks from various assignments, tests and oversee group project. Another plugin called 'UserPro' implements a social platform onto the system, providing all users with a social profile and the interactive capability to form groups and communicate among each other by direct messaging. This total package provides all that is needed to create an online game environment in which players can learn about joint urban planning, get quizzed on the this knowledge, earn rewards that are displayed in their profile and get in contact with other players, who are in fact all stakeholders within their community.

To meet quality requirements, the game should be accessible, functional and easy to access. It also has to be stable, scalable and flexible. By choosing Wordpress as the backbone of the game environment, it provides a clear web-based user interface which is easy accessible by any internet browser. With ease of access and use in mind, the UserPro plugin provides a very simple login module, welcoming all stakeholders to participate, including people with low play literacy or technical abilities. With almost 20 percent of websites on the internet powered by Wordpress (source), this provides as stable an online environment can get. To scale the system up for more users, no additional action is needed. The requirement of 500 users can be managed under this system with ease.

The baseline technical requirements are focused on the interface and the architecture of the system. By developing a simple and easy to use web interface with point and click controls, the interface is ideal for all types of players, including people with low technical abilities. Concerning the architecture,

Wordpress utilizes the standard three-layer model for web applications, consisting of database (1), application (2) and user interface (3).

# 5.2. Developing the virtual game world

By developing the underlying system as described in the previous paragraph, the foundation for the virtual environment has been constructed. We can now build various game components upon this foundation, creating the virtual world in which players will learn about themselves and connect with each other. When constructing a virtual game environment, the designer is basically creating a new world by illustrating a setting, characters and narrative. All the players within are confined to the boundaries of this world, but can freely move within that environment. This is called the designers story. The Joint Urban Planning Game is modelled after the real city of Eindhoven in The Netherlands, the fifth largest city in the Netherlands. The game environment is visualized using virtual city maps and images of Eindhoven. The characters in the game are based on real-life stakeholders within the city, such as the municipality, businesses and organizations. The narrative, or back-story, is that the municipality has stopped initiating new urban area development. Local stakeholders will now have to find each other and join forces to ensure the city's future development. The virtual world is composed of five game components: user profiles, missions, scenarios, groups and ideas. These 5 game components embody all 8 crucial game design elements as described in chapter 4.4. Each game component will now be described individually, explained in further detail.



# User profiles

Anyone who enrolls on the platform gets its own user profile, which is accessed through a profile page. At the start of the game, this profile consist of only a name, email-address and a temporary avatar. During gameplay, the player will gradually complement this with more detailed information about themselves. This player data is stored in the user profile on the server database. The input and results of their missions and challenges is saved, and the earned badges are visualized and presented on the profile page. To view other players` data or to connect directly through messaging, simply clicking on their name or profile picture will link through to their profile page.

Within the game environment, the choices a player makes during gameplay determine the players' story. Every mission and challenge can be viewed as a game-in-game branching story. Within these game-in-games, only a small number of story outcomes are possible. This way, multiple players have the same outcome, resulting in like-minded player-groups, regarding certain topics. Because each player is free to choose their own path throughout the game environment, the total number of possible player stories is almost infinite.



## Missions

There are five specific learning outcomes in the Joint Urban Planning Game. The first and second learning outcome are focused on gaining theoretical knowledge about the urban planning process. In order to make it more attractive to learn these new theories, it is spread out over multiple learning sections. These learning sections are called 'missions'. Every mission starts with a presentation of new information using text, figures and images. At the end of the presentation the player can take the test.

During this test the player is quizzed on the information presented earlier in the mission. By completing puzzles, matching words and correctly answering questions, the player can pass the test, earning the associated mission badge as proof, which will be displayed on the players' profile page.



### **Scenarios**

The third, fourth and fifth learning outcomes are focused on applying the knowledge gained during the missions. After completing several missions, the player can choose to play specific 'scenarios'. These scenarios are locked by default, players can unlock them by earning badges when successfully completing missions. In this study, Genneper Parken is developed as a pilot scenario. Players have to successfully complete mission 1 and 2, in order to gain access to the Genneper Parken scenario.

Every scenario presents a case/scenario using text, figures and images. After a short introduction, the player is asked to give advice on how to resolve the challenges they are presented with. This advisory report is again stored in the players' user profile and can be viewed afterwards on the profile page. Because they have learned the necessary knowledge during the preceding missions, players are now able to provide a substantiated advice by evaluating and valuating the available options according to their own views and wishes. Players don't have to guess, every single topic and concept has been explained, learned and tested through the missions. Therefore, these scenarios provide extremely valuable, and difficult to obtain, information, all of which is stored in the database. By means of that database, players with the same ambitions and wishes can then be introduced to each other in likeminded stakeholder groups.



### Groups

The ultimate purpose of the Joint Urban Planning Game is to connect real-life stakeholders in groups of like-minded-people. Within the game, various types of groups are possible. As a result of the scenarios, groups are formed with players who have given similar advice. This way, they can discuss these topics in a serious and engaged manner. They effectively went through a kind of self-selection process. All who enter the group, know the group goals and want to contribute somehow. After having made an online acquaintance, it is easy to invite all group members for an offline meetup. As a member of a group with clear goals, they will be more likely to join such an offline meetup, rather than a general public consultation meeting. But groups may also be formed for other reasons. For example, all municipal staff members are connected to a municipality group, in order to facilitate communication.



### Ideas

One of the key characteristics of joint urban planning is that ideas are easily proposed and that these ideas can then be discussed and developed further. The strength of an online platform is that it provides a stage to present ideas, which is available at any time. This way, everyone can propose new ideas and respond on the moments that suit them best. Everybody can add an idea by using an interactive form, from their profile page. All ideas have a title, one or more tags, a brief description and some clarifying and illustrative images. Anyone can respond to an idea and reward it with a like/vote. The ideas can then be filtered and sorted by number of likes/votes, but also, for example, by date or number of responses. The aim is to create a bulletin board where everyone posts their idea or initiative, in order to attract like-minded-people who want to contribute and form a group to realize their shared ideas.

When these 5 separate game components are interlinked, they merge into one virtual world, incorporating all 8 crucial game design elements into one unified virtual platform. Table 5-1 illustrates this unified system concept. To discover where, and how, the 8 key game design elements have been incorporated, please refer to Appendix A. There you can find the complete version, in which all connections are elaborated in full. Since this comprehensive version is rather complex, it is not included here, to avoid any confusion.

# User profiles Missions Scenarios Groups Ideas

Table 5-1 Joint Urban Planning Game system concept

# 5.3. Testing the prototype

In order to test the prototype, it was decided to start a pilot project. During a meeting with four area coordinators from the municipality, several projects and areas in Eindhoven were discussed. However, it soon became apparent that one area was especially well-suited to be chosen for this thesis. The Genneper Parken project met all the ideal requirements for a pilot project. At the end of 2015, the municipality has organized a series of workshops in the area to identify the major stakeholders and involve them in future area developments. The pilot project was able to fit in perfectly with the already ongoing process, as a continuation of the workshops. The actual prototype testing period extended over the months of March, April and May of 2016. In June of 2016, the results were collected, analyzed and presented in this thesis.

## Pilot project: Genneper Parken

Genneper Parken is a nature, sports and recreation area in the south of the city of Eindhoven. Surfacing over 200 hectare (or 2 square kilometers) and situated just 2 km from the center of the city, it is considered unique in the Netherlands. Virtually all the land is owned by the municipality (over 90 percent). In the past, every ten years, the municipality would present a new structural concept for Genneper Parken with spatial development strategies for the upcoming decade. The latest vision and the associated strategies, date back to 2004. However, it was decided that this will no longer be imposed top-down going forward. That is why in 2015, the municipality started the process of developing spatial ambitions for 2015-2025 by organizing five separate workshops with 25 major stakeholders, with an emphasis on co-creating



Figure 5-1 Genneper Parken

future area developments. These workshops have clearly shown that all involved parties attach great value to the area, and that there is a lot of commitment for collaboration. First however, the major stakeholders must agree on the organizational form that Genneper Parken should adopt going forward, and decide on the roles of the parties herein. This has a high level of urgency, and is a prerequisite for any further developments in the area.

# Walkthrough

For all major stakeholders, a user profile is created and its details are sent by email. In this email, the pilot project and the online platform are clearly explained, before redirecting the stakeholder to the platform. On the homepage, he logs in using the user profile details, which were received by email. Once logged in, some additional explanation is given, including a referral to the missions (Figure 5-2).

In order to gain access to the Genneper Parken scenario, the player must successfully complete the first two missions. In mission 1, he discovers why traditional area developments have stalled, and why joint urban planning is the future. Mission 2 teaches that collaboration is crucial in joint urban planning, listing the most commonly used organizational forms, including the roles one can assume. This is an extremely brief summary of the missions. For the complete mission content, please refer to Appendix B. Upon successfully completing the two missions, the player has gained the fundamentals of joint urban planning. After being rewarded with the two mission badges, the player is promoted to a higher rank, which increases his privileges and unlocks new features on the platform (Figure 5-3).

This higher rank provides him access to the Genneper Parken scenario. In each scenario, the area is first introduced with text and images. Subsequently, the main issues or questions are introduced. The player is asked to provide an advice on what he thinks that needs to happen in Genneper Parken. In this advisory report the player states, among other things, which organizational form he would like to see applied, what role he wishes to assume, the projects and activities he believes deserve priority, and in what ways he wishes to contribute to the area. All this information is stored on the server and a shortcut is added to his profile page (Figure 5-4) and (Figure 5-5).

Based on the advice given, the player is then added to one or more groups. These are groups of like-minded-people, where they meet with one another online, to further develop their ideas together. Group members can propose an offline group meetup themselves, but the municipality will also take on an active role in organizing these offline meetups. And when desirable, supplemented with guidance and support.

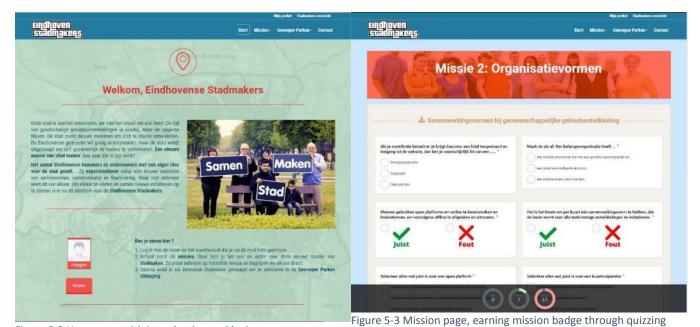


Figure 5-2 Homepage with introduction and login



Figure 5-4 Scenario page with advisory report

Figure 5-5 Data visualization of submitted advisory reports

To illustrate the process, a roadmap was made (Figure 5-6), comparable to a customer journey map.

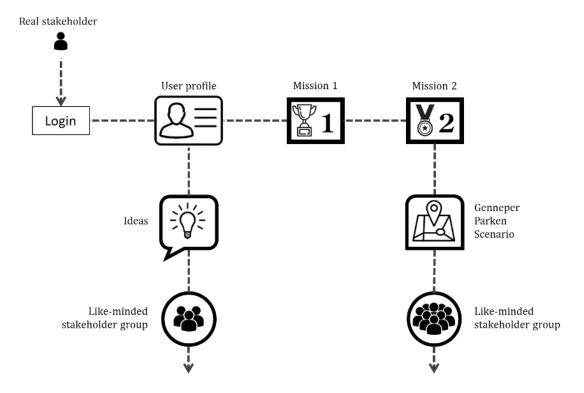


Figure 5-6 Pilot project roadmap

# 5.4. Results from the case study

At the start of the case study, 53 stakeholders were invited to partake in the study. These stakeholders were labeled as active within Genneper Parken by the municipality. All contact information was provided by the municipality. In total, 26 of those 53 invited stakeholders have actually participated and played the game. This group was formed by 6 people from the municipality, 11 citizens, 7 entrepreneurs/businesses and 2 people form organizations.

An additional 12 stakeholders initially logged in their user profiles, but did not follow through on completing the entire game. After inquiring, 3 stakeholders reported not understanding what was expected from them, after logging into their user profile. The remaining 9 stakeholders never responded to the inquiry concerning them quitting the study.

Of the total number of 53 invited stakeholders, 27 never responded to the invitation to participate in the study. About half of these non-respondents, 13 out of 27, are stakeholders located in the Sportpark. During the study it was uncovered that the stakeholders from the Sportpark and the stakeholders from the three other parks are not really on speaking terms, and that communication between them is practically nonexistent. It cannot be said with certainty, but it is likely that this is the reason why within the non-respondents group, sports stakeholders are so strongly represented. In fact, not a single stakeholder from the Sportpark responded in any way to this study. Of the remaining 14 non-responding stakeholders the reason could not be discovered.

This overall level of engagement (26 out of 53 stakeholders) was disappointing and quite surprising, since these stakeholders are considered the most actively involved by the municipality. We have to

conclude that within the group seen by the municipality as engaged stakeholders, there are still many people who are not willing to actively participate in joint urban planning. This also raises the question whether serious gaming is perhaps not as accessible as expected.

# Cooperation in Genneper Parken

The most important output of the Genneper Parken scenario are the advisory reports, submitted by the real life stakeholders from the area. These reports, of which the results are found in appendix C, have led to a number of insights. A quite impressive 20 stakeholders stated having taken part in some form of collaboration in Genneper Parken in the past. These collaborations were predominantly with the government (11 times), and to a lesser extent with organizations / associations (7 times), businesses (5 times) and local residents (5 times). Stakeholders with previous experience in collaborations were largely satisfied or very satisfied with this cooperation.

In 23 out of 26 advisory reports, stakeholders indicate that Genneper Parken needs more cooperation going forward. There is somewhat less consensus concerning the organizational form, such a collaboration would have to adopt. Nearly half of the advisors recommend to establish a (neighborhood) Cooperative, which deals with future urban area development in Genneper Parken. Within this group, 8 stakeholders opted for a passive role (spectator or adviser) in this process. And 3 stakeholders see an active role for themselves, as initiator or co-decider.

## Activities in Genneper Parken

The "Handbook Genneper Parken North and South", which was published in 2012, provides important and clearly defined guidelines concerning the future development of the area. It defines eight suitable and appropriate forms of usage, translating each form of usage into activities, associated with the four park spheres. These activities have been used in this study as well. When stakeholders were asked to select the most needed activities in Genneper Parken, *Organic groceries & food / drinks* and *small-scale hospitality venues & conference rooms* were the obvious favorites. However, only a small number of stakeholders envisions an active role for themselves in actually realizing them (in only 2 and 6 of the occasions, respectively). This seems to imply that a large number of stakeholders is presuming that these activities are needed, but will have to originate from outside of Genneper Parken.

The next most selected activities include *Artistic expression* and *Tranquility and freedom*. In contrast with the two most preferred activities described above, stakeholders intend to take on an active role in realizing these activities (in 8 and 15 of the occasions, respectively). Quite striking, is that *Healthcare* and *Informing* received practically no preferential votes.

Practically everyone (21 participants) agrees that these activities should be initiated within the next 12 months. About the location is also little disagreement, 18 participants recommend the beautiful two green parks, Stadspark and Natuurpark, would be ideal for this. When asked whether specific parties are absent at this moment in time, several stakeholders indicated that practically all sports associations have been painfully absent for a long time. The Sportpark accounts for a large portion of the total number of visitors. Currently, an uncomfortable and uncertain ambiance prevails in Genneper Parken. Various stakeholders indicate that this total lack of communication between the parties in Sportpark and Klankbordgroep Genneper Parken, is causing tensions on certain topics.

In chapter 4, the Joint Urban Planning system concept is introduced. A crucial part of this concept is the implementation of serious gaming. That is why in the same chapter, the Joint Urban Planning Game system concept is described in great detail. The prototype described in this chapter, is an attempt to actually create this Joint Urban Planning Game, and testing it in a case-study. The purpose of the Joint Urban Planning Game is to increase public participation in the urban planning process. In order to fulfill that purpose, three goals are set: resolving rational ignorance within stakeholders, providing clear communication between them and connecting them in like-minded stakeholder groups.

**Resolving rational ignorance within stakeholders.** This is achieved by adding play, through serious gaming methods and techniques. The missions and scenarios are specifically designed to motivate and reward the player during the learning process, providing entertainment and feelings of accomplishment, creativity and enjoyment.

### Providing clear communication between stakeholders.

This is accomplished by creating an online game environment in which all players are equal, independent of their role in real life. In the world of the Joint Urban Planning Game everyone starts as a junior city maker. By successfully completing missions, these junior city makers acquire the fundamental principles governing joint urban planning. Every new concept and each new term is first explained clearly during a mission, before it is ever used in a scenario. When the mission is completed successfully, we know the player is familiar with the discussed concepts and terms. This way, everyone on the platform will use words from a shared vocabulary when describing their thoughts and ideas on future urban planning in their community. Focus is then shifting from differences to similarities. The Joint Urban Planning Game uses, and consequently repeats, clear terminology and descriptions, encouraging the players to adopt them in their own communications.

### Connecting stakeholders in like-minded stakeholder groups.

In order for like-minded stakeholder groups to form, the game is designed in such a way, that players are sorting themselves, by going through the missions and scenarios. During missions, each player gradually provides more and more personal characteristics and preferences. This data is stored the corresponding user profile in the database. During scenarios, the player is asked to provide advice on a specific challenge. This advisory report contains valuable stakeholder-specific information which is also saved to the user profile in the database. This results in a dynamic database, to which all players are constantly adding and updating their own information, in real time. That database is then used to classify stakeholders with shared characteristics and/or wishes into specific groups. During the case study, those like-minded stakeholder groups were formed manually, in order to limit and control the number of groups. However, this can also be fully automated. For example, this would be definitely needed when the platform is scaled up city-wide. With such a large number of players, the information from user profiles is used to filter and sort shared characteristics and/or wishes.

All three goals of the Joint Urban Planning Game are addressed in the developed prototype. As a result of the Genneper Parken scenario, three like-minded stakeholder groups have been formed. One group of 6 stakeholders, 5 citizens and 1 entrepreneur is focused on workshops for artistic expressions. The second group exists of 2 entrepreneurs and 2 citizens, who share the ambition to establish an organic groceries market. The third group is made up of 3 municipal employees and 2 entrepreneurs, who all indicated to like to take on an active role in starting a neighborhood co-operative. Following six weeks

of summer holidays, all those stakeholders are invited by the municipality to meet up with their group offline, together taking the next step toward realizing their ideas.

# Reflecting on the case study process

The pilot project in Genneper Parken was not just used for testing the game system design. It was also used to explore the public support base for serious gaming in the joint urban planning process. In February 2016, a stakeholder meeting was held in which this research study, and the role of Genneper Parken herein as a pilot project, was presented. Following this presentation, they were asked whether they were interested in taking part in the experiment. The 25 attendees present on that day, indicated that they would like to participate. At the same time, multiple stakeholders indicated the lack of technical expertise in the majority of the stakeholder group, urging to focus the game design on ease of use. It was also mentioned that the disappointing results of a research study in the previous year by non-academic students, would very likely have a negative impact on the level of participation and involvement. With these stakeholder recommendations in mind, the testing period commenced throughout March, April and May of 2016.

During the prototype testing period, 53 stakeholders were informed during the progress by means of an email newsletter. In June 2016, all gathered data was analyzed and presented to the stakeholders. The most striking outcome, was the level of stakeholder engagement. By the end of the testing period, 26 stakeholders (49 percent) had actually visited the online platform to learn about joint urban planning and to give their opinion on what organizational form the Genneper Parken should adopt going forward. This is the final enumeration after three additional personal reminders. This overall level of engagement was disappointing and quite surprising, since these stakeholders are considered the most actively involved by the municipality. Nevertheless, 26 stakeholders did participate, and valuable information was collected. A number of stakeholders actually adopted a very proactive and communal attitude towards the further development of the platform. Which, in any case, is a good sign of communal thinking.

Most of the participating stakeholders (19 out of 26 participants) have also submitted a survey, reflecting on the prototype and the testing process. Also, 3 non-participating stakeholders took part in the survey, in order to elaborate on why they had not partaken in the Joint Urban Planning Game, bringing the total number of respondents to 22. The survey questionnaire is found in Appendix D. The Genneper Parken case study group is too small to derive any quantitative conclusions on the public support for serious gaming in joint urban planning. But it certainly provided a number of insights into the public perception on the use of an online serious game and the public support base for such a tool in Genneper Parken:

- At the start of this case study, virtually no one (only 2 out of 22 participants) knew of the
  existence of serious gaming, nor its potential applications
- About half of the participants considered the introductory presentation insufficient in order to access the platform themselves without any trouble
- Many (16 out of 22 participants), feel that serious gaming can attract and engage certain people who are currently absent, like the youths, into the urban planning process
- Only a quarter of participants, think that the current prototype will actually bring Genneper Parken stakeholders closer together
- A slight majority (15 out of 22 participants) still considers the municipality responsible for initiating urban area developments in Genneper Parken

# Results and research continuation from the perspective of the municipality

The Genneper Parken case study will be continued after the summer holidays. The municipality will, together with the main stakeholders in the area, actually choose an organizational form. There are also ongoing talks with master students who would like to support the next phase in the process, as part of a subsequent research study, spanning six months. This research will mainly focus on phase 2 of the joint urban planning approach, in which newly formed stakeholder groups will be taking the next steps towards realizing their ideas, moving from online to offline collaboration.

### 5.6.Conclusions

This chapter has been all about prototyping the Joint Urban Planning Game, in order to test the serious game system concept, proposed in this thesis. The chapter starts off with a detailed description of the underlying Wordpress content management system, which serves as the foundation. The second paragraph explains how the virtual game world is built on top of that foundation, by merging five game components: user profiles, missions, scenarios, groups and ideas.

In order to test the prototype, it was decided to start a pilot project. The details of this pilot project, and the resulting game prototype, are explained and visualized in the third paragraph. By the use of a 'game walkthrough' and a 'game roadmap', the process of moving through the game environment is illustrated. Paragraph four provides the results from the three month testing period, in which real life stakeholders were invited to explore the virtual game world. The fifth paragraph, describes the reflection on both the prototype and the case study. The prototype is compared to the set goals, and appears to meet all expectations. The case study is reviewed by the involved stakeholders by means of a survey. The results show that very few participants knew of the existence of serious gaming before this study and that many of the participants feel that serious gaming can attract and engage certain people who are currently absent, like the youths, into the urban planning process. Also, it indicates that a minority expects that the current prototype will actually bring Genneper Parken stakeholders closer together and a slight majority still considers the municipality responsible for initiating urban area developments in Genneper Parken.

# 6. Political support base for serious gaming

This chapter will describe the exploration into the political support for serious gaming in joint urban area development, in the city of Eindhoven. Starting off with an illustration of the municipal organization, based on an organizational chart. Subsequently, the current policy regarding the Spatial Domain is explained. The third paragraph focuses on public participation and describes the municipalities' current public participation program and its predecessors. At the end of each paragraph, the organization, the current spatial policy and the public participation program are assessed on compatibility with the application of serious gaming in joint urban area development. The fourth paragraph provides a summary of the findings from the preceding paragraphs, and the final balance is drawn up about the political support for serious gaming. Closing the chapter off with a number of conclusions.

# 6.1.Organization

In order to give a clear overview of the organization of the municipality of Eindhoven, an organizational chart (Figure 6-1) was made. At the top we see the City Council, in Eindhoven, this consists of 45 councilors. The current council was installed in March of 2014 for four years. The mayor and the council of seven aldermen compose the Executive Council, tasked with the daily management of the municipality. The three members of the Executive Board operate as the managing board of the municipality. Each member of the Executive Board is managing several sectors of interest.

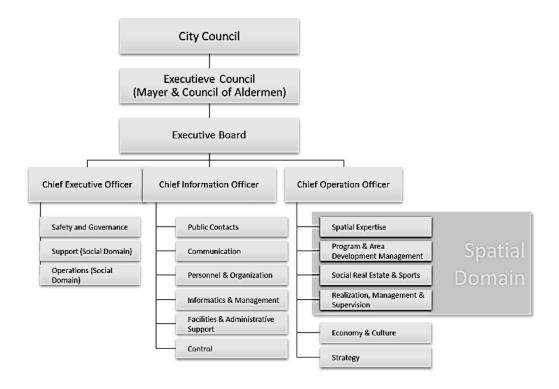


Figure 6-1 Municipality of Eindhoven organizational chart

As we can see in Figure 6-21, there are fifteen sectors of interest in total. Four of which together form the Spatial Domain: Program & Area Development Management, Spatial Expertise, Social Real Estate & Sports and Realization, Management & Supervision (figure 6-2). Program & Area Development Management is responsible for the strategy in the Spatial Domain. Spatial Expertise deals mainly with new area developments. Social Real Estate & Sports and Realization, Management & Supervision focus on managing the existing portfolio. Sector Spatial Expertise is divided up into eight departments, one of which is Area Development Expertise. This department, with approximately 40 area development coordinators at the operational level, is responsible for city-wide coordination regarding new area developments.

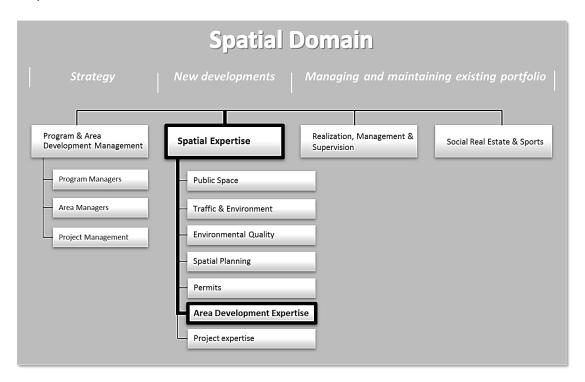


Figure 6-2 Municipality of Eindhoven organizational chart, Spatial Domain

To explore the political support base for serious gaming in area development, a number of key positions in the municipal organization were selected, and then interviewed. All 40 area development coordinators report directly to the Area Development Expertise department head, the first key position to interview. During an extensive interview with the current department head, Herman Zoetmulder, various related topics were discussed (the complete interview transcripts can be found in appendix E). Zoetmulder agreed that the traditional urban planning method is being phased out, and explained that joint area development methods are already being applied in Eindhoven, and the use is increasing fast. He notes, however, that these are all separate pilot projects and experiments, lacking adequate and structured knowledge management. Zoetmulder confirms that serious gaming certainly fits well into the participation train of thought, which is becoming increasingly prevalent across the municipal organization. Also, it might help in clearly communicating the idea behind the current participation program, which still lacks a structured communication approach. In conclusion: Yes, serious gaming certainly fits well into the current policy and can surely expect a solid political base of support in the current organization.

Area Development Expertise is one of the eight departments in the Spatial Expertise sector. All heads of department report to the Head of Sector. Together they form the management team of the sector, translating policy from the strategic level, into approaches and actions on the tactical level. The Head of Sector also meets regularly with the other Heads of Sector and members of the Executive Board to

discuss policy on the strategic level. Clearly, the Head of Sector Spatial Expertise is the second key position to interview. Again, during an extensive interview, various related topics were discussed with the current Head of Sector, Martijn Mentink (the complete interview transcripts can be found in appendix F). We start on the subject of the changing role of the municipality within society. Mentink explains that there is an extraordinary amount of knowledge, expertise and experience in the municipal organization. The overwhelming majority enjoyed higher education, often academic. They are well aware that the roles, tasks and responsibilities within the municipality is subject to change and they are being prepared for that. Mentink agrees that in general, the traditional urban planning method will lose its leading role in urban development. It might be used in exceptional cases, but it will no longer be the default approach. Future urban developments are going to be much more flexible, on a smaller scale and in close collaboration with stakeholders. In conclusion: Yes, serious gaming fits perfectly with the current policy and will definitely have political support in the current organization.

During both interviews, the Joint Urban Planning Game was explained, and Zoetmulder and Mentink were asked whether they are aware of any similar projects or tools with the objective of connecting stakeholders in order to improve public participation in area development. Both indicated that there are indeed projects with the same objective. They both mention the developments at Strijp and the NRE terrain as examples in which stakeholders are actively involved. Zoetmulder adds that the smart lighting project and *G1000Eindhoven* also have lot in common with this objective. Mentink indicates that multiple projects and teams are currently gaining experience with the SCRUM and Design Thinking methods. But they both state that a dedicated tool such as the Joint Urban Planning Game, is currently not being used within the municipality, nor is something similar being developed.

# 6.2. Spatial policy

The strategic spatial policy of the city is drafted by the City Council in what is called a structural vision. This policy document outlines the spatial policy (function distribution, consolidation, development) and how and when this will be carried out (execution). Moreover, this structural vision provides the basis for zoning plans. For instance, it outlines where people live, work and recreate.

In Eindhoven, Interim Structural Vision 2009-2020 currently applies as the strategic spatial policy of the city. A final structural vision was to be presented in 2011 but has been delayed, and is not yet realized at this time (May 2016). All Dutch municipalities are required to draw up a structural plan, under the national act on spatial planning (Wet Ruimtelijke Ordening). Eindhoven formally fulfilled that obligation when Interim Structural Vision 2009-2020 went into effect. Composing a final city-wide vision is expensive and time consuming. In addition, a city-wide vision is usually not much more than an attempt to patch together the various area development visions. At the same time we can see that society, and therefore the city, is changing increasingly fast. This means that before a city-wide vision is finished, it will already be outdated. That is why the municipality decided to focus primarily on the 4 strategic regional visions, the 13 area development visions and various thematic council programs.

Policy document: Interimstructuurvisie 2009-2020

# 6.3. Public participation program

In 2006, the city-wide 'Task Force Civic Participation' launched, and two years later this taskforce presented the 'Maak het Mee' program (loosely translated into 'Join In'). In 2011, this was followed up by the 'Koers burgerparticipatie' program (loosely translated into 'Course civic participation'). Partly through these programs, public participation was introduced in the city and within the municipal organization. Although it is appropriate to mention that these public participation programs were primarily focused on involving residents, rather than involving all stakeholders and end users. The current program 'Inwoners- en Overheidsparticipatie 2015 – 2018' (loosely translated into 'Resident and Municipal Participation'), builds on the foundation laid in recent years. Contrary to what the name suggests, this program is clearly committed to connect all types of end users, not only residents.

The program presents Eindhoven as a Living Lab. A city that is experimenting with new forms of collaboration, with new partnerships between government, residents, businesses and institutions. The municipality wants to maintain their own agenda and "be more a part of a network, instead of the authority that controls society from above". Or, 'the municipality remains ambitious in what they want to achieve as a city, but with appropriate modesty in the role they will play themselves". As an organization they want to work from the outside inward, better align with the living environment, and design the city together with residents and business owners. The starting point of the program is an equal partnership and co-creation with all parties involved.

The program provides direction to the quest for new relationships between residents and the municipality and new types of collaboration. Therefore, it is expected this program will advance public participation throughout all domains, not just the spatial domain. There are six program lines introducing six different directions to think, develop and operate public participation. These six program lines are not equivalent. The first two indicate how the municipality wants to work with the public on this theme. The other four are supportive or conditional. The program lines:

- 1. Residents participation in municipal policy
- 2. Municipal participation in initiatives from the city
- 3. Experimenting and learning
- 4. Inspire and be inspired
- 5. An organization
- 6. Permanent conversation with the city

To explore the support political base of support for serious gaming in the current public participation program, a number of meetings have taken place with the author and program leader Hans Wetzer. Prior to writing the current program, Wetzer was among the authors of the current programs' predecessor. In addition, he organized and led various projects concerning public participation. Understandably, Wetzer is regarded as an expert in the field of public participation.

During the initial meeting, the scientific field of serious gaming and its underlying theories were explained. Wetzer instantly recognized the potential of implementing serious gaming into the public participation program. In a subsequent meeting, the actual Joint Urban Planning Game was presented. Each element of the game has been detailed and scientifically substantiated. This is why we were able to put the Joint Urban Planning Game alongside the public participation program, in order to find out if, and where, the two overlap. Table 6-1 below, shows these overlaps, representing compatibility.

<b>Public Participation Program:</b> <i>Programma Inwoners- en Overheidsparticipatie 2015-2018</i>		Serious Gaming: Joint Urban Planning Game		
1. Residents participation in municipal policy		Residents learn how to participate through play		
Substantially enhance the reach of collaboration and control by involving more and especially other people	$\Rightarrow$	An online platform is available 24/7, so any interested residents can participate whenever and wherever they like. Through game elements, certain target groups can be triggered to engage, like the youths		
2. Municipal participation in initiatives from the city		Municipality obtains a real-time database of initiatives/ stakeholders		
Realizing useful and attractive information for residents who are already actively participating or like to be	$\Rightarrow$	The content of the missions and scenarios is filled with useful information that incrementally informs the players in a playful manner and guides them to available sources.		
Elicit and stimulate initiatives by residents and entrepreneurs		The platform produces data as to which stakeholders are like-minded.  The municipality can, for example, propose to meet offline with this select group like-minded stakeholders		
3. Experimenting and learning		The JUPG is a virtual environment to learn and experiment		
Experimentation with new creative forms of design and interaction and the use of new ICT technologies	$\Rightarrow$	Because of IT developments in online serious gaming in recent years, this creative way of interaction is suddenly accessible to many more parties, like municipalities, exposing new interaction opportunities		
6. Permanent dialogue with the city		The JUPG is a virtual environment for permanent dialogue		
Being permanently in talks with the city	$\Rightarrow$	Motivate the municipal staff to join the platform. This is a great way to improve direct communication between residents and municipal employees.		
Utilize and take advantage of resident expertise	$\Rightarrow$	Residents disclose during the missions and scenarios which expertise they have. This produces a dynamic database of resident experts, which the municipality can approach.		

Table 6-1 Overlaps between the public participation program and serious gaming

Table 6-1 shows that the current public participation program and the proposed Joint Urban Planning Game are indeed very compatible. In fact, in four of its six program lines, serious gaming can make specific contributions towards achieving the goals and ambitions of the municipality.

After studying the current public participation program and several meetings with its author and program leader, an informed judgment can be made. In conclusion: Yes, serious gaming fits very well within the current public participation program, and the program leader welcomes experiments and pilot projects such as the Joint Urban Planning Game.

Policy document: Programma Inwoners- en Overheidsparticipatie 2015 – 2018

# 6.4. Summary of political support base

The municipal organization or Eindhoven has been explored by drafting an organizational chart. This resulted in a clear understanding as to what the key positions in the current organization are, regarding urban area development. The people currently fulfilling these key positions have been interviewed on serious gaming and specifically the Joint Urban Planning Game. Both interviewees responded very positive to the proposal of applying serious gaming in the initiative phase of urban area development, indicating that its fits perfectly with the current policy and will definitely have political support in the current organization.

The municipal policy is examined in order to find common ground between the current policy and serious gaming. After analyzing the main policy documents it became clear that a city-wide public participation policy is in effect. The author and program leader has expressed throughout a number of meetings to have a positive attitude towards applying serious gaming in public participation. He sees multiple similarities with the present program lines allowing it to be implemented without any major problems.

### 6.5.Conclusion

This chapter describes the exploration into the political support for serious gaming in joint urban area development, in the city of Eindhoven. Starting off by describing the municipal organization, including an organizational chart. Zooming in on that organizational chart in the first paragraph, it is explained in more detail how the spatial domain has been divided into sectors and what the key positions are regarding urban area development. By interviewing the people in those key positions, we find that serious gaming fits perfectly within the current policy and will definitely have political support in the current municipal organization. In the second paragraph, the current policy regarding the Spatial Domain is analyzed and it became clear that a city-wide public participation policy is in effect. The third paragraph focusses on this public participation program by describing it in more detail and meeting with its author and program leader. During these meetings, common ground is found between the program and serious gaming. The fourth chapter summarizes all outcomes regarding this chapter on the exploration of political support for serious gaming in urban area development.

# 7. Conclusions & recommendations

This final chapter will conclude this thesis by summarizing all findings and gained insights from the entire research study. The first paragraph will start by answering all five sub-questions of the study. The answers of these sub-questions are then combined in order to answer both problem statements. Throughout the study, several opportunities and unknowns presented themselves. The second paragraph illustrates these conclusions. In the third paragraph, recommendations for further research are proposed and elaborated on. The fourth and final paragraph reflects on this research study, reviewing the literature review, the study approach and how it worked out in practice.

### 7.1.Conclusions

When designing this study, the two problem statements were split up into five sub-questions. By researching and answering these sub-questions, both problem statements can be answered as well. Next, these sub-questions are discussed one by one, finishing each one with a conclusion.

# What is serious gaming and how can it improve the initiative phase of urban planning?

Serious gaming is an approach to education, which emerged from the idea to use gameplay to learn new concepts. By simulating real-world events or processes, serious games are designed for the purpose of solving a problem. Although serious games can be entertaining, the main purpose is to educate. One of the key conclusions is that serious games have the capability to invite large numbers of participants, unknown to each other, and with a variety of backgrounds, to let them communicate with each other on a leveled playing field. This is exactly what the initiative phase of a joint urban planning method needs.

### What is the potential added value of serious gaming in urban planning?

The biggest challenge in future urban planning, is attracting the local community to participate. This challenge is actually the sum of two smaller ones. The first important challenge is informing the stakeholders in the community on the process of urban planning, specifically joint urban planning. Only when stakeholders are well informed on the process, will they actually invest their time. Serious gaming is a method of learning by play, making it fun to get informed about urban planning.

The second challenge is for all stakeholders to communicate with each other on an equal level. For example, it is important they use the same words when expressing their thoughts and ideas concerning future urban planning in their community. Through clear communication within the community, stakeholders find common ground as fast as possible. Focus is then shifting from differences to similarities, generating like-minded-stakeholder groups. Serious games provide a community environment with clear and consequent terminology, encouraging participants to adopt them in their own communication, making it much quicker and easier to connect with like-minded-stakeholders.

What form(s)/designs do these serious games have to adopt to activate private and commercial parties as initiators of urban area development and to reinforce and support governments as facilitators of this process?

To develop a game environment for learning about joint urban planning and motivating the public to take on a pro-active role, eight core game characteristics are presented. Such a game should adopt the characteristics: serious game, open game, digital game, open-ended environment, close-ended sessions, noncompetitive, no existing issues/plans, single player and a simplistic geographical environment. These game characteristics are followed up with eight crucial game design elements: learning outcomes, designers' story, players' story, mechanics, dynamics, affects and the user interface.

These eight core game characteristics and eight crucial game design have all been incorporated into an online game environment, composed of five separate game components: user profiles, missions, scenarios, groups and ideas. When these five game components are interlinked, they merge into one unified virtual world. The scientific fields of serious gaming and urban planning coalescing into a joint urban planning method, with at its core, the Joint Urban Planning Game, designed to educate, group and activate like-minded-stakeholders as initiators of urban area development.

# Is there political support for joint urban area development based on serious gaming?

The exploration into the political support for serious gaming in joint urban area development, was composed of studying policy documents and interviewing people currently fulfilling key positions in the municipal organization of the city of Eindhoven. This led to the conclusion that serious gaming fits perfectly in the current policy and, based on a limited number of interviews, is likely to have political support in the current municipal organization.

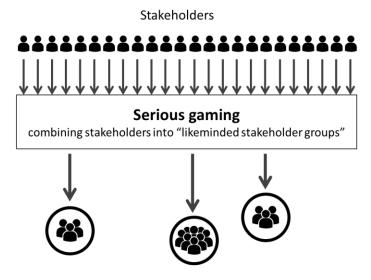
A high degree of cohesion and multiple connections between serious gaming and the present public participation program allow it to be implemented without any major problems, while reinforcing the feasibility of the goals and ambitions.

# Is there public support for joint urban area development based on serious gaming?

The exploration into the public support for serious gaming in joint urban area development, was attempted by performing a pilot project with real stakeholders, in a case study with a testing period spanning three months. It did provide a number of insights into the public perception on the use of an online serious game and the public support base for such a tool in Genneper Parken. However, due to the small sample size and rather large variations in the results and reviews, this study has yielded no clear view on the public support for joint urban area development based on serious gaming. In any case, it can be concluded that the prototype in its current form, is working, and meets the expectations. Three like-minded stakeholders groups have been formed, based on how the stakeholders have completed the game. So that is a positive outcome. Also, the results of the survey indicate that many of the participants (16 out of 22 participants) feel that serious gaming can attract and engage certain people who are absent currently, like the youths, into the urban planning process.

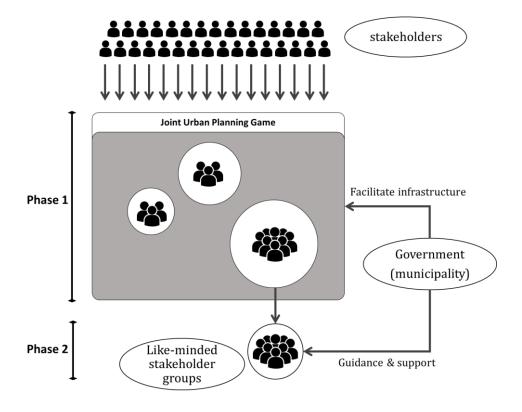
However, the overall level of engagement (26 out of 53 stakeholders) was disappointing and quite surprising, since these stakeholders are considered the most actively involved by the municipality. We have to conclude that in the group seen by the municipality as engaged stakeholders, there are still many people who are not willing to actively participate in joint urban planning. This raises the question whether serious gaming is perhaps not as accessible as expected. Also, the results of the survey show that only a minority (6 out of 22 participants) expects that the current prototype will actually bring Genneper Parken stakeholders closer together and a slight majority (12 out of 22 participants) still considers the municipality responsible for initiating urban area developments in Genneper Parken.

What is serious gaming and how can it improve the initiative phase of urban planning?

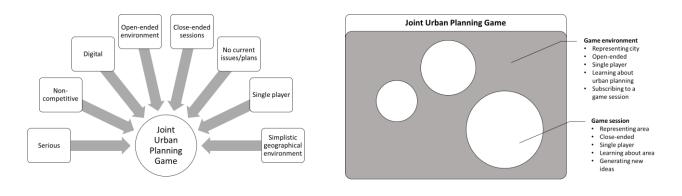


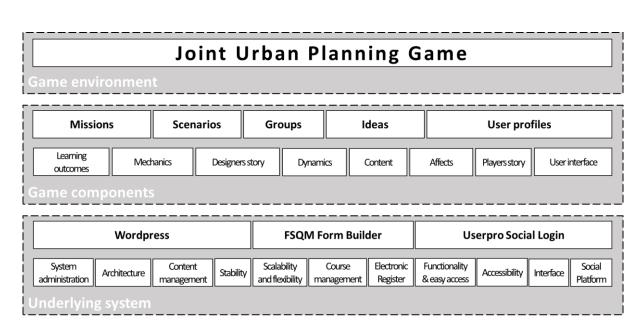
Like-minded stakeholder groups

What is the potential added value of serious gaming in urban planning?



What form(s)/designs do these serious games have to adopt to activate private and commercial parties as initiators of urban area development and to reinforce and support governments as facilitators of this process?





Is there political support for joint urban area development based on serious gaming?

	Positive attitude	Current policy compatible	Political support base
Organizational			
Head of Sector Spatial Expertise	✓	✓	✓
Head of Area Development Expertise	✓	✓	✓
Policy			
Program leader Public Participation	✓	✓	✓

### 7.3. Recommendations for further research

This study shows that by using serious gaming, it is possible to form like-minded stakeholder groups. In this case study, three groups have been formed with only 26 players in the game. Now the mechanics of the game are validated, a much larger group of stakeholders can be invited to join. If this game, or an equivalent one, is widely applied (inviting for example 1500 stakeholders of a neighborhood), the potential and possibilities of serious gaming in urban planning will truly become evident.

The three likeminded stakeholder groups formed in this study have a clear shared common denominator. But in order to work well together, and to take the next steps together, these stakeholder groups need guidance and support. It will be useful to guide these groups in the form of a subsequent research study. For instance, different approaches and tools from the scientific fields of group support systems and negotiation support systems might be tested, in order to develop a methodology to guide these groups of previously unacquainted stakeholders, to learn to work in a group and make decisions together.

During the interviews and conversations with stakeholders it emerged that certain groups, such as young people, may be inclined to get more involved with urban planning through serious gaming. A study into exactly which specific groups are susceptible to this, can bring more focus to the implementation and use of serious gaming in the urban planning process. Also a very specific investigation into the used terms can significantly broaden the support amongst stakeholders.

To stimulate the adoption and use of the platform, it might be useful to connect with existing channels. By partnering with local news channels, blogs and social media channels for example. Also, the addition of augmented reality offer many opportunities. By aiming the platform at mobile devices such as smartphones, a highly interactive urban planning game can be created.

### 7.4.Reflection

The literature review at the start of the study, has turned out to be very complete. The developed prototype met all expectations, which can be attributed to the detailed serious game system design that resulted from the literature studied. Also, during interviews and conversations with professionals it became evident that the literature review is very accurate and up to date.

The approach of the study resulted in a few limitations. Because so much time was invested in an extensive literature review, there were just three months left for the testing period of the prototype. For an optimal development, implementation and execution of such a complex prototype, some more time would be desirable.

Furthermore, upon reflection, too few stakeholders were invited to participate in the case study. In part because of this, the results proved to be uncertain and no apparent conclusions could be drawn concerning public support for serious gaming in a joint urban planning process.

Despite these limitations this study has contributed to the aggregation of two scientific fields, urban planning and serious gaming. It has expanded the knowledge on serious game design aimed at improving public participation in urban planning. This study is one of the first qualitative studies on the potential and optimal design of serious gaming in the urban planning process. It offers municipalities new insights they can implement directly in their public participation policies. Finally, it provides a scientific foundation for subsequent research on this topic.

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# Appendices

### Appendix A: Game components incorporating 8 crucial game design elements

Game components	Game design elements	Detailed desciption	Implementation	
User profiles				
Player information	Content	C. Player data		
Player results	Players story	P. Players story	- Wordpress plugin: UserPro	
Missions				
Presentations on urban planning process	Learning outcome 1	L. Receiving	Wordpress CMS	
Presentations on urban planning process	Mechanics	M. Mastering	Wordpress plugin: FSQM	
Quizzes on urban planning process	Learning outcome 2	L. Understanding		
Quizzes on urban planning process	Mechanics	M. Solving	-Wordpress plugin: FSQM	
Farn hadges	Mechanics	M. Earning		
Earn badges	Content	C. Player data	Wordpress plugin: UserPro	
			Wandanaa alaain FCOM	
	Affects	A. Challenge	Wordpress plugin: FSQM	
Scenarios				
Presentations on specific case	Designers story	D. Setting		
	Designers story	D. Characters	- Wordpress CMS	
	Designers story	D. Narrative	Wordpress Civis	
	Affects	A. Narrative		
Advising on the case	Learning outcome 3	L. Responding		
	Learning outcome 4	L. Evaluating	Wordpress plugin: FSQM	
	Learning outcome 5	L. Valuing		
	Content	C. Player data	Wandana a alimin Handu	
	Players story	P. Player story	Wordpress plugin: UserPro	
	Mechanics	M. Discovering	Wordpress CMS	
Groups				
Discussion on ideas	Learning outcome 3	L. Responding		
Set up offline group meetup	Learning outcome 4	L. Evaluating	Wordpress plugin: FSQM	
Set up offinite group meetup	Learning outcome 5	L. Valuing		
	Content	C. Player data	Wordpress plugin: UserPro	
Ideas				
Add new idea	Learning outcome 3	L. Responding	4	
Respond to proposed ideas	Learning outcome 4	L. Evaluating	Wordpress plugin: FSQM	
Like/Vote on ideas	Learning outcome 5	L. Valuing		
	Content	C. Player data	Wordpress plugin: UserPro	
Interface				
Game controls	User interface	U. Basic play literacy		
		U. Point and click	Wordpress CMS	
		U. Virtual environment		

### Appendix B: The complete mission content

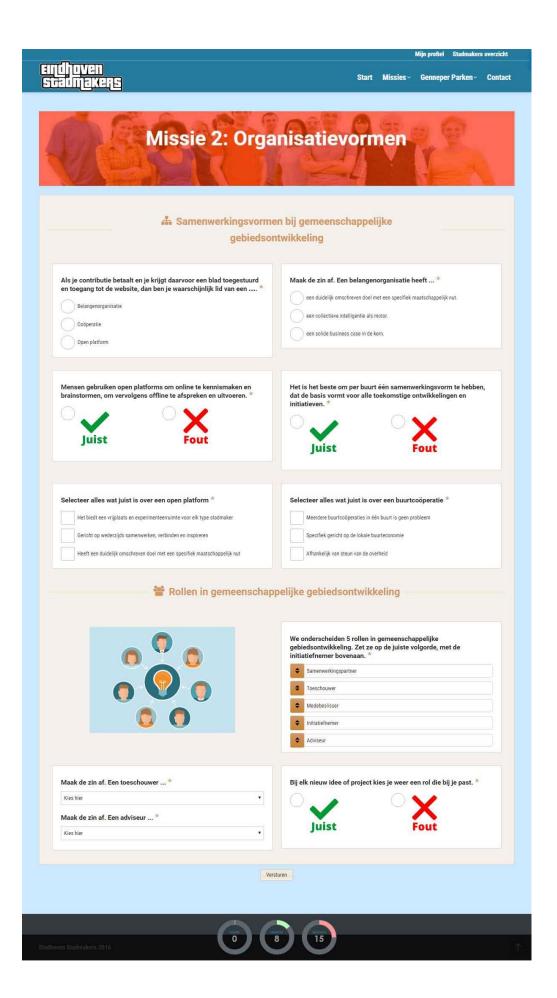












### Appendix C: The Genneper Parken advisory reports

	Ja	Nee						
Heb je zelf ervaring met bestaande	Ja	Nee						
samenwerkingsverbanden in Genneper Parken?								
	20							
A4-+iii	Overheid	Bedrijven	Organisaties/V	Bewoners				
Met wie was die samenwerking?			erenigingen					
	11	5	7	5				
		3	,	3				
Hoe tevreden ben je over die samenwerking?	Boos	Teleurgesteld	Neutraal	Tevreden	Zeer tevreden			
	2	1	3	12	8			
			3		Ü			
Denk jij ook dat Genneper Parken meer	Ja	Nee						
samenwerking kan gebruiken								
	23	3						
Wat adviseer jij voor Genneper Parken?	Belangenorga			Anders				
	nisatie	atie 7	4					
	4	12	3	7				
			c 1:		6			
Welke rol zou jij zelf willen aannemen?	Toeschouwer	Adviseur	Samenwerking spartner	Medebeslisser	Initiatiefneme r	Anders		
			spartner		1			
	4	12	3	1	5	1		
	Biologische	Kunstzinnige	Cultuurhistori	Natuur en	Kleinschalige	Rust en	Informatie	Zorgen voor
Welke activiteiten denk jij dat Genneper Parken	boodschappen	uiting	e &	duurzaamheid	-	Vrijheid	illioilliatie	Zorgen voor
kan gebruiken, om het een nóg fijnere plek te	en	uiting	archeologie	educatie	vergaderruimt	· · · · · · · · · · · · · · · · · · ·		
maken?	eten/drinken				es			
	42	45		-	12	9	4	2
	13	15	6	5	13	9	1	2
	Biologische	Kunstzinnige	Cultuurhistori	Natuur en	Kleinschalige	Rust en	Informatie	Zorgen voor
Welke activiteiten zou je zelf willen	boodschappen	uiting	e &	duurzaamheid	horeca &	Vrijheid		
(mede)initiëren?	en		archeologie	educatie	vergaderruimt			
	eten/drinken				es			
	2	8	2	2	6	4	1	0
In welk tijdsbestek zie je dit gebeuren?	0jaar to 0.5jaar	Ojaar to 1jaar	Ojaar to 1.5jaar	0,5jaar to	0,5jaar to			
•				1.5jaar	2.5jaar			
	6	15	2	1				
On well well and done are a supplier.	Charles	Natura	Ai	Con a setura sul				
Op welk park zal deze samenwerking dan gericht zijn?	Stadpark	Natuurpark	Agragisch Park	Sportpark				
ZIJII:								
	12	11	3	6				
				ļ				<u> </u>

### Appendix D: The survey questionnaire

		Oneens	geen mening	Eens
1	Wist je voor dit onderzoek wat serious gaming is, en wat het kan bieden			
2	Toen de eerste presentatie over het onderzoek werd gegeven, was je meteen geïnteresseerd om mee te doen			
3	Was de presentatie tijdens de introductie van het Eindhoven Stadmakers platform duidelijk genoeg om vervolgens zelf ermee aan de slag te kunnen			
4	Denk je dat serious gaming mensen kan aantrekken die op dit moment niet betrokken zijn in gebiedsontwikkeling (zoals bijvoorbeeld jongeren)			
5	Denk je dat serious gaming het missende instrument is voor gebiedsontwikkeling			
6	Denk je dat het Eindhoven Stadmakers platform in de huidige vorm de stakeholders in Genneper Parken dichter bij elkaar kan brengen			
7	Vind je het Eindhoven Stadmakers platform in de huidige vorm gemakkelijk is in het gebruik			
8	Heb je het idee dat je echt iets heb geleerd tijdens de missies op het Eindhoven Stadmakers platform			
9	Vind je dat de gemeente het Eindhoven Stadmakers platform verder moet ontwikkelen			
10	Vind je dat de gemeente verantwoordelijk blijft voor het initiatief voor nieuwe gebiedsontwikkelingen in Genneper Parken			

		Oneens	geen mening	Eens
1	Wist je voor dit onderzoek wat serious gaming is, en wat het kan bieden	20	0	2
2	Toen de eerste presentatie over het onderzoek werd gegeven, was je meteen geïnteresseerd om mee te doen	2	14	6
3	Was de presentatie tijdens de introductie van het Eindhoven Stadmakers platform duidelijk genoeg om vervolgens zelf ermee aan de slag te kunnen	8	4	10
4	Denk je dat serious gaming mensen kan aantrekken die op dit moment niet betrokken zijn in gebiedsontwikkeling (zoals bijvoorbeeld jongeren)	2	4	16
5	Denk je dat serious gaming het missende instrument is voor gebiedsontwikkeling	2	17	3
6	Denk je dat het Eindhoven Stadmakers platform in de huidige vorm de stakeholders in Genneper Parken dichter bij elkaar kan brengen	11	5	6
7	Vind je het Eindhoven Stadmakers platform in de huidige vorm gemakkelijk in het gebruik	14	3	5
8	Heb je het idee dat je echt iets heb geleerd tijdens de missies op het Eindhoven Stadmakers platform	5	5	12
9	Vind je dat de gemeente het Eindhoven Stadmakers platform verder moet ontwikkelen	7	9	6
10	Vind je dat de gemeente verantwoordelijk blijft voor het initiatief voor nieuwe gebiedsontwikkelingen in Genneper Parken	6	1	15

### Appendix E: Interview transcripts Herman Zoetmulder

Interview Guide Herman Zoetmulder

27-05-2016

Afdelingshoofd Gebiedsexpertise bij Gemeente Eindhoven

12:00-13:00

#### Introductie Paul

- HBO Bouwkunde in Tilburg, richting vastgoedontwikkeling
- Nu Master of Real Estate Management & Development aan de TU/e
- Gedurende deze master steeds minder interesse voor de 'harde kant' (M2 etc)
- Almaar groeiende interesse in de 'zachtere kant' (mensen, community 's, gemeenschappelijke gebiedsontwikkeling)
- Daarom thesis onderzoek over gemeenschappelijke gebiedsontwikkeling, met een duidelijke focus op maatschappelijke participatie in de initiatieffase
  - Probleem kort door de bocht: stedelijke gebiedsontwikkeling is fundamenteel veranderd afgelopen jaren, maar in de meeste gemeenschappen is dit nog totaal niet doorgedrongen.
  - Doel van het onderzoek: een verkennend onderzoek naar de mogelijkheden om serious gaming toe te passen om publieke participatie in de initiatieffase te verbeteren

#### Introductie Herman

Leidinggeven aan ca. 40 gebiedscoordinatoren, gebiedsanalisten, medewerkers buurtinfowinkels, medewerkers ondersteuning Jeugd In Beeld en subsidieverstrekker; verantwoordelijk voor een stadsdekkende coordinatie met de stad, analyses van gebieden, ondersteunen van buurtinfowinkels en -organisaties, ondersteuning van Jeugd In Beeldoverleggen en subsidievertrekking mbt gebiedsgericht werken



#### Afdelingshoofd Gebiedsexpertise

Gemeente Eindhoven

september 2014 - heden (1 jaar 9 maanden) | Eindhoven

Leidinggeven aan ca. 40 gebiedscoordinatoren, gebiedsanalisten, medewerkers buurtinfowinkels, medewerkers ondersteuning Jeugd In Beeld en subsidieverstrekker; verantwoordelijk voor een stadsdekkende coordinatie met de stad, analyses van gebieden, ondersteunen van buurtinfowinkels en organisaties, ondersteuning van Jeugd In Beeld-overleggen en subsidievertrekking mbt gebiedsgericht werken

#### Interim afdelingshoofd Stedelijk, sector Gebiedsontwikkeling

november 2013 – september 2014 (11 maanden) | Eindhoven

Leidinggeven aan ca. 15 programmamanagers en beleidsadviseurs, verantwoordelijk voor de ontwikkeling van gebiedsverkenningen, (planologische) stedelijke kaders en het begeleiden van initiatieven van derden

#### afdelingshoofd sector Projectmanagement

Gemeente Eindhove

april 2010 – september 2014 (4 jaar 6 maanden) | Eindhoven



Leidinggeven aan ca. 25 projectmanagers, verantwoordelijk voor de doorontwikkeling van het professionaliseren van de sector en het reorganiseren van de sector

Beginnen met wat algemene vragen over het werk in bij de gemeente voor de context

# Hoe ziet een gemiddelde dag van een Afdelingshoofd Gebiedsexpertise bij Gemeente Eindhoven er uit?

Het runnen van de afdeling door overleg, deels in teams, maar ook vooral individueel met de gebiedsmanagers en beleidsmakers. Als er een project binnenkomt kijk ik bij wie dit past. En ook bij de oplevering van het eindproduct ben ik er dan weer bij. Al die momenten zijn dus over mijn dagen verdeeld.

Als ik het goed heb bekleed je nu bijna 2 jaar deze functie, met het jaar interim afdelingshoofd erbij zelfs bijna 3 jaar ervaring in het sturen van gebiedsontwikkeling bij de gemeente. Hoe vindt je de samenwerking en verbondenheid binnen de gemeente Eindhoven. In het algemeen, en specifiek bij gebiedsontwikkeling.

Dit kan beter. Met name in het algemeen. De sectoren werken niet integraal genoeg samen. Er wordt teveel op thema gekeken terwijl gebiedsontwikkeling raakvlakken heeft met al die thema`s. Het zou beter zijn als er projectmatig gewerkt wordt en de rolverdeling planmatig gestuurd kan worden. In de ontwerpfase is een technische manager nodig die het geheel, inclusief rolverdeling, overziet.

Bij gebiedsontwikkeling is op dit moment de Programma Manager Ruimtelijke Ontwikkeling (Jean van Zeeland) verantwoordelijk voor de rolverdeling. Doordat het overleg op programma- en sector- niveau plaatsvindt, mist het soms aansluiting met de daadwerkelijke uitvoering. Kennismanagement is heel belangrijk, en daar is ruimte voor verbetering. Ontwikkelde kennis en ervaring blijft bij de persoon of het projectteam en wordt niet gedeeld. Kennismanagement zal door één persoon opgepakt moeten worden en anders zijn er structurele koppelmomenten nodig om te zorgen dat kennis en ervaring optimaal wordt gedeeld binnen de organisatie.

# De gemeente doet een stap terug in de initiatiefneming van gebiedsontwikkeling. Weten de bedrijven, burgers en verenigingen dat? Hoe wordt dit gecommuniceerd?

De gemeente veranderd wel van rol, maar doet niet per definitie een stap terug. Dit wordt per gebied en per project bekeken en gekozen. Per project kijk je wat je toepast en hoe je de markt betrekt. Het is vergelijkbaar met een inkoopstrategie. Eerst kijk je wat er is, dan maak je een afweging en vervolgens maak je een keuze. Bewust samen met betrokken stakeholders de ontdekking opzoeken kan ook een keuze zijn. Dit is bijvoorbeeld het geval bij het project slim licht. Daarbij neemt de gemeente straatverlichting af bij specifieke partners die niet alleen verlichting aanbieden maar verlichting 'plus'. Denk hierbij bijvoorbeeld aan verlichting die sociale veiligheid bevorderd of verlichting die aan en uitgaat als er wel of geen gebruikers zijn. Dit zijn voorbeelden, maar wat dat slim licht precies inhoudt is nog voor niemand helemaal duidelijk. Toch kiest de gemeente ervoor om samen op die ontdekkingstocht te gaan met vijf proefgebieden die als living labs worden gezien. Daarbij zijn de projectontwikkelaars verantwoordelijk voor het betrekken van de gemeenschap, niet de gemeente. Het klopt dat er een gat zit tussen het strategische beleid en de daadwerkelijke inwonersparticipatie. Er is in ieder geval geen uniforme communicatie aanpak over de rol van de gemeente richting stakeholders. Dit wordt per project bekeken.

Nu verder op de inhoud, stedelijke gebiedsontwikkeling en publieke participatie

Traditionele gebiedsontwikkeling werkt niet meer, dit heeft twee oorzaken:

- 1. De grote potten goedkoop geld is op, dus integrale masterplannen zijn niet meer haalbaar.
- 2. Bewoners en belanghebbende in een gebied willen steeds meer mee bepalen wat er allemaal gebeurt/ ontwikkeld wordt in de wijk.

#### Mee eens?

Grotendeels mee eens, al zullen er altijd wel masterplannen ontwikkeld blijven worden in uitzonderingsgevallen. Over het algemeen kun je wel stellen dat dat niet meer veel toegepast wordt in de toekomst. Dit heeft ook te maken met het feit dat de benodigde kennis er binnen de gemeente niet meer is doordat alles zo snel verandert.

Wat is de huidige status van gemeenschappelijke gebiedsontwikkeling, en publieke participatie daarin, binnen Eindhoven?

Gemeenschappelijke gebiedsontwikkeling wordt al veel, en steeds meer, toegepast in Eindhoven. Dat zie je bijvoorbeeld goed bij de ontwikkeling van Strijp en het NRE terrein. Maar zoals eerder gezegd, het zijn allemaal losse proeftuinen en experimenten. Dit moet beter op elkaar aansluiten met behulp van goed kennismanagement.

Welke samenwerkingsvormen denk je dat de grootste slaagkans hebben bij gebiedsontwikkeling en wat is daar de reden van. (denk bijvoorbeeld aan belangenorganisatie, buurtcoöperatie of open platform om de gemeenschap te verbinden).

Er is geen universele beste samenwerkingsvorm, bij elk project is een gedegen inkoopstrategie nodig door mensen die daar kennis en ervaring in hebben. Er moet goed gekeken worden naar de exacte vraag van zowel de stakeholders als van de markt. Vervolgens zal er afgewogen en gekozen moeten worden.

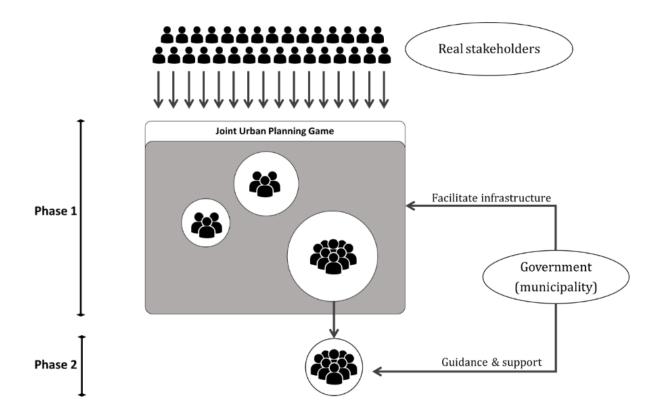
Nu verder naar mijn onderzoek

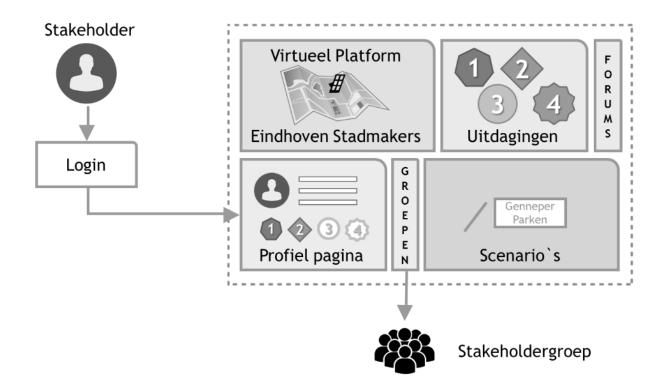
Doel van het onderzoek: hoe kan serious gaming kan worden ingezet om publieke participatie in de initiatief fase van gemeenschappelijke gebiedsontwikkeling te verbeteren.

"Serious games hebben als primaire doel om iets te leren."

- In tegenstelling tot gewone games/spellen waar het doel vermaak is
- Serious games mogen vermakelijk zijn, maar niet als hoofddoel

Daarom ontwikkel ik een *serious game* waarin mensen "spelenderwijs" leren hoe gemeenschappelijke gebiedsontwikkeling werkt, maar vooral ook om helder te krijgen **wat ze zelf willen** en **welke rol ze daarin willen aannemen.** Dit zorgt ervoor dat stakeholders die eerste fase zelf doorlopen en dat de gemeente pas in fase 2 gaat faciliteren en ondersteunen, op het moment dat er concrete vragen zijn.





Denk je dat er in de politiek draagvlak is voor een experimentele aanpak voor gemeenschappelijke gebiedsontwikkeling, zoals serious gaming? Past het volgens jou in het huidig beleid?

Ja, dat past zeker in de participatie gedachte die steeds belangrijker wordt. Er zijn twee aansluitingsmogelijkheden in het huidige beleid: Het programma Inwoners en Overheidsparticipatie dat net is gestart (2015-2018) en de Innovatie agenda van het bestuur.

Ben je bekend met initiatieven of projecten die bezig zijn met dezelfde of vergelijkbare doelstellingen als mijn onderzoek? (publieke participatie in gebiedsontwikkeling verbeteren)

Ja, zoals al besproken Strijp en het NRE terrein. Daarlangs dus ook het slim licht project. En daar komt in juni nog een nieuw initiatief bij, dat is G1000Eindhoven. G1000Eindhoven is een burgerinitiatief van, voor en door inwoners van Eindhoven dat de afstand tussen inwoners en politiek wil overbruggen door vernieuwing van de democratie. Zaterdag 25 juni wordt in het Beursgebouw een gesprek georganiseerd met 1000, door loting gekozen, Eindhovenaren. Een gesprek over onderwerpen die zij zelf belangrijk vinden. Dit zijn echter weer allemaal losse projecten en er is nog flink werk nodig om de achterliggende gedachte van inwoners en overheidsparticipatie in de toekomst beter te communiceren volgens een vaste structuur.

#### Appendix F: Interview transcripts Martijn Mentink

Interview Guide Martijn Mentink

10-05-2016

Hoofd sector Ruimtelijke Expertise bij Gemeente Eindhoven

11:00-12:00

#### Introductie Paul

- HBO Bouwkunde in Tilburg, richting vastgoedontwikkeling
- Nu Master of Real Estate Management & Development aan de TU/e
- Gedurende deze master steeds minder interesse voor de 'harde kant' (M2 etc)
- Almaar groeiende interesse in de 'zachtere kant' (mensen, community 's, gemeenschappelijke gebiedsontwikkeling)
- Daarom thesis onderzoek over gemeenschappelijke gebiedsontwikkeling, met een duidelijke focus op maatschappelijke participatie in de initiatieffase
  - Probleem kort door de bocht: stedelijke gebiedsontwikkeling is fundamenteel veranderd afgelopen jaren, maar in de meeste gemeenschappen is dit nog totaal niet doorgedrongen.
  - Doel van het onderzoek: een verkennend onderzoek naar de mogelijkheden om serious gaming toe te passen om publieke participatie in de initiatieffase te verbeteren

#### Introductie Martijn

'Waarom moeilijk doen als samenwerken kan'

Ik ben als sectorhoofd Ruimtelijke Expertise werkzaam bij de gemeente Eindhoven en heb vele jaren ervaring in de aansturing en advisering van overheidsorganisaties, instellingen en samenwerkingsverbanden. Ik ben een strategisch denker en geef met een verbindende leiderschapstijl veranderingen richting. Samen resultaten boeken is mijn drive. Samen werken is samen doen

#### Hoofd sector Ruimtelijke Expertise

januari 2015 - heden (1 jaar 5 maanden) | Eindhoven en omgeving, Nederland

#### Senior Advisor

2013 - januari 2015 (2 jaar) | Amersfoort

▶ 6 projecten:

#### sectorhoofd Regionale Ontwikkeling

De Stadsregio Arnhem Nijmegen

2009 - 2013 (4 jaar)

#### member

NIROV, forum stedelijke regio's 2006 - 2013 (7 jaar)

#### Directielid

Samenwerkingsverband Regio Eindhoven SRE 2006 - 2008 (2 jaar) | Eindhoven en omgeving, Nederland

Mobiliteit, milieu, zorg, toerisme en recreatie

Provincie Noord-Brabant

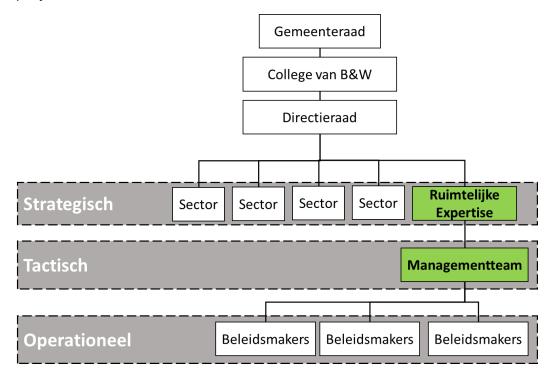
1999 - 2006 (7 jaar) | 's-Hertogenbosch

Grondwater, Grondwater-bescherming, vergunningverlening, ontwikkeling natuur.

Beginnen met wat algemene vragen over het werk in bij de gemeente voor de context

## Hoe ziet een gemiddelde dag van een Hoofd sector Ruimtelijke Expertise bij Gemeente Eindhoven er uit?

Hoofdzakelijk overleg en besprekingen op strategisch niveau met de andere sectoren en het vertalen van die strategie naar tactische uitgangspunten voor het managementteam (figuur i-1). Incidenteel is er op operationeel niveau betrokkenheid nodig, maar dat zijn alleen onverwachte situaties of op specifiek verzoek van de Directieraad.



Figuur i-1

Als ik het goed heb bekleed je nu 1,5 jaar deze functie. Na vele jaren ervaring in aansturing en advisering van andere overheidsorganisaties, hoe vindt je de samenwerking en verbondenheid binnen de gemeente Eindhoven?

Er is buitengewoon veel kennis, expertise en ervaring in de gemeente. Het overgrote deel heeft hoger onderwijs genoten. Mede daardoor gaat een erg grote groep op een natuurlijke manier mee in de beweging naar de nieuwe (participatie)maatschappij waar toch een aanzienlijk aantal functies inhoudelijk aan verandering onderhevig zijn. Slechts een kleine groep blijft 'hangen' in de oude ambtenarenrol waarbij de ambtenaren wachten tot het werk aangedragen wordt door andere partijen. Nogmaals, het overgrote deel van de mensen in de gemeente neemt actief deel aan de samenleving met raakvlakken bij bijvoorbeeld kinderen, vrienden en bekenden. Zij zien ook dat rollen en taken in overheden veranderen en zijn daarop voorbereid. Deze veranderingen worden zowel in groeps- als persoonlijke setting besproken zodat men goed voorbereid is op wat komen gaat, met aanvullende begeleiding en ondersteuning waar nodig.

Het onderzoek Gemeentelijke herindelingen: lessen en leerervaringen onderzoek naar ervaringen met recente herindelingstrajecten uit 2014 is eigenlijk gericht op herindelingstrajecten van gemeenten. Na het onderzoek gelezen te hebben dacht ik, eigenlijk moet elke gemeente anno nu deze lessen en leerervaringen bestuderen? Wat zijn denk je voor alle gemeentes in het algemeen en voor Eindhoven specifiek de twee belangrijkste thema`s, uitdagingen of kansen?

Ja, voor een groot gedeelte wel ja, maar niet voor alle gemeenten. Na de inperking van de stadsregio's zijn regionale banden verwaterd die waardevol waren, en dat nu nog steeds zijn. We zien dus steeds meer dat er gemeente-grens-overschrijdend wordt samengewerkt, met name bij kleinschaligere projecten. Zo is een goed voorbeeld om te noemen dat in de gemeente Eindhoven niemand de taak heeft om speciaal vervoer te organiseren (voor bijvoorbeeld mensen met een beperking). In de gemeente van Helmond is er wel iemand aangesteld met die specifieke taak. Die persoon organiseert dat nu ook voor Eindhoven. Zo zie je het regionale netwerk weer langzaam opbloeien, al is het verre van zelfsprekend. Het vraagt natuurlijk wel om 'verbinders' die de kansen zien liggen en daarop inspelen.

Nu verder op de inhoud, stedelijke gebiedsontwikkeling en publieke participatie

Traditionele gebiedsontwikkeling werkt niet meer, dit heeft twee oorzaken. De grote potten goedkoop geld is op, dus integrale masterplannen zijn niet meer haalbaar. En bewoners en belanghebbende in een gebied willen steeds meer mee bepalen wat er allemaal gebeurt/ ontwikkeld wordt in de wijk. Mee eens?

Ja, in grote lijnen ben ik het hiermee helemaal eens. Al is het wel goed om eraan toe te voegen dat de projectontwikkeling vlak voor de financiële crisis al in slechter weer verkeerde. De mismatch tussen vraag en aanbod was al vrij duidelijk te zien, en dat ging hoe dan ook voor problemen zorgen in de geplande stedelijke gebiedsontwikkelingen. De bankencrisis versnelde het vooral. En al zullen we hier en daar nog masterplannen opgeleverd zien gaan worden, ik denk ook dat die niet meer leidend zullen zijn in toekomstige stedelijke ontwikkelingen. Er zal veel flexibeler en kleinschaliger ontwikkeld gaan worden in de toekomst. Enkele projectontwikkelaars zien de wolken overwaaien en stappen terug in de oude manier van ontwikkelen, maar het overgrote deel heeft het licht gezien en zijn bezig om op nieuwe manieren te ontwikkelen om zo beter op de markt in te kunnen spelen.

Wat is de huidige status van gemeenschappelijke gebiedsontwikkeling en publieke participatie daarin binnen Eindhoven?

Zeker op de goede weg. De ontwikkeling van het NRE terrein is een goed voorbeeld van hoe stakeholders met verschillende achtergronden en ambities samen bouwen aan een prachtig en uniek terrein. Ook als je kijkt wat er allemaal is gebeurd op Strijp de afgelopen 10 jaar, dat laat zien dat gemeenschappelijke gebiedsontwikkeling in Eindhoven goed op weg is.

Welke samenwerkingsvormen denk je dat de grootste slaagkans hebben bij gebiedsontwikkeling en wat is daar de reden van. (denk bijvoorbeeld aan belangenorganisatie, buurtcoöperatie of open platform om de gemeenschap te verbinden).

Elk gebied is anders. Wat het beste is voor de ene buurt, kan het absolute verkeerde zijn voor de buurt ernaast. Factoren als algemene ontwikkeling van de stakeholders en eigendomsverhoudingen in het gebied zijn veel te bepalend voor de keuze van samenwerkingsvorm.

Nu verder naar serious gaming

- In tegenstelling tot gewone games/spellen waar het doel vermaak is
- Serious games mogen vermakelijk zijn, maar niet als hoofddoel

Daarom ontwikkel ik een *serious game* waarin mensen "spelenderwijs" leren hoe gemeenschappelijke gebiedsontwikkeling werkt, maar vooral ook om helder te krijgen wat ze zelf willen en welke rol ze daarin willen aannemen.

Denk je dat er in de politiek draagvlak is voor de serious gaming aanpak die ik in mijn onderzoek presenteer?

Ja absoluut. Het sluit perfect aan bij het huidige beleid. Politiek draagvlak is hier zeker voor.

Is de gemeente Eindhoven bezig met het ontwikkelen van instrumenten met dezelfde of vergelijkbare doelstellingen als ik beschrijf in mijn onderzoek?

Niet in de mate waar jij mee bezig bent. Aangezien jij al daadwerkelijk een instrument hebt ontworpen waar nu al een pilotproject mee wordt gedraaid. Wel wordt er uiteraard over deze dingen nagedacht en er wordt onder andere ervaring opgedaan met de SCRUM methode en de Design Thinking methode. Aangezien iedereen z`n tijd hard nodig heeft voor allerlei operationele activiteiten, is het lastig om de ontwikkeling van dergelijke systemen daar nog bij te doen. Daarom blijf ik graag op de hoogte, en wil graag deelnemen aan het platform om het eens te bekijken, dus houd me op de hoogte!

<sup>&</sup>quot;Serious games hebben als primaire doel om iets te leren."