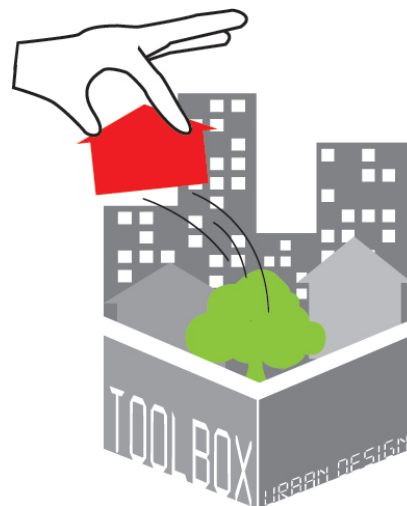


THE TOOLBOX

Introducing a 3D Digital Sketching Tool to the Field of Urban Design



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URBAN DESIGN: GOING FROM 2D MAPS TO 3D ENVIRONMENTS

Traditionally, the formal representation of physical space in all fields of construction, engineering and geography has been the orthogonal projections of defining lines on a 2-dimensional format.

In order to represent a space, the professional in charge must previously understand and master a complex formal language of representation, built upon standard conventional signs and symbols used by professionals worldwide. This language frames every single detail which a plan or map represents regardless of its nature, meaning there is a specific type of line, icon, symbol and even color for everything that is to appear on any map. It has only been possible to create such a complex language by making use of high levels abstraction in formal representation.

Moreover, this process of abstraction or simplification was meant to be a tool that would ensure modern society an easier reading of space and form among others, instead it became a highly complex language which can only be fully understood by professionals of the fields that create them and make use of them, and not by most lay people.

Even though humans have a natural capacity to read space through what McCullough (2005, p.32) defines as 'Survey perspective', which for example allows people to recognize their own house from an aerial photo without ever seen it from that orientation before; they do not necessarily understand an orthogonal architecture plan of the same space. Or, in words of McCullough, "*Tactic Knowledge loses something in the translation to conventional external representations*" (McCullough, 2005, p. 33)

Continuing with this, the phenomena of “way finding” on lay people has been studied in order to understand how people mentally construct space and how they navigate through it. McCullough (2005, p.33) writes that the navigation of space consists in making decisions at landmarks, even if the resulting mental image is more a recombined collage than a map. This precisely represents a problem to designers and architects when trying to communicate spatial ideas to lay people by means of conventional 2D orthogonal plans.

Another important difficulty that lay people find when confronting 2D representation plans is their static nature. McCullough (2005, p.36) claims that contexts are learned through actions and events, such as permanence, procedural contexts, swapped frames of references, systematic behavior, landmarks, building elements, generative typologies, formal elegance and so on.

Introduction to the Toolbox

The main objective in this project is to develop a hands-on tool that can be used to visualize different scenarios within the design phase of urban design projects. Our way of doing so is by introducing the ‘Toolbox’; a 3D- digital- sketching- tool where users can change and test their different scenarios regardless of their spatial representation skills as well as their ability to read formal spatial representations such as 2D plans and maps. This is possible because the Toolbox does not project spaces in an orthogonal way, but rather in perspective view, which is the way the human eye actually perceives space.

This project also challenges the way 3D digital models have been used previously in the field of urban design, where they have almost by rule been limited to the latest parts of a design process, showing the final design, after the development design phase has concluded. This therefore leaves the 3D digital models as a simple means of final ‘neat’ representations and out of all designing stages. The Toolbox instead is a tool for the earlier phases of the design process, and can be put next to tracing papers, plans and markers. It is a quick and easy tool for sketching on three dimensions, for it is not its intention to be a 1:1 reflection of

the reality. Therefore it does not intend to replace a more accurate CAD based model, but to complement it on the conceptual and designing phase of a design.

Furthermore, this project introduces a tool that allows a better communication between all professionals in the urban field, but also non-professionals regardless of their levels of competencies in reading the complex language of 2D orthogonal representation mentioned before on this introduction.

“As important tools in the [planning] dialog are photos, 3-dimensinal maps and drawings, because these can be immediately understood by ordinary people. Often ordinary people do not understand 2-dimensinal maps and drawings, but will not admit it”. (Holmgren, et.al. 1999; p. 24. Authors translation)

The objective of this project is the development of a 3D tool for urban discussion that condenses all the mentioned issues on this introduction, issues which have been ignored or badly dealt with in the field of urban design.

In order to make such a tool, the project has been developed using a specific site, the town of Sisimiut, Greenland, with specific urban issues as a case study.

The reasons why Sisimiut was chosen as the place to develop, test and analyze the Toolbox is explained in the chapter “Introducing the Toolbox into the Field of Urban Design”, however, it is relevant to mention at this point that Sisimiut’s natural characteristics confronted the project with a technical challenge to address with the development of the Toolbox. It has a rocky natural landscape full of heights and steep slopes that demand proper visualization in order to make a better understanding of these conditions in a given representation.

Moreover, the municipality of Sisimiut is giving a tool that allows them to fully design and test ideas on the sites at an earlier stage of a project than they would normally be able to do. This is of utmost importance, as the costs of preparing a site for development in Greenland are very high, and the municipality has to deal with limited resources to take over all their operations.

It is important to state that the Municipality of Greenland acted as an active discussion partner all through out our stay in Sisimiut, providing us with information, resources and feedback when we needed it.

However, it is important to keep in mind that the present tool is not locked to the chosen site of the case study, but rather it is a starting point where the tool is implemented, tested and reflected on.

The final result of this project is more general then the presented site-specific design analysis; instead the result is the implementation of the toolbox itself as a new method of urban design. Therefore, this project can be understood as 'urban designing' as a verb, instead of 'urban design' as a noun.

Another part of the project that also opens up the idea of the Toolbox, are some more theoretical issues within the field of urban design.

The first issue is the story telling in urban design. This is most relevant to the project as it determines the way the story of the future of a specific site is to be told by using the Toolbox. Urban designers are therefore space producers, not only in a physical way, but in a mental one from the beginning of the urban design process.

The second issue addresses embodiment and how people perceive spaces, the benefits of going from 2 dimensional to a 3 dimensional environment.

A third issue is a discussion about the means of communication urban designers posses in the urban design field, and the importance it means to him or her to master communication in the design practice.

Here it is relevant to understand how designers engage in a process of 'simplification' of forms and spaces, to achieve an easier, quicker and more direct communication with others in regards to urban design issues, counting this as the fourth theoretical issue to address. This last method of simplification relates to a forth issue to develop on, which is that of 'power' in the urban design professional praxis. Here the project studies how the designer has the ability to rule out what he or she considers to be 'noise', as well as to exalt whatever he desires to get more attention on.

FRAMING THE PROBLEM:

Two research questions are then important to ask according to the above mentioned issues of the field of urban design:

When is it important to introduce a 3D digital sketching tool in an urban design project?

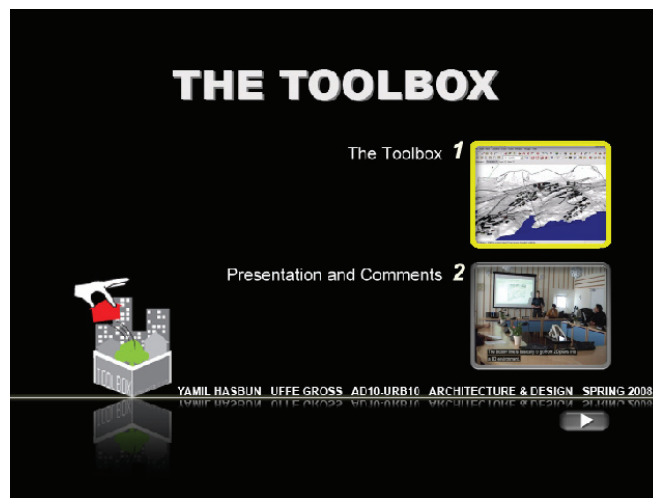
- The question enquires the neglected use of 3D digital media as an active part of the design process.

How relevant is it to introduce 3D digital sketching in an urban design project?

- The question addresses the role of 3 dimensional analyses of spaces before they are built and the power of communicating with a 3D digital environment.

THE TOOLBOX

In this project our answer to the former research questions is the Toolbox. The Toolbox is a 3D digital sketching tool that can be helpful in urban design. Before reading on, please insert the Toolbox DVD and watch chapter 1 “The Toolbox”. (Length: 12 minutes). This is a presentation showing what the Toolbox is capable of doing.



The 3D Digital Toolbox as a Sketching Tool

The Toolbox is a 3D digital sketching tool that ensures a better communication between urban designers, other planning professionals and lay people unfamiliar with formal planning and representation skills. It is a tool that allows planning related professionals to express their planning ideas on a discussion table, without the need to master representation skills such as hand drawing or modeling. Moreover, we see the toolbox as what it is – a toolbox that we can use and take with us. As a regular toolbox, we can add or change the tools inside according to the job we have to carry out. Since each urban project has its own challenges we as designers need to have tools that can be adapted or changed according to different locations.

In order to create a tool that is accessible for everybody in the urban field, the program Google SketchUp has been chosen, which can be downloaded for free on the internet. The program is a 3D sketching tool to quickly build 3D model of your ideas. Furthermore it is also important to note, that SketchUp has been chose for its availability (freeware), and its quality of been a software that is ease to learn.

The project implements a 3D digital model made for the earlier phases of a design project such as the conceptual, early sketching, and ‘hooking up a client’. These phases are still made in 2 dimensions, except for sporadic 3D physical conceptual models.

This characteristic gives the Toolbox a reason to exist in the first place, as it is a working tool made to be easily shaped and modified during a discussion with a potential client and with other professionals involved in the urban design process at the early stages. This is another reason why the Toolbox is designed to be another sketching tool that can be placed along with markers and tracing paper, but with the communication power of a 3D environment.

In summary, it can be concluded that this 3D sketching tool does not intend to

create hyper-realistic 3D images or renderings as can be done by most common 3D programs. Nor is it a tool made for the more precise phases of the design process, where CAD software takes over. The Toolbox is compatible with CAD software, working as an agile supplement for CAD programs which are often too 'heavy' and precise for the more conceptual or actually design phases. It is necessary to make clear that the Toolbox is an agile, quick and light digital tool of easy use once it has been prepared and adjusted by the urban designer behind it. This preparation takes a certain level of skills and time to be considered, but once the tool is set it can be used by almost anyone who uses it.

This introduces yet another essential purpose of the project, which is to promote a dialog of city structure between professionals involved in urban planning and other professionals such as politicians. In order to attain such a goal, the Toolbox has been design to represent the urban space in a way that it is easy to read by anyone outside the architecture practice, and therefore with limited or no skills in reading formal 2D plans. This allows both professionals and lay people to exchange knowledge about city structure without the barrier of technical formation and communication skills. Furthermore, the dialog with other professionals in the urban field will also benefit with the creation of the Toolbox as it represents a way to modify spaces and forms in real time and in three dimensions at once, eliminating the process of sketching over 2D plans that later become 3D models.

"Often professional who only have 2-dimensinal maps, can have a hard time overseeing the spatial consequence of their own proposal." (Holmgren et al., 1999; p. 24. Authors' translation)

The toolbox allows professionals to read 3 dimensional spaces in a clearer and more direct way from the beginning of any dialog, reducing this way the risks of spatial misinterpretation or the overseeing of details.

Purpose of the toolbox

As stated before, the Toolbox essentially allows its users to express their planning ideas on a discussion table, forming then a sort of 'custom' city design scenario without the need to master representation skills such as hand drawing or modeling. The main function of the toolbox is then to provide a way to evaluate one proposed design scenario from another, where each scenario has always several opportunities to be modified by the viewers while open discussions take place. Once the 'results' of a discussion are saved on a computer, the tool allows the designers to overlay the different 'results' and study the different overlaps, contradictions and interpretations made out of single pre-set scenarios and then 'take over' on the development of a single city plan by using his or her professional skills, judgment and knowledge. However, it is important to clarify that the Toolbox has been designed by urban designers for urban designers. This means that the Toolbox only makes sense if the person behind it is an urban designer who can make use of professional knowledge to setup the agenda of the design discussion, guiding the discussion through the options available in the Toolbox itself. This translates to the set-up of the Toolbox's interface where the 'options' provided for the users are relevant to the specific design issues that the designer must attain. Nothing on the Toolbox is there by chance. As an example of this decision making process that the urban designer goes through it is possible to mention the deliberate selection of specific 'building components' that the designer considers relevant to the site, allowing them to appear as options in the Toolbox; and the omission of others that might take the discussion towards 'unwanted' directions.

Finally, there must be an urban designer that can evaluate the resulting 3D sketches from a discussion and 'take over' for the conclusion of a final professional design

3D Digital Rendering Models and their Common Use

3D digital models have been around in architecture and design practice since the end of the 1970s (www.wikipedia.org visit 21/05/08). They have commonly been used in the late phases of design projects as a means of representation of a specific design in a virtual 3D environment. This is the reason why 3D modeling software technology and its market has experienced a strong and constant growth and development.

Commonly, a professional design process starts with convincing a potential client about the need to develop a specific design project. This pre-contract phase is commonly done through the use of conceptual 2D sketches, diagrams, models and also conceptual collages of the desired environment. Only once the contract for the design project has been agreed upon and paid for, and after all the actual design phases have taken place, some few designers actually take the time to transform their finished and fixed 2D design plans into 3D models and finally into polished digital renderings (which by the way are 2 dimensional). However, at this stage of the project, a 3D tool has no longer any relevance as an actual design tool as all design issues have already been concluded and fixed. Here the 3D tool only works as a nice digital picture to announce the design on the press, and on construction site banners.

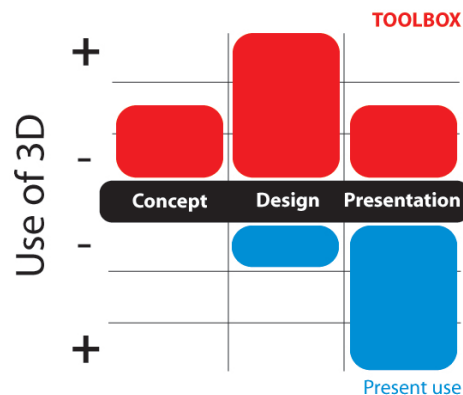


Diagram showing the use of the Toolbox in comparison with common 3D digital models throughout the different phases of a design process.

Some criticism has already taken place in the press (Vangby, 2008) as some believe that 3D digital models have often been used to ‘manipulate’ citizens and planning authorities’ views on a project by means of neat and idealized pictures of the design and some frequent optical tricks and manipulations to make the design appear more pleasant, lively and climatically comfortable. *“Many computer-drawing programs intentionally mislead their perspective giving a false impression of spaces in between buildings, making them appear smaller than they are in reality”* (Vangby, 2008. Authors translation). This critique towards the manipulation of 3D images is not limited to the modification of architectural forms, and spaces on their own sake, but also on how the presented designed buildings actually modify their surrounding spaces in visual and climatic ways.

“If the architects, who developers employ to make the presentation material about their projects, also found the tools that would allow them to analyze the light and wind conditions – and represent their results critically and objective – the results would probably surprise many professionals and politicians, who are currently being seduced by the attractive illustrations” (Vangby, 2008. Authors translation)

It is important to have in mind that the Toolbox does not seek to ‘sell heaven’ to its viewers and users, by making use of its powerful persuasive effect, but instead it must be clear that it is a sketching and analytical tool for the discussion of urban design, and therefore, it should promote discussions and modifications of a specific design, or proposal.

Opportunities and Limitations

Initially, it is basic to understand that in order for the toolbox to work, everything has to be pre-determined by the designer. The designers have to be aware of their role and their power when preparing and using a tool such as the Toolbox. An interesting questions worth looking into is the 'what you lose and what you gain' scenario when everything on the discussion table is pre-determined by the designer. Moreover, it raises the question of whether or not everything on the tool should be systematically 'locked' by the designer in terms of options of usage, and with this a second question arises in regards to the extent of allowed 'freedom' and 'control' on the tools' options when discussing.

If argued that the role of the designer is to make sure that a design attains a certain level of spatial quality as a result of his or hers professional skills, it is then accepted that the designer decides which elements are locked and which are open for discussion. The designer then also has to determine which components are open for discussions and how they are to appear. How much free design people can do depends on how many parameters the designers keep open.

"But not all the variables involved in a design are explicitly exposed as design decisions. Those that are, we call parameters. A design parameter then, is a transformation variable with the additional property that its value can be decided by the designer at design time." (Steinø, Veirum 2005 p. 4)

The designer therefore has to have focus on what should be open for changes and what should be decided upon by the professional. The idea with the Toolbox is not to let everybody create their own Utopia of a certain place, but to get people to have an opinion about one or more scenarios. The purpose of the Toolbox is to use it both as a discussion and a design tool. The Toolbox should give people

a better understanding of how a project can develop. In many cases within urban design, projects stretch over several years and thereby changing as the project develops. The Toolbox then becomes relevant in a discussion of possible development shown in scenarios.

What is then open for discussions could be elements such as house typology, colors, height, density, etc. What is not open for discussion are the decisions where the different kinds of buildings and areas (housing areas, city center, green area etc.) are to be placed. This is a job for the designer to determine, whereas small details of an area can be handed over to the people who are going to live there.

“While citizens may be able to formulate their requirements to the built environment, they lack the professional skills to generate solutions which can address these requirements. The lack of professional insight also makes it difficult to assess technical and organizational aspects of urban design, as well as the potentials for, and limitations to their aspirations” (Steinø. 2003. p.188). Having said that, urban design simply cannot be done without the presence of the professional skills and judgment of an urban designer, and he or she is irreplaceable in the planning process.

DISCOURSES, NARRATIVES AND EMBODIED PERCEPTION OF SPACE IN URBAN DESIGN

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This part of the project will pursue an understanding of how narratives and urban story telling builds the way different people view the city; how urban designers build their own stories of the future of a specific site and how important it is to be able to tell these. The chapter starts by showing the importance of being able to present designs in 3D, in order to understand these better; because the human body relates better to a 3D environment then it does to 2D projections.

Also, there will be an analysis of how planning discourses are built by the selection, omission and repetition in different formats, from the spoken word, to the planning documents. For this, the importance of the different 'plots' involved in planning storytelling will be highlighted to understand how the different planning agents 'paint the picture' of the different scenarios laid on the planning table.

This chapter will discuss the way planners and designers 'professionalize' the sites where they will place a design intervention, by using 'simplification'. This may imply the need to sometimes 'erase' whatever history, connotations and stories the place might have had. This process ends yet again with a new story of place which the designers and planners have assigned to the 'cleared out' sites.

The Need for a Discussion Tool

One of the skills that urban designers must master is how to persuade or convince people outside the planning field towards a certain 'story of the future'. This is because these stories or proposed scenarios must be understood by non-professional-viewers. Traditionally, planners use 2D-plans as the primary visual link between designer and viewers. The problem is that the two of them read the drawings differently. The designer might be able to read more spatial information of a drawing than the lay viewer can, because the designer is trained to do so. Even though the suggestion is good, the lack of spatial understanding can be a barrier for the viewer to accept the suggestion and to make one as well.

This lack of understanding is what has inspired us into developing the Toolbox in the first place. Moreover, another reason why design remains almost exclusively 2D is that it takes time, money and skills to do a 3D physical model. The project seeks to make possible an alternative tool that can solve both problems, which would be a benefit to both designers and viewers.

3D visual environments allow the possibility to show the spatial dimension of a plan or idea which can be relevant in many urban design aspects as it is a tool to be used in several stages of a design process. For instance, it can be used by the designer as a way of testing different designs, it can be used as a presentation-tool to convince stakeholders about a best design solution, and it could also be used as a discussion-tool about the development of an area.

What we find interesting and perhaps also missing in the urban field, is a tool that can help visualize different spatial ideas in 3 dimensions in real time. A tool that helps people understand the designer's ideas and plans, emphasizing the good and bad perspective of the different designs. By doing so, people might find it easier to accept or reject a specific proposal, as it helps them to see what they actually like or dislike from the design proposal, without the barrier of possessing or not skills for reading 2D representations such as orthogonal plans, sections and so on.

The next segment will develop on the way humans perceive the 3 dimensional spaces, regardless of the previously mentioned skills for reading 2D spatial representations.

Embodiment and 3D Perception

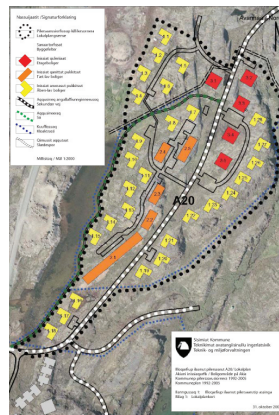
Essentially, perception of space begins with embodiment because body is the basic mediator between us and our surroundings, shaping our own perception. Place is experienced bodily by human sensations and perception. Moreover, the body is our first and last site, our centre, and our scale. *“Every person is the centre of the world, and circumambient space is different in accordance with schema of his body”* (Tuan, 2001. P. 41)

According to Yi-Fu Tuan (2001. P. 41), Human perception of space is determined by body characteristics in comparisons to external objects in space, where the body gives all the basic axis of movement in all 3 dimensions as well as a basic measurement of scale and range. In order to get to a specific destiny for example, first one must decide on which direction to move to, right, left, front, back, up or down. Once made that decision, the body assumes as ‘front’ wherever the decided direction is, and moves ‘forward’ to its destination. Similar case happens when considering an object’s basic scale; the mind assumes it as big or small in comparison to the body itself.

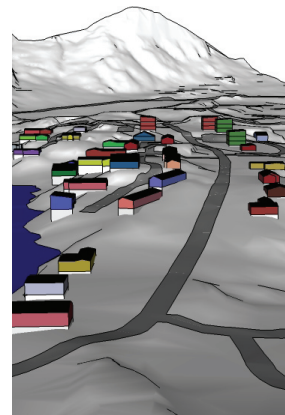
However, McCullough(2005, p.31) claims that in an era of cyberspace and 3D virtual representation of space the rules of perception are blurring between embodiment and technology. In all fairness it can be said that technology has often extended the experience of life beyond the scope of the bodily schema. As a clear example of this one can observe the human perception towards internet surfing where users feel as they ‘visit’ sites when in fact their internet browser software download packets of data from whatever site they are viewing. Perhaps another example of this is the way some people slightly move their bodies to one side or the other, when playing video-games simultaneously to the action that takes place on a virtual simulation of space.

Nowadays, technology seldom makes use of latent predispositions and too often requires arbitrary instruction meaning still more skills to learn. This contributes to a growing problematic defined by McCullough (2005, p.42) as spatial 'Deskilling'. Furthermore he states that technology should be re-thought in order to confront the problem and benefit mankind. *"If spatial deskilling has emerged as a major problem of our time, then our technology constructs must be adjusted to confront this. The appropriate technology will be that which taps into and uses embodied predispositions."* (McCullough, Malcolm. 2005, p. 43)

The Toolbox offers untrained eyes a way to read space and form in a much more accessible way than a 2D map or plan. The Toolbox does not project spaces in an orthogonal way, but rather in perspective view, which is the way human eyes actually perceive space.



Local plan for area A20 in Akia with indication of heights by colors



Screen shot from the Toolbox showing Local Plan for area A20 in Akia in 3D.

The Toolbox is not a static representation of space printed on a sheet of paper, but rather a 3 dimensional environment that allows users to 'move' their virtual head and body wherever they wish, and perceive space as one naturally would see it. Additionally it offers the possibility to navigate through the 3D environment by more or less coping the way we perceive space as we walk through it. The screen acts as your eyes, so that for example if you move the mouse to your

right you will virtually move in the same direction, if you move your mouse forward, the computer will imitate the way you would see a context at eye height while you walk forward.

However, it is important to state that none of the mentioned features of the toolbox translates into less rational simplification of 'reality' on a digital format, but rather a different parameter of simplification and abstraction of space and form. In sum, we understand 3 dimensional projections because we in fact live in a 3D world. Instead, 2D representation is a highly abstract way to lay out the physical reality, and it assumes a certain level of skills and knowledge from the person that reads and produces them.

The physical reality that surrounds us is not simply inert 3 dimensional buildings, objects and landscape. There is an important 'human layer' on the urban space that determines the way we perceive our surroundings. Furthermore we all construct the urban space in a mental way, adding our own stories and narratives to the different urban spaces as we experience them. Finally, it is relevant to remember that cities are not made, lived in or designed by inert physical objects but by humans, therefore we contribute to building cities through our daily narratives and our story telling.

Discourse and Story Telling in Urban Design

The day-to-day life that takes place in a city, as well as the city's built environment, are all together the study subject that urban design addresses. It is simply not possible to retrieve one part from the other, as cities are not cities without buildings, or without people actually using them.

Urban spaces become precisely that just after they have been flooded with people, and with them, their mental construction of the place. These mental constructions are present in the form of stories and narratives, weather they are told, written or scratched on a wall. Or as said by Jensen and Richardson *"Discourses produce lived spaces and actions within lived spaces in turn shape discourses. If discourse is necessary for attaching meaning to things in everyday life (as much as in policy-making, which is just one of those things that happen in everyday life), then analysis of discourse is inseparable from the analysis of space. In fact, analysis of space requires analysis of discourse if we are to understand how spaces come to be as they are, how people exist and act within spaces"*. (Jensen and Richardson, 2004 p. 43)

Urban branding, as well as urban design itself is a sort of evocative storytelling aimed at educating its recipients to see the city in a particular way. On this Sandercok (2003, p.12) argues that planning is performed through telling stories of what may occur in the future.

This stories are aimed to establish a 'common' story constructed upon different narratives, that at the same time come from different voices. Therefore, planners must accomplish a sort of understanding of the different narratives involved in the planning and visualization of the city's development, basically how different actors tell different stories about the same place.

Empty Sites-Professionalized Places for Planning New Places

“A site is a social construction, a representation of space. It is conceived apart from the complexity of human relations. In effect, a site is a place that has been denatured, formalized and colonized” (Beauregard 2005, p.40)

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Urban designers and planners, government administrators and other agents involved in development have constructed a complex methodology to make sense of places. They do so by ‘fragmenting’ the place into pieces that can then be organized, systematized and administrated all this by a process of simplification. The result of this process is a number of different types of sites categorized then in terms of their scale, slope, economic value, landscape features, solar orientation, configuration, and so on. In summary, ‘places are professionalized’.

After this formal (and mental) zoning, urban designers must remove the overlapping and contradictory stories and remembrances by simplifying -or ruling out- narratives into one coherent and transparent representation.

“Planners and designers take control of a place by distilling its narratives. They eliminate the ambiguities that might derail the project by casting doubt that this is the best and only available option” (Beauregard 2005, p.41) Planners and designers therefore control the place of development by isolation and by fragmentation of spatial stories and narratives, capturing the foundational nature of the place. This means that urban designers have the power to ultimately select what urban stories are relevant to his or her development intentions and which are not, entering in yet another round of simplification or ‘reductionism’ as Beauregard (2005, p.42) calls it, only this time simplifying the story of a place, in order to convert it to a site to host a specific development that the urban officials consider relevant.

‘Empty’ sites, of course, seldom remain vacant for development to take over. Therefore designers and planners must constantly ‘make’ vacant sites from exist-

ing places, erasing whatever narrative and story they already have through the mentioned 'distillation' of space. Furthermore, once a vacant site is constructed, designers can produce on them a new place that wasn't there before, full of completely new narratives.

Designer's means of Communication

Following the last conclusion, urban designers are themselves an authority with the power to tell a specific story by various means. Here it becomes clear that *"the theme of power is added to the fundamentals of place and narrative. In fact, one could say that power is what links narrative and place."* (Jensen. 2007. p.216). Thus power and narratives do not exist without one another.

Nevertheless, in spite of the fact that urban designers have several means to tell their own stories, they do not always communicate them effectively outside the professional planning circles. About this, Peter Marris (Marris 1997 in Sandercock 2003 p. 19) claimed that the relation knowledge – action in urban design practice is not straight forward, arguing that *"...academics [in the planning field] are powerful critics but weak storytellers. That is, they fail to communicate their findings in a way that is not plausible but persuasive."* (Marris 1997 in Sandercock 2003 p. 19). By this, it is argued that planners have commonly expressed their knowledge in a cold and rigid 'hard-core' style in urban plans, and planning documents, in search of a so called 'scientific objectivity' of analysis.

However, Sandercock criticizes the planners 'scientific' attitude from its core stating that its only purpose is to *"perpetuate a myth of the objectivity and technical expertise of the planners."* She continues stating that *"...there is no such thing as mere description, or pure facts"* (Sandercock 2003 p.21). Thus, it is important for urban designers to always keep in mind that the stories that they build should not try to seek a sterile 'scientific objectivity', as the subject of their discussions are daily human lives in city spaces and not chemical elements in a jar.

Finally, it is necessary to re-state that planning is mainly performed as story telling, where not only the planners' ability to listen to the many different stories involved in the planning process becomes a crucial skill of the planning practice. This skill is equal to the planner's ability to create and design the spaces for stories to be told. The simplification (see next segment) of the Toolbox contributes to tell a story about a place without having the skill to draw or built a physical model of the place.

A story can be told in many different ways, the important issue though, is that the story has a point and that this point is given to the right people. The Toolbox focuses on telling what the designer behind it wants to tell. The simplification works as a filter as to what goes into the story and what is left out.

Simplification in Communication

Simplification is a process developed at the beginning of modern society that basically consists in a sort of 'translation' between known elements in the 'reality' such as terrain, wealth and people themselves into, as Scott (1998, p.2) defines it, *"a common standard necessary for a synoptic view"*

Ironically though, that the process of Simplification was first adopted by society to counter the growing difficulties that modern governments were facing. Simplification was meant to be a tool that would ensure governments an easier reading of the complex modern society, with which they would possess a higher level of control and order over society. This 'easier reading' is itself highly arguable in many fields, including urban design and city planning as the language of codes created for this purpose became far too complex for the untrained eye to read. Therefore learning 'reading' skills in order to understand this language became necessary.

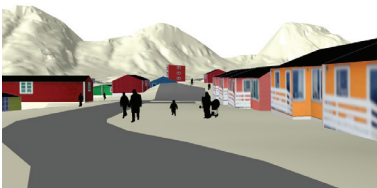
The Toolbox is constructed on the basis of simplification. It is not designed for the exclusive use of highly trained eyes in the reading of plans and maps, as could be said for 2 dimensional representations of space and form. Neither does the

Toolbox intend to be a mere imitation of 'reality', a sort of hyper realistic digital picture of space, as could be a common 3D rendering of a specific form or space. Thus the Toolbox is set in between being a much more legible representation of space than a 2D map as it simultaneously intrudes three dimensions. At the same time it presents a certain level of simplification and abstraction that can still be read by untrained eyes. This level of abstraction allows the urban designers to maintain the focus on the subjects chosen for discussion.

The toolbox only makes sense as long as the designer can systematically control it, and effectively establishes what, where and how specific urban design issues are to be discussed by making use of the toolbox.

In order to do so, the designer must make use of a certain level of abstraction or simplification that 'omits' certain features of the reality, context or design. The omission of certain elements must be the result of a previous discrimination process followed by the designer, where the features to be discussed are easily read, and even exalted, while other elements that represent 'noise' are therefore omitted or reduced.

"We cannot always stop and smell the roses. Over attention to the periphery may distract from urgent decision to be made in the foreground." (McCullough. 2005, p. 44)



Two different screen shots from the Toolbox showing the 3m standard height of building stories compared to human scale

The toolbox uses simplification as essential criteria for establishing its parameters of measurements, options, visuals, and others. Examples of this are the 3m heights of building stories, the 1.6 to 1.85 m heights of people, the limited selection of 3 to 4 colors per building component and the slight level of simplification in the digital Terrain among others.

Simplification in this case, is used as a filter that allows the urban designers to make use of the Toolbox to effectively reach the topics needed for a certain goal, and reduce the amount of unnecessary information that can result from a totally

opened debate not only with citizens, but with other professionals involved in the field of urban design.

Simplification and Power

As stated before on the subject of ‘Simplification and Communication’ on page 29, there is a rational process that involves empowered professionals to discriminate between important elements to show on planning documents whether it is a map, text or a 3D model. The rationale behind them only makes sense once the goals and the omissions of making the planning document in the first place are established.

This introduces the power that officials, in this case urban designers, have on the entire process even before discussions are taken with any particular audience.

Scott (1998, p.3) argues that these official documents do not successfully represent the actual shape of the subject they depicted, nor is this their intention. *“[Official documents] ...represent only one slice of it that interested the official observer. They were, moreover, not just maps. Rather they were maps that, when allied with state power, would enable much of the reality they depict to be remade.”* (Scott. 1998, P. 03)

However, dangers also exist of oversimplifying the subject of design which ultimately may lead to a rejection of the document by the host society. Scott (1998, p.7) argues that commonly this occurs as state officials ignore elements of practical knowledge of the community which the document has been made for.

As an example of oversimplification on a 3D digital model, an inaccurate terrain model, placing building sites on non-solid soil and an inaccurate scale are enough to condemn a model to be rejected or not taken seriously on a discussion table. Simplification can either contribute to a better understanding or mislead the viewer. Therefore it is important to state that the designer behind the Toolbox needs to know when he or she is making use of simplification and for what purpose.

INTRODUCING THE TOOLBOX INTO THE FIELD OF URBAN DESIGN

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The following chapter is about how we developed and tested the Toolbox according to an existing project in Sisimiut, Greenland, which included a 3 week study trip to this town. Here we co-operated with the planning division of the municipality developing the Toolbox, as well as testing the project in the field praxis of urban design.



Office of the Municipal Planning
Division of Sisimiut, Greenland

The reason for choosing Sisimiut, and the Akia project as a case study was based on the following criteria. First of all we wanted to develop the Toolbox alongside a real urban design project, giving ourselves the opportunity to get feedback from several active professionals in the urban field. Using a real project also provided some natural advantages in order to keep the focus on what was important. For example we knew that the focus would be on the housing area, and how dwellings would be best placed on the site, especially to secure most people with a view.

The landscape and the natural conditions found in this latitude reduced the amount of 'extra' elements that you normally find in other warmer climates. Green elements and outdoor spaces are not significant considerations in the arctic climate, allowing us to keep focus on developing the basic layout of the Toolbox for the housing areas.

By choosing Akia, which is located north from the existing town of Sisimiut across a small bay, we knew that we would be challenging the Toolbox in both performance and flexibility due to its landscape. The terrain is a mix of high and low points, where the challenge would be the creation of a believable model of that



Sisimiut Kommune

A20

Pilersaarusiaq

Akiani inissiaqarfik

Lokalplan

Boligområde på Akia

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Cover of the Local Plan for the A20 development area of Akia, Sisimiut.

complex terrain.

The municipality has been working on the area for the last five years, creating several plans for this area. This again gave us a live opportunity to use and test existing planning materials to be compared against the Toolbox. The real challenge for us was to establish if it was possible to show the planning staff anything new by re-introducing previously well-worked materials in a 3D environment.

The Setup

Our goal for the trip was to end up with the first fully operational Toolbox for the Akia project, which in the end was to be tested among professionals. In this case a fully operational Toolbox means a 3D digital model that can be used to test existing materials or allowing from that point new ideas to come.

The only element in the Toolbox that was pre-made before arriving in Sisimiut was the terrain model. From this point on, and during the first two weeks in Sisimiut, we gathered information about the town to be able to understand how planning works in Greenland, and be able to develop the different elements that needed to be in the Toolbox.

In order to make the Toolbox work, the designer behind the Toolbox needs, as in any other project, an understanding of the place where he or she is working. Furthermore, this phase was about including and excluding elements to go inside the Toolbox, and then to actually make them in the Toolbox.

The last week in Sisimiut was allocated to putting the Toolbox to work in the field. For this purpose, two meetings were arranged. The first meeting was with the planning division of Sisimiut, while the second was arranged with a broader audience consisting of many different professionals from design, planning and political fields.



Pictures from the presentation of the Toolbox to the planning staff of the Municipality of Sisimiut. 8th of April, 2008.

Presenting for the Planning Division

Having two meetings meant that we could focus on different elements of the Toolbox in each one of the presentations. We made a clear choice about the different topics of each meeting. The first meeting, with the planning division, would have a more technical approach to the Toolbox. The reason for this was that these people would actually be using the Toolbox as a design and analytical tool, and not only as a mean of communication. Most of them had never worked with 3D digital models before, and our job was to convince them that the Toolbox was not something that you needed to be a skillful user to get started.

The presentation also contained a session where we showed the many functions that we considered to be interesting to them. The presentation ended up in an open discussion where people commented on the possibility of where they thought it could be used according to their work area. Some of them were honest stating that within their area, they did not see the Toolbox useful to them. This opinion came mostly from people working with environmental issues. However, they could see the possibilities of the tool for their colleagues dealing with urban planning, stating that with the Toolbox, they would have a huge advantage when testing their different ideas in a 3D digital environment.

Presenting for a Broader Audience

As stated previously we had the opportunity to introduce the Toolbox to a wider range of professionals in the field of urban planning. This range of professionals consisted of politicians, economists, planners, architects and engineers (to see the invitation and full list of people please see Appendix 5 on the Appendix CD). The focus of this presentation was to evaluate the ability of the Toolbox to communicate different scenarios between professionals and non-professionals within the field of urban design.

This was a crucial test for the Toolbox, which would allow us to see if it was meaningful for people inside the field. Therefore we chose to tape the presentation and following discussion on video (you can find the full presentation and discussion on Appendix 1 on the Appendix DVD. Length: 1 hour).



Pictures from the presentation of the Toolbox to planning directors, and politicians of the Municipality of Sisimiut; and local architect firms. 10th of April, 2008.

Our intention regarding this presentation was to be honest about the Toolbox, what we had worked with and what it was capable of doing. Therefore we made an effort to explain why we considered the Toolbox was needed, that it was a sketching tool and that it should be kept that way, and that it did make a significant difference when working in a 3D environment and not only in 2 dimensions plans.

As stated earlier, storytelling is an important issue in Urban Planning, and presenting the Toolbox was no exception. We knew that our audience was a mix of people, all having their own agenda. Therefore we told the story of the Toolbox in a very pedagogical way. Starting off in the 2D dimensional projection, going into the 3D environment, and from there on we provided a lot of examples regarding what the Toolbox could do, both as a tool and most certainly as a way of communicating a design for an entirely new city area.

The agenda of the presentation was to obtain feedback on the Toolbox for us to work on. Therefore it was our job as the designers behind the Toolbox, to make sure that the Toolbox was used in a way so the discussions would be about the use of the Toolbox in the field of urban design. Again persuasive storytelling here is the keyword. We as designers knew even before entering the stage, that by just introducing their own previous work in a 3D environment we would be able to catch their interest.

Once we caught their interest in the Toolbox we focused on the story in the presentation; “what was the Toolbox capable of doing inside the field of urban design?” which was the goal for us to get feedback on. An underlying agenda of the presentation was to identify if everybody would be able to understand what we would be talking about. In other words, too see if the Toolbox would function as a way to communicate highly complex 2D material of the project in a better way.

The responses provided by the audience at the presentation were also honest. When finishing reading this segment, please watch chapter 2 “Presentations and comments” on the “Toolbox DVD” to see the actual comments made on this

second meeting. The video consists of a four minute clip where the focus is on the advantages of being able to work and show things in a 3 dimensional environment. The second part is an eight minute video where we introduce some of the possibilities of using the Toolbox as an analytical tool, followed by comments from the audience.



Potential of 3D in the Field of Urban Design

Based on the comments in the video, we would like to state that we believe the Toolbox has a great potential in the field of urban design. Our goal of being able to contribute with something new on the Akia development project was a success. By introducing a 3D digital environment we were able to get people to see new sides of the projects, re-think the way plans were made, and most important that it was easier to communicate ideas and design among the many professionals when it was presented in 3D.

The video shows that even though people have looked at the plans many times over the past years, introducing it in a 3D environment will most likely introduce new details and questions. This goes for both professionals and non-professionals, indicated by the comments given by Architect Erik Grundtvig and Project- and Development chief Laust Løgstrup.

As for the purpose of the Toolbox as a new tool for the field of urban design, the comments given on the video indicate that it has potential. It is most likely to work in the earlier phase of a project, both as a sketching tool and as an analytically tool. This option is relevant to the designer him- or herself but also as a way of communicating problems and solutions to others. The Toolbox will minimize the danger of misunderstanding a design proposal compared to the traditional 2D plans.

The case study in Sisimiut indicates that it would be worth continuing to develop the Toolbox. The present version of the Toolbox allows us to do what we, in the first place, set out to answer, but it could also hold some unexplored topics that might be helpful to introduce in 3D for a better understanding. Introducing it to the field verified that there is a need to use 3D in the earlier stage of a project, simply because spaces are easier to understand when presented in 3 dimensional.

ANALYSIS AND REFLECTION

In this segment of the report, we will analyze and reflect on different issues that arose during the development of this project. It starts with reflecting on different issues of the Toolbox itself such as its strength and its limitations, its implications in the field of urban design, and its base software 'Google SketchUp'. Finally, this Analysis and Reflection will conclude on an evaluation of our performance in Si-simiut, Greenland, where we reflected on what could have been done differently on the testing phase of the project as well as on the 'setting-up' of the Toolbox.

Reflections on the Toolbox

We have stated that the Toolbox introduces a quick and easy way to build design sketches in 3D, without the need to possess any particular skills in 3D modeling, or on any other design representation in general. However, the Toolbox can only be quick and easy to use after it has been systematically set-up by an urban designer with certain skills in SketchUp, and certainly with the professional judgment and skills of a professional in the urban field.

Setting up the Toolbox is not as fast and easy as using it once it is ready. The process of building the many different predetermined elements needs a fair amount of hours and skills. However, it is important to say that the level of speed and complication of 'setting up' the Toolbox is mainly determined by external factors to the Toolbox itself. These are commonly the quality of the terrain maps available (DWG files), computer power and high levels of details on the model.

This last factor affects the performance of the Toolbox because the more detailed its setup is, the heavier and stiffer it is to work with it, meaning less effective and relevant to the urban discussion. Then, in order to make the Toolbox a quick and easy design tool, the designer must carry out a preliminary discrimination of all the elements to be present on the model, and others that are irrelevant for a specific design task. This is done by a process of deliberate 'Simplification' which is pos-

sible from an underling position of 'power' that the urban designer possesses. The designer decides what is relevant and what is not before the Toolbox ever meets any other agent involved in the urban design process.

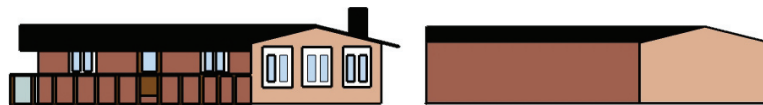
In our project, there are many examples of this process of 'filtering' and 'enhancing' through simplification; as examples of filtering we can mention our decision to 'strip' architecture typology details from our pre-made components and also our decision to exclude all types of city equipment from the Toolbox, meaning the deliberate omission of light posts, benches, garbage bins, heating pipes, etc. On the other hand, we also enhanced some elements in the Toolbox, which we considered necessary to 'stand out' from other elements. Our decision to detail landscape to a certain extent is an example of this rational. We considered necessary to do so, in order for the Toolbox to be accepted by our audience, who is very familiar with the site, and at the same time, so that references could be made between the Toolbox and the actual site, by natural landmarks.

The simplification on the Toolbox is therefore not a result of coincidence or a technical limitation, but a deliberate decision made by the urban designers in charge of setting up the Toolbox.

It is however necessary to reflect on some limitation that arise alongside the simplification filter of the Toolbox. The first one would be the limitations of working with pre-made boxes as components. Components are perhaps the essential elements that allow the Toolbox to be a quick and easy sketching tool, capable of building 3D sketches of design ideas in real time, and without the need to possess any particular skills in 3D modeling. These components must be made by the designer previously to the actual use of the Toolbox in a design project or discussion. The designer must begin by building a library of boxes/buildings that represent different architecture typologies which are then 'selectable' in the Toolbox component library. In order to keep the attention on the planning of an area and not on particular architecture issues, the components must be made basic and simple. Meaning they should be stripped from unnecessary elements such as

detailed doors, windows, textures, heating pipes, etc. Furthermore, the components must be as simple as possible in their geometry, where the number of ‘faces’ – surfaces in 3D digital programs consist of triangles called faces - on each volume should ideally be reduced to a minimum quantity in order to make the 3D models less heavy to work with in terms of geometry and therefore file size. This ultimately translates to the omission of smaller architecture details.

Adding details also means the file on the computer becomes bigger and thereby also heavier to work with. Big files may end up slowing down the computer’s performance and thereby losing some of the flexibility and flow in the process when you are working.



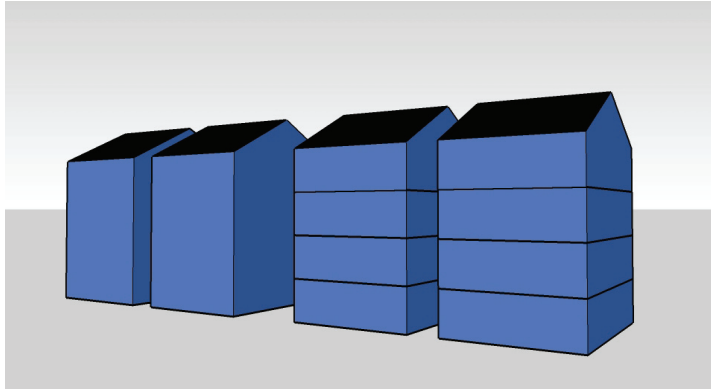
3D model of a house

Simplified Component of the same house

However, the pre-made components also present a limitation to the Toolbox as they reduce to a certain extent the level of variety in the Toolbox, due to the fact that the number of components is not unlimited. Even though the designer creates a large library of components, this library will reach a limit at some stage. Moreover, even if the library’s variety is very large, it does not mean that the users of the Toolbox will spend a long time browsing through it in search of different components.

Reading Information

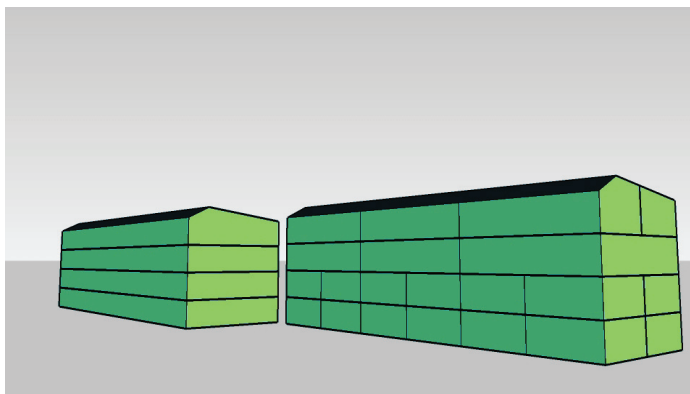
Another limitation we found on our early pre-made components was the difficulty to read the number of stories on the larger building blocks. The measure we took to fix this problem was to split the large building blocks into smaller



Apartment block component without (left) and with (right) indication of stories.

modules that stacked together build a building block.

This allowed us to show the numbers of floors in the bigger building blocks, thereby adding a better understanding of the place. In a second round we would consider to build the bigger blocks by apartments, so it would be possible not only to read the numbers of floors but also the numbers of apartments directly on every building. With no doubt, this should be considered according to the flexibility mentioned earlier. Building blocks like this would increase the number of details because every block would consist of more faces instead of one big surface. But you would quite easily be able to see if an area would have a high density or not.



Apartment block component built by number of stories (left) and by variable apartment units (right).

Flexibility vs. Detail

There is a constant counter-relation in the Toolbox between the level of flexibility in its use, and the amount of details it can hold. This means the more flexible the Toolbox is, the less visual detail you can get from it; and the more details you program in, the less flexible the Toolbox becomes. This goes for every aspect of the Toolbox including the already mentioned 'simple forms' that the pre-made components must possess, and another issue of detail that we came across within the development of this project. - the visual 'mode' of the components.

This subject deals with our early decision to make our components somewhat realistic by covering them with photo-texture images of existing housing typologies found in the town of Sisimiut. However this photo-textured images were modified to be less readable by slightly blurring the images, so that they were not 'too' recognizable. This decision was taken as we thought it was important for people involved in the discussion to be able to read 'houses' when looking at the components and not just simply white or colored boxes, which can lead to another set of misinterpretations derived from an over-simplification of forms. This could mean that the audience and users of the Toolbox could be misled to read literally the white boxes projected on the screen as massive cement blocks with no windows painted in white. Later on, we concluded that this decision was not appropriate as our audience could read houses and typologies out of the simple colored boxes, leaving the experience as part of the learning process of the project.

However, we believe that in another scenario where the audience is less familiar with planning and designing, setting the components to have photo-textured images might still be relevant and an effective way to communicate architecture.

A new Tool and not a new 'Recipe' for Urban Design

It must always be clear that the Toolbox represents a new tool for the early stages of urban design projects, and not a substitute for other existing design and analytical tools. It is a tool made to efficiently work in some issues and stages of the design process, but in others it is inadequate by its own definition.

The Toolbox should not be forced into becoming a new 'magical recipe' for urban design. Moreover, we believe that there could be a danger of overuse of the Toolbox, if this is used systematically without any changes of its components and settings. In this case, the Toolbox would then 'uniform' the early sketches of all the projects that use it as a tool, finally affecting the praxis of urban design. The Toolbox therefore should be constantly 'customized' by the urban designers that use it, this by expanding its library, changing its light settings, basically stamping their own finger mark on it. We conclude that the Toolbox would actually work best if it were constantly seen through new eyes and modified to follow the professional needs and interests of each designer that uses it.

Persuasiveness resource of the Toolbox

The Toolbox possesses a strong persuasive resource as a communication tool as it imitates the way we perceive space through embodiment. This, in combination with the already persuasive attributes of digital technology can either help make people more interested towards a specific design discussion, stimulating an interactive participation; or it can become a strong tool to persuade viewers towards a specific design or another. This is naturally determined by the 'hidden agenda' of the urban designer behind the Toolbox and his or her pre-conceived design goals for the specific urban intervention.

The Toolbox could also be used to show only the 'best angles' of a proposed specific design by manipulating the Toolbox settings such as the shadow cast settings, the measurements of the components and the scenes in which the views are locked to.

Therefore, we are aware of the persuasive resource that the Toolbox possesses. However, we argue that this is not exclusive of the Toolbox or of the ability to project forms and spaces in 3D, as 2D representations such as collages are so frequently used to persuade people into one design or another. The question is more about the agenda and professional ethics of the urban designer behind any tool of space representation.

Possible Resistance to the Toolbox

Again, a basic consideration to keep in mind when reflecting on the Toolbox and its application is that it does not intend to replace any other existing tool in the field of urban design. Instead, the Toolbox seeks to complement the existing urban design tools by introducing itself in the stages of design processes that have traditionally lacked analytical and sketching digital tools in 3 dimensions. 'It is a new Toolbox inside the bigger toolbox of urban design'

We are fully aware of the possible resistance that some urban designers might show towards the Toolbox as it represents a challenge to the way urban design is traditionally carried out in a project, in 2D still pictures. By introducing a new methodology for the early stages of the design process, the Toolbox 'opens up' places for discussion that were practically 'sealed off' for anyone except the designer him self.

However, we believe that more so than the reason mentioned above, some designers might argue against the use of 3D digital models as these can mislead those who are not trained to look at them from a critical point of view, and therefore be seduced by the persuasiveness implicit in 3D digital modes.

The next segments of this reflection will evaluate more specific issues concerning the Toolbox itself and its applications on an urban design discussion. In order to do so, it is necessary to start by evaluating the way the Toolbox is previously set-up by the designer behind it, even before it is used in an urban design project and on an urban design discussion.

When is the Toolbox the ideal Tool?

The Toolbox possesses a remarkable strength as a communication tool because it can be understood almost by anyone who uses it. This is possible because the Toolbox allows the user to virtually go inside the model by imitating the way people would perceive real spaces. Moreover the Toolbox allows the user to 'walk inside the model' by imitating the 'embodiment' spatial perception reviewed on page 23.

Furthermore, the Toolbox is also an effective communication tool because it allows its users to express their spatial ideas through quick 3D sketches by using the pre-made 'buildings' available in the library.

Because of its pre-made library, the Toolbox also allows all its users to be 'at the same level' when sketching a representation. This allows less experienced users to easily express their spatial ideas without the barrier of drawing or modeling skills, ensuring a more equal and smoother communication between all parts in a discussion.

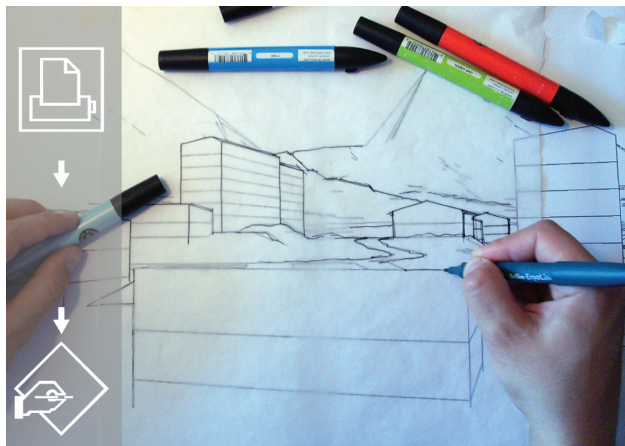
The Toolbox is also a powerful analytical tool in the early stages of a design process because it engages its users to explore spaces directly in three dimensions since the beginning and not after long hours of settings and renderings as a common 3D digital model do. Having said this, it is important to systematically evaluate in what tasks the Toolbox does work, and in which ones it does not, in other words, it is necessary to establish when it is the correct tool for a job, and when it is not.

When is the Toolbox not the Proper Tool?

Because of its intrinsic characteristic as a sketching tool that is deliberately not a 1:1 reproduction of reality in terms of precision, design and visuals, it is not a usable tool for presentation where traditional hand sketches are best, and in a much lower level, in our opinion, 3D Renderings.

The Toolbox does not seek to replace the already existing tools of design presentation, but it could be a powerful asset for hand drawing illustrations if it is used as a back ground over which you sketch on.

This would allow the designer to reduce the time spent in calculating perspective lines, shadows, scales and depths on a hand drawing by using simple 'blocks' and lines projected by the Toolbox from a desired view point. A hand drawing adds a personal touch giving it life, where most computer drawings and collages tend to appear too sterile. However, nor a hand drawing, a collage or the toolbox can ever reproduce the human layer of an urban space. There is simply no way to express the sounds, smells and atmospheres of the real thing.



Printed graphics from the Toolbox as a support tool to hand illustrations.

The reason why it is easier to relate and understand hand drawing of a 3D space than a computer representation of such is that hand drawings are a sort of extension of the human body into a sheet of paper. Computer images instead are produced from beginning to end by machines, featuring the precision of line and measurements, as well as the impeccable finishes of a plotter or a printer. Even though it is a person who controls the computer, the computer does not seem to work as a natural extension of the arm. It has been and will still (for a long time) be a machine.



The same place illustrated through a hand drawing (above) and the Toolbox (below).



Not a precision tool

The Toolbox is not a precision design tool, such as CAD drawings and CAD-made 3D models. As stated earlier, the Toolbox is not designed to be a precision tool because it is intentionally made for quick sketching. It is not a tool for drawing design plans, nor is it for discussing precision parameters of a design such as measurements, structures, etc. Instead the Toolbox is made for the early discussions on a design process, such as concept of design, and general design features, but not their final layout.

Is SketchUp the Right Software for the Toolbox?

We must start by saying that we are fully aware of the capacity of the Toolbox to be more precise showing much more details, and therefore be less sketchy and 'abstract', but then the question is if the Toolbox should be taken to that level? Initially, it becomes relevant to reflect on the Software used as the frame of the Toolbox, 'Google SketchUp 6'. Some basic software features that the Toolbox needs can be found on other 3D software such as the layer control and the use of components in programs such as auto-cad and 3D Studio Max. What makes SketchUp different is that it is by principle a fast and easy sketching tool not intended for precision and 'hyper-realism'.

The software's name already indicates the word 'Sketch' which it can be said implies 'not the end result' and 'fast drawings' and therefore 'not precise'; instead its purpose is to communicate and develop quick ideas 'hands on' designing.

There is no doubt that the Toolbox could have been more detailed by making use of the SketchUp software, as this program seems to us to developed more and more towards a more precise 3D software, where the focus is to be able to represent the materials more and more realistically, and therefore away from its original purpose as a sketching tool. However, we conclude that the Toolbox must be sketchy in order to make sense and our best choice is still by far the SketchUp software.

Reflections on the application of the Toolbox on the project's case study

Having evaluated the Toolbox and its performance as a new designing, analytical and communication tool for the field of urban design, we would then evaluate on our performance as urban designers in Sisimiut, Greenland, and towards objectives of the program in general. This implies a reflection on all the relevant decisions we made that helped shape the Toolbox as well as the entire project as a whole. It is be relevant to state since the beginning of this reflection, that this project like any other design project, has not been carried out in a straight line. Instead, it has been rethought, retried and redirected several times through out the process.

This we consider, to be a positive connotation of the design project as it has developed according to the ongoing understanding of the potentials and limitations of the Toolbox, and a further understanding of the specific characteristics of not only the project site, but also the audience to which the Toolbox was exposed to. In other words, we are very satisfied with the learning process that this project implied as well as with the results of the project.

On more specific issues, we would like to reflect on the decisions we took in regards to the development of the Toolbox, as well as the decisions made in its testing phase in Sisimiut.

The Toolbox was always intended to be a tool for the early stages of a design process. Its intentions have always been to ensure a better understanding of different design proposals inside a 3D environment; we conclude that this intention was satisfactorily accomplished, as shown in the "Presentation and Comments" discussion video. Furthermore, one of the objectives of this project is that it can help as a communication tool among different types of users, regardless of their skills in formal representation and their professional background.

Initially, we also believed that the Toolbox should be one that literally anyone

could use in order to express their design ideas through easily built 3D projections. Through the process however, we discovered that the scope of users was too broad, as we reflected on the actual results that the Toolbox would then have in the field of urban design. We concluded that it is essential to have the judgment and knowledge of an urban designer behind the set-up of the Toolbox before it is even exposed on an urban design discussion. Otherwise, the discussions made by a completely 'opened' Toolbox would be so broad and disperse that they would end up being useless in an actual design process. There must be a clear structure and a clear formulation of what is being discussed in order to obtain results that can be systematized and used –or not– in an urban design project.

The Toolbox was then intentionally controlled by us since its set-up, in order to obtain consistent results which would follow our own agenda within the project. This is the reason why we deliberately controlled the Toolbox and the discussions that took place instead of making a sort of 'open participatory' session with the Toolbox. Furthermore, we also decided to exclusively expose the Toolbox to professionals in the planning and administrative areas of the Municipality of Sisimiut. The reason behind this decision is the same as the previous one; we concluded that we needed to obtain concrete feedback on the Toolbox, from professionals familiar with planning processes in many different areas.

We however believe that in another project scenario, with another agenda, other objectives and possibly in another context, the setup and development of the project would have been different. Perhaps the application of the Toolbox in a round table, where people would directly use the Toolbox would be an interesting case study by itself. Maybe also the exposure of the Toolbox to lay citizens, recording their reactions and expectations towards the tool would be then another case study worth looking at, too.

Nevertheless, we consider that in this specific project, we have concluded with very satisfactory results, accomplishing the objectives that we established for the project.

CONCLUSION

Having reflected and analyzed the different theoretical and practical issues the this project engaged, it is then possible to draw the conclusions we set out to attain. Therefore, this 'Conclusion' chapter consists on the answering of the two research questions established which are firstly 'When is it important to introduce a 3D digital sketching tool in an urban design project?' And secondly 'How relevant is it to introduce 3D digital sketching, in an urban design project?'. The further answer of these follows next.

When is it Important to Introduce a 3D Digital Sketching Tool in an Urban Design Project?

Traditionally, urban designers have engaged their projects by making almost exclusive use of 2 dimensional representations and concept diagrams in order to reach a finished design that is materialized in plans, sections and elevations. 3D analyses are seldom made because of the time, skills and money required to build 3D physical models. Ironically, this traditional design methodology has as an end result a physical intervention on the urban spaces that exists in 3 dimensions. This omission of the 3D analysis and exploration is the cause of so many examples of inaccurate and unsatisfactory urban interventions where problems of scale, shadow casts and blocked views are frequent. These problems could be reduced with the analysis of the specific design in a 3 dimension environment, where it is not isolated from the existing built context and conditions such as illumination and scale.

This project therefore consists of a new analytical tool for the field of urban design to be used in the early phases of a design project; where as stated before, 3D analysis, testing and designing has been neglected.

The Toolbox is a 3D design, testing and analytical tool that can create quick 3D

sketches of an idea designed and immediately placed in the context, allowing the urban designer to evaluate it, and easily modify it where he or she finds it necessary. This possibility to create 3D models quickly, without costs and fairly easily, gives the designer not only the possibility to design more proposals but also to evaluate the designs in an earlier stage of the design project. Thus, the Toolbox can also reduce the risks of an inaccurate design not only by its own extent but also in relation to the surrounding context.

The 3D digital Toolbox has been designed to attend yet another subject of the urban design process that has traditionally been conducted without the use of 3D tools which is the communication between the different agents involved in the planning process.

The Toolbox is an effective tool of communication initially because it projects spaces and forms in 3D environments that imitate the way we perceive 'reality'.

What makes the Toolbox different from traditional 3D digital models is that it is designed to be kept on a sketch-like level, becoming a fast sketching tool, where previous skills on 3D digital models are not required to be used. The features just mentioned above make the Toolbox an ideal tool to sketch and discuss with, since the early stages of a design process are more about drawing the 'big lines' and concepts, meaning that flexibility and not precision is needed.

Here flexibility represents not only a lower degree of precision of measurements, but also a lower precision of representation. This means that the Toolbox allows its users to sketch 'by the hand' and to communicate their early spatial ideas through sketches and not renderings. What makes it possible to have a 3D digital tool that is effective in the early stages of a design project is its dimension of simplicity. Therefore the Toolbox will always be effective and analytical, as long as it is kept simple, thus not complicated by increasing its precision and details.

By having a 3D digital sketching tool for the early stages of a design project, the

process of design can be substantially accelerated and fully understood by all actors involved, regardless of their professional field within the planning process. This quicker and better communication is possible because the toolbox reduces the dangers of spatial misunderstanding and misinterpretation, as it shows forms and space in a way that are easily recognizable by almost anyone, regardless of their spatial 'reading' skills.

How Relevant is it to Introduce 3D Digital Sketching in an Urban Design Project?

Introducing the possibility to make quick design sketches in 3 dimensions at the early phases of a design project opens up a broad range of possibilities to enrich the urban design praxis.

Perhaps an initial possibility is the fact that design ideas can be easily communicated to anyone present on a discussion, regardless of their skills in reading design documents. This is possible because the Toolbox uses a visual projection mode that imitates the way we humans read space through the already introduced embodiment projection on page 23.

The potential of the Toolbox to easily communicate design ideas is not unilateral, as the tool is designed so that the audience in an urban design project can also express their spatial concerns and ideas through the same language and the same tool. The barrier between urban designers, planning agents and general audience is reduced in a discussion, as the Toolbox will sketch all their different design ideas by making use of the same components, settings and parameters. Furthermore, the dangers of spatial misinterpretation and of the 'idealization' of a design are reduced. Anyone can virtually 'go in' and actually see what a space will look like before it is built, within the limitations of a virtual experience. For this last purpose, we believe that it is not necessary that the virtual spaces projected be 1:1 accurate, on the contrary it is better that they are not. These projections should be simplified to a point where, the only elements that one could

evaluate on are those relevant to the discussion regarding urban design and not others that could mislead the focus of attention to minor issues.

It is important to insist on the fact that the Toolbox is not intended to be the new 'magical recipe' for urban design. It is instead a new tool designed for the phases of a design project that have traditionally lacked ways to analyze, sketch and communicate in 3 dimensions.

Metaphorically speaking, 'Just because you have a new hammer, you will not unscrew with it. You use the appropriate tool for a specific task.' This project therefore adds a new Toolbox to a wider urban design Toolbox, while not intending to replace any other which might be better for other specific tasks.

PERSPECTIVE

Having reflected and concluded on the different aspects elaborated on this project, we consider it is important to open a discussion on the development of further future perspectives as a new tool for the field of urban design.

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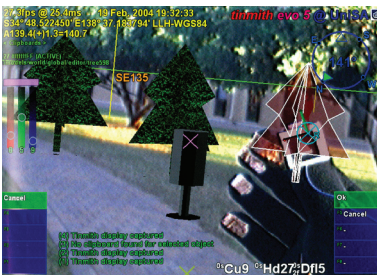
We conclude that no matter what future modifications the Toolbox might go through, it is basic to always maintain two basic principles that give sense to the Toolbox. The first one is the simplification filter in its visual projections and the second one is the existence of an urban designer behind its setup, use and interpretation of results.

However we would like to explore some possibilities for the future development of the Toolbox as current technologies advance towards the merging of the digital and the physical world. Always as long as the Toolbox contributes to make the communication among the different professionals in the planning process more direct, quicker and more interactive.

Merging of Physical and Digital Worlds

It is possible to state that physical models and digital environments have their own specific advantages and limitations in several aspects, making them both relevant and difficult to replace one another. However, what happens if they are combined through technology, making use of the best of both worlds in a single urban planning tool?

Already today, there exist projects seeking to merge 3D modeling with physical embodiment without the use of a desk computer. One project named TIMNITH (www.timnith.net. Visit: 28/March/08) is an outdoor 3D modeling game that makes use of digital graphics over its user's view of the outdoor space. Its players make use of their body directly in the placing of prefabricated components such



(Images: www.timnith.net)

Two images from the TINMITH game.
The picture above shows part of the gear its players must use.
The picture below shows the interface of the game, viewed from the players perspective.

as trees and cars 'on' the physical world. This intuition-based video/physical game could develop into a tool for urban planning and pre-visualization of buildings before they exist in the reality. This project is most interesting because of the possibilities it opens for individuals to 'walk inside' the virtual world without leaving the physical world, allowing them to see the physical and the digital layers of a site one over the other. However, we consider that such a project has several considerable limitations as an urban design tool from its bases. It is a game that allows an individual to simultaneously explore the digital and the physical worlds by his own, while he walks inside it. This implies that there is no possibility to either discuss or show what he or she is actually doing 'inside' the virtual world and to have a full picture of the entire design site, meaning no possibility to see everything from a top view perspective, as well as to 'fly bye' the digital space. What would be an interesting feature is the possibility to create a "multi player game", allowing more people to walk and talk together inside the game seeing what other people are doing. With a pre-made library of urban elements it would then be possible to have a very dynamic discussion on the site.

A down side to such a tool would be that you would actually need to be at the location to use the tool. We would also need to consider all the technical equipment that would need to be transported back and forth.

Moreover, we consider essential for an urban design tool to both always allow the designer to have the possibility to see the 'big picture' of the site on a top view plan and to have the possibility to discuss his ideas and considerations with other professionals involved in the project in real time.

Another technology worth while looking at would be touch screens. This technology may hold the key to merging some of the advantages from a physical model with the advantages of a pre-made library and the possibility of replacing building as shown in the Toolbox. This is shown in a program from National Geographic about surveillance technologies showed on the 6th of May on National Geographic Channel (See Appendix).

Unlike the previously mentioned video game, this concept for a program is



Two images from the Surveillance future technology concept shown in the National Geographic Channel.

The picture above shows several users working simultaneously around a single touchscreen with an 3D image of a city.

The picture below shows one of the users sketching on the projection with his own bare fingers.

designed to see the 'big picture' of an urban space from a top view and perspectives; while at the same time allowing several professionals to simultaneously use it, letting them discuss relevant issues in real time and one next to the other. All this is possible because the users manipulate a single touch screen on which the projections and program interfaces are laid out. (To see more of this project please see Appendix). The idea here is to make use of the advantages of having more people around the table and the possibility of sketching within the 3D digital environment. The video clip is a good example on how technology can be used to merge the best of two worlds.

We consider to be interesting to blend some of the elements found in these two examples with the Toolbox, creating a highly useful 3D physical/digital tool as an analytical, designing and communicating tool for the field of urban design.

In our opinion we consider that a future version of the Toolbox could employ a simultaneous participation dynamic process around a discussion touch screen table where spaces can be projected in any way needed, yet allowing every professional in the discussion to directly sketch on a single screen while discussing the ideas in real time. The result of such a tool could be a much faster design process as ideas are discussed at once. This would ensure all the different professionals a better understanding of the design ideas their colleagues have towards the same issue, contrary to the otherwise fragmented design process that results from a design going from one closed office-computer to another until its conclusion. Another application of this technological improvement on the Toolbox could be to improve the communication of the design with a broader audience. This is due to the fact that the designer would then not need to be behind a computer, giving his or her back to the audience, but instead could dialog directly with the participants of the discussion, using his/her own hands to sketch the arising ideas from the discussion in real time.

The possibilities of the future of the Toolbox are then immense, making it worth while to see what awaits for the development of the Toolbox as well as other designing tools with the improvement of technologies, and furthermore the impacts these would have on the practice of urban design.

REFERENCES

Beauregard, Robert. A. (2005) From Place to Site: Negotiating Narrative Complexity, in C. J. Burns and A. Kahn (eds.) (2005) *Site Matters. Design Concepts, Histories, and Strategies*. Rutledge. London. Pages 39-58

Holmgren, Steen; Hansen, Jan Kaadekilde; Ole Svensson, (1999) *Byarkitektur i Byfornyelsen – i dialog mellem fagfolk og beboere, 3-D, digital bymodel*, Statens Byggeforskningsinstitut. By- og Boligministeriet. København. page. 24

Jensen, Ole B. (2007) *Culture Stories: Understanding Culture Branding*. SAGE Publications. Denmark.

Jensen, Ole. B. & T. Richardson (2004) *Making European Space. Mobility, Power and Territorial Identity*. Routledge. London.

McCullough, Malcolm (2005). *Digital Ground*. Cambridge, MA: MIT Press, USA.

Sandercock, Leonie (2003) Out of the Closet: The Importance of Stories and Storytelling in Planning Practice, *Planning, Theory & Practice*, vol. 4, no. 1, March 2003. London. Pages 11-28

Scott, James C. (1998) *Seeing like a state: How certain schemes to improve human conditions have failed*. Yale University Press, New York.

Steinø, Nicolai (2003). *Vision, Plan and Reality – urban design between conceptualizing and realization*, Aarhus School of Architecture. Denmark (<http://www.aod.aau.dk/staff/steino/>)

Steinø, Nicolai & Niels Einar Veirum (2005) "A Parametric Approach to Urban Design: Tentative Formulations of a Methodology". In: eCAADe 23: Digital Design: The Quest for New Paradigms. Lisbon: Technical University of Lisbon. pages 679-686.

Tuan, Yi-Fu (2001) Space and Place. University of Minnesota Press, Minneapolis

Vangby, Bo (2008) "Det optiske bedrag" Aalborg: Nordjyske Stiftidende, 24. April 2008. Aalborg. Page 8.

Websites

TIMNITH project, www.timnith.net, visit 28/March/08
www.wikipedia.org/wiki/3D_computer_graphics_software