Tangible possibilities—envisioning interactions in public space

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Abstract
This article explores approaches to envisionment in the field of interaction design. Design fictions are introduced as a method to articulate future possibilities. Three case studies are described which explore interaction in public space. The fictions create imaginative projections with the intention of generating reaction and responses in the public that will lead to a greater understanding of the physical and conceptual design space. The first case study explored how citizens could anonymously comment on their relationship with a city. The second study encouraged participants to reflect on their habits and rituals and to view these through fresh eyes. The final case study sought to surprise and engage gallery visitors through an interactive piece that raised issues concerning the surreptitious capture of data. The paper concludes by reflecting on the utility of design fictions and the role they can play in concept envisionment.

Keywords: design fictions, urban interaction design, ethnography, envisionment

1 Introduction
Design plays a central part in our lives. It holds a mirror up to the human condition but it also points ahead to how things could be. It is shaped by the events of today while all the time presenting alternatives to what might be our shared futures. This is not a new role for design; indeed, Dormer in his book entitled Design Since 1945 (1993) reports Ettore Sottsass as stating that design ‘is a way of discussing society, politics and eroticism, food and even design. At the end it is a way of building up a possible figurative utopia or metaphor about life.’ (p. 10). This sentiment is ever-more pressing in today’s society where technology and science present us with a myriad of futures that seem to be ever-changing. As products and services become ever more complex with the integration of technology, designers are faced with the challenge of integrating form and function into artefacts that provide a meaningful emotional experience for the consumer. As if this were not difficult enough, more products are becoming dematerialised, raising the question of how this new generation of products and services might reflect the human condition. Paradoxically, as more designs lose their physical form, there is a growing trend to move from the pixilated world of the screen out into the physical world of the urban environment. City populations are currently in a state of rapid flux. Conurbations are fast becoming a hybrid of the physical environment and the digital datasphere. How we, as
physical beings, will connect with, interpret and adapt this increasing dataflow residing in our cities is already becoming a significant question for designers.

The three case studies reported in this article take as their focus our relationship with the city and through design fictions seek to explore interaction in public space. Through drawing parallels from the past, changing the perspective on the present and questioning relationships in the future, the case studies present scenarios that invite us all to reflect on the nature of our concerns and desires before we accept solutions to problems that others have framed. The challenge facing design is how to make us more critical of our shared futures and to prompt us to question whose futures these really are and what form they might take; in short, to acknowledge that design can be a political act.

2 Design: shaping the future

It can be said that design is concerned with the creation of objects and environments that do not yet exist (Smyth and Helgason 2011). However, the activity of design most often concerns the modification or improvement of existing designed artefacts and services in an incremental way, perhaps in response to changing technologies, business requirements or contexts of use. In this situation there is a substantial repertoire of methods and approaches available to designers as they explore requirements, consider alternative solutions and refine finished concepts. However, when designers are required to respond to design spaces that are still largely unknown, this can be a much more daunting task. Implicit in this work is the need to extend the design horizon beyond existing realities in order to identify emergent themes. But how far into the future is it useful, or indeed valid, to look? Does design envisionment need to be rooted in design reality?

Design envisionment is a critical part of the design process. One method is prototyping, which enables a better understanding of the problem space. Prototypes act as a manifestation of design ideas and through their creation offer an opportunity to generate a dialogue with the problem space. They are a way of externalising thoughts and enable new perceptual processes to reflection and critique. In short, they provide a mechanism for what Schön (1983) described as ‘the talk-back’ (p. 79) of the design situation.

Design envisionment is considered so crucial that companies have sought to weave explicit methods into their working practices. For example, Philips has adopted a Three Horizons Model that emphasises the relationship and role of envisionment and how this can be integrated into an innovative business model. Not only does it identify potential new products and services, the model enables the company to position itself relative to future markets (Kyffin and Gardien 2009). The acknowledgement of design as a means of identifying emergent themes raises a pragmatic question for designers: how do you begin to envision concepts when you don’t know what the design space will look like?

3 Envisionment and interaction design

Interaction design is a nascent discipline that is operating in a rapidly changing context. It is also one of the fastest growing areas of design (Design Council 2007) and it sits at the intersection of art, design and technology (Rodgers and Smyth 2010). As a fusion of technology and the humanities, and of aesthetics and culture, interaction design is concerned with the design of both the services that novel technologies can offer and the quality and meaning of the interactive experience. Furthermore, as pervasive technologies become increasingly prevalent in urban spaces, and individuals encounter and interact with these systems, either knowingly or unknowingly, in their daily lives, public space and its potential for interaction is rapidly becoming an important focus for designers.

Cities, and the public spaces of which they are composed, have always raised particular issues for technologists and researchers. But today, more so than ever, a transformation is taking place in how our cities work. Cities are being laced with
sensors, which in turn generate urban informatics experiences, imbuing physical space with real-time behavioural data (Hill 2010). A digital landscape overlays our physical world and is expanding to offer ever-richer experiences. In the cities of the future, computing isn’t just with us; it surrounds us, and it uses the context of our environment to empower us in more natural, yet powerful ways (Rolston 2011). What is clear is that the urban fabric itself is becoming increasingly reflexive and responsive, and this in turn has numerous implications for the design and experience of cities as a result.

In a similar manner to other areas of design, the process of envisionment is central to interaction design, both in terms of user response but also as a means of reflection. A method that has proven popular among interaction designers has been ethnography. Traditional ethnographic methods, as practiced by social scientists, have a well-documented history of use through the last century, but more recently these approaches have been picked up by designers as a way of understanding the culture of technology use and the practices of users in situ. In this appropriation, many flavours of design ethnography have emerged (Crabtree et al. 2009), with the aim of revealing insights that can be useful in influencing and shaping design practice. The challenge here is to take the descriptive detail of the in-depth ethnographic study, along with the critical interpretation of these data, and shape them into something that can be usefully informative for the practice of design. This can be difficult in itself, and is compounded by the fact that few design projects are allowed the luxury of enough time for substantial longitudinal studies as practised in social science research. This can potentially expose the pressured designer to dangers, discussed insightfully by Crabtree et al. (ibid.), including overly broad generalisations and generic interpretations, in place of the rich understandings that result from detailed analysis of situated action as carried out by Suchman (1987). This is not to dismiss ethnographic approaches as useful for design, merely to point out potential limitations if not handled carefully. Added to this is the concern that ethnographic methods explicitly study what is happening now, and by the time the results of these studies reach the design studio they are already documents of the past.

Ethnography explicitly acknowledges the context of the activity under study as it promises to reveal rich detail about lived experience, but it is embodied in the stories that have already passed by (Brewer 2000). The ‘rich pictures’ produced by ethnographic research are undoubtedly an important document of peoples’ need, rituals and priorities. It is deliberately non-prescriptive, leaving the burden of interpretation on the designer. This raises the question of how to ‘jump across’ the divide between description and concept envisionment. While ethnographic data can clearly point to more enduring factors that can be assumed to remain in future scenarios, the precise manifestation of these essentially human attributes remain to be articulated through design. The situation is further exacerbated by the practical requirement of ethnography to have an activity to study; if that is not available, the undoubted strengths of the method are short-circuited.

4 Articulating future interactions

When considering the next generation of products, services and infrastructures, it is notoriously difficult to disassociate from current technology and to move beyond iterative improvements (Smyth and Helgason 2011). As an approach, fictional design concepts may offer new insight as a method for articulating potential future or near-future interactions. Part of ethnography’s appeal to interaction designers is the expectation that the method’s concern with behaviours and cultures will reveal rich insights that could inform the creation of better products, services and experiences. What has become apparent over the course of this relationship is that ethnography uncovers meaning, it does not identify problems, much less solutions per se. Interaction designers have responded by taking a more ‘designerly’ approach to envisionment by considering both the problem and the solution in a more fluid and intertwined
This approach more explicitly adopts design as a means of presenting alternatives and as a technique to better understand the human condition as a whole. In short, it echoes the political aspirations of design as it acts as a means of better understanding ourselves.

One purpose of design can be to shape strategy and set agendas for future generations of technology and design outcomes. The challenge facing such early-stage concept generation is to project forward by tapping into higher level needs and desires that are often not obviously apparent. Critical design (Dunne 1999) presents design as a catalyst or provocation for thought. In this approach design is framed as a means of asking questions and making us, as both designers and consumers, think about future possibilities. By grounding the approach in design reality, critical design attempts to challenge assumptions and preconceptions about the role that products and services play in everyday life. As a method, it seeks to push to the limits our understanding of the lived experience and through this to better position designers to respond to the cultural and aesthetic potential of the transformative applications, concepts and infrastructures that will characterise the next decades. The creation of fictionalised designs is a strategy for exploring the space that lies tantalisingly beyond the current and the now. By contextualising this approach at the edges of our knowledge, it is possible to use design to create ‘design fictions’ (Bleecker and Nova 2009). In a similar manner to cinema, such fictions have the capacity to immerse an audience in worlds and situations that do not yet exist. They have the potential to project us into different possible futures, causing us to focus, and reflect upon, current concerns and their potential trajectories (Smyth et al. 2011). In the introduction to the book entitled NonObject (Lukic 2011), Barry Katz described design as a means of surveying the bounds of the believable and pressing against the perimeter of the possible. This characterisation of design as a means of ‘cultural research’ closely parallels the aspirations of critical design. Indeed Lukic (2011) views design as a way to probe the emotional space between the human and the artefact and, in a wider sense, a more complete understanding of our object world will provide a means through which we can better understand ourselves.

What we are proposing here is that design can itself be considered as a kind of ‘fictional ethnography’. By using design to develop rich and detailed envisionments of future scenarios, we can make the possible tangible, and offer these possibilities for consideration, reflection and debate. The production and presentation of these envisionments invites a wide audience to react, consider and respond to ideas. Public display of these prototypes can enable the collection of responses, and encourages discussion. In our role as design researchers we are not attempting to steer the development of technology onto, or way from, any particular path; instead, we are concerned that the impacts of possible options on the lives people live are explored in different ways, giving voice to a broad a range of individuals as is feasible.

5 Three case studies of design fiction

The remainder of the article will describe three case studies that have adopted a design-informed approach to encourage or provoke participants to question commonly held beliefs or assumptions about rituals, patterns and relationships and how these are mediated with and through technology in everyday life. Each case study seeks to humanise potential futures and thereby enable us as designers to focus on the minutiae of behaviour and the subsequent questions this exposes. In these case studies, the fictions presented are not intended to be read as prototypes, but as possibilities, maybe not even desirable ones. All of the cases are sited in public space and are intended to generate responses leading to a greater understanding of the physical and conceptual design space.

When we consider the future, we are not attempting to predict; rather, we are creating imaginative projections based on what we already know. This knowledge comes from our experience of the past, our embodiment in the present and our
imagined narratives of the future. These case studies each represent instances of how we frame this knowledge.

The first case study looked to the past as inspiration for a design fiction that explored how citizens could anonymously comment on their relationship with a city. The second case study was more explicitly rooted in the present. The piece used photography as a ‘disruption’ to slow down a familiar journey and encourage participants to reflect on their habits and rituals and to view these through fresh eyes. This was effectively asking participants to create and record their own design responses. The final case study was more forward looking as it sought to surprise and engage gallery visitors through the display of fictitious personal information in response to their physical proximity. It was hoped that people would question the implications of the surreptitious capture of such data in a near-future age of machine-readable humans.

Each of the case studies is essentially different, but what does unify them is, firstly, their siting in public space, and secondly, the creation of design fictions that acted as mechanisms for reflection and response. In each case the resulting dialogue was with the public as they participated in, engaged with or were provoked by each of the pieces.

5.1 The past: digitalANTIQUE
digitalANTIQUE was an installation created over a five-day period in Split, Croatia. It was developed in response to a brief entitled ‘The Hybrid City’ that sought to explore the contention that urban spaces of the future will be saturated with both visible and hidden media that gather and transmit information. The work used digital projection as a way of connecting the past with the present, and in so doing enabled the citizens of Split to express their opinions on local issues. The aim of the piece was to create a means whereby citizens of Split could read the opinions of others and have the opportunity to reflect on how the concerns of today echoed the concerns of the past.

5.1.1 Context of the city
In order to understand the rationale behind the work it is important to realise the context in which it was sited. The city of Split is located on the Adriatic coast and is Croatia’s second-largest city. The citizens are proud of the city’s Roman heritage and its identity as the largest Dalmatian city. Croatia gained independence in 1991 in the aftermath of the breakup of the former Yugoslavia. Since then the city has experienced economic prosperity associated with the rejuvenation of Croatia, but recently has suffered in the economic downturn that has swept across Europe. This has been particularly marked, as the city is highly dependent on the tourist industry. The result is that many citizens of Split are becoming increasingly dissatisfied with both local and national politicians.

5.1.2 The Hybrid City brief
The design brief centred on the idea that urban spaces of the near-future will be a hybrid of digital and analogue data and that how we as physical beings connect with, interpret and shape the increase of data residing in our environment will be a significant design challenge.

The Hybrid City is an urban environment that comprises both the physical and the digital (virtual). The brief raised a series of questions:
• What form will the information landscape take?
• How will people adapt their behaviours and indeed how will the nature of the urban landscape alter as increased amounts of information is overlaid on the physical environment?
• What new products and services will be available given the increase of targeted information aimed at specific communities and interest groups?
• Will this result in an increase in segmentation and fragmentation associated with the urban experience leading to the possibility of the creation of multiple experiences of the same physical space.
• What will inform the visual aesthetic of the future information landscape?

5.1.3 The work
In response to the brief and the particular context of the city, an installation piece was created that
explored ways to give an alternate voice to the citizens of Split. But rather than looking to the future, the piece looked to the past for inspiration. The work drew on the fact that the citizens of Split are proud of their city and its heritage. While the response was not overtly political, it did address the question of how citizens might anonymously share their opinions about the city in a public way.

The initial phase of the piece was to collect the opinions of the people of Split. Interviews were conducted with a variety of age groups in the city’s bars, cafes and galleries. Through this process a series of phrases and comments were gathered, and it was these that gave the voices to the digital projections. The second phase of the work was to research historical figures connected to the city; this work was undertaken in cooperation with the Museum of Split. Once a statue was selected, it was photographed from a variety of angles and the resulting images were used to create the digital projection. The final part of the work was to select an appropriate location in the city where the digitised statues could be projected (Figure 1). An important detail was to record the surface on to which the projection would take place so that the digital statue could be successfully blended into the physical walls of the city.

A series of historical figures were selected to give a voice to the issues and concerns of today’s inhabitants of the city, including Diocletian, Ivan Meštrović and Sigmund Freud. These individuals represented the city spirits who will, by re-living on the walls, ‘tell’ people how they feel about city today and so encourage reflection on how the concerns of today mirror those of the past. Examples of the statements spoken by the statues include the following: ‘Pomagati drugima pomaze meni’ (‘Helping others helps me’); ‘Gledam ovu danasnu dicu, sve propada’ (‘I look at what all today’s children have wasted’); and ‘Daj mi kino’ (‘Give me a cinema’). By projecting sculptures with the messages of the current generation of citizens, the idea was to make people stop, look, read and re-think their values, priorities and their relationship with the city and its citizens.

5.2 The present: Preckam Most— Crossing the Bridge

Crossing the Bridge was a site-specific intervention in the city of Maribor, Slovenia, in 2009 that sought to create a momentary pause as people moved from place to place within the city. Participants were asked to take photographs on part of their journey, so the act of taking digital images became a mechanism for reflection: literally and metaphorically a lens through which to view the relationship between the self and the city. The work used digital images as a vehicle through which people could reflect on their identity and its relationship with place. While it is acknowledged that photographs capture a moment in time, they also appear to provide insight into people’s sense of place.

5.2.1 The embodied vision brief

The piece was created over an eight-day period in response to a brief entitled ‘Embodied Vision: Mind, Body and the Urban Landscape’. The brief raised a series of questions centred on the relationship between abstract thinking and the urban space. For example:
- What opportunities reside in the urban environment to engage, provoke and intrigue us and thereby stimulate our brains?
- How can spaces be re-appropriated to become different places?
- How might the urban environment be augmented to gather information and how might this be personalised?
- Can the body be a source of mental wellbeing?
- What role can interactive technologies play in creating and informing social spaces where intellectual and critical dialogue can take place?

5.2.2 The work

Interesting things happen at boundaries, points that connect people, places and ideas. Such points raise questions for interaction designers in terms of both process and outcome. Sometimes boundaries are explicit, but more often they are implicit and unseen, simply routes that connect places or destinations, often travelled but seldom acknowledged. The Old Drava Bridge in Maribor, Slovenia, is one such place, silently connecting the city, but central to the heart of the
Figure 1. digitalANTIQUE: digitised statues from the past, articulating the sentiments of the people of today. © Ivica Mitrovic.
people, and so it was entirely appropriate the bridge became the focus for a piece of work undertaken as part of the Magdalena Festival in May 2009.

An overarching theme of the work was the concept of transitions, the idea of movement and its impact on the body and mind, in particular how this might translate into movement within a city and subsequently sense of place. The Old Drava Bridge in Maribor has provided a crossing point for the people since 1913, so it provided an interesting location for a ‘cultural probe’ that sought to create a playful interaction among the people as they crossed the bridge; the aim being to slow their journey down a little, provide a moment for contemplation and reflection, or simply an opportunity to admire the view of the city.

At each end of the bridge people were provided with digital cameras and asked to take a photograph while they crossed the bridge, returning the camera at the other side. Suddenly crossing the bridge became a different experience, the act of taking photographs facilitated chance meetings, exchanged glances and made everyday routines a little more memorable and special (Figure 2). On a more political note, one participant photographed a metal ring attached to one of the lights on the bridge. They later commented that they wanted to document the local government’s failure to replace the hanging baskets of flowers of previous years due to financial cutbacks.

The camera encouraged people to view the familiar city and its population in a considered way. By making the process of taking a picture explicit, participants were made to question and reflect on their choice of image and what it meant to them as an individual and as a citizen of Maribor.

At the conclusion of the project The Old Bridge was appropriated as a gallery to exhibit the pictures taken during the previous two days. People who had taken photographs returned and walked the bridge to admire the work of the people of Maribor and perhaps hope to see their own contribution. For just a few days the experience of the journey was changed, so something that people do throughout the year—crossing the bridge—was just a little different, somehow more joyful. It was a chance for the people of Maribor to re-acquaint themselves and reflect upon a much-loved part of the city, and critically the piece gave them an opportunity to view the bridge and what it means through fresh eyes.

5.3 The future: The PerAda Exhibition

Design researchers such as Weisberg (1993), argue that creative production requires a critical view on
existing objects and ideas; the notion of ‘constructive discontent’ that often inspires innovation. This critical viewpoint provides motivation to produce a better design, to eliminate problems and do things more efficiently. This method is likely to be limited to improving what already exists, and is less likely to produce major shifts in how our environment, and the products within, is viewed. One purpose of design fiction is to encourage constructive discontent over a world that might exist, and so push design into a space past the incremental improvement of existing products.

In the domain of technical research there is a growing pressure on scientific researchers to move towards greater dialogue with the general public in order to explain and justify their work. This is a change from the more traditional view of scientific engagement with the public as a ‘top–down’ approach, where the scientist explains the principles behind their work to the public in a simple, educational manner, and the benefit to society of the resulting applications is assumed (Holliman et al. 2009; Delgado, Kjølberg, and Wickson 2010). As public unease over scientific and technical developments, and how they are funded, has grown, scientists are being increasingly encouraged to enter into dialogue with people outside of their own domains, both explaining what the impacts of their work could be and considering the reactions of others.

One method of addressing this feedback loop aspect of public engagement is to present scenarios of future technologies in use as public exhibitions. These scenarios can bring science to life, informing the public about particular new developments, but, perhaps more importantly, these concrete examples can encourage reflection and debate about possible impacts to individuals and society. Through the presentation of tangible future products and services, critical thought and constructive discontent can emerge in response to things and systems that do not yet exist.

An example of this approach was an exhibition titled ‘This Pervasive Day’, developed as part of an international science festival in Edinburgh in 2011. This exhibition formed part of the outreach work of a European Commission Future and Emerging Technologies project. The activities and physical displays that formed the exhibition, and the accompanying interactive documentary, were designed to be as engaging as possible in the way that they informed visitors about the subject matter - pervasive and adaptive technologies. Integrated into some of these exhibits were methods of eliciting and recording audience reactions to a variety of scenarios of pervasive technologies used in daily life from a human-centred perspective.

Sensor-rich devices are becoming smaller, cheaper and more powerful. Together with advances in intelligent software, these developments will soon enable products and environments to detect, and respond to, many aspects of individual and collective human behaviour. Activity, physical appearance and emotional states will be detected, recognised, stored and processed. Humans are becoming machine-readable. This opens up a wide range of potentially beneficial designed applications in areas of health, safety critical systems and entertainment. The other side of this pervasive future is less desirable; invisible surveillance, invasions of privacy, and major questions around who is in control of these highly responsive devices.

The exhibition, ‘This Pervasive Day’, was designed to raise awareness, not just of the technological developments behind this vision of the future, but it also hoped to encourage consideration of potential implications and how they might affect visitors personally in their own lives.

In particular, one of the applications used a webcam to capture images of faces in response to the detection of people passing by. Captured faces were immediately presented on the screen, attracting attention as the visitors recognised themselves. They were then presented with personal data randomly generated by the system. The fictions in this application lay in suggesting that simple face-detection was in fact face-recognition, and that the system could identify any individual who passed by and then retrieve quantities of stored data concerning that person. The intention of this work was, firstly, to alert visitors to
Figure 3. Fictitious personal data to prompt reflection on the ethical implications of the surreptitious capture of data. © Ingi Helgason.
this new capability of hidden systems to surreptitiously capture and present personal, biometric data in an instant in response to nothing more than a person moving through an environment. Secondly, the application encouraged visitors to reflect on how systems might be designed to make use of this functionality in the near future and for what purpose.

6 Conclusions

Envisioning design futures that are grounded in design reality is a notoriously difficult task. Ethnography can highlight enduring meanings, but its focus on the present is a limitation. This article has explored design fiction as a means of provocation for creating a dialogue concerning the nature of interaction in public spaces of the near future. Three distinct case studies have been reported that created imaginative projections based on what we currently know. This knowledge comes from our experience of the past, our embodiment in the present and our imagined narratives of the future.

The experience of using design fictions in this way has revealed that it is easier to fabricate fictions based on the past and on the future than on the present. In the case of the present, the installation acted as a disruption and caused participants to reflect and respond to smaller changes in their everyday life. The design fictions based on the past and future possibilities resulted in more forward-looking scenarios. Interestingly, the fiction created from the past adopted a more utopian standpoint, while the future-based fiction was more dystopian in outlook. Perhaps this reflects a propensity in the human condition to view the past in an idealised way, while the future will always remain a source of uncertainty and anxiety.

The case studies also raised some pragmatic issues concerning the utility of design fictions. Undoubtedly the experience of creating the fictions offered insight into possible interactions in public spaces of the near future, and successfully engaged the public in reflection and dialogue. The work did raise the question of how best to record and capture such dialogues in ways that do not weaken the potency of the design fiction. While design fictions have the potential to be more forward-looking than ethnography, they also placed the burden of interpretation on the designer. While this should not be surprising, it is after all the role of the designer to point ahead to the future. The possible bottleneck of interpretation could limit the potential of design fictions to offer new insights that will mature into design facts. Only once this has been overcome will the promise of design fictions inform the emergent objects and environments that will characterise the near- and more distant future.

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Notes

1 Diocletian was born in the Roman province of Dalmatia and rose to become the 51st Emperor of the Roman Empire. In 305 he retired and returned to his homeland, where he built a palace that now forms the core of the city of Split.

2 Ivan Meštrović was a Croatian sculptor and architect, born close to Split, who was famed for his depiction of religious subject matter. One of his sculptures was of Gregory of Nin that stands in the city of Split. After 1945 he worked in both Europe and latterly in the USA until his death in 1962. He was the first living person to have a one-man show at the Metropolitan Museum of Art in New York.

3 In 1898 Sigmund Freud lived in Split for a short time, and during that period he is said to have developed his ideas on ‘eros and thanatos’. Freud postulated that these are the life and death drives that both coincide and conflict within the individual and among individuals.
References


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