Tangible Business Model Sketches to Support Participatory Innovation

Robb Mitchell and Jacob Buur

SPIRE, Mads Clausen Institute
University of Southern Denmark
Alsion 2, 6400 Sønderborg, Denmark
robbathon@gmail.com and buur@mci.sdu.dk

ABSTRACT

This paper introduces the notion of "tangible business model sketches" – interactive sculpture-like mechanisms – to stimulate discussions concerning how businesses create and capture value. We outline the need for opening up discussions around innovation that these models address and their proposed utility for designers. We present three examples that model aspects of lighting design, audiology and internet businesses. Responses from industrial partners suggest that unforeseen interactions and unpredictable feedback are important qualities for tangible business models to achieve the aim of expanding business discussions among non-specialists like designers.

Keywords

Participation, business models, tangible sketching

INTRODUCTION

Business models impact a great deal upon the work and life of designers but in general, designers and many other professions are excluded from participating in discussing them because of the language and logics necessary to understand business aspects. This paper is intended to open up new avenues for interaction designers to apply their skills whilst also offering a means for designers to have a greater say in the implementation of their designs. In addition to bringing a fuller understanding of the "innovation landscape", developing artefacts to support decision-making in innovation will increase the influence of designers in such discussions.

A major factor in the bursting of the dotcom bubble was identified as being ill thought through business models [9]. Given that the IT field is a major employer of interaction designers makes it especially pertinent for such practitioners to increase their ability to discuss business models.

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Why do business models need to change?

Business models attempt to capture in a formal and concise way what is often informal knowledge of how a company generates value. They typically describe not only the internal architecture of a business but also their key relationships with customer segments and their network of partners [5]. These descriptions have become increasingly short lived. Rapid technological development, and increase in competition brought about by globalisation is a strong motivation for a business to continually question and innovate its business model [10].

Drawing voices into discussion from a company's internal and external networks appears as one promising route to develop and test new business models. It is considered that more successful innovation occurs when more differing viewpoints and perspectives collide [11]. However the comprehension, let alone modification of business models has thus far been largely the province of higher management and business experts. This is an obstacle to the interdisciplinary exchange that has been identified as important for the generation, development, and realisation of ideas [4] – and which led us to coin the concept of Participatory Innovation.

Making values tangible to understand value creation

In an attempt to address this challenge, our ongoing research is to explore how to facilitate the meaningful participation of people without specialist business training in discussions concerning not just the offering, but also the business viability of a proposed innovation. One strand of this work is to enliven the theory and practice of business modelling by bringing it off the spreadsheet and into three-dimensional space. This "tangible business modeling" includes the development of novel dynamic physical artefacts to represent components of a business and important relationships with other entities. Such interactive physical representations of the processes by which a company creates and captures value are intended to provoke discussions between people with different professions, backgrounds and interests. We suggest that "tangible business model sketches" may thus act as *boundary objects* [12] across professional and organisational boundaries in increasing shared

understandings of current business practice and fostering discussions on innnovation potential. We think of our boundary objects as "sketches" in the dual meanings of Buxton [1]: We intend our artefacts to share the properties of *preliminary drawings* i.e. they are evocative, suggestive, explorative, questioning, tentative and not commercial products in themselves. At the same time the interactive and on occasion lighthearted nature of our tangible business models also corresponds with the sense of sketch as a *short, informal scene* in a play.

Business models in participatory design

This research was commenced within the Scandinavian participatory design tradition of deploying physical objects to successfully provoke responses from workers, managers and others in design processes. The value of such props or "things to think with" [2] are determined not by their realism or fidelity but by the dialogue the objects help to facilitate and by the inspirations that they spark. Tangible business modelling can be seen as an attempt to apply such expertise from participatory design to address more abstract challeges. In particular this inquiry builds upon recent work using material objects to construct maps of business networks in innovation workshops [7].

This inquiry may be seen as part of a wider trend whereby design is turning attention to issues beyond the development of products or as the CEO of the world's largest design consultancy argued: "*the active engagement of everyone...the design of participatory systems...is going to be the major theme not only for design but our economy*" [3]. Our investigation can be considered as a vivid example of the ability of design to translate values into tangible experience. However the aspiration goes beyond this, as it seeks to use these tangible experiences to further understand and provoke new ideas concerning how value is and can be created.

THREE TANGIBLE BUSINESS MODEL SKETCHES

We present three models that were developed in response to interviews with management and other employees at three different technology companies: a hearing aid producer, a specialist lighting fixtures manufacturer and a major internet portal provider. The models were developed by graduate students of the IT Product Design programme at the University of Southern Denmark.

Customer and Advertiser Alignment Wheels

This tangible business model sketch is a set of four large rubber castors and their independent steel mountings. The mountings are positioned, but not attached to a table surface, so that the wheels face up and can spin freely. The wheels are decorated with various shades and shapes of plasticine, Figure 1. The spinning wheels were intended to resemble the display in an arcade coin slot machine. Different wheels represent on one hand the hobbies and interests of different users of a popular online photo sharing service, and on the other hand the interests of the advertisers on the service. If the colours or shapes of plasticine forms match up after the wheels are spun, the business is succesful as it lines up user and advertiser interests.

This, our first tangible business model was developed in thirty minutes on the basis of a student's own prior experience with the online service. It was made in preparation for a discussion concerning how an internet media company makes business with the vice president, customer insights of the photo sharing service's parent corporation. After a period of slight skepticism, the guest himself started spinning the wheels to explain the way his company operated on the market, and in the end he complimented the team with this simple, yet powerful way of visualizing a business model.

Fig 1. A tangible sketch to illustrate the photo sharing service's revenue generation mechanism

Besides the feeling that this was a first success, what did we learn from this experience?

(1) It must be possible to establish a good alignment between real business variables and the physical entities of the model. In the discussion this alignment itself became a topic (what could this wheel represent?) that fueled exploration, so all things may not need to be decided upon at the outset.

(2) The model must be dynamic; things should move and change to allow for experimentation (some static attempts in the same session did not provide the same engagement in the discussion).

Hearing Aid Pinball Machine

From a distance, this model might resemble a homemade version of a pinball machine. Two receptacles at the base of an inclined surface are labeled with the name of a hearing aid supplier and its competitors, Figure 2. From the opposite end several dozen marbles – the hearing impaired customers – will roll and bounce off various obstacles towards either receptacle when a release gate is lifted. The obstacles represent the various entities and opportunities such as clinics, product features and services, which mediate the indirect relationships between the hearing aid companies and potential individual users of audiological devices. The 'flippers', for instance represent audiology

clinics which depending on their history or ownership may have a preference for leading customers to specific manufacturers. Manipulation of these obstacles could cause different numbers of marbles to end up in the receptacle of one company or the other.

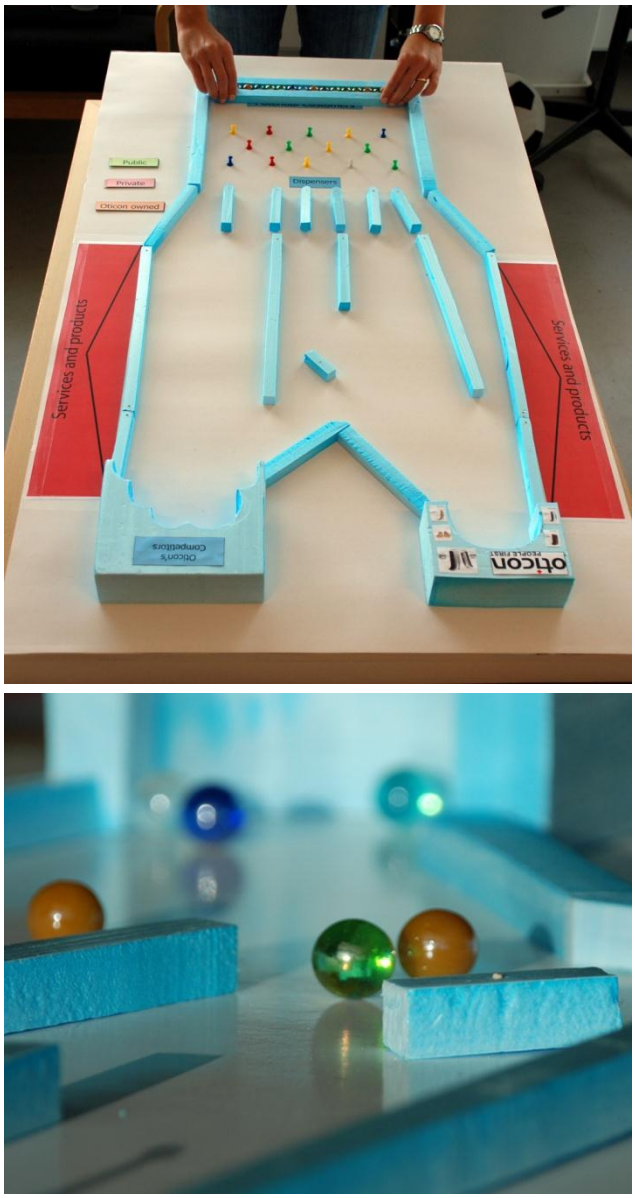

Figure 2. Comparing a hearing aid manufacturer's customer relationships with that of its competitors

The Hearing Aid Pinball Machine was produced as the outcome of a 2-week intense team project that included presentations from business experts, a visit to the company and interviews with marketing and development employees. The actual building of the model itself took no more than a day. At the presentation this model attracted much attention with the guests (faculty, research colleagues) and invited participants to experiment and run the marbles again and again. Later it stirred a similar interest with a group of design managers, including one from the hearing aid manufacturer, and it has been tested in several situations since with various industry professionals. What we took away from this experience was that:

(3) Tangible business models should allow a variety of interactions that will alter the outcome.

(4) The fact that the model allows for unexpected and unforeseen ways of functioning should be seen as a strength, as it fuels engagement and discussion. In a sense one needs to design for the unexpected.

Sales Effort Balance

The third model was developed to illustrate some of the business dilemmas experienced by a lighting technology company. It took the form of a suspended mobile comprising a 2m long dowling pole, and two shorter poles suspended at either length of the main pole, Figures 3.

The Sales Effort Balance has the appearance of a set of balancing scales with another set of smaller balancing scales at each end of the pivot. All three poles feature a measurement scale along their length and the point at which they hang is adjustable. The large uppermost pole is labeled to indicate *sales effort* at one end and *development effort* at the other. The two lower poles are labeled with respective subdivisions of these two kinds of effort. Screwed into the ends of the two secondary poles are four small hooks. A number of filled cloth bags of different weights and colours are labeled to indicate in further detail the kinds of effort (i.e. resources) that may be expended within the categories and subcategories delineated by the poles. The sketch thus proposes to show how the company putting different emphasis (or weight) upon different areas of development may need to be balanced by amounts of effort in sales and marketing.

The model was developed as one result of a 3-week intensive team project. The project started off with a visit to the 50-employee lighting company, presentations of the new technology innovation the company was planning to launch, and a discussion of the business challenges involved. For the remainder of the project the team was in regular contact with the sales manager of the company. At the project presentation the CEO and three managers were so enthusiastic about the demonstration of this model that we were invited to come and present it at a meeting with the board of directors two weeks later. At the board meeting we challenged the directors to try out the model and make sense of it by themselves. This started a discussion of whether the balance between sales and R&D effort was adequate at present, and whether such a balance should indeed exist at any point in time, or it should be an average balance over, say, a year. The sales manager, not usually part of the board meeting, was exceedingly happy that his challenge of putting sufficient resources into launching the new product was now being recognized by the directors. Shortly after, the company announced an additional sales employee position.

Figure 3. Experimenting with the balance between sales effort and research & development resources.

The most important learning from this experience was:

(5) The model should offer a tricky challenge to overcome in collaboration between participants (i.e. finding the balance, or in the previous model, guiding most customer marbles in the right direction).

DISCUSSION

Looking across the three models, unpredictability of both the participants and the tangible sketches' behaviour seems to be a key factor in engaging participants and provoking discussions.

Unpredictable Inputs

If the designers of a tangible sketch can foresee every possible way that their creation maybe interacted with, then this may diminish the usefulness of the sketch in provoking ideas for innovation. For example the *Sales Effort Balance* provoked several unexpected interactions upon its brief testings such as participants inserting additional objects that were to hand, such as items from their pocket, to make additional weights. Those interacting with the *Hearing Aid Pinball Machine* also deployed materials at hand to create additional and interlinked obstacles to the marbles' descent and also dramatically varied the tilt of the artefact's surface in order to simulate the conditions of "fast and slow markets". Such improvisation suggests a greater engagement on the part of participants and is more likely to result in new ideas. So we recommend that tangible business model sketches should be open to a wide range of interactions, both expected and unexpected. In other words, the models should in a sense be "hackable" [8]. The more that the users reconfigure the model, it seems the greater their sense of "ownership" in the sketch and hence engagement in discussions.

Unpredictable Feedback

The *Alignment Wheels* could be moved into different positions and spun at different speeds, but the independence of the different components meant that users could predict in advance the response from the system. Much more engaging were the two other sketches. Marbles bouncing off each other on the audiology model meant that the route and destination of the marbles could very rarely be exactly predicted. Similarly, all of the elements of the *Sales Effort Balance* affected the behaviour of the sketch as a whole.

CONCLUSIONS

The three tangible business models presented here have been tested on separate occasions. Senior employees and managers who encountered the sketches of their respective companies and many independent business consultants and researchers all gave overwhelmingly positive feedback. To engage professionals in talk about business in this way and to secure their commitment to further experimentation can be considered an achievement in itself. Both we as designers and our graduate design students felt greatly empowered in discussing business models with senior industrialists during their encounters with our tangible models. We propose that the benefits of tangible business modelling can be viewed as a form of visualisation and so may have many benefits similar to those identified by Haudan [6]. Namely, that the tangible sketches may: Facilitate thinking in systems, create simplicity, express the vivacity of the business, make it easier to think big, provoke new connections and associations, support story telling, work across language barriers, and provide easy to recollect experiences. In addition the interactive and collaborative nature of tangible business models show potential as catalysts to co-construct new possibilities for innovation.

FURTHER WORK

We have as yet done little to investigate if junior employees and other stakeholders who are less versed in business modeling practice and/or interaction design, can have their participation in discussions around innovation facilitated through the tangible business modeling approach. We will

be exploring this through the development of new models for different clients.

The examples we present can be said to each represent partial business models. For instance, the *Sales Effort Balance* represents a way of looking at a company's internal resource allocation, The *Hearing Aid Pinball Machine* models an aspect of external customer relationship, and the *Alignment Wheels* illustrates a company's income stream. Integrating all of these aspects and other components of a business model into a single unified sculpture is a challenge we are only now starting to address. Additionally we will be investigating if introducing elements of electronic interactivity can augment the provocation that the tangible sketches provide. We also hope to report soon on some co-design workshops in which we facilitated industrialists to create their own tangible business model sketches.

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REFERENCES

1. Buxton, B. *Sketching User Experiences: Getting the Design Right and the Right Design*, Burlington, MA, Morgan Kaufman, 2007.
2. Brandt, E. and Grunnet, C. Evoking the future: Drama and props in user centered design. *Proceedings of Participatory Design Conference* (2000) 11–20.
3. Brown, T. Tim Brown urges designers to think big *TED Conference*, Oxford, England July 2009. Available via http://www.ted.com/talks (last accessed 21st January 2010)
4. Buur J. and Matthews B. Participatory Innovation. *International Journal of Innovation Management*, 12(3), (2008) 255-273.
5. Dubosson-Torbay, M., Osterwalder, A., and Pigneur, Y. E-business model design, classification, and measurements, *Thunderbird International Business Review* 44 (2002), 5–23.
6. Haudan, J.: *The Art of Engagement*, New York, NY McGraw-Hill Professional, 2008.
7. Heinemann, T, Mitchell, R. and Buur, J. "Co-constructing meaning with materials in innovation workshops", *Objets et Communication*, MEI 30-31 (2009) 289-304.
8. Galloway, A., Brucker-Cohen, J., Gaye, L., Goodman, E. and Hill, D. Design for hackability. *Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques* (2004) 363–366..
9. Magretta, J. Why business models matter, *Harvard Business Review*, vol. 80, (2002), 86–93.
10. Osterwalder, A. *The Business Model Ontology - a proposition in a design science approach*, Academic Dissertation, Universite de Lausanne, Ecole des Hautes Etudes Commerciales, 2004.
11. Osterwalder, A. and Pigneur, Y. *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, Amsterdam: Modderman Drukwerk, 2009.
12. Star, S.L. The structure of ill-structured solutions: boundary objects and heterogeneous distributed problem solving. *Distributed artificial intelligence*: vol. 2. (1990) p. 54.