

Exploring Design 2.0

Brief Encounters

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Abstract: The aim of the Brief Encounters Research Network was to explore the potential for new and emerging technologies to enable interdisciplinary collaborative design practices at distance. This research network was developed in response to current trends in industry, where design is becoming an increasingly international activity undertaken with partners in geographically distributed locations. As a result design development team members are working 'at distance' in virtual cross-cultural, cross-disciplinary and cross-institutional teams, interacting through the use of ICTs, such as Web 2.0. To achieve network's objectives a multidisciplinary consortium of research collaborators was established including national and international representatives with diverse disciplinary and organizational backgrounds which actively contributed to the network workshop activities.

Key words: *collaborative design, distributed design, research network, interdisciplinary design*

1. Introduction

A recent report by the Council for Industry and Higher Education suggested that globalisation is impacting on all workers engaged in knowledge production [1], including designers. These changes mean cultivating additional skills in addition to those required in a traditional work environment [2]. These current trends of organisations increasingly undertaking new product development activities by distributed design team members inspired an idea to conduct a series of workshops with the aim to explore what it means for designers to work in this type of work environments and what roles and skills they might need to operate in a virtual networked world. A large body of research has signalled the shift from a linear and hierarchical model of product development, where everything happened in proximity, to a model of decentralized and dislocated product development, characterized by partnerships of geographically distributed organisations [3-5] and the dispersal of the design process. The new global division of labour means that product development teams are now scattered across the world as they contribute to the different components of the same commodity. Proliferation of Information and Communication Technologies (ICTs) is enabling product development team members to work virtually 'together', while distributed around the globe [6, 7]. O'Sullivan [8] argues that organising virtually has the potential to greatly reduce costs, particularly in relation to personnel disruption and travel. He also argues that it makes available 'a world-wide pool of potential partners, thereby giving access to a wider range of competencies than otherwise and perhaps more flexibility in the terms under which development risks are shared'... [8, p.94]

The purpose of this paper is to reflect on workshops undertaken to elaborate on issues in distributed cross-institutional and cross-disciplinary design. In order to do this, the paper presents an overview of issues associated

with undertaking design by distributed product development teams. First, we briefly outline the context of why design is undertaken by distributed product development teams. Then, we describe some of the issues associated with distributed teams that have been identified and discussed in a series of workshops sponsored by AHRC and IED. Afterwards, we discuss some of the challenges faced by designers when undertaking product development within distributed product development teams. We suggest that many of the challenges are associated with ‘distances’ on dimensions of time, technology, geography, culture, and discipline.

2. Working in distributed design environments

The increasing globalisation of production, distribution and consumption of goods and services is both the condition for, and the consequence of, major changes in the ways consumer products are developed and manufactured [9-12]. These changes include an emphasis on increasing flexibility of production, reducing product development time and enhancing quality [e.g. 6, 13, 14, 15].

It has been suggested that: ‘Through advances in ICT and efficiencies in production and logistics, global supply chains are becoming more disaggregated and open to greater competition. A country which understands and specialises on specific parts of the supply chain can grow in competitiveness and gain access to new markets.’ [16, p. 46] Indeed, it is claimed that ‘recent developments in ICT, such as Web 2.0, computer aided design and rapid prototyping are impacting on the design processes and in turn are changing the skills requirements of designers’. [17, p. 19]

Engardio and Einhorn [18] provide examples of consumer electronics companies such as HP, Nokia, Nikon, Canon, Sony and Apple who engage other companies to undertake the majority of their product development. Thus, product development in these companies is often cross-organisational. For example, the Apple iPod is manufactured by subcontractors who source components from around the world, and in turn are designed by other companies such as PortalPlayer [19, 20]. Thus, the trend of moving production offshore, the increased cost and complexity of new product development, and advancements in information and communication technologies (ICTs) and manufacturing technologies, are contributing to the design and development of products to be undertaken with partners in geographically distributed settings [21-24]. These types of arrangements are known as ‘virtual organisations’. O’Sullivan [8, p. 94] describes a virtual organisation as having: ...’diverse project membership conducting much of its work across time and space boundaries and mostly through horizontal communication enabled by distributed technologies’.

Recent report by European Commission [17, p. 6] states that ‘companies must adapt to globalisation, increasing competition and diverse consumer demand. Innovation is a key driver of competitiveness and economic growth, and part of the solution to environmental and social challenges.’ [17, p. 7] The report asserts that ‘design is an important part of the innovation process. Research shows that design-driven companies are more innovative than others.’ [17, p. 14]. For example, ‘in view of growing competitive pressures on global markets, the [European] Commission has developed a research strategy for the design and development of consumer-centred and personalised products in manufacturing. It aims at the development of tools that enable the design of products everywhere — with the customer as co-designer — and the manufacture of these products anywhere in the world.’ [17, p. 52]

As a result product design and development team members are working in cross-cultural, cross-disciplinary and cross-institutional teams, whose interactions are mediated by ICTs [e.g. 23, 25, 26], such as Web 2.0 technologies [16].

Despite significant technological advances distance still matters in collaboration, particularly in corporate contexts [27]. Previous projects undertaken between School of Design at Northumbria University with external commercial collaborators confirm that at distance collaboration remains difficult because of complex issues, such as protecting intellectual property, organisational IT policies and cultural differences [28]. Although, the UK design sector is clearly creative, it has been suggested that the ‘workforce lacks diversity and is therefore ill-equipped to work in increasingly multi-cultural and global markets’ [2, p. 10]. This is supported by research, which suggests that it is often a complex challenge to successfully negotiate cross-cultural and cross-organisational exchanges [29, 30].

At this time, literature and discussions on how ICT is impacting on the new product development activities is not unified. For example, on the one hand, it highlights the potential of distributed mode of product development in the sense of higher levels of creativity and innovation [31, p. 1476]. On the other hand, it also points to some of the challenges associated with the geographic distribution of workgroups, i.e. intersection of organisational, cultural and disciplinary boundaries in virtual product development teams [32].

Additionally, the Design Skills Advisory Panel [2] in the UK suggested that: ...‘working globally and in partnership (both remotely and face to face) with overseas designers and suppliers will require language and communication skills that go way beyond current needs, while designing in, and for, different cultures and contexts will stretch designers’ abilities and methodologies to the limits.’ It is therefore of paramount importance to understand all of the discussed intersections in collaborating in global design environments, as it is claimed that social and cultural aspects of individual design team members play a significant part during the design process [33]. Some of these issues have been discussed and addressed in the three workshops, prepared and executed by the Brief Encounters Research Network.

3. Three Workshops



Supported by AHRC and IED grant, investigators from City University London, Northumbria University and Lancaster University brought together academics and practitioners within the design field from all over the world in order to discuss the challenges emerging technologies bring to design education, theory and practice.



Three structured workshops were held at three separate locations to discuss these challenges and find possible ways forward in (re)designing design practice through new technologies.

3.1 Workshop 1 – London

The first workshop was held at City University in London in April 2012. One of its aims was to start exploring opportunities to improve interdisciplinary design processes over distance by use of existing technologies.



Twenty-one academics, commercial researchers and designers were present from companies as diverse as Autodesk, Square One, ICDancing, Philips, Motorola, Mayborn Baby and Child, and Kohler, five of which participated remotely. The workshop was structured into two sessions. After an overview of the workshop programme from the organizers and brief introductions from all participants, the first session aimed to capture details of creative conversations that the participants had been part of within the last four to six weeks.



Figure 1. Introduction cards on the left and working with a participant at distance on the right

In order to improve workshop participants engagement, the team from University of Lancaster incorporated entertaining elements through a series of creative conversation prompts that would generate interesting stories. These prompts were developed into a comic strip theme that would encourage the participants to describe their creative conversations by drawing or writing in blank comic strip cells, see Figure 2 below. The completed

comic strips would feed into discussions in the second phase of the workshop around the four themes: the effect of supporting artefacts, different media, participant’s background and the overall success of the conversations.

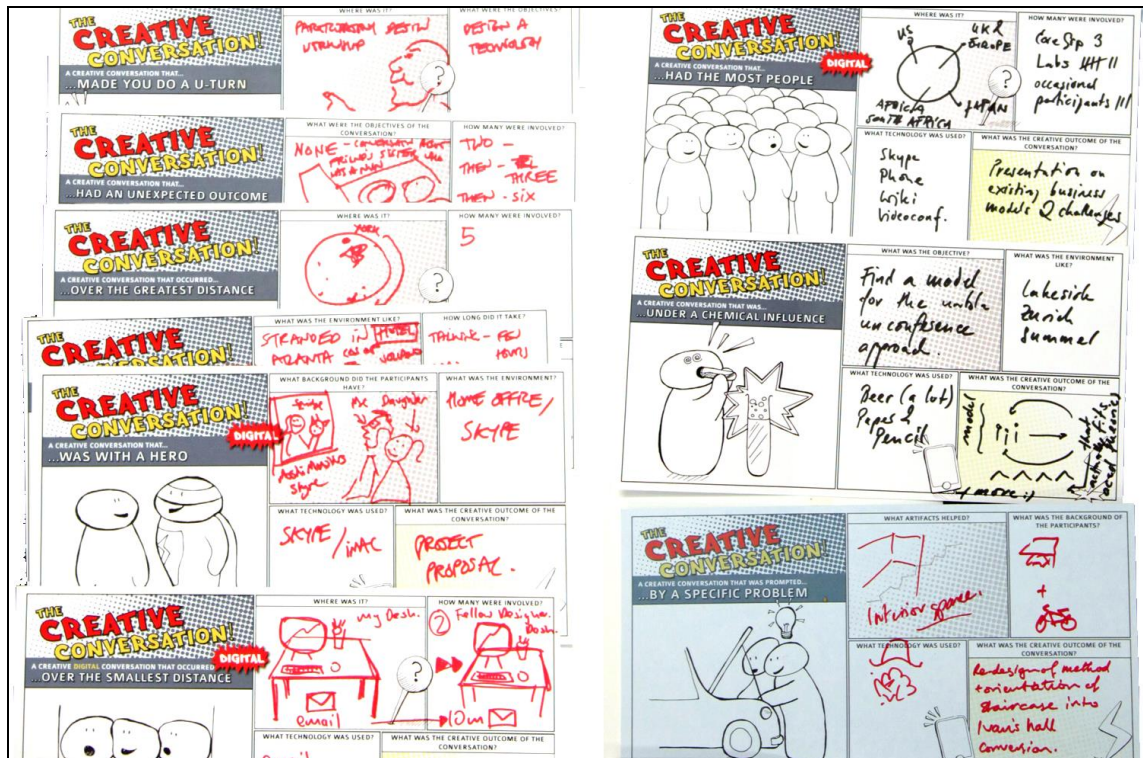


Figure 2. Example of comic strips generated by the workshop participants

Building on the ‘creative conversations’ the second session involved teams of participants identifying challenges that working in distributed environments brings and how these can be tackled by the use of technologies at hand (see Figure 3). The introduction to the second session was provided by presentations from academic and industrial participants. Short talks focused on the use of communication technologies in both professional and educational environments and aimed at boosting discussions among the workshop participants on these topics.

The final result of the second session was a set of roadmaps, identifying how and when technologies need to be adapted to aid the design processes. Each group of participants briefly presented their ideas. Furthermore, areas to be explored in the Workshop 3 were informed by the groups.

Ian Thompson, a senior designer at Kohler, said that:



...our design practice and global working methods are evolving and the problems we face to stay at the peak of productivity and innovation change constantly. Sessions like these bring real world context to academic research and combined will develop deeper understanding of the current and future landscape and provide a roadmap to the future of technologically assisted design practice.

Ian’s interview is available from this link <https://vimeo.com/49751462>



Figure 3. Mapping activities involved co-located and distributed workshop members more photos from this workshop are available on from this link <http://sdrv.ms/QLHrUd>

Dr. Andy Polaine Lucerne University of Applied Sciences and Arts said that:



Andy's interview is available from this link <https://vimeo.com/48744819>

It was interesting for me to take part via Skype and the other technologies involved. "Eating our own dog food" in that way highlights just what the reality is of involved too many technologies in one go. Facetime inexplicably didn't work on the iPad in the location, Skype was okay, but displayed all the usual delays and drop-outs of Skype, and suddenly there are three or four ways of sending files to people. The spectrum of too much technology makes for a stressful scenario. Often it's better to simply have a couple of channels and, more important, to adhere to some agreed conventions (files go on Dropbox, Skype is for chatting live with some kind of text chat back-channel).

Actually the social/work conventions were more important than what technology we used, because they are transferable across technologies. The other thing that was interesting to me was how we are still socially not very competent at including "virtual" or remote parties in group conversations. Often the laptop camera was facing away from the table, so I could hear, but I could not see what was going on. We need to develop the social skills to have someone taking the remote person by the hand, as it were, and being their shepherd to include them actively in the face to face processes. It's all new territory.

3.2 Workshop 2 – Cavtat

To gain additional information on how designers perceive working in distributed teams and the challenges they face with the new technologies as part of their work environment, the Brief Encounters team held a half day workshop at the *12th International Design Conference Design 2012* in Cavtat, Croatia.



Figure 4. AHRC Brief Encounters workshop conducted at *12th International Design Conference Design 2012* more photos from this workshop are available from this link <http://sdrv.ms/Tmm0lj>

Twenty-two participants from academia and industry attended the workshop held in May at this international design conference. Similar to the first Brief Encounters workshop in London, the participants were asked to outline one of the creative conversations they had in the past months. The major questions this time were, how the use of technology helped/challenged them and was there something they could do through the use of technology that they otherwise would not be able to do. The participants of this workshop identified similar challenges as the participants of the workshop held in London. The main four identified challenges were: *Cultures to support distributed collaboration; Intimacies; Trust; Use of artefacts* and *Visualisation in distributed design teams*. In the second part of the workshop participant worked on proposals to solving these challenges.

3.3 Workshop 3 – Lancaster

The results of the first two workshops served as a starting point to the third workshop held in the creative facilitation space of [ImaginationLancaster](#), Lancaster University in early June 2012.

The main objective of the workshop was to determine common research topics that the participants want to pursue within the field of (re)designing design practice through emerging technologies.

In the first part the participants from industry led the discussion on challenges identified in earlier workshops.



Figure 5. Gavin Proctor, Design director Lifestyle Philips Design, participating from a ‘distance’ more photos from the workshop are available on this link <http://sdrv.ms/YjKzn8>

The second part of the workshop was structured into three sessions to foster creative discussions. The first session was structured group work where each work group was given a task to explore a specific question. The participants were allocated into 5 groups and each group included members participating from other geographic locations such as China, Denmark, Japan and Netherlands. Each team was asked to explore issues related to one of the 5 predetermined questions/challenges (identified in the first two workshops, see Figure 6). The participants were asked to map out methods and techniques to manage and overcome these questions:

- How can we use digital tools to support design creativity?
- How can digital technologies support Open and Agile design process?
- What digital tools can we create to transform initial creative process?
- How will design practice be transformed through digital technologies such as 3D printers?
- What new skills are needed to support distributed design collaborations?

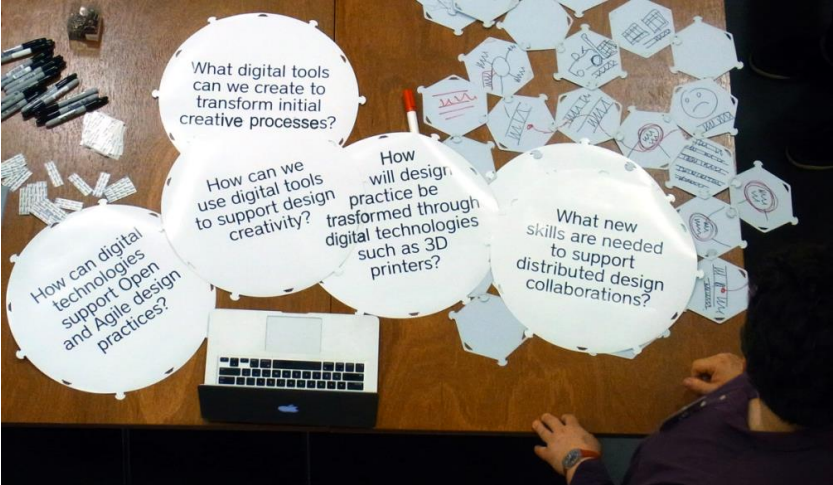


Figure 6. Five key areas explored during the 3rd workshop



Figure 7. Exploration of questions

During the second session the participants were asked to outline their interest in regard to future research proposals. Each of the participants individually outlined their research interest, skills and competences and presented one of the challenges he/she was interested in pursuing in the future.



Figure 8. Workshop participants presenting their research interests

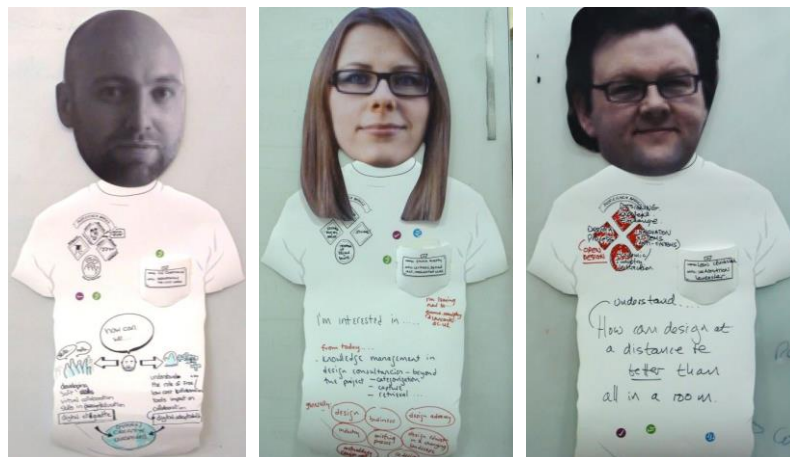


Figure 9. Examples of issues identified by the workshop participants

The last session was discussion between participants to outline possible research funding proposals. This led to the formation of small groups that individually discussed their research interests after the workshop closure.

Commences from the workshop participants

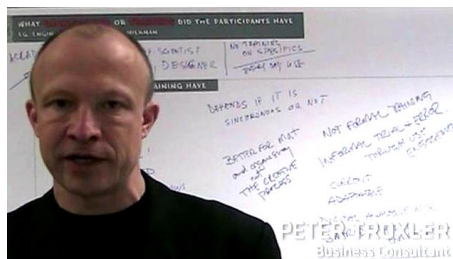
Professor Simon Vaitkevicius, IED representative, commented that:



Simon's interview can be accessed at this link <https://vimeo.com/49168897>

The event was interesting and innovative in its approach to the use of collaboration tools. The virtual participants interacted very well throughout the day and it felt like they were there in person. There was also a definite positive feeling with those participating and the feeling that something will come from these events. It was an excellent event to network and foster new ideas. Certainly a good breeding ground for innovative new ideas in collaboration with Industry and Academia.

Dr Peter Troxler an independent researcher and consultant, in the area of open source and digital manufacturing, said that:



Peter's interview can be access via this link <https://vimeo.com/48582259>

Virtual collaboration across distances, languages and time zones has become somewhat like second nature to me as an independent consultant and researcher. University has never really prepared me for that, and even if today's students are all supposed to be "digital natives" I'm often stupefied how little virtuosity they show in using the various technologies appropriately in different situational setting.

The two workshops I attended were clearly addressing this specific question – how to employ the technical means in a way that supports collaboration in the particular situation and addresses the specific challenges of the distributed, mediated communication setting.

Most of us already work remotely in some way or other, cobbling together the sets of tools and applications that suit us, that we have to hand or simply those thrust upon us by I.T. departments. It's hard to imagine a work environment without e-mail, Skype and some kind of central server or shared space like Dropbox. Some applications and services, like Dropbox, are more flexible and lend themselves to a variety of workflows. Some, like most of the intranet systems I've ever been made to use, are constraining and force people to conform to a certain way of working. Here is, I think, the challenge.

There is no shortage of tools and technologies out there – the real task is understanding the human, often emotional aspect, of what people are trying to achieve together. As soon as you start thinking in terms of abstracts, such as 'projects' and 'teams' or, worse, in terms of technologies the focus spins very quickly away from people's needs. A basic platform that is easily understandable is always more useful than a full-featured technology that has a steep learning curve. Too much research has gone into developing technologies – we're left with engineers with handfuls of technology looking for uses. What we really need to do is to understand more deeply how people collaborate in a much more human-centred way, based around all the messiness of human activity and relationships, not an idealised view of project plans and team structures.

Itamar a designer at Autodesk identified that:



Itamar's interview is available from this link <https://vimeo.com/48741789>

One of challenges that we are facing more and more at Autodesk is that design teams are collaborating across geographies. So, how do you design object interfaces when teams are distributed as the interfaces of these product are very important in getting the user experience right?

One of the issues that we have identified during the workshop was how do we build an awareness of what each design team member is doing at any particular time across the distributed design team. This is a very small, but very difficult aspect of synchronising teams located in different locations. Another issue is the lack of tools supporting the early design development stages.

4. Conclusion

The aim of the Brief Encounters Network was to identify key research themes in the area of digital transformations in Design and to start discussion on possible joint research proposals among the participants. Digital technologies are transforming how and with whom designers are able to work. This in turn is stretching current design methodologies while at the same time creating new possibilities for designers. Through the workshops the participants found that companies ranging from *Philips Research* to the small but excellent *Radarstation* are all looking for creative ways of practising design across different locations. For example, *AutoCAD* is a company which is developing digital design tools but is also exploring how to support designers in the early stages of the design process.

The five key questions were identified by the participants and are suggested to be a guide to explore research areas in respect to digital transformations in Design:

- How can we use digital tools to support design creativity?
- How can digital technologies support Open and Agile design process?
- What digital tools can we create to transform initial creative process?
- How will design practice be transformed through digital technologies such as 3D printers?
- What new skills are needed to support distributed design collaborations?

In addition to the above questions the workshops participants have found out that designers will need to develop the capacity to work in cross-cultural teams and abilities to deal with challenges related to working at ‘cross-distance’. Participants felt that designers will also need to develop an understanding of users’ cultures. Co-development and co-production with developing countries was identified as another opportunity which should be further explored. It was suggested that development of physical ‘apps’ can help to facilitate remote collaborations/communications. How can ‘designing at distance’ be made ‘better’ than ‘design in a room’ was identified as a further challenge.

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