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STORYTELLING STIMULATES SCIENCE

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ABSTRACT
Multi-disciplinary working is claimed as an essential ingredient for innovation. However, the barriers to multi-disciplinary cooperation that lead to meaningful contributions for an organisation are significant.
The authors describe how a series of collaborations between an industrial R&D science community ("the scientists") and Northumbria University's School of Design has helped to develop a new approach to research and teaching based on the communication device of storytelling. We find that this approach can create a common platform in to which different disciplines can embed their specialist knowledge to the benefit of multi-disciplinary working. This paper builds on previous work of Smith and Sams 2007; 'Friendly' [1].
This paper also describes observations on how the level of engagement of the scientists with the design-led projects has developed, charting a shift from sceptical suspicion to engaged enthusiasm.
This paper focuses upon recent projects that have involved both undergraduate Design for Industry (DFI) and postgraduate Multidisciplinary Design Innovation (MDI) groups, disclosing the academic structures and investigative methods that allowed design, business and engineering students to collaborate with the scientists and help inform their strategy team, e.g. how new patented science could be better communicated.

Keywords: Narrative, multidisciplinary, storytelling, science and design

1 INTRODUCTION

"There is no design in silence. All designers, like all designed objects, "tell stories," sometimes deliberately, many other times without much degree of consciousness". [2]
Any product by its physical nature could be argued to tell its own story and to some extent this simple statement positions and historically reflects the thinking and approach that product designers adopted in the traditional service offer they made to their clients.
Typically, the specialist designer lays out their skills and portfolio of practice and invites the client to work with them through the clients' wants and needs. Working in this way the design process appears in stages of linear and hierarchical layers, which develop through the design proposition and specification, ending up with a synthesis of unintentional preconceived ideas which may fulfil the declared needs of the commissioning firm or organisation, but may be running tangential to the needs and aspirations of the end user. In design education Gaver, Dunne and Pacenti, express this opinion of the design studio
"We think that the Design Studio already criticized for being vertical, authoritarian, and based on the experience of teachers, rather than the experiences of students, must be challenged by new forms of teaching". [3]
Design management processes such as the 'stage and gate' approach are tuned to assist non-designer decision-makers (typically those with Business training) in making choices based upon previously agreed criteria. This model is ideally suited to the deductive logic typical of business managers. Roger Martin proposes that

"The designers who can solve the wicked problems do it through collaborative integrative thinking, using abductive logic, which means the logic of what might be. Conversely, deductive and inductive logic of what should be or what is". [4]

More ambitious businesses are starting to embrace the principles of Design-Thinking through multidisciplinary team working in pursuit of disruptive innovations. This presents its own challenges as these multidisciplinary teams seek working practices that allow them to gain and communicate a common understanding of the task at hand. In the first instance, this may involve identifying and defining a brief for the task that all of those involved, irrespective of disciplinary background, culture or experience can understand. Often this can involve a degree of managed ambiguity, which Tim Brown describes thus

"...A well-constructed brief will allow for serendipity, unpredictability, and the capricious whims of fate, for that are the creative realm from which break-through ideas emerge. If you know what you are after, there is usually not much point in looking". [5]

Whilst the designers in a team may be comfortable to trust the "capricious whims of fate" their business, technology and science colleagues may not!

The use of a connecting narrative has value in giving the multidisciplinary group a platform that allows new ideas and insights to flourish. The reason for this is that if the narrative is well crafted it will generate a common two-way dialogue that is easy for all participants to engage with. Tom Erickson describes storytelling as a vehicle for collaboration

"Stories also work well as a way for promoting collaborative work and understanding within the design team. Stories are a sort of equalizer". [6]

It must be stated however, that this alone is not a complete process but is seen as a methodology to engage a multidisciplinary group. The designer must still have enough of the more established competencies to convert the propositions into credible product/service offers.

David Seah advocates the value of storytelling as a valuable part of the relationship between designer and client by saying

"The storyteller-designer, by comparison, first asks about motivation and desire, and designs for the dramatic moments. The primary goal is not to produce to a functional spec, but to create a story about the client, with the client in the hero-protagonist role. Only then are the production skills applied to create causal elements in the real world". [7]

A key value in this approach to design is that the narrative-designer integrates into multi-disciplinary work environments much more readily.

The idea of using the technique of storytelling has been accepted as a valued method of practice within the Social Sciences. This community has collected stories from individuals in order to look at how adults view their lives and deal with such things as depression, bereavement and addictive behaviour. It has been demonstrated as an effective analysis methodology in helping understand certain behaviours and their progression.

Erickson argues that the story-telling techniques used by the designer are '*Subjective, ambiguous and particular'* [8]. In order for the outcome to remain un-skewed by this subjectivity, narratives may need adaptation in order to ensure relevance to different client audience.

2 STARTING WITH PURE RESEARCH

The process for the study discussed in this paper has grown out of a 4+ year collaboration between an industrial R&D research community ("the scientists") and Northumbria University's School of Design. It is a loosely connected suite of projects. Initially the projects involved undergraduate product designers (BA Honours Design for Industry), but more recently the student resource has been extended to include postgraduate students (BA Honours Design for Industry & MA/MSc Multidisciplinary Design Innovation).

The starting point in 2004/05 was pure research, completely free of product, brand or business. The project was phrased as a simple yet intractable question, "Has Design got anything new to say about the nature and behaviour of Fluids?" The method was to create unique scenarios which stimulate debate within the organisation, but which are not grounded within the usual technology paradigms known to them.

At the outset of this collaboration it was anticipated that working with a large student cohort of up to forty students, within the same problem framework was likely to create a convergence of ideas and methods. The problem was how to maintain each of the groups' individual unique story,

communication method and authenticity, whilst keeping within the overall project ambitions and constraints. It was envisioned that the students would fall into a comfort zone, reflecting on each other's ideas and perhaps compromising the variety of approaches that could be adopted.
To avoid this convergence of ideas, projects were only brought together at the moment of telling. This took the form of a series of presentations undertaken at the scientists' research headquarters.
The fundamental role for the academic and client acting as 'directors', lies in giving individual and discrete direction to each of the project teams during the project, acting as a steer and filter to each teams' evolving ideas.
Understanding that there would be a risk to this approach where students may feel isolated and uncertain of their ideas, an initial period of shared discovery and research was conducted. At this phase, we involved the relevant scientific specialists. This co-creation phase bonds ideas between the client, student and academic team.

3 APPLICATION OF NARRATIVE TECHNIQUES

The freedom of this project encouraged thinking beyond conventional design lines. It emerged that some of the most successful outcomes for the project led to the use of 4D animation (time and motion) tools to create social and cultural metaphors and drivers for debate and engagement within the organization. The ambition was to create non-confrontational entry points for both design and science research teams. These allow a common language to be developed between disciplines to open up new design spaces and opportunities.
What emerged from this initial pilot project was that even the most complex ideas generated by the students were resolved and communicated to the audience when time based narrative techniques were applied. As product design students, not traditionally versed in the use of animation and film techniques, delivered this work it became clear that the power of narration was paramount in the students minds whilst working through their proposals.
A large student group exposes a greater number of particular and individual points of view, which whilst they may be hard to interpret and analyse singularly, give direction and influence when seen as a complete suite of work. We reference the outcomes, as ideas that in turn become data. It is the value of these clusters of ideas when viewed as a suite of work gives value to the scientists.
Recently, taking these collaborative projects into our new multidisciplinary groups has shown that the designer in the team can usefully adopt the role of 'narrative-designer' through which they become the interpreter; taking and translating observations derived from research and collaborative creativity into a meaningful, human-cantered story around which all within the team can rally. This is a role that is as valid at the point of defining the brief as it is at the point of communicating the outcome of the work.
To equip the design graduate with the necessary skills needed to adapt and be comfortable in the increasingly complex work place it is important to expose them to a new form of teaching and break away from the norm of studio practices.
Our contention is that the narrative-designer, the designer who is story-maker and storyteller, able to engage in the value of ideas around highlights and moments, has the capacity to encourage innovation from the multidisciplinary team, whilst reflecting both the values and aspirations of the end-user and commissioning organisation.
Fig. 1 reveals a typical project timeline used during the Unilever collaborations and indicates the key phases of the project. Noteworthy features are the key points of collaboration between the science community project management team and the student cohort. The project phases shift from shared research by all students within the first week of the project before moving into discreet project groups which take responsibility for creating and maintaining their own team identity, project management and direction. Typically they will develop and refine around three to four concepts. Beyond this point the team and the collaborating partner select and agree on a single project concept to fully develop and animate. Across this timeline one can chart the shift from story-maker to story-teller.

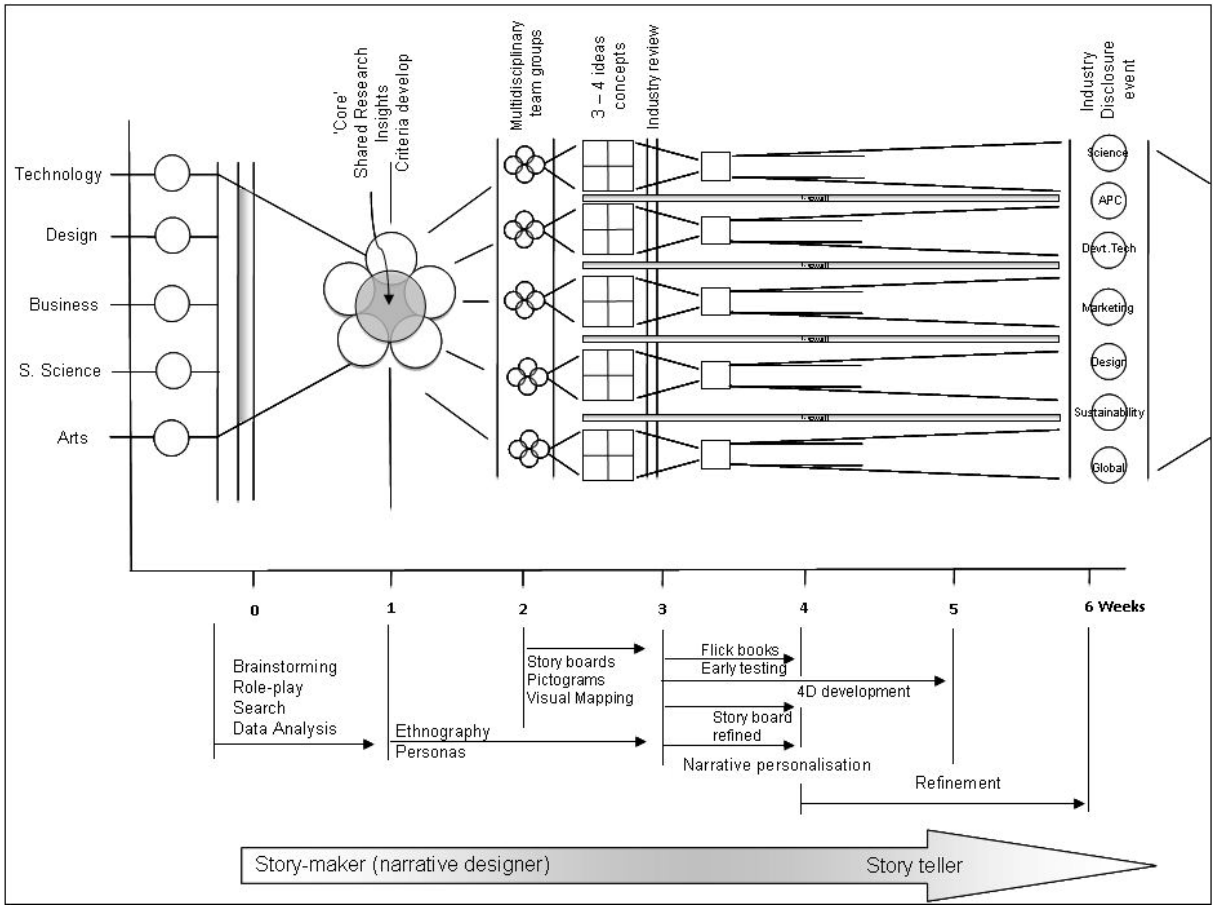

Figure 1. Project journey map

4 DEVELOPING THE CLUSTER OF IDEAS

Students who may be more comfortable with a linear view of designing artifacts need to learn that exploring and adopting new approaches can be liberating. To this end, these projects have been structured in such a way that students see 'quick wins' in the form of staged reviews that allow them to present emerging stories around the brief, the scope, the proposition and the outcome. At each stage the value of the approach is endorsed by industry review. These singular moments do not need to be grounded in the dogma of 'will it work, and can we make it?' but allow the 'what if?' to become the fulcrum to develop the 'how?' The end point becomes the engagement of moving the allegory or fiction on in which the shared dreams and aspirations are co-created and then turned into products and strategies of true meaning and worth.

The problems with this strategy are that there are no certain outcomes and the student journey within the problem space is potentially compromised by their personal inhibitions and preconditioning to achieve high grades. The removal of any form of summative assessment from the module frees the student from the anxiety of having their outcomes measured against a given criteria, and potential failure. Introducing this work into un-graded modules of study where the assessment is based upon the quality of reflection upon the activity and associated learning rather than the outcome itself is liberating for the students.

There are a number of key factors and phases that support the successful working of these projects and vastly increase the potential for their development.

- Linked student projects where each student group passes on and builds from the previous body of student work
- Initial inclusive cross-team based research collaboration
- Maintaining the effectiveness within the team by agreeing on a clear strategy
- Participatory workshops and role-play activities within the studio environment
- Re-phrasing and constraining the problem space through active debate
- Shared visualization and brainstorming around general problem context

- Development of strong individual personas, to test against the evolving ideas

Typically we have found that the loading of the early project stage has a dramatically positive effect on the project outcomes and increases potential for development. Building the student confidence to experiment and prototype ideas is vital to positive outcomes.

It is important to be non-judgmental within the early stage of the work but to listen and embellish (from personal meaning) around the stories as they unfold, as one would in listening to any story. As the student groups are now multidisciplinary the motivation to find common understanding is paramount and forms a core competency within the MDI programmed.

The added time based dimension allows both the story and the image to run together, and create a much richer experience for the scientist audience, and was seen as highly beneficial in the development and communication of the delivered concepts.

5 CONCLUSION

The work with Unilever Research has been a fascinating and dynamic journey that has been about partnership and shared ideas that for the students have been liberating.

What has emerged from this suite of projects is the fundamentally valuable tool of 'designer as storyteller', and its value when working within a multidisciplinary team. The freedom to open up ideas and to find context that these projects pose has allowed our MDI programme to take on highly complex scenarios whilst engaged with other organisations and quickly find value and connection both within the internal team and with our partners.

Developing from this suite of work has been in the understanding of defining and constraining of the project objectives. The early projects started with very loosely defined parameters that offered too much choice and direction. The latest work has had a greatly increased value to the science community, as its focus is clear and specific. It has been an interesting observation that through these projects our initial intention to keep the scope of the project more open in its problem context has been challenged, revealing that the more defined the parameters the richer the outcomes and more creative the responses. This needs to be measured against the value in keeping the brief open enough to allow for the opportunities presented by ambiguity that Tim Brown has cited. Our adopted approach here has been initially to allow the students scope to explore the broader problem space and then, through narrative proposition, define a more defined scope. The challenge of working within these constraints has had a complementary and positive effect in obtaining directional and valued outcomes from the student work. We have seen growing confidence in how the students open up to complex challenges. At this stage we are not challenging the science discovery and development but rather assisting and developing its connection and value to the user.

At the start of the relationship with the scientists, the objectives for the project were to stimulate and engage their own research community in looking at their work from a different perspective thus to energise debate. The power of these stories creates relevance and as animated ideas it is easy for individuals within the research community to see how it relates to their own life experiences. This is important as it engages all stakeholders at the level of 'audience' rather than specialist so that their engagement takes on a more empathetic and, therefore, potentially more receptive nature.

This was a vital phase in the early relationship as an open and abstract context allowed all the participants to open up their thinking.

Through the action of adding strong constraining parameters around each of the later projects, confidence is given to the student group and this creates robust platforms from which the narrative can develop. Our belief is that what was achieved with the student groups was a strengthening of self-belief and unbridled enthusiasm and dedication to create and communicate in new ways.

Following this through, the most recent work has achieved meaningful engagement, becoming part of a proposition to help the scientists explain the scientific discovery beyond their community to colleagues delivering to brand and ultimately to the consumer.

By engaging in the apparently open-ended actions of story-making and telling, we have found that designers can reveal outcomes which have potential to add real commercial or user value. Similarly, the methodology can be employed to integrate designers, technology specialists, clients and users within a common theme thus creating new shared stories that can lead to real objectivity and focus. This has been evidenced by the last in the suite of projects with Unilever that is now being actively used in connecting the marketing and brand teams to the work of the scientists and the innovation platforms generated by them.

The future of this work needs to engage further with academic structure and possibly rethink aspects of curriculum within design education, and how to manage any change to current studio practices.
Within our programmes of study we have had the liberty of developing this challenge through a teaching module structure and programme framework that are both flexible and adaptive, their basis being aimed at how to develop and work in collaboration with industry and the wider society.
So far the indicators to the success of the approach are extremely positive and exciting, evidenced by the growing audience that have attended the presentation events at Unilever, including by video-conference from as far away as Brazil.

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