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ABSTRACT
This paper is the story of what happens when industry becomes the broker for product design education. The paper has been written collaboratively with three partners – from an industry perspective NCR Financial Solutions Division Ltd and two product design programs based respectively at the University of Dundee and the Robert Gordon University, Aberdeen. We will present the outcome and reflect on an exciting new project that ran for the first time in the Autumn of 2005. The project was proposed and ultimately judged by industry, with academic educational programs asked to respond to industrial needs/wants. The theme for the project was service design – an area that has become well established within industry, but is less well reflected in the teaching of undergraduate product design education currently, and something that in the view of the authors has to change.

Keywords: Service Design, Industry lead education, Product Design, Design for Industry, Global Design

1   INTRODUCTION
In July 2005 NCR approached both the Innovative Product Design (IPD) course at the University of Dundee and the Design for Industry (DFI) course at the Robert Gordon University, Aberdeen with a proposal to stage a student competition framed around self-service design issues. What followed was a 6 week highly competitive highly motivated group project that was widely lauded as the "best project ever" by staff and students from both institutions.

2   BACKGROUND
2.1 The perspective from industry
NCR Ltd was established in 1884; initially inventing and building cash registers. The company has grown over the decades, developing and adapting to become a world leader in hardware and software solutions that make interactions between banks and their customers easier, more convenient and secure.

At NCR it is recognised that for a company to survive it must be flexible, adaptable and constantly looking ahead for opportunities and threats while understanding its weaknesses and building on its strengths. A key factor in this is its understanding of the strategic benefits of design. NCR as a result is an enthusiastic sponsor of the annual RSA (Royal Society of Arts) Design Directions student competition and will annually take 2 to 3 design students from across disciplines such as product, graphic and digital media design, on summer placements within the company.

In the past NCR has been involved with Duncan of Jordanstone and in particular the IPD and Interactive Media Design (IMD) courses in running projects and sponsoring

students, whilst members of the NCR in-house Design, Usability + Accessibility team (DU+A) are on the industrial advisory board of the IPD course, also members of the DU+A team have lectured on the DFI course. Building on this level of involvement with both the DFI and IPD courses by means of the project outlined has allowed them to be brought closer together at one level, but also challenge the sometimes insular nature of design courses in Scotland which can often be unaware of how they stand within national and international contexts.

The main ambition of initiating a project based on direct competition like this was to generate both fresh thinking within NCR and the design departments through untainted, un-institutionalized groups of individuals. But also to give DU+A an insight into the quality of future design graduates and even identify students for possible summer placements. The direct nature of competition established between these courses give everybody the chance to independently investigate very particular user groups and the chance to then try and understand their specific needs with respect to their partner groups alternative positions.

A very open brief was produced that would allow the students to be creative but also asked them to focus on one particular user. Six distinctive characters were created with a range of different identities, habits, needs and even addictions. An example being: *"Annalise Martel", Age: 48, Interests: Bridge, Handy Crafts. Background: Born and brought up in a tight knit community near Johannesburg, Annalise has been suffering from depression since she lost her eldest son three years ago. She has since joined a support group who meet every week. She finds this a very rewarding experience. Her two other children are doing well in school and would like to go to university but funding may be an issue. Annalise is currently unemployed and lives of state benefits but has almost finished an evening class course in business administration.* The student groups then build on this formative initial information provided about their character and designed a specific service or self service product around the developed character profile.

Once the project brief was written and passed over to the individual courses NCR's involvement was minimal. But it was important for us to introduce students to aspects and demands of a commercial design group and the role R&D plays. A site visit was arranged to NCR Solution Centre (a customer demonstration and meeting centre for retail banking solutions) in Dundee where the students were shown the product line, future concepts and talked through the design process from drawings, models to prototypes. In an effort not to influence the students with current products – as another Automated Teller Machine (ATM) was clearly not what this project was about. ATMs are very complex machines with countless security, technology, accessibility and usability legislation and guidelines to adhere to. It would be an overwhelming and an impossible task for the students to design anything relevant in the limited project duration. Therefore the site visit was arranged 2 weeks into the 6 week project where most of their research would have been completed.

3 OUTCOME

The project ran over six weeks with teams from DFI and IPD in a blind competition (neither program was aware of the work of the other course). Whilst the modules under which these programs ran this project had very different learning outcomes – DFI students were working within the context of a self-directed design methods module; and

IPD students were working under the umbrella of design research. What resulted was a series of very distinct and individual responses and styles from each of the student groups.

3.1 DFI response to the brief
Context

The DFI Product Design course at the Robert Gordon University, Aberdeen (http://www.rgu.ac.uk/grays/) provides students with a clear integration between the disciplines of design, management and technology as well as stimulating creative and innovative qualities in students, whilst developing the essential skills required in managing design in commercial, mass-manufacturing industries. The project was framed within the self-directed projects module where students are expected to be able to:

- Identify design problems or opportunities via a self-managed programme
- Demonstrate clear critical definitions and resolution to design concepts
- Demonstrate an understanding of their design practice within a broader professional, historical and contemporary context
- Communicate design concepts: visually, orally and written

The project formed the main component of this module and was supported by a formal seminar program from tutors, together with critical and contextual staff in order to establish clear frames of reference and build whilst also facilitating students peer learning activities. The project also directly engaged students in considering: Experience Design, Participatory Design and User Centred Design methods and issues. The emphasis of the teaching and learning in this sense sough to provide students with specific contextual material, support their research methods and importantly peer-to-peer team working through staff tutorial support. The varied responses to the brief by DFI students was encouraged whilst students were challenged to activity test previously held notions and definitions of service design with aspect to the character profile and their own user experiences.

Outcomes

The six groups selected their character profile at random this resulted in an unbiased and open initial engagement in the project but subsequently lead to difficulties in the developmental processes for the groups. The results ranged across critical design solutions to very pragmatic individual services briefly summarised as follows:

Helping+Hand: a tactile haptic device addressing personal security issues whilst aiding psychological factors related to trust and comfort outside the home.

Communi-card: a communication device and web-based organisation service for family and friends employing visual emotion-symbols.

De-Stress Window: a responsive glass office divide, visually reproducing a growing or fading tree that responds directly to executive or office stress levels.

Comfort Blanket: a product offering physical warmth and emotional support in the absence of a named carer.

Trading Fair Indigenous Arts & Craft: a service to provide outlets for third world arts & crafts whilst establishing clear and long lasting relationships between 'makers' and 'customers'.

Missing pieces: service and device offering greater levels of communication between family and friends by linking GPS technology to temporal and location issues related to keeping in touch.

Reflection by DFI

The 'live' nature of the project both offering a fantastic opportunity to directly engage with Industry whilst also bringing interesting critical dimensions and levels of focus to the student's normal deliberations and established means of framing and/or proposing concepts. The solutions as a consequence were considered by all staff, students and NCR as a great success. The external live industrial and peer competitive dimension of the project directly challenged the student's comfort zone in interesting ways. Not simply by seeking to be 'better' in terms one might normally expect from a cohort-to-cohort competition like this, but rather the student's saw this oppositional model as an opportunity to validate and actively reflect on design ideas that fell out with their expected or normal education environment.

The clear strength of the submission rested in the high level of critical reflection developed in response to the character. A typical brief for this cohort previously would have contained some indication of the context within which the outcome might be framed. But with this project students did not have that frame of reference and so regularly asked, at lease in the initial stages of the project, 'what do NCR want?' however, once in the mindset of the 'black box' nature of the project, the students were able to focus on the intrinsic critical aspects of their own individual design solutions. With the result that each group where able to arrive at and express complex levels of understanding related to their specific user wants and desires.

3.2 IPD response to the brief

Context

IPD is an interdisciplinary product design program at the University of Dundee [1]. The Self Service design project set by NCR fitted within a new module exploring design research. To this end students were provided with a set of research skills encompassing: Ethnography [2], Cultural Probes [3], Participatory design [4], Gonzo design [5], Experience Prototyping [6] alongside the more traditional methods of survey, interview and analysis [7]. This was the first year of running a research centred module, which had the following aims:

- to understand design practice based research
- to develop the students' skills through deeper understanding of people
- to develop and test prototypes through design research methods
- to have experience of dissemination of practice based research

Teaching and learning was provided through the studio environment with material delivered through a combination of workshops and personal tutorials. Design in this module was presented as a mode of enquiry. In response to the brief, IPD students were

encouraged to develop their understanding of the service design aspect through intensive user understanding.

Outcome

Five groups responded in very different ways. The projects can be thought of as experiments in/through/for design and can be briefly summarised as follows:

The Wandering Pet Parade: A service to enable animals to be used as therapy for depression through enabling better social and community communication.

Release: A service to provide custom office interior design for stressed time constrained city executives.

CAL TV: A personal TV service to improve the confidence of a male staff nurse through providing tongue-in-cheek programs aimed at improving the viewers sense of manliness through 'The Man Way'.

Community Chest: A community drop box situated in a small rural Scottish village creating a site specific free recycling/exchange service.

Grandkids for the weekend: A bespoke service for grandparents given the temporary responsibility of looking after their grandchildren at the weekend – by maximising activity while minimising impact.

Reflection by IPD

Students and staff directly involved with this project gained an invaluable collaborative experience. In addition, students and staff across the IPD program (i.e those not taking part in the project) benefited by placing the teaching and learning of one module under the spotlight of a live face-to-face competition. Informal reflection, through verbal feedback from each student and comments from IPD staff, on the learning and teaching is best presented through the SWOT matrix shown in table 1 in the follow up to the project.

Strengths	Weaknesses
• Design research • Understanding of service design • Understanding through film making	• Product finish • Model making • Board and final presentation.
Opportunities	Threats
• Collaboration with NCR and DFI • Improvement of product finish and delivery • Staff peer learning	• Timetabling across two institutions • Time allowed for making use of opportunities presented/created during this project.

Table 1. SWOT analysis of IPD's involvement

4. REFLECTION AND FUTURE THOUGHTS

There was a lot to learn from this project on many different levels; everyone involved gained something from it. From an NCR point of view it was particularly interesting and impressive how the students researched the problem, namely the use of experience prototyping. This is something that is already within the design process but definitely highlighted the importance of getting out into the field and understanding the product from every viewpoint, from the man on the production line to the service engineer to customers and users.

At the outset NCR intentionally set a project which did not specify a solution that one might immediately relate to our core business and the broad range of ideas and concepts presented reflected that intent. The ideas themselves will not be immediately evident in any future NCR products but in some ways the thought processes and themes will influence the in-house design team in their quest to develop the next generations of self-service technologies. As we took some themes and user issues from our business and tasked the student to develop or seek something else for those user types which would provide direct benefit.

This principle illustrates very well that projects don't necessarily have to be directly related to a companies industry as there is much to learn from the actual developmental process together with the final solutions. Preconceived ideas from industry that developing competitions and projects drains resource, budget and is time consuming are unfounded in this sense. The competition proved to be a very rewarding experience where both academic and industrial partners learnt from this relationship and is one that all parties are keen to build on and develop in the future.

5. ACKNOWLEDGEMENTS

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