Institution:	University of Northumbria at Newcastle
Unit of Assessment:	34 - Art and Design: History, Practice and Theory

Title of case study: Multiple Perspective Problem Framing: the creation of Intellectual Property resulting in business growth through product development, jobs and sales

1. Summary of the impact

The Multiple Perspective Problem Framing (MPPF) model enables the complexity of the design process to be effectively addressed. Developed from research at Northumbria University, the MPPF has resulted in the development of commercially valuable Intellectual Property in exhibition, packaging and medical sectors. This case study focuses on one example in the exhibition sector, manufacturing and marketing of roller banners for exhibition by Eve Products Ltd. Since using the MPPF approach the company has created five new product ranges, increased turnover exceeding £1million and generated ten new jobs, with further benefits to its suppliers.

2. Underpinning research

Senior Lecturer Dr Stuart English joined Northumbria on 1 January 1990. He is a specialist in design-led innovation and has developed an approach to examining a problem or situation which involves exploring it from several different perspectives at the same time. This approach is known as MPPF – Multiple Perspective Problem Framing. Since 2002, English has applied MPPF to identify and exploit design opportunities within different industrial and commercial enterprises. This has resulted in a portfolio of Intellectual Property (IP) and led to refinements in the MPPF model.

English's research is grounded in design practice innovation. The correlation of his practice through a process of reflection, informed by critical literature in the field, has enabled the development of MPPF theory. The theory involves relational modelling of design parameters, which reflects the complexity and inherent opportunity that exists in design situations. English has developed tools that help designers to frame and interpret this complexity in purposeful ways, leading to the creation of new value innovations that are typically masked by more conventional linear interpretation.

Between 2007 and 2010, English led a data-mapping process supported by Northumbria University Design School colleagues including T. Moor (initially an associate of a collaborative innovation partnership with Ward Hadaway law firm, and then Research Fellow at Northumbria from July 2009 to July 2011) with 43 different companies, on the 'Cornerstones of Innovation' project. For this, English used his MPPF theory, combined with others' research into organisation design (De Waal 2006, Galbraith 1995), to create the 'Ideas-lab' process. This composite approach maps a company in relation to six key characteristics of high performing organisations, which together frame the company's 'value arena', and within which effective strategies can be modelled. The process aims to reveal new commercial opportunities for the business. A 'Cornerstones of Innovation' report was prepared to inform each company of the observations made by the researchers. The report and approach is navigated by the company, with the design researcher's support, to highlight commercial opportunities. It does this through revealing 'untapped value' in the company.

The application of MPPF within the three-year Cornerstones of Innovation practice-based research project generated further insights, resulting in amendments to improve the 'Ideas-lab' process, tested during the project timescale. For instance, at first the mapping process was carried out by the researchers as a separate activity distinct from the collection of company data. However, insights into the importance of development of a shared understanding between the researchers and company executives led to the introduction of co-creative conversational mapping.

In the case of Eve Products Ltd, the MPPF method was used both as part of the Ideas-lab process to reveal commercial opportunities for the company and also to map the separate valuable

attributes of existing products and intellectual property prominent in the exhibition industry. This enabled English to envisage new and highly relevant inventions for the company. The global reach of English's design products is recognised in his success at securing international patents and design registrations.

3. References to the research

Moor, T. and English, S.G. (2013) 'Reflections on Multiple Perspective Problem Framing', *The International Journal of Design Management and Professional Practice*, 6(2), pp29-50. Available at: http://ijgmpp.cgpublisher.com/product/pub.239/prod.12 or from Northumbria University on request.

English, S.G., Moor, T. and Jackson, W. (2010) 'Value innovation modelling: Design thinking as a tool for business analysis and strategy', in *Design and Complexity* (eds.) D. Durling, R. Bousbaci, Lin-Lin Chen, P. Gauthier, T. Poldma, S. Roworth-Stokes, E. Stolterman, Proceedings of the Design Research Society International Conference 2010, Montreal, Canada. 7-9 July, 2010. Available at: http://www.drs2010.umontreal.ca/data/PDF/037.pdf

English, S.G. (2009) 'Integrated mind mapping: multiple perspective problem framing'*, Networks of Design.* E-book. Proceedings of the 2008 annual international conference of the Design History Society. Glynne, J., Hackney, F., and Minton, V. (eds), Falmouth, UK. 3-6 September. ISBN -10: 1-59942-906-3 ISBN -13: 978-1-59942-906-9 Universal Publishers, Florida, pp35-42. Available at: http://www.universal-publishers.com/book.php?method=ISBN&book=1599429063 or from Northumbria University on request.

English, S.G. (2007) 'Mapping key factors in value innovation', *Shaping the future? Proceedings of the 9th Engineering & Product Design Education International Conference.* Newcastle upon Tyne, UK.13-14 September 2007. ISBN 978-0-9553942-1-8 Hadleys Ltd, Essex, pp419-424. Available from Northumbria University on request.

References to specific innovations in the exhibition industry:

PCT Patent - *Improvements in or relating to roller banners* WO2011045069, also published as EP2489030 (A1) and GB2474582 (A). (22 August 2012). Claiming priority GB20090018067 20091015; GB20100014822 20100907; WO2010EP06304 20101015. (2009 and 2010) Inventor: ENGLISH STUART [GB]

This invention is the world's first in-line linking roller banner developed by English as described in REF2.

UK Patent - *Support system for banners*. Patent numbers: GB2381366 (B), (13 April 2005) GB2381366 (A). International: *G09F15/00;* G09F15/00; (IPC1-7): G09F15/00. European: G09F15/00B4. Inventors: ENGLISH STUART GERALD [GB]; FARRAR PETER [GB]; HEIN JOHN [GB]. This invention was developed by English, Farrar and Hein between 2003 and 2005. It describes a method of dynamically tensioning a display banner so that it cannot wrinkle and that any graphic carried by the banner is effectively displayed.

Key research grants

B. Watson (PI). 'In support of MPPF excellence and its applied research'. Contribution to NURTURE bid: ERDF / Single Programme / Northumbria University. MPPF was a component part of this bid and English delivered cornerstones of innovation reports to several companies as part of this project. 2009-2012. £1.6M.

S. English (PI). 'In support of MPPF excellence and its applied research'. Collaborative project funded by One NorthEast and Ward Hadaway (law firm), County Durham Development Company, CPI National Centre for Printable Electronics, Procter & Gamble and HEIF. 2007-2013. £116.5K.

NSD, B. Watson (PI). 'Zero Emissions Transport'. Sunderland University AMAP (£86K) and Design

Network North (£20K). 2010-2011£106K total. English employed his MPPF method to reveal new concepts in zero emission transport and worked with Conti to create transport solutions including a new electric scooter design.

4. Details of the impact

During the Cornerstones of Innovation project (2007-10), English worked with 43 individual companies to implement his MPPF model. 80% of the companies identified opportunities through 'revealed value' detailed within a company-specific Cornerstones report. Reports typically focused on the interrelationships of a particular company's unique assets and how these might be utilised most effectively, leading to new IP, new applications and new markets for a company's technologies, new ways to exploit company know how and better ways to engage customers. The application of English's MPPF approach as part of design-led problem-solving has to date been applied to over 50 (mostly UK based) organisations to reveal new product, service and business opportunities. These organisations range from original equipment manufacturers in consumer electronics, pharmaceuticals, oil and gas, automotive, filtration, cosmetics, air conditioning, medical and sports equipment; to technology companies operating in fields including satellite GPS, renewable energy, printable electronics and advanced chemicals. English used the MPPF approach to identify and address unsolved challenges in the exhibition industry, leading to the creation of new intellectual property and products. This case study focuses on one specific commercial area - the exhibition industry - where English has applied his MPPF research.

Eve Products Ltd was created in 2003 and is based in Skipton, Yorkshire. From 2008 to 2013, the company engaged with English's MPPF research. As a result of the research, economic impacts include the creation and sustaining of jobs and increase in business revenue, for both Eve Products Ltd and a number of associated organisations in the supply chain. Specifically, English's research underpins five of Eve Products Ltd's product ranges, under the brand names of, 'Twist', 'Curve', 'Lumos', 'Connect' and 'Link'. English used MPPF to reveal market opportunities and to model the relationship of valuable product attributes. His relational mapping process enabled the creation of intellectual property including patents and designs (features of shape and configuration). This IP solves a number of problems common to the exhibition industry, including; the tensioning of banners to display a flat graphic; the linking and levelling of multiple banners; and the controlled retraction of roller banners. Because these innovations solve problems that other companies do not address, they provide Eve Products with a unique proposition in the market place and the IP is therefore described as business critical.

The products are marketed and sold across the world and used by international organisations at events all over the globe. Eve Products' extensive client list includes high-value global-reach organisations, including Unilever, Ferrari, NHS, Vodafone, BBC, Intel, The Open University, Mars, Nissan, Harrods, British Airways, The Victoria and Albert Museum, Audi, The British Army, Barclays, Sainsburys, Channel 4, SAAB, BAE Systems, Mercedes, Bacardi, EDF Energy, RBS, Hewlett Packard and the House of Commons.

The products developed through MPPF provided Eve Products Ltd with a turnover in 2013 of £2m. The products are founded on intellectual property developed by English and based on his application of his MPPF approach. This is evidenced by four nationally and internationally published patents (Patent Nos. WO/2011/045069, WO/2012/113556, US/2012/0260547, GB/2005/2381366), as well as an EU design registration (EU registered design No.000496476-0001).

As a result of engaging with MPPF between 2008 and 2013, economic impacts for Eve Products Ltd include an increase from 10 to 20 jobs and an increase in turnover from £850K to £2m. A further 7.5 jobs and £261K sales p.a. have been created for three local supply businesses which support Eve Products Ltd's manufacturing through the provision of 'tooling', materials and other essentials. These are all directly attributable to English's application of his MPPF approach to the design improvement of exhibition products such as the roller banners.

Managing Director of Eve Products Ltd, confirms the impact on the business: *'Dr. English has collaborated closely with us at Eve Products Ltd since 2008. Through the application of his multiple perspective problem framing methods he has generated new innovations and new IP that underpin the success of the company and currently generate annual turnover of over £*2m [The increased turnover is £1m+]. *Patents developed by Dr. English address several previously unsolved challenges in the industry, including the tensioning, levelling and linking of exhibition banners - he has recently invented the world's first in-line linking roller banner. These innovations give Eve Products Ltd a significant advantage over our competitors and the IP developed by Dr. English provides the company with a monopoly over their commercial exploitation.'*

'80% of Hardware products sold by Eve products (Twist, Curve, Connect, Link) incorporates IP developed by Dr. Stuart English. 95% of components and services used by Eve Products are provided by UK companies.'

5. Sources to corroborate the impact

The impact of English's innovations on the exhibition industry can be corroborated by the Managing Director, Eve Products Ltd

The following sources show product ranges that are manufactured by Eve Products Ltd based on intellectual property developed by English. The 'Twist' range of products designed by English with Farrar and Hein is described at http://www.eveproducts.com/products/twist/. This design along with the 'Curve' range http://www.eveproducts.com/products/curve/ and the 'Connect' range http://www.eveproducts.com/products/connect/ is based on English's patented tensioning and levelling system. The 'Link' range of products designed by English is the world's first in-line linking roller banner and is patented in UK, Europe, US and Hong Kong http://www.eveproducts.com/products/link/ 'Lumos' is a new range of products designed by English http://www.eveproducts.com/products/lumos/

The originality of English's innovations and his UK, European, US and Hong Kong patents can be corroborated by the Director and Principal Chartered Patent Agent at Bawden and Associates

English's patent 'Improvements in or relating to Roller Banners' was filed in 147 countries under the Patent Cooperation Treaty. It describes the world's first in-line roller banner and is patented in the UK, Europe, US and Hong Kong http://worldwide.espacenet.com/publicationDetails/originalDocument?FT=D&date=20110421&DB=worldwide.espacenet.com&locale=en_EP&CC=WO&NR=2011045069A1&KC=A1&ND=4

English's patent 'Roller Banners' was filed in 147 countries under the Patent Cooperation Treaty. It describes a means of providing accurate and controlled rolling of roller banners and is progressing to grant in UK, Europe and US. http://worldwide.espacenet.com/publicationDetails/biblio?CC=WO&NR=2012113556A1&KC=A1&FT=D&ND=3&date=20120830&DB=worldwide.espacenet.com&locale=en_EP

English's European Community Design no 000496476-0001 is registered with the Office for Harmonization in the Internal Market. It describes and protects the shape and configuration of a linking banner design http://oami.europa.eu/RCDOnline/RequestManager/getRCDAttachment?idRCDAttach=000075374633.pdf

English, Farrar and Hein's 'Support system for banners' is a tensioning and levelling system and is patented in the UK http://worldwide.espacenet.com/publicationDetails/originalDocument?FT=D&date=20050413&DB=worldwide.espacenet.com&locale=en_EP&CC=GB&NR=2381366B&KC=B&ND=4