

Knowledge Exchange as a tool to build Design Capability and Strategy in a B2B SME

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This paper is in the form of a case study, examining the developing relationship between a university and a Business to Business (B2B) small/medium sized enterprise (SME) working in the disability sector.

The paper will highlight a Knowledge Exchange Internship (KEI) between Teesside University and the disability aids manufacturing and sourcing company, NYMAS, to develop design capability within their business.

The paper will discuss,

- *A staged approach to the introduction of a design function including lessons learned*
- *Map the development of design capability in an SME*
- *Discuss the pressures inherent in re-orientating a sales driven company to embrace and effectively use design*
- *Describe a facilitated workshop session by the university, midway through the KEI, that highlighted issues inhibiting change and impacted upon Design*
- *Comment on the success in changing the company's orientation*
- *Highlight the next steps for the company which includes an application for a further Knowledge Transfer Partnership (KTP), to refine the fledgling design capability into a fully research lead, design and development capability.*

This abstract includes 167 words.

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Introduction

Many companies now see Design-Led Innovation as a critical next step in their evolution. There is a recognition that the creation of Unique Selling Propositions (USPs) gives companies a clear, competitive and defensible advantage within their market place. For many, competing on price alone is no longer sustainable in the long term as margins and profits are continually being squeezed by foreign imports. 'Distinctiveness' allows such companies to stand out, trading on, for example, enhanced product quality, additional functionality and improved customer service. In so doing, these companies develop 'brand stand out'.

It was with this in mind that NYMAS contacted the University of Teesside, Department of Design in early 2016.

NYMAS is a Tees-Valley-based, manufacturing and sourcing SME, specialising in disability, bathing and washroom products. Typical products include grab rails, ambulant toilet packs, shower seating and associated accessories. The business operates in the B2B sector, supplying solutions for healthcare providers and the private companies alike. This includes residential, commercial and hospitality. NYMAS operates three distinct brands,

- *Nyma®PRO products are the simple, cost effective and durable solution for any accessible washroom. Designed with both ease of installation and client safety in mind... for home adaptations, residential care homes, social housing, private use and commercial developments.*
- *Nyma®CARE has been formulated for high use public areas. With the essential features of durability, infection control, vandal resistance, and aesthetics all incorporated into this range*
- *Nyma®STYLE combines design-led class with full compliance... for a wide variety of installations for the more discerning end user. From adapting a bathroom right up to completing a high-specification hotel project. (<https://www.nymas.co.uk>)*

The company operates in a heavily sales driven commercial sector which, historically, offers little innovation within the market and where functional, performance characteristics and price sensitivity have been the major drivers.

Kotler and Keller (2016, p42) describe five company orientations to the marketplace

1. The Production Concept
2. The Product Concept
3. The Selling Concept
4. The Marketing Concept
5. The Holistic Marketing Concept (which builds upon previously referenced Societal Marketing Concept)

The NYMAS Business model was orientated towards the Product and Selling Concepts. This sales driven approach had seen the company expand, predominantly through the sale of sourced products. The focus had been on supplying excellent quality in both the physical product and service, within competitive pricing. As such, the company was very knowledgeable of existing customer needs, effective sourcing of products, understanding pricing structures and accurately assessing price margins. These represented 'knowns' and offered low risk opportunities to the business.

More recently, the company had begun to offer new design solutions and modifications to products using design consultancy support. They had also previously employed an engineer whose work had largely centred on technical modifications to their current product ranges but with little aesthetic design output.

This represented a subtle move in orientation towards The Holistic Marketing Concept. However, having no prior experience in the deployment of design process or thinking techniques, NYMAS had experienced a number of problems. They were rapidly moving outside their comfort zone to a situation with a great many 'unknowns'. Issues had emerged in the accurate estimation of design development times and the unexpected complexity of certain products at the time of initial proposal. This was compounded by a lack of experience in estimating development and production costs, all of which had impacted on judgements of pricing and in estimating profit margins.

Whilst recognising these difficulties, the company had noted a commercial opportunity to move more fully into the premium sector of the market (a sector previously occupied by the Nyma®STYLE brand). They were in the process of forming a new company to service this opportunity - Fitzroy of London (Fitzroy).

'Design' was seen as playing a pivotal role in the Fitzroy selling proposition and the development of design capability would be critical to success. It is fair to say that, at the start of this journey, NYMAS considered the introduction of design to be relatively straight forward. In reality, the company was poised to make a strategic change in order to grow the business. In doing so, it would need place design at the forefront of its activities and develop its business model to embrace The Holistic Marketing Concept through,

- Internal Marketing - bringing together knowledge and skills within the existing workforce to support a proposed new design function
- Integrated Marketing - extending on existing sales expertise to develop a greater synergy of activity and deliver improved value for customers.
- Relationship Marketing - through the Fitzroy brand, to extend the company's reach by delivering improved products and services in line with the changing needs of key external stakeholders.
- Societal Marketing - developing improved functionality in their products for the benefit of their commercial customers and their end users

(cited in Kotler and Keller, 2016)

The Opportunity

During early discussions with the university, it became clear that significant growth potential lay in targeting,

- medium/high end market opportunities in
- premium market segments with
- aesthetically improved, high specification, 'luxury' offerings.

In doing so, the company would be differentiated within their marketplace and add value through design.

Luxury offerings would include short run, semi bespoke and bespoke work. This would require agility in 'design to market' in order to meet highly demanding customer expectations. This would also offer a significant USP within the commercial and private sectors and provide for the sale of higher margin products.

Prior to engagement with the university, NYMAS had little experience of working with design. Having not employed design expertise or operated an internal design unit, 'design' as a business function was not really understood. This lack of understanding had been exposed when subcontracting occasional design work to design consultancies. Problems had arisen in the space between the company's opportunity recognition and the formulation of a design brief, including defined outcomes and setting project constraints. This had resulted in less than optimal project success.

Thus, the company needed assistance to embrace design and embed new working practices and capability through Knowledge Transfer and Exchange.

It was agreed to embark on a one year Knowledge Exchange Internship (KEI) with the university. The team consisted of the following: a recent product design graduate (the KEI associate) who was recruited to head up the new design function; the company supervisor was Craig Anderson, the Managing Director of NYMAS and the university academic supervisor was Peter Reid, an experienced academic in Strategic New Product Development

KEI's operate using a similar model to that of Knowledge Transfer Partnerships (KTP's). Further info. on KTP is available at www.gov.uk. The significant difference between a KEI and KTP is that a KEI is shorter (typically a year in duration) and is focused on developing an operational improvement within a business as opposed to a KTP which undertakes more significant strategic change.

The focus of the KEI would be to develop design capability across the entire NYMAS portfolio but with a specific focus on premium product ranges for the newly established Fitzroy brand.

Mapping Capability and Structural Alignment

The KEI project had a number of discrete stages

1. Diagnostic Stage - a series of audits were undertaken to familiarise the KEI associate with the company and external factors
2. Product Families Stage - a strategic evaluation of the company's current portfolio and subsequent Gap Analysis
3. Objective Setting - Defining the criteria by which designs and design opportunities would be assessed.

4. New Product Development and Process - Implementation of a simple gated design process and the creation of new designs through a series of design projects.
5. Design and Process Effectiveness Evaluation

In order to commence developing a cultural change in working practices and to embed the new design capability, a series of audits were undertaken.

The academic supervisor applied the Knowledge Exchange Strategic Innovation Model (Reid, 2010) in the organisation of the KEI which had been proven through successful prior KTP applications.

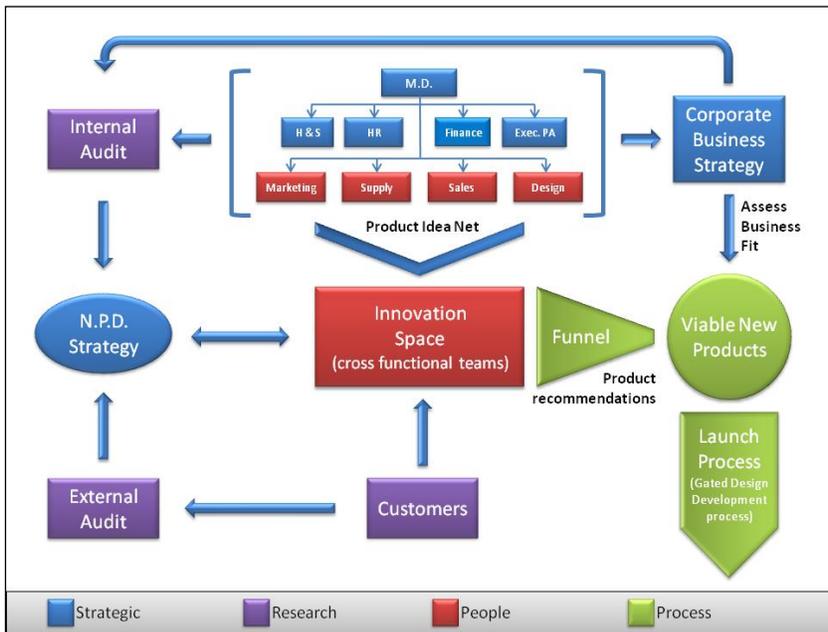


Figure 1 Developing design capability using the Knowledge Exchange Strategic Innovation Model. Source: Reid (2010).

Figure 1 outlines the basic process adopted in the implementation of this KEI project. It highlights the four basic factors at play in delivering the new design function,

1. **Strategic** - Understanding the business and how internal factors impact on design strategy
 - In the strategic phase, the associate works with senior management to develop a picture of the company, its strategy, structure and people. Commercial aims and the current product portfolio are reviewed. Strengths and intellectual property assets are assessed. This feeds into an internal audit and in turn into the new overarching NPD strategy for the company. Key people and skill sets are identified to contribute to the new design function (referred to as the innovation space) including potential roles and responsibilities.

2. **Research** - Understanding the external environment affecting the company's ability to perform in chosen markets
 - Research is undertaken into the broad external factors that impact upon the company. The research takes the form of an external audit, assessing the marketing environment, competitor positioning, legislative requirements, etc. This adds to NPD strategic thinking. Together with a recognition of the business's internal strengths and weaknesses, an opportunity search identifies themes and desirable sectors for design activity.

3. **People** - Bringing together the required skill sets for cross functional NPD team working
 - The agreed personnel may make a continuous contribution to NPD or be 'project specific', depending upon the skill sets needed for a particular project, the size of the company and pre-existing work commitments. Ideas for new products and services may be brought to the Innovation Space by company employees through their working practices, initiatives or from customer research and sales intelligence.

4. **Process** - Developing a bespoke process that works for the company in its specific circumstances.
 - Ideas are funnelled against a management agreed metric for business desirability. Problematic concepts are rejected or put on hold at this stage. Those clearing the first stage gateway are assessed for business fit against the overarching business strategy, before commencing on a bespoke (gated) research and development process to product launch.

Focusing Minds on Product Families

BusinessDictionary.com defines a Product Family as a "Group of products derived from a common product platform. These goods... use similar or same production processes, have similar physical characteristics and may share customer segments..."

NYMAS had not previously categorised their product portfolio by product families. The academic supervisor worked with the KEI associate to define current products 'by family' and to expand these families, based on modular platforms. This would enable the company to quickly and cost effectively grow their product portfolio. A gap analysis was also conducted to identify new products that would complement the existing portfolio.

Objective setting further defined product and market opportunities. The NPD/design strategy was agreed which rated potential product families against market attractiveness, barriers/facilitators to market entry, potential Return on Investment (ROI) and risk assessment.

The intention was that the associate would develop an effective and streamlined model for New Product Development, referencing Stage-gate protocols and including comprehensive briefing and evaluations procedures.

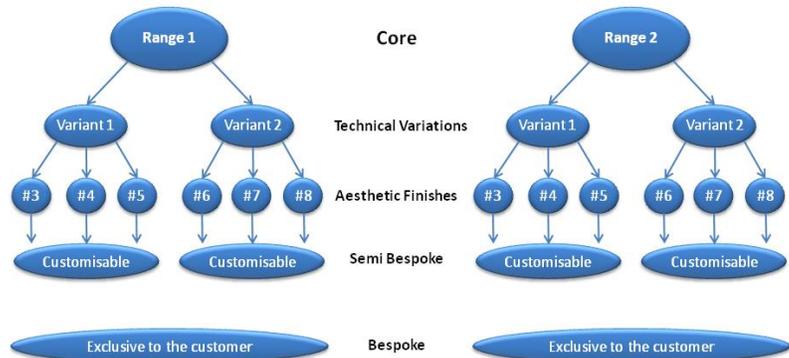


Figure 2 Planned core Product Families and variants for the Fitzroy of London Brand

Figure 2 shows the proposed Product Family hierarchy.

Based on the afore mentioned company audits, the NPD strategy proposal was to develop two core families. Beneath this, two technical variants would share components. Aesthetic variants would offer standard technical solutions but with a range of surface finishes, commanding an enhanced price premium. Below this, semi bespoke products would offer customers additional detailing choices, for an additional price premium. This could include application of customers' own branding. At the final level, and at the extreme of the premium offering, the company would offer exclusive designs in the form of tailored solutions. Tailored solutions would still utilise standard technical components but would be aesthetically unique to the customer and be designed with them. This final level would take the company into service design.

With two core ranges, four technical variants and shared componentry, efficiencies of scale could be achieved. Aesthetic variants through surface finishes and detailing would quickly and easily provide significant customer choice. 'Semi bespoke' would allow for customisations and 'bespoke' would, for the most discerning customers, allow them to have exclusive, tailor made solutions.

This approach offered low risk sales opportunities for NYMAS in the first three tiers but would require more careful consideration/pricing when offering customers solutions at the semi/bespoke levels.

From Sales to Design Orientation – a cultural shift

There was genuine enthusiasm and recognition within NYMAS that design could help the bottom line of the business. After 6 months, the KEI project had made significant progress. A number of issues had been raised through the internal audit that needed immediate corrections. This work had been completed. On an operational level, a clear system for parts assemblies and a structured system for Bills of Materials had also been introduced. Understanding and rationalisation of components was also delivering efficiencies. There was also an improved understanding of profitability with regard to designed products (as compared to sourced). Progress had also been made in co-developing NPD procedures and a number of new designs had been developed.

However the development of an expanded family of products as the core range for Fitzroy of London was proving surprisingly problematic. The issue here was about balancing the pressures that existed in the business - the need for the newly formed Fitzroy company to deliver immediate returns from 'live' customer leads verses an investment of time to develop the core ranges for the longer term.

It is commonly known that tensions can exist within multi-functional teams and between departments within business. This was highlighted in the model of Managers-Designers Polarities, Walker (1990)

Table 1 Managers-Designer Polarities Source Walker (1990)

Characteristics	Managers	Designers
Aims	Long term Profits/ Returns Survival Growth Organisational durability	Short term Product/Service Quality Reform Prestige Career Building
Focus	People Systems	Things Environments
Education	Accountancy Engineering Verbal	Crafts Art Visual

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	Numerical	Geometric
Thinking styles	Serialist Liner Analysis Problem oriented	Holist Lateral Synthesis Solution led
Behaviours	Pessimistic Adaptive	Optimistic Innovative
Culture	Conformity Cautious	Diversity Experimental

Company directors with little/no prior experience or understanding of design can experience these tensions as early an ROI is often expected. Other areas of the business may also be unrealistic in their expectations regarding quick turnaround speeds in individual product development projects. Sales and marketing, in particular, can be highly demanding from an early stage.

Sales departments are inevitably motivated by the need to hit targets, often incentivised by commissions, bonuses, etc. They provide the life blood for any business. However, 'Sales' can also create difficulties in the Knowledge Transfer/Exchange process. In previous Knowledge Transfer projects the academic supervisor had observed Sales Departments greeting the creation of a Design Function with great enthusiasm. 'Design' was seen as providing additional USPs that could be exploited during the sales negotiation process. The unfortunate by-product of this had also been that Sales expected an immediate return from Design, often making promises to customers that,

- the company was not ready to make
- that required very large amount of design time for a sale of marginal financial value
- that offered uncosted changes to products for an agreed price without consideration of the impact on profit margins
- offering new products whose technical solution or viability had not yet been established or proven
- divulging sensitive Intellectual Property (I.P.) information in order to win sales on a product in development too early, thus compromising the ability to later apply for I.P. protection.

Clearly there are reasons for this, not least of which are those characteristics listed by Walker (1990). Departmental pressures exist and it

is useful for the KEI associate to understand and map these differences and motivations. Due to the relatively small size and close nature of this company, an informal approach was taken, but for larger organisations a more formal Motivation Matrix has previously proved helpful in mapping stakeholder responsibilities and interactions. (www.servicedesigntools.org/tools/20)

As had been previously observed, tensions emerged at NYMAS between the fledgling design function and the sales department.

Partly, this was found to be an issue of language and could be attributed to different interpretations of the word "bespoke". Sales also lacked an appreciation of the business impact of offering bespoke products in terms of,

- design and business process,
- development time,
- costing and pricing to ensure acceptable margins were achievable.

At its heart, the significant issue was that sales were overpromising 'fully bespoke' products. Selling a bespoke offering had an understandable appeal to sales staff as it set them clearly apart from competitors in negotiations. However, fully bespoke would not always present the most desirable financial outcome for the company.

In essence, the company was still working in a highly individualistic manner. This had not been a problem when NYMAS had been operating a Selling Concept business orientation. However, as they moved to the Holistic Marketing Concept model, better team working and understanding of the business goals were needed at an operational level. To be clear, the departments continued to work well as individuals, all with significant strengths in their own areas, BUT they were very much focused on their own area of the business. This was a problem that was recognised by the Managing Director. After discussions with the academic supervisor it was decided to conduct a facilitated workshop with key stakeholders in the business. This would enable better understanding of the issues and departmental pressures. In so doing, this would also assist the cultural shift.

A facilitated workshop was arranged by the academic supervisor which was built upon his knowledge and experience of three Design Thinking techniques,

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- Rose, Bud, Thorn
- Traffic Lighting
- Future backwards

‘Rose, Bud, Thorn’ technique is conventionally attributed to members of the Boy Scouts of America who,

...are taught to be thorough, methodical, and analytical about each situation they encounter. In turn, scouts are routinely encouraged to identify one positive experience (Rose), one negative experience (Thorn), and one new goal or insight (Bud). Adapted for use as a design method, this structure provides an opportunity to analyze a set of data or help scope a problem by revealing focus areas, allowing you to plan next steps. (LUMA Inst. 2012)

In innovation practice, Rose, Bud, Thorn has a multitude of applications for evaluating activities, problem spaces and design/service solutions.

‘Traffic Lighting’ is a well worn technique used in business for benchmarking and evaluating: for example - risk, relative success, desirability, etc.

‘Future Backwards’ relates to work undertaken by Kurtz and Snowden (2006), titled "The new dynamics of strategy: Sense-making in a complex and complicated world"

The Future, Backwards method was created to aid in widening the range of perspectives a group of people can take on understanding their past and the possibilities of their future. The entrained perspectives of people within an organisation give them a limited view of the present, and such entrained patterns of past perception can determine its future. (Snowden, retrieved 27 Mar, 2018)

Typically, the above techniques are used as tools to stimulate strategic planning and generate new ideas based on current and past knowledge and judgements.

Present to Future State Workshop

The purpose of this workshop was to modify behaviours which were inhibiting the new design function and cultural shift towards a Holistic Marketing Concept business model.

The workshop sought to,

1. Bring together the stakeholders in the company to discuss the way forward and come to a consensus.
2. Understand a little more about each other's roles and pressures through dialogue.
3. Break down barriers between different business functions, enabling an open conversation to take place
4. Develop a collective impetus to move forward as a team.

In essence, the purpose of the workshop was to unblock the departmental silos that were inhibiting a cultural shift in the company. The proposal was to do this through the examination of the necessary journey from Present to Future State.

The workshop participants were selected by the Managing Director and were,

- Managing Director (who was also acting as company supervisor for the KEI)
- Product Designer (KEI associate)
- Sales Manager
- Brand/Marketing Manager
- Account Executive
- Design Intern
- Academic Supervisor (as workshop facilitator)

The academic supervisor's role was to act as a facilitator to this process. As someone that stood outside the team, the facilitator's role was to impartially pose questions and guide the participants, giving structure to the session and allowing the conversation to be free flowing whilst staying focused.

The Process:

Coloured 'Post-It' style notes and pens were given to all participants. A wall space was used to post, reflect upon and later collate ideas and comments.

Colour coding was used to represent,

- Green (Strengths) – Typical question – What are the things that we do well?
- Yellow (Initiatives) – What are the things that we think we could and should do more of?
- Pink (Problems) – Where are the problems?
- Blue (Solutions) – What are the possible solutions to get us to where we want to be?

The order and wording of the questions was important in order to build trust and openness by easing participants into the more vexing issues.

Round 1 – Questioning:

What are the things that we do well? (What are we good at?)

This allowed each department to highlight and celebrate their achievements, what they bring to the business and their 'value'. This started the conversation with positivity. It was a crucial first step to gain trust in the group and dispel any nervousness. The facilitator role was simply to allow and encourage participants to voice, share and record what they have achieved.

What are the things that we can do more of and expand?

This question was designed to allow participants to begin to air topics that could be improved both within and outside their departments. It opened up the conversation to enable individuals to discuss what might work across business functions, propose ideas, and ask for help. The facilitator role was to guide participants to identify areas where closer working would improve outputs.

Where are the problems? (What are we not good at?)

This question would have been a very thorny one at the start of the conversation and would have doubtless resulted in defensiveness and/or a reluctance to voice concerns. However, posing this question after the second round meant that some issues had already been touched upon. The facilitator role was to ensure that the conversation did not become personal, focusing on the abstraction of the problem as being outside of any

individual/group. Participants were encouraged to link problems to the next question – solutions

What are the possible solutions? (Where do we want to be and how are we going to get there?). By this stage the conversation was free flowing and the facilitator role was to,

- encourage some cyclical revisiting of the subject matter until all contributions had been exhausted.
- Step in to retain focus if the conversation started to drift in purpose
- Ensure that all contributions within the conversation were captured on Post-its and added to the wall.

Regrouping:

The discussion activity was allowed to run its course and naturally draw to a close. At this stage the Post-it notes were grouped by

- Present State (a mix of green, yellow, pink)
- Future State (a mix of largely blue with some green and yellows)

The facilitator then asked the participants to regroup the present state based on areas of common business activity or engagement. The participants were allowed to decide what these categories should be.

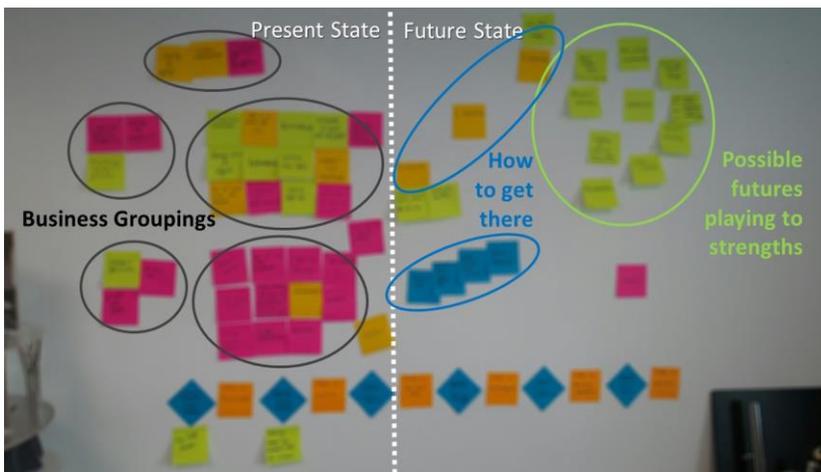


Figure 3. Regrouping of present and future states by business function

The result of this regrouping was that the previously jumbled colours that had emerged during the questioning stage, when grouped by business activity, showed clear and consistent areas of strength and weakness. The specifics of these points cannot be discussed for reasons of commercial sensitivity. However, figure 3 shows the pattern of the regrouping in low resolution format.

This concluding stage of the workshop clearly highlighted areas of commonality in the business and, as can be seen, certain areas had a high propensity to green/yellow whereas other areas of the business had a high propensity towards pink.

Conclusions

The KEI project has been a success in embedding a fledgling Design Function within NYMAS/Fitzroy of London and in establishing a design focused culture. Design Thinking, processes and supporting protocols have been put in place on an operational level.

However, the KEI project exposed issues that are pertinent to companies with limited/no prior experience of design management. The process of embedding design highlighted conflicts caused by departmental pressures and differing motivations that needed to be resolved.

Senior management and operational staff needed to understand the benefits of design integration within the company and how to manage this process. A facilitated, Future State Workshop allowed the company to take ownership of their thinking with regard to how departments should work together in order to move the company forward.

The Future State workshop proved useful in focusing minds on how each department could contribute to a design focused (Holistic Marketing) business model. The timing of the workshop, 6 months into the KEI, presents an interesting question. Should this workshop take place earlier in the process in order to focus minds from the outset? Activities to promote the preparedness of an organisation for change at the start of a KEI would warrant further investigation.

At the end of the workshop, the Managing Director commented that, whilst he had known that there were some problems with certain aspects of their operations, this workshop had very clearly brought to light the compounded sets of issues that existed and which had not previously been fully appreciated. The visualisation of these issues had given food for thought and focused minds on what needed to change.

The workshop was a first step in bringing together more cohesive, cross departmental working. It was effective in visualising and highlighting the problems that had existed. The workshop generated ideas to develop the business and highlighted the need for better cross-departmental working and communication in order to achieve this. There was, subsequently, a new resolve to work together to solve the problems and work towards the identified opportunities that could be achieved through collaborative working.

The Managing Director's assessment of the KEI is,

'The process has been a very interesting learning curve. The embedding of a design function has been a more challenging journey than anticipated due to the differing objectives of team members which has surprised me. The skillsets required for this new function were entirely different to that needed in a primary sales driven organisation with a lot more focus needed on project management than had been previously.

The two main learning points of the KEI are:

1. Giving the time and space necessary for creative development time
2. Keeping the team together by explicitly addressing the differing objectives and keeping all team members focussed on the bigger picture'

Since completion of the KEI, Teesside University and NYMAS have successfully secured funding to support a Knowledge Transfer Partnership (KTP). This two year KTP will focus on front end research to 'embed a bespoke New Product Development function into NYMAS utilising emerging concepts in "design thinking", novel material applications and associated manufacturing methods'.

Details regarding this KTP are commercially sensitive and therefore remain confidential at the present time. It is, however, expected that in due course, further research will stem from the expected new design innovation.

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