Sensemaking the business case: championing low-carbon initiatives

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Abstract: This study discusses owner-managers' sensemaking of the business case for green products and services. How the use of knowledge transfer partnerships, particularly the embedding of an intrapreneur into the small business, contributes to a more successful outcome for all parties. Starting with the evaluation of six selected case studies and the impact that engaging with 'greening' products and services has on the underlying business model, and the significant change that is often demanded of the owner-managers' strategic orientation. The paper presents a contingent framework that links the development of green products and services, owner-managers mindset change to changed business model.

1   Introduction

Small- to medium-sized enterprises (SMEs) are increasingly operating in marketplaces that are uncertain, ambiguous and highly complex (Chaston et al., 2001; Mikkola, 2001), where shorter product life cycles, more fickle customers, and quicker and more adaptable competitors are 'hard' realities of survival. SMEs, like larger organisations, are being pushed into undertaking low-carbon initiatives, acquiring new knowledge and technology from outside their existing networks (Garcia et al., 2003), to stimulate the creation or modification of green customer-valued products, or services.

Burgelman (1984) suggested that individuals, and communities, who are attempting to extend the firms' 'domain of competence' through internally generated innovation, are engaged in 'corporate entrepreneurship'. These internal entrepreneurs, 'intrapreneurs', enact the new opportunities they perceive, or acquire, and drive the development and/or acquisition of new resources or knowledge combinations to stimulate new learning – resulting in new skills, competencies and opportunities. This mobile learning and associated collective actions by the owner-managers and intrapreneurs, thinking and acting both inside and outside the box, prompts a need for sensemaking (Weick, 1995). Sensemaking is the process of constructing a link between future actions and past experiences and outcomes, providing our owner-managers and intrapreneurs with guidelines on when not to act, and how and when to act (Conrad and Poole, 1998). These owner-managers and intrapreneurs actively pursue and create new linkages with external knowledge bases, like universities, research institutions and other innovative communities, and therefore surmount, or augment their current shortfalls, in knowledge and technology, associated with existing restrictive internal mindsets, resources, and skills (Freel, 2000).

These knowledge exchanges require resourcing, often the recruitment of a new intrapreneur, one that will and can challenge the existing business model – the existing rationale for the business operations. The knowledge exchange and newly engaged intrapreneur brings with it a challenge for the existing owner-manager, often the founding entrepreneur. They are often forced to relinquish total control of the business model, and to challenge their underpinning values and belief systems. The collaborative effort between the owner-manager and these new engaged intrapreneurs, is potentially beset with problems, issues and conflicts, one of which is the acknowledgement of these intrapreneurs as 'strategists' (Burgelman, 1984) and the importance of their role in the strategic process of business model change.

Entrepreneurial literature (Burgelman, 1984; Russell, 1999) suggests that 'all entrepreneurial events originate in the creative acts of individuals', but the development of these creative acts needs supporting systems that can provide resources, autonomy and emotional support. These supporting innovation communities or partnerships, share collective sensemaking of their social world (Marshall and Rollinson, 2004), one constructed from their interpretations' of organisational events, innovative outcomes, and the individuals', and others' collective actions. This sensemaking draws from their experiences, and training (Dougherty, 1992), of how to create, develop and deliver superior customer-valued products, and services. These innovative partnerships create thought worlds and interpretative systems relating to their symbolic interactions surrounding say a particular low-carbon initiative (Weick, 2001). These are highly subjective actions and are driven by an agreed set of super-ordinate goals (Sherif, 1975). These goals are key to the objectives of the innovative community, and link the

communities' desired value orientations, and therefore the standards of conduct, or behaviour, expected of participants/partners (Bates and Chen, 2004), with their interpretation of their own enterprises' overall value drivers, and the underlying business model. It is these symbolic interactions, part of the rationale behind the owner-managers' and intrapreneurs' membership of this innovative community, that suggests the potential for cognitive conflict between the owner-manager, and the newly recruited intrapreneur - supported by the academic supervisor.

This paper reports on the research into one particular innovative community consisting of owner-managers, intrapreneurs and academics on low-carbon innovative initiatives supported by Knowledge Transfer Partnerships (KTPs) funded by the Technology Strategy Board (TSB), a UK Government funded non-government organisation, and usually conducted over a six to twenty-four month period. The study focuses on the perceived and desired collaboration of owner-managers, intrapreneurs, mentored by university academics, and the conflicts resulting from their collective sensemaking of the knowledge/technology exchanges associated with developing and delivering a low-carbon product/service. These exchanges result in the need to change the enterprises' business model, and more importantly the owner-managers' mindset business model. The research outcomes should inform academics and practitioners of the difficulties of managing knowledge exchanges and the inevitable impact it has on the collective sensemaking driving business model change.

2 Enterprise and individual's sensemaking

Enterprise research has suggested that individuals, owner-managers and intrapreneurs, analyse the action-outcome relationships associated with specific enterprise processes (actions and outcomes), and then create cognitive maps to link these to their overall sensemaking (Alexander, 2004). These individual cognitive maps ascribe specific interpretations to observed collective actions, enterprise events and innovative outcomes, and it is the reinforcement and modification of these that supports, or amends, their future actions. This sensemaking process has some hierarchy, a taxonomy of sensemaking is presented in Figure 1 (Brown, 2006), see Figure 1.

Figure 1   A taxonomy of sensemaking
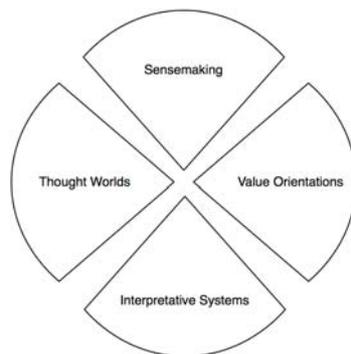
Source: Brown (2006)

The owner-managers' or intrapreneurs' interpretative systems are their internally shared 'systems of meaning' (Dougherty, 1992), and these are used to give meaning to the observed collective actions, their own, and other sub-cultures', organisational events, and innovative outcomes. Dougherty's (1992) research suggested that individuals organise their thinking and actions around this interpretative schema, and that over time these can create major barriers to relationships and collaboration between the individuals, the enterprises' sub-cultures and collaborative partners.

Overlying this are the owner-managers' or intrapreneurs' thought worlds, these reflect both what they know, and how they know, defining unique meanings to the social/business world, based on past experiences, and their professional training. Recent research on business entrepreneurs and their experiences has suggested that beyond a certain level of business experience, type of businesses and functional roles, they will exhibit a dip in their ability and propensity to identify opportunities (Ucbasaran et al. 2009). It is these entrepreneurs' or intrapreneurs' thought worlds that help attribute meaning to their own, and other sub-cultures', position, role and task within the enterprise (Rafiq and Saxon, 2000), especially associated with any innovative initiative (Brown and Frame, 2007).

These owner-managers or intrapreneurs' thought worlds directly influence their value orientations, both how they perceive the social world to work (perceived value orientations), and how they would like it to work (desired value orientations). These value orientations provide a standard of conduct for, their own, and other sub-cultures or individuals within the enterprise, and is the means by which they appraise, judge and criticise their own, and other sub-cultures' collective actions (Smith, 1969). It is this 'hierarchy of meaning' that facilitates their sensemaking of the social/business worlds, creating a coherent world, and one where they can develop mutual expectations associated with any enterprise-wide low-carbon initiative.

Lastly, these low-carbon initiatives often create artefacts, a realisation of assumptions and values of the owner-manager or intrapreneur (Hatch, 1993). The owner-managers', or intrapreneurs' interpretation of the actions and outcomes in the enterprise, and their view of these artefacts as the visible, tangible and audible results of collective actions associated with this innovative initiative (Schein, 2004). The owner-managers' or intrapreneurs' retrospective sensemaking of these artefacts creates symbols, conferring on these action/outcomes additional information and meaning. Hatch (1993) suggested that artefacts must be translated into symbols if they are to be comprehended as culturally significant events by the entire enterprise, and an innovative initiative in the form of a knowledge transfer partnership project is just that. Cohen and Bailey's (1997) definition of symbols alludes to the significance of the subjective meaning attributed by those who use them:

> '..more than merely stand(ing) for or represent(ing) something else.. they also allow those who employ them to supply part of their meaning' [Cohen and Bailey, (1997), p.14]

It is the additional meaning that different individuals confer on these symbols, like a 'KTP', that suggests the importance of symbolic interpretation in shaping owner-managers' or intrapreneurs' interpretative systems, and the thoughts worlds, sensemaking that ultimately result.

Sensemaking then is an integrative process of communicative sharing of relevant information pertaining to the challenge; interpretative act of directing and shaping of that

information; and then interpreting it (Neill et al., 2007). Through this sensemaking activity our individuals close the loop of their understanding and interpretation on action/outcomes differences.

2.1 Owner-managers' and intrapreneurs' strategic orientation

Research in the 70's suggested that problems in enterprises are most often rooted in past decisions rather than any present marketplace dynamics or events (Miles and Snow, 1978; Greiner, 1998; Aragon-Sanchez and Sanchez-Maron, 2005). Research by Miles and Snow presented a typology that linked strategic orientation to those enterprises' evaluation of internal and external environmental factors, and that these triggered changes in their strategic orientations – management style, structural, cultural and process orientated. The research suggested that these strategic orientations result from the owner-managers and the enterprises' analysis of internal and external environmental factors (competitiveness, marketplace uncertainty and ambiguity, market orientation, economic growth) (Sahlman and Haapasalo, 2011). They represent a natural reaction to the owner-managers' thought worlds, his/her habits and perceived opportunities:

1 Defenders – these owner-managers often focused on a narrow or limited product market, creating a niche for themselves where they have subsequently developed a leading position. They fall into a strategy of trying to protect their market share and revenues/profits.

2 Prospectors – these owner-managers often start with a single successful product, but then steadily grow their product/service portfolio by their continuous search for new market opportunities by applying their knowledge and know-how to innovate and develop superior customer-valued products and services.

3 Analysers – these owner-managers can act both defensively or prospectively depending on their analysis of the environmental challenges and the perceived innovation-resources that would be required.

4 Reactors – these owner-managers are characterised by perpetual instability and inconsistency in their strategies, predominantly because of their incapacity to respond effectively to environmental changes.

The real challenge for owner-managers that have stretched most of the value of their original product/market concept is where to go next? They are generally eager to adopt new low-carbon innovative initiatives, developing new product and/or markets where they can leverage their enterprises new found or modified core competencies and experiences. The management of these low-carbon innovative initiatives ultimately falls on two types of individuals and groups within an SME, the owner-manager and the intrapreneur, brought in from the outside to help project manage.

3 Enterprises' business model

There are three factors driving SME success and failure: the effectiveness of the existing business model; the dynamics of business owner-managers' and intrapreneurs' mindsets; and the strategic orientation of the enterprise.

3.1   Business model concept

Business models are a "description of the roles and relationships among a firm's consumers, customers, allies and suppliers that identifies the major flows of product, information, money and major benefits to the participant" [Owens, (2006), p.1]. The components of the business model are the value creation, development and implementation activities if the enterprise. The business model constructs builds on this premise of value delivery by the integrated strategy and positioning of the enterprise's products and services within the network of suppliers, partners and customers (Morris et al., 2005). Owner-managers' business models are often built upon the answers, the understanding arrived, from the following questions:

1   How does the enterprise create value?

2   Who does the enterprise create value for?

3   What is the source of competence?

4   How does the enterprise competitively position themselves?

5   How does the enterprise make money?

6   What are the enterprises time, scope and size ambitions?

The business model, defined by the answers to the six questions above, has to deliver three principal outcomes – it must fit the enterprise and its customer base (current and future), it must be sustainable and it must evolve – to meet uncertainty caused by competition and marketplace forces. The last two of these criteria, for a successful business model, are the key challenges for our owner-managers. Owner-managers look outside their enterprise for ideas of how to drive sustainability into their business model, hence the search for new knowledge, technologies and practices.

The UK business marketplace is more complex than it was 20 years ago, the simple linear model of 'market pull' and 'technology push' are insufficient to both, base a enterprises' strategy on, or induce the critical movement of knowledge and technology throughout the economy (Etzkowitz and Leydesdorff, 2000; Hekkert et al., 2007). At the heart of this knowledge and technology transference revolution are the UK's academic institutions, those same institutions that are heralded as the principal source of future entrepreneurs, innovators and leaders, they also hold the key to national economic development. In the UK the government has spearheaded a tri-partnership between industry, universities and themselves, the scheme the 'KTPs' has been aimed at enterprises needing new knowledge and technology to move their business models onto the next level of growth and development. These KTPs are one mechanism by which the UK government hopes to transform both business and universities, the intention being to:

- establish government/enterprise/university relationships at a strategic level, where all partners are working towards a valued-solution (Anussornnitisarn et al., 2010)

- profit from the exchange – taking that from the individual partners perspective

- that knowledge and outcomes can be flexible and adaptable (Moroz et al., 2010)

- develop further the human capital factor (Ucbasaran et al., 2009) – supporting the concept of a knowledge intensive economy.

Another important impact of the knowledge exchange process is the ability of universities to more successfully engage and demonstrate the value of their knowledge and expertise to the SME sector.

> **Comment [a1]:** Author: Please note that Section 5 was replaced with Section 4. The succeeding sections were renumbered as well.

4   Research aims, objectives and strategy

The research study set out to explore owner-managers' and intrapreneurs' approaches to the evaluation of these low-carbon product/service developments, and the impact they had on the enterprises' business model.

The research questions set for this study were:

1   How does this environmental uncertainty, represented by new low-carbon requirements, impact on the owner-managers' strategic orientation and their openness to engagement in knowledge exchange activities?

2   What is the impact of the new intrapreneurs' mindset to the owner-managers' strategic orientation?

3   What is the impact of the both the environmental uncertainty and new intrapreneurs' mindset on the underlying business model?

4.1   Research strategy

Existing research on the link between owner-managers' mindsets and process-orientated business models is limited. Our research uses a case study approach to help develop our exploratory strategy. The case study approach is in-line with Yin (1989) and Eisenhardt (1989) guidance on using this methodology for early phase theory development. The research design was based on an exploratory strategy collecting data from two sources, using two methods: the first, a literature review; the second, a multi-case study approach analysing six enterprises, over a twelve month period, examining the perceptions of these owner-manager's towards the link between external business opportunities and threats, and changes to their mindset-business model (Yin, 1984).

> **Comment [t2]:** Author: Please confirm the year of publication (whether 1984 or 1989).
>
> Reference entry:
>
> Yin, R. (1984) *Case Study Research*, Sage Publications, Newbury Park, CA.

> **Comment [t3]:** Author: Please provide the full reference or delete from the text if not required.

> **Comment [t4]:** Author: Please confirm the year of publication (whether 1984 or 1989).

During our visits to the enterprises we asked the owner-managers to collect together events since the last meeting that exemplified the current business processes and strategies used. The five questions below were used to open the meetings with the owner-managers, to get them to reflect on how the events have potential changed their mindset towards the sustainability and appropriateness of their business model, and the potential impact of the innovative initiative (KTP project) on their strategic orientation:

1   Describe your existing business model?

2   What type of business opportunities and threats do you face each year?

3   How do these opportunities and threats challenge your existing business model?

4   How do you evaluate these opportunities and threats?

5   What are the critical factors determining a positive outcome?

The six businesses where chosen out of 30 businesses studied over the last five years. Table 1 provides some background information about their operations and characteristics, and initial reasons for undertaking a KTP.

Table 1   Six business case studies

Firm characteristics	Strategy	Management team/style	Market dynamics	Reasons for KTP – knowledge transferred
Enterprise A < 50 employees	Differentiation	Business owner	Regional limited sectors	Diversification – how to conduct new market research, using digital marketing to create sales leads.
Enterprise B < 100 employees	Differentiation	Partnerships (2) designer/sales	European hospitality/ distribution	Improved effectiveness and new markets – understanding of how to create a marketing function, using marketing to build brand equity.
Enterprise C < 50 employees	Cost leadership	Partnership (2) trainer/QA	Regional social care training	Improved effectiveness and new markets – develop skills into using viral marketing via social media, understanding the link between e-mail campaigns and sales lead generation.
Enterprise D < 100 employees	Market entry	Partnership (3) operations/ sales/designer	International safety equipment	New market entry – undertaking market research, developing market entry strategies, building new sales and marketing channels.
Enterprise E < 20 employees	Differentiation	Partnership (2) scientist/ accountant	European pharmaceutical	Market-orientation – using social media to drive website traffic, digital marketing strategies to encourage involvement in Webinars.

Table 1 Six business case studies (continued)

Firm characteristics	Strategy	Management team/ style	Market dynamics	Reasons for KTP – knowledge transferred
Enterprise F 150–200 employees	Diversification	Business manager leadership PLC	European retail technologies	Improved market diversification and product portfolio management – online business development strategies, linking e-mailing campaigns to sales lead generation.

Nvivo software, a Nu*dist type qualitative analysis software package, was used to help conduct the content analysis and then organise, code and provide statistical data on the resulting axial and core codes. A key concern was the validity of the content analysis, therefore considerable weighting was given to the latent sense-making these business entrepreneurs put on their actions and subsequent understanding, rather than just the superficial interpretation of the literal content of the data.

The analysis of the qualitative data is presented in the next section.

5 Findings

5.1 Enterprise A

This enterprise operates in a fragmented medium-value manufacturing sector, servicing its business client with high quality products.

Table 2 Enterprise A entrepreneurial mindset, strategic orientation and business model changes

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Enterprise A Owner-manager	Sector uncertainty – falling sales[1]	Develop new markets and increase share of existing[1]	Reactive[1]	Previous success based on quality of product delivered – not turning into revenue/profit streams?[1]
	How to engage these new customers[2]	Marketing best practice to existing markets[2]	Analyser[2]	Slowly changing value orientations from being process-driven towards being market-oriented[2]

Notes: [1]started
[2]finished

Table 2 Enterprise A entrepreneurial mindset, strategic orientation and business model changes (continued)

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Intrapreneur	Understanding business model[1]	Identify new market sectors[1]	Prospective[1]	Changing business entrepreneurs' mindset model[1]
	Delivering value through tactical marketing plans[2]	Legitimise the changes in market orientation through B2B research[2]	Analyser[2]	Changing business entrepreneurs' mindset model[2]

Notes: [1]started
        [2]finished

At the beginning of the project the business owner-manager, had just taken back control of business development from a senior manager, who then subsequently left. The enterprise had just been through a very demanding eighteen months period where orders had dropped by over a third. Yet through this period the owner-managers had remained active and positive. The nature of the business was both seasonal and non-repeat business, putting a strain on forecasting and developing any sustained relationship with key customers.

At the completion of the project, some fifteen months later, several important outcomes were noted. First, a market development plan was developed, highlighting potential sectors, lists of businesses likely to benefit from the enterprises' services, and strategy to contact and visit them. Interestingly, the intrapreneur very quickly recognised within six months of the project start the importance of linking strategic development with quick win financial gains – especially focusing on the link to sales lead generation. The owner-manager's strategic orientation had changed from 'Reactive' to 'Analyser', but he was still very reticent to change market sectors or delegate more authority to the intrapreneur, as a consequence they left at the completion of the project.

5.2   Enterprise B

The current owner-manager founded this business with another colleague to provide an output for their creative efforts, both were trained as industrial designers. The enterprise had successfully developed retail sales of its products through some leading-name High Street stores, and had also successfully set up a European sales network of small distributors selling into electrical retail outlets and to property developers.

Table 3 Enterprise B entrepreneurial mindset, strategic orientation and business model changes

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Enterprise B Owner-manager	Stagnation in European sales[1]	Develop new markets and increase share of existing[1]	Defender[1]	Quick solutions to market identification and sales inefficiencies[1]
	Managing the European sales network[2]	Understanding how to drive sales efficiencies[2]	Defender[2]	Realisation that the European sales network was not delivering full value[2]
Intrapreneur	Sales and marketing management[1]	Market application knowledge[1]	Prospective[1]	Changing business entrepreneurs' mindset model[1]
	Sales and marketing management[2]	Sales management[2]	Analyser[2]	Changing business entrepreneurs' mindset model[2]

Notes: [1]started
[2]finished

At a chance meeting of small business owners the university first met the owner-manager of this thriving manufacturer, during this meeting they expressed an interest in conducting a project to look at one particular challenge they had. Their sales were predominantly through high street retailers, however this somewhat limited their sales to the domestic market and they were keen to develop further the commercial side. When the project started the owner-manager was very passive in his business development activities, and because of this was unable, or unwilling, to provide firm leadership. Over the previous five years the enterprise had taken a very defensive position in regards to its product development plans and management of its European sales channels.

At the completion of the project, some nine months later, several important outcomes were noted. A tactical marketing plan was generated showing the key territories and applications where growth was possible, and suggested communication strategies to drive this. However, the intrapreneur was unable to directly identify and implement plans that had any quick wins for the business. Since, the owner manager continually wanted to focus on the business/market strategy and not on specific country marketing plans. The owner-managers' strategic orientation had remained unchanged, very unwilling to change his thought worlds on how to drive more revenue/profit from his existing sales channels. Equally unwilling to provide leadership on the search for new opportunities (market and product). During the project increasing conflict arose between the owner-manager, intrapreneur and the university mentor on the project value deliverables, specifically the need to demonstrate the value of the strategic options in generating new customer markets and specifically new channels for distribution.

5.3   Enterprise C

The owner-manager came from the public sector skill training sector, starting a training enterprise, with a close colleague, focused on utilising government funding opportunities for client enterprises to increase the skills and core competencies of their employees.

Table 4   Enterprise C entrepreneurial mindset, strategic orientation and business model changes

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Enterprise C Owner-manager	Growth into other sectors[1]	Develop new markets and increase share of existing[1]	Prospective[1]	New market sectors and needs analysis[1]
	Training market uncertainty[2]	Increasing the value of training provision – accreditation with Universities[2]	Prospective[2]	New market sectors and needs[2]
Intrapreneur	Communication strategies – clients[1]	Sector Needs analysis[1]	Analyser[1]	New market sectors and needs analysis[1]
	Communication strategies – clients/trainers[2]	Alternate home market differentiation strategies[2]	Analyser[2]	New market sectors and needs[2]

Notes: [1]started
         [2]finished

As often the case, the university and owner-manager met at a regular networking event held by the local business link. The enterprise was experiencing a particular uncertain period of less than impressive growth because of marketplace uncertainty and increased competition. The enterprise was looking to expand outside its traditional market sector, and develop a national coverage. When the project started the owner-manager was very active and keen to provide strong leadership through frequent meeting with his trainers and clients. The enterprise had been very aggressive in developing a strong position in both in the social care sector, and as a training provider regionally.

At the completion of the project, some six months later, several important outcomes were noted. A tactical marketing plan was generated showing the market needs for training, pricing strategies and communication strategies. This did generate specific action plans for new market development, and include suggested campaigns for extending the training products portfolio. The owner-managers' strategic orientation had remained unchanged, but his mindset had changed, he was more aware of the importance of aligning his enterprise values to the new demands of the emergent sectors. One major challenge was a difficulty in communicating the legitimisation of these changes to his business partner. Interestingly, the communications between owner-managers and intrapreneur worsened over the duration of the project, they only communicated with each other via e-mails.

5.4 Enterprise D

The enterprise provides contract manufacturing to high-tech electronic manufacturers who need relatively low-volume manufacture, but high-quality and reliable service. The owner-manager was also the person who led the management buy-out (MBO) only eight years previous.

Table 5 Enterprise D entrepreneurial mindset, strategic orientation and business model changes

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Enterprise D Owner-manager	Concept of market[1]	Understanding of the market demands and buyer needs[1]	Reactor[1]	Proof of market and product concept[1]
	Concept of market[2]	Product technology evaluation[2]	Reactor[2]	Some proof of market[2]
Intrapreneur	Concept of market[1]	Understanding of the market demands and buyer needs[1]	Reactor[1]	Proof of market and product concept[1]
	Concept of market[2]	Product technology evaluation[2]	Reactor[2]	Some proof of market[2]

Notes: [1]started
[2]finished

The owner-manager approached the university to look for funding opportunities to evaluate the marketplace for a new product concept. The product idea was a new-market concept, the technology of which had been proven, at least on the lab bench. They were looking for specific knowledge and expertise in a new sector for them, requiring extensive market research and product trials. When the project started the owner-manager was relatively passive, in that the product idea had been 'kicking around' between him and one of his senior partners for over three years. The product idea had been IP protected and released to the sector, and only a few interested parties had responded with a request for trial. The strategy to date had been very reactive, but like market research had been carried out and no resource committed to it.

At the completion of the project, some six months later, several important outcomes were noted. A product trial programme had commenced at two principal sites, a further four where planned around the world. Unfortunately for the intrapreneur the proof of concept of the product and the underlying business model where still relatively untested, no new orders were taken during the entire project period. Marketing materials had been generated from the trial data and detailed pricing and systems specifications had been written for purposes of selling and marketing the product. The owner-manager had not changed his overall uncertainty and riskiness of the project, and therefore was unsure of the business value it could deliver. There was still no firm business model to support the project, and hence the owner-manager was uncommitted to its continued funding. Interestingly, the communications between intrapreneur and owner-manager were good,

however, the relationship between the owner-manager and his joint-partner became strained.

5.5   *Enterprise E*

This enterprise was started by a husband and wife team, who gave up their previous salaried positions to start a new business helping companies to get regulatory approval for their products.

Table 6   Enterprise E entrepreneurial mindset, strategic orientation and business model changes

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Enterprise E Owner-manager	Market development[1]	Understanding of the market demands and buyer needs[1]	Analyser[1]	Increase marketing performance[1]
	Market and product development[2]	Product gaps and software development[2]	Analyser[2]	Increased marketing performance[2]
Intrapreneur	Market development[1]	Understanding of the market demands and buyer needs[1]	Analyser[1]	Marketing communication effectiveness[1]
	Market and product development[2]	Product gaps and software development[2]	Reactor[2]	Increase sales and marketing performance[2]

Notes: [1]started
         [2]finished

Like most of the previous enterprises discussed earlier, the opportunity to work with the university came from a chance meeting at a regional business engagement workshop. The owner-manager, the technical half of the partnership, was looking for specific knowledge and expertise to improve their market position, and to develop partnerships that would provide further opportunities for product/service developments. When the project started the owner-manager was relatively passive in his business development activities, having instead spent much time on developing effective and efficient processes for undertaking the contract work. The key challenge for the business was to get more companies to use their services, to speed-up and electronically submit, for product approval requests. The past strategy to increase awareness of the products and services had limited success.

At the completion of the project, some twenty-four months later, several important outcomes were noted. Generally, sales leads had increased by over 100%, a comprehensive marketing strategy had been developed and the communications part of it had been implemented, with agreed key performance indicators. The owner-manager was a very analytically driven entrepreneur, requiring detailed analysis on any proposal suggested, and a clear indication of the performance expected and the tools to measure this. The owner-manager was willing to initiate change but unable to provide clear leadership on how to research and legitimise this change. Openness between

owner-manager and intrapreneur was evident, and this led to strong mutual understanding, trust and respect for their relative contribution to business model change.

5.6 *Enterprise F*

This enterprise is a very different type of business having been a family run affair for over fifty years. The enterprise was an important system integrator for the retail sector, bringing together products and services to provide solutions that delivered value for its clients, and their customers. The enterprise was split into three separate business units, run by a dedicated and very sales-oriented owner-manager.

Table 7 Enterprise F entrepreneurial mindset, strategic orientation and business model changes

Perceptions of needed business model change	Environmental factors	Prospective business model changes	Strategic orientation	Expected and actual impact
Enterprise F Owner-manager	Integrated product/market development strategy[1]	Understanding of the market demands and buyer needs[1]	Prospector[1]	Integrated marketing and product strategy[1]
	Integrated market and product development[2]	Marketplace/ technology roadmapping[2]	Prospector[2]	Integrated marketing and product strategy[2]
Intrapreneur	Integrated product/market development strategy[1]	Understanding of the market demands and buyer needs[1]	Analyser[1]	Integrated marketing and product strategy[1]
	Integrated market and product development[2]	Marketplace/ technology roadmapping[2]	Analyser[2]	Integrated marketing and product strategy[2]

Notes: [1]started
[2]finished

Interestingly, this enterprise had engaged with the KTP scheme previously when it was looking to improve its operational processes, specifically managing its diverse product and system development projects. When the project started the BM was active in development his business markets, looking for new product opportunities and market developments that would both increase revenue, and profit streams. The key challenge for the businesses was in developing an integrated approach to both the effective management of the product portfolio, and identification and evaluation of market opportunities. The somewhat eclectic nature of previous business development could not be sustained without some rationalisation of the product portfolio and a more analytical approach to market/product sector evaluation and selection.
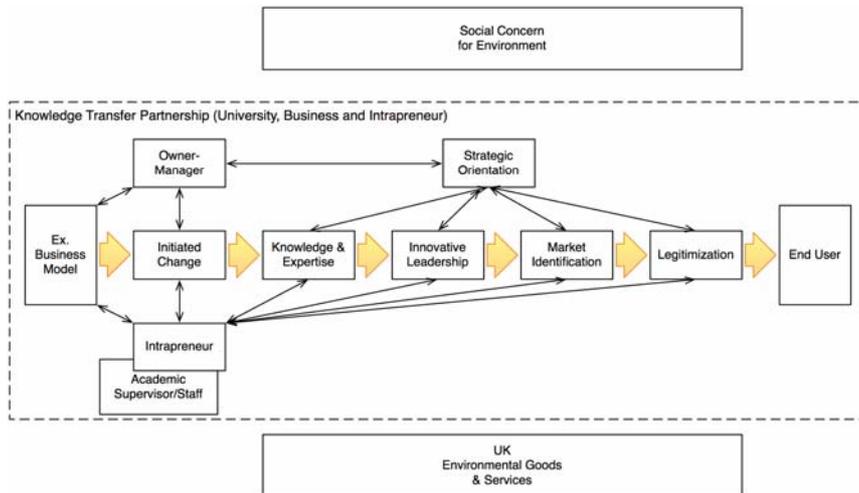
At the completion of the project, some twenty-four months later, several important outcomes were noted. Market and product strategies were integrated, investment in product technologies and development of core skills and competencies was focused, delivering high improved revenue/profit streams. The owner-manager was a prospective entrepreneur, requiring little analysis of a market/product opportunity to actually commit to it, this remained largely unchanged at the end of the project. The owner-manager was quick to initiate changes in the business model, but was weak at legitimising these based

on medium/long term benefits, again unchanged by the end of the project. A healthy relationship was developed between the owner-manager and the intrapreneur, but the relationship was too distant, not enough leadership was provided in more critically evaluating opportunities versus costs. Yet this relationship deteriorated as the project went into the final phase of embedding the strategies into actionable digital marketing campaigns, and thus tying these into future sales lead generation.

6   Conclusions

This paper began by proposing that business model change initiatives, stimulated by KTP schemes and 'low-carbon innovative initiatives' in general, was a systematic approach undertaken by the owner-manager and intrapreneur jointly. Identifying and initiating change in the different areas of the business model, with the help of the newly installed intrapreneur, backed up by his university supervisor, providing support for the owner-manager in legitimising the change, identifying both new business and customer value associated with 'greening' the products and services.

Figure 2   Learning framework of a low-carbon KTP initiative (see online version for colours)

Source: Developed from Noci and Verganti (1999) and Hekkert et al. (2007).

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The author's analysis of the six enterprise case studies identified the challenges that SMEs are facing when attempting to address 'low-carbon innovative initiatives' associated with creating and developing future greener products and services. Interestingly, for our six enterprises the traditional issues common across SMEs, like short-term orientation, scarce resources and poor networking capabilities, were not a determining factor in our owner-managers commitment to the development of green products and services. What was of more concern for the SMEs was the ability to detect the opportunities and threats represented by developing and delivering these low-carbon based products and services into their respective sectors and in developing a business-

wide strategy. The learning framework, see Figure 2 above, emerged from our analysis and observations:

- Initiating change – all of our owner-managers were managing existing enterprises attempting to diversify their business strategy to take advantage of the new low-carbon marketplace. The initial high levels of risk uncertainty resulting from combining the newly acquired technological knowledge, practices and awareness of new markets was tempered by the support given by the KTP. A key element in the potential success of the low-carbon innovative initiative was attributed to the early owner-managers activity and support, particularly the influence and input they have on the business processes.

- Knowledge and expertise – our analysis of our owner-managers and their workforces established their general acceptance of the importance of market & technology knowledge and expertise as the strongest contributor towards their enterprises' competitive advantage. A point supported by other research on the activities of entrepreneurial firms' in uncertain marketplaces (Studdard and Munchus, 2009).

- Innovative leadership – the recruitment of the nascent intrapreneur was heralded by all owner-managers as one of the key elements associated with the success of the KE scheme. The primary reason cited was the additional leadership provided by these individuals within the enterprise to drive innovation, and particularly to challenge the existing status quo within the enterprises existing business model.

- Market identification – our analysis of these three case studies and other enterprises previously engaged in knowledge exchange activities with the university has identified the relative myopic nature of our owner-managers knowledge of his current and future low-carbon product based marketplace. With the help of the academics mentoring of the owner-managers, and importantly the nascent intrapreneurs, all of the enterprises have been able to more accurately identify and target new low-carbon product-related markets, enabling the enterprises to develop new previously untapped revenue streams, and importantly create more sustainable competitive advantages over their current competitors.

- Legitimisation – probably one of the key challenges for our owner-managers in getting approval of, commitment to and overall agreement from all the other enterprise employees was the legitimisation for the change. Many of our owner-managers had great difficulty with convincing other senior colleagues and the workforce in general of the benefits of adopting and disseminating low carbon initiatives both in the enterprises processes, and importantly embedding it into future products and services. The knowledge exchange scheme provided the detailed evidence relating to both financial and non-financial impact on the overall business model.

- Strategic orientation - interestingly most of our case study enterprises started out as having a *re-active strategy* towards 'green issues', adopting a minimum compliance approach to regulations and sector-wide green initiatives. By the very fact that they engaged with the KTP already had changed the owner-managers perspective of seeing the low-carbon initiative as a future competitive advantage. Effectively these owner-managers adopted an analyser strategy of evaluating the benefits and costs of being an 'early mover'. Some of the enterprises went further by adopting a

prospector strategy, taking on new low-carbon technologies that would deliver more radical improvements in their product and services environmental performance.

This paper presents a first step in understanding and interpreting the owner-managers development of a learning framework to assist in the implications of pushing through 'low-carbon innovative initiatives' into their enterprises' products and services. Our research also highlights the strong role of our new intrapreneurs in pushing these low-carbon innovations into the enterprise, they have effectively become their innovation champions, linking outside knowledge and expertise with internal needs, an important role noted in previous research (Coakes and Smith, 2007). Our six business case studies suggest that owner-managers management of the business model changes are significantly influence by three factors: the life cycle the enterprise is currently in; the business type; and lastly the marketplace dynamics. Interestingly the two businesses that are in their five years of operation are the most dynamic and proactive in their strategies and business model changes, and in their openness to assimilating knowledge and experience from outside sources. Equally business type, especially those in product manufacturing are less open to more radical innovation, most likely to be attributable to enterprise culture and reluctance to make large capital investments in uncertain markets. Which brings us to look at marketplace dynamics, the uncertain in most of the enterprise markets has focused our owner-managers on assessing risks, those that are reluctant to change see risks as threats, however those that more open to change see some of this risks as opportunities.

Though our research sample is small, we have been able to undertake a very in-depth analysis of the changes experienced by these owner-managers and the intrapreneurs in engaging in these low-carbon driven KTPs. Previous SME research (Sharifi and Zhang, 2009) has identified the important link between sensemaking and knowledge and particularly the networking and external linkages to outside sources of knowledge, yet has provide only general links to specific processes associated with the business model. For the academic practitioner involved in these type of knowledge exchange schemes, then the advice is simple: understand the owner-managers mindset business model, manage their expectations of the project deliverables and lastly, always look for quick-wins on showing the value of the knowledge and expertise newly embedded.

7   Future direction for research

This study focused on enterprises that had already engaged in a KTP, who largely through the inflexibility or flexibility of either the entrepreneurs' mindset or the evolved business model experience a degree of success/benefit from the programme. Even across our limited sample set, the authors could draw some commonality of findings. We identified that those owner-managers who could both articulate their business model in a fashion that acknowledge risks and opportunities did have a more prospector type approach to future business development. The fact that they are already engaged in knowledge exchange shows at least their interest in searching for new knowledge and expertise that will help them understand and interpret the future challenges to their business model. Our identification of the three factors: business life cycle, business type and marketplace dynamics; does show that the challenges owner-managers face in changing their mindset business model are not entirely based on their own personality

traits. Future research on studying the effectiveness of knowledge exchange schemes between higher educational institution's (HEIs) and SMEs, should both further investigate the values and attitudes of owner-managers, and the environmental drivers on their enterprises too. Most owner-managers are wary of coming to HEI's because of the perception of universities as ivory towers future research should also study the perceived business value (financial and non-financial) from engaging in these mentoring and coaching type projects?

In our particular study, we should have included other enterprises who had not engaged in such programmes, but who had sought external help/mentoring from other sources (like through the traditional government funded support services (GFSS). Ideally, such a study should include longitudinal data to examine entrepreneurs' mindsets, their strategic orientations and business model changes over the entire project duration.

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