Disruptive Innovation:
Removing the Innovators' Dilemma.

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Abstract.

The objectives of this research are to co-create understanding and knowledge on the phenomenon of disruptive innovation in order to provide pragmatic clarity on the term's meaning, impact and implications. This will address the academic audience's gap in knowledge and provide help to practitioners wanting to understand how disruptive innovation can be fostered as part of a major competitive strategy. This paper reports on the first eighteen months of a three year academic and industrial investigation. It presents a new pragmatic definition drawn from the literature and an overview of the conceptual framework for disruptive innovation that was co-created via the collaborative efforts of academia and industry. The barriers to disruptive innovation are presented and a best practice case study of how one company is overcoming these barriers is described. The remainder of the research, which is supported by a European Commission co-sponsored project called Disrupt-it, will focus on developing and validating tools to help overcome these barriers.

1.0. Introduction and Background.

In his ground breaking book "The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail", Clayton Christensen first coined the phrase 'disruptive technologies'. He showed that time and again almost all the organisations that have 'died' or been displaced from their industries because of a new paradigm of customer offering could see the disruption coming but did nothing until it was too late (Christensen, 1997). They assess the new approaches or technologies and frame them as either deficient or as an unlikely threat - much to the managers' regret and the organisation's demise (Christensen 2002).

In the early 1990s, major airlines such as British Airways decided that the opportunities afforded by a low-cost, point-to point no frills strategy such as that introduced by the newly formed Ryanair was an unlikely threat. By the mid-1990's other newcomers such as easyJet had embraced Ryanair's foresight and before long, the 'low cost' approach had captured a large segment of the market. Low-cost no frills proved a hit with European travellers but not with the established airlines who had either ignored the threat or failed to capitalise on the approach. Today DVD technology and Charles Schwab are seen to be having a similar impact upon the VHS industry and Merrill Lynch respectively, however, disruption is not just a recent phenomenon - it has firm foundations as a trend in the past that will also inevitably occur in the future. Examples of past disruptive innovations would include the introduction of the telegraph and its impact upon businesses like Pony Express and the transistor's impact upon the companies that produced cathode ray tubes. Future predictions include the impact of Light Emitting Diode' (L.E.D.) technology and its potential to completely disrupt the traditional light bulb sector and its supporting industries.

More optimistically, Christensen (2002) further shows that the process of disruptive innovation has been one of the fundamental causal mechanisms through which access to life improving products and services has been increased and the basis on which long term organisational survival could be ensured (Christensen, 1997).

In spite of the proclaimed importance of disruptive innovation and the ever increasing interest from both the business and academic press alike, there still appears to be a disparity between rhetoric and reality. To date, the multifaceted and interrelated issues of disruptive innovation have not been investigated in depth. The phenomenon with examples has been described by a number of authors (Christensen, 1997, Moore, 1995 Gilbert and Bower, 2002) and practitioner orientated writers have begun to offer strategies for responding to disruptive

change (Charitou and Markides, 2003, Rigby and Corbett, 2002, Rafi and Kampas, 2002). However, a deep integrated understanding of the entire subject is missing. In particular, there is an industrial need and academic gap knowledge in the pragmatic comprehension of how organisations can understand and foster disruptive innovation as part of a major competitive strategy.

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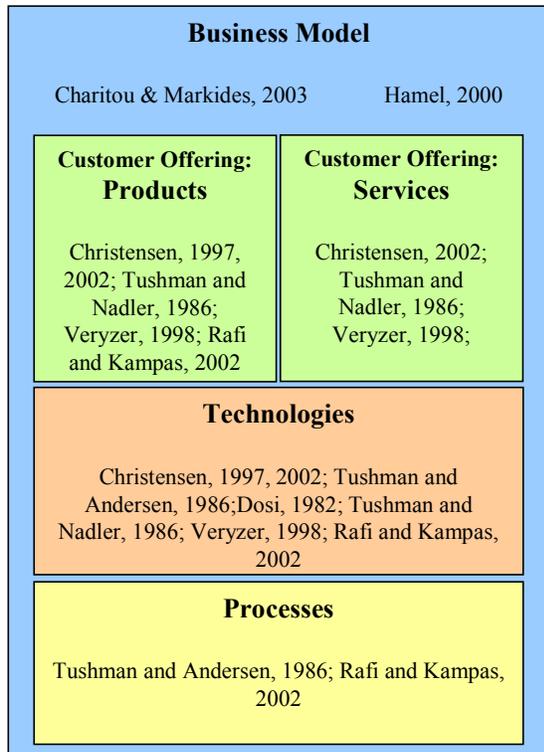
2.0 Understanding the Phenomenon of Disruptive Innovation.

'Disruptive Innovation', 'Disruptive Technologies' and 'Disruptive Business Strategies' are emerging and increasingly prominent business terms that are used to describe a form of revolutionary change. They are receiving ever more academic and industrial attention, yet these terms are still poorly defined and not well understood. A key objective of this research is to improve the understanding of disruptive innovation by drawing together multiple perspectives on the topic, as shown in Figure 1, into a more holistic and comprehensive definition.

Much of the past investigation into discontinuous and disruptive innovation has been path dependent upon the researchers' investigative history. For example, Hamel's strategy background leads him to see disruptive innovation through the lens of the 'business model'; whereas Christensen's technologically orientated past leads to a focus on 'disruptive technologies'. What many researchers share is the view that firms need to periodically engage in the process of revolutionary change for long-term survival and this is not a new

phenomenon (Christensen, 1997; Christensen and Rosenbloom, 1995; Hamel, 2000; Schumpeter, 1975, Tushman and Anderson, 1986; Tushman and Nadler, 1986, Gilbert and Bower, 2002; Rigby and Corbett, 2002; Charitou and Markides, 2003; Foster and Kaplan, 2001; Thomond and Lettice, 2002).

Disruptive innovation has also been defined as "a technology, product or process that creeps up from below an existing business and threatens to displace it. Typically, the disrupter offers lower performance and less functionality… The product or process is good enough for a meaningful number of customers – indeed some don't buy the older version's higher functionality and welcome the disruption's simplicity. And gradually, the new product or process improves to the point where it displaces the incumbent."

Figure 1: Multiple perspectives on disruptive innovation

(Rafi and Kampas p 8, 2002). This definition borrows heavily from the work of Christensen (1997), which in turn has some of its origins in the findings of Dosi (1982). For example, each of the cases of disruptive innovation mentioned thus far represents a new paradigm of customer offering. Dosi (1982) claims that these can be represented as discontinuities in trajectories of progress as defined within earlier paradigms - where a technological paradigm is a pattern of solutions for selected technological problems. In fact, new paradigms redefine the future meaning of progress and a new class of problems becomes the target of normal incremental innovation (Dosi, 1982). Therefore, disruptive innovations appear to typify a particular type of 'discontinuous innovation' (a term which has received much more academic attention). The same characteristics are found, except that disruptive innovations first establish their commercial footing in new or simple market niches by enabling customers to do things that only specialists could do before (e.g. low cost European airlines are opening up air travel to thousands that did not fly before) and that these new offerings, through a period of exploitation, migrate upmarket and eventually redefine the paradigms and value propositions on which the existing industry is based (Christensen, 1997, 2002; Moore, 1995;

Rigby and Corbett, 2002). Consequently, the incumbent's traditional offering is left in a prime position for collapse.

With a focus on new technologies and products, Christensen (1997) illustrates the dilemma faced by established organisations when practitioners' decisions to ignore technologies that do not appear to address their customers' needs become fatal when two paradigmatic trajectories of progress interact. His model (Figure 2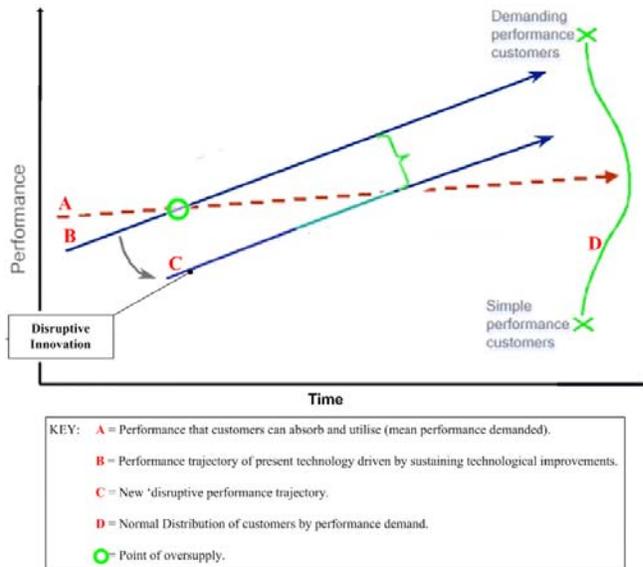) shows that as the performance demanded by the customers of an existing market increases over time so does the performance provided within a technological paradigm. Quite often the performance improvement provided has a different trajectory to the trajectory of performance improvement demanded by the customers. When the trajectory slopes differ, and performance provided exceeds performance demanded, new technologies that were only performance-competitive in remote market niches may migrate into other customer networks. This provides innovators with a vehicle to new customers, who would have previously viewed their offerings as substandard; and enables them to offer established mainstream markets a new set of performance value attributes that are now more relevant than the current paradigm.

Figure 2: Intersecting trajectories of: performance demanded vs. performance supplied (adapted from Christensen 1997)

Christensen's comprehensive model can be further enriched by considering the work of other authors researching terms such as 'discontinuous', 'revolutionary', 'non-linear' and 'highly-radical' innovation. For example, also analysing the emergence and impact of discontinuities, Veryzer (1998) states that the perceived value attributes of a product or service are critical to discontinuous innovation, the same would also seem to be the case with disruptive innovations, and he illustrates that organisations can deliver three types of discontinuity (Figure 3) - each requiring a different management approach. Likewise, in

Figure 3: Types of discontinuous innovation performance supplied (adapted from Veryzer, 1998)

considering processes and technologies, Tushman and Anderson (1986) identify two main types of discontinuity: 'competence enhancing' and 'competence destroying' – the latter baring a strong resemblance to disruptive innovation. Tushman and Nadler (1986) conclude that all 'Highly Radical Innovations' involve the application of significant new technologies, or significant new combinations of technologies, to new market opportunities, giving rise to new products or services.
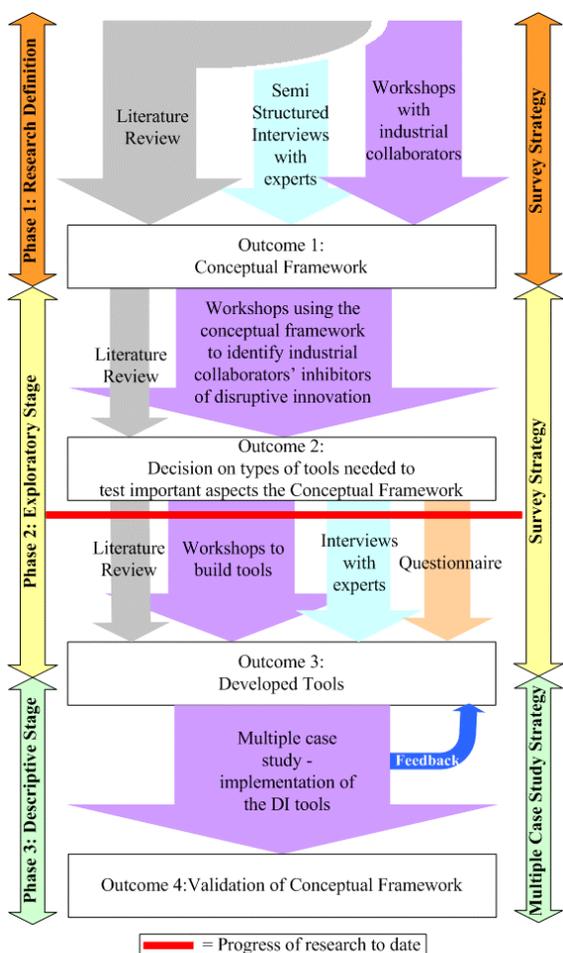
Hamel (2000) states that organisations can attempt to disrupt industries with processes, technologies, products or services but the real economic value of 'Non-Linear' innovation is only unlocked when the larger system, or the 'Business Model', is factored into the disruption and 'business concept innovation' occurs. In an attempt to integrate these multiple perspectives and offer a more holistic definition, it is proposed that *incremental and radical innovations improve customer offerings and organisations along dimensions that have been historically valued. In stark contrast, 'Disruptive Innovations' are successfully exploited processes, technologies, products, services or business models that allow organisations to significantly change conventional competitive rules, thus transforming the demands and needs of existing markets. New performance dimensions are introduced in direct conflict with traditional approaches, which historically could have only been offered by specialists, to enable a larger population of customers to consume products and services in a more convenient setting. The disruption takes a foothold in an underserved customer segment (or with those who choose non-purchase as an alternative) and both the path and resource dependence of incumbent organisations result in their displacement as a major player, thus offering the disrupter significant new wealth opportunities.*

This definition highlights that the consequences of not securing disruptive innovations are far more devastating than simply lost opportunities or lost market share (Gilbert and Bower, 2002; Hamel, 2000; Rice et al., 2001) - disruption signals the end of industries as we know them (Christensen, 1997, Foster and Kaplan, 2001). Furthermore, historical evidence shows that a consistent pattern in business is the failure of leading companies to stay at the top of their industries when technologies or markets change (Christensen, 1995). What makes them successful today could be their downfall tomorrow, especially in an increasingly global, turbulent and discontinuous world. It is therefore the aim of this research to provide both an academically robust and practically relevant investigation into organisations' ability to foster disruptive innovation as a major competitive strategy.

3.0 Research Design.

There is a complex, challenging and sometimes problematic relationship between management practice and the practice of management research (Stewart et al., 2002). In fact, there is a perception that a push for industrial relevance in management research has negative consequences for academic rigour and vice versa (Tranfield, 2002, Hill et al., 1999); consequently, Hill et al. (1999) and Huff (2000), along with others from the British Academy of Management (e.g. Tranfield and Starkey, 1998) elevated the concept of 'Mode 2' research to the fore of management inquiry. The Mode 2 approach offers researchers an opportunity to simultaneously seek relevance without sacrificing rigour.

At the onset of the current research the authors were faced by the simultaneous appearance of four features, which typify the Mode 2 approach to research (Stewart et al., 2000). Firstly, the research problem 'how can organisations understand and foster disruptive innovation' was framed in the context of application. Secondly, a heterogeneous group of both academics (from two European universities) and practitioners (from a medium sized French manufacturing company, a global Swedish financial services organisation, a medium sized Spanish design consultancy, a small Israeli research/management consultancy and a national Israeli manufacturing organisation) were engaged in the investigation of disruptive innovation, using a trans-disciplinary approach. Thirdly, the group had a socially-distributed research capability; and fourthly, theory-building and application were combining in the co-production of new knowledge. A three phase approach with four key outcomes form the basis of the research design (figure 4). To date the first two outcomes (the development of a conceptual framework and a decision on the

Figure 4: Research design

types of tools that can be used to test the validity of the framework) have been achieved and will therefore be the focus of the remainder of the current paper.

A survey strategy was employed for the co-creation and development of a conceptual framework for disruptive innovation. The conceptual framework that emerged from an extensive literature review, 7 semi-structured interviews with 'innovation experts' and 4 two-day workshops with 5 industrial collaborators, benefited all of its co-creators. The framework contributes to the holistic academic understanding of disruptive innovation in the context of the larger agenda of innovation strategy, whilst simultaneously adding value to the practitioner audience by explaining the multifaceted and interrelated features of disruptive innovation in a pragmatic and understandable manner. The importance of the conceptual framework is further extended by the nature of the Mode 2 research design as it is "...characterised by a constant flow back and forth between ... the theoretical and the practical... discovery occurs in contexts where knowledge is developed and put to use, while results, which would have been traditionally characterised as applied - fuel further theoretical advances" (Gibbons et al., p9, 1994). The conceptual framework surfaced further major benefits. For example, the graphical and conceptual synthesis of a holistic understanding of the topic, led to the development of a common language that encouraged feedback and two-way connections between the academic and industrial communities. Prior to commencing the research, it was acknowledged that limited time resources available may make testing the validity of the whole conceptual framework for disruptive innovation in the context of application an unfeasible task. A focused approach to testing some of the parts of the conceptual model has therefore been taken.

The conceptual framework was used in the first part of the second phase of the research and formed the basis of 2 three-day workshops with 5 industrial collaborators and 2 research centres. The use of the framework in the workshops generated a wealth of qualitative data that allowed the shared understanding and experiences of the participants to be extrapolated and captured. A key input to the workshops were barriers to disruptive innovation, as identified in the literature (and illustrated in Figure 5). An outcome of the workshops was the prioritisation of these barriers to disruptive innovation, as faced by each of the industrial collaborators in the context of their organisation and innovation processes.

The output of the ranking process provided the authors and the rest of the research team with the specific areas of the conceptual framework that would become the subject of further in-

depth investigation, tool development and validation within the context of understanding and fostering disruptive innovation as a competitive strategy.

4.0 A Conceptual Framework for Disruptive Innovation

The conceptual framework developed during this research is pictured below. It is composed of 4 key modules: opportunity recognition, opportunity development, solution development and exploitation. These modules are supported by the organisation's innovation strategy and human resources. All of these elements continuously interact with the market and external environment in which the organisation operates. If these elements are effectively managed, it is believed that disruptive innovation can be encouraged.

Market and External Environment

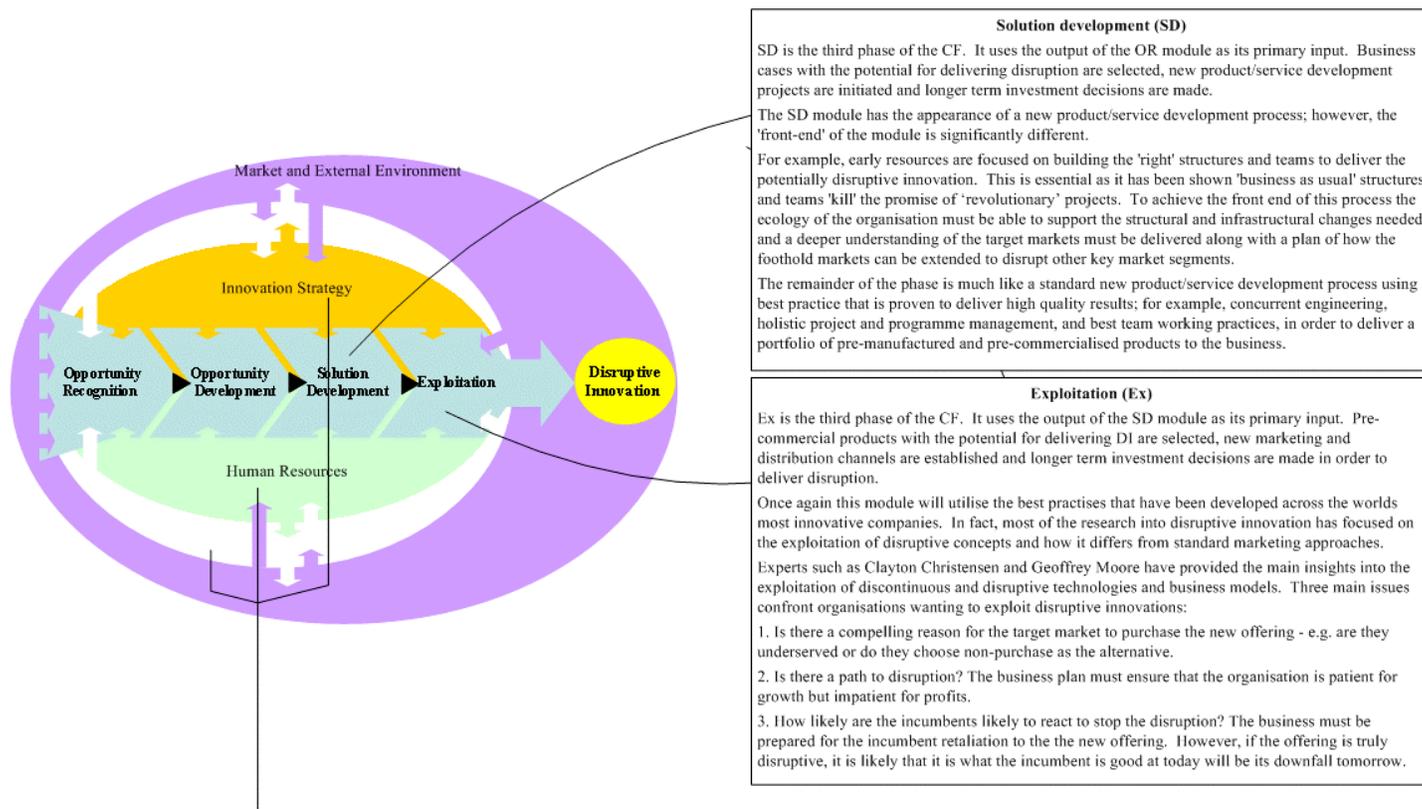**Innovation Strategy**

Opportunity Recognition → Opportunity Development → Solution Development → Exploitation → **Disruptive Innovation**

Human Resources

NB:
Following the analysis of the data from the workshops and interviews and the extensive literature review, it was concluded that disruptive innovation can be fostered through the management of seven core components, or modules, and an understanding of how these interact with each other, the external markets and the external environment.

Opportunity recognition (OR)

OR is the first phase of the CF. The OR module uses a variety of stimuli to generate ideas and a number of processes to convert ideas into recognised opportunities. Stimuli are gathered through three approaches:

1. By 'futurising' or thinking about possible future scenarios.

2. By reflecting on the past.

3. By scanning or sensing the current environment, both external and internal to the organisation.

The function of the OR module is to is to use these stimuli to develop ideas and to convert ideas into opportunities, thus providing an organisation with a portfolio of opportunities that have the potential to become highly radical or disruptive innovations in the future.

Of particular importance to delivering the function of the OR module is the process of matching ideas generated, from futurising, reflecting and scanning with the external environment and the organisational ecology, to potential market opportunities and market segments.

Opportunity development (OD)

OD is the second phase of the CF. It uses the output of the OR module as its primary input and further develops the insights and promise of the opportunities that have been identified to have the potential for disruption.

The function of the OD module is to provide an organisation with a portfolio of credible, high value business cases with the potential for delivering a disruptive innovation. The organisation can assess risk and make investment decisions. To achieve this function, the OD module selects potentially disruptive opportunities, identified by the OR module, and provides the nurturing organisational ecology needed so that selected options can be developed in to valid commercial opportunities.

Three key issues are highly critical to the development of the Disruptive Innovation business cases:

1. Plans of how the organisation can structure itself and manipulate its ecology to deliver and commercialise Disruptive Innovation (e.g. as a spin-off, in collaboration with partner organisations or with venture capitalists)

2. Special attention should be paid to the target markets and the 'path to disruption' - disruption will only come by targeting an underserved niche or from customers choosing non-purchase as the alternative.

3. The organisation must have a adaptive and flexible funding mechanisms in place that will support and allocate resources to disruptive innovation alongside incremental innovation.

Solution development (SD)

SD is the third phase of the CF. It uses the output of the OR module as its primary input. Business cases with the potential for delivering disruption are selected, new product/service development projects are initiated and longer term investment decisions are made.

The SD module has the appearance of a new product/service development process; however, the 'front-end' of the module is significantly different.

For example, early resources are focused on building the 'right' structures and teams to deliver the potentially disruptive innovation. This is essential as it has been shown 'business as usual' structures and teams 'kill' the promise of 'revolutionary' projects. To achieve the front end of this process the ecology of the organisation must be able to support the structural and infrastructural changes needed and a deeper understanding of the target markets must be delivered along with a plan of how the foothold markets can be extended to disrupt other key market segments.

The remainder of the phase is much like a standard new product/service development process using best practice that is proven to deliver high quality results; for example, concurrent engineering, holistic project and programme management, and best team working practices, in order to deliver a portfolio of pre-manufactured and pre-commercialised products to the business.

Exploitation (Ex)

Ex is the third phase of the CF. It uses the output of the SD module as its primary input. Pre-commercial products with the potential for delivering DI are selected, new marketing and distribution channels are established and longer term investment decisions are made in order to deliver disruption.

Once again this module will utilise the best practises that have been developed across the worlds most innovative companies. In fact, most of the research into disruptive innovation has focused on the exploitation of disruptive concepts and how it differs from standard marketing approaches.

Experts such as Clayton Christensen and Geoffrey Moore have provided the main insights into the exploitation of discontinuous and disruptive technologies and business models. Three main issues confront organisations wanting to exploit disruptive innovations:

1. Is there a compelling reason for the target market to purchase the new offering - e.g. are they underserved or do they choose non-purchase as the alternative.

2. Is there a path to disruption? The business plan must ensure that the organisation is patient for growth but impatient for profits.

3. How likely are the incumbents likely to react to stop the disruption? The business must be prepared for the incumbent retaliation to the the new offering. However, if the offering is truly disruptive, it is likely that it is what the incumbent is good at today will be its downfall tomorrow.

Supporting components

The CF proposes a model of four modules which practitioners can manage in order to foster and exploit disruptive innovation as a major competitive strategy. However, there are a number of supporting components that must be understood:

- *Innovation Strategy (IS):*

Disruptive innovation cannot be delivered without the support of an IS. For example, within the OR module the IS has to generate a "call to arms" that encourages employees to generate ideas and the IS has to provides a language in which opportunities can be communicated throughout the business. In order to deliver the OD module the IS has to be able to support the funding decisions needed to initiate and deliver potentially disruptive projects; it has to support the exploration of unfamiliar markets and it has to be able to generate an ecology that is willing to think about support and aim for disruption etc.

- *Human Resource Management:*

Disruptive innovations cannot be delivered without the support of the employees. Practitioners must ensure that all key staff (including those with the "purse strings" and the "green lights" are aware of the decision to foster disruption and its importance to corporate survival.

- *Organisational Ecology:*

An organisation's 'ecology' (its culture, its physical environment and its infrastructure) must be permeable to the external environment, whilst also encouraging the transfer of knowledge and business intelligence throughout the innovation process in order to deliver disruptive innovation. Customers cannot be expected to think the unthinkable, therefore there must be a culture, which is supported by appropriate mechanisms, that is thirsty for the challenge of disruption.

5.0 Barriers to Disruptive Innovation - A Case Study

Two senior members from each of the industrial collaborators took part in a three day workshop, facilitated by the corresponding author. They were asked to consider how effectively their organisations managed each of the key components of the conceptual framework in relation to innovation and disruptive innovation. The output of the workshop along with the cases, literature survey and expert interviews revealed that organisations face a number of key barriers in pursuing disruption (Figure 5). In an attempt to further understand these inhibitors, to discover whether these barriers were equal in magnitude, dependent upon one another etc., the same collaborators, in a subsequent workshop, were asked to describe in

detail how their organisations were inhibited by these factors and if it was possible to prioritise them or to show any linkages etc. The surprising outcome of the exercise was that all five organisations, almost without hesitation, independently highlighted the same 'top four barriers to fostering disruption':
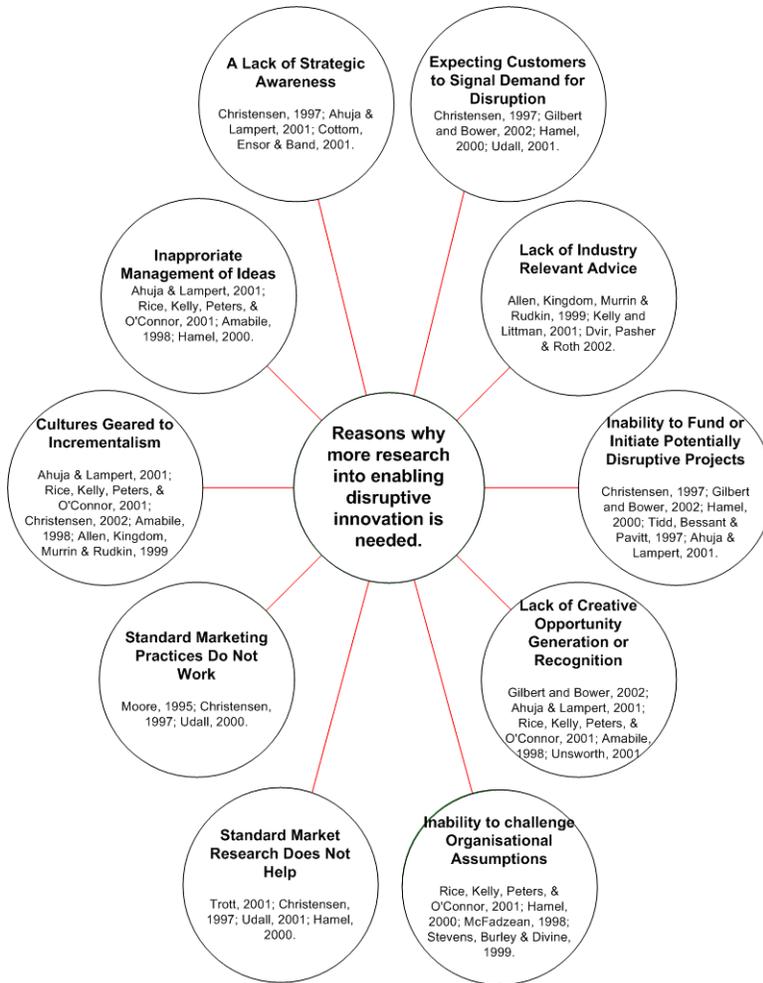

Figure 9: A multiple method research approach revealed key barriers to an organisations ability to foster disruption.

(1) a lack of strategic awareness, (2) a lack of creative opportunity generation or recognition, (3) an inability to fund the initiation of potentially disruptive ideas and (4) the inappropriate management of ideas leads to radical and potentially disruptive concepts being ignored, killed or not vocalised.

Case studies of 'best practice' approaches to disruptive innovation on companies such as IDEO, Sony, amazon.com and Vodafone were conducted to investigate how such companies had overcome these barriers. The Vodafone

case study is presented in this paper to illustrate how one company tackles these issues. Vodafone Pilotentwicklung GmbH (v-pe) is part of Vodafone Group Research and Development. It is responsible for developing new technologies and applications for mobile technologies for clients within the Vodafone group. Consequently, v-pe has to deal with new technologies that are not yet developed, with customers who do not yet know their future needs and with market players who compete for technological standards and intellectual property rights. Thus v-pe deals with potentially disruptive technological innovations as a

major part of its daily activity and can be considered as a best practice example of an organisation that seeks to actively foster the phenomenon of disruptive innovation[1].

5.2.1 The strategic importance of disruptive innovation.

Vodafone recognises the strategic importance of disruptive innovation and actively seeks to identify potentially disruptive innovations as early as possible in order to enable strategic responses. If a potentially disruptive innovation arises and it does not fit to the stated strategy, v-pe develops the necessary steps to adapt and realign the group technology strategy – thus Vodafone is not an organisation defined by its current customer offerings.

A number of techniques are used to enable v-pe to adopt the results of technology monitoring, market intelligence and product development into strategic alignment. An exemplar of these techniques can be seen in the 'v-pe academy'. The academy is a bi-weekly forum in which employees, students and external partners present and discuss results of their projects, thesis projects and other interesting topics around their daily work. Presentations and the resultant discussions are facilitated by a neutral moderator. The academy allows stakeholders to partake in the internal giving and receiving of information thus acting as an enabler of information logistics and knowledge flows. The information from the academy provides channels for v-pe to influence the owners of group strategy in an ever changing discontinuous world.

5.2.2 Generating disruptive ideas.

V-pe recognises the failure of many organisations to generate and support potentially disruptive ideas. The 'ide[e]fix forum' is an example of a process that v-pe has dedicated to new ideas and future trends and possibilities of disruption; its objective is to develop shared ideas or fragments of ideas that could be used in later projects or that could be developed and worked into full project proposals. It is held every four to six weeks and invites employees to present insights and ideas. Presenters thus have the opportunity to find promoters and to elicit ideas and feedback from outside of their normal working network. Ideas are collected and those considered as strategically interesting are presented to the business management.

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[1] the tools and techniques presented in this case example were developed within the project UNIKAT, funded by the German Ministry of Education and Research, the programme "Research for the Production of tomorrow". The measures are described in detail in: Hipp, C; Herzberg, T (2003): "Mit strukturierter Kommunikation die Potenziale möglicher Zukunftsfelder erschließen –Visionen der Vodafone Pilotentwicklung", in: Kohlgrüber, M., Schnauffer, H.-G., Jäger, D. (Eds.): "das einzigartige Unternehmen –mit dem Potenzialscanner strategische Wettbewerbsvorteile entdecke", Berlin, Springer, pp. 81-94

Therefore, ide[e]fix is not only a forum for idea generation, it also acts as a link to strategic decision making. A responsive project or a disruptive innovation can be placed in this forum to be adapted to strategy. Discussing ideas is not the only purpose of this forum: one objective is also to create new ideas. This is done within creativity sessions in which societal and technological trends are combined to new project ideas. Together with a no-doors architecture and a creative and open culture the generation of potentially disruptive ideas is supported.

5.2.3 Transparency of funding routines and managing the new product development process.

The decision to fund ideas is based on attractiveness and fit to strategy. Dedicated to maintaining transparent funding decisions, v-pe uses a tool that they call 'business plan light'. The tool helps employees to further develop their ideas and present them in one step. A detailed checklist of necessary and relevant information combined with a description of the process from an idea to a project proposal helps idea generators to discuss and prepare ideas before they can be evaluated for funding decisions. Ideas that have been presented but not yet considered as mature enough to be worked out as a project proposal are stored in a database, available for every employee.

V-pe is primarily involved at the front end of the new product development process. It is the role of v-pe to prove the validity of new concepts with prototypes and demonstrators and then local Vodafone operations take over the responsibility for their continued development and application. For this reason they use the policy that creativity consists of two components: originality and adequacy. They believe that no creative idea can be developed to a successful innovation if it does not have the adequacy to fit a market. In these terms, v-pe is aware that the adequacy of potentially disruptive innovations is often not visible on first sight, which makes it harder to identify a disruptive idea as a good idea. Therefore, v-pe not only supports the creativity of its employees but acts to ensure adequacy at all times. This is done by equipping the employees with a number of tools. A method toolbox has been developed. It is possible for every employee to 'rummage' in this box, on-line and on paper, to find the 'right' method for the 'right' time. The toolbox provides creativity, analysis, future research techniques and business planning methods. Employees are, therefore, supported in the process of combining future market needs and new technologies to create new product concepts and to develop ideas into planned project proposals.

6.0 Conclusions and Next Steps.

The research to date has delivered a more comprehensive definition of the term 'disruptive innovation'. In collaboration with practitioners the authors have used the definition to co-create a conceptual framework that explains the multifaceted and interrelated issues of the phenomenon and how it can be fostered and managed within an organisation as part of a major competitive strategy. The framework has been used to extrapolate the key barriers to disruption faced by a heterogeneous group of practitioners, and the four most important barriers for each of the collaborating organisations were identified and these were supported by the literature, case studies, and further practitioner and expert interviews. From the results of the research so far, it can be concluded that practitioners struggling to foster disruptive innovation suffer from one or a combination of some or all of the following inhibitors:

- the strategic importance of disruptive innovation is not understood;

- there exists an inability to generate disruptive concepts;

- there are inappropriate funding routines, which either kill or do not allow the initiation of potentially disruptive projects; or

- the organisation's new product development routines strangle all but continuous innovation.

These factors are now the focus of deeper investigation within this research project. Initial findings have culminated in the decision to develop a 'toolkit' that aims to tackle the barriers to disruption in the context of application. There are two major outstanding objectives in the research:

- Firstly, to design a prototype of the toolkit for feedback from a larger audience of practitioners and comparison to the latest developments in the theory of innovation management.

- Secondly, to ensure that the toolkit will be iteratively developed and tested in industrial settings. This will culminate in the validation of the conceptual framework for disruptive innovation that has been co-created by innovation practitioners and academia.

The Mode 2 approach to the current research has proved vital in establishing the academic rigour of the investigation whilst also addressing a pertinent industrial problem in the context of practice. The focus of this research has been on transferring knowledge iteratively between

practice and theory and theory and practice. This has facilitated the development of new knowledge on the theory of disruptive innovation and how it can be fostered in practice by organisations.

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