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## **Evolution in Design Management and its effect on Design Practice**

### **Abstract:**

The past decade has seen greater interest around design practice from an evolutionary perspective (Dawkins, 1986, Sibly, 2000, Langrish, 1999, 2004, 2005, Yagou, 2004). Arguments from these contributors include the memes construct, adaptation and natural selection. Similarly management is engaged in the evolutionary debate in the field of business practice with similar points of reference (Aldrich, 1979, 1986, Bahk and Gort, 1993, Doz, 1996, Biggiero, 2001, Matthews, et al, 2003).

This paper argues that Design Management, the interface between design and business, (De Mozota, 2003) adds dimension to the debate. Missing from these debates is the autopoietic view of evolution. Ontogeny described by Maturana and Varela (1972, 1987) is the history of structural changes in a particular unity. The perturbations by the environment in which this unity exists may impact on the unity “if” the internal communications determine this to be appropriate; thus creating a change in the structure of the unity. This subsequently leads to phylogeny or development and diversification in the unity. This filtering of feedback to feed-forward to determine change within the unity is an appropriate metaphor for any design, problem solving process. This is convergent with the way in which business units’ change in structure and organisation in their attempts to aligning with their changing operational environments.

Natural selection is viewed in a particular manner in autopoiesis. The use of the word selection usually infers choice. In the case of autopoiesis and in Darwin’s theory on evolution and natural selection (Darwin, 1859) it is important to note that Darwin stated it was “as if” there was natural selection occurring. This seems again appropriate given the manner in which design practice in

its complexity and likewise with management systems in business that an informed drift to a new state or change is occurring rather than known, restricted predictability.

Drawing upon comparison around the scholarly debate of evolution within the fields of management and design practice, this paper proposes a table which outlines parallel and divergent thinking, with additional data from two case studies which postulate that drift is a more appropriate conclusion. It will demonstrate the determinations regarding the effect of design management on design practice from an evolutionary perspective. Highlighting the complexity of the situation, this paper will articulate why business and design practice struggle to answer the problems of selection as opposed to drift.

## **Evolution in Design Management and its effect on Design Practice**

### **Introduction:**

With evolution drifting into the current debates about design and management it presents itself as an area for discussion and examination. The major contributor to the model of evolution as we understand it today can arguably be attributed to Charles Darwin, (Darwin, 1859). Darwin wrote a treatise on evolution and presented it to a society that, at that point in its own evolution, struggled with the concepts. This was a time when religion dominated the debate about where and how life came into existence and its subsequent evolution. It can be argued that Darwin was cognisant of this situation and would have finessed his writing accordingly. This did not however prevent him from shifting some of the previous thinking around the topic of where life had originated and how it had evolved.

Evolution as Darwin presented it was built on a mass of scientific research and writing that preceded his own. What Darwin wrote about was to begin a drift of changing attitudes to where species had evolved from. Dawkins, (1996) argues that Darwin's timing coincides with an ability of humanity to question his findings rather than dash them outright. Dawkins (1976) has added to

the theory presented by Darwin, by the introduction of the ‘memes’ construct. Memes being the notion of memory, this in turn has been argued by Langrish (2004) as a key element within the evolution of design practice.

The dominant argument against Darwinism or evolution revolves around the area of ‘chance’ or randomness that would dictate the process of evolution of the species. This Dawkins refutes by the inclusion of the notion or model of cumulative selection as opposed to single-step selection. This construct of cumulative selection, where each improvement, however slight, is used as a basis for future building means something dramatically different from chance and quintessentially non random: This being closely linked in terms of Dawkins argument regarding complexity theory.

If we look at what is occurring from an evolutionary perspective in design practice and in management we can start to build a picture or model of what is happening to these two areas of study. It can be argued that these two areas are congruent along with communication within the field of design management. This paper will focus on the evolution that is occurring in the field of design management.

### **Methodology:**

In order to conduct this research a review of the literature will be presented. The review will cover evolutionary perspectives in the fields of design, management and the “highbred”, Design Management. In addition to the existing research analysis from four case studies that have been conducted in the field of Design Management within the nascent business area of Direct Digital Textile Printing will be added to extend those currently represented in the field.

The four case studies can be characterised as having a dual identity where design and creativity are considered key activities along with research into the use of emergent innovative technologies. These characteristics will be explored in more detail in this paper.

The particular theoretical perspective that has been taken in regards to this research activity is from an autopoietic position. Autopoiesis, as defined by Maturana and Varela (1987) is a ‘self-generating, self-bounding and a self-renewing’ process. This theory was developed during the 1970’s as a biological model to define whether some unity is alive or not.

The theory has been widely used by scholars from a variety of fields beyond its original proposal of a biological proposition. The theory appears and is validated in scholarly research in the fields of management, the social sciences and more generally in the field of evolutionary debate (Luhmann, 1989, Dawkins, 1996, Stacey, 2001, Capra, 2002, Carnie 2004, 2005) but is largely omitted from the Design Management and design practice debate. Autopoiesis when used in these wider fields is either used in its original construct or in convergence with other pertinent theories. Autopoiesis takes a particular view of evolution that will be described in detail later in this paper.

### **Autopoiesis and evolution:**

In terms of evolution and the autopoietic model presented by Maturana and Varela, (1980) the description of evolution given by the authors is the, “history of change in the realisation of an invariant organisation embodied in independent unities sequentially generated through reproductive steps, in which the particular structural realisation of each unity arises as a modification of the preceding one (or ones) which, thus, constitutes both its sequential and historical antecedent.”

Here one sees no particular reference to the notion of small or incremental steps. Autopoiesis as a theory embraces the notion of leaps or large scale jumps that might form part of the evolutionary process of change in a unity. This in Autopoiesis is closely linked to ‘ontogeny’, “the history of structural transformations of a unity”.

Within the textile print field it can be determined that a number of transformational situations have occurred. Looking at the history of textile print, both from a technical position and from a

resultant dialectical or visual vocabulary position there have been several large leaps that have transformed these along with the businesses that are part of this changing situation from a social and economic situation.

Stencil printing can be described as the first recorded step in this design evolutionary map. Block printing followed and can be described as small in scale due to the time factors involved, this had only a marginal impact on the economic situation of the parties involved. The introduction of flat bed screen printing increased the through-put speed and efficiency. This technological advance can be said to have had a substantial impact on the parties involved in the business side of this advance. Copper roller printing similarly had a substantial impact on the economics, both socially and on the fiscal returns for the businesses involved.

When rotary screen production was introduced in the 1960's the impact on society was vast. Large scale production was no longer an obstacle. With this advancement came considerable economic changes. Economies of scale were introduced to this method of production. This impacted on society's acceptance of mass produced prints, with cheaper printed textile product available to the masses. Similarly with each of its predecessors a new visual vocabulary emerged. The next important leap has been the introduction of CAD and Direct Digital Textile Printing. This as described above has impacted significantly on the potential visual output. This can be said to be in the risk taking phase of its evolution. In confluence with this shift there are several other significant changes that present themselves. These include the opportunity to considerably alter society's perceptions of the economies of scale model. This is no longer the model that applies. With set up costs considerably decreased and simple to apply through these innovative technologies, the cost effectiveness has shifted to a model more aligned to on demand production. This has been difficult for the industry and in particular for business to fully appreciate. The business sector is struggling with the changes that this on demand model offers.

From an ecological stand point the benefits are also considerable. The waste from Direct Digital Textile Print as opposed to rotary screen printing processes is markedly lower. This innovation could be described as falling within the co-evolutionary model or ecological model that

recognises that human existence is part of a more complex network of ecological sustainability this model falling in line with the Gaia model (Lovelock, 1972).

### **Evolution in management:**

Turning our attention to evolution in management we see something of the same scope of debate and arguments arise from the scholars in this field. Of note here is that within this field of management there is little by way of generally accepted theory of how management has evolved. Similarly, if we try to trace evolution in business the main environment of management activity we see a similar picture. "...few recurring patterns; on the surface, at least, their evolution seems highly idiosyncratic" (Bhide, 2000).

This can be attributed to the heterogeneous nature of these convergent fields of management and business. However when we look at filtering the common elements from the contextual noise we can start to make some sense of the data collected by researchers in these fields particularly when we compare these more contemporary findings with more classic theory of management and business.

Edith Penrose proposed a model (Penrose, 1995) that treated a business as an administrative unit. The unit Penrose described need not be tied to a particular market or technology. In other words it could produce anything for which a demand was recognised by the business. The significant administrative attributes of a given business differed from those of others and thus gave it a particular identity. This model certainly contributes to the debate about identity and gives us some basis on which we can determine the evolutionary aspects of a given business. This is particularly the case with businesses that do not have a specified boundary of operations, i.e. niched. In the case of niched boundaries of operation there can be a tendency for the business to reach a maximum state and subsequently stagnate or die. The model proposed by Penrose has significant limitations from a heuristic perspective as it presents a mainly linear proposition.

Other theorists in the field of business and management, Dosi, Nelson and Winter, (2001), present a business with resource based attributes. These included distinct decision-making routines, memories, reputation as well as less tangible attributes such as human attributes. This broader more complex approach although not heuristic is more in line with the autopoietic approach to looking at the evolutionary development and sustainability of business operations. Given the nascent aspects of the businesses that have been selected for case study work the approaches presented by Bhidé, (2000) have a considerable contribution to make to this argument. Bhidé focuses his attention on the origin and evolution of businesses. He presents a model of the attributes that are most likely to position a nascent business for a sustainable evolution. Bhidé highlights that,

“Although it seems natural to think of a firm as integrated, living entity, we should remember that the firm merely uses the assets that one or more of its constituents own and may redeploy.”

Bhidé defines the bundle of assets and specifies the nature of longevity and size of a business. Although at pains to distinguish a business from a living unity he goes on to describe longevity as the “life” of a business with the continuity of its asset portfolio. He describes how this asset portfolios change over time. The examples he gives are the expiration of patents, relationships with customers sour and valuable employees retire or leave the business. It is not the assets themselves that Bhidé sees as the key actor here in sustainability but the complement to the function of the business that will lead to sustainability and evolution. He also includes loss of its identity in that of another firm. My findings indicate that it is the very confluence of these aspects of business, identity, communications and evolution that determine whether a business will continue on a sustainable path or stagnate or die.

Bhidé also argues that businesses need to move from a situation of homogenous assets to a heterogeneous bundle of assets. The differentiating factors in homogenous assets to that of heterogeneous assets are based on the scope of the assets involved. For some businesses with homogenous assets the scope of their operations is constrained by the niched or limits of their assets. This may mean that they are vulnerable to stagnation or decline. A conscious effort to develop a portfolio of diverse assets is advocated by Bhidé for longevity and evolution. It is

noted that this seems at odds with the current situation for businesses to have a focused set of strategies with limited scope. Bhidé here advocates an extended view of business assets that can include activities beyond the unity of the business itself including partnerships with other business unities.

Complementarities may involve a higher level of risk for the parties involved. Joint ownership may be the outcome of this external complementation of assets. Williamson (1975, 1985) expresses a concern about the costs involved to the parties involved in these joint ventures or ownerships. Uncertainty of outcomes becomes a central issue here for Williamson. Uncertainty is articulated as the difficulties in predicting or anticipating the contingencies that may (or may not) evolve in their transactions. The added values in these circumstances also need to be considered. Williamson argues that combining successive stages into a single firm alleviates opportunism and facilitates adaptation to unforeseen events by “harmonizing interests and permitting a wider variety of sensitive incentive and control processes to be activated” (Williamson, 1993: 104). Gialis, Paul and Doukidis (1996) add to the debate by adding their model of business process modelling (BPM). This model focuses on complex and mature businesses but highlights the degree of complexity involved as the number of parties increases as the case of joint ventures. These scholars advocate for change management concepts to be identified including BPM, a new look at organisations based on processes they perform rather than the functional units, divisions or departments they are divided into as preferable. They identify processes as “structured, measured sets of activities designed to produce a specified output”. This returns to a more simplistic and again, a linear analysis of change and evolution and is at odds with the real world situation in businesses as they evolve from nascent to mature and sustainable enterprises.

### **Evolution in design:**

Langrish, (Langrish, 1999, 2004, 2005) has contributed significantly to the debate about design and evolution. His arguments revolve around the Darwinian explanation or model. Counter arguments have been raised by the likes of Sibly, 2000, and Yagou, 2004. Each of these scholars



has a different slant on how evolution is progressing within the field of design practice. Langrish argues the stance that progressive evolution, from simple to complex, as presented first by Herbert Spencer, (Spencer, 1857) and adopted by Darwin in his later editions of, "*The origin of Species*", (Darwin, 1859) does not align with what we know to be the case with design practice. Langrish argues that a truer Darwinian model where natural selection plus in-put from genes is a more accurate situation from which we can look at the evolution of design practice. Langrish argues that design evolution is the evolution of ideas, and the Darwinian evolution of ideas being 'memetics' from the concept of self-replication of ideas introduced by Richard Dawkins (1976). Langrish presents arguments against Evolutionary Design around the Spencerian notion of progress, but sticks with the Darwinian model of natural selection. Langrish here is using society as the means of natural selection. The problem with Langrish's argument is that it is presented as a linear model to a significant extent. I would argue that the complexity of design in society with an abundance of players demands a more multifarious and confluent model of evolution in design.

Yagou (2004) extends the argument from Dawkins model of memes, a Darwinian evolutionary perspective. Yagou describes design as unstable and at the same time our perceptions of design also alter. This he describes as evolutionary in a Darwinian construct. Again although Yagou adds another dimension to the complexity of design evolution by the inclusion of societies ever changing perceptions of design this model in my opinion remains too simple in a real world situation.

On analysis of my own case study work I found that in the case of nascent businesses where design is a key or critical element of the input and output, situations of chance (risk), intuition, (memes) and then feedback (following societies responses) were all evident where design was a driver aligned with innovative technologies for these new business ventures. Design it can be argued is only somewhat conscious in terms of decision making where novelty and innovation of output was concerned.

## The link between design and innovation

In terms of design, innovation too needs to be added to the debate as this is often, and perhaps mistakenly used interchangeably with the term design in many instances. However if we look at the various types of innovation described by scholars we see that design in part contributes in some way to each of these.

- ***Business Model innovation*** involves changing the way business is done in terms of capturing value e.g. Compaq vs. Dell computer sales models
- ***Marketing innovation*** is the development of new marketing methods that involve improvements in product design, packaging, product promotional activity or pricing
- ***Organisational innovation*** involves the creation or alteration of business structures, practices or models and can include process, marketing and business model innovation or a confluence of these
- ***Product innovation*** involves the introduction of a new good or service that is novel or substantially improved. These improvements may include functionality, technical abilities, improved user interface etc.
- ***Service innovation***, is similar to product innovation except that the innovation relates to services rather than products
- ***Supply chain innovation*** is where innovation occurs in the sourcing of input products from suppliers and the delivery of the output from these to the customer

When looking at design we see that design and innovation are intrinsically linked. Often innovation occurs in the areas of technological change. Technology can be described from an innovation position as being the introduction of something novel, a device, a system or method or the successful exploitation of a new idea, or the change that creates a new dimension or performance. The term innovation may refer to both radical and incremental changes to products, processes or services. Again we see the strong intrinsic link between innovation and design. Innovations can be triggered by creativity or it can and often is the goal of solving a problem, again a description that is often ascribed to the process of design.

## **Disruptive vs. sustainable or evolutionary innovation/ design**

We have divided innovation/design into the above mentioned types or categories but innovation/design is also characterised by its impact on existing markets and businesses. Sustained or evolutionary innovation allows businesses to continue to approach their target markets in the same ways. This can be illustrated by the sustained or evolutionary design and innovation in fuel efficient cars. This is an example of evolutionary change that is incremental step innovation and design coupled with technological advances and governmental, global and societal push for changes and requirements.

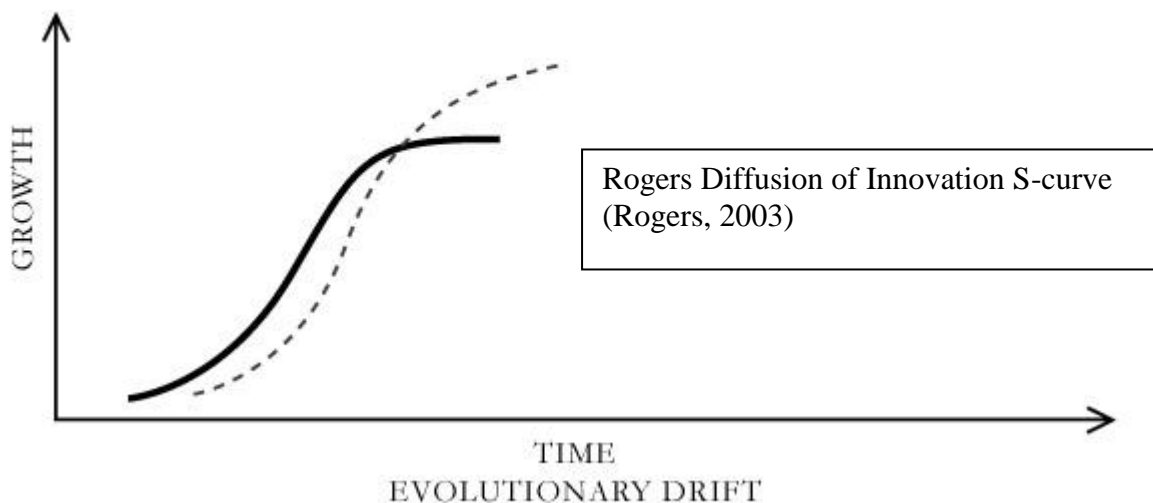
Disruptive technological innovation/design can be illustrated through the case studies under review. The introduction of direct digital textile print to the market place where there has been a radical or substantial leap in the innovative technology can be described as having potentially radical impacts for design, by way of a novel visual vocabulary, novel manufacturing models and changes to the model of economies of scale, on demand production and integrated design out put. E.g. No longer are printed textiles seen as an intermediate output but a textile design can be integrated into the production of say a finished garment (Campbell, 2000, 2001, 2003, 2004). There is evidence however that indicates that this disruptive innovation/design has less likelihood of pick up in the market place by businesses and customers alike (Hesselbein, 2002). This lack of take up can be described as an intolerance of businesses to risk the loss of well established customers, known profit margins modelling and market research based acceptance of incremental step design advances.

## **Sources and diffusion of innovation/design**

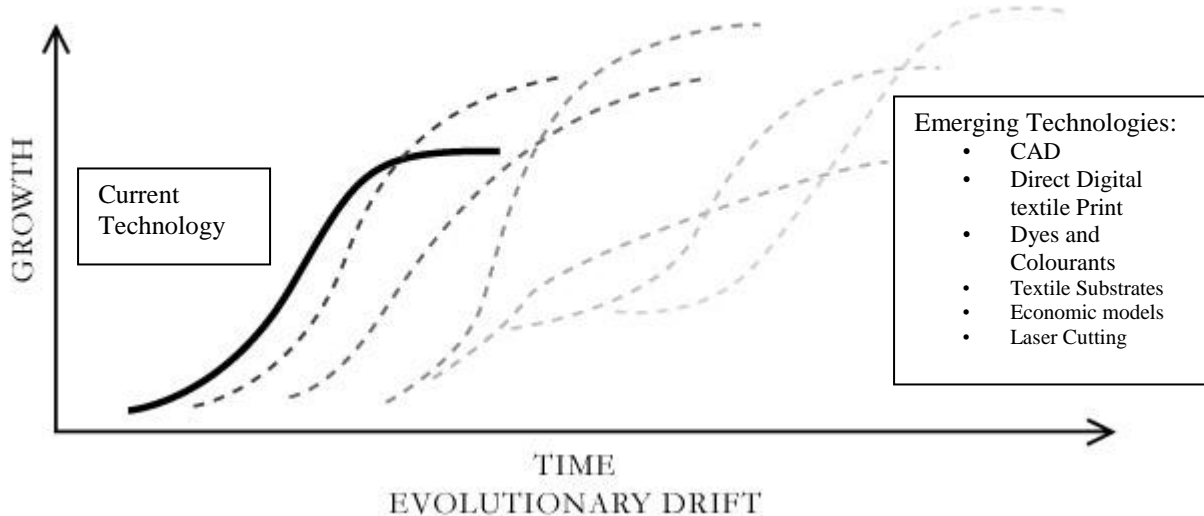
Traditionally innovation design is liable to come from an existing business. This is where the business perceives a problem and looks at ways to advance the situation and profit from a solution to that problem. There is also the model of the end user being the innovator or design participant. This is where entrepreneurial activity can be described to exist. This may also be described as mainly supply-pushed or new technology lead innovation or demand-led, or societal

and market need lead innovation. These areas seem balanced in the literature in the field with no particular resolve.

Rogers in, *The Diffusion of Innovation* (2003) proposes a life cycle of innovation that can equally well be applied to design output. Rogers produced an “s-curve” or diffusion curve. The curve describes the slow growth and pick up of a new design or innovation and that then there is a period of more rapid pick up by the market as acceptance creeps in. This more rapid pick up phase occurs along the time line where more incremental or evolutionary changes are made to the design output. In the later stages of the life cycle of the innovation growth slows or may even decline. This is the time when the design output from an economics position should be considered no longer valuable to the business in question.



If we take this s-curve and extend it as described by Rogers we find that in terms of this proposed model that drift can be seen to occur if there are variables in each of the curves involved: A result that can be deemed a likely scenario when creativity and design are involved in the use of this emerging technologies.



## Failure of Innovation

When looking at innovation from a positivist position its objectives have to be seen as goal oriented. Failure of the innovative process however is quoted in much of the scholarly research conducted in the field. There are a number of rationales that are attributed to these failures and it is worthy to look at some of these. The failures can be generally split into two categories. Firstly there are the internal factors that are deemed to be held within the control of the organisation involved in development of the innovation. Secondly there are the external factors that can be described as factors beyond the control of the organisation producing the innovation.

If we look at the internal factors leading to innovation failure the literature defines the following: The internal factors tend to stem from cultural infrastructure, such as poor leadership, poor communications and poor knowledge management. All of these factors can be described as falling within the scope of Design Management activity. Similarly poor goal definition, poor team participation or dysfunctional team activity and poor access to information by the participants in the innovation process are also deemed the responsibility of Design Management.

## **A Design Management perspective**

### **Overview**

Design Management is the field of management that offers business or organisations models for optimising design relevant processes. It has implications for all levels of business performance. Design Management also acts as the interface between management and design activity and a link between technological innovation, design development and out put, marketing and external communications of the business or organisation (Bruce and Bessant, 2002).

Collaboration is critical to the effectiveness of design management for any organisation. Designers historically can be described as having a focus on the creation of artefacts or out put for the organisation but in the current climate this has changed markedly with design taking a more active role in the operational, functional and strategic elements of business activity. In this widely based managerial activity, design management is pivotal to determining many of the directions any organisation or business will travel along.

Given the afore mentioned model of drift that is in place with regards to innovation and design illustrated in Rogers s-curve, it can be easily transcribed to the way that design management will be affected by the environment, societal, economics and governmental in the operations, functions and strategies that tend to present themselves for consideration by any design manager. If we take the example of the introduction of direct digital textile print the following can be ascertained: Design Management is the conduit for communications between the Direct Digital Textile Print unit or business and the external environment or potential client base. In this role the design manager can assist in gaining insights for the business about how it might articulate out put from the print business that will have a positive effect on the client or potential client base.

This can also work in a reverse manner, in that the design manager can assist in a greater understanding of the potential output differences that the technology and design convergence can have for the market place and the businesses as they change or evolve to meet the demands of the market place.

In either of these scenarios there is a situation where there is a substantial jump that has occurred by the introduction of this novel technology and its potential applications for the market. This can be considered to be a similar jump along the evolutionary time line that the introduction of any similar technological innovation may have upon any manufacturing processes. Each of these has the potential to have a significant impact on the noteworthy changes that can occur in design, the market, economy and society.

Cultural infrastructure, such as leadership, communications and knowledge management are integral to the portfolio of Design Management. Similarly goal definition, activating dynamic team participation and providing access to information by the participants in the innovation process are also deemed the responsibility of Design Management. (Bruce and Bessant, 2002) These activities as outlined above are all important aspects of assuring innovation aligned with the goals of the business.

### **Analysis from case study data collection:**

The analysis of collected data from the four case studies in question, indicate that leaps of advancement can be described by the participants as prompted by technological innovation. This for Direct Digital Textiles has presented itself in four forms; firstly CAD and the offer of a novel visual vocabulary. Secondly the development of Direct Digital Print technology with the ability to manufacture with novel economies of scale thirdly with other integrated technologies such as laser cutting and body scan pattern making. Lastly, appropriate dyestuffs or colourants that are still advancing incrementally are adding to the variety of output available to these nascent businesses. These can be described from an evolutionary stand point as leaps, not as incremental small steps. These leaps can also be described as non directional, with each innovation providing a non specified linear direction of progression. The erratic nature of these innovations can therefore be more accurately described as drift.

Co-evolution is also worthy of note in the situation that has been described above. My analysis indicates that design driven businesses using Direct Digital Textile Printing technology show a

strong alignment with other businesses that can assist in the articulation of innovative/creative design output. This alignment has been indicated in dye and colourant technology, CAD innovations and production facilities. These co-evolutionary linkages may also lead to changes in identity when partnerships or joint ventures may occur. This can lead to a loss of identity or substantially altered identity. This may be more likely to lead in the case of risk seeking design driven businesses aligning with more risk adverse businesses where greater financial sustainability is driving the risk adverse business to dominate the design, risk seeking business in their merger.

The high levels of risk taking amongst design practice based business ventures where creativity is at a high level, innovation is deemed an integral component of the output from these businesses. This creativity laden situation is less financially driven and is expressed by the case study participants as, “more a sense of personal achievement”. This can be seen at odds with the more conventional model adopted by more established businesses that are more risk adverse and have systems and strategies in place in order to monitor and analyse innovation and risk taking against more financially sustainable activities.

Although some degree of acknowledged building on prior experiences and knowledge, the leap in technology innovation has led to radical or novel output from these case study participants. This is seen as not necessarily having a clear direction for an end user or viable financial market in all of its manifestations. This indicates a drift as a result of this innovative technological advancement when viewed from a more sustainable economics perspective.

An indication is also apparent that the s-curve models presented illustrate that these innovations within the direct digital textile print business are sitting on the upward turn of these curves where incremental evolution is liable to step in. Along a parallel time line there is an indication from my analysis that there is a small tapering off of business activity in the analogue print field of textiles.



**Table of parallel and divergent thinking:**

Management Theories	Design Theories	Case Study Analysis
Heterogeneous convergence of management and business <i>(Usually incremental)</i>	Product Innovation by Design through novel technology, designer driven <i>(Leap)</i>	Unconscious/tacit/intuitive innovation through design <i>(Non directional and can include leaps)</i>
Business as an administrative unit <i>(Limited by creativity of personnel usually incremental)</i>	Marketing Innovation by Design, customer driven <i>(Usually incremental)</i>	Alliances with suppliers of new technological innovations <i>(Non directional and can include leaps)</i>
Resources based business unit (technology/equipment for manufacturing as well as personnel) <i>(Usually incremental but can involve leaps)</i>	Service Innovation by Design, customer driven <i>(Incremental)</i>	High levels of risk taking behaviour and creativity <i>(Non directional and can include leaps)</i>
Business Model innovation: Changing the way business is done in terms of capturing value <i>(Limited by risk taking of personnel, usually incremental)</i>	Product innovation by Design team for an established market <i>(usually incremental but can involve leaps)</i>	Market driven design innovation <i>(Usually incremental but can involve leaps)</i>
Business asset portfolios change over time, personnel, corporate memory, knowledge capital all may be changed or lost <i>(Incremental)</i>	Supply chain innovation: occurs in the sourcing of input products from suppliers and the delivery to the customer <i>(Usually incremental but can involve leaps)</i>	Design development using given manufacturing constraint <i>(Usually incremental but can involve leaps)</i>

## **Conclusions:**

Taking the s-curve model presented by Rogers and extending this to include nascent innovations, there is an indication of a less clearly defined or “classic” evolutionary path that design practice moves along when innovative technology are intrinsic to the business in question. Through analysis of the table above, outlining evolutionary paths in management, design practice and the case study analysis we see emerge the following: A classic evolutionary path being taken by the management field and to some considerable extent this is echoed in the design practice and theory sections of the table. However, when analysing the case study examples we see emerge a more erratic situation with technology providing leaps and changes in direction for design centred businesses that are favourable to risk taking design activity.

As indicated by my amendment and augmentation of the s-curve model, each additional technological innovation can be independent or branch and develop from existing technological innovations. This can be described as evolutionary drift. This drifting presents itself most clearly within the practice of design where innovative technology is seen by the participants as a key feature of their practice. Viewing Design Management as the captain or champion of this drift as it works across the boundaries that exist between business/management and design practice and between the customer and the businesses involved in these leaps of design innovation and output we can see emerge a situation where Design Management is presented with the challenge to steer or manage this drift in a sustainable manner to suit all stakeholders.

Given the diversity of direction from where the drift may be initiated, being from both internal and external change and innovation the Design Manager is charged with monitoring all influences that can lead to the directions that this drift might take. This I see as a significant aspect of the Design Management brief.

“Even when chance provides the starting point from an initiative, it usually takes considerable purposive effort to turn it into a profitable enterprise” (Bhide, 2000). As Bhide points out, even when talking of new businesses or for that matter established businesses with a novel initiative or innovation, Design Management as the interface between business and design practice is charged

with purposive effort to bring this innovation to a sustainable solution for all parties. Bhidé writes of tactical ingenuity in the face of attracting customers, suppliers, capital and sustaining this endeavour throughout in order to advance the business venture to a state of sustainability. This too becomes part of the portfolio of management activities that Design Management addresses. As a tool to deal with this extensive and diverse portfolio of management activities Design Managers need to equip themselves with strategies to both monitor the leaps and changes in direction that design activity may veer towards. Design focussed businesses that can be described as risk seeking, as an integral part of their operations; need assistance in balancing this type of erratic activity against more sustainable incremental activities with a design focus.

This more balanced approach will bring with it more stability and sustained identity for the business or enterprise involved. This sustained sense of identity becomes a tool for maintaining relations within the organisation and with external stakeholders.

Identity of any organisation is a critical component of Design Management activity. This could be describing the harnessing of the drift due to innovative behaviour and strategic sustainable activities. Thus a steadier evolutionary path may be reached where incremental steps are a more dominant part of the S-curve diagram.

A hypothesis on the effect that Design Management, a nascent field of practice and theory, has on design practice it could be construed that Design Management is involved as the steering and constraining agent on design practice activity. This is particularly in regards to the high risk taking behaviour and innovation seeking activity that is deemed a significant part of design practice within the scope of my case study participants.

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