Managing innovation for sustainability

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‘Sustainability’ is a major and growing driver of business change. Its implications for innovation are clear – living and working in a world of up to 9 billion people with rising expectations, providing energy, food and resource security, dealing with climate change, ecosystem degradation, a widening economic divide and a host of other interdependent issues will require massive change in products, services, processes, marketing approaches and the underlying business models which frame them. The focus of this paper is to develop an understanding of new approaches to innovation management required to take account of the growing pressures and emerging opportunities in the ‘sustainability’ agenda. In particular, it draws on case studies of a variety of organisations to help answer the question of what practical actions might be taken beyond the rhetoric of moving towards greater sustainability or ‘greening’ of business.

1. Introduction

The evidence underpinning concern about sustainability is extensive, and there is a sense of urgency about much of the discussion it provokes (MEA, 2005, UNEP, 2007; Rockstrom et al., 2009. WWF suggests that lifestyles in the developed world at present require the resources of around two planets, and if emerging economies follow the same trajectory, this will rise to 2.5 by 2050. (WWF, 2010) Others draw attention to the implications of reaching ‘peak’ availability of key strategic energy and physical resources. (Heinberg, 2007; Adams and Jeanrenaud, 2008; Brown, 2011)

Current discussion echoes earlier concerns dating back to the 1972 Club of Rome report on ‘Limits to growth’ and it is important, as then, to temper the more sensational predictions with an understanding of where and how change is taking place and make realistic assessments of potential impacts (Meadows et al., 1972; Cole et al., 1973).

But it is also important to reflect a more optimistic view which sees significant opportunities emerging. The provision of alternative goods and services, more efficient approaches to resource and energy management, new partnerships and ways of working can help unleash a new era of economic development. A recent Price Waterhouse Coopers report suggests significant market potential in the provision of ‘green’ goods and services; their estimate was as high as 3% of global gross domestic product (GDP). UNEP’s (2011) report illustrates how ‘greening the economy’ is already becoming a powerful new engine of growth in the 21st century. The World Business Council for Sustainable Development’s (WBCSD) Vision 2050 sets out new opportunities for businesses in responding to sustainability challenges, promoting whole system perspectives (WBCSD, 2010).
The scale on which change is required is also leading some commentators to talk about a systems level shift and to argue that what is emerging – as a consequence of socio-economic pressures and enabling technologies – is another ‘long wave’ of innovation (Freeman and Perez, 1989; Perez, 2002). In their studies of such ‘Kondratieff’ waves, Freeman and Perez talk about the need to change the lens through which activities are viewed – the ‘techno-economic paradigm’ (TEP) – and the economic growth cycles which are associated with this. Long waves of this kind are associated with acceleration towards a crisis followed by a period of significant economic growth and social restructuring. Sustainability commentators see a ‘6th wave’ emerging which is linked to growing social movements (and the communication networks underpinning them. Figure 1 illustrates this.

Whatever the perspective adopted, it is clear that change – innovation – will be needed. Growing concern of the kind described above is driving a combination of increasingly strong legislation, international environmental management standards, new sustainability metrics and reporting standards that will force business to adopt ‘greener’ approaches if they are to retain a licence to operate. At the same time, the opportunities opened up for ‘doing what we do better’ (through ‘lean, green’ investments in improving efficiencies around resources, energy, logistics, etc.) and ‘doing different’ – radical new moves towards systems change – make it an increasingly significant item in strategic planning among progressive organisations of all sizes. Evidence for this can be seen in their participation and active engagement with United Nations (UN) and non-government organisation (NGO) business initiatives (such as the UN Global Compact and The Climate Group) and in networks like the Global Sustainability Forum. It is also reflected in strategic human resource development – for example the growth in job titles dealing explicitly with the sustainability agenda and of specialist programmes such as WWF’s One Planet MBA and One Planet Leaders.

While there is plenty of discussion about the need for innovation, it is less clear how this process will be managed. Innovation research highlights a well-established framework for what might be termed ‘best practice’ innovation – a suite of routines around which organisations can organise the search, select and implementation stages of an innovation process (Tidd and Bessant, 2009). Typical elements include well-established approaches and criteria for strategic decision making and resource allocation to innovation projects and stage gate systems for reviewing the validity of these decisions as innovation projects take shape. But the theory of dynamic capability argues that organisations need to deal with a changing context by reviewing these routines and adapting, editing and adding to them (Teece and Pisano, 1994).

So we need to ask whether our current models for handling the process are sufficient – or will the nature and pace of change be so disruptive that it requires
expressed as an inability to 'think outside the box'. At the limit – as Dorothy Leonard argues – their ‘core competencies’ may become ‘core rigidities’ which limit the organisation’s ability to deal with changing conditions (Leonard-Barton, 1995).

The issue is problematic because different degrees of novelty require different solutions to the search, select, implement questions and trying to manage these simultaneously – developing ‘ambidexterity’ – sets up tensions across an organisation (Tushman and O’Reilly, 1996). For example, there is a long standing discussion in innovation literature around ‘exploration’ and ‘exploitation’ – both are search behaviours, but one is essentially incremental, adaptive learning while the second is radical, generative learning (March and Olsen, 1981; Benner and Tushman, 2003).

In similar fashion, concern with selection (and subsequent resource allocation) has led to the evolution of routines for dealing with this – decision rules and criteria, portfolio techniques, stage gate review systems, etc. Different configurations to suit different size and scale of projects have been explored – for example ‘fuzzy front end’ tools for early stage selection (Koen et al., 2001), ‘fast track routines’ for simple small-scale projects (Bessant et al., 2002) and idea management funnels and systems for use in high involvement innovation where the participation of many people in suggestion schemes leads to a high volume of idea flow for screening (Bessant, 2003; Schroeder and Robinson, 2004). Under ‘discontinuous’ conditions – triggered, for example, by the emergence of a radical new technology or the emergence of a new market, or a shift in the regulatory framework – established incumbents often face a major challenge. Heuristics and internal rules for resource allocation are unhelpful and may actively militate against placing bets on the new options because they are far outside the firm’s ‘normal’ framework. As Christensen argues, in his studies of disruption caused by emergence of new markets, the existing decision making and underlying reward and reinforcement systems strongly favour the status quo, working with existing customers and suppliers. Such bounded decision making creates an opportunity for new entrants to colonise new market space – and then migrate towards incumbent’s territory (Christensen, 1997). In similar fashion, Henderson and Clark argue that shifting to new ‘architectures’ – new configurations involving new knowledge sets and their arrangements – poses problems for established incumbents (Henderson and Clark, 1990). We suggest that sustainability-led innovation (SLI) highlights this problem of dynamic capability in that it forces firms to learn new approaches and let go of old ones around the core search, select and implement questions. By its nature, SLI involves working with different knowledge components – new technologies, new markets, new environmental or regulatory conditions, etc. – and firms need to develop enhanced absorptive capacity for handling this (Zahra and George, 2002). In particular, they need capability (and enabling tools and methods) to acquire, assimilate and exploit new knowledge and to work at a systems level.

3. Managing system-level innovation

A key point is that the search and selection space is not one dimensional. As Henderson and Clark point out, it is not just a question of searching near or far from core knowledge concepts but also across configurations – the ‘component/architecture challenge. They argue that innovation rarely involves dealing with a single technology or market but rather a
bundle of knowledge which is brought together into a configuration. Successful innovation management requires that we can get hold of and use knowledge about components and also about how those can be put together – what they termed the architecture of an innovation (Henderson and Clark, 1990). This is particularly relevant in the case of SLI where a systems level view is required.

One of the difficulties with this is that innovation knowledge flows – and the structures which evolve to support them – tend to reflect the nature of the innovation. So if it is at component level then the relevant people with skills and knowledge around these components will talk to each other, and when change takes place, they can integrate new knowledge. But when change takes place at the higher system level – ‘architectural innovation’ in Henderson and Clark’s terms – then the existing channels and flows may not be appropriate or sufficient to support the innovation, and the firm needs to develop new ones. This is another reason why existing incumbents often fare badly when major system level change takes place – because they have the twin difficulties of learning and configuring a new knowledge system and ‘unlearning’ an old and established one.

We can map this innovation management challenge as in Figure 2. The vertical axis refers to the familiar ‘incremental/radical’ dimension in innovation, while the second relates to ‘environmental complexity’ – the number of elements and their potential interactions. Rising complexity means that it becomes increasingly difficult to predict a particular state because of the increasing number of potential configurations of these elements.

In this way, we capture the ‘component/architecture’ challenge outlined above. Firms can innovate at component level – the left hand side – in both incremental and radical fashion but such changes take place within an assumed core configuration of technological and market elements – the dominant architecture. Moving to the right introduces the problem of new and emergent architectures arising out of alternative ways of framing among complex elements. Arguably, SLI represents a significant challenge to innovation management because it requires bringing in multiple new elements and stakeholders.

Zones 1 and 2 represent ‘business as usual’ innovation space within which established routines for search, select and implement work well. But on the right hand side, there are configurations which require the development of new routines and the modification – or even abandonment – of existing ones. This favours new entrant entrepreneurs over established players who have both a learning and an ‘unlearning’ challenge around such configuration of innovation management routines.

Reconfiguration can take place at incremental level (zone 3) – essentially finding new ways of doing what we already do. The case of ‘lean’ thinking provides an example; the extreme conditions of post-war Japan brought new elements into the frame as far as manufacturing was concerned. Faced with shortages of skilled labour, reliable energy sources or key raw materials firms like Toyota were unable to follow the established mass production trajectories which dominated innovation thinking. Instead, they developed an alternative approach to process innovation based around minimizing waste. This led to a radically different performance in terms of key productivity indicators, but it also involved a suite of new innovation management routines (for example the development of effective employee involvement, concurrent engineering, kaizen tools and methods, etc.).

Zone 4 represents the ‘edge of chaos’ complex environment where innovation emerges as a product of a process of co-evolution. Rather than the end point of a predefined trajectory, it is the result of complex interactions between independent elements. Processes of amplification and feedback reinforce what begin as small shifts in direction – attractor basins – and gradually define a trajectory. (This is the pattern in the ‘ferment’ state/fluid state before a dominant design emerges) (Utterback, 1994). Search and selection strategies here are difficult since it is, by definition, impossible to predict what is going to be important or where the initial emergence will start and around which feedback and amplification will happen. Under such conditions, innovation strategy breaks down into three core principles: be in there, be in there early and be in there influentially (i.e. in a position to be part of the feedback and amplification mechanisms).
4. Mapping sustainability-led innovation (SLI)

We suggest that it is in zones 3 and 4 that much of the innovative activity around SLI will take place. In zone 3, firms begin to take into account the impact of their activities on wider social and environmental systems, and this influences the design of particular products and processes, but innovation may remain incremental. In terms of sustainability outcomes, zone 3 is associated with the 'eco-efficiency' concept (WBCSD, 2000) which involves finding new and more efficient ways of 'doing more with less'. Eco-efficiency, with its famous '3 Rs' – reduce, re-use, recycle – has its roots in early industrialisation but is now being widely adopted by companies. Reducing carbon footprint through supply chain improvements or switching to less energy or resource intensive products and services which deliver equivalent value can generate significant savings. 3 M, for example, saved nearly US$1.4 billion over a 34-year period and prevented billions of pounds of pollutants entering the environment through their Pollution-Prevention-Pays (3P) programmes (3 M 2011). GE Industrial saved $12.8 million per year by using high-efficiency lights in their plants. One of Alcoa’s facilities in France achieved an 85% reduction in water consumption leading to a $40,000 a-year reduction in operating costs (Senge et al., 2008).

In zone 4, it will involve significant systems level thinking around emergent and radically different solutions, as well as the co-evolution of technical, organisational and socio-economic structures. For example, innovations in zone 4 might represent the shift from improving the fuel efficiency of vehicles, to designing a sustainable mobility system, involving renewable energy supplies, new infrastructure and vehicles, user practices, lifestyles, policies, regulatory frameworks, etc. Such system-level innovation goes beyond reviewing the relationship between a particular product and the environment, to rethinking the way we produce and consume, imagining new outcomes and understanding and leveraging the interdependencies of system components. Zone 4 innovation builds on the insight that one company, however green, cannot be sustainable in an unsustainable system in the long term. Such innovations frequently involve collaboration between a wide range of private, public and civil society partners, and may take nature itself as a design model (Benyus, 1997; McDonough and Braungart, 2002). Such innovations have the capacity to generate positive social and environ-mental impacts and actually enhance life rather than simply minimise negative ones, representing a shift from eco-efficiency to ‘eco-effectiveness’ (McDonough and Braungart, 2002). According to Porter and Kramer (2011), the focus on creating ‘shared value’, which builds connections between social, environmental and economic progress, has the power to unleash the next wave of global growth. While the notion of creating shared value is still in its genesis, a new wave of system innovation is underway requiring leaders and managers to develop new kinds of knowledge and skills, and work across traditional boundaries, which is reshaping the relationship between business and society globally.

One aspect of this is the involvement of multiple players that have traditionally not worked together in co-creating system level change. For instance, Grameen Shakti, a rural renewable energy initiative in Bangladesh, fosters collaboration between the micro-finance sector, suppliers of solar energy equipment and consumers, enabling millions of poor households to leapfrog to new energy systems. It is generating new employment opportunities, increasing rural incomes, empowering women and reducing the use of environmentally polluting kerosene. Grameen Shakti is the largest and fastest growing rural renewable energy company in the world (Grameen Shakti, 2011).

‘Better Place’ is an electric vehicle and network system founded in 2007 by Shai Agassi in California. It involves developing an ecosystem of electric cars, infrastructure and services including a network of charging points for batteries, battery exchange facilities, driver and network software. Better Place, which has raised over US$700 million in investments, has formed partnerships with governments and major energy and car companies (such as Renault-Nissan) to implement new systems in parts of Israel, Denmark, Canada, Hawaii, as well as the United States. Denmark opened Europe’s first Better Place electric vehicle battery swapping station in July 2011. Its goal is sustainable transportation, global energy independence and freedom from oil (WWF, 2010; Better Place, 2011).

Innovations can arise from developing unusual partnerships across sectors. For example, the Green-Zone, in Umea, Sweden, designed by architect Anders Nyquist, is an early example of holistic planning. It involves a block of interconnected businesses, including a car dealership, a petrol station and carwash and a fast food restaurant. The buildings are connected, allowing a recycling and sharing of heat (The Green Zone, 2011).
5. Visions for the future

Reconfiguring an established organisation’s innovation approaches and portfolio on this scale is a major strategic undertaking and requires a combination of clear and stretching vision linked to a coherent road map for delivering it. A number of models for such frameworks are emerging around the sustainability challenge – for example, the WBCSD involved 29 major multinational companies and many NGOs, academics and other partners in elaborating a long-term vision in which ‘by 2050 some nine billion people live well, and with the limits of the planet’. The pathway map introduced in this multi-industry sector vision suggests both a radically changing innovation context and discontinuous innovations responding to current global challenges.

Applying such long-term visions for business planning is beginning to deliver business as well as social benefits; for example, one of the ‘success’ stories has been the growth of floorings business Interface, which has made radical changes to its business and operating model and secured significant business growth. Interface has cut greenhouse gas emissions by 82%, fossil fuel consumption by 60%, waste by 66%, water use by 75% and increased sales by 66%, doubled earnings and raised profit margins. To quote Ray Anderson, founder and chairman; ‘As we climb Mount Sustainability with the four sustainability principles on top, we are doing better than ever on bottom-line business. This is not at the cost of social or ecological systems, but at the cost of our competitors who still haven’t got it.’

In the next section, we explore how this is being experienced within the Philips Company.

6. Philips as a case example

Philips is a Dutch multinational corporation, founded in 1891 in Eindhoven and now headquartered in Amsterdam. In 2010, sales of €25 billion were generated in over 100 countries through its 118,000 employees organised in the three business sectors: lighting, consumer lifestyle and health care.

Responding to major global environmental and social trends like climate change, the rise of the middle class in emerging markets, increasing consumer empowerment and demand for sustainable lifestyles and ageing populations, Philips changed its strategic positioning to ‘Health and Well-being’ in 2007, and in 2010 sustainability became an integral and explicit element of the Philips Management Agenda.

The company has a long-standing commitment to sustainability both in its social and environmental aspects. On the social side already in the early 20th century, when this was not common, Philips’ employees benefited from schools, housing and pension schemes. On the environmental side, in the early 1970s, Philips participated in the Club of Rome’s ‘The Limits to Growth’ dialogue. This resulted in the establishment of the first corporate environmental function as early as 1974. Initially, this function created transparency on how Philips complied with environmental laws and health and safety regulations. Later, in 2003, a structured sustainable supply chain programme was also introduced.

Philips’ involvement in the WBCSD dates back to 1992 when the Council was set up in the wake of the first Rio Earth Summit. Philips was one of the 29 multinational companies that co-shaped this vision and required multi-sector pathways to get there. Vision 2050 was developed using the back-casting approach, suggesting required action towards a desired future, rather than extrapolating and forecasting for the current situation.

Philips’ EcoVision programmes were first launched in 1998, setting corporate sustainability-related targets (Table 1).

In parallel in 2003, the Philips Environmental Report (first published in 1999) was extended into a Sustainability Report, and in 2009 this was integrated into the Philips Annual Report, signalling the full embedding of sustainability in Philips’ business practices.

6.1. Vision 2015 and EcoVision5

In September 2010, Philips published Vision 2015, stating: ‘Philips wants to be a global leader in health and well-being . . . to simply make a difference to people’s lives with meaningful, sustainable innovations’.2

Philips EcoVision5 programme for 2010–2015 establishes concrete targets for sustainable innovation, covering both the social and the environmental axis:

- to bring care to 500 million people,
- to improve the energy efficiency of our overall portfolio by 50%,
- to double the amount of recycled materials in our products as well as to double the collection and recycling of Philips products.

On sustainable innovation, the Philips Annual Report 2010 states: ‘Green and Social Innovation are the building blocks for Sustainable Innovation. Green
Innovation focuses on reducing the Environmental or Ecological Footprint of our products. Social Innovation comprises contributions to the improvement of the Human Development Index (HDI)⁴.

6.2. Philips innovation legacy

Philips’ legacy of innovation dates back to its foundation in 1891. In 1914, Philips Research was established to fuel the company with innovative technologies. And since the mid-1920s, Philips Design has complemented technology with aesthetic and human perspectives. Today, Philips’ multidisciplinary, multicultural employee base continues this tradition of creativity, as reflected in its array of innovations and high patent right, trademark and design right output.

Like many other long-lived corporations, Philips has adjusted its innovation approach several times, anticipating major changes in society. In recent decades, this has resulted in the opening of an Experience Lab in Eindhoven and the extension of the traditional technology driven product creation process towards end-user driven innovation.

Philips is recognised as a leader in Open Innovation. In the late 1990s, the former Research Laboratories were transformed into a vibrant High Tech Campus, now hosting over 80 non-Philips business entities. During the last decade, its focus was ‘inside-out’ based on teaming up, incubation and spin-outs. The next step will be to increase its ‘outside-in’ effectiveness in co-creating sustainable systems solutions.

6.3. Managing innovation at Philips

Innovation in Philips is managed using a 4 ¥ 4 matrix which maps innovation types against the market life cycle (see Figure 3). The three innovation types are:

- roadmap: strengthening the core business,
- adjacencies: new to Philips, creating profitable adjacent business,
- breakaway: new to the world.

Philips sectors work closely with the various units of Philips corporate technologies to define a portfolio

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Table 1. Targets for eco-innovation within Philips

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<th>Targets</th>
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<tr>
<td>• Implementation of EcoDesign in product development</td>
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<tr>
<td>• Reduction of packaging material</td>
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<tr>
<td>• ISO 14001 at all production sites</td>
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<tr>
<td>• Development of first Green Flagship products</td>
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<tr>
<td>• Development of Sustainable Supply Chain programme</td>
</tr>
<tr>
<td>• New targets on energy- and water- consumption</td>
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<tr>
<td>• Increase of Green Flagship product launch</td>
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<tr>
<td>• Phasing out of several hazardous materials</td>
</tr>
<tr>
<td>• Re-focussing of social investments</td>
</tr>
<tr>
<td>• 30% of all product sales comes from Green Products</td>
</tr>
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<td>• Decrease of CO2 footprint by 25% (base year 2007)</td>
</tr>
<tr>
<td>• Investment of 1 billion Euros in Green Innovation</td>
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<tr>
<td>• Bring care to 500 million people</td>
</tr>
<tr>
<td>• Improve energy efficiency of overall portfolio by 50%</td>
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<tr>
<td>• Double the amount of recycled materials in our products as well as to include double the collection and recycling of Philips products</td>
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Figure 3. Managing innovation at Philips.
of innovation areas and topics designed to safeguard the company’s future business success.

6.4. Linking the Philips sustainability and innovation agenda

Since 2004, Philips Green Products have provided consumers with a way to make a difference through their buying decisions. Philips defines ‘green’ products as those offering significant environmental improvements in one or more green key focal areas: energy efficiency, packaging, hazardous substances, packaging, weight, recycling and disposal and lifetime reliability.

The lifecycle approach is used to determine a product’s overall environmental improvement over its total life cycle. Most green products directly contribute to EcoVision5 targets 2 and 3: energy efficiency and closing the material loop.

For example, the Consumer Lifestyle division has recently launched the first ‘Cradle to Cradle’ inspired products, such as the Performer EnergyCare vacuum cleaner, 50% made from post-industrial plastics and 25% from bio-based plastics. It is extremely energy efficient, but it earns its designations as a Green Product primarily because it scores so highly in the focal area of recycling.

Another example is the award-winning Econova LED TV. This high-performance LED TV consumes 60% less power than its predecessor. Even the remote control is efficient – powered by solar energy. In addition, the TV is completely free of PVC and brominated flame retardants, and 60% of the aluminium used in the set is recycled.

In 2010 green products accounted for 37.5% of the Philips sales. By 2015, it will be 50%.

With the launch of EcoVision4, Philips introduced a target on Green Innovation. Within five years until 2012, a total of €1bn will be invested in Green Innovation contributing to the green key focal areas and leading to green products. This target was already reached in mid-2010. Therefore in 2010, the EcoVision5 programme was launched for the first time setting sustainability target aiming at both the social and environmental dimension of sustainability.

6.5. A new innovation paradigm emerging

In her 2007 paper Democratizing the Future, Josephine Green (at that time working at Philips Design) suggested that a new innovation paradigm is emerging. Figure 4 below introduces the consequences of this for innovation.

![Figure 4. Evolution of innovation within Philips.](image-url)
In her paper *Sustainable Innovation* (Seebode, 2011), Dorothea Seebode explains in more detail how Vision 2050 reinforces the observation of an emerging new innovation paradigm and introduces how Philips is merging its sustainability and innovation agendas.

7. Discussion

We saw earlier the challenges posed to innovation management in moving into the zone 3 and 4 innovation space posed by SLI. In particular, there is a need for clear strategic frameworks to guide and shape project level activities over a sustained period of time. In the Philips example, we can see this pattern emerging – with a long-term commitment to sustainability taking more concrete form in the past decade with an explicit vision providing the context for specific and targeted initiatives. Such change – reflected in many other company examples – is driven by a recognition of the increasing social and regulatory pressure but also of the significant new business opportunities offered by innovating in this space. As a recent report from consultants Boston Consulting Group (BCG) suggests, SLI is becoming a mainstream approach characterised by early adopters – termed ‘embracers’ – who have an explicit strategy and road map to shape their activities (Boston_Consulting_Group, 2011).

But as they increasingly target SLI within their businesses, there will be challenges to their innovation management systems. For example, ‘search’ strategies based on ‘conventional’ R&D or market research may need to shift to take account of new signals giving early warning of newly emerging innovation trajectories (Bessant and Von Stamm, 2007). In the case of Philips, there has been a marked shift from an R&D led business to one with a much stronger market orientation, and this is now moving into the social and human development domain (Tidd and Bessant, 2009). An indicator here is the growth of new functions within established organisations associated with searching and building links into the emerging sustainability communities.

Similarly, resource allocation systems will need to shift to embed SLI values and criteria into established frameworks such as stage gate systems (Bessant et al., 2009). Developing explicit criteria, and measuring performance against these, will become an important driver of behaviour change within innovation systems. The example of Green products within Philips is an indicator of this process at work, and similar cases can be found in fields like greenhouse gas emissions. However, it could be argued that these represent improvement innovations – essentially doing what is already done in more sustainable fashion. As such, they can fit within an existing approach; the challenge may come to innovation management systems when more radical business cases need to be considered which represent significant leaps into the unknown.

Implementing SLI at the level of ‘doing what we do but better’ will require adaptation in terms of pathways, skills, project management arrangements, etc – and the emerging evidence is that this adaptation is being accommodated within ‘embracer’ organisations. However, more radical SLI projects may need to follow novel pathways, especially when they involve external partners and new configurations of knowledge – ‘architectural innovations’. The challenge here is one of learning to work with new partners and raises issues around ‘finding, forming and performing’ within new innovation networks (Birkinshaw et al., 2007).

Table 2 summarises these.

<table>
<thead>
<tr>
<th>Innovation activity</th>
<th>Challenges in zone 3 and 4</th>
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<tbody>
<tr>
<td>Search</td>
<td>Peripheral vision – searching in unfamiliar fields (sectors, technologies, markets, etc.)</td>
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<tr>
<td></td>
<td>Reframing</td>
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<tr>
<td></td>
<td>Finding, forming, performing new networks</td>
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<tr>
<td>Selection</td>
<td>Resource allocation under high uncertainty</td>
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<tr>
<td></td>
<td>Cognitive dissonance</td>
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<tr>
<td></td>
<td>Not invented here</td>
</tr>
<tr>
<td>Implementation</td>
<td>Internal mobilisation – new skills, structures, etc</td>
</tr>
<tr>
<td></td>
<td>Crossing the chasm and the diffusion problem</td>
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<tr>
<td></td>
<td>New appropriate language</td>
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<tr>
<td>Innovation strategy</td>
<td>Need for a clear framework within which to locate search, select, implementation – a ‘roadmap for the future’</td>
</tr>
<tr>
<td></td>
<td>New corporate paradigm – criteria based on sustainability – people, profit, planet, etc.</td>
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If – as an increasing number of commentators argue – SLI is a new Kondratiev-type wave, then we can learn some lessons from studies of previous examples. In particular, as Perez points out, the early stages are associated with a ‘substitution’ kind of innovation. Innovation takes place around the new techno-economic conditions but is essentially about replacing existing products, processes and services.
with variants which are more aligned – a ‘do better’ approach in our terms. But as the new paradigm becomes the dominant lens so the nature of innovation shifts to more radical and unexpected variants. (We can see this in the context of the Internet, where early innovation was essentially substituting online versions of what were often manual and physical transactions. Only later did the full potential of widespread reach, customisation, social and network effects, etc. give rise to a radical surge of new to the world products, processes and services).

The key message in studies of this kind is that riding the waves of change challenge existing incumbents. In the early stages, there is a refocusing of efforts around incremental innovation along the new trajectory – which favours the established players. But as the game shifts, so does the need for radically different approaches favours new entrant entrepreneurs. The challenge to incumbents is thus one of learning new tricks and letting go of their old ones – a real test of dynamic capability.

Arguably, SLI represents just such a shift – and the current success with which ‘embracers’ – like Philips – deal with it may belie a more significant challenge in the longer term which requires them to rekindle a strong entrepreneurial spirit and create fluid and open structures to enable it to flourish.

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References


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Notes

2. More background information to be found at: http://www.philips.com/about/company/missionandvisionvaluesandstrategy/vision2015.page
3. More information to be found at: http://www.philips.com/about/sustainability/index.page

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