Patterns of Innovation
Digital Xchange 2018

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Executive Summary

The combination of disruptive technologies and powerful new players in today's increasingly digital economy has triggered a flurry of innovation activity within established organisations, large and small. Our work at the University of Surrey such as Futurice suggests that innovation patterns vary widely between companies. This implies a degree of immaturity that is consistent with the early stages of the new digital era.

At the heart of current innovation is the harvesting of data as the primary source of value in the digital economy. As we shift from 'value in exchange' to 'value in use', data holds the key to unlocking new sources of value relating to customer context – something that few manufacturers understood or exploited in earlier decades.

The advent of data analytics, machine learning and artificial intelligence is fuelling an information revolution that should progress well into the next decade.

Our research suggests that organisations have three options when considering where and how to innovate. The first is a transformation at the 'core' of current operations through the application of new techniques such as IoT. The second is a more radical look at the business model, and ways in which digital can deliver fundamental changes to core processes and relationships. The third is an excursion beyond the boundaries of today's markets and services to find new 'White space' to operate in. All of these options are being pursued by the Centre for the Digital Economy (CoDE) at the University of Surrey.

According to delegates at our research meeting such as L&G and GSK, the factors that are likely to limit an organisation's ability to innovate are numerous and include: its decision-making processes; commitment of the leadership to change; ability to adopt new technologies; attitude to risk; and lack of recognition of external forces that may pose existential threats. One look at the retail and media sectors illustrates how so many leading companies are facing imminent failure due to dominant positions being adopted by digital giants such as Amazon and Google.

Through our research discussions during the February meeting, we have identified several constructive approaches towards successful innovation. These include:

- Engaging customers directly in the co-development of new products and services
- Exploiting changes in the workforce, especially the millennial generation
- Forging new partnerships with start-ups and digital giants
- Aligning systems to take advantage of open standards and cloud platforms

This paper summarises our research into the state of practice in business innovation, the desired 'future state', and the factors that both encourage and inhibit success in the process. We conclude with five actions that should enable companies to innovate more effectively.

Co-development with customers and partners is key to successful transformation

Why innovate?

Most large, well established companies have employed successful business models for decades that are optimised around certain long-term consistencies in the operating environment, and predictability of market conditions. In the last ten or so years such models have been challenged by new players such as Amazon and Google, and new technologies such as cloud, mobility, and data analytics.

At the core of such disruption is the ability to exploit data about customers and operations in near real-time. Understanding the context in which a product or service is used gives market leaders an ability to generate new sources of value. For example, in food production, information on individual animals helps to optimise the efficiency of the farm to maximise yield. However, more broadly, information gathered from a large sample of farm animals can help predict unusual behavior that often precedes an epidemic. This 'data' enables farmers and others involved in the animal food chain to take preventative action well in advance of a national outbreak. Such data-driven insights are being seen across many areas: in machines (preventive maintenance); in the home (reducing running costs); in humans (preventative healthcare treatments); and elsewhere.

The shift from 'value in exchange' to 'value in use' unlocks new sources of value

The current shift from 'value in exchange' to 'value in use' is helping companies unlock new sources of revenue and profit. It also enables rapid product or service refinements to be enacted based on customer behaviour. Digitally-enabled organisations can achieve service upgrades in hours or days rather than weeks or months, as well as continually generating new product releases targeted at specific market segments, emerging trends, and experimental learning. This is widening the gap between incumbents and newcomers, with increasing numbers of fatalities. Just compare Netflix and Blockbuster as two divergent stories.

As we progress into new eras of technical development such as Internet of Things, Machine Learning and Artificial Intelligence, the need to innovate becomes ever more pressing. Already we see much positive activity amongst established players, but the approaches appear to differ widely between company and sector. This paper, informed by the discussions that took place among a group of 18 industry leaders at a research workshop in February 2018, examines where and how companies need to innovate and provides guidance on best practice. The views and experiences of innovation at the organisations represented at the workshop were gathered through a combination of informal conversation, structured workshop activities, and instant online polling questions.

What is the current state of Innovation Practice?

The factors that currently influence an organisation's ability to innovate were scored amongst eighteen participating company members using an online polling technique:

Factor	Optimal situation	Score (out of 5)
Co-development with customers and partners	Full co-dependency	3.5
Leadership from the top	Accessible, robust	3.1
Innovation	Encouraged, enabled	3.1
Communication	Open, cross-silo	2.9
Mindset	Curious, experimental	2.8
Skills and Knowledge Base	Digital literacy	2.7
Team Dynamics	Flexible, agile	2.7
Strategic View	Visionary	2.6

The factors that appear today to limit an organisation's ability to innovate are: its decision-making processes; ability to adopt new technologies; attitude towards risk; and lack of recognition of external forces that may pose threats.

What are the current innovation capabilities?

Despite the challenges such as culture facing organisations making transformational changes, there are grounds for hope. Throughout the workshop views were expressed that the participating companies are relatively optimistic about their ability to exploit internal and external environmental factors to launch and sustain innovation activities.

At the external level, established companies recognise that factors such new sources of energy, healthy customer appetite for innovative solutions, emerging digital platforms, and strong competition encourage a swift response, and can deliver performance improvements.

At the internal level, the same companies identified factors such as trust in the brand, adequate funding, collaborative workstyles, ability to experiment, and trade partnerships as assets that could support innovation across product and service lines.

Some specific suggestions on how to harness innovative forces included:

- Exploit the new workforce skills and attitudes implicit in the millennial generation. This included the prospect of 'reverse mentoring'.
- Supplement existing processes with agile equivalents that would enable faster responses to external changing conditions.
- Take advantage of new partnerships, especially with small start-up companies, to invigorate cultures and attitudes towards risk.
- Align systems to take advantage of open standards, cloud and other recent developments, each contributing to greater flexibility.

Applying an Innovation Canvas

Derived from the Business Model Canvas created by Osterwalder and Pigneur, an updated Innovation Canvas built by Canviser and adapted by Futurice was used to explore some of the innovation opportunities and challenges being faced by the attendees at the workshop. This canvas tool enables organisations to analyse internal and external factors that may accelerate or inhibit innovation. There are six internal factors ranging from strategy, leadership and culture to people, process, and technology. In the discussions, break-out groups were asked to assess the current strengths of their organisations in each of these categories i.e. 'what is working on our side'.

Here is a summary of the responses:

1. **Strategy** – *relating to core competencies; alignment between strategy and innovation; and the process for renewing the strategy*. Innovation is feasible where there is a clear sense of purpose; a strong CEO committed to change and a sense of urgency within the executive team.
2. **Culture and Leadership** – *common appreciation of values; encouragement for creativity; orientation towards intrapreneurship and learning.* Innovation is encouraged by a collaborative environment; willingness to adapt and change; a sense of vision and ambition; entrepreneurial roots; a history of successful innovation.
3. **Funding and Measurement** – *strength of balance sheet; discretionary investment resources for experimentation*. Innovation is most practical where management is prepared to invest without immediate prospects of a return. Private companies are at an advantage, especially where they have deep pockets.
4. **People** – *assignment of roles and responsibilities; ability to build and capitalise on external networks*. Innovation is accelerated when companies have access to external resources; visionary people within the firm; ability to harness the millennials for change; and an appropriate reward system.
5. **Process** – *product development and ideas management; connection between process and strategy; engagement of external parties such as customers*. Innovative ideas can be implemented when there is freedom to act and to make decisions; organisations adopt a compressed time cycle (4-6 weeks); ideas can be transferred rapidly out of the laboratory.
6. **Technology** – *how well is IP managed; what are the current sources of technology (internal and external); is technology-led innovation encouraged*. Innovation is enabled through an open standards environment; stable internal systems; contributing partners; and agile techniques.

Participants were also asked to assess their current strengths against five external factors ranging from networks and partnerships, trends to markets, products, and brands.

Here is a summary of responses to these external factors:

1. **Networks and Partnerships** – *how well structured is our network of partnerships; how do we foster such relationships; what role does each partner play*. Innovation through partnership depends on scale and influence; ability to gain trust; availability of joint venture funding; and existence of a shared vision between parties.

2. **Trends** – *ability to gather and assess trends systematically; incorporating trends into corporate strategies, processes, and technologies.* Decisions to innovate are best supported by full recognition of external trends that support the business case. Customer use-cases are helpful in building a case for innovation.

3. **Product** – *where are current products on the technology maturity curve; what new technologies will be required to enhance products; what are the sources of such technologies.* Innovation focuses on customer experience and longevity; the product offering is clear; and demonstrates value to the customer.

4. **Brand** – *how deep is brand heritage and do customers perceive brand value; is brand identify tied to current products and services.* Innovation is supported by a strong brand representing customer trust and loyalty; safe brands provide a firm base for experimentation and product refinement.

5. **Market** – *how well do we know our target markets and customers; are there new markets where our capabilities would be of interest*. Innovation takes advantage of strong customer relationships and the potential for co-development; companies rethink which markets they need to be in as barriers come down.

Innovation examples – learning from global best-practice

Exploring our understanding of the broad concepts of innovation to gain a shared view became a central theme of the workshop. The breadth of views highlighted the need for a common conceptual framework as a foundation for discussion. To ground the conversations, the MAXOS Group's innovation framework was introduced.

According to a recent survey of global companies conducted by the MAXOS Group, there are up to nine different innovation patterns that are being adopted by market leaders. These include two key dimensions relating to scope, and where the activities are focused:

- **Scope of Innovation** – incremental (gradual improvement of internal process performance in the 10-20% range); radical (complete redesign of business processes to transform performance in traditional markets); new business (entering new markets with associated new business models)

- **Focus of Innovation** – core (reworking the primary work activities of the organisation); edge (creating new activities out at the periphery of the organisation); both (innovation conducted both within the core and out at the edge)

The MAXOS survey focused on organisations that are engaged in radical and/or new business innovations encompassing both core and edge activities.

In the case of Swiss Post, the company has developed an entirely new service based on drone technology to deliver bio-samples between hospitals. Philip Morris International (PMI) is abandoning cigarettes and adapting e-cigarette technology to enable new forms of drug delivery. Philips is exiting consumer electronics to concentrate on healthcare – building a large research center in Boston. More examples can be drawn from the recent MAXOS survey, visit www.rogercamrass.com.

In all these cases, success is based on factors such as tighter trade partnerships and related eco-systems; new infrastructures such as open APIs and cloud services; relocation to areas with appropriate skills; and new and more expansive problems to solve (as in oil displacement).

What are the barriers to innovation?

In contrast to the factors that work alongside organisations to support innovation, attendees were asked to articulate inhibitors that worked against such activities. Applying the 'innovation canvas' to these barriers, the following internal factors were identified:

1. **Strategy** – no apparent burning platform to encourage a rethink of strategy; time lag between external events; internal planning processes (often years)
2. **Culture and Leadership** – inherent conservatism within the organisations (and often across entire sectors); conflicting objectives between individuals, departments, and business units
3. **Funding and Measurement** – difficulty in developing business cases for innovative projects (longer and more risky outcomes); success syndrome (if it isn't broken, why fix it)
4. **People** – attracting younger talent; reskilling the existing workforce; creating slack in the organisation; overcoming nervousness within middle management
5. **Process** – incorporating new ideas within rigid and static practices; developing effective governance models to promote change; working across silos; working within tighter regulations; finding the right execution capabilities
6. **Technology** – overcoming legacy constraints; learning to work in a bi-modal systems world; balancing short and longer-term needs; setting priorities when faced with too many ideas

Many of the attendees expressed variations of the "innovators dilemma" of short term incremental change being favored over riskier disruptive options. They pointed to key mindset barriers that favored the well-proven methods of making money versus risky approaches based on agile techniques (fast-fail). Few organisations appeared to have built an effective bridge between innovators and implementors, implying that many good ideas were being lost in translation.

External factors listed within the innovation canvas also presented barriers to effective innovation:

1. **Networks and partnerships** – difficulties in aligning strategic goals between partners; shortage of quality partnerships; shareholder pressure to focus on current business and relationships.
2. **Trends** – changes in regulation, health and safety; uncertainty of the macro-environment post the 2008 financial crash; move from product to services.
3. **Product** – lengthy cycle time for product development; dislocation between R&D and the rest of the supply chain; need to become skilled in software and data analytics as key components of a product.
4. **Brand** – not perceived as relevant to the digital world; encapsulating outmoded values; disconnected to modern lifestyle needs.
5. **Market** – diminishing barriers to market entry; growing threats of competition from other sectors; changing social sentiments; prioritising opportunities from a growing list of possibilities.

Creating an innovative environment

Having examined factors that enable and barriers that inhibit innovation, delegates were asked to re-appraise their views on what would constitute a successful environment for a digital future. Here are the results, with comparisons on earlier scorings:

Factor	Optimal situation	Current score (out of 5)	Earlier score (out of 5)
Strategic view	Longer term horizons	3.8	2.6
Communication	Changing channels	3.7	2.9
Leadership from the top	New faces	3.7	3.1
Skills and Knowledge	External input	3.5	2.7
Structures and processes	Radical re-work	3.5	1.7
Technology adoption	Changes in current portfolio	3.4	2.4
Co-development with customers	Strategic partnerships	3.3	3.5
Team dynamics	Structural changes	3.1	2.7
Decision making	More agile	3.1	2.5

In addition, feedback from attendees highlighted that other factors that remain important include Mindset, and Approach to Risk.

These results emphasise an important gap between current and futures states. There is a clear, dramatic re-ordering of several factors such as strategy, communications, structure and processes, technology based on the difference between ‘what is on our side today’ and ‘what we will need to become more innovative tomorrow’.

Actions to be taken

The breadth of the conversations that took place were reflected in the diversity of views on how to make a positive difference in innovation practices in a fast-paced digital environment.

However, discussion at the end of the workshop revealed some important actions to be taken in the following areas:

- **Listening to the customer** – successful companies need to remain close to their customers, especially in a data-driven world where every aspect of product or service usage can be captured and analysed.
- **Co-development** – the voice of the customer is especially important in new product or service development, both in b2b and b2c segments. Research groups need to be closely connected to key customers.
- **Changing the culture** – this was felt to be more important than technology adoption when preparing an organisation for innovation. Giving permission to be creative helps to energise a culture and stimulate enthusiasm.
- **Using real-world examples** – bringing success stories into an organisation can help to build advocacy for new ways of working, especially experimentation. Partners can help to inject new thinking based on different sets of experience.
- **Leadership in action** – executives must demonstrate commitment to innovative practices by offering incentives to staff. Middle management must be encouraged to adopt new practices and relinquish old habits.
- **Introducing new skills** – the millennial generation will bring new thinking and new skills. However, companies will need to work had to attract and retain this cohort given the relative attractions of start-up companies.

Conclusions

The opportunities and challenges for organisations adopting accelerated approaches to innovation are well known and well document across the academic and business literature. This workshop was important in highlighting several ways in which focus and priority can be placed on bringing those ideas into practice.

Considering this, and based on the wider experience at CoDE, we identify five actions to enable successful innovation:

1. **Strategic vision** – innovation should be an integral component to any future strategy, with appropriate investment and operational priorities.
2. **Cultural alignment** – innovation requires a fundamental shift in culture towards a more agile and experimental way of working.
3. **Leadership** – the CEO and executive board must drive change. This cannot be delegated down the organisation. Any major project without such backing is likely to fail.
4. **Partnerships** – customers are the most valuable innovation partners, whether b2b or b2c. However, different engagement methods will be required in across these segments.
5. **Technology** – much of today's innovation is focused on data-driven ways of working. The adoption of data analytics, IoT and artificial intelligence are critical tools in digital business. Not for their own sake – but as essential elements of discovering new forms of value through which organisations can satisfy customers and compete effectively.

ABOUT THE AUTHOR

Roger Camrass pioneered today's Internet, working as an ARPA research fellow at MIT in the mid-seventies. Since then he has helped Fortune 1000 corporations across the globe to adopt successive waves of new technologies, from mobile and e-commerce to cloud and data analytics. He is a visiting professor at the University of Surrey and director of CIONET in the UK. He has authored numerous papers and books, including 'Atomic: reforming the business landscape into the new structures of tomorrow'. Visit www.rogercamrass.com

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