



WINNING IDEAS.

The Management Articles of the Year.

February 2014

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FOREWORD

SIR PAUL JUDGE



Reducing the gap between theory and practice in leadership and management is as important as ever. The CMI Management Articles of the Year competition helps to promote to practitioners in the field the latest thinking and analysis from some of our leading academics. I am delighted that the Universities and Science Minister David Willetts says of our awards:

“Management Articles of the Year gives managers the opportunity to stay up to date with the latest and best thinking from British Business Schools. Opening up research and data to a wider audience can help to foster innovation, drive growth and create new areas of academic discovery.”

Indeed innovation and growth are at the heart of this year’s collection of articles which offer rich and thought provoking insights. These range from the use of competitions to solve complex business problems to innovation for sustainable business.

Another provocative and somewhat shocking theme is that in many organisations in the UK the quality of management is so low that substantial improvements to performance can be achieved through introducing very basic management practices or effective employee engagement. I was particularly impressed by Jules Goddard’s paper ‘The Fatal Bias’ which makes a powerful case for investing in quality and growth rather than in a strategy of cost cutting and competing on price.

We are grateful to those in the research community who made submissions to this year’s competition and also to the CMI members who gave their time and considered thought to rate the articles. We look forward to even more researchers and managers becoming involved in the competition as it enters its fourth year.

I trust that the articles presented here will help readers to find solutions to some of the practical challenges that they face in the months ahead.

Paul Judge

Sir Paul Judge

Chairman of the Academic Advisory Council, Chartered Management Institute

INTRODUCTION

As the only chartered professional body dedicated to promoting the highest standards in management and leadership excellence in the UK, CMI provides forward-thinking advice and support on management issues for our 90,000 members and thousands of wider stakeholders.

CMI aims to bring the best research on management topics from leading universities and business schools to managers in the workplace. This is why we launched Management Articles of the Year in 2011, an annual competition open to academic researchers affiliated to a UK university.

Our first collection focussed on the interrelated themes of leadership, change and communication, demonstrating the rich tapestry of academic management literature that interested CMI members in 2011. Last year's collection included issues as diverse as the quality of working life and the potential benefit for small and medium enterprises of effective customer relationship management. This year, we feature five of the best articles submitted in 2013, as rated by CMI's members, encompassing topical issues about well being and sustainable engagement to strategies that work and the returns from improving management practice.

The purpose of the competition is to assist universities in disseminating their research findings to a wider audience, help them demonstrate societal impact and raise the profile of their work with employers. It will also benefit practising managers by providing them with insights from credible, authoritative and leading edge research.

The competition has two features. First, articles entered into the competition are reviewed and rated online by CMI's membership for their usefulness to practising managers. Secondly the articles achieving the highest average ratings were scrutinised by CMI's Academic Advisory Council, a committee made up of leading academics drawn from across the United Kingdom.*

We are grateful for the high level of support we have received from the academic community and CMI's membership. Working in collaboration with the British Academy of Management, the Association of Business Schools and the British Library, this innovative initiative is sponsored by John Wiley and Sons Ltd, one of the world's leading business publishers. To view the articles and the reviews received, or to find out more about entering this competition next year, go to <http://www.managers.org.uk/toparticles>

* To avoid conflicts of interest, any Council members whose work was being scrutinised by the Council were not present for those discussions.

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ABOUT THE ARTICLES

This year's winning article is 'The Fatal Bias' by Jules Goddard. For decades, executive orthodoxy has been to run a lean, cost-efficient firm. An increasing amount of research reveals this to be counter-productive, and resting on a cultural bias towards cost-analysis, rather than a behavioural understanding of how revenue is generated. One of the counter-intuitive conclusions is that an organisation's costs are just as likely to be too low as too high. Goddard eloquently describes this emerging understanding and the evidence base. He builds a model describing and explaining the different biases of winners and losers, illustrating how winners create shareholder value by investing in higher costs and delivering superior value. Goddard does not baulk at the implications, describing a truly Copernican shift.

In 'Test-Driving the Future', Joseph Lampel, Pushkar P Jha, and Ajay Bhalla provide a comprehensive update on the rapid development of design competitions to spur innovation. They describe how inviting open competitions to solve technical problems, or create next-generation technology, or solve complex problems, is a revival of approaches that propelled the original industrial revolution. The move is towards collaborative, multi-year programs, and to share learning and engage in on-going learning, rather than a 'winner-takes-all' approach. There is a useful list of five key practices.

On the question of sustainability, Rachel Lewis and Emma Donaldson-Feilder bring the concept to the matter of employee engagement in 'Managing for Sustainable Employee Engagement'. There is a sobering summary of studies illustrating that the level of engaged employees remains low, and draw attention to a tendency to define

engagement in a way that emphasises commitment to the organisation, neglecting well-being. This can create a fragile type of engagement, prone to collapsing when extra demands are made. Their research concludes that five behavioural themes for managers can create a balanced approach and sustainable engagement: 1) being open, fair and consistent; 2) handling conflicts and problems; 3) knowledge, clarity and guidance; 4) building and sustaining relationships; 5) supporting development.

Few politicians accept that current levels of consumption are environmentally unsustainable, but some enlightened businesses are taking the lead. They are moving towards a way of working that has a net positive effect on society and the environment, report Richard Adams, Sally Jeanrenaud, John Besant, Patrick Overy and David Denyer in the article 'Innovating for Sustainability'. They describe three phases an organisation can move to, from being more efficient and reducing harm, to a second phase of innovating new ways of working, towards a third level where a business is properly viewed as part of an interdependent society and environment.

More evidence to undermine the zero-sum, cost-based approach to management can be read in 'Does Management Really Work?' by Nicholas Bloom, Raffaella Sadun and John Van Reenen. They report that standards of management are actually so low in many organisations that even basic monitoring and performance management can bring about dramatic improvements, often leading to higher margins and better wages, simultaneously. Aggregated across an economy, the returns from improved management can be huge.

ARTICLE 1

The Fatal Bias: the prevailing managerial bias towards cost efficiency is seriously harmful to corporate performance.

Dr Jules Goddard, Fellow, London Business School.

Overall cost leadership is not a viable strategy. This is the key discovery to have come out of the most extensive and thorough study of corporate performance ever conducted. Michael Raynor and Mumtaz Ahmed, both with Deloitte, examined the performance of more than 25,000 U.S. companies over a 40-year period. Their aim was to identify companies with sustained levels of high returns on assets and to find an explanation in terms of the strategies pursued by these companies. In a recent paper in Harvard Business Review (Raynor and Ahmed 2013), they report on their ground-breaking findings, the most provocative of which challenges Michael Porter's assumption that overall cost leadership is one of three generically viable competitive strategies. Of the 25,000 companies in their sample, only a handful achieved strong and sustained success with this strategy. They conclude that: 'Very rarely is cost leadership a driver of superior profitability ... it could have turned out that price-based competition was systematically more profitable, or that cost leadership took precedence as a driver of superior performance – but it didn't'.

When this finding is placed alongside Tim Ambler's equally provocative finding (Ambler 2003) that 'on average, boards devote nine times more attention to spending and counting cash flow than to wondering where it comes from and how it could be increased', the implication is clear: there is a perilous bias within many top management teams towards what is invariably a losing strategy, that of cost competitiveness.

Context of the argument

We live in puzzling times. More and more of the beliefs and assumptions that business leaders and managers take for granted are being shown to be false or flawed. The behavioural sciences are gradually eroding the pillars on which traditional managerial and strategic policies and practices have been based:

- the principle of obliquity – the idea that goals are best reached *indirectly* – is undermining the confidence that managers have traditionally placed in goals, targets, key performance indicators and budgets (Kay 2010);
- experiments in motivation are dismantling the assumptions that money is an effective motivator and that financial incentives drive productive behaviour (Pink 2009);
- studies of wealth creation are demonstrating the perils of emulating best practice (Capozzi, Kellen & Smit, 2012);
- the hegemony of the traditional theory of management, resting upon the twin pillars of hierarchy and bureaucracy, is being challenged by an entirely new set of organisational principles emanating from web-based enterprises (Birkinshaw 2012, Hamel 2012);
- empirical studies of profitability are challenging the premises of industry analysis and particularly the five forces model of corporate performance (Rumelt 1991);
- now researchers at Deloitte are dismantling Porter's model of competitive strategy by showing that overall cost leadership is a counter-productive strategy.

In this article, I will draw out the practical implications of Raynor and Ahmed's findings, both by combining them with other, related discoveries, and by pushing their findings to their logical conclusion.

In an earlier article (Goddard 2010a), I argued for the following propositions:

“ EVERY COST SAVING IS AS LIKELY TO REDUCE PROFITABILITY AS TO INCREASE IT. ”

1. Costs are not the basis of a strategy, but the result of putting it in play;
2. Cost efficiency is always relative to a strategy or to a business model, never to a competitor or to an absolute standard or benchmark;
3. If, when executed, the strategy proves to be uncompetitive, it is usually the strategy that is flawed, not the costs that are too high;
4. Strategy is therefore the skill of staying one step ahead of the need to be efficient;
5. Time spent on a strategy of cost efficiency is therefore time stolen from the much more important and wealth creative activity of customer focused innovation;
6. The most prevalent source of corporate failure is management's conviction that their costs are out of line rather than that their strategy is misconceived.

In a related article (Goddard 2010b), I extended the argument to make the following practical observations:

1. A company's cost position relative to that of its rivals provides absolutely no indication of competitiveness or efficiency or waste;
2. The highest cost player is just as likely to be the most competitive player in the industry as the lowest cost player;
3. Every cost has the same likelihood of being too low as too high;
4. Every cost saving is as likely to reduce profitability as to increase it;
5. For example, every cap on recruitment or training or travel expenses is just as likely to destroy value as to create value;
6. The imminence of an economic recession – or indeed a dip in sales, market share, or profitability – conveys no useful information as to whether costs (or indeed prices) should be raised or reduced;
7. When times are good, that is no reason for increasing costs (on the spurious grounds of 'affordability') nor, when times are bad, for cutting costs (on grounds of 'austerity').

“ THE RAW TRUTH IS THAT A COST INCURRED IN DOING BUSINESS – ANY COST – IS JUST AS LIKELY TO BE TOO LOW AS TOO HIGH. ”

Many years ago, Jim Collins demonstrated that a focus on profit is self-damaging, the evidence being that companies whose goals are financial tend to *underperform* those whose purpose is more visionary. Perhaps, in a similar way, a focus on cost-cutting has the unforeseen consequence of cutting revenues and therefore margins at an even faster pace. What would appear at first glance to be a bold assault on waste and inefficiency turns out to be a careless and costly assault on earlier investments made by even bolder managers in the competitive differentiation of the enterprise.

A challenge to Porter's generic strategy model

At face value, Michael Porter's concept of a cost leadership strategy would seem to make abundant intuitive sense. By achieving the lowest cost base in your industry, you can afford to set the lowest prices and capture the most price sensitive customers.

Porter suggests that there are 3 principal routes to cost leadership:

1. enjoying a *higher asset turnover*, by spreading fixed costs over larger sales volumes, thereby benefiting from greater economies of scale and learning curve advantages
2. securing *lower operating costs*, by economising wherever possible on the cost of inputs, reducing variety and other sources of complexity, standardising business processes, outsourcing non-critical activities, paying low wages, off-shoring manufacturing and assembly, and generally institutionalising a culture of parsimony
3. negotiating a *low-cost supply chain*, using techniques of bulk buying, competitive bidding, hard bargaining, lean purchasing, and vendor managed inventory.

Raynor and Ahmed's research casts all three of these assumptions in doubt. Specifically, the implications would seem to be that:

1. *Economies of scale* are generally a mirage, perhaps because every doubling of scale creates more than a doubling of managers, systems and processes. This self-fuelling ratchet effect yields what Gary Hamel has aptly called 'the management tax';
2. A climate of *excessive frugality* focused relentlessly on the denominator of any calculation of returns (whether on assets, capital, equity, or sales) ends up being an inwardly focused culture that, in the words of Oscar Wilde, knows the cost of everything but the value of nothing;
3. Treating *suppliers* as a cost to be cut rather than a relationship to be nurtured may be counter productive in the long run. Those who treat their suppliers in this way may find themselves being treated by their own customers in a similar fashion.

Beneath all of these assumptions lies a deeper misconception still – the idea that a policy of cost-cutting makes more commercial sense than one of purposeful and judicious cost-adding. The raw truth is that a cost incurred in doing business – any cost – is just as likely to be too low as too high. In fact, the systematic corporate bias towards cost-cutting, particularly in an economic recession, means that, on average, more costs end up being too low than too high, and that, therefore, a strategy of increasing costs – making bolder, less risk averse investments in the cost base of the business – is more likely to be successful than one of cutting costs. In other words, the bias, particularly in British manufacturing companies, of managing the denominator in preference to the numerator stands in need of a strong counter-bias in favour of bolder investments and higher costs.

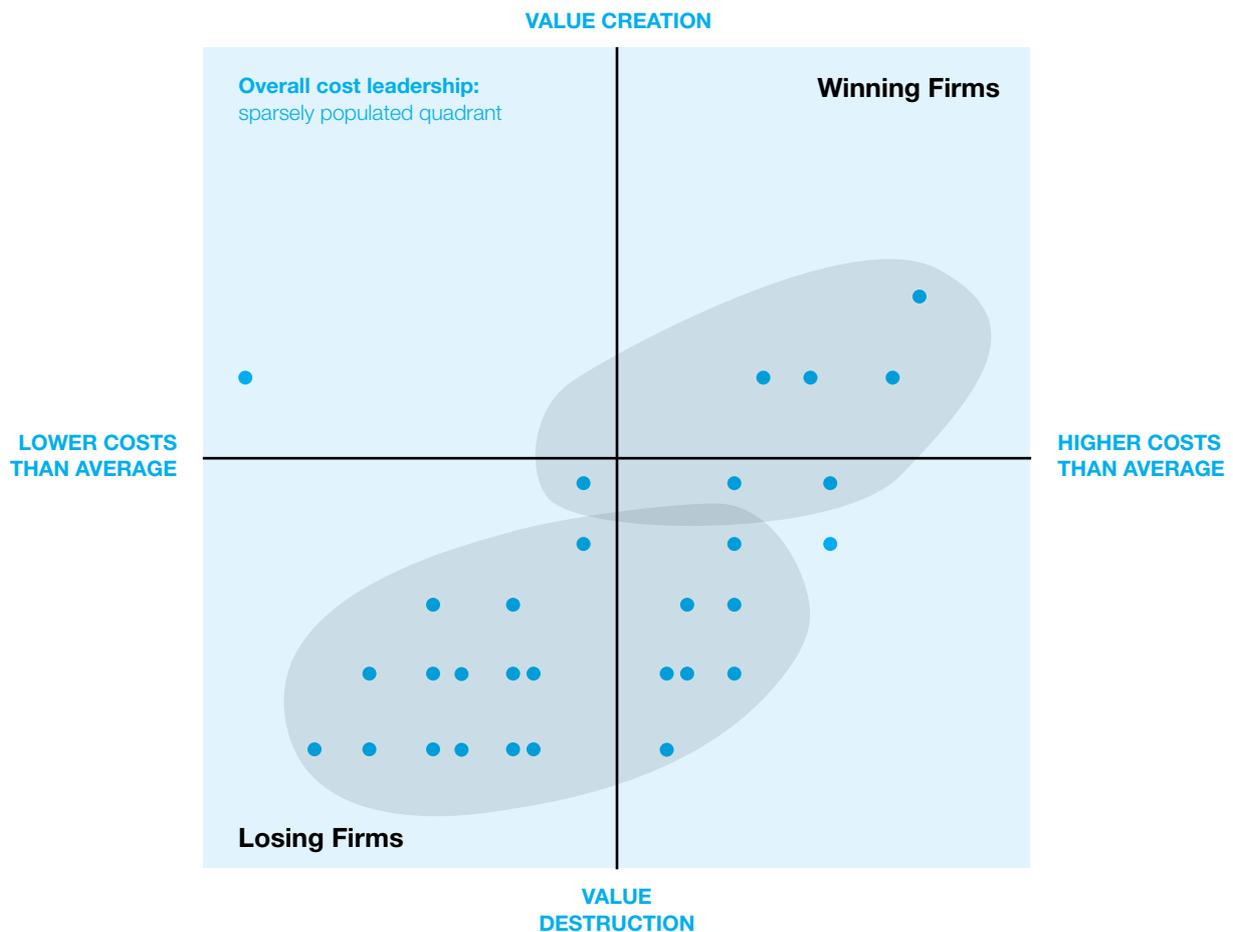
Take the case of Dyson. The genuinely newsworthy story underlying the extraordinary success of Dyson was not the off-shoring of manufacturing to Malaysia but the on-shoring of prodigious engineering talent to his research and design hub in Malmesbury. We misread the brilliance of James Dyson, and the lessons he has to teach British business, if we choose to interpret his skill and originality as a cutter of costs than as a creator of premium products. His vacuum cleaners, hand-dryers and fans are some of the most profitable products in the world not because their production costs are low (they are decidedly not), but because their functionality in use justifies a market price roughly three times that of the competition. Dyson exemplifies Raynor and

Ahmed's two key rules of success: 1) Better before cheaper; and 2) Revenues before costs.

Analysis

In this section, I build a model to describe and explain the different biases of winners and losers. Firms in the same industry or strategic segment are positioned on a 2-dimensional grid (Figure 1). The horizontal dimension plots firms in terms of their unit costs; the vertical dimension plots them in terms of their added value. Thus, firms above the horizontal axis are creating wealth; firms to the right of the vertical axis bear unit costs higher than the industry average.

Figure 1: Distribution of firms in an industry by cost base and economic profitability

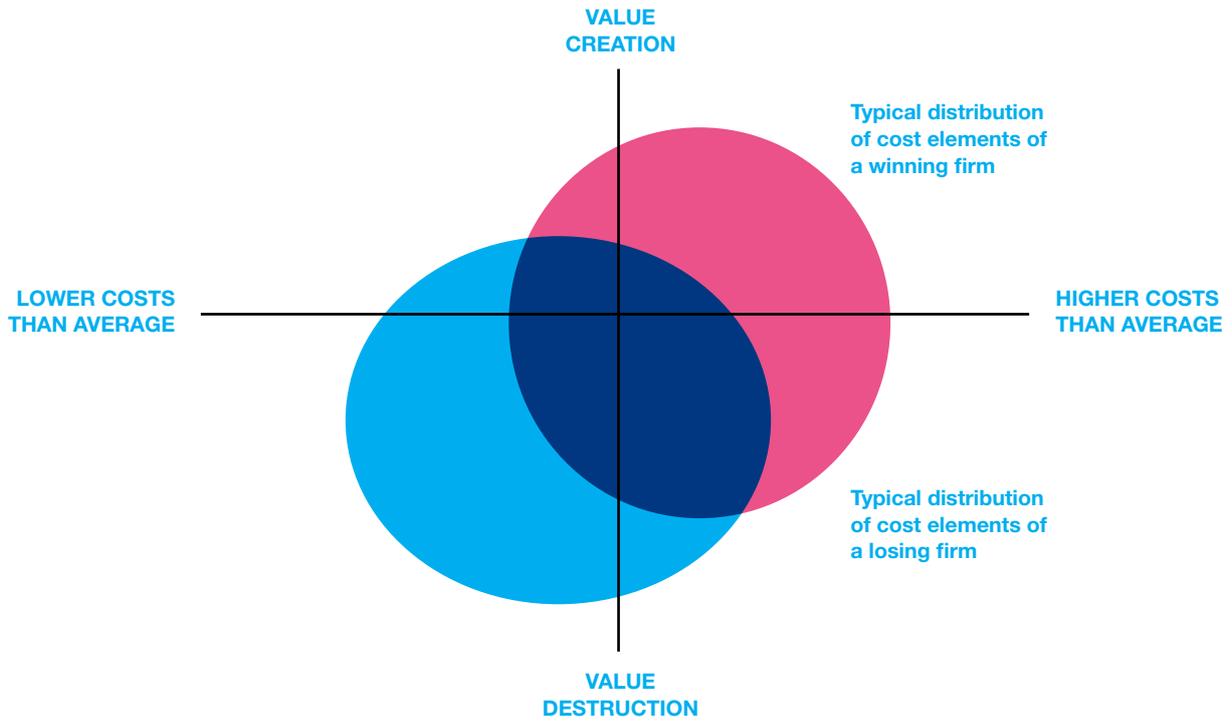


Winners tend to sit in the upper right-hand box, creating shareholder value by judiciously investing in higher unit costs and delivering superior value to customers. This strategy takes entrepreneurial courage, since it relies upon market insights that are unique to the firm – what I call ‘uncommon sense’ (Goddard and Eccles 2012). Those firms that choose to take on this risk but exaggerate the quality of their insights end up in the lower right-hand box: the home of brave losers.

It is rare to find a firm in the upper left-hand box. This is the core discovery of Raynor and Ahmed. Most losers sit in the bottom left-hand box, perplexed that their quest for cost leadership through cost-cutting has only led to value destruction. This is the home of false economies: there are no short cuts to wealth creation.

Self-evidently, the cost base of any firm, whether winner or loser, will comprise some costs that are higher than the industry average and others that are lower. Each firm makes its judgment on each category of cost as to where it thinks the optimum lies. This is the skill of strategy. Overall, most of the costs of winners will be higher than most of the costs of losers (Figure 2).

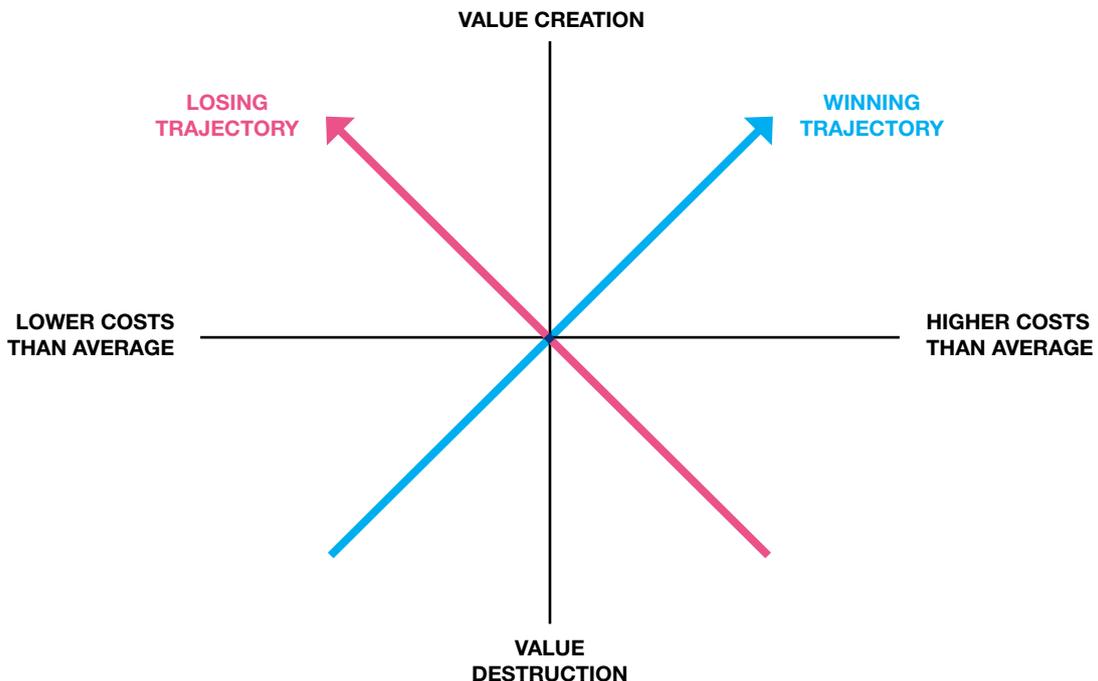
Figure 2: How winners and losers differ in the composition of their cost base



The strategic plans of companies reveal their assumptions as to the origin and destination of their strategic journey (Figure 3). The majority of companies envisage their path towards greater economic profitability as a journey from a place of relative inefficiency, waste and profligacy to one of greater discipline, frugality and competitiveness (the South-East to North-West trajectory). This 'drive for efficiency' will invariably contain such fashionable cost-cutting methods as out-sourcing, off-shoring, service-sharing, and re-engineering. It is the journey chosen by the majority of losers. They aim for El Dorado but, by the law of obliquity, they end up in the land of lost illusions.

A minority of companies, by contrast, envisage their path to success very differently. They see their strategic journey as one of continuous discovery, moving from a place of 'best practice' to one of 'unique practice' – from conventionality, convergence and commoditisation to daring, distinctiveness and differentiation (the South-West to North-East trajectory). This quest for 'corporate individuation' is driven by the conviction that markets reward uniqueness. This strategy has its risks, but it is the preferred path of most winners.

Figure 3: How winners and losers differ in their strategic journeys



Broader implications and suggested remedies

What are the practical implications of the finding that long-run profitability is strongly associated with a higher than average cost base? In other words, if managers and strategists are to break the habit of looking mainly to cost efficiencies for the creation of competitive advantage, what changes of mindset and behaviour are implied?

- **Strategies as experiments**

There needs to be a more concerted, more confident focus on opportunities for out-spending competitors, for investing earlier in entrepreneurial ideas, and for using experimentation more routinely. Only an irrational objection to the cost of experimental risk (its hit or miss nature) can explain the reluctance of companies to conduct frequent, small scale experiments in the search for viable strategic ideas. Is it not surprising that the tried and tested methodology of clinical trials, all too familiar to pharmaceutical companies in the testing of drugs, is not in routine use by companies for the testing of strategic ideas?

- **Plans as conjectures**

All too often the process of strategic planning descends into a self-defeating duel between the requirements of the executive board and the commitments of the individual business unit. Management teams, under varying degrees of duress, find themselves signing up to a host of targets and timelines. This has the inevitable effect of placing the focus on costs as the easiest way of securing the required margins and profits. When plans become promises to be met rather than propositions to be tested, the default position tends to be a cost-cutting strategy. To combat this, perhaps firms should consider a one year moratorium on any plans containing numbers. Instead, they could require plans to be built entirely out of ideas. In other words, the purpose of planning could (and perhaps should) be shifted from accountability to exploration and discovery?

- **Management accounts as explanations**

It is symptomatic of the bias towards cost management in the pursuit of profit that the standard profit and loss statement devotes a single line to revenues and a long list of lines to costs. Imagine reversing this order of priority by breaking down revenues into multiple lines according to the source of sales and, conversely, aggregating all costs into a single line. Might this not have the desirable effect of shifting strategic attention from the cost of sales to the growth of sales? The way in which management accounts are constructed betrays a belief that costs are a tiresome burden to be subtracted after the revenues have been earned rather than the generative source of those revenues. Indeed, the names given to different categories of cost serve only to accentuate this illusion. Perhaps the cost of inventory should be re-labeled as the 'cost of product availability', the cost of debt as the 'cost of accelerating investments in new products', the cost of training as the 'cost of capability', the cost of bad debt as the 'cost of trust in customers, and so on.

- **The economy as a scapegoat**

When the economy falters, or when competitive pressures build, or when sales revenues dip, the cost consciousness of companies typically strengthens and managers instinctively default to 'play-safe' strategies. Instead of 'battering down the hatches', why not use the challenging conditions as an incentive to 'break out of the box' of conventional thinking – to be bold when others are choosing to be more circumspect? When everyone else is cutting back, perhaps that is the opportune moment to invest in attracting the customers of competitors.

- **Volatility as hype**

Preferring caution to courage under conditions of change is closely related to the belief that the world is becoming more volatile, more complex, and more unpredictable. In 'Beyond the Hype', Robert Eccles affectionately teased Peter Drucker for routinely prophesying that the succeeding decade was destined to be a singularly significant moment in history, a potential game changer, a once in a lifetime discontinuity, the dawn of a new age, and so on (Eccles and Nohria 1992). These portentous pronouncements, which are adopted by so many self-respecting commentators, are threadbare. We like to feel that we are on the cusp of change – that our generation is living through particularly auspicious times – but the evidence for this is thin. If anything, the great achievement of the generations since the Second World War has been to make the world less eventful, more predictable and less threatening. But by using these alarmist prognostications, we give ourselves permission to be especially conservative and risk-averse in our policies and actions. In other words, over many years, we have used the volatility of the external world as an excuse to be internally cautious, particularly with respect to costs. I suggest that this caution ultimately negates any volatility that there ever was: if everyone plays safe year after year, the argument for turbulence refutes itself.

- **Re-defining waste and inefficiency**

Wasted opportunities are a far more significant source of economic inefficiency than wasted resources: the opportunities that we regularly forego that in retrospect we will wish we had had the courage and foresight to grasp are the real source of waste, regret and failure, not the investments that, in the nature of entrepreneurship, fail to come good. The strategic imagination is better employed attending to the former notion of waste, than fretting about the latter.

Final word: changing the frame

The way in which executive teams frame their forward thinking makes a critical difference to the quality of the strategic ideas that emerge. If 'cost-competitiveness' or 'labour productivity', or 'competitive benchmarking' or 'operational excellence' or 'affordability' is a defining features of the frame, then the thinking is unlikely to yield profitable solutions.

All too often, the overriding problem to which a company's plans are expected to find solutions, particularly in 'difficult' times, concerns the identification and removal of waste and inefficiency in the organisation. The kinds of questions that all too often form the implicit frame of reference when strategies are being formulated take the following form:

- What cost savings can be made without our customers noticing?
- Which investment opportunities can be postponed or cancelled without upsetting our shareholders?
- What boosts to our short-term earnings can be created without damaging long-term value?
- What pressure can be placed on our suppliers without losing their trust?
- What targets do we need to meet to keep the City happy?

Now imagine framing the challenge in a different way, with a different set of questions:

- If we were required to carry a 20% premium price on our products and services, how would we change our thinking?
- If we had to double our margins without cutting our costs, what strategy would we pursue?
- If there were no recriminations for making mistakes in the bold pursuit of greater success, what investments would we choose?
- If we were forced to double our cost base over the next 5 years, what changes would we make?

Just by shifting the frame, we would get to different strategies, priorities and solutions. These more strategically astute questions play to our optimism, our imagination, and our responsibility. They get the creative juices flowing. And by countering the lazy option to cut costs, they are more likely, all other things being equal, to lead to enhanced performance.

About the author



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Dr Jules Goddard is a Fellow of the Centre for Management Development at London Business School, and a Member of the Academic Committee of CEDEP at INSEAD. He was formerly Gresham Professor of Commerce and Mercers School Memorial Professor at the City University and Visiting Professor of Marketing at the École Nationale des Ponts et Chaussées in Paris. He has consulted with many organisations around the globe, including Microsoft, J Walter Thompson, Orange, Mars, Danone, Aon Benfield, the BBC, Rolls-Royce, Freshfields Bruckhaus Deringer, PwC, Ubisoft, Conran Design Group, Hoffmann-La Roche, SAP and LVMH.

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ARTICLE 2

Test-Driving the Future: how design competitions are changing innovation.

Professor Joseph Lampel, Professor of Strategy and Innovation at Cass Business School, City University, London

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Design competitions, target-setting events that offer monetary awards and other benefits to contestants, are an increasingly popular tool for purposes that range from fast-tracking nascent technologies to focusing entrepreneurial attention on pressing social needs. Although design competitions often capture headlines, they are not new. As far back as the 18th century, organisations and governments staged “design competitions” that challenged innovators to submit prototypes to competitive evaluation in nonmarket settings (Sobel, 2007). These competitions, however, were limited by fragmented entrepreneurial fields and diffused communities of knowledge. The current generation of design competitions, while still focused on solving problems and pushing technological frontiers, has overcome these limitations through the transformative impact of open innovation, crowdsourcing systems, and powerful Internet platforms.

Research on design competitions has lagged behind these developments. To some extent this may be due to differences in terminology. For example, what we call here “design competitions” have been defined elsewhere as innovation contests (Boudreau, Lacetera, & Lakhani, 2011), technology contests (Cohen, Kaplan, & Sela, 2008), innovation tournaments (Terweisch & Xu, 2008), and tournaments for ideas (Morgan & Wang, 2010). Another reason is the long-standing influence of economic modelling of design competitions (Masters, 2003; Nalebuff & Stiglitz, 1983; Shavell & van Ypersele, 2001; Surowiecki, 2004; Taylor, 1995). The modelling approach to design competitions is primarily interested in what can be learned about “invisible hand” market competition from organised competitions where incentives and performance criteria are set and manipulated. However, as design competitions increase in number and importance, we need a more comprehensive analysis that integrates relevant insights from research in economics, strategy, organisation theory, and innovation studies to create an understanding of how these competitions work in practice (Boudreau et al, 2011; Jeppesen & Lakhani, 2010; Terweisch & Ulrich, 2009).

This paper contributes to this analysis. The paper begins by looking at how sponsors and organisers of design competitions translate their innovation agendas into competition targets that define specific criteria against which participants’ innovation will be judged. We next argue that an important influence on how innovation agendas are translated into competition targets is the type of outputs design competitions are expected to produce, specifically whether they are expected to create private, public, or mixed goods. Thereafter, we turn our attention to how design competitions are set up and managed, and look at the various structural options that are available to sponsors and organisers of design competitions. We also explore the alternative governance systems that are used to evaluate competitive performance.

To examine the emergence and development of design competitions, we then reflect on the relationship between design competitions and the rise of open innovation. We argue that the increased importance that organisations have placed on using external sources of innovation has reinforced the perceived benefits of design competitions and led to a shift away from a winner-takeall view in favour of encouraging collaboration alongside competition. We then look at design competitions, from one-off challenges to multiyear events and, in some instances, permanent programmes that manage portfolios of design competitions. We pay particular attention to the role of the Internet in augmenting the emergence and development of design competitions. In the penultimate section, we argue that effective design competitions must adapt to the idiosyncratic requirements of their particular contexts by developing practices that modify and complement formal competition processes. We conclude with a discussion on the future of design competitions.

Design competitions as arenas of exploratory innovation

Design competitions connect two sets of actors: sponsors and organisers of design competitions and contestants. In most early design competitions, the sponsor and the

organiser were one and the same. In the past decade or so, however, we have witnessed increasing separation between sponsors and organisers of design competitions. While sponsors provide prize money and exercise considerable influence on setting the targets competitors must meet to win, they increasingly delegate the task of publicising and managing the competition to organisers that specialise in these tasks. In some instances, this separation leads to a clearly defined principal-agent relationship, with sponsors defining all key aspects of the design competition and then handing over the day-to-day operations to organisers. In most contemporary design competitions, however, there is flexible collaboration between sponsors and organisers when it comes to defining the key aspects of the design competition, even when the two are separate entities.

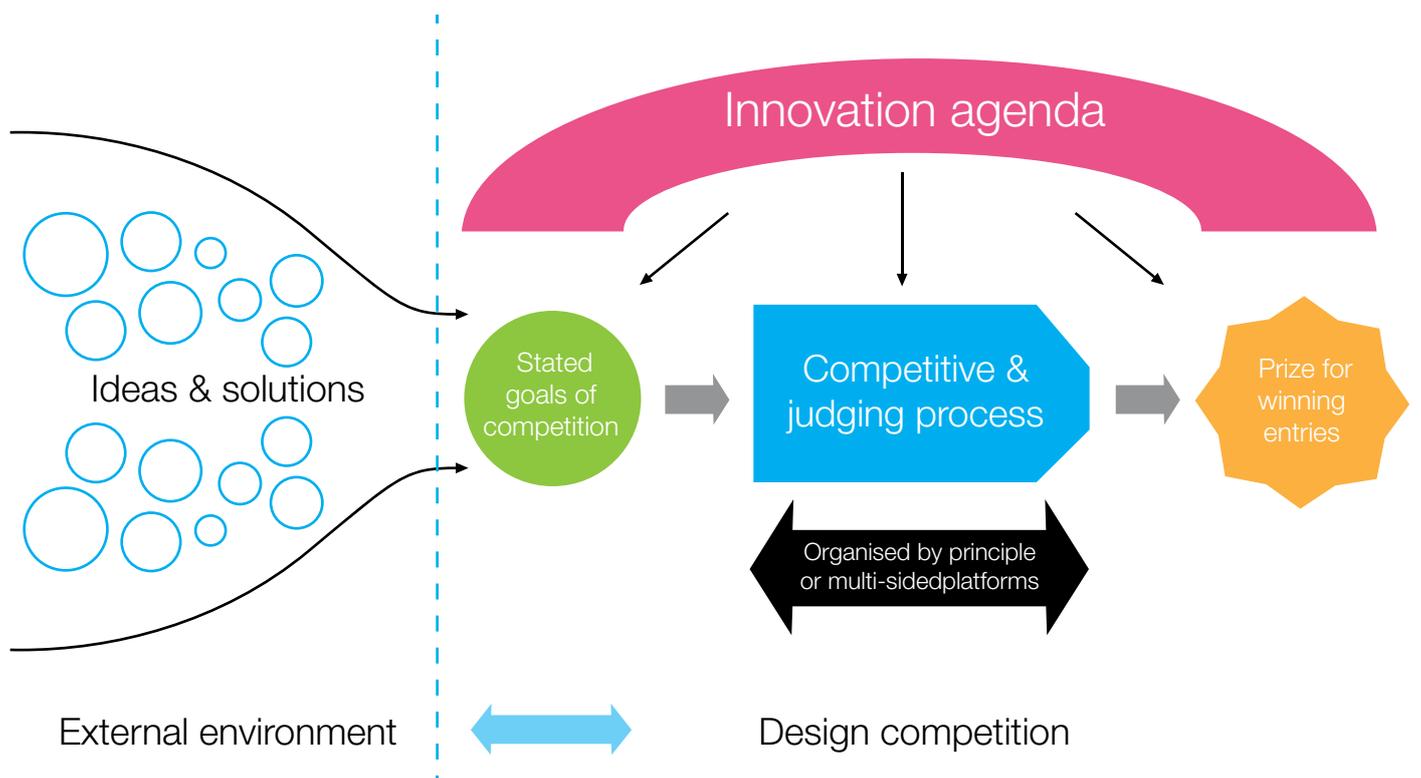
Design competitions create temporary arenas of exploration where innovative solutions can emerge at far lower cost than similar efforts in permanent research and development establishments. For example, Malone, Laubacher, and Johns (2011, p. 4) noted that design competitions organised by TopCoder “can often provide clients with development work that they would get by more traditional means but at as little as 25% of the cost.” There are cost advantages to innovators as well. Innovators often seek design competitions because they lower the costs of finding and securing innovation-related resources such as publicity, domain expertise, supporting technologies, and expert assessment. Design competitions have these cost advantages because they have the infrastructure and capabilities to bundle these resources and services more efficiently than would be the case if innovators sought to recruit the same on their own.

The innovation agendas of design competitions

To understand design competitions, it is necessary to look at both their public face – their stated goals and the prizes and recognition they offer – and their unstated motivations. Our analysis of design competitions suggests that sponsors and organisers come to the table with agendas rooted in their immediate concerns and future aspirations.

These agendas shape the competitions’ declared goals and map the process that selects final winners. The relationship between innovation agendas and the design competition is shown in Figure 1. Reading this figure, we have to begin with the external environment, where innovators who may potentially engage with the design competition are located. The sponsors and organisers define their declared goals to attract interest from innovators who are widely dispersed professionally and geographically. Doing this requires a balancing act between the innovation agenda, which may cover multiple areas of interest and is not always fully developed, and clear and relatively well defined competition goals that are able to persuade innovators to participate. Therefore, the process of successfully defining the competition’s declared goals depends on translating the innovation agenda into goals that are meaningful to potential participants.

Figure 1: Innovation agendas and the design competition



“ THE SERP PRIZE FOR SUPER-EFFICIENT REFRIGERATORS IS A GOOD EXAMPLE OF A MIXED-GOODS DESIGN COMPETITION: LAUNCHED WITH PRIVATE RETURNS IN MIND, BUT WITH PUBLIC-GOOD SPILLOVERS. ”

Narrow to broad goals

Our analysis suggests that design competitions run the gamut from narrowly focused innovation agendas, usually motivated by tightly defined problems, to broader and more complex agendas that reflect a desire to shape current and future social, economic, or technological environments. Narrowly focused innovation agendas tend to arise when organisations lack the resources and the administrative flexibility necessary to innovate solutions to business problems or urgent social issues. The main purpose of design competitions under these circumstances is to develop innovative solutions at far lower cost than would be the case for internal research and development or external contractors. The Netflix Prize¹ is one of the best known recent examples of a private firm configuring a design competition to solve a technical problem that is central to its strategic operations. Netflix had been struggling with how to better predict the kinds of films users might like based on their past choices. Internal software specialists were making little progress, so the company launched a design competition for an algorithm that could substantially improve its prediction rate.

At the opposite end of the spectrum are design competitions that reflect broader innovation agendas, such as accelerating or even reshaping market development. Innovation agendas in this case are often influenced by a strong conviction that certain markets that ought to exist do not, or if they do exist they should evolve in a different direction. Translating these agendas into a design competition usually involves focusing innovators' efforts on key bottlenecks that stand in the way of market evolution or creating incentives that encourage technological and product trajectories that suffer from underinvestment.

An example of the use of design competitions to reshape market evolution is the 1991 Super-Efficient Refrigerator Programme (SERP) (Holloman, Ledbetter, Sandahl, & Shoemaker, 2002),

a competition sponsored by a consortium of United States electric utilities that offered a prize of up to US\$30 million for the manufacturer that could design and manufacture refrigerators that delivered the most energy savings at the lowest cost per kilowatt-hour. Whirlpool's winning design substantially influenced refrigerator technology and has had a long-term impact on the energy efficiency of refrigerator models in the industry.

Innovation agendas are not limited to existing markets, however. In contrast to the SERP prize, which dealt with an existing and relatively mature market, the Ansari X Prize² focused on developing a market that did not yet exist: commercial, privately run space travel and tourism. To ensure that designs would be commercially viable, the Ansari X Prize stipulated that entries could not benefit from government funding. This focused innovators' efforts within the constraint of cost factors that stood in the way of a private market for space travel and exploration.

In other instances, design competitions that are narrowly focused to begin with become broader over time. This is not necessarily because original targets have been abandoned, but because earlier design competitions point toward more ambitious targets. For example, the U.S. Defence Advanced Research Projects Agency (DARPA)³ driverless vehicle competition started with a focus on military applications in hostile environments (specifically motivated by the challenge of improvised explosive devices), but the competition's innovation agenda subsequently took on the broader ambition of creating driverless "vehicles of the future" without, however, relinquishing the more specific target of developing driverless vehicles for military use.

Identifying new talent

Innovation agendas sometimes focus on identifying and developing new talent. The Mapping Dark Matter Competition, sponsored by NASA, the European Space Agency, and the Royal Astronomical Society,⁴ asked entrants to use "gravitational lensing," a predicted effect from general

1 <http://www.netflixprize.com/rules>

2 <http://www.xprize.org>; <http://space.xprize.org/ansari-x-prize>

3 http://www.darpa.mil/NewsEvents/Events/Challenge_Contest.aspx

4 <http://www.kaggle.com/c/mdm>

relativity, to calculate the amount of dark matter between a galactic light source and Earth (Rhodes, 2011). The winner is invited to work with a NASA team to transform the winning entry into a workable tool. Winning this competition is attractive not only to individuals keen on developing their scientific careers, but also to organisations such as NASA that are always on the lookout for first-rate talent.

Using design competitions to identify individuals with exceptional skills and talents is particularly important in areas of innovation where rapid progress often depends on identifying and supporting talent. In more general terms, we can say that even though innovation agendas are usually translated into specific design competition targets, they may have subsidiary aims that are not always manifest to the casual observer. For instance, the X Prize Foundation has recently launched a competition to develop a portable device for diagnosing illnesses, pitting proposed designs against a panel of physicians. In the process it also helps to identify individuals with exceptional talent and skills who do not work in biomedical instrumentation.

Private-, public-, and mixed-good benefits of design competitions

With the considerable resources that go into setting up and managing design competitions, it is natural to ask who ultimately benefits from this approach to innovation. Clearly, winners of the competitions do, in terms of monetary reward, visibility, and relationships established with key stakeholders such as investors and lead users. But what are the benefits to sponsors and organisers that put up these resources in the first place?

To evaluate this we need to examine the mission and values of these organisations and individuals. Corporations, governments, foundations, entrepreneurs, and civic-minded individuals who sponsor design competitions will inevitably gauge the potential benefits according to their specific interests. Corporations, for instance, are more likely to set up design competitions with the intention of creating private good (McCann & Mudambi, 2005); this usually entails a stipulation within the competition rules that gives them exclusive rights to the winning innovations. In contrast, foundations are more likely to set up design competitions with the public good in mind. This means they are more likely to forgo appropriation of intellectual property and will take steps to encourage the widest possible diffusion of the innovation.

A third kind of benefit is so-called “mixed goods,” which are products and services that create both private returns and public benefits (CuUis & Jones, 2009, p. 68). The SERP prize for super-efficient refrigerators is a good example of a mixed-goods design competition: launched with private returns in mind, but with public-good spillovers. The competition was sponsored by a consortium of private utilities with the aim of reducing their capital construction costs, but was also intended to benefit national efforts to improve energy efficiency.

Unlike the SERP competition, where public benefits were secondary to private returns, most of the mixed-goods design competitions we examined came from sponsors and organisers that may have benefited privately but saw the

creation of public goods as their main purpose. Surprisingly, we found that this held for many private corporations and individual entrepreneurs that sponsored design competitions for foundations and governments. In other words, mixed-goods design competitions that were launched by corporations or private entrepreneurs did not necessarily focus on the creation of private goods with public spill-overs. Rather, far more common, even for corporations and private entrepreneurs, were design competitions that were explicitly framed in terms of public goods with potential benefits to private users of the innovation. For example, beginning in the early part of the 20th century private individuals and public foundations sponsored a series of design competitions that sought to encourage the development of aviation. The aim was to generate public goods in the form of technical data and feasibility demonstration, but there was also the expectation that the competitions would generate private returns for budding entrepreneurs who would go on to develop the aviation sector.

Creating effective design competitions

Translating an innovation agenda into a set of targets and announcing monetary prizes or other rewards are the first steps in setting up a design competition. Taking it forward requires an organisational framework within which the innovation processes will take place. In all design competitions, this organisational framework consists of two related sets of choices: about the architecture of the design competition and about the governance system that defines and administers the rules by which the competition will be adjudicated.

The architecture of design competitions

Our research suggests that design competitions share two common architectural principles that organisers modify to suit circumstances and goals. The first principle that informs competition architecture is competitive orientation, specifically, the degree to which the design competition emphasises rivalry versus collaboration. The second principle is the structural composition of the design competition, ranging from the simple to the complex.

Competitive orientation

Design competitions that capture headlines often convey the impression of a struggle for supremacy at all costs. This impression greatly over simplifies how design competitions manage the innovation process. Organisers of design competitions calibrate their competitive orientation between two extremes, using prizes to motivate and direct “innovative labour” (Eickelpasch & Fritsch, 2005; Lazear & Rosen, 1981). At one extreme are design competitions that promote winning as the prime motivator and thus cultivate a climate of intense rivalry. They usually have prizes awarded to the first “past the post” winner, leaving other participants with little to show for their efforts. Past X Prize competitions and the British Ministry of Defence’s Grand Challenge for the best ideas in defence technology are good examples of this orientation.

At the other extreme are design competitions that emphasise collaboration over competition. The motivating rationale of these design competitions is to encourage knowledge sharing, seed networks, develop communities, and build innovation competencies by motivating “learning by interaction” (Nooteboom, 2000). By offering multiple awards and conferring

recognition more widely, these design competitions work to counteract the winner-take-all mindset that militates against cooperation.

In some instances, organisers of design competitions encourage cooperation and sharing of ideas by requiring participants to reveal their progress as the competition moves forward. The Heritage Health Prize offers US\$3 million for a model that can improve predictions of which patients are most likely to require a hospital visit within a year. The competition offers a US\$230,000 milestone prize for solutions that exceed a given threshold on the condition that participants disclose their algorithms to each other. Organisers note that even without this incentive participants tend to share information of their own accord, perhaps in part because those who fail to do so are usually derided as “spongers” (Economist, 2011).

Structural composition

Design competition architecture falls along a continuum between simple and complex structures. Simple design competitions usually have one stage and culminate with a single award. These tend to have relatively clear criteria by which the competition is judged. At the opposite end of the continuum are design competitions, such as the Netflix Prize, with multiple stages and even stage-based progress awards. These competitions normally require participants to undergo a multistage evaluation process. Their drawback is the complexity that accompanies a competition that confers multiple awards based on different performance criteria (Akerlof, 1970; Nalebuff & Stiglitz, 1983; Rosenman & Wilson, 1991). Further complexities can stem from assessment features, institutional support systems, and stakeholder involvement.

The governance of design competitions

At the heart of a design competition is the assurance to participants that all performances will be judged impartially, without allowing competitors’ previous reputation or economic clout to influence assessment. This means creating a governance structure where rules are fair and unambiguous, and communicating this governance structure as clearly as possible. Performance assessment is central to its legitimacy. This holds true for participants, who must be certain that a fair process is in place before taking on the challenge, and for other stakeholders, who rely on the credibility of the assessment when deciding whether to invest, lend support, or adopt or purchase the innovation.

Our analysis of design competitions reveals three distinct methods of assessment: (a) expert assessment by a jury of individuals selected on the basis of their specialist knowledge and/or public profile; (b) peer assessment by innovators from the same knowledge or practice communities as the participants; and (c) vox populi assessment rendered by popular acclaim or voting of participating audiences or the public more generally. These methods can be used separately or in combination.

Expert assessment

Expert assessment relies on experts in relevant areas to evaluate performance and determine the final competition outcome. The experts usually come from universities, research institutions, think tanks, and policy-making bodies, but they can also come from politics, business, or the arts.

They may owe their credibility to their high academic or scientific standing, or they may have gained their reputation through public service or a distinguished career.

Selecting experts with high credibility in the innovative community is crucial to the credibility of expert based assessment. Design competition organisers often consult innovators for recognised experts. For innovators and innovation stakeholders, expert judgment also provides useful evaluation and analysis, identifying problems and areas of application that may be otherwise overlooked.

Peer assessment

Peer assessment relies on the evaluation and judgment of non participating innovators in the same community, who are intimately familiar with the issues and the progress made to date. Peer assessment has the dual advantage of providing valuable feedback from practitioners with an intimate knowledge of the area and conferring community legitimacy from leading figures. Peer assessment, however, can be undermined by community disagreements about fundamental issues or by personal rivalries that politicise the process. Therefore, it is important, but often difficult, to select peers who are impartial and well regarded. A remedy to this problem is to use expert assessment to screen initial submissions. This counteracts perceptions of bias but ensures that a wide range of technological options and social solutions are represented.

Vox populi assessment

Vox populi (voice of the people) assessment relies on acclaim and popular approval by audiences that attend the competition or by the public more generally. Vox populi assessment works best when the products, technologies, or social solutions have subjective and intangible personal dimensions that are ignored by innovators bent on technically “sweet” solutions or that cannot be articulated fully by objective expert analysis (Grève, Pozner, & Rao, 2006). The advantage of vox populi assessment is that it provides innovators and innovation stakeholders with important information on how individuals and communities will react to innovations. In this sense, it is both a form of spontaneous market research and a platform for advanced marketing and publicity.

The main disadvantage of the vox populi method is that the evaluation it produces can be ambiguous: The voting is not accompanied by analysis and feedback, dissenting minorities with important views may be ignored, and the final outcome is sensitive to innovators’ presentation skills. Therefore, vox populi assessment is frequently used in combination with other forms of assessment to provide analysis and feedback. For example, the Dell Social Innovation Challenge⁵ uses expert assessment to clarify and articulate the judgment that emerges from the vox populi assessment phase.

The evolution of design competitions

Design competitions today have evolved considerably beyond their original structure and form. Several factors have played a role in this evolution. First, we have had a shift from models that emphasise management and control of the innovation process within the confines of organisations to “open innovation” models that weave together internal organisational processes with the external innovation ecology. Design competitions fit well into this trend, which is one reason they

⁵ <http://www.dellchallenge.org/about/about-dsic>

are being used more frequently today. Second, the rise of the Internet has provided sponsors and organisers with more powerful and relatively inexpensive tools for setting up and managing design competitions. Many design competitions today are purely Internet based; several allow entries to be submitted and evaluated entirely online. Finally, we are witnessing an increase not only in the number of design competitions, but also in the number that become institutionalised as multi-event competitions with broader innovation agendas. Design competitions today are therefore the direct descendants of an approach to innovation that first became popular several centuries ago, but, as we argue below, they have evolved considerably since that time.

Design competitions and open innovation

The current enthusiasm for design competitions is partly a rediscovery of the virtues of an old institution that emerged in response to the difficulties of translating scientific and technological breakthroughs into reality. Design competitions in the 18th and 19th centuries were often used to bridge this gap. As such competitions gained in popularity, they also added evidence to the view that arose during the scientific revolution and subsequently gained credence during the industrial revolution: namely that setting goals and backing them up with the right incentives can yield solutions to important social and economic problems. The university laboratory, the government research agency, the high-tech consortium, not to mention the corporate research and development department that emerged as the industrial revolution matured, incorporate and extend this view. Our review of the design competition phenomenon suggests that the emergence and increasing dominance of these institutions in the first half of the 20th century may also account for the relative decline of design competitions. While they continued to be launched, they became peripheral to the main R&D institutions that relied on salaried employees.

This view, that innovation is best managed when kept entirely within the boundaries of the organisation, dominated organisational mindsets until the close of the 20th century (Fredberg, Elmquist, & Ollila, 2008). In recent years, however, open innovation and crowdsourcing have emerged to challenge this assumption (Almirall & Casadesus-Masanell, 2010; Jeppesen & Lakhani, 2010; Lichtenthaler, 2011). Research on these models suggests that mobilising innovation from sources located outside established organisation boundaries can deliver results that in many instances are superior to innovation kept strictly within the organisation.

The appeal of open innovation and crowdsourcing models also springs from the increasing costs of maintaining the internal resources to cultivate innovation. As organisations struggle with a persistent mismatch between the innovation resources at their disposal and the demands of a rapidly shifting environment, they increasingly turn to external actors such as technology brokers, project promoters, and innovation intermediaries as a way of complementing their internal innovation processes (Neyer, BuUinger, & Moeslein, 2009).

The same mismatch increasingly confronts society as a whole. Institutions designed for the challenges of an earlier age lack the resources necessary to innovate timely solutions for an expanding list of social and economic problems. Top

down attempts by governments to expand these organisations' resource base confront institutional rigidities that slow down and often defeat the wider mission with which they are entrusted. Turning to external innovation processes such as design competitions has the merit of tapping a wide range of external innovation resources while at the same time avoiding open-ended budgetary commitments.

Design competitions and collaborative innovation

Although the use of design competitions to access external innovation is not new, what is new is the increased power that comes with combining this approach with the rich innovation ecology that has emerged over the past several decades (Davis, 2002; Love & Hubbard, 2007). An overview of this ecology must start with suppliers that provide innovative technology through market transactions (Arora & Gambardella, 2010; Chesbrough, 2007).

An interesting example is the evolving relationship between internal and external innovation at Procter & Gamble. When Procter & Gamble launched a search for corporate or individual collaborators to improve packaging, product design, and marketing, it not only obtained ideas and solutions but also triggered rapid development of organisational processes that focus on managing innovation inflows. This translated into direct involvement in the creation of NineSigma, a company that connects firms seeking solutions to science and technology problems with solution providers (Huston & Sukkab, 2005). More recently, Procter & Gamble has been developing a parallel process for managing outflows of innovation. This involves licensing of trademarks, technologies, engineering solutions, and market research methods. The company has also put this two-way flow of innovation on firmer footing by helping to create yet2.com, a marketplace that brings together buyers and sellers of intellectual assets.

An additional change in current design competitions, compared to their predecessors, is the emphasis on collaboration. This occurs by inducing processes that allow innovation to benefit from the collective pool of ideas and capabilities in communities targeted by the competition. By their very nature, design competitions appeal to the competitive spirit. This tends to limit collaboration (Dunlap-Hinkler, Kotabe, & Mudambi, 2010), which in turn, according to Laursen and Salter (2006), limits their potential to deliver radical innovations. As we noted earlier, sponsors and organisers of design competitions attempt to moderate this tendency by encouraging knowledge sharing among participants. This applies not only to encouraging collaboration directly during the event, but also to fostering collaboration within the communities of practice and knowledge to which these participants often belong.

Working through these knowledge and practice communities, current design competitions are increasingly encouraging innovation within communities before as well as during the competitive events. For example, VJAM, launched by Virgin Atlantic in 2008, was premised on collaborative idea generation initiated in workshops on how social networking could improve the travel experience. Of the ideas generated, six social media projects were selected to receive support to develop a proof of concept and further investment. The "Vjammers" were not affiliates of Virgin Atlantic, so they brought outside observations and an entrepreneurial mindset

to the VJAM workshop. They had proprietorship over their ideas but Virgin Atlantic had the first call on licensing them. The VJAM-produced social media products and successful Vjammers continue to be highlighted by Virgin Atlantic to encourage such co-innovation with customers.

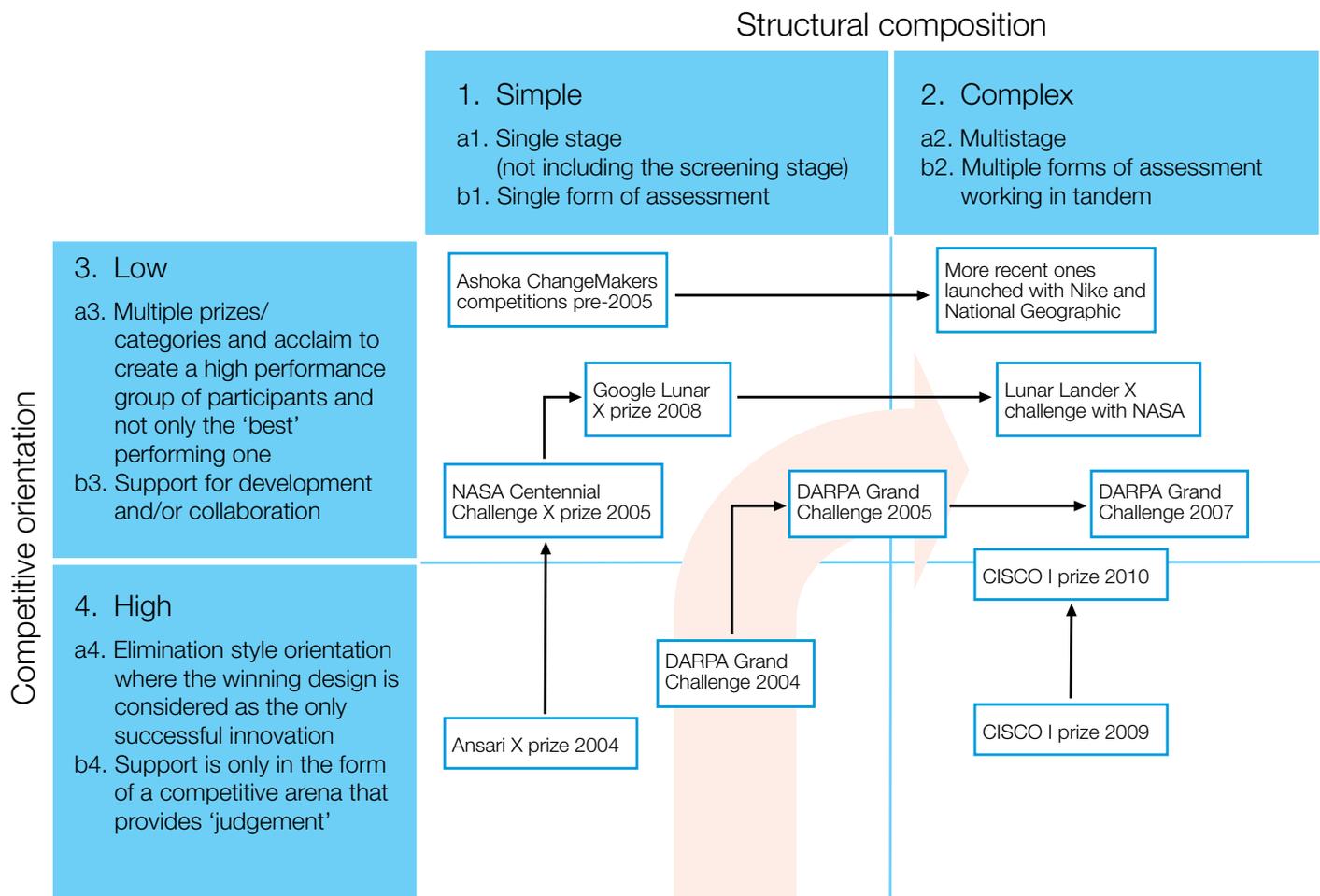
The push for greater collaboration is visible not only in more interaction among participants, but also in joint sponsorship of design competitions. The LAUNCH Initiative⁶ (begun in 2010) brings together sponsors with different interests and varied competencies. Founded by Nike, NASA, the U.S. State Department, and the U.S. Agency for International Development (USAID), the initiative challenges entrepreneurs and innovators to address key sustainability problems in the areas of water, health, energy, and air. Initiatives such as LAUNCH represent increasing government use of public-private design competitions to further national innovation agendas. Other examples can be found in the German government programme of contests, such as BioRegio, InnoRegio, and Lernende Regionen, that specifically target collaboration (Fickelpasch & Fritsch, 2005), and the “innovation inducement prizes” sponsored and organised by the U.S. government’s National Research Council (Stine, 2009). Both of these initiatives require the partnership to include the academic community, venture capitalists, and private firms.

Design competitions’ expanding scope

Design competitions were originally established as a one-time challenge with a finite duration. Even when the targets set by a competition took decades to accomplish, the basic assumption was that the organisation that set up and ran the competition would be dissolved once these targets were met. The finite duration of design competitions limited the upfront costs of setting up and running such organisations. However, as use of design competitions has expanded, we are seeing a tendency for them to evolve beyond one-time challenges into multiyear events, and then into portfolio programmes that encompass multiple design competitions. This has underpinned the emergence of organisations such as the X Prize Foundation, which launches competitions for specified agendas. More recently, organisational setups such as TopCoder go one step further and “broker” customised solutions for their clients by designing competitions that address their needs.

To illustrate this evolutionary development, we selected several representative examples of design competitions. Figure 2 maps their evolutionary trajectories according to their competitive orientation and structural composition. Taken together these examples cover a range of design competitions that target social innovation, technological solutions, and pathbreaking technological change. They also represent a variety of organisers and sponsors, from government agencies to not-forprofit organisations and corporate entities. Below we discuss a few of these to provide a perspective on their evolution.

Figure 2: Design competitions’ evolutionary trajectories



⁶ <http://launch.org>

We first examine the X Prize Foundation and the DARPA Grand Challenge. In both, we see a move toward greater collaborative orientation, mostly by linking monetary awards to targets being achieved within a specified time frame. For example, the Google Lunar X Prize sets a timeline for meeting the target of sending an unmanned robot to the moon; prize money is progressively reduced as time passes. Therefore, it makes sense for participants to collaborate rather than go for a winner-take-all approach that may take longer. More generally, to encourage collaboration both the X Prize and DARPA's portfolio of competitions have moved away from evaluation criteria that focus team efforts on competitive gains toward more diverse criteria that balance competition and collaboration.

Greater visibility and apparent success encourage sponsors and organisers to expand the scope of design competitions, contributing to their growing complexity. When we look at the example of Ashoka Changemakers competitions,⁷ we see a gradual increase in the number of competition stages and categories since the competition was first introduced in 1996. The sponsorship element has also become very explicit. In other words, many organisations are now directly engaged in sponsoring themes for competitions. Public voting, peer reviews, and jury-based expert decision making have now extended the earlier Changemakers competitions' relatively simple schema of predominantly peer-based evaluation.

Another example in Figure 2 is the Cisco I-Prize⁸ (King, 2008). This design competition had only two iterations, but organisers used the experience of the first competition to revamp the second I-Prize in 2010, putting more emphasis on collaboration and providing greater support for contestants through Cisco's knowledge base.

The discernible trend, as shown in Figure 2, is a move by design competitions toward multiple prize structures and multiple forms of assessment. There is also increasing emphasis on collaborative development and less on competitive elimination that results in winner-take-all outcomes. More generally, the evolution of design competitions, when managed within the same programme, demonstrates a search for balance, or congruence, between collaboration and competition. For instance, DARPA has changed its emphasis from finding technological winners to being part of a wider movement toward "re-architecting social networks" for innovation (Fuchs, 2010).

Design competitions and online platforms

The final factor affecting the evolution of design competitions is the increasing role of the Internet. The emergence of the Internet has exponentially increased the "broadcast for search" capability of all design competitions (Jeppesen & Lakhani, 2010). For example, Goldcorp, a relatively unknown mining company, used the Internet to launch a competition that offered a US\$500,000 prize for methods that could increase gold extraction from a low-performing Northern Ontario mine. The Internet allowed Goldcorp to attract more attention and reach more potential participants than if it had relied on standard media publicity. It also allowed Goldcorp to post the relevant geological data online, making it easier for even casually

interested persons to peruse the data before committing seriously to solving the problem (Tapscott & Williams, 2006).

The data communication and sharing functionalities of the Internet have also enabled organisers to build collaborative processes into the structure and competitive orientation of design competitions. For example, DARPA recently announced the launch of vehicleforge.mil as part of its initiative to develop a Fast Adaptable Next Generation Ground Combat Vehicle (FANG GGv) for the U.S. military. The Internet platform will provide the infrastructure for sharing design files among distributed design teams that, from mid-2012, will compete in three design competitions, each carrying a prize of between US\$500,000 and US\$1 million.

The more design competitions rely on the Web, the more it becomes apparent to sponsors and organisers that they lack the resources and expertise needed to exploit the full potential of virtual space (Malone et al, 2011). To address this problem, many organisations turn to specialist firms that offer support services to design competitions that are executed partially or completely online. Some of these firms go beyond Internet support to act as online brokers between solution-seekers and problem-solvers. Many of these online brokers have developed multisided platforms (MSPs) that help solution-seekers formulate their search objectives for online postings, recommend the best governance mechanism, and evaluate the relative merits of the solutions submitted by problem-solvers (Boudreau & Hagiu, 2008; Boudreau & Lakhani, 2009).

Such MSPs are common in many industries, such as eBay in online retail and Apple's App Store in software. An MSP's primary function is to provide "support that facilitates interactions (or transactions) among the two or more constituents (sides) that it serves, such that members of one side are more likely to get on board the MSP when more members of another side do so" (Hagiu, 2009, p. 3). Organisations such as TopCoder and Innocentive, which custom-build design competitions and help attract problem-solvers, have done much to develop and legitimise this brokerage role. For example, TopCoder is hosting the NASA Tournament Lab (NTL), a partnership between NASA and Harvard University that will help NASA researchers tackle difficult computational and data-processing problems. Once problems are posted on the platform, software developers are invited to submit competing solutions. Entries are evaluated on internal code quality, benchmark performance, and ease of integration into NASA systems.

The challenge of managing design competitions

Alongside processes that lay out the formal guidelines and mechanisms for managing design competitions, there are practices that represent the informal and contingent aspects of managing systems and situations. Practices are the adaptive interventions that decision makers undertake when tackling the idiosyncratic contingencies of the context in which they operate. Our research suggests that five key practices are particularly applicable to the role that design competitions are expected to play in today's innovation processes.

7 <http://www.changemakers.com/competitions>

8 <http://www.cisco.com/web/solutions/iprize/index.html>

“DESIGN COMPETITIONS ARE FAST BECOMING AN IMPORTANT INSTRUMENT FOR DELIVERING INNOVATIVE PRODUCTS AND SOLUTIONS.”

Practices for aligning incentives with motives

Motivations for participating in design competitions vary: Some participants are focused on the monetary value of the prizes, some use the challenge to test their capabilities, others are interested in meeting potential investors or users, and still others are intent on learning from other innovators or participating experts. Many design competitions put together a “value pack” consisting of monetary prizes, technical advice, dedicated facilities, and marketing support, and then align the value pack with the key objectives of the competition.

Practices that prevent competition from suppressing collaboration

Increasingly, the value of design competitions often resides as much, if not more, in the collaborative processes they initiate during and following the event. Competition and collaboration are not mutually exclusive, but unless the design competition is designed to encourage collaboration, competition often overwhelms collaboration. This means fostering collaboration early by facilitating communication among participants and maintaining collaboration during the competition by creating spaces where participants can meet, exchange views, and develop solidarity that outlives the event.

Practices that enable design competitions to evolve

Sponsors and organisers of multiple design competitions tend to retain the structure and scope of competitions that meet their goals and are administratively tractable. Countering inertia requires analysis followed by assimilation of lessons learned into subsequent sponsoring and organising. Practices that feed past experience back into future design competitions not only improve effectiveness but also allow organisers to reflect on the basic purpose of the competition. In many instances this reinforces the initially defined purpose and structure, but in others it may lead to wider scope and more elaborate structure. In general, as design competitions evolve, a tension between structure and scope tends to emerge. Keeping the same structure while taking on more goals undermines the ability to deliver on both new and old goals. Changing the structure, for example, by increasing the number of stages and introducing more awards, presents serious managerial challenges.

Practices that enable learning from failure

Design competitions can fail to accomplish their goals. For example, no team managed to cross the finish line in the first DARPA Grand Challenge (2004) for remote-controlled driverless vehicles. What worked in the laboratory was not up to the task when put to the test in field settings. DARPA could have interpreted this failure as technology “teething” problems and let future contestants struggle with the problem of transitioning their designs from the laboratory to the field on their own. Instead, it decided to revise the basic terms of the competition and provide more technical support to participating teams. In subsequent DARPA Grand Challenge competitions more teams entered and more crossed the finish line, demonstrating conclusively that the technology could perform outside laboratory settings. The initial design competition failure was therefore used to implement improvements. What was a failure for the contestants was a learning experience that DARPA put to use in planning future design competitions.

Practices around selecting judges

The quality and the objectivity of the judging panel are crucial for the long-term effectiveness of design competitions. Unfortunately, the selection of the panel of experts or judges is rarely public. There is, therefore, always the risk that this process will be politicised or co-opted by key stakeholders. This may result in a loss of credibility for the design competition and damage the prospects of innovations that would have benefited from a more impartial assessment. Even when the selection process is undertaken with due care, the verdict may be subject to the inevitable compromises that any group must make to arrive at a collective decision, thus giving the impression of bias even when none is present. This is less of a problem when competitors are expected to meet clearly specified targets, but can be a serious deficiency when determining outcomes depends heavily on the judgment of the panel.

Conclusions

Design competitions are fast becoming an important instrument for delivering innovative products and solutions. The pattern is now well established: Corporations, foundations, governments, or individual entrepreneurs sponsor and organise a competition with targets and prizes. This may take the form of an event in which participants display their skills and ingenuity, or it may simply be a stand-alone challenge that innovators tackle at their discretion.

The growing popularity of design competitions suggests that they are a firmly established innovation strategy. This has also led to greater experimentation in configuring design competitions themselves. Whereas past design competitions were set up as single competitive episodes, current design competitions are more likely to be a multi-episode or even a permanent process using the Internet. Whether one looks at X Prizes, the Goldcorp Challenge, or Ashoka Changemakers, in many cases design competitions are “serialised episodes” delivered by dedicated setups. This gives sponsors greater opportunity to learn and refine the architecture of such competitions. It also allows sponsors to improve the alignment of motives of participants with the objectives of the design competition, and with the interests of organising and sponsoring institutions more generally.

The increasing popularity of competitions raises interesting questions for innovation researchers in general. The importance of first-mover advantage and fast technology launch to sustainable advantage is stretching corporate innovative capabilities to the limit (Kessler, 1996). Design competitions clearly address these constraints. In principle, they should also reduce the costs and risks normally associated with radical innovations (Berndt, Cockburn, & Grepin, 2006). However, if we examine design competitions in the context of the wider move toward open innovation, we have to note studies by Laursen and Salter (2006) and Dunlap-Hinkler et al. (2010), which together suggest that breakthrough innovations are less likely to emerge from open innovation. Laursen and Salter (2006) argue that “deep search,” building long-term relationships with a small number of external knowledge sources, plays a crucial role in promoting innovation. Dunlap-Hinkler et al. (2010), for their part, demonstrate that breakthrough innovations are more likely to come from joint ventures and alliances. Clearly, design competitions that normally cast their search nets widely and commit to participants only on an event-by-event basis promote neither deep search nor long-term relationship.

Hence it is possible that the hopes for radical technological or social transformation that motivate some sponsors and organisers of design competitions, such as the X Prize Foundation, may be excessively optimistic, while the more modest aims of design competitions such as the Netflix Prize or Goldcorp Challenge may be more realistic.

At this point in the evolution of design competitions it is probably premature to make a full assessment of the potential of this approach to innovation. It took decades of organisational and managerial innovation after Edison pioneered his “invention factory” for observers to fully appreciate the power of organised research and development. The same can be said about design competitions. Though they have a long pedigree, it is only in the past two decades that a shift toward open innovation, combined with the reach of the Internet, has allowed organisations and individuals not only to apply this approach across a broad range of problems, but also to use the resulting experience to experiment with this form of innovation. Not surprisingly, when these experiments have delivered strong results they have contributed substantially to the legitimacy of design competitions as an effective approach to innovation. But even when results have been disappointing or slow in coming, sponsorship by top corporations, prestigious foundations, and major government departments, not to mention well known entrepreneurs, deliver a vote of confidence that lends considerable legitimacy to the use of design competitions. Perhaps this, as much as anything else, is ensuring that design competitions will continue to attract the attention and resources needed to establish them as a permanent innovation institution.

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ARTICLE 3

Managing for Sustainable Employee Development.

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Emma Donaldson-Feilder, Occupational Psychologist and Director of Affinity Health at Work

Employee engagement has long been believed to be, and is now widely accepted as, a key factor in achieving performance in the workplace. However, if managers focus purely on engagement, without considering employee wellbeing, they risk any engagement created being unsustainable. Our research aims to help managers understand how to build sustainable employee engagement, by developing a framework of manager behaviours required to both build engagement in employees whilst also protecting their wellbeing.

What is employee engagement?

Although the term employee engagement is widely used in management practice and literature, definitions vary widely between academia and practice. Organisational definitions of engagement tend to refer to engagement with the organisation and describe it in terms of employee outcome behaviours (such as going the extra mile, demonstrating commitment to the organisational values and objectives). Academic definitions in contrast tend to place more emphasis on engagement with roles and tasks and define engagement as a cognitive state (what engagement feels like rather than what it produces).

In our research we aimed to define employee engagement in a way that encompasses the range of definitions across academic research and practice:

'Being focused in what you do (thinking), feeling good about yourself in your role and the organisation (feeling), and acting in a way that demonstrates commitment to the organisational values and objectives (acting).'
(Lewis et al, 2011)

Why is employee engagement important?

Employee engagement is important for two reasons – firstly that it is consistently believed across business to have powerful effects on productivity (for instance 94% of the world's most

admired companies believe engaged employees creates a competitive advantage – cited by Engage for Success, 2012) – and secondly, that *it does* have powerful effects on productivity. The recent publication by the Engage for Success task force entitled 'Nailing the Evidence' (Rayton, Dodge, D'Analeze, 2012) presents a detailed business case for the evidence – showing positive impact of engagement at the organisational level (on operating income, revenue growth, productivity, innovation, profitability, retention, customer service, reduced absenteeism, safety), and at the individual level (job satisfaction, mental and physical wellbeing).

The fragility of engagement in a changing world

Despite its importance, employee engagement may be becoming increasingly fragile and difficult to sustain. Indeed, figures suggest that, in the UK, engagement levels are worryingly low: that only one third of employees in the UK are engaged (Wiley, 2009), that those strongly engaged may be less than 10% (CIPD, 2010) and that two thirds of employees are disengaged, unsupported and detached (Towers Watson, 2012).

Organisational change is perhaps the only constant in today's working life. In the last decade, global competition, harsh economic conditions, continuous innovation and new technology has resulted in organisational restructures, downsizing and changes in the nature and structure of work. This has impacted employees, with many having to cope with higher demands and fewer resources than ever before. In addition, the boundaries between work and non-work life are increasingly blurred, with internet and mobile technologies enabling employees to work around the clock and from any location.

It is likely that both the financial and technological changes in the way we work have meant that employees are enabled, and impelled, to work harder and longer. Recent surveys (e.g. Towers Watson) show that employees are more anxious, and more worried about their futures than in previous years. Employees were found to be working longer hours, taking

less time off to recover and experiencing higher levels of stress. They may also be more likely to take sickness absence and intend to leave their organisation.

It is possible that the way engagement tends to be defined within organisations may actually be exacerbating its fragility and the potential negative impact on psychological wellbeing. If engagement is perceived as and measured by employees 'demonstrating additional effort', this could create an unsustainable situation where engaged employees are expected to work ever longer and harder to demonstrate their commitment. Over time, working in this way could negatively impact on an individual's wellbeing.

Of course, just working longer hours isn't necessarily detrimental. Research suggests that it is not the hours worked, but the underlying motivations behind the hours that is key. Therefore, working longer hours isn't a problem if that individual is doing so for enjoyment and vitality – but it can lead to poor psychological health if the individual is working longer for reasons such as they feel they have to, or feel a compulsion to.

From this perspective, if engagement is measured in terms of working long and hard, it may mean that employees who are seen as, or rewarded for being 'engaged' may not be feeling 'engaged'. Research by CIPD and Kingston Business School (Gourlay et al, 2012) reinforced this, exploring the motivations behind employee engagement. Their work defined two types of engagement. Both may involve similar behaviours from employees such as putting in additional effort at work, but one, termed emotional engagement, was where employees enjoyed work and identified with the work values; and the other, termed transactional engagement, where employees were displaying engaged behaviours because they were interested in reward or were in fear of losing their job/reward if they didn't. Emotional engagement was associated with positive outcomes of increased wellbeing and decreased family conflict and burnout; whereas transactional engagement was associated with increased family conflict and burnout. Further, research suggested emotionally engaged employees could become transactionally engaged if they were given increasingly high work demands and pressures.

Therefore, measuring engagement by employee outcomes may be both clouding the evidence, and potentially worsening the problem. Instead, employers need to engage employees in a way in which is sustainable and healthy.

Wellbeing + Engagement = Sustainability

There is evidence to suggest that employee engagement and psychological wellbeing work together in predicting outcomes (Fairhurst & O'Connor, 2010), in that those employees who were highly engaged and had high levels of wellbeing were the most productive and happy; and those disengaged with lower levels of wellbeing were likely to contribute least to the organisation. The relationship can be represented as follows:

There is also preliminary evidence (Robertson & Birch, 2010) that employee psychological wellbeing is important for sustaining employee engagement by enhancing the relationship between employee engagement and productivity. This

Figure 1: Wellbeing/Engagement relationship



suggests that if organisations only focus on initiatives that target employees' commitment and 'going the extra mile', without nurturing employee psychological wellbeing, the impact will be limited and unsustainable.

How managers can sustain employee engagement

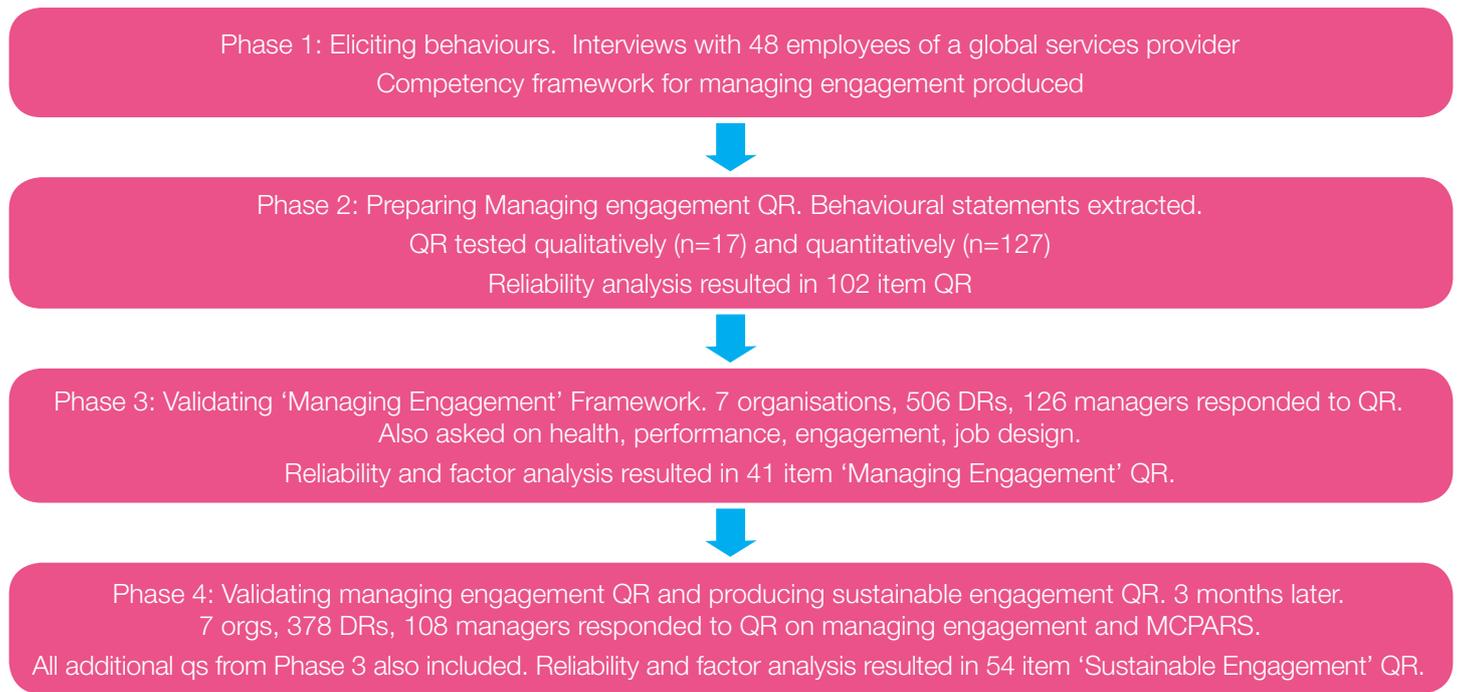
Various reports highlight line managers as one of the most important influences on engagement (e.g. Alfes et al, 2012; McLeod & Clarke, 2008). It has also been consistently shown that managers are key to the health and wellbeing of employees. For instance, Dame Carol Black's review of the health of Britain's working age population (Black, 2008) stated that 'good line management can lead to good health, wellbeing and improved performance' and a recent review of evidence by Kelloway and Barling (2010) stated 'sufficient data have now accumulated to allow the unambiguous conclusion that organisational leadership is related to, and predictive of, health and safety relevant outcomes in employees'.

This suggests that one of the key ways to achieve sustainable engagement in employees, will be to focus on improving line manager skills and relationships.

Management behaviour for sustainable employee engagement

Our recent research has brought together two frameworks from our previous work: management behaviour for enhancing employee engagement on the one hand; and management behaviour for preventing and reducing stress at work on the other hand. The methodology taken is shown in the following flowchart. For full methodology for development of the 'management behaviour for enhancing employee engagement' framework, see Lewis et al. (2011), for development of the 'management behaviour for preventing and reducing stress framework', see Donaldson-Feilder et al. (2009), and for development of the 'Management behaviour for sustainable employee engagement framework', see Lewis et al. (2012).

Figure 2: Methodology flowchart



The results revealed a 'managing for sustainable employee engagement' framework made up of five behavioural themes, or competencies, as follows:

Figure 3: Managing for sustainable employee engagement' framework

Competency	Brief Description
Open, fair and consistent	Managing with integrity and consistency, managing emotions/personal issues and taking a positive approach in interpersonal interactions
Handling conflict and problems	Dealing with employee conflicts (including bullying and abuse) and using appropriate organisational resources
Knowledge, clarity and guidance	Clear communication, advice and guidance, demonstrates understanding of roles and responsible decision making
Building and sustaining relationships	Personal interaction with employees involving empathy and consideration
Supporting development	Supporting and arranging employee career progression and development

Underlying these five behavioural themes are 54 behavioural indicators providing details of what each behavioural theme/competency means. These also form a 54 item questionnaire that is a measure of whether a particular manager is 'managing for sustainable employee engagement'.

Figure 4: Managing for sustainable employee engagement' questionnaire / behavioural indicators

Open, fair and consistent		Knowledge, clarity and guidance	
1	Is overly critical of me and other team members	29	Does not give advice when required
2	Blames me and other team members for decisions taken	30	Deflects responsibility for problem solving to senior management
3	Focuses on mistakes	31	Gives vague rather than specific advice
4	Demonstrates a lack of faith in my capability	32	Does not clarify role requirements and expectations
5	Tells me what to do rather than consulting me	33	Is not clear of their own role requirements
6	Doesn't allow decisions to be challenged	34	Demonstrates a lack of understanding of the role I do
7	Uses humour and sarcasm inappropriately	35	Does not communicate whether I am on track or not
8	Shows favouritism	36	Does not give adequate time for planning
9	Talks about team members behind their backs	37	Demonstrates a lack of understanding of processes and procedures
10	Criticises me and other team members in front of others	38	Does not follow up on action points
11	Treats me with respect	39	Is too busy to give me time
12	Is unpredictable in mood	40	Is indecisive at decision making
13	Acts calmly in pressured situations		Building and sustaining relationships
14	Passes on his/her stress to me	41	Shows interest in my personal life
15	Is consistent in his/her approach to managing	42	Checks I am feeling okay
16	Panics about deadlines	43	Shows understanding of the pressures I am under
17	Seems to give more negative feedback than positive feedback	44	Provides regular opportunities to speak one to one
18	Imposes 'my way is the only way'	45	Brings in treats
	Handling conflict and problems	46	Socialises with the team
19	Acts as a mediator in conflict situations	47	Is willing to have a laugh at work
20	Deals with squabbles before they turn into arguments	48	Takes an interest in my life outside work
21	Deals objectively with employee conflicts	49	Regularly asks 'How are you?'
22	Deals with employee conflicts head on		Supporting development
23	Uses HR as a resource to help deal with problems	50	Takes time to discuss my career development
24	Seeks help from occupational health when necessary	51	Actively supports my career development
25	Follows up conflicts after resolution	52	Offers opportunities for career progression
26	Supports employees through incidents of abuse	53	Plans/arranges time off from day-to-day tasks for development opportunities
27	Doesn't address bullying	54	Arranges development activities
28	Makes it clear he/she will take ultimate responsibility if things go wrong		

What can managers do?

The messages from evidence presented here are clear: a) employee engagement is important for performance, but is likely to be unsustainable unless it goes hand-in-hand with employee wellbeing; and b) manager behaviour is pivotal to both engagement and wellbeing. The 'managing for sustainable employee engagement' framework provides managers with specific indications of what they can do in order to create sustainable employee engagement in their team.

As a manager, you can use the framework to help you by:

- Identifying which behaviours you already use and which ones you could change: When you look at the 'managing for sustainable employee engagement' framework, you will probably find that some of the behavioural indicators are things that you already do (or avoid doing in the case of the negative behaviours) whereas others are not part of your current approach. It might be helpful to get feedback on whether others, particularly those who work directly for you, see you doing these things or not. If your employer

provides an opportunity for upward or 360 degree feedback, this is in an ideal way to find out others' views in a systematic and confidential way.

- Changing behaviour where appropriate: Where there are elements of the 'managing for sustainable employee engagement' framework that are not part of your current management repertoire, you can use the specific behavioural indicators underlying the framework to help you make changes to your behaviour. You might find coaching or other learning and development activities helpful in making and sustaining these changes.

Managers also need to focus on ensuring they engender real engagement in their employees: this means you need to beware of rewarding or encouraging a 'façade' of engagement in which individuals are acting engaged, perhaps by working long and hard, but not really thinking or feeling engaged, in terms of their underlying motivations. Individuals who are just working long and hard, and are not emotionally engaged are likely to have poorer wellbeing and their performance and engagement is unlikely to be sustained over time.

Conclusion

In the current economic and workplace context, employee engagement could potentially help organisations survive by improving productivity and performance. However, the same context that makes engagement desirable also makes it potentially fragile. It is important that managers behave in ways that engender both engagement and wellbeing in their teams. The newly developed 'managing for sustainable employee engagement' behavioural framework offers opportunities to support this.

Further details

This article is adapted from our research report *Managing for sustainable employee engagement: developing a behavioural framework*. For the full report, including a reference list and more information on methodology, result and implications, go to <http://www.cipd.co.uk/publicpolicy/policy-reports/engagement-behavioural-framework.aspx>. And for a short guide based on the research, go to <http://www.cipd.co.uk/publicpolicy/policy-reports/engagement-behavioural-framework-guidance.aspx>.

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ARTICLE 4

Innovating for Sustainability: a user's guide.

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Introduction

In recent years, concerns over social injustice and environmental degradation have come only second to economic recession as amongst the ills besetting society. In 1994, assigning equivalence to each of these foci – People, Planet, Profit – John Elkington coined the term the ‘Triple Bottom Line’ to promote a greater organisational awareness of and responsibility for addressing financial, social and environmental performance: the sustainable organisation.

Increasingly, firms are looking to adopt more sustainable practices and outputs, not least of all to retain their legitimacy. Thus, the ability to innovate in the domain of sustainability is a capability that firms need. But is Sustainability Oriented Innovation (SOI) different from more traditional forms of innovation; and, if so, what characterises it?

To help firms move toward sustainability, the Network for Business Sustainability commissioned a review of the research evidence on the practice and management of SOI. We were asked to address the question “What innovation activities do firms engage in to become sustainable?” SOI involves making intentional changes to organisational products, processes or practices that produce environmental and/or social benefits as well as economic value. In this paper we summarise our key findings and provide guidance by identifying activities that firms could be adopting to adapt their innovation systems and drive toward sustainable outcomes.

We developed a framework that integrates the range of diverse perspectives which present SOI, variously, as a series of small incremental steps in the right direction all the way to something more radical, a disruptive transformation. Next, we distinguish between three different contexts of SOI which allows for a more nuanced understanding of the sustainability journey. Finally, we argue that the move through the framework requires a step-change in both mind-set and behaviour. It is

about whole systems change in which companies, large and small, government agencies and international regulators, NGOs and other stakeholders collaborate to address the biggest problems with radical solutions.

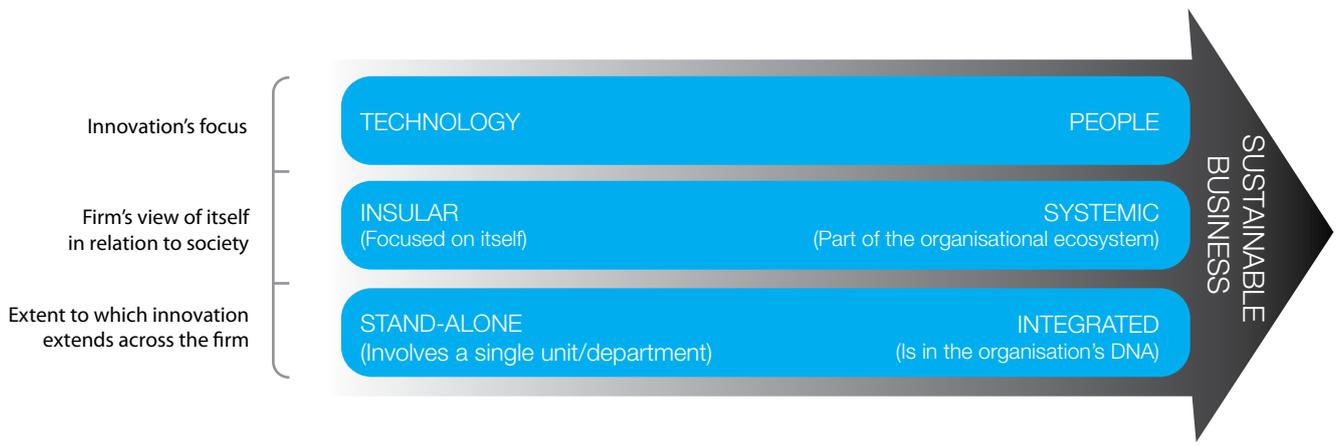
What we did

To address the research question, we adopted the systematic review methodology in which previous, relevant research studies that address the question of interest are identified, their quality appraised and findings aggregated and summarised using a scientific approach to generate a synthesis of the best available research evidence. The method's advantage is that it makes accessible a whole body of research, thus obviating the need to read individual academic papers.

Findings are based on a review of 100 peer-reviewed academic journal articles and 27 non-academic sources. We mapped the innovation activities that we uncovered along three dimensions (Figure 1): whether they focused on technology or people; how they reflected the firm's view of itself in relation to wider society; and, the extent to which the innovation extends across the firm.

Our framework (Figure 2) builds on these dimensions and presents a new conceptualisation for assessing and planning an organisational approach to sustainability. Managers can use this framework to evaluate current activities at the level of individual products, product lines and business units or their entire organisation.

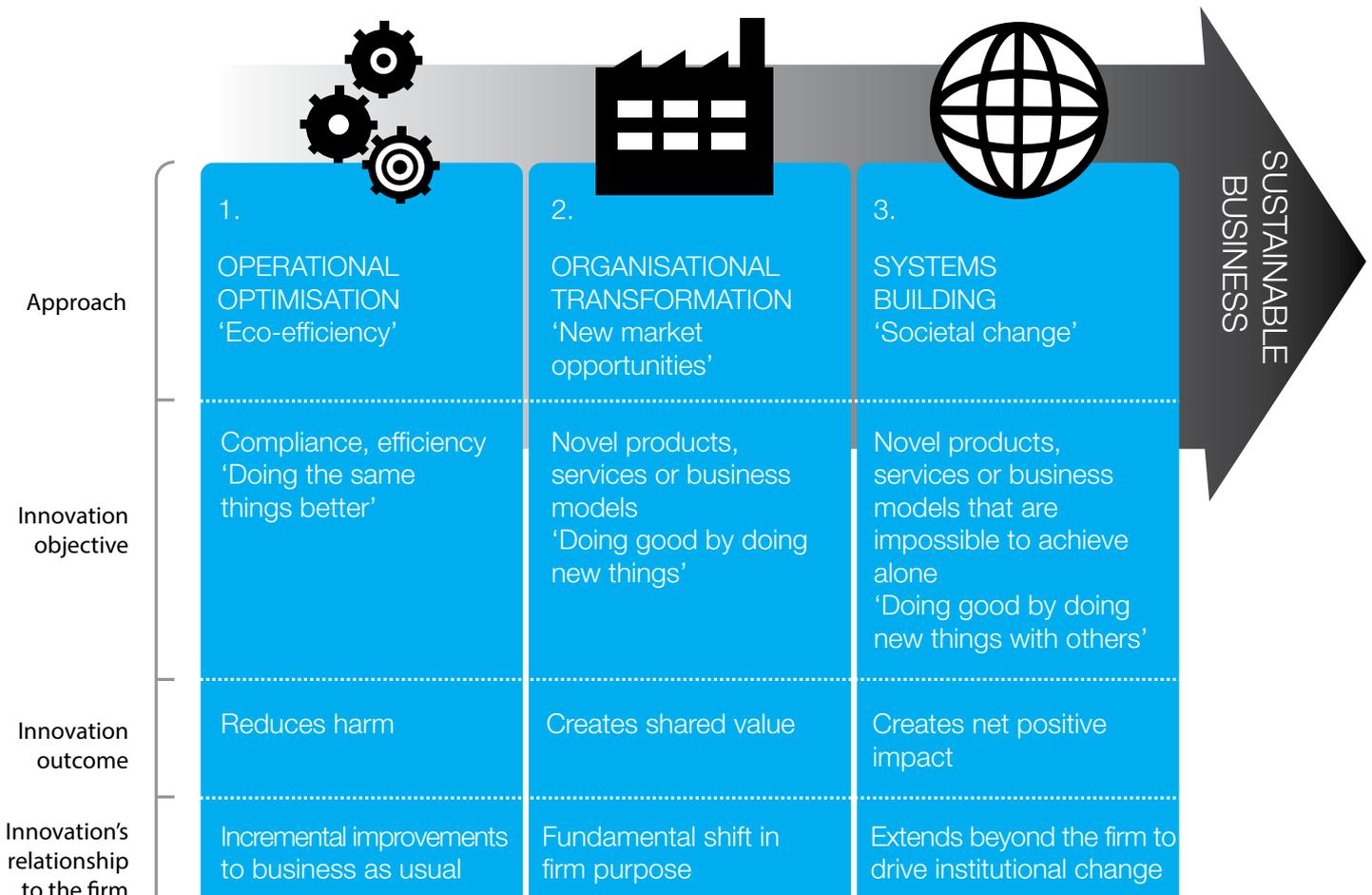
Figure 1: SOI dimensions



A framework for SOI

Past research helped shape our framework for SOI consisting of three contexts: Operational Optimisation, Organisational Transformation and Systems Building. Because the sustainability orientation incorporates social and environmental dimensions alongside economic ones, it introduces new challenges to innovating. Especially as it progresses, SOI requires more integrated thinking. Firms must reconsider their capabilities, stakeholder relationships, knowledge management, leadership and culture.

Figure 2: Framework for SOI



“ THE MOVE FROM OPERATIONAL OPTIMISATION TO ORGANISATIONAL TRANSFORMATION REQUIRES A RADICAL SHIFT IN MIND-SET FROM DOING THINGS BETTER TO DOING NEW THINGS. ”

As firms move from the left of the framework to the right they change across several dimensions:

- becoming systemic thinkers: interested in connections with society rather than being inwardly focused
- integrating innovation throughout the firm rather than a stand-alone, ‘add-on’ activity
- incorporating social as well as technical considerations
- moving from reducing harm to delivering societal benefits.

Operational Optimisation – doing the same things better

In the context of Operational Optimisation, the organisation actively reduces its current environmental and social impacts without fundamentally changing its business model. An Optimiser innovates to ‘do less harm’, typically to comply with regulations or optimise performance through increased environmental efficiencies.

Innovations are typically incremental, addressing single issues. They tend to favour the ‘techno-fix’, focusing on new technologies as ways to reduce impacts while maintaining business as usual. Innovation tends to be inward-looking in both development and outcome. In this context, companies typically rely on internal resources to innovate, and resulting innovations are company-centric: their intent is primarily to reduce costs or maximise profits.

Designing sustainability into products and processes can be done either ex post facto – e.g. introducing end-of-pipe technologies such as for pollution capture or control – or, a priori and so obviate the need to address issues further down the line. Firms can be active in this context by asking a set of questions to address negative environmental impacts, including:

- What levels of waste or pollution are generated in production?
- Could the production process use less energy/water?
- Are components derived from scarce resources?
- Is packaging and distribution optimised for sustainability?
- Do suppliers subscribe to our sustainability principles
- At end of life, can product components be recycled, re-used, disassembled?

These are questions that many firms are not accustomed to asking, and so may require bringing in new knowledge, skills and expertise: not necessarily cost free or easy. But a supportive culture and leadership can greatly help in promoting an environment in which these questions can be asked and addressed.

By asking questions such as these, for example, Kraft were able to remove 150million lbs of packaging from their Food and Consumer Products supply chain between 2005 and 2010. The environmental benefits are self-evident, but there are also cost and reputational gains for Kraft.

Operational Optimisation can be regarded as a step toward diminishing unsustainability: that is, scarce resources continue to be used, but less quickly than previously; pollution and waste are still produced, but not in the same volumes as previously and so forth. In effect, we remain on the same unsustainable flight path, but with optimisation the flight lasts a little longer.

To move away from diminishing unsustainability to increasing sustainability, a shift in mind-sets is required: and this is about Organisational Transformation and Systems Building.

Organisational Transformation – doing good by doing new things

The move from Operational Optimisation to Organisational Transformation requires a radical shift in mind-set from doing things better to doing new things.

Organisational Transformation is a more complex context, it is one in which sustainability thinking becomes more pervasive throughout the firm: it is no longer an add-on. Sustainability becomes ‘business-as-usual’ and is viewed as a market opportunity and stimulates the creation of disruptive new products and services.

Rather than focusing on ‘doing less harm,’ Organisational Transformers believe their organisation can benefit financially

from ‘doing good.’ They see opportunities to serve new markets with novel, sustainable products, or they are new entrants with business models predicated on creating social and/or environmental value as well as economic value.

Organisational Transformers often produce innovations that are both technological and socio-technical – designed to improve quality of life for people inside or outside the firm. Transformers are still primarily internally focused in that they see their organisation as an independent figure in the economy. However, they do work up and down the value chain and collaborate closely with external stakeholders.

Sustainable supply chain management (SSCM) plays a critical role in this context. SSCM is characterised by its broader systems view: so, sustainability principles inform the firm’s relations with the whole value chain – from the original sourcing of raw materials, through stages of extraction and processing, manufacture, distribution, consumption and disposal. To achieve effective SSCM, long-term collaborations with external partners are critical. This marks a shift toward networks of relations in which sustainability value is created collaboratively rather than individually.

However, the implied level of collaboration raises important questions about whether or not it is in the capacity of individual firms to be sustainable on their own or whether or not sustainability can only be achieved within a wider sustainable system. This question demarcates the frontier of current thinking and practice, and takes us into the third context of our framework – Systems Building.

Systems Building – doing good by doing new things with others

The move from Organisational Transformation to Systems Building requires another radical shift in mind-set – this time from doing new things and serving new markets to thinking beyond the firm. This is a space in which the purpose of business in society is being reinvented and redefined. It is a much more challenging space, and fewer organisations operate here. Those that do recognise that ‘everything is connected’ and are engaging in wide ranging institutional dialogues to ‘change the rules of the game’.

Systems Builders perceive their economic activity as being embedded within society, not distinct from it. Individually, almost every organisation is unsustainable. But taken as a collective, systems can sustain each other. Systems Builders extend their thinking beyond the boundaries of the organisation to include partners in previously unrelated areas or industries.

This notion is exemplified by the concept of Industrial Symbiosis in which organisations come together and explore sustainability-oriented interdependencies: creating localised ‘circular economies’. In the UK, for example, the National Industrial Symbiosis Programme encourages its members to ask ‘What are you throwing away that I might be able to use?’ One company’s waste material or waste energy becomes another’s resource.

Another example is the emergence, in the United States, of the ‘B-Corporation’. B-Corporations are organisations

adopting a new legal form which obliges those who sign up to deliver societal benefit, thus expanding the idea of corporate accountability so that firms are required to make decisions that are good for society, not just for shareholders. Included amongst firms adopting the B-Corp designation and demonstrating to consumers, investors, employees and the wider world their commitment to their social mission are ice cream producer Ben & Jerry’s, e-commerce platform Etsy and cleaning products manufacturer Seventh Generation. Systems builders are also signing up to other initiatives – such as the Global Reporting Initiative - that also publicly and expressly make visible their commitment to sustainability goals.

Another area of innovative activity is around changing behaviours, for example by transforming how products are delivered and consumed, as exemplified by the concept of servitisation. The idea behind this is that human needs are fulfilled by services, not products; customers buy what the product does not necessarily the physical artefact. So, instead of selling light bulbs a manufacturer might sell illumination services – and customer, supplier and the environment would benefit from the development of efficient, durable, maintainable and recyclable products.

System building innovators have also adopted new innovation platforms, including:

- cradle-to-cradle innovation
- closed loop production
- circular economy principles
- net positive contributor
- frugal, resource-constrained, jugaad and reverse innovation

These have in common a move away from linear approaches which hand off responsibility to an approach that actively takes on responsibility. One expression of cradle-to-cradle innovation is, for example, Interface’s ambitious goal of eliminating any negative impact of the company by the year 2020 – their so-called ‘mission zero’. Relatedly, becoming a net positive contributor means devising strategies to give back more than the firm takes. These innovation platforms mark significant shifts in mind-sets from simply reducing impacts to restoring nature and strengthening society.

Frugal, resource-constrained, jugaad and reverse innovation are platforms that have emerged from innovators serving ‘Bottom of the Pyramid’ (BOP) markets: 4 billion people in less developed economies who live on less than \$2.50 per day. The BOP innovation platform is characterised by generating deep customer insight, designing for local needs and low margin mind-sets. The Tata Nano, for example, was designed to bring mobility to many who previously found cars unaffordable. In its design, much western functionality was stripped away and the product re-engineered for local conditions to make a four-seater car retailing for about \$2,500. Similarly, GE designed and developed a portable ultrasound machine in and for the Chinese market to be lightweight, affordable, portable and durable.

Versions of both the Tata Nano and GE’s ultrasound device have been introduced into developed economy markets and are having a disruptive effect. And, so, it is worth remembering that populations in BOP countries can be sources of innovation as well as markets for innovation.

In summary

Many commentators have argued that by 2050 we will need as many as 5 planet earths simply to maintain current levels of consumption. Add to this the inequitable distribution of resources around the globe and the situation is unjust and unsustainable. Politicians find it difficult to engage with these issues, but the business community is well-placed to act.

In its earliest manifestations, sustainability was primarily envisaged as a cost. Over the last 20 years, the case for integrating sustainability thinking into organisational routines and practices has been well made. Integration brings major opportunities in terms of cost reduction – e.g. using fewer inputs – and revenue increase – e.g. better products or new businesses. Other benefits such as first mover advantages and reputational gains also accrue. Innovating for sustainability is, therefore, at the front of many managers' thinking.

In this systematic review of the literature we have identified three contexts of SOI. The transition through the contexts appears to be marked first by shifts in 'insight and purpose' and next by the configurations of innovation activities that a firm will engage in (see Figure 3).

The framework should be useful to stimulate discussions among senior executives regarding how their firms might

move toward sustainability and also among policy makers looking to support businesses in their transitions. More specifically, the list of activities can be used to benchmark firm activities and highlight new ways of thinking about SOI.

If sustainability is a desirable objective, then Operational Optimisation is not enough. Focusing on 'less bad' will not get us to 'good enough'. Being sustainable is about doing things differently. Sustainability leaders reflect a wholly different mind-set. They continue to create financial value but also know how their actions affect the environment and actively address those impacts, they care about their employees, customers and communities and work to make positive social change, they are re-imagining the purpose of business and understand how these elements are intimately connected to each other.

Further details

This paper draws on the findings of Adams, R.J., Jeanrenaud, S., Bessant, J., Overy, P. & Denyer, D. (2012). *Sustainability oriented innovation: a systematic review*. Network for Business Sustainability, a copy of which is available at www.nbs.net. The authors acknowledge the generous contribution of the Network for Business Sustainability in supporting this work.

Figure 3: The activities of sustainability-oriented innovation

	Operational Optimisation	Organisational Transformation	Systems Building
Product innovation	Efficiencies...Dematerialisation...Renewables...Recyclables...Integrated design principles... Servitisation...New platforms		
Innovation process	Existing innovation processes...Use tools like LCA s... Experiment with new innovation platforms (EMS, frugal/reverse innovation, industrial symbiosis)...Cradle-to-cradle and Closed-loop		
Institutional innovation	Work with regulators.....SOI at core of organisational vision.....Broaden networks to include NGOs, IAs, lobby groups etc.		
What will change	Emissions.....Processes.....Product.....Product lifecycle.....Supply chain.....Servitisation..... Business models.....Wider systems		
Involving whom	Production line.....R&D....Cross-functional....Top Management Team....Immediate stakeholders... Customers....Wider socio-technical systems		
Extent of ambition	Easy wins.....Experimentation.....Radical solutions		
Opportunity identification	Regulations.....Efficiencies.....Competitive advantage.....Lifecycle analysis.....Knowledge networks.....Biomimicry.....BoP		
Targets and guidelines	Set efficiency targets and policies (reduce waste/energy use by 20%).....Set audacious goals: zero waste, net positive energy.....Change systems behaviour		
Collaborations	Instil SOI internally.....Extend into organisational ecosystem.....Forge systemic partnerships		

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ARTICLE 5

Does Management Really Work? How three essential practices can address even the most complex global problems.

Professor Nicholas Bloom, Professor of economics at Stanford University

Professor Raffaella Sadun, Assistant Professor at Harvard Business School

Professor John Van Reenen, Director of the Centre for Economic Performance at the London School of Economics and Political Science

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Abstract

The authors take, what they believe, are the three basic elements of good management practice (targets, incentives, monitoring) and consider whether these fundamental principles can be applied to complex, worldwide problems. Their research looked at whether there was a link between performance and implementation of the three basic principles. When assessing management practices, their initial focus was on manufacturers. Following this, they then turned their attention to the public sector (specifically schools and hospitals) to discern whether there is indeed a correlation between performance and the implementation of the three basic management principles. The findings from their research are presented, with conclusions drawn. Top-level statistics for the return on good management are included.

The text of this article is included in the printed version of 'Management Articles of the Year' and can be sent to you on request.

CMI members can access the full article through ManagementDirect at www.managers.org.uk/managementdirect

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