Procurement Leadership: More than a goalkeeper in the modern business team?

Whatever happened to British Manufacturing – What is to be Done?

Forecasting in supply chain companies: should you trust your judgment?
With over forty years’ experience of delivering high quality management programmes, the School of Management is one of the oldest established business schools in the UK. The School is research-led, with a faculty and staff unique in the diversity of cultures and interests represented.
Dean’s Message

Since taking on the role of Dean of the School of Management in 2008, I have been inspired by the quality of research activity and the resulting thought leadership that is emerging from Bath.

The articles written by my colleagues in this publication give a taste of some of the ideas that are emerging from our faculty.

Prof Mike Lewis is stirring up thought with his ideas on procurement leadership; he shares the ‘seven habits of successful procurement leaders’. Initial responses suggest this work will have a major impact on the understanding of procurement leadership, with the work being published in CPO Agenda, the practitioners' publication, and being used by a major pharmaceutical company - moving the habits from a descriptive to a prescriptive tool.

Prof Andrew Graves also stirs up the received wisdom and argues that manufacturing and engineering are the keys to the UK’s future – he contends that the UK needs to meet the challenges of existing and emerging economies through knowledge generation and implementation. His position is that to grow as a world-class economy the UK must invest in dramatic change by government, industry and the education sector in order to regain its competitive strength amongst the new order of leading industrial nations.

Dr Baris Yalabik argues for dramatic change in the way that industry takes responsibility for its impact on the planet. His challenging, but upbeat, message is that it is not too late to find ways of innovating beyond simply complying with environmental regulations.

Prof Paul Goodwin has delved into the world of supply chain forecasting and has discovered some very interesting results showing how managers are adjusting product forecasts produced by expensive, sophisticated software. He looks at why this is and whether it has positive or negative consequences on the ‘bottom line’.

Dr Dawn Eubanks questions the role of the leader in the creative process. Her contention is that the leader has a critical role in this area and that the accepted view of leaders retaining a degree of distance from the process to allow others’ creativity to flow is now outdated.

Evidence of the success our students and alumni are enjoying by putting their management knowledge into practice is shown via the profiles of Ewan O’Connell and Alex Edwards. Angela Webley, our own Marketing Manager, shares her insights into what we have been doing to sharpen our School’s identity, as a marketer myself. I fully support these efforts.

I hope you enjoy reading these articles and I hope they will prove to be thought provoking. We welcome your comments and our contributors are happy to be contacted if you would like to follow-up on how their ideas might be applied to your business situation. Further contacts in the School of Management can be found on the back of this publication.

Prof Richard Elliott

R. Elliot
Procurement leadership: More than a goalkeeper in the modern business team?

Michael Lewis, Professor of Operations and Supply Management
Gerard Chick, Chartered Institute of Purchasing & Supply

As part of an ongoing stream of work exploring the nature of functional leadership, Professor Lewis has been working with the Chartered Institute of Purchasing and Supply (CIPS) Leaders Network on a series of procurement leadership projects.

A new way of thinking?
These projects have been specifically looking at those attributes or habits that mark out today’s most effective procurement leaders. Not finance or operations or marketing leaders but procurement leaders; those individuals responsible for – call it what you like: buying, purchasing, supply management, procurement, acquisition, etc. The results have been fascinating but also speak to the classic T-shaped management challenge: people are promoted due to their technical skills but they succeed due to their breadth of skills. The projects raise the profound question of whether most procurement leaders can break out of current ways of thinking and create a new future – for themselves, their functions and their organizations.

Procurement at the heart of organizational value?
We can argue, quite logically, that procurement lies at the very heart of shaping and developing organizational value, after all it helps define the boundaries of the organization; directly influences operating costs and manages many of the organization’s key relationships with the outside world. Despite this, there are many alternative perspectives asserting a more peripheral view of the value of procurement and procurement leaders.

Indeed it became apparent during the research that many CPOs’ own judgments on the strategic value of their role were often clouded – in part by the typical managerial burdens of too much work and too little time (all managers are capable of confusing motion with progress) – but also by CEOs setting hard performance targets based on cost savings alone. Of course, when pushed a little harder it was also evident that most CPOs took real pride in the transparency and criticality of this cost-driven performance regime. At one workshop for example, a CEO suggested that most Chief Procurement Officers (CPOs) are only really comfortable taking on the role of corporate goalkeeper – essentially a reactive job whose role is to make the save when other things have gone wrong.

Understanding procurement leadership
The changing economic context has introduced a range of undeniably strategic leadership challenges for senior purchasing and supply professionals. To help understand the notion of procurement leadership in a more structured and comprehensive manner, we carried out interviews with senior, high-performing procurement professionals from a range of public and private sector organizations from around the world. We employed the Competing Values Framework model that detailed how individuals reconcile two fundamental strategic dimensions - stability versus flexibility and external versus internal focus. Eight generic leadership roles were described and then linked to purchasing- and supply-specific themes.

The 7 habits of highly effective procurement leaders

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The 7 habits identified are not associated with the traditional principles of what procurement does; they question the clichéd perceptions and suggest a proactive way of ensuring CPOs are meeting the challenges of their profession. This work is intended to contribute to an ongoing – almost eternal – debate: are leaders born or bred? Is management different from leadership? Is procurement leadership different from leadership in general?
Although it is clear that specific leadership qualities relate to specific personalities (e.g. what is your Myers Briggs Type Indicator – MBTI-profile?), the 7 habits outlined highlight distinct bundles of attributes and activities that appear to maximize the potential contribution of procurement leaders to organizational performance.

1 Actively seek alignment with the organization and its objectives….  
• Procurement Leadership is always purposeful.  
• It is about being part of a senior team not just running a function. An important part of this is to recognize that aligning with inner – think top team Belbin – and outer business context – think culture, stakeholders, competitors, etc. – is a key part of the procurement leader’s task.  
• Procurement leaders decipher business objectives and communicate them often and effectively to their and team and the rest of the business (and, given their connector role, its stakeholders).

2 Build credibility by promoting procurement’s contribution…. 
• Clarity of role as innovator and mentor allows for a kind of internal branding to be developed. Most of the interviewees talked about being, or becoming, the go to people in the organization.  
• They never/rarely say “no” but rather reply with: “interesting, now how about this?”  
• Think advertising - without awareness of the message, no one is listening.

3 Creatively challenge notions of value….  
• The research highlighted the innovator characteristic (i.e. encouraging creative thinking; leading change and challenging the status quo) is and will continue to be one of the key attributes in the procurement leadership mix.  
• This may manifest itself as a restless dissatisfaction with the status quo – think of boundary spanning, and therefore often more fundamental, form of kaizen.  
• Procurement leaders must be as independent as possible and always demonstrate integrity and insight – think about the need to be forensic in analysis.

4 Actively work across internal and external boundaries – rarely be in the office…. 
• The research highlighted broker characteristics (i.e. negotiating agreement and commitment, presenting a range of ideas, developing and maintaining a power base) as becoming increasingly significant over the next few years.  
• Effective procurement leaders readily assume responsibility for the motivation of people who don’t report to them – think a coalition of interests.  
• They act as a hub for conversations about value – honest brokers for others’ (again internal and external) ideas.

5 Deliberately build an eclectic team….  
• Many of the most effective leaders have followed an eclectic career path but however they got to their senior position, following through on habit 2 requires a broad mix of skills.  
• This may necessitate a challenge to the organization’s (and sector’s?) definition of what constitutes a procurement professional.  
• Lots of specific skills and experiences will therefore potentially be relevant but effective procurement leaders combine strong quantitative and qualitative skills.

6 Commit significant amounts of time to building the next generation of leaders….  
• The research highlighted mentor (i.e. Strong emphasis on understanding self and others. Communicating effectively and actively developing subordinates,) as the other (with innovator) dominant – and enduring – attribute in the procurement leadership mix.  
• Given the maturity of the discipline, and the changes/challenges it faces, this role is particularly significant for procurement leaders – and effective procurement leaders spend a lot of time on it.  
• In line with habits 4 and 5, this process can and should encourage eclectic career profiles. Many of the interviewees talked about looking for staff outside the function and/or encouraging their people to take development opportunities that will lead them in the other direction.

7 Act with demonstrable integrity….  
• There can sometimes seem to be a fine line between integrity and naivity but all the above requires a strong sense of self and repeated demonstration of active integrity.  
• In some senses this is the inter-personal equivalent of building trust and social capital between trading partners – think real partnerships.

A common theme in all the habits is an unambiguous emphasis on individual and organizational – not procurement – outcomes, but they are about the unique contribution made by procurement leaders to these outcomes.
It is clear from these world-class procurement leaders that an alternative procurement mindset exists; one that recognizes the need for functional legitimacy and authenticity (i.e. there is no substitute for having deep procurement skills) but replaces a hierarchical “it’s not my job” or “that’s above my pay-grade” attitude with a sense of ambition, accountability and self-responsibility – accepting that senior roles sometimes trade responsibility for influence.

The critical questions are now in what ways this new attitude can be nurtured and how individuals can make the transition?

A conflicted role?
What became clear from the project was that in many ways the typical CPO role seems conflicted. No CPO felt that they were in dead-end, unattractive, nowhere roles yet at the same time, in subsequent discussions of the war for talent, several felt that they were at a disadvantage because this was how many perceived their field. Similarly, the senior procurement professional can conceive of his or her skills as being technical – drawing up contracts, establishing trading rules, ensuring compliance and so on - or they can recognize their almost unique combination of both technical and commercial strengths. They can recognize that they have invaluable negotiation skills and often act as one of very few boundary spanners within the organization and with the outside world. Moreover, they are very used to the kind of explicit measurement of performance that CEOs have to deal with.

This conflict over the strategic role of procurement was not limited to the CPO community however; although some of the CEOs interviewed were absolutely sure that “procurement must be strategic”, others talked about having “a first-rate procurement function that was never really drawn into the strategic debate” or that “procurement don’t contribute to these objectives, they are disconnected really”. Or most disappointingly, “most of the top team wouldn’t even consider that procurement could be part of the solution”. Inevitably this kind of confusion is strategically limiting because to be truly effective in leadership roles people need to think extremely clearly about their own strengths and weaknesses.

Can an alternative procurement mindset emerge?
A mindset works like the grid lines on a map; it doesn’t determine our journey but does allow us to orient ourselves and strongly influences our direction of travel – personal and professional. Moreover like the layout of a map, a mindset is not just person-specific: rather it is derived from shared experiences and based on a number of agreed assumptions. When managers talk of common-sense decisions for instance, they are typically basing these judgments on their own particular mindset and this has been influenced both by their own personality and experience but also set by their educational background, functional skill-set, organizational and societal status. Just as an inaccurately orientated map can take us in the wrong direction, our mindset too can sometimes lead us astray.

The power of self-awareness
In an effective organization, the entire top team has a crucial role to play in strategy. Consider the following: CEO tenure in Europe is now approximately five years; CEO turnover was 15% in 2006 (up from 5% in 1995) and, consequently, even an extremely effective CEO may have very short-term drivers. Moreover, is it really the CEO’s job to develop detailed strategy? It can be argued that meaningful top leadership roles are primarily about developing talent, embodying organizational values, building commitment, constant (two-way!) communication, and, where necessary, making the final call on big decisions. But even if the CEO doesn’t exhibit these kind of behaviours, and is intimately involved in detailed strategy formulation, those CPOs wishing to have significant influence in their organization must ask themselves the question: who am I in this organization and what do I do? The power of self-awareness is crucial.

As already noted, it is critical for leaders to understand their strengths and weaknesses, but self-awareness also underpins the key leadership attributes of personal authenticity and legitimacy. These are powerful characteristics for influencing people. Until procurement leaders achieve this state they may be able to dictate through their position in the hierarchy (i.e. decide what their team
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does) but they will always find it difficult to influence upwards and, just as critically, sideways. Interestingly, the nature of the traditional procurement management role – specifying buying procedures and clarifying stakeholder expectations – can easily become overly control and structure oriented and gives little opportunity to learn more personal rather than processual leadership skills. Inevitably much of this relates to individual personalities and there was a great deal of debate at our CPL workshop about the type of personalities who were drawn to the procurement function – and whether they had the ambition to be more strategic.

Making the transition

Although being assertive and ambitious will necessarily be part of the mix if CPOs are to play a greater strategic role, there are also risks to be considered. One CPO was very clear about what it meant to talk frankly about strategic matters: “It takes bravery to put your head up above the parapet.” Another CPO argued that he would “rather get a good bronze medal than fall over”. Ultimately however, although it is important to be sensitive to circumstances where there is uncertainty about the basic value of procurement, this idea of personal risk taking is central to the idea of being a good leader. If you are unwilling to commit yourself - when you know that there are personal consequences – it is very difficult to ask others to do the same.

The specific challenge of seeking to transform procurement is the need to balance the traditional virtues of control and cost minimisation – “covering the table stakes” as one delegate at the event described it - with a willingness to take risks: “deliver innovation and strategic value”. Good leaders will encourage others to develop ideas of their own; they focus on unanswered questions and unsolved problems and encourage those around them to seek answers and solutions – they develop people who will lead (in their own right) not follow.

No longer charlatans, rogues and penny pinchers

Although the brave CPO is a key part of the transition mix, it is also clear that the rest of the senior team and the CEO in particular, have a central role to play in this transition too. Several of the participating CEOs suggested that they had observed and/or encouraged changes in purchasing and supply-management but the exact degree of change is clearly dependent upon history and aspirations as well as appropriateness. One CEO talked about “wanting to be at the leading-edge of sector [procurement] practice” but another argued that the perception of the function had moved – it was no longer seen as a group of “charlatans, rogues and penny pinchers!” In other words although we may read in CPO Agenda that the strategic contribution of supply-side management is increasingly measured not just in terms of cost savings but increased shareholder value – how many CEOs believe this?

Fundamentally, this means that CPOs need to foster corporate belief and influence others’ mindsets, not just their own.

Influencing the top team

Of course, it is not just the CEO who needs to be influenced. In fact if we return to an earlier argument, influencing and contributing to strategy may have less to do with the CEO than is sometimes assumed. Influencing the rest of the top team, and in turn their teams, represents its own distinct challenge. After all, just as there is a procurement subculture in most organizations – a blend of organizational and professional functionality – there will also be distinct subcultures in accountancy, production, sales and marketing. These tend to be more or less reinforced depending upon on the extent to which functional groups hire and promote their own staff but this separation means that even apparently minor differences in vocabulary can make interaction tough.

A classic solution to this problem has long been the rotation of staff through multiple departments – either as initial training or more crucially for this debate, training for the top position. Most CPOs, however, aren’t being prepared for the top job and therefore once again, personal promotion and lateral influencing skills become crucial capabilities.

Further details on these projects can be found in a series of articles published in CPO Agenda, the senior procurement practitioners’ publication. The next step in the project is to test the habits in a series of organizational development situations and develop a much larger sample in which to test further the findings.

To contact Prof Lewis about this work, please email: M.A.Lewis@bath.ac.uk
In the CIPS Leaders’ Network study, the CV framework was used to give some consistent structure to the underlying procurement leadership behaviours. Participants were asked to allocate 100 points across all 8 roles (see table below) in order to reveal their ‘natural’ style (column A). They were then asked to give consideration to whether this profile had changed given the recession (column B) and whether it would change again once a significant recovery was underway (column C).

Consider filling in your own profile and then reflect on the following generic questions (the bits that make it procurement specific are in brackets):

1. Which are your strongest behaviours (and how do they relate to those underpinning the 7 habits?)
2. How would the rest of your (procurement) team score themselves and you – what do you imagine would be the greatest discrepancies?
3. How balanced is your profile and where do you think most improvement could be achieved?

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<th>Role</th>
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<td>Encouraging creative thinking. Leading change and challenging the status quo.</td>
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<td><strong>Broker</strong></td>
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<td>Negotiating agreement and commitment, presenting a range of ideas, maintaining a power base.</td>
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<td><strong>Producer</strong></td>
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<td>Emphasis on efficiency and productive work environment.</td>
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<td>Time management</td>
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<td><strong>Director</strong></td>
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<td>Planning and goal setting. Designing and organizing.</td>
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<td>Effective delegation</td>
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<td><strong>Coordinator</strong></td>
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<td>Designing and managing projects. Managing work across functions.</td>
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<td><strong>Monitor</strong></td>
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<td>Monitoring and managing individual and collective performance.</td>
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<td><strong>Facilitator</strong></td>
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<td>Building teams and using participative decision-making. Seeking to mitigate and manage conflict.</td>
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The Bath Perspective

‘If you move on you should keep going.’ That is the philosophy of Ewan McConnell, a straight-talking Yorkshireman whose two engineering companies in the South Wales Valleys are riding out the recession through a combination of hard work and pre-planning.

Ewan has kept going since he was an undergraduate student at Bath, sponsored by Shell. His placements with the global energy and petrochemicals company were formative experiences, giving him a diverse range of experience and exposure to real business tasks and he anticipated a well mapped-out future via their management development programme. Instead, he surprised himself by taking up the offer of a fast-track corporate graduate programme with Calor Gas and parent SHV. From there he moved on to become the youngest director of Yorkshire Electricity, followed by eight years at British Energy/Hyder.

Despite this strong corporate career, Ewan says: “I was always hankering to do my own thing. When I left University I was ready to conquer the world but I realised during the first 6-12 months in business that I still had a lot to learn and I am still learning every day. I looked around for my own business in the late ‘90s but the time was not right in terms of my own experience and in terms of the capital available.”

Stepping off the corporate ladder

The catalyst finally came in 2004 when he realised that his next move in the corporate world would involve being away from home five days a week. He says: “It was the quality of life cost that I didn’t want to bear, but I was also slightly jaundiced by the corporate world. I’d reached a point where most of my focus was managing the bureaucracy of business and external stakeholders instead of the customers and the people. I knew it was time to do something different.”

He stepped off the corporate ladder in 2006 and spent 12 months conducting research into different businesses, whilst supporting himself doing interim work. Commenting on the move, Ewan says: “I knew I didn’t want to go back, but I wasn’t sure what I was going forward into.”

Ewan knew that he didn’t want to get involved in venture capital funding (“I wanted as much personal control as practical”); he was looking for a slightly tired business with a good brand that he and his wife, Julie (pictured above), could push forward and put their stamp on, and importantly one that
they could enjoy running and developing. When the opportunity arose to acquire two engineering-based businesses in South Wales, Nidum Precision Tooling and Magor Designs, Ewan knew he had found what he was looking for. Having no hands on engineering expertise himself did not concern him, he notes: “I don’t need to be the best precision engineer – I employ them, in fact I’ve probably got the best 40 of them in the UK. The issue was for me to use my expertise to develop new business around a solid strategy and for Julie to sort out the customer service and administrative side so that together with our engineers we, as a team, could complement each other.”

Aliens in South Wales
Taking on two long-established businesses in a small, close-knit community was a welcome challenge for Ewan and Julie: “We weren’t just outsiders; we were like aliens when we first arrived! We both come from small industrial communities in North Yorkshire, though, so we understand the importance of business to the local community and we made the effort to engage with people, to understand their issues and to see the opportunities available. The business had been managed from a distance for 10 years and this change in emphasis was appreciated, so we were warmly welcomed. This is a business in which the majority of people walk from home to work, it is very embedded in the local community and we understood that from the outset and we take account of that. The nature of our location and of being 40 people in the business means my role is not just of Managing Director but also life coach and mentor, and I enjoy that, it feels good to be putting something back at a practical level.”

Building the right team
“I believe being successful is not about what you do, but getting the right team and having the right focus and support. One of the key success factors in buying the businesses was in building the team around me that I needed to make the acquisition. I couldn’t afford to pay a full-time board of experts so it was a virtual board with complementary skills. I hired a very experienced old-school finance director who works on a part-time basis; he brings lots of knowledge and experience. I also used a small partnership specialising in merger and acquisition, Hollis and Gore, and legal firm Clark Holt in Swindon. I found people with a similar mindset and philosophy to me and I used them when required – and still use them.”

Coping with the recession
“We’re very growth-orientated but at the moment we have been caught by the banking conservatism that has slowed down our acquisition plans. For us the recession isn’t hitting us as badly as it is hitting some; we sell to blue-chip manufacturing companies so they were one of the first areas to nose dive, they have been seeing two-thirds of normal turnover levels.”

“I’ve coped with the challenges thrown up by the recession by using the disciplines and skills from corporate life and from what I learned at Bath; all that has really come into play: planning, forecasting and making pre-emptive decisions. Lots of small businesses are victims of circumstances but we are more proactive in terms of selling, so we are riding things out OK. I’ve learnt how important stakeholder management is – keeping people informed: when the going gets tough you need to be a very visible leader in my view. I’m sorry to say that we are frequently having to drag information out of people higher up the supply chain, there are a few notable exceptions, but in general I am having to manage up and down the supply chain. This is disappointing given the nature of our client base – global manufactures who you would expect to be more proactive, especially in tough times.”

Managing the workforce
One of the areas in which Ewan has had to be proactive is in managing his own workforce. He has had to make 25% cuts during the last 12 months, he says: “People aren’t stupid, they know what is happening, you have to deal with people professionally and with dignity and even in a close-knit organization you have to separate personal life and work. Everyone affected by the cuts was dealt with professionally and we tried to make them as well equipped as possible to face the future. Most have found other jobs, although not in engineering.” Despite these cuts Ewan says: “The current workforce is still pretty upbeat; we have had a hard time but it has not been as bad as for some. The core team is committed but there is a
healthy degree of gallows humour, as is the way in South Wales. People are working hard, 30 hours sometimes 50 hours; people are prepared to put in the time and not for a financial stake in the business but because they have an emotional stake in it – many were apprentices here and they’ve worked here their entire careers. They share our vision for the long-term.”

Developing for tomorrow
“I am open about the company’s financial performance and plans; the team see me being committed to the future and saying thanks for their efforts. We are a very growth-orientated company and I see our greatest challenge for the future as coping with that growth. I know that people and technology will be the answer; you get out what you invest in people so we are still investing in training. My Financial Director tuts and mutters but I am committed to it. The Welsh Assembly has selected us as a pioneer in a major training programme – PROACT – aimed at supporting manufacturing in Wales. It was a vote of confidence by the Assembly in Nidum and Magor, and it is all about developing for tomorrow.”

Advice for others starting their own business
“I’ve been managing my own business now for two years and it’s very fulfilling – I enjoy the engagement with all elements of business, the immediacy of making things happen. If I were advising others setting out on the path of running their own business, I’d say: do your research well; be honest with yourself about your skills and limitations; be realistic with your business plan and action plans; have a clear view of what your objectives are; be clear about what you and your family want out of it - not just in fiscal terms but in quality of life, work-life balance, terms. Be prepared to work very hard. I am working harder now than in corporate life, even though it is very different – I’m not catching the ‘red eye’ to Brussels but I’m certainly doing the hours and you’ve got to be willing to pitch in with everything - be it taking the tea towels home to clean or negotiating with customers. I have no regrets, I just wish I’d done it a long time ago but I know I didn’t have enough wool on my back then so it was right to wait. I knew from my corporate career that I have a flair for developing businesses; I like making a difference and I’ve been successful. Doing our own thing makes this a good place to be.”

Three formative elements at Bath:

- Placement
  I got to see the real world, and got practical experience. I could put the theory I had learned into practice. This added to my teenage years’ experience of my father’s steel founding business.

- Exposure to a group of exceptional and talented people
  There were many characters who graduated in 1982 who have gone on to be very successful people. For a country lad from North Yorkshire, mixing with them was very educational. It was clear then that these were people who were going to be successful.

- Academic side
  I had the opportunity to soak up the breadth of knowledge of business from the academics who taught us.
Whatever happened to British manufacturing?
What is to be done?

Prof Andrew Graves, CBE, originally wrote this article for the Royal United Services Institute in June 2007; it is a sign of the times that what Andrew calls “a deeply unfashionable position” to take two years ago has now become the accepted wisdom of the day. He notes that: “Back in 2007 the Knowledge Economy and Financial Services were seen as the answer to all our economic concerns; now the focus has shifted towards manufacturing and engineering”. He adds: “I am now doing talks around the country to promote this view and people are taking note”.

Introduction and Overview
This paper examines the current state of the UK Manufacturing Sector with particular reference to the Aerospace and Defence sector and its prospects for survival against increasing global competition. The challenge for the sector is not only to compete against established competition from the United States, Japan and mainland Europe, but also against the increasing penetration by developing Asian and transition economies.

It is often argued that service sector growth and the ‘knowledge economy’ will replace traditional manufacturing as the key ‘engine for growth’ of the UK economy during the 21st century, however, it is unclear exactly how these activities could possibly replace existing high value jobs and create significant growth for the future.

The importance of manufacturing is often dismissed or marginalised when future industrial strategy is being formulated and its crucial role in providing sustained growth is not fully appreciated. Successive British governments, since the 1980’s, have focused on how “the cake” is distributed – instead of “how to increase it”.

This paper will argue that Manufacturing provides 5 key areas for wealth creation and growth by:

• Creating an infinite demand for manufactured goods
• Driving innovation and technical change
• Driving other sectors - powerful internal dynamic
• Generating exports – balance of payments
• Creating high value jobs and support industries

These wealth creating attributes were the cornerstone of the British economy from the 19th through to the 20th century. However, since the 1950’s Britain has been outperformed, first by the United States, Germany and Japan and recently by increased competition from Korea and
China and in the near future by India and the transition states. Manufacturing as a percentage of GDP has declined from over 30% in the 1970’s to under 14% today (see fig. 1).

The resulting crisis for innovation, high-value skilled jobs, support industries and the UK balance of payments, should not be underestimated. The balance of payments deficit, once the obsession of politicians and industrialists is now at record levels (see fig. 2). In addition, the recent banking and financial crisis, the worst for a century, has brought this debate into focus.

World Class Manufacturing – what is it? During the early 1980’s both the United States and Europe were threatened with increased numbers of manufactured goods from Japan. The Japanese industrial base was beginning to dominate key sectors such as consumer electronics, watches, cameras and motorcycles. It was clear that the European and U.S. automobile industry was the next sector to be targeted and to this end a programme of research was established entitled ‘The International Motor Vehicle Programme’ (IMVP), at the Massachusetts Institute of Technology (MIT). Funded by the EU, DTI and Department of Commerce together with all the leading automobile companies and their suppliers, it set out to benchmark western performance against the Japanese auto manufacturers and suppliers. Metrics for factory operations, product development and supply chain performance were developed and by the late 1980’s a ‘two to one’ performance gap was exposed between the Japanese producers and the rest of the world (see fig 3).

These Japanese manufacturing techniques, pioneered by Toyota, were given the name ‘Lean Production’ to differentiate them from the existing best practice of ‘mass production’ as carried out by western manufacturers. Over the past 15 years western auto firms have focussed upon closing the gap with considerable success. The rise of lean production, pioneered by the Auto sector, often regarded by leading analysts as the “Industry of Industries”, has led to:

- Higher productivity
- Reduced costs
- Improved quality
- Reduced cycle times

However, whilst lean production has enabled western manufacturers to survive, the profitability of the industry is a significant concern. Most western firms have concentrated on improving their operations to the exclusion of optimising the whole supply and order chain. This has enabled them to now assemble a vehicle in a day, but the average order to delivery time is about 50 days. Clearly the customer cannot get the car they want when they want it! This leads to significant waste in the supply and distribution chain as well as dissatisfied customers. However, research is currently underway, funded by the EU’s ‘Intelligent Logistics for Innovative Product Technologies’ (ILIFT) programme, to build a vehicle in 5 days from order to delivery. If successful, this programme will enable the European auto industry to not only return to profitability, but possibly become, once again, the leading region for automotive manufacture and export.

Learning from the auto industry
Lean production, utilising only half the number of engineers and half the time to design and assemble an automobile, has been viewed by other sectors as a key management tool to effect change. In particular the U.S. aerospace and defence sector, faced by the threat of decreasing defence budgets and escalating procurement costs approached the MIT Motor Vehicle Programme in the early 1990s in order to establish a parallel programme of research led by the United States Air Force and Department of Defence (see fig 4).

The research programme, ‘The Lean Aerospace Initiative’ (LAI), was officially launched in 1993 by MIT’s Department of Aeronautics and Astronautics, Sloan School of Management, and the Centre for Technology, Policy and Industrial Development. Key aerospace and defence companies together with government stakeholders and academics have built a partnership in order to transform the industry
LAI members showed 33% of inventory in lean techniques. An inventory survey of liability to be removed using ‘just-in-time’ industry which considers inventory as a safety net, as opposed to the automotive as an ‘asset’ using buffers as a ‘just-in-case’ and defence sector considered inventory in the sector and showed that the aerospace research examined inventory carrying costs and rapidly changing environment. Early principles able to compete in a complex from a craft base to one based upon lean performance. The auto industry research supplier partnerships as a key to improved and quality. In addition, the LAI investigated together with improvements in productivity managerial head count could be achieved space. It was shown that a reduction in work-in-progress, inventory turns and facility significant improvements in flow time, productivity gains in on-time shipments, defect rates, subcontract cycle times and main project order deliveries.

Since the success of this early research and its implementation, the LAI has progressed into its 5th phase focused upon delivering value to all stakeholders with regard to the transition to the ‘lean enterprise’ driven by an informed client. Their activities can be characterised as:

- Product / tool / process development
- Fostering transformation
- Expanding knowledge
- Facilitating education and learning
- Sharing knowledge
- Governance
- Collaborative activities

Over the past 14 years the U.S. Lean Aerospace Initiative has been driven and funded at the highest level by the industry’s main clients, the Department of Defence and the United States Air Force. It has resulted in a process that with short, medium and long-term goals has provided a substantial platform for the reform of outdated industrial practices. The process of collaborative research across industrial boundaries has been key to its success supported by a consortium of government and industrial ‘in kind’ and financial support. Key Universities have acted as an ‘honest broker’ in this role and have delivered world-class research results across many industrial manufacturing sectors.

UK Manufacturing Research
Numerous small research projects and programmes have been undertaken by UK companies, often in collaboration with external consultants or academics over the years. However, no programme has been attempted on the scale or scope of the U.S. Lean Aerospace Initiative. The closest attempt to emulate the MIT programme was launched in 1998 by the Society of British Aerospace Companies (SBAC) in collaboration with over 40 member companies and the Universities of Bath, Cranfield, Nottingham and Warwick. This programme has developed metrics for measuring performance, benchmarking tools, planning tools and identifying companies’ core competences in the aerospace and defence sector. Although not driven by the client base it has proved to be a valuable programme in disseminating best practice amongst its core industrial partners. It has identified a key number of crucial issues which need to be addressed if the industry is to remain competitive. These include:

- Need for productivity improvement
- Need for cost reduction
- Faster technology introduction
- Need for integrated solutions and through life value

A SWOT analysis undertaken by the team shows that the European, and in particular the UK industry, is still strong with a large market and a high value order book. However, although there are opportunities in both the civil and defence markets, the industry is probably over dependent upon military contracts. The European industry still relies upon economic and political models now being questioned by emerging states, with the developing Asian and transition economies currently showing the greatest growth. Although a significant number of high value aerospace and defence projects will help support the immediate future of the sector, the combination of an inherently conservative industry, accompanied by technology transfer to potential competitors through offset and outsourcing agreements,
threatens the long-term survival of the sector.

The Outsourcing Dilemma

Figure 5 illustrates the outsourcing dilemma facing manufacturing in the west. As pressure mounts on assemblers they are forced to manage two crucial supply chains, the physical and the intellectual.

Increasing outsourcing of capacity, partially to low-cost regions, has led to the loss of core competence and knowledge. What may be a powerful business case, in the short-term, will have significant consequences for capacity in the long-run. In addition, western firms are actively helping to build potential competitors’ core competences, as design authority follows manufacturing capability. The consequence of this strategy is to also reduce the skill-base, as firms find increased difficulty in attracting both engineers and managers from the intellectual supply chain.

At present China has labour costs which are a fraction of those in the west (see fig 6). It is one of a number of countries which is developing aerospace excellence with the help of outsourcing from western firms.

China’s strategy is to compete in the civil aircraft market with Boeing and Airbus in the near future and to this end it is utilising partnering agreements to access western technology and production capability. Japan also views both aerospace and defence as the next high value sector, with Toyota and Honda recently becoming ‘new entrant’ players.

The Clockspeed dilemma

In addition to the threats and weaknesses outlined above, the aerospace and defence sector faces a fundamental problem when attracting both capital and human resources. Research undertaken both in the United States and the UK has recently focussed upon cross-industry benchmarking, i.e., learning from other sectors.

This research has attempted to transfer ‘best-practice’ knowledge across sectors, particularly from the auto industry with lessons from the ‘lean producers’. Research from MIT by Professor Charles Fine highlights the competitive advantage obtained by firms who can demonstrate the fastest ‘clockspeed’ (see fig 7).

Firms at the ‘slow end’ of the chain, for example the construction and civil engineering sector (who spend more on litigation than R&D) find great difficulty attracting both capital from the markets and world-class managers and engineers (55% of all UK construction is paid by the Treasury). Aerospace and defence, the next slowest sector to develop new products, have similar problems. Investments for new programmes usually have to be financed by government, through launch aid agreements. Attracting engineers is also difficult due to the often long gestation periods for new products. Engineers need to be in an exciting environment and see the results of their labours rewarded quickly. Automobiles have shown a significant improvement over the past decade with model replacement cycles down from about 10 years, on average, to 18 months - thanks to the implementation of lean product development techniques pioneered by Toyota.

The fastest clockspeed industries are clearly information systems, i.e. Microsoft, Intel etc. This sector produces new products and processes at an astonishing rate and can therefore attract global investment which is returned to the markets with high returns for investors. In addition, it can attract world-class managers and engineers to the sector through its dynamic capacity for innovation.

The dilemma for the slow clockspeed firms is that they are not just competing against each other (e.g. Airbus vs. Boeing) but against Dell or Microsoft for resources.
This has been a wake-up call for many firms who believed they only had to achieve ‘best in class’.

**What is to be done? The knowledge economy delusion**

Many economists and policy makers now believe that the service sector and the ‘knowledge economy’ will replace manufacturing as the main engine for growth during the 21st century. It is clear, however, that service sector jobs, financial services excluded, do not create wealth, but only redistribute existing resources. They are usually low-paid, requiring only semi-skilled capability and often rely on government, through tax breaks or income support, to survive. This would be the road to a low wage, low growth economy.

The ‘knowledge economy’ is predicated upon the idea that the UK will somehow be able to compete globally through its excellence in design and innovation while the rest of the world manufactures the products for our consumption. It is clear from the past that countries such as the United States, Germany, France and Japan have not been satisfied to be assemblers but have climbed the value added chain in order to command the high ground of research and development. Virtually no R&D has been transferred by the Japanese to the UK to complement their assembly plants for example. The UK government has recently declared an ambition to raise the level of R&D to 2.5% of GDP over the next decade, however, this will still leave the UK behind its major competitors. The emerging transition economies and particularly China do not intend to be low-cost producers and to this end China is investing substantially in R&D across all sectors. It is therefore unclear why some economists believe that these emerging economies will need to access design and innovation from the UK particularly, as it has been demonstrated by the Japanese that innovation and technical change is a by-product of manufacturing. Both are needed to progress to the next and higher level of performance. The UK still has great strength in its design and engineering consulting sector, but most of these firms are engaged in helping overseas competitors through technology transfer. This, at the present time, results in better and faster product development for firms that then export finished high value goods to the UK, thereby increasing the UK’s balance of payments deficit.

Manufacturing is therefore the key for sustained economic growth and to select only the high value parts in an attempt to find competitive advantage, will be doomed to fail. So what is to be done?

A recent Deloitte report entitled “The ball’s in our court – the UK technology sector at a crucial juncture” argued that the UK has the potential to become one of the world’s pre-eminent technology nations. However, the research observed the lack of communication between different groups in the UK’s technology sector and the fact that universities have insufficient dialogue with large technology companies. Deloitte concluded: “Communicate, co-operate, collaborate”.

Recent research undertaken in the UK shows that the science base, largely represented by 128 universities, and the industrial base undertake little relevant research compared to our leading competitor nations. There exist few mechanisms to encourage universities, whose research agenda is largely determined by the Research Assessment Exercise (RAE), to engage with industry. The percentage of science and engineering graduates has been falling and an alarming skills shortage has been identified. The UK will soon be producing less than 20,000 engineering graduates per year (many will also be overseas students who will return home) against China’s 300,000 target. In addition, Mathematics, Physics and Chemistry, disciplines which underpin engineering and innovation, graduates are now in serious decline.

Research indicates that the UK’s major competitors do not suffer from this lack of capability. Mechanisms have been developed in order to access the science base in a structured and coherent way. Japanese manufacturers, for example, spend up to 15% of sales on R&D and have close relationships with regional universities. They can attract high level students to work and be training within this group, usually in an exciting and rewarding environment. These on-line streams of the brightest students are highly regarded as professional engineers working at the forefront of technological innovation. They have access to state-of-the-art technology and use the ‘factory as a laboratory’ to innovate new products and processes. The results are self evident on the world market.

In the United States the leading technical universities such as MIT and Caltech work closely with industry across all disciplines. The Bank of Boston economic report states that companies founded by MIT graduates out of Cambridge would form the 24th largest economy in the world, employing over 1.1 million people in high-tech jobs and worth over $232 billion – about the GDP of South Africa or Thailand. Large global research programmes, such as the IMVP and LAI, already mentioned, are therefore able to bring together researchers from both the management and engineering disciplines in industry and academia to solve common problems. By acting as an ‘honest-broker’ these teams are able to access research data, often unavailable to consultants, in partnership with industry, in the pursuit in new industrial paradigms. Laboratories and workshops in collaborative joint-ventures turn these new materials, processes and skills
The majority of the Fraunhofer-Gesellschaft’s activities therefore take place in the middle ground between public sponsorship and free enterprise.

The Fraunhofer-Gesellschaft sees itself as a service company, offering its scientific and technical expertise on the market for research and development services.

Research of practical utility
The key to business success lies in the ability to develop new ideas and rapidly transform them into marketable products. Accelerating the transfer of information and know-how is thus one of the Fraunhofer’s chief objectives. Companies of all sizes and in all sectors of industry make use of the Fraunhofer institutes as outsourced high-tech laboratories for all kinds of development projects, for specialized services and as skilled consultants on questions of organization and strategy. Professional project management and quality management processes lead to concrete solutions that produce valuable results in practice.

The formation of spin-off companies offers a direct route for know-how developed in the research laboratory to be applied in industrial practice.

The benefits of contract research
The Fraunhofer-Gesellschaft develops products and processes right up to commercial maturity. Individual solutions are sought in direct contact with the customer. Extensive internal collaboration ensures that the customer can call on the specialized expertise of all of the Fraunhofer institutes when required. Common quality standards and a professional approach to project management guarantee reliable results.

The highly advanced equipment available in its laboratories makes the Fraunhofer-Gesellschaft an attractive partner for companies of all sizes and in all branches of industry. As well as the reliability of a strongly cohesive research network, collaboration also brings economic benefits, for the Fraunhofer-Gesellschaft’s contribution to the partnership includes valuable knowledge acquired through cost-intensive preliminary research.

In 2005 Fraunhofer registered 384 patents ranking as number 10 of the organizations applying for patents in Germany; more patents than Audi, GM or Porsche. The most prominent recent success story is MP3. The MP3 compression algorithm was invented by the Fraunhofer Institute for Integrated Circuits. Its license revenues generated 100 million Euro to the society in 2005.

All these examples expose the lack of capability in the UK between the science base and industry. Each example is different, but has been developed to meet the long term objectives of global penetration of markets, export success and employment of a highly trained and rewarded workforce.

For the UK to compete against this background it will have to bridge the gap between academic research output in science, engineering and management and also meet future industrial requirements.

Meeting the challenge
The UK needs to meet the challenge from existing and emerging economies through knowledge generation and implementation. Lessons learned from the above examples offer the UK the opportunity to radically rethink its industrial policy, not by copying its competitors, but by delivering lean and focused solutions that meet the needs of UK industry and world markets. At the present time large amounts of financial and human resources are spent on thousands of initiatives which are usually short-term solutions to yesterday’s problems.
A co-located, industrial / academic team approach will be required to bring together multidisciplinary skills, new materials and lean processes in order to deliver proof-of-concept, scale-up and real costing solutions, as illustrated in figure 8.

Regional centres would address 3 principal challenges for the industry:

- Collaboration between industry, the science base and markets
- The need for cross-industry benchmarking and performance improvement
- Integration of the physical and intellectual supply chains

It would also influence the management of the public sector by:

- Placing productivity at the centre of the reform agenda
- Improving governance in the interests of technology generation
- Investigating the structural factors that would facilitate the elimination of bureaucracy
- Involving government clients in the improvement process - driving change

Centres would not need additional funding but a redirection of existing resources that are often wasted on small initiatives with little or no value. It would take a concerted effort by central and regional government, industry and academia to provide a national capability, built upon the notion of ‘joined-up government’ focused on a new business model for the 21st century. The recent report from the Department for Business, Innovation & Skills (BIS), entitled the “New Automotive Innovation and Growth Team (NAIGT)”, has recommended the establishment of a Manufacturing Institute(s) along the above lines, to help leverage R&D and manufacturing technology for the Automotive sector. It remains, however, unclear if the required financial and political support will be forthcoming for a truly UK-wide initiative across all manufacturing centres.

The UK’s economic, social and military security will only be secured through a strengthening of its scientific, technological and manufacturing base. This paper has argued for a fundamental reassessment of the relationship between basic and applied research and its commercialisation of new products and processes.

The development of a dynamic high-value manufacturing system for the 21st century will require far-sighted government action and long-term planning.

The UK’s industrial base is now not dissimilar to those of Germany and Japan in the late 1940’s. Both of these economies restructured to meet the challenges of the late 20th century with great determination and have built robust business models that have challenged the rest of the world. To grow as a world-class economy, the UK must invest in dramatic change by government, industry and the education sector in order to regain its competitive strength amongst the new order of leading industrial nations.

Fig. 8. Organisational structure for co-located industrial / academic team

The centres could be located regionally on the Fraunhofer model and based upon lean production principles as described earlier. It would be the first example in the world of the application of this new model of translating knowledge of engineering, science and management across sectors – learning from fast clockspeed sectors (e.g. BAe Systems, Motorola, Toyota). This would cross the divide between industry and academia, creating a new type of problem solving community. The philosophy would be one of high competition / high reward, with greater flexibility of employment contracts and management structures. It would operate at an inter-university level and be open to schools and colleges with the objective of raising the profile and professional status of engineering and manufacturing. The centres would also support fundamental research as it relates to current problems of innovation in design and manufacture and would be able to educate a new technologically-literate workforce, thereby partly addressing the skills-deficit agenda.

Prof Graves would like to thank the following colleagues for their help and assistance with this paper; he notes that ‘any errors or omissions are of course the responsibility of the author’:

Professor Charles Fine (MIT), Markus Witthaut (Fraunhofer, Dortmund), Dr Glenn Parry, Ron Humphries, Janice Legge (University of Bath) and finally, Sir John Harvey Jones for all his enthusiasm and knowledge regarding the importance of manufacturing.
Predictions for the next one hundred years suggest that producers will continually have to find ways to do more with less. If we look at current population growth rates, we can forecast that the world’s population will reach 10 billion people sometime in that period. On the other hand, climate change experts predict that if the climate of the earth continues to deteriorate as it is doing now, we will have enough resources to feed 2 billion people in the year 2100.

Reducing the effect of industry on the planet
Since the consumption of resources lies at the heart of climate change, the need to devise ways to continue delivering products while utilising fewer resources is obvious – indeed consumers and governments have for some time been demanding that firms be much more efficient in their operations. This necessity has been the mother of many inventions – many firms have responded positively to the challenge by innovating in ways that have let them reduce the environmental footprints of their operations while improving profitability. Success stories such as those of companies like Xerox, IKEA, and 3M are becoming more common every day. However, we are finding that we are still at the infant stage when it comes to reducing the effect of industry on the planet. Of particular concern are industries such as petroleum or mining that are finding it difficult to innovate despite considerable external pressure. For these industries environmental concerns still stop at compliance with environmental regulations, as they feel many of the concerns they face are due to the nature of the businesses they are involved in and not necessarily due to their mismanagement of resources. Firms in other industries also have trouble improving their environmental performances due to competitive priorities beyond consumer environmental concerns; in these industries cost or quality rather than environmental performance are still the top priorities.

Several factors and actions (some well-meaning, some not) currently combine to prevent greater environmental sustainability of industrial activities. Below are some highlights.

Ineffective environmental regulation
Regulation is seen as one way of forcing industry to reduce its environmental impact. Some scholars have suggested that environmental regulation that sets limits on emissions or that charges firms fees based on their impacts has the power to force firms to find innovative ways of being more efficient in delivering their goods and services, and that firms might not look for these ways without the inducement of regulation. Although this might be true to a certain extent, we are also seeing that mismanaged regulation can do more harm than good. For instance, environmental regulation is hardly effective when applied in isolation with respect to geographical area. As an example, strict environmental regulation in the European Union might have helped to reduce emissions of European firms, but the emissions have in effect been transferred to those parts of the world which have more relaxed environmental laws, since firms in those countries have become more competitive as a result of the lower costs involved. In fact, this kind of action increases the carbon footprint of a given European citizen since Europe has to import more of its goods from overseas, creating additional environmental emissions through the transport of those goods. As a result, regulation of this form not only fails to solve the overall issues related to the amount of consumption in the EU but also does little to reduce global emissions levels. Social issues also arise here; regional regulation in effect causes jobs to be lost to other regions while also putting more people at risk in those regions that have less stringent environmental regulations.

Measuring the environmental impact
There are also problems with the measurement of environmental impact of any firm. For instance, carbon emissions of many industrial processes are estimated rather than actually measured since the technology to measure actual emissions is not yet developed enough. As a result, environmental factors specific to regions and plants cannot be effectively taken into consideration. Therefore, regulations do not go much further than prescribing the adoption of certain technologies under certain circumstances. In turn, there is little incentive for a firm to make...
improvements that would not have a “measurable” impact on the environment from the point of view of regulation, or on its bottom line.

Summarising, effective environmental regulation should:

(i) level the playing field across the globe with respect to environmental requirements,
(ii) provide ways of accurately measuring the environmental impact of an organization.

Global regulation
Consider a scenario where the EU environmental regulations related to steel production (the industry with the highest global emissions per unit of output, according to some estimates) were brought into effect globally today. Steel would become a much more expensive commodity, resulting in reduced volumes (probably many lost jobs) and consumption might be reduced to such a level that would require drastic and immediate changes in lifestyle. Such a change would not be very popular, but that might be where we will eventually have to go.

So what does a firm faced with such competition from outside its region as a result of ineffective environmental regulation do? One way to improve the situation is to lobby the regional government to demand that the same environmental rules be applied to anyone bringing goods for sale into their region. Such regulations already exist in certain industries, and it is one way to level the playing field without actually having to force other governments to change their environmental regulations. For instance, steel manufacturers in the United States are pushing for a “pollution equalization tax” to protect themselves against Chinese steel manufacturers who enter their markets with very cheap products. Manufacturers in the UK (who see themselves increasingly as providers to a low-carbon niche in the market) are utilising a different strategy at the regional level: Asking the government to incentivise the use of low-carbon products by consumers. Note that both of these strategies require better action from the government at the local level rather than at the international level. We are observing, through experiments such as Kyoto, that international pressure can only go so far in terms of forcing any given government to tighten its local environmental laws.

Green business is dirty business
Consumers today are increasingly aware of the environmental impacts of their choices. As a result being ‘green’ is now big business; firms highlight their environmental efforts as never before (as evidenced by the environmental reports that now accompany annual reports and the environmental ads that companies use) and do their best to be environmentally responsible in the public eye. Unfortunately, the potential profitability of being perceived as a green organization by consumers also attracts firms that prefer to look for cost-efficient methods of grabbing a part of the green pie without necessarily making substantial investments in the environment themselves.

Greenwashing
There are several ways to ‘greenwash’. For instance, a firm might benefit from the environmental efforts of other firms in its industry, profiting from the improved image of the industry as a whole. This might happen in industries where a small number of environmentally friendly brands lead the industry. For instance, it is difficult for a consumer to think about Swedish furniture or Japanese automobiles in environmentally unfriendly terms. In other cases, firms will make small environmental investments that they communicate on a wide scale (this strategy seems to be popular with petroleum distributors that invest small portions of their earnings in clean technologies). Finally, acquisitions of environmentally friendly firms have become a considerable part of business, with large corporations purchasing small environmentally friendly firms in an effort to gain a positive image. This allows these corporations to play the environmental game without necessarily disrupting their own operations.

Recycling
An activity that is potentially beneficial for the environment but that is also risky in this respect is recycling. Recycling, in one form or another, has been around for a long time as a solution to the environmental problems that we face. There are variations of recycling; the recycling of materials such as paper and plastic brings the product back to the raw material level so that it can be used in new products while recycling electronics or cars may in certain cases reduce the product to its working components for reuse in new products. The benefits of recycling are numerous, from reducing the amount of energy needed to create new products (since the raw material or component is already there and does not have to be made from scratch) to reducing the amount of natural resources extracted. However, recycling is not a ‘one-strategy-fits-all’ solution, and can be harmful to the environment if not properly managed. For instance, there is still no consensus regarding the benefits of plastics recycling, although its wide availability shines a positive light on the industry. Electronics recycling also has its problems, with much recycling being done in developing countries with less stringent environmental laws – this is necessitated by the amount of poisonous gases and metals released during the recycling process. In addition, there is research that suggests that the emissions resulting from the transport of used items to developing countries for recycling might be having a greater environmental impact.
than producing new items instead. As a result, recycling can become a source of profits for firms without necessarily providing the advertised benefits to the environment.

**Consumer education**

Consumer education in environmental issues seems to be one way of reducing the effect of greenwashing. Some environmentally friendly firms have made it their priority to provide such education to consumers by becoming more transparent in revealing their environmental performances than their less environmentally friendly counterparts. In addition to this, firms that do invest in becoming more environmentally friendly make an effort to collaborate with law-makers to tighten environmental regulations so that firms that do not make these investments find it harder to compete.

**Dirty business is dirty business**

There are some industries that do not have the capacity to transform themselves into shining examples of sustainability overnight. Here is one list, by the World Bank, of the top 10 polluting industries (considering emissions per unit of output produced):

<table>
<thead>
<tr>
<th>Rank</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iron and Steel</td>
</tr>
<tr>
<td>2</td>
<td>Non-ferrous metals</td>
</tr>
<tr>
<td>3</td>
<td>Industrial chemicals</td>
</tr>
<tr>
<td>4</td>
<td>Petroleum refineries</td>
</tr>
<tr>
<td>5</td>
<td>Non-metallic mineral products</td>
</tr>
<tr>
<td>6</td>
<td>Pulp and paper</td>
</tr>
<tr>
<td>7</td>
<td>Other chemicals</td>
</tr>
<tr>
<td>8</td>
<td>Rubber products</td>
</tr>
<tr>
<td>9</td>
<td>Leather products</td>
</tr>
<tr>
<td>10</td>
<td>Metal products</td>
</tr>
</tbody>
</table>

It is not easy for these industries to reduce their environmental impacts as they are industries that take materials from the earth and convert those materials (in many cases using high temperatures and chemicals to break chemical bonds) into products that are directly or indirectly (through the production of other goods) used by consumers. What’s more is that their production volumes are quite high, as it is almost impossible to think of a day in the life of a modern consumer where products that have their roots in all of these industries are not used (a telling experiment for the reader would be to select any industry from the list and survive a day without using any products that are related to that industry).

Although these industries do make efforts to become more efficient in their use of energy and utilise end-of-pipe technologies to control their emissions, the nature of what they do (extraction and conversion) and consumers’ great need for their products prevent them from making further improvements. They can be regulated to the bone, but that does not seem to be a long-term solution since continued dependence on these industries necessitates their existence. In fact, regulation can be counterproductive in this case as it might take resources away from valuable R&D efforts that could be geared towards improving efficiency further. The way out of this quandary seems to be the adoption of cleaner alternatives – managing the innovation process for these alternatives becomes an important factor in determining the future of industry as well as the planet. Thus, the current industries, with all their resources and technical knowhow, should be allowed to become a greater part of the search for alternatives, which the industries can then see as opportunities to continue their existence in some other, more sustainable form.

**Concluding remarks**

The factors described above are hindrances to the greater sustainability of business. Ineffective environmental regulation and greenwashing take away valuable resources from efforts that could be directed at further improving the efficiency with which firms can bring goods and services to consumers. On the other hand, environmental sustainability is going to be a distant wish as long as the greatest polluters, given how much they are needed, cannot find alternative products that fulfil the same needs without the same impact.

We are facing the loss of 8 billion of our species in the next 100 years to climate issues. Most believe we are not too late. The danger is that more and more of us will start believing that it is too late to make a positive change. Suppose you lead a government that believes that we have passed the point of no return. Would you feel that your responsibility is to go on conserving resources even though it will no longer make much of a difference? Or would you start hoarding resources for the sake of your people – so that your people become part of the 2 billion that survive the 100 years? If we do not win the race against time to conserve resources, we will start fighting each other for the right to rule over them. From this perspective, industry has a great responsibility.

**References**


Sharpening our Identity

Angela Webley, Marketing Manager in the School of Management, led the recent project to update the School’s visual identity. Here she shares the process and gives some tips for anyone planning a similar exercise.

Why a new visual identity?
We had been using the same visuals on our brochures for the last 10 years and with a new programme launching every year it was starting to look dated. There was also no unifying look across the media – our advertising campaigns did not link with our brochures, our website or our other publicity materials. The fragmented portrait of the School that this conveyed did not help with brand recognition and meant we were missing out on cross-selling opportunities across programmes – for example MBA students didn’t know we had an excellent undergraduate programme and vice-versa. We recognised that it was important for our positioning, both internally within the School and externally, that we sharpen our visual identity.

What was the first step in the process?
Stephen Rangecroft, the School’s Director of External Relations and Marketing, and I wrote the brief and convened a meeting of what was to become the core team. The work of this core team was to prove extremely important in the success of the project as it encompassed the key areas of the School’s operations and had a direct link to our parent organisation, the University of Bath – ensuring our key internal stakeholders all had a voice in the process. We recognised that it was important for our positioning, both internally within the School and externally, that we sharpen our visual identity.

How did you choose your agency?
Six agencies were selected mainly on the basis of their reputation and word-of-mouth recommendations. Stephen and I set up meetings with each of the short-listed agencies and explained the brief and, importantly, explained that the very tight budget was set and non-negotiable. We discovered that not every agency was willing to invest the time in taking part in the selection process and one agency dropped out prior to the pitches. Going to meet the agencies prior to the pitches was very beneficial as we were able to see them in their own environments and to set the parameters for the project from the start.

Stephen and I then developed the selection criteria and it was against these criteria that all members of the core team were asked to assess each agency when they delivered their pitches. The results were then collated and the overall picture was clear, SampsonMay were unanimously chosen as our preferred agency. Their creative work had been particularly impressive and they showed a good understanding of what we wanted.

How did SampsonMay refine their ideas for the new visual identity?
They followed up on the pitch with a presentation to the School’s Executive Board and then conducted workshops with the School’s Advisory Board, students and other stakeholders. They used these sessions to work out what our vision, mission, and values were and to gain insight into the terminology members of the School’s community use to describe it and to gain a feel for how they saw the place. Logistics did not allow for a focus group with our alumni, but we recognised that their input was vitally important, so an email questionnaire was used to gather their views.

The feedback was considered and SampsonMay then held another focus group with the core team. Having the terminology from the wider groups really helped with considering what the “look and feel” of the visual identity should be. One strong theme which developed was that students were proud of their University;
they had worked extremely hard to gain a place at Bath and wanted the new visual identity to reflect the high standing of the University. At the same time they were very keen for it not to be seen as elitist; the friendliness combined with a place that has a very good reputation and high kudos were two elements that students felt needed to be conveyed in tandem so as not to give an unbalanced view.

**How did the change of leadership in the School affect the project?**
At this point in the project the School welcomed its new Dean, Prof Richard Elliott. The transition from one Dean, Prof Andrew Pettigrew, who had been fully in support of the project to another, equally supportive Dean was very smooth. With Richard’s expertise in marketing and particularly branding, he saw the value of the project immediately and he was very keen to keep the momentum going; formal approval to proceed to the next phase was quickly granted.

**How did you gain buy-in from your stakeholders?**
Involvement was the key. The focus groups had given people the opportunity to be involved from the beginning of the process. We then shared the first draft visuals with the core group and the wider School membership to maintain their involvement. This was done via a School-wide event where we displayed posters showing the reworked logo, the grids that would be used as the basis for the new brochures, templates and some examples of photography from previous work that SampsonMay had done. The photography was a vital element of the new look; it became clear that we needed original, not stock, photography that showed our own community. The focus groups had made clear that it was important to convey the idea of students engaging in the world of work, being pictured on work placements around the country, as well as showing them studying in a beautiful, historic city.

The posters provided the ‘look and feel’ of the new visual identity and people were able to give their feedback before the final versions were mocked up. It was really important to make sure people felt they were being given a voice in the process at all stages so that they could feel a sense of ownership of the new visuals.

**Why did you choose a soft launch?**
With a tight budget we knew that a full-scale rebranding exercise was not going to be feasible. There was no big PR campaign to push it; it was kept deliberately low-key. We needed to ensure that no publication material was wasted, so we produced new brochures only as old stocks were depleted; this conscious decision to minimise waste was very important to the School. We are now working on ensuring consistency in using it in all media, at recruitment fairs, for research presentations and so on. All the visual guidelines have been posted on the intranet and we have encouraged people to access and use them.

**How has the new visual identity been received?**
It has had a very positive welcome internally and most people want to use the new visuals, but as is always the case there have been some people who are still using old versions for their own work. We deal with this by following up individually with people. We seek to encourage them to use the new visuals by persuading them of the benefits of doing so; often we find they have just been using the wrong material out of habit or they have forgotten about the new material. I certainly think it has helped that the new look is easy to accept, it doesn’t aim to shock; it simply aims to reflect more accurately who we are.

We will be conducting a focus group with new students to get feedback from them to find out how they perceived the visuals as ‘outsiders’ and what impression it gave of the School. Initial reports suggest that the new brochures have gone down very well, so the external reception to it seems to have been positive.

**How important has the exercise been?**
The return on investment is difficult to quantify but there have been savings on having just one brochure instead of six separate ones for our MSc programmes. The impact our publicity material has is certainly stronger as all materials are obviously from the same family. Phase two of the process is to integrate the website into the new look and that will be a very important development as it is usually the first contact people have with the School; the work on this is having to be timed to link in with the University’s CMS system which is being developed. Once the website has adopted the new look people will see the adverts, the website, our brochures, business cards, signage and conference folders and they will know that we are all one and the same.

**Do you have any advice for others planning a similar exercise?**
Have a thick skin; even if most people love what you’ve developed, not all the comments will be favourable! Also, expect it to take longer than you think. I would say that from the outset you should establish what you see as the key process and be realistic about the time involved. Make contact with all the relevant people at the start; don’t miss any of the key people out or you risk them derailing things at the end when they want to have their input.

Get as much feedback as possible from insiders and outsiders. We had done a reputation audit just before the work started so we knew our position in the external market. Don’t assume you know what people think of you. Get representation from all sections of your stakeholders – gather opinions from people of different ages, different nationalities etc. – it is important to find the common ground that will appeal to all, but without diluting the end product. That is where working with a specialist agency is critical; they need to have the skills to combine all the different wants and desires of your stakeholders and to produce really professional work.

**Did you enjoy working on the project?**
Yes, I really enjoyed the whole process. Although I did wonder at times ‘when will it be ours’, I was eager to take the new look and really start using it to promote the School. Now that we have the finished product and it is such a success, it is something the whole School community can be proud of; we have a contemporary visual identity that correctly represents our vibrant and intellectually stimulating environment.
Forecasting in supply chain companies: should you trust your judgment?
Prof Paul Goodwin

Sophisticated software exists to help managers accurately forecast demand for products, but many managers spend a considerable amount of time applying judgmental adjustments to these statistical forecasts. Is the software a waste of money or should the managers accept what their computers are telling them and apply their energy elsewhere?

Introduction
Accurate forecasts of the demand for products are crucial for supply chain companies. Supermarkets lose goodwill and profits when customers find that their favourite product is absent from the shelves. Suppliers, in turn, may be faced with costly emergency production runs or excessive stock levels if they get their forecasts wrong. Not surprisingly, many companies have invested large sums of money in software products that allow them to use statistical methods to forecast demand. These products crunch through past sales data seeking to identify systematic patterns that they can then project into the future.

Surprisingly, having purchased their expensive software, managers in many companies spend considerable time using their judgment to adjust or override the statistical forecasts. These products crunch through past sales data seeking to identify systematic patterns that they can then project into the future.

To investigate these questions I worked with Robert Fildes of Lancaster university to collect over 60,000 demand forecasts from four large UK-based companies - a retailer, a pharmaceutical company, a food manufacturer and a domestic cleaning products manufacturer. Most of these forecasts were for one week or one month ahead. We recorded the extent to which the forecasts had been changed by managers and investigated whether these changes improved accuracy. We also observed forecasting meetings and interviewed the people involved in the forecasting process. As a check on the generality of our results, we also carried out a survey of 120 forecasters who were mainly based in US companies.

Small adjustments galore
Figure 1 shows the percentage of forecasts that were judgmentally adjusted in our four companies. Note that in the food company almost all of the forecasts are changed by the managers every month. In the pharmaceutical company the adjustments are made at 17 ‘forecast review’ meetings which tie up around 80 person hours of valuable management time every few weeks. The managers at the retail company have over 26000 SKUs (stock keeping units) to forecast each week so they are adjusting over 2000 of their computer-generated forecasts.

Figure 2 shows the size of the judgmental adjustments made by the managers. These are expressed as percentages so that, for example, changing a statistical forecast of 200 units to 250 would be a +25% adjustment. It is immediately clear that most of the adjustments are small. Managers, either individually or in meetings, were spending a lot of time merely tweaking the forecasts generated by their computers. Many of these adjustments were apparently being made simply to demonstrate that forecasters were doing their job. Indeed, one experienced consultant claimed to us that forecasts presented earlier in meetings are more likely to be adjusted. After people feel that sufficient adjustments have been made to justify the meeting they wave most of the remaining forecasts through unchanged.
In contrast, the rarer large adjustments were made for important reasons. For example, the statistical forecasts usually did not take into account the effects of forthcoming sales promotions or price changes so that, without adjustment, these forecasts would probably be highly inaccurate.

Seeing false patterns in randomness
Further analysis, together with our observations of the forecasting processes in the companies, revealed other reasons for the high percentage of forecasts that are adjusted. Recent movements in sales graphs were often examined in forensic detail by managers and there was evidence that they were sometimes seeing systematic patterns in what was really random noise in the sales levels. Thinking that the statistical forecast had somehow missed this pattern they applied an adjustment to it. Humans are poor at handling randomness. In one study, laboratory rats outperformed Yale university students in predicting a sequence of random events!

Optimism rules OK
What was the effect of all these adjustments on forecast accuracy? Figure 3 shows the extent to which the mean accuracy of forecasts made by the three manufacturers was improved using the absolute percentage forecast error as a measure of forecast accuracy. The graph distinguishes between adjustments of different sizes and also between positive and negative adjustments. A positive adjustment is made when the statistical forecast is increased; a negative adjustment when it is reduced.

Confusing forecasts with decisions
The results for the retailer were not included in figure 2 because they exhibited a very different pattern. Curiously, in this company, almost all of the positive adjustments that were applied to the statistical forecasts served only to worsen accuracy. On average, they doubled the absolute percentage error from a poor 32% to an apparently disastrous 65%. Also, 83% of the positive adjustments were in the wrong direction. Something strange was going on. Why would a team of forecasters in a major national company spend so much time apparently making their forecasts less accurate?

Discussions with the forecasters revealed the answer. What they were representing as forecasts of the demand for their products were actually estimates of the amount of stock that they needed to hold at the start of each week to meet customer demand. For example, while a demand of 300 units might be expected next week, a stock level of 330 units might be considered to be advisable in case demand was higher than expected. In

![Figure 3 Mean improvements in accuracy by size and direction of adjustment (manufacturers only)](image-url)
essence, the demand forecast was being confused with a stock control decision and the statistical forecasts were therefore being adjusted upwards to reach this decision. Yet the forecasters themselves and other managers were unaware of this confusion. Clearly, there was a danger that the adjusted estimates, which were still labelled as ‘forecasts’, would be mistakenly treated as genuine forecasts of demand when they were used as a basis for other decisions in the company. Indeed, other managers might have considered adjusting these ‘forecasts’ even further upwards if they were unaware that they had already been adjusted to take into account the need for safety stocks.

So why buy the software in the first place?
If managers are busy adjusting up to 90% of the statistical forecasts generated by their computers why do they buy the software in the first place? Our research –recently confirmed in a paper by a leading US software vendor – suggests that having the software and then overriding its forecasts is a situation that suits all parties involved in the forecasting process. Managers want to be able to say that they are using a modern ‘scientific’ method to produce their forecasts, but they also want to have some control and ownership over these forecasts. Software that allows them easily to replace statistical forecasts with judgment will therefore be popular. It is also useful having the software around to blame when the forecasts are inaccurate –even when those forecasts have been based largely on judgment. In one company the software was manipulated until it gave forecasts that were consistent with managers’ judgments, but the resulting forecasts were still regarded as the ‘system’s forecasts’. Many software vendors advertise the accuracy of forecasts generated by their algorithms and the ease with which these forecasts can be changed knowing that, while the former will supply a pretext for a purchase, the latter will be more likely to clinch the deal.

Improving judgmental adjustments
While software vendors readily provide facilities allowing the judgmental adjustment of forecasts few products contain facilities to assist managers when they have to decide whether to adjust a forecast and how much they should adjust it by. Psychologists tell us that the human brain, despite its complexity, has limited memory and information processing capacity. Faced with a mass of information from different sources, most managers would struggle to use the information efficiently when they have to assess its implications for a product’s future sales. If software can be designed to help managers to overcome these limitations then they may be able to concentrate their efforts on cases where intervention is likely to improve forecasts and make better judgments in these situations. For example, we observed managers in meetings desperately trying to recall what happened to demand the last time that a product had a ‘buy-one-get-one-free’ promotion so that they could decide how much to adjust a statistical forecast for a forthcoming promotion. My former PhD student Wing Yee Lee designed software that, not only kept a database of the effects of past promotions, but also identified which past promotions were most similar to the planned promotion. It then allowed the user to explore, in a structured way, why the effects of the planned promotion might differ from the earlier analogies. In an experiment these facilities significantly improved forecasters’ estimates of the effects of future promotions.

We suspect that similar improvements may be obtained if managers are provided with up-to-date and comprehensive on-screen information that is presented in a form that allows it to be easily assimilated and evaluated. In some organizations ‘islands of analysis’ exist and important information and analysis is not shared between departments. A forecaster for a supermarket chain once told me that she sometimes only hears that her company is promoting certain products when she gets home and sees the company’s advertisements on television.

Additional facilities would allow the task of estimating the effects of the information to be broken down into smaller and easier tasks so that the quality of judgment would be improved. Carefully designed feedback on the effectiveness of judgmental interventions is also likely to be useful – a surprisingly large number of companies do not assess whether these interventions are adding value to their forecasts, or even damaging them.

Concluding remarks
Judgmental adjustments to statistical forecasts of the demand for products can often lead to improved accuracy, but in many companies much time and effort is wasted in making unnecessary or harmful interventions. Our analysis suggested that such interventions should be relatively rare and only be made when managers have reliable information about important future events that the computer has no knowledge of. Improved software design is likely to lead to the better use of judgment, but current software often acts only as a cover to confer apparent ‘scientific’ status on what are really purely judgmental forecasts. Unfortunately, because forecasts are so important to decision making in supply chain companies they can also be highly political so there are often temptations to replace reliable forecasts with ones that are politically convenient. These political barriers are only likely to be challenged if forecasters can demonstrate the value that greater accuracy will bring to the ‘bottom line’ of companies. When this happens we forecast a brighter future for supply chain forecasting.

Further reading


Research on creativity and innovation has been extensive since the middle of the twentieth century with many reviews being written about what helps and hinders creativity and innovation. While many have speculated on creativity – the generation of novel and useful ideas and innovation – the implementation of those ideas, few have examined the role of the leader, believing that the leader should step back and allow the creativity to flow. Leadership researchers are beginning to take a different stance on this, explaining that the leader indeed has a critical role in the creative process.

One highly visible creative effort underway that provides an interesting illustration of the innovative process is the development of a viable electric car. While the first automobiles were in fact electric, petrol powered cars proved a less expensive alternative. With realizations of environmental change upon us and the auto industry in distress, manufacturers are making investments toward the development of an electric car that proves a worthy rival to its petrol powered alternative. Auto manufacturers are racing to develop the best electric car. The most successful will be the one that is the easiest to integrate into our current infrastructure and one with the fewest hurdles in terms of use (i.e. amount of time before a charge is needed).
Why now?
Innovation involves a high degree of risk and a high rate of failure (i.e. market rejection). In order to offset this risk, there must be a high payoff in the future coupled with the knowledge that a new innovation is critical at the current time. With the case of the electric car, many feel that with fuel prices soaring we cannot wait any longer for this innovation. Additionally the electric car that enters the market with the least amount of disruption to our current lifestyles will inevitably be the winner in the market.

What capacities and capabilities should leaders hold?
There are a multitude of attributes desirable in a leader of an innovative effort. Leaders should have expertise in the domain of interest in order to guide and advise their team. Without expertise in their work domain, leaders would have difficulty engaging in planning and forecasting activities, and allocation of resources. This expertise also allows followers to view the leader as a role model.

Next, it is important for the leader to have creative thinking skills. They must be able to envision the consequences of ideas proposed by others. Idea evaluation in addition to identifying implications also includes suggestions for revision and refinement of ideas. This type of feedback and generation of strategies to overcome obstacles requires creative thinking skills.

Social skills are important for leadership, particularly when leading for innovation. Creative efforts are stressful and generally involve conflict. The leader must ensure that this conflict does not become personalized. Not only must the leader maintain relations within the creative team, they must manage the innovative efforts within the larger organization. Creative efforts are time consuming and expensive, thus making them political in nature. In order to maintain interest in the project and retain senior leadership support, the leader of innovative efforts must be politically skilled.

Social skills alone are not enough to successfully maintain momentum for the creative effort. In addition to social skills, the leader must have an extensive knowledge of the organization. Leaders need to have a deep understanding of the organization, its objectives and structure in order to form multi-functional teams to allow for the further development and fielding of newly generated ideas.

Understanding the internal environment is important, but the context in which the organization operates must be understood. Thus, it is important for leaders to understand the larger context in which the organization exists meaning relationships with competitors, suppliers, consultants, etc. so the leader understands relationships with existing alliances.

What role should leaders take?
Leaders of innovative ventures must first engage in problem definition of those issues they have identified as worth pursuing. This means that the potential payoffs should outweigh the costs. Next, leaders should work to create a context where divergent groups of people can come together to exchange and generate ideas relating to the problem space identified by the leader. Lastly, leaders must manage this context and become involved in the fielding of viable ideas to be adopted in the market.

Defining the problem
Scanning of the environment allows a leader to define the problem at hand based on surrounding relevant information. Factors to consider in problem definition include new technologies available, scientific discoveries, and competition monitoring. Information can come from multiple sources including customers, suppliers, market research, etc. In fact, a wide range of information sources received by a leader with expertise in the domain of interest will substantially inform the problem definition and leading of the innovative process. Many organizations realized long ago that creativity training would be a positive step for those leading creative efforts. Additionally, the ability to forecast future trends is important for those leading innovation.

It is not only those that the leader gathers information from that are important to leading creative efforts, those on the leadership team play a key role. While in some settings a diverse team may unnecessarily prolong decision making, in contributing to innovation this is an asset as they increase the amount of external information available. Additionally, a diverse leadership team provides multiple perspectives that prove helpful to the comprehensive evaluation and integration of information. A leadership team that has joint accountability and evaluations that are based on project success will ensure collaboration among team members.

It is important to realize that innovation is not always the answer to the problem. Leaders must carefully balance the risks and potential pay-offs before determining a course of action. While some innovations have a high fit with the current organization and its associated culture, market, competencies, and technologies, it may only result in an incremental innovation. The problem with these incremental innovations is that since they take place within the same framework as before, the same obstacles will inevitably be encountered. In order for truly new
While talented individuals generally rise to the top within their own narrow field, identifying these individuals through traditional recruitment mechanisms is somewhat difficult. While talented individuals generally rise to the top within their own narrow field, identifying these individuals through traditional recruitment mechanisms is somewhat difficult. Creative individuals often attach themselves to the profession—engineer, artist, scientist—rather than the organization. Because of this, individuals are

innovation to occur, the leader must create a perception of fit to allow others to visualize how it fits within the organizational context. Creating a sense of mission that is neither too broad nor too narrow to stifle creativity must be communicated in order to provide clear objectives, structure for collaborative relationships to develop, idea development, and sensemaking to occur.

The creative problem solving context
As stated earlier, it is not enough for the leader to step back and let the creativity flow. In fact technical expertise is one of the key attributes to leading creativity and innovation. Technical skill is necessary for leaders to allow for idea exploration, ask critical questions to stimulate elaboration, and help define viable and nonviable paths for the idea. Not only is it important to encourage participation in shaping solutions, leaders must know whose participation will prove critical to innovation.

Leaders play a critical role in shaping the context in which ideas are generated and evaluated. The environment should be one where ideas can be safely pursued in collaboration with others. Additionally, the development of ideas should be supported. While it is clear that the leader may not have control over the climate of the entire organization, the leader must manage the climate of their group within the broader context of the organization. The leader must also understand how the organizational culture, structure, and strategy influence approaches to shaping a creative climate.

Once ideas have been generated the leader must evaluate the solutions provided. Idea evaluation should be viewed as a process of idea reformation in order to increase their chances of success. This is in contrast to previously held views about evaluation in terms of fixed standards. As this should be viewed as a generative process different standards should be used in the evaluation and revision of ideas based on the stage of the idea development.

A significant question on the topic of creativity and innovation is the optimum team size. Research indicates that innovation increases up to a team size of five to seven. More individuals than seven results in decreased innovation as a result of group process demands. In reality, teams are often larger than seven. In these instances, teams should be divided into individual initiatives allowing for communication and integration among the sub-teams.

Idea development and fielding
Once viable ideas have been evaluated, those selected must be developed. Then fielding of the new product must occur. During this phase, the leader will be engaged in constructing and developing a plan for the development and fielding of the new idea. This is a particularly tricky phase for leaders as they must apply a critical eye to the new idea, while being careful not to squelch the enthusiasm surrounding the creative effort. Leaders must monitor progress towards implementation, constantly challenging others to adapt to current conditions and incoming information. Thus, leadership becomes a balancing act between providing structure and encouraging adaptation of ideas through idea development strategies.

While developing and fielding ideas will involve a wide range of individuals in order to engage different forms of expertise, the resulting differences in background of these individuals will create a diverse group that could have low cohesion and greater conflict. Because of this communication could become difficult creating a stressful environment, thus inhibiting idea refinement. To overcome these obstacles, the leader must have credibility, commitment to the mission, and allow all voices to be heard in order to build group cohesion. Superior social skills are necessary to accomplish this.

Finally, creative and innovative efforts require large amounts of resources, both financial and time. Thus, in order for an innovation to lead to a successful outcome, time and resources must be adequately allocated to allow for this process to be successful. Time and money are tight commodities in most organizations so it is up to the leader to secure support from senior management from the beginning and throughout the process. To meet this end, leaders must sell and periodically re-sell the innovation.

Building leaders of innovative efforts
In the previous sections, many attributes have been identified that a leader needs to hold to successfully lead for innovation. While this is an extensive list, it must be understood that this role is particularly demanding. So, a key question remains as to how an organization selects and develops individuals that will be successful in this challenging role? Primarily, organizations should seek to recruit those with expertise and creative thinking skills where innovation is desired. Because of the interdisciplinary nature of many creative efforts, individuals with a diversity of expertise and willingness to learn about related fields should be sought. While talented individuals generally rise to the top within their own narrow field, identifying these individuals through traditional recruitment mechanisms is somewhat difficult. Creative individuals often attach themselves to the profession—engineer, artist, scientist—rather than the organization. Because of this, individuals are
often reluctant to accept a leadership position. In fact these individuals may not view themselves as having the requisite leadership skills and as a result may not opt for this position. Organizations can provide opportunities for these individuals to explore leadership roles by linking the leadership roles with professional activities and providing the appropriate mentoring and coaching.

Oftentimes organizations try to allow potential leaders to gain a breadth of exposure through rotational assignments. This can in fact limit technical exposure and expertise in a given area. An alternative lies in action learning exercises where creative leaders work with leaders from other organizational areas to address emerging problems and receive feedback and coaching.

Training for leaders of innovation will also prove helpful. Training in such areas as team work, team formation, and team management will help these individuals learn how to bring together and manage a group of creative individuals. Training in complex social interactional skills will help them to develop the necessary skills to not only manage their team, but manage the creative effort in the larger organizational context. Training in effective idea evaluation strategies will allow them to move into the area of leadership and away from the idea generation role. The technical skill and expertise held by the leader along with the ability to forecast upcoming trends in the market prove invaluable to leading the innovative process. Identifying a leader holding all of these key attributes is critical to leading successful innovations. The identification of such individuals will become increasingly important as we continue to move into the realm of an economy built of ideas rather than manufactured parts. Take for instance the search engine Google which is based on information rather than a physical product. To appreciate this shift in our mentality think about how you would describe Google to someone that was born in 1850. It would be a challenge. In fact even 50 years ago, it would have been difficult to imagine our reliance on computers and the life-changing influences of having computers in nearly every home.

Back to the example of the electric car, it will remain to be seen who emerges as the leader in this effort. The timing is right with the government and public both on board with developing a viable alternative to petrol automobiles. The hurdle that many of the automobile manufacturers may face is that they become stuck in previous traps that have been created. For example, they may have difficulty breaking out of the trap of finding locations where cars can be plugged in to recharge due to a short battery life. This requires a change in our broader infrastructure. Since many of these automobile manufacturers have developed versions of electric cars in the past, they are apt to remain stuck in their past framework and obstacles rather than branching out into an entirely new approach. Perhaps the future of the automobile will be determined by who is leading for innovation and the strategies they use in the various research and development units at these automobile firms.

References


Alex Edwards
BSc in Business Administration current student

Few undergraduates know much about the tailored suit market, but Alex Edwards is no ordinary undergraduate. As a final year student on our BSc in Business Administration (BBA) Alex and his business partner Richard Demczak, have launched their own business selling tailored suits to rival those on Savile Row.

Know, first, who you are; and then adorn yourself accordingly.
Epictetus

Alex and Richard stumbled across the world of bespoke tailoring whilst doing holiday jobs working as waiters at an exclusive Cotswold estate. They quickly realised that a well-made suit is a vital part of the armoury of a successful business person. They also saw a gap in the market for bespoke tailored suits targeted at a lower price point in the market.

Taking on the establishment
Traditionally tailored suits can range anywhere between £1,200 and £15,000. Aptus Suits have pitched themselves in the £400 - £850 price bracket. Alex explains how they have achieved substantial cost savings, enabling them to charge lower prices than the establishment: ‘We have cut the overheads associated with having an expensive London office; instead we have opted for a small studio in the heart of the Cotswolds. We have also been able to make further savings by adopting sophisticated technologies to streamline our entire ordering system. Our biggest problem has been showing people that it is possible to produce high quality tailoring at affordable prices without lowering the quality.’

A successful new business
Alex believes that the key to the success of their new business lies in the brand they have built. He comments: ‘We have worked very hard to create a brand that stands for high quality, exclusive, affordable tailoring that can’t help but turn heads. During my gap year I travelled across Asia and carefully researched tailors and suppliers. Having found a tailor with over 40 years’ experience who could fulfil our dream of producing high quality hand-tailored suits at affordable prices, I knew we could make the business work. We have since teamed up with some of the best master tailors around the world; we have selected them very carefully and the university holidays have been helpful in allowing us to visit them on a regular basis. We have been very careful to ensure that all of the staff employed by our tailors benefit from good working practices,'
and that they are of legal working age; CSR is something we take very seriously. We are looking at projects in Asia where we can work alongside our tailors to provide apprenticeships to unemployed local villagers. We are also planting our own Aptus Woodland and looking at other ways to make our suits carbon neutral.’

Going against the norm
Combining their overseas operation with a base in the Cotswolds has enabled them to cut costs without sacrificing service or quality, Alex comments: ‘The level of service we offer to our clients is as important to us as the finished suit; we want the experience of buying a suit to be an enjoyable one. We use the studio to conduct the fittings and we will include up to three fittings within the price. We use our local Cotswold tailor to make any adjustments needed to give our clients the perfect end-product.’

Success during the recession
Despite the recession the business is thriving, Alex notes: ‘A recession can open many doors, and often is a time of change where people are looking for real value for money. At Aptus we have chosen a pricing structure that is appealing to those on a tighter budget, but instead of cutting quality we have simply spent time looking for ways to save money. I also think networking is absolutely key; around 40% of all of our business comes from referrals and word of mouth.’

The secret to combining work and study
‘I am lucky in that I absolutely love my work; to succeed in your own business you need passion, and a lot of it. When most individuals read novels, I read marketing texts, when a lot of students are sleeping off their hangovers I am looking at new ways of making money. The important thing is that running Aptus doesn’t feel like a chore, that’s not to say it’s not hard work though! When originally setting up Aptus I saw it as a way of putting into practice some of the aspects being taught on my course. I had always intended to shut it down after my final year and continue applying for retail management graduate jobs. This was all before I realised how popular Aptus was going to become.’

How the BBA has helped
‘The University of Bath, and particularly my business course, is one of the main reasons why I set up the business in the first place. The BBA not only gave me an overview of every sector of a working company but it also gave me confidence and self belief to go ahead and try running my own business. The University has also been great in that it is awash with knowledge and expertise in every area of running a business; I thus have been fortunate enough to discuss new marketing ideas, development of the brand, plus finance and sales with professors here. I have even tailored suits for several members of the management staff.’

Advice for other students setting up their own business
‘If you have an idea, being at university is an ideal time to try it out. The University is full of expertise and individuals who can help out. I think being realistic is also important. Becoming a millionaire overnight is very unrealistic, therefore strict budget control is essential to avoid start up cost spiralling out of control. At Aptus we were able to break even very quickly by being very careful with our start up costs. It is also important to bounce ideas off as many people as possible. Have a clear set of goals and try not to lose sight of what it is you are trying to achieve. Finally, seek advice from individuals who have been through the process before, there are plenty of students, past and present, who will all be able to offer nuggets of advice - don’t be afraid to ask them for these.’

Find out more about Aptus Suits
Aptus Suits can now be found at ‘The Old Country House’ on the High Street in Witney, and next year they will be at every major country fair/show in the UK. Within the next 12 months they are aiming to have a presence in every major Cotswold town.

To keep up to date with their developments, please see their website www.tailored-suits.co.uk

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