

# ACHIEVING SUSTAINABLE **GROWTH**

Helping ambitious manufacturing  
and technology companies  
achieve their goals



# About us

## Institute for Manufacturing (IfM)

The IfM is part of the University of Cambridge. It brings together expertise in management, technology and policy to address the full spectrum of issues which can help industry and governments create sustainable economic growth.

## IfM Education and Consultancy Services (IfM ECS)

IfM ECS provides consultancy and executive development – based on the new ideas and approaches developed at the IfM – to help manufacturing and technology companies around the world create and capture value more effectively. As well as supporting mid-size companies we also work with some of the world’s leading multinationals (such as BP, Caterpillar, Linde, Mars and Rolls-Royce) and more than 1,000 SMEs and early stage ventures in the UK.

## Working with mid-size companies

Mid-size companies are those that sit somewhere between large multinationals and SMEs. They are often very successful, longstanding businesses which play an important part in their national economies.

Our consultants work with mid-size businesses – and with business units of global companies – and understand both the challenges they face and the opportunities they have for growth. All our consultants have extensive industrial experience at a senior level and a commitment to bringing research to bear on real industrial challenges and learning from the results.

All our approaches have robust theoretical underpinnings, derived from University of Cambridge research. Most have been extensively tested through practical application. For others, which reflect the very latest research, we actively seek ‘pioneers’ to work with us to test and refine our approaches – and seize an opportunity to differentiate themselves by adopting new knowledge and methods.

We have worked with a wide range of mid-size companies including: Carl Zeiss, Domino, Elektron Technology, Redring Xpelair, SecureMeters, Soil Machine Dynamics and Syfer Technology.

## Why choose IfM ECS?

- ▶ **We are not a conventional consultancy: our approach is highly collaborative, designed to help you achieve your goals and build your capabilities.**
- ▶ **We get results: companies we have worked with have shown significant increases in revenue, cost savings and increased confidence about the future.**
- ▶ **We understand that your time and resources are scarce – our approaches are both effective and efficient.**
- ▶ **We share our techniques with you so that you can keep on applying them after the project has finished.**
- ▶ **Our methods, often workshop-based, are designed to build consensus and communicate the results throughout the organisation and beyond.**
- ▶ **Everything we do is derived from research from one of the world’s leading universities – and any profits we make help fund future research.**



“Working with people from Cambridge University has undoubtedly brought a fresh and creative perspective to our product development approach. Often if you engage a large consultancy firm, you can risk engaging multiple consultants and a not inconsiderable bill. Businesses sometimes need a lighter touch and a guiding hand in the right direction. IfM ECS is a real ambassador for such an approach and is a credit to the University.”

Head of Centre of Excellence, Gas and Engineering



To find out more about how we can help your company achieve its ambitions, email: **Peter Templeton** pwt23@cam.ac.uk

# Achieving sustainable growth

If yours is a mid-size business, you are already, by definition, very successful. And mid-size companies are often well placed to grow, combining the agility of a smaller company with the resources to invest in new production methods, markets and technologies. But in order to make the right decisions in complex and changeable market conditions, it is important to take a structured and ‘whole company’ approach to all strategy and capability development activities.

IfM ECS can work with you to:

**Identify and prioritise key business needs and opportunities:** our ‘prioritisation’ process helps you focus your efforts on your most pressing needs and those areas of the business which will deliver the most growth. **page 4**

**Develop a successful business strategy:** ‘prioritisation’ often reveals a need to reassess the business strategy and develop capabilities in a particular area. If so – or if you want help specifically with strategy development – our business strategy process helps you ‘choose your future’ and create a plan to achieve it. **page 5**

**Understand your markets:** our market analysis tool can be used to support strategy development, particularly in the context of commercialising new technologies. **page 6**

**Make your strategy work:** we can help you communicate your strategy effectively, implement it and refresh it both on a regular basis, and whenever your internal and external circumstances change. **page 7**

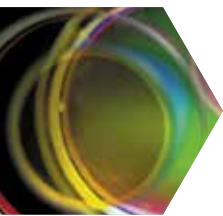
**Turn your R&D into successful products, processes and services:** our range of scaleable approaches and techniques can help you develop a robust innovation and technology strategy and system. **page 8**

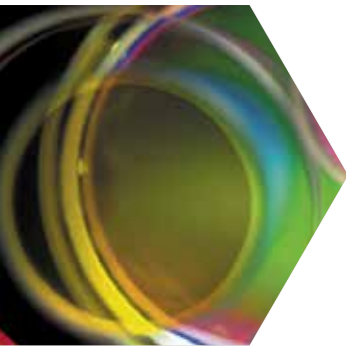
**Develop your operations strategies and capabilities:** we can work with you to optimise your supply and production networks, choose the right process technologies, understand your opportunities for automation and ensure your factories can respond to change. **page 10**

**Improve individual factory performance:** around volume, quality, delivery and unit cost, and develop more resilient operations. **page 12**

**Add a service dimension to your business:** with many manufacturers now looking to offer services alongside their products, we provide a set of strategic approaches to support the challenging transition to a more service-based business model. **page 13**

**Build a sustainable business:** environmental sustainability is key to achieving long-term growth and we can help you embed ‘sustainability’ into your business strategy and model, and throughout your functional strategies and capabilities. **page 14**





# Identifying and prioritising business needs and opportunities

In today's complex and rapidly changing business environment, it can be difficult to identify and focus on those aspects of the business which are really going to deliver long-term growth.

We can work with you to address your most pressing needs and to capitalise on your most promising opportunities. We do this by looking at your business as a whole within the context of the constraints you face. By ensuring that everything you do is in line with your strategic priorities you significantly increase your chances of focusing on the most promising opportunities and reduce the risk of wasting resources on unproductive activities.

## How we can help

This fast and effective process has been designed to help businesses manage the constraints they face and to improve their ability to win orders. The management team emerges with a clear, shared understanding of its business priorities and of the company's strengths and weaknesses.

We do this by analysing priorities and performance across the business, during a day of interviews with senior managers and functional leaders. We present the findings at a workshop, and review them in detail with the management team. These results are graphically represented and easy to understand, providing a powerful communication tool which helps to build rapport across the business and enables managers to compare their priorities with colleagues.

The data generated also provides a useful performance reference point for the business which can then be revisited to assess the impact of improvement activities. The process may also indicate that you need to reassess which markets and product groups you should focus on, and on what basis you should be competing. If this is the case, our other approaches to strategy and capability development may be useful.

### Aerospace and nuclear sectors

IfM ECS is one of the partners delivering a government-funded programme – Sharing in Growth (sig-uk.org) – aimed at developing the capabilities of small and medium-sized suppliers to the UK aerospace and civil nuclear sectors.

The programme provides training and development to help firms in the supply chain overcome barriers to growth and increase the number of high value jobs in the UK's aerospace and associated high value manufacturing sectors. To date, IfM ECS has worked with 45 companies to develop their business strategies and prioritised action plans.

Sharing in Growth UK Ltd has been set up with support from the UK Government's Regional Growth Fund and Rolls-Royce to work with 40 to 50 UK suppliers over a five-year period.



# Developing a successful business strategy

Do you have a clear idea of where you want the business to go and how you are going to get there? Does everyone in your organisation share that vision and know what part they need to play in achieving it? Is the vision sustainable in the face of escalating change, caused by factors such as globalisation and changing market conditions, new government policies and regulations? Are you concerned that rapid developments in areas such as materials, sensors and big data may have a major impact on your products, processes and business models?

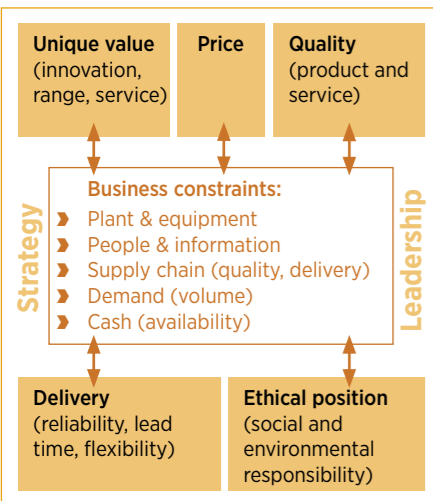
## How we can help

IfM ECS has developed a fast and effective approach to business strategy development. It results in a clear vision for the future of the business, a shared understanding of which markets and product groups to focus on, your competitive position within those markets and a prioritised set of capability development projects.

The process has four key steps, based around workshops. Each workshop uses a structured yet creative approach to generate and review ideas leading to the identification of clear strategic options and a shared ownership of – and commitment to – the direction the company should take. This leads, in turn, to the definition and prioritisation of the projects needed to put the strategy into practice.

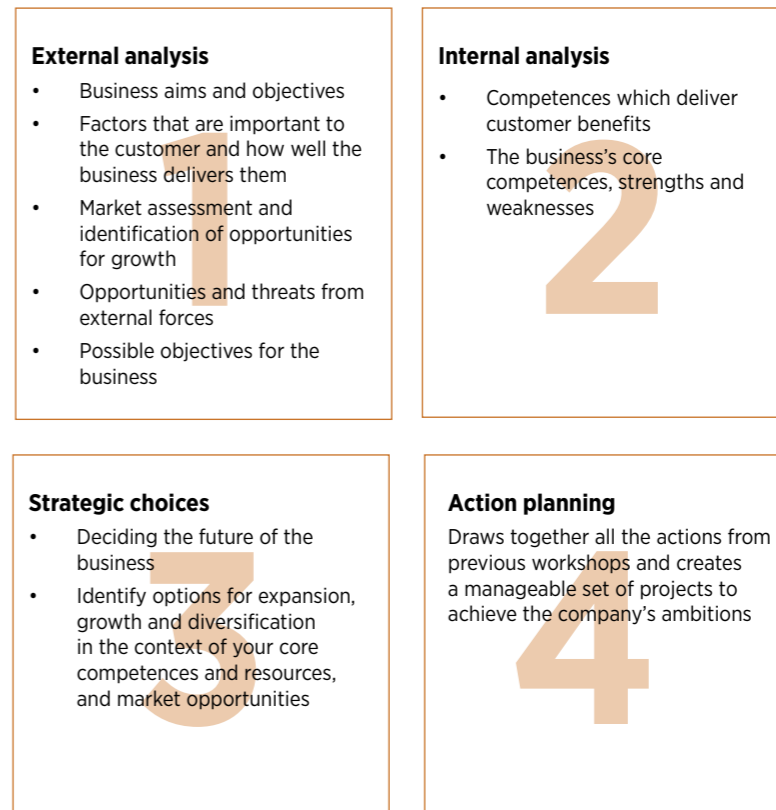
### Market analysis

Alongside the strategy development workshops, companies can also elect to use our market research tool to develop a deep understanding of their markets and their position within them. See next page for more details.



Order-winning criteria and business constraints

**We have used our 'prioritisation' tool with more than 750 companies to date. It also provides the basis for the The Institution of Mechanical Engineers' National and Regional Manufacturer of the Year Awards scheme.**



Four-step approach to business strategy development



## Understanding your markets

A systematic analysis of your markets, and your own and your competitors' position within them, is a key component of a successful strategy for growth. Knowing your customers – their needs and aspirations – is the starting point from which you can evaluate the prospects of your products and services and the commercialisation potential of new technologies.

### How we can help

IfM ECS has been developing a fast, effective and modular toolkit based on research from two of the IfM's research centres: the Centre for Technology Management and the Design Management Group. It uses structured workshops supported by market research and analysis to explore your markets and the opportunities they offer. This approach can be used to look at both new and existing products and services in a wide range of contexts.

It can also be used in conjunction with our Innovation and Technology Management toolkit (see pages 8 and 9), when considering how best to commercialise a new technology. The two key questions here are: what are the most promising markets for the technology and how can we ensure it fulfils its potential?

To address those questions we work with you to identify:

- ▶ **Possible applications and markets**
- ▶ **Potential customers, looking at their particular needs and developing a value proposition that would meet those needs and give you distinct competitive advantage**
- ▶ **Which technology options are the most feasible and integrate best with existing operations.**

We then help you develop a set of action plans to help you achieve your objectives, benefit from any 'quick wins' and, where necessary, develop the capabilities you need to put your plans into practice, from a technical, operational and commercial perspective.



## Making your strategy work

### Communicate it effectively

However well planned a business strategy, it can still fail if it is not clearly communicated to managers and stakeholders across the company and, where appropriate, to customers and external partners as well. But communicating highly complex and interconnected information is not easy. Developing effective visual outputs is a significant focus of IfM research and we use this new thinking to help you communicate the strategy, gain support for it and overcome barriers to its successful implementation.

### Put it into practice

Even with a clear set of project plans agreed and in place, it can be challenging to maintain momentum. We can work with you to help keep your development programmes on track through regular monitoring and progress reviews.

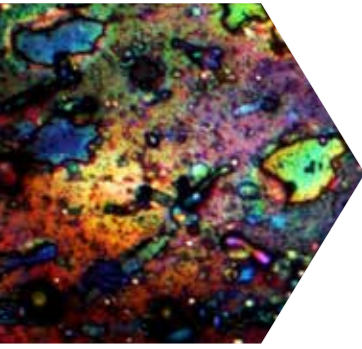
### Renew it

Strategy needs to be reviewed and refreshed regularly, as a matter of course. But when a change in circumstance (whether external or internal) threatens your company's ambitions for growth, it becomes imperative to update your business strategy accordingly.

We can work with you to review and explore your capacity to grow, and to help you identify the best market opportunities. We use our 'Business Strategy Refresh' tool to:

- ▶ **Review and update the business strategy**
- ▶ **Develop a tailored framework for exploring further business development and growth**
- ▶ **Focus on opportunity identification, prioritisation, definition.**





# Turn R&D into successful products, processes and services

Developing new products, services and processes is vital to profitable – and sustainable – growth. But mid-size companies face many challenges, not least the sheer pace of change in new technologies and the increasing costs of development.

To meet these challenges, companies need an **innovation and technology strategy and system** which supports their business objectives and delivers new products and services effectively and efficiently.

## How we can help

IfM ECS has a portfolio of scalable innovation and technology management approaches and techniques which we customise to address your company's needs. The flexibility and scalability of our methods is key: they can be used together to provide a total innovation and technology management development programme or they can be used selectively to meet a particular challenge.

## Assess your capabilities

We have developed a rapid assessment tool which identifies those aspects of your innovation and technology strategy or system which could be improved – and how. It reveals a complete picture of your current strengths and weaknesses by comparing responses from different parts of your organisation, from the R&D coalface to the boardroom. This can be done either by online self-assessment or interview. We collate and analyse the results, review them with you in a facilitated workshop and consider their implications for your business. These provide the basis for a prioritised action plan for improvement.

As well as helping companies in a 'steady state', the assessment tool can also be helpful in identifying opportunities following a merger or acquisition, a major business reorganisation or the creation of new types of innovation partnerships.

### Case study: exploiting technologies

IfM ECS worked with a mid-sized company based in the UK and India looking at ways in which it could improve its complex and labour-intensive production processes to bring their products to market more quickly and efficiently. This ongoing collaboration has used a number of IfM ECS methods, initially to define and prioritise the issues that need addressing and then, using 'Design for Manufacturing and Assembly' to achieve some 'quick wins' by redesigning products and improving subassembly processes. An online diagnostic tool was subsequently used to collect large quantities of data from both within the company and from its suppliers and customers to understand the strengths and weaknesses in the company's technology system, to avoid bottlenecks, reallocate resources to ease constraints in key areas and make gains in capacity. The project also looked at issues relating to people and organisation such as developing management capabilities and looking outside the business for expertise in key areas.



The project has enabled us to develop a framework to introduce new model concepts into the market in a more efficient and coordinated way. It ensures that we take account of all the future external factors and link them to our existing and developing capabilities in order to deliver these new models to our customers.

Head of Research Department,  
Automotive



We work with manufacturing and technology companies across the three core elements of innovation and technology management: the **strategy**, the **system** and the **people & organisation**. We can help when any or all of these elements need to respond to changes in the firm's context, strategy and business model.

## Define your innovation and technology strategy

A good innovation and technology strategy focuses R&D and design resources on your target markets and products in order to achieve the business's overall objectives.

We can help you:

- **Understand the complex and often dynamic external context and drivers**
- **Interpret the corporate and business strategy and translate it into technology and innovation objectives**
- **Understand your (and your partners') innovation and technology capabilities and your strengths and weaknesses**
- **Consider a range of strategic options and assess how well equipped your innovation system is to deliver them**
- **Develop business cases to evaluate and select the most promising opportunities**
- **Communicate the strategy clearly to all stakeholders**
- **Decide how the strategy will be implemented and measured.**

## Building your innovation and technology system

A robust innovation and technology system is needed to put the strategy into practice. It should deliver the optimal products, processes and services and make good use of resources and capital.

IfM ECS's framework for doing this comprises five key processes based on IfM research: Technology **Identification**, **Selection**, **Acquisition**, **Exploitation** and **Protection** (see panel, right). We can help you define your objectives and develop your capabilities in any – or all – of these areas.

## Developing successful people and organisations

Strategies and systems are only as good as the people who design and implement them. Companies need clear and effective leadership as well as people with the expertise and motivation to put their strategies into practice. We can help you with:

- **Creating new leaders through bespoke executive and professional development**
- **Organising for innovation, helping define the role and focus of technology leaders and developing your culture to support the 'fuzzy front end' of innovation.**

## A structured approach to building an innovation and technology management system

**Identify** technologies: improve your mechanisms for finding, capturing and communicating information about technologies which may affect your product development and production processes, and identifying which are opportunities and which are threats.

**Select** technologies: decide on your portfolio of products and services and the associated production process technologies; evaluate emerging technologies.

**Acquire** technologies: through internal development, external acquisition or co-development with partners.

**Exploit** technologies: understand and define market and customer needs, design new products and services that best address those needs and specify the processes to deliver them.

**Protect** technologies: understand the most appropriate approach to intellectual property whether it is sole ownership, sharing it with technology partners or adopting an open approach.



# Developing your operations strategy and capabilities

Successful companies are very good at delivering products (and services) on time and in full, at the right quality and price. Their operations are also sufficiently agile to respond to changing strategic imperatives with minimal disruption and investment.

To achieve all this, an operations strategy must support the overall business strategy. Complex operations are inevitably closely interconnected so being able to take a 'joined-up' approach is key. Once your operations strategy has been defined, you can develop your manufacturing capabilities accordingly. One of the main issues companies face is how to address a range of potentially competing requirements, such as: cost, quality, delivery, flexibility, agility, innovation, customer service, risk and resilience.

## How we can help

We have a set of structured approaches based on research from a number of IfM Centres: the Centre for International Manufacturing, the Centre for Strategy and Performance, the Centre for Technology Management and the Distributed Information and Automation Laboratory. These approaches can be used selectively to address particular needs or collectively to address your operational planning and activities.

## Supply and operations strategy

The art of getting your products to the end customer now involves co-ordinating a complex and often fragmented network of suppliers, distributors and delivery partners. Network design and integration has never been more challenging or, arguably, more important. The IfM's Centre for International Manufacturing has developed new strategic approaches to help companies design their production, supply and service networks and improve the business processes they need to operate them. These tools include new industry supply network mapping techniques and capability models which help companies configure their supply chains to improve operational capability and delivery. Our latest research models also consider the redesign of supply networks by exploiting emerging technologies that can support different production and supply network configuration and location options.

## Making the right things in the right places

IfM ECS has been working with companies on their 'footprint strategies' for more than 10 years. Our approach addresses four key questions: why do you need to reorganise your production network, what is the basis of your distinctive market position, where should each factory be located and how do you put your footprint strategy into practice and measure the results? We have developed a robust process which works through these questions to develop a footprint strategy in the context of your external market conditions and your overall business strategy. We give you our tools and techniques so that you can embed this process into your annual business planning and review it in the light of internal and external change.

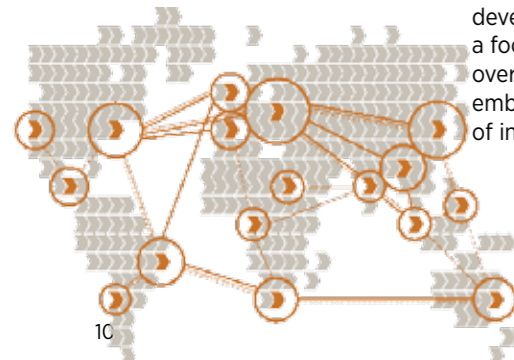


We worked closely [with IfM ECS] to develop and direct the Global Manufacturing Strategy which will expand our global production capabilities in developing markets around the world, as well as re-aligning our existing production into manufacturing centres of excellence within an optimised network. Our goal is to significantly improve our operating efficiencies, lower our overall cost structure and implement new technologies more effectively, while not compromising service, quality or EHS [Environmental Health and Safety].

*Vice-President of Global Manufacturing and Vice-President Supply Chain Europe, Packaging*

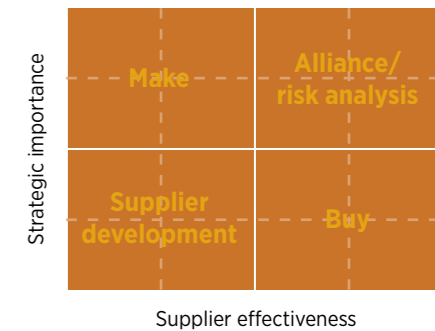


The company reported a series of updates over the period 2008 to 2011, where it announced that the overall project involved capital expenditure of \$220m, and delivered repeating savings of \$55m per annum.



## Make or buy?

This is another key area of IfM research and our approach has been used with manufacturers across a wide range of sectors. Deciding what to make in-house and what to outsource is a fundamental part of any manufacturing strategy and needs to take into account a number of factors of which cost is just one. Our framework helps you consider key questions such as: how strategic a particular process or component is? Is it important to the customers' buying decisions? Does it represent unique know-how?



## Choosing the right process technologies

Investing in process technologies is a big decision. They are expensive in the first place and can be difficult to re-purpose if the business or manufacturing objectives change. We can use a range of our technology management techniques (roadmapping, portfolio selection, technology intelligence, open innovation) to help ensure that your decision-making process is sufficiently robust.

## Reconfigurable factories

Change will happen in your business context and not all of it can be foreseen. Having a 'reconfigurable' factory that allows you to adjust your production volumes, or the types or mix of products, easily and at little or no extra cost will give you significant competitive advantage. Our approach starts with an assessment of your existing factories and their potential for reconfigurability and the ease with which it can be achieved. We then work with you to identify an appropriate approach based on re-usable 'building blocks', common interfaces and shared structures.

## What and when to automate?

Automation can add real value to your business but understanding what to automate and whether to choose a partially or fully automated solution will depend on a number of factors. Our assessment tool helps you identify your current products and production needs and future aspirations. It then looks at opportunities for automation, their feasibility and their benefits. This assessment provides a firm foundation for developing an integrated automation strategy and, ultimately, a specification of requirements for potential vendors.

### Case study: automation assessment

We used our automation assessment tool to clarify a company's automation objectives and to give focus and direction to its international automation team. The project stimulated higher-level discussion of the benefits and challenges of automation and our structured assessment approach has been adopted across the company. The result was a company-wide picture and consistent analysis for multi-site manufacture.



## Getting better performance from your factories

Successful companies have a good understanding of the basis on which each of their product market groups competes. And they translate that into realistic performance targets around volume, quality, delivery and unit cost – and their relative importance. At the same time, they recognise which ‘levers’ to use if the need to improve performance in key areas. These levers might be:

- ▶ **Longer-term strategic issues such as manufacturing footprint, supply chain management, process technologies and innovation**
- ▶ **Short- and medium-term issues such as managing demand and capacity, process design and layout, planning and control, people management, quality management, lean operations and agile operations.**

### How we can help

Using structured approaches and workshops, we can help you define your product-market groups, your performance objectives for each group and appropriate ways of measuring performance (KPIs).

And using a range of diagnostic tools, we can assess your order-winning capabilities in terms of quality, delivery performance, price, uniqueness and innovation, environmental and ethical performance. We also review factors which might constrain the business such as: managing your supply chain, demand, plant and equipment, people, information and cash.

### Resilient operations

The reality of today’s operating environments is that they are subject to frequent change – good or bad – planned or unplanned. We can work with you to identify high impact disruptions, assess the magnitude of their impact and review your capabilities for managing under difficult conditions. At the end of the process, you will have a prioritised resilience improvement plan.

Whatever the challenges you face, we look at them across the whole business and develop joined-up approaches to resolve them. We can also provide project oversight and support to help you put the plans into practice.

#### Case study: taking a systematic approach to defect reduction

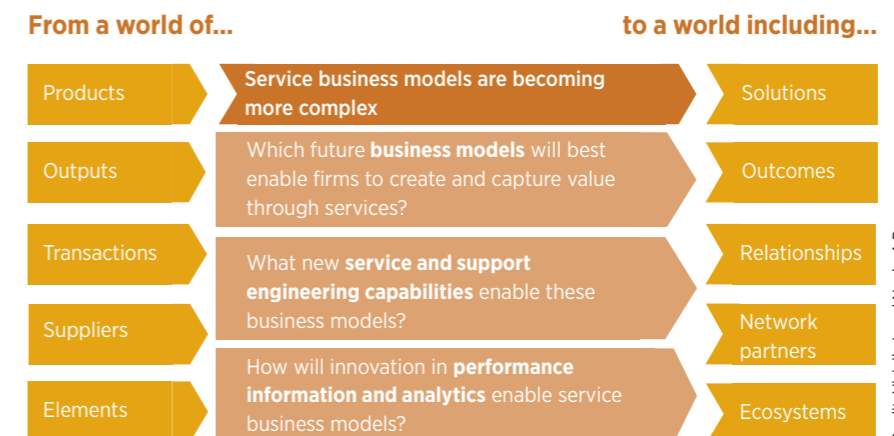
A company supplying engine components for the aerospace sector was losing money. It knew it was not achieving consistently high levels of accuracy with its laser-cutting machines but was struggling to understand why. IfM ECS analysed its production process and introduced a new, systematic approach to defect reduction. As a result, the company is now achieving significant levels of growth and continues to use our tools and techniques to maintain its present high levels of accuracy in the future.



## Adding a service dimension to your business

More and more companies have come to realise that their customers value not just the products they offer but also the services – or ‘solutions’ – they can provide. Services are increasingly seen as a key differentiating strategy. But developing an effective servitization strategy can be challenging because the processes and principles are very different to those of traditional manufacturing.

One of the key differences is that companies need to adopt new ways of working not only with their customers but with their service-delivery partners. Service solutions tend to be more complex than a single company – particularly a mid-size company – can deliver by itself. Instead, it may have to rely on a network of firms acting as a ‘business ecosystem’ in which former competitors may become new delivery partners.



For companies who have already made the shift to services, or are considering doing so, IfM ECS is working with the Cambridge Service Alliance to develop a structured approach to addressing the challenges of servitization. This is based on a major research programme carried out by University of Cambridge academics in collaboration with some of the world’s leading businesses. It addresses issues such as:

- ▶ **Mapping complex ecosystems to understand how they work and where new opportunities may lie**
- ▶ **Moving from a product- to a more service-based business model**
- ▶ **Measuring your service performance using KPIs.**

We can work with you to:

- ▶ **Assess your business’s current capabilities and readiness for introducing a service component into your business model**
- ▶ **Carry out ecosystem mapping that will underpin your understanding of the market and service delivery opportunities**
- ▶ **Inform and support your business transformation.**



## Building a sustainable business

Integrating resource and environmental sustainability throughout your business not only has clear social and environmental benefits but is also a key component of achieving long-term growth – by reducing your exposure to risk and improving your margins.

From a company's perspective, there is a clear need to manage risk in relation to:

- ▶ **Volatility in the availability – and hence prices – of key resources**
- ▶ **New legislation around environmental protection**
- ▶ **Customers' expectations that companies should be committed to environmental and socially ethical behaviour.**

And by becoming more efficient, businesses can reduce their costs while operating in a more sustainable way. But in order to do so, companies must be able to measure their current performance accurately and in detail, understand what other scenarios might look like, map manufacturing lifecycles to see where waste is created and identify ways in which it can be given a value and set clear and achievable performance goals.

### How we can help

The IfM's Centre for Industrial Sustainability is leading a national research programme which aims to transform current industrial strategy and practice. It has developed a number of tools to help companies integrate sustainability into their business models and to analyse and improve their performance in all areas of the business, from product and packaging design to supply and, ultimately, to product and part re-use. These tools have been developed in conjunction with a wide range of industrial partners so they reflect real issues and challenges.

*Value Mapping Tool* helps you systematically analyse how you can derive new economic, social and environmental value from your business through a multiple stakeholder perspective.

*Sustainable Value Analysis Tool* helps you identify opportunities to create new sustainable value by analysing the entire lifecycle of your products.

*Business Transformation Tool* helps you turn a new value opportunity into a new, sustainable business model. It helps design change programmes to implement business model innovations and develop action plans.

#### Case study: reducing energy use and environmental impact

A photochemical machining company wanted to reduce its energy consumption and environmental impact. IfM ECS carried out a detailed assessment of its processes revealing a number of areas in which improvements could be made straight away and others which could be addressed in the longer term. The 'quick wins' included: reducing lighting bills by about 60%; making 33% energy savings by installing a new compressor; and becoming much more efficient in their water usage. The company has also made a major investment in treating its effluent which has reduced the metals in the discharge to just trace elements.

The Centre for Industrial Sustainability has developed a set of 'Quick Guides' for businesses which summarise best practice. Find out more at: [www.industrialsustainability.org/publications-media/quick-guides](http://www.industrialsustainability.org/publications-media/quick-guides).



We felt we knew our energy use well but IfM ECS came at it from a different angle. That allowed us to look at things we would not have looked at. We were using an amazing amount of electricity over the weekends. We have reduced this quite considerably.

Operations Director



## IfM research underpinning IfM ECS support for mid-size companies

### CENTRE FOR STRATEGY AND PERFORMANCE (CSP)

CSP aims to understand and improve the ways in which organisations make strategic choices at both the business and plant levels, put those plans into practice and develop effective ways to measure their performance.

### CENTRE FOR TECHNOLOGY MANAGEMENT (CTM)

CTM researches innovation and technology strategy, and processes and practices for identifying, selecting, acquiring, exploiting and protecting technology for business benefit. It is one of the world's leading centres of roadmapping research.

### CENTRE FOR INTERNATIONAL MANUFACTURING (CIM)

CIM focuses on strategic and operations management in close collaboration with industrial partners. It researches new approaches to the configuration of global value networks, spanning production, supply, service, engineering and R&D networks.

### CAMBRIDGE SERVICE ALLIANCE (CSA)

In collaboration with industrial partners, CSA researches the challenges of designing and delivering high-performance complex services. Key areas of interest include the innovation of service-based business models, developing service capabilities and the measurement of service systems.

### CENTRE FOR INDUSTRIAL SUSTAINABILITY (CIS)

CIS aims to develop the knowledge and tools that will help accelerate the transition towards a sustainable industrial system. Its main research themes are concerned with: how to make existing factories more sustainable, developing new products and processes with lower environmental impact and how to create new business models that deliver environmental, social and economic value.

### DESIGN MANAGEMENT GROUP (DMG)

DMG is interested in how design can be effectively managed to create sustainable, desirable, usable and producible new products and services. Key research interests include: new ways of managing product development, how to integrate design and technology and how to design sustainable products and services.

### DISTRIBUTED INFORMATION AND AUTOMATION LABORATORY (DIAL)

DIAL studies ways in which advanced information systems and automated identification technologies can be combined with advanced production and asset management systems to create and deploy smart products, reconfigurable manufacturing operations and innovative services.





**INSTITUTE FOR MANUFACTURING: IfM**

The IfM is part of the University of Cambridge. It brings together expertise in management, technology and policy to address the full spectrum of issues which can help industry and governments create sustainable economic growth.

**IfM EDUCATION & CONSULTANCY SERVICES LIMITED:****IfM ECS**

IfM ECS works with companies of all sizes to help create and capture value and with national and regional governments to support and grow their industrial sectors. It does this by transferring the new ideas and approaches developed by researchers at the IfM through a programme of education and consultancy services. IfM ECS is owned by the University of Cambridge. Its profits are gifted to the University to fund future research activities.

**To find out more, email Peter Templeton at:  
[pwt23@cam.ac.uk](mailto:pwt23@cam.ac.uk)**