



UNIVERSITY OF
CAMBRIDGE
Cambridge Service Alliance

CAMBRIDGE SERVICE ALLIANCE

annual report

2016

The Cambridge Service Alliance

The Cambridge Service Alliance is a unique global partnership between businesses and universities. It brings together the world's leading firms and academics, all of whom are devoted to delivering today the tools, education and insights needed for the complex service solutions of tomorrow.

About the Cambridge Service Alliance

Founded in 2010 by BAE Systems, IBM and the University of Cambridge's Institute for Manufacturing and Judge Business School, the Cambridge Service Alliance brings together world-leading organisations with an interest in complex service systems to:

- Conduct insightful yet practical research to improve the design and deployment of high-performance complex service systems.
- Create and develop industrially applicable tools and techniques that deliver competitive advantage.
- Provide an unparalleled network of academics and industrialists that share experience, knowledge and insight in how better to design and deploy high-performance complex service systems.
- Develop and deliver public and member-only education programmes to raise the skill levels of organisations.



Joining the Cambridge Service Alliance

Industrial members

The Cambridge Service Alliance is a business-led alliance with industrial members who have an active interest in the shift to services. In 2015 the industrial members were BAE Systems, Caterpillar Inc. and IBM.

The Cambridge Service Alliance will bring together further companies prepared to make significant and long-term contributions to support the Alliance. Benefits of joining include:

- Challenging yet practical insights into the design and delivery of high-performance complex service solutions.
- Practical tools, techniques and methodologies.
- Education and training to enhance capabilities in service and support.
- A stimulating international network of the world's best talent engaged in solving problems associated with complex service solutions.

Academic members

The Alliance draws on members from across the University of Cambridge, initially from the Institute for Manufacturing and the Judge Business School.

Internationally leading researchers and educators will be invited to join the Cambridge Service Alliance to meet specific research requirements and the needs of industrial members.

Further information

Email: contact@cambridgeservicealliance.org

www.cambridgeservicealliance.org

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Foreword

The Cambridge Service Alliance is a unique global partnership between Cambridge University and leading businesses – BAE Systems, Caterpillar and IBM. Working together we are delivering today the tools, education and insights needed for the services and solutions of tomorrow.

Why services and solutions?

Wherever you look, firms are innovating their business models. They are seeking to create more value for their customers (and their customers' customers) by offering services and solutions, rather than products. In the aerospace sector engine manufacturers sell 'power by the hour'. In agri-tech, equipment providers sell services designed to maximise yield. In construction businesses are seeking to increase availability and uptime, while reducing operating costs. In mining the focus is on ensuring the minimum cost per tonne. This laser-like focus on outcomes – the results that customers really value – can be observed in non-capital-intense industries too. In education there is a growing focus on delivering 'learning' outcomes. In health care the question that is being asked is how we deliver better health outcomes. Wherever you look, the underlying concept is the same – a focus on outcomes, with providers increasingly worrying about how they create and successfully operate business models that deliver the outcomes their customers really want.

Delivering outcomes in a changing world...

Since we launched the Cambridge Service Alliance in 2010 there have been three important developments. First, increased emphasis on ecosystems – ecosystems where networks of firms pool their capability to ensure they collaboratively deliver customer outcomes. Second, increased emphasis on digital and data – using new technologies to remotely monitor products, processes and supply chains, ensuring that providers are deeply embedded in customers' operations. Third, increased expectations around risk and relationships – organisations becoming much more sophisticated in how they manage and control risk and the associated responsibilities.

The Cambridge Service Alliance is providing answers...

In the Cambridge Service Alliance we are working with our partners to understand today's challenges and, importantly, to identify and explore tomorrow's challenges. We have learned a lot since we started working together. We understand more about the risks of service contracts and how these risks can be better identified, managed and mitigated. We understand the importance of customer dependencies – knowing where and when your ability to deliver outcomes is affected by your customers' actions. We understand how to map and model ecosystems, using them as sources of innovation. Through our research we have identified seven critical success factors that underlie the successful shift to services. We have developed new methods of analysing unstructured customer data, so we can better identify how services can be improved and customer satisfaction enhanced. We have studied business models and ecosystems, identifying which capabilities firms need to successfully deliver excellent services in partnership with firms.

While asking better questions...

We work closely with all of our partners – developing ideas and concepts with them, testing out these ideas and concepts in their businesses and then supporting our partners as they seek to capitalise on this work and roll out the insights across their organisations. While we have learned a lot we have also learned that there is much more to understand – in essence we are now able to ask much better questions than we were a decade ago. Critical issues that we need to understand include how can you scale services – successfully growing your services business. How you price services – especially when customers are already paying for capital equipment. How you can leverage big data and the industrial internet/Industrie 4.0 to create better services. And how you can innovate and coordinate across ecosystems – networks of organisations that are pooling their capabilities to deliver outstanding service.

In essence, the Cambridge Service Alliance is itself a complex service ecosystem. Through deep and cooperative long-term relationships with our partners we are seeking to uncover and communicate the secrets of designing and delivering world-class services and solutions. We are always interested in hearing from and talking to others who share our interest in these issues. We hope you will find this annual report interesting and insightful and that it will stimulate you to join us as we continue to explore these new ways of doing business.

A handwritten signature in black ink, appearing to read 'Andy Neely', written in a cursive style.

Professor Andy Neely
Director, Cambridge Service Alliance

Our industrial partners



BAE Systems is a global defence, aerospace and security company employing around 83,100 people worldwide. Its wide-ranging products and services cover air, land and naval forces, as well as advanced electronics, security, information technology and support services. BAE Systems provides a wide range of military and technical services, from preparation and training programmes that ensure personnel and equipment are ready for deployment, to maintenance and modernisation services to keep equipment at the forefront of technology.











Caterpillar Inc. For more than 85 years, Caterpillar Inc. has been making sustainable progress possible and driving positive change on every continent. Caterpillar is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives. The company is also a leading services provider; Caterpillar Job Site Solutions offers complete solutions to customers that are designed to improve the jobsite performance and increase sustainability.



IBM. Throughout its 100-year history IBM has continually strived to innovate and progress. In the mid-1990s the company faced some real challenges as the information technology industry started to become rapidly commoditised. IBM survived and prospered by changing its strategy, and over the past decade has shifted into high-value services and software, which now account for more than two-thirds of its revenue. Radical innovation in IBM's business model has been another example and is central to its re-invention as a globally integrated enterprise. Globally integrated delivery is now IBM's business norm, enabling it to provide services that draw on large, new pools of highly skilled specialists from across the planet.

Contents

| | | |
|--|---|---|
| <p>Alliance industrial partners</p> <p>2</p> | <p>2016: new challenges</p>  <p>4</p> | <p>2016 Impact & Priorities for 2017</p> <p>5</p> |
| <p>Research – Shift to Services</p>  <p>6</p> | <p>Research – Data & Analytics</p>  <p>8</p> | <p>Research – Ecosystems</p>  <p>10</p> |
| <p>Research – other projects</p>  <p>12</p> | <p>PhD Research</p> <p>16</p> | <p>Engagement</p>  <p>18</p> |
| <p>Community of Interest</p> <p>23</p> | <p>Cambridge Service Week</p>  <p>24</p> | <p>Executive education</p>  <p>25</p> |
| <p>Communicating Alliance research</p> <p>26</p> | <p>People</p>  <p>28</p> | <p>Papers</p> <p>29</p> |



This is a really great model to understand our priorities to deliver better customer experience. The model has many details and it is insightful.

Service Director, Finning



2016: new challenges

Complex services play an important part in all sectors of the economy, from education and health care, through to capital-intensive and asset-heavy industries. Whatever the sector, complex services have three defining characteristics:

- A focus on solutions.
- Networks of firms pooling their capabilities.
- Long-term relationships involving outcome-based contracts.

In all cases, the firms involved are looking for ways to increase the efficiency of their operations, reduce their cost-based and risk exposure and to partner with strategic providers to deliver integrated solutions.

Making this shift to services is not straightforward. To design, deliver and support complex services and solutions many firms need to innovate their business models. They need to rethink the ways in which they interact with their partners and their broader industrial ecosystems. They may need to collaborate with companies they had traditionally regarded as competitors. New sources of competition, especially data integrators and dedicated service providers, may enter their markets. The shifting landscape means that firms constantly have to evaluate and review their approach to complex services.

The Alliance provides a forum for doing just this, by offering a unique environment where non-competing organisations can share their knowledge and experience. The partners in the Alliance jointly agree a defined research programme with the University of Cambridge, addressing issues of interest and relevance to them.

In 2016 we explored:

- How you successfully scale services.
- How you innovate and create value through business ecosystems.
- How you can enhance customer experience through better data analytics.

You can find more details about this work and our other projects in the pages that follow.





More impact

Through a rigorous programme of research and investigation, we have been developing a set of tools and techniques that can be used by businesses to address some of their most pressing needs.

Business model innovation assessment: this process helps senior teams understand whether their organisations have the right capabilities to innovate their business models. We have used this assessment successfully with a variety of senior teams, helping them to develop a much clearer and more coherent strategy for organisational capability development as they seek to make the shift to services.

Identifying and designing enterprise-wide key performance indicators: firms often work with partners to deliver complex services and solutions but this creates a challenge when it comes to performance measures, which are typically developed within the confines of a single firm. The Cambridge Service Alliance has developed a structured process for developing cross-organisation, enterprise-wide, key performance indicators. The process helps you to identify and design a small and well-structured set of key performance indicators that you and your partners can use to coordinate value creation and delivery across the network of organisations involved in the delivery of a complex service.

Ecosystem mapping and innovation toolkit: as networks of firms pool their capabilities to deliver the desired customer outcomes, the question of who to collaborate with, and how, becomes central to the strategic debate in many firms. Understanding the structure and nature of your ecosystem, as well as its economics, is a prerequisite to thinking about your approach to collaboration and competition. The Cambridge methodology for mapping and innovating ecosystems helps you understand the structure of your ecosystem, analyse its economics and decide how you should seek to shift the balance of power within it.

Priorities for 2017

2017 promises to be an exciting year for the Alliance. We will be focusing on three areas in particular:

- The continued exploitation of existing materials – ensuring we deliver value to our partners. We are expanding the network of people involved in the Alliance to ensure we can support the demand from partners for successful application of the materials and ideas we have created.
- Further research and investigation – exploring new areas and ideas. In particular we are focusing on issues such as the digitalisation of services, the use of digital twins, blockchain technologies and customer insight and analytics.
- Education and development – building skills and capabilities in our partners, and more broadly.

While 2017 will see us exploiting existing materials, we will also continue to investigate new areas and topics. To make these materials more widely available we will be running a series of executive education programmes – both public and in-house – to support organisations making the shift to services.

2016

Research themes

Each year the Alliance partners agree a programme of research that reflects their most pressing challenges. In 2016 we focused our activities on the following three themes.

Shift to Services

Shift to Services Theme

Scaling Services Up

Theme leader: **Veronica Martinez**

Scaling services up is a key strategic priority for all organisations. Equally, it is one of the most critical challenges that industrial manufacturers confront. In the USA, services account for more than 78% of its GDP; while in the European Union, services account for 70% (Schöllmann, 2015; World Bank, 2014). It is reported that more than 50% of innovations fail in the market place before achieving their full scale-up potential (Proster, 2015; Downey, 2007). Companies such as Siemens, Caterpillar, GE, GEA, and Pearson, among others, have flagged the scaling up of services as a critical problem. The problem that companies like these face is 'how to successfully scale up their embryonic service innovations (also called service business models)'.

This research theme is devoted to helping firms like yours to make and sustain the shift to services. Building on our 2015 research, the 2016 objective was to identify the operational process and leadership practices for successfully scaling up services. This is a collaborative project with BAE Systems, Caterpillar Inc., IBM, Thales, Rolls-Royce, Zoetis and others.

Firms need to understand the nature of the service innovation and decide the strategic process for scaling up. Despite the fact that there is a lot of information on how to scale products, there is almost no information and guidance on how to scale services, particularly industrial ones. At the Cambridge Service Alliance, we identified that in scaling up services, firms often try to scale up services as if they are scaling up products. As a result they often drastically fail. Consistently, we found that organisations neglect to focus on the winning elements of the services for scaling these up.

We created a systematic method for scaling services up. Our method enables firms like yours to:

1. identify your own major challenges in scaling up,
2. select the service scale-up strategies,
3. gauge the strategy for scaling up versus the nature of the service innovation,
4. apply our 'Scale Up Services Process',
5. guide your key scale-up indicators to measure the success of your services innovation.

Our method guides firms in how to understand the service scale-up process and key elements of the services that need to be carefully scaled. A particular factor that empowers the scale-up of services is the leadership factor. Our research found that leaders with entrepreneurial, tenacious and charismatic qualities, who have business knowledge and are bilingua (able to understand and communicate in the service and product worlds), and with the power to make changes, are more effective in scaling up services in non-service organisations.





Industry acceptance

The findings and scale-up method attracted a lot of interest from partners and other organisations. Organisations felt automatically connected to the underpinning problem that this research project is solving. The top three major challenges identified by this research are:

1. Inconsistent perceptions, particularly about the level or risk involved in scaling up.
2. Resource difficulties – both financial and human. These disrupt the scaling up of a service innovation.
3. Critical tensions around the core elements of the service innovation to be scaled. The structured versus customised element.

‘One size does not fit all’ – we learnt that a single service scale-up strategy is inefficient to scale up all services innovations. Our participating firms in this project were surprised by the comparison of the traditional approach to scale services with the benefits of our new methods and process for scaling up services.

Keynote from 2016 Service Week: <http://bit.ly/sw2016scaleup>

The Seven Critical Success Factors in the Shift to Services

The *Seven Critical Success Factors* research and executive briefing sets out a roadmap for making the shift to services’ journey. It identifies the seven critical success factors in order to deliver services successfully and gives firms a set of key actions to do this. The report leads organisations through the process they need to follow in order to use these critical success factors in their implementation strategy. There is a logical progression to them and a relationship between them. Each of the critical success factors has a defined set of rules, which will allow your company to embed these into your organisation.

The *Seven Critical Success Factors in the Shift to Services* report was written by Veronica Martinez and Andy Neely, Cambridge Service Alliance; Neil Allison and Monica Lund, Pearson North America; Dav Bisessar, IBM; Thomas Bucklar, Caterpillar; Stewart Leinster-Evans and Graham Pennington, BAE Systems; and Daniel Smith, Zoetis.

Read the briefing at: <http://bit.ly/28MeYSs>

Listen to the authors’ podcast at: <http://bit.ly/28MeYSs>

Watch the webinar at: <http://bit.ly/28N46Fk>



The CSA’s Seven Critical Success Factors have been helpful to us because they have been derived from industrial experience and I can see that they are up to date in their thinking.

Brian Holliday, Siemens





Data and Analytics for Services Theme

Customer Experience Analytics: Dynamic Customer-centric Model

Theme leader: Dr Mohamed Zaki

Creating a strong customer experience is a strategic priority for organisations. Companies are leveraging new technologies such as mobile applications, social media platforms, virtual reality, drones and the Internet of Things to provide smart services and enable a seamless customer experience. The complexity of using these technologies within an organisation's myriad touchpoints has led to a data explosion across touchpoints in the entire customer journey. Most of this customer data is unstructured textual data, which is generated at several touchpoints in the customer journey. Text-mining techniques relating to traditional sentiment have focused on developing more accurate models, but failed to obtain managerial insights by adopting these methods.

Thus, firms require new data-driven methods that could highlight what really matters in driving customer satisfaction and delivering actionable insights. Thus, we created systematic multi-methods using a text-mining approach to capture and analyse customers' data. Our method will enable firms to:

1. Identify critical customer pain points from real-time data and provide deeper insights into critical touchpoints in order to reduce friction and improve the customer experience.
2. Gain early recognition of nuances in customer sentiment and demonstrate a novel method for analysing textual data from CRM and social media data.
3. Monitor the customer experience while cross-referencing internal and external data sources.
4. extract employee evaluations and the customer-buyer relationship that can be used on 'big data', building on text-mining methods relating to the customer experience.
5. Create rich, dynamic, customer-centric models that can provide a deeper understanding of customer behaviour, including subsequent customer responses to organisational attempts to improve the customer experience.

“ *I think the method is very interesting and provides sound points to tailor next steps and actions for enhancement (e.g. enhancement of our CRM system).*

Director of Marketing Research & Business Analysis in Zoetis ”

We argue that our customer experience analytics will guide scholars and practitioners in how to understand the customer experience and how to gain insights from the extensive real-time 'big data' that arises throughout the customer experience. In particular, the incorporation of our method will help text-mining algorithms to capture specialised vocabulary used by the customers in the CRM and social media data. Furthermore, it is expected to be more effective in monitoring the customers' views for each touchpoint and identifying pain points rather than relying on algorithms or techniques using general English terms. Importantly, this research offers practitioners and academics a novel way to utilise data more effectively in order to provide a more in-depth understanding of the complexity of the customer experience, in addition to actionable insights for improving services.

Industry Evaluations

The findings of this research have generated considerable interest and feedback from Zoetis employees (Zoetis Senior Manager and the Director of Marketing Research & Business Analysis, and the Director and the Programme Manager of the Centre for Digital Innovation (CDI)). Findings were assessed to be consistent and compatible with existing knowledge, validating the research, but with previously unseen and valuable insights. The Director of Marketing Research & Business Analysis confirmed that generated analytics 'was realistic'. He commented that some pain points were surprising. The Senior Manager of Marketing Research & Business Analysis commented that he would need to look into it further as it is insightful. The CDI team found the model insights to be very interesting to study, and identified several areas that appeared to be performing particularly well or badly. Both the CDI and CRM teams were happy with the work, and interest has been shown in taking the process demonstrated in this project further. Senior teams feel it is crucial to 'ensure knowledge is transferred over so subsequent work can take place.'

Customer Experience Analytics in Caterpillar:

In this project, the Cambridge team and customer insights team at Caterpillar evaluated different machine translation (MT) methods to assess the applicability to translate multiple languages such as Spanish and Chinese to English to automate the analysis of the customer surveys. In this experiment, we compare and contrast the effects of translation methods on the accuracy of the text analytics models developed for English (Spanish and Chinese) – using SDL-translation capability- IBM support, Google Translate and Prompt. We analysed four transactional surveys from two Spanish dealers (Finning, Medisa) and two Chinese dealers (Lei Shing Hong, WesTrack China). In total, we had 22,231 comments to compare the machine translation accuracy across sample data set. We created an evaluation method using two measurements (intelligibility and accuracy). Ineligibility is a measure of how fluent and grammatical the output of an MT system is, and measures the clarity, fluency and, sometimes, readability of text. Accuracy is a measure of the extent to which a translated text preserves the content of a source text. The impact of this research is to demonstrate to partners how MT could be applied to scale up the customer experience analytics and analyse customer comments in different cultures and languages.





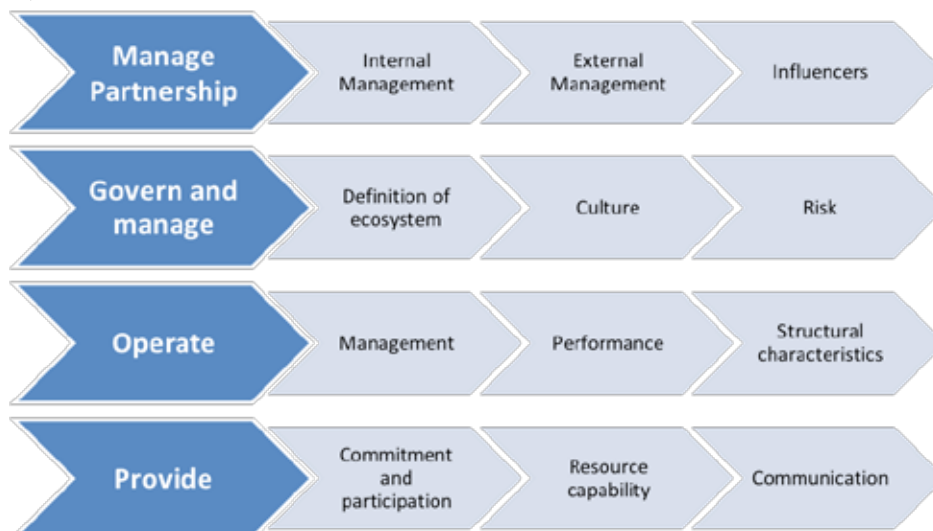
Ecosystems and Value Mapping and Analysis

Service Business Ecosystems

Theme leader: Florian Urmetzer

The boundaries of competition are becoming ambiguous. Provider firms are asked to integrate into business processes, firms collaborate to deliver value to one customer and with other customers they are competing. Overall company boundaries are blurred through close collaboration with partners, customers and competitors. And the complexity does not stop there. Many business ecosystems have not just one but multiple customers, which need to be thought about in the value definition and delivery. The challenge is that organisational operations have to be orchestrated across the ecosystem and partnerships defined and organised.

The background to the ecosystems and value mapping and analysis work stream is that customers' needs for goods and services are often better addressed by multiple interacting organisations. A company will have relationships with suppliers, competitors, partners, complementary organisations and a range of other stakeholders. Such networks act as business ecosystems or extended enterprise, in which companies' strategies are closely interdependent. Competition goes hand in hand with cooperation and no single firm can succeed without relying on resources and capabilities controlled by others. The partner companies of the Service Alliance are involved in complex ecosystems and are contracting those partnerships. Hence, it is important to understand the 'full' value exchanged in those partnerships and wider ecosystems to make them a success. While defining the new research theme for 2016 with the Alliance partners, the discussion led to the need to define the salt and pepper of an ecosystem. How does it work and what are the components to make it work? Hence, over the year we have defined a detailed list of items to consider when building an ecosystem (for a short overview, see table).



The model defines details of management, governance, operation and provision. We have found that governance is needed for an ecosystem in multiple ways. This is to ensure that the definition and value creation process of the business ecosystem stays valid over time and is changed according to needs. In addition, culture and risk need to be governed closely. The ecosystem needs management, which should be separated into internal and external management, as well as by influencers. Internal here is seen as internal ecosystem and concerns close partners, while external is looking at the wider partners that contribute to the system. Influencers are the wider stakeholders such as NGOs, the press or governments. They have to be managed as well, but again a very different skill set is needed. The daily operations need to be managed. This is after building and managing the structures, which includes project management, performance management and managing structural characteristics of the partnership. Finally, there are characteristics to the ecosystem that have to be provided by the engaged partners. This includes commitment and participation, as well as resources and communication. All the above topics were defined with subtasks and are being exploited within the Alliance's partner organisations.

Last year's research was looking at value exchange in business ecosystems. We found that there is not only direct (monetary) value exchange between partners, but also indirect (for the firm, the management, the strategic intent and risk). The research was published in both an international conference and the White Paper. Additionally, BAE Systems has decided to invest in the method and has integrated the work done into its sales cycle. BAE Systems' service offerings will now be constructed using ecosystem mapping investigated by the Cambridge Service Alliance.

Read paper: <http://bit.ly/2mEYSVP>

Ecosystem Value Mapping in BAE Systems

Over the last five years, the Cambridge Service Alliance has been conducting research in collaboration with BAE Systems. In 2015 the research conducted within the ecosystem and value mapping work stream was defined in collaboration with the Alliance partners. By early 2016, BAE Systems had decided to take this research into its organisation, by initially running additional ecosystem value mapping workshops, and then planning an international capability role-out.

The research: The initial research was conducted using a comprehensive literature review, case studies and case workshops. This included working across partner firms with different value propositions of ecosystems. The tool of ecosystem value mapping was quickly found to produce great results. The attendees of workshops are enabled to gain a deeper understanding of the business ecosystems, as well as the value exchange (direct and indirect) between stakeholders. In detail, throughout the research, we could identify five focused levels in which firms exchange value with one another when they are involved in an ecosystem. One level is the direct level. This means there is a level at which value gets exchanged that is normally contracted, for example, a contracted service against money. However, there are then four levels that we found to be indirect values. First, there is the organisational level, where the stakeholders exchange value. An example is the collaboration between a start-up and a multinational, where the multinational captures value through innovation brought by the start-up. The multinational brings value to the start-up by increasing its valuation. The second level is the managerial level. Here managers create and capture value for a collaboration. This may be meeting a KPI, enabling more sales for the company, or perhaps having experience in collaborating and communicating in partnerships, hence being the person in the company who can make the collaboration a success. The next level is the strategic intent. We found that companies are capturing or creating value for future plans by participating in a collaboration. This may be in the form of gaining market access through a collaboration, or better operations. The final level is risk. Collaborations may capture or create value by reducing risk for a partner organisation. An example would be financial risk or market risk.

Advanced workshops and design: The research workshops had shown that the methodology worked in very different business settings and returned great results in the form of business insights and details of how value is exchanged overall, but also specifically to customers and between partners. There was, however, an awareness that using the methodology within BAE Systems would create additional work. This work was then conducted in close collaboration with the Institute for Manufacturing's Education and Consulting Services. Andrew Gill, Principal Industrial Fellow, was tasked with running the design of the workshop and processes. For this task, multiple BAE Systems' internal workshops were conducted to test and enhance the workshop process. The work conducted was concluded with the design of a 'train the trainer' workshop, which was specifically aimed at explaining the background and details of how the workshop process works. This was done using the capability building methodology that has been developed in the IfM over the past seven years.

Roll-out and building of capability: The train the trainer workshops will be conducted throughout 2017 to specifically build the capability to run ecosystem value mapping developed by the Cambridge Service Alliance within BAE Systems.



Other research activities

Through-Life Accountability: Managing Complex Services

Chara Makri

Chara Makri has been conducting research, in partnership with BAE Systems and the sponsorship of EPSRC, that seeks to understand how complex service networks can affect safety. Chara's research is based on the analysis of 23 exploratory interviews with experts within the field. It was found that even 'expert' service providers feel that the complexity of service networks can lead to confusion over accountabilities and impact safety. Even in cases where accountabilities are clearly defined in contracts, a general lack of control, due to the large number of partners involved, can prevent manufacturers from taking the proper actions, with devastating consequences. The results suggest that manufacturers turning into service providers will need to have a clear understanding of three main issues within their service network. These are: a) duty holder and governance b) attitudes, and c) competencies. Furthermore, they need to consider that these characteristics can change depending on the wider context in which each partner operates. This depends not only on the size of the firm, but also on the sector and country in which the partners operate.

Read the paper at: <https://goo.gl/wRcvGN>

Watch the webinar at: <https://goo.gl/MCHsvU>

Or listen to the podcast at: <https://goo.gl/qZglwN>

Digital Re-distributed Manufacturing Studio

Mohamed Zaki

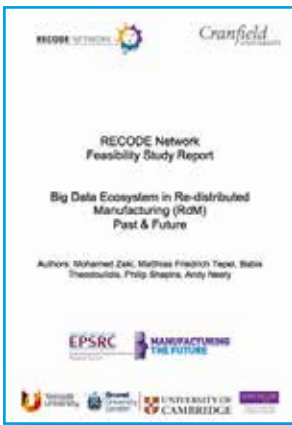
How can data-driven decisions predict a future RDM business model? This is the aim of a feasibility study funded by RECODE, which aims to develop a digital RDM Studio that will enable data-driven experimentation with different business models for the consumer goods industry. The nine-month study's aims will be fulfilled through undertaking the following objectives: i) identify current RDM business models; ii) pilot selected future RDM business models; and iii) contribute to the RECODE roadmap of research. Dr Mohamed Zaki is part of the team of researchers on this project, having participated in the RECODE Sandpit meeting in March.



Digital Service Business Models

Veronica Martinez

Digital technology enables the emergence of new service business models by disrupting traditional ways of doing business and establishing new ones. This research studied the new types of service business model enabled by digital technology. In addition, we carefully identified the winning practices that successful digital business models use to maintain their leadership in the market. This study was well received by the Cambridge Service Alliance partners. Based on the configurations enabled by digital technology, the research found five types of digital service business model. We provided a comprehensive framework to guide companies on the design of their digital service business model. From the partners we received interesting comments, including: 'Fantastic research... this typology makes you reflect how easy it is for fast moving firms to create, destroy and create again a digital business models... we all need to learn from these.'



Big Data Ecosystems in Re-distributed Manufacturing

Mohamed Zaki and Andy Neely

The RECODE Network Feasibility Study Report: Big Data Ecosystems in Re-distributed Manufacturing (RdM) Past & Future report was published, authored by Mohamed Zaki, Matthias Friedrich Tepel, Babis Theodoulidis, Philip Shapira and Andy Neely. The nine-month study aimed to identify the challenges and opportunities to effectively leverage big data in consumer goods and provide a better understanding of the drivers and value that redistributed manufacturing can deliver for a manufacturer, as well as for a customer. The enormous amount of data, which can include anything from online chatter about a brand or product to real-time feeds from cyber-physical systems, machine tools and robots, has great potential to facilitate and enable the redistribution of manufacturing. This study investigated data-driven pathways in re-distributed manufacturing that target and engage different consumer goods industries.

Read the final report at: <http://bit.ly/28KWmaq>

Data Disruption and New Business Models in the Education Sector

Mohamed Zaki

Dr Mohamed Zaki discusses data disruption and new business models in the education sector in this blog from the Cambridge University Press Thought Leadership Blog. He outlines how universities and colleges have started to look for new ways to improve the learning quality, cut costs and increase graduation rates in this complex world. The development of the new online learning paradigm enables institutions to collect a vast number of data about student actions daily, such as how long they devote to reading, where they get electronic resources, and how quickly they master key concepts. One of these ways is online learning, which is continuing to grow in popularity. Mohamed suggests that by adopting a big data approach, and specifically by designing a data-driven approach that collects data at every step of the student learning process, educational institutions can address student needs with customised modules, assignments, assessment and feedback in the curriculum that will promote better and richer learning. This is known as a competency-based model. The advantage of applying this model with the power of data is to give instructors the necessary intelligence to directly address a student's learning style or deficits. In this way, big data can amplify factors that contribute to student success, provide personalised courses, improve instructor and student connection and create a wired sense of community despite being in the detached online learning environment. The time required to obtain a degree would be reduced, resulting in a less expensive and higher-quality education.



Read blog at: <http://bit.ly/cupblogbigdata>

Manufacturing Metrics: Exploring the Scope for Alternative Sources of Data

Andy Neely, Jingchen Hou and Sarah Barrington

This research was commissioned by the Department for Business, Energy & Industrial Strategy, with the aim of exploring the opportunities to supplement national statistics with alternative sources of data, so that policy-makers can better understand the manufacturing industry. It includes three pilot projects: (i) mapping alternative sources of data for manufacturing analytics; (ii) exploration of company reports as alternative data sources; (iii) exploration of company created data as alternative data sources. The first pilot project recognises the value of big data for policy-making, and pioneering governments and international organisations have started to explore how to use big data to inform policy and supplement the official statistics. However, there is limited use of big data in manufacturing policy-making. The second pilot project uses five examples to demonstrate the feasibility of using public data to better understand the manufacturing industry, such as mapping local manufacturing, analysing the servitization of manufacturing, mapping the structure of the global supply chain, identifying emerging technologies, and assessing public attitudes to new technologies. These examples demonstrate that data is available, accessible, comparable and current – close to real time in some cases – and can provide insights to some of the policy-makers' interested questions. Challenges include assessing the reliability and validity of the data, as well as understanding potential data biases. The third pilot study demonstrates the feasibility of using firm-created data to inform policy, and suggests that firms would be willing to share certain types of data with policy-makers, but data security and confidentiality should be addressed. Based on this research, we provide several recommendations for policy-makers to consider.



Feedback From the Front Line: Engaging Front Line Employees in Service Innovation

Florian Urmetzer, Stefan Titz, Veronica Martinez and Andy Neely

Customer feedback is an invaluable source of information for organisations engaged in service innovation and improvement. In most service organisations there are employees that deal with customers on a day-to-day basis. These are the service engineers, the sales personnel, the customer assistants and reception staff – people who have frequent and close contact with the customer base. These front-line employees (FLEs) are perfectly positioned to provide feedback about the organisation’s service provision, both in terms of their own views on the customer-service interaction and their perceptions of the customers’ views on that interaction. Unfortunately, many companies neglect FLEs as a potential source of knowledge and value. We set out to construct a framework that would allow organisations to tap into this rich source of knowledge about their customers. With the appropriate high-level support, organisations can leverage FLE knowledge and insights to improve customer relations, as well as improving the scope and quality of the services and service experience that they offer. This in turn feeds into competitive advantage and sustainable success.

Read the report at: <http://bit.ly/2ljtkRg>
Watch the webinar at: <http://bit.ly/2khMMh4>

Definition of a Business Model Canvas for Ecosystems

Florian Urmetzer and Patid Boonyarungsrit

An increasing number of organisations are moving away from the conventional business model of value creation to value co-creation by engaging in collaborative partnership with their business ecosystem members. As a result, traditional business templates for business models are no longer suited when confronted with the wider scope of ecosystem partnership. Research has been limited in this area. In response to this, we studied business model components, to make ecosystems work and to develop a tool to assist business practitioners. Empirical data was collected through two interrelated cycles of interviews with

industry professionals and professional services. Twenty-one interdependent business model components could be identified, which are critical to effective ecosystem partnerships. The elements of the ‘ecosystem business model canvas’ tool integrate ecosystem business model components to overcome the boundaries of the traditional business model templates. With its practical design, the tool presented in this study was found useful by organisations when taking an ecosystem perspective of their business models (to be published in 2017).

Health Service Stakeholder Networks: Insights from Social Media

Jessica Wyllie, Benjamin Lucas, Brent Kitchens, Ben Kozary, Mohamed Zaki and Jamie Carlson

This research looks at the opportunities presented to not-for-profit organisations by the insights available from social media monitoring, so that by actively scanning their stakeholder networks, not-for-profit organisations can identify opportunities to enhance marketing effectiveness. There are novel insights for marketing managers and social media analysts presented in this research, which are flexible and can be applied to other not-for-profit and for-profit service contexts.

Read report at: <http://bit.ly/28N5isu>
Watch webinar at: <http://bit.ly/28LUBFo>

Classification of Noisy Data

Abdul Rauf Khan, Henrik Schiøler, Torben Knudsen, Murat Kulahci and Mohamed Zaki

Digitalisation of manufacturing, the Industrial Internet of Things (IIoT) and the fourth industrial revolution are concepts that are receiving significant attention. The advantage of these is not only the idea of machine to machine (M2M) communication, but as a step forward, the deployment of machines that are capable of making more informed and automated decisions. The key to manifesting this idea of informed and automated decision-making is the intelligent handling and astute analysis of sensor data. This year we have worked with Alliance visitor Abdul Rauf Khan on a classification methodology designed especially to deal with the issues related to the sensor data analysis and failures of classification in manufacturing.

Read the paper at: <http://bit.ly/2jXA22R>

Customer Loyalty Predictive Model

Mohamed Zaki, Dalia Kandeil, Andy Neely and Janet McColl-Kennedy

The Net Promoter Score (NPS) is still a popular customer loyalty measurement despite recent studies arguing that customer loyalty is multidimensional. Therefore, firms require new data-driven methods that combine behavioural and attitudinal data sources. This research develops a novel customer loyalty predictive model that employs a big data approach to assessing and predicting customer loyalty in a B2B context. This framework holistically assesses and predicts customer loyalty using attitudinal and behavioural data sources. They are able to demonstrate the use of varying big data sources, confirming that NPS measurement does not necessarily correspond to actual behaviour. The model they developed utilises customers' verbatim comments to understand why customers are churning.

Read paper at: <http://bit.ly/2lj1gxo>

Direct Value Exchange in Business Ecosystems

Florian Urmetzer and Guilhem Delorme

The competitive realities of the modern economy resulted in the emergence of business ecosystems, in which companies become interdependent based on the value that they exchange. In those structures, each organisation creates and captures value, in order to serve the end-customer's need and ensure its own sustainability. Therefore, a correct understanding of the value exchange process seems paramount to the success of a provider-customer relationship, from a managerial perspective. However, if the concepts of value creation and value capture have been studied extensively in the literature, most studies tend to focus on one side of the equation and very few contemplate the underlying mechanisms responsible for the determination of value. This study addresses the call from managers and academics to close this gap and provides a new framework for unpacking the value exchange process between two partners, in the context of a business ecosystem (to be published).

Application of Advanced Big Data Methods in Manufacturing Industry

Mohamed Zaki, Abdul Rauf Khan and Andy Neely

The research investigates the classification of pass and fail categories on the basis of quality control data in highly optimised industrial processes. Classification is a major constituent of the data-mining toolkit. Well-known methods for classification are built on the principle of either logic or statistical reasoning. For imbalanced and noisy cases, classification may, however, fail to deliver on basic data-mining goals, namely, identifying statistical dependencies in data. In this research we propose a novel strategy for data mining based on partitioning of the feature space through Voronoi tessellation and genetic algorithm, where the latter is applied to solve a combinatorial optimisation problem. We apply the suggested methodology to a range of classification problems of varying imbalance and noise and compare the performance of the suggested method with well-known classification methods such as SVM, KNN and ANN. The results obtained indicate the proposed methodology to be well suited for data-mining tasks in the case of highly imbalanced classes and significant noise.

Read paper at: <http://bit.ly/Nov16paper>



Customer Experience Analytics

Mohamed Zaki and Ben Lucas

Following an award from the Marketing Science Institute Mohamed Zaki and Ben Lucas will be researching a flexible approach to measuring customer experience factors and emotional complexity for customer experience analytics. The project will aim to build a data-driven measurement system that uses topic modelling as a basis to identify distinguishable textual manifestations of different CX factors (i.e. customer experience attributes) from different CX frameworks, in online customer reviews and social media activity. It will assess the stability of these CX attributes as a basis for real-time analytics, and identify to the extent to which these factors emerge as dominant compared to other themes emerging from the data. The research also assesses the extent to which different customer experience factors interplay with emotional complexity (i.e. emotional dialecticism and emotional differentiation) when they manifest in customer recounts of their experiences. The aim will be to illustrate the important extension of customer experience measurement beyond simple sentiment analysis and valence scoring introduced by previous systems and literature.



PhD Research



Co-creation in Living Labs

Katharina Greve

In today's customer-empowered world, co-creation capabilities are critical to the future growth of a company. Reaching beyond their own boundaries, companies aim to enhance internal innovation and expand their markets. An open approach to innovation requires the inclusion of more activities and actors than those of traditional innovation models. Living labs offer a new platform for companies to engage with customers in a process of co-creation to understand both existing and emerging user needs. In order to develop new products and services that better meet these wants and needs, it is crucial to identify elements that facilitate co-creation in living labs. However, understanding multiple stakeholders in the co-creation process in living labs is complex due to their diverse interests. Thus, the objective of this doctoral research is to explore and analyse factors that are critical to the facilitation of co-creation in living labs by integrating findings derived from existing literature with primary data collected with managers and researchers of a living lab called JOSEPHS® as well as companies and co-creators. This study therefore not only attempts to bridge the gap between research and practice, but also does so considering the perspective of diverse stakeholders. This doctoral research is sponsored by EPSRC.

Read paper at: <http://bit.ly/28QdCdy>

Watch webinar at: <http://bit.ly/28MPPwd>

Listen to podcast at: <http://bit.ly/2klmeJ6>

Warranty Data Analytics

Tim Pearce

Warranty claims are a major cost to manufacturers, at around 2% of revenue. Keeping control of these costs is important for companies and yet far from simple – they require accurate forecasting systems, the ability to detect emerging patterns in claims, ensuring that optimal policy terms are being offered on their products. The focus of warranty research has traditionally been the development of high-level statistical models. In the age of big data, there is the potential to perform more granular analyses, integrating new data sources such as that captured by sensors on board products. Tim's research applies data science and machine-learning techniques to advance the state-of-the-art in warranty data analysis. Specifically, he is looking to create algorithms to facilitate and enhance claim analysts' work (including analysis of textual data); also to integrate new data sources into the forecasting process, and to individualise warranty terms based on product usage patterns.



Through-Life Accountability: Managing Complex Services

Chara Makri

The objective of this research is to investigate how an understanding of through-life accountability can improve safety by examining the human and organisational factors that can lead to failures and, in turn, accidents within a service environment. Chara is interested in engaging with researchers and practitioners in order to understand more about why these failures happen and how they can be prevented. The ultimate goal is to equip servitized manufacturers with a unique tool in order to face such challenges and support them in the challenging path towards the services of the future. This research is conducted in partnership with BAE Systems and is sponsored by EPSRC.

Read paper at: <http://bit.ly/july16paperCM>
Watch webinar at: <http://bit.ly/oct16webinar>
Listen to podcast at: <http://bit.ly/Nov16podcastCM>



Supplying Innovation – Unlocking Innovative Behaviours in the Supply Chain

Jingchen Hou, Keith Wishart, Jonathan Baker-Brian and Claire Vine

Engaging multiple suppliers to form an alliance to deliver outcome-based agreements is a novel approach to encourage suppliers to innovate and to provide exceptional customer outcomes. This White Paper, conducted with IBM, outlines how supply chains with numerous partners can build alliances to bring about new innovations for firms. Trust and collaboration are key words to enable these innovative behaviours to thrive and prosper and all the partners need to be included. *Supplying Innovation, unlocking innovative behaviours in the supply chain* is co-authored by Jingchen Hou, with three senior IBM managers, Keith Wishart, Jonathan Baker-Brian and Claire Vine, and challenges the conventional concept that innovation comes from within a company.

Read the White Paper at: <http://bit.ly/28QfnYh>
Listen to podcast at: <http://bit.ly/28P6nCb>
Watch webinar at: <http://bit.ly/28QfCCD>
Read blog at: <http://bit.ly/28OEBIm>



Multi-sided Platforms: The Adoption and Discussion Process

Xia Han

Multi-sided platforms have had a great impact on the business paradigm. Uber, Airbnb, and Alibaba are among the biggest players in their respective industries. However, they do not own or produce the products and services. These companies merely match consumers and suppliers. Xia Han currently studies the adoption and diffusion process of such platforms, which is critical for the platforms' survival and success. The current body of literature predominantly provides economic explanations, such as transaction cost and first-mover advantages, which have been proven inadequate in many cases. He proposes a theoretical framework, which views user adoption of platforms as a process of 'legitimacy seeking' as a result of institutional pressures arising from user communities. Xia Han has been conducting multiple case studies on a diverse range of industries from automotive to finance and technologies to test and improve the framework. This research provides a pioneering perspective for both industry and academics to better understand the dynamics of the platform businesses.

Read paper: <http://bit.ly/junepaper16XH>



Engagement

In order to maximise the impact of our research, we seek to engage not only with our industrial partners, but also with the wider business and academic communities and with policy-makers. These are just some of the things we have been doing to engage these audiences.

Published Material

The Alliance is committed to providing accessible output from its research and collaboration activities. The material produced varies from monthly releases of academic papers to executive briefings, case studies, blogs and conference papers. In addition, there is a steady stream of multi-media outputs, which are becoming ever more popular, including webinars, podcasts and videos. These provide further clarification and dissemination to academic and industrial audiences. A list of the papers produced and the available podcasts and webinars is available later in this publication and they are available to download from the Alliance website.

Keeping in touch



The Alliance is keen to engage with academics and industrialists who are interested in the transition from products to services. There are several ways that have been developed to encourage interaction with the Alliance. Primarily, we have the website for the Alliance, which has continued to grow and now has numerous resources available for download. In addition, we have an active social media presence, including Twitter (@CamServAlliance) and a growing LinkedIn group. The web address for the Alliance is www.cambridgeservicealliance.org.

With quarterly newsletters we keep interested practitioners and academics up to date with the research and associated activities of the Alliance and its partners. We also encourage partner-specific relationship development, via dissemination of alliance materials and participation in events such as the webinar series and executive events.

If you would like to engage with the Alliance, please do get in touch at contact@cambridgeservicealliance.org

In the Media

The Alliance has been represented in various articles in the media over the year. This is an important avenue for disseminating the research and output from the collaborations undertaken with Alliance partners. Articles have included:

‘Britain suffering as politicians don’t get tech’

A report in the *Evening Standard* by Antony Hilton on the issue of the importance of technology in manufacturing today, which followed the industry day conference held during Cambridge Service Week.



‘Data-Driven Text Mining for CX Analytics in Services’

Mohamed Zaki and Benjamin Lucas wrote an article for the ServSig Community, based on research recently funded by a Marketing Science Institute (MSI), Customer Experience Initiative grant. The article was based on their project entitled: ‘CX Analytics: A Data-Driven Measurement System for Customer Experience and Emotional Complexity’.

Enabling the 4th Industrial Revolution – ‘Industry 4.0’ or the ‘Internet of things’?

An article by Andy Neely appeared in *Field Service News*, Issue 11, March/April 2016. In it Andy presented his thoughts on the explosion of discussions about industry 4.0, Internet plus, and the industrial Internet.





The need for servitization

In this video Dr Veronica Martinez explains that UK manufacturing companies often cannot compete on price alone, while product differentiation is getting more difficult and expensive. Veronica argues that services are the key to creating a more diversified business and to building stronger customer relationships. Veronica suggests that in future, the interaction of systems, processes and technology will provide a route to 'total solutions' for customers. Examples mentioned are miniaturisation to drive connectivity of services, and mass personalisation.

Watch video at: <http://bit.ly/28L3GRJ>

In an IfM video, Mohamed Zaki describes how big data can create value for companies. He identifies the key elements of the Data-Driven Business Model and explains the questions that large companies need to ask when creating their own data-driven business models. Watch video at: <http://bit.ly/28KP42X>



Teaching Taiwanese special interest group

Progressively, economies are placing a strong emphasis on learning how to increase their service growth, particularly in the industrial sectors. The Minister of Economic Affairs from Taiwan, Dr Chia-Juch Chang, highlighted the importance of service growth in the Taiwanese economy. The Taiwanese Department of Economic Affairs, with the support of the China Productivity Center, organised a special interest group of Taiwanese industrial firms to attend the Cambridge Service Design Programme.



EurOMA 2016 Conference – Alliance research presented

The 23rd EurOMA conference took place at the Norwegian University of Science and Technology (NTNU) in June 2016. Several papers were presented at the conference, including work on co-creation; services in a platform context; complex service contracts; and how manufacturers link advanced services and service expansion. In addition, Mohamed Zaki took part in a panel debate on redistributed manufacturing, while Andy Neely took part in a panel debate on 'Industry 4.0 – Creating Interactions Through Technology'.

ITEC Conference

Florian Urmetzer was invited by BAE Systems to present at this year's ITEC Conference. ITEC is the international forum for the military simulation, training and education community. He presented on 'Value and Innovation in Ecosystems'. This presentation described state-of-the-art research that enables managers to visualise the complexity of these service ecosystems through ecosystem mapping. Different avenues for the use of the ecosystem maps were explored, with a particular focus on how ecosystem maps are used to understand the complete value exchanged between organisations in the network.



Audio and Visual

We have been keen to continue to develop the audio and visual dissemination and engagement with both academic and industrial audiences, and so 2016 has seen the release of monthly webinars, as well as frequent podcast interviews and some video interviews. We hope that these media provide an easily accessible means of understanding the ongoing research being undertaken in a timely and engaging way. Below is a list of webinars and podcasts recorded this year. As part of this year's webinar series we held a number of webinars (marked below in orange), which focused on explaining some of the tools developed by the Alliance to date.

WEBINARS:

- * **Data Diagnostic Tool – Mohamed Zaki**
- * **Enterprise KPIs – Aligning Metrics Across Complex Service Networks – Prof Andy Neely**
- * **Mapping Ecosystems: Identifying Service Innovations Tool – Prof Andy Neely**
- * A Small-Scale Analysis of Health Service Stakeholder Networks: Insights from Social Media – Benjamin Lucas

WEBINAR AND PODCASTS:

- * Supplying Innovation – Unlocking Innovative Behaviours in the Supply Chain – Jingchen Hou and Keith Wishart
- * Critical Success Factors – Shift to Services – Dr Veronica Martinez
- * **Innovating Your Business Model: The Capability Assessment Tool – Prof Andy Neely**
- * Critical Incidents in Complex Service Contracts: Human Causes and Means of Prevention – Chara Makri
- * Feedback From the Frontline: Engaging Front-Line Employees in Service Innovation – Florian Urmetzer
- * Service in the Platform Context: A Review of the State of the Art – Xia Han
- * Facilitating Co-Creation in Living Labs – The Josephs Study – Katharina Greve

PODCASTS:

- * Importance of Academia to the Manufacturing Landscape, Manufacturing FM, by Andy Neely
- * Switching to Services in an Age of Digital Disruption, by Andy Neely
- * Service Week 2016
 - Scaling Up Your Service Business, by Veronica Martinez
 - Disruptive Service Business Models: Experiences and Lessons from Uber, by Fred Jones, Uber
 - IOT and Data Intelligence: Enabling Risk Management and Service Business Growth, by Per Sternqvist, Trackunit A/S
 - Design, Make and Service in a Digital World – A Siemens Perspective on Industry 4.0, by Brian Holliday, Siemens plc
 - Growing Your Service Business in an Age of Digital Disruption, by Andy Neely
 - Compilation Podcast of all speakers from the Industry Day Conference, compilation





The CSA has considered a number of the practical challenges that you would have encountered in servitizing your business, and, for companies like ours, which largely have a product they wish to sell but increasingly need to differentiate themselves through service, what the CSFs highlight is that you have to think about assessing your market and your internal readiness and create the right culture and structures. Then you have to ensure you have the resources to do it.

Brian Holliday, Siemens plc

Keynote at Cambridge Service Week Industry Conference, 2017



IET Award for Professor Andy Neely

Andy Neely was awarded the Viscount Nuffield Silver Medal for Services to Manufacturing by the IET (Institute of Engineering and Technology) Achievement Medal. IET Achievement Medals are awarded to individuals who have made major and distinguished contributions in the various sectors of science, engineering and technology. In Andy's citation the IET says 'Professor Andy Neely has been at the forefront of research on manufacturing industries for over 25 years. He is one of the most widely cited scholars in the world on two primary topics of research and has personally advised four governments. His work on servitisation - the tendency for manufacturing firms to sell services and solutions rather than products - has ensured long-term survival and success for many UK firms. His ideas on key performance indicators have influenced numerous organisations to rethink how they position themselves for long-term success, including their wider responsibilities to society.'

EuBC Research Award 2016

Florian Urmetzer was awarded the EuBC Research Award 2016. The European Business Circle (EuBC) is an international and independent non-profit association of entrepreneurs and distinguished personages from business, politics, academia and society. Its aim is to stimulate and promote entrepreneurialism, economic and political cooperation. The annual distinction rewards outstanding academic research on European economic and political issues. Florian was awarded for his research in the area of service business design and the shift to services of classical manufacturing companies.



Manchester Business School MBA guest speaker on Data-Driven Business Model

Mohamed Zaki was invited to speak to the MBA students at Manchester Business School on the future of Data-Driven Business Models and their implication for established organisations. In addition he presented the published *Case Study of Nettavisen Online Newspaper Publishing: A Transition Towards a Data-Driven Business Model (DDBM)*.

Former Mexican President visits the Alliance



Former President of Mexico, Vicente Fox, and his wife, Marta Sahagún de Fox, visited the IfM and researchers of the Alliance. They were interested in the research in the area of manufacturing and services, to understand future trends in the area to further Mexico's economy. They have multiple charities, including the Centro Fox, which is the first presidential library created by a Mexican president. The aims include the disadvantaged and poor, but also serve Mexico as a think tank.

Alliance research at CITEK16

Florian Urmetzer was invited by former President of Mexico, Vicente Fox, and his wife, Martha, to talk at the town hall meeting about his research on business ecosystems and value exchange at the CITEK16 conference. The CITEK is one of the largest conferences on technology and innovation in Central America, bringing together over a thousand participants from industry and politics.



Workshops

A number of workshops have been organised by Alliance members over the year, on subjects as wide ranging as customer experience, big data to re-distributed manufacturing. These provide an excellent opportunity to engage with other academics, as well as industrialists, to disseminate and progress ideas around servitization.

Re-distributed Manufacturing – EurOMA Workshop

Mohamed Zaki was one of the panellists in the Re-distributed Manufacturing Workshop, which was organised and hosted at the Euroma Conference 2016. Mohamed presented the impact of big data on re-distributed manufacturing (RDM). The workshop invited operation management scholars and practitioners to explore key issues affecting the realisation of RDM.

Customer Experience Management and Big Data Workshop

Mohamed Zaki was selected to join the Service and Customer Experience Measurement research teams of the Customer Experience Management (CEM) and Big Data workshop in January. This was organised by The Customer Management Leadership Group (CMLG) at Alliance Manchester Business School (Alliance MBS), University of Manchester, UK. The two-day invitational workshop enabled academics to work with companies and academics across disciplines in order to tackle topics identified by companies working in services and the facilities outsourcing, transport, retail, banking and manufacturing sectors.



Manufacturing Analytics Workshop

Mohamed Zaki, Philip Woodall and Andy Neely ran a workshop on Manufacturing Analytics: The Role of Big Data in the Future of Manufacturing. Representatives from a range of UK manufacturing and technology sectors (SME and established companies), research councils and academics attended. The speakers included Professor Boris Otta, Franhoufer Institute, and Daniel Keely, Cisco, as well as Professor Andy Neely and Dr Mohamed Zaki from the Alliance.



Co-Creation Workshop at JOSEPHS®

Professor Andy Neely, Dr Veronica Martinez, Professor Kathrin Moeslein, Julia Jonas and Katharina Greve launched two workshops in the JOSEPHS® Living Lab in Nuremberg, Germany, in February. In the first workshop the onsite JOSEPHS® Living Lab team, managers, researchers and coordinators participated. In the second one, firms that have been using the JOSEPHS® Living Lab participated and presented their co-creation experiences and best practices. During these workshops, we identified several elements and sub-components that facilitate co-creation at JOSEPHS®.

European Operations Management Service Forum

Andy Neely presented at and co-hosted the European Operations Management Service Forum in Nuremberg in December, providing an opening address on 'Service Innovation: Concepts, Platforms and Business Models'. At this forum Katharina Greve presented the structure of the co-creation literature through a systematic literature review and network analysis.



POMS College of Service Operations Mini-conference

Ornella Benedettini and colleague Liana Victorino from the University of Victoria (Canada), as Vice-Presidents of the POMS College of Service Operations (CSO), organised the 2016 POMS CSO Mini-conference. The theme was 'Experiential Service'. The programme featured presentations from Orlando Utilities Commission (OUC – The Reliable One), IBM, Hilton WorldWide and SeaWorld Parks & Entertainment, as well as a behind-the-scenes tour at the SeaWorld Orlando theme park. The Mini-conference was held in Orlando, Florida, the day before the Annual General POMS Conference.





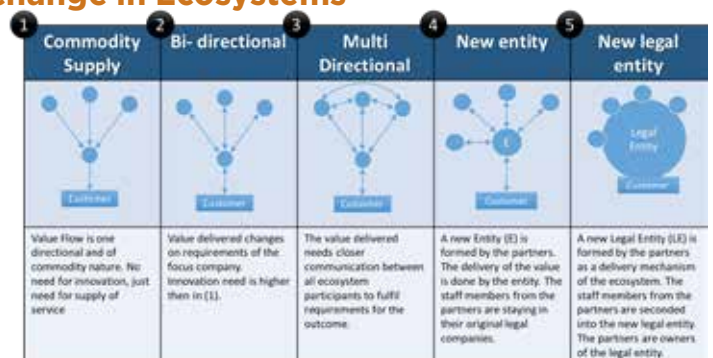
Community of Interest

The Cambridge Service Alliance brings together non-competing firms with a common interest in innovating their business models and making the shift to services and solutions. The Community of Interest (CoI) was established to provide an open forum where our partner firms can share experience and ideas, learning directly from one another. The meetings also provide an opportunity to update partners on the research work of the Alliance, as well as providing a valued opportunity for partners to networks with one another, and to participate in current thinking discussions. Topics covered for 2016 have included:



The Third Dimension of Value Exchange in Ecosystems

During the Community of Interest meeting in April 2016, the partners came together to discuss the third dimension of business ecosystems. We found that they differ in their type of partner connections and how the partner connections are operated (see the value view). It has to be acknowledged that all of the differentiations can be present within a wider business ecosystem. The work has been distributed among the partners and published at the P&OM World Congress 2016, Havana, Cuba.



Data Security and Privacy in Business to Business

Big data has many applications and will bring unprecedented opportunities, along with new risks, to business and society. Security and privacy concerns are among the risks that continue to pose an essential challenge for organisations. In addition, there is a tension between making the data widely accessible to an organisation's network and also ensuring data security. In the November 2016 Community of Interest meeting our industrial partners shared and discussed their thoughts on this important challenge. In particular, this discussion considered the legal, technology and business implications of these practices. The key lessons from this meeting were that firms should consider:

- Data privacy by design while firms develop data services and involve different stakeholders in the process (e.g. security, technology, customer, audit, legal, board)
- Risk recognition and building a mitigation strategy. Firms have to accept a percentage of risk because of the nature of uncertainty in this domain.
- Building internal programmes such as procedures, training using gamification solutions, awareness, documentation, robust contracts and notices.
- Developing a process for the GDPR and how to be compliant with its principles.
- Continuous learning from harmless incidents, which could make firms learn more about what is possible and what is not possible.
- New technology experimentation, such as blockchain and other technologies, could increase customers' trust in firms digital solutions.

2016 Cambridge Service Week

The digital twin concept is exciting, whether it is the product, the factory or the service you are offering.
Brian Holliday, Siemens plc

In October, the Alliance held its annual Cambridge Service Week, a series of events that brings together leading academics, industrialists and policy-makers to address the challenges facing service education, research, practice and policy.

Growing Your Service Business in an Age of Digital Disruption

This year the theme for Cambridge Service Week was focused on 'Growing Your Service Business in an Age of Digital Disruption'. Digital disruption, the Internet of Things and big data analytics all mean the rules of the game have changed. Firms are looking for new digitally enabled business models that deliver customised solutions in response. Whether it is smart health services, smart transport solutions or guaranteeing uptime, availability and output from complex equipment, the underlying themes are the same.

Speakers at Service Week 2016 – Industry Day Conference

'Design, Make and Service in a Digital World – A Siemens Perspective on Industry 4.0', Brian Holliday, Siemens plc.

Brian discussed the industrial digital transformation impacting design, manufacturing and service, as well as Industry 4.0, and the ideas it has introduced. Brian went on to discuss Siemens' digital factory concept and their journey to date, and how they are making data work better for their service organisation.



'Disruptive Service Business Models: Experiences and Lessons from Uber' Fred Jones, Uber.

Fred introduced Uber and the Uber business model. He focused on the importance of platforms and markets, and outlined the importance of creating a seamless customer experience and reducing barriers to entry. Fred also discussed the issues around scaling service businesses across multiple cities and geographies.

'IoT and Data Intelligence: Enabling Risk Management and Service Business Growth', Per Stjernqvist, Trackunit A/S.

Per introduced Trackunit and traceability solutions, giving details of how Trackunit minimises risk in leasing and operating businesses. He also discussed how Trackunit created and scaled their business model.



'Scaling up Your Service Business' Veronica Martinez and Andy Neely, Cambridge Service Alliance.

Veronica and Andy discussed the Alliance's research into scaling up services. They outlined the importance of scaling up services for your business, as well as challenging the types of exploration. They outlined the drivers for scaling up services and discussed the role of digital disruption in scaling up your services.

The pace of change we see is exploding, but we are seeing so many retrofit solutions. It will be a standard option that every machine that leaves the factory in the future will be fitted with Telematics and the costs will be low.
Per Stjernqvist, Trackunit A/S



Executive education

Making the Shift to Services Programme

The Service Design Programme: **Making the Shift to Services** is a University accredited two-day executive programme, which helps organisations understand how to make the successful transition to services and how to design or redesign services successfully. The programme is derived from the latest research from the Cambridge Service Alliance. The tutors have a highly engaging and interactive teaching style and have delivered workshops to a host of clients in the public and private, manufacturing and service sectors. At the end of this intensive programme, participants are well equipped with practical tools and techniques to start the shift to services in their organisations.



Topics include:

- Design thinking for service design.
- Understanding the ecosystem – raising your strategic horizons.
- Crafting the business model – focusing on your customer’s outcomes.
- Innovating the value delivery system – aligning resources and partners.
- Service emotion – identifying and managing the customer’s emotional journey.
- The role of big data in both optimising service delivery and designing better solutions.

Delegates learn how to:

- Design services that satisfy customers and create new revenue streams.
- Work with partners to deliver successful services.
- Change your organisational thinking to support service delivery.
- Use new technology and big data to develop innovative services and solutions.

In-company courses

We also tailor this course to a company’s particular needs and run a bespoke version for them in-house.

Contact: Florian Urmetzer
Email: flu20@cam.ac.uk



Feedback from previous participants:

Great overall process of understanding how to develop new business opportunities and understand the customer perspective.

The collaborative work created opportunities to learn different perspectives.

A key learning for me was how to take a structured approach to fleshing out and refining a new or existing service.



Programme leaders



Prof Andy Neely



Dr Florian Urmetzer



Dr Mohamed Zaki



Dr Veronica Martinez

Find out more about the programme here: <http://bit.ly/shift2services>

Communicating Alliance research

JANUARY

Executive Briefing: *Critical Success Factors in the Shift to Services*, by **Veronica Martinez, Andy Neely, Florian Urmetzer, Neil Allison, Monica Lund, Dav Bisessar, Thomas Bucklar, Stewart Leinster-Evans, Graham Pennington and Daniel Smith**

Blog: *Data Disruption and New Business Models*, CUP Blog piece, by **Mohamed Zaki**

Webinar: *Innovating Your Business Model: The Capability Assessment Tool*, by **Andy Neely**

Video: *Servitization*, IFM Video series, by **Veronica Martinez**

Video: *Career Profile Talk*, Cambridge University Press Education, by **Mohamed Zaki**

3 x Podcasts: *Seven Critical Success Factors in the Shift to Services*, by the **authors of the Executive Briefing**

FEBRUARY

Monthly paper: *A Small-scale Analysis of Health Service Stakeholder Networks: Insights from Social Media*, by **Jessica Wyllie, Benjamin Lucas, Brent Kitchens, Ben Kozary, Mohamed Zaki, and Jamie Carlson**

Webinar: *Critical Success Factors – Shift to Services*, by **Veronica Martinez**

Blog: *Enabling the 4th Industrial Revolution – 'Industrie 4.0' or the 'Internet of Things'?*, by **Andy Neely**

Podcast: *Importance of Academia to the Manufacturing Landscape, Manufacturing FM*, by **Andy Neely**

MAY

Monthly paper: *Facilitating Co-Creation in Living Labs: The JOSEPHS Study*, by **Katharina Greve, Veronica Martinez, Julia Jonas, Andy Neely and Kathrin Möslein**

Webinar: *Supplying Innovation – Unlocking Innovative Behaviours in the Supply Chain*, by **Jingchen Hou and Keith Wishart**

Conference: *The Contribution of Capabilities to the Service Orientation of Manufacturing Companies*, POMS Conference, Orlando, FL, by **Ornella Benedettini**

Conference: *The POMS CSO Mini-conference, on Experiential Services*, Orlando, FL, was organised by **Ornella Benedettini and Liana Victorino**

JUNE

Monthly Paper: *Service in the Platform Context: A Review of the State of the Art*, by **Xia Han, Veronica Martinez and Andy Neely**

Webinar: *Facilitating Co-Creation in Living Labs – The JOSEPHS Study*, by **Katharina Greve**

Talk: *Value and Innovation in Ecosystems*, at ITEC 2016, by **Florian Urmetzer**

Podcast: *More Services More Value for Manufacturing Firms*, by **Florian Urmetzer**

Conference: *Facilitating Co-creation in Living Labs: The JOSEPHS Study*, EurOMA Annual Conference, Trondheim, Norway, by **Katharina Greve, Veronica Martinez, Julia Jonas, Andy Neely and K Moselein**

SEPTEMBER

Executive Briefing: *Feedback from the Frontline: Engaging front-line employees in service innovation*, by **Florian Urmetzer, Stefan Titz, Veronica Martinez and Andy Neely**

Webinar: *Enterprise KPIs – Aligning Metrics Across Complex Service Networks*, by **Andy Neely**

Podcast: *Switching to Services in an Age of Digital Disruption*, by **Andy Neely**

Blog: *Looking at the Future of Business Models for Global Manufacturing Companies as They Make the Switch to Services in an Age of Digital Disruption*, by **Andy Neely**

OCTOBER

Monthly Paper: *The Fallacy of the Net Promoter Score: Customer Loyalty Predictive Model*, by **Mohamed Zaki, Dalia Kandeil, Andy Neely and Janet McColl-Kennedy**

Webinar: *Critical Incidents in Complex Service Contracts: Human Causes and Means of Prevention*, by **Chara Makri**

Podcasts: Service Week 2016

- *Scaling Up Your Service Business*, by **Veronica Martinez**

- *Disruptive Service Business Models: Experiences and Lessons from Uber*, by **Fred Jones, Uber**

- *IOT and Data Intelligence: Enabling Risk Management and Service Business Growth*, by **Per Sternqvist, Trackunit A/S**

- *Design, Make and Service in a Digital World – A Siemens Perspective on Industry 4.0*, by **Brian Holliday, Siemens plc**

- *Growing Your Service Business in an Age of Digital Disruption*, by **Andy Neely**

- *Compilation Podcast of all speakers from the Industry Day Conference, compilation*

2016 highlights

MARCH

Monthly papers: *Supplying Innovation – Unlocking Innovative Behaviours in the Supply Chain*, by **Jingchen Hou, Jonathan Baker-Brian, Claire Vine**

Webinar: *A Small-scale Analysis of Health Service Stakeholder Networks: Insights from Social Media*, by **Benjamin Lucas**

Blog: *Supplying Innovation: Unlocking Innovation in the Supply Chain*, by **Jingchen Hou**

Article: *Global Engineering Services: Shedding Light on Network Capabilities*, *Journal of Operations Management*, 42–43, March, pp. 80–94 by **Y Zhang, Mike Gregory and Andy Neely**

Podcast: *Supplying Innovation: Unlocking Innovative Behaviours in the Supply Chain*, by **Keith Wishart, IBM, and Jinchen Hou**

APRIL

Monthly paper: *Engineering Services: Unpacking Value Exchange*, by **Florian Urmetzer, Andy Neely, Veronica Martinez**

Webinar: *Mapping Ecosystems: Identifying Service Innovations Tool*, by **Andy Neely**

Col Meeting: *Ecosystems: Different Types of Ecosystems and Difference in Best Practice*, held in Cambridge

Blog: *Supplying Innovation, University Research Site*, by **Jinchen Hou**

Report: *The final report, RECODE Network Feasibility Study into Big Data Ecosystem in Re-distributed Manufacturing (RdM) Past & Future*, by **Mohamed Zaki, Matthias Friedrich Tepel, Babis Theodoulidis, Philip Shapira, Andy Neely**

Article: *Enabling the 4th Industrial Revolution, in Field Service News, Issue 11*, by **Andy Neely**

JULY

Monthly Paper: *Critical Incidents in Complex Service Contracts: Safety Challenges and Means of Prevention*, by **Chara Makri and Andy Neely**

Webinar: *Service in the Platform Context: A Review of the State of the Art*, by **Xia Han**

Podcast: *Service in the Platform Context: A Review of the State of the Art*, by **Xia Han**

AUGUST

Podcast: *Harnessing the Power of Innovation on Offer in Living Labs for Your Company*, by **Katharina Greve and Veronica Martinez**

Podcast: *Critical Incidents in Complex Service Contracts: Safety Challenges and Means of Prevention*, by **Chara Makri**

Blog: *Harnessing the power of innovation through living labs*, by **Katharina Greve**

NOVEMBER

Monthly Paper: *Classification of Noisy Data: An Approach Based on Genetic Algorithms and Voronoi Tessellation*, by **Abdul Rauf Khan, Henrik Schiøler, Torben Knudsen, Murat Kulahci and Mohamed Zaki**

Webinar: *Data Diagnostic Tool*, by **Mohamed Zaki**

DECEMBER

Monthly Paper: *The Ecosystem Value Framework: Supporting Managers to Understand Value Exchange between Core Businesses in Service Ecosystems*, by **Florian Urmetzer, Veronica Martinez and Andy Neely**

Webinar: *Feedback from the Frontline: Engaging Front-Line Employees in Service Innovation*, by **Florian Urmetzer**



2016 people



Left to right:
Professor Andy Neely,
Professor Michael
Barrett, Professor
Duncan McFarlane

Left to right:
Dr Chander Velu, Dr
Ornella Benedettini
Jacqueline Brown,
Katharina Greve



Left to right:
Xia Han, Ben Lucas,
Jingchen Hou, Ari Ji

Left to right:
Abdul Khan, Chara Makri,
Dr Veronica Martinez,
Professor Janet McColl-
Kennedy



Left to right:
Alexis Nicolay, Dr
Ajith Parlikad, Torsten
Steinbach, Tim Pearce

Left to right:
Dr Florian Urmetzer, Dr
Ivanka Visnjic Kastalli,
Angela Walters, Dr
Mohamed Zaki



2016 papers

Critical Success Factors in the Shift to Services, by Veronica Martinez, Andy Neely, Florian Urmetzer, Neil Allison, Monica Lund, Dav Bisessar, Thomas Bucklar, Stewart Leinster-Evans, Graham Pennington, and Daniel Smith – January Monthly Paper Series 2016.

A Small-scale Analysis of Health Service Stakeholder Networks: Insights from Social Media, by Jessica Wyllie, Benjamin Lucas, Brent Kitchens, Ben Kozary, Mohamed Zaki, and Jamie Carlson – February Monthly Paper Series 2016.

Supplying Innovation – Unlocking Innovative Behaviours in the Supply Chain, by Jingchen Hou, Jonathan Baker-Brian, and Claire Vine – March Monthly Paper Series 2016.

Global Engineering Services: Shedding Light on Network Capabilities, Journal of Operations Management, 42–43, March, pp. 80–94 by Y Zhang, Mike Gregory, and Andy Neely.

A Transition Towards a Data-Driven Business Model (DDBM): A Case Study of Nettavisen Online Newspaper Publishing, by Mohamed Zaki, Tor Bøe-Lillegraven and Andy Neely – Sage online Cases, Online Pub. Date: March 16, 2016.

Engineering Services: Unpacking Value Exchange, by Florian Urmetzer, Andy Neely, and Veronica Martinez – April Monthly Paper Series 2016.

The final report, RECODE Network Feasibility Study into Big Data Ecosystem in Re-distributed Manufacturing (RdM) Past & Future, by Mohamed Zaki, Matthias Friedrich Tepel, Babis Theodoulidis, Philip Shapira, Andy Neely.

Enabling the 4th Industrial Revolution, in Field Service News, Issue 11, by Andy Neely.

Facilitating co-creation in living labs: The JOSEPHS study, by Katharina Greve, Veronica Martinez, Julia Jonas, Andy Neely, and Kathrin Möslein – May Monthly Paper Series 2016.

The Contribution of Capabilities to the Service Orientation of Manufacturing Companies, by Ornella Benedettini – POMS Conference, 6-9 May 2016, Orlando, Florida.

Service in the Platform Context: A review of the state of the art by Xia Han, Veronica Martinez, and Andy Neely – June Monthly Paper Series 2016.

Critical Incidents in Complex Service Contracts: Safety Challenges and Means of Prevention, by Chara Makri and Andy Neely – July Monthly Paper Series 2016.

Feedback from the Frontline: Engaging Front-Line Employees in Service Innovation, by Florian Urmetzer, Stefan Titz, Veronica Martinez, and Andy Neely, Executive Briefing, September 2016.

Governing the City: Unleashing Value from the Business Ecosystem, by Ivanka Visnjic, Andrew Neely, Carmelo Cennamo, and Nikola Visnjic, 59/1 (Fall 2016): 109-140.

The Fallacy of the Net Promoter Score: Customer Loyalty Predictive Model, by Mohamed Zaki, Dalia Kandeil, Andy Neely, and Janet McColl-Kennedy – October Monthly Paper Series 2016.

Capturing Value From Big Data – a taxonomy of data-driven business models used by start-up firms, by Philipp Max Hartmann, Mohamed Zaki, Niels Feldmann, and Andy Neely (2016) International Journal of Operations & Production Management, Vol. 36 Iss: 10, pp.1382 - 1406.

Distributed manufacturing: scope, challenges and opportunities, by Jagjit Singh Srail, Mukesh Kumar, Gary Graham, Wendy Phillips, James Tooze, Simon Ford, Paul Beecher, Baldev Raj, Mike Gregory, Manoj Kumar Tiwari, B. Ravi, Andy Neely, Ravi Shankar, Fiona Charnley and Ashutosh Tiwari, International Journal of Production Research, published online 16 June 2016, pp 6917-6935.

The Ecosystem Value Framework: Supporting Managers to Understand Value Exchange between Core Businesses in Service Ecosystems. Florian Urmetzer, Andy Neely, Veronica Martinez. EurOMA 2016, 17-22 June 2016, Trondheim, Norway.

Business Ecosystems: Towards A Classification Model, by Florian Urmetzer, Andy Neely, and Veronica Martinez, 5th World POM Congress, Havana, Cuba. 2016.

Service-Transitioning Strategies: An Exploration of the Critical Success Factors, by Veronica Martinez, G. Granryd, and Andy Neely, 5th World POM Congress, Havana, Cuba. 2016.

How Much Does Manufacturing Depend on Access to the EU Single Market? by Andy Neely, and C. López-Gómez, Prospect Magazine, November 2016.

An Examination of Not-for-Profit Stakeholder Networks for Relationship Management: A Small-scale Analysis on Social Media, by Jessica Wyllie, Benjamin Lucas, Brent Kitchens, Ben Kozary, Mohamed Zaki, and Jamie Carlson (2016) PLOS One Journal, 11 (10).

Classification of Noisy Data: An Approach Based on Genetic Algorithms and Voronoi Tessellation, by Abdul Rauf Khan, Henrik Schiøler, Torben Knudsen, Murat Kulahci, and Mohamed Zaki - November Monthly Paper Series 2016.

The Ecosystem Value Framework: Supporting Managers to Understand Value Exchange between Core Businesses in Service Ecosystems, by Florian Urmetzer, Veronica Martinez, and Andy Neely – December Monthly Paper Series 2016.

Examining the influence of service additions on manufacturing firms bankruptcy likelihood, by Ornella Benedettini, Morgan Swink and Andy Neely – Industrial Marketing Management, Volume 60, January 2017, pp 112–125.

Innovating in Reverse Gear: Innovation Process of Outcome-Based Contracts, by M. Jovanovic, Ivanka Visnjic, and Andy Neely (2016) accepted for publication in International Journal of Production Research.



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