

Institution: University of Salford
Unit of Assessment: 17
<p>1. Unit context and structure, research and impact strategy</p> <p>Unit context and structure</p> <p>Research within the Salford Business School Research Centre (SBSRC) prioritises the external business environment, ensuring that the University makes significant contributions to wider society, fulfils its responsibilities to the civic community and builds an organisational culture that aims to deliver wider impact in all that it does. The body of business-related research developed at Salford over the past 30 years is characterised by stakeholder-focused studies, informed by social theories, critique and the development of frameworks for understanding complex organisational environments. This body of knowledge, combined with a conscious industry orientation, continues to underpin research in SBSRC. SBSRC research makes a major contribution to the research strategy of the University of Salford through addressing two of its five interdisciplinary research strengths: 'Industry 4.0' and 'Creative and Resilient Communities' and focuses on the critical examination of specific business functions and sectors with the aim of delivering outputs that can be directly applied within business.</p> <p>SBSRC researchers are grouped into two main themes (UoA17 submitted staff in bold; staff returned to other Units are <i>italicised</i>; leavers in plain text):</p> <p>(i) Digital (7.0 FTE) – Big data, analytics, disruptive technologies and business models (Alam, Chadwick, Dron, Fenton, Fletcher, Griffiths, Kane, Kreps, McEachern, McHale, Liu, Reeves, Rashid, Vik, Zhai): focused on the use of big data to drive digitalisation projects, business transformation, smart working and the achievement of Industry 4.0. This cluster uses expertise in models of digital transformation to implement innovative change in organisations leading to economic and social benefits.</p> <p>(ii) Business operations and governance (5.0 FTE) – project management, operational management and process optimisation (Chang, Darlington, Kitchen, Papanagnou, Polychronakis, Sahadev, Sandro, Scarf, Seiler, Sharifi, Udagedara) focusing upon benefits realisation and value generation. This cluster builds on expertise in agile and lean projects, project analytics, governance and legal and ethical questions.</p> <p>Research strategy and achievements 2014 – 2020</p> <p>By anticipating economic and societal innovation and responding to real-world developments, SBSRC has risen to the challenge of increasing digitalisation in all business activities. Our core focus has been the opportunities and implications for practice brought about by massive and ubiquitous digitalisation of business and the connected wider social impacts.</p> <p>SBSRC was established in 2015 to provide a focus to research within the School replacing a range of smaller, more loosely related centres. This led to the formation of our two clusters, with critical mass of staff to ensure the sustainability of our contributions. Specifically, within each cluster our research has focused on:</p> <p><i>Digital:</i></p> <ul style="list-style-type: none"> • <i>Digital Business</i>: the mechanisms, ubiquity and impact of digital transformation • <i>Social Business</i>: the increasing risks for social exclusion through digital poverty and the widespread need for digital literacy skills within the community • <i>Sports Business</i>: the rise of the app to engage fans and spectators combined with the use of data within professional sports to improve performance and outcomes

- *Marketing*: the pivotal importance of digital, mobile and social media technologies in shaping and leading all marketing and strategic business practices
- *Accounting & Finance*: the rise of FinTech, engaging with the cryptocurrency debate, and improving systems of financial regulation.

Business operations and governance:

- *Operational Research*: the increasing digitalisation of the supply chain including advances and innovations in logistics
- *People Management*: the expectation for digital literacy within the talent pool coupled with the use of technology for selection and staff development

Over this REF period the two clusters have successfully addressed the following objectives:

1. Continue to produce **excellent research that leads to innovations in business practice** through the development of close stakeholder partnerships that allow us to respond effectively to the needs of industry.

SBSRC has a long association of working with SMEs that underpins a broader vision for Salford Business School (SBS) to be firmly industry focused. We have been geared toward research questions around managing the impact of digitalisation in work and society, how digitalisation can improve the productivity of SMEs and the use of technology can empower workers in modern workplaces. Knowledge Transfer Partnerships (KTPs) have been used as a priority income source to facilitate work that addresses these questions, leading to £1.3m in awards (£800k Innovate UK funding and £511k contribution from the businesses receiving assistance).

Our focus on KTPs is integral to our ongoing impact strategy and has produced commercial and social benefits within businesses and organisations across a variety of sectors (REF3). SBSRC has successfully introduced strategic digital transformation to SMEs across the North West of England with 12 projects over the past ten years (7 within the REF period) (**Fenton, Fletcher, Griffiths, Kreps, Polychronakis, Scarf, Sharifi**). Collectively these transformations have implemented ethical and socially aware technology systems that have resulted in quantifiable gains to productivity and turnover. Undertaken using action-research approaches, this series of projects has informed numerous subsequent research outputs from **Fenton, Fletcher, Griffiths** and **Kane**.

2. Influence relevant **policy making** at national and international levels.

As presented in our REF3 submission, we have undertaken significant projects for the European Commission, who awarded our Community Finance Solutions (CFS) unit (**Vik** - returned to UoA25, and others) a contract in 2010 to draft the European Code of Good Conduct for Microcredit Provision. This prompted research through this REF period into self-regulatory frameworks in two areas: Operating standards for European Microfinance Initiatives and the role and effectiveness of self-regulation. CFS led the drafting of social performance standards (2016-17), which are now incorporated into the European Code as part of a 2018 revision and consultation. This project involved adopting and adapting relevant practices from international social performance frameworks through a series of practitioner roundtables. This was the first systematic analysis of the appropriateness of international microfinance standards in developed economies leading to substantial impact on practices within the European microfinance sector, individual microfinance institutions and their customers.

3. Produce creative research outputs and solutions that result in **socially conscious** and sustainable business practice.

We have undertaken several projects to address the question of *how can businesses improve and grow in ethical and sustainable ways?* MSBLeaders (2016-17, **Fletcher, Griffiths**) was a 12-month project that analysed the resource, technology and staffing challenges that mid-sized

companies uniquely face in contrast to micro, small or large enterprises. The final report was sponsored by Shoosmiths and was shared extensively through the network of the Greater Manchester Chamber of Commerce, as well as the Greater Manchester Combined Authority (GMCA) with the purpose of influencing regional policy.

‘Reputation Management’ (**Fletcher, Griffiths**) was an 18-month Knowledge Exchange Project. This developed a new in-house data analytics system that enabled the company to deliver an enhanced service provision in the area of online reputation analysis, quantification and management. The project gave the company complete control over its systems, the code base that delivered their services and the intellectual property of the materials they generated. This represented significant savings in annual licensing fees and enhanced the internal capacity to deliver new products with short lead times. Hydro-X, a specialist in water treatment services (**Fenton, Griffiths**) was a further project that developed the functionality of a customised open-source platform offering Health and Safety training, assisted the company’s digital transformation process and developed an organisational culture of intrapreneurship (REF3). The online training provision was highly successful and has led to City and Guilds accreditation of the courses.

Research and impact strategy 2020 – 2025

Vision: Salford Business School will be recognised as a thought leader in excellent, creative and critical business research and how it is applied to meet the digitalisation challenges of Industry 4.0 in a post-pandemic world.

Key Objectives: To support a vibrant and focused research culture that enables established researchers to excel; to nurture our early career researchers to develop; to attract rising stars and reward success. We are also committed to expanding our leadership early in the next REF period through strategic appointment of senior researchers. These objectives will be fulfilled with a conscious attention to diversity and inclusivity.

Building on the strong base for generating impact that was recognised in REF2014, future impact will be delivered through our industry collaboration activities. Through Research & Knowledge Exchange’s impact development framework, including development of annual impact action plans, researchers are supported to consider impact generation as part of the development of future projects. The School Impact Coordinator (**Sharifi**) will support and shape the direction of SBSRC’s impact priorities and guide staff to maximise social and economic benefit from all projects.

SBSRC’s future research will build on our strengths in data analytics, digital transformation, ethical consideration of technology, governance practices, human and technical resilience and smart working, as well as building on the achievements of the previous strategy. During the next REF period priority will be given to delivering more KTPs that build on the experience and knowledge generated previously. Our goal is to achieve eight new KTPs per annum by the end of 2026 and these projects will address the following areas, mindful of the difficulties many sectors face in responding to COVID-19 challenges over the short to medium term:

Digital:

- Identifying the desirable combinations of hard and soft skills required for successful strategic digital transformation
- The role of disruptive business models in enabling sustainable economic growth
- Solving contemporary business problems through the transformation of disparate data into actionable insight, knowledge and strategic decision-making
- Sustainable digitalisation of organisational processes and knowledge

Business operations and governance:

- The creation and application of ethical AI tools to business

- The planning of resilient, optimal and sustainable supply chains
- The identification of value generation opportunities and business use cases for new technologies
- Identifying the key social and people challenges within digital transformation processes

As part of the Campus Masterplan (see REF5a), major initiatives already in development will contribute to the expansion of SBSRC research over the next five years and ensure we achieve our research goals. Our £17.6m North of England Robotics Innovation Centre (NERIC), part-funded by ERDF, will create a centre of excellence where SMEs can access University expertise to create engineering and automation solutions. When open from 2022, this, together with a new Acoustics building (first phase of the Campus Masterplan, 2020-24), will provide opportunities for SBSRC to work together with the businesses supported by these facilities on industry 4.0 and enhancing productivity. Both developments will be part of a larger Innovation District: a new university-to-business interaction zone. At the heart of this will be the Collision building, which will house incubation units for start-ups and SMEs, and a VR/visioning centre. This will be a dedicated, physical space where researchers in business and management can work directly with industry partners.

Research integrity and open access

New staff and postgraduate researchers (PGRs) are given guidance on research integrity at induction and all staff are required to undertake online learning resources focused on research ethics, data management and open access. All staff and PGR research projects must be submitted for double-blind peer review to a Research Ethics Committee. No PGR student can progress in their studies if they have not attended the formal ethics training programme. Performance monitoring of research is undertaken 3 times a year with the School's Research and Enterprise Committee (SREC) which comprises the Associate Deans for Research and Innovation as well as Enterprise, the Director of Postgraduate Research (PGR), the cluster leads and a PGR student representative. The committee scrutinises PhD activities, including integrity of appointments for the conduct of vivas, completion pace and rates, the deposit of outputs in the institutional repository and goal setting for research activity over the next 3-4 months. Any shortfalls in conduct or process are tasked to a member of SREC for action, with the outcomes minuted and reported for the next meeting.

In line with our institutional strategy of creating a culture of open research to promote industry collaboration and real-world learning, the SBSRC research environment at Salford is committed to promoting and delivering an open research culture within and beyond the University. Via the Central University Library Open Research Team, SBSRC researchers have received and implemented training on: open access and its benefits, research data management best practice, routes to publication and how to publish outputs as open access resources, as well as targeted training and workshops on using Figshare (a University repository) to store, curate and publish data and related research materials. All submitted staff have an ORCID identifier and all outputs are deposited in the institutional repository within 3 months of their acceptance for publication.

SBSRC has made 467 outputs from research available on USIR during the census period. During this same period, outputs deposited in this REF period and from previous years have been downloaded 611,228 times. This number represents only one Research Centre at Salford yet exceeds download figures for 131 institutional repositories for other UK universities, according to JISC's Institutional Repository Usage Statistics UK (IRUS-UK).

2. People

Staffing strategy

Our staffing strategy focuses on appointing and developing new talent. We are returning 12 staff to the Unit, including 5 in senior roles (3 male; 2 female) and 7 at a Lecturer grade (5 male; 2 female). As a longer-term priority, we have identified a group of staff as Next Generation (NG)

researchers who will be supported through mentorship by established SRRs to develop research trajectories that align with institutional priorities and SBSRC strengths during the next REF cycle. Both SRR and NG scholars represent the research interests of the Business School on University committees.

We have recruited 10 scholars into SBSRC since 2013, including 3 lecturers who have taken up their first substantive academic posts (**Alam, Sandro, Udagedara**). All SRR staff are involved in the University-wide mentoring and training schemes outlined in REF5a. All SRR staff are on permanent contracts. This reflects our approach to staffing whereby new research lecturers are made permanent after 1 year of probation if they demonstrate sustained engagement with research.

Equality and diversity

An SBS Self-Assessment Team (SAT) and Athena SWAN lead were appointed in 2016 and we received the Bronze Award in 2019. **Griffiths** also contributed to enacting the University's Athena SWAN bronze action plan through chairing the Women in Research working group. The gender split of submitted staff, 4 female (31%) and 9 male, is reflected in the proportion of REF2 outputs attributed to women, at 27%, with the small discrepancy related to inclusion of outputs from leavers. We have been committed to supporting career progression for our staff during this REF period and, of the five promotions within the REF period, 80% were female: **Fenton** progressed from Technology Innovation Officer to Lecturer; **Griffiths**, Liu and McEachern moved from Senior Lecturer to Reader and Liu from Reader to Professor. We have good representation of staff from a BAME background within SBSRC and of the 13 members of staff being returned to REF2021, 5 identify as BAME (38%). Of all the researchers who have outputs that are being returned, 8 (38%) of these 21 identify as BAME. Commitment to the continued development of our early career researchers (ECRs) and all staff with protected characteristics remains a priority.

Our new three-year research plan process to standardise allocation of research workload and support staff career development, outlined in our REF2021 Code of Practice, involved discussion with staff on an individual basis where they disclosed that they had experienced difficulties progressing research activities due to health, caring responsibilities, or equality of opportunity that related to protected characteristics. These exchanges were then used to make reasonable adjustments for individual staff to ensure they are being appropriately supported to achieve their research goals.

Staff support and development

Formal career development mechanisms

Between 2014 and 2019 research workload was assessed locally through the heads of directorates (resource centres). From 2019, research-active academics could access this resource through completing a three-year research plan after consulting with research group colleagues. This informs decisions about research workload, training and development needs and eligibility for submission to REF. Research workloads are set in line with the outcome from the assessment of the three-year plan, with a minimum of 20 workload units for staff with 'significant responsibility for research' as described in our REF2021 Code of Practice. Three-year plans are reviewed through discussion with an individual's line manager as part of the University's annual Performance and Career Conversation. Line managers have a responsibility to ensure that research allocations are treated equitably with other duties by not having researchers' workload exceed the overall School workload median by 10 points (approximately 8% of total workload).

Evidence of effective support for career progression

This is evidenced by our pipeline of ECRs, both postgraduate research students and KTP Associates who have progressed to academic roles within SBSRC, benefitting from our collegial and developmental approach. **Griffiths'** journey at Salford has been exemplary. After taking a BSc Business Information Systems at Salford she was appointed as a KTP Associate. This work was then followed with an EPSRC Research Fellow on Gender and IT during which she gained her

PhD in 2007. After this role she was appointed as a Lecturer, promoted to Senior Lecturer and then to Reader. She is now the SBS Postgraduate Research Director and has a track record of over 50 publications. **Fletcher** was appointed Lecturer in the former Information Systems Institute, promoted to Senior Lecturer and is now Director of a Directorate within the SBS Senior Leadership Team. **Fenton** worked for a University spin-out company, EDInteractive, and was subsequently appointed as the School's Technical Innovation Officer before then being promoted to Lecturer in Digital Business and subsequently undertaking and completing a PhD within the Sports Business group.

We support KTP Associates to progress into careers in industry, for example, Associates have undertaken further postgraduate study (Blaynee, Sigma KTP; Hornby, Pennine Telecom KTP) or progressed on to a Lectureship elsewhere (Muirhead, The Foundry KTP). Bankole, an MSc Information Systems Management student, was employed as a Knowledge Exchange Partnership Affiliate for Hydro-X and another (McCourt, Tameside Council KTP) is now a Non-Executive Director for Salix Homes. Other Associates have remained and progressed into more senior roles within their company (Hackett, FastWebMedia KTP).

Early career researcher development

We provide support and resources that enable these new researchers to maximise their opportunities to deliver high-quality outputs and to attract suitable research income. Targeted support through the University KTP & Partnerships Office and a School Enterprise and Engagement Office also supports our active researchers to undertake industry collaboration activities. Our ECRs receive an internal mentor and have access to the expertise of our honorary industry fellows and Industry Advisory Board. This portfolio of support echoes the industry focus of our overarching strategy. All staff are encouraged early on to develop and maintain links with companies seeking opportunities for new funded projects. The School facilitates a collaborative research culture across its clusters, between research-active staff and external partners, encouraging cross-disciplinary fertilisation of ideas for co-authoring and joint bidding activities.

Mentoring

In addition to informal mentoring there are 2 separate but complementary mentoring programmes. Within SBSRC, we match experienced researchers with early career researchers to support and develop research, collaborations, outputs and impact. Through the University-wide programme, new researchers also receive support as part of a network that offers further development guidance and advice. One example of this process in action is **Papanagnou** who has acted as a mentor to Andreas Seiler. Dr Seiler is a software architect and data analyst at TRUMPF GmbH and a Visiting Research Fellow at the University of Salford. Dr Seiler has represented the School at a range of reputable conferences, has published several articles and has provided expertise for the analysis of very large datasets in the programming language, R.

Staff development opportunities and resources

The development of research-active staff is a key strategic goal of the University. The goal is delivered through the Salford Early to Experienced Career Research & Enterprise Training (SECRET) programme and is part of the core business of the Schools of the University in which SBSRC researchers undertake their work. This is complemented at School level by investment in networking opportunities with peers and leading researchers. Developmental opportunities at a local level include training in research methods (including data analytics), writing workshops, funded proposal writing, publishing high-quality outputs and disseminating them effectively, developing impact, obtaining research ethics and PGR supervision practice. We support staff in their bidding activity and in the management of funded projects, with a range of training workshops. These are provided centrally across the institution and in more tailored sessions aimed at the School with a centrally located KTP support team which has a reputation for developing KTPs from initial idea, through application, to successful realisation and project completion.

Over the REF period, £185k of QR has been spent on supporting staff with conference attendance to develop the reputation of our scholars and ensure they are able to network globally with their

respective research communities. **Fenton** attended the Social Media and Society conference in Toronto, Canada, which then saw him join the conference committee; in 2019, **Griffiths** hosted a workshop in Sweden on Surveillance in the Digital Society and also attended the European Conference for Information Systems (ECIS) in Portsmouth 2018 to chair a UK Academy for Information Systems (UKAIS) workshop.

In total, SBSRC scholars have been supported 174 times with internal funding. This has included engagement with leading scholarly bodies such as the British Academy of Management, the American Marketing Association, UKAIS, ECIS, the European Society of International Law and the European Association Sport Management. To ensure the greatest possible impact from conference attendance, financial support is only available to scholars presenting a paper. A further £14k has been provided to support staff and students with their specialist software needs, with the purchase of applications such as Mplus, OIMDEA, Smart PLS, Sublime Text and MindJet.

In keeping with our industry collaboration focus, internal funding, scholar development and the infrastructural input of professional colleagues have also supported smaller knowledge exchange projects, helping to increase staff engagement with companies in the region. For example, **Fenton** and **Griffiths** developed a Health and Safety training platform for the water treatments sector with Hydro-X.

PGR community support and development

The enhanced strength of the community is demonstrated by an increase in successful completions from 80 reported in REF2014 to 151 at the end of the current census period. The cohort of completers in this period is made up of 59 international and 55 home students, with 42 female and 62 male. We currently have (in 2019/20) 114 PGRs from 14 countries, testifying to a continuing diversity in our postgraduate community.

Supervision and Support:

- The University-wide Doctoral School is the heart and hub for our PGRs and provides the support structure of dedicated administrators, research developers and the governance of regulatory processes
- To ensure quality and to build capacity, lead supervisors work in a co-supervisory capacity with less experienced supervisors
- All PGR students complete their doctoral studies under the University regulatory framework for progression, with 2 formal progression points and a Learning Agreement, completed with their supervisors within 3 months of registration
- PGR feedback forums, chaired by the PGR Director (**Griffiths**), are held 3 times a year ensuring that the voice of the community is recognised and responded to
- The PGR space, renovated in 2020, is a physical hub for our research students, with several dedicated PCs for those with specialised software needs. From 2014 personal laptops have been available.

Training:

- The University-wide Salford Postgraduate Research Training (SPoRT) programme for PGRs is comprehensive, multi-disciplinary and varied. Specialised training provision is delivered by SBSRC researchers who also contribute to the SPoRT provision
- The School has hosted annual PGR symposia for the dissemination of research
- Students are supported to attend specialist training offered by other institutions. For example, Bello attended the University of Central Lancashire's International Crime & Intelligence Analysis training
- Between 2015 and 2018, an internal Pathways to Excellence Scheme used QR to provide bursaries to 15 students working within in a strategic priority area
- **Sandro** sits on the Academic Management Committee as the Law Representative

- The School was a member of the Northern Advanced Research Training Initiative (NARTI) from 2013-2019 that provided specialist advanced doctoral training.

Development:

- SBSRC Seminar Series is a fortnightly research seminar where a scholar and a PGR present their work. This culture of collaboration has featured in different guises throughout the census period with PGRs being offered a 'safe stage' to present their work to a supportive audience
- During this period PGRs have been supported 134 times with travel and conference fees for attendance at national and international conferences through total expenditure of £43k. Examples of this are: Oluwadebi (Amsterdam); Creswell, Mawer, Odiaka, Poor-Rezaei, Xu and Yusup (BAM); Oginni (CIPD); Adewolu, Bello, Dron, Kair, Laryeafio, Muirhead and Yusup (UKAIS). Adewolu won Best Paper at the UKAIS conference and Bello published a book chapter as a result of the Cybercrime conference.
- SBSRC organises a Three Minute Thesis (3MT) competition and winners Bello (2018) and Oginni (2020) were entered into the 3MT national events organised by Vitae.

Many PGRs have subsequently entered Lectureships: for example, Adewolu - Lecturer (Manchester Metropolitan University), Adoo-Anderson - Lecturer in Management, Earle - Lecturer in Management, Harvey - Lecturer in Strategy, Imran Khan - Senior Lecturer in Marketing (University of Wolverhampton), Iredale - Lecturer in Digital Marketing (Manchester Metropolitan University), Laryeafio - Lecturer (University of Professional Studies, Ghana), Mtonga - Lecturer in Marketing, Muirhead - Lecturer in Computer Science (Glyndwr University) and Ogundele - Lecturer in Accounting.

3. Income, infrastructure and facilities

Income strategy

Our income generation strategy throughout the period has focused on collaboration with industry. This action-research approach to understanding issues of productivity and readiness to engage the development of Industry 4.0 amongst SMEs has enabled us to discover how best to work with companies and to offer the support they most need. This work has enabled us to author publications highlighting the strategies, socio-technical issues and realities faced by SMEs during this period of digital transformation, whilst at the same delivering tangible beneficial impact to individual stakeholders.

Initiatives such as the KTP projects have been at the forefront, alongside European projects aimed at innovation, including both European collaborations and European Regional Development Fund partnerships. Income generation has thus been targeted at funding engagement with our city-region's SMEs and in the SME sector across Europe. This underpins our broader vision to be an industry-focused Business School. During this time, our work has evolved with the realisation of Industry 4.0 as a viable business perspective and our strategy for the coming years reflects this.

We have led or been a part of 25 projects with total income to Salford of £389k. Over the current REF period, SBSRC scholars have contributed to 7 KTPs representing an award total of £1.31m including £511k of company contribution, and an EU-funded project (representing £3.2m in awards with £60k to Salford).

Knowledge Transfer Projects (KTPs)

Projects utilising the KTP initiative have achieved substantial success for local companies. FastWebMedia was helped to develop an integrated metrics collation and reporting tool that spans multiple media channels (£121k, **Fletcher**); Pennine Telecom harnessed innovative approaches for its cross-channel sales and marketing to deliver a seamless approach to engaging clients through their preferred channels (£119k, **Griffiths, Rashid**). Consequently, FastWebMedia were

able to develop new products including an automated television monitoring service that integrates with monitoring social media activities, while Pennine Telecom became influencers in the sector, resulting in group sales rising from £9.5m to £13.8m in the year following completion of the KTP. The 30-year history of research on socio-technical systems consolidated within SBSRC was harnessed to help Tameside Metropolitan Borough Council understand the community aspects and challenges encountered by local government in their management of public housing stock (£119k, **Griffiths**). This KTP was ranked 'outstanding' by Innovate UK. The transformational benefits of the partnership are evidenced by the fact that the work subsequently informed the articulation of an empty-homes policy resulting in 70 empty homes returning to the housing pool in the borough and generating £400k in New Homes Bonus (NHB). Across the Greater Manchester region, the KTP has supported 541 homes being returned into use, equivalent to £3.7m in NHB across the ten local authority districts.

SBSRC scholars' expertise in socio-technological understanding has underpinned a values-driven approach to digital innovation in the companies we have collaborated with. Sigma UK signed and adopted the inclusion-focused UK Digital Charter during the course of a project with us (£122k, **Griffiths, Kreps**) and was subsequently able to secure a £150k 2-year contract with the BBC. The project also assisted Sigma in establishing a new User Experience Competency Centre for AstraZeneca as a direct result of the company's work with the team. Our project with H&H Reeds Printers (£65k, **Fletcher, Griffiths**) focused on embedding ecommerce capabilities and a new business model into a very traditional and specialised print business.

This work continues, with KTPs already awarded and ready to start after July 2020 to bring digital transformation expertise to the goods vehicle sector (GVL, £142k) and project management expertise to the construction sector (PLP Construction, £155k).

European networks and projects

Our engagement with EU funding schemes and the ERDF over the period has focused on our industry collaboration strategy and the practical digitalisation of business functions. Building on initial engagement with the original Passport to Trade project, researchers worked with business leaders to continue the partnership into Passport to Trade 2.0 (2011-October 2013, £262k, **Fenton, Heinze**). This collaboration developed international business culture guides including documentation of the varying social media practices in different European countries. The project's broad impact is ongoing with the online resources and guides still attracting between 1 million and 1.5 million visitors to the project website each month.

Industry collaboration was likewise the aim of the online matchmaking platform developed by the Universities and Companies Crowdsourcing (UCCrowd) project (€120k, **Fletcher, Heinze, Kreps**). The project developed a platform for companies and universities to come together in ways that would enable students to access real business problems and projects. Providing knowledge exchange for digital transformation is also the target of the CyberFoundry project, a collaborative project with regional universities delivering workshops and targeted technical support to SMEs across the region (ERDF, £518k, **Griffiths**).

Scarf was part of 'Sustainable Manufacturing through Advanced Robotics Training in Europe (SMART-E)' (FP-7, £3m, £60k to Scarf). This was led by Salford's Autonomous Systems and Robotics (ASAR) group in collaboration with scholars from the Italian Institute of Technology and Technical University of Munich and with industry collaborators AGCO (Germany) and Airbus (United Kingdom). The project developed solutions for applications in robotics and intelligent automation for sustainable manufacturing including development of business and leadership skills for researchers and a doctoral training programme. Since the project concluded in 2017, the work has produced 43 publications.

Other collaborative projects

Industry collaboration projects using internal funds matched with company contributions have included two Knowledge eXchange Partnerships. One with Reputation Consultancy (£36k, 2018-19, **Fletcher, Griffiths**) developed a new data gathering and analysis tool to examine the online reputation of a company or individual. Another took place with Hydro-X (£36k, **Fenton, Griffiths, Heinze**) which focuses on the pivoting of the company's business model towards online education services.

Expertise in the Sports Business group has been nurtured through internal funding that has more recently been augmented by external awards. The University has internally funded the development and growth of an eHealth project through 3 pots of support (£12k, £10k and £12k respectively) to build the 'Fan Fit' app and undertake the associated underlying research (**Fenton**). This seeding resulted in the roll-out of a completed version of the app for a local rugby team, the Salford Red Devils. Following the success of this first version of the technology, **Fenton** secured external funding (£30k) from the NESTA Healthier Lives Data fund in 2019 for a 12-month project to create a fitness app for Glasgow Rangers FC fans and associated research. This work was boosted in 2020 with a further £5k from NESTA COVID-19 funds to produce additional content.

The Word of Mouth Mammogram e-network or WoMMen project (College of Radiographers Industrial Partnership Scheme, £10k, **Griffiths**) is an example of cross-disciplinary working within UoS. A multi-disciplinary team was established with the School of Health and Society, radiographers and practitioners and SBSRC scholars. Typically, breast-screening is associated with high patient anxiety related to expectations of pain and fear that can result in non-attendance. The project developed a digital platform to enable women to share experiences of breast-screening mammography to improve attendance rates and delivered social media awareness workshops with radiographers across England.

Finally, there have been several smaller grants for micro, pilot and developmental projects working in conjunction with organisational partners including a Social Business project, 'Social Supermarkets: Unlocking the social value of UK Food Retailing' (£3k, McEachern) and a FinTech project with the South Manchester Credit Union (£7k, **Zhai**).

Infrastructure and facilities

Ongoing engagement with SMEs and digital transformation has included a number of investments in the School environment that have physically housed this work and supported wider engagement with the local business community.

In February 2015, the Regional Scholarship and Innovation Fund (RSIF) awarded SBSRC scholars £58k for the Pop-up Research Unit (**Fenton, Fletcher, Griffiths, Papanagnou, Polychronakis**). This investment was a combination of funding for equipment and teaching buy-out for scholars. The Unit was a mobile setup that could be erected in internal atria or at exhibitions. The pop-up was used at MediaCityUK to promote SBSRC research. It was also set up in the foyer of the Co-Op's Manchester headquarters and at an exhibition relating to digital skills held in the Manchester One exhibition hall. The funding also enabled the purchase of equipment, such as resin-based 3d printers, Raspberry Pis, location beacons, 3d digitisers and drones; all of which could be showcased through the Pop-Up and used in other settings to generate discussions around the potential uses of these within business. The primary purpose was to actively experiment with these technologies and to develop clear business use cases for their deployment within SMEs. This work led to the establishment of CodeUp Salford (**Griffiths**), a free adult coding club that brings together professionals and private individuals with an interest in coding, no matter their level of skill. The work around location beacons forked into a wider development partnership with a Manchester-based development agency, Desap Systems Solutions.

SBS staff are located in the Maxwell Building on Salford's main Peel Park Campus. In May 2018, the School embarked on a larger internally funded £393k project to redevelop the 7th floor of the

Maxwell Building as a Digital Business Lab and Innovation Space. This programme of works redesigned the landing area of the building as a front-facing physical space for all of the School's research activities. This work included the full renovation of six rooms, including the outfitting of one as a fully equipped recording studio. As intended, the space has since had multiple uses, including workshops for generating new paper ideas, a meeting space for engaging with businesses, live streaming remote conference presentations from the studio and as a flexible working space for both established and early career researchers.

Learning from both the Pop-Up Research Unit and the Digital Business Lab was subsequently applied to developing a Digital Transformation Clinic. The Clinic's establishment was supported by internal funding that enabled time release of academics as well as providing for the fractional appointment of a research assistant/project manager. The Clinic's purpose is to offer its services freely to regional SMEs to evaluate their current digital maturity and preparedness, as well as to enable collaborative horizon scanning for new opportunities. By building these SME partnerships the School expects to generate further impact through KTPs and other types of industry collaboration. The work of the Digital Transformation Clinic will, over the short-term, further expand into the makings of a wider Business Clinic, underscoring the School's continued commitment to industry collaboration, and focused on the interests connected with each of the Research Clusters. This business clinic will also work on a largely pro bono basis with the value being realised through academic outputs and an increase in KTP project proposals and income.

4. Collaboration and contribution to the research base, economy and society

Evidence of successful engagement with industry

A particularly strong example of how industry collaboration has shaped SBSRC research over the period is engagement with the multinational firm, Brother. A focus on novel forecasting methodologies and approaches in different industrial contexts has helped to initiate a change programme in the company. Over the period, **Polychronakis** and Syntetos have addressed 4 aspects of forecasting as well as the specific interactions between judgemental and statistical forecasts, namely demand forecasting, statistical forecasting, judgemental forecasting and forecasting for projects. Work with the company focused on the impact of judgement on statistical forecasts and scrutinised the relative performance of judgemental methods in project environments.

Polychronakis is also the Lead Academic Member of the Expert Guidance Group (EGG), providing guidance on Programme and Project Management (PPM) for the public sector in the UK. Over 200 PPM professionals are involved in the North West PPM improvement programme, Right Track North West. This is helping local governments address high failure levels in projects and programmes, low capacity, governance issues and costs.

Papanagnou has been part of a project consortium with Bosch Rexroth (a key partner of SBSRC) and Siemens relating to Industry 4.0. 'Sports marketing using social media' employed research conducted using a series of network analyses of large Twitter datasets generated during the 2018 UEFA Champions League and the FIFA World Cup to study who was leading or even hijacking conversations on social media. A separate study, 'Big data in supply chains' used confirmatory factorial analysis and structural equation modelling to study aspects of UK grocery retailing. **Papanagnou** was also an Advisory member for the European Commission Technical Working Group on best environmental management practices in the car manufacturing sector.

The School has a presence on the Northern Consortium UK (NCUK) Digital Transformation strategy board (2019-20, **Fletcher**) supporting its ambitious and comprehensive change programme. This presence supports the digitalisation of the consortium's offering and improvement in its underlying business drawing upon **Fletcher's** knowledge of transformation processes and KTP experience. Quick wins for the project have included savings from the retiring of legacy systems and the integration of business systems.

The School engages with businesses on multiple levels, from a strategic perspective to the level of specific process improvements. Business engagement features in all our activities. One way this happens is through our industry fellows programme, which provides a structured means for the School to engage with external partners. This programme has been in place since 2015 and examples of current fellows include: Tim Griggs, Associate Director from ARUP Group, Justin Bentham from the Salford City Council executive, Naomi Timperley, a Tech North Advocate, Emma Sheldon MBE, from the Growth Company, serial entrepreneur Vikas Shah MBE, MD of the Swiscot Group and Graham Howieson, a pharmaceutical innovator. Previous partners of note include the 'Class of '92' footballing partnership, which supported growth in our Sports Business group over a number of years, as well as fostering internships, placements and research. The work culminated in a formal partnership in 2014 and sports commentator Gary Neville was awarded an honorary Doctorate by the University in the same year. More recently, Leeds United Football Club have established a partnership with the School to collaborate on the development of sports business programmes. A similar partnership with Visionary Sport Investment (VSI) has brought prominent sportspeople such as Beth Tweddle MBE (gymnastics), Lawrie Sanchez (football) and Matthew Hoggard (cricket) to the University as they start a new career journey developing their own business careers.

Further evidence of our partnerships within the Sports Business group can be seen through the creation and development of the Sports Analytics Machine (SAM) over the past 15 years (McHale). SAM is a forecasting model for football that can be used to predict the scores and results of Premiership matches. SAM uses results data, in-game events data and scouting data for each player and from 2016 has been used by the BBC for its televised match previews and on the BBC Sports website. SAM has been used to successfully predict outcomes of every Premier League match at a more accurate rate than the football pundits' guesses.

Contribution to the sustainability of the discipline

Conference organisation

Our industry collaborations have been paralleled with academic collaborations through a string of conferences hosted at Salford, often including representation from local industry, particularly from partner SMEs. SBSRC researchers have also engaged with international and national research bodies throughout the period.

Our flagship annual event, *Creative Entrepreneur* (Dron, **Fenton**, Scarf) has run every year throughout the REF period, hosting a wide range of academic and industry partners, for talks, workshops, demonstrations and networking opportunities. Companies such as ASDA, Manchester City Football Club, Magnetic North, MEC, WebAppsUK, The National Football Museum and SMEs including Found, Sigma UK and Two Circles have given presentations over the years, as well as academics from the Universities of Sheffield, Newcastle, Coventry and Imperial College, London. The team started a national innovation competition called *Innovating Future Business*, which was subsequently adopted by the University Alliance affinity group in 2017. The scholars have since published related journal papers on 'Events 4.0'.

Engagement in the organisation of conferences has exemplified our strengths across SBSRC. **Sharifi** hosted an ESRC seminar series on home working and the use of technology. Focusing on 'Home based teleworking in the European labour market' **Sharifi** and a consortium including colleagues from Sheffield Hallam University, Radboud Universiteit, Nijmegen, Uppsala Universitet and the University of Birmingham received an ESRC grant to run seminars involving guest speakers and representation from industry. **Zhai** organised a research workshop on Green Factor, Self-Accounting and AI in Finance as part of the ESRC Research Festival in 2019 and **Alam** was part of the organising team for British Accounting & Finance Association (BAFA) 2019 Conference at MediaCityUK.

Notably during this period, **Sharifi** has been a committee member for the European Research Area (ERA), which involved organising conferences within the EU and reviewing papers as part of SPACE (European Network for business and language). **Sharifi** is also a cofounder of the

Organisational Learning Conference - Middle East and North Africa (OLC-MENA), which held its inaugural meeting in 2012 in Abu Dhabi and collaborated with colleagues in Manchester and Huddersfield Universities and Wigan Hospice for a study of the practices and change management in hospices in the UK. The resulting book, *Inside the Compassionate Organization; Culture, Identity and Image in an English Hospice* (2018, Oxford University Press) was a nominee for the Business Book of the Year award.

As President of the UK Academy for Information Systems (UKAIS), **Griffiths** has been directly involved in delivering the annual UKAIS national conference since 2014. This follows on from two years (2014-16) as a Board Member and then 2 years as Vice President (2016-18). **Griffiths** was also a Committee Member for the Association of Information Systems (AIS) Task Force on Women in IS (2013-15). The Taskforce has the goal of enhancing the outreach efforts of the AIS to women in Information Systems (IS) based on a systematic assessment of the current status of women in this field globally. **Fletcher**, meanwhile, has been a Member of the IFIP cross-domain working group on the Internet of Things (2017-present) and a member of the Chartered Association of Business Schools (CABS) international committee (2012-present). **Kane** has worked on a series of pedagogic research projects with colleagues from multiple UK universities on projects relating to pedagogic research relating to induction and the first-year experience. All these projects produced publications that have informed practice at the participating universities and more widely. In 2016, the 12th IFIP TC9 International Conference on Human Choice and Computers entitled 'Technology and Intimacy: Choice or Coercion' was hosted at Salford (**Fletcher, Griffiths, Kreps**).

Scarf organised two annual conferences on Mathematics in Sport and Maintenance Modelling through the Institute of Mathematics and its Applications (IMA). In 2016, Scarf was Chair of the 9th IMA International Conference on Modelling in Industrial Maintenance and Reliability (MIMAR). Chadwick hosted a number of sports research events and a conference with the Global Centre for Sport, in collaboration with MMU and University of Manchester, that included the premiere screening of a film about the plight of 1.6m migrants working at the 2022 Football World Cup.

Reeves chaired and hosted a meeting of the Political Studies Association Political Marketing Group entitled 'Political Marketing and the Future of the Labour Party' in 2017. **Papanagnou** organised a stream at OR61 conference in Kent in 2019 on 'Control Theory and its Applications to OR-related Fields' and is also a member of the Flexible Manufacturing SIG Workshop at Advanced Manufacturing Research Centre. **Sandro** organised the workshop 'From creation to application of law: reality or fig-leaf?' as part of the IVR 2019 World Congress held in Lucerne, Switzerland.

Wider university collaborations

Fenton has focused on the development of the 'Fan Fit' project, which has produced work in collaboration with the Coppead Business School, Brazil, namely 'eSports England vs Brazil and Fan Fit Brazil'. 'Fan Fit' has been interdisciplinary from the outset, working with colleagues from across the University, including Health Science, Engineering and Environment and Sociology.

Innovation expertise delivered by **Udagadera** has been shared with UCLAN, through 'Novel Energy Trading Models to encourage the use of Smart and Renewable Energy (SRE) Technologies'. This project was funded by DTA to design and validate energy trading models that can be used by households to trade energy saved through SRE Technologies with the public and private sector.

Zhai's projects on finance and machine learning involved collaborations with the Universities of Surrey, Edinburgh, Ulster and Nottingham Ningbo. **Reeves** has been engaged, alongside Professor Peter Schofield of Sheffield Hallam University, on the project 'Classifying Electoral Choice Using the Three Factor Theory of Satisfaction'.

Journal editorships

Our industrial and academic collaborations have been bolstered through our scholars' presence on the editorial boards of scholarly journals aligned to our strategy. For example:

- **Alam** has been on the editorial board of the *Journal of Economic Science Research* during the period
- **Griffiths** has been a distinguished editorial advisory board member for the *International Journal of Information Management* since 2018
- **Papanagnou** has been an advisory board member of the *International Journal of Strategic Engineering* since 2019
- **Polychronakis** is a member of the editorial boards of the *Euro-Mediterranean Journal of Business (EMJB)*, the *International Journal of Logistics and Transport* and the *Operations and Supply Chain Management Journal*
- **Rashid** has been on the editorial boards of the *International Journal of Sales Retail and Marketing* and the *International Journal of Religious Tourism and Pilgrimage*
- **Reeves** has been on the editorial board of the *European Journal of Marketing* and the *Journal of Marketing Management*, on the Academic Advisory Board of *Palgrave Studies in Political Marketing and Management Book Series* and a guest editor in the *Journal of Customer Behaviour Special Issue in Political Marketing*
- Scarf is editor of the *IMA Journal of Management Mathematics*.