

# Digitally Enhanced Advanced Services (DEAS) NetworkPlus

## Portfolio of Projects



# 1. Introduction

The EPSRC funded Digitally Enhanced Advanced Services (DEAS) NetworkPlus funded a portfolio of innovative research projects. 24 projects were funded in total with awards varying from £5,000 FEC (Full Economic Cost) to £120,000 FEC. The projects cover at least 4 sectors and have involved 20 universities, 9 disciplines, at least 45 investigators and 14 industry/government partners. For the manufacturing, transportation/mobility and financial services sectors, funding calls were released that looked for projects that would address at least one of the research questions in the associated research agenda(s). The charity and voluntary sector funding call focused on research that addressed challenges related to Covid-19 with the potential for rapid impact in the sector.

An overview of each of the DEAS funded projects is given, split according to sector (section 2), followed by a high-level taxonomy that has been used to classify the funded projects (section 3).



## 2. The Projects

Tables 1 to 5 give an overview of the projects that were funded in the different sectors. A brief description is given for each of the 24 projects with a list of any publications that were available at the time of writing this report (Sections 2.1 to 2.5). Any further outputs can be found on the DEAS website<sup>1</sup> and Research Fish<sup>2</sup>.

<i>Project Title</i>	<i>Principle Investigators</i>	<i>Co-investigators</i>
Digitally enhanced advanced services for domestic appliances	Dr Maria Holgado (University of Sussex)	Dr Peter Ball (University of York), Prof Ashutosh Tiwari (University of Sheffield)
A digital twin Platform of the customer Journey for future BAXI advanced Services	Dr Sara Mountney (Sheffield Hallam)	Prof Vicky Story, Dr Tracy Ross, Dr Andrew May, Dr Melanie King (Loughborough University), Prof Shengfeng Qin (Northumbria University), Prof Jamie Burton (Manchester Business School), Dr Kawaljeet Kapoor (Aston Business School)
The enhancement of customers understanding and education in the value of DEAS through serious games/gamification	Dr Soheeb Khan (Glasgow Caledonian University)	Prof David Harrison (Glasgow Caledonian University)
Development of a digital twin proof of concept for DEAS Value delivery system	Dr Victor Guang Shi (AMRC, University of Sheffield)	Dr Ruby Hughes (AMRC, University of Sheffield), Dr Miying Yang (University of Exeter), Dr Andreas Schroeder, Dr Omidvar Tehrani and Dr Ahmad Beltagui (Aston Business School)

*Table 1: Projects funded for the manufacturing sector*

<sup>1</sup> [www.deas.ac.uk/outputs](http://www.deas.ac.uk/outputs)

<sup>2</sup> <https://researchfish.com/researchfish/>

<i>Project Title</i>	<i>Principle Investigators</i>	<i>Co-investigators</i>
Digitally Enhanced Advanced Rail Signalling Services (DEARRS)	Dr Phil Davies (Henley Business School)	Prof Glenn Parry (University of Surrey), Prof Stewart Birrell (University of Coventry), Prof Joshua Ignatius (University of Exeter), Dr Hoang Nga Nguyen (University of Coventry)
MaaS Prototype for TfGM	Dr Ulysses Sengupta (Manchester School of Architecture)	Dr Sigita Zigure (Manchester School of Architecture), Dr Delia Dimitriu (Manchester Metropolitan University)
ROSCO, Exploring future advanced services developments and collaborations for a ROSCO using a systems thinking approach	Dr Melanie King (Loughborough University)	Dr Sara Mounthey (Sheffield Hallam)
MaaS Prototype for TfGM: Last Mile Freight integration	Dr Ulysses Sengupta (Manchester School of Architecture)	Dr Sigita Zigure, Solon Solomou, Mahmud Tantoush (Manchester School of Architecture)

*Table 2: Projects funded for the transportation/mobility sector*

<i>Project Title</i>	<i>Principle Investigators</i>	<i>Co-investigators</i>
Supporting innovative work behaviours to drive DEAS innovation in fintech	Prof Colin Lindsey (University of Strathclyde)	Dr Nicola Murray, Professor Matthew Revie, Professor Patricia Findlay (University of Strathclyde)
DEAS- Interactive Digitally Enhanced Advanced Service Simulations	Dr David Williams (University of Portsmouth)	
Taxation policy and distributed ledger technologies (DLTs): can leveraging DLTs and smart contracts increase efficiency for the consumer?	Dr Chris Carr (University of the West of England)	Dr Dalia ElEdel (University of the West of England)
Development of a Serious Game prototype to aid education of smart contract policies	Dr Soheeb Khan (Glasgow Caledonian University)	Prof David K Harrison (Glasgow Caledonian University)
Evaluation of Serious Game prototype to aid education of smart contract policies	Dr Soheeb Khan (Glasgow Caledonian University)	Prof David K Harrison, Professor Vassilis Charissis (Glasgow Caledonian University)
Application of Central Banking Digital Currency (CBDC) and tax implications	Dr Dalia ElEdel (University of the West of England)	
The role of innovative financing for advanced service provision	Dr Chris Raddats (University of Liverpool)	
From Ownership to Use: A Systematic Literature Review and Future Research Agenda for Financing Servitization	Dr Phil Davies (Henley Business School)	Prof. Yipeng Liu, Dr Maggie Cooper (Henley Business School)

*Table 3: Projects funded for the financial services sector*

<i>Project Title</i>	<i>Principle Investigators</i>	<i>Co-investigators</i>
'DEAS Principles in the Charity Sector - A Case Study of the Refugee Council's Digital Social Care Provision for Children in Vulnerable Contexts'	Prof Giorgia Dona (University of East London)	Roxanne Nanton (Refugee Council)
Innovative Technologies and Gender Equality: Supporting Unaccompanied Asylum-seeking and Refugee Girls to Achieve Digital Proficiency	Prof Giorgia Dona (University of East London)	Roxanne Nanton (Refugee Council)
Innovative Digital Technologies and Emotions: Supporting staff working with young asylum seekers in the UK	Prof Giorgia Dona (University of East London)	Roxanne Nanton (Refugee Council)
Using a bricolage strategy to enhance the human touch in digitally enhanced provision for refugee service users: a response to COVID-19	Prof Judith Zolkiewski (University of Manchester Business School)	Dr Ilma Nur Chowdury, Dr Marzena Nieroda and Amir Raki (University of Manchester Business School)
Helping ensure survival: Digitally Enhanced Advanced Services in Community Business	Dr Peter Bradley (University of the West of England)	Mandy Gardner (University of West England), Prof Glenn Parry (University of Surrey)
Improve accessibility and flexibility of counselling through digitally enhanced counselling service delivery models during and beyond COVID-19	Dr Zsafia Toth (University of Nottingham)	

*Table 4: Projects funded for the charity/voluntary sector*

<i>Project Title</i>	<i>Principle Investigators</i>	<i>Co-investigators</i>
Sandpit: Contracts for Advanced Services - Developing the Research Agenda	Dr Kyle Alves (University of the West of England)	
Advanced Service Contracts - A play-book for contract development	Dr Kyle Alves (University of the West of England)	

*Table 5: Cross sector funded projects*

## 2.1. Manufacturing

### *Title:*

Digitally Enhanced advanced services for domestic Appliances (DEAL)

*Project Investigator:* Dr Maria Holgado (University of Sussex)

### *Overview:*

The DEAL project aimed at exploring the state-of-practice of digitally enhanced services for domestic appliances in the UK to gain an understanding of current practice, potential benefits and any barriers for implementation for practitioners. The knowledge on current practice was contrasted with the state-of-art from academic literature to identify key implementation gaps.

### *Outputs:*

- Holgado, M., Ball, P., Oyekan, J., & Tiwari, A. (2020). An exploratory study of digitally- enhanced advanced services for domestic appliances in the UK. Proceedings of the Spring Servitisation Conference 2020, Online, 14-16 September 2020.
- Chávez, C.A.G., Holgado, M., Rönnbäck, A.Ö., Despeisse, M. and Johansson, B., 2021. Towards sustainable servitization: A literature review of methods and frameworks. Procedia CIRP, 104, pp.283-288.

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### *Title:*

A digital twin Platform of the customer Journey for future BAXI advanced Services

*Project Investigator:* Dr Sara Mountney (Sheffield Hallam)

### *Overview:*

This project explored how digitalized approaches could specifically benefit the understanding and incorporation of the user experience in the development of new advanced services. The case study considered was a manufacturer of heating equipment looking to develop such services. The motivation came from the research challenges and opportunities embodied in the HaaS (Heat as a Service) environment. The project highlighted the importance of capturing the user experience in the development of advanced services, particularly in complex environments with multiple actors such as HaaS.

### *Outputs:*

- Mountney, S., T. Ross, A. May, S. Qin, X. Niu, M. King, K. Kapoor, V. Story and J. Burton. 2020. Digitally supporting the co-creation of future advanced services for Heat as a Service. In Proceedings of the Spring Servitization Conference (SSC 2020), Birmingham, UK.

**Title:**

The enhancement of customers understanding and education in the value of DEAS through serious games/gamification

**Project Investigator:**

Dr Soheeb Khan (Glasgow Caledonian University)

**Overview:**

The DEAS concept can be complex for customers to understand, limiting them to express their needs and see true value of DEAS offers. Serious Games/ Gamification offers innovative and creative ways for communication, engagement and education. As well as bringing awareness and providing information, a serious game can potentially communicate complex information in a fun and simple manner. This project explored whether gamification could help explain the value of DEAS to customers within the manufacturing sector through the development of a prototype serious game.

**Outputs:**

- Khan, M.S., Charissis, V. and Harrison, D., 2021, May. Development and preliminary evaluation of a serious game to communicate a digitally enhanced advance service (DEAS) offer. In The Spring Servitization Conference 2021 (pp. 287-289).
- Khan, M.S., Charissis, V., Godsiff, P., Wood, Z., Falah, J.F., Alfalah, S.F. and Harrison, D.K., 2022. Improving User Experience and Communication of Digitally Enhanced Advanced Services (DEAS) Offers in Manufacturing Sector. Multi-modal Technologies and Interaction, 6(3), p.21.

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**Title:**

Development of a digital twin proof of concept for DEAS Value delivery system

**Project Investigator:**

Dr Victor Guang Shi (AMRC, University of Sheffield)

**Overview:**

This project sought to understand how digital twin technology could support manufacturers with the development and delivery of DEAS and define important areas for future research. This project used the case of a manufacturer seeking to offer Heat as a Service (HaaS) in order to understand the existing delivery system for heat products, the details of a future HaaS service delivery system and the contributions the digital twin technology can provide. Based on this case the project identified a number of key opportunities the digital twin technology can provide to the DEAS design and delivery but also identified a range of challenges that need to be addressed to capture the full potential of the digital twin.

### **Outputs:**

- Shi, V.G., Kandemir, C., Hughes, R., Yang, M., Beltagui, A., Schroeder, A., Tehrani, O.O. and Wasserbauer, R., 2020. DELIVERING HEAT-AS-A-SERVICE (HaaS): THE ROLE OF THE DIGITAL TWIN. Advanced Services for Sustainability and Growth, p.133.
- Schroeder, A., Beltagui, A., Shi, V.G., Kandemir, C., Omidvar, O., Yang, M., Hughes, R. and Wasserbauer, R., 2020, June. Digital twin for Advanced Service delivery systems: Opportunities and challenges. In EurOMA Conference 2020.

## **2.2. Transportation/Mobility**

**Title:** Digitally Enhanced Advanced Rail Signalling Services (DEARRS)

**Project Investigator:** Dr Phil Davies (Henley Business School)

### **Overview:**

This project worked with a project partner to investigate how the organisation could deliver a performance-based DEAS for their signalling and traffic management systems for the London Underground and National Rail services. To begin, performance was defined as providing a specified level of reliability for the company's signalling and traffic management systems. This definition evolved during data collection. This novel case-based and action research project aimed to (1) understand the existing business model, delivery system and the DEAS opportunity space for the London Underground and National Rail services; (2) design a proof-of-concept DEAS business model; and (3) use Agent-Based Modelling to analyse the proposed business model and delivery system and provide a proof-of-concept of the performance-based DEAS solution.

### **Outputs:**

- Awaiting publishing.

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**Title:** MaaS Prototype for TfGM

**Project Investigator:** Dr Ulysses Sengupta (Manchester School of Architecture)

### **Overview:**

This project aimed to develop a DEAS focused prototype model for Mobility-as-a-Service (MaaS) integration in Greater Manchester (GM). The project conducted two workshops and a survey as part of a participatory backcasting

methodology providing participants with the opportunity to reflect on the existing issues and envision future MaaS scenarios that help mitigate or solve the concern. The data gathered from workshop 1 was analysed to produce two distinct stakeholder envisioned MaaS future scenarios for GM (a centralised and a decentralised future). The outcomes of the survey were presented to the stakeholders at the beginning of the scenario backcasting activity (workshop 2) allowing decision-makers to understand current user needs and preferences. The workshops results allowed for the creation of a stakeholder informed MaaS prototype model.

**Outputs:**

- Žigire S., Tantoush M., Solomou S., Sengupta U. “Participatory Backcasting for Achieving Desired Co-produced Mobility Futures: A Case Study of MaaS in Greater Manchester.” In NEST Conference 2021 Sustainability Transition pathways. Sofia, Bulgaria, 2021.

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**Title:**

Exploring future advanced services developments and collaborations for a RO-SCO using a systems thinking approach

**Project Investigator:** Dr Melanie King, Loughborough University

**Overview:**

A study was set up with a major UK railway rolling stock leasing company (RO-SCO), in order to test new ways of thinking about the future. The organisation’s strategic goals were to increase their visibility to their customers and become market leaders in digitally enhanced advanced asset management and maintenance services. The company was interested to explore new ways to identify opportunities for organisational and cultural change, as well as barriers and enablers towards advanced services within and between organisations within the transportation and mobility sectors. The aim of the research was to explore if the combination of foresight research methods with systems engineering techniques, could shift existing perspectives to future innovative operating possibilities within a wider mobility ecosystem.

**Outputs:**

- King, M., Mountney, S. and Timms, P. (2021), Using foresight futures and systems thinking to evaluate digitally enhanced service concepts for a rolling stock company (ROSCO), Spring Servitization Conference 2021, Florence, Italy. May 10th – 12th, 2021.

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**Title:**

MaaS Prototype for TfGM: Last Mile Freight integration

**Project Investigator:**

Dr Ulysses Sengupta, (Manchester School of Architecture)

**Overview:**

Last mile freight refers to the last leg of the supply chain, where the goods are delivered to the customer from the local delivery depot. This is currently the most inefficient part of the delivery chain and is linked to multiple transport and mobility related systemic issues for cities including pollution and congestion. MaaS has the potential to mitigate some of these issues by building on a customer centric model utilising new delivery methods/services. Digitally enhanced services play a crucial role in enabling this approach. This project aimed to explore a digitally enhanced approach to the potential integration of 'last mile' freight/delivery service within the recently developed MaaS Prototype for TfGM.

**Outputs:**

- Žigire S., Tantoush M., Solomou S., Sengupta U. "Participatory Backcasting for Achieving Desired Co-produced Mobility Futures: A Case Study of MaaS in Greater Manchester." In NEST Conference 2021 Sustainability Transition pathways. Sofia, Bulgaria, 2021.

## 2.3. Financial Services

**Title:**

Supporting innovative work behaviours to drive DEAS innovation in fintech

**Project Investigator:** Prof Colin Lindsey (University of Strathclyde)

**Overview:**

Fintech and finance sector organisations, and their people, face challenges in adopting new methods and systems such as DEAS. Moving to a servitisation business model may involve developing different ways of thinking and working, and new technical skills and approaches to skills development. This project explored new approaches to research and knowledge exchange on how Fintech SMEs can support workplace and people management solutions that maximise the potential of their employees at all levels to contribute innovation in the development and delivery of Digitally Enhanced Advanced Services (DEAS). The research focused on challenges and good practice associated with supporting Fintech employees at all levels to contribute to innovation in responding to service users' needs.

**Outputs:**

- Awaiting publication.

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**Title:**

IDEAS- Interactive Digitally Enhanced Advanced Service Simulations

**Project Investigator:**

Dr David Williams (University of Portsmouth)

**Overview:**

Innovative technologies, including distributed ledgers and overlay services, are seen as enablers for modernising payments and tax administration to deliver comprehensive outcomes through Digitally Enhanced Advanced Services (DEAS). Revolutionising payments/tax processes needs stakeholders to radically change their perceptions of what service outcomes are possible and how they can be delivered. The greater the extent of the service transformation, the more difficult it is to envision; an unclear vision of what could/would be delivered leads to unclear requirements being specified, which in turn increases the likelihood that, once implemented, the digital service fails to deliver the comprehensive enhancement/advancement promised. The IDEAS project aimed to establish and apply a new approach to the specification and development of digitally enhanced advanced services (DEAS) that transform digital payments and tax administration.

**Outputs:**

- Awaiting publication.

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**Title:**

Taxation policy and distributed ledger technologies (DLTs): can leveraging DLTs and smart contracts increase efficiency for the consumer?

**Project Investigator:**

Dr Chris Carr (University of the West of England)

**Overview:**

This project investigated the possibilities made available by distributed ledger technology to automate tax collection. The focus was on consumer benefits and efficiency and ease of use: can smart tax calculation be achieved with collections in real time? Will the system be easy to understand and use? The aim was to look both at the technical possibilities, as well as regulatory and policy

framework. The project explored current state-of-the-art, determined the challenges, and identified the possibilities for improvement in taxation policy that not only offered the most value to the consumers, but were also achievable in terms of applicability, usability, and technology readiness. A proof-of-concept smart contract implementation was also developed.

**Outputs:**

- Awaiting publication.

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**Title:**

Development of a Serious Game prototype to aid education of smart contract policies

**Project Investigator:**

Dr Soheeb Khan (Glasgow Caledonian University)

**Overview:**

Parametric insurance products related to weather risks management can potentially offer preferable and greater solutions for the construction industry in contrast to traditional insurance models. Such smart contract solutions/policies can potentially aid management of risks related to weather in a more effective manner, settle insurance claims faster and overcome some of the limitations associated with traditional insurances. However, smart contracts solutions/policies can be complex for customers and stakeholders to understand, limiting them to express their needs and see the true value of such DEAS offers. As well as bringing awareness and providing information, a serious game can potentially communicate complex information in a fun and simple manner. This project worked to design and develop a serious game focused on enhancing the understanding and education of a company's servitization offer, which relied on smart contracts.

**Outputs:**

- Awaiting publication.

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**Title:**

Evaluation of Serious Game prototype to aid education of smart contract policies

**Project Investigator:**

Dr Soheeb Khan (Glasgow Caledonian University)

### *Overview:*

This project built upon the research carried out in the 'Development of a Serious Game' prototype to aid the education of smart contract policies. The prototype game that had been previously developed was upgraded and refined to allow the addition of a leader board. This allowed a player's score to be compared with other players and provide an overview of successful choices made by professionals that could inform future real-life possible courses of action.

### *Outputs:*

- Awaiting publication.

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### *Title:*

Application of Central Banking Digital Currency (CBDC) and tax implications

### *Project Investigator:*

Dr Dalia ElEdel (University of the West of England)

### *Overview:*

Payment systems have undergone major development in recent years as part of the fintech ecosystem. The change in the mode of payments has prompted Central banks to consider the adoption of CBDC. Among the objectives of the CBDC is to support household and businesses in making fast efficient payments through innovative systems that are reliable and resilient. CBDC will also provide 'better cross-border payments' in a fast, efficient manner. However, these objectives will only be realised if tax systems are prepared and can incorporate these changes to the payment systems. This project analysed tax policy implications resulting from the potential adoption of Central Bank Digital Currency (CBDC) and the impact on DEAS solutions. The project considered international experience from China and other countries to analyse the challenges and opportunities in tax administration in preparation of potential adoption of CBDC.

### *Outputs:*

- Awaiting publication.

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### *Title:*

Multi-actor financial innovations in servitization: the case of outcome-based contracts

*Project Investigator:* Dr Chris Raddats (University of Liverpool)

*Overview:*

To address gaps in the literature, this project aimed to consider the financial innovations used by multiple actors as part of the provision of advanced services. The study considered three main research questions: 1) What are the challenges to developing financial innovations for advanced services? 2) Which solutions exist to overcome these challenges? 3) What aspects still need to be addressed to develop financial innovations that overcome these challenges?

*Outputs:*

- Awaiting publication.

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*Title:*

From Ownership to Use: A Systematic Literature Review and Future Research AGenda for Financing Servitization

*Project Investigator:* Dr Phil Davies (Henley Business School)

*Overview:*

To date, servitization has been studied extensively from the perspective of operations management and marketing, with key topics being business model innovation, delivery system design, organisational change and digital servitization. However, some key areas remain under explored from the perspective of the broader servitization ecosystem. One particular area that remains under researched is how servitization models are financed and how new risks associated with financing and providing them are managed or shared amongst members of the ecosystem. In this project a systematic literature review identified the broader servitization ecosystem, inclusive of and cutting across the three industries defined by DEAS of manufacturing, transport and mobility and finance. An understanding of how the shifting emphasis from ownership to outcomes changes the role of actors in the ecosystem was developed identifying what new types of risks will/could emerge from contracting advanced services, where these risks, with respect to the asset finance supply chain, will emerge and who is responsible for them within the broader servitized ecosystem. The literature review resulted in a future research agenda that stimulates the broader management field to conduct research in the area of servitization, ecosystems and the financing of servitization.

*Outputs:*

- Awaiting publication.

## 2.4. Charity/Voluntary

### *Title:*

DEAS Principles in the Charity Sector - A Case Study of the Refugee Council's Digital Social Care Provision for Children in Vulnerable Contexts

*Project Investigator:* Prof Giorgia Dona (University of East London)

### *Overview:*

This project aimed to create an underpinning evidence base of the applicability of DEAS principles to the charity sector through the effective case study of the Refugee Council. The objectives were to: a) collate data from young service users in vulnerable circumstances of their accessibility, feasibility, security and usage to DEAS to improve and increase representation of beneficiaries' views in decision making of charity providers in the transition to digital social care provision; b) examine challenges and enhanced value of DEAS through the collection of RC staff/service users data of digital care provision to evaluate how technology can be leveraged to produce new services; c) assess how RC understands their requirements for delivery DEAS outcomes by gathering data on how charitable policies, funding strategies, data security protocols and practices operate to review the way in which the charity raises and uses its resources; and d) extract lessons from the case study through reflexive practice internally and within networks to scale up DEAS across the charity sector to improve digital operations and outcomes and to contribute to the development of effective case studies within the charity sector.

### *Outputs:*

- Nanton, R. and Doná, G. (2021) "Life is not Just Normal as Before" Covid-19 and Digital Service Provision in the Charity Sector: A Case Study of the Refugee Council's Children's Section, London: Refugee Council
- Doná, G. and Nanton, R. (2021) Digitisation of the charity sector: unravelling the tensions between the virtual and the reality, Competitive Advantage in the Digital Economy (CADE), Vol. 2021,112-117
- Nanton, R. and Doná, G. (2021) DEAS Principles in the Charity Sector: A Case Study of the Refugee Council's Digital Social Care Provision for Children in Vulnerable Contexts, Short report to the Children's unit of the Refugee Council

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### *Title:*

Innovative Digital Technologies and Emotions: Supporting staff working with young asylum seekers in the UK

*Project Investigator:* Prof Giorgia Dona (University of East London)

### **Overview:**

This project built upon the key recommendations of the DEAS+ funded study 'DEAS Principles in the Charity Sector - A Case Study of the Refugee Council's Digital Social Care Provision for Children in Vulnerable Contexts'), namely a) monitor the transition to a hybrid form of digital and in-person servitisation, and b) upskill staff with a focus on digital emotional support.

### **Outputs:**

- Nanton, R., Doná, G. and Brandão, T. (2022) A Guide to Providing Emotional Support Online to Refugee Youth, London: Centre for Migration, Refugees and Belonging, University of East London & Refugee Council, <https://repository.uel.ac.uk/item/8qx16>
- Doná, G. (2021) Psycho-social perspectives in forced migration (includes a section on providing online emotional support to clients in vulnerable situations), Lecture for Introduction to Conflict, Displacement and Human Security, University of East London, 10 November
- Nanton, R. and Doná, G. (2021) Digital Social Protection for unaccompanied asylum-seeking children, CMRB website. <https://www.uel.ac.uk/our-research/research-school-education-communities/centre-research-migration-refugees-belonging>.

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### **Title:**

Innovative Technologies and Gender Equality: Supporting Unaccompanied Asylum-seeking and Refugee Girls to Achieve Digital Proficiency

**Project Investigator:** Prof Giorgia Dona (University of East London)

### **Overview:**

This project aimed to promote gender equality in the use of innovative technologies among unaccompanied asylum-seeking children and to contribute to the DEAS scientific community by mapping the application of DEAS principles to the charity sector. The project followed-up key recommendations of the DEAS+ funded study 'DEAS Principles in the Charity Sector - A Case Study of the Refugee Council's Digital Social Care Provision for Children in Vulnerable Contexts' (September 2020-June 2021). Working with the Head of the Children's Section (CS) at the Refugee Council (RC), three key recommendations were identified for implementation: 1) co-creation of digital resources with clients, 2) upskilling service users on innovative technologies, and 3) creating opportunities for improved communication and peer-to peer support among clients that address gender inequalities.

### **Outputs:**

- Nanton, R., Doná, G. and Cestaro, C. (2022) Innovative Technologies and Digi-

tal Equity: Supporting Unaccompanied Asylum- Seeking and Refugee Children to Achieve Digital Literacy, London: Centre for Migration, Refugees and Belonging, University of East London & Refugee Council, <https://repository.uel.ac.uk/item/8qx5y>

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**Title:**

Using a bricolage strategy to enhance the human touch in digitally enhanced provision for refugee service users: a response to COVID-19

**Project Investigator:** Prof Judith Zolkiewski (University of Manchester Business School)

**Overview:**

In transitioning charity and voluntary services to digital platforms, the question is: how the sector could transfer human touchpoints online to support their vulnerable service users with their relational needs and foster their holistic wellbeing. Against this background, this research aimed to explore the experience of online charity and voluntary service users and to generate insights into how the charity and voluntary sector can ensure that human touch and peripheral services such as social, emotional, and psychological support, conveyed in face-to-face service contexts, are reflected in their digital services.

**Outputs:**

- Raki, A., Chowdhury, I.N., Nieroda, M. and Zolkiewski, J., 2021, May. Using a Bricolage Strategy to Augment the Human Touch and Deliver Digitally Enhanced Advanced Services in the Charity and Voluntary Sector: A Response to Covid-19. In Spring Servitization Conference 2021 (pp. 274-276).
- Raki, A., Chowdhury, I.N., Nieroda, M. and Zolkiewski, J., 2021. Embracing Advanced Digital Services in the Charity and Voluntary Sector: a response to Covid-19. In Competitive Advantage in the Digital Economy (CADE) 2021, p. 7-10.

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**Title:**

Helping ensure survival: Digitally Enhanced Advanced Services in Community Business

**Project Investigator:**

Dr Peter Bradley (University of the West of England)

### **Overview:**

Community Businesses (CBs) are place-based (geographically sited) organisations that trade to create social outputs or benefits for their communities. CBs are directly accountable to their communities with any additional value that is created being invested back into that community. The aim of this project was to evidence and share learning on how CBs used digitally advanced services (DEAS) to adapt their business models during the Covid 19 pandemic. The project sought to explore the enablers and barriers to DEAS that CBs experienced when developing to ensure the continued cost-effective delivery of their services in socially distanced environments.

### **Outputs:**

- Gardner, M., Bradley, P., Parry, G. and Webber, D., 2021. Helping ensure survival.

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### **Title:**

Improve accessibility and flexibility of counselling through digitally enhanced counselling service delivery models during and beyond COVID-19

**Project Investigator:** Dr Zsafia Toth (University of Nottingham)

### **Overview:**

There is an imminent need to further explore how to solidify digital service delivery in charities' business models, and establish further understanding about industry best practices, how the changed customer need could be best satisfied on a medium/longer term amidst and beyond COVID-19. The pandemic situation made it necessary to introduce temporary changes - delivery became digital through necessity, but there might be future or longer term benefits of integrating digital elements into traditional ways of service delivery. This project aimed to study the opportunities to improve the accessibility and flexibility (in terms of time and place) of counselling through the creation of digitally enhanced counselling service delivery models and explore how digitally enhanced business networks between charities, and business models can improve organisational attractiveness and value co-creation.

### **Outputs:**

- Awaiting publication

## 2.5. Other

### *Title:*

Sandpit: Contracts for Advanced Services - Developing the Research Agenda

*Project Investigator:* Dr Kyle Alves (University of the West of England)

### *Overview:*

This project aimed to create a topography of the extant research or industry knowledge on contracts that deliver Advanced Services and identify challenges and areas where knowledge is lacking, and where knowledge is needed as a priority to better understand the creation of contracts to deliver Digitally Enhanced Advanced Services. A sandpit-style even allowed contracts to be considered from the perspective of Procurement, Risk Management, Marketing, Finance, Insurance, Legal (including HSE), Operations Management, and General Management. The goal of the event was to develop the knowledge base associated with Advanced Service contracts. Such a knowledge base could help early adopters avoid potential pitfalls inherent with poorly-drafted contracts. It may also expose potential adopters to unfamiliar yet available contract options. Awareness of these issues could reduce costly errors associated with poorly constructed contracts (delays, risk exposure acceptance & transfer, and insurance costs).

### *Outputs:*

- Contracts: “Help Wanted” to deliver Advanced Services. In Competitive Advantage in the Digital Economy Conference (CADE) 2022.

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### *Title:*

Advanced Service Contracts – A playbook for contract development

### *Project Investigator:*

Dr Kyle Alves (University of the West of England)

### *Overview:*

The project built on the results of a DEAS-funded practitioner-led workshop on Contracts to deliver Advanced Services (AS) with both original research and secondary research on AS to build a framework (or ‘playbook’) for AS contract development. The project explored the research question ‘What are the multi-disciplinary considerations for contract lifecycles for Digitally Enhanced Advanced Services?’. The playbook illustrates a staged-approach to raise known challenges and key concerns for researchers and practitioners developing contracts that deliver AS. The framework connects known challenges with relevant knowledge from existing research. The playbook presents a topography of

the academic research and industry knowledge informing the different points along the lifecycle of a contract.

*Outputs:*

- Awaiting publication.

### 3. The Taxonomy

A high-level taxonomy has been developed which allows the projects to be classified according to three aspects: a set of key principles, the stakeholders being considered and what the project delivered. Since some projects explored more than one research theme from the research agendas, these themes were not deemed a suitable way of distinguishing between projects.

#### *Key principles*

Three sector agnostic principles of servitization were identified as part of the work of the DEAS network: the use of data-driven digital technologies, delivery of improved outcomes and changes in business models<sup>3</sup>. Each of the projects were found to explore one of these principles. One of the findings of the Network was that the term business model was not always understood by practitioners or academics outside of Business -related disciplines. Therefore, the third principle refers to a change in operating model.

#### *Stakeholders*

Projects could be classified according to the stakeholders that they considered. Initially projects are classified according to whether they focused on one group of stakeholders or multiple stakeholders. Projects dealing with multiple stakeholders could focus on those related to one organisation or multiple organisations. Projects dealing with one group of stakeholders could focus on an internal (e.g., employees, management) or an external group (e.g., customer, regulators, financiers).

#### *Project deliverable*

The projects resulted in one of three types of deliverable: a tool (e.g., a prototype, proof-of-concept model) , a set of guidelines/recommendations (e.g., what good practice looks like, a research agenda) or some form of review. Reviews typically took the form of a written report or academic paper.

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<sup>3</sup> Wood and Godsiff (2021). Establishing the Core Principles of Servitization for Application Outside Manufacturing. In Proceedings of Competitive Advantage in the Digital Economy (CADE) 2021.

## 3.1. Reflections

The taxonomy is being refined as part of further work. This section reflects on how the 24 projects have been classified given the current classification system.

### *Data-driven technologies projects*

Eight projects were classified as focusing on data-driven technologies. Out of these projects six resulted in some sort of tool being developed and two some form of review. Both projects that produced a review focused on stakeholders from more than one organisation. The projects that developed a tool mostly focused on multiple stakeholders from a single organisation (i.e., four projects). The remaining two projects focused on stakeholders from a single organisation, one internal and one external. The high number of projects classified as delivering a tool in this group suggests that a more granular classification could be employed (e.g., according to type of tool).

### *Delivery of improved outcome projects*

Seven projects focused on the delivery of improved outcomes. Four of these projects focused on multiple stakeholders (one from a single organisation and three from more than one organisation). The remaining three projects focused on a group of external stakeholders from a single organisation. Three projects resulted in a tool, three projects in a set of guidelines and one project in a review. There were no distinct patterns comparing what was delivered to the stakeholders that were being considered.

### *Operating model projects*

Nine projects were classified as focusing on a change in operating/business model. All of these projects focused on multiple stakeholders with three focusing on a single organisation and the remaining six on multiple organisations. Four projects delivered a tool, four projects a form of review and one project a set of guidelines. The majority of projects that developed a tool focused on multiple stakeholders from a single organisation (three projects). The majority of projects that focused on multiple stakeholders from multiple organisations delivered a review (four projects), with the other two projects delivering either a set of guidelines or a review.

## 4. Conclusion

This report has documented the projects that were funded through the Digitally Enhanced Advanced Services (DEAS) NetworkPlus. We would like to thank all of the individuals who were involved in these projects.

## Further information

For more information about the DEAS Network Plus and the outputs from the funded projects, please visit:

[www.deas.ac.uk](http://www.deas.ac.uk).



# Appendix 1

## The DEAS Team

### Principal Investigator:

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Industry Liaison Manager: Gill Holmes, Aston University Business School

It is with great sadness that the DEAS Network Plus team  
lost our much-respected friend and colleague,  
Professor Robert John, on 17 February 2020  
following a short illness.  
We dedicate this report to him.

# Digitally Enhanced Advanced Services (DEAS) NetworkPlus

## Portfolio of Projects

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