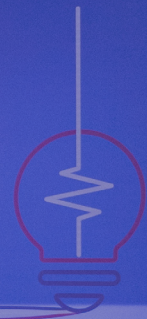




Digital Health & Care
Innovation Centre

Impactful
Innovation
starts here



Phase 2 - Year 4 Annual Report

(August 2022 to July 2023)

Authors

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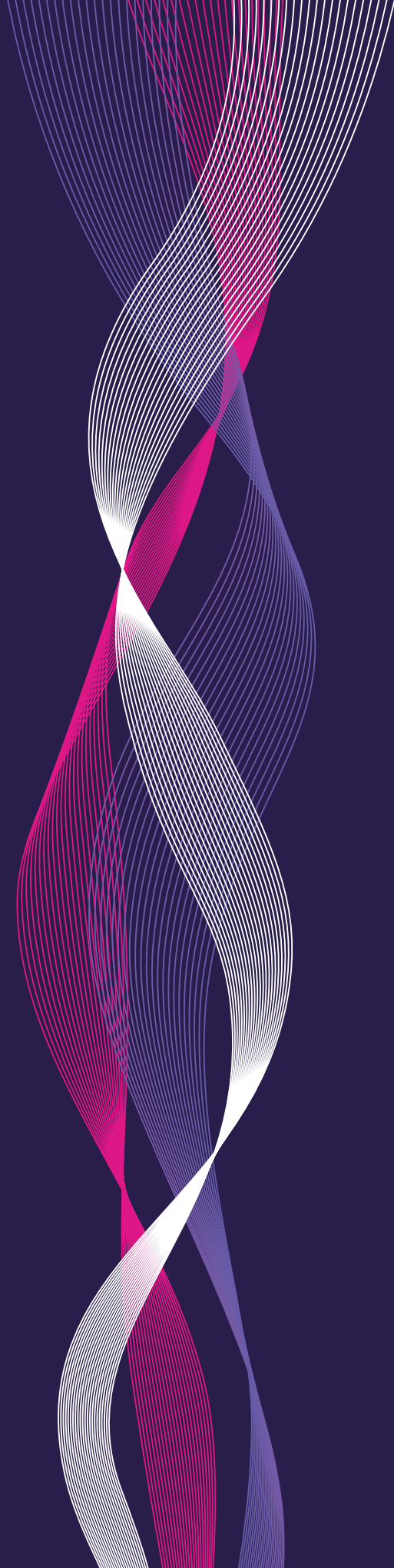
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DHI supports innovation between academia, the public and third sectors, and businesses in the area of health and care.

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Foreword

As the DHI approaches the end of its second phase it seems appropriate to not only reflect on the previous year, but on the decade since its creation as an innovation centre. The last 10 years have seen a significant amplification of the challenges faced by health and care systems worldwide. The COVID-19 pandemic and consequent economic uncertainty have had a global impact and although transformative innovation in drugs and medical technologies hold out great hope for the future, their adoption and cost of implementation remain serious challenges for providers and payers. There is now a clear consensus that digitally enabled, citizen centric care offers a vital contribution in addressing these challenges.



Against this backdrop the DHI continues to deliver on its mission to co-design and support the deployment of impactful innovation. As readers of this report will note, last year has seen considerable success in meeting key performance indicators and, perhaps even more importantly, further establishing its credibility as a thought leading institution on the global stage and enhancing its partnerships with health and care providers, industry, academia and the third sector. Looking forward to the next 10 years, the management team and Board have developed a strategic plan which sets a course for further evolution and impact of the centre.

Our primary academic partners have made invaluable contributions to the successes achieved in this last year. The University of Strathclyde continue to provide support, advice, and encouragement as the DHI's host institution and the design partnership with the Glasgow School of Art is a fundamental element of much of the practical work of the centre. I should like to thank the management and team of the DHI for another excellent year and the Board for its guidance and wise council.

John Jeans CBE - Chair of the DHI Board

Introduction

The last year has been another very busy and productive period in the ongoing evolution of DHI. While continuing our focus on delivering a suite of innovation programmes, supporting front line health and care providers to address a number of the key challenges across their services, we have also been looking to the future and developing our strategy and ambition for the next phase of DHI. Consulting with key people and groups across Scotland we have established a number of priority areas for us to focus our time and effort. Utilising our national and international networks, we have been able to sense check our thinking and ensure that the approach we are proposing aligns with many of the recognised leading health and care systems thinking from around the world.



Over the past year the Rural Centre of Excellence, funded through the Moray Regional Growth Deal, has moved from the planning and development phase into delivery. Working with the local population and health and care professionals, the DHI team has been building out several Living Labs. This approach will support the delivery of new digital tools and services, based on user centred design and a desire to keep the individual at the heart of the digital services being designed and deployed.

Our cluster management role will ensure that Scotland can secure the maximum advantage from the global growth being projected for the digital health and care sector. We will continue to strengthen and grow our subject specific clusters, bringing together Scotland's assets across industry, academia, the 3rd sector and our citizens and public services to build a better and sustainable future model of health and care focussed on addressing the many challenges that we are currently facing. As you read through this annual report, you will see how we have developed a solid platform for us to build on for the next exciting phase of DHI's development as a national innovation centre.

Professor George Crooks OBE - Chief Executive Officer

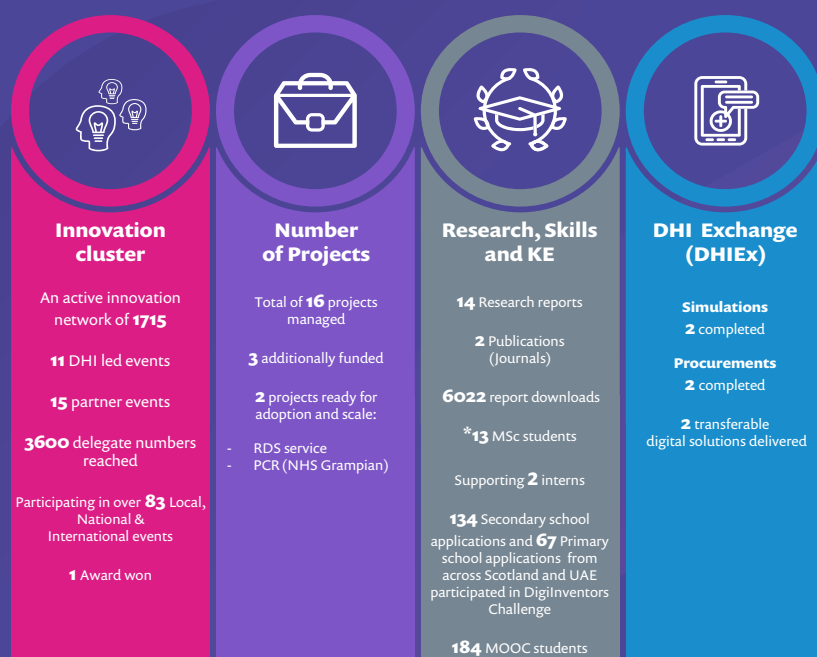
Strategic Summary Statement

This Year 4 annual report highlights DHIs significant impact in the past year. DHI has advanced various strategic initiatives, including crafting our **10-year strategy**, which played a pivotal role in shaping the SFC Infrastructure Investment case and presentation. Furthermore, we've successfully transformed our headquarters in Glasgow to create a more agile and inspiring space. This **newly configured HQ** features a dedicated creative area, Demonstration and Simulation cell pod for the 'Art of the Possible' to come alive, and an environment that promotes flexible working for both our staff and partners.

What sets DHI apart from similar institutions is our unique **fusion of technical, service, and business innovation capabilities**. We intentionally leverage our assets to assemble teams with the right skills required to support our partners, encompassing engagement, facilitation, technical expertise, research, and service/programme management. Design, particularly **design research**, plays a pivotal role across our portfolio of activities. Our founding partner, GSA, integrates design and creative practices as a distinctive feature, making our collaboration truly unique in the innovation landscape. This approach brings to life our design research capabilities, now recognised as crucial by innovative organisations across all sectors. It often results in solutions that are sufficiently mature in terms of development and readiness for adoption.

A significant milestone achieved in the past year involves translating our combined research and development insights into tangible prototypes, with greater emphasis on addressing **social care demands**. Notably, the DHI Rural Centre of Excellence in Moray has placed a stronger focus on integrated care, bridging gaps between health and social care integration challenges and the acceleration of R&D. DHI continues to meet its key performance indicators (KPIs), as outlined in the four pillars (refer to Figure 1) for phase 2.

Under the **Clusters and Engagement** initiative, our overarching cluster boasts a membership of over 1,700 individuals and includes two active themed clusters: Healthy Ageing and Mental Health. Our **Project Portfolio** maintains a balanced approach, with two projects ready for adoption and scale this year. The first is the Right Decision Service, including all associated apps, transitioning to Health Improvement Scotland. The second project involves Patient Centered Records development, now implemented in NHS Grampian. Our **Knowledge, Research, and Skills** activity has fostered stronger connections and strengthened knowledge transfer. One notable research project involved a commission from UKRI, focusing on virtual reality technology, and the findings informed an Innovation Support Programme tender issued by UKRI. Furthermore, the **DHI Exchange R&D infrastructure** has effectively de-risked innovation, with ongoing efforts to create and enhance pathfinder projects across Scotland.



**It should be noted that the MSc scholarships this year was underachieved due to reduced interest and post graduate course cost increases.*

Investment
DHI has secured **£911k** of additional funding for Year 4

Fig 1 - Key Performance Indicators 2022/23

Over the past year, the DHI Exchange has significantly elevated DHI’s presence in critical Scottish Government work programmes. DHI Exchange projects have now become pioneering initiatives within the Digital Front Door and Digital Identity activity. DHI remains dedicated to supporting the National Digital Platform Initiative, actively participating in national architecture development, and advocating for standards-based platform approaches. This commitment is exemplified by our recent joint event and presentations at national FHIR / SNOMED conference in collaboration with NHS Scotland and FHIR partners in Australia.

At the Moray Rural Centre of Excellence, notable progress has been made this year in the co-design and development of three out of the five Living Labs (LL1 – Co-management, LL2 – Care in Place, and LL3 – LTC management). This advancement has enabled industry partners and key Health & Care stakeholders to advance R&D towards prototype development, paving the way for real-world evidence gathering. This evaluation and evidence collection is being spearheaded by UHI under a strategic partnership agreement. Additionally, the Moray RCE officially opened the DSE physical facility at Moray College in June this year, providing a collaborative co-design environment that breathes life into discussions on the ‘Art of the Possible’ for the region, supported by an R&D cloud-based sandbox infrastructure for industry testing.

DHI continues to perform well in attracting new funding. Over the last 12 months (Yr4) DHI has attracted £911,829 (as per fig.2) of additionally Funded Project income. This equates to a total for DHI 2.0 being £13,094,316, and with the total amount of additionally funded income distributed as illustrated below, therefore over Phase 1 and Phase 2 funding generated being £14.1m (as per fig 3).

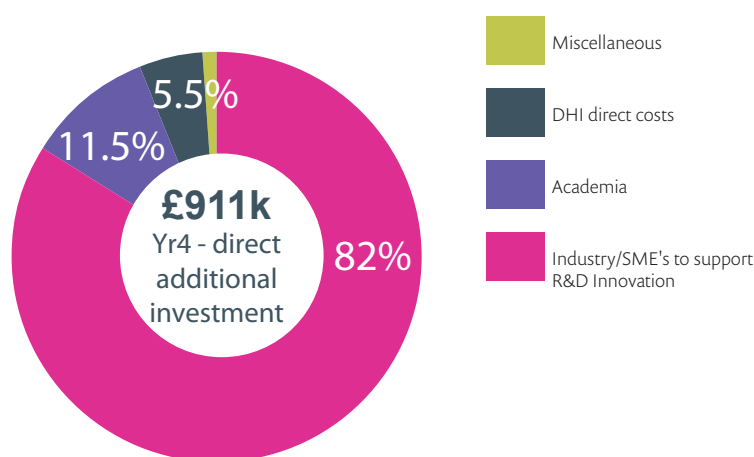


Fig 2 – Funding distributed

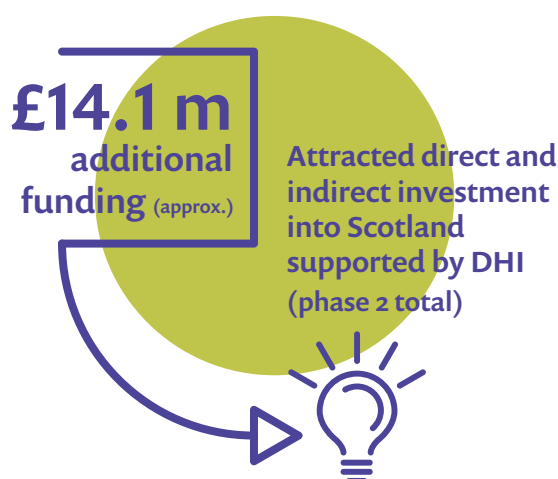


Fig 3 – Additional funding source

This year’s significant accomplishments are depicted and elaborated upon throughout this annual report, aligning with the DHI Innovation Process Model (refer to Fig.4). This model initiates early engagements within our diverse network under the ‘Engage and Scope’ phase before progressing into deeper collaboration activities in the ‘Initiate, develop’ phase, and, when/if successful, shifts to the ‘evaluate and iterate’ phase. Activities and projects that have advanced successfully, ready for adoption this year, are highlighted in the ‘Embed and Adopt’ section. All of DHI’s work encompasses an aspect of ‘Learn and Share’, the end section summarises DHI’s dissemination and underscores our outreach and thought leadership position within the innovation landscape, both locally and on a global stage.

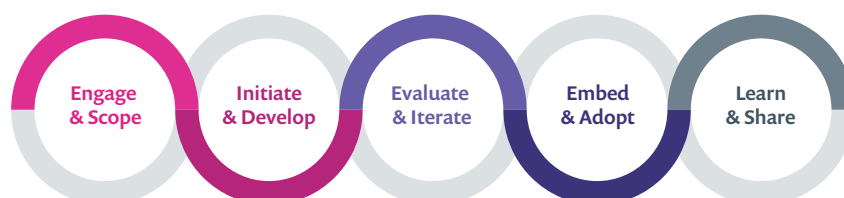


Fig 4 -DHI Innovation process model



Engage and Scope

DHI engages to influence national and international policy; exchange knowledge and insight; support introductions and facilitate exciting collaborations which continue on to deliver a strong pipeline of digital health and care innovations.

Engagement and Reach

DHI appointed a Digital Content creator to improve photography, videography, animation and hybrid event delivery. Website traffic increased by 106%, number of sessions increased by 112% and page views increased by 24% over the last 12 months. Newsletter subscribers increased by 32%, and opening and click through rates are well above comparator offerings. DHI is placed first and second on LinkedIn and Twitter respectively compared to other ICs, with over 15,000 LinkedIn followers. The introduction of the new DHI Linktree, QR codes and digital business cards has enabled the tailoring of content to specific events and audiences, driving up traffic to our website.

Innovation Clusters

This year, the overarching Digital health and care Innovation Cluster has increased its membership from circa 1,300 to over 1,700. This equates to an almost 25% increase. This year has seen the move to in person events for both the Healthy Ageing and Digital Mental Health themed clusters and all sessions continue to be recorded allowing for an on demand viewing resource to promote and support further knowledge exchange. In addition DHI supported a Diabetes and a Digital Lifelines SBRI in partnership with SHIP.

DHI manages a mature and interactive digital health and care R&I cluster, extending and enhancing our reach within Scotland, the UK and internationally. Our themed clusters on Digital Mental Health and Healthy Ageing have expanded their membership to over 950 this year, publishing two key reports and seeded a number of successful funded collaborations.

This successful cluster activity has allowed for two challenge calls to be supported in partnership with United Kingdom Research and Innovation (UKRI); Mindset challenge for Digital Mental Health, and for Healthy Ageing, the Brain Health Challenge in partnership with The Data Lab Innovation Centre.

The DHI also established a special interest group for this increasing area (Brain Health) of global priority and this year the DHI helped to support the development of and to be on the steering group of the Scottish Advanced Research Collaborative (ARC) – Brain Health.

“

Introductions made through DHI have facilitated a fantastic partnership between Alzheimer Scotland and Abertay University, breaking new ground in the codesign and development of Virtual Reality football reminiscence experiences for people living with dementia. This collaboration wouldn't have been possible without the connection made through DHI

”

Fiona Corner, Head of Development, Innovations & Development, Alzheimer Scotland

“

The Innovation Cluster plays a significant role promoting and coordinating innovation activity in Digital Mental Health across Scotland. The Cluster provides a focal point while providing a dedicated, consistency of approach that will shape the innovation landscape for years to come creating the right environment for innovation to flourish.

”

Chris Wright, Scottish Government National Advisor for Digital Mental Health/Head of Programme Digital Mental Health

Project Pipeline

The priorities for DHI’s project pipeline were agreed with Scottish Government to include the National Care Service/Social Care, Mental Health, Drug Deaths Prevention and Digital Front Door. DHI recognises that collaboration is essential to maximise the impact of its work and therefore, continues to develop strategic relationships.

This year DHI has formed many partnerships, placing an emphasis on working more closely with others in the innovation landscape, including CSO/SHIP and NES with whom strategic partnerships arrangements are in place. This has also included the Scottish 5G centre, Censis, Datalab, BE-ST and Precision Medicine. DHI currently has a healthy project pipeline, the most mature and qualified of these valued at £3.8m. Some examples of our project pipeline are:

Roche Stage 2

DHI worked with global company Roche to explore digital opportunities within pharmaceutical supply chains to support the delivery of medicines directly to the patient. This project drew on DHI’s design, collaboration and project management expertise and engaged supply chain expertise.

The project delivered a quantitative assessment on the opportunities and costs associated with a direct to patient/home delivery, using the UK as a model market. This project was delivered in February 23 and DHI continues discussions around next steps.

Mindset

DHI was commissioned to undertake scoping work that would allow UKRI to inform their approach to test and trial a platform for the distribution and procurement of mental health and wellbeing XR experiences, products, and solutions.

The project delivered a final report with recommendations and key findings influencing the MINDSET Workstream 2 activities. Further future opportunities are under review.

Digital Lifelines 1

Evidence highlights that digital exclusion is a particular issue amongst people with multiple and complex needs. Digital Lifelines Scotland seeks to help overcome this and to design new digital solutions that better meet people’s needs, and improve health outcomes for people who use drugs, reducing the risk of harm and death. DHI provided engagement and scoping support to the ‘Define’ stage of the programme, by collaborating with Digital Lifelines Scotland delivery partners, stakeholders, and people who use drugs, to analyse and distil the activities undertaken in the ‘Discover’ phase of the programme.



Fig. 5 – Digital Lifelines workshop

This involved carrying out service mapping to understand and visualise the current context of services to collaboratively produce a future vision for digitally enabled services to support people who use drugs. DHI employed a participatory design approach to undertake this work and produced a published research output. Our key stakeholders will use this insight to create key requirements for the next phase (see quote below).



We were delighted with the highly visual methods and the sensitivity used (by DHI) to communicate and to engage with people with living and lived experience and staff in understanding and mapping the current situation. (-) We now have a clear set of requirements for the next phase of work, a means of communicating this clearly and visually and enhanced strategic coherence across numerous delivery partners.



**Margot White, Programme Lead,
Digital Lifelines Scotland**



Initiate & Develop

DHI's Initiate and Development portfolio further expands and promotes ideation around the Art of the Possible, moving early concepts forward through co-design workshops, rapid prototyping and simulations to Level 5 of our Service Readiness Level framework (see project portfolio appendix - Service, Business & Technical readiness framework). This allows partners a safe space to imagine and construct new possibilities and de-risk innovations at an early stage.

Moray Rural Centre of Excellence (RCE)

RCE (funded by UK Gov) officially launched a Demonstration and Simulation Environment in UHI Moray (Elgin). This event attracted over 100 delegates spanning from senior officials from the Health and Social Care Partnership, 3rd sector practitioners, academics, industry and importantly the citizens and patients of Moray. This launch activated the official opening of the RCE citizen panel, enabling Moray citizens to become active members of the co-design process supported by a [Digital Innovation- Hub](#) for collaboration purposes.

Out of the five [Living Labs \(LL\)](#) three are progressing well ([LL1 – Co-management](#) (use case - weight management), [LL2 – Long Term Condition monitoring](#) (use case - diabetes) and [LL3 – Care in Place](#) (use case – frailty), with two advancing to the initiate and develop, prototype stage - the Care in Place Living Lab and the Self-Management Living Lab. These Living Labs are progressing to move into the real-world evidence stage where the prototypes will be evaluated and iterated. RCE has activated a strategic partnership with the University of Highlands and Islands for evaluation. This work will allow a consistent approach to be delivered with robust academic and impartial evaluation methods deployed.

Underpinning all these activities is a comprehensive skills and workforce development package. A key deliverable is a series of micro-credentials designed to upskill the workforce delivering direct care in Moray (including paid, unpaid carers and volunteers). RCE have partnered with Moray libraries and the Alliance to increase digital access to tools, technologies and training. RCE have published an [Education and Training Provision in Moray](#) report which outlines gaps and opportunities to strengthen the local skills agenda.

The RCE is attracting national and international attention with other health and social care partnerships closely following activities. From an international perspective the European Network of Living Labs affiliation has allowed us to raise the profile with successful international publications (e.g [LL3 – Care in Place](#)) and knowledge transfer (e.g Vitalis – [LL4 – Smart Housing/Communities](#)) applications accepted.



“

UHI Moray are delighted to have the RCE Demonstrator and Simulation environment housed at our Elgin facility, a building that is dedicated to Life Science and Innovation, we look forward to working with DHI as part of the Moray Growth Deal to bring innovation, job opportunities and skills to the region

”

**David Patterson
Principal and Chief Executive
UHI Moray**

NHS Volunteering Stage 2

Led by NHS HIS Community Engagement, DHI completed a Stage 1 project to outline requirements and deployment options for a new national Volunteer Management System (VMS) platform to support the future needs of NHS Volunteering. Stage 1 highlighted that to achieve its strategic aims, NHS Volunteering itself must transform into a more coordinated and impact-focussed national service, able to adapt to generational transition and shifting expectations in the volunteer landscape. The Scottish Government therefore funded ‘NHS Volunteering Stage 2’ to define structural and operating models of the NHS Volunteering ‘future state’, and to draft key processes and new engagement models.

Through a series of workshops and small group sessions with stakeholders from Scottish Government and NHS Volunteer Managers from across Scotland, DHI developed a ‘future state’ model of NHS Volunteering, including converged national processes, agreed data sets, and new impact and reporting requirements. The core output will inform the procurement of the VMS, and will form the blueprint for transforming the NHS Volunteering service. DHI assisted NHS HIS:CE in drafting the Outline Business Case for funding the programme of change.

AIM4ALL

The Life Sciences Competitiveness Indicators 2022 indicate that the UK must increase the number of clinical trials in Scotland to improve health outcomes and economic investment. There are two key challenges to increasing clinical trials in Scotland; disparate data sets across the healthcare landscape, and protracted contract negotiations due to treatment manufacturers requiring high fees to cover development costs and Scottish Government and NHS Scotland having insufficient data to demonstrate impact and hence assess affordability.

The aim of AIM4ALL is to produce a Proof of Concept of a service which provides a mechanism to collate standardised, long-term, clinical datasets across Scotland – with CAR T-cell therapy as an initial use case - that can be input to outcomes/ risk-based treatment pricing algorithms. A future operational service would inform treatment contract prices that work for both Scottish Government and manufacturers, enabling a swifter conclusion of negotiations to enable trials of emerging treatment to be secured.

Digital Identity Project

The purpose of the project was to build confidence in the sharing of health data using citizen-controlled record systems. Scenarios were based on live heart failure digital service models to help partners move beyond a purely conceptual exercise and so to learn and build confidence effectively. This project was to be based on the Digital Identity Scotland (DIS) approach, using citizen held ‘attribute stores’ (hereafter called Personal Data Stores) to allow people to port their health attributes (e.g., age, diagnosis) across organisations on a consented basis. (see fig. below)

DHI partnered with Sitekit (and its sister company Condatis) to develop user interfaces, undertake the bulk of the integration activities, and provide digital platforms for the certification and sharing of health attributes. Storm ID’s Lenus platform provided the health attributes. Mydex CIC was engaged to provide a Personal Data Store platform to be the citizen held record to receive and reuse the health attributes. This project has provided a blueprint for follow up live deployment activity to support integrated care in the North of Scotland.

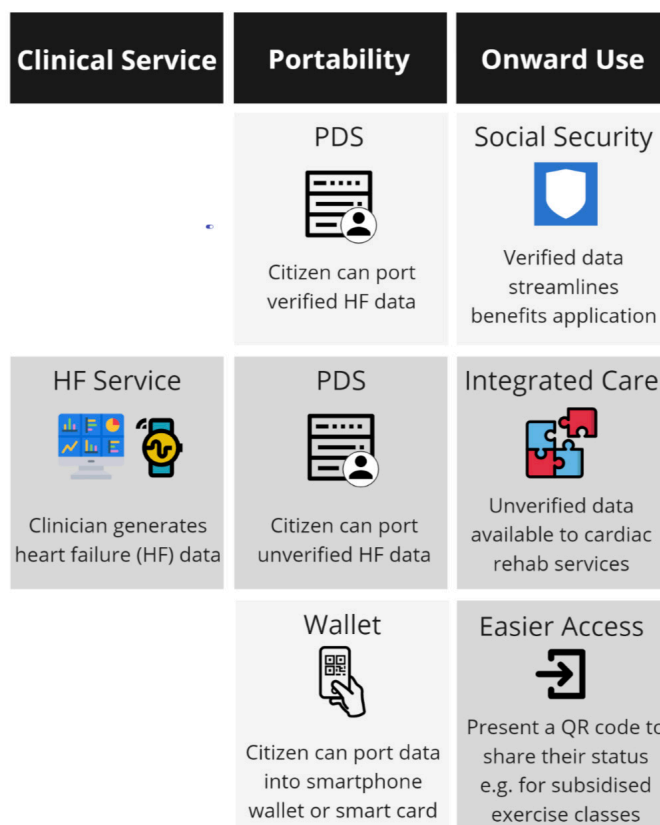


Fig. 6– Digital Identity Graphic



Evaluate and iterate

Beyond Readiness Assessment Level 5, DHI often advances projects where the future state of the digital solution has been developed on a small scale and is ready to be trialled, iterated and evaluated (usually in real world settings).

HERE4U Scotland Responder App Pilot

In response to the high rate of drugs related deaths in Scotland, the 'BRAVE' – Here4U Project is part of the Overdose Detection and Responder Alert Technologies (ODART) programme. Here4U Scotland is a partnership between University of Stirling, Aberdeen City Alcohol & Drugs Partnership, DHI and the Brave Technology Co-op.

Brave Technology Co-op is based in Canada and is the owner of the Brave App which links people who are using drugs in homes or hostels to a community of 'supporters' who can support the person who uses drugs through an 'at risk' period and can initiate a response in the event of an overdose to avoid a fatality. The App has been refined for Scotland to create the 'Here4U' App and is being trialled and evaluated in Aberdeen City and evaluated for its suitability in Scotland. This project is well under way and the evaluation report is expected in autumn 2023.

AICE Europe

The University of Strathclyde, with input from DHI, have secured a 4 year programme funded by Horizon Europe with an overall value of 6 million Euro. There are three Scottish Partners as part of the consortium; NHS Highland, University of Edinburgh and University of Strathclyde. The aim of AICE is through evaluation, to enable clinical routine application of a complete AI Image diagnostic pathway for large bowel investigations by validating Artificial Intelligence Algorithm (AIA) supported camera capsule endoscopy (CCE).

By adding artificial intelligence for image analysis and a new remote system for data capture, handling, and fast reporting, the objective is to eliminate the current medical, technical, and economic barriers to further adoption of CCE, hereby benefiting both patients and health care systems. DHI is working alongside University of Strathclyde to support the delivery of a work package focused on design and development of patient facing digital tools .

My Cancer mAI Care

My Cancer mAI Care is a joint project involving Macmillan Cancer Support, Abertay University, and DHI. Employing principles from game theory, an AI driven visual tool has been developed capable of identifying appropriate services for individuals impacted by cancer.

The system leverages rule-based machine learning to deliver data-driven suggestions for the next steps in a care plan, while also offering tailored recommendations for apps and websites that align closely with each person's specific requirements.

The project is now at the stage where the user experience is being evaluated with the final workshop scheduled to take place this month. This will result in a prioritised set of final recommendations relating to the User Experience in advance of being deployed into Macmillan's service pathway.

“

DHI have led a series of co-design workshops that allow Macmillan staff to explore our technical tool set in a supportive environment and provide feedback in a structured way that can feed directly into the development process.

”

Professor James Brown, School of Design and Informatics, Abertay University

Digital Lifelines Scotland Stage 2

Building on the work completed in Digital Lifelines Scotland stage 1, DHI has received grant funding to support the Develop phase of the programme with DHI forming part of the core Digital Lifelines Delivery Team with a focus on Digital Products and Services workstream. We are trialling these products to see if they can reduce drug misuse fatalities and if they are suitable for embedding and adopting across Scotland to support people who use drugs.



Fig. 7 – Digital Lifelines workshop

DHI Exchange - Pathfinder (simulations)

The DHI Exchange has recently shifted the focus of its work towards integrated care innovation. This is to support emerging national health and care programmes (Digital Front Door, National Care Service), while also stimulating industry capability and economic development to ensure a supply of next generation industry capabilities to meet these demands. Several pathfinder projects across Scotland are underway.

Pathfinder Project: Midlothian

An example is a frailty project with Midlothian Health & Social Care Partnership. This has explored how a citizen held ‘Personal Data Store’ can allow a citizen to curate their story as they move between pathways and organisations, enhancing their voice while reducing duplication and friction. Through their consent, this can also provide invaluable shared care records for the professionals to enable a more integrated care model.



I think it’s generated some really useful conversations locally about our systems and how we share information and the experience for the people that we’re supporting who get passed between service to service to service and how do we try and overcome that to give a better experience for the individual.



Third Sector Project Partner – Midlothian Frailty

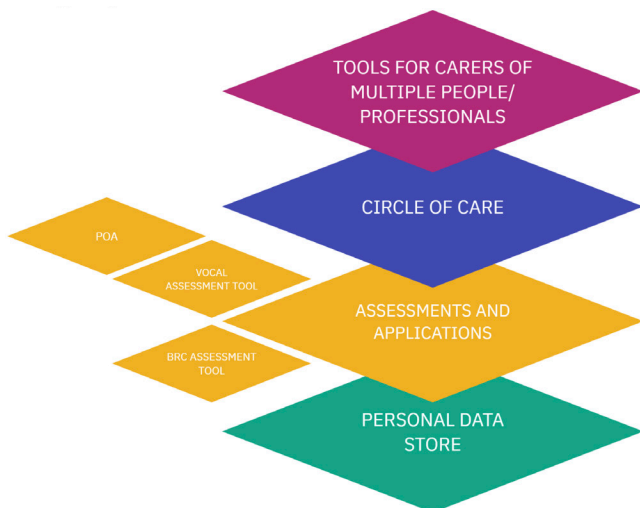


Fig. 9– Midlothian future state model



Fig. 10– Moray RCE activity

Pathfinder Project: Moray

As part of the Moray RCE, DHI is undertaking R&D based on a common, person-held data sharing ecosystem. The programme is still in early stages, but it is already leveraging some of the learning from Midlothian co-design and development. This programme will extend further, integrating a citizen’s ‘about me’ (see fig.10) into a variety of people, groups, and organisations across the different sectors. This will enable a holistic, integrated response driven by the citizen’s story, told once, and reused multiple times.



There are strong indications that the outputs from the Pathfinder will inform the future development of national strategies and are of ‘high value’ with significant potential to support other research, service design and transformation projects.



Conclusion of the Technology Enabled Care Pathfinder Programme Evaluation – Midlothian Frailty

Transferring Pathfinder learning

This pathfinder activity allows DHI to spot opportunities to transfer the learning and assets to other regions, creating collaborations and leveraging further funding to test in the real world across regional boundaries.



Embed and Adopt

This includes projects that have been successfully tested and evaluated in the real world and are considered to have sufficient evidence to support wider adoption. At this stage, the DHI shifts into higher Readiness Levels (6 and 7) and adopts a supportive role to assist implementation, adoption and developing a case for scale, often led by other partners (e.g., Innovation hubs, CfSD or NSS) and can be handed over as part of the new revitalised ANIA (Accelerated National Innovation Adoption) pathway. This year, DHI has progressed 2 projects into a readiness state for scaling.

Right Decision Service

The Right Decision Service (RDS) has associated products that have been widely embedded and adopted across Scotland (as previous annual reports highlighted). However, the entire Right Decision Service is now fully ready for moving to scale and is transitioning over to Health Improvement Scotland (HIS) a special Scottish Health Board that is well aligned as HIS have a focus on ‘Enabling people to make informed decisions about their care and treatment’. The Right Decision Service delivers a national portfolio of decision support tools as web/mobile solutions, integrated with electronic care records along with a ‘no-code’ decision support builder toolset.

This enables trained ‘super-users’ in local and national teams to build quality assured tools to support health and care priorities and ‘Governance, implementation support and training’ to facilitate embedding of decision support in day-to-day activities across health and social care. The service has been developed to a robust, sustainable state and is ready for handover and scale to NHS. RDS will be transferred to NHS HIS during the summer of 2023.



This is excellent news, both for the organisations that have developed the Right Decision Service and see it move to the next stage, and ultimately those providing and receiving care that will see the real benefits that RDS will provide. This is the first example of a digital health and care programme that has been trialled and piloted with our partners, through to mainstream delivery led by a national NHS Board and highlights the success of our collaborative approach. It also demonstrates our commitment to delivering on the priorities of our shared Digital Health and Care, and Data Strategies. I thank the DHI and all those involved in RDS development, and very much look forward to the programme’s future success



**Scottish Government, Michael Matheson
Scottish Cabinet Secretary for Health and Social Care**





Person-centred Records (NHS Grampian)

DHI with NHS Grampian helped develop a blueprint and specification to embed a more person-centred approach within NHS Grampian systems. NHS Grampian have since been building and rolling out their new record keeping systems guided by the co-designed findings of the project.



In NHS Grampian we were committed to the implementation of an in-patient electronic record in order to provide safer and more effective services for patients admitted across our hospitals. Our work would have not had the same success in terms of really achieving a person-centred solution that captured the multi-professional team’s plan of care. The new record keeping processes have increased patient safety and improved communication between the different professionals within our in-patient services.



Jill Ferbrache, Lead Nurse Excellence in Care and Innovation, NHS Grampian

Working with CfSD/ANIA

DHI is supporting the Centre for Sustainable Delivery in its role taking innovation to scale in Scotland. As part the Accelerated National Innovation Adoption (ANIA) process, DHI is facilitating co-design, service mapping and consensus building while also providing advice around digital elements.

In the last year, DHI has facilitated the current and future state mapping across Scotland for dermatology and heart failure services (refer to image below). The development of current state maps helps to identify local variation in service provision to ensure any national digital implementation is well informed and future shared processes harmonised.

Future state mapping is a consensus and co-design method that engages clinical leads from across Scotland to jointly visualise a target digital service model. From this DHI helps to distil requirements that can then inform ‘build or buy’ decisions later in the ANIA process.

Both mapped services (heart failure, dermatology) originated through the Health Data Exchange programme run by DHI in partnership with NHS Greater Glasgow & Clyde, Lothian, and Grampian. DHI is supporting the innovation pipeline at multiple points from ideation and early platform development, through to developing national business cases through ANIA.



The CfSD team have been very grateful to DHI in supporting the digital dermatology and heart failure projects specifically. This work around helping define the future state clinical pathways and the related data flows has been very helpful, if it hadn’t been for DHI capability it would have taken much longer.



Jason White, Head of Innovation, CfSD

Heart Failure Diagnostic Service Harmonised Current State

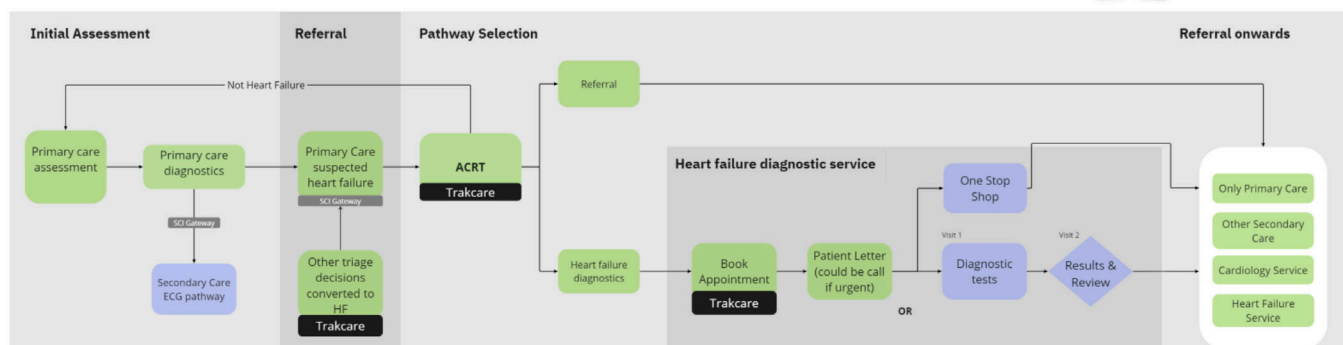


Fig. 11– Heart failure diagnostic harmonised current state



Learn & Share

DHI undertakes a broad range of activities at a local and international level to create learning and KE opportunities. This includes events (webinars, seminars, thought leadership and speaker slots), which disseminate key findings from its innovation cluster, market research, project portfolio and simulations to influence skills, strategic thinking and collaborations.

Future Talent Pipeline

DHI supports the creation of a talent pipeline by raising the profile of digital health and care career opportunities and influencing the curricula in Scottish Schools, Colleges and Universities. Supporting our partners to create learning options, including working with partners to develop Clinical Innovation and Entrepreneurial fellowships and further online learning through updated MOOCs and CPD modules. DHI partners with national and international organisations on this mission, including WHO, EHTEL and others as well as leading the ECHAlliance Global Health Connector Partnership for Skills.

Events

DHI has undertaken a range of events over the last 12 months, both locally and on an international level. These platforms and events allow DHI and partners to share learning and create meaningful knowledge exchange and transfer opportunities. In total DHI has led 11 events, delivered 15 partner events and participated in another 58 events engaging over 3600 delegates.

DHI also showcased 10 Years of Meaningful Co-design at The Glasgow School of Art Highland Campus Summer Show titled 'Inclusion'.

DigiInventors Challenge

Following the continued success of DHI's #DigiInventors Challenge, which received 134 applications from Scotland and United Arab Emirates, DHI partnered with City of Glasgow College, Raising Aspirations in Science Education (RAiSE) and Sphero Inc. to launch a Primary School version of the Challenge. This received 67 applications, engaging over 268 pupils.

The winners of our 2022 Secondary School Challenge were the T1D Trailblazers from Robert Burns Academy East Ayrshire, a charity called Lochlan's Legacy. This charity developed a digital solution that would empower family, friends and sports coaches to better support young people, living with diabetes get involved in sport.



The DigiInventors Challenge was an incredible experience and fantastic to win. Having my own charity, and being supported by DHI has been great and allowed us to work with organisations like The Scottish Tech Army to transform my ideas into reality.



**Lochlan Murdoch, Founder,
Lochlan's Legacy**

International Knowledge Exchange

This year international activity has been high with key speaker slots: Mobile World Congress, Dubai and Saudi Arabia, resulting in knowledge transfer and exchange sessions with both Ministry of Health organisations and key University links strengthened. In addition, DHI have participated in numerous inward trade missions with active activity across Europe (ASCELL), India, and the USA, creating opportunities and focus for its Global Innovation Health Summit (in partnership with Kaiser Permanente). Thus strengthening academic and industry links to promote Scotland and its appetite for partnership working across the globe.

Market Research

DHI's thought leadership position remains at the forefront of innovation for this sector. This year a range of market reports (14) have been published including deep dives on digital mental health innovations to inform our innovation cluster priorities. DHI has also contributed to six peer reviewed publications, adding to over 240 reports.

Emerging Trends Report

This report reviewed technical and softer developments in Digital Health and Care following covid. It identified six overarching trends: Greater personalisation of health and care; More efficient, effective, and precise use of health care data; Growing health data autonomy for citizens; Overall emphasis on wellbeing and prevention of ill health; Care moving away from hospitals into community setting; Transformation in skills needs and workforce requirements in health and care (see fig. 13).

The primary takeaway from this review is that there is now an established acceptance for digital health and care solutions as part of health and care service delivery. The pandemic has acted as a catalyst for change in the sector, with citizens expecting digital technology to play a part in the delivery of their health and care.

Masters Scholarships/Internships

In 2022-23, the SFC awarded DHI 20FTE master's scholarship to award to Scottish PG students in digital health and care subjects. Contrary to previous year's DHI struggled to use all MSc scholarships funds, and therefore DHI were left with a surplus of 8 FTE scholarships unawarded (due to inflation in relation to University Master course fees and Brexit). DHI will take steps next year to heighten the awareness and reach out to individual course organisers to rectify this position.

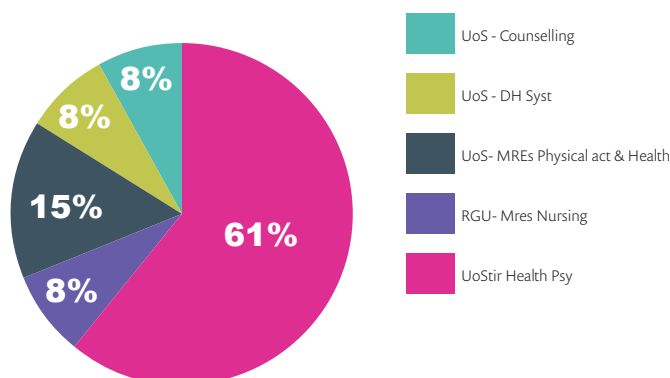


Fig. 12—University scholarship allocation

A new DHI activity was the initiation of the first Digital Health & Care Master's Alumni Conference. This event featured past (Alumni) students whose study has been supported by DHI's scholarship scheme, which to date has supported over 120 scholars in 18 disciplinary areas across 10 Scottish Universities since 2015. The event was a great success and will now be delivered as an annual event, linking in with DigiFest.



Fig. 13—Emerging trends key themes (findings)

Stakeholder Feedback

DHI surveyed 17 project partners around the short-term impact of projects completed within the last 12 months with a 53% response rate. When asked how useful it was working with DHI, on a scale of 1-5 (5 being the most useful) 67% of our partners rated DHI at 5 out of 5 and a further 22% rated us 4 out of 5.

This section highlights feedback from project stakeholders on how DHI’s work has had an impact, as per their strategic objectives. In summary, the results show that DHI is positively impacting services/citizens:

- 50% of stakeholders felt there was already less wasted resource and a further 25% anticipate this will emerge
- 63% noted the service had become more citizen focussed as a result of the project with a further 37% anticipating this will emerge (see fig.14)
- 57% of stakeholders noted that the project had already led to better data exchange between citizens and services with a further 43% anticipating this will emerge (see fig.15)

DHI is making an impact on the strategic intention and achievement by stakeholders:

- 56% of stakeholders felt that working with DHI had already helped them provide influence at national and policy level with a further 33% anticipating this will emerge
- 67% of stakeholders felt that working with DHI had already enabled them to secure collaboration opportunities with a further 22% anticipating that this will emerge (see fig.16)
- 72% of stakeholders felt that working with DHI had provided them with a voice for their sector with a further 14% anticipating this will emerge
- 45% of stakeholders had noted that working with DHI had helped increase their organisation’s appetite for digital innovation with a further 33% anticipating that this will emerge

Stakeholders feel that working with DHI has increased their knowledge in the following areas:

- 78% of stakeholders increased their knowledge around digital options and opportunities
- 56% of stakeholders increased their knowledge on service development
- 56% of stakeholders increased their knowledge of design

Fig.14 Impact: Service becoming more citizen focussed:

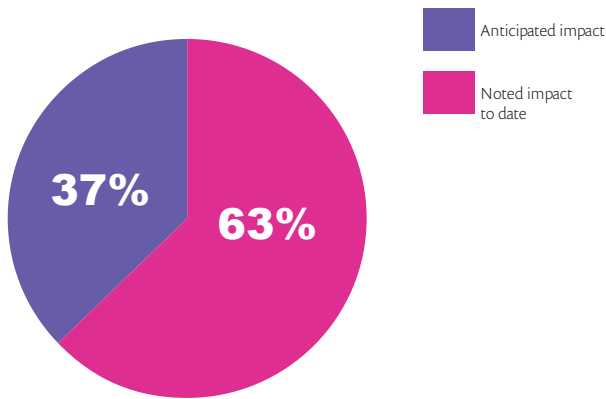


Fig.15 Impact: better data exchange between citizens and services

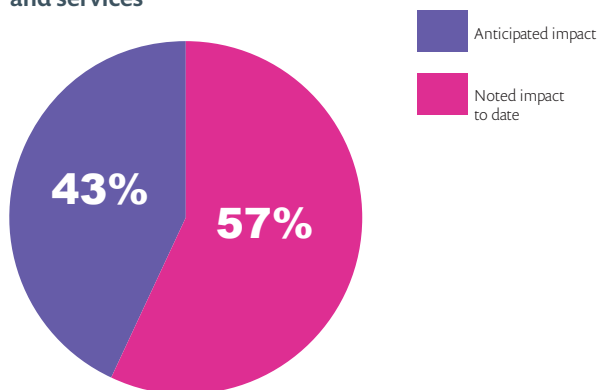
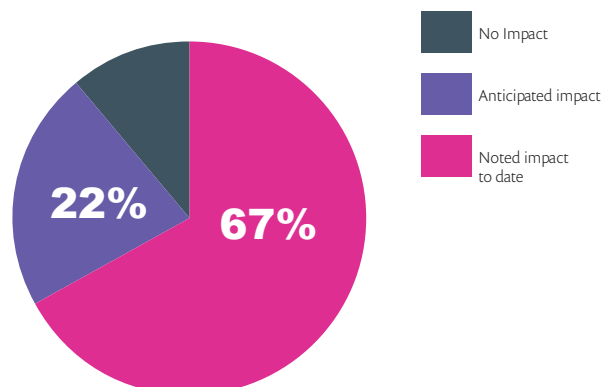


Fig.16 Impact: secure collaboration opportunities



The RKM Benefits Realisation Survey

Research Requests (4 workstreams)

Feedback was received for 4 research workstreams, 3 from Diabetes Innovation Challenge, and 1 from Procurement methods for mixed reality digital mental health therapeutics. All feedback stated excellent collaboration with the DHI, high-quality outputs, and high impact on the wider system.

Master's Scholarships – course leaders' feedback

Six course leaders completed the survey for the 6 participating courses in the Master's Scholarship programme for the academic year 2022-2023.

Course leaders noted the level of impact that these scholarships have had on their universities work (see fig 17 for breakdown).

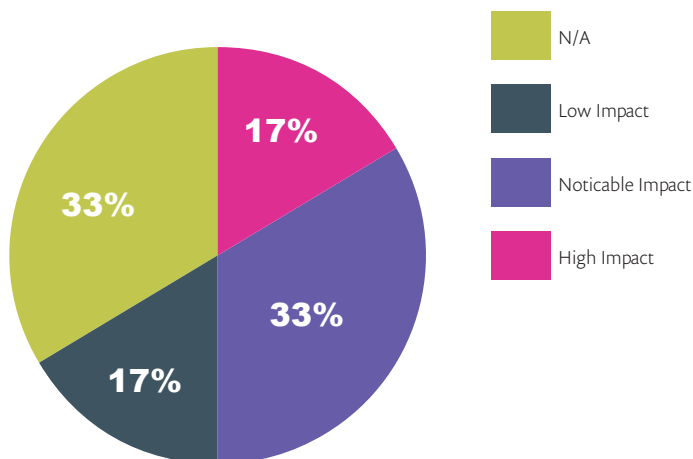


Fig. 17– MSC course leader feedback regarding impact on their work

Kajaani University of Applied Sciences, Finland – Webinars

Jukka Seppänen, Head of Education and Research at the University provided a highly praising testimonial to working with the DHI, stating that the webinar and the RKM's participation as a keynote speaker at the Winternational Week was highly impactful to the participants, initiating lots of discussion.

“

DHI have been an excellent organisation to work with. They have helped support all aspects of diabetes related innovation. This has included discovery work, helping identifying priority areas for future investment to the ongoing support for diabetes related projects within the innovation pipeline such as ANIA.

They have also played a vital role in the implementation of digital solutions to support type 1 diabetes care. This has included extensive support around procurement and contracting, stakeholder engagement and implementation at clinical level. Without this support, leadership, and guidance it is unlikely if this initiative would have progressed highlighting the vital role that DHI played in this process

”

Professor Brian Kennon, National Clinical Lead for Diabetes

“

KAMK have been very pleased to continue collaboration with the DHI in the past year. In October, we organised a second collaborative webinar with the DHI aimed at staff and students around digital health & care innovation in rural areas, and in February 2023, we were delighted to have the DHI as one of our key notes speakers at the Winternational Week.

The presentation on Emerging Trends in DH&C inspired a lot of discussion among the participants of the week. We hope to continue our collaboration around digital health in the rural areas, and explore, e.g., ideas around using VR to support young people in rural area

”

Jukka Seppänen, Head of Education and Research, Kajaani University of Applied Sciences Finland

Conclusion and future focus

DHI has demonstrated exceptional performance in achieving overall its Phase 2 Year 4 Key Performance Indicators (KPIs). This success can be primarily attributed to our focused efforts and the accelerated pace of innovation aimed at addressing the challenges posed by the Covid-19 pandemic and stresses on the Health and Care services due to high demand. As highlighted in the updated ‘Emerging Trends’ report, the pandemic has acted as a catalyst for transformation in the health and care sector, with citizens increasingly expecting digital technology to play a pivotal role in the delivery of their healthcare.

Throughout the year, DHI has successfully accomplished all the primary objectives set forth in the previous year’s annual report (Year 3). These objectives encompass:

1. Maintaining and promoting a demand-driven, well-balanced portfolio.
2. Expanding our cluster and engagement initiatives to broaden our reach and enhance knowledge exchange.
3. Expanding the reach and repositioning of the DHI Exchange as a pioneering force and R&D infrastructure within the innovation landscape.
4. Strengthening and activating strategic partnerships in alignment with future needs and recent strategies.
5. Advancing our skills development activities to redefine the future skills and education pathway as we transition into the next phase of DHI’s delivery ambitions.

Furthermore, DHI has successfully crafted its comprehensive DHI 10-year strategy, with seven priority action areas detailed (refer to Figure 18) in the coming year we shall construct a delivery plan for these areas of action.

PAA1 – Support the transformation of health and social care		
PAA2 – Develop a digital & data infrastructure as national assets to de-risk innovation	PAA3 – Enhance Scotland’s connected ecosystem through cross sectoral innovation clusters	PAA4 – Develop a future skills pipeline which delivers workforce capabilities fit for Scotland’s future
PAA5 – Extend commercial engagement to support economic growth	PAA6 – Support health and care contribution to Net Zero	PAA7 – Enhance Scotland’s international reputation in R&I

Fig. 18 Potential priority action areas for Phase 3

As we approach the final year of Phase 2 funding, DHI is strategically preparing for a transition period. During this phase, we will meticulously develop the specifics of our initial phase 3 programme, spanning three-year delivery plans, financial modelling, and organisational realignment. Our primary aim is to align all efforts with funder’s strategic objectives, with an overarching focus on the Transformation of Health and Care by developing and embedding appropriate digital innovations that will make a positive impact.



Fig. 19 - Photo of some of the DHI team members

Our 2023/24 contribution to the wider strategic landscape will be progressed through our four key pillars of activity as outlined below.

INNOVATION CLUSTERS AND ENGAGEMENT

DHI will extend and deepen its role as Scotland's Digital Health & Care INNOVATION CLUSTER MANAGEMENT ORGANISATION by;

- Developing an International Strategy to heighten global exposure and inward investment opportunities.
- Furthering engagement with UKRI, Chief Scientists Office Innovation Team and others to raise awareness and encourage Scottish R&I orgs participation in relevant funded Challenge Calls.
- Identify and support a further 2 cluster member collaborations to submit high value funding applications.
- Develop a hybrid events methodology to expand engagement and cluster membership.
- Extend communication and engagement collateral, including expansion of the Digital Innovation Hub.

PROJECT PORTFOLIO will continue to focus on supporting partners to co-design and manage the transition to scaling digital innovation where maturity and readiness has been robustly proven, disseminating the learning to support progress. DHI will support at least one project ready for adoption, supporting the three key project strands:

1. Remobilisation and recovery;
2. Commercialisation and adoption of specific initiatives;
3. Rapid shifting of health and care service delivery to a community setting (includes National Care Service considerations).

Creating opportunities to optimise and learn from the Rural Centre of Excellence in the Moray Region through the Living Lab (LL) initiatives; with a particular focus in the next 12 months on delivering the Real-World Evidence for the first three and initiating the Smart Housing/Communities and the Mental Health Living Labs.

SKILLS, FUTURE WORKFORCE & KE will develop a new strategy and continue to raise awareness (in collaboration with academic, civic and industry organisations) of the DH&C sector. This will include supporting:

- Post Graduate developments, including Master's scholarships, Internships, Fellowships (Clinical and Entrepreneurial), and investigating Apprenticeships and CPD opportunities to encourage diversification from other sectors;
- local and international KE events;
- skills and education pathway development in DH&C from early years via schools, FE and HE to workforce and career changers and citizen upskilling;
- DHI and its partners through offering our internal research service to further our collection of resources, including grey and peer reviewed literature;
- FE and HE to review their curricula to support the digital transformation of health and care.

The DHI EXCHANGE will restart a programme of immersive demonstrations in the newly opened and reopened Demonstration Environments in Moray and Glasgow respectively. Following the methods used pre-pandemic, DHI will engage thousands of industry, health, care, academic and citizen participants in 'art of the possible' sessions that will exchange knowledge, build consortia, and stimulate new project activities. Extension of the model into more formal Living Lab environments for real world evidence gathering, will help move things developed in the DHI Exchange mechanisms towards full business case development and adoption processes for Scotland.

Key deliverables for the next year include:

- Develop two innovations ready for transfer to Living Labs;
- Develop a more formal and strategic integrated care programme;
- Extend DHI and Scottish reach through a reinvigorated Demonstration Environment programme post-pandemic.