



Digital Health & Care
Innovation Centre

Phase 2 - Year 3 Annual Report

(August 2021 to July 2022)

Authors

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The DHI is a collaboration between the University of Strathclyde and the Glasgow School of Art and is part of the Scottish Funding Council's Innovation Centre Programme. The DHI is also part-funded by Scottish Government.

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

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Foreword

The direct and indirect consequences of the Covid pandemic continue to challenge health and care providers. Increasing demand and a chronic shortage of skilled human resource make digital innovation in support of service transformation a vital element in confronting these challenges. DHI has had another extremely busy year, and the Board continues to be impressed by the impacts made by the staff team, their strong partnerships and KPI performance. Our Board also continues to evolve, with representation added from NHS Education Scotland (NES) and senior representation from the Care Inspectorate adding to the important contributions of our industry, academic, health and social care stakeholders.

DHI's successful collaborative approach to developing and deploying innovative solutions with cross-sectoral partners has also attracted further international interest this year. This is no surprise to those of us who follow the global market for digital health technology and services, which was estimated in 2021 to be \$176 billion and growing at 28% pa. Scotland's public sector investment in DHI ensures an excellent position from which the country can capitalise on the health and economic benefits from this significant market opportunity.

Of particular note this year has been the DHI's regional expansion, with the establishment of the £5m Rural Centre of Excellence for Digital Health and Care Innovation in the Moray Region. This will harness digital innovation for the direct benefit of local communities, with potential impact and transferability far wider than Scotland and the UK. I look forward to the continuing success of DHI and offer my personal thanks to the Board, the staff team, its partners and funders on their continuing commitment to this impressive initiative.

John Jeans CBE - Chair of the DHI Board

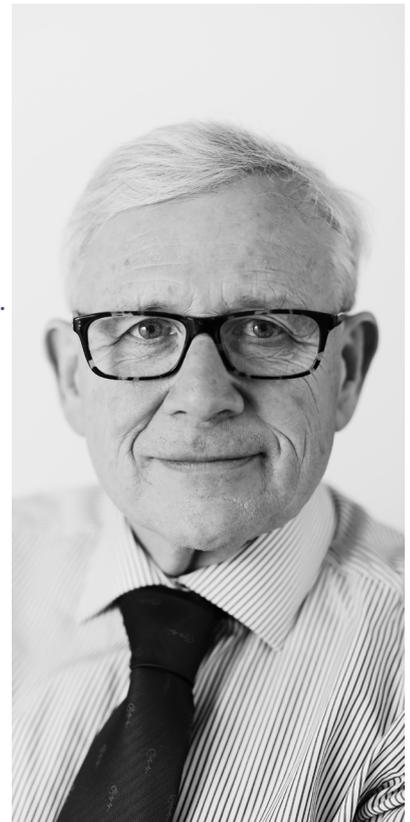
Introduction

Despite the continuing challenging Covid-19 environment, DHI has not only exceeded its key delivery targets but has also brought in significant additional investment. This has enabled DHI to expand its contribution to the health and care innovation landscape and support Scotland's economic growth aspirations. The evident impact DHI makes is due to the hard work, effort and personal commitment of its team of 43 members and to the direct support received from our host institutions, the University of Strathclyde and the Glasgow School of Art.

Our themed innovation clusters in healthy ageing and digital mental health are proving important catalysts for collaboration, service evolution and transformation. Our DHI Exchange infrastructure and our approach to citizen centred design and data sharing continue to inform next generation health and care services for Scotland. The breadth and depth of our project portfolio continues to expand, and our future skills agenda is exerting influence on new courses and curricula in schools, colleges and universities. These DHI activities are being regarded internationally as mechanisms to address some of the key global health and care challenges.

It has been an absolute privilege to continue to lead the organisation over this past year, and I look forward to another interesting and productive year, working in collaboration with colleagues across government, the public sector, academia, industry and most importantly the people of Scotland.

Professor George Crooks OBE - Chief Executive Officer



Strategic Summary Statement

This Year 3 annual report sets out the significant impact made by DHI over the past 12 months with continued success to report evident, including 5 projects transferred to other organisations as ready to scale.

DHI continues to respond to the unprecedented demands on health and care service partners and the imperative for accelerated innovation. DHI's design led innovation approach and methodology continues to evolve, and is increasingly recognised by our partners as differentiating and effective. This has led and shaped a number of key initiatives at different stages of DHI's innovation process model (Page 5 Fig. 4) including scoping of drug deaths prevention initiatives with the Scottish Government (SG) Digital Lifelines Programme, initiating and developing the transformation of frailty identification and management within Midlothian Health & Social Care Partnership and influencing next generation pharmaceutical delivery planning with Roche, one of the worlds largest Biotech companies.

In addition to scoping activity, DHI continues to balance the project portfolio with over 14 projects managed this year. One major programme activated this year was the Rural Centre of Excellence for Digital Health and Care Innovation in the Moray Region, funded by UK Government. This initiative allows DHI to create more focussed opportunities for rural communities. In doing so this gives us the chance to broaden the innovation pipeline into the integrated care agenda - stretching the innovation model, with a greater focus on social care, data sharing and commercialisation. Launch of the Moray RCE was marked by an official visit from UK and Scottish Government representatives. Iain Stewart MP, Parliamentary Under Secretary of State for Scotland and Richard Lochhead Member of the Scottish Parliament.

“ Digital innovation in healthcare has huge potential for improving the quality, accuracy, timeliness and cost of diagnosis and treatments in our NHS. This will have a particularly positive impact for Moray’s communities, who will benefit greatly from advancements in remote medicine ”

Iain Stewart, Under Secretary of State for Scotland, UK Government

The four pillars illustration below depict the main achievements with a summary and leading examples described throughout this annual report.



Fig 1 - Key Performance Indicators 2021/22

DHI has expanded the future skills and workforce development activities this year, through extensive scoping, engagement, and Knowledge Exchange activity both nationally and internationally. Key strategic partnerships have been built with the SG, NHS Education Digitally Enabled Workforce, NHS Skills Academy and South of Scotland Digital Skills Hub to help address urgent demand and gaps, and in addition DHI has strengthened collaborative activities with Schools, Colleges and Universities to influence curricula, whilst supporting graduates with the introduction of DHI internships.

The DHI Health Exchange (DHIEx) continues to be a key asset for DHI. Partners this year have welcomed the DHIEx Discover sessions which have helped services convey high level needs, understand the art of the possible around digital technology and how it can best be used to meet urgent service demand whilst laying the groundwork for more holistic service transformation. This year, DHIEx Discover sessions have focused on Irritable Bowel Disease (IBD), Heart Failure (HF) and Dermatology in support of Scottish Government (SG) and the relatively newly established Scottish Centre for Sustainable Delivery (CFSD) priorities.

The Rural Centre of Excellence in Digital Health and Care Innovation received £5M from the UK Government. The total additional funding secured this year was in excess of £8.4m (Fig 2). This means that an additional £15m (Fig 3) has been secured by DHI since the start of phase 2 (i.e. from Aug 2019 to July 2022 including direct and indirect investment leveraged). The vast majority of additional funding continues to be leveraged from mainly public sector sources (98%) and distributed widely to support the growth of digital health and care in Scotland (Fig 2).

Fig 2 – Funding distributed

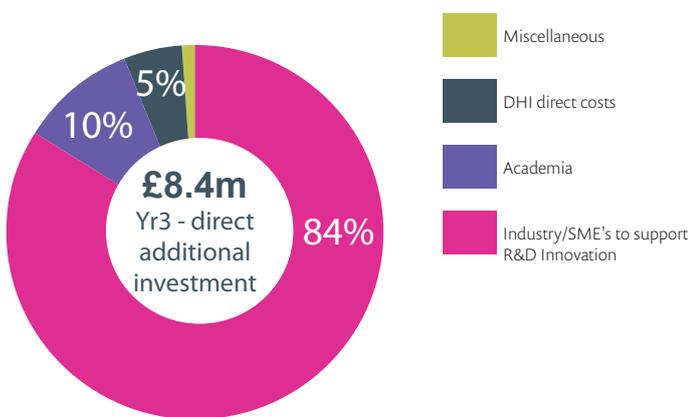
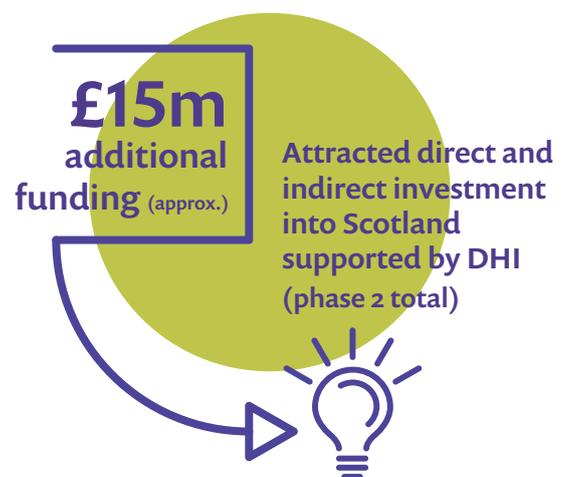


Fig 3 – Additional funding source



The Covid-19 pandemic has made many organisations rethink their operating models, and consider how to maximise impact, productivity and future working models. To remain at the cutting edge of innovation, DHI has embedded a blended working model for our staff team and advanced plans for the reconfiguration of our headquarters in Glasgow to create an immersive knowledge exchange environment with leading edge co-design and creative facilities.

This years key achievements are further illustrated and detailed throughout this annual report, using the structure of the DHI Innovation Process Model (see Fig 4 - DHI Innovation process model).



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 to deliver a strong pipeline of digital health and care innovations.

Strategic Engagement

DHI exerts considerable influence on the broad health and care policy landscape. DHI is represented on a range of groups: Scottish Government Digital Health & Care Citizen Board, UKRI Healthy Ageing Grand Challenge and UK5G Advisory Board. We have supported the National Care Service's international landscape review and chair the highly influential Scottish Life Sciences Industry Leadership subgroup on Digital and Data driving key opportunities, including working with big Pharma. A differentiating factor for DHI is the role played by design innovation across the portfolio and design approaches for health and care as an area of research expertise. GSA (founding partner) have embedded design practice across the organisation. The approach drives how we engage citizens to understand and define requirements, allowing the development of scalable, adoption ready solutions that is person centered rather than technologically driven.

Innovation Clusters

Our overarching Digital Health & Care Innovation Cluster continues to grow with over 1,300 actively engaged members, two themed clusters and this year we introduced a Digital Innovation Hub to strengthen the opportunity to further collaborate online. The clusters bring disparate organisations together in a shared endeavour, creating opportunities for knowledge exchange and facilitate partnership working.

Healthy Ageing Innovation Cluster - HAIC

The Healthy Ageing Innovation Cluster has held 5 events this year attended by over 200 members. Cluster membership has grown by 28%. HAIC hosted the UKRI Designed for Ageing Challenge 2021 Call, reaping positive benefits for Scottish partners in 2022. (see UKRI quote for detail)

Digital Mental Health Innovation Cluster (DMHIC)

Launched in March 2022, this cluster is building momentum. DHI initiated knowledge exchange on digital innovation opportunities by publishing two horizon scanning reports and is currently developing challenge themes with key stakeholders to mobilise collaborations. DHI has engaged Matter of Focus (a Scottish SME) to use participatory design methods to develop outcome maps for the DMHIC. These will enable the cluster to evidence impacts over time on the areas of most importance to its members.



The DHI team supported us on our journey towards providing more patient-centric outcomes. They ran a series of well-structured workshops, and their report has helped us sharpen our focus on home-delivery

**Nick Wigdahl, F. Hoffmann
La Roche**



DHI Scotland were fantastic partners in our search for quality Designed for Ageing innovation investments... three of our 26 Designed for Ageing projects are Scottish consortia – delivering service innovations across self-care, mobility, and community service themes – sharing some £2m of the £20m fund. We look forward to working with DHI again in the future

**Julia Glenn
UK Research & Innovation**



Project Pipeline

The priorities for our project pipeline were agreed with Scottish Government to include the National Care Service/Social Care, Mental Health, Drug Deaths Prevention and Digital Front Door. Additional funding of over £450k was secured for initiatives to progress these objectives. DHI recognises that collaboration is essential to maximise the impact of our work and therefore, continues to develop strategic relationships. This year we have formed many partnerships, placing an emphasis on working more closely with other Scottish Innovation centres on joint propositions. This includes the Scottish 5G centre, Censis, Datalab, BEST and Precision Medicine. We currently have a healthy project pipeline, the most mature of these valued at £371k. Some examples of our project pipeline are:

Diabetes Innovation Scoping

DHI is working with the SG's Digital Health and Care & Innovation Directorate, the SG Diabetes Group and the Scottish Health and Industry Partnership (SHIP) sponsored by the Chief Scientist's Office to accelerate Digital Diabetes Innovation Opportunities. DHI will support an anticipated Digital Diabetes Innovation Call in 2023.

Digital Dermatology Pathway

DHI progressed a rapid discovery and simulation project in partnership with the CfSD to develop a 'high level' current state map dermatology service in 10 NHS Scotland Health Boards. These were harmonised into one national current state map and used as the basis to create a future state map with input from professionals. This innovative approach optimised health staff time, and produced quality outputs only three months after initiation. These materials are now being used to support a business case to drive forward the implementation of a national digital dermatology pathway in Scotland.



DHI research and engagement helped quantify and qualify the unmet need for dermatology and informed deployment of the first Dermatology improvement project: Digital Dermatology Assessment Service across Health Boards.



John Murray, Programme Manager, NSS



As a partner, DHI provided invaluable insights into the requirements and opportunities as well as an opportunity to connect with health and social care providers / stakeholders in a rural environment.

This achieved more insight and pace and as a consequence new models for connectivity are being progressed.

Paul Winstanley, CEO, CENSIS

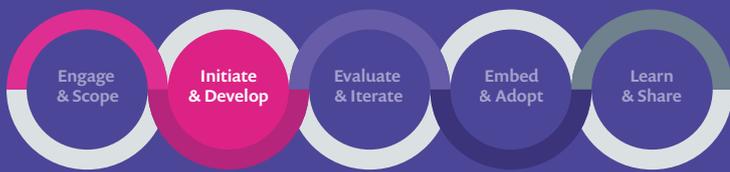


Digital Lifelines Discover & Define

Digital Lifelines Scotland is a SG priority programme which seeks to help overcome digital exclusion and design new digital solutions with and for people with multiple and complex needs at increased risk of drug related harm. This is an area of priority for Scotland, due to the high number of drug related deaths. DHI is working with key partners on the Discover and Define phases of the programme, to help identify the target group, locations, engagement aims and opportunities for digitally enabled innovation.

NHS Volunteering System Requirements

DHI supported the NHS in its recovery by informing requirements for a new digital volunteering system. The current platform used to record volunteering activity at NHS Board level, was installed in 2015 and used by 19 NHS Scotland Health Boards. However, the Volunteer Information System (VIS) is regarded as no longer fit for purpose. This project captured business requirements and insights and converted this into new opportunities to inform a new solution and operating model. Discussions are now progressing with NHS Health Improvement Scotland (HIS) and key stakeholders on next steps.



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)

This ground-breaking UK Government funded Programme was launched this year. It supports the remobilisation of health and care services and the economic recovery of the Moray Region. It will create a dynamic digital health and care ecosystem in a rural area, sustaining public services; inclusive growth through job creation and skills development; accessible services and will contribute to the UK's Net Zero ambitions. The programme will run until 2025, this year has seen the successful activation of the RCE programme including recruiting specialist innovation staff, this includes design research service innovators located in Forres and establishing the enabling technical infrastructure whilst validating the key objectives of each Living Lab with the Health and Care partnership to allow for market stimulation. The five co-designed Living Lab test-beds across Moray region focus on the most acute areas of demand, as per Living Lab themes:

- Healthy Living – Weight Management
- Care in Place
- Co-managed Wellness
- Mental Wellbeing
- Smart Housing and Communities

Over the last 12 months DHI has worked closely with NHS Grampian and other key partners to deliver the Healthy Living – Weight Management Living Lab, with DHI initiating how we might better support people to self-manage their weight.

The project worked with professionals to co-design a future state service map and produced a set of prototypes which can integrate into NHS systems. This generated a set of requirements that are being introduced into the first activated Rural Centre of Excellence Living Lab for full development, deployment, and evaluation over 2022-23.

A robust skills and workforce development programme will be embedded to build capacity and capability in the Moray Region. In the first year the local skills needs have been scoped and skills related partnerships established.



“

For many years Moray has been spoken about as an ideal location for testing digital healthcare innovation given that we have all sizes of populations as well as being largely rural at the same time. I hope that local residents are amongst the first to benefit from such innovations.

”

Richard Lochhead, MSP

Innovating the Frailty System of Care

This project was initiated in 2019, exploring how digital technology and design can support transformative care for people living with frailty in Midlothian Health & Social Care Partnership. It has now delivered comprehensive insights about the service landscape and experiences of living with frailty in Midlothian, identifying ‘navigation’ as a key challenge. The next stage will focus on transforming blue badge Disabled Parking Applications and Carer Support Plans enabled by digital innovation.

NHS Forth Valley Dermatology AI

Artificial Intelligence (AI) is attracting interest in many different areas of Health and Care. This year DHI delivered a series of co-design workshops to support NHS Forth Valley and the Scottish Dermatology AI Innovation Consortium to design a preferred future state for an AI supported Dermatology Service.

DHI facilitated design-led, participatory workshops which mapped the current provision, highlighting opportunities and challenges. A ‘future state’ map was then collaboratively designed, including how AI technologies could support citizen self-management. All workshops and outputs captured for project closure in November 2021, with potential for future development. (Refer to Fig 5 - NHS Forth Valley Dermatology mapping)

Community Pharmacy Scotland (CPS)

Scotland’s community pharmacies currently offer a range of locality based services, from medicines dispensing to retail. This is an excellent position from which they could strategically extend their role as front line healthcare providers in support of NHS Scotland. CPS commissioned DHI and Cohesion Medical (Scottish SME) to design a digital hypertension management service to support people living with Long Term Conditions. The project developed a digital offering to an advanced state of service readiness, including technical and service designs and blueprints, business & cost models.



DHI brought a level of unbiased understanding and advice to our project that was beyond the experience or capability of our clinical team. This was essential in allowing delivery partners to be challenged on their thinking and in allowing a refined product that met our needs to be delivered



**Harry McQuillan,
Community Pharmacy Scotland**

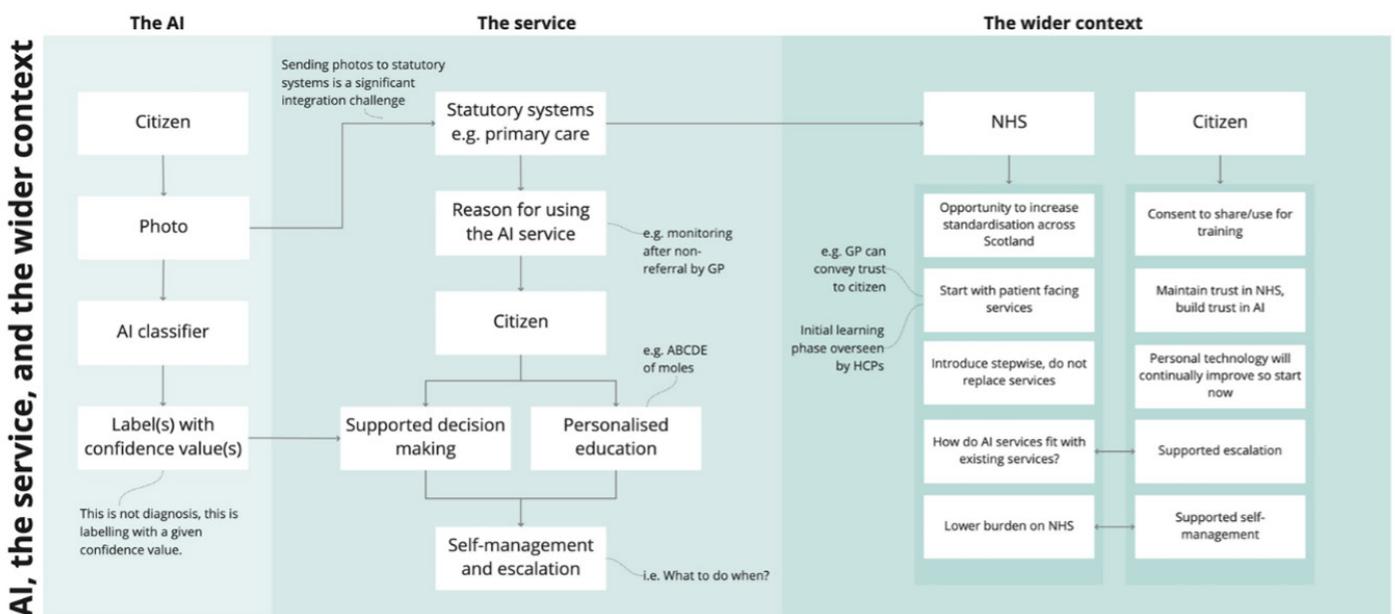


Fig 5 - NHS Forth Valley Dermatology mapping



Evaluate and iterate

Beyond Readiness Assessment Level 5, the 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

Scotland has the most severe Drug-Related Deaths problem in Europe. Innovative solutions are required to help save lives. HERE4U Scotland is a one-to-one smartphone application which connects people who are consuming drugs alone to volunteer supporters who remain on the line with them during the high-risk of overdose period.

Following successful results in the USA and Canada, this pilot is trialling the app within the Scottish context. It is being led by the University of Stirling in collaboration with DHI, Alcohol and Drug Action (Aberdeen City), and the Brave Technology Co-op. DHI is managing the licensing of the app and advice on the UK digital context.

My Cancer mAI Care

This project is a collaboration between Macmillan Cancer Support, Abertay University, and DHI. This project uses game theory to develop a visual tool that will identify suitable services for People Affected by Cancer (PABC). The tool draws on AI technologies to provide data-driven recommendations of what to do next in a care plan and provides a personalised recommendation for apps and websites most pertinent to individual needs.

The project builds on the collaborative work completed in Stage 1 which involved research to develop an early proof of concept and then a prototype which was iterated over a period of time. Further prototype refinements and testing have been delivered through Stage 2 to develop the tool ready for implementation in the Macmillan live service.



As part of the My Cancer mAI Care project, Abertay University has developed an interactive visualisation tool that provides a system-wide overview of Macmillan Cancer Support data. To ensure adoption of the tool by Macmillan staff into practice, DHI have facilitated stakeholder workshops to co-design the tool from the outset, providing an engaging and open platform for discussion and constructive criticism that has fed directly into tool interface design and planning



Professor James Bown
School of Design and Informatics, Abertay University



Colon Capsule Endoscopy (CCE) Innovation

During 2020/21 DHI successfully enabled the large-scale evaluation and design of a scalable national service model for CCE through the SCOTCAP project. National roll out of CCE is well underway in NHS Scotland under the leadership of the Centre for Sustainable Delivery (CfSD) and is actively contributing to the reduction of waiting times for Bowel Cancer Diagnosis. DHI is exploring and evaluating opportunities to iterate the service further, co-ordinating an innovation pipeline to support next generation service redesign and technologies. This includes the successful participation in a new EU Horizon Europe funded project to accelerate the use of Artificial Intelligence and Machine Learning within the CCE pathway which will progress over the next year.

Care Homes Assessment Tool (CHAT)

Building on an earlier Stage 1 Test of Change, this Stage 2 (proof of Concept – ‘POC’) project developed a user guide, (ref fig 6 CHAT User Guide) trialled, and evaluated an early production mobile application within a live setting in four Scottish care homes in Glasgow and South Lanarkshire. The app was developed in partnership with NES Digital to increase staff confidence around when and how to escalate deteriorating resident situations involving Covid-19 and other common infections with external GP support. The POC was independently evaluated by University of Strathclyde with recommendations and next steps identified.

Academic Grant Award Programme

DHI commissions and administers academic research grants directly and on behalf of key partners. This year DHI co-funded an academic call to evaluate the ‘Connecting Scotland’s Care Home Residents’ programme (£65K) in partnership with the SG Digital Health & Care Division. This evidenced that the approach had been successful and provided insights to inform policy considerations. A further three awards are progressing, with University of West of Scotland evaluating an outbound calling service for vulnerable people implemented during the early wave of Covid-19, University of Strathclyde’s Glasgow City Innovation District initiative on telecare; and a project with University of St Andrews on evidence and gap maps to inform a collaborative bid with Ireland for future Peace Plus funding.



This exciting European collaborative will build on Scotland’s current work and support future diagnostic models by harnessing the understanding of AI as a tool for clinicians. Clinicians can use AI for effective decisions on management to deliver “significant improvements” in the management of patients at risk of bowel cancer

**George Crooks OBE
Chief Executive Officer, DHI**

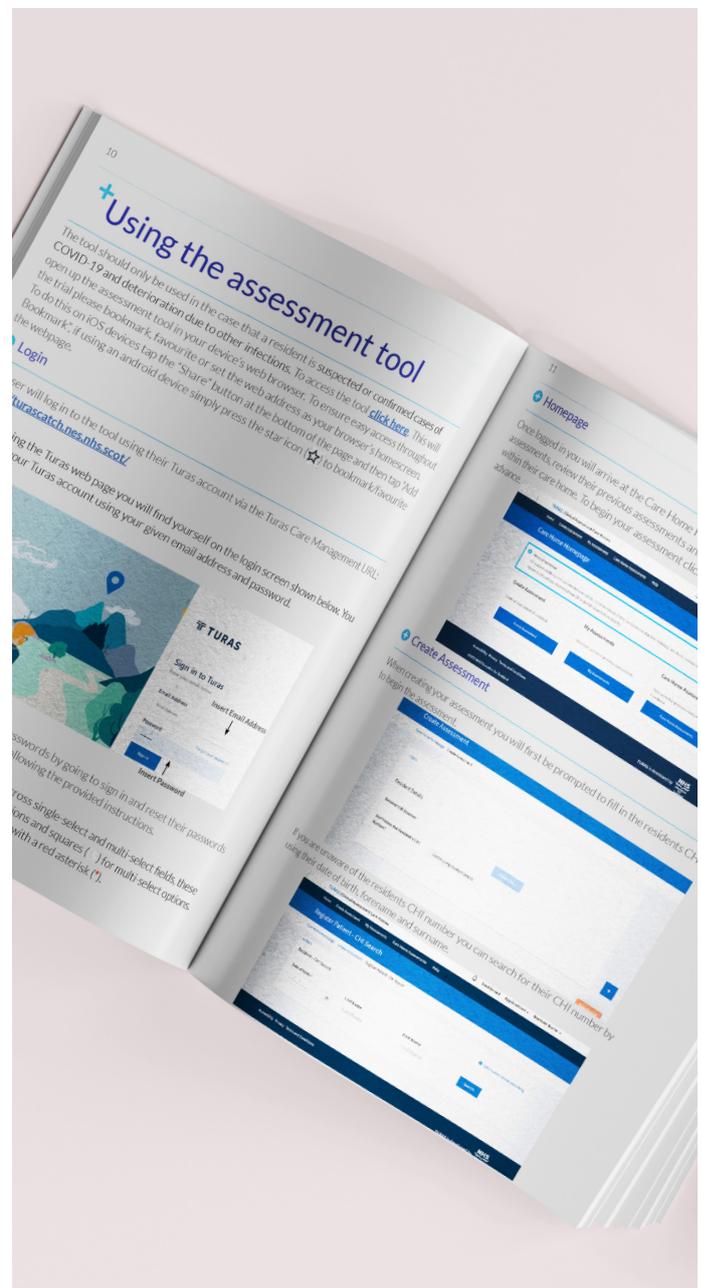


Fig 6 - Assessment Tool Manual



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 often handed over as part of the new revitalised ANIA (Accelerated National Innovation Adoption) pathway. DHI have made 5 ready for scale.

Right Decision Service

This initiative has gained significant traction over this past year, embedding the following aspects across Scotland:

Polypharmacy High Risk Prescribing (RDS tool)

Evidence-based algorithms, prompts and alerts have been successfully introduced into primary care clinical systems used in Scotland as a result of piloting by NHS Lothian and NHS Tayside. National roll-out is planned following UK CA marking and acceptance onto the national ANIA Pathway Development managed by the Centre for Sustainable Delivery.

Home Care Decisions App (RDS App)

Developed in partnership with Scottish Care, Macmillan Cancer Support and Marie Curie this app was successfully piloted this year. It provides assessment and management decision support tools and guidance on palliative and end of life care for registered care-workers in care home and care at home services. Scottish Care and DHI are now actively promoting implementation and adoption across services.



The Home Care Decision app was full of useful hints and tips regarding daily communications and challenges we face but are maybe not prepared for

(Care at home worker, pilot)



Mega App Builder (RDS app builder)

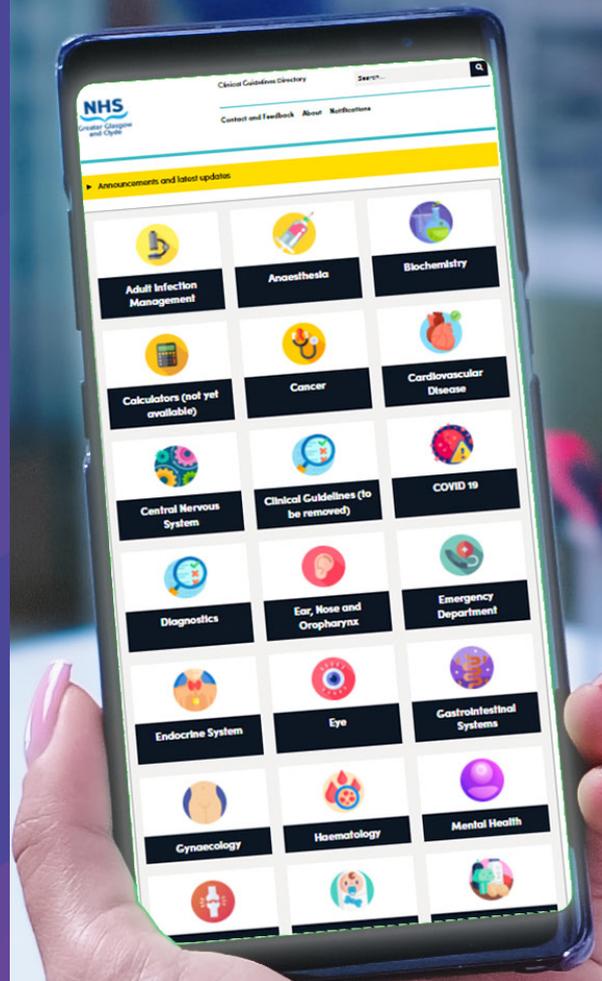
There are nine NHS Health Boards now using the Right Decision Service to deliver local guidelines and pathways via the web and mobile app builder toolkit with three Boards corporately committed to using the Right Decision Service for all guideline delivery.



This is the realisation of a quest for a single portal of information ... a catalyst for smoother and more efficient patient journeys



Associate Medical Director, NHS Lanarkshire



Long Covid App

The SIGN (Scottish Intercollegiate Guidelines Network, HIS) Patient Information Booklet for Long Covid to be translated into simple web and mobile formats provides an interactive symptom tracker for citizens to record and share how their symptoms change over time.

This supports shared decision-making between the patient and health professionals. The app is now nationally available and is being promoted widely through patient and carer networks.

Asynchronous Digital Clinics & Other Advanced Simulations

DHI simulations have supported the embedding and adoption of asynchronous digital clinics across Scotland. Three of the largest Health Boards (Grampian, Lothian, Glasgow) have now procured this capability, building on DHI's Health Data Exchange infrastructure to modernise outpatient care with many of these services now Live.



Partner analysis of 3000 patients across 8 health boards, showed medium appointment times halving in duration

Chal Chute, CTO, DHI



DHI has also influenced adoption outside Scotland. Within NHS England the East Accord Cancer Care Records simulation project. DHI partnered with SME's Cohesion Medical, Mydex and FreshEHR to develop co-managed care plan simulations. FreshEHR and Cohesion have utilised learning to progress to live deployment transferring the innovation across nations.

Dynamic Scot

This project commenced in July 2020 in partnership with NHS Greater Glasgow and Clyde (NHSGGC), NHS National Services Scotland (NSS) and Storm ID (Scottish SME). It built on an Innovate UK funded initiative which developed a web-based application to support people with Chronic Obstructive Pulmonary Disease (COPD) to self-manage at home with support from clinicians and tools for self-management.

This year the work focused on making ready the solution for wider Health Board adoption and evidenced excellent clinical outcomes and patient satisfaction. Future stages of the project will be led by the West of Scotland Innovation Hub and NHS GGC with funding successfully secured to transfer it more widely across Scotland.



Fig 7 -Dynamic Scot--COPD information and monitoring tool Clinical lead: Dr Chris Carlin, Consultant Physician, NHS Greater Glasgow and Clyde.



The DHI team provided a wide ranging set of support; funding acquisition, programme management, service mapping, implementation effectiveness and stakeholder engagement, drawing from DHI's well established ecosystem and expertise. Activities and partnership working was greatly appreciated



Dr Chris Carlin, Consultant Physician in Respiratory Medicine, NHS Greater Glasgow and Clyde



Learn & Share

The 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 our innovation cluster, market research, project portfolio and simulations to influence 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 and 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. We also partner with national and international organisations on this mission, and lead the ECHalliance Global Health Connector Network for Digital Workforce.

Market Research

In DHI's thought leadership position, it requires to remain at the forefront of innovation. This year there has been a range of market reports (14) including deep dives on digital mental health innovations to inform our innovation cluster priorities. We have also contributed to six peer reviewed publications, adding to over 240 reports. One well cited report is our 'Spotlight on Careers' which has achieved global recognition.

Events

DHI significantly exceeded its planned programme of events, including 18 partner events, 49 speaker slots including 13 international slots providing input to an array of late Autumn UN COP26 events in Glasgow, Designopps Global Conference, World Health Organisation, Nordic Gerontology Conference and the industry led Health Future Plans summit. These events allow DHI to raise the profile for Scotland.

DigiInventors Challenge

This year witnessed our biggest and most exciting challenge to date working with enthusiastic partners in Scotland and the United Arab Emirates (UAE). Nine partners helped deliver the challenge – Glasgow Warriors, Heriot Watt University Dubai, dressCode, Scottish Tech Army, Scottish Edge, Orcha, Okadoc and SDI. TEDxGlasgow also provided support.

We received 150 applications from 600 school students across Scotland and the UAE. Both winning teams were all girl teams with digital ideas to support mental health. SDI held a prize giving ceremony in Dubai whilst DHI hosted awards for our Scottish winners. This year's success has led to several opportunities to expand DigiInventors Challenge.



“

In my experience as an assessor for the European Commission for Health Programmes and research and innovation, this type of research information and cluster activity is an invaluable resource for future projects

”

Andy Bleaden, Community Director, ECHalliance

TITTAN Covid (Interreg)

This Interreg Europe funded project supports international knowledge exchange to help tackle the effects of COVID-19 in an ageing population. DHI has enabled the sharing of six best digital practices from Scotland on Healthcare Delivery Pathways; Active & Healthy Ageing Ecosystems (Clusters), and Patient empowerment.

NWE-CHANCE (Interreg)

This Interreg North West Europe (NWE) project focused on Home Hospitalisation (i.e. Hospital at Home - H@H), developing and testing a “Home Hospitalisation Platform”, for patients living with heart failure in the Netherlands and Belgium. To support broad knowledge exchange in these types of initiatives, DHI launched an associated [Digital Innovation Hub](#), and are currently expanding this to support a broad network of Living Lab partners.



DHI brought strength and leadership to the project, their expertise and commitment to the project was invaluable in delivering the Market Access Strategy and Return on Investment report during very challenging times, the same competence was evident with their design and development of Digital Innovation Hub for Home Hospitalisation



Astrid van der Velde, Project Director for Lead partner ISALA, Netherlands

Masters Scholarships/Internships

In the 2021-22 academic calendar year, the DHI’s MSc Scholarship programme awarded 19.5 FTE Scholarships to fund 22 students studying across five institutions. The gender balance of the cohort bucked the trend for a digital/tech subject, with almost three quarters of the students identifying as female (refer Fig 9 -Master Scholarships statistics). In addition, DHI this year introduced internships, supporting 2 interns this year. We also readied a pilot Graduate Innovation Internship for 2022/23 this included design research interns from GSA. In addition DHI supported the Clinical Innovation Fellowships and Clinical Entrepreneurs in partnership with CSO - SHIP, NES and SG.

International Knowledge Exchange

DHI’s global networks support knowledge exchange and best practice to push forward the frontier for innovation in digital health and care. Our strategic partnerships with Kaiser Permanente, Saudi Arabia, The Gates Foundation explore cutting edge initiatives; and DHI continue to work across Europe, with strong alliances and Interreg projects with ECHAlliance, NWE.CHANCE, ACSELL and TITTAN; and national collaborations with Ireland, Nordics (Finland and Norway), the Middle East and Australia.

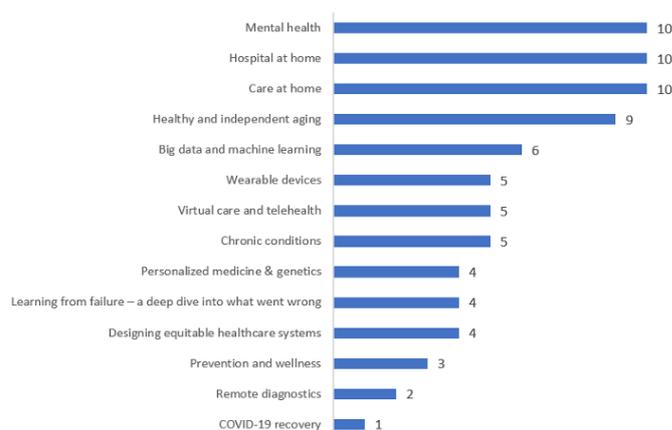


Fig 8 - Global Health Innovation Summit survey

This year, our annual Global Health Innovation Summit (led in partnership between DHI and Kaiser Permanente) survey identified future top three priority topics of interest as Mental Health, Hospital at Home, and Care at Home (Refer Fig 8 - Global Health Innovation Summit survey).

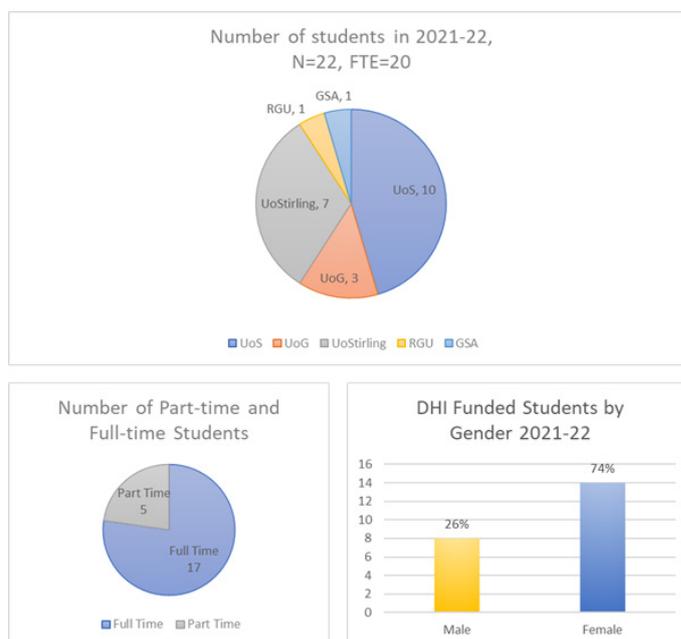


Fig 9 -Master Scholarships statistics

This section illustrates impacts identified by our key project partners, drawing on all functions within DHI. This reflects the success of DHI in enabling stakeholders to harness digital for transformation purposes.

When asked how useful it was to work with DHI out of a score of 5, where 5 is the most useful, 100% of respondents chose the top two scores (55% selected 5 out of 5), 73% of respondents said they would definitely work with DHI again.

Fig.10 Working with DHI appears to help stakeholders at a strategic level in the following ways

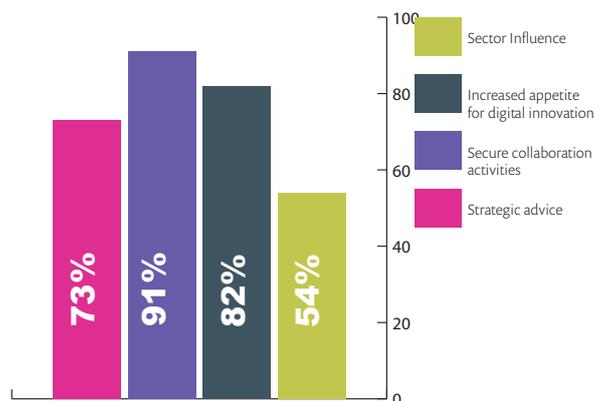


Fig 11. Impact on operational activity and patients

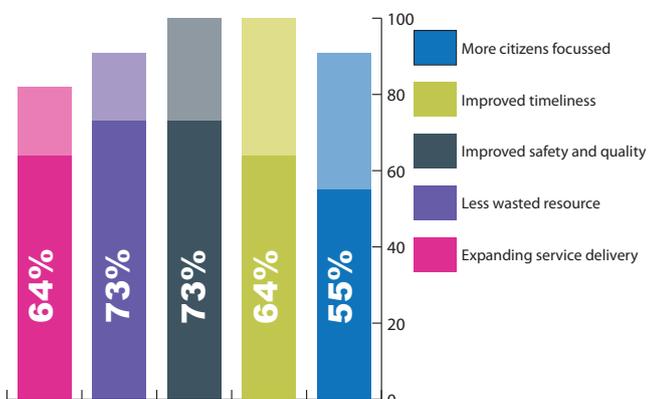
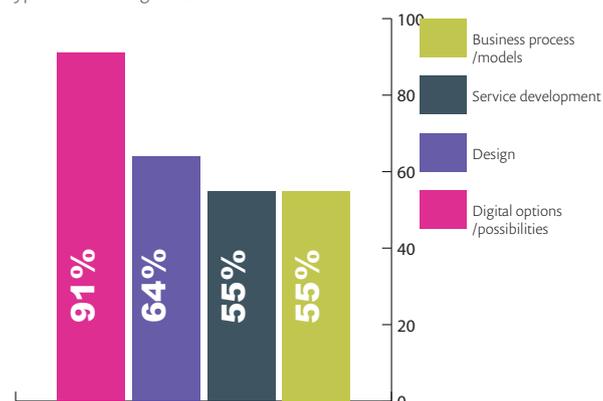


Fig 12. Working with DHI was noted to help stakeholders by improving different types of knowledge and know-how:



Working with DHI was noted to help stakeholders at a strategic level in the following ways:

- 73% of respondents felt the work had helped them with strategic advice
- 91% felt that the work had helped secure collaboration activities
- 82% felt the work had increased the appetite for digital innovation
- 54% felt DHI has helped influence change by being a voice for the sector

With regard to operational impact and the impact on patients/citizens, some immediate impacts have been observed with some longer-term impact anticipated by stakeholders:

- Regarding expanding service delivery, 64% anticipated this would happen as a result of the work with 18% already observing this has happened
- Regarding less wasted resource, 73% anticipated that this will emerge from the work done with DHI with 18% already noting this has happened
- Regarding improved safety and quality of care, 73% anticipate this will emerge from the work done with DHI with a further 27% noting an impact already
- 64% also anticipate that the work will have an impact on timeliness of the service with a further 36% noting this impact already
- 55% also anticipate the work will lead to services being more citizen focussed with a further 36% seeing this impact already

Working with DHI appears to help stakeholders by improving different types of knowledge and know-how:

- 91% of stakeholders noted an impact on their knowledge/know-how regarding technical and digital options or possibilities
- 64% noted an impact on their design know-how
- 55% noted an impact on their service development know-how
- 55% noted an impact on their business processes or models

Conclusion and future focus

The last 12 months have confirmed that the areas of priority for our key stakeholders remain relatively unchanged with the acute need to remobilise and recover from the effects of the Covid-19 pandemic remaining top of their customer feedback agenda, confirming that DHI services and support remains valuable.

Our focus in 2022/23 will be on the following four missions:

- Expansion of digital health and care innovation and ecosystem support, which will include supporting the remobilisation and recovery efforts
- Extend support for Industry partners
- Scotland's Green Recovery, contributing to the Net Zero ambitions and targets
- Advancing skills, to support the future skills agenda

Therefore, DHI will go deeper, faster with more emphasis on demonstrating impact over the next 12 months. A particular focus will be placed on advancing our work in Mental Health, Integrated Health and Social Care, Drug Deaths Prevention and driving forward our work nationally with key strategic partners, including NES, HIS, CfSD and the CSO SHIP to deliver the right digital solutions that allows services and industry to get better ready for scale - 'Transforming great ideas into real solutions'.

Building our ecosystem locally and internationally will continue to be a key priority, with DHI opening up more industry opportunities with the new Business Innovation Lead taking on key activities for business and commercialisation in tandem with the Rural Centre of Excellence in Moray's economic focus. This will assist in activating two Living Lab calls 1. Care in Place and 2. Co-managed Long-Term Conditions, whilst we scope further the Smart Housing/Communities and Mental Wellbeing Lab allowing market opportunities for key partners: Health and Care services (including 3rd sector), Industry and Academics.



Fig 13 - Rural Centre of Excellence in Digital Health and Care Innovation in Moray Region Launch Event

All of the above activities will be consolidated with a continued drive on Skills, Research, Knowledge agenda coupled with the data sharing efforts that the DHI Exchange pillar is leading with key partners. By merging all activities and pillars to act in a more symbiotic fashion this will ensure DHI not only reaches its objectives next year, but further secures confidence and a more streamlined way of working as we commence the development of our Phase 3 Forward Strategy to remain at the leading edge of global innovation.

This five-year strategy will be produced in the next 12 months, in partnership with our ecosystem, funders, staff, and partners. It will include longer-term vision and strategy to build a more sustainable and secure case and take advantage of the local and international networks and alliances created over phase 2. This strategy will take into consideration all the learning from the last eight years, marry this up with the key global insight and emerging trends to establish an exciting and ambitious vision to re-energize the opportunity for Scotland to create a self-assured position that will enable the nation to further seize the inclusive opportunity that is predicted globally for Digital Health and Care Innovation.

Our 2022/23 contribution to the identified missions will be progressed through our four key pillars of activity as outlined below.

INNOVATION CLUSTERS will focus on identifying and building collaborations for near market along with emerging innovations, and focus on a more prominent shift into supporting the care sector:

- Manage a robust pipeline of innovation opportunities, including hosting 2 funded challenge calls to stimulate cross sector collaborations
- Create focussed opportunities to build on the Digital Innovation Hub, which will include a focus on digital innovations that will support; Healthy living, Mental health, Hospital@Home, Diabetes and Drug death prevention services
- International engagement will be further harnessed, and relationships strengthened to ensure Scotland leads Digital for the health and care innovation sector, exploiting more export and inward investment opportunities including the development of Peace Plus funding bids

SKILLS, FUTURE WORKFORCE & KNOWLEDGE EXCHANGE will continue to raise awareness (in collaboration with academic, civic and industry) of the future skills and career opportunities within the growing digital health and care sector. This will include supporting:

- Post-graduate developments including MSc scholarships, Internships, Apprenticeships, Fellowships (Clinical and Entrepreneurial) and CPD opportunities to encourage diversification from other sectors
- Local and International KE events
- Strengthen links with Research Innovation Pools to promote and develop academic research and marketing opportunities (including schools, colleges and universities) whilst continuing to build further our collection of resources, including grey and peer reviewed literature

PROJECT PORTFOLIO this year will 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. We will again develop at least one project ready for a case for scale, supporting the three key project strands:

1. Remobilisation and recovery
2. Commercialisation 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 the newly established Rural Centre of Excellence for Digital Health and Care Innovation in the Moray Region through the Living Lab initiatives; with a particular focus in the next 12 months on: Healthy living (weight management), Care in Place and Co-managed care, set to deliver inclusive and economic growth, with a focus on recovery, skills, and sustainability of services in rural communities

The DHI EXCHANGE will continue to develop a business/commercial model for expansion outside Scotland as a key attractor for inward investment which will be built into the Phase 3 forward strategy. Reconfigure and innovate further the immersive exchange environment, introducing more community based portable solutions, taking the innovations to communities:

- Deepen collaborative projects with NHS Innovation Test Beds to fully utilise common assets and data sharing infrastructures
- Develop two innovations ready for transfer to Living Labs

The above pillars are designed to fundamentally improve our partners readiness and to ultimately make a positive impact for citizens, civic partners, and industry. Impact monitoring in the next 12 months will be reinforced by DHI creating improved feedback processes and monitoring systems. This work will assist in ensuring that the Phase 3 forward strategy takes into consideration the key services that are proven to remain valued by our key stakeholders and partners, along with ensuring we are fully aware of any support gaps that will inhibit the sector in Scotland to flourish and grow in the future