



Digital Health & Care
Innovation Centre

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DHI 10 Year Strategy 2024 – 2033

Transforming great ideas into real solutions

Authors

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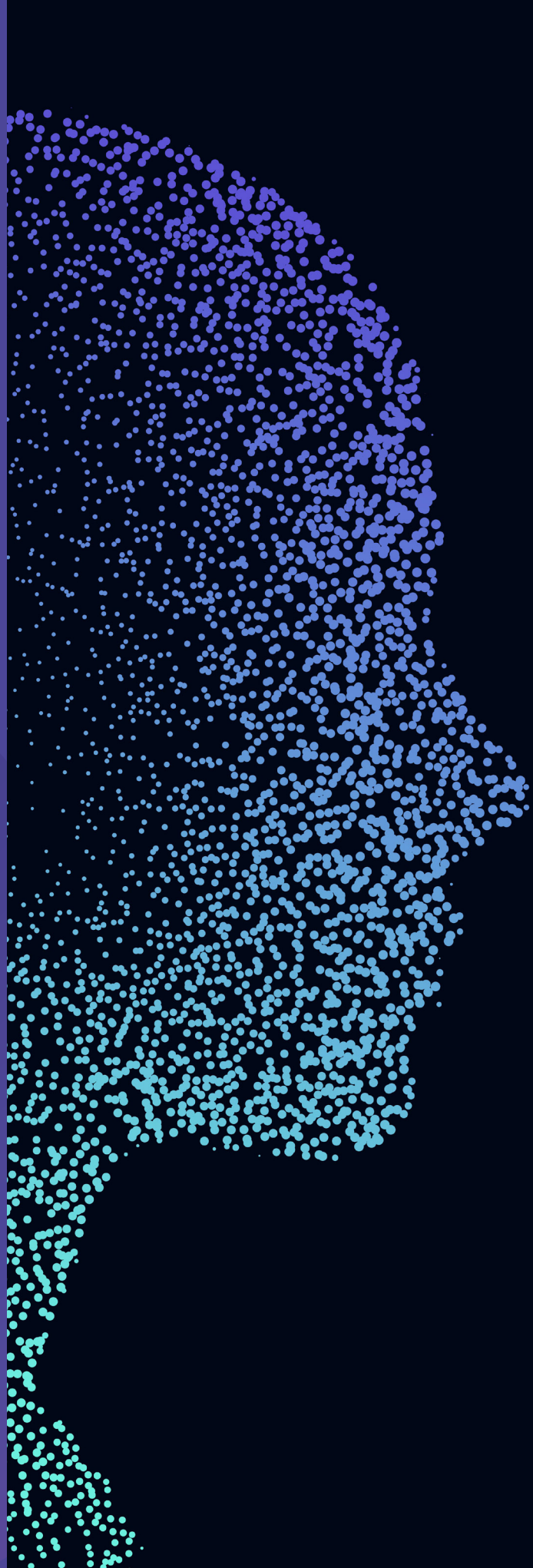
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DHI is a world-leading collaboration, hosted by the University of Strathclyde in partnership with the Glasgow School of Art (GSA). It is part of the Scottish Funding Council's Innovation Centre Programme and has been co-funded by the Scottish Government Digital Health and Care Directorate to secure alignment with health and social care policy and strategic priorities. DHI supports innovation between academia, the public and third sectors, and businesses in the area of health and care



1.0 Introduction

As Scotland’s innovation centre for digital health and care, DHI is a catalyst for change and a conduit for NHS reform, health and social care transformation. DHI occupies a unique and visible position at the heart of the innovation ecosystem for digital health and care in Scotland. It sits at the nexus of commercial, academic, health and social care sectors, combining extensive skills and experience to accelerate research and the adoption of innovation (R&I). DHI’s impressive track record of delivery provides a strong foundation for the ambitions set out in this 10-year strategy.

DHI has adopted Scotland’s National Innovation Strategy¹ definition of innovation as “the introduction and implementation of a new or significantly improved product, service process or method with the purpose of helping to solve societal challenges or delivering economic growth”.

DHI’s vision is that,

“**Research and Innovation in digital health and care creates sustainable services and develops future skills, helping Scotland’s people live longer and healthier lives and enabling the economy to flourish to meet global needs.**”

Delivering high quality, safe and responsive health and social care services in Scotland has never been so challenged. There are escalating cross-sectoral demand and capacity issues, at a time when public finances and the workforce are under significant pressure. Similar challenges are being felt around the world, and the underlying national and global factors mean that this harsh reality will be evident for many years to come. For Scotland’s health and social care system to be sustainable, it is recognised that transformational service change is an imperative. R&I must be at the heart of the necessary systemic changes over the next 10 years and the effective adoption and scaling of digital technologies and solutions will be crucial.

DHI is a key enabler, deploying expertise and influence to harness the power of Scotland’s academic institutions, its public services, its commercial and entrepreneurial base to build a fairer, inclusive, accessible, and equitable health and social care system. It’s unique positioning and capabilities in the innovation landscape, supports the creation of digital solutions and approaches to address Scotland’s challenges. With the global growth in this sector estimated to reach in excess of \$700 billion by 2030, the innovations developed and tested in Scotland will have export potential.

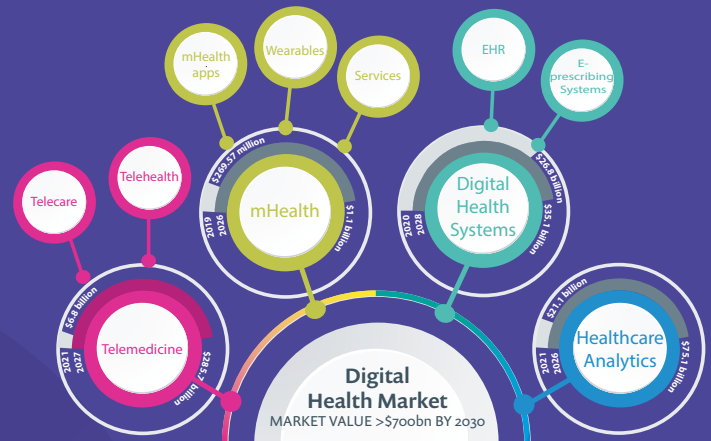


Figure 1. Global Market growth projections²

The opportunities for research and innovation in the field of digital health and care are immense. Scotland is currently considered an international leader in this field, which in part is due to the influence of DHI.

DHI has deepened its experience, knowledge, and contribution over the past decade, and has evidenced its ability to respond swiftly to pressing need e.g., expertly supporting Scotland’s response to the Covid-19 pandemic. Over the next 10 years, DHI will build on its record of sustained success in innovation, translation, and adoption to ensure that the benefits of digital technologies and solutions are further realised, in order to support the Scottish Government’s priorities of Equality, Opportunity and Community.

In an influential partnership with Scotland’s colleges, universities, other innovation centres, commercial companies, and its strategic partners, DHI will maximise collaborative effort to provide the health and social care sector with the digital tools and ways of working that will revolutionise care, empower a healthier nation and create economic development opportunities.

¹Scotland’s National Innovation Strategy

²Emerging Trends in Digital Health and Care : A Refresh Post-COVID

2.0 DHI Team

Scotland’s Digital Strategy effectively summarises the challenge inherent in the introduction of digital into the health and social care environment.

“**The way in which we respond to the impact of technology is one of the greatest public policy challenges of our age. The digital agenda goes beyond the adoption of the latest digital technology. It’s about the adoption of digital thinking (-). This is not simply a question of adopting new or better technology. It requires a fundamental shift in culture, skills, leadership, service design, process engineering, the use of data, collaboration, and investment planning.**”³

To address this challenge, DHI deploys a unique Innovation Process Model (Figure 2) which blends three components - service innovation, technical innovation, and commercial innovation.



Figure 2. DHI Innovation Process Model

DHI has evidenced that all three innovation strands need to be carefully crafted and converged for the successful introduction and adoption of digitally enabled services. The innovation process model is highly effective as demonstrated via impressive impacts to date (see Section 3.0) and as highlighted by the SFC Innovation Centre Evaluation Report⁴. The model is adapted to reflect new insights and practices as DHI evolves, supporting accelerated delivery and impact.

DHI’s current team consists of 39 multi-cultural, and multi-lingual individuals, with extensive skills and experience. The core staff complement of 21.5 FTE, provides a stable foundation for the introduction of supplementary skills, capacity and expertise associated with the agile DHI innovation portfolio. Additional resources are funded either from the self-generated DHI Growth Fund or secured by attracting additional project income. DHI’s organisational structure is included in Appendix 1 – DHI Governance & Organisational Structure.

Utilising its extensive and blended capabilities (Figure 3), DHI provides a range of services to its key partners and stakeholders. This includes curating and communicating demand; market research; horizon scanning and global trend tracking; current and future service mapping; participatory design research; academic grant awards; specialist programme management; interactive prototyping, demonstrating and simulating the ‘Art of the Possible; digital product and service innovation; future skills and workforce support; collaboration and consortium building; along with international outreach to ensure research, knowledge and innovations are exchanged, widely disseminated and transferred to other nations for exporting benefits.

DHI intelligently combines and reshapes its services and capabilities in response to the strategic priorities of Scottish Government and the requirements of its key stakeholders and partners. It exerts strong system leadership, influencing policy and leveraging resources to increase knowledge sharing, develop skills, drive research and innovation to support adoption and commercialisation of digital health and care solutions.

DHI is a fundamental part of the Scottish and International innovation ecosystem, increasing R&I and showcasing Scotland’s strengths, whilst attracting significant international interest and investment. DHI’s government sponsoring division is the Digital Health and Care directorate.

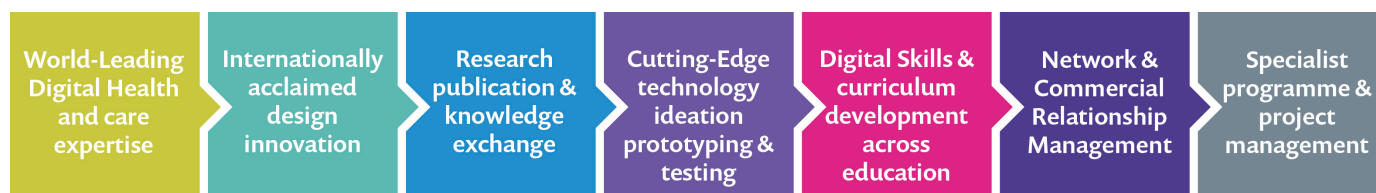


Figure 3. DHI capabilities

³ (<https://www.gov.scot/publications/a-changing-nation-how-scotland-will-thrive-in-a-digital-world/documents/April 2021>)

⁴ IC Evaluation not yet published. Ref to be inserted at later date.

3.0 Evidencing Added Value

DHI collaborates with a wide range of cross-sectoral organisations to leverage skills, opportunities, and expertise e.g. working closely with a number of directorates in Scottish Government, The Digital Office for Local Government, national health boards such as National Education for Scotland (NES) and Healthcare Improvement Scotland (HIS), COSLA and the Care Inspectorate, other SFC funded Innovation Centres.

DHI deploys a suite of qualitative and quantitative feedback mechanisms to capture benefits, lessons learned and inform further innovation opportunities. These mechanisms support DHI’s agility and resilience, enabling it to pivot and adapt to optimise and evidence impact.

DHI has evolved from exploring needs and linking research opportunities in its Phase 1 (2013-2018), into a mature organisation that understands the needs and challenges of the health and social care sector before crafting collaborative responses to deliver impact at scale. The learning from Phase 1 and partnerships which formed, were instrumental in providing a strong foundation for Phase 2 (2019-2024), which leveraged additional investment into Scotland and has evidenced significant benefits.

Leveraging Additional Investment

DHI brings real value to the system by attracting and distributing significant inward investment to connect and build R&I capabilities for Scotland. The provision of DHI’s core funding from SFC and Scottish Government enabled it to leverage over £29.1m (Direct £14.1m and indirect £15m as at July 23) additional funding from a range of sources over the last 4 years, evidencing that for every £1 invested in DHI, it secures approx, £3. This is achieved in 2 main ways;

- Direct investment
- Indirect investment

Direct Investment: Up to end July 2023, DHI had leveraged direct investment of £14.1m (Phase 1 & 2), some of which was influenced by increased Covid investment. This was largely distributed by DHI to academic and commercial partners to support the delivery of digital health and care innovation in Scotland and ensure that the innovation centre is supporting the wider marketplace, see Figure 4.

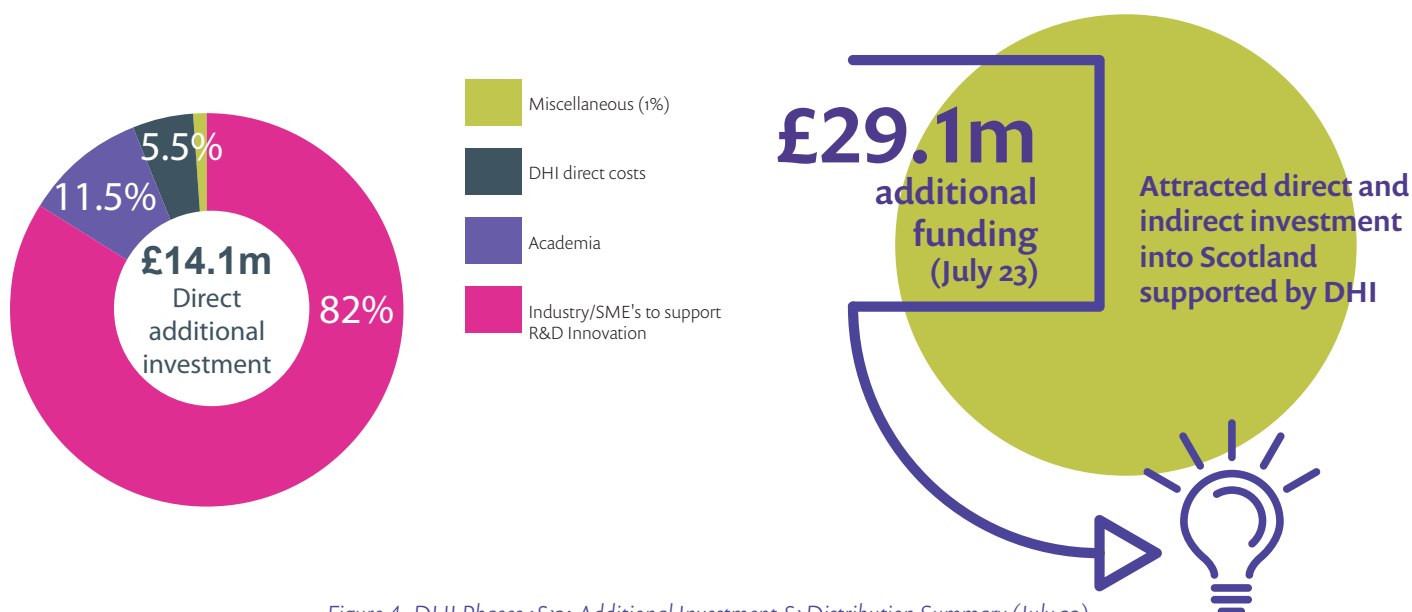


Figure 4. DHI Phases 1&2: Additional Investment & Distribution Summary (July 23)

Case study 1: Direct Investment - Moray Regional Growth Deal (£5m)

DHI led a proposition with Moray Regional Partners (including UHI and Moray College) to develop a Rural Centre of Excellence (RCE) for Digital Health and Care in the Moray Region (2021-25). This focused directly on realising digital opportunities to address rural challenges and benefit local communities. The Moray RCE enabled DHI to leverage £5m directly from UK Government, attracting additional in-kind resource of approx. £3m from partners.

This investment will bring economic, service and skills benefits to the region, while contributing towards net-zero targets for Scotland. Successes from the Moray RCE will be extended into other regions that experience similar rural community challenges, to ensure knowledge exchange (KE), positioning Scotland's rural R&I test beds and expertise on the international stage to encourage further investment.

Indirect Investment: DHI also signposts and expands opportunities to other partners within the ecosystem, providing letters of support, access to innovation clusters, assets, and expert advice. Over the last 5 years, DHI has directly supported partners to successfully secure funding that has leveraged at least an additional £15m investment into commercial organisations and academic institutes in Scotland.

In addition, DHI promotes collaborative and strategic whole system thinking through advice and signposting to relevant funding opportunities via its newsletters, website, social media and innovation clusters which are increasingly being regarded as providing a fundamental contribution to the innovation ecosystem.

Case Study 2: Leveraging Indirect Investment - UKRI Collaboration

DHI's Healthy Ageing Innovation Cluster (HAIC) was approached by UKRI to host the Designed for Ageing Challenge Call in 2021. This reaped positive benefits for Scottish partners, with 3 out of the 26 successful projects (11.5%) involving Scottish consortia who are developing service innovations across self-care, mobility, and community service themes. These projects attracted circa £2m of the £20m fund (10%).

This successful collaboration resulted in a further request from UKRI to host a MINDSET challenge call in September 2022. The £20m MINDSET programme aims to support transformation through the development and scale-up of emerging digital therapies for mental health. It aims to achieve this by catalysing collaboration between healthcare and creative sectors to develop an innovation sector with global potential, and to provide urgently needed new digital delivery models for mental health services.

DHI's Digital Mental Health Innovation Cluster hosted the first round of an £8M R&D Fund to develop new innovative mental healthcare solutions, with feedback advising that 2 projects from Scotland have been successful in securing an award of circa £200k.

System Impacts

DHI has a strong collaborative culture, demonstrating significant system level impact as evidenced by partner feedback and testimonials. The following diagram summarises partner feedback in 2023⁵.

DHI is having an impact on improving services for people:



78%
anticipate improved quality of care to citizens, with a further 22% percent noting this had already happened.



75%
anticipate improved timeliness of services provided to citizens, with a further 25% noting this had already happened.



63%
advised their service was now more citizen focused, with a further 37% anticipating this will emerge.

DHI is impacting on the effectiveness and efficiency of its partner organisations through:



50%
of partners felt there was less wasted resources as a result of their work with DHI, with a further 25% anticipating this will emerge.



57%
anticipate service expansion from project work with DHI, with a further 29% noting this had already happened.



57%
noted better data exchange between citizens and services, with a further 43% anticipating this will emerge.

DHI adds value by sharing knowledge and supporting skills transfer with partners:



78%
advised of increased knowledge of digital options and opportunities.



56%
noted an impact on their service development knowledge.



56%
noted an impact on design know-how.

DHI brings partners together to mobilise strategies and collaborate:



56%
of partners felt that working with DHI had enabled them to exert influence at national and policy level, with a further 33% anticipating this will emerge.



67%
of partners advised that working with DHI had enabled them to secure collaboration opportunities, with a further 22% anticipating that this will emerge.



45%
of partners identified an increased organisational appetite for digital innovation, with a further 33% anticipating that this will emerge.

Figure 5. DHI Benefits Realisation – Partner Feedback (July 2023)

The impacts and DHI's value, were further reinforced by the findings from the SFC Innovation Centre Programme Evaluation including evidence that DHI increased the visibility of the digital health and care sector and supported the direct introduction of new solutions.

- **“60% of DHI clients stated that DHI had been a significant source of support for the wider innovation ecosystem of in terms of raising the profile of the sector/ technology area within Scotland. Further, 57% of DHI clients stated that DHI had been a significant source of support for their establishment in terms of supporting improved visibility within sector/ technology area.”**⁶
- **“Overall, 48% of client survey respondents had introduced new or significantly improved goods, services or processes since working with DHI, and 43% attributed these to DHI support.”**⁷

⁵The feedback survey was issued to 19 contacts within a portfolio of 20 projects at different development stages, with a return rate of 58%

⁶ IC Programme Evaluation, Annex D DHI, p17

⁷ IC Programme Evaluation, Annex D DHI, p11.

Case Study 3: System Impact Response to Covid-19

In March 2020, DHI rapidly redeployed its capacity and capabilities to enable rapid pace and scale to help address Scotland's response to Covid-19.

DHI's market research and international engagement helped inform Scotland's approach by adapting the learning from other countries. DHI worked closely with the Scottish Government's Digital & Digital Health & Care Directorates, NES Digital, NSS, PHS, NHS 24, territorial boards, the Digital Office for Local Government, Scottish Care and key third sector and independent care sector organisations to deliver initiatives in short weeks rather than years. DHI utilised unique, co-design methods, tools and online platforms to ensure that human factors and need principally determined the design of digital solutions. It engaged several academic and industry partners in this national effort, including Scottish SMEs (Storm ID, Sitekit, Daysix, Tactuam and Cohesion Medical) and the Universities of Aberdeen, Edinburgh, Edinburgh Napier, Glasgow, Strathclyde and West of Scotland. Key senior members of DHI were directly involved in advising Scottish Government on the digital aspects of the health and care response.

Five new Covid-19 projects were initiated, with 3 of these quickly scaling to become a fundamental part of the Scottish Government's digital response to Covid-19. These contained standardised and linked data services, improved user experiences and reduced pressure on front line health and care staff.

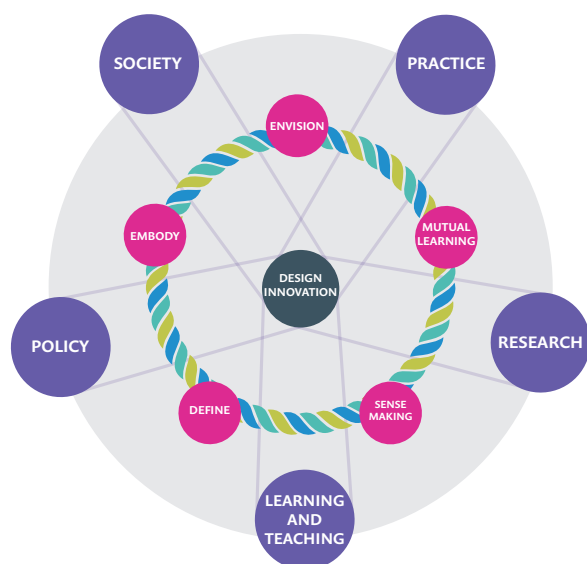


Knowledge Exchange

In addition to quantitative impacts as per DHI Key Performance Indicators as set out in **Appendix 2 – Phase 2 KPI Summary**, DHI publishes case studies to evidence qualitative impacts across its portfolio <https://www.dhi-scotland.com/projects/>. These share knowledge and showcase successful digital health and care innovations, amplifying the impact of DHI delivery and allowing partners to understand the Technical, Service and Business readiness shifts and activities that have taken place. Case studies have also been used to illustrate key points throughout this document, with further examples in **Appendix 3 – DHI Case Studies**.

Design Innovation

DHI's design led innovation approach and methodology is recognised by its partners as differentiating and effective. This was a key element in delivering vital initiatives and services during the Covid-19 pandemic and has pioneered the subsequent development of Design for Health and Wellbeing as an area of research expertise. Design Innovation is at the core of DHI and runs right through its innovation process, enabling direct engagement with quadruple helix organisations and individuals to define requirements, align different perspectives, and provide a stable foundation for scalable, adoption ready solutions.



Design Innovation within the DHI

Multidisciplinary Team

The Design team comes from a variety of backgrounds and has extensive expertise in the context of health, care and wellbeing.

Creative Practice

We develop bespoke engagement tools and methods based on the needs of the project and the people we are working with, this involves an emphasis on thinking by making and iterative prototyping throughout the design process.

Participatory Design Approach

We work collaboratively with citizens and partners from the beginning of any project, to reframe and better understand the challenge using creative methods

Making the Future

We work to envision preferable futures for health and care and do this using methods that are contextually aligned to delivering meaningful outcomes co-designed with citizens.

Proven, evolving capability

As GSA continues to develop its specialist design capability, our design team, the DHI and ultimately, Scotland's health and care services continue to benefit from and contribute to the evolution of design research and practice in health and care.

Figure 6: DHI Design Innovation

In the future, it is anticipated that design and designers will play an increasingly influential role in the development of health and social care services. This is already evident in the adoption of design research capability in major pharmaceutical and healthcare companies, who recognise the potential for creative practice to visualise complexity and the role of designers to ensure that products, services, and systems meet the needs of those engaging with them.

Case study 4: Collaborative Knowledge Sharing

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 skills, and engaged supply chain expertise. The project delivered a quantitative assessment on the opportunities and costs associated with a direct to patient home delivery service, using the UK as a model market. The output has been well-received by Roche and discussions are underway on related opportunities.

“

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, Pharma Technical Services,

”

F. Hoffmann-La Roche.

4.0 Strategic Alignment

DHI plays an integral role in influencing and delivering national strategies and priorities, remaining responsive to change and using its extensive convening powers to mobilise collaborative effort. It enables a strong contribution to a wide range of national and international strategies including Scotland’s National Performance Framework, United Nations Sustainable Development Goals, Scottish Funding Council Strategy, Scotland’s Digital Strategy, Digital Health and Care Strategy and associated annual Delivery Plan, the NHS Recovery Plan, NHS Scotland Delivery Plan Guidance, Review of Adult Social Care, Delivering Value Based Health & Care, NHS Scotland Climate Emergency and Sustainability Strategy (2022-26), Scotland’s National Innovation Strategy, National Strategy for Economic Transformation, Health & Social Care Data Strategy along with input to the Scottish Government’s H&C Innovation Design Authority (IDA).

The table below (Table 4.1) represents the strategies most closely aligned to the DHI remit and expertise, highlighting key strategic priorities and themes for each;

Strategic alignment	Against DHI Strategic Priority Action Areas (PAA) and key objectives						
	PAA1 – Health and Care transformation	PAA2 – Data and Digital	PAA3 – Connected Ecosystem	PAA4 – Skills Development	PAA5 - Economic development	PAA6 – Net Zero	PAA7 - International reputation
SFC Strategic Plan			✓	✓	✓	✓	✓
SG Digital H&C Strategy	✓	✓	✓	✓		✓	✓
National Strategy for Economic Transformation		✓			✓	✓	✓
UN Sustainability Goals	✓			✓	✓	✓	
Scotland’s Innovation Strategy		✓	✓		✓	✓	✓
Scottish Tech Ecosystem Review			✓	✓	✓		✓
<u>Topol</u> skills review	✓			✓			
Life Sciences Strategy	✓	✓	✓		✓	✓	✓
UK Gov Plan for Growth				✓	✓	✓	

Table 4.1. DHI Strategic Alignment (July 23)

To refresh and inform the DHI strategy and ensure Scotland’s R&I resources are deployed to best effect to meet both Scotland’s demands and respond to global opportunities, DHI held strategy development sessions with its Board and SMT, reviewed recent international and national strategies, subject matter expert papers and evaluations. DHI also engaged with and consulted with key stakeholders. **Appendix 4 – Key Stakeholders.**

The strategic review, along with the stakeholder and Board consultations surfaced the following 7 priority action areas (PAA) as a focus for R&I in the digital health and care space.

- Transform health and social care
- Develop digital & data infrastructures as national assets
- Enhance Scotland’s Connected Ecosystem through Cross Sectoral Innovation Clusters
- Develop a Future Skills Pipeline which delivers workforce capabilities fit for Scotland’s future
- Extend Commercial Engagement to support economic growth
- Health and Care’s contribution to Net Zero targets
- Enhance Scotland’s international reputation in R&I

Although the identified priority action areas are anticipated to endure for some significant time, DHI will continue its representation on relevant, high level strategic boards and engagements to ensure it can respond in an agile way to new policy imperatives, technology trends, and activate any necessary repositioning within the R&I community.

The specific objectives and activities associated with the PAA's for DHI are expanded in Section 6.0. To shift early developments into tangible deliverables and accelerate market-ready solutions into adoption at scale, DHI will use the 3 innovation horizons⁸ methodology to manage its innovation pipeline.

Horizon 1 (1-3 yrs to market)	Horizon 1 innovations are generally short-term projects/activities which generate tangible results relatively quickly. They tend to be incremental improvements of existing projects/activities or small-scale rapid ones.
Horizon 2 (2-5 yrs to market)	Innovation opportunities and challenges to be addressed over the medium term which may have been tested out in other areas or contexts and need to be applied within a new context. They could involve technology, service or business innovation but not all 3.
Horizon 3 (5+ yrs to market)	These are long-term innovation projects/activities that generally produce results in 5-12 years. Although in other sectors they tend to be non-incremental, within health and care they may be incremental innovations/activities because of the complex nature of the environment or approach.

The 3 Horizons approach help de-risk innovation by testing in real world environments and iterating in a safe space, to add tangible value to the system. See SCOTCAP Case Study 5 as an example of a DHI Horizon 3 project

Case Study 5: Horizon 3 Project – SCOTCAP:

The Scottish Capsule Programme (SCOTCAP) is a multi-sector collaboration of partners from academia, NHS, Industry (Corporate Health and Medtronic), Government, and economic enterprise agencies. Led by DHI, the partners tested and evaluated an Innovative Service Model within NHS Scotland using Colon Capsule Endoscopy (CCE) for early diagnostic testing for bowel cancer symptoms. DHI initiated this opportunity in 2016/17. DHI secured evaluation input from Aberdeen and Strathclyde Universities and developed a detailed service model blueprint with partners to support an NHS Scotland business case for expansion.

The evaluation identified that the innovative service model led to better care experience for patients, reduced the need for travel for appointments and avoided invasive colonoscopy procedures while actively increasing scheduled care diagnostic capacity within NHS Scotland. The demonstration of impact over a 5-year period enabled a £5m investment in Inverness from one of the industry partners. The SCOTCAP programme transitioned from DHI to NSS and CfSD partners in 2021 to take to scale. Further Horizon Europe research funding of €1.2 million has since been secured to validate and test Artificial Learning models for CCE (AICE) including digital experience tools within an international consortium led by partners from Denmark. The Universities of Edinburgh and Strathclyde are key delivery partners in this project.

⁸ McKinsey 3 Horizons

5.0 10 Year Routemap

DHI will consolidate the connections and networks already established in its early development phases to catalyse system level change for Scotland over its next 10 years. It has already built system level resources - such as deeper connections, knowledge development and dissemination routes, specific physical and digital assets - and has attracted significant investment and new entrants into the sector.

These have improved the competitiveness and international attractiveness of Scotland's R&I ecosystem and are a strong foundation for maximising the value of universities, colleges and commercial companies to the Scottish and global health and social care sectors.

“
65% of client survey respondents identified significantly improved aspects of networking benefits attributed to DHI.’ Further ‘46% identified significantly improved aspects of knowledge benefits attributed to DHI (including improved awareness of academic capabilities, public or private sector support).⁹
”

Effective collaboration to maximise impact and optimise shared resources is at the heart of DHI activities. Insights into the strengths and capabilities of Scotland's universities, colleges and commercial companies has been instrumental in establishing an effective ecosystem contribution. For example, out of the 19 Scottish Universities, DHI has worked closely with 16, assisting universities to respond to specific commercial needs and opportunities and improving understanding of the digital needs of the health and social care sector. Over DHI Phase 2, at least seven new digital health courses have been established, with 120 postgraduate courses initiated.

DHI has successfully attracted funding from public sector and commercial sources, along with a demonstrable increase in international R&I funding. DHI has also engaged directly with 65% of Scotland's 26 colleges, influencing curricula and encouraging cross-disciplinary and inter-college shared learning and collaboration. Of note, is the growing collaboration with Heriot Watt University (Dubai) and City of Glasgow College on internationalising and expanding the DHI annual DigilInventors Challenge that encourages school children to consider careers in digital health and care. DHI is also providing Dumfries & Galloway College with strategic advice through our strong links with the south of Scotland economic area and the Crichton Campus initiative on smart housing.

DHI extends its reach into the wider expertise and skills of the other Innovation Centres to collaboratively progress R&I opportunities and bring together complementary capabilities e.g, Healthy Ageing Brain Health initiatives with The Data Lab & Brain Health ARC ¹⁰, Cancer Innovation challenge with The Data Lab, FutureEquipped Project with BE-ST.

In this next phase of development, DHI will work with the wider Innovation Centre family to seek deeper strategic collaborations and partnerships with universities and colleges to co-design and accelerate the necessary system change, further leveraging collective strengths and expertise.

With more maturity, critical mass, and capacity to drive complex collaborative actions, DHI will enhance its role in Scotland's R&I infrastructure, to expand system-targeted actions over the next 10 years and curate a robust innovation pipeline for adoption at scale e.g. the Right Decision Service which was initiated and developed by DHI, then successfully transferred to HIS for mainstream delivery in 2023. This approach will increase new services and products to improve delivery and enhance health and social care experiences for Scotland's citizens.

⁹ IC Programme Evaluation, Annex D DHI, p11

¹⁰ Alliances for Research Challenges - <https://www.sfc.ac.uk/research/research-collaboration/alliances-research-challenges.aspx>

“

72% of clients thought DHI was very or extremely important in advancing their projects TRL¹¹ (technology readiness level)¹¹

”

Strategic Alignment

DHI plans to converge its skills, experience, and resources to generate faster progress and traction on strategic priorities within an interconnected portfolio, contributing to the following business outcomes;

- **Driving change:**

DHI does not just explore innovations but supports successful implementation. It creates the conditions and builds capability that help its partners embed change and overcome barriers to adoption at scale, whether that be technological capability or changing behaviours. DHI will accelerate further progress by acting as a catalyst to build momentum in projects and investment.

- **Connected ecosystem:**

DHI sits at the nexus of the quadruple helix, and uses this position to build networks and connections, facilitating collaborations, brokering introductions with broader and deeper linkages to create accelerated impact and attract inward investment, collaboration opportunities and joint ventures.

- **Enhanced Knowledge and skills:**

DHI will continue to build understanding and develop capability, identifying and leading research from academic partners, sharing and showcasing that knowledge and addressing knowledge gaps. DHI will use its insights to help inform HE/FE curricula and teaching, assisting partners to upskill the workforce and inform future skills requirements.

- **System Leadership:**

DHI is viewed as a digital trailblazer in the sector, providing a credible and trusted source of intelligence and knowledge. It will use its knowledge to inform and influence policy and showcase the ‘art of the possible’ by amplifying good practice and spread in digital health and care innovation.



¹¹ IC Programme Evaluation, Annex D DHI, p12.

Priority Action Areas

DHI will deliver its vision by aligning the combined resources and expertise of the R&I ecosystem on 7 key strategic priority areas (PAA) as introduced in section 4.0 and further expanded below.

Priority Action Areas*	High Level Activities
Support transformation of health and social care	<p>This is the DHI overriding priority. It will harness R&I to support the essential recovery and digitally enabled transformation of health and social care services in Scotland, aligning with the priorities of the Digital Health & Care Strategy, NHS delivery plan and Adult Social Care Review to drive innovation and support readiness for adoption at scale. DHI will work with cross-sectoral partners to co-design change, remove barriers to the implementation, adoption and scaling of successful innovation, to ensure service readiness is embedded into the process for all partners.</p>
Develop digital & data infrastructures as national assets	<p>Deploy DHI key digital assets such as the Health Data Exchange to re-imagine care and support a strong pipeline of digital and data pathfinder initiatives, contributing to the SG and COSLA Health & Care Data Strategy. DHI will collaborate to develop new ways of generating, gathering, and sharing trusted personal health and care data to inform integrated, predictive and sustainable health and care service models that support R&I and empower individuals. DHI's influence on the evolving data landscape will also seek to increase investment in medicines development and clinical trial activities in Scotland.</p>
Enhance Scotland's Connected Ecosystem through Cross Sectoral Innovation Clusters	<p>Extend and deepen the digital health and care R&I ecosystem to enable quadruple helix partners to gather insight, undertake research, co-design and develop collaborative innovations to implement change, generate real impact and attract increased investment into R&I and institutional capabilities.</p>
Develop a Future Skills Pipeline which delivers workforce capabilities fit for Scotland's Future	<p>Engage with key stakeholders including SFC, NES, SSSC, SDS, universities, colleges, and schools at strategic and operational level to generate a future skills pipeline and help deliver a skilled future workforce. DHI will identify gaps, raise awareness, commission research, participate in knowledge exchange, demonstrate necessary skills requirements, and influence curricula, to engage the workforce of the future and build expertise in digital, entrepreneurship and change management.</p>
Extend Commercial Engagement to support economic growth	<p>Work with Enterprise companies and the Scottish Lifesciences Industry Leadership Group (ILG) to develop and deliver a suite of support for commercial partners, helping them navigate policy and funding landscapes, engage with public procurement to develop products and services capable of health and social care adoption. This will include further strategic alliances, supporting trade missions, promoting inward investment, and partnering opportunities for businesses.</p>
Contribution to Net Zero targets	<p>Scotland's Just Transition commitment to become net zero by 2045 will transform all sectors of the economy and society, requiring rapid structural change. It is estimated that Healthcare represents 4.4% of global net emissions (Healthcare without Harm, ARUP, 2019). DHI currently influences procurement and supply chains to reduce waste, reducing avoidable travel through virtual co-design environments and blended working. Much more will require to be done to meet targets.</p>
Enhance Scotland's International Reputation in R&I	<p>DHI will operate as an anchor institution to showcase Scotland's capability and appetite for digital health and care innovation. Scotland's expertise and impact will be highlighted in international engagements, to attract ground-breaking collaborations with subject matter experts which drive R&I and knowledge exchange.</p>

* As stakeholder priorities may evolve over a 10-year period, DHI will formally review its priority action areas every 3 years and implement a rolling programme of annual delivery plans.

6.0 Innovation portfolio

This section details how DHI will converge its skills, experience, assets, networks, and resources to deliver impact for the 7 Priority Actions Areas (PAA), helping to address national and global challenges to drive forward the delivery of Scotland's ambitions in the R&I space.

DHI will stay ahead of the curve to intelligently inform health and social care of emerging opportunities. Specific DHI objectives and key activities are included within a high-level Delivery and Outcomes Plan attached at **Appendix 5 - DHI Strategic Delivery & Outcome Plan**.

PAA 1: Contributing to Health & Social Care Transformation

Challenge: The current configuration of public health and social care services is recognised as no longer sustainable due to changes in demographics, fiscal policy, and user expectations. Digital solutions are recognised as a key enabler of transformational system level change to support sustainability, but there are implementation challenges and system barriers to navigate. DHI facilitates an extended network of experienced and skilled organisations and individuals who can effectively collaborate to address these issues.

Next Stage Objectives: DHI will focus its capabilities, assets and networks on researching, co-designing, developing and evaluating approaches and solutions to address the following specific system PULL opportunities, informed by the priorities of the Scottish Government's Innovation Design Authority, the NHS Delivery Plan 2022-26 which aims to **“work collaboratively with other organisations to scale and adopt innovation¹²”** and the independent review of Adult Social Care¹³ which states **“The answer to tomorrow's challenges in social care support is not more of the same”**. It will also support the realisation of innovation which can contribute to **“productivity gains”** as highlighted by Scotland's Innovation Strategy 2023.

System PULL

- **Mental Health** – As a key contribution to the Scottish Government and COSLA's Mental Health and Wellbeing Strategy (June 23)¹⁴ DHI leads the [Digital Mental Health Innovation Cluster](#). This undertakes research to identify global exemplars, technology and societal trends (e.g. poverty is the biggest driver of poor mental health) and key demand challenges. DHI supports co-design and multi-sector collaboration forming, identifies funding and challenge calls, undertakes local and international mapping to expand R&I and investment in this area to inform scalable solutions.
- **Drug Related Harms** - DHI is the portfolio lead for the [Digital Lifelines Scotland Programme](#) which seeks to improve digital inclusion and to design digital solutions to improve the health outcomes for people who use drugs. DHI is supporting the Chief Scientists Office (CSO) £5m Challenge Call bids, and is working with St Andrews University, Queens University Belfast, and Trinity College Dublin on a high-profile 6m Euro proposal for the European Union Peace Plus Programme to further address substance use and co-occurring mental health issues.
- **Hospital at Home** – Moving people as quickly as possible from an acute to community/home settings wherever possible and in some cases not admitting them to the traditional hospital has enormous individual and system benefits. It also supports the net zero ambitions. Currently 'virtual ward' approaches have not fully optimised digital solutions, providing a significant growth opportunity. DHI's experience from the Interreg North West Europe funded CHANCE project has established effective international networks and delivered a DHI managed Digital Innovation Hub asset to effectively support knowledge transfer and further collaborations.

¹²NHS Delivery Plan Guidance (Feb 2023)

¹³<https://www.gov.scot/groups/independent-review-of-adult-social-care/>

¹⁴ Scottish Government and COSLA's Mental Health and Wellbeing Strategy

- **Integrated Care** – Helping people with complex care needs to thrive at home and in the community is an increasing challenge, with whole system demands and waiting lists increasing as the population ages. Networks of informal and formal social care and support have an increasingly difficult time staying person-centred and coordinated. DHI will deliver pathfinder projects (Moray, Midlothian) to inform the proposed National Care Service and support integrated care through effective, person-centred service transformation. Knowledge exchange with the International Foundation for Integrated Care (IFIC), the European Connected Health Alliance (ECHA) and other international networks will inform best practice and highlight further R&I opportunities.
- **Chronic Diseases** – More people in Scotland are living with long-term conditions such as cardiovascular disease, neurological conditions, chronic respiratory conditions, and diabetes. DHI is supporting Scotland’s National Diabetes Prevention Programme, accelerating innovation opportunities by optimising access to digitally enabled Diabetes Care Pathways. This will address unscheduled care, improve the delivery of planned care, and support independent living in the community. Key insights, evidence and evaluation findings captured through this programme will be extended to support other chronic diseases by leveraging insights, capabilities, and solutions.
- **Social Care** – DHI is a member of the Scottish Government Digital Social Care Delivery Board, providing advice, assistance for a range of activities including commissioning academic research grants in support of Proactive Telecare (University of West of Scotland), Connecting Residents in Scotland’s Care Homes (University of Stirling) and evaluation of specific digital products (Robert Gordon University). DHI partners with the Local Government Digital Office (LGDO) on the Digital Telecare Programme and shared Alarm Receiving Centre Project to expand and modernise early intervention and preventative social care services to improve lives. DHI is also a member of the cross-academia Care Homes research network Scotland (ENRICH) to share insights and identify R&I opportunities for the care
- **Healthy Ageing** – DHI facilitates a 900+strong innovation cluster on behalf of national stakeholders and promotes eight key challenges for healthy ageing to provide focus for collaborative research and innovation. DHI manages a project portfolio of healthy ageing initiatives including working with Midlothian Health & Social Care Partnership’s Transforming Local System Pathfinder Programme on Re-imagining the Frailty System of Care.
- **Rural Communities**– There are many specific challenges and opportunities for rural communities that are being explored by DHI through the £5m Moray RCE programme. Collaborative partners are developing opportunities to support integrated care, delivering a range of Living Labs to accelerate transfer of knowledge and assets from develop phase into business as usual informed by real world evaluation. Collaboration with other rural places in Scotland and internationally will be used to inform approaches and optimise transferability e.g. Dumfries and Galloway Crichton Campus on smart housing & communities.
- **Resource Use Optimisation** – To address the demand/supply imbalance in health and social care services, DHI will use its skills and networks to identify and develop opportunities that change care delivery and optimise productivity. The current innovation pipeline includes a range of solutions designed to reduce pressure on the NHS and social care including - artificial intelligence to support accurate diagnosis as part of colon capsule endoscopy; asynchronous outpatient services in collaboration with the Centre for Sustainable Delivery (CfSD); decision support tools for health, social care and self-management through the Right Decision Service; maximising the use of community services to provide distributed care services close to home.

Specific Activities:

- Onboard a balanced innovation portfolio of projects that deliver at least 10 innovations for scaling to transfer to appropriate implementation partners, focusing on the identified system PULL priorities and supporting integrated and person-centred care.
- Provide Strategic and Programme Leadership for three large Scottish Government Digital Programmes including the Diabetes Innovation Programme and the Digital Lifelines Scotland Programme.
- Establish formal strategic partnerships with key stakeholders to enable effective identification, assessment, and transfer of innovations for adoption and scale e.g., CfSD¹⁵ ; Digital Office for Local Government, Chief Scientist's Office.
- Develop the DHI Innovation Process Model to accelerate and deepen support for the pipeline of innovation. This will include developing a virtual resource bank of tools, methodologies and skills that support partners and build more cross-sectoral capacity and capability in the system.
- Use cutting edge design innovation to build and expand the Scottish Approach to Service Design and develop collaborations e.g. with CivTech¹⁶, to increase commercial innovation to address the identified demand challenges.
- Leverage additional inward investment to support the identification, expansion and real-world evaluation of digital solutions in the identified System PULL priority areas.
- Implement 5 Living Labs as part of the Moray RCE to reflect the specific rural and remote dimension associated with the System PULL priorities and work with other partners that have an interest in R&I for rural communities (e.g., Public Health Scotland, NES, Scotland's Rural College).

PAA 2: Digital & Data Infrastructure

Challenge: Data sharing is integral to how health and social care services must transform and how the market evolves. Scotland has previously led the world in national clinical system integration and data linkage, driving further world-leading research and exploitation. However, in the context of the 4th industrial revolution, a clinical systems focus can no longer share and link the required data. To help inform the necessary change, DHI provides a ground-breaking data-sharing infrastructure and demonstration facility (DHI Exchange) as a safe place to showcase the 'Art of the Possible' and where next generation data sharing is developed, de-risked and deployed. This has successfully proven the value of methods that combine clinical, social and consumer services and technologies to create and share dynamic and rich data sets to support early intervention, preventative and personalised care.

Case Study 6: Innovative Demonstration and Data Sharing Infrastructure

The DHI Exchange initiative has influenced Scottish Government strategy/policy, and has supported commercial and academic partners to leverage significant funding opportunities (over £6m in investment into Scotland) establishing a vital launch pad for scaling R&I. This impact was demonstrated at pace during the Covid-19 Pandemic, where DHI worked with health partners, academia, and commercial companies to develop and deploy a national Covid test results and contact tracing platforms in just over 50 days. The DHI Exchange has become a unique differentiator for Scotland on an international stage and creates substantial added value for ecosystem partners. It has attracted international interest allowing Scotland to strengthen its world-leading reputation for pioneering digital health and care.

¹⁵ Centre for Sustainable Delivery hosted by NHS Golden Jubilee.

¹⁶ <https://www.civtech.scot>

Next Stage Objectives: DHI will support Scottish Government cross-directorate activity on national digital programmes and NES Digital to create processes and infrastructure to support person-centred data sharing, co-managed and integrated care. This will further enhance DHI and Scotland’s international reputation, securing knowledge exchange and collaboration opportunities.

Specific Activities:

- To influence and support National Programmes e.g., Digital Front Door, National Digital Platform, Integrated Health & Care Record Digital Identity Scotland.
- Horizon scanning to explore new data sharing platforms, methods, and capabilities to support digital health and care transformation.
- Influence international strategies on data sharing and management, participating in key strategic think tanks to promote knowledge exchange.
- Promote DHI and Scotland on a global stage, helping to commercialise and scale DHI Exchange related services and companies.
- Establish a network of self-sustaining Demonstration & Simulation environments across Scotland and partnering countries by 2033.
- Continue to co-design and develop engaging and accessible interfaces that support citizens in understanding and managing their personal data and care-related interactions.
- Enhance procurement methods by developing and iterating a procurement framework approach that support R&I and contributes to Net Zero targets.
- Engage with the Care Homes Data Review and explore setup / access to social care system sandbox environments to support the proposed National Care Service.
- Develop an integrated care / shared care record programme that shows simulates person-centred data sharing across health, social work, social care, third sector, housing, and other services.

- Further develop and transition the DHI’s Health Data Exchange into health board / national agency procurement or replacement with DHI as the junior partner by 2026.
- Influence curriculum at FE/HE level to ensure the future workforce understands the practical use of digital and data and its ability to be used more productively to create sustainable service.
- Embed further emerging technology capability into the DHI, e.g., by exploring imaginative and novel uses of advanced 3D digital visualisation and interaction technologies.

PAA 3: A Connected Innovation Ecosystem

Challenge: Scotland’s Innovation Strategy stresses the importance of building successful Innovation Clusters, with Health & Life Sciences and Data & Digital identified as 2 out of 4 priority innovation themes. A more rigorous supportive environment for clusters is promised, including a new Scottish Cluster Network and Scottish Cluster Scheme. DHI has established a strong digital health and care connected ecosystem and innovation clusters with a current membership of over 1,700 individuals and is keen to enhance and expand impact. The membership includes strong representation from quadruple helix partners (Figure 7).

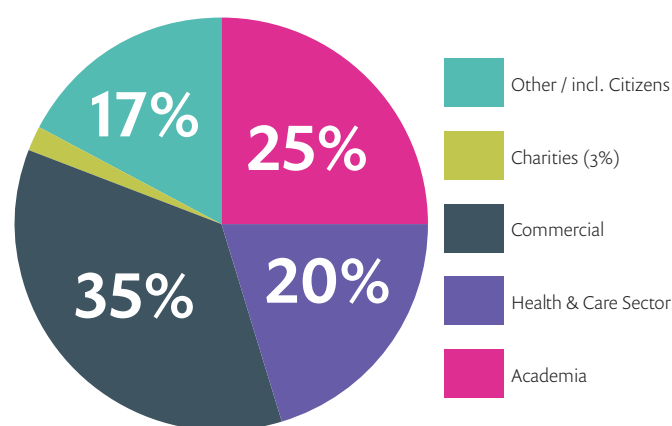


Figure 7 – Digital Health & Care Innovation Cluster Membership by Sector (July 23)

The establishment of themed innovation clusters and 'Special interest groups' for Healthy Ageing, Digital Mental Health and Brain Health has provided granular understanding of partner capabilities, enabling DHI to target interaction, R&I opportunities, and matching options. In addition, DHI channels funding, supports requests and signposts collaborations to the wider ecosystem including Interface, University Innovation Fund Manager, ScotlandIS, SICSA and SULSA. It uses its international and global networks such as IFIC, ECHA, EHTEL and ENOLL for extensive reach. DHI is a strong cluster management organisation which has connected a previously fragmented innovation ecosystem to deliver together which cannot be achieved alone.

Next Stage Objective: The next stage of innovation cluster escalation will focus collaborative effort to increase impact and leverage additional investment in support of health and care transformation. To enhance its cluster management capabilities, DHI will learn from national and international experience on clusters, including further engagement with the Scottish Cluster Ecosystem Alliance (SCEA), the international TCI Network, FINTECH to expand reach and share good practice.

Specific Activities:

- Focus cluster capabilities on key system priorities to increase collaborative impact and leverage resource to support transformation.
- Learn from and apply national and international experience on cluster management.
- Establish robust methodology to measure and evidence value generated through clusters.
- Strengthen connections into universities and colleges to leverage research capabilities and support collaboration opportunities which support the expansion of Entrepreneurial Campuses.
- Support expansion of innovation and adoption at scale by attracting greater inward investment, targeting UK and EU research and innovation funds such as UKRI and Horizon Europe.

- Establish an innovation cluster blueprint to inform strategy, co-ordinate activity, expand connectivity and implement robust knowledge exchange methodologies.
- Expand the cluster model to other key demand challenge areas where resourcing can be sourced e.g. diabetes, addictions.
- Identify and participate in cluster accreditation mechanisms to improve quality and excellence, seeking formal accreditation by July 2026 e.g. EU cluster management scheme EUCLES.
- Develop cluster infrastructure and communication methods to deepen meaningful and targeted engagement and expand membership to an additional 1,500 individuals by July 2023.

PAA 4: Constructing A Future Skills Pipeline

Challenge: DHI has evidenced that the current Scottish education system largely prepares future health and social care students to work in a non-digital service delivery context. This is also a common issue internationally.

At the same time, the job market for digital technology professionals, change managers and design experts is thriving, making it very difficult for the health and social care sector to compete for skilled talent due to traditionally lower wage levels, and limited awareness of these type of opportunities in the health and social care sector.

Next Stage Objectives: DHI will collaborate with NES, Scottish Social Services Council, SFC, and SDS to integrate a robust skills development and education programme, expand change management and innovation capability.

This will build on the existing collaboration with health, social care, schools, colleges, and universities to respond to current gaps and future job demands for the whole system, training and educating the innovators of the future. DHI will also continue to invest in the skills base of its own team to ensure it can anticipate and respond effectively.

DHI has identified the following key objectives to support, accelerate and contribute towards this area of demand:

- Raise awareness of digital health and social care career opportunities;
- Address digital, change management and entrepreneurial skills gaps for future health and social care workforce;
- Address digital skills shortage within the digital health and care sector workforce working together with other IC's in common areas of skills shortages.

Specific Activities:

- Establish and facilitate a Skills, Education and Future Skills Workforce Special Interest Group
- Establish a Social Care Entrepreneurship Programme to support early-stage innovation and increase under-represented groups in entrepreneurial endeavour e.g women.
- Deliver annual DHI Programme of Postgraduate education (Masters, MRes, PhDs) and Graduate Innovation Internships.
- Extend the Clinical Innovation Fellowships and Clinical Entrepreneurial Programmes.
- Award Academic Grants for the development, co-design and delivery of educator CPD courses and materials, to support the development of new education pathways and courses.
- Continue to influence curricula in health, social work, social care, medicine in HE & FE.
- Secure research funding for skills and education R&I challenge calls through the Moray RCE and create micro-credentials where applicable to be utilised across Scotland.
- Establish formal International Skills and Education Collaborations for KE
- Support innovation implementation, through co-designing tools and approaches, upskilling and building innovation and change capability.
- Expand DigilInventors in Primary & Secondary Schools to activate a long-term domestic talent pipeline and engage internationally to attract global entrepreneurs into Scotland.

PAA 5: Supporting Commercial Growth

Challenge: There is a persistent lack of understanding in the commercial base about the full extent of health and social care customer needs. The routes to market for digital health and care innovations can be complex, and the support landscape is populated by many players with overlapping remits. These hurdles have implications for return on investment for commercialisation of assets developed in the Scottish research and company base, and the attractiveness of Scotland as a market and location for global companies. Unless addressed, the growth of the digital health and care sector in Scotland will be limited.

DHI has a granular understanding and insights about health and social care needs and a deep understanding of the hurdles that need to be overcome to successfully commercialise into health and social care delivery including how to innovate within complex and confusing procurement systems.

Next Stage Objective: Create dedicated commercial engagement resources and services to better align the commercial sector 'PUSH' with health and social care challenge 'PULL' priorities.

This will be achieved by the following activities.

- Extend the Innovation Process Model to provide more structured support for companies, emphasising the importance of Commercial Readiness and new business models for this sector learning from international partners such as Finland and Denmark.
- Build and extend relationships with stakeholders in the independent and private sector to ensure DHI support is aligned with and complementary to wider support efforts including the Techscaler Network, other SFC Innovation Centres and Infrastructure Investments such as Interface.
- Continue to provide leadership and support for the Scottish Lifesciences Industry Leadership Group for Digital and Data (ILG DD) to deliver key priorities including promoting improvements in collation, curation and sharing of large-scale public owned data to improve front line services, support new approaches/ discoveries which improve care and save lives.

- Create R&I opportunities and attract businesses to test and develop innovations in the north of Scotland, through the Moray RCE flagship programme in the five Living Lab themes of healthy living and weight management, care planning and Care in Place, smart housing and smart communities, co-managing long term conditions and support for mental wellbeing. Insights from delivery of this programme will be extended to other regions in Scotland.
- Develop a commercial model, contributing to longer term sustainability of DHI, decreasing the extent of reliance on public sector funding.

Specific Activities:

- Embed service and business readiness training into spin-out and start-up development programmes delivered by Scottish universities and colleges in partnership with enterprise agencies.
- Promote inward investment through international engagement activities and collaboration with SDI.
- Align specific technology ‘PUSH’ opportunities from the company base with health and social care challenge ‘PULL’ priorities.
- Develop “learn and share” assets and interventions specifically for commercial audiences, drawing on insights and collaborations with academia, health and social care providers.
- Identify and support specific collaboration opportunities identified through the Innovation Clusters to secure increased R&I funding.
- Utilise Moray RCE as a microenvironment to inform and refine increased commercial growth activities, accelerating the process from R&I to commercialisation.
- Implement stronger links and processes with partner agencies such as the Scottish National Investment Bank to support and develop routes to commercialisation for regional and business innovations.

PAA 6: Contribution to Net Zero

Challenge: Support for a Green Recovery and a transition to net zero carbon emissions are recognised as the major priorities of the 21st Century. The deterioration of our environment has significant impacts on human mortality and health e.g., up to an estimated 5 million excess deaths per annum are due to climate change (Nature 2021). The Scottish Government’s target is to become net zero by 2045, with NHS Scotland committing to become a net zero greenhouse gas emitting organisation by 2040. It is recognised that addressing climate change is also *“the greatest health opportunity of the 21st century”*¹⁷.

Next Stage Objectives: This is a relatively new area of priority for DHI, and it will identify specific opportunities where it can do more to increase and accelerate its contribution to net zero targets in support of addressing climate change.

Specific Actions:

- Support the concept of the 20-minute neighbourhood with Moray RCE and SOSE, enabling people to live more independent lives while reducing the need to travel long distances to receive health and social care services.
- Develop key Net Zero principles and build these into DHI processes and procedures to influence supply, travel, procurement, and supply chain management.
- Promote Master student opportunities and provide academic grant awards which identify and recommend the contribution digital health and care can make to net zero targets.
- Join the ECHA Global Health Connector Partnership working group to share best practice, create knowledge and undertake joint international actions and collaboration projects.
- Create frameworks and evidence paths to feedback on DHI contributions to Net Zero targets.
- Utilise international networks to identify and inform the contribution of digital health and care to the wider UN Sustainable Goals for achieving Net Zero.

¹⁷ Lancet Commission (Vol 386, No10006)

PAA 7: Enhancing Scotland's International R&I Reputation

Challenge: The challenges and opportunities for health and social care in Scotland are also reflected globally. It is crucial for DHI to remain at the forefront of international R&I, to allow best practice to be shared and opportunities for joint working and funding to be optimised. Scotland's Innovation Strategy stresses the importance of international collaboration and the role it has played in developing Scotland's innovation ecosystem.

DHI has an established international network which has yielded additional funding and joint projects, raising the profile of DHI and Scotland. DHI employs a range of engagement and dissemination mechanisms, from a self-serve internationally accessed Open Content Research Library to stimulating robust debates and knowledge exchange (KE) with international leaders to formulate new ideas. DHI has forged links with international academic institutions where regular academic KE and joint bid opportunities are progressed e.g., with University of Agder in Norway, the University of Southern Denmark and KAMK in Finland.

Next Stage Objectives: The next stage will consolidate existing key strategic international relationships and place greater emphasis on joint funding and structured knowledge exchange programmes which mirror the identified PAA1 areas.

Specific Activities:

- Consolidate international strategic partnerships, networks and thought leadership to increase focused knowledge exchange partnerships.
- Develop joint propositions to attract funding from outside Scotland and enter new emergent trade bridges.
- Collaborate with DBT and SDI to engage in new international markets and build a solid pipeline of partnerships for the transfer of knowledge, assets and skills across geographic and cultural boundaries.
- Create opportunities with new trade partners to extend out links to USA, India, Middle East, Asia and the Global South.

- Further develop the Global Digital Health Innovation Summit in partnership with Kaiser Permanente and Gates Foundation to identify specific R&I collaboration opportunities within the key priority areas.
- Develop relationships where 'R&I Twins' can be activated to deliver enhanced transferability across nations.
- Create support to attract inward investment in relation to knowledge exchange on navigating and entering the UK marketplace.

“DHI is an important strategic partner for Kaiser Permanente. Together our organisations have pulled together thought leaders from across the world to exchange knowledge on some of key topics and trends impacting healthcare today. Leveraging DHI's existing relationships with influential healthcare organizations provides a forum to make meaningful contributions to shape the future of healthcare.”

Dr Funahashi, Chief Innovation Officer, Kaiser Permanente Southern California



Figure 8. Examples of DHI Global Alliances

7.0 Demonstrating outcomes and impact

DHI will evidence added value and impact using its benefits realisation framework, case study methodology and outcomes through a revised Monitoring and Evaluation Framework (MEF) to be developed with the Scottish Funding Council to better evidence wider societal benefits.

7.1 Logic Model

DHI has developed a logic model (Figure 9) to demonstrate how the Priority Action Areas link to activities and deliverables that drive outputs and outcomes to ultimately achieve the DHI Vision and success factors for its partners. In addition, a table of DHI target outputs has been developed (see section 7.2).



Figure 9: DHI Logic Model

7.2 Summary of Target Outputs

PAA	National Critical Success Factors	DHI Contribution	Target 2033
PAA1 H&C Trans	Increase extent and scaling of digital innovation in health and social care.	<ul style="list-style-type: none"> Drive forward a balanced innovation portfolio that addresses key demand priorities & increases capacity within H&C services Independent evidence & evaluation generated 	<ul style="list-style-type: none"> 10 high- quality transformative digitally enabled innovations transferred for scaling Onboarding over 80 projects with innovations in the Pipeline across 3 horizons Attracting Academic Grant Award funds - H&C evaluation
PAA2 D&D Infa	Influence effective use and sharing of health and care data.	<ul style="list-style-type: none"> Evidence of policy & process influence open access to data for R&I Generating new types of data that drive prevention and prediction Creation of structured data as by-product of re-designed care pathways and processes 	<ul style="list-style-type: none"> Wide scale adoption of person-centred data sharing infrastructure and a single Digital Identity across health and care A shift to consensual sharing of cross-agency aggregate data sets by citizens to power R&I Over 100 Simulations utilising or extending interoperability
PAA3 Conn Eco	Increased collaborative cross-sectoral initiatives.	<ul style="list-style-type: none"> Increased depth and breadth of DHI innovation cluster membership Range of KE events delivered, ecosystem matchmaking, and introductions initiated Value of collaborative projects/initiatives developed through clusters and R&I investment secured 	<ul style="list-style-type: none"> An Additional 1,500 Ecosystem members Over 500 KE events (e.g., DHI led, partnership and external events included) with introductions facilitated Additional £10m direct R&I investment and £30m indirect funding attracted via partners through cross-sectoral collaborations
PAA4 Future Skills	Increase in digitally skilled and enabled workforce.	<ul style="list-style-type: none"> Influencing curricula to embed digital as core part of medical, health and care courses; expand university and college courses containing DH&C aspects; increase educational opportunities and pathways leading to careers in DH&C and digital in H&C Supporting number of skills development opportunities 	<ul style="list-style-type: none"> Over 300 Post graduate scholarships (MSc, PhD, Clinical and Social Care innovation and Entrepreneur fellowships) Annual post grad alumina summit and student network Over 50 Work experience placements
PAA5 Comm Grow	Increase in high value jobs in the Lifesciences Sector increase in exports	<ul style="list-style-type: none"> New models and methodologies are embedded to accelerate R&I to commercialisation. DHI brings together company capability with H&C needs Building connections and helping facilitate collaborations to solve challenges. Support to develop commercial models that are ready to take advantage of global opportunities 	<ul style="list-style-type: none"> 6 procurements/commissions 365 HV jobs created or/and safeguarded (incl. spin outs and startups) 20% increase in SMEs working in the H&C sector
PAA6 Net Zero	Support transition to Net Zero Carbon Emissions by 2045	<ul style="list-style-type: none"> Develop key Net Zero principles and introduce in DHI processes and procedures Utilise international networks to inform the contribution of digital health and care to the wider UN Sustainable Goals 	<ul style="list-style-type: none"> Net Zero Best Practice Framework and Metrics established for the DHI sector
PAA7 Int Rep	Evidence of international reputation as a world leader in this field	<ul style="list-style-type: none"> Champion Scotland's reputation as a world class R&I ecosystem Create strong knowledge network through market research reports and peer reviewed publications activated through its HE networks and international partners Continue to expose Scotland's position in pioneering innovation for this sector 	<ul style="list-style-type: none"> Over 120 International Presentations, Workshops or thought leadership events delivered Over 100 market research reports with over 40 peer reviewed publications Joint projects and R&I funding leveraged Evidence of influencing policy and practice

8.0 Financial case

This section introduces indicative core budgets for the first year only of DHI’s SFC infrastructure investment funding, within a longer-term investment of 10 years. The indicative core budget provides the foundational skills and capacity upon which significant growth can be built. It should be noted that the identified funding contributions are insufficient to support ongoing staff retention, career progression pathways, and address necessary inflationary uplifts in salaries and running costs. It is therefore essential for DHI to secure additional investment from a range of private and other public sector funding sources to consolidate the core team and support sustainability and growth.

Core Funding Assumptions/Implications

- An indicative core budget of £2.5m p.a has been assumed. The anticipated Scottish Funding Council baseline contribution of £2m will be used to seek a contribution of £0.5m p.a. from Scottish Government Digital Health & Care to continue successful delivery and support of its core priorities. This investment will provide the necessary springboard to attract additional investment and deliver increasing traction on digital health and care innovations in Scotland.
- All DHI staff work collaboratively with quadruple helix partners and posts. As such, individual core posts cannot be individually attributed to either SFC or Scottish Government Funding. The staffing and operating costs have been generally subdivided based on an 80%/20% split.
- Additional support from Scotland’s 3 Enterprise Companies will be sought to fund the commercial support aspects of the strategy including funding for the Senior Business Innovation Manager Post and a contribution to Innovation Clusters. Further investment on a project-by-project basis to support businesses will also be progressed. These will build on existing collaborative relationships and shared priority areas.

DHI Core Financial Summary

The following Table provides a 1-year income and expenditure summary for DHI core activity based on the indicative core funding budget of £2.5m.

Although a balanced budget position has not been possible, the University of Strathclyde (as DHI’s host institution), has advised it is comfortable progressing within the identified risk envelope subject to the following mitigations - DHI to leverage sufficient additional project funding to offset core deficits, implement a vacancy management approach and ensure Dean of Science is provided with regular quarterly financial performance information and assurance from the DHI Board.

		DHI Budget Overview	
		Year 1 (Aug 24 - July 25)	
DHI Core Income	Scottish Funding Council	£	2,000,000
	Other Income	£	500,000
	Total Core Income for DHI:	£	2,500,000
EXPENDITURE - STAFF	Corporate Staff	£	620,961
	Planning & Performance	£	383,666
	Technology Staff	£	93,760
	GSA Design Staff (7.3 FTE)	£	467,941
	Service Development Staff	£	62,500
	Total Staff	£	1,628,828
EXPENDITURE - OTHER	Academic Grants	£	-
	Marketing/Events/Comms	£	122,000
	Property	£	92,236
	Training	£	4,800
	UoS Support Services	£	95,223
	DHI Exchange	£	200,000
	ICT Hardware	£	5,000
	Other Running Costs/Misc	£	98,724
	GSA Overhead Recovery	£	323,826
	Total Other	£	941,809
	TOTAL EXPENDITURE	£	2,570,637
	Budget deficit per year	-£	70,637

Leveraging Additional Sources of Income

Core investment in DHI has already leveraged around £30m investment to further Scotland’s ambitions in digital health and care at a Core to Additional Investment Ratio of approximately 1:3. To reflect the market growth expected over the next decade but within the context of public sector fiscal challenges, DHI has set a target of attracting an additional £40m direct and indirect investment. This will be generated through additional projects and commissions both locally and internationally. Where additional skills and capacity are required by DHI to deliver project commitments, this will be built into project proposals, with an additional management overhead applied to contribute to the innovation centre operating costs.

Value for Money

The embedding of digital solutions and services within health and care is a complex process. The skills and experience provided by DHI are in high demand from public and private sector organisations as evidenced by the additional funding leveraged over the past 4 years. The core public sector contribution catalyses significant additional investment and builds on the experience, capability and valuable skills anchored in DHI to support and deliver key health and social care transformations and the global market opportunity.

Without this essential and continuing investment in the core infrastructure, the vital strategic leadership and R&I convening role played by DHI will set a number of developments back, potentially by years, and influence Scotland's ability to deliver on its ambitions, further exacerbating the challenges experienced by the health and social care sector.

Pricing and Value Strategy

To deliver the strategy and to remain at the forefront of R&I in an emerging solutions space e.g. AI-driven services, DHI must continue to lead and contribute to a diverse range of projects, involving multiple cross-sectoral partners. As DHI's portfolio evolves it has to consider new pricing and value models – including cost recovery, approach to and margin for risk, and profit.

It is essential that DHI retains core income as a foundation for public service-funded projects. This will sit alongside an adaptive approach which will enable DHI to provide pricing structures appropriately matched to contract responsibilities, risks, and fair return on DHI's investment into its resource base. This will apply to projects with both chargeable and in-kind components.

DHI will prepare and maintain appropriate rate cards, which identify actual charge sought for proposals, or which can be applied 'virtually' to demonstrate 'in kind' contribution. DHI will ensure the balance of engagements and income will continue to align to the strategy and will monitor the income and in-kind contributions as it does today to inform the evolution of the pricing models and to ensure compliance with its fiscal governance responsibilities.

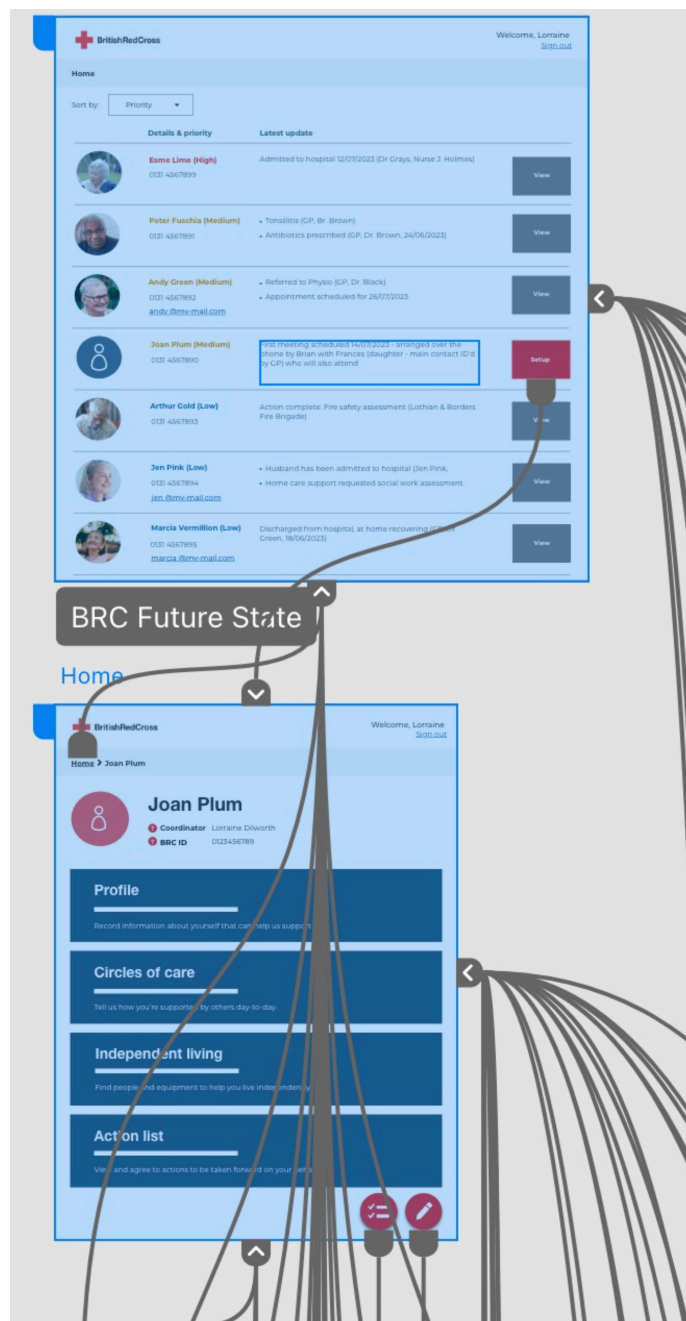


Figure 10: Examples of Midlothian Demonstrator Prototyping

9.0 Conclusion

Transformational service change is unavoidable if Scotland’s health and social care system is to continue to meet citizen needs and be sustainable. Government policy and strategic priorities for the NHS and social care identify digital innovation as a crucial component of the necessary systemic change. DHI’s expertise and significant convening power effectively mobilised the digital health and care community during the pandemic to rapidly identify and develop digital solutions which had the potential for scale. The learning from this experience and others over the past 10 years has underpinned the development of this strategy and informed DHI’s Strategic Route Map for the next decade (see figure 11).

The opportunities for research and innovation in the field of digital health and care are immense, with exponential global market growth projections of >\$700bn predicted to 2030. DHI’s unique position at the nexus of commercial, academic, health and care sectors has evidenced it has already leveraged cross-sectoral skills and experience for the development and adoption of R&I plus attracted significant additional investment. However, greater cross-sectoral effort and co-ordination is required to make the necessary systemic changes to accelerate traction and impact.

Core investment in DHI provides organisational stability which enables the innovation centre to create economic, societal and environmental opportunities for Scotland to flourish. It does this by facilitating and supporting collaboration, evidencing impactful innovation, asset development, skills and global partnerships. DHI will further strengthen and connect a multi-dimensional ecosystem to enable Scotland to compete internationally, harnessing world class R&I capabilities to meet tomorrow’s global needs.

Strategic vision	Research and Innovation (R&I) in digital health and care will help the people of Scotland live longer, healthier lives, create sustainable services and future skills which will allow the economy to flourish to meet global needs						
National Strategic priorities	<p style="text-align: center;">Health & Care Transformation</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Digital & Data</td> <td>Connected Ecosystem</td> <td>Skills Pipeline</td> <td>Economic Growth</td> <td>Net Zero</td> <td>International Engagement</td> </tr> </table>	Digital & Data	Connected Ecosystem	Skills Pipeline	Economic Growth	Net Zero	International Engagement
Digital & Data	Connected Ecosystem	Skills Pipeline	Economic Growth	Net Zero	International Engagement		
Strategic Success Factors	<table style="width: 100%; text-align: center;"> <tr> <td>▲ SCALE</td> <td>▲ GROWTH</td> </tr> <tr> <td>▲ RESEARCH</td> <td>▲ DATA USE</td> </tr> <tr> <td>▲ SKILLS</td> <td>▲ INTERNATIONAL</td> </tr> </table>	▲ SCALE	▲ GROWTH	▲ RESEARCH	▲ DATA USE	▲ SKILLS	▲ INTERNATIONAL
▲ SCALE	▲ GROWTH						
▲ RESEARCH	▲ DATA USE						
▲ SKILLS	▲ INTERNATIONAL						
Strategic objectives (our goals)	<ul style="list-style-type: none"> • Support readiness for adoption at scale through an innovation pipeline • Influence the reimagining of health and social care • Gather insights and gain traction through collaborative environments • Develop technical assets and future skills 						

Fig 11: DHI Strategic Route Map to 2033

Glossary

ANIA	Accelerated National Innovation Adoption
BE-ST	Built Environment – Smarter Transformation Innovation Centre (formerly CSIC)
CfSD	Centre for Sustainable Delivery
CSIC (BE-ST)	Construction Scotland Innovation Centre (now BE-ST)
CSO	Chief Scientists Office
CENSIS	Innovation Centre for Sensing Imaging and Internet of Things
COPD	Chronic Obstructive Pulmonary Disease
COSLA	Convention of Scottish Local Authorities
DDI	Data Driven Innovation
DH&C	Digital Health and Care
DHI	Digital Health and Care Innovation Centre
DIT	Department for International Trade
E&D	Equality and Diversity
ECHA	European Connected Health Alliance
ENRICH Scotland	Enabling Research in Care Homes
ENROLL	European Network of Living Labs
ETHEL	European Health Telematics Association
EQIA	Equality Impact Assessment
FE	Further Education
FEC	Full Economic Costing
FOI	Freedom of Information
GSA	Glasgow School of Art
HAIC	Healthy Ageing Innovation Cluster
H&C	Health and Social Care
HE	Higher Education
HEI	Higher Education Institutions
HDE	Health Data Exchange
HIE	Highlands and Islands Enterprise
HIS	Healthcare Improvement Scotland
ICS	Impact Case Study
IDA	Innovation Design Authority
IFIC	International Foundation for Integrated Care
ILG	Scottish Life Sciences Industry Leadership Group
ILG DD	Scottish Life Sciences Industry Leadership Subgroup for Digital & Data
KE	Knowledge Exchange
KAMK	Kajaani University of Applied Science (Finland)
KPIs	Key Performance Indicators
LGDO	The Digital Office for Local Government
MEF	Monitoring and Evaluation Framework
MOOC	Massive Open Online Course
NES	NHS Education for Scotland
NHSGG&C	NHS Greater Glasgow and Clyde
NSS	NHS National Services Scotland
PMO	Project Management Office
PAA	Priority Action Area
REF	Research Excellence Framework
RCE	Rural Centre of Excellence
R&I	Research & Innovation
SDI	Scottish Development International
SDS	Skills Development Scotland
SE	Scottish Enterprise
SICSA	Scottish Informatics & Computer Science Alliance
SIG	Special Interest Group
SG	Scottish Government
SMT	Senior Management Team
SOSE	South of Scotland Enterprise
SSSC	Scottish Social Services Council
SULSA	Scottish Universities Life Science Association
TRL	Technology Readiness Level
UHI	University of the Highlands and Islands
UKRI	UK Research & Innovation (national funding agency)

Appendix 1: DHI Board & Organisational Structure

DHI Board

Governance is provided by a well-established, extensively connected and engaged Board <https://www.dhi-scotland.com/our-team/> who add a broad range of expertise and support to the DHI Executive team of Chief Executive Officer, Deputy CEO/Director of Innovation, Director of Planning & Performance, Chief Technology Officer (4 Exec Posts). Governance is overseen by the DHI Board on behalf of its host institution the University of Strathclyde, with senior level board membership from GSA, and Scottish Government Digital Health & Care as DHI’s sponsoring division. Board Meetings take place on a quarterly basis with any required formal support and approvals routed through the collaborating institutions governance structures as appropriate. An annual performance review involving Board members is undertaken by the Chair to review progress, ensure strategic alignment and contribution to key issues.

DHI Staffing

The Exec consists of 4 key posts – Chief Executive Officer, Deputy CEO/Director of Innovation, Director of Planning & Performance and Chief Technology Officer. The Exec team is accountable for effective strategic development and stakeholder relationship management, identifying and negotiating substantial public and private investment. Key responsibilities are set out in Table 1.

Role	Summary of Key Responsibilities
Chief Executive Officer	<ul style="list-style-type: none"> • Development of DHI vision, providing leadership and strategic direction for the DHI • Development of strategic relationships with key stakeholders to ensure DHI remains relevant, sustainable, and aligned to their challenges and priorities • Accountable to the University of Strathclyde, and the DHI funders for the successful running of the Innovation Centre
Deputy CEO/ Director of Innovation	<ul style="list-style-type: none"> • Deputising for CEO, lead for strategy development • Resource planning, financial management, audit, liaising with HR, finance and procurement functions within the University of Strathclyde and the Glasgow School of Art • Appraises and evolves the working models within DHI, leading organisational development to ensure a positive culture and support long term sustainability and growth • Leads Comms & Marketing, Engagement and Design functions
Director of Planning & Performance	<ul style="list-style-type: none"> • Leads the DHI Project Management Office (PMO) and the Research & Knowledge Management (RKM) functions • Establishes and monitors overall performance reporting for DHI, including risk management • Leads wider UK and international engagement to identify collaboration, future skills development and knowledge exchange (KE) opportunities
Chief Technology Officer	<ul style="list-style-type: none"> • Leads UK and international horizon scanning to inform and identify digital technology opportunities • Leads the development and utilisation of DHI Exchange (immersive demonstration and simulation environment and its associated portfolio of projects) to influence policy and accelerate innovation • Continuously assesses the overall technical innovation model to improve the model’s efficacy and comply with regulatory or legislative changes

Senior Management Team

The DHI Executive is supported by SMT who provide the following key roles;

Role	Summary of Key Responsibilities
Design Director	<ul style="list-style-type: none"> Leads and manages the development and exploitation of design innovation across the DHI's Innovation Process Model and project portfolio Provides specialist advice on matters across DHI, including the development of digital products and services, product design, immersive VR, interactive entertainment, communications and service design, digital, design research and healthcare Manages and supports the dynamic and flexible DHI Design team resource ensuring compliance with GSA strategy, policy, and ethics including research and knowledge management, HR and equal opportunities, health and safety, and research
Head of Communications & Marketing	<ul style="list-style-type: none"> Lead Comms & Marketing strategy development, including strategic brand development and deliver a creative suite of ongoing marketing communications Support the dissemination of core pieces of work locally, nationally, internationally, managing the DHI website and social media presence National and international event management, including the DHI lead role for the innovative Diginventors Programme
Head of Engagement (part funded by Scottish Gov Mental Health Directorate)	<ul style="list-style-type: none"> Acts as a principle contact point for DHI engagement, identifies and responds to key stakeholder engagements, including national and international knowledge exchange visits Identifies and scopes potential opportunities for DHI pipeline of innovation Leads the delivery and development of DHI themed innovation clusters on Healthy Ageing and Digital Mental Health to progress Knowledge Exchange and build collaboration opportunities
Programme Manager	<ul style="list-style-type: none"> Leads the Programme Management Office to coordinate and manage the portfolio of key projects ensuring effective project and resource Supports the DHI contracting and reporting functions (including maintaining the risk, issues and lessons learned logs) Identifies and maintains a benefits realisation plan collating partner feedback, benefits, and impacts
Head of Research & Skills	<ul style="list-style-type: none"> Leads a team of researchers to deliver research, publications, and academic grant awards Identifies and collaborates with partners to shape and influence the DHI Future Skills agenda, working closely with FE/HE and others to share best practice and influence curricula Leads postgraduate scholarships and work experience/internships developments

Role	Summary of Key Responsibilities
Service Development Manager (Funded by Scottish Government/DHI)	<ul style="list-style-type: none"> • Lead the development and delivery of a portfolio of Digital Innovation and Technology Enabled services on behalf of SG Digital Health and Care and DHI, with an initial focus on diabetes and Artificial Intelligence to support bowel cancer screening • Collaborate with local partners and Scottish Government to regularly undertake and lead the commissioning of R&D and evaluation activity to demonstrate the impact and outcomes of digital interventions
Senior Business Innovation Manager (Funded by Scottish Enterprise)	<ul style="list-style-type: none"> • Establishing, developing and the ongoing management of key commercial stakeholder relationships • Establish and support specific cross-sectoral, cross-industry research, development and innovation (RDI) proposals, to attract increased R&D investment into Scotland • Support delivery of DHI activities within the Scottish Lifesciences Industry Leadership Group, including contributing to an Opportunity Pipeline
Product Manager (Funded by DHI Growth Fund)	<ul style="list-style-type: none"> • Lead a portfolio of service/technical design projects from engagement, through technical proof of concept to development • Deliver engagement workshops to utilise DHI’s data sharing infrastructure and rapidly develop exemplar digital services • Interpret policy, legislation, regulations within digital development and data sharing areas, advising and responding to any compliance requirements

Short biographies for DHI Executive and Senior Management Team members are on the DHI website - <http://dhi-scotland.com/about-dhi/meet-the-team/>.

To optimise its networks and resources, (and to respond to the challenges of the pandemic) DHI formally established a blended working model in 2022. This adheres to the ambition of Scotland’s Digital Strategy that *“Scotland should position itself as a leading centre for home and remote working, supporting our rural communities, and attracting international experts”*¹.

As at March 2023, DHI employs 39 members of staff, based on a total of 38.8 full time equivalent posts (FTE). There are 6 vacancies (4.3 FTE). Staff are currently organised into 4 internal teams – Engagement (ENG), Programme Management Office (PMO), Research & Knowledge Management (RKM), and DHI Exchange (DHIEx). In addition, a separate specialist innovation team has been established to implement the Moray Rural Centre of Excellence (MRCE) funded by UK Government. A Senior Business Innovation Manager is funded directly by Scottish Enterprise to expand support for commercial organisations.

Supporting Professional Advisors and Services

A range of professional support services are provided by the University of Strathclyde to support operations in a cost-effective way. These include HR, Legal Services, IT Support, Information Governance, Financial Services, Procurement, Academic Digital Health Expertise, Accommodation and Office Management Services. Clinical, Professional, Strategic Design, eHealth and Economic expertise are accessed by DHI on an intermittent basis via other routes and partners, predominantly within the portfolio of programmes and projects. Some additional corporate support for Finance and HR is provided by the Glasgow School of Art as it relates to the DHI Design Team.

¹ <https://www.gov.scot/publications/a-changing-nation-how-scotland-will-thrive-in-a-digital-world/pages/supporting-our-digital-technology-sector/>

DHI Current Organisational Structure (As at March 2023)

Total FTE = 43.1 (45 posts)

Funding Sources;

- SFC/SG Core Grant (21.5 FTE)
- Moray Growth Deal
- Additional Project Income
- DHI Growth Fund

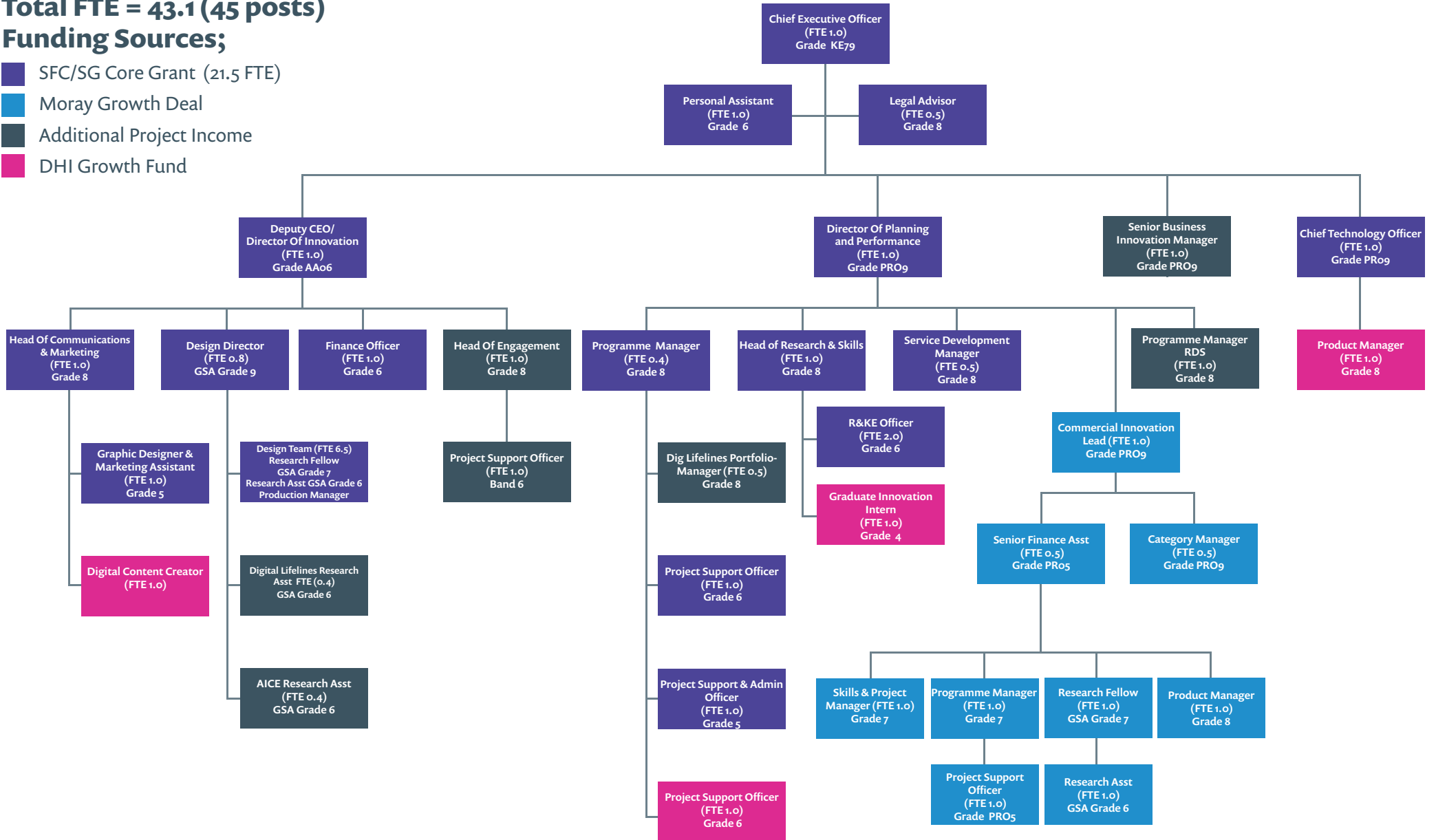


Figure 1: DHI Current Organisational Structure (March 2023)

Appendix 2: Phase 2 KPI Summary

DHI submits regular quarterly and annual monitoring and evaluation reports (MEF) to Scottish Funding Council and the Scottish Government Digital Health & Care Directorate, along with an Annual Report. The following table provides an overview of DHI monitoring information to Year 3 of DHI Phase 2 (2019 - 2024).

CORE PERFORMANCE TARGETS	Yr1 Actuals Jul '20	Yr2 Actuals Jul '21	Yr3 Actuals July '22	Yr4 Target July '23	Yr5 target July '24	Actuals for (Yr1,2 &3)	Target for 2024	Phase 2 RAG
1. Innovation Cluster								%
IC1.1 - DHI Total innovation cluster numbers (2019 Baseline = 600)	1664 (+1064)	1016* (-48)	1332 (+316)	+100	+100	1332 (+416)	1,200 (+600)	110%
IC1.2 – Number of events led (workshops, seminars, etc.)	28	6	15	4	4	49	20	245%
IC1.3 – Number of events partnered	9	10	18	4	4	37	20	185%
IC1.4 - Estimated delegate numbers reached	1097	4020	6650	480	480	11,767	2400	490%
IC1.5 – Number of introductions and signposting from cluster	14	8	10	7	7	32	35	91%
IC1.6 – No. challenge competitions hosted	0	1	0	1	1	1	3	33%
2. Project Portfolio								
PP2.11 – No. of SG core projects	2	2	0	2	2	4	10	300%
PP2.12 – Joint funded projects – some of which span over years	6	11	14			17		
PP2.13 – Additionally funded projects	5	4	2			9		
PP2.2 – SG project ready for adoption	4	3	5	1	0	12	2	600%
PP2.31 – Academic grants (From core funding)	NIL	50k	£98,800	50	50	c.148k	250k	60%
PP2.32 – Academic grants (expenditure from additional funds)								
PP2.4 – Secure additional funding (target)	2.56M*	1.7M	8.4M	750	500	11.7M*	3M	390%
3. Skills Development & Knowledge Exchange								
SDKE3.1 – Market & research reports	19	19	14	14	14	52	70	74%
SDKE3.2 – Publications	4	2	6	1	1	12	5	240%
SDKE3.3 – Work experience placements (including Internships)	2	0	2	2	4	4	10	40%
SDK3.4 – Master scholarships (FTE)	24	25	22			67	N/A	N/A**
4. Demonstration & Simulation Environment								
DSE 4.1 – DSE asset dev (cap ex)	NIL	209k	130K	0	0	339k	400	84%
DSE 4.2 – No. of digital transferable solutions (showcased)	5	7	2	2	2	14	10	140%
*£2.56m included phase 1b funding of approx. £800m – for clarity this figure has been deducted from the overall total to reflect the Phase 2 period								
** - Master scholarships (FTE) did not have an associated target from SFC but work on the basis of approximate 20 scholarship awards per annum								
RAG KEY DEFINITIONS	GREEN - Confident it will be delivered	AMBER - Slippage, but will be delivered within target year	RED - May not be delivered, consider target review and steps for mitigation/escalation	BLUE - Complete				

Please note the pink column details the accumulative figures covering the first 3 years (2019 to July 2022) and the last column shows the RAG status (see RAG status definitions at the bottom of the table) incl. percentage % achieved to date as per RAG (Actuals – Target = RAG%).

Appendix 3: DHI Case Studies

The following case studies provide some examples from the DHI Project Portfolio as at March 2023.

My Cancer mAI Care

Integrating health and social care data, interpreted by AI, to redesign the cancer care journey



Collaborators: Macmillan Cancer Support, Abertay University

Background: Rising cancer prevalence in the UK places is increasing strain on health and social care services. Artificial Intelligence (AI) has the potential to integrate and visualise health and social care data to support decision-making and improve outcomes for people affected by cancer facilitated by immersive user experience (UX) tools, such as computer games technology. To progress this, DHI brokered a partnership with Macmillan Cancer Support and Abertay University Dundee.

Summary: In the My Cancer mAI Care project, AI was applied to data from the ‘Improving the Cancer Journey Programme’ in Glasgow, to produce a visual tool to predict the future service needs of people living with cancer, and support Macmillan to offer a more personalised digital referral service for citizens and carers, improve planning and resource use. DHI led a series of workshops to prototype and test user interfaces with Macmillan staff and people affected by cancer, ensuring service needs effectively informed technology requirements. Two prototype user interfaces with underpinning computational models were created by Abertay. For staff, 3D interactive graphs offered novel insights and enabled improved planning and management. For people living with cancer, an iPad app prototype was developed to offer users Macmillan Cancer Support’s electronic Holistic Needs Assessment (eHNA) with personalised care recommendations identified by the AI. These aimed to help individuals to self-manage and prime social care staff to have more intuitive conversations.

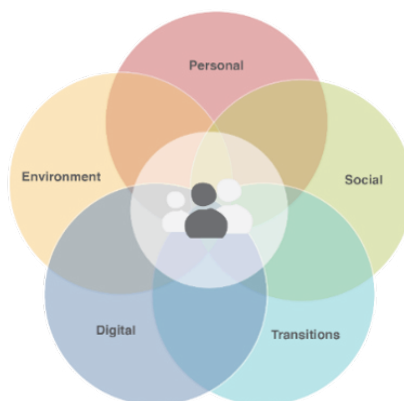
Impact: The personalised eHNA is now part of Macmillan’s infrastructure and the AI machine learning Proof of Concept has demonstrated the potential of guided navigation. Stage 2 of the project aims to de-risk the technologies for use within Macmillan’s operations and deliver an integration-ready system which improves the user experience. DHI is also exploring additional uses of this innovative approach with Abertay, including a collaboration with Alzheimer’s Scotland.

Testimonial: *“The Macmillan-DHI-Abertay partnership is an innovative application of games technology and data mining to explore optimisation of highly complex service provision for individuals living with cancer. DHI were instrumental in recognising the application of expertise at Abertay to a hitherto unexplored challenge for Macmillan. The project has already delivered new insights into patterns in service use and DHI has been central to the project success through both their partnering role and effective management.”*

- Janice Preston, Macmillan Head of Services, Scotland

Saving Lives Through Connections

Drug deaths prevention and support for vulnerable communities



Collaborators: Digital Lifelines Scotland, Scottish Council for Voluntary Organisations (SCVO), Drug Research Network Scotland (DRNS), Aberdeen City Council, Dundee City Council, Queen’s University Belfast, St Andrews University, Simon Community Scotland, and Trinity College Dublin.

Background: Scotland has the most severe Drug-Related Deaths (DRD) problem in Europe, and evidence highlights that digital exclusion is a particular issue amongst people with multiple and complex needs. DHI is collaborating on a range of high profile national and international activities to support drug deaths prevention.

Summary: DHI is a member of the Digital Lifelines Scotland (DLS) Portfolio Board which is funded by Scottish Government and the Drug Deaths Taskforce to reduce digital exclusion and design new digital solutions to improve health outcomes for people who use drugs, reducing the risk of harm and death. DHI produced a future vision for digitally enabled services using a participatory design approach to engage with delivery partners, stakeholders, and people who use drugs. DHI is now engaged in the next phase of the programme to identify suitable digital solutions.

DHI is also partnering with University of Stirling, Alcohol & Drug Action (ADA Aberdeen City) and Brave Technology Co-Op to pilot the ‘Hear4U Scotland – Overdose Detection Responder App’. This is a remote mobile application which aims to detect and prevent overdose by connecting people who use drugs alone with support from people who are experienced in preventing drug related deaths. The project went Live in January 23.

DHI is working with Queen’s University Belfast who are leading a strong collaboration of partners from Northern Ireland, Republic of Ireland, and Scotland (DHI and St Andrews University) to develop a €6m submission for the EU/UK PEACEPLUS Programme. The SUMIT Proposal (Substance Use & Mental Health Interventions using Digital Technology) aims to provide an integrated cross-border programme of research, training, and skills development, to inform digitally enabled service transformation for people who use drugs.

Impact: The establishment of a collaborative pipeline of innovation and investment opportunities to address the challenging issue of drug deaths prevention.

Testimonial: *‘DHI’s involvement has been pivotal, without them our innovative Queen’s, Trinity, and St Andrew’s inter-university collaborative submission for Peace Plus Programme Funding would not have succeeded. Importantly we have also identified opportunity for significant future collaborations.’* - Professor Kathryn Higgins, Professor of Social Science and Health School of Social Science Education and Work, Queen’s University Belfast.

Midlothian TEC Pathfinder Collaboration

Integrating health and social care using a Personal Data Store to innovate the frailty system of care



Collaborators: Midlothian Health & Social Care Partnership, British Red Cross, Voices of Carers around Lothian (VOCAL), Mydex CIC

Background: As part of the Scottish Government’s Technology Enabled Care (TEC) Transforming Local System Pathfinder Programme, Midlothian Health and Social Care Partnership (MHSCP) is exploring how digital technology and design can act as transformation enablers to innovate the frailty system of care. The project is using design research led approaches to engage with citizens and stakeholders to directly involve them in innovating care.

Summary: The initial stages of the project delivered comprehensive insights about the service landscape and experiences of living with frailty in Midlothian by engaging with health and social care professionals, people with lived experience, and their carers. ‘Navigation’ was identified as a key challenge, and a focus on Blue Badge disabled parking applications and carer support plans was agreed for the exploration of digital innovations. This included co-design, discovery, prototyping and integration with DHI’s data sharing infrastructure.

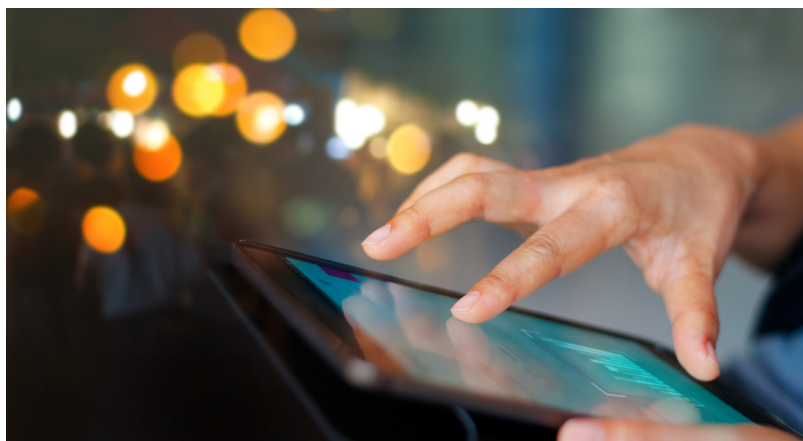
Mydex CIC (Community Interest Company) has been commissioned to develop a functional prototype of a British Red Cross frailty assessment, which connects with VOCAL systems, and is fed by a personal data store to illustrate the two chosen action areas. Citizen engagement continues throughout by using a non-functional prototype to illustrate the future scenario through a ‘Circle of Care’ view, and to carry out ‘data journey mapping’ to support future data alignment and simulation

Impact: Interactive tools have been developed to help directly engage citizens in the co-design of new service models. These are informing User Experience Models for other digital service developments across Scotland. The experiences to date are informing a business case for a live development trial, and evaluation. The team is also exploring synergies and opportunities with other national partners to explore wider applicability.

Testimonial: *“Prior to the Pathfinder, we wouldn’t have had the design vocabulary within the HSCP to generate the interview maps. ...The paradigm of enquiry, a qualitative research lens rather than asking and seeking answers to specific questions or an appraisal of a service, was a conscious choice designed to help us dive deeper than normal and learn this skill in action by realising benefits in a test case.”* - Matthew Curl, Digital Programme Manager, Midlothian Health & Social Care Partnership

Dynamic Scot

Expansion of a digital tool to support patients with Chronic Obstructive Pulmonary Disease (COPD) to better manage their condition.



Collaborators: NHS Greater Glasgow and Clyde, West of Scotland Innovation Hub, Scottish Government Digital Health & Care Division, NHS Lothian, National Services Scotland (NSS), Storm ID, University of Glasgow.

Background: COPD affects approximately 120,000 people in Scotland and is the second most common reason for emergency hospital admissions. In response to Covid-19, DHI worked with partners to support the wider adoption and scaling up of a web-based application to support high to medium risk patients with COPD to self-manage at home. Patients monitored their symptoms of COPD through a digital service accessed via smartphone or tablet devices. They were also able to message their clinician and community respiratory response team in real-time, allowing for routine care to continue virtually. The aim was to keep vulnerable patients out of hospital during a dangerous period, and to take pressure off respiratory services. Dynamic Scot built upon an earlier project funded by Innovate UK to scale up the service to support more patients within NHS GGC and introduce it within NHS Lothian.

Summary: This project uses a digital asynchronous messaging service to provide remote support to patients and utilises 'Patient Experience and Outcome' data to optimise patient and clinical interactions. Its clinical integration capacity supports the development of machine learning algorithms and uses the Storm ID LENUS platform to integrate data into trusted NHS Systems in Scotland. Funding awarded by Scottish Government in June 2020 supported the expansion of the service across NHS GGC and the trial of the service in NHS Lothian. DHI's role was to refine the digital service, producing a 'GGC toolkit' to support scaling and application within other Health Boards, and to support the development of a business case.

Impact: The final evaluation report from the University of Glasgow in December 2021, outlined excellent clinical outcomes and positive patient experiences including:

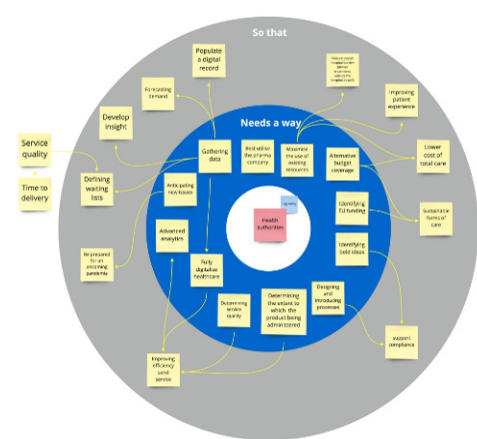
- 54% mean reduction in hospital admissions.
- Increased median time to readmission or death from 2 months to 12 months.
- Decreased Co2 emissions by 96,530 kg e.g reduced travel.

By the end of August 2021, 511 patients had accessed the service with some patients also enrolled within Lothian. The digital service continues to be expanded within both Health Boards, led by NHS GGC and the West of Scotland Innovation Hub.

Testimonial: *“The DHI team provided wide-ranging support to the inception, funding acquisition, successful delivery and reporting of the DYNAMIC-SCOT project. (-) Continued collaboration with DHI colleagues on next phase of this project - DYNAMIC-SCOT2 – and across our portfolio of activities is greatly appreciated* - Dr Chris Carlin, Consultant Respiratory Physician and NRS Senior Investigator, NHS GGC

Integrated Direct to Patient (ID2P) Medicine Delivery

Next Generation Supply Chains to improve efficiency and effectiveness, integrating patients and carers as partners in care.



Collaborators: Roche, Wolfcam Limited, University of Strathclyde, University of Cambridge

Background: In 2021, DHI established its initial relationship with Roche, one of the world’s largest biotech companies, and collaborated with them to explore a next generation pharmaceutical supply chain model to support the safe and effective delivery of medicine directly to the patient.

Summary: Over 2021-23, DHI utilised a combined skillset to analyse the ID2P approach being progressed by Roche. An initial collaboration phase explored the design of a user-centred ‘first and last mile’ supply chain. This highlighted challenges and opportunities, and developed a preferred future state for a digitally enabled supply chain model that would maximise safety and effectiveness. Crucially, the project placed an emphasis on the important role of the patient and their care network in service delivery. DHI delivered recommendations, through three co-design workshops, bringing together expertise and capabilities from supply chain experts, universities, cross-DHI and applying DHI Exchange methodology to create maps to demonstrate a viable, standalone, asynchronous remote monitoring model, and evaluated the scalability of the proposed solutions. The team identified the requirements for empowering a patient and their Circle of Care as integrated partners in the delivery of the clinical service. This included the provision of digital tools, personalised information, and access to advice through multiple channels. The project also identified how digital technologies could be used to capture supply chain ‘demand’ triggers e.g. consumption.

A second stage of the project delivered a quantitative assessment of costed opportunities to deliver D2P services using the UK as a model market, utilising multi-criteria and multi-stakeholder analysis to evaluate options.

Impact: This work has informed patient-centred delivery models which integrate the individual and their carer as partners in the delivery of care. DHI has utilised insights from this project to collaborate with Precision Medicine Innovation Centre to develop a digital service within the pharmaceutical landscape which focuses initially on CAR-T therapy for specific cancer patients. This is anticipated to act as a test case to expedite and increase the number of data driven clinical trials in Scotland, supporting dialogue between payors for late-stage clinical trials, such as NHS, Scottish Government, and commercial companies. It is anticipated that this project will commence and deliver in 2023.

Testimonial: *“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, Pharma Technical Services, F. Hoffmann-La Roche

The Scottish Capsule Programme (SCOTCAP)

Point of Care diagnostics for bowel cancer symptoms
Colon Capsule Endoscopy.



Collaborators: Multi-partnership collaboration of academia (University of Aberdeen, University of Strathclyde), NHS (NSS, Highland, Grampian, Western Isles), Commercial Companies (Corporate Health International, Medtronic), Scottish Government, and Highlands & Islands Enterprise (HIE)

Background: The capsule or “Pillcam” contains a digital camera which is swallowed and takes up to 400,000 images on its journey. These images are then remotely reviewed and analysed to deliver highly accurate information to clinicians to support diagnosis and inform treatment options. Established in 2016 with an initial £5m investment over 5 years, the SCOTCAP cross-sector partnership has rigorously tested and evaluated an Innovative Service Model within NHS Scotland using Colon Capsule Endoscopy (CCE) for early diagnostic testing for Bowel cancer symptoms.

Summary: The project began as a trial in Highland (‘Hi-Cap’ Horizon 3) with promising results, moving to iteration and evaluation, and expansion of the trial into Grampian and the Western Isles (‘SCOTCAP’ Horizon 2). DHI specified and procured academic evaluation, carried out robust service innovation and business innovation to develop a managed service model and an innovation partnership procurement approach. The evaluation identified that the innovative service model led to better care experiences for patients, reduced the need for travel for appointments and avoided invasive colonoscopy procedures whilst actively increasing scheduled care diagnostic capacity within NHS Scotland. Data from the evaluation was used to inform a business case for the adoption of CCE and transition to scale within NHS Scotland.

Impact: CCE is now part of NHS Scotland’s Remobilisation Plan for Endoscopy Services with over 4,000 patients benefiting (Nov 2022), across 9 Scottish HBs. SCOTCAP is recognised as an exemplar in accelerating innovation adoption and in creating Scotland’s first Innovation Partnership procurement contract and is informing an ‘innovation to scale’ pipeline for NHS as part of the Accelerated National Innovation to Adoption (ANIA) pathway. Due to this success, an international consortium led by Danish partners and including Scottish academic intuitions (UoS/GSA) has secured €1.2 million Horizon Europe Funding and inward investment for Scottish SMEs to develop Artificial Learning capacities for CCE reporting (Horizon 3). SCOTCAP led to the establishment of 10+ additional jobs for Scottish based SME Corporate Health International in the North of Scotland, and in addition, Medtronic Global has opened new business and innovation opportunities in the other UK nations to progress CCE based on this pioneering work.

Testimonial: *“We can make [the colon capsule] so accessible; I really believe that we can change the instance of bowel cancer in Scotland.”* - Angus Watson, Consultant General and Colorectal Surgeon & Director of Research Development & Innovation, NHS Highland

Polypharmacy Decision Support App

Reducing waste and harm associated with medicines through Scotland's Right Decision Service.



Collaborators: Scottish Government Effective Prescribing and Therapeutics Division, Digital Health & Care Division, Right Decision Service multi-partner Programme Board, Tactuum

Background: The health system currently generates a lot of waste, much of which can be avoided. The use of medicines and chemicals accounts for 20% of the carbon footprint of NHS England, however up to 50% of medicines are either not taken correctly or not taken at all. Scotland is championing a value-based approach to reduce waste and harm associated with medicines and reduce the impact of the NHS on the environment <https://www.gov.scot/publications/delivering-value-based-health-care-vision-scotland/> The Scottish Government's Effective Prescribing and Therapeutics Division is working with DHI to implement consistent national quality prescribing guidance through decision support tools provided by DHI's Right Decision Service (RDS). This has delivered a national web and mobile app for managing medicines with prescribing alerts embedded into NHS health record systems. The expansion of these tools will include sustainable prescribing and reducing waste guidance.

Summary: Prescribing of inhalers is a major source of CO₂ emissions. In 2020/21 it was estimated that NHS Scotland emissions due to inhaler propellant was the equivalent of 79,000 tonnes of carbon dioxide (CO₂). A target of 70% reduction in CO₂ emissions from inhalers by 2028 has been set, as NHS Scotland works towards its commitment of net zero emissions by 2040. The new national respiratory prescribing guidance being delivered through RDS will play a key role in delivering this target. The associated prescribing tools include a decision aid to guide switching from propellant-based to dry powder inhalers. This suite of prescribing tools also highlights a range of recommendations to clinicians around environmental considerations in respiratory prescribing e.g., promotion of patient reviews, streamlining devices, and automated alerts to promote environmental messages.

Impact: The polypharmacy guidance (managing multiple medicines) being delivered through the Right Decision Service aims to reduce over-ordering and improve safe disposal of medicines. This includes reducing use of packaging, supporting recycling and safe disposal procedures, and raising public awareness of waste in relation to patient ordering of medicines and safe medicines disposal. The Right Decision Service will deliver Scotland-wide access at point of care to national guidance that will reduce the environmental impact of prescribing, reduce medicines-related waste and associated costs.

Testimonial: *"A fantastic addition to safe prescribing."* - GP, NHS Tayside

DigiInventors Challenge

Developing entrepreneurial and digital skills in schools to deliver a talent pipeline for careers in digital health and care.



Collaborators: Glasgow Warriors, City of Glasgow College, Scottish Tech Army, dressCode, Raising Aspirations in Science Education (RAiSE), Heriot Watt University, Glasgow City College (and formerly including Andy Murray OBE as a digital champion).

Background: The DigiInventors Annual Challenge was launched by DHI in 2017, and has successfully expanded to engage more schools, more partners and on an international basis. The challenge seeks to inspire and empower young people to develop entrepreneurial and digital skills, while raising awareness of career opportunities in digital health and care. Young people in secondary and primary schools form teams to generate ideas for digital solutions which could solve daily health and care challenges. Shortlisted teams take part in a two-day bootcamp, where they further develop their idea and participate in pitching sessions to a panel of judges before attending a formal prize giving ceremony as part of Scotland's digital health and care events schedule.

Summary: In 2021, Scottish Development International (SDI) invited DigiInventors to be part of Scotland's Contribution to Expo 2020 in Dubai. DHI partnered with Heriot Watt University's Dubai campus to deliver parallel challenges in Scotland and Dubai – this was the biggest competition to date with 150 applications from 600 students. In 2022, DigiInventors was delivered across the seven independent states of the UAE, and following expressions of interest from many other countries, a strategy is now developing to expand the Challenge further internationally. In 2023, DigiInventors partnered with Raising Aspirations in Science Education (RAiSE) and the City of Glasgow College to develop a Primary School Edition of the Challenge targeted at P5, P6 and P7. A range of primary school resources was produced, which met core curricular teaching standards, and equipped teachers with the tools to deliver several weeks of lessons preparing pupils in entrepreneurial and digital skills.

Impact: The #DigiInventors Challenge is now a fundamental part of the DHI Future Skills programme and is becoming embedded into Primary and Secondary classroom teaching in Scotland. It also aims to tackle gender imbalances in subjects including STEM, re-enforce digital skills in school curricula, and create a pathway into careers in digital health and care whilst raising Scotland's entrepreneurial reputation on the international stage.

Testimonial: *“Our partnership (with DHI) is focussed on educating our health and social care delivery teams on new developments impacting the digitisation of the sector. We're also identifying ways to create agility in our curriculum offer and developing vocational pathways into employment. This year saw our first involvement in the DigiInventors Challenge, and we're looking forward to seeing how our relationship develops, as our partnership deepens.”* -Stuart McDowall, Head of Innovation & STEM, Glasgow City College

Global Health Innovation Summit

Enhancing Scotland's International Reputation through Knowledge Exchange



Collaborators: In partnership with Kaiser Permanente and contributions from The Gates Foundation, Singapore, Commonwealth Digital Health, Ireland, Middle East, WHO and Australia

Background: DHI established a Global Health Innovation Summit Programme in which it collaborates with key international influencers such as World Health Organisation, Kaiser Permanente and the Gates Foundation.

Summary: This is an exclusive network of thought leaders, with a shared aim of knowledge exchange expanding the boundaries of digital innovation and sharing knowledge across borders. Engagement with experts from the USA is particularly important for Scotland (post Brexit), as it has a progressive market environment for the promotion of digital health innovation.

Impact: This collaboration has enabled DHI to share and discover exciting innovation opportunities e.g. AI in system developments, visual interfaces using avatars and gamification to support mental health for young people, and new hospital at home models that create new research and market opportunities, signalled by global demand.

Testimonial: *“DHI is an important strategic partner for Kaiser Permanente. Together our organisations have pulled together thought leaders from across the world to exchange knowledge on some of key topics and trends impacting healthcare today. Leveraging DHI’s existing relationships with influential healthcare organizations provides a forum to make meaningful contributions to shape the future of healthcare.”*

-Dr Funahashi, Chief Innovation Officer, Kaiser Permanente Southern California

Appendix 4: Key Stakeholders

To inform the DHI’s strategic priorities for this next period, its Board and Senior Leadership Team have reviewed its key stakeholders and recognises that there are different levels of interest and influence in supporting its objectives and ambitions, using the ‘Power/Interest Matrix’ approach (as per Figure 1) key stakeholders have been categorised as follows;

- High interest and High influence: these stakeholders are decision makers and have the biggest impact on DHI. DHI meets regularly on a one-to-one basis with these stakeholders to ensure alignment and contribution (Board representation, MoU and strategic partnership agreements and core joint projects developed) e.g., Scottish Funding Council (&KEI Advisory Board), Scottish Government, University of Strathclyde, Glasgow School of Art, NES.
- Low Interest and High influence: these stakeholders are kept in the loop with what is happening in DHI. Even though they may not be directly interested in the outcome, they yield influence (Regular meetings and participation in steering/working groups as appropriate) e.g., The Digital Office, CfSD, SHIP, NCS, PHS, ILG, IDA, Universities Scotland networks, HE/FE etc.
- High interest and Low influence: DHI works with these stakeholders to ensure they are informed and communicated with to ensure potential opportunities highlighted and major issues addressed (regular meetings, board participation and joint project activity as required) including commissioners of additionally funded projects e.g., UKG, Macmillan, Roche etc. SE/HIE/SOSE, NHS Boards, Local authorities, Innovate UK, Research councils, SDS, etc.
- Low interest and Low influence: DHI monitors these groups of stakeholders, and generally engages on a one-to-many basis, using its communication channels (newsletters, ecosystem membership, cluster events and KE activity) e.g., SG Digital and Economic directive.

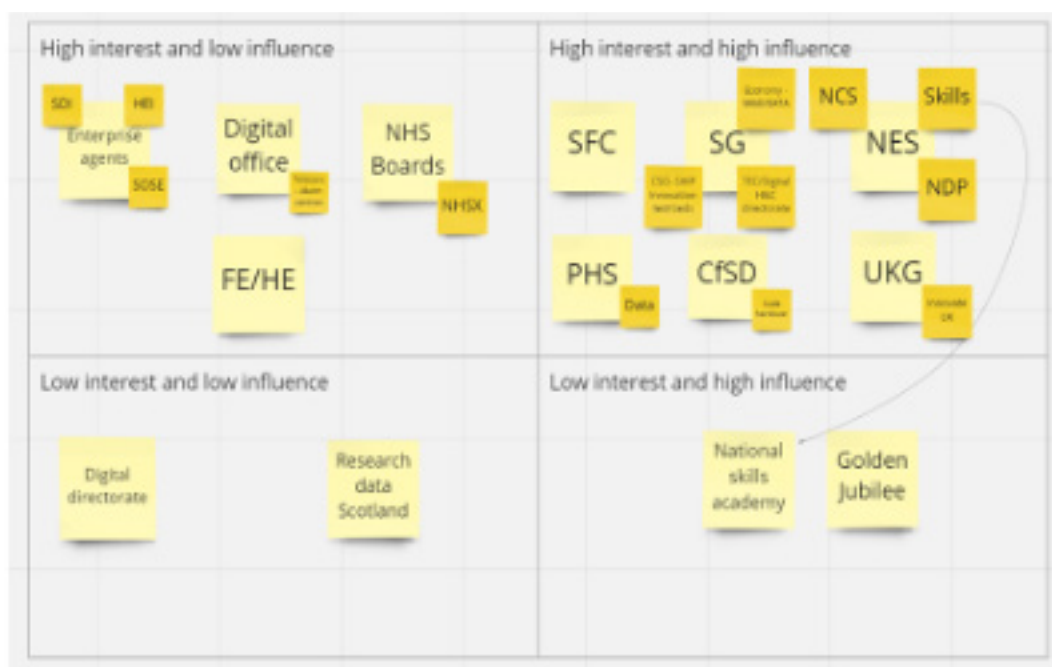


Figure 1: DHI Power/Influence Matrix (Nov 2022)

There are also high value strategic partnerships, where DHI aims to leverage optimal collaborative advantage by working with other organisations on both an individual and collective basis. There is a significant opportunity for synergies across multilateral (as well as bilateral) relationships to ensure strategic coherence and accelerated impact.

In addition to the key stakeholders represented in the matrix above, DHI has many relationships with a variety of organisations, these engagements are illustrated in the following diagram (Figure 2 – stakeholder map) with the larger circles representing more intense relationships and the smaller circles demonstrating less intensity. These relationships may shift and flex over time



Figure 2: Stakeholder map

Appendix 5: DHI Strategic Delivery and Outcome plan

High Level Delivery Activities and Outcome measures - 2024 to 2033 aligned to DHI Priority Action Areas (PAA)

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
PAA1 – H&CT	<p>Onboard a balanced innovation portfolio of over 50 projects that deliver at least 10 innovations for scaling to transfer to appropriate implementation partners, focusing on the identified system PULL priorities and supporting integrated and person-centred care.</p> <p>Provide Strategic/Programme Leadership for 3 SG large Digital Programmes including Diabetes Innovation Programme and the Digital Lifelines Programme.</p> <p>Establish formal strategic partnerships with key stakeholders to enable effective identification, assessment, and transfer of innovations for adoption and scale e.g., CfSD; Digital Office for Local Government, Chief Scientists Office/SHIP for Challenge Call.</p> <p>Develop the DHI Innovation Process Model to accelerate and deepen support for the pipeline of innovation. This will include developing a virtual resource bank of tools, methodologies and skills that support partners and build more cross-sectoral capacity and capability in the system, supported by robust market research reports</p> <p>Use cutting edge design innovation to build and expand the Scottish Approach to Service Design and develop stronger partnership working e.g. with CivTech, InnoScot Health to increase commercial innovation to address demand challenges.</p> <p>Leverage additional inward investment to support the identification, expansion and real-world evaluation of digital solutions identified in System PULL priority areas.</p> <p>Implement five Living Labs as per Moray RCE to reflect the specific rural and remote dimension associated with the System PULL priorities and work with other partners that have an interest in R&I for rural communities (e.g., Public Health Scotland, NES, Scotland’s Rural College).</p>	<ul style="list-style-type: none"> • 18 projects (6 pa) • 1-2 projects handed over for scale • Leverage additional investment for academic evaluations £200k (£65k pa) and market research commissions 	<ul style="list-style-type: none"> • 18 projects (6 pa) • 2-3 projects handed over for scale • Leverage additional investment for academic evaluations £300k (£100k pa) and market research commissions 	<ul style="list-style-type: none"> • 18 projects (6 pa) • 4-5 projects handed over for scale • Leverage additional investment for academic evaluations £500k (£165k pa) and market research commissions 	<ul style="list-style-type: none"> • By 2033 – 80 projects delivered made up of 54 portfolio projects and 30 simulation projects • By 2033 - Min 10 projects handed over for scale • By 2033 – Additional investment for academic evaluations is leveraged = £865K • Min 100 Digital H&C related research reports commissioned with 20% having a positive policy impact

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
<p>PAA2 – D&D</p>	<p>Influencing and support National Programmes e.g., Digital Front Door, National Digital Platform, Digital Identity.</p> <p>Horizon scan to explore new data sharing platforms, methods, and capabilities. Influence international strategies on data sharing and management, participating in key strategic think tanks to promote KE.</p> <p>Promote DHI and Scotland on a global stage, helping to commercialise/scale DHI Exchange services/companies. Establish Scottish network of self-sustaining DSE and partnering countries by 2033.</p> <p>Support citizens in understanding/managing personal data -related interactions with intuitive interfaces.</p> <p>Enhance procurement methods by developing and iterating a procurement framework approach that support R&I and contributes to Net Zero targets.</p> <p>Engage with the Care Homes Data Review and explore setup / access to social care system sandbox environments to support the development of the proposed National Care Service. Develop an integrated care / shared care record programme that simulates person-centred data sharing in health, social work, social care, third sector, housing etc..</p> <p>Further develop and transition DHI Health Data Exchange into national agency procurement/NHS Board or replacement with DHI as junior partner by 2026.</p> <p>Influence curriculum at FE/HE level to ensure future workforces understand the practical use of digital and data to be used more productively/create sustainable service.</p> <p>Embed further emerging technology capability into the DHI, e.g., bringing expertise and research capability into the design team to focus on the interface between science, technology and the arts by exploring imaginative and novel uses of 3D digital visualisation/interaction technologies.</p>	<ul style="list-style-type: none"> • 12 – over 3 years (4 pa.) multi-disciplinary simulation scoping events facilitated • 3 – over 3-years (1 pa) peer review publication (health and care) • 6 – over 3-years (2 pa) peer review publications pa (design research) • 2 White Papers • 900 participant DSE demos over 3-years (300 pa) • 18 over 3-years (6 pa) Rapid design reports • Adoption and demonstration of one novel procurement method over 3 years • 6 use cases over 3-years (2pa) integrating with NDP • 3 over 3-years (1pa) projects that integrates with social care systems • 3 over 3-years national integrated care programmes/policy impacts • 3 over 3-years (1 pa) Demonstrated application of templates and standardised processes 	<ul style="list-style-type: none"> • 12 – over 3 years (4 pa.) multi-disciplinary simulation scoping events facilitated • 3 – over 3-years (1 pa) peer review publication (health and care) • 6 – over 3-years (2 pa) peer review publications pa (design research) • 2 White Papers • 1200 participant DSE demos over 3-years (400 pa) • 18 over 3-years (6 pa) Rapid design reports • Adoption and demonstration of one novel procurement method over 3 years • 6 use cases over 3-years (2pa) that integrates with NDP • 3 over 3-years (1pa) projects that integrates with social care systems • 3 over 3-years national integrated care programmes/policy impacts • 3 over 3-years (1 pa) Demonstrated application of templates and standardised processes 	<ul style="list-style-type: none"> • 12 – over 3 years (4 pa.) multi-disciplinary simulation scoping events facilitated • 3 – over 3-years (1 pa) peer review publication (health and care) • 6 – over 3-years (2 pa) peer review publications pa (design research) • 2 White Papers • 1500 participant demos over 3-years (500 pa) • 18 over 3-years (6 pa) Rapid design reports • Adoption and demonstration of one novel procurement method over 3 years • 6 uses cases over 3-years (2pa) that integrates with NDP • 3 over 3-years (1pa) projects that integrates with social care systems • 3 over 3-years national integrated care programmes/ policy impacts • 3 over 3-years (1 pa) Demonstrated application of templates and standardised processes 	<ul style="list-style-type: none"> • By 2033 - 36– multi-disciplinary simulation scoping events hosted / facilitated • By 2033 -27 peer reviewed publications 9– (health and care), 18 peer reviewed (design research) • By 2033 - 6 White Papers • By 2033 - 3600 DSE participant demos • By 2033 – 54 Rapid design reports • By 2033 – utilisation of 3 novel procurement methods • By 2033 – Deliver 18 use cases that integrates with NDP • By 2033 – 9 projects that integrates with social care systems • By 2033 - 9 national integrated care programmes and policy impacts evidenced • By 2033 - 9 Demonstrated applications of templates & standard processes deployed with best global practise evidenced

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
<p>PAA3 – ICE</p>	<p>Focus interconnected cluster and ecosystem capabilities on key system priorities to increase collaborative impact and leverage resource to support transformation. Learn from and apply national and international experience on cluster management.</p> <p>Establish robust methodology to measure and evidence value generated through clusters. Strengthen connections with FE/HE to leverage more research, support collaborations - build key expertise areas.</p> <p>Support expansion of innovation and adoption at scale by attracting greater inward investment, support SDI interest.</p> <p>Establish an innovation cluster blueprint to inform strategy, co-ordinate activity, expand connectivity and implement robust KE methodologies.</p> <p>Expand cluster model to other key demand challenge areas e.g., diabetes, skills, and future workforce.</p> <p>Identify and participate in cluster accreditation to improve quality, seeking formal accreditation by July 2026.</p> <p>Develop cluster infrastructure and communication methods to deepen meaningful and targeted engagement services (e.g., matchmaking, introductions, joint calls) and expand membership to an additional +1,500 individuals by July 2033 on top of the position as at end of phase 2.</p>	<ul style="list-style-type: none"> + 300 new members 12 DHI led events- over 3-years (4 pa) 24 partnered events - over 3-years (8 pa) – (4 pa per cluster) 12 non DHI events - over 3-years (4 pa) No set target. 36 meaningful intros – over 3 years (12 pa) <p>6 challenge competitions over a 3-year period</p>	<ul style="list-style-type: none"> + 500 new members 12 DHI led events- over 3-years (4 pa) 24 partnered events - over 3-years (8 pa) – (4 pa per cluster) 12 non DHI events - over 3-years (4 pa) No set target. 36 meaningful intros – over 3 years (12 pa) 9 challenge competitions over a 3-year period 	<ul style="list-style-type: none"> + 700 new members 36 DHI led events- over 3-years (4 pa) 24 partnered events - over 3-years (8 pa) – (4 pa per cluster) 36 non DHI events - over 3-years (4 pa) No set target. 36 meaningful intros – over 3 years (12 pa) 12 challenge comps over a 3-year period 30 meaningful introductions 	<ul style="list-style-type: none"> By 2033 - +1500 active members in the DHI ecosystem By 2033 DHI will deliver min of 500 events (made up of DHI led events, partnered events and non DHI) and over 100 meaningful introductions initiated. 27 demand led challenge competition calls delivered.

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
<p>PAA4 – Green Recovery</p>	<p>Support the concept of the 20-minute neighbourhood with Moray RCE and SOSE, enabling people to live more independent lives while reducing the need to travel long distances to receive health and social care services. This could also involve smart home technologies and wider diet and nutrition market opportunities to support prevention and early intervention.</p> <p>Develop key Net Zero principles and build these into DHI processes and procedures to influence supply, travel, procurement, and supply chain management.</p> <p>Promote Master student opportunities and provide academic grant awards which identify and recommend the contribution digital health and care can make to net zero targets.</p> <p>Join the ECHA Global Health Connector Partnership to share best practice, create knowledge and undertake joint international actions and collaboration projects. Create frameworks and evidence paths to feedback on DHI contributions to Net Zero targets.</p> <p>Utilise international networks to identify and inform the contribution of digital health and care to the wider UN Sustainable Goals and align the digital health and care sector with policy ambitions for achieving Net Zero.</p>	<ul style="list-style-type: none"> • Scope best practise Net Zero frameworks in relation to the DHI sector creating a framework and agreed metrics. • Embed the metrics in portfolio delivery. • Create links and stimulate academic grants to review how best DHI can create Net Zero opportunities to help meet the Green recovery agenda • Review and track DHI operations and reflect organisational policy to reflect Net Zero ambitions. 	<ul style="list-style-type: none"> • Consolidate and evolve the Net Zero frameworks in relation to the DHI sector creating a framework and agreed metrics. • Review the metrics in portfolio delivery. • Create links and stimulate academic grants to review how best DHI can create Net Zero opportunities to help meet the Green recovery agenda • Review and track DHI operations and reflect organisational policy to reflect Net Zero ambitions. 	<ul style="list-style-type: none"> • Consolidate and evolve Scope best practise Net Zero frameworks in relation to the DHI sector creating a framework and agreed metrics. • Review the metrics in portfolio delivery. • Create links and stimulate academic grants to review how best DHI can create Net Zero opportunities to help meet the Green recovery agenda • Review and track DHI operations and reflect organisational policy to reflect Net Zero ambitions. 	<ul style="list-style-type: none"> • DHI will make a positive contribution towards the overall funders Net Zero targets with clear metrics agreed as the programme develops. • DHI will ensure that operations and projects embed Net Zero best practise

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
<p>PAA5 – International</p>	<p>Consolidate international strategic partnerships, networks and thought leadership to increase focused KE partnerships between institutions.</p> <p>Develop joint propositions to attract funding from outside Scotland and enter new emergent trade bridges.</p> <p>Collaborate with DIT and SDI to engage in new international markets and build a solid pipeline of partnerships for the transfer of knowledge, assets and skills across geographic and cultural boundaries.</p> <p>Further develop the Global Digital Health Innovation Summit in partnership with Kaiser Permanente and Gates Foundation to identify specific R&I collaboration opportunities as per key priority areas.</p> <p>Create opportunities with new trade partners to extend out links to USA, India, Middle East, Asia and the Global south.</p> <p>Develop relationships where ‘R&I Twins’ can be activated to deliver enhanced transferability across nations.</p> <p>Create support to attract inward investment in relation to KE on navigating and entering the UK marketplace.</p>	<ul style="list-style-type: none"> • 12 international events - over 3-years (4 pa) • 5 inward investments supported (with SDI) • 3 International joint (1pa) projects initiated. • Support international trade missions and international field trips from new emergent markets 	<ul style="list-style-type: none"> • 12 international events - over 3-years (4 pa) • 7 inward investments supported (with SDI) • 3 International joint (1pa) projects initiated. • Support international trade missions and international field trips from new emergent markets 	<ul style="list-style-type: none"> • 12 international events - over 3-years (4 pa) • 10 inward investments supported (with SDI) • 3 International joint (1pa) projects initiated. • Support international trade missions and international field trips from new emergent markets 	<ul style="list-style-type: none"> • 36 International events to raise exposure, KE and attract investment • 22 Inward investment deals supported. • Min 9 International projects initiated, leveraging international R&D funds – attracting at least £5m into Scotland • Supporting a range of sector specific trade mission and field trips to encourage the transferability of DHI innovation*.

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
<p>PAA6 – Economic Dev</p>	<p>Embed service and commercial readiness training for Scottish company development programmes delivered by Scottish universities and colleges in partnership with Enterprise agencies and DHI.</p> <p>Promote inward investment through international engagement activities and collaboration with SDI and DBT</p> <p>Align technology ‘PUSH’ opportunities from the company base with health and social care challenge ‘pull’ priorities & demands exposed.</p> <p>Develop “learn and share” assets and interventions specifically for commercial audiences, drawing on insights and collaborations with academia, health and social care providers.</p> <p>Identify and support specific collaboration opportunities identified through the Innovation Clusters to secure increased R&I funding.</p> <p>Utilise Moray RCE as a microenvironment to inform and refine increased commercial growth activities, accelerating the process from R&I to commercialisation.</p> <p>Implement stronger links and processes with partner agencies such as the Scottish National Investment Bank to support and develop route to commercialisation for regional and business innovations.</p> <p>*denotes stretch targets dependent on (a) growth of sector and (b) DHI resource</p>	<ul style="list-style-type: none"> +100 companies signed up to DHI Cluster, of which: 200 accessing light touch support (opening newsletter, funding alerts) - 100 (Scottish) accessing 1:many support (events attendance; interaction “learn & share” assets)- 30 (Scottish) supported to increase SRL, CRL and/or TRL - 50 are outside Scotland (o/S) - 20 are receiving in depth support (Co-dev, DHI Exchange), of these: - 4 are on commercial terms 8 funded collaborative projects generated. 18 1:many activities delivered (events and “learn & share” assets) 6 Business related factsheets developed and seminar sessions if required £1M Leveraged additional funds - £200k (commercial terms funding of 4 projects @£50k/project) -£800k (8 collab projects with external funding @ £100k/project) 	<ul style="list-style-type: none"> +200 companies signed up to DHI Cluster, of which: 200-300* accessing light touch support - 120-170* (Scottish) accessing 1:many support - 40-60* (Scottish) supported to increase SRL, CRL and/or TRL - 60-100* are outside Scotland (o/S) - 24-34* are receiving in depth, of these: - 12 are on commercial terms - 12-17* funded collaborative projects generated 18-24* 1:many activities delivered (mix events and “learn & share” assets) 6 Business related factsheets developed- seminar sessions if req’d Forecasts for economic impacts to be generated after processes/ capabilities generated during Horizon 1; 120 jobs created or safeguarded; £10M increased t/o and/ or investment £1.8M Leveraged additional funds - £600k (commercial terms funding of 12 projects @£50k/project) - £1.2M (12 collab projects with external funding @ £100k/project) 	<ul style="list-style-type: none"> +400* companies signed up to DHI Cluster, of which: 300* accessing light touch support - 100-300* (Scottish) accessing 1:many support - 60-100* (Scottish) supported to increase SRL, CRL and/ or TRL - 100-200* are outside Scotland (o/S) - 36-60* receiving in depth: 20 on commercial terms 18-30* funded collaborative projects generated 24-30* 1:many activities delivered events and “learn & share” assets) 6 Business related factsheets developed seminar sessions req’d Forecasts for economic impacts to be generated after processes/ capabilities generated during Horizon 1.: 240 jobs created or safeguarded; £20M increased t/o and/ or investment £2.8M Leveraged additional funds - £1M (commercial terms funding of 20 projects @£50k/project) - £1.8M (18 collab projects with external funding @ £100k/project) 	<ul style="list-style-type: none"> By 2033 +700 companies signed up* to ecosystem By 2033 - *360 jobs created or safeguarded; and £30M increased t/o and/or investment leveraged. *£5.6M additional funds leveraged from business commissions and joint bid opportunities. Deliver an evolving range of economic development related content in partnership with economic agencies eg., factsheets, tools and seminars -to assist commercial maturity& readiness in entering this sector with focussed KE, matchmaking and awareness ranging activity to promote growth

Priority Action Areas	Specific activities	2024-2027 targets	2027- 2030 targets	2030 – 2033 targets	Outcomes by 2033
<p>PAA7 – Skills</p>	<p>Establish and facilitate a Skills and Future Workforce Special Interest Group.</p> <p>Deliver annual DHI Programme of Postgraduate education (Masters, MRes, PhDs) and Graduate Innovation Internships.</p> <p>Extend the Clinical Innovation and Clinical Entrepreneurial Fellowships.</p> <p>Establish a Social Care Entrepreneurship Programme to support early-stage innovation and increase the representation of women and other under-represented groups in entrepreneurial endeavour.</p> <p>Attract commissions for Academic Grants and grant awards for the development, co-design and delivery of educator CPD courses and materials, to support the development of new education pathways and courses.</p> <p>Continue to influence curricula in health, social work, social care, medicine in HE & FE.</p> <p>Secure research funding for skills related R&I challenge calls building from the Moray RCE activity and create micro-credentials where applicable to be utilised across Scotland.</p> <p>Establish formal International Skills Collaborations for KE and dissemination.</p> <p>Support innovation implementation, through co-designing tools and approaches, upskilling and building innovation and change capability.</p> <p>Expand DigilInventors in Primary & Secondary Schools Locally and internationally to activate a long-term talent pipeline.</p> <p>*denotes stretch targets dependent on (a) growth of sector and (b) DHI resource</p>	<ul style="list-style-type: none"> In collaboration with SDS develop a sponsored skills survey on education paths - FE/HE +1 CPD/careers events Strengthen consortium to review NOS Engage 30% FE/HE to review curriculum incl digital content areas e.g., AI etc... Establish skills SIG 6 events over 3 yrs (2pa) Education pathway - work with NES in FE/HE to review curriculum in connection with skills shortage – min 5 new education pathways dev Expand DigilInventors – Primary and Secondary 20 FTE PG in Digital Health and care KE&I opportunities to identify best practice in education opportunities support talent pipeline Up to 30 NHS CEP candidates funded in collaboration with Scottish Enterprise Up to 30 SHIP Innovation Fellows supported 5 SCIF + SCEP (each) candidates supported as part of a pilot to develop the programme Support career diversification – career changers e.g, MOD, Fintech etc. 4 Micro credentials delivered online to upskill adult social care staff through college network Support the development short online courses to complement online existing courses (MGD RCE, KIND) with e.g., Alliance - Offering a health literacy course to public, students & library staff 	<ul style="list-style-type: none"> In collaboration with SDS develop a sponsored skills survey on education paths - FE/HE +1 CPD/careers events Expand consortium to review NOS Expand to +40% FE/ HE to review curriculum incl content areas e.g., AI Expand skills SIG 6 events over 3 yrs (2 pa) Education pathway - work with NES in FE/HE to review curriculum in connection with skills shortage – min 5 new education pathways dev 20 FTE and extend funding options for PG in Digital H&C Expand DigilInventors – Primary and Secondary KE&I opportunities to identify best practice in education opportunities to support talent pipeline Up to 45 NHS CEP candidates funded in collaboration with SE Up to 45 SHIP Innovation Fellows supported p/a 10 SCIF + SCEP (each) candidates supported, programme established in Scotland. Support career awareness – career changers e.g, MOD, Fintech etc. 4 Micro credentials delivered online to upskill adult social care staff through college network Support developments of short online courses to complement online existing courses (MGD RCE, KIND) in partnership e.g.- Alliance. Health literacy course to public, students & library staff 	<ul style="list-style-type: none"> 1 skills survey for educators - FE/HE 1 CPD event Min 4 DHI attendance at career event Extend consortium to further review NOS Expand to +30% FE to review curriculum. Extend to 100% HE to embed Decision support e.g., AI etc... Extend skills SIG 6 events over 3 yrs (2 pa) Sponsored skills survey Education pathway work with NES/HE review curriculum – min 10 new education pathways dev Expand DigilInventors – Primary and Secondary 20 FTE and extend funding options for PG in Health and Social care KE&I opportunities to identify best education talent pipeline options Up to 60 NHS CEP candidates funded in collaboration with Scottish Enterprise Up to 60 SHIP Innovation Fellows 20 SCIF + SCEP (each) candidates supported, exploring expansion beyond Scotland. Support career awareness – career changers e.g., MOD, Fintech etc. 4 Micro credentials delivered online to upskill adult social care staff through college network Develop short online courses to complement online existing courses (MGD RCE) in partnership e.g. Alliance <p>Offering a health literacy course to public, students & library staff</p>	<ul style="list-style-type: none"> Education curriculum to deliver the right skills and talent inc; schools – DigilInventors work By 2033 Establish and build a Skills Special Interest Group + 250 members - covering all FE/HE educators represented. By 2033 deliver 20 New education pathways By 2033 deliver new talent to the pipeline* successful graduation of - 60 FTE Post Graduate (PG) in Digital H&C related subjects- 135 Clinical Entrepreneurs fellows – supported by SE funds- 135 Clinical Innovation Fellowships graduated – supported by SHIP - 35 Social Care Innovation and Entrepreneurial Fellowships. By 2033 deliver - 12 Micro credentials through college partnerships. By 2033 support a range of partnership CPD/MOOCs – online courses for citizens and educators – train the trainer format.

Appendix 6 - DHI Project and Risk Management Approach

Project management

A key component of DHI operational governance sits with the Project Management Office (PMO) which has four key functions.

- Ensuring a balanced portfolio of projects – to ensure that the range of projects support the strategic aims of the organisation and the required KPI’s and outcomes agreed with funders. The portfolio is influenced by the Priority Action Areas and the three-horizon concept which reflect readiness maturity levels. This approach ensures DHI maintains some innovations ready for handover, along with investing in emerging ideas and innovations.
- Project Delivery: To oversee the high quality and timely delivery and governance of the portfolio of projects and initiatives.
- Measuring impact of DHI activities: To measure and evidence the impact of DHI activity, in line with the strategic objectives and priorities outlined in the Strategy and Delivery Plan
- Quality Governance including a risks and issues process for the organisation: Facilitating governance process for risks and issues management at project, operational and corporate level and includes a lesson learned log.

Project performance is reported on monthly basis on a project dashboard to the Programme Manager with exception reporting provided to the SMT Monthly Meeting and the DHI Board on a quarterly basis within the Planning & Performance Standing Report.

Risk Management

The DHI Risk Management approach runs at multiple levels - corporate, operational and project. Risks are consistently categorised as below, being scored before and after mitigation.

Risk Categories	
1	Strategic / Commercial
2	Economic / Financial / Market
3	Legal & Regulatory
4	Organisational / management / human factors
5	Political
6	Environmental
7	Technical / operational / infrastructure

Scoring of risks before mitigation		Probability				
		Rare	Unlikely	Possible	Likely	Almost Certain
Impact		1	2	3	4	5
5	Catastrophic	5	10	15	20	25
4	Major	4	8	12	16	20
3	Moderate	3	6	9	12	15
2	Minor	2	4	6	8	10
1	Negligible	1	2	3	4	5

Escalation requires a score of 12 (amber) and above after mitigation, using an agreed scoring mechanism and are escalated monthly to the Director of Planning and Performance, SMT and the DHI Board on a regular basis. In addition, 6 monthly updates are formally provided to the University of Strathclyde. SMT Training has been provided on Risk and Issue Management. Where urgent risks or issues need earlier action, they are raised directly with the Chief Executive and the Chair (for corporate); the SMT or with the Director of Planning and Performance (for operational).

Specific to this strategy a number of risks (and their appropriate mitigation) have been identified.

Risk categories	DHI Strategy - Risk Description	Mitigation
Finance risks	There is a risk that DHI is unable to secure Scottish Government and economic development estimated contributions due to the challenging fiscal environment.	DHI will discuss with SG sponsoring division and enterprise companies where input can add most value. This is anticipated to include more projects that are higher up the readiness levels to realise short-medium term impacts.
	There is a risk there is insufficient financial flexibility to provide appropriate remuneration for skilled and experienced staff, support career progression or necessary changes to the staff complement resulting in issues with recruitment and retention.	SFC and Scottish Government to be asked to confirm plans for inflationary uplifts to any core budget. Additional funding sources to be identified to compensate for shortfalls in the core budget.
	There is a risk that the current volatility in inflation and salary uncertainties will make it difficult to accurately predict the DHI 10 Year investment case, resulting in potential shortfall.	The investment case is being set out on an initial 1-year basis only to reduce compounding inaccurate assumptions over a longer period. Inflation estimates have been provided by host University of Strathclyde to ensure alignment.
	There is a risk that it may be more difficult to attract additional funding at anticipated rates due to the UK withdrawal from EU, a general economic downturn and increased pressure on public sector budgets.	DHI will strengthen international networks (including new trade partners, e.g., India, Japan, USA) and new digital health and care market players e.g., Big Pharma, Data, Philanthropy and Wellness Orgs.
Technical risks	There is a risk that DHI is not able to keep ahead of R&I advancements or abreast of leading research and innovation potential in this field due to operational delivery pressures.	DHI will maintain a balanced portfolio across three horizons from early development to closer to market opportunities and remain well connected into the research strengths of leading actors in Scotland and internationally to support knowledge transfer.
	There is a risk that the repositioning of the future skills and education portfolio as a Priority Action Area will change the capability required within the organisation.	DHI will review the staff roles and responsibilities to effectively manage a transition over to more skill development capability, upskilling and re-skilling as required.
	There is a risk that partners have insufficient capacity and capability to embed digital innovations as they transition to adoption readiness.	DHI will continue to cement relationships with partners in the ANIA pathway, the Local Government Digital Office, NES, CfSD and others and others to secure implementation capacity for projects ready for scale
Human factors	There is a risk that DHI will be unable to retain experienced staff due to limited career progression opportunities and inadequate succession planning.	DHI continues to improve the working environment and hybrid culture to amplify its creative, interesting, and flexible working. The wellbeing benefits from contributing to civic good will also attract and retain employees. Succession planning is considered by the Board and Exec Team to support employees to extend career opportunities e.g., promotion roles within the wider system to help build extended system capacity and retain skills in the sector.