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A NEW CULTURE OF INNOVATION IN SCOTLAND -THE CASE FOR DIGITAL HEALTH & CARE INSTITUTE

AN EXAMPLE OF A NEW INNOVATION MODEL FOR THE DELIVERY OF DIGITAL HEALTH AND CARE IN SCOTLAND

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Scotland, United Kingdom

GENERAL INFORMATION

TITLE OF THE CASE
A new culture of innovation in Scotland -The case for Digital Health & Care Institute

SALES PITCH
An example of a new innovation model for the delivery of digital health and care in Scotland, joining co-design and patient-centred care though academic, business and citizen involvement.

ORGANISATION(S)
The Digital Health and Care Institute

COUNTRY / COUNTRIES
Scotland

DATE
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NATURE OF INTERACTION
☑ Collaboration in R&D
☐ Academic mobility
☐ Student mobility
☑ Commercialisation of R&D results in science
☐ Lifelong learning
☐ Curriculum development and delivery
☑ Entrepreneurship
☐ Governance
☑ Innovation

SUPPORTING MECHANISM
☑ Strategic instrument
☐ Structural instrument or approach
☑ Operational activity
☐ Framework condition

CASE STUDY PROFILE

1. SUMMARY

Following the spending review of 2011, the Scottish Government decided that all the public service organisations should have a role to play in growing the Scottish economy. To that effect, £124m were invested for setting up eight Innovation Centres in Scotland to create sustainable and internationally ambitious open-communities bringing together universities, academics, research institutes, businesses, health and care professionals and providers, third sector organisations and citizens, as well as the Scottish Government to deliver economic growth and other benefits for Scotland.

This good practice case drills into the Digital Health and Care Institute (DHI) set up by a consortium formed by the University of Edinburgh, Glasgow School of Arts and the NHS24. The remit of the DHI is to transform the way health and care is delivered within Scotland by constructively disrupting health and care provision through idea generation, innovating the right products and services and establishing a new digital health and care economy for Scotland. The DHI operations are based on a unique triple-helix innovation model, which consists of an Exploratory (helping to define an area of investigation or innovation), Laboratory (product design and development) and Factory (moving a known solution towards a marketable product). Since opening its doors in October 2013 the DHI has supported and facilitated nearly 90 research and development projects in different phases of maturity.

2. BACKGROUND

Following the spending review of 2011, the Scottish Government decided that all the public service organisations should have a role to play in growing the Scottish economy. To that effect, £124m were invested for setting up eight Innovation Centres in Scotland to create sustainable and internationally ambitious open-communities bringing together universities, academics, research institutes, businesses, health and care professionals and providers, third sector organisations and citizens, as well as the Scottish Government to deliver economic growth and other benefits for Scotland.

Each innovation centre supports businesses to understand the underlying specialist science and helps with the design and development of technology they require to deliver new products, processes and services to their customers. The Innovation centres' role is to help industry to deliver effective and transformational solutions in their respective areas.

Each one of the eight innovation centres addresses specific market and sub-sector opportunities.

‣ Digital Health & Care Institute is set to transform the way health and care is delivered within Scotland by constructively disrupting health and care provision through idea generation, innovating the right products and services and establishing a new digital health and care economy for Scotland.

‣ Censis produces innovative sensor and imaging solutions, and works to reduce risks, costs and time it takes for an industrial application to get into market.

‣ Construction Scotland Innovation Centre blends industry demand driven challenges with world-leading academic expertise to supercharge growth across

the construction sector in Scotland. Methodologies include a mixture of collaborative R&D, explorative new technologies and disruptive innovation.

‣ DataLab – working with Big Data, "Unlocking Value from Data".

‣ IBioIC produces bio-based solutions for the chemical, life science and energy industries. Industry-led.

‣ OGIC, the Oil and Gas Innovation Centre - provides access to innovation funding and academic expertise for the entire oil and gas supply chain.

‣ The Scottish Aquaculture Innovation Centre drives applied research to boost the long-term economic benefits of farmed fish, shellfish and aquatic plant life.

‣ Stratified Medicine Scotland – Innovation within precision medicine. Applying genomic medicine to the NHS and Pharma/bio clinical development in Scotland.

This case study focusses on the innovation model employed by the Digital Health & Care Institute (DHI). The DHI is funded by the Scottish Funding Council (SFC) and founded by NHS24, the University of Edinburgh and the Glasgow School of Arts in joint collaboration with a focus on innovation in delivery of health and social care.

Since opening its doors in October 2013 the DHI has supported and facilitated 87 projects. 20-30 of these are at the Exploratory phase, 20-30 at the Laboratory phase and 30 in Factory phase.

3. OBJECTIVES

‣ To support and facilitate innovation within the digital health and care market by leveraging Scottish academic, business and civic expertise;

‣ Transform how health and care is delivered to and received by citizens in Scotland, ensuring that the system is fit for purpose;

‣ To produce viable and affordable products and services for the Scottish and the international market;

‣ To establish Scotland as an exporter of digital health & care technologies;

‣ To contribute to growing the Scottish economy by producing new jobs and expanding the digital health and care market;

‣ The specific emphasis of DHI's work is to address areas where technologies can support, enhance and establish alternative forms of care away from primary or acute care services as appropriate to give the citizen a more healthy, active, agile and independent life.

4. RESPONSIBILITY

The Digital Health and Care Institute holds the responsibility for the actions and activities of the innovation centre, together with our project partners and the Scottish Government. Each of the DHI project partners has to nominate a lead agency amongst themselves, whose ultimate responsibility the management and running of the project will be, with guidance and support from the DHI.

IMPLEMENTATION & FUNDING

5. STRATEGY & ACTIVITIES UNDERTAKEN

DHI seeks to create academic, business and civic impact in all of its operations. In order to do this, the DHI requires all projects that are accepted as part of the DHI portfolio to have a partner from all three sectors, i.e. universities and research institutes, SMEs and businesses and the third and civic sectors, such as charities, carer organisations, healthcare professionals or the citizens themselves. Collaboration is key for innovation in all of these settings.

The DHI philosophy is to capture the innovation ideas at the earliest possible stage, and to support industry by any means available to develop these. For example, if a project proposal comes from a business partner, the DHI will help them find suitable academic and civic partners for their projects. The application process has two phases: first, the application goes through an evaluation panel, which assesses the project following specific criteria for suitability for the DHI. The suitable projects are given advice on how to improve their applications, if necessary. Once deemed ready, the proposals move onto the second phase of evaluation, the approval panel. The panel will decide which phase of the DHI's unique innovation model consisting of Exploratory, Laboratory and Factory -stages the project will initiate in.

Exploratory-setting helps innovators to measure their idea against the most current, diverse and relevant research, innovation and knowledge sources. This horizon scanning capability will ensure that the DHI work with cutting-edge technology, innovation and design. A project usually comes into the Exploratory-phase if the question needing an answer is very broad or the innovation domain is not well defined, such as re-designing a segment of the health and care service. An example of this is the redesign of outpatient services.

The project proposal goes to the Laboratory setting, if the proposed project idea is relatively well-defined, but requires further refinement. The 'Experience Laboratories' are the domain of the Glasgow School of Arts design experts, and provide an environment where service users (practitioners and patients), businesses and researchers can collaborate and rapidly prototype in response to health and care challenges. Experience Laboratories can replicate real life scenarios and use design input to trial new ideas, technology, services, roles and behaviours. For example, the Scottish Ambulance Service (SAS) has been in a steady shift in service demand from an emergency focus to a more complex variety of demand. An Experience laboratory exercise helped the SAS to bring sharply into focus what the paramedics require for a functioning ambulance service, as well as helped the service with their procurement decisions with regard to the design of the next cohort of ambulances to be delivered in 2016.

If the project is in a pre-technology stage, or almost ready for the market, these can be piloted, evaluated and tested in real life settings at the Factory stage. The proposal will get in-kind help from industry, health and care, and third sector partners on its way towards a commercial solution. The academic partners will get funded for up to £50 000. The Factory stage offers access to expertise and test environments, business mentoring support and facilitation to source funding.

6.   MONITORING AND EVALUATION

DHI reports quarterly to a Management Board comprised of all key funders and stakeholders of the DHI, including the NHS24, Glasgow School of Arts, University of Edinburgh, Glasgow University, International Diabetes Federation, the Highlands and Islands Enterprise, an SME, a Local authority, Centre for Telehealth and Telecare, The Scottish Funding Council and a local hospital. DHI also has to report progress and key performance indicators to Scottish Funding Council as the main source of revenue. Below is a list of KPIs set for the DHI:

KPI Update (As of 01/08/15)

The KPI table below does not attempt to detail the 2015/16 KPI achievement so far, as the key metrics have been projected in the portfolio overview tables at the beginning of this section. As per the definitions section on the next page, this table will be updated quarterly beginning with Quarter 1 figures updated mid-way through Quarter 2.

#			Name	2013/14 Actual	2013/14 Target	2014/15 Actual	2014/15 Target	2015/16 Actual	2015/16 Projected	2015/16 Target	2016/17 Actual	2016/17 Target	Total Actual	Total Target	Total Stretch
1	I		£ Value of Inward Investment Funding into DHI	0	0	100,041	666,666	133267	To be revised*	To be revised*	To be revised*	To be revised*	233,308	To be revised*	To be revised*
2	I		n:n Ratio of DHI £s vs In kind & External £s	1.5	n/a	1.72	1.5		To be revised*	To be revised*	To be revised*	To be revised*	1.59	To be revised*	To be revised*
3	A		# Exploratory Outputs Completed	10	10	12	12	10	19	13		14	32	49	81
4	A		# Laboratory Outputs Completed	4	4	27	23	5	48	26		29	36	82	134
5	A		# Factory Outputs Completed	0	0	10	25	11	42	28		31	21	84	137
6	A		# Postgrad programmes developed	0	0	1	1	tbc	1	1		0	1	2	2
7	A		£ Value of DHI approved project intake (Grant Value)	0	0	1,446,687	1,445,913	394,315	To be revised*	To be revised*	To be revised*	To be revised*	1,841,002.44	To be revised*	To be revised*
8	A		% Value of DHI projects referred elsewhere (est. Grant Value)	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*	To be revised*
9		O	# Additional Innovations identified as a % of total completed Laboratorys	n/a	n/a	TBC**	50%	tbc	Collected annually**	50%		50%	TBC	50%	80%
10		O	# Postgrad qualifications enrolled	0	120	0	160	tbc	Collected annually**	180		200	0	660	n/a
11		O	# H&C employees trained (average / project)	n/a	n/a	78	25 / project	tbc	Collected annually**	25 / project		25 / project	78	25 / project	35 / project
12		O	# Industry employees trained (average / project)	n/a	n/a	4	2 / project	tbc	Collected annually**	2 / project		2 / project	4	2 / project	3 / project
13		O	# right products / processes / services / models	0	0	1	5	1	14	14		23	0	42	69
14		O	# New collaborations formed	5	5	35	18	26	31	20		20	66	63	103
15		O	# Publications	n/a	n/a	N/A***	75%	tbc	Collected annually**	75%		75%	0	75%	85%

* No longer appropriate markers given ongoing state aid and budget re-profiling activities. **

** Collected annually (June - July)

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Definitions

		Name	Definition	Collection
1	I	£ Value of Inward Investment Funding into DHI	Total investment secured from external sources.	Quarterly
2	I	nn Ratio of DHI £s vs In kind & External £s	The ratio of DHI grant funding to project contributions from external partners (Contracted Laboratory & factory projects only).	Quarterly
3	A	# Exploratory Outputs Completed	1 Output = A package of content (or artefact) that materially advances an opportunity towards the health & care marketplace.	
4	A	# Laboratory Outputs Completed		
5	A	# Factory Outputs Completed	As above but more specifically 3 types of output – 'product developed', 'product viable', 'product impact evaluated'.	Quarterly
6	A	# Postgrad programmes developed	Development of a postgraduate course in digital health.	Annual
7	A	£ Value of DHI approved project intake (Grant Value)	The grant value (£) committed for all approved projects in the current financial year.	Quarterly
8	A	% Value of DHI projects referred elsewhere (est Grant Value)	This measure has proven impossible to collect in % form. It is recommended that this be re-written.	
9	O	# Additional Innovations identified as a % of total completed Laboratorys	Each Lab will pursue a core objective, but will generate additional outputs that can form or enhance innovations. It is expected this number will be half the core lab outputs per year.	Annual
10	O	# Postgrad qualifications enrolled	Number of Postgraduate students enrolled.	Annual
11	O	# H&C employees trained (average / project)	The number of H&C employees trained in the use of a new digital technology.	Annual
12	O	# Industry employees trained (average / project)	The number of industry employees trained in the use of a new digital technology.	Annual
13	O	# right products / processes / services / models	The right product taken into the marketplace.	Annual
14	O	# New collaborations formed	The number of new cross-sector collaborations formed.	Annual
15	O	# Publications	75% of projects are expected to yield a publication.	Annual

7. SUSTAINABILITY MEASURES

All innovation centres have been initially funded for a period of between four to five years. As part of that funding a Sustainability Plan for the future has to be developed, which will include various and alternative funding sources. A review of all innovation centres has been scheduled for summer 2016 to identify future funding requirements.

8. COSTS

Major sources of cost (expenditure) for the DHI relate to Personnel (salaries, office accommodation) and Grant Awards for the academic partners of the projects that we support. This accounts for over 80% of DHI's overall running costs, which is funded by £11.2M (14.2M euros) over five years. The bulk of the remainder expenditure relates to Marketing, Promotion and Events.

9. FUNDING

The DHI was funded by the Scottish Funding Council for five year. £11.2M (14.2M euros) including Capital Spend of £1.2M (1.53M euros).

OUTCOMES & IMPACT

10. OUTCOMES

Since October 2013 and as of March 2016 DHI has:

- ‣ Started from a team of 1 and has grown to a team of over 40 in size
- ‣ Over 80 on-going projects engaging over 5000 citizens, patients and professionals, with an additional 85 initiatives at earlier stage in our opportunities pipeline.

These include:

- ‣ Over 30 ideas at speculative stage (at Exploratory)

    E.g., Health and social care innovations; Next generation digital records; Children services; etc.

- ‣ Over 20 products near prototype (at Experience Laboratory)

    E.g., Online-safety gamification for youth with learning difficulties; Falls-prevention technology; Digital diabetes etc.

- ‣ Over 30 projects at prototype or beyond (at Factory)

    E.g., My Little One-baby monitor; Mobile ECG for screening Atrial Fibrillation; Care-clip etc.,

- ‣ Network of over 1000 members from 20 countries across the academic, business and civic sector
- ‣ Over 150 partners

‣ 1.5M awarded since Oct 2013

‣ 1.72M invested by civic and industry partners since Oct 2013

11. IMPACTS

The Digital Health and Care Institute bottom lines are contributing to economic growth of Scotland through supporting the generation of new business ideas, expanding the Scottish Digital health and care market and creating jobs; and benefitting the Scottish health and care sector. Our KPIs measure the Outcome success across these areas. Each project engaged by the DHI is approved on the basis of its expected benefits and impact in these areas. These are then measured de facto after delivery. Our institute is just over two years old, which is why it is too early to predict full impact of the supported projects. However, the trend generally show a positive trend in this area.

12. INVOLVED STAKEHOLDERS AND BENEFICIARIES

The main beneficiaries of the DHI activity are businesses, whose growth will be positively impacted in Scotland through the support and facilitation offered by the DHI for their innovation to develop towards a marketable product. Further, the Scottish health and care organisations, including civic and third sector agencies are key beneficiaries of the DHI, as the innovation activity of the DHI focusses on key strategic areas within health and care integration identified by the Scottish Government. The Scottish Higher Education Institutions benefit from receiving direct funding from the DHI to take their R&D projects beyond the academic research and development remit towards the commercial market. Ultimately, also the citizens and civic and third sector organisations benefit from the DHI through participating in developing better health and care solutions.
The DHI epitomises the regional innovation system within this area.

13. AWARDS / RECOGNITION

DHI was shortlisted for the prestigious Marketing Gravity Innovation Award for the 2015 Lloyds Bank Business Awards. This Award is the flagship awards programme that recognises and rewards excellence across all sectors. Although DHI was not successful in winning the award, we were very proud to be among the five finalists selected from hundreds of entries. Justene Ewing, the CEO of DHI, made the TECH 100-list in October 2015. Holyrood's Tech 100 profiled the key figures driving the digital agenda in Scotland. Full article available here https://www.holyrood.com/articles/feature/justene-ewing-digital-health-care-institute-chief-executive

LESSONS LEARNED

14. PRIMARY CHALLENGES

The main role of the DHI has been to disrupt the established health and care systems in Scotland in order to find new ways to deliver health and care, while contributing to growing Scottish economy by facilitating product development carried out by small and medium

enterprises, civic organisations and Scottish higher education institutes. The main issue has been trying to find a way of working innovatively with a well-established system built up over decades. Once the initial perception of the DHI being a "threat" dissipated following an intense campaigning, the challenge area now is the national scaling up of successful projects, and trying to get the health care system to adopt the new innovations as part of their work.

Another challenge emerged from bringing into collaboration three different types of agencies, whose operational and organizational cultures are traditionally different: Higher education institutions, businesses and the NHS24. An innovation centre amalgamates all three, yet it is being governed by individual organisations with different approaches to how things should be run. This has caused some operational challenges and learning opportunities along the way.

15. SUCCESS FACTORS

The DHI has managed to successfully link industry/entrepreneurial capability to the Scottish Government Health and Care priorities, while leveraging the high quality academic expertise present at Scottish HEIs.

Until April 1st 2016 Health and Social care services in Scotland were provided, financed and governed by different agencies. Social care was provided by 32 local authorities and health care by 12 Health Boards. In 2014 a new law on integrating health and social care services, "the Public Bodies (Joint Working) (Scotland)" act, was passed. This opens vast number of avenues for innovation within health and social care integration. However, integration of services in Scotland is also problematic due to Scottish geography, which means that one type of solution does not fit all. For example, mobile network connectivity and the available internet coverage have been ongoing issues for many of the rural and island communities, something that creates natural sources of health inequalities. The socioeconomic status of residents also varies greatly between different areas of Scotland. The largest challenge of all is the increasing older population, in particular the growth rate of the numbers of over 75 year olds within the next 5-year period.

16. TRANSFERABILITY

The DHI Model for Innovation is based on a combination of Technology, Service and Leadership readiness. As a model it is repeatable in other countries. However, Scotland does have some advantages in terms of the applicability of the system, e.g. a centrally governed public healthcare service, significant national eHealth systems integration already in place, legislation for health and social care integration, a rich set of digital health and care data, a cultural history of invention and innovation, several top university research institutions, ambitions and plans for unique digital health facilities, which aim to establish Scotland as a global leader in digital health. As a small country Scotland is agile yet large enough to yield representative results for other areas. The learnings from the DHI-case could be transferred to smaller European communities facing similar geographical challenges as Scotland.

FURTHER INFORMATION

17. PUBLICATIONS / ARTICLES

‣ Tech 100 – Justene Ewing, Digital Health & Care Institute Chief Executive https://www.holyrood.com/articles/feature/justene-ewing-digital-health-care-institute-chief-executive

‣ This site lists the different case studies the DHI has been involved in. (Registration on the site needed to access the case studies): https://dhi-scotland.com/research?locale=en

18. LINKS

‣ The Digital Health & Care Institute: https://dhi-scotland.com

‣ Public Bodies (Joint Working) (Scotland) Act 2014: http://www.legislation.gov.uk/asp/2014/9/contents/enacte

‣ eHealth Strategy 2014-2017 - The Scottish Government: www.gov.scot/Resource/0047/00472754.pdf

‣ Twitter @dhiscotland

19. KEYWORDS

Digital health and care, innovation, Scotland

20. PUBLIC CONTACT DETAILS

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