SCSP Innovation Fund Case Study

Spinal Injuries Scotland

Summary

This project, Smart Support for people living and a spinal cord injury, leverages 5G and advanced wireless technologies to create connected smart home environments, enabling individuals with spinal cord injuries to live independently. The initiative is a collaborative effort involving Spinal Injuries Scotland (SIS), Vodafone, NHS Scotland, and Glasgow City Council Social Services. Key achievements include the installation of tailored smart home technologies and the delivery of training workshops for participants, enhancing their independence and quality of life.

Watch the Spinal Injuries Scotland case study video.

Introduction

Context and Rationale

Every year, approximately 400 people in Scotland suffer from spinal cord injury, facing significant challenges that affect their physical, mental, and social well-being. Post-discharge, these individuals often encounter heightened risks, including difficulties with mobility, household management, and accessing essential services. This project addresses these challenges by creating digitally enabled care environments to support their rehabilitation and independence.

Project Objectives

- Enable 12 individuals with a spinal cord injury to live independently post-discharge.
- Use 5G-enabled technologies to overcome barriers to recovery and independence.
- Enhance participants' quality of life through tailored assistive technology and training.
- Develop a replicable model for digitally enabled care across Scotland.

Background Statistics / Supporting Data

Problem Statement

Around 400 spinal cord injuries occur annually in Scotland.

The 2023/2024 report from the Queen Elizabeth National Spinal Injuries Unit in Glasgow gives the following data:

- New patients admitted: 129
- Day cases treated: 323
- Operations performed: 57

Additional information from the National Spinal injuries Research Centre at Glasgow University indicates that the number of people suffering spinal cord injuries, who are not referred through regular clinical pathways, and do not appear in official statistics, means the number of people in Scotland with a SCI could be significantly higher.

A significant portion of these individuals require wheelchairs or experience reduced mobility, necessitating tailored solutions to support their independence.

Glasgow City Region Context

- Aligns with the Glasgow City Region's goals of fostering innovation and addressing challenges faced by vulnerable populations.
- Integrates with existing healthcare and social service frameworks to ensure long-term impact.

Project Objectives

- Create 12 smart homes tailored to the needs of participants.
- Deliver training workshops on using assistive technologies effectively.
- Implement a robust monitoring and evaluation framework to track progress and outcomes.
- Develop sustainability and scalability plans for broader implementation.

Approach

Collaborative Design

The project involves collaboration between:

- **Spinal Injuries Scotland (SIS)**: Overall project management and participant support.
- **Vodafone**: Technical expertise and device provision.
- **NHS Scotland Healthcare Professionals and Support Specialists**: Supporting our Assistive Technology Champion in delivering tailored solutions and guidance.
- **Glasgow City Council:** Advice on home adaptations and equipment installation.

We have benefited from the close collaboration with GCC Project staff, and Vodafone. They have responded quickly to all our requests for help, and have consistently provided regular updates, information, and support since the outset.

Implementation

- Selection of 12 participants based on injury levels and living arrangements.
- Installation of 5G-enabled smart technologies, including routers, smart locks, ring doorbells, and Alexa systems.
- Delivery of workshops led by the Assistive Technology Champion, and Vodafone representatives to build participants' digital skills.

Evaluation Framework

- **Qualitative Measures**: Feedback from participants and stakeholders on feasibility and acceptability.
- **Quantitative Data:** Tracking participant progress in independence, well-being, and technology usage.

Evaluation tools have been developed to measure progress in participants proficiency in use of the technology, as well as their assessment of changes in physical independence, safety and security, emotional wellbeing, levels of social interaction, and overall quality of life.

Findings

Establishing a baseline

We interviewed all participants before their Smart Home Technology was installed to get an indication of:

1. Their knowledge, awareness, and understanding of Smart Home Technology, and their views on the potential benefits of 5G equipment on their day-to-day household management and quality of life.
2. The level of Smart Technology equipment that they had in the house (if any).
3. The key areas that they envisaged Smart Technology having the greatest effect.

Key Findings

1. Comfortable with Smart Technology: Extremely 8%, very 16%, moderately 25%, uncomfortable 50%
2. Level of Understanding: High 17%, medium 50%, low 33%
3. Have Smart Technology in the home: Yes 25%, no 75%
4. Priorities:
    - Ring door bell
    - Lighting controls
    - Voice/phone control of locks, blinds, appliances
    - Movement sensors, smart alarms
    - Communication with family friends and carers
    - Opportunities for online leisure, learning, shopping online, entertainment

Post-installation review of progress

- I am able to perform more activities independently (light controls, using appliances, answer door. 92%
- Smart Technology has reduced my dependence on family members and carers. 84%.
- Before installation I often felt unsafe or worried about my safety and wellbeing at home, I now feel very secure. 92%

92%

say they are able to perform more activies independently

84%

feel less dependent on family members and carers

- Technology has lessened the risk of falls, not having to reach for lights or appliances, or get out of bed to complete tasks. 86%
- I feel confident that I can get help in an emergency, (cameras and alarms) 62%
- I feel more secure leaving my home unattended. 88%
- Previously I felt isolated and disconnected from family, friends and the wider community. 5G technology has enabled me to maintain regular contact with family and friends and widened my social circle. 82%
- Since having the technology, I have noticed real improvements in my overall quality of life. 92%

82%

feel less "isolated and disconnected from family, friends and the wider community"

92%

have noticed real improvements in overall quality of life

- My general wellbeing has improved, fewer health related issues, less anxiety, reduced fatigue, sleeping better. 80%
- Satisfaction with the new technology. 100%
- Likely to recommend the technology to other SCI patients. 100%
- Likely to continue using smart technology in the future. 100%
- Assessment of the support received in in setting up and learning the technology. 100%
- Evaluation of training. First class. 100%

100%

are likely to recommend the technology to other SCI patients

100%

are likely to continue using the smart technology in the future

"This has changed my life, I was injured a year ago and just got out of the Spinal Unit in September. I was in despair and suicidal. Now I feel I have a future and can get on with my life."

"What I particularly like is being able to go through doors in my wheelchair without having to put out lights manually."

"My wife is a classroom assistant, and mobiles aren't allowed in school. She got a smart watch as part of the equipment which allows me to contact her in an emergency and get back home."

"It has made life much easier, more comfortable, and reduced feelings of isolation, I now feel more connected with the outside world. I thought the training was excellent, everything was explained in detail, and Rich was so patient and understanding.

"I hope that we will continue to get training in the future to enable us to get the maximum possible benefit from this 5G technology. Rich tells us that 5G has the capacity to handle future upgrades of my equipment, as I continue to learn I am excited about possibilities."

"My wife works an early shift and I used to have to go to bed at 9.00 with her as I couldn't work the lights. Now I can stay up late and watch telly, knowing that I can get into bed without disturbing her."

"The best thing for me is smart plugs and lights, and appliance controls meaning I don't have to use a wooden spoon or long breadknife to turn on the microwave switch at the back of the worktop."

"Life is generally much easier, with a lot less hassle, I can't tell you guys how much I appreciate everything you've done for me."

"It's a pity we can only score from 1 to 10, I'd give Rich a score of 100, and it still wouldn't be enough. He's a brilliant guy, and anyone that can make me confident using high tech is a genius!"

Key Insights

- **Stakeholder Feedback**: Positive reception of smart technologies as enablers of independence.
- **Workflow Observations**: Successful integration of technology into daily living tasks.

Stakeholder Feedback

Participants reported:

- Enhanced feelings of security and well-being.
- Increased confidence in managing their environments.
- Improved ability to stay connected with healthcare providers and support networks.

Key Considerations

Facilitators

- Strong collaboration among partners.
- Comprehensive training and support systems for participants.

Barriers

- Initial resistance to adopting unfamiliar technology.
- Variability in participants' digital skills requiring tailored training approaches.

Learnings

- Importance of co-designing solutions with participants and stakeholders.
- Necessity of ongoing support and adaptation of technologies to meet evolving needs.

Conclusion

This project demonstrates the transformative potential of 5G-enabled technologies in supporting individuals with spinal injuries. By creating digitally enabled care environments, the initiative aligns with broader strategic goals of promoting independence and well-being for vulnerable populations.

Next Steps

- The Smart House for independent living at Clober Farm will provide individuals with disabilities the opportunity to trial 5G-enabled technologies in real-life settings. This project will drive continuous improvement in care solutions, enhancing independence and well-being. It will also offer councils, NHS, and social work professionals' live demonstrations to explore how these technologies can be integrated into clients' homes.
- Expand the initiative to additional regions and demographics.
- Continue refining training and support frameworks for staff to roll out to all members.
- Secure long-term funding and partnerships to sustain and scale the project.
- Seek funding to implement smart technology in the Queen Elizabeth National Spinal Injuries Unit for patient education sessions.

Sustainability Plan

1. The project's success lays the groundwork for an upscale and national rollout across all SIS operating areas, supported by ongoing discussions with NHS Scotland and the Scottish Government. SIS aims to integrate smart technologies into its Peer Support strategy, ensuring long-term benefits and scalability across Scotland.
2. To ensure long-term sustainability for the programme among Health Care Practitioners and Care Providers in Central Scotland SIS will implement the following:
    - **Training and Education**: Income-driven workshops and training for users, caregivers, and staff to maximise the benefits of smart home features.
    - **Revenue Generation:** The income from training sessions will be reinvested into ongoing technology upgrades and the creation of a technology grant/ subsidy for SIS members.
    - **Promotional Activities**: Creation of articles, case studies, and success stories to highlight the impact of the initiative. Attendance at events, speaking engagements, and leveraging our website, social media platforms, and newsletters to engage the community and attract supporters.
    - **Community Engagement**: Hosting open days for the public to explore and experience assistive technology firsthand, with opportunities to contribute through donations.
    - **Ongoing Maintenance and Upgrades**: Establish partnerships with technology providers for regular free trial, upgrades, maintenance and software updates.
    - **Supplier Collaboration**: Securing discounts, promotions, and referral codes for participants to generate income through sales.
    - **Research Partnerships**: Collaboration with universities and research projects to secure additional funding.
    - **Device Reuse Initiative:** When devices reach the end of their life cycle but remain in working condition, they will be donated to the community for reuse, ensuring ongoing positive impact.

Acknowledgements

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Find out more about the project on the Glasgow City Region website.

Disclaimer

The findings presented in this case study reflect the independence of the project and the collaborative efforts of all stakeholders. No conflicts of interest have been identified.