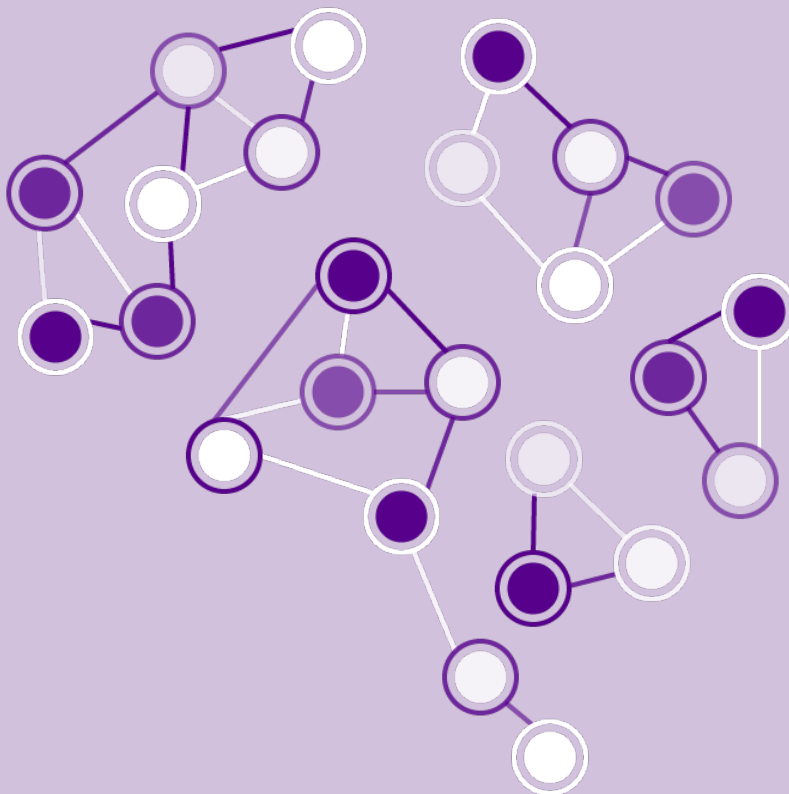


# REPORT & EVALUATION

## **Brain Injury Technologies Think (BITT) tank Technologies for Independent Living**

Wednesday 27<sup>th</sup> January 2016, 9:30am – 4:00pm  
The Courtyard Suite, Madingley Hall, Cambridge, CB23 8AQ



“Very innovative and informative.”

“It was great to hear about clear unmet needs.”

“Great progress and outcomes for applied science.”

“Chance to network and talk with colleagues working in complementary areas.”

“Great to see the integration of those involved in the ‘brain space’.”

“Lots of enthusiastic people, great discussion and introductions to technologies.”

“Very informative and of practical value.”

“Potential collaborations and partnerships.”



## Patient Inspired Innovation

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## Executive summary

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Following the success of the pilot held in March 2015, the Brain Injury Technologies Think (BITT) tank on Technologies for Independent Living was held on 27th January 2016 at Madingley Hall, Cambridge. The event successfully hosted approximately 60 participants, including 9 small-medium enterprises and entrepreneurs.

The purpose of the BITT tank was to address a key strategic objective for the HTC of 'NHS pull' of novel technology solutions through engaging small-medium enterprises (SMEs). The BITT tank invited SMEs to showcase relevant technologies/solutions and the opportunity of an open Q&A session with clinicians, academics, patients and carers with the intention of expert input for product development relevant to the market.

A key driver of this event is the initiation of collaborations, both with and without the HTC, and mixing skills and expertise to deliver novel technological solutions for the brain injury patient pathway. The NIHR Brain Injury HTC will therefore continue to track progress of collaborations and developments that were initiated at the BITT tank.

'Technologies for Independent Living' was the first BITT tank of the series that the NIHR Brain Injury HTC will be delivering throughout 2016. Three other focussed BITT tank on different research priorities across the brain injury patient pathway that have been identified during a prior HTC unmet needs roadmapping workshop will take place during the year:

- Co-ordinated Care: Septembre 2016
- Primary Prevention: September 2016
- Acute Treatment and Monitoring: November 2016

Overall, the feedback from the BITT tank on Technologies for Independent Living has indicated that the participants found the event very useful, especially for the networking. Blind dates between delegates who haven't previously met have been suggested in order to facilitate potential collaborations.

# Brain Injury Technologies Think tank - Technologies for Independent Living

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## Session 1: Clinical unmet needs

- **Dr Peter Jarritt, Deputy Director, NIHR Brain Injury HTC**  
*Patient Inspired Innovation*
  - The NIHR Brain Injury HTC is one of eight HTCs funded by the NIHR. The Brain Injury HTC is based in Cambridge.
  - Centre of expertise that focuses on the brain injury pathway and associated **unmet needs** which have high potential for improving quality of life of NHS patients and improving the effectiveness of healthcare services that support them.
  - Supports the development of new medical devices, healthcare technologies or technology-dependent interventions, which improve treatment and quality of life for patients
  - Acts as a catalyst for NHS “pull” for the development of new medical devices, healthcare technologies and technology-dependent interventions
  - Work collaboratively with patients and patient groups, charities, industry and academics.
  - The HTC has an unblocking role.

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Website: [www.brainhtc.org](http://www.brainhtc.org)

- **Dr Alexis Joannides, Clinical Lecturer in Neurosurgery, University of Cambridge**  
*Role of Informatics in the Adoption of Healthcare Technologies*
- **Professor Valerie Pomeroy, Professor of Rehabilitation, University of East Anglia**  
*Unmet Need for Motor Recovery early after Stroke*

- **Mr Austin Willett, Chief Executive, Headway Cambridgeshire**  
***Client led Challenges***

- Headway delivers services in different places: Addenbrooke’s hospital, in the community, within their hubs. The services include lifeskills, art therapy, gardening the therapy and rehabilitation gym.
- Their work within the community is funded by grants and donations.
- Brain injuries affect everyone very differently. People with brain injury need support in different ways.
- Client unmet needs: Effective ‘grabber’ – technologies don’t work if they cannot be picked up off the floor; Converting a standard one-legged stick, to a four-pronged stick; Help with hanging up clothes.
- Developing new technologies: Involvement of clients at an early stage; Primary purpose must be support people in making real improvements to their lives

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Block 10, Ida Darwin,  
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Website: [www.headway-cambs.org.uk](http://www.headway-cambs.org.uk)

- **Ms Margaret Fosh, Reablement Manager, Cambridgeshire County Council**  
***Reablement: User Needs and Technology***

- Re-Ablement: service supporting service users when they are coming out of the hospital. This service is trying to get them back to where they were before the accident. Sometimes, after an accident, illness or if confidence with daily activities has been lost some help may be needed to improve
- Re-Ablement is for adults who have the potential to improve and the ability to follow a programme
- Short programme: Designed to help regain, in a realistic and safe way, the ability and confidence that there once was i.e. taking care of one’s own personal care, cooking, taking medication etc., A programme that is tailored to one’s needs, working together to practice daily activities or finding new ways to support, its not about doing things for people its about empowering/supporting people to do things for themselves
- Cambridgeshire County Council provides the services
- Re-ablement usually lasts a few weeks. Everyone is different, the programme will be tailored to suit the individual needs and what realistic level of independence has been agreed to achieve
- What Happens After Re-Ablement? If it has worked well, you may find that,

that person can manage well on their own or with a low level of help; It may be that whilst on the re-ablement programme there were goals that were not achieved and further ongoing support may be needed. A discussion would be had to ascertain how to take this forward

- **Ms Anava Baruch, Managing Director and Clinical Lead, Design for Independence**  
***Designing for Independent Living***

- There is a huge difference between home and hospital environments.
- Good Product Design: There is a need of having a good understanding of the end user group. Know what the common features are.
  - Our clients' quality of life relies primarily on their support team.
  - Our clients would like to be treated as equals. Products should address our emotional well being not just our safety.
- Example of product: Outdoor Pendants
  - **The Limmex watch** acts as a GPS and basic mobile phone.
  - Pressing the button will ring up to 5 people.
  - Once someone accepts the call the phone will send that person a text with accurate location of the user.
  - For the next 30 minutes following the initial call you can ring directly to the watch for further communication.
- Monitoring Devices
  - For carers and family members:  
Reassurance, remote monitoring.  
Likely to be used (due to it dual function)
  - For the client:  
Reassurance and safety to explore the outdoors, Independence and personal space, free of "Disability Tag" encourage social inclusion
- Products should address the emotional well being not just the safety; otherwise they might not use them.

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## **Session 2: Technology showcase, including panel Q&A**

SMEs, start-ups and project teams had 15-minute slots to showcase their technology/product to an audience of expert clinicians, service providers, academics and the public. Interactive Q&As focused on the technologies immediately followed the showcase.

Please see the next section of the report 'Company profiles' for more details about this session.

## **Session 3: Panel discussion, chaired by Dr Peter Jarritt**

- Mr David Walker, Senior Scientist, Philips Research

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- Professor Nigel Harris, Director, Designability

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- Mr Ravi Chana, Business Development Manager, NOCRI

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## Company profiles

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### Obex Technologies



**Obex Technologies** in partnership with the University of Cambridge and Addenbrooke's Hospital developed the Outcome Registry Intervention and Operation Network (ORION) web application framework in 2012.

ORION enables cloud-based, multi-site capture and processing of diverse healthcare information. ORION provides the platform for a number of modules including various national neuroscience registries and datasets for specific studies.

Most recently Obex has developed the Integrated Rehabilitation Management Application (IRMA). This module allows all of the institutions involved in the rehabilitation of brain injury patients to share data in a seamless and structured fashion. The data is also available in anonymized form for audit, reporting and research purposes.

The IRMA project has been commissioned and funded by NHS England through an initial feasibility study and has been awarded follow on funding also by NHS England for a pilot phase that involves a full rollout in the East of England and the North-West.

**Presenter(s): Dr Michael John Gifford, Mountain Hare Consulting, Director**

#### **Presentation notes:**

#### **IRMA - Integrated Rehabilitation Management and Assessment**

- Challenge: data flow through the rehabilitation pathway.
- Data protection: data flow within the ORION application enabling dual use for service provision and aggregate analysis. Clinicians can access clinical needs.
- Stakeholder benefits: Two different levels:
  - Organizational:
    - NHS commissioning: standardized reporting outcome dataset; ongoing, real-time service delivery assessment; cost savings through improved service planning.
    - Secondary services: Improved readmissions protocol; reduction in bed days and cost per patient; general planning of rehabilitation services; improved data handover.
    - Community care: Increased empowerment and involvement; transparency of patient care pathway.
  - Individual:
    - Clinical professionals: Improved continuity in rehab pathway; reduced referral volume to specialist services; improved safety culture.

- Patients: improving monitoring; tailored information portal; enhanced continuity of care.
- Researchers: linking long term outcomes with early data capture; improved prognostication; capture of entire regional cohort.
- Phase 1 (done): 42 patients enrolled in IRMA, 3 Institutions participated in pilot (including Addenbrooke's Hospital and Norwich).
- Phase 2: it will have a wider rollout (East of England, Sussex, North West). 600 patients to be enrolled in IRMA, 30 institutions to participate in pilot, 150 clinicians to be trained to use ORION. Phase 2 is kicking off now and will last one year.
- The data can be used for research and assessment if they are anonymised. The institution that puts the data in, owns them.

## Red Ninja

### RED NINJA

Red Ninja is a design-led digital technology company working with several trusts, councils, commissioners and providers to create software and hardware solutions to meet health and social care needs. The Red Ninja approach to design and development is relatively unique to the industry; Red Ninja take an agile and collaborative approach to product development, hosting 'hack days' to rapidly prototype solutions to identified priorities utilising new and existing technology. The end-users are actively involved in the co-creation process where individual and shared experiences are used to create solutions that are pertinent to the user's needs.

Connected Kitchen is a phase 1, SBRI project and is jointly funded by North Wales Betsi Cadwaladr University Health Board, Welsh Government and Innovate UK. This aims to promote independence in cooking tasks, to identify and develop innovative solutions that maximise the benefits for service users' and benefits for public services.

The product Red Ninja are developing consists of a multitude of technology centered around a tablet and smartwatch with a personalised, co-created cooking application with analytics and a management dashboard with the ability to connect various sensors around the kitchen to regulate and monitor safety in the cooking process. Connected Kitchen will provide support at each level of the task in the kitchen, from planning, preparation to completion with notifications on the smartwatch from sensor detection around the kitchen connected to the dashboard and visual and auditory support on the tablet for the user.

**Presenter(s): Dr Hayley Webb, Technical Strategist**

**Presentation notes:**

- Project: 'Connected Kitchen': The aim of the platform is to be able to prepare food in an independent way, but also a safe way.
- The project is a SBRI funded project in phase one and supported by Innovative UK.
- Platform overview:
  - Connected devices: Alerts and notifications can be sent to smartphones, smartwatches and home telephones. This enables users to have more freedom and better safety while cooking.
  - Sensors: The platform will be able to link multiple sensors. The first being an infrared motion sensor. This allows the platform to send notifications to other devices when the user is detected as being out of the room.
  - Central hub: A small connected device which links the tablet, sensors and other connected devices together, and collects and transmits data to the cloud for use by the dashboard.
  - Cloud servers: Secure cloud-based server system. The cloud servers store user data and feed the data into the dashboard.
  - Dashboard: Accessible through a website, the dashboard shows usage information helpful to Occupational Therapists. This includes overall platform usage and individual user's usage.
  - Connected kitchen tablet: The tablet app acts as an interactive, customisable cookbook, guiding users through each recipe.
- The tablet app contains a lot of picture with a lot of details and the possibility to ask for help.
- It's possible to adjust the level of details depending on the needs of the user.
- Safety feature: Time, link to the wearable to say for example "you are 10 minutes over the time".
- Financial aspects: A commercialisation plan is part of the SBRI. They are exploring how to bring it to market. The clinical input and insure that the app is flexible is very important. People can download the app on their own tablet.
- Service user involvement: as the product is in phase one, they have only engaged with the OT team for the moment.
- Suggestion: Some people would prefer the button as an icon rather than the word on it.
- Suggestion: contact Tesco API for potential funding.

## **Mimex Montague Healthcare Limited**



Strannik technology is based upon an original mathematical model of the autonomic nervous system and Physiological Systems. It was first commercialised in 1999. It has taken until 2013-2015, until the existence of the European Commission's EUR1.2BN funded Human Brain Project, for the world to recognise the significance of Grakov's brilliant

research which (i) is able to determine what the brain does and how it does it; (ii) determine the health of a patient in an unprecedented level of medical detail, and (iii) treat autonomic dysfunction thereby alleviating the symptomatic manifestations of pathological onset and/or progression.

***Presenter(s): Mr Graham Ewing, Chief Executive, and Dr Elena Ewing, Medical Director***

**Presentation notes:**

- Strannik Technology: a games-like, digital, software, medical technology which is based upon a mathematical model of the autonomic nervous system and physiological systems.
- Altered visual perception, of colour and of visual contrast, is associated with disease states and the use of drugs i.e. changes of colour perception have pathological origins. It is therefore associated with the function of the autonomic nervous system and the onset of pathologies. This involves the level of protein expression (genotype) and the rate at which proteins react (phenotype) - each pathology being linked to different proteins and altered reaction conditions. Accordingly a cognitive test of colour perception can be linked to the onset of pathologies and used as a diagnostic principle i.e. for the diagnosis of all common pathologies.
- Strannik technology can screen for the earliest pathological onset; distinguish between genotype and phenotype; determine the progression of co-morbidities (c15/organ); determine the most destabilised systems & organs; determine the future progression of pathological onset; re-establish the coherent and co-ordinated function of the autonomic nervous system and physiological systems.
- Benefits: to healthcare: to provide an immediate screen of patient health and reduce the need for expensive and timeconsuming diagnostic & scanning tests; to a medical device company: identify the progression of complex pathologies e.g. cardiovascular disease(s) depression, Alzheimer's disease, Raynaud's phenomenon; to a drug company: to better understand the complex nature of pathologies, and how this could be used to influence the development of drug and drug combination therapies.

## **Novastone**



The company delivers secure instant digital messaging which enables clinician and multi-disciplinary teams to connect communicate, collaborate around the needs of patients using secure mobile phone messaging. For patients it empowers patients and increases their engagement in their care.

***Presenter(s): Ms Angela Single, Business Development Director***

### Presentation notes:

- Objectives: To enable clinicians and multi-disciplinary teams to securely connect, communicate, collaborate and share data together using their own mobile phones. To enable patients to engage with their clinicians securely, empowering them to manage their own conditions.
- Instant messaging is a very important way of communication. Need to bring instant messaging into the NHS, but also need to have secure and safe conversation. It would enable people to connect, communicate and collaborate together.
- Need: clinicians want secure instant messaging services. 71.6% and 37.2% of doctors and nurses want secure instant messaging services to share patient-related clinical information. People want to use technology they use in their everyday life (ex: their phone).
- Challenge: Security and Instant Messaging is not always a given.
- Novastone unique engagement technology: Configurable, asymmetrical engagement models allows groups of users to engage other groups of user in conversation directly. In addition, permissions allow conversations to be orchestrated across these models where appropriate. This technology was originally built for the financial sector.
- Benefits: Multi-agency teams no longer need the same software to communicate; Teams can use their own mobile phone to communicate securely and share identifiable data; No need to access portals to communicate; Teams can easily communicate amongst themselves and with their service users on the move; Participants only see the conversation that they have permission to see; Conversation follows the persons journey through the health and care system; User friendly and flexible to support workflow, clinical and integrated pathways
- No conversation can be deleted. All the clinical data are stored securely. The objective is that it allows to follow the patient journey.
- It is developed for the desktop and phone.
- It is possible to attach a document and open it in the app and the App can show if you are available or not.
- Comment: Very timely. So needed.
- Is there a search functionality? It is something they are thinking about.

### Maddison Product Design

**maddison**

Product Design

Maddison is a design company at the cutting edge of innovative product development. We specialise in transforming disruptive technologies into ground breaking, market leading products, building on clients' IP and creating new IP to maximise their success. We develop medical devices, including wearable sensors, therapeutic, diagnostic, monitoring and treatment systems. We also develop Graphical User Interfaces (GUIs), ranging from those simplifying

complex systems for clinicians, to those facilitating more limited interaction by the cognitively impaired.

We have considerable experience with projects for patients with chronic conditions including products and system solutions to support independent living. These include: telehealth, fall detection systems, a dysphagia treatment system, wearable sensors, patient sample collection systems and home monitoring solutions for chronic conditions.

***Presenter(s): Mr Patrick Hall, Development Director, Maddison Product Design, and Professor Jane Burridge, Professor of Restorative Neuroscience, University of Southampton***

**Presentation notes:**

- Maddison Product Design collaborates a lot with universities. They help to create prototypes.
- It is very important that the product has a user centred design. The first step is a user research to understand the user need and then create a design that will be changed if the user thinks something would be better
- 'First for stroke' project: use a 3D camera, can identify feature of the patient. The system would recognise how well they have done and give feedback.
- 'M-MARK' project: collaboration between Maddison Product Design, University of Southampton, Imperial College London, tactiq, University of Maryland and North Bristol NHS Trust.
- Mechanical Muscle Activity with Real-time Kinematics (M-MARK) is an i4i supported project developed for stroke patients. It's a novel combination of existing technologies to improve arm recovery following stroke.
- Key facts: Stroke is the 2<sup>nd</sup> most common cause of adult disability and costs the UK tax-payer £7 billion / year. Advances in rehabilitation hindered by lack of objective assessments. Intensity is key to recovery. Rehabilitation in people's homes.
- The idea was to create something wearable so it would be easier for people to use. It. The wearable product can be used to give feedback to patients to motivate them to do their rehabilitation at home. Type of feedback: angle, repetitions, exercise accuracy and smoothness. It can be used for therapy assessment and patient therapy.
- They hope that, as an i4i funded project, they will be able to bring this product to market, so patients will be able to benefit from it.
- Cost: Sensors are cheap. The software is the main part but once developed it won't cost much. They hope that the garment will be cost effective. The idea is that the product would be owned by a trust and used by many patients.
- Comment: If the product uses Bluetooth, it is certainly possible to use cheaper components.
- Suggestion: fund the product through another market e.g. tennis.
- Licensing opportunities: Have you compared one to one therapy to the platform approach? Think of it as a platform.



## Codamotion (Charnwood Dynamics Ltd)



Portable motion capture systems providing one familiar, unified environment for human motion analysis in central hospitals and decentralised locations including clinics and

patient homes. Recent academic research suggests that motion capture is an easy and accurate technique for early identification and ongoing assessment of a wide range of traumatic and degenerative neurological conditions.

**Presenter(s): Mr Jon Gamble, Global Business Manager**

### **Presentation notes:**

- Changing Economic & Demographic landscapes see NIH, EU and National Government demanding that funding delivers real-world solutions to today's healthcare challenges. Different disciplines, technologies and industries must increasingly work together. Multi-technology motion capture platforms create an environment where this can start to happen.
- The different fields have different needs. They want to capture different aspects. Motion capture touches different fields. The Codamotion Lab have evolved. Modern labs have treadmills, multi-sensors, synchronised data. Motion capture is looking at the whole person; it is cross-disciplinary.
- The role of motion capture in predicting, assessing & managing brain disease: Many research papers published over the last 10 years demonstrating that gait and posture analysis can be used as an early indicator of disease onset. System sensitivity allows very subtle "motion markers" to be identified. Upon diagnosis, motion analysis allows precise changes in the patient to be tracked on an ongoing basis. Also an increased interest in using motion capture in areas such as upper body muscular degeneration and gene therapy, for example to improve the intervention timing of drug therapies.
- The role of motion capture in rehabilitation & smart prosthetics: Allows products to be designed integrating predictive motion, that react appropriately in the real world. (Smart prosthetics, muscle stimulators for reaching tasks, etc). Helps design for improving overall comfort and wellbeing – e.g. In the case of wheelchair users. Provides an environment in which new products and services can be researched, developed, deployed and monitored on the same platform with clinical traceability. E.g. tele rehabilitation.
- Codamotion provides a unified multi-discipline-multi-technology platform where brain injury research, product development & clinical services can co-evolve. The objective is to provide an environment where different disciplines can co-exist, where people can work together, share data and ideas.

## Filisia Interfaces



Filisia Interfaces is an assistive technology company that enables people with disabilities to live their lives to the fullest. Our first product, Monoma, is a modular set of hardware controllers and a software platform with gamified rehabilitation modules. The software trains cognitive, communication and motor skills through games and musical expression. Therapists can select among a variety of interactions that train socialisation, logical reasoning, exergaming, memory and turn taking skills among others. The hardware is interoperable with training, automation and gaming applications, making it

the first connected device for people with additional needs. Monoma also collects and reports data of users' abilities.

**Presenter(s): Mr Georgios Papadakis, Founder and CEO, and Ms Eirini Malliaraki, Business Development and Operations**

### Presentation notes:

- Different types of games: for cerebral palsy rehabilitation - musical expression games. For stroke rehabilitation – logical reasoning game or research and endurance game. Nine different games are available.
- Hardware: connected device; ergonomically designed for people with motor difficulties; unprecedented customisation; dynamic sensitivity; illuminates and can take any colour.
  - Can be used to: connect to rehabilitation and training apps; connect to Skype; medication reminder; access to phone/tablets for people with motor difficulties; connect to +100 apps through IfTTT.
- Software: designed with therapists; modules for different conditions; gamifies rehabilitation exercises; multiple difficulty levels; collects and displays data on clients' physical and cognitive abilities.
  - Can be used to: train cognitive skills; train fine and gross motor skills; train hand-eye coordination; support sensory integration; musical expression; memory; games; turn-taking interactions; local reasoning; reaction to stimuli and exergames.
- Benefits:
  - Recreational tool: strengthen the sense of accomplishment; users can play together and socialise; enable the musical expression.
  - Cognitive training tool: trains orientation, memory and attention; supports sensory integration; encourages reaction to stimuli.
  - Physical rehabilitation tool: motivation to press, stretch and lift hands; speed and width of movement; supports hand-eye coordination.
  - Evaluation tool: data on the speed, strength and endurance; data on memory, reaction time, turn-taking skills.
- They started two years ago and the team has been working with 70 therapists,



- and 2 Universities (Birmingham and Goldsmith's).
- The sensitivity of the sensor can be adjusted. It is also possible to change the colour and the songs.
  - The device can track data. It tracks the exercise of the user overtime. The device is also connected with Skypw and Google Calendar.
  - Devices are not able to communicate together. It could be interesting for example to know the distance between them for example.
  - A pack of 5 would cost about £700. They are considering a membership for musical therapists. Is the price too high? Should they sell them individually?
  - As it would be easy to throw the device away, they are skid-proof.
  - They recently closed a funding round from Deepbridge Capital so they will be going to the factory and delivering their systems to early adopters.

## Inclusive Media Solutions



**Inclusive**  
Media Solutions

Inclusive Media Solutions specialise in mobile technology for people with cognitive disabilities. We provide expert advice and innovative products to a range of industries

including health, local authority, educational providers, housing associations and third sector. We are the company behind the award winning innovation Q-View, Q-View is the worlds largest library of 'how to' videos for people with cognitive disabilities. Each video is created by our industry experts and accessed through our unique QR code system.

Q-View enables people with cognitive disabilities to use there smart device to scan an item around their home and it plays a video of how to use it for example; scanning the kettle with an iPad and it plays a video of how to make a cup of coffee.

**Presenter(s): Mr William Britton, Founder and CEO**

### Presentation notes:

- **Q-View** is the worlds largest library of systematic instructional videos for people with Cognitive Disabilities. Each video plays by the user simply scanning our QR codes with any Smart Device for example; Scanning the kettle with an iPad and it plays a video of how to make a cup of coffee. This product focuses on independent living; the videos are on independent living in the home.
- The company is based in the South-West and they have started to work with health and care providers.
- They track the videos that have been watched, so they can see if there is any improvement. The idea is that the users need to watch the video less and less over time.
- Q-View for Stroke Rehabilitation Pathway:
  - 1 hospital licence: use for all patients on ward and staff training, reminder posters and 'how to' videos.
  - 10 user license: For 10 patients discharged to use at home. It is possible

- to transfer licenses between patients.
- Data for all licenses: Monthly data and yearly collation.
- £6,449 + VAT: No hidden costs – includes training and administration; Discounts available for larger packages/longer timeframe.
- **Expected Outcomes:** Improves independence; Upholds Dignity; Reasonable adjustment; Person centered approach; Can use what's in their pocket; Teaches the same technique every time; Data will show use and effectiveness, continual efficiency and financial savings; Excellent PR opportunities (leading innovation).
- Suggestion: extend this for more complicated situations.
- Suggestion: contact washing machines companies and ask them to put the QR code directly on the washing machine.

## Virtualware



Virtualware develops Healthtech products and solutions that help manage diseases and disorders in the fields of neurology, physiotherapy and psychology. These are solutions oriented at aiding the diagnosis and treatment of patients and are used by healthcare professionals around the world.

The product **VirtualRehab** is a **clinically validated** and **CE Certified** videogame platform that complements physical rehabilitation therapies. It uses motion capture technology to allow patients to augment their therapy through engaging gamified exercises that can be done in a clinical setting as well as in their own home through telerehabilitation.

VirtualRehab was developed in conjunction with neurologists and therapists to assure that it meets the requirements of both patients and rehabilitation professionals. VirtualRehab is currently being used in various hospitals around the UK as well as rehabilitation centres throughout Europe, Asia, the Middle East and Latin America.

**Presenter(s): Mr David Fried, Director of International Business Development**

### Presentation notes:

- Virtualware: Medical Device manufacturer that develops Healthtech products that assist in the diagnosis and treatment of diseases and disorders in the fields of neurology, physiotherapy and psychology.
- VirtualRehab is a clinically validated and CE Certified cloud-based rehabilitation platform launched in 2012 which complements physical rehabilitation therapies. It uses the motion capture technology of the Microsoft Kinect sensor and Leap Motion controller to turn patients into the stars of customized gamified exercises.
- Conditions treated:
  - Neurodegenerative Diseases: Multiple Sclerosis, Parkinson's Disease,

- Amyotrophic Lateral Sclerosis, Alzheimer's Disease
- Neuromuscular Disorders: Dystrophies, Myopathies, Amyotrophies, Neuropathies
- Neurovascular Disorders/Trauma: Stroke, Traumatic Brain Injuries
- Mobility: Geriatrics care
- Others: Diabetes, Sport injuries.
- Prof Valerie Pomeroy from University of East Anglia is helping them to develop the product.
- They take therapeutic movement and gamified them.
- There are 20 different games. Some games measure how quick was the reaction. They are working on another exercise that will measure the quality of the movement.
- The data are saved on a platform. On the platform, there is a stats mode, so therapists can see how the patient is doing. It is possible to export the results into an Excel file.
- They are currently selling it all over Europe, Middle East and Asia.
- They are going to add an assessment module.
- Patients have to do it through a therapist.
- Price: £1400 for the subscription and £350 for the device.
- What about creating competitions? Competitive games could improve recovery. Another idea would be to create cooperative games.