

Slide 1

IPAC, PEI, 19th June 2017

Establishing proof of concept for a tablet-based staff training tool to help in the prevention and control of healthcare associated infections (HAIs)

 The Glasgow School of Art

 Robert Gordon University, Aberdeen

 NHS Grampian

 NHS Lanarkshire

 GAMA Healthcare Ltd

 Arts and Humanities Research Council

Slide 2

research leaders

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Senior Research Fellow, HAIVAIRN, The Glasgow School of Art

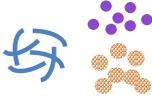
Slide 3

overview of presentation

1. Outline of the issues
2. The initial Visualising the Invisible (VisInVis) project
3. visionOn: a tablet-based visualisation tool for training staff re healthcare associated infections (HAIs)
4. HAIVAIRN: Healthcare associated infection visualisation and ideation research network

Slide 4

context: hospital service ecosystem

		
people - doctors, nurses, cleaning staff - their everyday roles and tasks – plus patients & visitors	pathogens - norovirus, C diff, MRSA - location, survival, transmission	environment – <i>hard</i> hospital beds, bedside areas, curtains, taps, toilets, flooring...; <i>soft</i> - air currents, humidity, temperature ..

Slide 5

The issues

- Pathogens under normal circumstances are invisible. How do people (hcws) conceive of pathogens within the context of clinical practice?
- Use of visuals in IPC often taken for granted. Very little systematic R&D
- Much opportunity for the development of more dynamic visualisations to explain and educate e.g. to convey new microbiological data on risk-in-context such as hand touch sites and pathogen transmission
- Much opportunity for related evaluation of what works and how in particular contexts
- Tablet-based computers are convenient and now commonplace

Slide 6

visualising the invisible

the visualising the invisible study

Phase 1: (see poster T10)

- If “seeing helps believing”, can dynamic approaches to visualisation help us to prevent and control HAIs?
- Do healthcare workers envisage pathogens in their own mind’s eye when they go about their work?
- What current ways of representing pathogens and their consequences are most meaningful to these workers?
- How might visualisations best convey new data such as who touches what, and what grows there?

Slide 7

visualising the invisible

design

- Phase 1: Workshop 1 exploring these issues with 12 healthcare staff and 2 patient representatives (also pilot with 6 nurses/midwives)
- Phase 2: development and evaluation of visualisation prototypes (over 200 healthcare staff)

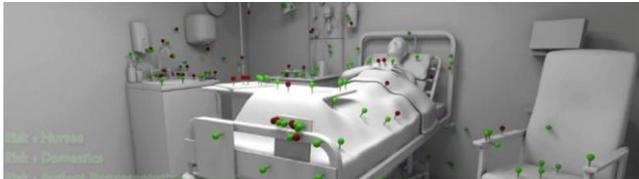
Slide 8

visualising the invisible

moving forward

djcad **RGU** **SCHOOL OF DESIGN**
Centre of Excellence for Design in Glasgow **THE GLASGOW SCHOOL OF ARCHITECTURE**

Vis-Invis: Recommendation: "Further development of the concept prototypes for staff training would be beneficial if the visualisations could be augmented with specific training information and scenarios centred around the prevention of HAIs."



3D visualization of a hospital room with a patient in bed, surrounded by numerous small green and red markers representing data points or infection hotspots.

Slide 9

visionOn a tablet-based visualisation tool for training staff in healthcare associated infections (HAIs)

 SCHOOL OF DESIGN
THE GLASGOW SCHOOL OF ARTS

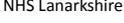
 The Glasgow School of Art

 **RGU**

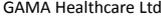
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 **NHS**
Grampian

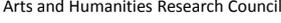
 **NHS**
Lanarkshire

 NHS Lanarkshire

 **GAMA**
HEALTHCARE LTD

 GAMA Healthcare Ltd

 **Arts & Humanities**
Research Council

 Arts and Humanities Research Council

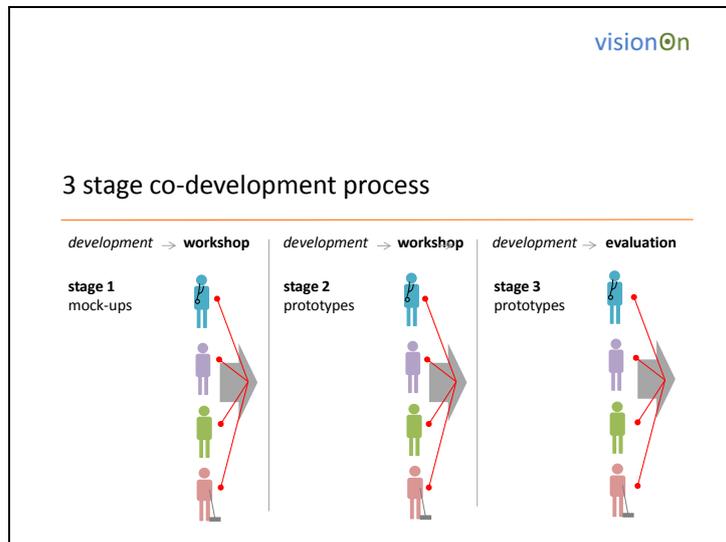
Slide 10

 visionOn

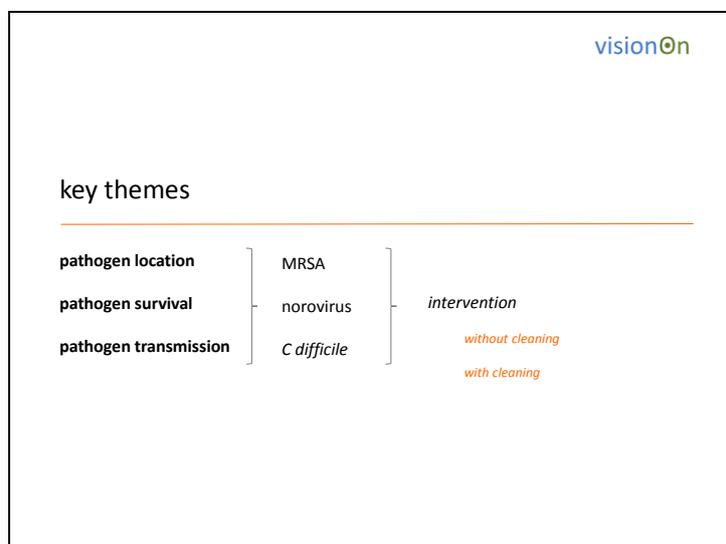
using visualisation

Could a visually-oriented interactive tool raise awareness of location, survival and transmission of pathogens in the ward environment and assist training in IPC across job roles by reinforcing the 'why' behind IPC procedures?

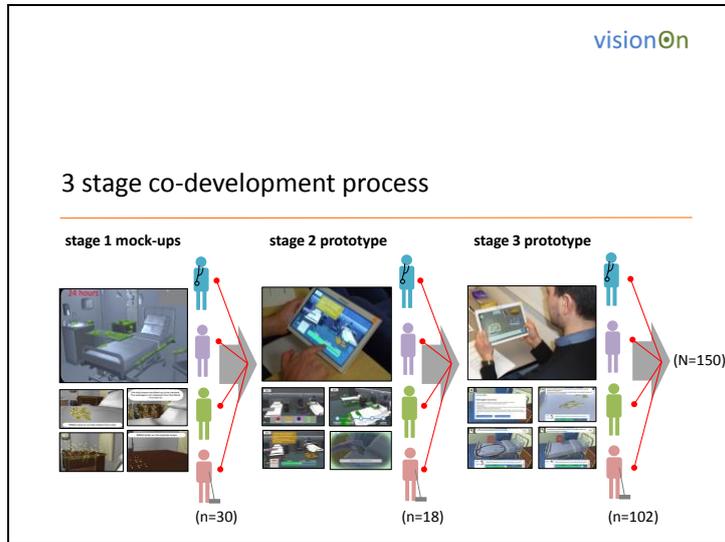
Slide 11



Slide 12



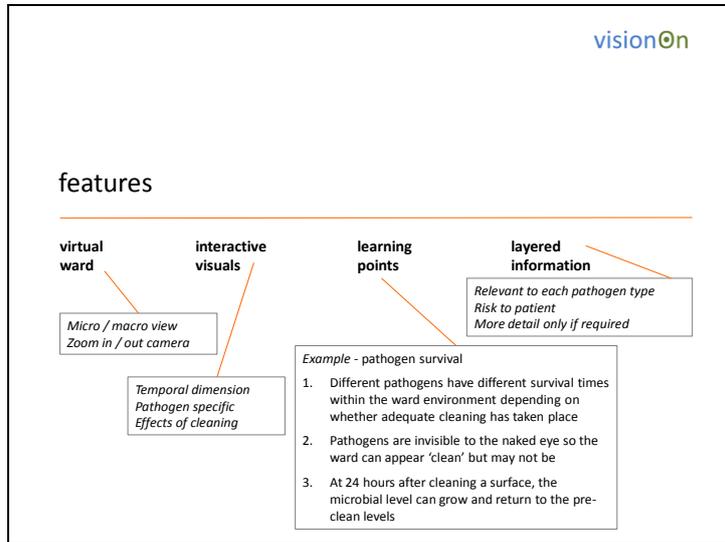
Slide 13



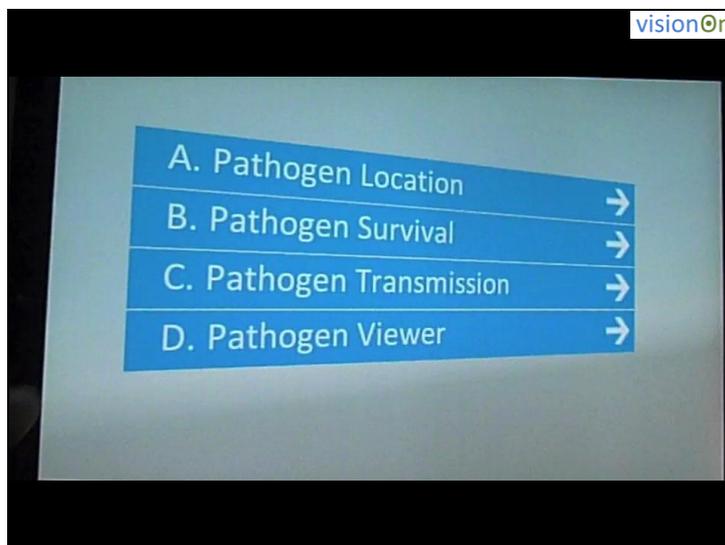
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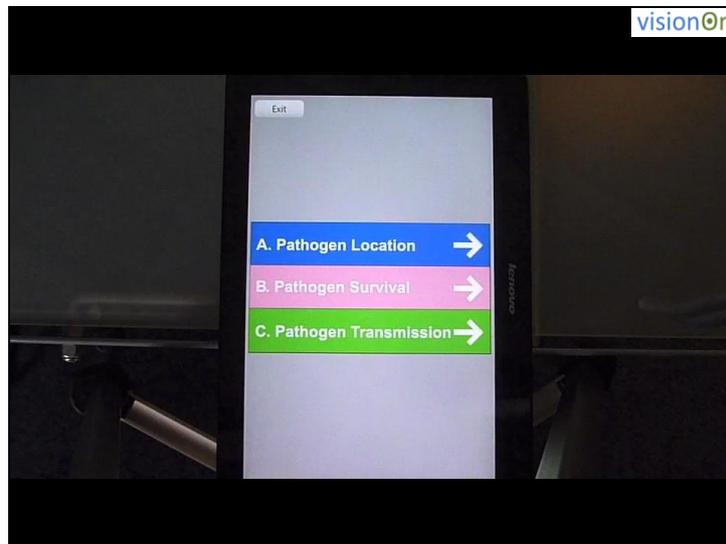
Slide 15



Slide 16



Slide 17



Slide 18

visionOn

3 stage participative process

Stage	1	2	3
domestic	N = 10	N = 3	N = 24
nurses	N = 12	N = 9	N = 51
doctors	N = 4	N = 6	N = 6
other (mixed)	N = 4		N = 16
RGU staff			N = 5
Stage totals	N = 30	N = 18	N = 102
Overall total		N = 150	

Lanarkshire

workshop 1 workshop 2

Grampian

stand-alone
evaluation

ARI

Elgin

Cornhill

RGU

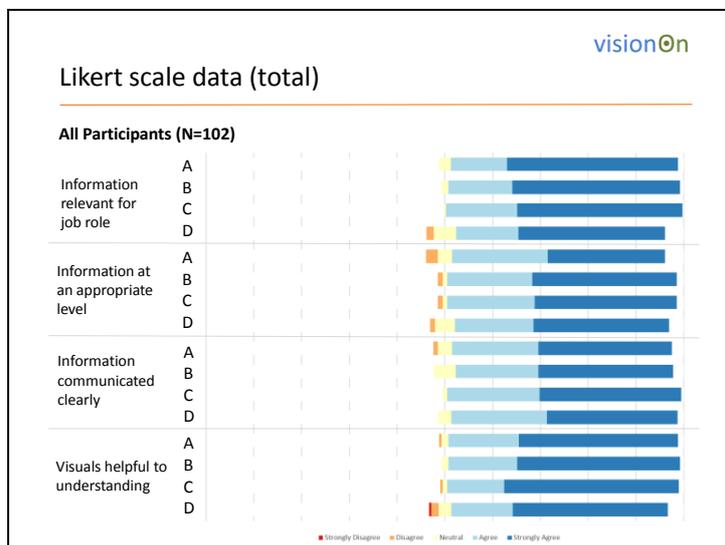
Slide 19

visionOn

initial findings

- Visualisations were **engaging** and **supportive of different learning styles**
- Offered staff a **new perspective on pathogens**, being able to **'see'** them contextualised in the virtual ward, making them **seem more real**
- Information **relevant for different staff cohorts, with a mix of experience levels**
- **Increased participants' awareness about pathogens by explaining 'why'** (*through dynamic visuals and information*) **IPC procedures should be followed**
- Reinforced understanding of **how HAIs occur**

Slide 20



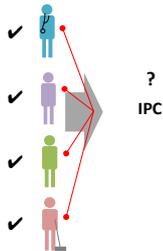
Slide 21

visionOn

question

Will the tool help improve adherence to IPC protocols?

Awareness ✓
Understanding ✓
Adherence ?



The diagram illustrates a process flow. On the left, four stylized human figures are arranged vertically: blue, purple, green, and red. Each figure has a small black checkmark to its left. Red lines connect each figure to a central grey arrow that points to the right. To the right of the arrow is a question mark above the text 'IPC'.

Slide 22

visionOn

next

publication of detailed findings in preparation

stage 4 prototype embodying 102 x stage 3 feedback datasets

development of new 'modules'

in-ward feasibility trial



The image shows a tablet screen. The top part of the screen displays a 3D virtual environment of a hospital ward with beds, desks, and chairs. Below the environment, there is a list of tasks under the heading 'Epidragon survival'. The tasks are numbered 1 through 5. At the bottom of the screen, there are two buttons: 'initial without cleaning' and 'initial with cleaning'.

Slide 23

HAIVAIRN

HAIVAIRN (see Poster M9)

**Healthcare associated infection visualisation and ideation research network
2016 – 2018 (AHRC funded)**

***How can we better address the problem of healthcare associated infections (HAIs)
through visualisation-related ideation and applications?***

Widening out interdisciplinary involvement and collaboration

See gateway website for more information on all these projects: <http://visionon.org>

Slide 24

acknowledgements

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- visionOn AHRC Follow-on Fund for Impact and Engagement AH/M00628X/1
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