

Faculty of Design

#### <sup>2014</sup> How easily understandable are complex multi-layered system maps

Holmen, Alfred Clatworthy and Jun, Gyuchan Thomas

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# Complex multi-layered system maps Does zoom in/out interaction help for better systems understanding?

Alfred Clatworthy Holmen Thomas Jun Loughborough Design School Loughborough University, UK





# Background



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## System/Process Maps



# Mapping/Modelling allows us to

- Identify complexity
- Aid understanding
- Improve communication



# **Basic elements of modelling methods**

















## Study 1–Perceived ease of use and usefulness





#### 1. Stakeholder diagrams



# 2. Information diagrams



#### 3. Process content diagrams



#### 4. Flowcharts



# 5. Swim lane activity diagrams



# 6. State transition diagrams



#### 7. Communication diagrams



## 8. Sequence diagrams



## 9. Data flow diagrams



# **10. IDEF0**



# **Diagram Acceptance**

![](_page_24_Figure_1.jpeg)

(Davis, F.D., 1989)

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![](_page_24_Picture_4.jpeg)

# **Findings**

![](_page_25_Figure_1.jpeg)

Ease of use

Usefulness

(Jun, G., et. al., 2010)

# Findings

• A single diagram cannot effectively capture the full

range of perspectives present in **complex healthcare** 

![](_page_26_Figure_3.jpeg)

![](_page_27_Figure_0.jpeg)

# Study II – Choice and usage

![](_page_28_Picture_1.jpeg)

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![](_page_28_Picture_3.jpeg)

# **Diagram Choice and Usage Model**

![](_page_29_Figure_1.jpeg)

# **Diagram Choice and Usage Model**

![](_page_30_Figure_1.jpeg)

# **Study III - Workshops**

![](_page_31_Figure_1.jpeg)

![](_page_31_Picture_2.jpeg)

# Issues

- Not enough time for systems mapping
- Inconsistent and uneven participation
- Potential of using online engagement
- How to present complex system maps?

![](_page_32_Picture_6.jpeg)

![](_page_33_Picture_0.jpeg)

![](_page_33_Figure_2.jpeg)

Follow this challenge 4:

413 followers

![](_page_33_Picture_5.jpeg)

in 8+ 💌

How might we rapidly equip and empower the care community to fight Ebola?

![](_page_33_Figure_8.jpeg)

![](_page_34_Picture_0.jpeg)

The first iteration of the NHS gather submission phase has now completed and you can't add new ideas. You can still prioritise, debate and comment on all ideas and we encourage you to participate.

![](_page_34_Picture_2.jpeg)

The debate and prioritization phase will continue and meanwhile we will present people's views to the NHS board. Reflect on the process so far, what we have learned and how we can improve. All ideas, points and comments that have been put forward during this test session will be carried over through the different phases of the gather space and will not be lost.

We will keep you up to date via the NHS Citizen blog (nhscitizen.demsoc.org), our mailing list and twitter.

#### **RANDOM IDEAS**

	Physical & Mental Health should be assessed together.	Vote	Sign in with Facebook
	The NHS spends a millions on drugs for things like hypertension, asthma, epilepsy, depression, anxiety, stroke, heart, etc Some of these conditions in the early stages, might be due to what is happening in that patient's life	DOWN 2	Sign in with email
	at that time, i.e. Unemployment, bereavement, worry over a family member, finances, etc	Tweet 0	Instructions
-	15300652489_ebb2d4ipg * 🔎 15300646659_dd38ddipg *		

http://www.nhscitizen.org.uk/

# **Study IV- Interactive zoom in/out**

![](_page_35_Figure_1.jpeg)

![](_page_36_Figure_0.jpeg)

![](_page_36_Picture_2.jpeg)

![](_page_37_Figure_0.jpeg)

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![](_page_37_Picture_2.jpeg)

# **Evaluation – Performance and preference**

- Time taken till participants felt they had a good understanding of the map contents
- Usability Questionnaire
  - Easily understandable (ease of use)
  - Helpful in understanding and communicating how the system works (usefulness)
  - Enjoyable to use the map
- Semi-structured interviews

# **Results - Time**

	Ave	Std	Max	Min
Zoom in/out	6 min	55 sec	8 min	5 min
interaction	57 sec		56 sec	52 sec
No	7 min	49 sec	8 min	6 min
interactions	27 sec		54 sec	12 sec

![](_page_39_Picture_3.jpeg)

# **Results - Questionnaire**

1. Easily understandable

2. Helpful in better understanding and communicating

![](_page_40_Figure_3.jpeg)

![](_page_40_Figure_4.jpeg)

# **Results-Interviews**

	Positive	Negative	Etc
Zoom in/out interaction	Fun and easy Interesting	Daunting and overwhelming Hard to control	Top-down vs bottom-up Clearer instruction
No interactions	Easy and useful	Complicated, unclear and overwhelming	Better use of colour

![](_page_41_Picture_3.jpeg)

# Conclusion

- Interactive zoom in/out map took less time in understanding
- Interactive zoom in/out map was rated better in the interview (more fun)
- However, little difference between them in terms of perceived ease of use and usefulness

![](_page_42_Picture_4.jpeg)

![](_page_42_Picture_5.jpeg)

# **Diagram Choice and Usage Model**

![](_page_43_Figure_1.jpeg)

![](_page_43_Picture_3.jpeg)

# **Thank You!**

![](_page_44_Figure_1.jpeg)

Alfred Clatworthy Holmen Thomas Jun, g.jun@lboro.ac.uk Loughborough Design School Loughborough University, UK

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![](_page_44_Picture_4.jpeg)