1 Summary of development, findings, and question design for a shop floor digital maturity survey

2 Proposed 8 minute survey using top-rated questions from each measurement theme

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SURVEY AIMS

The Clinician DMA uses functional end-user measures to identify actionable problems with EHR and IT

01
Measure active EHR pain areas that have local or national actionability

02
Design robust and objective indicators for each function, for quality / safety of care

03
Match multi-level assessment to measure digital implementation gap

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DEVELOPMENT METHODOLOGY

What is most relevant for shop-floor clinicians in 2022/23?
We engaged **150 doctors, nurses, and pharmacists** from across the UK to discover the most important digital themes related to user experience, quality, and safety of care

ROLL-OUT

» We will roll-out nationally to secondary care Trusts
» **Helped by the BMA, the CQC, our network of societies, professional colleges, and social media campaigns**

PILOT

» Survey will be structured to suit stakeholder requirements, and tested in clinician subgroups
» Validate against existing benchmarks, evaluate response survey structure

DELPHI

» Question design in collaboration with team of EHR usability experts
» Delphi panel reviewed and iterated on proposed questions to reach consensus on core question-set

WORKSHOPS

» 10 workshops held via clinical and hospital networks, national societies, and professional colleges for nurses, pharmacists, doctors
» Workshops discovered key digital functions, and impacts on quality and safety of care
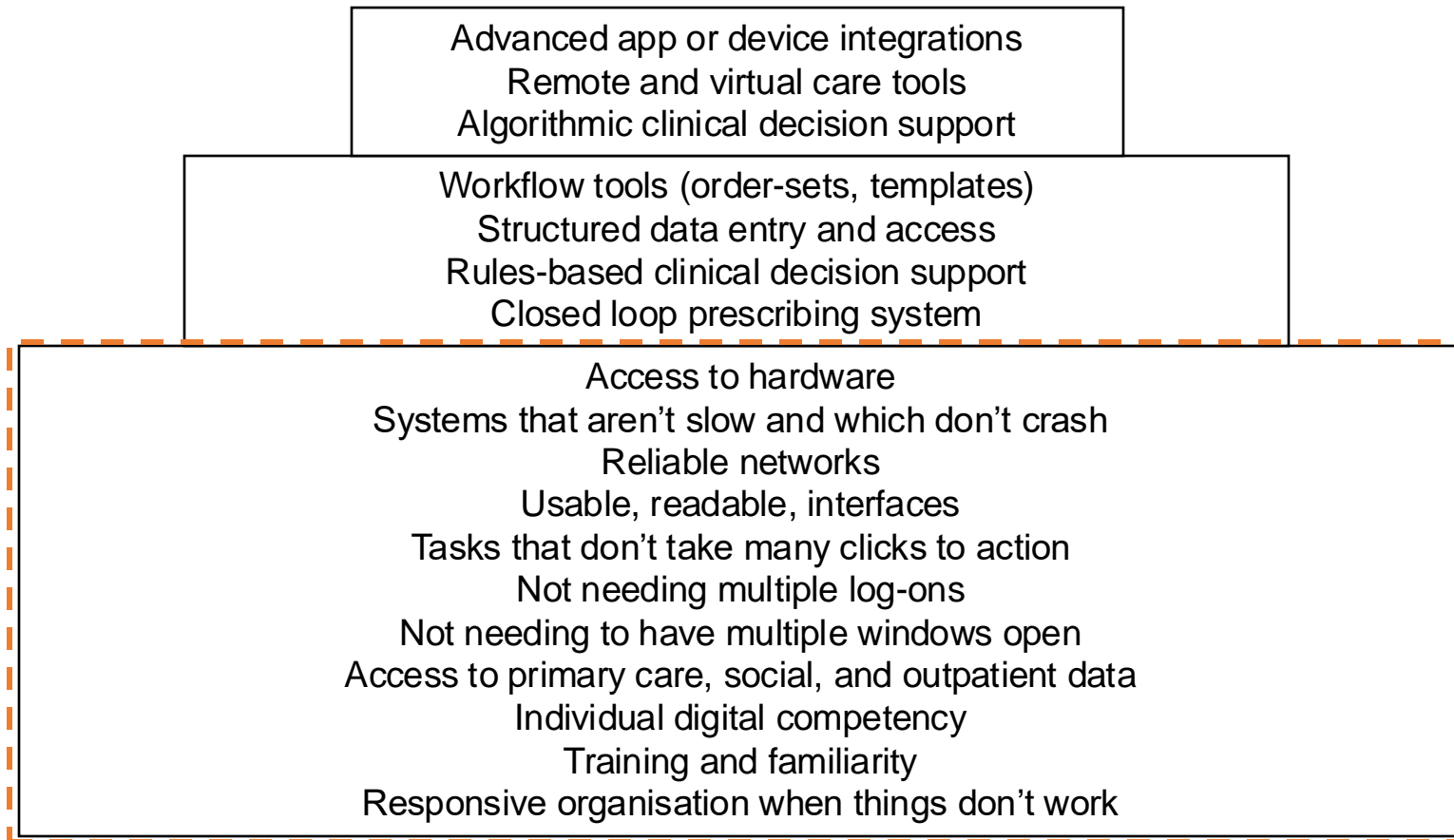
Q2 2023 and onwards

Q1 2023

May 2022 – Q3 2022

Aug 2021 - April 2022

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A DIGITAL HIERARCHY OF NEEDS

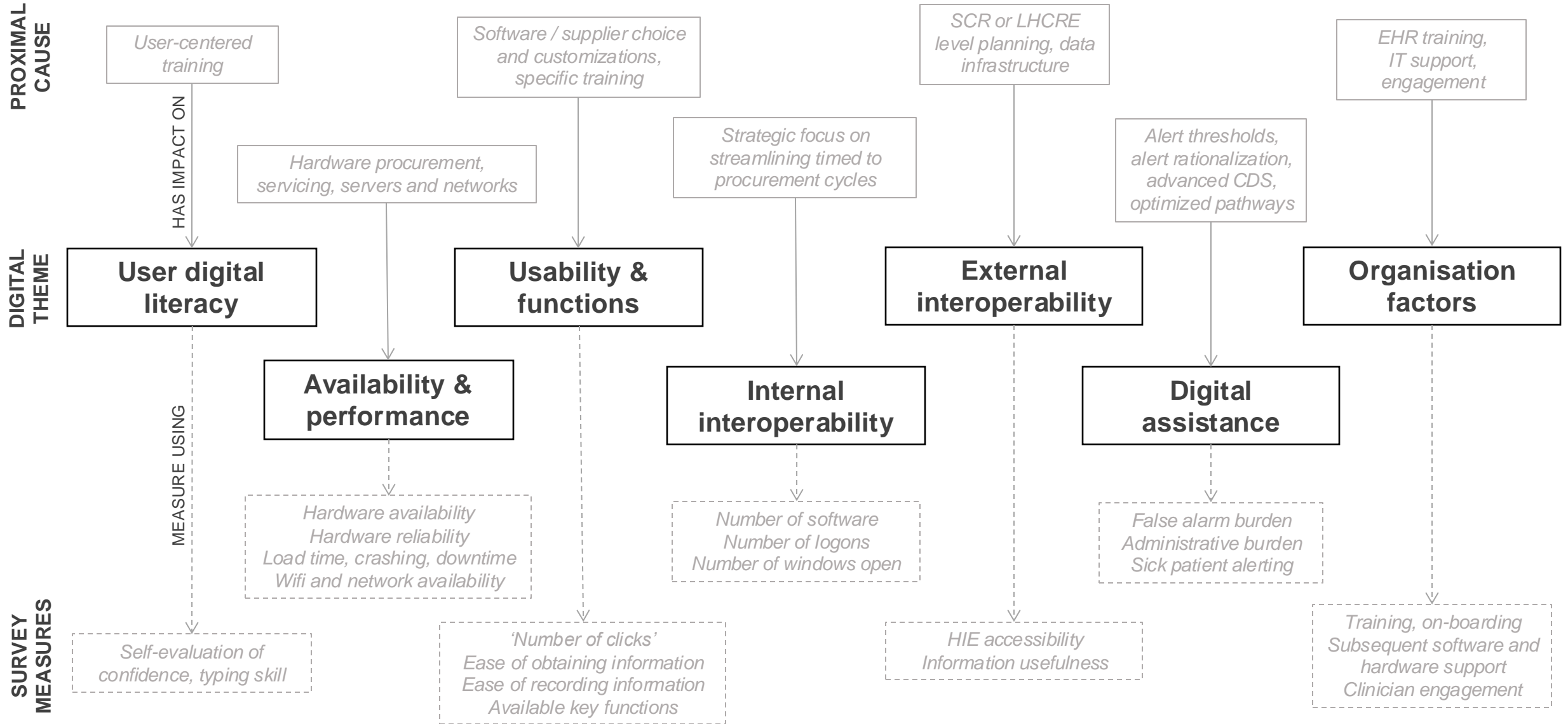*We found that poor basic functionality destroys clinical efficiency, and should be measured and addressed first*

Advanced app or device integrations
Remote and virtual care tools
Algorithmic clinical decision support

Workflow tools (order-sets, templates)
Structured data entry and access
Rules-based clinical decision support
Closed loop prescribing system

Access to hardware
Systems that aren't slow and which don't crash
Reliable networks
Usable, readable, interfaces
Tasks that don't take many clicks to action
Not needing multiple log-ons
Not needing to have multiple windows open
Access to primary care, social, and outpatient data
Individual digital competency
Training and familiarity
Responsive organisation when things don't work

Year 1 – measure this layer first

These add value, but only if bottom tiers are satisfied

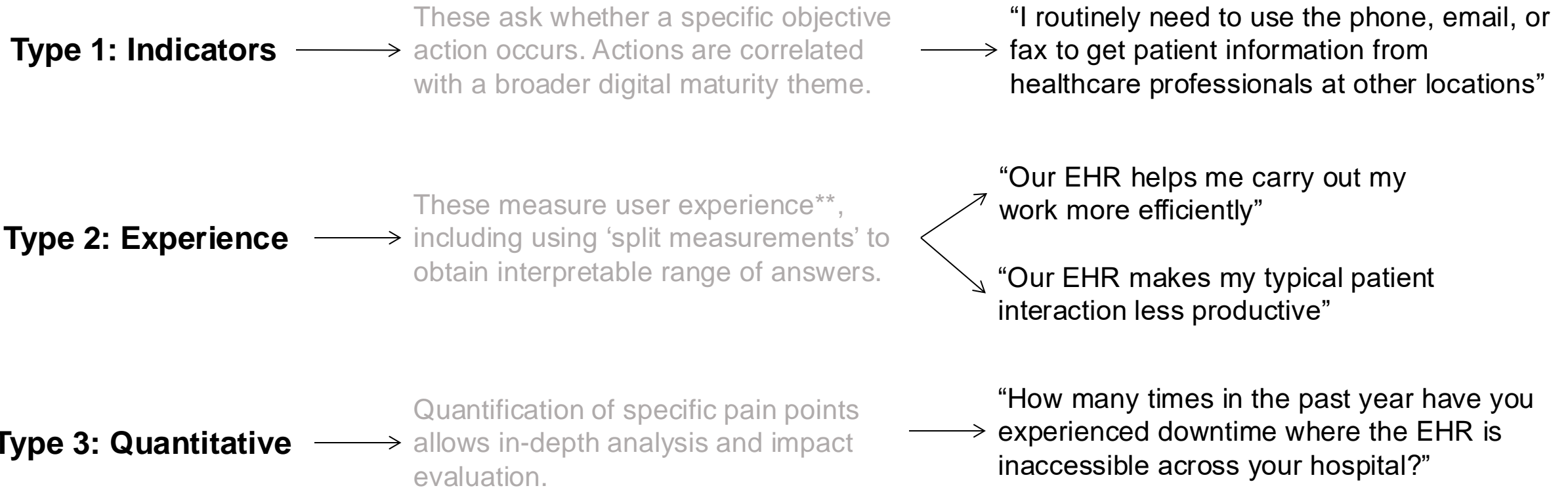**Problems here actively harm, and prevent upper tiers from being useful**

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CLINICIAN DIGITAL MATURITY THEMES

We identified seven measurable themes with addressable causative factors

PROXIMAL CAUSE

User-centered training	Software / supplier choice and customizations, specific training	SCR or LHCRE level planning, data infrastructure		EHR training, IT support, engagement

Hardware procurement, servicing, servers and networks

Strategic focus on streamlining timed to procurement cycles

Alert thresholds, alert rationalization, advanced CDS, optimized pathways

HAS IMPACT ON

DIGITAL THEME

User digital literacy	**Usability & functions**	**External interoperability**	**Organisation factors**

MEASURE USING

Availability & performance	**Internal interoperability**	**Digital assistance**

SURVEY MEASURES

Hardware availability
Hardware reliability
Load time, crashing, downtime
Wifi and network availability

Number of software
Number of logons
Number of windows open

False alarm burden
Administrative burden
Sick patient alerting

Self-evaluation of confidence, typing skill

'Number of clicks'
Ease of obtaining information
Ease of recording information
Available key functions

HIE accessibility
Information usefulness

Training, on-boarding
Subsequent software and hardware support
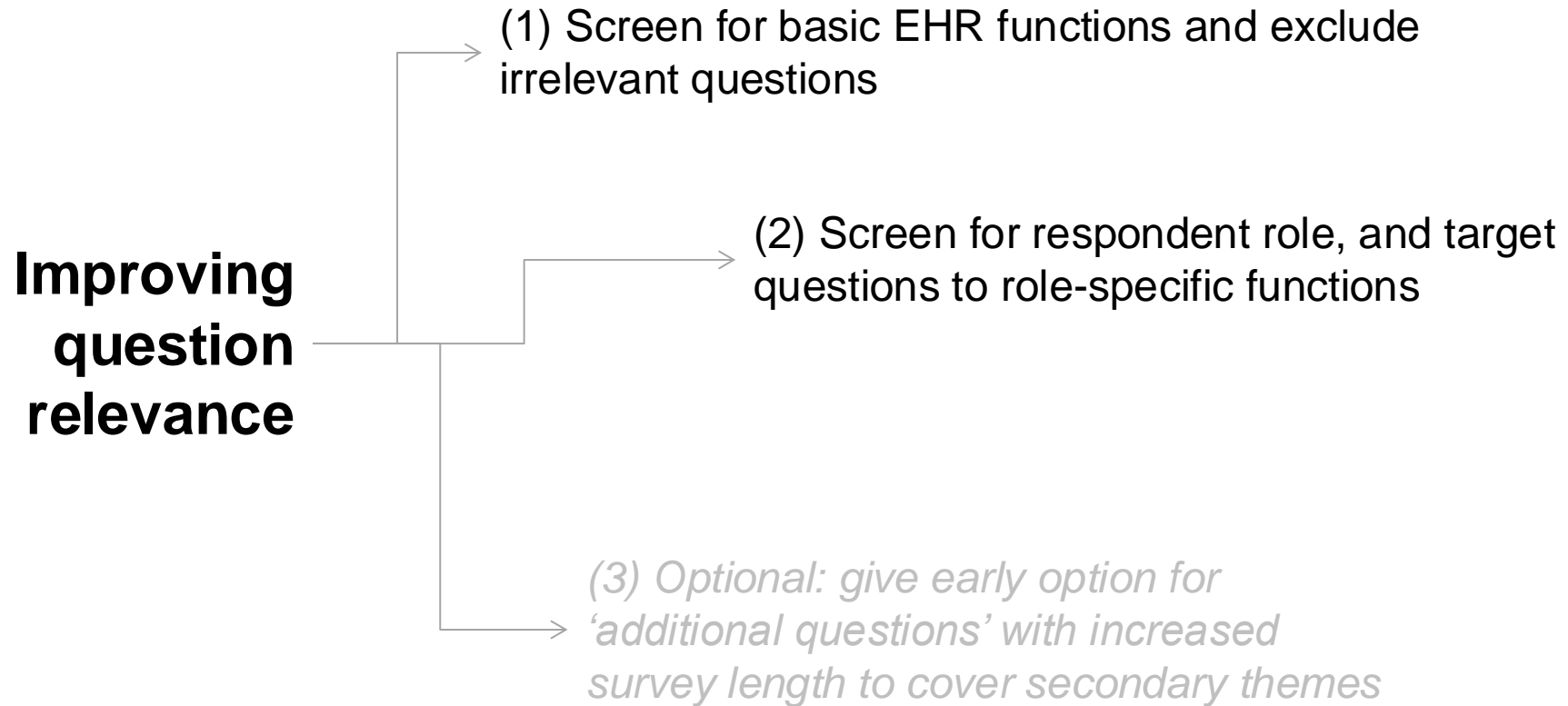Clinician engagement

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QUESTION TYPES

Our Delphi and question design panel helped create three main question types for maximising objectivity, and for quantifying 'pain points'.

Type 1: Indicators ⟶ These ask whether a specific objective action occurs. Actions are correlated with a broader digital maturity theme. ⟶ "I routinely need to use the phone, email, or fax to get patient information from healthcare professionals at other locations"

Type 2: Experience ⟶ These measure user experience**, including using 'split measurements' to obtain interpretable range of answers. ⟶ "Our EHR helps me carry out my work more efficiently"

"Our EHR makes my typical patient interaction less productive"

Type 3: Quantitative ⟶ Quantification of specific pain points allows in-depth analysis and impact evaluation. ⟶ "How many times in the past year have you experienced downtime where the EHR is inaccessible across your hospital?"

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QUESTION FILTERS

To reduce survey burden, we minimise the number of questions
presented by tailoring questions to role using an initial screening stage**.

Improving question relevance

(1) Screen for basic EHR functions and exclude irrelevant questions

(2) Screen for respondent role, and target questions to role-specific functions

(3) Optional: give early option for 'additional questions' with increased survey length to cover secondary themes

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ADDITIONAL FINDINGS

We asked Delphi participants (n=56) additional questions to guide survey design and roll-out

(1) If a survey is described as taking '**less than 12 minutes**', 63% of participants would immediately not consider taking part.

(2) If described as '**less than 8 minutes**', 75% would consider taking part.

(3) '**Making voices heard**' and '**clear path to make change**' are main drivers for participation in a survey

(4) 92% would complete a survey if encouraged through word of mouth by a colleague. 60% would complete the survey if encouraged by a trusted national clinical organisation or society. Other sources averaged <30%.

(5) 85% would be happy to complete a national NHS sanctioned digital survey every year, if results are used centrally.

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USER INFORMATION, SCREENING, DIGITAL LITERACY: 1.5 minutes

1a – What national region do you work in?
[list]

1b – What NHS Trust do you work in?
[list]

1c – What is your role at work?
[nursing, doctor or clinical practitioner, pharmacist, AHP, other]

1d – What specialty area do you work in?
[white space]

1e – Does your hospital have an electronic health record for documenting and/or reading clinical notes?
[yes/no]

1f – If yes, what is the name of this system?
[white space]

1g – Within your specialty, do you use a separate EHR system for specialist patients? If this is the same as your main EHR, select No.
[yes/no]

1h – If yes, what is the name of this system?
[white space]

1i – Do you routinely encounter paper clinical notes being used anywhere in your hospital?
[yes/no]

1j – In your day-to-day work, do you use electronic prescribing or an electronic medication chart?
[yes/no]

1k – In your day-to-day work, do you encounter electronic alerts, flags, or an early warning system for sick patients?
[yes/no]

These questions measure your own confidence with using computers and software. Please answer on a scale of strongly disagree to strongly agree.

1l – I am confident in my typing skills
[Likert]

1m – I am confident with using computers in general
[Likert]

1n – I am confident with using our hospital's EHR system
[Likert]

[screen – end survey if no EHR systems]

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AVAILABILITY & PERFORMANCE: 1-1.5 minutes

2a – In the past year, how many times have you experienced downtime where the EHR is not functional?
[none, once, twice, three times or more]

2b – What is the longest period of **continual** downtime you have experienced in the past year?
[less than an hour, a few hours, an entire shift, several shifts]

Please answer the following questions on a scale of strongly disagree to strongly agree.

2c – There are enough computers to access the EHR whenever required
[Likert]

2d – I can easily print documents/labels/wrist-bands whenever required
[Likert]

2e – Waiting on slow IT systems frequently delays my clinical work
[Likert]

2f – There is good Wi-Fi coverage for clinical tasks
[Likert]

2g – I often stay late at work because of digital problems (such as slow software, computers, or access to printers)
[Likert]

2h – In the past month, my response to a sick or deteriorating patient has been hindered due to a problem with EHR or a computer
[Likert]

USABILITY & FUNCTIONS A: 1-1.5 minutes

Please answer the following questions on a scale of strongly disagree to strongly agree.

3a – Our EHR helps me carry out my work more efficiently
[Likert]

3b – Our EHR makes my typical patient interaction less productive
[Likert]

3c – It takes too many unnecessary mouse clicks to perform my day-to-day tasks
[Likert]

3d – It is easy to find the information I need within a patient's record
[Likert]

3e – I can write my clinical notes while viewing relevant clinical information at the same time
[Likert]

3f – I can easily find and prescribe the correct medications electronically
[Likert] [screen – drug chart/doctors]

3g – I can easily administer the correct medications using electronic medication charts
[Likert] [screen – drug chart/nurses]

3h – I need to frequently switch between interfaces to complete my clinical medication checks or reviews
[Likert] [screen – drug chart/pharmacists]

3i – When viewing test results, abnormal results are clearly highlighted
[Likert]

3j – I can easily tell a patient's resuscitation or escalation status from our EHR
[Likert] [screen – doctors/nurses]

3k – Our EHR system gives me awareness of which patients in a ward (or around a hospital) are sick.
[Likert] [screen – doctors/nurses]

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USABILITY & FUNCTIONS B: 1 minute

3l - Please rate each of the following EHR functions** on how useful they are for your day-to-day work.
[I don't have this/don't use this, I use this but it's not helpful, no strong opinion, I find this very helpful]

Electronic ordering of tests and investigations

Electronic referrals to other teams

Electronic patient handover information

Order-sets or order templates

Discharge summaries automatically populated with clinical information

Structured forms or templates for writing patient notes

Being able to customize your EHR layout

Access to EHR on a phone or tablet

Voice dictation of patient notes onto EHR

**These functions were rated by more than 80% of Delphi panellists as being important for workflow efficiency (out of 20 separate EHR functions)

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INTERNAL INTEROPERABILITY: <1 minute

4a - How many log-on accounts do you need to perform your day-to-day work (for example, you may have separate accounts for taking notes, prescribing, and radiology software)
[single log-on, 2, 3, 4 or more]

Please answer the following questions on a scale of strongly disagree to strongly agree.

4b – I have access to a summary view that displays the most important information I need from across the patient record
[Likert]

4c – I have to constantly swap between different programs on a computer to access everything I need
[Likert]

4d – Our EHR lets me access electronic outpatient letters and/or notes
[Likert]

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EXTERNAL INTEROPERABILITY: 1 minute

A "Local Care Record" is an electronic system for viewing patient records from primary care or from other hospitals.

5a – Do you use a Local Care Record?
[Yes/No]

Please answer the following questions on a scale of strongly disagree to strongly agree.

5b – Accessing a Local Care Record is an essential part of my day-to-day work
[Likert] *[screen – 5a]*

5c – My access to a Local Care Record has improved quality of care for my patients
[Likert] *[screen – 5a]*

5d – My access to a Local Care Record has reduced unnecessary repeat tests for my patients
[Likert] *[screen – 5a]*

5e – I routinely need to use the phone, email, or fax to get patient information from healthcare professionals at other locations
[Likert] *[screen – 5a]*

5f – I am able to view patients' social care records electronically
[Likert]

5g – My specialty EHR system enables access to patient notes from the same specialty system in other hospitals
[Likert] *[screen – yes to specialty EHR system]*

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DIGITAL ASSISTANCE: <1 minutes

Please answer the following questions on a scale of strongly disagree to strongly agree.

6a – Automatic alerts have helped me spot potentially dangerous prescribing or medication errors
[Likert] [screen – drug chart/doctors/nurses/pharm]

6b – When using electronic medication/prescribing systems, I frequently receive alerts that are incorrect or not useful
[Likert] [screen – drug chart/doctors/nurses/pharm]

6d – Automatic electronic alerts for sick patients help me respond in a timely fashion
[Likert] [screen – electronic obs/doctors/nurses]

6e – In my experience, I receive inappropriate electronic alerts that reduce my capacity for seeing genuinely sick patients
[Likert] [screen – electronic obs/doctors]

6f – In my experience, I receive too many automatic alerts for sick patients who do not need escalation
[Likert] [screen – electronic obs/nurses]

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ORGANISATION FACTORS: <1 minutes

7a – I was provided with the following training to use my EHR. Tick all that apply.
[A: No training; B: eLearning course; C: Hands-on computer lab session; D: Training with a peer who uses the system in practice]

Please answer the following questions on a scale of strongly disagree to strongly agree.

7b – The training I received made me confident in using our EHR for my day-to-day work
[Likert]

7c – My organisation quickly repairs or replaces broken devices
[Likert]

7d – I trust our support department to quickly sort out my IT problems
[Likert]

7e – My organisation acts on clinician feedback about EHR and computer systems
[Likert]

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FINAL: <1 minutes

8a – What are the main changes you would make to improve your EHR or IT experience (optional)
[white space]

8b – Have you ever been concerned about patient safety as a result of EHR or IT systems (optional)**?
[yes/no]

8c – If yes, you can optionally describe safety issues below. Please do NOT enter patient identifiable information. This survey is NOT for incident reporting. If you wish to report an incident, please do so via your organisation.
[white space]

**Question structure designed with CQC panel.   NCIC

CORE TEAM

Dr. Joe Zhang – Project lead
Intensivist, Wellcome Trust Clinical Research Fellow, FFCI

Dr. Harpreet Sood – Co-lead
NHS GP, HEE Non-Exec Director, ex-Assoc CCIO NHS-E, FFCI

Dr. Sanjay Budhdeo – Co-lead
Neurologist, Wellcome Trust Clinical Research Fellow, ex-CQC, FFCI

Angela Burgin – Pharmacy lead / RPS link
Senior Pharmacist, HEE Digital Transformation Fellow, RPS Digital Forum

Dr. Kieran Zucker – FCI lead
Oncologist, Clinical Lecturer Digital Health, FFCI & Faculty of Clinical Informatics Council

Dr. Latifa Patel – BMA lead
Physician, BMA chair of representative body and Digital Lead

Sam Neville – Nursing co-lead / RCN link
Chief Nursing Information Officer, Mid and South Essex Hospitals, RCN eHealth forum

Simon Noel – Nursing co-lead / RCN link
Chief Nurse Informatics Officer, Oxford University Hospitals, RCN eHealth Forum