

The process of technology selection, procurement and implementation to help reduce HCAIs – Case study of 12 NHS Trusts

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Study of 12 NHS Trusts across England



Research Objectives

To understand

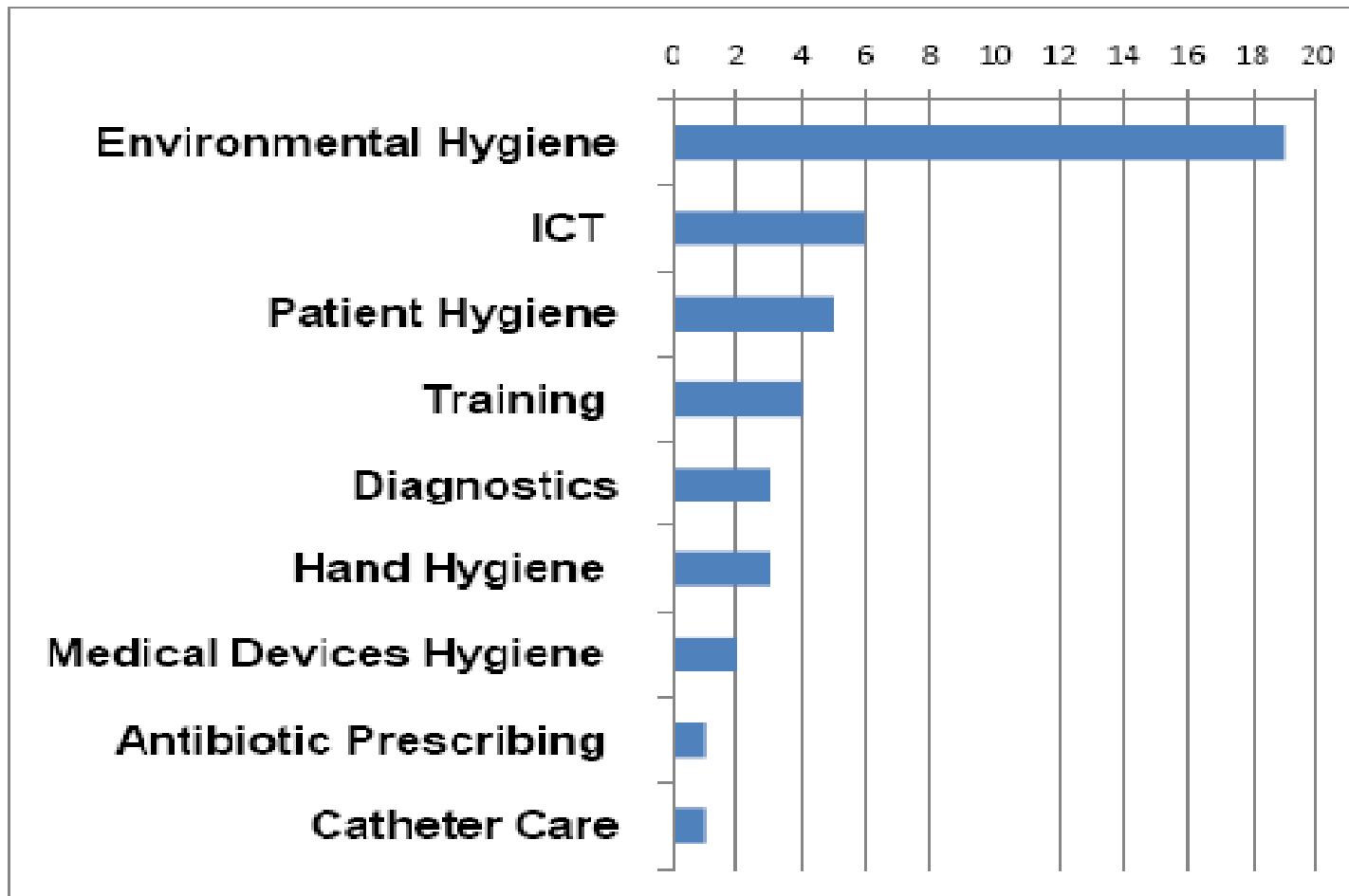
- (a) **Decision making:** how the decision to spend the £150,000 has been reached? who was involved ? which factors affected the choice of technology?
- (b) **Procurement:** Which process of procurement was used? Was this smooth or protracted?
- (c) **Adoption:** Was the technology implemented? Who was involved in implementation? How did trusts define successful implementation?

Methodology

- “ Comparative case studies . pre-defined sample of 12 NHS Trusts
- “ Qualitative - semi-structured interviews: over 100
- “ Secondary data
- “ Process research: May 2009 . August 2010
- “ Sample: Multi-level, multi-stakeholder, management and practice: CEO, DIPC, microbiologists, biomedical scientists, nurses (IP & specialities), estates.

What was selected?

Selected technologies by IPC priority area



The technologies

Technology	Brand/supplier
ATP Hygiene Monitoring System	<i>SystemSURE Plus™ / Hygiena™ CleanTrace™ / 3M™</i>
Hydrogen Peroxide Vapour (HPV) Decontamination System	<i>Sterinis® / Gloster Sante Europe Bioquell® BioGienie® / Hygienics™</i>
Comprehensive (All in one) Care Foley Catheter Tray	<i>BARD®</i>
Endoscopy sinks	<i>Ecolab® (detergent), Neocare™ (sinks)</i>
PCR testing . Norovirus	<i>SmartCycler® / Becton and Dickinson</i>
Infection control IT surveillance system	<i>ICNet® / ICNet International</i>
Non Chlorine-based Cleansing / Disinfectant	<i>Virusolve+® / Cairn Technology</i>
Hand Inspection Ultra Violet (UV) light inspection kit	<i>DaRo UV Systems</i>

The technologies

Technology	Brand/supplier
Portable PC Tablets	<i>ThinkPad® X- 200 / Lenovo Toughbook CF-H1 / Panasonic</i>
Smart flat infection control PC Keyboards (for all portable computer carts and PACS machines)	<i>Medigenic® / Esterline Advanced Input Systems</i>
Ultrasonic Cleaning tanks	<i>MediSonic™</i>
Digital Camera (as training aid for Infection Control)	<i>DSC-W210 / Sony</i>
Digital Count Up Posters/Boards (showing MRSA / CDI free days for each ward)	<i>Local Supplier</i>
Ozone Sanitizer Machines Brand/supplier	<i>OTEX / JLA</i>
Electronic Data Management System for the Evaluation of Cleaning Schedule Brand/supplier	<i>Maximiser® / Expolink</i>

The technologies

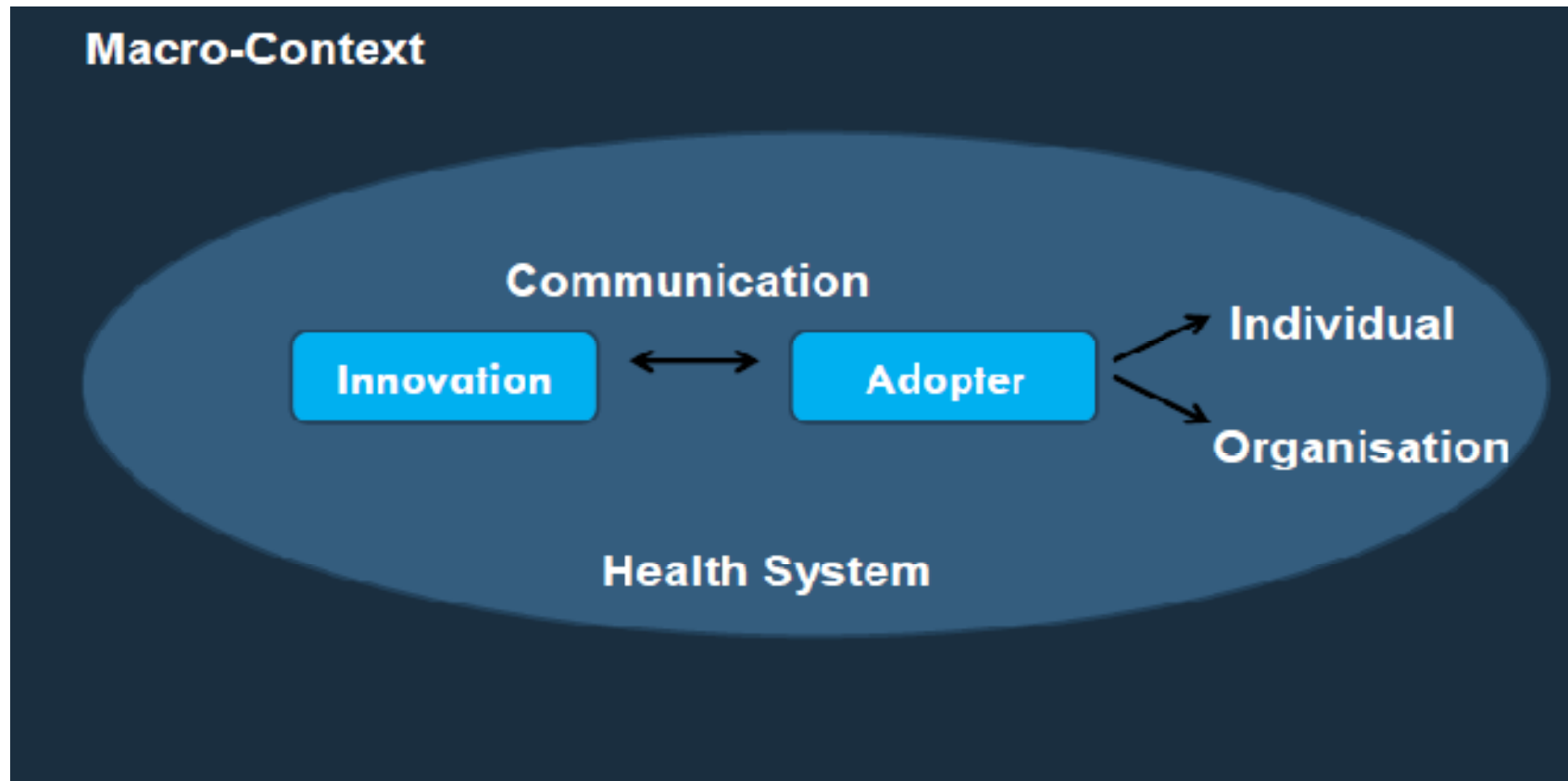
Technology	Brand/Supplier
Hand Inspection Ultra Violet (UV) light Brand/supplier	<i>UV Light Technology</i>
Single Use Patient Admittance Packs: Disposable Blood Pressure Cuffs & Pulse Oximeter Probes	<i>FlexiPort™ / Welch Allyn (BP Cuffs) & Masimo Set / LNOP® (SpO2 sensors)</i>
Chlorhexidine Gluconate (CHG) Dressing (disk) to prevent Catheter-Related Blood Stream Infections (CRBSI)	<i>Biopatch® / Johnson & Johnson</i>
Ultra Violet (UV) Air Sterilisation Units	<i>Medixair / GE Healthcare</i>
Microbiology testing: mass spectrometry analysis machine	<i>MALDI TOF / AB SCIEX</i>
Infection Manager Software System	<i>VitalPAC / The Learning Clinic</i>
Individual Patients MRSA Decolonisation Pack	<i>In-house product pack</i>

The technologies

Technology	Brand/supplier
Individual Patients MRSA Decolonisation Pack	<i>In-house product pack</i>
Antiseptic Body Cleaning Washcloths 2% Chlorhexidine Gluconate	<i>Sage®</i>
Faecal management system	<i>Zassi (ActiFlo) Bowel Management</i>

Why were these technologies selected?

Framework of analysis



(Kyratsis & Atun, 2005; Atun, Kyratsis et al, 2007)

Attributes of the technology

“ **Innovativeness: *software/hardware – radical/incremental***

“It depends in which way you look; I look upon it as being innovative. A lot of people out there might not, but I think it’s the whole, it has to be sold on the whole concept, with the whole package”

“ **Cost: *initial v ongoing***

“ **Effectiveness : *Types and sources of knowledge***

Types and sources of knowledge

<i>Awareness knowledge</i>	<i>Principles /theory knowledge</i>	<i>How to knowledge</i>
Professional networks	Professional networks	Suppliers
Rapid Review Panel products (RRP1)	Peer review journals	Other Trusts
Trust Staff	Suppliers	Showcase hospital evaluations
Patients		Previous experience (success/failure)
Supplier marketing		
Showcase hospitals conferences		

Attributes of the adopter & context

- “ **Trust size**
- “ **PFI sites**
- “ **Ability to evaluate**
- “ **Pro-innovation culture**
- “ **Professional groups and evidence**
- “ **Leadership roles**

Leadership roles

“I’m a microbiologist by background but, and this is something that I learnt right at the beginning when I took on this post, when you actually become a clinical manager or a clinical leader you have to drop your knowledge of your own...because that professional background starts interfering... I think that is important for clinicians who become either leaders or managers of any sort, that they really have to let the expert professionals guide and say, this is what we need to do, and the role of the manager or leader is just to facilitate”

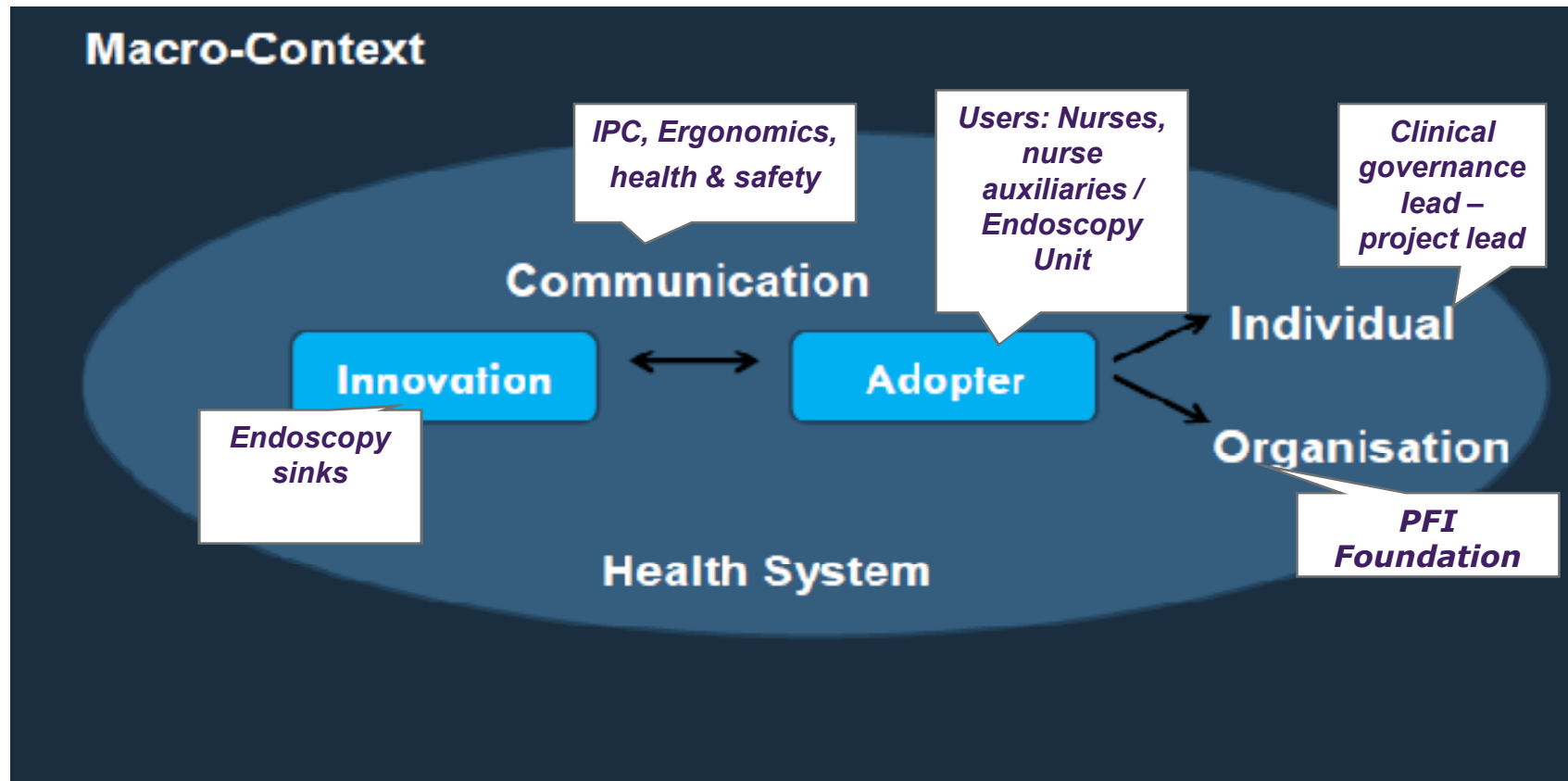
“ We do get a lot of brochures through the post, and they do send them to the wrong people as far as they get to the Chief Exec and get to the Chief Nurse, and they just all look wonderful, and I think it’s a real, real problem for trusts that perhaps have a DIPC who’s not a microbiologist, [to have the expert knowledge to judge for the validity of technology effectiveness claims / evidence] “

How were these technologies adopted?

Processes

- “ **Communication**
- “ **Decision making**
- “ **Procurement**
- “ **Implementation**

Framework of analysis



Decision making – highly inclusive of wider trust

Communication

- “ **User involvement:** in decision making and/or implementation phases
- heightened feelings of ownership - swift and efficient technology implementation
- “ **Formal and informal:** Formal presentations by manufacturers to informal expert opinion sought by various stakeholders during decision making and implementation
- “ **Opportunity to raise profile of IPC:** Through internal communication of the process
- “ **Patient and the public communication:** lacking in majority cases

Example where trust invested in patient communication when introducing the individual patient MRSA decolonisation packs. This resulted in high patient involvement, better informed patients who did not seek to ‘blame’ the hospital for ‘catching’ MRSA

Decision making

- “ **Exclusive to the IPC team OR inclusive of wider trust:**
Organisational culture as well as size of trust determined the approach
- “ **Pre-determined or emergent**
- “ **Technology push or demand pull**
- “ **Senior management support** : facilitated implementation by mobilising resources and providing increased legitimacy to the initiatives
- “ **Early involvement of the intended technology users** : helped to obtain user buy-in. But also led to feedback to suppliers

Example of excluding relevant stakeholders: hotel services personnel being excluded in the design and testing of the ATP Hygiene Monitoring system, which would have potentially saved time and effort for training during the trust-wide roll out of the technology.

Procurement

- “ Procurement frameworks or direct to supplier
- “ Involvement of trust procurement teams

Those trusts facing particularly hard financial constraints involved procurement earliest, and viewed this expertise as a facilitator to innovative practice

Barriers and facilitators to implementation



**What are the key learning
points from this study?**

For trusts

- Early involvement of the trust procurement team is essential to ensure effective and sustainable innovation decisions.
- Coordinating activities across in-house innovation programmes can promote locally relevant learning and avoid duplication. Organisational learning will be important to inform future adoption decisions.
- Encouragement and support for staff to visit other NHS Trusts and attend specialised conferences / workshops is important. In conjunction with staff participation in professional forums / networks exposure to innovation dissemination events encourages knowledge exploration and exploitation of such knowledge by trusts.
- Dedicated funding and time for training is important.

For IPC teams

- Understanding the ~~h~~ow to ~~q~~knowledge through appropriate channels requires as much investment as is currently given to the ~~o~~principles/theory knowledge. Identifying appropriate individuals to obtain this knowledge is critical.
- IPC is evolving from a highly technical service to one that requires a more strategic and general management approach. This also needs to be reflected in how adoption decisions are made, who is involved, and implications for implementation need to be considered early on.

For industry/suppliers

- Providing ~~h~~ow to knowledge alongside principle/theory knowledge appropriate to staff who will be using the technologies is important to successful adoption. This includes appraising the adopting environment for structural compatibility.
- Work with national and trust procurement to create sustainable solutions.

For future research

- Longitudinal follow up of this sample of trusts/technologies will build and complement the showcase hospitals work stream. Such studies will provide learning of the routinisation and sustainability of the adopted technology.
- Use of theory based analysis is important to provide meaningful and generalisable learning of innovation adoption.
- Effective procurement models and processes are central to the technology adoption process. However this process requires deeper exploration and understanding.

Acknowledgements

Study participants

Department of Health

UKCRC

Thank you