

A New Perspective on Clinical IT Resistance: The WOSP Framework

Karen Hare, New Jersey Institute of Technology, USA
Brian Whitworth, Massey University, New Zealand
Fadi Deek, New Jersey Institute of Technology, USA
Tony Norris, Massey University, New Zealand

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Background – US Healthcare Problems

- 44,000 - 98,000 people die in US hospitals per year from medical errors
(Institute of Medicine, 1999)
- 8.8 Million adverse drug events in ambulatory care each year
(Center for Information Technology Leadership, 2003)
- 45 Million Uninsured Americans
- Spiraling US health costs
 - 1.7 Trillion dollars current expenditure
 - 2012 estimates are at 3 Trillion dollars

(Center for Medicare and Medicaid Services)
- 'A fractured and "unwired" healthcare system'
(Middleton, 5/2005)



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Some IT Solutions

- Health IT Framework for Strategic Action
(President Bush, State of the Union Address, 20/1/04 and 27/4/04)
 - \$100 Million earmarked for health IT over the next 10 years
 - Replace handwritten charts and scattered medical files
 - Computerize health records: avoid mistakes, reduce cost, improve care
- Goals
 - Improve safety, quality, efficiency
 - Improve care coordination (systems and data integration)
 - Avoid medical errors
 - Improve use of information resources
 - Reduce variability of care
 - Advance consumer role
 - Strengthen privacy and data protection (Hersh 2004)
 - Promote public health and preparedness



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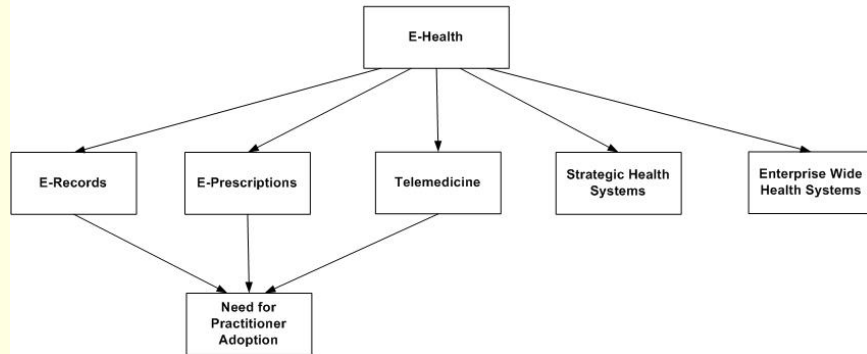
Administrative and Clinical Healthcare

Administrative Healthcare Systems	Clinical Healthcare Systems
HIMS - Designed to support information requirements of hospitals and university-affiliated medical centers; predominantly for healthcare delivery	CIS - Component of HIMS, clinically orientated capabilities, such as order writing and results communication
Operational needs of the hospital, i.e., census management	Computerized patient records
Patient billing	Clinical order entry
General accounting (payable, receivables)	Data privacy, confidentiality, and security
Payroll	Mobility

- IT successful for support of business aspects of healthcare
 - Saves money, increases efficiency
 - Aligns with business, organizational and strategic needs
- Clinical healthcare IT lags behind other businesses

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Major Areas of Health IT Adoption in the USA

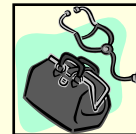


- But take-up of clinical IT is still not widespread (Blumenthal, 3/2005)

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Some Reasons for Poor Acceptance of Clinical IT

- Complexity of IT – poor utility and ease-of-use (TAM model)
 - But clinicians use other complex technologies
 - Study (Chismar & Wiley-Paton, 2002) shows otherwise
- Cost – but reducing and no worse than other technologies
- Many IT project failures
- Functionality – legacy systems but again reduced incidence
- Integration – difficult to introduce into the clinical environment
- Cultural acceptance
 - Healthcare is human-centred, IT is impersonal
 - IT is alien and negates clinical trust



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A Different Approach?

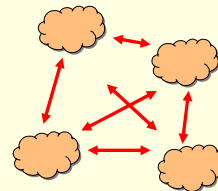
So can these multiple causes be integrated into a framework that can help us to a better understanding of the poor acceptance of IT and so reduce it?



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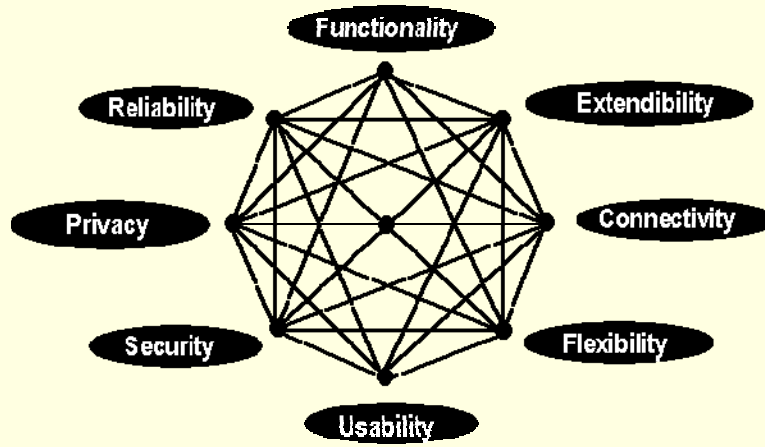
Systems View of Clinical IT

- System utility
 - Maximize system utility (functionality)
 - Reduce system complexity (usability)
- System boundaries
 - Enable boundary changes (extendibility)
 - Make boundaries impermeable (security)
- System interconnections
 - Enable system interconnections (connectivity)
 - Limit system interconnections (privacy)
- System operation
 - Allow operational changes (flexibility)
 - Deny operational changes (reliability)



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Web of System Performance (WOSP)

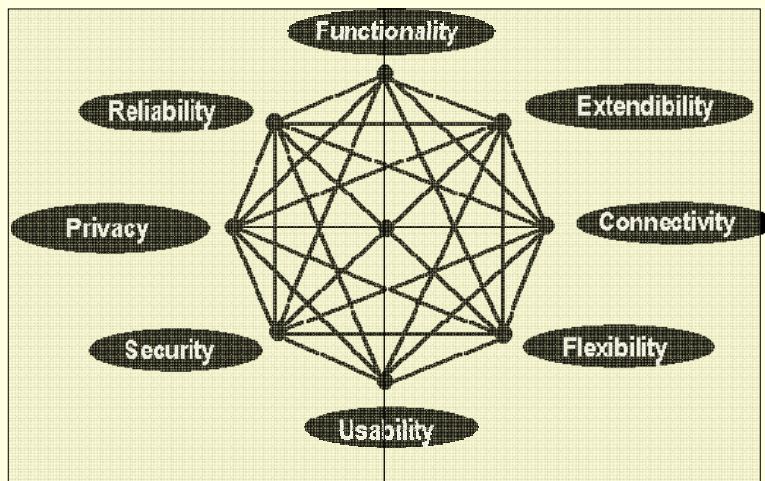


- System parameters interact
- System performance is a balance between parameters

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Whitworth B, Fjermestad J and Mahinda E, The Web of System Performance, CACM, 49 (5), 93-99, 2006

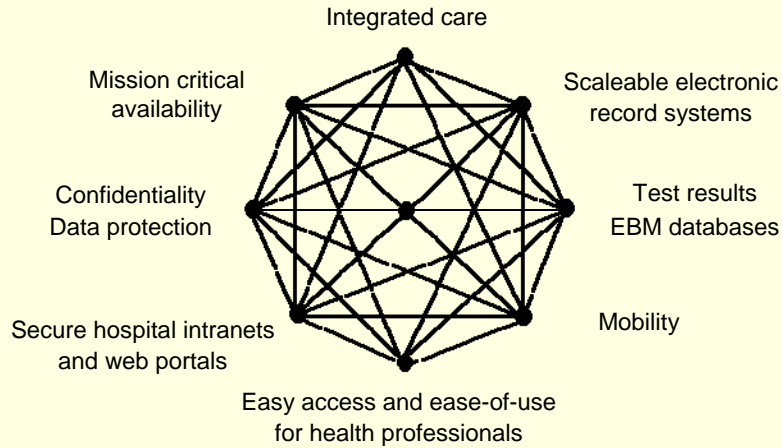
WOSP and Clinical IT



- System designers prefer systems with right-most parameters
- Healthcare professionals prefer systems with left-most parameters

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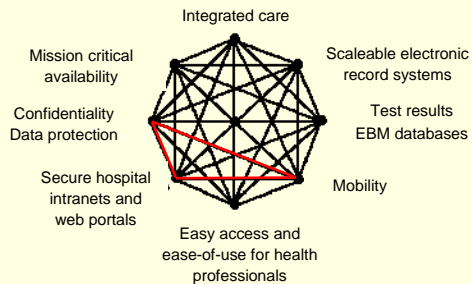
Performance of Clinical IT Systems



- Parameters may have different weights in different systems
- For example...

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Mobile Health Systems



- Increasing availability of wireless and mobile computing
 - PDAs, laptops, Bluetooth interconnectivity, smart phones
- Mobile systems less secure than wired systems
- Health Insurance Portability and Accountability Act of 1996:
 - Mandates privacy, security electronic transactions
 - HIPAA compliance must keep data confidential and secure

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Conclusions

- There is a critical gap between IT providers and clinical IT users
- Clinicians resist IT systems that are too 'open'
- The WOSP framework identifies balances to close this gap
- Clinicians require systems that have:

- Functionality with usability
- Flexibility with reliability
- Extendibility with security
- Connectivity with privacy



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