



University of the
West of England

BRISTOL

Ward, R. (2010) Why dont innovation models help with informatics implementations? In: *Medinfo 2010*, Cape Town, South Africa, 12 - 15 September. Available from: <http://eprints.uwe.ac.uk/11877>

We recommend you cite the published version.

The publisher's URL is:

<http://www.medinfo2010.org/>

Refereed: Yes

(no note)

Disclaimer

UWE has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

UWE makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

UWE makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

UWE accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.

PLEASE SCROLL DOWN FOR TEXT.

Why don't innovation models help with informatics implementations?

Rod Ward

University of the West of England

Medinfo 2010

Overview

- History of innovation and technology acceptance models
- Application to health informatics
- Weaknesses of the models
- Resistance to innovation
- Conclusion

Technology Acceptance

What factors affect an individual's decision to accept and use any innovation?

- Technology Acceptance Model (TAM)
- Perceived Usefulness- "the degree to which a person believes that using a particular system would enhance his or her job performance"
- Perceived Ease-of-Use - "the degree to which a person believes that using a particular system would be free from effort"
- The TAM can be seen as an extension of Ajzen and Fishbein's theory of reasoned action

Diffusion of Innovation (Rogers)

5 stage model for the diffusion of innovation

- Knowledge - learning about the existence and function of the innovation
- Persuasion - becoming convinced of its value
- Decision - committing to the adoption of the innovation
- Implementation - putting it to use
- Confirmation - the ultimate acceptance (or rejection) of the innovation.

Limitations of Rogers & TAM

- Need for greater emphasis on social influences, rather than the nature of the technology.
- Complex organisations - different players in positions to influence the success or failure of the innovation.
- Not just age & gender but roles, communication mechanisms and social networks.

Integration

Venkatesh et al compared existing models to identify and test a model (UTAUT) that integrates elements.

- Influence of performance expectancy on behavioral intention moderated by gender and age.
- Influence of effort expectancy on behavioral intention will be moderated by gender, age, and experience.
- Influence of social influence on behavioral intention will be moderated by gender, age, voluntariness, and experience.
- Facilitating conditions will not have a significant influence on behavioral intention.

Application to healthcare

2005 a major systematic literature review

- Aimed to draw together the research on the diffusion of innovations and apply them to health service organisations.
- Emphasis was placed on the relevance of the work to the United Kingdom's National Health Service which funded the work.

Greenhalgh et al model (1)

- **Innovations:** relative advantage, compatibility, complexity, trialability, observability, reinvention, fuzzy boundaries, task issues, the nature of the knowledge required to use it and support required.
- **Adoption by individuals:** general and context specific psychological antecedents to, and the nature of the adoption decision.
- **Assimilation by organisations:** dynamic relationship between initiation, development and implementation.

Greenhalgh et al model (2)

- **Diffusion and dissemination:** network structure, homophily, opinion leaders and harnessing their influence, champions, boundary spanners and formal dissemination programmes.
- **The inner context:** organisational antecedents and readiness for innovation, discussing structural determinants of innovativeness, absorptive capacity for new knowledge, the receptive context for change and the resources available.

Greenhalgh et al model (3)

- **The outer context:** inter-organisational networks and collaboration
- **Implementation and routinisation:** structure, leadership and management, human resources, funding and communication issues.

They argue that it is not possible to make “formulaic, universally applicable recommendations for practice and policy” based on the model, however...

SYSTEM ANTECEDENTS FOR INNOVATION

THE INNOVATION

Relative advantage
Compatibility
Low complexity
Triability
Observability
Potential for reinvention.
Risk
Task issues
Nature of knowledge required (tacit/explicit)
Technical support

COMMUNICATION AND INFLUENCE

DIFFUSION (Informal, unplanned)

Social networks
Homophily
Peer opinion

Marketing
Expert opinion
Champions
Boundary spanners
Change agents

DISSEMINATION (formal, planned)

THE OUTER CONTEXT

Socio-political climate
Incentives and mandates
Interorganisational norm-setting and networks
Environmental stability

Structure
Size/maturity
Formalisation
Differentiation
Decentralisation
Slack resources

Absorptive capacity for new knowledge
Pre-existing knowledge/skills base
Ability to find, interpret, re-codify and integrate new knowledge
Enablement of knowledge sharing via internal and external networks

Receptive context for change
Leadership and vision
Good managerial relations
Risk-taking climate
Clear goals and priorities
High-quality data capture

SYSTEM READINESS FOR INNOVATION

Tension for change
Innovation-system fit
Power balances (supporters vs opponents)
Assessment of implications
Dedicated time / resources
Monitoring and feedback

THE ADOPTER

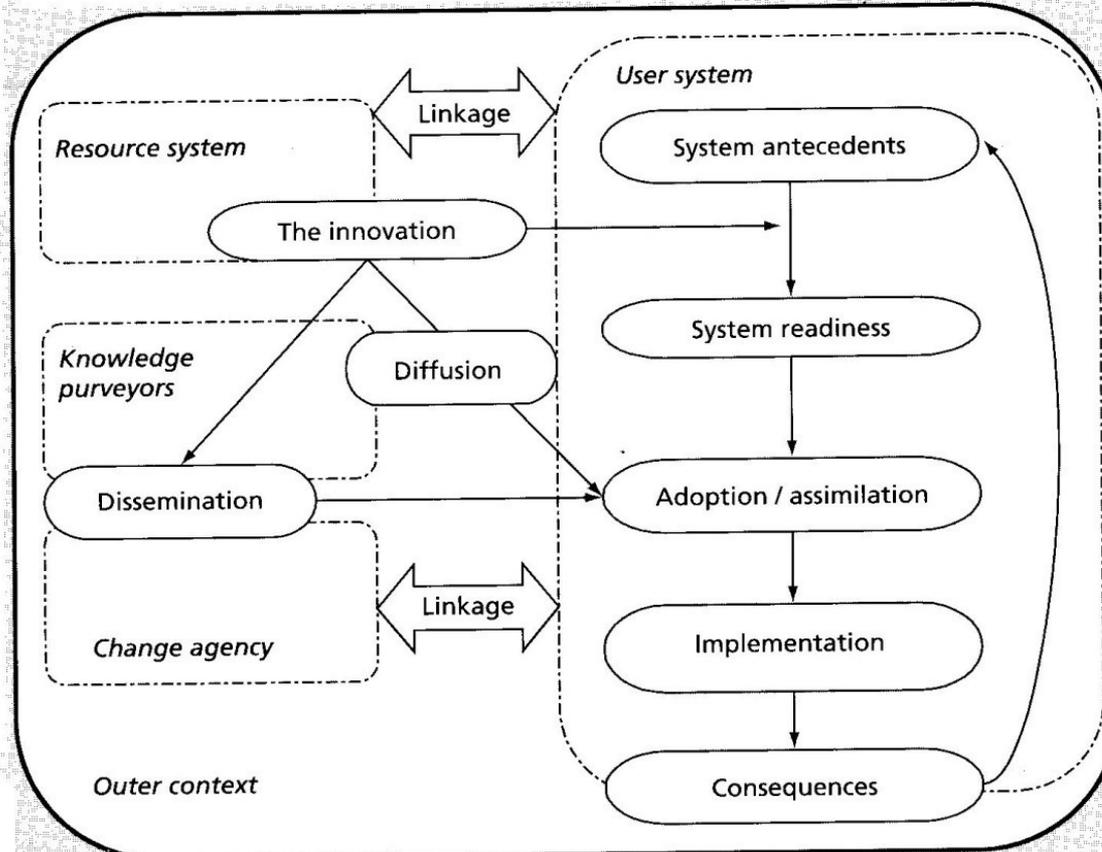
Needs
Motivation
Values and goals
Skills
Learning style
Social networks

ASSIMILATION

Complex, non-linear process
'Soft periphery' elements

THE IMPLEMENTATION PROCESS

Decision-making devolved to front-line teams
Hands-on approach by leaders and managers
Human resource issues, especially training
Dedicated resources
Internal communication
External collaboration
Reinvention/development
Feedback on progress



LINKAGE

Design stage
Shared meanings and mission
Effective knowledge transfer
User involvement inspecification
Capture of user-led innovation

Implementation stage

Communication and information
User orientation
Product augmentation, e.g. technical help
Project management support

Fig. 10.1 A conceptual model for the spread and sustainability of innovations in service delivery and organisation.

Criticism of Greenhalgh et al (1)

- Un-dynamic and undifferentiated
- Avoids ranking the importance of the various factors
- Provides a checklist rather than a full exploration of the complex factors involved in the diffusion of new technologies.
- Said that power relations were critical to successful implementation, but difficult to explore systematically.
- Lack of research on spreading and sustaining innovation in service organisations as opposed to initial innovation.

Criticism of Greenhalgh et al (2)

- Networking behaviours of senior nurses and medical staff, and their cliques, are different – making simple models inadequate

Resistance to innovation

- Fit between the technology and the task it is intended to support.
- System design (from IT people) may not match the objectives and values of clinical staff
- “One size fits all” solutions cause local resistance in organisations and individuals who have been used to “locally grown” systems which have customization and localization

Nurses reactions to technology

- Software driven algorithms for decision making is inflexible which hampered work
- Overrode the guidance given by the system because it was not seen as being individualized to the specific patient problem
- At NHS Direct, nurses felt software was unable to consider contextual or other relevant information.

Design reality gap

Implementation needs to take into account:

- Attitudinal and organisational factors
- Professional autonomy
- Values and assumptions of groups (both clinicians and managers)
- User interfaces and response times which work within a clinical environment

Conclusion (1)

- Human factors need to be taken into account at all stages of the design, implementation and use phases of informatics implementations.
- Individuals within organisations are the ultimate users and consumers of the technology
- The true benefits and impacts of IT depend on the extent to which individual users appropriate and use IT in their ongoing work activities

Conclusion (2)

- Adoption and diffusion models offer some insights into the success or failure of informatics innovations often focussing on policy drivers and barriers to innovation but do not fully take into account the complex organisational and personal factors which impinge of development and adoption.
- Further work to test and refine models is needed, but the more effective approach may be to simplify the models, focusing on the most important or significant factors in the hope of producing something which can be used to predict and support informatics implementations.

Why don't innovation models help with informatics implementations?

Questions, comments, advice