

Ubiquitous Monitoring and Human Behaviour in Intelligent Pervasive Spaces

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(Kindly presented by Khulood Rambo)

Outline

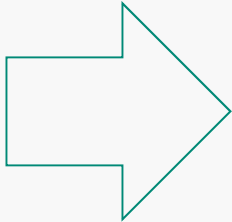
- Introduction
- The Problem and Approach
- Behaviour Influencing Factors
- Model

Introduction

- Pervasive Era
 - Mobile and wireless technology
 - Intelligent Pervasive Spaces
 - Significant levels of data
 - Ubiquitous collection
- Ubiquitous Monitoring
 - Need for understanding its effects
 - Widely adopted tool
 - Undesirable changes



The Problem and Approach

- New Systems
 - Always have some impact
 - Desirable and undesirable effects
 - Monitoring technology is no exception
 - Ubiquitous Monitoring
 - Increased Coverage
 - Risk of undesirable effects
 - Insufficient research in usage of ubiquitous monitoring
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- Behavioural Factors
 - Identify behaviour influencing factors
 - Found in related literature
 - Modelling
 - Identify relationships between factors
 - Tool for prediction and explanation of effects of ubiquitous monitoring

Behaviour Influencing Factors

- Identified through literature review
- **Context** (Abowd and Mynatt 2000), (Cas 2005), (Benerecetti, Bouquet et al. 2001), (Kostakos and Little 2005),
- **Awareness** (Cas 2005), (Dearman and Hawkey 2005), (Hayes, Poole et al. 2007), (Kostakos and O'Neill 2004),
- **Intrusion** (Beaudin, Intille et al. 2006), (Intille, Tapia et al. 2003), (Kidd, Orr et al. 1999), (Lyytinen, Yoo et al. 2004),
- **Control** (Dryer, Eisbach et al. 1999), (Ducatel, Bogdanowicz et al. 2001), (Hayes, Poole et al. 2007), (Heijden 2003),
- **Boundaries** (Araya 1995), (Bohn, Langheinrich et al. 2007), (Kostakos and Little 2005), (Marx 2001), (Punie 2003),
- **Justification** (Abowd and Mynatt 2000), (Hayes, Poole et al. 2007), (Kostakos and O'Neill 2004), (Stanton 2000).
- **Trust** (Ducatel, Bogdanowicz et al. 2001), (Hayes, Poole et al. 2007), (Melenhorst, Fisk et al. 2004), (Nguyen and Mynatt 2002),

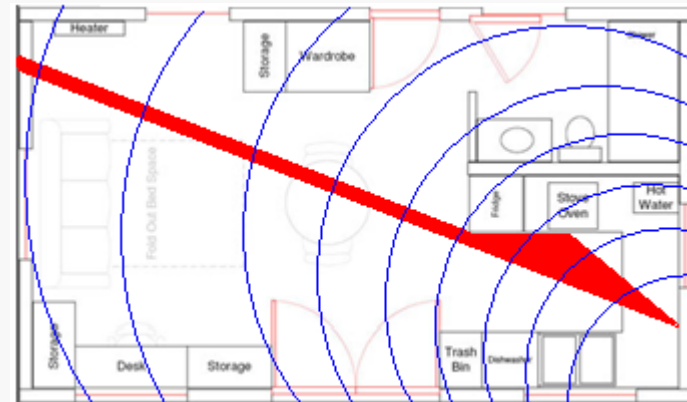
Behaviour Influencing Factors

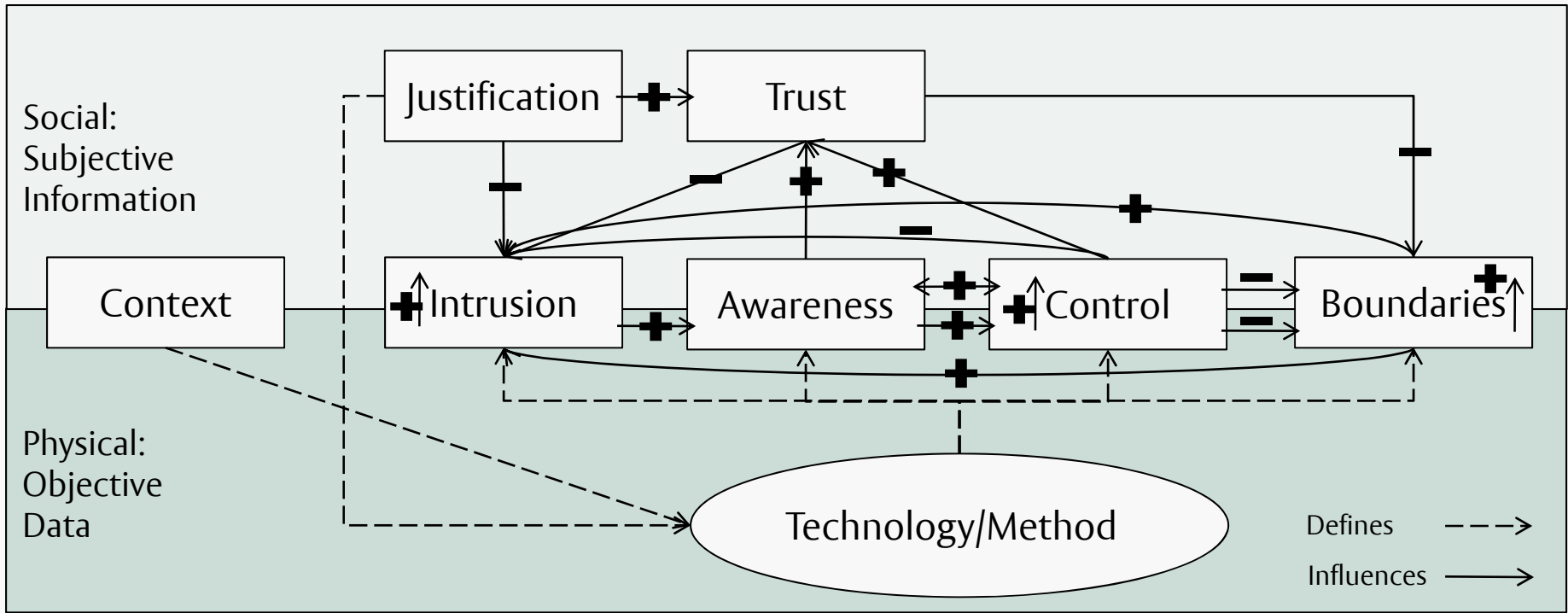
- Context
 - Defines the technology used
 - Multiple Contexts
 - E.g. Hospital
 - Physical/Social
- Awareness
 - Awareness of being monitored changes behaviour (cf. Hawthorne effect)
 - Physical/Social
- Intrusion
 - Intrusiveness related to awareness
 - Perceptions of intrusion decrease acceptance
 - Physical/Social



Behaviour Influencing Factors

- Control
 - Manual control beneficial
 - Levels of control
 - Physical/Social
- Boundaries
 - Defined by the range of a technology
 - Ubiquitous monitoring increased coverage
 - Physical/Social
- Justification
 - Reason for being monitored
- Trust
 - Who, How, and Why?

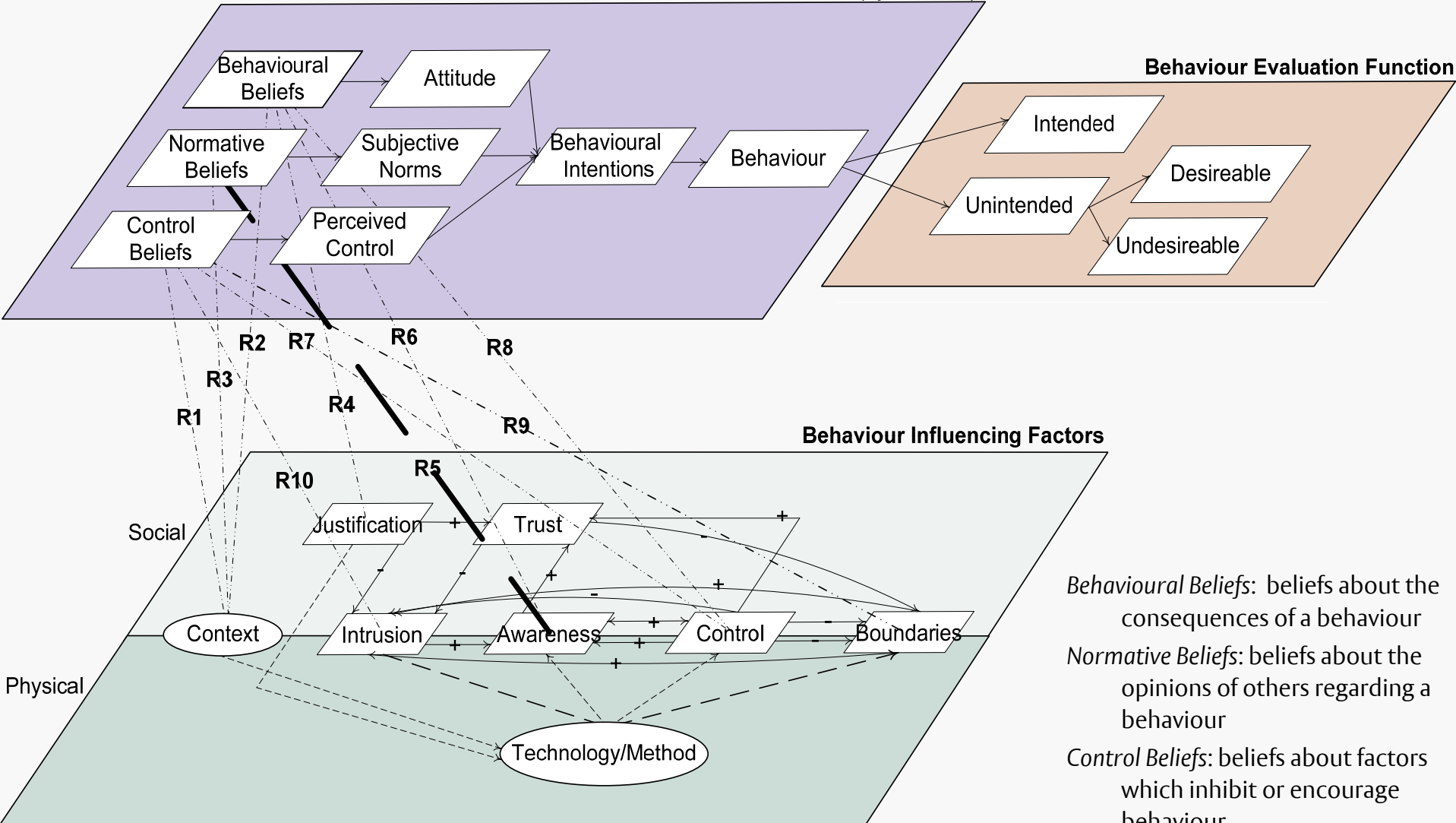




Effect on	Trust	Intrusion	Control	Boundaries	Awareness
Trust		(Zweig 2005) +		(Lahlou, Langheinrich et al. 2005) -	
Intrusion		Own Hypothesis +			Own Hypothesis +
Control	(Scholtz and Consolvo 2004) +	(Stanton 2000) -	Own Hypothesis +	Own Hypothesis -	(Hayes, Poole et al. 2007) +
Boundaries		(Punie 2003) +		Own Hypothesis -	
Awareness	(Hayes, Poole et al. 2007) +	(Kostakos and Little 2005) -	(Hayes, Poole et al. 2007) +		
Justification	(Stanton 2000) +	(Melenhorst, Fisk et al. 2004) -			

Model

Theory of Planned Behaviour (Ajzen 1991)



Behavioural Beliefs: beliefs about the consequences of a behaviour
Normative Beliefs: beliefs about the opinions of others regarding a behaviour
Control Beliefs: beliefs about factors which inhibit or encourage behaviour

Summary

- **Research question:** How does ubiquitous monitoring affect human behaviour?
- **Results so far:** Identified behavioural factors and their relations and created a preliminary model
- **Future direction:** To enrich and validate the model using surveys, questionnaires and observations.