

INTRODUCTION TO INFORMATION SYSTEMS - THEORIES 1

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26 August 2020

IN5210 - Information Systems

Overview

- ▶ Introductions
- ▶ IS: what sort of science is it?
- ▶ IS: main research themes
- ▶ IS: theoretical perspectives
- ▶ Ongoing debates!

Who am I?

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Information Systems (IS): What sort of science is it?

Information Systems

(from Avgerou, 2000)

- ▶ The academic field of Information Systems (IS) is concerned with a large range of questions regarding the **development**, **use** and **implications** of information and communication technologies (ICTs) in organisations.
- ▶ Substantial **evolution** of the field over time!

But...

- ▶ Issue-oriented rather than theory-driven - defined by its **objects** of interest rather than its theories
- ▶ As a result, the field of IS is not always well understood by academics and professionals in other fields, even in fields related to IS, such as Operational Research, Management, or Psychology.
- ▶ Therefore, we will introduce the field through a brief history, its core objects of interest, and the theoretical approaches that prevail in it.

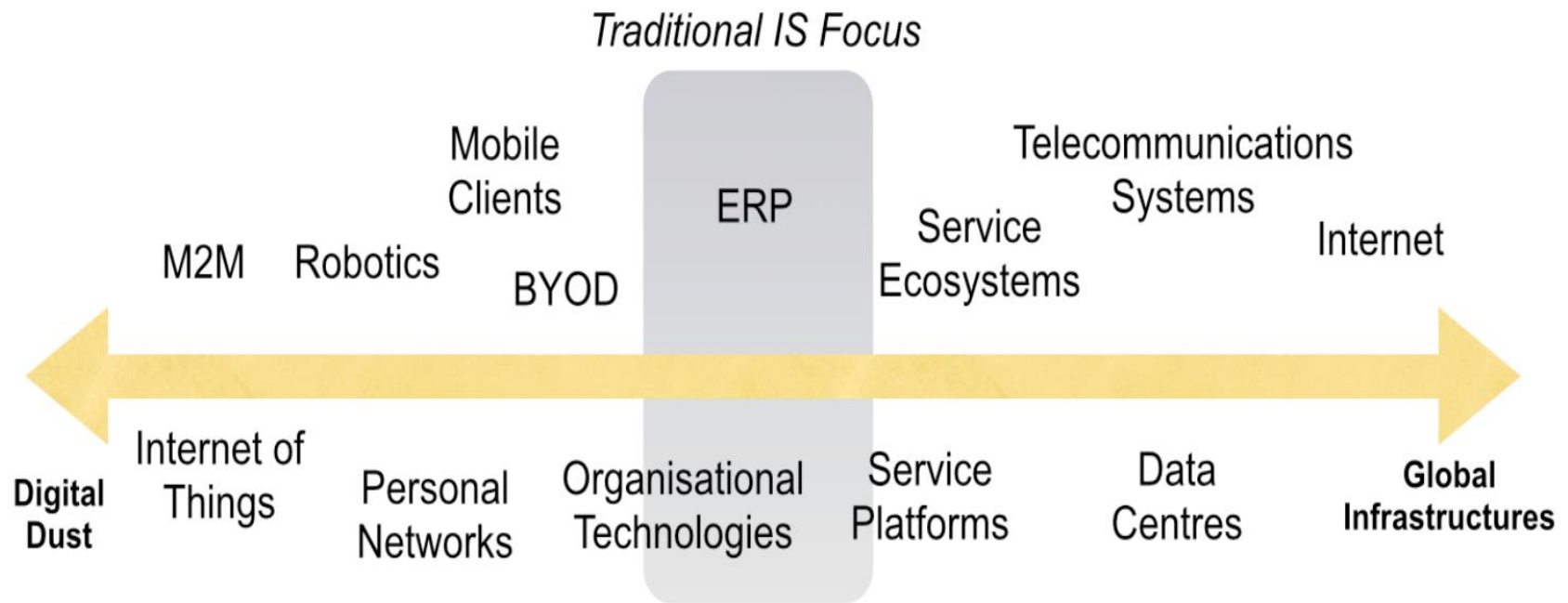
The IS field

(from Avgerou, 2000)

- ▶ The IS field has its origins in the applied computer science studies of the 1960s, aimed at systematising the design of **data processing** applications in organisations.
- ▶ Origins: in 1972, the American Computer Society (ACM) published a curriculum for a two-year Masters degree on computing in a **business context**. In 1974, the International Federation for Information Processing (IFIP) built a curriculum on **design** of computer based information systems.
- ▶ Other landmarks: two major research journals (MIS Quarterly 1977, Information Systems Research 1987), 1st International Conference on Information Systems (1980)

...IS today!

(from Sørensen, 2016)



- ▶ From the mainframe to platforms: an evolving range of topics
- ▶ Geographical focus expanded (from North America to Europe and - increasingly - Asia, Latin America and Africa)

...what sort of science is it?

- ▶ «**Social** study of technology» (Land & Hirschheim, 1987)
- ▶ The field has broadened in scope, to study the efforts **organisations** make to respond to the challenge of continuous innovation in ICTs. (Avgerou, 2000)
 - ▶ How did employees respond to the introduction of Enterprise Resource Planning (ERP)?
 - ▶ What organisational power shifts does a new Decision Support System (DSS) imply?
 - ▶ How does a digital health platform affect a government's ability to address the needs of vulnerable users?

...all these are IS questions!

So...

- ▶ ...not the technology alone, but its participation to, and impact on, organisations and society, is the centre of attention in IS research.
- ▶ What **thematic areas** does IS engage?

IS: Research Objects

IS Research Objects (from Avgerou, 2000)

Five main thematic areas of IS research:

- ▶ Applications of IT to support organisational functioning
- ▶ The process of systems development
- ▶ Information systems management
- ▶ The organisational value of information systems
- ▶ The societal impact of information systems

Theme 1: Applications of IT to Support Organisational Functioning

- ▶ In the early 1970s, data processing applications for "commercial organisations" emerged as a distinct area of computing. Over time these have included database technology, decision support systems (DSS), expert systems, electronic data interchange (EDI), multimedia systems, enterprise resource planning (ERP).
- ▶ Main question: *how* to combine technical components to form a useful application?

Theme 2: The Process of Systems Development



Focus: methodical practices for developing reliable and effective systems in **cost-efficient**, beneficial ways

Tension between an engineering and a social intervention perspective



Today: studies of systems development in the context of **global infrastructures** (Sørensen, 2016)

Theme 3: Information Systems Management

- ▶ In the days of the mainframe a centralised department (usually EDP, from Electronic Data Processing) was the ‘natural’ way to organise expertise and control investment
- ▶ The diffusion of ever more powerful computing and software packages raised questions on diverse ways of **managing** IS, regarding especially: (a) **centralised** vs. decentralised architectures; (b) intra-organisational **power** distributions in IS management
- ▶ These concerns are alive and well for present-day objects of IS research! (e.g. **platform** architectures)

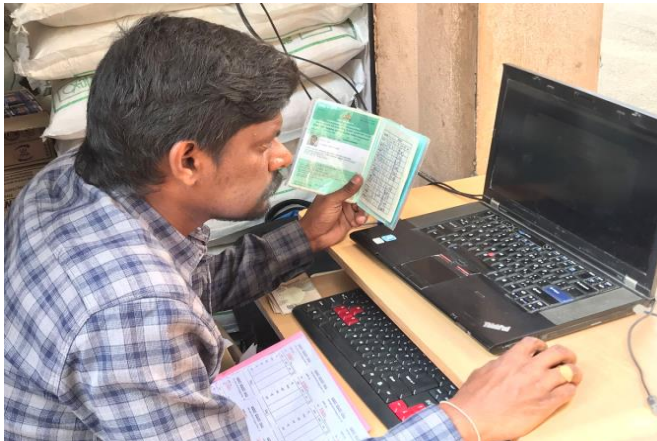
Theme 4: The Organisational Value of Information Systems

- ▶ Over time, organisations became aware of the significance of effects of a non-straightforward economic nature, such as organisational **structure** or the **morale** of the employees who have to cope with new information procedures.
- ▶ **To whom** is the technology beneficial?
- ▶ For example: which new information flows has email enabled? What about **employees** whose working practices have been disrupted by the introduction of new systems, such as ERP?

Theme 5: The Societal Impact of Information Systems



Explores impacts of ICTs beyond the organisation, and on **society** at large - including contexts of human and economic **vulnerability** (ICT for Development - ICT4D)



For example: which impacts does a digital health platform have on healthcare systems in developing nations? How is such a platform governed?

To recap...

Five main thematic areas of IS research:

- ▶ Applications of IT to support organisational functioning
- ▶ The process of systems development
- ▶ Information systems management
- ▶ The organisational value of information systems
- ▶ The societal impact of information systems

...all characterised by evolving research objects!

IS: Theoretical Underpinnings

The background of the slide features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the right side and bottom of the slide, creating a modern, layered effect against the white background.

What's a Theory?



Structuring elements of social research
(Crotty, 1998)

Structuring Elements of Social Research (Crotty, 1998)

- ▶ Epistemology: our assumptions about knowledge and how it can be obtained
- ▶ **Theoretical perspective: the philosophical stance informing the methodology and providing context for the process and grounding its logic and criteria**
- ▶ Methodology: the plan of action, process or design lying behind the choice and use of particular methods
- ▶ Methods: the techniques or procedures used to gather and analyse data

IS Theoretical Perspectives (from Avgerou, 2000)

Multiple theoretical perspectives in IS research - an issue-oriented field, whose diversity of theoretical visions increased through the 1980s and 1990s

Four perspectives can be seen as dominant:

- ▶ Systems theory
- ▶ Organisational rationalism
- ▶ Structuration theory
- ▶ Critical theory

Systems Theory

- ▶ Systems theory is a perspective that addresses issues of interrelations within a 'whole': the 'whole' of interest is the **organisation**, considered as 'purposeful system'
- ▶ Challenges the principles of classical science to break down problems into as many separate parts as possible, trying to discover one-way **causality** between them
- ▶ For example: Ackoff (1971) on the relationship between a systems and its parts, and its implications for the study of modern organisations

Organisational Rationalism

- ▶ A perspective centred on identification of the principles of deploying the **resources** of organisations in order to survive and excel in the market economy
- ▶ “With its origins in the work of Max Weber, Taylor and Fayol, organisational rationalism emerged as the theory committed to improving **organisational efficiency**. It is a rather mixed bag of general approaches to social phenomena in organisations and specialised research fields, such as decision making theory, management theory, administration science, industrial and organisational psychology.” (Avgerou, 2000)
- ▶ For example: Keen (1981) on decision support systems as means to increasing managerial productivity

Structuration Theory

- ▶ The **socio-technical** tradition of IS research and practice has maintained the complementarity between technology and the social context
- ▶ Structuration theory reinforces this position: uses concepts of **structure** and **agency** to theorise the relation between the technical and the social
- ▶ For example: Orlikowski (1992) proposes a view of “duality of technology” that balances its organisational properties (structure) with its human aspects (agency)

Critical Theory

- ▶ Critical research combines the different, but interlinked purposes of **theorisation** and **transformation** of a status quo characterised by socially oppressive conditions.
- ▶ Its theoretical intent is that of generating social critique, where “the restrictive and alienating conditions of the status quo are brought to light” (Myers, 1997)
- ▶ For example: [Trauth & Howcroft \(2006\)](#) critical theory study of women in the US IT industry - engages under-representation of women in the industry (theorisation) and interventions to increase it (transformation)

Ongoing Debates!

(An introduction...)

- ▶ Transcending the mainframe heritage (Sørensen, 2016): digitalisation leading to new object of interest in IS
- ▶ New theoretical approaches: from the four-pronged paradigm (Avgerou, 2000) to the emergence of localised approaches and **indigenous theories**
- ▶ Thematic & geographic boundaries of the IS field: (how) have these evolved over time?

To Recap...

- ▶ We have introduced the field of **Information Systems (IS)** as centred on the participation of information and communication technology to, and impact on, organisations and society
- ▶ We have discussed five main **thematic areas** of interest in IS research, and four main **theoretical perspectives** on which IS research is based
- ▶ This equips us to deal with the **methodologies** and methods of IS research!

THANK YOU!