INTRODUCTION TO INFORMATION SYSTEMS – THEORIES 1

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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 that 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.

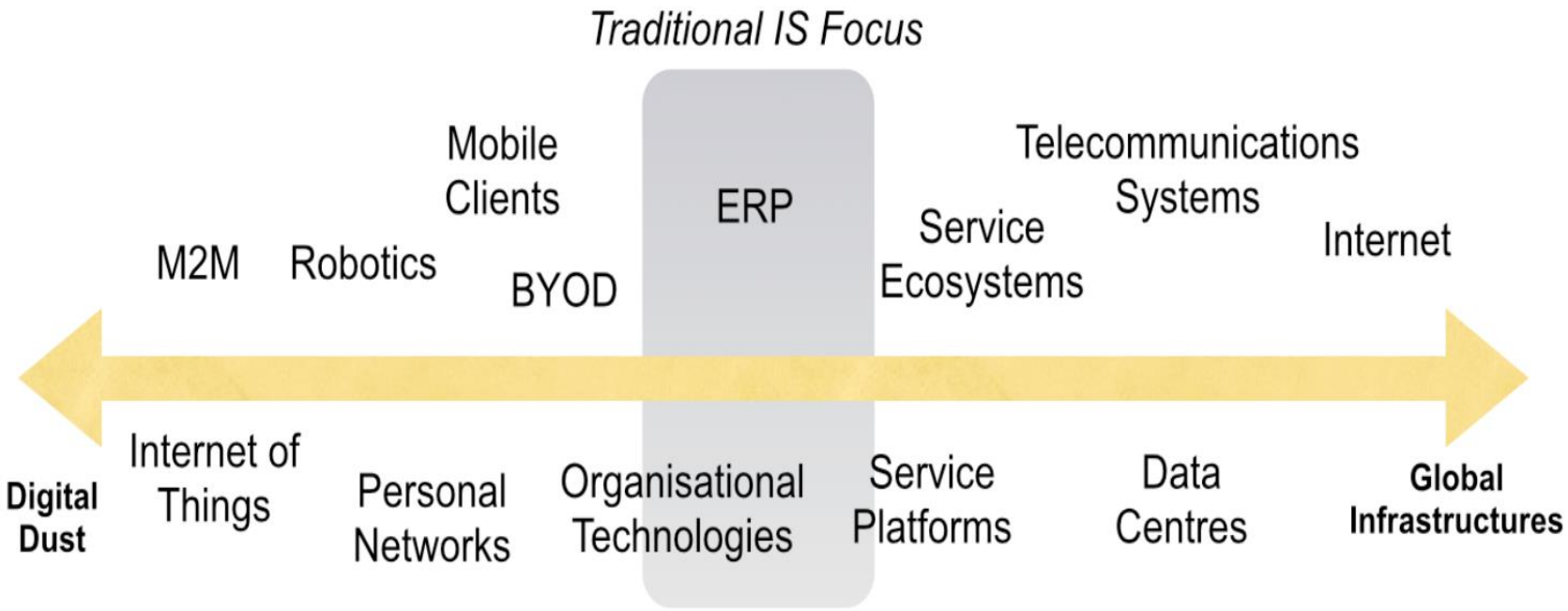
The IS field (from Avgerou, 2000)

- 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

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!