

# **Information and Organizational Change on Long Time-Scales**

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Nobody will doubt that over time organisations change and that to a large extent organisational changes are related to technological development. As new technologies become available they reshape how work is undertaken, for instance, by enabling new forms of work, offering more sophisticated production methods, or enabled new forms of organisational communication.<sup>1</sup> One particular technology associated with wide ranging organisational transformation over the last decades is information technology (IT).<sup>2,3,4</sup> This research therefore draws methodologically from business history to investigate organisational change at the crossroad between business information systems and organisational studies.

Earlier research on the history of IT in organisations investigated organisational change from different angles.<sup>5</sup> For instance, several studies looking at long time-scales take an industry-wide focus investigating the emergence of inter-organisational information systems<sup>6</sup>; industry wide standards for data exchange such as SWIFT in financial transactions<sup>7</sup> or SABRE for airline reservations<sup>8</sup>. Other researchers points out how IT build on earlier manual data processing approaches.<sup>9,10</sup> Yet other studies investigate IT related organizational change at individual organisations including for instance the Bank of America<sup>11</sup> or Texaco.<sup>12</sup>

While this earlier research enabled insights into larger IT related organisational change it largely black boxes how the content stored, processed and made available by IT becomes relevant to members of an organisation over time. Besides technology facilitating new ways for storing, processing and transmitting data, it is human actors within organisations that regard

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<sup>1</sup> Yates, JoAnne. 1989. *Control through Communication: The Rise of System in American Management*. Baltimore: Johns Hopkins University Press.

<sup>2</sup> Castells, Manuel. 1996-1998. *The Information Age: Economy, Society and Culture*, 3 Vols. Oxford, UK: Blackwell.

<sup>3</sup> Cortada, James W. 2014. "When Knowledge Transfer Goes Global: How People and Organizations Learned about Information Technology, 1945-1970." *Enterprise and Society* 15 (1): 68–102.

<sup>4</sup> Zuboff, Shoshana. 1988. In *the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

<sup>5</sup> John, Richard R. 2001. "Rendezvous with Information? Computers and Communications Networks in the United States." *Business History Review* 75 (1): 1–13.

<sup>6</sup> Reimers, Kai, Robert B Johnston, and Stefan Klein. 2013. "An Empirical Evaluation of Existing IS Change Theories for the Case of IOIS Evolution." *European Journal of Information Systems* 23 (4). Nature Publishing Group: 373–99.

<sup>7</sup> Scott, Susan V, and Markos Zachariadis. 2012. "Origins and Development of SWIFT, 1973–2009." *Business History* 54 (3): 462–82.

<sup>8</sup> McKenney, James L, Duncan G Copeland, and Richard O Mason. 1995. *Waves of Change: Business Evolution through Information Technology*. Boston, Mass.: Harvard Business School Press.

<sup>9</sup> Wit, O. De, and J. Van Den Ende. 2000. "The Emergence of a New Regime: Business Management and Office Mechanisation in the Dutch Financial Sector in the 1920s." *Business History* 42 (2): 87–118.

<sup>10</sup> Yates, JoAnne. 2005. *Structuring the Information Age: Life Insurance and Technology in the Twentieth Century*. Baltimore: Johns Hopkins University Press.

<sup>11</sup> McKenney, James L, Richard O Mason, and Duncan G Copeland. 1997. "Bank of America: The Crest and Trough of Technological Leadership." *MIS Quarterly* 21 (3): 321–53.

<sup>12</sup> Porra, Jaana, Rudy Hirschheim, and Michael S Parks. 2005. "The History of Texaco's Corporate Information Technology Function: A General Systems Theoretical Interpretation." *MIS Quarterly* 29 (4): 721–46.

data made available by IT as relevant or irrelevant to what they are trying to achieve.<sup>13</sup> This research therefore uses a sociocultural conception of information<sup>14</sup> for investigating organisational change. According to this understanding information is defined as:

Information: specific output provided by IT systems that is considered relevant by members of an organisation to what they are trying to achieve as a collective.<sup>15</sup>

Investigating the role of 'information' as a sociocultural concept in organisational change this research thus neither simplifies the role of technology nor does it overstate the influence of social actors. Early accounts of technology in organisational change were often grounded in technological deterministic thinking assuming that technology itself is directly linked to organisational change.<sup>16</sup> However, such accounts are nowadays disregarded as overly simplifying the role of technology in organisational change by disregarding the importance of human agency.<sup>17</sup> A sociocultural conception of information acknowledges the importance of human actors while also recognising the influence of technology. It thus does not replace technological determinism with social constructivism. Instead it furthers a socio-technical understanding of organisational change where human actors and technology both have agency in the process of organisational change.

The aim of the research is thus to investigate the process of how the content made available through IT is related to organisational change as it becomes relevant to the members of an organisation over time. From studies of individual IT projects we know that IT is often implemented in order to automate recurring tasks<sup>18</sup>, such as calculating insurance premiums<sup>19</sup> or billing customers. However, by focusing on individual IT projects, usually spanning from several months to a few years, earlier research offers no insight as to how IT enabled information is related to wider organisational changes beyond the time-scale of individual IT projects. If we want to develop models of organisational change on long time-scales it is therefore crucial that we better understand how over time IT systems enable and change what is considered to be information (as defined above) by the members of an organisation.

This research therefore investigates oral historical accounts of IT related changes to organisational information. The paper reports findings of oral historical accounts by IT pioneers working on the implementation of mainframe systems in Australia. In these accounts IT pioneers describe how over longer time-scales IT systems enabled wider organisational change as users realise initially unintended ways for deriving information from IT systems. The research thus enables insights into information related organisational change beyond the usual IT-project focus of earlier studies.

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<sup>13</sup> Brown, John Seely, and Paul Duguid. 2002. *The Social Life of Information*. Boston, Mass, USA: Harvard Business School Press.

<sup>14</sup> Goguen, Joseph A. 1997. "Toward a Social, Ethical Theory of Information." In *Social Science, Technical Systems, and Cooperative Work. Beyond the Great Divide*, edited by Geoffrey C Bowker, Susan Leigh Star, Willam Turner, and Les Gasser, 27–56. London: Lawrence Erlbaum Associates.

<sup>15</sup> Boell, Sebastian K. 2017. "Information: Fundamental Positions and Their Implications for Information Systems Research, Education and Practice." *Information and Organization* 27 (1). Elsevier Ltd: 1–16.

<sup>16</sup> Leonardi, Paul M, and Stephen R Barley. 2010. "What's Under Construction Here? Social Action, Materiality, and Power in Constructivist Studies of Technology and Organizing." *The Academy of Management Annals* 4 (1): 1–51.

<sup>17</sup> *ibid*

<sup>18</sup> Zuboff, Shoshana. 1988. *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

<sup>19</sup> Yates, JoAnne. 2005. *Structuring the Information Age: Life Insurance and Technology in the Twentieth Century*. Baltimore: Johns Hopkins University Press.

Interviews are ongoing and currently include IT pioneers that were working in government, insurance, banking and libraries. One important finding is that all interview partners report that IT systems were eventually used to derive information in initially unintended ways. This finding resonates with Shoshana Zuboff's finding that over time as the users of IT systems become more experienced in using an IT system they generally find new ways for using the system beyond its initially intended use.<sup>20, 21</sup> Beyond Zuboff's insight that initially unplanned uses of an IT system facilitate new insights as IT projects mature<sup>22</sup> the accounts from IT pioneers gathered by this research further indicates that when looked at longer time-scales IT systems are also related to initially unplanned changes to organisational structures, processes and goals. Furthermore interview findings indicate that changes to organisational structures, processes and goals themselves are associated with further changes to IT systems.

Based on these preliminary findings an approach for further research is introduced and discussed. The oral accounts gathered from IT pioneers indicate that further interviews with other members of the organisation using IT systems should be conducted. To further investigate the planned and unintended information associated with IT systems further interviews will also include, beyond IT pioneers, users of such IT systems and managers. In addition an approach for a detailed case-based analysis is discussed where organisational change is investigated by analysing changes to organisational structures, processes and goals as well as IT. In addition to collecting an oral history of these changes findings will be based on archival research that can corroborate the accounts from interviews. The types of material thought for such an analysis are discussed.

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<sup>20</sup> Leonardi, Paul M. 2007. "Activating the Informational Capabilities of Information Technology for Organizational Change." *Organization Science* 18 (5): 813–31.

<sup>21</sup> Zuboff, Shoshana. 1988. *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

<sup>22</sup> *ibid*