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Knowledge Management from a Big Data Perspective

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Big Data is defined as an information asset with high volume, velocity and variety, which requires specific technology and method for its transformation into value (De Cnudde & Martens, 2015). Several studies demonstrate that Big Data would improve the process of decision-making (Chen, Tao, Wang, & Chen, 2015; Fan, Lau, & Zhao, 2015), forecasting (Butler, 2008; De Cnudde & Martens, 2015; Helbing & Baretto, 2011), and service improvement (Xiang, Schwartz, Gerdes Jr, & Uysal, 2015), which show that Big Data has implications for knowledge management. As is studied by Chan (2016), the ability to abstract insights from Big Data and transform the insights into feasible actions could be helpful for knowledge management, from knowledge creation to knowledge utilization. Recent studies also indicate that there is positive influence of Big Data on knowledge generation (Fuchs, Höpken, & Lexhagen, 2014) and knowledge sharing (Sukumar & Ferrell, 2013). Therefore, to understand knowledge management from a Big Data perspective would give an additional dimension that has not been discussed to any large extent.

A two-year research project, Big Cities meet Big Data: A Case of Turku (2015-16) has explored the role of Big Data in decision making and service development in municipalities, which are areas relevant to efficient knowledge management. According to the review by Fredriksson, Mubarak, Tuohimaa, and Zhan (in press), Big Data could be beneficial for government authorities and organizations, and societies and citizens. The overall aim of this project was to study both the need and range of Big Data from three main perspectives of a city: citizens needs and use of Big Data, decision maker's production and need of Big Data, and the need and output of Big Data in operative administration. Out of these three perspectives, two are related to knowledge management.

Library Digital Collections as Big Data

The role of public libraries as the nexus of information and knowledge is emphasized in this subproject. Meanwhile, the roles of public libraries to manage Big Data for further utilization are discussed. The meaning of such roles is twofold: first of all, it indicates responsibilities and accountabilities of the public library when they

tend to manage newly emerging knowledge; second of all, since Big Data has positive influence on knowledge management, how to benefit for libraries' own practice can be reflected by certain roles. In a word, Big Data is considered as one kind of knowledge and a useful tool in this subproject.

The role of knowledge management with Big Data in decision-making

This study is designed to explore the nature of multi-level decision-making processes with the help of Big Data. This study rests on the one of the characters of Big Data: Value (Brown, 2014), which implies that valuable insights or knowledge could be created through the application of Big Data. Such knowledge could be used for decision-making. There is still much to learn regarding the conceptual base for knowledge management and Big Data. Being able to find useful information and valuable knowledge from large databases, new opportunities arise, both for decision-makers as well as for other societal actors.

The outcome of these subprojects demonstrates how decision-makers and service developers see the possibilities and challenges working with Big Data, and how they reflect upon the role of efficient information management. Since Big Data could enable better knowledge management, this research would contribute to research in the field of knowledge management. Furthermore, since urban performance and smart cities increasingly depend on the availability and especially the quality of knowledge communication and infrastructures (Caragliu, Del Bo, & Nijkamp, 2011), this project would not only enrich the theory of knowledge management, but also put forward implications to improve urban performance.

References

- Brown, M. S. (2014). Big Data, Mining, and Analytics. Components of Strategic Decision Making. In S. Kudyba (Ed.), *Big Data, Mining, and Analytics. Components of Strategic Decision Making* (pp. 211-230). Boca Raton: CRC Press Taylor & Francis Group.
- Butler, D. (2008). Web Data Predict Flu. *Nature*, 456(7220), 287-288. doi:10.1038/456287a
- Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart Cities in Europe. *Journal of Urban Technology*, 18(2), 65-82. doi:10.1080/10630732.2011.601117
- Chan, J. O. (2016). Big Data Customer Knowledge Management. *Communications of the IIMA*, 14(3), 5.
- Chen, J., Tao, Y., Wang, H., & Chen, T. (2015). Big Data Based Fraud Risk Management at Alibaba. *The Journal of Finance and Data Science*, 1(1), 1-10.
- De Cnudde, S., & Martens, D. (2015). Loyal to Your City? A Data Mining Analysis of a Public Service Loyalty Program. *Decision Support Systems*, 73, 74-84. doi:10.1016/j.dss.2015.03.004
- Fan, S., Lau, R. Y. K., & Zhao, J. L. (2015). Demystifying Big Data Analytics for Business Intelligence Through the Lens of Marketing Mix. *Special Issue on Computation, Business, and Health Science*, 2(1), 28-32. doi:10.1016/j.bdr.2015.02.006
- Fredriksson, C., Mubarak, F., Tuohimaa, M., & Zhan, M. (in press). Big Data in the Public Sector: A Systematic Literature Review. *Scandinavian Journal of Public Administration*.
- Fuchs, M., Höpken, W., & Lexhagen, M. (2014). Big data analytics for knowledge generation in tourism destinations – A case from Sweden. *Journal of Destination Marketing & Management*, 3(4), 198-209.
- Helbing, D., & Baliatti, S. (2011). From social data mining to forecasting socio-economic crises. *The European Physical Journal Special Topics*, 195(1), 3-68. doi:10.1140/epjst/e2011-01401-8
- Sukumar, S. R., & Ferrell, R. K. (2013). 'Big Data' Collaboration: Exploring, Recording and Sharing Enterprise Knowledge. *Information Services & Use*, 33(4), 257-270. doi:10.3233/ISU-130712
- Xiang, Z., Schwartz, Z., Gerdes Jr, J. H., & Uysal, M. (2015). What Can Big Data and Text Analytics Tell Us about Hotel Guest Experience and Satisfaction? *International Journal of Hospitality Management*, 44, 120-130.