



# Data-driven innovations in electronic markets

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## Introduction

For more than 25 years now, Electronic Markets (EM) has published papers in the field of networked business and electronic commerce. The editors see the scope and merit of the journal in its recognition of “the transformational role of information and communication technology (IT) in changing the interaction between organizations and customers” (<http://www.electronicmarkets.org/about-em/scope/>). In the early years of the journal, this transformation was predominantly driven by the increasing availability of the internet, which allowed networked-driven business innovations to emerge. Today, recent advances in the capabilities to store and analyze the wealth of data that is created by network business have become the transformational engine pushing the industry towards more data-driven innovations (Alt and Zimmermann 2014). Not surprisingly, the journal has recently addressed this development by dedicated special issues and papers, such as the special issue on “Big Data Analytics and Electronic Markets” (Volume 27, Issue 3, 2017). Following this trend, the current special issue includes four papers representing current research on “data-driven innovations in electronic markets” that are located at the interface between networked business and business analytics.

The papers in this special issue have originally been submitted to the 13th International Conference on Wirtschaftsinformatik (WI 2017) “Towards Thought Leadership in Digital Transformation” in St. Gallen, Switzerland, the

majority of them to the Track “Data Science & Business Analytics”. In total 35 manuscripts were submitted to the track, out of which 13 papers were accepted after revision. Selected, high quality papers of this track and some authors of other tracks with topics related to “data-driven innovations in electronic markets” were invited to submit an extended and revised version for this special issue. This also included the paper “Is paid search overrated?” by Daniel Schlangenotto and Dennis Kundisch, which has received the WI 2017 best paper award. We could finally accept four papers that are presented in the issue at hand. In this context, we would like to thank all reviewers and authors as well as the editors of Electronic Markets. Without their support and contributions this special issue would not have been possible.

## Overview of the papers in the special issue

While several authors have already drafted a research agenda for big data and analytics in general (e.g., Abbasi et al. 2016), some EM contributions have focused on the specific challenges and opportunities of such research in the context of networked business and e-commerce. In particular, the papers in this special issue contribute to different grand research questions in “big data analytics in e-commerce” that have been identified in the EM position paper by Akter and Wamba (2016). The authors identified a set of six future research streams, related to 1) strategy, culture, leadership and organization, 2) marketing and sales, 3) product and operations management, 4) data quality, IT infrastructure and security, 5) human resources/talent management, and 6) overarching value. In detail, the topics of the issue at hand can be assigned to the research streams two, three and four. Some of the lead research questions in these streams, as identified by Akter and Wamba (2016, p. 189), which will be addressed by the authors of this special issue are: “What offerings generate more profit and which segments are more attractive?” (stream two), “How can organizations better use insights from big data to achieve operational excellence?” (stream three), and “What factors influence data costs, [...] and privacy”, as

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well as “How can a firm leverage big data sources [...] to produce insight and business value?” (both stream four). In the following, we describe the specific research questions and main findings of each paper in the special issue briefly, and highlight in which research stream they belong.

Contributing to the research stream “marketing and sales”, Schlangenotto et al. (2018) conduct a novel field experiment in which they empirically test the impact of search advertising on sales for bricks-and-mortar offline retailers (furniture stores in their case). In their paper “Is paid search overrated? When bricks-and-mortar-only retailers should not use paid search“, the authors premise is to investigate whether those users that click on sponsored search advertisements are indeed new, unique visitors that eventually contribute to additional sales and revenues, or whether sponsored search advertisements motivate old, existing users to click on the sponsored search results instead of the organic search results. In the latter case, a company would just burn money by using search advertising. But the authors go beyond the question of “clicking” on advertisements, and – using a clever design of coupons – can even identify how sponsored search translates into actual offline sales. Without the use of a field experiment, in which just some, but not all stores belonging to the same furniture chain used sponsored search, these observations would not have been possible due to a “lack of the counterfactual”. This is also the reason, why the authors raise the question “Is paid search overrated?”, as previous research found positive effects of sponsored search on revenues (usually of online firms), but did not have a good baseline, the counterfactual, to compare it to. Schlangenotto et al. (2018) show that in their sample, paid search does help to increase the reach of marketing efforts (coupons in their case), but ultimately does not translate into more offline sales. Thus, they caution brick-and-mortar stores not to burn too much money in paid search advertising.

The second paper by Kleindienst and Waldmann (2018) entitled “Between death and life - a formal decision model to decide on customer recovery investments” belongs to the research stream “production and operations management”. In particular, the authors approach the e-commerce sector from a different angle and contribute to the overarching research question “How can organizations better use insights from big data to achieve operational excellence?” posed by Akter and Wamba (2016, p. 189). Specifically, the authors propose a formal decision model that lays the foundation for a firm’s decision whether it is worthwhile to invest in a “dying” customer relationship in order to regain this customer, or whether one should rather not invest and let the customer go. The issue is discussed in a general, abstract manner that does not only apply to the e-commerce sector, but clearly, their model is most helpful in the e-commerce context, because here the competition for customers is very strong and customer migration is easy. At the same time, in e-commerce multifaceted and

rich customer data sets are readily available, so that big data analytics can be used to estimate the probabilities that a customer is “dying”, which, in turn, is the basis for the decision model of Kleindienst and Waldmann (2018).

Also the paper by Gimpel et al. (2018) is concerned with customer analytics, but from a customer privacy perspective. Their paper belongs to the research stream “data quality, IT infrastructure and security” and addresses the overarching research question “Do privacy and security concerns have any impact on customers?” (Akter and Wamba 2016, p. 189). More specifically, instead of pointing to data privacy measures and laws as a hinderance of competitiveness for data-driven businesses, the authors already highlight in their title “the upside of data privacy – delighting customers by implementing data privacy measures”. They demonstrate, based on insights from the literature, legal texts, privacy statements, expert interviews and ultimately from survey responses of customers that firms should see value in implementing privacy measures beyond those associated with “risk management”. In particular, they point to the trade-offs associated with implementing different privacy measures and suggest firms to offer a “premium service”, above and beyond their “basic service”, which caters to those customers that are particularly delighted by privacy-preserving measures. Clearly, their research is very topical and important in the context of the new General Data Protection Regulation (GDPR) that took effect in May 2018 in all Member States of the EU.

Finally, the paper by Hopf et al. (2018) complements this special issue with a contribution on data analytics in a narrower sense. In their paper “Enhancing energy efficiency in the residential sector with smart meter data analytics” they demonstrate how data that is readily available from smart meters and other publicly available data sources (weather data in their case) can be used to predict household-specific characteristics (e.g., age of residency, type of heating, number of appliances) with considerable accuracy. Such data can be used for targeted campaigns and advertisements, but also as to assess the potential impact and scope of new policy measures. From a methodological point of view, the authors highlight that a Random Forest was the statistical learning method that performed best in their context, and, that this approach is relatively robust to sparse temporal data. In this vein, it contributes to three research streams mentioned above, because it highlights how “marketing and sales” as well as “operations management” can be facilitated by combining readily available data, even if it is of poor “data quality”. At the same time, their research highlights how “private” household information can be determined through the use of data analytics in the energy sector, and in this context, it complements the contribution of Gimpel et al. (2018), who suggest that the use of such technology should go hand in hand with heightened efforts to delight customers through additional privacy preserving measures.

## Conclusions

Overall, the papers collected in this special issue span across many relevant topics in the context of “data-driven innovations for electronic markets”. However, they also employ a diverse set of methodological approaches, ranging from mathematical modeling over online field experiments and survey research to statistical learning. This highlights that meaningful and relevant IS research in this domain is not confined to “big data”-methods. Rather, it is the very strength of IS research that, depending on the research question, problem context and state of research, the appropriate research method can be chosen from the rich toolset that is available to the IS community.

Finally, while embracing this methodological richness, we further encourage research at the intersection of networked business and business analytics. The research agenda by Akter and Wamba (2016) seems a fruitful starting point here. For example, of the six promising future research streams identified by these authors only three were represented in this special issue. The next grand challenge for networked business, once “data-driven innovations” have been implemented at large, may well be to manage the cultural transformation that will follow. This is likely to put the research stream on “strategy, culture, leadership and organization” to the forefront of research on

networked business. For now, we leave it to a future special issue in EM to address this in more detail.

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