

Seminar on Digital Transformation and Value Creation

This seminar is a joint effort of the Digital Transformation Research Initiative. It will be supervised by Prof. Dr. Hernan Bruno (Marketing and the Digital Environment, hernan.bruno@wiso.uni-koeln.de) and by Prof. Dr. Jörn Grahl (Digital Transformation and Analytics, grahl@wiso.uni-koeln.de). Although each individual research project will be supervised by one professor, all sessions will be held jointly and all grading criteria and formal aspects are the same.

In this seminar you will gain a deeper understanding of topics connected to the ongoing “Digital Transformation” of business and society. We have chosen a set of question that we consider to be central aspects of Digital Transformation. The general objective of the seminar is to produce a report and a presentation that combine rigor and relevance on one of the topics described below. To do so, you will first review the literature, concentrating on what is being published in international journals and on leading conferences. In some cases, you will be expected to use broader sources such as consulting reports, managerial articles or blog posts. This is a very new area and it could be the case that the cutting edge of a particular topic has not yet reached the academic journals. Depending on the research question and your own qualification and methodological skills, you may then proceed to gather data, examine existing datasets, interview consumers or managers, or write code.

You are expected to write a short rigorous paper (“Seminararbeit”) and to give an oral presentation about your findings. Before enrolling in this seminar, please make sure you fulfill all requirements, and make sure that you can visit the kick-off meetings and the final presentations (see below). There will be no joint meetings for everybody during the semester. Although we expect you to work on your own, we encourage you to meet with your supervisor regularly in order to make sure that the direction of your work is fruitful. We expect you to submit the paper in English, but German can be an option. Presentations will be in English.

Requirements

It is required that you visit the kick-off meeting and the presentations. Most of the topics in this seminar are either empirical or computational. If you choose a quantitative or computational topic, we expect you to know how regression, hypothesis testing, significance levels, p-values, or programming works. The seminar will not serve as a first introduction into statistics/econometrics or programming. If you choose a qualitative topic (e.g., using interviews, or case studies) we expect you to pursue a rigorous and methodical approach.

The final grade will be a weighted average of grades for the paper (70%) and the oral presentation (30%).

Registration and kick-off

In order to participate you have register until November 4th.

You register by visiting Ms. Ommer, WiSo-Sekretariat, Universitätsstr. 91, 50931 Köln (ground floor).

During the registration you will be asked to name three (3) preferred topics. Pick any three.

The kick-off meeting will take place November 5th. Place and time t.b.a.

List of topics

Digital transformation refers to the impact of new technologies on business and society. These themes were chosen to reflect important trends on digital transformation. These changes are occurring rapidly and many of the trends and ideas below do not have a specific associated academic literature. This should not be seen as a drawback, but as an opportunity to look into exciting new questions that will only become more relevant in the next 5 to 10 years. The description of each topic below should provide a general direction. The student is expected to discuss the details and boundaries with Prof. Bruno and Prof. Grahl.

The associated readings (if any) are provided as context.

Digital Transformation and its Impact on Customer Behavior and Marketing

Prof. Dr. Hernan A. Bruno (hernan.bruno@wiso.uni-koeln.de)

1. Native advertising

Native advertising refers to advertising that matches the form of the medium. For instance, an ad on tweeter looks like a tweet on the timeline rather than a banner ad. Some industry experts believe that increasing antagonism to banner ads and the prevalence of ad-blocking software will make native advertising one of the main forms of advertising in the future. The objective of this project is to evaluate the impact of native advertising on different media, highlight the best practices, and comment on the ethical implications of blurring advertising with content.

Associated reading

<http://www.adweek.com/prnewser/native-advertising-explained-cannes-edition/115551>

2. Showrooming

Showrooming is a term used to describe the examination of merchandise in brick-and-mortar shops to later purchase it via an online --and perhaps cheaper- store. This is a problem for retailers who show and educate customers about products only to see them buy the product elsewhere. Some brick-and-mortar retailers have their own online channels and allow customers to order online a product while they are physically inspecting it in the store. There are many open questions concerning these practices: how should brands deal with this cross-channel conflict? Should physical shops become mere "showrooms" leaving all transactions to the e-commerce platform? The student is expected to define an important question and use academic and non-academic sources. The student is free to visit stores and interview store managers or shoppers to answer the question.

Associated reading

Mehra, Amit, Subodha Kumar, and Jagmohan S. Raju. "'Showrooming'and the Competition between Store and Online Retailers." *Available at SSRN 2200420*(2013).

3. Viral Content

What do we know about content "going viral"? New communication technologies have allowed consumers to share and therefore propagate pieces of content, whether these are news, advertising, or general videos. The objective of this project is to summarize what we know about why some pieces of

content propagate fast and reach a large audience via sharing. The academic papers below can be used as a starting point, but the student is free to use other sources academic or not.

Associated Reading

Berger, J., & Milkman, K. L. (2012). What makes online content viral?. *Journal of marketing research*, 49(2), 192-205.

Tucker, C. E. (2014). The Reach and Persuasiveness of Viral Video Ads. *Marketing Science*, 34(2), 281-296.

4. *Multi-channel attribution*

One of the biggest headaches companies are facing when evaluating the effectiveness of advertising is to attribute a behavior (visit to a website, a purchase, a booking) to a particular advertising channel. For instance, a user sees an online ad, and then a TV ad for the same hotel. She then searches online and reads an online review. Finally, she is exposed to an outdoor billboard at the airport for this same hotel brand. When she books the hotel, how should we think about the effectiveness of each of the ad exposures? The objective of this project is to survey how companies are addressing this challenge and what the best practices are.

Associated Reading

Li, H., & Kannan, P. K. (2014). Attributing conversions in a multichannel online marketing environment: An empirical model and a field experiment. *Journal of Marketing Research*, 51(1), 40-56.

5. *Online Banner Advertising*

Online advertising is not a new topic. However, it is continuously changing in form, practices, and measurement. What have we learnt in the last 15 years of banner advertising? The student is expected to provide a summary of what we know about online advertising, from academic research and other reputable sources.

Associated Reading

Lambrecht, A., & Tucker, C. (2013). When does retargeting work? Information specificity in online advertising. *Journal of Marketing Research*, 50(5), 561-576.

Goldfarb, A., & Tucker, C. (2011). Online display advertising: Targeting and obtrusiveness. *Marketing Science*, 30(3), 389-404.

6. *Freemium*

Many products with low or zero marginal costs (e.g. software, online services) are sometimes offered for free. In some cases, these services are supported by advertising. But it is also possible to have a business model in which customers use a basic version of the service for free and can then upgrade to higher value versions for a fee. The objective of this project is to survey the industry for good practices of such "Freemium" model, what works and what does not work.

Associated Reading

Lee, C., Kumar, V., & Gupta, S. Designing Freemium: a Model of Consumer Usage, Upgrade, and Referral Dynamics.

7. *Online education*

The hype around online education has subsided. A few years ago startups like Coursera and Udacity, as well as University initiatives like EdX were expected to completely disrupt the education market. Has such disruption happened? Has online education become integrated to traditional methods? What

are the latest ideas on online education? The objective of this project is survey the current state of online education, identify the main barriers to adoption and best practices.

8. *Bitcoin*

Bitcoin is based on a technology that allows parties to make payments using a virtual currency without the need of a centralized authority. The objective of this project is to explore potential uses of this technology, either in payments or in other forms of ownership.

Associated Reading

<http://www.economist.com/news/special-report/21650295-or-it-next-big-thing>

9. *The sharing economy*

The terms "Collaborative consumption" and "sharing consumption" cluster a fairly wide range of practices from sharing tools or real state. An ecosystem of companies has emerged that allows owners of a product to rent to others (Airbnb being the most salient example) and other forms of enabling collaboration. But we still don't know why this model works for some industries and not for others. We don't know if this process needs to be centralized by a controlling platform (like Airbnb does, obtaining a fee from each transaction) or we envision a future where technology will allow sharing without an intermediary. The objective of this project is to provide a useful framework to put this complex ecosystem of companies into a clear perspective.

Associated Reading

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/378291/bis-14-1227-unlocking-the-sharing-economy-an-independent-review.pdf

<http://www.pwc.co.uk/issues/megatrends/collisions/sharingeconomy.html>

10. *The future consumer*

This is a project about identifying trends of the future consumers. Children and teenagers are exposed to a very different media environment from that of previous generations. What are these demographic groups consuming? How is that consumption changing the way they behave, feel, think and consume? What are the implications when we think of consumption patterns in the future? This project that requires some data collection, perhaps via interview, consulting forums, talking to educators, etc.

Digital Transformation and Analytics

Prof. Dr. Jörn Grahl (grahl@wiso.uni-koeln.de)

11. *The economic impact of product recommendation networks*

Almost every online store display recommendations for products (think of “Customers who bought this product, also bought:…”). You can think of the structure of such recommendations in terms of networks. The network connects products. The links in this networks are the recommendations. It has been found that the large-scale structure of this network has implications for product choice and other economically relevant behavior. The goal of this work is to review and summarize the literature about recommendation networks and to discuss the state of the art and possible future research.

Associated Reading

Oestereicher-Singer, G.; Sundararajan, A. (2012): Recommendation Networks and the Long Tail of Electronic Commerce. In: *MIS Quarterly* 36 (1), S. 65–83.

12. *Reachability in networks of recommendations*

Almost every online store display recommendations for products. You can think of the structure of such recommendations in terms of networks. The network connects products, the links in this networks are the recommendations. But how difficult is it to navigate such networks? Are all products reachable and what does this mean for the online shop? The goal of this work is to review the literature about reachability in recommendation networks, to summarize it, and to discuss whether this topic is relevant to marketing, or the social sciences.

Associated Reading

Lamprecht, D.; Strohmaier, M.; Helic, D. (2015): Improving Reachability and Navigability in Recommender Systems. Working Paper. <http://arxiv.org/abs/1507.08120>

13. *The fragmentation debate*

Back in the days, when we watched TV, chances were high we watched the same movie or show. Today we have online streaming services for many niches and we can watch what we want at any time. What does this mean for the joint experience of cultural consumption? Are we still watching similar shows or does personalization on the web isolate us in our small niches? This question is discussed in the so-called “Fragmentation Debate”. The goal of this work is to review the literature about the fragmentation debate, to discuss the results and to make suggestions for future research.

Associated Reading

Hosanagar, K.; Fleder, D.; Lee, D.; Buja, A. (2014): Will the Global Village Fracture Into Tribes? Recommender Systems and Their Effects on Consumer Fragmentation. In: *Management Science* 60 (4), S. 805–823.

14. *How can we measure sales diversity?*

Many scientific studies explore how certain technologies or interventions influence product choice. One way to characterize product choice is to use measures of sales diversity. The question then is, do all consumers choose the same product, how diverse are the shopping baskets, and how can we describe structural differences between them? An related discussion is that about the long-tail of E-Commerce. Here sales diversity is a central outcome. A popular measure is the Gini coefficient but there are many more measures of concentration across the sciences. The goal of this work is to collect and compare measures of concentration from various literature streams and to discuss their drawbacks and potential.

Associated Reading

Brynjolfsson, E.; Hu, Y.; Smith, M. D. (2010): Research Commentary-- Long Tails vs. Superstars: The Effect of Information Technology on Product Variety and Sales Concentration Patterns. In: *Information Systems Research* 21 (4), S. 736–747.

15. *Who is interested in Bitcoin, and why?*

Bitcoin is a purely digital currency that is used online to shop in relative privacy. Most of the discussion about Bitcoin is technical, i.e., it asks how we can build digital currencies that work, and what algorithmic concepts are behind them. But, is Bitcoin important for Marketing? Is it important for those who study social welfare? The goal of this work is to explore ways in which digital currencies could influence value creation and social and economic behavior.

Associated Reading

Nakamoto, S. Bitcoin: A Peer-to-Peer Electronic Cash System. Available on the Internet.

16. *Peer Effects*

Whenever we are active in online social networks chances are high that we are being influenced by our peers. How do our peers influence our economic decisions? To which degree do consumers rely on peers? Who is influential? Who is susceptible to influence? The goal of this work is to review and synthesize the empirical literature about peer effects.

Associated Reading

Aral, S.; Walker, D. (2012): Identifying Influential and Susceptible Members of Social Networks. In: *Science* 337 (6092), S. 337–341.

17. *The Lasso*

The Lasso is a statistical method to identify subsets of covariates that are important. It does so by penalizing the absolute size of the regression coefficients. Such methods can be important in the age of Big-Data because we can easily find a large number of covariates for an observation. The goal of this work is to summarize the Lasso and related methods and to discuss their drawbacks and potentials.

Associated Reading

Hastie, T.; Tibshirani, R.; Friedman, J. (2009): *The Elements of Statistical Learning*. Springer-Verlag. 2nd edition.

18. Scalability of statistical methods

In the age of Big Data we have large datasets that keep on growing. This can be a problem if the statistical method used in your analysis does not scale well (i.e. it becomes too slow for large n). The goal of this work is to study the scalability of selected statistical methods such as regression or matching, and to make suggestions how the scalability can be improved.

19. Programmer's corner: Crawlers

We are looking for candidates who are able to write crawlers for websites. If you can program in JAVA, Python, C, or another language and you are interested in writing a crawler and analyzing the data, choose this topic and we discuss the details.

20. Programmer's corner: Twitter Bots

We are looking for candidates who program Twitter-Bots. There are many possible applications of Twitter Bots and not all of them are useless. If you think you would be able to code up a bot, let us know by choosing this topic. We discuss the details.