

# Visual Representations of Chatbots - A Literature Review

MA



Supervisor: *Ulrich Gnewuch*

**Problem Description:** *Early chatbots were not more than simple command-line interfaces. Over the years, they have been endowed with all kinds of visual appearances:*

*•Icons (Cortana, Siri, ...), Cartoon-like characters (IKEA Anna, Yellostrom Eve, ...), Talking heads, 3-D avatars, ...*

*However, **it is unclear if chatbots really need rich visual representations.** Research suggests that non-embodied, 'low-overhead' chatbots might be more successful and seem to meet user expectations.*

**Goal of the Thesis:** *Review literature in the field of Human-Computer Interaction (HCI) to **find out what kind of visual representations have been used and how different visual representation have affected user perception of chatbots***

## Starting Literature:

- Michael McTear, Zoraida Callejas, and David Griol. 2016. *The Conversational Interface: Talking to Smart Devices*. Springer.*
- Mohammed Slim Ben Mimoun, Ingrid Poncin, and Marion Garnier. 2012. Case Study - Embodied Virtual Agents: An Analysis on Reasons for Failure. *Journal of Retailing and Consumer Services* 19, 6: 605–612.*
- Astrid M Von Der Pütten, Nicole C Krämer, Jonathan Gratch, and Sin Hwa Kang. 2010. "It doesn't matter what you are!" Explaining Social Effects of Agents and Avatars. *Computers in Human Behavior* 26: 1641–1650.*
- Jana Appel, Astrid Von Der Pütten, Nicole C. Krämer, and Jonathan Gratch. 2012. Does humanity matter? Analyzing the importance of social cues and perceived agency of a computer system for the emergence of social reactions during human-computer interaction. *Advances in Human-Computer Interaction* 2012.*

**Supervisor:** *Christian Fleig*

**Problem Description:** *A central decision in process transformation is the decision whether the future process design should follow the implementation of a standard business process, or be specific to the individual organization. Literature has acknowledged the significance of harmonization for process improvement activities (Hammer 1990), and authors report an increased interest in process harmonization (Romero et al. 2015b). Increasing process standardization is perceived and found to be an effective means for increasing organizational performance.*

*However, although the phenomenon of “process standardization” is ubiquitous in business and academics alike, an exhaustive understanding and definition of the phenomenon has been missing. As a consequence, the term “standardization” is frequently used without a clear understanding of what is meant by it, and what different types of “standard processes” there might be.*

**Goal of the Thesis:** *The seminar paper contributes to an understanding of process standardization by exploring the literature and tries to give an own explanation („definition“) of business process standardization. Ideally, the thesis also discovers different types and degrees of standardization, and comes up with an indication of whether a business process is „standard“ or not.*

## Starting Literature:

- Münstermann, Björn; Eckhardt, Andreas; Weitzel, Tim (2010): *The performance impact of business process standardization*. In: *Business Process Mgmt Journal* 16 (1), S. 29–56. DOI: 10.1108/14637151011017930
- Wüllenweber, Kim; Beimborn, Daniel; Weitzel, Tim; König, Wolfgang (2008): *The impact of process standardization on business process outsourcing success*. In: *Inf Syst Front* 10 (2), S. 211–224. DOI: 10.1007/s10796-008-9063-x
- Romero, Heidi L.; Dijkman, Remco M.; Grefen, Paul W. P. J.; van Weele, Arjan J. (2015): *Factors that Determine the Extent of Business Process Standardization and the Subsequent Effect on Business Performance*. In: *Bus Inf Syst Eng* 57 (4), S. 261–270. DOI: 10.1007/s12599-015-0386-0

# State-of-the-art Literature Review on Decision Support Systems in Business Process Management

MA



**Supervisor:** *Christian Fleig*

**Problem Description:** *Organizations are required to conduct transformation activities of businesses and associated business processes to survive, stay competitive, and thrive under new environmental conditions. Thus, decision-making in process transformation becomes a decisive capability for organizations to succeed in increasingly complex and dynamic environments.*

*Decision support systems (DSS) are information systems to support organizational decision-making processes by deciding between alternatives in highly dynamic and semi-structured or unstructured “wicked” problems. However, literature on DSSs in the domain of Business Process Management has been fragmented, with many individual contributions exploring separate facets of the phenomenon, such that a clear understanding of DSSs has been missing.*

**Goal of the Thesis:** *The aim of the thesis is to provide a structured literature review on decision support systems within the context of business process management. In particular, the contribution should include an explanation of the phenomenon, and identify seminal works and current streams of research on decision support systems (DSS). Furthermore, the seminar paper should provide an overview of different types of DSS available and ideally propose a taxonomy of the discovered DSSs in BPM.*

## Starting Literature:

- Sprague, R;(1980). “A Framework for the Development of Decision Support Systems.” MIS Quarterly. Vol. 4, No. 4, pp.1-25
- F. Burstein; C. W. Holsapple (2008). Handbook on Decision Support Systems. Berlin: Springer Verlag
- Wright, A; Sittig, D (2008). "A framework and model for evaluating clinical decision support architectures q". Journal of Biomedical Informatics. 41: 982–990

# Literature Review on Similarity-Based Process Matching Approaches

MA



**Supervisor:** *Christian Fleig*

**Problem Description:** *Numerous business organizations are transforming and reinventing their businesses in response to new business opportunities and changing competitive environments. In order to support business transformation, organizations need to transform their business processes as „business enablers“. However, decision-making in process transformation requires to objectively compare process models against each other. For example, in the current process design needs to be compared against several possible future process design to plan transformation projects in advance and to select the best process alternative.*

*The calculation of the similarity between two process models is not a trivial endeavour. Numerous methods such as similarity-based process matching compete against each other.*

**Goal of the Thesis:** *Research has provided numerous methods, techniques, and algorithms to match two processes against each other. However, this thesis should focus on similarity-based matching measures to provide an overview over the different methods and outline their respective strengths and weaknesses.*

## Starting Literature:

- *Becker, Michael; Laue, Ralf (2012): A comparative survey of business process similarity measures. In: Computers in Industry 63 (2), S. 148–167. DOI: 10.1016/j.compind.2011.11.003*

# Literature Review on Contextual Factors in Business Process Management

MA



**Supervisor:** *Christian Fleig*

**Problem Description:** *The external business environment is a decisive determinant for the organizational structure, design, business models, and therefore ultimately the design of business processes. With respect to business process management, contingency theory has often been used as an argument to answer the question of why organizations need to adapt business processes in response to internal and external pressure for transformation. Among the most prominent, organizational contingency theory (OCT) by Donaldson (2001) claims that the internal and external environment determines the way an organization designs itself. With regard to business process management, business processes are context-dependent and need to adapt accordingly to any changes in the context (Rosemann and Vessey 2008; van der Aalst and Dustdar 2012; Wieland et al. 2007).*

**Goal of the Thesis:** *The question of which “contextual” factors impact business processes remains unclear and imposes a significant challenge for organizations when trying to optimize business processes and to react to environmental change. At the same time, not knowing context factors for which business process management needs to account imposes significant risks on organizations.*

*The seminar thesis should perform a structured literature review to identify what is meant by „context“ in terms of business process management. Ideally, the thesis also finds several examples for context factors.*

## Starting Literature:

- *Vom Brocke, Jan; Zelt, Sarah; Schmiedel, Theresa (2016): On the role of context in business process management. In: International Journal of Information Management 36 (3), S. 486–495. DOI: 10.1016/j.ijinfomgt.2015.10.002*
- *van der Aalst, Wil M. P.; Dustdar, Schahram (2012): Process mining put into context. In: IEEE Internet Computing 16 (1), S. 82–86.*

# Exploring the Benefits and Challenges of Business Process Standardization

MA



**Supervisor:** *Christian Fleig*

**Problem Description:** *Standardization of business processes has been associated with organizational benefits in terms of responsiveness, reduced time and costs required for process executions, increased effectiveness and efficiency of processes, as well as higher quality of process outputs. Process standardization aims at a situation where the same activity in different organizational units is performed identically (Harmon 2010). In today's business world, process standardization has experienced a true "hype", and many organizations try to re-standardize their formerly individual business processes. At the same time, the trade-off between standardization and individualization and the drawbacks of overly homogeneous business processes require a well-balanced strategy between individualization and standardization. Thus, is it actually true that standardization brings about the promised benefits, or does it also expose organizations to disadvantages which outweigh these benefits?*

**Goal of the Thesis:** *The thesis should perform a structured literature review identify the benefits and drawbacks of process standardization, and identify under which circumstances these benefits and challenges play a role. The outcome should be a critical argument for or against business process standardization regarding the countervailing effects of standardization.*

## Starting Literature:

- *Kauffman, Robert J.; Tsai, Juliana Y. (2010): With or without you. The countervailing forces and effects of process standardization. In: Electronic Commerce Research and Applications 9 (4), S. 305–322. DOI: 10.1016/j.elerap.2009.11.009.*

# The Role of Process Standardization in ERP Systems Implementation

MA



**Supervisor:** *Christian Fleig*

**Problem Description:** *With regard to the implementation of enterprise resource planning systems (ERP), process standardization is found to be a decisive step as it aligns business processes and ERP systems (Botta-Genoulaz et al. 2005; Romero et al. 2015a). In addition, standardized business processes allow for a uniform ERP implementation. With respect to the requirement to implement new organization-wide information systems such as the SAP S/4 HANA business suite, numerous organizations are at the brink of having to standardize business processes in advance to the implementation of any new ERP system. However, although standardization is a “hype” in today’s business world, the actual role of standardization in an ERP implementation remains rather opaque.*

**Goal of the Thesis:** *The seminar thesis should perform a structured literature review within the domain of ERP implementation literature to identify the role that the standardization of business processes plays with respect to the success of the ERP implementation.*

## Starting Literature:

- *Richen, Albrecht; Steinhörst, Ansgar (2005): Standardization or Harmonization? You need Both. In: BPTrends. Online verfügbar unter [www.bptrends.com](http://www.bptrends.com).*
- *Wüllenweber, Kim; Beimborn, Daniel; Weitzel, Tim; König, Wolfgang (2008): The impact of process standardization on business process outsourcing success. In: Inf Syst Front 10 (2), S. 211–224. DOI: 10.1007/s10796-008-9063-x*
- *Romero, Heidi L.; Dijkman, Remco M.; Grefen, Paul W. P. J.; van Weele, Arjan J. (2015): Factors that Determine the Extent of Business Process Standardization and the Subsequent Effect on Business Performance. In: Bus Inf Syst Eng 57 (4), S. 261-270. DOI: 10.1007/s12599-015-0386-0.*

# Use of Eye-Tracking Devices in Business Intelligence and Analytics Systems – State-of-the-Art and Research Gaps

MA



**Supervisor:** *Peyman Toreini*

**Problem Description:** *Business Intelligence & Analytics (BI&A) systems focus on helping decision makers in the decision-making process, and BI&A dashboards refer to graphical user interfaces that contain analytical results and measures of the organization's business performance. Predominant modality for communication between dashboard and decision makers is visual, and eye-trackers enable the measurement of users responses when they react to various stimuli in such dashboards. Collecting eye-movement data through these devices create the opportunity for designing intelligent user interfaces that support user interactions and creating new features. Moreover, such information can be used to evaluate the design of dashboards. So far, the use of this technique for the evaluation and developing intelligent BI&A dashboards is less prominent.*

**Goal of the Thesis:** *(1) Provide an overview of using eye-tracking devices in BI&A domain (2) Classify opportunities to use eye-movement data in designing intelligent BI&A dashboards*

## Starting Literature:

- *Kurzahls, K., Fisher, B., Burch, M., & Weiskopf, D. (2016). Eye tracking evaluation of visual analytics. Information Visualization, 15(4), 340-358. ISO 690*
- *Dereck Toker, Cristina Conati, Ben Steichen, and Giuseppe Carenini. 2013. Individual user characteristics and information visualization: Connecting the dots through eye tracking. Proceedings of the SIGCHI ...: 295–304. <http://doi.org/10.1145/2470654.2470696>*



# Attention-aware Human-Computer Interaction – State-of-the-art Overview and Research Gaps

MA



**Supervisor:** *Peyman Toreini*

**Problem Description:** *Researchers refer to attention as the set of processes enabling and guiding the selection of incoming perceptual information. User interfaces (UI) that are sensitive to the users' visual attention are called attentive UI and managing the users' attention is one of the most pressing but also difficult challenges in human-computer interaction (HCI) research. Visual attention is particularly relevant to attention-aware systems since the current predominant modality for computer-to-human communication is visual. Using eye movement information when users are interacting with visual information can enable a computer system to gain more contextual information about the users. This information can be leveraged to design interfaces which are more intuitive and intelligent UI, such as attentive UI.*

**Goal of the Thesis:** *(1) Investigate state-of-the-art for the attention-aware human-computer interaction approaches (2) Find the research gaps in investigating attention-aware human-computer interaction*

## Starting Literature:

- Bulling, Andreas. "Pervasive Attentive User Interfaces." *IEEE Computer* 49.1 (2016): 94-98.
- Vertegaal, Roel. "Attentive user interfaces." *Communications of the ACM* 46.3 (2003): 30-33.
- Roda, Claudia, and Julie Thomas. "Attention aware systems: Theories, applications, and research agenda." *Computers in Human Behavior* 22.4 (2006)

# A Review of the Ethical Issues of Nudging

MA



**Supervisor:** *Dennis Hummel*

**Problem Description:** *Nudges are „any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler and Sunstein, 2008). Although very effective, nudges have been criticized widely for their manipulative nature (e.g Goodwin 2012 or Hansen & Jespersen 2013). They argue for instance that nudges, although meant to help people, could be used against them if the choice architect has an evil agenda (see also Thaler & Sunstein 2008). Other arguments have been mentioned but there has not been a review of the criticism of nudges and which criticisms have already been solved. Thereby, a systematic literature review is an adequate method to investigate this issue.*

**Goal of the Thesis:** *The goal of the thesis is to develop an overview of the arguments against the concept of nudging. After searching and reviewing the literature, the student should then list the arguments and compare their scientific foundation. Moreover, in the discussion part of the seminar thesis the student could find possible replies to the arguments brought forward by the critics.*

## Starting Literature:

- Goodwin, T. 2012. “Why We Should Reject ‘Nudge,’” *Politics* (32:2), pp. 85–92 (doi: 10.1111/j.1467-9256.2012.01430.x).
- Hansen, P. G., and Jespersen, A. M. 2013. “Nudge and the Manipulation of Choice,” *European Journal of Risk Regulation* (4:1), pp. 3–28 (doi: 10.2307/2489305).
- Selinger, E., and Whyte, K. 2011. “Is There a Right Way to Nudge? The Practice and Ethics of Choice Architecture,” *Sociology Compass* (5:10), pp. 923–935 (doi: 10.1111/j.1751-9020.2011.00413.x).

# A Literature Review of Literature Reviews on Nudging

MA



**Supervisor:** *Dennis Hummel*

**Problem Description:** *Nudging describes „any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler and Sunstein, 2008) and a variety of studies, mostly lab or field experiments, using nudges have been performed. In turn, these studies have been conceptualized in several literature reviews focusing on certain domains (e.g. energy or health) or certain types of nudges (e.g. digital nudges). With this variety of literature reviews emerging in different fields, it is unclear whether they all reach a similar conclusion or whether type and effectiveness of nudges depend on the area. A literature review of literature review (meta-literature review) is an appropriate method to shed light on this matter.*

**Goal of the Thesis:** *The goal of the thesis is to compare existing literature reviews on nudging and to test whether these studies reach similar conclusions. Possible areas of investigation could be whether all domains have been covered, whether the developed taxonomies of the literature reviews are comparable or what the contributions of each review are.*

## Starting Literature:

- *Wilson, A. L., Buckley, E., Buckley, J. D., and Bogomolova, S. 2016. “Nudging healthier food and beverage choices through salience and priming. Evidence from a systematic review,” Food Quality and Preference (51), Elsevier Ltd, pp. 47–64*
- *Mirsch, T., Lehrer, C., and Jung, R. 2017. “Digital Nudging : Altering User Behavior in Digital Environments,” in 13th International Conference on Wirtschaftsinformatik, pp. 634–648.*
- *Lycett, K., Miller, A., Knox, A., Dunn, S., Kerr, J. A., Sung, V., and Wake, M. 2017. “Nudge’ interventions for improving children’s dietary behaviors in the home: A systematic review,” Obesity Medicine, Elsevier Ltd*

# Reviewing the role of perceived risk in electronic commerce

MA



**Supervisor:** *Dennis Hummel*

**Problem Description:** *Perceived risk can be defined “as a consumer’s belief about the potential uncertain negative outcomes from the online transaction” (Kim et al. 2008, p.546). Perceived risk is a major driver of online behavior of private consumers and it remains a challenge for online companies to reduce the perceived risk of their applications and online services. Different theoretical models exist to explain perceived risk in an e-commerce context but it remains unclear which antecedents have proven to be effective across multiple studies and which dependent variables are influenced by perceived risk. Thereby, the seminar thesis should synthesize the knowledge on perceived risk.*

**Goal of the Thesis:** *Review the IS literature to find the antecedents of perceived risk as well as the dependent variables that are influenced by perceived risk in an online context. The student could aggregate antecedents and dependent variables in a single overview to derive commonalities and differences.*

## Starting Literature:

- *Kim, D. J., Ferrin, D. L., and Rao, H. R. 2008. “A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents,” Decision Support Systems (44:2), pp. 544–564.*
- *Fang, X., Chan, S., Brzezinski, J., and Xu, S. 2006. “Moderating Effects of Task Type on Wireless Technology Acceptance,” Journal of Management Information Systems (22:3), pp. 123–157.*
- *Schoenbachler, D. D., and Gordon, G. L. 2002. “Multi-channel shopping: understanding what drives channel choice,” Journal of Consumer Marketing (19:1), pp. 42–53*

**Supervisor:** *Celina Friemel*

**Problem Description:** *Shopping involves a lot of emotions for the customers (Childers et al. 2001; Koufaris 2002). When shopping online customers more and more can make use of the opportunity to interact with virtual shopping agents or other forms of user assistance (Häubl and Trifts 2000; Ben Mimoun et al. 2012). When interacting with such agents emotions can even be imagined to play a role on both sides. However, so far not much literature exists that deals with identifying and defining the role of emotions within this human-computer interaction scenarios. It will be a major contribution to different communities of research to identify literature and classify existing findings on this topic.*

**Goal of the Thesis:** *Review literature in the field of Human-Computer Interaction (HCI), Information Systems (IS), and other related fields (e.g. Marketing) to **find out what role emotions play in the interaction of online shopping customers with (virtual) agents or assistants.***

## Starting Literature:

- *Koufaris, M. 2002. "Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior," Information Systems Research (13:2), pp. 205-223.*
- *Childers, T. L., Carr, C. L., Peck, J., and Carson, S. 2001. "Hedonic and Utilitarian Motivations for Online Retail Shopping Behavior," Journal of Retailing (77:4), pp. 511-535.*
- *Ben Mimoun, M. S., Poncin, I., and Garnier, M. 2012. "Case study-Embodied virtual agents: An analysis on reasons for failure," Journal of Retailing and Consumer Services, (19:6), Elsevier, pp. 605-612.*
- *Häubl, G., and Trifts, V. 2000. "Consumer Decision Making in Online Shopping Environments : The Effects of Interactive Decision Aids Consumer Decision Making in Online Shopping Environments : The Effects of Interactive Decision Aids," Marketing Science, (19:1), pp. 4-21.*

# User Roles during the Process of Service Design: A Systematic Literature Review

MA



**Supervisor:** *Xuanhui Liu*

**Problem Description:** *Existing studies depict the importance of user involvement in the service design process and benefits of user involvement. Harris and Weistroffer (2009) conduct a review study on the relationship between user involvement and system success. But how users are involved has not yet been systematically reviewed. A user can be involved to discuss design ideas or to generate design concepts or to evaluate a low-fidelity prototype. As roles of users in the service design process are various, it is interesting to have a review on what roles that users play when they are involved during the service design process.*

**Goal of the Thesis:** *This seminar thesis aims to conduct a systematic literature review on user roles during the process of service design.*

## Starting Literature:

- *Harris, M. a., & Weistroffer, H. R. (2009). "A New Look at the Relationship between User Involvement in Systems Development and System Success Development and System Success," Communications of the Association for Information Systems, 24(1), 739–756.*
- *McKay, J., Marshall, P., and Hirschheim, R. (2012). "The design construct in information systems design science," Journal of Information Technology, (27:2), pp. 125–139 (doi: 10.1057/jit.2012.5).*

# Phases of the e-Service Design Process: A State-of-the-Art Review MA



**Supervisor:** *Xuanhui Liu*

**Problem Description:** *As e-service outcomes can influence customer satisfaction, customer loyalty, etc. (e.g., Cristobal et al. 2007, Edvardsson et al. 2011), some studies introduce the phases that need to be considered in the design process to approach high-quality e-service outcomes. But studies on service design process are scattered around in the literature. So far, there is no review study that looks into the phases that need to be considered in the e-service design process. The differences and similarities of the phases in related studies can be summarized by conducting a review on state-of-the-art.*

**Goal of the Thesis:** *This seminar thesis aims to have an overview of the state-of-the-art to understand phases in the service design process.*

## Starting Literature:

- *Cho, Y. K., Menor, L. J., Yun Kyung Cho, and Menor, L. J. 2009. "Toward a Provider-Based View on the Design and Delivery of Quality E-Service Encounters," Journal of Service Research, (13:1), pp. 83–95 (doi: 10.1177/1094670509350490).*
- *Hill, T.P. 1977. "On Goods and Services." The review of income and wealth 23(4): 315–38.*

# State-of-the-Art of Strategy Implementation in Digital Transformation

MA



**Supervisor:** *Dominik Augenstein*

**Problem Description:** *In today's business, companies are aware of having a digital transformation strategy is essential to survive on competitive markets. However, existing digital strategy implementation concepts are limited and in practice, companies often lack implementing their digital transformation strategy successful. One key problem hereby is, that they do not know, how exactly they should execute the defined strategy with regards to organisational structures, information technologies and individual employees. Organizations and individuals are strongly linked with information technology, changing one element will typically also impact the other elements. Thus, there is a need to deal with digital transformation strategy implementation differently than with generic strategy implementation approaches*

## **Goal of the Thesis:**

- *The student will show, which IS and organizational science literature provides knowledge about strategy implementation in digital transformation*
- *The student will show the limitations of these approaches as a starting point for new research*

## **Starting Literature:**

- *Pella, M. D. A., Sumarwan, U., & Daryanto, A. (2013). Factors affecting poor strategy implementation. Gadjah Mada International Journal of Business, 15(2), 183-204.*
- *Roh, J., Hong, P., & Min, H. (2014). Implementation of a responsive supply chain strategy in global complexity: The case of manufacturing firms. International Journal of Production Economics, 147*
- *Alharthy, Abdullah H., et al. "Identification of Strategy Implementation Influencing Factors and Their Effects on the Performance." (2017). International Journal of Business and Social Science*



# Enterprise Architecture Modeling in Business Model Transformations

MA



**Supervisor:** *Dominik Augenstein*

**Problem Description:** *Fast changing demands and digitalization of products and services force companies to rethink their business models. Rarely concepts for such business model transformations exist. Since many years the field of Enterprise Architecture Modeling (EAM) provides useful concepts that may build a base for business model transformations. The problem hereby is to find out, how far existing concepts may support business model transformation. In this*

## Goal of the Thesis:

- *The student will first provide an overview on the state-of-the-art of Enterprise Architecture Modelling and business model transformation concepts. In a second step, existing literature at the intersection of EAM and business model transformation will be identified and summarized.*
- *The student will discuss limitations of existing approaches as a starting point for new research*

## Starting Literature:

- *Simon, Daniel, Kai Fischbach, and Detlef Schoder. "An exploration of enterprise architecture research." CAIS 32 (2013): 1.*
- *Löhe, Jan, and Christine Legner. "Overcoming implementation challenges in enterprise architecture management: a design theory for architecture-driven IT Management (ADRIMA)." Information Systems and e-Business Management 12.1 (2014): 101-137.*
- *Cameron, Brian H., and Eric McMillan. "Analyzing the current trends in enterprise architecture frameworks." Journal of Enterprise Architecture 9.1 (2013): 60-71.*