FINAL REPORT

1 General Information

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2 Summary

2.1 English Summary

The project theorizes the discontinuous use of information systems (IS) and its causes. Discontinuous use of IS is a behavior that encompasses switching, referring to users switching from one IS to another and continuing to perform the task associated with that IS in the same or an improved way, and quitting, referring to stopping the use of an IS and the tasks associated with it entirely (Maier et al., 2024). We argue that there is a need for organizations to understand discontinuous use. For example, streaming services (e.g., Netflix), matchmaking services (e.g., Tinder), or social networking sites (e.g., Facebook) need to address user loss as it directly impacts their revenues and market valuations.

The core focus in understanding the discontinuous use of IS is on shocks, which are defined as significant life events. These events range from personal crises (e.g., a break up) to data breaches (e.g., an IS disclosing users' personal information publicly on the internet) and influence user behavior. We developed a taxonomy of shocks, explored different paths to discontinuous use of IS, and characterized ex-users. The findings were disseminated through leading academic journals in the IS discipline (e.g., *Journal of the Association for Information Systems*, *Information Systems Journal*).

One of the core theoretical findings is that shocks have a strong influence on user behavior, which happens in complex and diverse ways. For instance, some users discontinue a matchmaking service after finding a suitable partner (e.g., shock-induced quitting) or switch from a social networking site after a data breach (e.g., shock-induced switching). Counterintuitively, shocks can also encourage IS use under certain conditions, as illustrated in the spark of user interactions with chatbots during the COVID-19 pandemic. Based on that, we crafted an agenda for future IS research interested in shocks, suggesting, among others, that future studies should investigate the influence of shock strength on user behavior and explore mechanisms for recovery of ex-users who experienced a shock.

The practice will benefit from those findings in various ways, as we provide actionable insights for organizations to better manage user retention. For example, organizations need to develop targeted strategies to mitigate the impact of shocks and, thus, prevent users from discontinuing their IS use.

2.2 German Summary

Das Projekt untersucht warum Personen ihre Nutzung von Informationssystemen (IS) einstellen. Das Einstellen der Nutzung von IS umfasst Switching, bei dem Nutzende von einem

IS zu einem anderen wechseln und die zugehörigen Aufgaben in gleicher oder verbesserter Weise weiter ausführen, sowie Quitting, bei dem die Nutzung eines IS und die damit verbundenen Aufgaben vollständig eingestellt werden (Maier et al., 2024). Anbieter von IS wie Streaming-Diensten (z. B. Netflix), Partnervermittlungsdiensten (z. B. Tinder) oder soziale Netzwerken (z. B. Facebook) müssen dieses Verhalten verstehen, da ein Verlust von Nutzenden direkte Auswirkungen auf ihre Umsätze und Marktbewertungen hat.

Der Schwerpunkt des Projekts liegt auf Schocks, also einschneidenden Lebensereignissen. Diese Ereignisse reichen von persönlichen Krisen (z. B. eine Trennung) bis hin zu Datenpannen (z.B. die ungewollte Offenlegung persönlicher Nutzerdaten durch einen Dienst) und beeinflussen das Verhalten von Nutzenden. Im Rahmen des Projekts wurde eine Taxonomie von Schocks entwickelt, verschiedene Pfade, die zur Einstellung der Nutzung eines IS führen, untersucht und Ex-Nutzende charakterisiert. Die Ergebnisse wurden in führenden Fachzeitschriften der IS-Disziplin veröffentlicht (z.B. *Journal of the Association for Information Systems*, *Information Systems Journal*).

Ein zentrales Ergebnis ist, dass Schocks das Verhalten von Nutzenden stark und auf komplexe und vielfältige Weise beeinflussen. Beispielsweise stellen einige Nutzende nach der erfolgreichen Partnersuche die Nutzung eines Partnervermittlungsdienstes ein oder wechseln nach einer Datenpanne von einem sozialen Netzwerk zu einem anderen. Interessanterweise können Schocks unter bestimmten Bedingungen auch die Nutzung von IS fördern, wie beispielsweise die verstärkte Nutzung von Chatbots während der COVID-19-Pandemie zeigt. Auf Basis dieser Erkenntnisse wurde eine Forschungsagenda entwickelt, die unter anderem vorschlägt, die Auswirkungen der Stärke von Schocks auf das Nutzungsverhalten zu untersuchen und Mechanismen zur Rückgewinnung von Ex-Nutzenden nach erlebten Schocks zu erforschen.

Die Praxis kann von diesen Ergebnissen in mehrfacher Hinsicht profitieren, da umsetzbare Handlungsempfehlungen für ein besseres Management der Nutzerbindung gegeben werden. Organisationen sollten gezielte Strategien entwickeln, um die Auswirkungen von Schocks abzumildern und so zu verhindern, dass Nutzende ihre Nutzung von IS einstellen.

3 Scientific Work and Results Report

3.1 Research Objectives of the Project

Discontinuous use of information systems (IS) occurs in two distinct ways: through switching, referring to users switching from one IS to another and continuing to perform the task

associated with that IS in the same or an improved way, and quitting, referring to stopping the use of an IS and the tasks associated with it entirely (Maier et al., 2024). Practice indicates that discontinuous use is crucial for many organizations that rely on user numbers. For providers of streaming services (e.g., Netflix) or matchmaking services (e.g., Tinder), the loss of users directly impacts revenue streams (Reid, 2024). In addition, for providers of social networking sites (e.g., Facebook), user loss compromises their ability to attract advertisers and business partners (Deyo, 2024). For all of these providers, discontinuous use jeopardizes their financial viability and stock market valuations (Taboola, 2022).

Existing IS research primarily explains discontinuous use based on users' dissatisfaction with an IS (Bhattacherjee, 2001; Goodhue & Thompson, 1995). The main argument is that users' behavior is subject to their rational considerations based on reasoned action, experiential response, and habitual response (Bhattacherjee & Lin, 2015). However, studies in other disciplines suggest that significant life events, referred to as shocks, also play a critical role in influencing behavior (Braukmann et al., 2018). An illustrative example is the Cambridge Analytica data scandal, where the breach of trust led to increased users discontinuing their use of Facebook, including Apple co-founder Steve Wozniak (Swan, 2018). These illustrations highlight the need to consider the role of shocks in discontinuous use and user behavior in general. This project addresses this need in three stages. In stage 1, we developed a taxonomy of shocks that helps identify and classify shocks based on their different characteristics. In stage 2, we explored the various dissatisfaction- and shock-based paths that lead to discontinuous use. In stage 3, we characterized and distinguished ex-users from other user types, such as non-users and users.

3.2 Description of the project-specific insights

The project yielded several key insights that we disseminated through published papers in leading IS journals, including *the Journal of the Association for Information Systems*, *Information Systems Journal*, and *Internet Research*.

Stage 1. We classified types of shocks based on their characteristics, which resulted in a taxonomy of shocks (Meier et al., 2023). While extant IS literature largely focuses on negative IT-related shocks (Ortiz de Guinea, 2016), we highlight the importance of broadening this perspective. Based on a multi-method study (i.e., review of 70 shock-related studies from management and IS literature; qualitative interviews with 39 users), we demonstrate that different types of shocks influence user behavior across various contexts. In addition to shock type (i.e., environmental, private, technology, work), the proposed taxonomy categorizes shocks based on anticipation (i.e., expected, unexpected), valence (i.e., positive, negative),

and urgency (i.e., high, low). These findings extend existing explanations of user behavior based on rational considerations (Bhattacherjee & Lin, 2015), demonstrating that user behavior is also influenced by shocks. The study provides recommendations for future IS research interested in shocks and outlines ways for organizations to effectively support users who experience shocks. We presented preliminary findings from the study at the ACM SIGMIS CPR Doctoral Consortium in 2022. Based on the feedback received, we refined the study and published it in *Internet Research* (Meier et al., 2023).

Stage 2. We built on image theory (Beach, 1990) to develop a theoretical model that comprehensively explains discontinuous use in the form of quitting and switching (Maier et al., 2024). Based on a multi-methods study (i.e., retrospective analysis of 467 ex-users, scenario-based study of 201 current users), we identified nine distinct paths leading to discontinuous use: six triggered by shocks and three by dissatisfaction. For instance, a user of a matchmaking service may discontinue use after finding a suitable match (i.e., contextual shock), as they no longer need it to find a partner. Another user might discontinue after a while of not finding a suitable match, illustrating one of the dissatisfaction paths. By retrospectively surveying ex-users, we revealed that most respondents followed one of the identified paths. We conducted a scenario-based study to evaluate whether shocks can also predict current users' discontinuation intention. Findings provide empirical evidence that shocks can lead current users to develop discontinuous intentions. With this, we contribute to extant IS research by showing that and how shocks can cause users to discontinue an IS, crafting a comprehensive explanation of quitting and switching based on shocks and dissatisfaction. We published the findings in the *Journal of the Association for Information Systems* (Maier et al., 2024).

We also explored users' discontinuous use in the form of switching, irrespective of shocks. We used a mixed methods study (i.e., qualitative interviews with 21 users; fuzzy set qualitative comparative analysis (fsQCA) with 282 users) to highlight that users develop switching intentions based on different configurations of perceptions related to the incumbent IS and the alternative IS. When users experience the alternative IS as superior in some ways, they switch partially to it while still using the incumbent IS. When they experience it as superior in every way, they switch completely. With this, we advance IS research that is interested in discontinuous use by showing that users vary in their rationales for switching, as reflected in the different configurations of perceptions that guide their behavior. We published our findings in *Internet Research* (Meier & Maier, 2023).

In addition, we demonstrate that shocks can also foster IS use. Users exposed to shocks that an IS can support them address may reevaluate their use of it. Based on a multi-method study (i.e., qualitative interviews with 51 users; fsQCA with 153 users), we showed that users use an IS, such as chatbots, due to different values they ascribe to them. While users who experience all values are generally more likely to use an IS, shocks can lower users' thresholds for what they consider sufficient values. In other words, shocks can lead users to IS use even though they may experience values that would otherwise not have been sufficient. We contribute to behavioral IS research interested in shocks by emphasizing that shocks not only let users discontinue their use of an IS (Maier et al., 2024) but can also foster IS use. We published this study in the *Information Systems Journal* (Meier et al., 2024a).

Finally, we focused on the methodological toolkit needed to gain rich insights into shocks and IS discontinuation by exploring how configurational methods, such as fsQCA, can shed light on the complex interplay of multiple influencing factors. The study enhances extant configurational IS research that has largely followed inductive (Huang et al., 2024) and abductive modes of reasoning (Meier et al., 2024a) by providing a blueprint for configurational approaches with a deductive mode of reasoning. We built on conceptual discussions (Park et al., 2020; Schneider & Wagemann, 2012) and developed guidelines for using deductive fsQCA for refining, extending, and delimiting configurational theory. We contribute to configurational IS research by illustrating a way to test configurational theory and extending the methodological toolkit needed to understand the interplay between shocks and rational considerations that guide user behavior (Meier et al., 2024a). We published that methodological toolkit in the *Information Systems Journal* (Meier et al., 2024b).

Stage 3. We characterized and distinguished ex-users from non-users and users. Therefore, we build on field theory's core premise that behavior is a function of individuals themselves, i.e., internal forces, and their environment, i.e., external forces (Lewin, 1946). We used these arguments to characterize the user types and reveal their similarities and differences. Based on a configurational study (i.e., fsQCA with 293 non-users, users, and ex-users), we show that the same internal and external forces characterize the user types. However, they have a differentiated effect on the behavioral pattern of each type through different configurations. Non-users and ex-users lack internal and external forces that drive them towards IS use. At the same time, users experience different configurations of internal and external forces that let them use IS. We contribute to IS research on discontinuous use by revealing the similarities and differences between non-users, users, and ex-users.

Summary. The findings from the project were rigorously validated through the peer review processes of leading A- and B-ranked journals in the IS discipline[1], including the *Journal of the Association for Information Systems*, the *Information Systems Journal*, and *Internet Research*.

3.3 Deviations From the Original Concept

In the third stage, the project slightly deviated from the original concept. After the initial data collection, initial findings were presented at a doctoral workshop organized by the LMU Munich School of Management, and the feedback suggests three key areas for improvement. First, it was recommended to analyze the interplay between internal factors, such as personality traits, and external factors, such as social influence, as considering both would provide a more comprehensive understanding of ex-users. Second, the study should compare the different user types, i.e., non-users, users, and ex-users, instead of focusing on only ex-users to generate broader and more valuable insights. Third, focusing on a specific illustrative IS context was recommended to ensure that the results were targeted and easy to interpret. Based on this feedback, the study's concept was refined, and additional data was collected to align with these suggestions. Specifically, the revised study draws on field theory (Lewin, 1946) to consider the interplay between internal and external factors and compares this interplay across non-users, users, and ex-users. The comparison across user types allows the reveal of similarities and differences, which is useful for differentiating ex-users as a relevant and distinct user type compared to similar user types such as non-users. To reduce complexity and make the focus of the study more concise, we decided to focus on the illustrative context of chatbots. While the narrowed-down focus means that we do not provide empirical evidence on characteristics of ex-users in other contexts, e.g., streaming services and social networking sites, it offers rich insights into characteristics of user types in an illustrative context that can be generalized in future work.

3.4 Validity and Reproducibility of the Research Results

To ensure quality and validity, we presented the preliminary findings from the first and second stages at the ACM SIGMIS CPR Doctoral Consortium 2022 and discussed preliminary findings from the third stage at a doctoral workshop at the LMU Munich School of Management. We confirmed the final validity and reliability of the findings through the rigorous peer review process of the leading journals in the IS discipline.

[1] https://www.vhbonline.org/verband/wissenschaftliche-kommissionen/wirtschaftsinformatik/vhb-rating-2024-wirtschaftsinformatik

3.5 Research Data Generated in the Project

We collected various data during the project, including qualitative, quantitative, and literature data. Regarding qualitative data, we conducted and analyzed a total of 163 interviews across various contexts. We conducted 39 interviews during the first stage in the illustrative context of social networking sites to explore how shocks lead to discontinuous use (Meier et al., 2023). In the second stage, we conducted 21 interviews with users to understand their reasons for switching, irrespective of shocks (Meier & Maier, 2023). Additionally, we conducted 51 interviews to examine if and how shocks may lead to IS use (Meier et al., 2024a) and 52 interviews to offer in-depth insights into configurational findings (Meier et al., 2024b).

Regarding quantitative data, we collected and analyzed survey data of 1771 individuals in total. We analyzed survey data from 467 ex-users in the first study of the second stage to identify the paths that lead to discontinuous use (Maier et al., 2024). In the same study, we conducted a subsequent scenario-based survey of 201 current users to explain how shocks influence discontinuous intention. In the second study, we surveyed 282 users to explain switching irrespective of shocks (Meier & Maier, 2022). We analyzed survey data of 153 users in a third study to explain how shocks may foster IS use (Meier et al., 2024a). We analyzed survey data of 375 individuals in a fourth study of the second stage to illustrate deductive fsQCA for refining, extending, and delimiting configurational theory (Meier et al., 2024b). We analyzed survey data of 293 non-users, users, and ex-users in the study of the third stage to characterize user types.

Regarding literature data, we conducted a systematic literature review in the first stage, identifying and analyzing 70 shock-related studies within IS and management research (Meier et al., 2023). The collection and categorization of the identified literature are available in the Appendix of the published paper.

3.6 Data Usable and Openly Accessible by Other Persons

The survey data from the third study of the second stage are openly available for use by other researchers (Meier et al., 2024a). The dataset can be accessed through the Open Science Foundation at https://doi.org/10.17605/OSF.IO/FK3YQ. Additionally, we developed a methodological approach for using configurational methods such as fsQCA deductively to refine, extend, and delimit theory. Our proof of concept and developed guidelines serve as a foundation for future deductive configurational research (Meier et al., 2024b).

3.7 References

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4 Published Project Results

4.1 Peer reviewed publications

We provide an overview of the studies that are published in peer-reviewed journals in Table 1.

Year	Authors	Title	Journal
2023	Meier, M., Maier, C., Thatcher, J. B., & Weitzel, T	Shocks and IS user behavior: A taxonomy and future research directions	*Internet Research*
2024	Maier, C., Laumer, S., Sun, H., Thatcher, J. B., & Weitzel, T.	Proposing Shocks and Dissatisfaction to Explain Quitting and Switching a Service: An Image Theory Perspective	*Journal of the Association for Information Systems*
2023	Meier, M., & Maier, C.	From stocks to ETFs: Explaining retail investors' migration behavior	*Internet Research*
2024	Meier, M., Maier, C., Thatcher, J. B., & Weitzel, T.	Chatbot interactions: How consumption values and disruptive situations influence customers' willingness to interact	*Information Systems Journal*
2024	Meier, M., Maier, C., Thatcher, J. B., & Weitzel, T.	Cooking a telework theory with causal recipes: Explaining telework success with ICT, work and family related stress	*Information Systems Journal*

Table 1: Studies published in leading peer-reviewed journals