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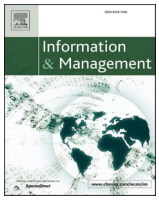

Why ex-users come back: revealing characteristics and patterns of information system use resumption

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ABSTRACT

Individuals often cycle between using, discontinuing, and resuming information systems (IS). Despite recognizing the growing importance of reacquiring ex-users in IS research and practice, factors driving IS use resumption remain underexplored. Addressing this gap, we conducted 29 interviews analyzing 96 resumption cases. Our findings reveal seven recurring characteristics across five resumption patterns, providing a thorough understanding of the nuanced dynamics influenced by diverse contexts, users, and IS. These findings provide a better understanding of IS use resumption and practical insights for organizations seeking to enhance customer numbers, sales, and revenues by tapping into the potential of winning back ex-users.

1. Introduction

Information system (IS) use resumption is the behavior of ex-users returning to an IS after having stopped its usage for some time [1]. IS use resumption occurs in several contexts, both on the job and in private life. Several examples from practice showcase its increasing importance for IS vendors and organizations navigating system transitions. For example, the number of users of Duolingo, an IS supporting learning and education, experienced significant fluctuations throughout 2022. By the end of 2022, Duolingo recorded approximately 2 million fewer users compared to the third quarter of the same year, indicating that many users discontinued using the platform during this period [2]. By the beginning of 2023, the number of users rose again and exceeded previous numbers of users [2]. This rising number of users included new customers and some ex-users who restarted using Duolingo after a break [3].

Within IS research, initial work on IS use resumption has focused on investigating initial characteristics causing the behavior [1,4] on social networking sites (SNS) [1] and the use of mobile internet services [4]. Here, two characteristics of IS use resumption were studied: absence, representing how long a user discontinued using an IS before resuming it [1], and frequency, pointing out that individuals resume using an IS once or multiple times [5]. For instance, an ex-user of an IS for education and learning who used the application to learn a new language might resume using it after some months because of wanting to learn another language. Such a cyclical relationship between an individual and an IS occurring several times represents IS use resumption, a unique IS use behavior with distinct characteristics that manifest differently depending on the context, user, and the IS [1].

However, despite the initially outlined relevance of IS use resumption for organizations, IS research is still at an early stage, lacking a comprehensive theoretical understanding of aspects that influence whether ex-users resume using an IS. In contrast to well-studied IS use behaviors, underlying mechanisms of IS use resumption remain unexplored as relationships between ex-users and IS changed so that they became more robust with a more intense IS use. These relationships can end and continue, extending existing knowledge about IS use and defining different and unique characteristics for IS use resumption. Thus, research needs a profound understanding of IS use resumption as a behavior before gaining the ability to explore which external and internal aspects influence this specific behavior. Against that backdrop, we aim to provide insights into the phenomenon of IS use resumption and develop an understanding of why users return to a previously used IS after having discontinued it for some time. We aim to address this by identifying additional characteristics and by revealing resumption patterns relevant to understanding individual IS use resumption [6]. Such resumption patterns are combinations of characteristics that provide insights into the dynamics of IS use resumption. Correspondingly, we

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aim to answer the following research question:

What are the characteristics of IS use resumption, and what resumption patterns are formed based on these characteristics?

To address this research question, we conducted a qualitative study, including 29 semi-structured interviews with users of various IS (see Table 9, Appendix). From 96 cases of users resuming these IS, we identified seven key characteristics of IS use resumption by using the Quine McCluskey algorithm [7]. Additionally, we derived five patterns that represent different combinations of these characteristics. These resumption patterns illustrate the co-occurrence of specific characteristics, providing deeper insight into each case of IS use resumption.

By identifying these resumption patterns, we discern relationships between specific characteristics of IS use resumption. This contributes to IS research by confirming two previously recognized characteristics, uncovering five new ones, and establishing five resumption patterns. Our findings offer a comprehensive understanding of the dynamics of IS use resumption across various contexts, user groups, and types of IS. With that, we provide an in-depth knowledge of the behavior and explain multiple directions for future research.

The structure of the paper is as follows. We begin by presenting the current status of knowledge on the concept of IS use resumption. Then, we outline how we proceed in our qualitative study, describing the identification process of characteristics for IS use resumption and the derivation of resumption patterns. Finally, we discuss our findings, propose implications for future research, and clarify the limitations of this work.

2. Literature review

The following presents a theoretical foundation for investigating IS use resumption. We summarize existing knowledge about IS use resumption as a unique behavior and distinguish IS use resumption from other IS use behaviors (i.e., adoption, continuance, discontinuance, and switching). Additionally, we reveal well-established characteristics for the other IS use behaviors and outline characteristics of IS use resumption.

General information. IS use resumption is the behavior of ex-users returning to an IS after having stopped its usage for some time [1]. While the period after stopping the IS is not specified, some core characteristics of IS use resumption exist. IS use resumption implies that individuals had adapted, continued, and discontinued using the IS before they resumed it. Thus, IS use resumption results from experiences regarding using and not using an IS. This behavior happens in different contexts, such as SNS [1] and mobile internet services [4].

Reference to related IS use behaviors. IS use resumption complements existing behaviors, such as IS adoption, IS continuance, IS discontinuance, and IS switching [8,9]. *Adoption* reflects the behavior of a non-user starting to use a particular IS [10]. Non-users do not have any prior experiences regarding a specific IS, and adoption intention is created based on expectations [11,12]. *Continuance* refers to the persistent usage behavior of individuals within an IS [13]. Users continue their engagement based on ongoing experiences with the IS [14], including user satisfaction, perceived usefulness, and significant enjoyment [15]. *Discontinuance* signifies the cessation of a user's interaction with an IS [16]. It arises from user dissatisfaction and unmet expectations [13]. *Switching* involves users replacing or supplementing an existing IS with a comparable alternative [17]. Users leverage their familiarity with one IS and their expectations of another unfamiliar IS. While switching often implies discontinuance, there are cases where users adopt a new IS alongside the existing one, essentially complementing the old IS rather than substituting it entirely with the new one. For instance, users of Facebook might incorporate Instagram into their usage habits alongside their continued use of Facebook.

IS use resumption has some commonalities with those behaviors, but there are also differences. Among others, IS use resumption centers on the ex-user, implying that this user type has experiences with using and no longer using the IS. Being an ex-user reflects a conscious decision to use an IS no longer, distinguishing between a non-user and a user. Thus, IS use resumption focuses on another group of individuals than other well-known IS use behaviors (see Table 1). While IS adoption refers to non-users and IS continuance and IS discontinuance refer to users, IS use resumption describes ex-users' behavior. A related difference is the base on which individuals develop intentions. While continuance, discontinuance, and switching behaviors are based on experiences with using an IS, IS use resumption is based on experiences of using and not using an IS. This makes it different from earlier studied IS use behaviors.

Characteristics in IS use behaviors. Existing research extensively investigated other IS use behaviors like adoption, continuance, discontinuance, and switching in different contexts [6,7,15,23] and revealed respective characteristics. Characteristics detail the IS use behavior and the respective context. Each characteristic has two or more manifestations, meaning that the characterization of a behavior manifests itself in different forms. We use well-known literature to identify all established characteristics and manifestations, each related to several IS use behaviors or specific to one IS use behavior (see Table 2). We will explain all identified characteristics and their manifestations in the following, referring to the IS use behaviors that each characteristic exists with and naming investigated types of IS.

The characteristic of *compulsion* refers to the degree of voluntariness regarding IS use behaviors, meaning they are either voluntary or mandated by somebody else [25,28]. Existing literature assumes that off-the-job adoption (e.g., SNS) is voluntary [10], while in on-the-job contexts, organizations mostly mandate IS adoption, IS continuance, IS discontinuance, or IS switching [27].

The characteristic of *abruptness* explains that non-users adopt an IS immediately or after trial, meaning they start using it with or without trying it [24]. Thereby, individuals either follow their own information or imitate others when adopting a particular IS [19], defining the level of *independence* as another characteristic.

The characteristic of *depth* refers to IS continuance, defining how often and intensely users use an IS. Examples reflecting the different use depths include sporadic, habitual, and excessive use [12,33]. Sporadic use describes an occasional but non-regular IS use [34]. Habitual use describes automatically repeating previous behavior because of learning [32]. Excessive use is the behavior of using a particular IS more prolonged and more extensively than planned and necessary [40]. The depth of IS continuance is often related to another characteristic, referred to as *goal-orientation*, which distinguishes IS continuance based on the underlying purpose of a user. Routine use explains the behavior of repetitively using a particular IS, meaning that individuals integrate this IS into their daily lives [39]. Innovative use means that users continue using an IS in novel ways to extract additional value from the IS [12]. Users exercise different degrees of *comprehensiveness* [26], meaning their IS continuance differs in the number of sessions, functions used, or messages sent [25]. In contrast to the prior assumption that discontinuance is generally permanent, users can quit IS use temporarily or permanently [5,31], defining the characteristic *duration*. Permanent IS discontinuance, also known as quitting [33] or termination [8], is about abandoning an IS that previously has been used [33]. Duration is also a characteristic of continuance [25] and switching [8], describing whether using an IS or switching to an alternative is permanent or temporary.

During discontinuance, which is the behavior of no longer using an initial IS, ex-users might use another comparable IS, which we refer to as *consistency*. Consistency distinguishes ex-users' behavior based on whether they use an alternative IS [8,30]. As an example, in organizational contexts, it might happen that users do not use an IS as intended and consequently switch to non-approved alternatives [35]. On the other hand, temporary IS discontinuance often results from time or information burdens, meaning that disturbances arise, which can either be of a social or technological nature [38] and, therefore, temporarily quit using an IS [31,36]. For example, users might terminate using a

Table 1
IS use behaviors.

Behavior	Definition	User type	Experiences	Determinants	References
IS adoption	The behavior of non-users starting to use an IS.	Non-user	–	Positive expectations; Subjective norm	[8,10,18,19]
IS continuance	The behavior of users continuing the use of an IS.	User	Use	Satisfaction with use; Habit; Positive attitude; Enjoyment; Subjective norm	[13,15,19–21]
IS discontinuance	The behavior of users terminating the use of an IS.	User	Use	Dissatisfaction with use; Negative attitude; Subjective norm	[9,16,22]
IS switching	The behavior of the user replacing or complementing an IS with a comparable one.	User	Use	Alternative attractiveness; Dissatisfaction; Fatigue; Subjective norm	[9,23]
IS use resumption	The behavior of ex-users returning to an IS after having stopped its usage for some time.	Ex-user	Use, Non-use	Dissatisfaction with non-use; Satisfaction with prior use	[1,4]

particular IS during their vacation or when fatigued using an IS [33], thereby considering IS use resumption [5,31].

Characteristics of IS use resumption. So far, IS research has only focused on explaining IS use resumption of SNS [1] and mobile internet services [4]. Based on that, two characteristics of IS use resumption were identified: absence and frequency (see Table 3).

Absence refers to the time a user stops using an IS before resuming [1]. We differentiate between short-term and long-term discontinuance. Short-term discontinuance is the characteristic of the resumption of an IS after a brief period of discontinuation. Long-term discontinuance is resuming using an IS after it has been discontinued for an extended period. The differentiation is relevant, as, for example, use-related satisfaction brings long-standing ex-users back, while nonuse-related dissatisfaction drives IS use resumption of recent ex-users [1].

Frequency considers how often ex-users resume using an IS. It can be a single instance or multiple instances [5]. Users may be detained in a cycle of discontinuance and IS use resumption, meaning that they might iterate between discontinuance and IS use resumption. This behavior might have different reasons, such as social influences, changing functionalities of the IS, and habits [5]. Thus, resuming using an IS is no final state, meaning that IS use resumption is no behavior induced by an irreversible decision. Instead, individuals might discontinue using an IS again after having resumed using it.

Comparing existing research regarding IS use resumption and other IS use behaviors (i.e., adoption, continuance, discontinuance, and switching), the two characteristics of IS use resumption build a starting point for further investigating IS use resumption. Characteristics of well-known IS use behaviors, as shown in Table 2, are a starting point to inform IS use resumption, meaning that these characteristics might exist similarly or in an adapted form for IS use resumption. In addition, we assume that IS use resumption might have unique characteristics that are less or even irrelevant to other IS use behaviors.

3. Methodology

We followed a qualitative approach to identify and investigate characteristics of IS use resumption. We captured users' experiences and perceptions around IS use resumption, which is feasible by conducting interviews [7]. Using our empirical findings, we identified relevant characteristics and revealed resumption patterns for users. Our research methodology is summarized in Fig. 1.

3.1. Data collection

Our sampling strategy was to recruit a heterogeneous group of users, differing in gender, age, and professional background (see Table 4), who have resumed using different IS. We did not focus on one specific type of IS but asked for all possible examples within the field of IS to understand IS use resumption from a general perspective. We did 29 semi-structured interviews [41] in Germany and Austria, following a pre-defined guideline (see Table 8, Appendix). The guideline focuses on collecting individual resumption cases by guiding the interviewees to remember relevant situations when they resumed using an IS they had used and discontinued beforehand. Interviewees mentioned cases of currently resuming using an IS and already having stopped using an IS after IS use resumption. The choice of semi-structured interviews ensured that the most relevant aspects were covered, but interviewees could provide additional information. We advertised our project in our private and professional networks to recruit users. We used the snowball sampling strategy [42], meaning that many of our interviewees had told others about our study and recommended participating, through which we could generate additional interviewees.

With the interviewees' consent, we recorded the interviews. In the transcript, we anonymized all personal data about the users. Based on our interview guidelines, we started to explain our research topic of IS use resumption. We asked the interviewees to name all examples in

Table 2
Characteristics around IS use behaviors.

Characteristics	Manifestations	Behavior	IS	References
Abruptness	Immediate after trial	Adoption	Mobile television service	[24]
Comprehensiveness	Light, medium, heavy	Continuance	Spreadsheet software; Business intelligence application; Sales force automation	[25,26]
Compulsion	Voluntary, mandated	Adoption; Continuance; Discontinuance; Switching	SNS; organizational IS; Spreadsheet software	[16,25,27,28]
Consistency	Alternating, non-alternating	Discontinuance	Enterprise resource planning; shadow IT; Social networking services	[8,29–31]
Depth	Sporadic, habitual, excessive	Continuance	University internet application; Search engines; Business intelligence application; customer support application	[12,17,32–35]
Duration	Permanent, temporary	Continuance; Discontinuance; Switching	Spreadsheet software; SNS; Search engines	[5,25,31–33,36,37]
Goal-orientation	Routine, innovative	Continuance	SNS; Customer support IS; Business intelligence application; Sales force automation	[12,26,38–40]
Independence	Independent, imitating others	Adoption	Collaboration software	[19]

Table 3
Characteristics around IS use resumption.

Characteristics	Manifestations	Behavior	IS	References
Absence	Short-term, long-term	Resumption	Social networking sites	[1]
Frequency	One-time, multiple times	Resumption	Social networking sites	[5]

which they discontinued and resumed using an IS. We consider each example as one resumption case, meaning that every interviewee could have mentioned several cases. For example, one interviewee stated IS use resumption of an SNS (i.e., Facebook), a communication service (i.e., Skype), a purchasing service (i.e., Zara), and a delivery service (i.e., Lieferando, Just Eat Takeaway), such that this interviewee counts in with four different cases. We counted each resumption case separately because interviewees showed other behaviors in each resumption case. For example, one interviewee resumed using Facebook and Skype. Referring to the first case, the interviewee resumed using Facebook permanently after discontinuing using it for more than a year and deleted the IS during discontinuance. Referring to the second case, the interviewee resumed using Skype temporarily twice after stopping using it for a short period each. Interviewees were asked to agree on our interpretations at the end of the interviews to ensure accuracy. We summarized the mentioned resumption cases and respective behavior and let the interviewees clarify misunderstandings or agree on our interpretations.

We used our guiding questions to discuss each resumption case and to find out details about IS use resumption around individual resumption cases. To identify characteristics, we asked the interviewees to explain each resumption case, thereby focusing, for example, on how long they did not use an IS before resuming it, how long the period of IS use resumption was, how often they resumed using one IS and if they ever tried any alternative. The interviewees could talk about each resumption case for as long as they wanted, giving us additional information on when each case occurred and if specific circumstances existed. The interviews were between 15 and 60 mins long, depending on the number of resumption cases each interviewee mentioned. In the last five of our 29 interviews, we found no new characteristics of IS use resumption, proposing that we have reached theoretical saturation [41].

3.2. Data analysis

To analyze the interviews, we chose a narrative approach [41,43] because this best fits studies where the stories represent the raw data

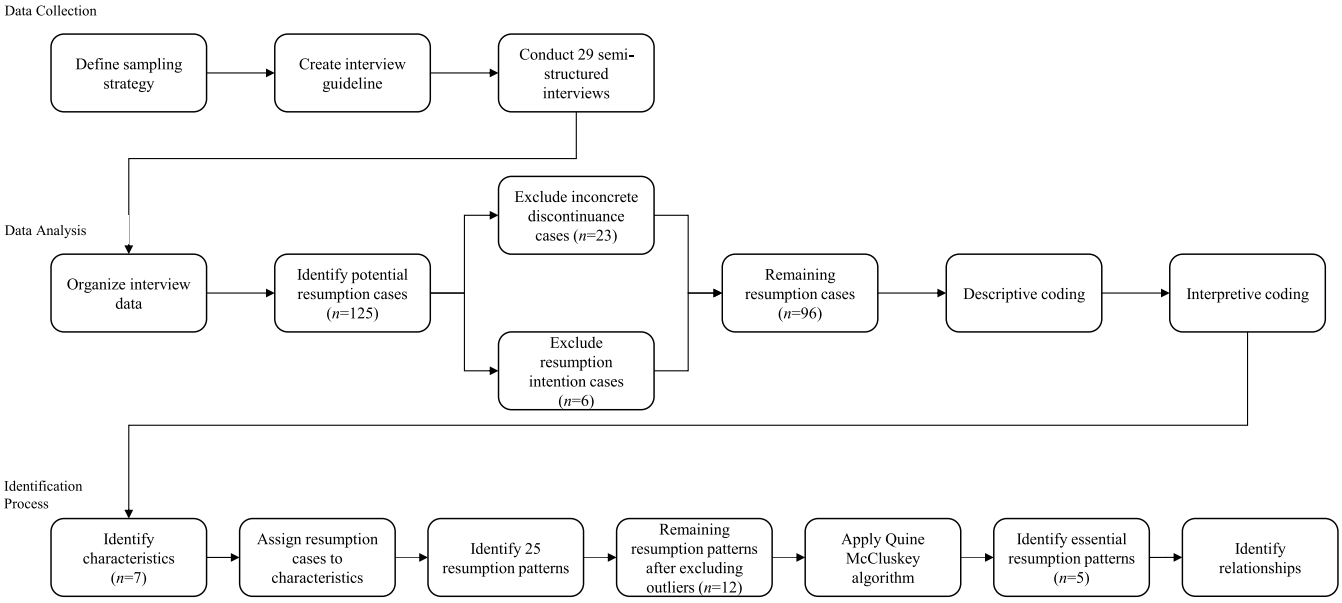

Fig. 1. Research methodology (based on Butina 2015 and Myers 2019).

Table 4
Demographics of the 29 interviewees.

Demographic feature	Types	Distribution (in %)
Gender	Male	44.83
	Female	55.17
	Other	0.00
Age	<26	31.04
	26–35	44.83
	36–45	6.90
	46–55	10.34
	>55	6.90
Professional category	Education	13.79
	Medicine	10.34
	Retail	41.38
	Law	6.90
	IT	10.34
	Pharmacy	6.90
	Other	10.34

[43,44]. In our case, the resumption cases were the stories that built our empirical basis.

We started by organizing the collected data using an Excel sheet. We listed all the cases mentioned regarding IS use resumption for each interview. We added detailed information about each resumption case while listening to the interview records. The 29 interviewees who participated in this study mentioned 125 potential resumption cases. To ensure data quality and consistency, we applied a rigorous filtering process based on the definition of IS use resumption.

Specifically, we removed six cases where individuals spoke of their intention to resume using an IS but had not yet resumed it. For example, one interviewee explained discontinuing Instagram after several years and thought about reinstalling it because of considering the content more interesting than the one on Facebook. This case is only about IS use resumption intention but not actual IS use resumption, thus resulting in exclusion from our data set. Then, we excluded 23 cases where the concrete step of discontinuance was missing. For example, one interviewee mentioned only using Netflix when a show becomes available but never concretely discontinuing using it by canceling the individual subscription or consciously not opening the application anymore. We consider this behavior as constant low use without concrete discontinuance. The decision criterion for concrete discontinuance is that a conscious decision about not using the IS anymore must have existed. We identified 96 resumption cases that built the basis for our analysis.

After organizing the empirically collected data, we developed a coding scheme to group the remaining 96 resumption cases. To maintain methodological rigor, we used an iterative coding approach. We initially used descriptive coding, describing each resumption case as an individual instance and using the outcome to perform interpretive coding, identifying similarities between resumption cases. We used descriptive coding to outline and compare different characteristics around IS use resumption, which interviewees mentioned during the interviews [41]. For example, we descriptively coded "… some weeks later, I downloaded it again …" as "*some weeks later*" and "… I started using Bookbeat … After that, I used Audible instead before I went back to Bookbeat…" as "*used Audible instead*." Afterward, we grouped similar statements by using interpretive coding [41]. For example, we coded "some weeks later" as *short-term* and "used Audible instead" as *alternating*. We used 14 interpretive codes, of which each two relates to the same aspect, thereby excluding each other. For example, short-term and long-term discontinuance relate to the duration of absence before IS use resumption. One resumption case can only include short-term or long-term discontinuance, but not both. The coding process resulted in having seven characteristics that explain IS use resumption. We report some coding examples in Table 10 and provide an overview of resumption cases per characteristics inTable 11 (see Appendix).

To ensure coding quality, two researchers independently coded all interviews. Both researchers analyzed the audio files from the interviews. They coded them independently regarding characteristics per resumption case, meaning that both researchers classified each resumption case that our interviewees mentioned based on possible manifestations per characteristic. This independent coding process ensures that the classification of each resumption case is based on a consistent and unbiased interpretation of the data. We achieved a level of agreement of 98.02 percent. Consequently, we fulfill inter-coder reliability as this value meets the highest qualitative standards [45], thereby ensuring the dependability and confirmability of our findings.

We identified seven of 14 manifestations for each of the 96 resumption cases, as each manifestation represents the opposite of one other. To enhance the credibility of our findings, we employed triangulation by comparing the codes and themes identified in this study with existing literature on IS use resumption. We combine seven characteristics for each resumption case of our data set, thereby revealing resumption patterns. Patterns represent constellations of conceptually distinct characteristics that occur together [46,47]. Resumption patterns allow us to look at IS use holistically, looking at combinations of manifestations [25].

In the next step, we compared the combinations of all 96 resumption cases and identified resumption patterns that occurred at least three times. In the following, each combination was only listed once, reducing redundancy. The combinations that were left represented the resumption patterns in our empirical data. This process ended with 12 resumption patterns, which built the basis for the following procedures.

We applied the Quine McCluskey algorithm [7] to present more parsimonious and sufficient results. The algorithm works based on set theory and reduces complexity by minimizing Boolean functions and merging logical redundant conditions [48]. In the first step, all resumption patterns are transferred into Boolean representations, meaning that each position of the Boolean representation is "0" or "1", depending on which characteristic is true for each case. The algorithm checks whether there are Boolean representations that each differ in only one characteristic. This process leads to merging these two representations and setting the respective position to "-". In the second step, the algorithm proceeds the same, but "-" in addition to "0" and "1" is seen as a variable. The algorithm finishes when no more Boolean representations can be merged, ending with seven resumption patterns. In the last step, we reduce complexity by identifying essential resumption patterns. Thus, resumption patterns can be eliminated if others already consider their content. We eliminate two resumption patterns. The algorithm ends with five resumption patterns based on the seven characteristics previously identified in our work.

We use the identified resumption patterns to discuss relationships of characteristics. We analyze the final resumption patterns in a way that we look for similarities in characteristics. We check whether specific manifestations of characteristics always exist in combination with particular manifestations of other characteristics. For example, permanent IS use resumption always leads to one-time IS use resumption and vice versa, meaning that permanent IS use resumption and one-time IS use resumption always occur in combination.

4. Findings

4.1. Characteristics of IS use resumption

Our empirical results build the basis for our analysis. Stepwise, we incorporated the findings of our qualitative study. In every step, we identified relevant characteristics by using our interpretive coding. We identify characteristics regarding IS use resumption among users on a general level. We continued the development process if we could not identify any other characteristics. Overall, we confirm the existence of two IS use resumption characteristics (i.e., *absence* and *frequency*), which research already identified [1], and found five additional characteristics (i.e., *duration, consistency, partitioning, compulsion*, and *circumstances*), of which some are already known through other IS use behaviors. Some are

unique for IS use resumption.

First, we found that *absence*, the time of discontinuance before IS use resumption, can be either short-term or long-term. Thus, our empirical results confirm what existing research has already explored, namely that each resumption case can be categorized based on the duration of discontinuance before IS use resumption [1,4]. We align with existing research considering short-term discontinuance as IS use resumption within six months and long-term discontinuance as IS use resumption after more than six months [1].

Second, we identify *duration* to distinguish resumption cases into permanent and temporary IS use resumption. Duration relates to how long an individual resumes using an IS after discontinuing it. Comparably to short-term and long-term discontinuance, we use the threshold of six months to separate these characteristics [1]. While permanent IS use resumption is defined as resuming using an IS for an extended period, temporary IS use resumption relates to resumption cases that last for a short period.

Third, individuals resume using an IS once or multiple times, showing that the *frequency* of resumption is also relevant. Frequency defines how often an individual resumes using one IS [5]. IS use resumption is not necessarily a one-time decision, but an individual can resume using an IS more often. Thus, individuals can be detained in a cycle of discontinuance and IS use resumption, clarifying that IS use resumption is not a final state.

Fourth, individuals either use an alternative or not before they resume using an IS. We added this finding by including *consistency*. We consider consistency as the possibility that individuals might switch to an alternative before resuming using the previously used IS [4,8]. An alternative is an IS that can be used for the same reasons and has functionalities comparable to those of the previously used and discontinued IS. Individuals might stop using an IS, then try an alternative, and afterward discontinue using the alternative and resume using the previously used IS.

Fifth, only some individuals removed the IS from their lives before resuming using an IS. We distinguish between individuals who explain that they deleted the IS or unsubscribed. Hence, it is clear that they did not have access to the IS before resuming using it, and individuals who had access to the discontinued IS but consciously stood away from it before resuming using it. We name the characteristic *partitioning*, describing whether to eliminate or retain access to an IS while discontinuing it.

Sixth, we found that IS use resumption is sometimes voluntary. For example, a supervisor can force an individual to resume using an IS. We include *compulsion* to indicate whether IS use resumption is a free choice or instructed by somebody else [25].

Seventh, we identify *circumstances* as the characteristics to describe external influences. We distinguish between normal and disruptive circumstances [49], indicating whether particular situations have influenced IS use resumption in a user's life or if it solely refers to the IS.

The identification process of characteristics resulted in seven characteristics, each with two possible manifestations (see Table 5). These seven characteristics describe each IS use resumption case, meaning that each manifestation per characteristic exists in each resumption case. In the following, we use these seven characteristics to derive resumption patterns, which are combinations of the seven characteristics depending on their possible manifestations.

4.2. IS use resumption patterns

After following descriptive and interpretive coding to group the 96 remaining resumption cases, we use the identified characteristics to reveal resumption patterns by assigning the respective seven manifestations to each resumption case and eliminating duplicates. The process resulted in five resumption patterns, as displayed in Table 6. We use those resumption patterns to reveal relationships between characteristics among and across users by presenting empirically existing

Table 5
Definition and examples of IS use resumption characteristics.

Characteristics	Manifestations	Definition	Example
Absence	Short-term	Discontinue using an IS for a short period before resuming it	"In 2020, I created a TikTok account … in 2021, I stopped using it … some weeks later, I downloaded it again." (Female, 25y)
	Long-term	Discontinue using an IS for an extended period before resuming it	"From 2012 until 2016, I used Snapchat to chat with my friends … I did not use it anymore … In 2020, during the first COVID-19 lockdown … I started using it again." (Female, 23y)
Circumstances	Normal	Resume using an IS in a familiar situation	"I started to use Netflix in 2015, but after three months, I deleted my account. However, in 2017, I subscribed again …" (Male, 33y)
	Disruptive	Resume using an IS because of external influences	"I started using Instagram when it was new, in 2010 or 2011 … I did not use it anymore because I was bored. … Since 2017, I have used it a lot …" (Male, 51y)
Compulsion	Mandated	Resume using an IS because it is mandated by somebody else	"I used Skype since 2010 to talk to my friends … Due to the COVID-19 pandemic, in 2020, I reinstalled Skype because some lecturers wanted us to use Skype." (Female, 23y)
	Voluntary	Resume using an IS because of own choice	"I adopted Briskine during my job in 2018. In 2021, I quit this job and did not use Briskine anymore. … I started a new job and created a new account." (Female, 27y)
Consistency	Alternating	Use an alternative during discontinuance before resuming it	"In 2021, I started using Bookbeat … After that, I used Audible instead because of a discount … then I went back to Bookbeat." (Female, 24y)
	Non-alternating	Not use an alternative during discontinuance before resuming it	"I started to use Tinder in 2018 … I never used any alternative, such as Lovoo or Parship." (Male, 30y)
Duration	Permanent	Resume using an IS for an extended period	"I used Facebook since 2007 … then I deactivated my account, and since I moved in 2012, I use Facebook daily." (Male, 30y)
	Temporary	Resume using an IS for a short period	"I used Duolingo for the first time in 2015 … I deleted it after only two weeks …" (Female, 25y)

(*continued on next page*)

Table 5 (*continued*)

Characteristics	Manifestations	Definition	Example
Frequency	One-time	Resume using an IS once	"… I used Dropbox about once a week … did not need Dropbox anymore. In August 2022 … I started using Dropbox again." (Female, 28y)
	Multiple times	Resume using an IS more than once	"I also have some games on my smartphone, for example, Candy Crush. I always use it for some time before deleting it again…" (Male, 30y)
Partitioning	Keep	Keep access to an IS during discontinuance before resuming it	"Since 2012, I used YouTube for two or three years, but I stopped using it … I never deleted YouTube, and since the COVID-19 pandemic, I restarted using YouTube." (Female, 23y)
	Delete	Delete an IS during discontinuance before resuming it	"In the summer of 2020, I started using Komoot for hiking, but I do not hike in the winter, so I deleted the app … In the summer of 2021, I downloaded it again." (Male, 24y)

combinations of different manifestations.

We will discuss the resumption patterns by identifying the present manifestations per characteristic. Thus, each manifestation is denoted either "0" or "1" as all characteristics are mutually exclusive, meaning two possible manifestations exist per characteristic. Using "0" and "1", we can indicate which of the two manifestations of a characteristic exists in a resumption pattern. Some resumption patterns also include "-", representing so-called "don't care situations." In these situations, one or two manifestations can be formed without changing the outcome (i.e., resumption patterns). We also give examples and identify relationships between resumption patterns. Based on our interviews, we report exemplary quotes to illustrate the five resumption patterns (see Table 12, Appendix).

Functionality-based resumption. Ex-users return to using an IS on a single occasion, resuming permanently without resorting to any alternative IS during discontinuance. Their decision to resume results from personal preferences, such as improved offers or the introduction of new features. Essentially, they voluntarily resume using the IS under normal circumstances. For instance, providing new functionalities or an emerging need for specific features motivates ex-users to re-engage with the IS.

Lifestyle-based resumption. Ex-users temporarily ceased using an IS and deleted it during discontinuance without adopting any alternative. They resume using the IS sporadically because a need arises again, but this return is voluntary. Initially, they didn't plan to resume using the IS, but a temporary requirement prompts its re-engagement.

Convenience-based resumption. Ex-users briefly resume using an IS after a short discontinuation period, repeatedly resuming without shifting to an alternative. Their voluntary return is due to their familiarity with the IS; it's more convenient to resume using it than to start anew with a different IS.

Mood-based resumption. Ex-users, after a prolonged absence where they deleted the IS during discontinuance, return permanently on a single occasion due to a change in mood. Despite their initial decision to discontinue the use voluntarily under normal circumstances, their altered mood compels them to resume using the IS.

Situation-based resumption. Ex-users, after a long absence where they previously deleted the IS without adopting an alternative, return permanently on a single occasion. Their return is driven by disruptive circumstances or events in their life, prompting them to re-engage with the IS that they had initially parted with due to these particular situations.

4.3. Post hoc analysis: relationships among resumption patterns and contexts

We use our findings to conduct a post-analysis, providing further information regarding IS use resumption and its relevant contexts in two ways. First, we use the five resumption patterns to identify relationships between different characteristics. Second, we reveal the respective contexts in which the five resumption patterns exist.

Relationships. We determine relationships between different characteristics using the identified five resumption patterns. Three resumption patterns (i.e., *functionality-based, mood-based,* and *situation-based resumption*) include resuming an IS for an extended period (permanent). These three resumption patterns also include one-time resumption. This finding means that resuming using an IS only once automatically allows a conclusion about the duration of IS use resumption and vice versa.

In addition, four resumption patterns (i.e., *functionality-based, lifestyle-based, convenience-based,* and *mood-based*) cover mandated IS

Table 6
Users' resumption patterns.

		Functionality-based resumption	Lifestyle-based resumption	Convenience-based resumption	Mood-based resumption	Situation-based resumption
Absence	Short-term (0) Long-term (1)	–	–	0	1	1
Circumstances	Normal (0) Disruptive (1)	0	0	0	0	1
Compulsion	Mandated (0) Voluntary (1)	1	1	1	1	–
Consistency	Alternating (0) Non-alternating (1)	1	1	1	–	1
Duration	Permanent (0) Temporary (1)	0	1	1	0	0
Frequency	One-time (0) Multiple times (1)	0	–	1	0	0
Partitioning	Keep (0) Delete (1)	–	1	–	1	1

Note: - means don't care, meaning that either one (0) or the other (1) manifestations is included in each case.

Table 7
Resumption patterns and IS contexts.

Resumption pattern/IS context	Convenience-based resumption	Functionality-based resumption	Lifestyle-based resumption	Mood-based resumption	Situation-based resumption
Education and learning	x		x		
Entertainment and gaming	x	x	x	x	x
Health and sports	x	x	x	x	
Purchasing and delivery	x	x	x	x	
Social networking and communication	x	x	x	x	x
Transportation and travel	x		x		
Work and productivity		x	x	x	x

use resumption. These four resumption patterns also include normal circumstances. This means that the manifestations mandated IS use resumption and normal circumstances always occur together.

Contexts. We use these results to derive five resumption patterns, each occurring with IS in various contexts (see Table 7). A list of IS used in the different contexts can be found in Table 9 in the appendix. We find some interesting relationships between resumption patterns and cases. First, functionality-based and mood-based resumption does not include any resumption cases regarding "transportation and travel" and "education and learning." In respective resumption cases, the functionalities of the IS itself and ex-users moods are not essential. Still, ex-users resume using it to pursue a particular goal (e.g., learning a language). The reasons might be twofold. Either ex-users resume using an IS because they already know how to use it instead of starting to use a new IS, or they must resume using it.

Second, convenience-based resumption occurs around all IS contexts except "work and productivity." Respective resumption cases might be mandated by somebody else, or users perceive separate IS necessary because it makes particular tasks more manageable. Regarding work and productivity, IS use resumption does not result from convenience. Still, ex-users aim to increase efficiency, meaning that it is irrelevant to ex-users if an IS is convenient to use as long as it supports them in fulfilling their work.

Third, situation-based resumption only includes resumption cases of three IS categories. This finding might be somewhat surprising as one might assume that specific circumstances significantly influence IS use resumption of various IS. Only substantial changes in an ex-user's life (e.g., starting a new job, moving to a new city) [50] influence IS use resumption.

5. Discussion

Motivated by the critical importance of IS use resumption, we conducted a qualitative study to uncover and analyze individual resumption cases. Our research significantly enriches the literature [1,4] by demonstrating that resumption behavior is not confined to isolated instances or specific IS types but is prevalent across diverse IS domains. This includes work and productivity, social networking and communication, entertainment and gaming, health and sports, purchasing and delivery, transportation and travel, and education and learning. This extensive scope, detailed in Table 9 of the Appendix, is empirically captured through 96 instances of IS use resumption, categorized into seven distinct characteristics contributing to the theory. We structure the contributions of these findings in three key areas: empirical, theoretical, and practical.

5.1. Empirical contributions

Our study provides an essential empirical extension by establishing IS use resumption as a widespread and generalizable phenomenon across multiple everyday contexts. Prior research largely confined itself to SNS [1,5] and mobile internet services [4], leaving a gap in understanding the behavior in other domains.

We empirically illustrate that IS use resumption occurs across seven diverse areas: work and productivity, social networking and communication, entertainment and gaming, health and sports, purchasing and delivery, transportation and travel, and education and learning. That way, we challenge the assumption that IS use resumption is context-specific. This broader context highlights the ubiquity of IS resumption and suggests its fundamental role in shaping users' digital interactions. Mainly, the context of work and productivity demands further inquiry, as IS use resumption here displays distinct characteristics not observed in other domains, such as higher levels of compulsion and situational triggers. IS use is primarily mandated at work, meaning that users cannot decide on their own if they want to use a particular IS [27]. In addition, IS use at work is driven by productivity, meaning that users use particular IS to reach their goals, meet deadlines, and finish their tasks efficiently.

5.2. Theoretical contributions

Theoretically, our study advances the IS resumption literature [1] by developing a more comprehensive understanding of the characteristics that influence this distinct behavior. Whereas previous studies focused on absence and frequency as the defining dimensions of IS use resumption [1,5], we introduce five additional characteristics to theory: duration (the length of time before resumption), consistency (regularity of resumption), partitioning (division of resumption into distinct phases or segments), compulsion (the degree of urgency or need driving resumption), and circumstances (the situational factors influencing resumption). These characteristics allow for a richer and more nuanced conceptualization. These new characteristics also offer a granular understanding of how users experience the process of IS use resumption, distinguishing it from other IS use behaviors such as continuance or discontinuance.

Moreover, our identification of five resumption patterns, in terms of functionality-based resumption (resumption driven by the functional aspects of the IS), lifestyle-based resumption (resumption aligned with the user's lifestyle and daily habits), convenience-based resumption (resumption influenced by the convenience offered by the IS), mood-based resumption (resumption that is affected by the user's emotional state or mood), and situation-based resumption (resumption dictated by specific situational factors or contexts). These patterns reveal how combinations of characteristics shape the particular dynamics of IS use resumption. For instance, mood-based resumption highlights the role of emotional states in triggering the return to an IS. Thus, a former Netflix user might instinctively navigate to the Netflix app when settling on the couch with the TV on, only to remember that they no longer have an active subscription. The repeated instinctive attempts to access the service might eventually lead the ex-user to renew their subscription as they become increasingly aware of their ingrained viewing habits. In contrast, functionality-based resumption underscores how the evolving utility of a system draws users back. For example, former users might return to using Runtastic when they start exercising again because it's handy to track the running process. These patterns explain variations in IS use resumption and contribute to broader IS theories by clarifying

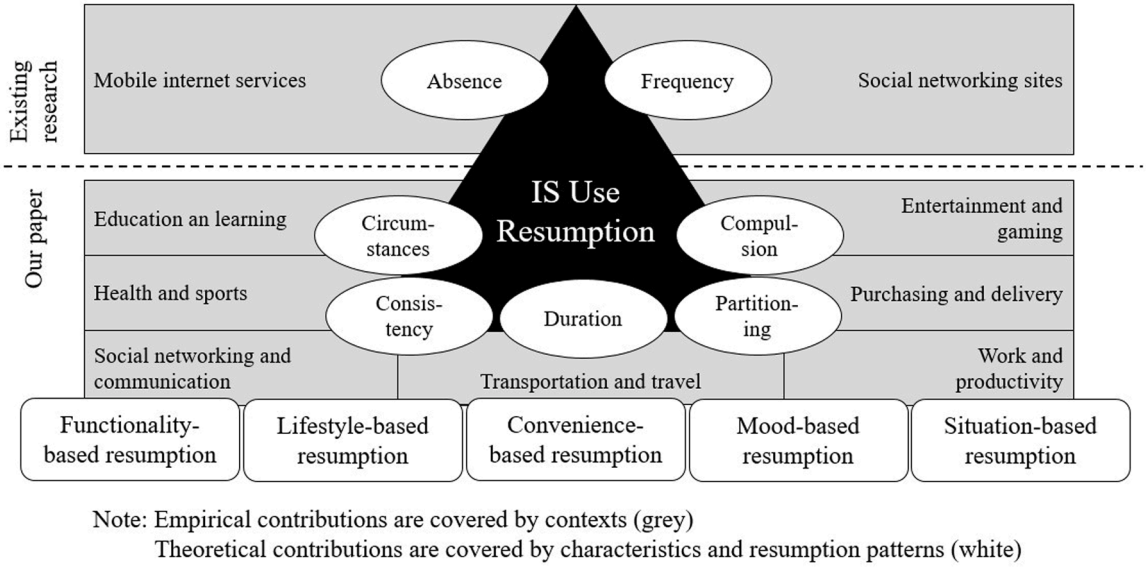

Fig. 2. Empirical and theoretical contributions.

how personal, situational, and external factors interact to influence user behavior. Thus, we offer a more integrative model of IS use resumption that bridges individual motivations with contextual drivers. We illustrate our empirical and theoretical contributions in Fig. 2.

5.3. Practical contributions

Our findings have significant implications for practitioners, mainly IS vendors and organizations navigating system transitions. For IS vendors, understanding the nuances of IS use resumption is critical for designing strategies to re-engage ex-users. Knowing that IS use resumption tends to occur after specific intervals allows vendors to deploy personalized marketing campaigns at crucial moments, such as timed reminders or incentives. The differentiation between short-term and long-term ex-users, based on resumption patterns, enables vendors to fine-tune their approaches, focusing on users more likely to resume use permanently. These strategies, informed by the resumption patterns, can contribute to more sustainable customer retention efforts and increased profitability [51].

Using the resumption patterns that resulted from our research can be additionally helpful in influencing ex-users behavior and, for example, knowing that individuals who resume using an IS for an extended period after having discontinued its use for an extended period (i.e., *mood-based resumption* and *situation-based resumption*) might be very interesting for vendors. This knowledge enables them to realize that focusing on long-term ex-users might result in permanently winning back users while winning back short-term ex-users might only lead to winning them back temporarily. Consequently, sales and loyalty might be higher when winning back a long-term ex-user instead of a short-term ex-user. It is better to focus on users who discontinued using an IS for an extended period when sending individual vouchers via email or placing personalized advertisements. Individual user statistics that result from methods such as mouse tracking can help to identify relevant ex-users and where to place these customized advertisements. Knowing that all resumption cases related to private IS occur voluntarily emphasizes the efficiency of creating incentives to drive ex-users to resume using an IS.

Our findings provide actionable insights for managing system transitions and minimizing the risk of employees reverting to old systems in organizational settings. Early intervention strategies, including targeted training workshops and ongoing user support, are critical during the initial adoption phases of a new IS. These efforts should address the involuntary nature of IS use resumption in workplace contexts, where users might be compelled to return to legacy systems due to organizational pressures or situational factors. Organizations can better anticipate potential resistance and proactively manage user adoption by understanding whether IS use resumption is voluntary or mandated. Looking at the resumption patterns, supporting users when resuming using an IS is especially relevant when they discontinue using it for a short period, as this is often related to temporary IS use resumption (i.e., *convenience-based resumption* and *event-based resumption*). Employers might consider regularly scheduled workshops and user meetups, even some months after implementing a new IS, to supporting users in using a new IS, experiencing new features, sharing knowledge, and thereby recognizing the value of the IS.

5.4. Limitations and future research

Although we followed established guidelines while conducting our qualitative study [41], some limitations must be mentioned. We conducted interviews among German and Austrian users, of whom more than 75 % were younger than age 36, creating two limitations. First, interviewing individuals of another age group could have changed our results as older people, for example, might not be as convenient with IS use and, thus, might show different IS use resumption behavior. Second, conducting the study in another part of the world could have also changed our results, meaning that the generalizability of our analysis is limited because different cultures might influence IS use resumption. However, we find no significant differences in the behavior of German and Austrian users, which is why we can assume that our results are generalizable for the context of other countries in the European Union. Nevertheless, we do not expect our study to generalize to other countries outside the European Union [52–54].

6. Conclusion

This research introduces IS use resumption as a frequently occurring behavior among users. We conducted a qualitative study, uncovering 96 resumption cases and identifying seven characteristics to describe IS use resumption across different contexts, such as work and productivity, social networking and communication, and education and learning. We identify five resumption patterns among our interview data, enabling us to reveal several relationships between different characteristics and contexts. We contribute to IS research in three ways. First, we extend the existing literature by providing empirical evidence that IS use

resumption is a unique and relevant behavior in various contexts. Second, we identify five characteristics of IS use resumption (duration, consistency, partitioning, compulsion, and circumstances) in addition to absence and frequency. Third, we reveal five resumption patterns (functionality-based, lifestyle-based, convenience-based, mood-based, and situation-based resumption), representing empirically existing combinations of characteristics. Based on that, we point to aspects that require future research.

CRediT authorship contribution statement

Nina Platzer: Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Franziska Stoeckl:** Writing – review & editing, Validation, Methodology, Investigation. **Christian Maier:** Writing – review & editing, Supervision, Funding acquisition. **Andreas Eckhardt:** Writing – review & editing.

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Appendix

Table 8
Interview guideline.

Welcome & introduction	Hello, … Thank you for being so willing to participate in our study. First of all, is it okay for you if the interview is recorded? We do not process personal data, but we use the contents of the interview for a research project, in which we then state, for example, that interviewee #1 (female, 23) said: "…", but we do not use names, addresses or the like. So, we have a current and exciting research project. We observe that more and more people use different IS both professionally and privately, then stop using it and later start using these IT services again. In other words, users return to IS, which they have used before. We want to take a closer look at this behavior in the research project and understand it theoretically.
Introduction of the interviewee	First, I would ask you to tell me your age, gender, and profession. Also, what is your experience with IS in general? Are there any relationships with specific technologies (e.g., looking at your smartphone is the first thing you do when you get up)? Do you use a lot of IS or a little? Please briefly describe your day or week in terms of IS use. Are there differences in IS use between personal and professional environments?
Identification of potential resumption cases	Next, I'd like you to tell me if there are any services like Netflix, Amazon Prime, MS Teams, or specific products in the IS context, like tablets or smartphones, that you've returned to using even though you've consciously stopped using them before. Please name any IS to which this applies, both personally and professionally.
Use process per IS	*For each IS: we start with A* - *Adoption.* Can you tell me why you used A for the first time? Approximately what year was that, and what were the reasons? How important was it for you to use A, and why? - *Continuance*. I would be interested to know why you continued to use it at that time. How intensively and how often did you use it? Why did you use it so often and continuously? - *Discontinuance.* What caused you to stop using A? When was that (year), and what were the specific reasons? - *Resumption.* What finally caused you to start using A again? When was the (year), and why did you retake it? *Discontinuance-Resumption.* What exactly happened before you started using A again? How did you behave here in general (in terms of social networks/streaming services/…)?
Questions/ Comments	Are there any questions on your part, or is there anything else you want to tell me about this topic? Can you think of anything interesting?
Thank you & Goodbye	Thank you for your time and the exciting insights, and have a nice day.

Table 9
IS contexts among our interview data.

Context	IS examples	Proportion
Work and productivity	Microsoft Word, Microsoft Office, SAP, Lotus Notes, WorkTime, OneNote, Dropbox, Trello, Zoom, FlexSim, Citavi, Fritzbox, MS SyncToy, Icecream Screen Recorder, Windows 95, LaTeX, Azure, iOS, Allplan, Briskine, Outlook, Windows	32.29 %
Social networking and communication	Facebook, Snapchat, Instagram, LinkedIn, TikTok, Skype, Tinder, Microsoft Teams	20.83 %
Entertainment and gaming	Candy Crush, Youtube, Netflix, Sims, Hayday, SkiChallenge, DAZN, Amazon Prime, Rival Stars, Doodle Jump, Bookbeat	15.63 %
Health and sports	Runtastic, Komoot, Freeletics, Apple Health, Base Five App, Bergfex, Skiline	14.58 %
Purchasing and delivery	Willhaben, Zara App, Lieferando, Mc Donald's App, Hellofresh, Kaufhaus Tyrol App	7.29 %
Transportation and travel	Wiener Linien App, MVV App, Uber	5.21 %
Education and learning	Duolingo, Kindle, Google Translate	4.17 %

Table 10
Coding examples.

IS	Data examples	Descriptive coding	Interpretive coding
Bookbeat	"In the summer of 2021, I started using Bookbeat … because I got a free trial month. After that, I used Audible instead because they had a discount … and then I went back to Bookbeat." (Female, 24y)	"used Audible instead"	Alternating
Briskine	"I adopted a program called Briskine during my job in 2018. In 2021, I quit this job and did not use Briskine anymore. But, when I started a new job a few months later, I created a new account." (Female, 27y)	"decided to create a new account"	Voluntary
Candy Crush	"I have some games on my phone, like Candy Crush. I already deleted and redownloaded it several times." (Male, 30y)	"redownloaded several times"	Multiple times
Dropbox	"When I studied, I used Dropbox about once a week … did not need Dropbox anymore. In August 2022 … I started using Dropbox again and since then use it regularly." (Female, 28y)	"since 2022, use it regularly"	One-time
Duolingo	"I downloaded Duolingo for the first time in 2015 … I deleted it after only two weeks … in 2018, I downloaded it again t… I stopped the use after two or three weeks." (Female, 25y)	"stopped the use after two or three weeks"	Temporary
Facebook	"I used Facebook since 2007 … then I deactivated my account, and when I moved to another city in 2012, I started using it again … Since then, I use Facebook daily." (Male, 30y)	"since 2012"	Permanent
Komoot	"In the summer of 2020, I started using Komoot for hiking, but I do not hike in the winter, so I deleted the app … In the summer of 2021, I downloaded it again." (Male, 24y)	"delete the app"	Delete
Runtastic	"I started to use Runtastic in 2014 because I went running a lot, but then I stopped running and using Runtastic for about three years. In 2019, I re-installed Runtastic just because I wanted to work out more." (Male, 29y)	"wanted to workout more"	Normal
SAP	"I was on maternity leave between August 2020 and January 2021, so I did not use SAP. However when returning to work, I needed to restart using SAP, and since then, I have used it daily again." (Female, 34y)	"returning to work"	Disruptive
Skype	"I used Skype since 2010 to virtually talk to my friends … Due to the COVID-19 pandemic, in 2020, I reinstalled Skype on my laptop because some lecturers wanted us to use Skype." (Female, 23y)	"some lecturers wanted us to"	Mandated
Snapchat	"From 2012 until 2016, I used Snapchat to communicate with friends … I did not use it anymore … In 2020, during the first COVID-19 lockdown, I started using it again." (Female, 23y)	"until 2016 … since 2020"	Long-term
TikTok	"In 2020, I created a TikTok account … in 2021, I stopped using it … some weeks later, I downloaded it again." (Female, 25y)	"some weeks later"	Short-term
Tinder	"I started to use Tinder in 2018 … I never used any alternative, such as Parship." (Male, 30y)	"never used an alternative"	Non-alternating
YouTube	"Since 2012, I used YouTube for 2 or 3 years, but I stopped using it because I got bored. However, I never deleted YouTube, and since the COVID-19 pandemic, I restarted using YouTube." (Female, 23y)	"never deleted"	Keep

Table 11
Number of cases per characteristic.

Characteristics		Distribution	Resumption cases
Absence	Short-term	40.63 %	3, 5, 7, 11, 12, 13, 14, 16, 17, 19, 20, 21, 22, 28, 29, 31, 32, 45, 47, 48, 50, 54, 56, 57, 58, 61, 65, 67, 68, 71, 71, 73, 74, 77, 78, 90, 91, 92, 93
	Long-term	59.38 %	1, 2, 4, 6, 8, 9, 10, 15, 18, 23, 24, 25, 26, 27, 30, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 49, 51, 52, 53, 55, 59, 60, 62, 63, 64, 66, 69, 70, 75, 76, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 94, 95, 96
Circumstances	Normal	78.13 %	1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 19, 20, 21, 22, 23, 24, 26, 28, 31, 32, 33, 34, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 85, 86, 89, 90, 91, 93, 94, 95
	Disruptive	21.88 %	4, 9, 15, 18, 25, 27, 29, 30, 35, 36, 50, 63, 70, 81, 82, 83, 84, 87, 88, 92, 96
Compulsion	Mandated	8.33 %	30, 41, 44, 71, 82, 83, 84, 88
	Voluntary	91.67 %	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96
Consistency	Alternating	14.58 %	1, 5, 6, 11, 19, 21, 29, 33, 37, 51, 60, 69, 80, 86
	Non-alternating	85.42 %	2, 3, 4, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 67, 68, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96
Duration	Permanent	56.25 %	1, 2, 4, 6, 8, 11, 13, 15, 23, 24, 25, 26, 27, 28, 30, 33, 34, 35, 36, 37, 38, 40, 41, 42, 44, 45, 46, 47, 49, 51, 52, 55, 56, 59, 60, 62, 63, 69, 70, 71, 74, 75, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89
	Temporary	43.75 %	3, 5, 7, 9, 10, 12, 14, 16, 17, 18, 19, 20, 21, 22, 29, 31, 32, 39, 43, 48, 50, 53, 54, 57, 58, 61, 64, 65, 66, 67, 68, 72, 73, 76, 78, 90, 91, 92, 93, 94, 95, 96
Frequency	One-time	69.79 %	1, 2, 4, 5, 6, 8, 11, 12, 13, 15, 19, 20, 21, 23, 24, 25, 26, 28, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 50, 51, 52, 53, 55, 56, 59, 60, 66, 67, 69, 70, 71, 74, 75, 77, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 92, 94, 95, 96
	Multiple times	30.21 %	3, 7, 9, 10, 14, 16, 17, 18, 22, 27, 29, 31, 48, 54, 57, 58, 61, 62, 63, 64, 65, 68, 72, 73, 76, 78, 90, 91, 93
Partitioning	Keep	27.08 %	3, 5, 8, 9, 13, 14, 16, 22, 24, 36, 39, 45, 48, 50, 54, 56, 57, 61, 75, 77, 78, 89, 91, 92, 93, 95
	Delete	72.92 %	1, 2, 4, 6, 7, 10, 11, 12, 15, 17, 18, 19, 20, 21, 23, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 46, 47, 49, 51, 52, 53, 55, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 76, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 94, 96

Table 12
Examples of resumption patterns.

Resumption pattern	Example
Convenience-based resumption	"In 2017, I started to use Komoot for hiking. In Winter, I stopped using it because I don't do ski touring. Since then, I restarted using Komoot every summer." (Female, 19y) "In 2020, I created a TikTok account to explore and upload content. In 2021, I deleted several social media apps because I realized that my relationship with these apps was somehow toxic. Some weeks later, I downloaded it again. I have deleted TikTok several times but always return to it after a maximum of 2 months." (Female, 25y)
Functionality-based resumption	"I used Facebook since 2004 or 2005, but between 2012 and 2017, I did not use it at all. In 2017, I started to use Facebook again. Since then, I have used it regularly, less for scrolling around and more for specific things. For example, I recently used Facebook to organize a high school class meeting." (Female, 40y) "I started to use Netflix in 2015, but after three months, I deleted my account because I found it too expensive. However, in 2017, the offer became much better. Thus, I subscribed again and since then use it regularly." (Male, 33y)
Lifestyle-based resumption	"In 2021, I downloaded Lieferando for the first time because I thought I could save time if I ordered food instead of cooking myself. After two weeks, I deleted the app because the exam period had ended, and I wanted to eat healthier again. When the next exam was about one month later, I reinstalled Lieferando for the same reasons." (Female, 23y) "In 2015, I started to use Tinder because of recommendations. After months, I met somebody I was seriously interested in, so I deleted Tinder. Some months later, I downloaded Tinder again. I deleted and redownloaded Tinder several times depending on my interest in meeting someone." (Male, 31y)
Mood-based resumption	"I started to use Runtastic in 2014 because I went running a lot, but then I stopped running and using Runtastic for about three years. In 2019, I re-installed Runtastic because I wanted to work out more." (Male, 29y) "In 2016, I started to use Instagram, and I used it regularly to post vacation photos or check other profiles. But, in 2019, I deleted Instagram from my smartphone because I wanted to spend less time on social media platforms. In 2020, I reinstalled Instagram, but I use it less than before." (Male, 37y)
Situation-based resumption	"I was on maternity leave between August 2020 and January 2021, so I did not use SAP, one of the main programs I use at work. I had no access to it during maternity leave, as the work laptop was kept at the company. However, when returning to work, I needed to restart using SAP, and since then, I have used it daily again." (Female, 34y) "From 2010 until 2012, I intensively used Snapchat because every one of my friends used it, but then Facebook, Instagram, and other platforms came up, which were way more interesting. So, I stopped using Snapchat and deleted the app. But, when I went to Sweden for an exchange year in 2019, I downloaded it again because many people there used it." (Female, 25y)

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