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The future of personal information management in the age of ubiquitous personal data

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ABSTRACT
This introduction discusses the background and motivations for this special issue on Personal Information Management (PIM). We summarize accepted papers and outline future issues for PIM research.

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1. Introduction

Personal Information Management (PIM) is integral to our daily lives, encompassing the collection, retrieval, consumption, and management of personal data such as e-mails, messages, files, photos, music, social media and web information. PIM is enacted for work, study, and entertainment purposes. While some PIM technologies like files and folders have been around for decades, others like cloud storage, music recommendations, and photo search are more recent. These technological shifts bring new challenges to PIM, which this special issue aims to address. The proliferation of mobile phones and social media has increased the taking and sharing of photos, while AI technologies are transforming our music and video consumption habits. Additionally, regulations like General Data Protection Regulation (GDPR) impose legal requirements on technology providers, while users are becoming increasingly concerned about the privacy of their personal information. This special issue seeks both to enhance our understanding of PIM behaviors with mature technologies and also to identify emerging research topics related to new technologies and regulations.

2. Summary of accepted papers

Following a broad call, we accepted six articles reflecting a broad set of topics that are representative of PIM:

2.1. *Research and practice in PIM systems (Dix, 2024)*

Dix reviews 40 years of PIM systems research, characterizing the significant challenges in transferring research prototypes into working products. The article first deconstructs the concept of personal information management and then reviews successful commercial products. These analyses are used to identify future research directions for PIM systems research.

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2.2. *Individual differences and PIM (Sillence et al., 2023)*

This study explores the issue of digital hoarding, where users struggle to delete personal information. A survey measured users' tendency to hoard and evaluated associated PIM behaviors. Results indicated that hoarding propensities were linked to difficulty finding items, distress, and concerns about information loss. The paper also suggests the underlying motivations or drivers of digital hoarding in personal use settings may vary in comparison with workplace settings with disengagement, rather than anxiety or compliance, being important (McKellar et al., 2020).

2.3. *Post-mortem information management (Holt et al., 2024)*

This research examines what happens to personal collections after the owner's death, addressing complex issues like access rights and policies to safeguard the deceased's wishes, while also supporting the living. The study highlights the challenges of inheriting poorly organized personal collections and the postmortem privacy paradox, where owner's actual collection behaviors do not reflect their intent.

2.4. *Collaborative archiving and access (Oh, 2024)*

This article investigates the challenges of creating effective collaborative archives in cloud-based systems. A large-scale survey of researchers revealed that active file management was rare, but satisfaction was highest when teams had explicit rules for organizing and archiving shared files.

2.5. *Unlocking data from personal services (Syrmoudis et al., 2024)*

This study evaluates the effectiveness of transparency tools developed in response to GDPR, which aim to make users aware of the data collected about them. Surveys showed that while these tools improved attitudes toward data privacy, users found them less useful than browsing data within native applications.

2.6. *Terms and conditions (Mols et al., 2024)*

Interconnected and smart technologies complicate PIM, because users delegate certain aspects of storing, organizing, and retrieving of personal information to service providers. This creates flows of personal information that people do not control, preventing effective information management. This research examines the relationship between PIM and privacy through the lens of impression management. Findings indicate that PIM practices are influenced by anthropomorphic interpretations of technologies and perceived appropriateness of information flows.

3. Future Issues

We build on these findings to identify a number of challenges for future PIM research: The field is poised to undergo significant changes, driven by advancements in technology as well as shifts in societal attitudes toward privacy and data security. As we look ahead, several key trends are likely to shape the evolution of PIM research.

3.1. *Lifetime archives and legacy curation*

Lifetime archives generate multiple challenges for PIM. They demand new technical methods for retrofitting older materials when formats, hardware and applications are no longer supported. Furthermore, there is a requirement for clearer policies to specify and implement

access permissions to these archives in the event of the owners' death. There is also a pressing need for new curation tools (Holt et al., 2024). The challenges for descendants are both cognitive and affective. Prior research on collaborative archive organization indicates major problems in deliberately designing archives that allow effective access for others (Berlin et al., 1993; Oh, 2024). However, lifetime archives represent a more significant problem as the deceased may have organized their archive subjectively, without orienting to descendants' access needs. Sorting through a loved one's lifetime archive can also be highly fraught as descendants encounter information that may trigger unanticipated emotions. Descendants also do not want to inadvertently discard valued items that may be encountered in unexpected locations. These difficulties are exacerbated by both the scale and unfamiliarity of the archive. Together these challenges suggest the need for new tools allowing owners to structure lifetime archives and communicate their intentions enabling their descendants to access archives as owners intended.

3.2. *Fragmentation and the continued need for system integration*

Information fragmentation has been a long-term challenge in PIM as materials needed for a given task are often distributed across different applications (Bergman et al., 2006; Boardman & Sasse, 2004; Karger, 2007). Dix (2024) documents how PIM systems are balkanized, making it difficult to share information between them. He also notes there are few incentives for individual companies to support application integration as doing so may surrender proprietary data. The fragmentation problem is exacerbated as applications continue to proliferate, with the lack of integration meaning that users often have to conduct multiple retrievals across similar but distinct applications, e.g. to determine whether contact information was shared in e-mail, WhatsApp, LinkedIn, a text, or in Messenger. It may be that more stringent enforcements of legal policies such as GDPR will spur new efforts by companies to address this problem, but the technical challenges are severe (Dix, 2024; Holt et al., 2024; Syrmoudis et al., 2024), and there are few incentives for companies to do so (Dix, 2024).

3.3. *Security and privacy*

Despite legal requirements for transparent access, users are very unclear about what data is stored about themselves, as well as where their personal data is stored (Holt et al., 2024; Mols et al., 2024; Syrmoudis et al., 2024). This in turn makes it hard for users to enact strategies for ensuring their data is secure and private. Corporate data breaches are commonplace, and there is still little transparency about how and when personal data is collected. Much security research indicates that users find it difficult to manage access privileges for a single application (Holt et al., 2024; Kokolakis, 2017). Moreover, the lack of well-designed UIs providing consistent security defaults across applications, combined with the proliferation of applications make this highly challenging for the average end user. Furthermore, sophisticated AI-based inferences can now be made from stored data that would previously have been secure and private. As a result, users need to constantly upgrade their already demanding privacy practices.

3.4. *AI applications*

Given the immense recent interest in AI, we were surprised that we did not receive more papers on applications of AI to PIM, with the exception of Mols et al. (2024) which only tangentially addresses this. Intuitively there are many potential areas of PIM that could be facilitated by AI; an AI agent informed by one's personal profile and preferences could be deployed on many tasks, e.g. responding to e-mails, setting privacy and security settings, organizing one's archive, making music/movie recommendations or even determining how one's lifetime archive will be shared with descendants. Why, then, did we not receive papers tackling these issues? One barrier to generating accurate

personal profiles is that they demand large-scale user datasets. To collect such datasets requires the research team to develop scalable in-house apps that are robust enough for daily usage. As documented by Dix (2024) as well as Bergman and Whittaker (2016), designing and maintaining such applications is a considerable undertaking. These demands place academic research at a considerable disadvantage. In consequence, such novel AI initiatives are likely to take place within companies who have the resources and skills to develop them. A second, orthogonal set of challenges to AI are user-centric; while potentially reducing work, AI applications may preclude users from actively organizing their personal data with the result that their retrieval is less effective (Bergman et al., 2014). Active organization may also increase users' enjoyment and subsequent likelihood of exploiting their archives (Bergman & Gradovitch, 2023; Bergman et al., 2023). Nevertheless, the prevalence of AI leads us to anticipate a flurry of research activity around new PIM based agents, addressing where they might have impact for users.

3.5. *Regulatory compliance*

The regulatory landscape for data protection is becoming increasingly complex, with laws like GDPR setting high standards for privacy and data handling. Such laws are well-intentioned, and in principle PIM systems will need to be designed with compliance in mind, to provide users with easy-to-use tools to exercise their rights, such as data portability and the right to be forgotten. However, we are not optimistic that effective tools will result. Current portability tools seem designed to meet minimal legal requirements rather than genuinely serve users, and they often represent data dumps to standard formats. Several of the papers in this special issue demonstrate that in practice tools that are described by companies as supporting "transparency" and "portability" are far from meeting actual user needs (Holt et al., 2024; Syrmoudis et al., 2024). New designs and user deployments are desperately needed to bridge these gaps.

3.6. *Theory and methods*

Early PIM was dominated by qualitative methods such as the PIM tour and user interviews. As PIM has evolved, quantitative methods have also emerged. Greater access to logging tools and quantitative datasets has made it possible to operationalize important PIM concepts such as "archive size," "organization," "folder size" and "file depth" (Bergman, 2013). The effects of, and relations between, these variables can then be measured on user retrieval efficiency and accuracy (Bergman et al., 2010, 2020; Dinneen & Frissen, 2020; Dinneen et al., 2019). As noted above, there is a crucial need for similar conceptual and definitional work to operationalize key concepts such as "transparency" and "ease of use" in the context of GDPR regulations.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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