Integration of Personal Informatics and Library and Information Services in Academic Libraries in the Philippines

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Abstract

This study is a work-in-progress looking to understand how Personal Informatics frameworks and systems can fit into the mold of academic library institutions in achieving a level of personalization that increases library user engagement and user self-insight generation for possible feature optimizations.

Keywords

Personal informatics, Library and information services

1. Introduction

1.1. Motivation

Libraries, in their effort to keep up with technological advancements, have introduced various forms of digitalization in the premises and, more recently, beyond. From redesigning almost-abandoned public buildings into technologically-ready libraries [1] to radio frequency identification application in public libraries [2], these advancements have created a library ecosystem present in both the physical and digital realms, helping constituents seamlessly interface with the library and engage with its services.

On the other hand, academic libraries have also been at the forefront of a deluge of information; to maintain technological keep up with societal progress, digital subscriptions to academic publishers as well as remote access are becoming a staple academic library service alongside its previous regular physical amenities. These services, however, also contain a great deal of information; access to thousands and thousands of digital journals in addition to rows and rows of physical books can create a more intimidating sight to behold. With how users encounter more and more information this way, helping them navigate through that information in any way can make the wayfinding more palatable.

With even libraries, bastions of information themselves, slowly getting overwhelmed with the amount of information passing through its halls, what of the average person? The advancement of modern technology has made people capable of accessing millions and millions of information at their fingertips; knowing how to interact with this vast ocean is essential to be able to keep up with modern society. The importance of managing this information shines further in day-to-day activities, especially with the pervasiveness of information that occurs in the current context of the Internet, smartphones, wearable technologies, and more. Jones and Dineen [3], "[forming] an inclusive definition of personal information" in response to this complex information spread, show us six dimensions in which it exists: "[information] can be owned by, about, directed toward, sent by, experienced by, or relevant to 'me.'" This definition rightfully includes a convoluted and innumerable amount of information, establishing the need for a process to help filter everything for clarity. Tracking these pertinent personal information encountered from both library systems and the outside world through various tools can help in reducing the complexity and in actualizing more relevant data into actionable insights and applicable knowledge.

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1.2. Problem Statement

Academic libraries have been, however, prioritizing other parameters besides personalization. Khavidaki et al. [4] examined the level of current personalization practices that academic libraries are applying to their processes and developed recommendations for future planning and policy, presenting a need for "[accelerating] the move toward smart and/or expert systems." The potential for Personal Informatics to complement this acceleration by delegating user tracking to automated system processes can help both librarians and users in approaching goals expeditiously. Creating an interconnected system can help users rapidly generate insight from, for example, article recommendations on a personal user page derived from subject matters of core and elective courses taken through a hypothetically-combined system information system and library system.

Personal Informatics (henceforth PI) systems have been in the business, so to speak, of navigation: specialized in collecting, integrating, and reflecting data back [5] to the user, it seeks to help the user in achieving the goal they set out to do with data tracked from the user either manually or autonomously. These systems have been mainly in finance, health, exercise, and journaling [5] have since dealt with tracking pertinent personal information. Kersten van-Dijk et al. [6] have even evidenced its effectiveness in increasing user insight on tracked parameters; however, the insights were generated from systems that only dealt with the previously mentioned disciplines, requiring further verification for its application on library information systems.

This study seeks to understand the possibilities of overlaying Personal Informatics frameworks as a possible solution to the furthering of the personalization of library systems based on Khavidaki et al.'s [4] recommendation of needing "further research on the use of an automated/system-based approach in services personalization ... for the ultimate users of digital libraries" and deeming it "necessary to provide recommendations to the user on the different ways of interacting with the library ... by tracking the user's behavior and needs," both of which already long-standing features of PI systems.

2. Background and Related Work

2.1. Digital Transformations in Libraries

As much as an individual is swathed with information every so often–and therefore has, throughout the years, produced tools that help themselves truncate information overload–so are institutions in their bid to keep adapting to society to further service users and consumers. This is a necessity even more so for an institution considered to be on the forefront of dealing with books, journals, and other types of information: libraries.

A requirement for libraries in the current age of technological advancement is accommodating the ever-changing needs and services of their patrons through various digital transformations, especially when the COVID-19 pandemic forced most human activities to the digital space. This accelerated the process further of libraries from being "mere repositories for books" [7] to "dynamic, digitally-driven knowledge and information centres" [8]. Digital transformation (DT)–and, as a subset [9], digitization in organizations–have been a phenomenon since the 1950s [10]; it has gone from being just an "economic discussion" [10] to a force with a tremendous influence on a huge spread of fields of interest.

DT is "deep conversion of business activities, processes, technologies and models to fully penetrate and take advantage of the opportunities and changes through a combination of digital technologies" [7] and has encompassed all library functions and activities in their pursuit of keeping up with the rapid onset of new technologies. It has also created a renaissance towards the processes that library users undergo in interacting with information, especially in their capability to navigate the new interfaces that have now spread across the library institution.

Digital transformation is a holistic process that updates the library's priorities to include the physical and digital realms, from a space that requires the "availability of electrical outlets" [1] to a mobile application for interacting with library data [11], to name a few examples. Library technology, as a means to each library's respective goals, can then be furthered accordingly, adjusted to be a budget

priority, and adapted to user demand and be of service more effectively.

2.2. Personal Informatics

Personal Informatics (PI) is a field of study that helps deal with this phenomenon. It is an "activity where people collect and reflect on personal data to gain a better understanding of their own behavior" [12]. "Living by numbers," "quantified self," "self-surveillance," "self-tracking," and "personal analytics" are some of the fields of study that are considered equivalent to Personal Informatics [13], and has therefore been a topic of interest since the 1500s; from Santorio Santorio, a physician from the 16th century, measuring his weight through a "weighing chair," to Benjamin Franklin and his everyday journal of food intake and sins violated [14], to today's explosion of technological advances that have let today's populace track statistics never before possible.

PI systems have since gained traction in the self-tracking space, helping in the self-reflection domain by collecting, integrating, and reflecting data back to the user through various visualization techniques. As an example, MyFitnessPal, a calorie- and exercise-tracking app and website for health and fitness, had over 200 million users in 2020 and generated 310 million USD in 2023 [15]. It logs food and exercise through various means–barcode scanning and searching an 18-million entry database for food, integrating partner fitness applications and manually inputting repetitions and sets for exercises–and reflects the information back to the user through various graphs and charts that can help them gain insight.

These systems contain features that assist in the self-tracking phenomenon. They promote goal achievement and self-efficacy through personalized notifications; using the previous example, MyFitnessPal pushes alerts at certain points in time to help remember noting down meals taken to generate a more comprehensive image of the user's diet. This information can be used to then establish a base point for losing, maintaining, or gaining weight, whatever the preferred goal.

2.3. Personalization

Personalization has always benefited information systems by appropriating content to more specific situations than what is generalized, giving a thicker breadth of insights generatable from said systems; it is, after all, "any combination of information and behavior change strategies intended to reach one specific person based on characteristics that are unique to that person" [16]. Evidenced by user-focused studies, Tunis et al. [16] portrays that even "patients value apps that are customized and tailored to meet their needs, and ... [for] more complex health conditions, personalization is an essential requirement." Rapp et al. [17] corroborated the need for personalized Personal Informatics systems, especially for a new user base. Inexperienced participants in PI tool usage but had an interest in pattern discovery through self-tracking "represent a new category of potential users that could largely expand the market of PI tools, ... [and] recent research highlights that they quickly abandon PI devices." Personalizing systems specific for this user persona then establishes foundational processes that can "deal with the quick disengagement that they experience when interacting with PI devices" [17].

Personalization has been baked into the core tenets of Personal Informatics systems in that even though it is considered a "grand challenge" [18] in the development of further PI systems, the point is with a gamut of literature examining how current systems have applied, prototyped, and approached personalization and how their capabilities fared, personalization has long been applied in the implementation of these types of systems. Tunis et al. [16] reviewed literature on personalization in PI tools and needed to split it into four groups of lenses—user needs, current approaches, current challenges, and industry and commercial contexts—analyzed through for clarity, presenting the tremendous amount of personalization inherent in Personal Informatics tools that analysis of these tools and their implementations have generated a lot of hubbub in the field of study.

As an example, the phenomenon of digital reading has been optimized by personalizing facets of the processes undergone by readers. Huang and Liang [19] developed a technique for tracking reading rate in juvenile e-book readers after finding out that reading rate is "a useful indicator to assess students'

reading performance, ... investigate related reading behaviors, and ... a formative evaluation of the overall reading process." They establish the capability of tracking reading rate to help students in understanding assigned texts and teachers in helping students get themselves unstuck from possibly difficult passages.

2.4. Research Gap

Personal Informatics systems have long been a purveyor of data-driven behavior change [6] in its users in various genres and have a current corpus on analysis of these systems and their effects on various fields of study, to name a few. Academic library services, on the other hand, often do not generate user-trackable metrics for user perusal. They might track metrics and use them for both internal and external processes [20], but these capabilities are on show for the general public and upper management, respectively; as a current patron in the here and now, how would the library user then track personal progress of library service usage?

With how library and information services have transformed library usage over the years, even library users have renewed preferences for their ideal library use. Studies have focused on varying perspectives on these preferences—library architectural design [1], library impact on progressing patient care support [21], digital and physical library resource allocation balance [22], to name a few—and have left an opportunity for Personal Informatics systems to be included in those ranks in relation to library and information services.

Academic library systems, though "[providing] some indication of personalization feature use, ... overall use of measured features is relatively low compared to the total enrollment of organizations," [23] proving "no overwhelming clamor for personalization features" in these systems. Current library database features [23] corresponding to their personalization strategy [24] are listed in Table 1; as is presented and as compared to Fan and Poole's four-way categorization, functionality personalization strategies remain to be lacking in the ways to engage library users. PI tools, therefore, establish their footing in the academic library user engagement improvement plan as a functionality personalization strategy effort and an additional channel stratagem [25]; the paper derives these capabilities from examining PI tools according to Fan and Poole [24]'s categorization system as well, juxtaposing a flurry of systems against the framework for a comprehensive view of the level of personalization enacted by PI tools.

Showing users a data-backed overview of their activities can help them understand their current capabilities and show them possible insight that can help further their attempts in achieving their goals. High early usage of calorie-tracking PI systems establishes a higher likelihood of seeing the calorie goal through [26], for example; if presented through simple visualizations—a notification of low app use in the user's early usage, perhaps—a person can then determine if they have optimizations to do based on their goals. Presenting users with tracked data points can help them in establishing a snapshot of their data and discover how possible interactions among listed factors play out [12]. Why not, therefore, apply these personal-level engagement motivators and apply them on an institutional scale to potentially increase library user engagement? With how Personal Health Records (PHRs)—electronic records that contain current and past medication, previous doctor visits, laboratory results, among a few others—are integrated with various government and third-party systems for fluid information dissemination of patient information for more efficient patient care processes [27, 28], academic libraries could in parallel incorporate Personal Informatics principles to current systems to then generate insights for users.

3. Expected Outcomes

Preliminary observations of the possible interactions that could arise from this integration are automation of graph production of digital services compared to other variables—amount of journal papers read in a proprietary academic publisher website in an academic year, for example—course recommendation taking into account previous courses taken and number of remaining free electives available to claim,

such as recommending a data visualization course after two information-related subjects. Full range of possible interactions have yet to be fully understood as of the time of writing, however.

4. Challenges and Next Steps

4.1. Current Limitations

The study aims to analyze annual reports of an academic library in order to find potential opportunities for Personal Informatics systems to optimize feature development for a user-facing insight generation platform. The study could be complemented by interactions—interviews, surveys, or observations perhaps—with librarians and patrons of the academic institution and/or inclusion of annual reports from other academic libraries for a more comprehensive understanding of how PI can generate system optimizations.

4.2. Next Steps

Appropriating a methodology method from reviewed literature would be the next step to be able to test would-be integrations in academic library services and PI features, from possibly altering terminologies in previously-used survey methods to a full ground-up construction of a semi-structured interview question sheet.

5. Conclusion

This work-in-progress proposes the integration of PI systems into academic libraries and establishes its capability as a solution to the personalization deficit in academic libraries introduced by Khavidaki et al. [4]. Academic libraries could turn previously-meted out general insights and visualizations towards users themselves, empowering them in their journey through the ocean of information. Expected outcomes could result in breakthrough recommendations for possible feature introductions and optimizations, but thorough analysis and feedback from the CHIRP community would sharpen that scalpel further.

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Declaration on Generative AI

The author has not employed any Generative AI tools.

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