

**Report for Part1**

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1. **identified problem**

In today's society, personal financial management tools have become essential for achieving financial goals and simplifying budget management. However, some issues in human-computer interaction (HCI) design continue to be obstacles to user experience (UX), directly affecting user satisfaction and the overall utility of these tools. Based on existing research on HCI in financial management tools, as well as key issues that have been identified, we will explore the design challenges in current personal financial tools, focusing on usability, interaction complexity, transparency and user control, data visualization, accessibility, and multilingual support.

1. Usability Issues and Interface Complexity  
   In personal financial tools, usability issues and interface complexity often intertwine, affecting the user's experience and satisfaction. Choe et al. (2017) pointed out that users often feel overwhelmed by large amounts of complex financial data. In personal financial management tools, overly complex charts and data displays increase the difficulty for users to understand and manage their financial situation. For users of financial management tools, they generally hope to quickly grasp their spending, income, and budget status through simple interfaces and clear charts. However, in reality, many tools do not effectively address interface complexity, making it difficult for users to intuitively extract the key information they need from the interface.  
   Moreover, efficiency issues are another major pain point in existing tools. Users often need to manually enter and update large amounts of data, especially in tools that lack cloud synchronization. Manually updating financial information not only increases the user's operational burden but also greatly reduces their efficiency. This issue directly leads to an increase in the user's cognitive load, making them feel more confused and fatigued when using these tools.  
   For example, while Mint is widely used, users often report issues with automatic synchronization, requiring frequent manual adjustments and corrections. This not only affects user experience but also reduces the accuracy of data updates. As Choe et al. (2017) mentioned, users need simplified and efficient data display methods to reduce excessive data processing tasks.  
   Kocielnik et al. (2019) emphasized the importance of transparency and user control in personal financial tools. Many tools, such as YNAB and Albert, rely on automation to simplify budget tracking and financial planning. However, the automation processes of these tools often lack transparency. Users want to understand how the system processes their financial data and be able to manually adjust it when necessary. However, many of the existing automated functions fail to provide enough explanations or allow users to intervene, causing users to lose trust in the system. Users want to have more control in intelligent systems, but most tools do not fully consider this need during design.
2. Data Visualization and Interaction Design  
   In financial management tools, data visualization is a key component in improving user experience. Choe et al. (2017) pointed out that the clear visualization of financial data not only helps users better understand their financial situation but also encourages users to explore the data and reflect on and optimize their financial management decisions. One of the goals of financial management tools is to help users identify and adjust their spending habits, a process that relies on concise, intuitive chart displays.  
   However, many existing tools still face serious issues in data visualization design. For example, while Quicken's interface is powerful, its outdated design and complex charts confuse users when viewing financial reports. Overly complex interfaces not only fail to effectively convey information but may also cause users to overlook key information, reducing their motivation to manage their finances. In contrast, some simpler tools, such as Refresh.me, reduce the user's cognitive load through simplified charts and intuitive data displays, improving the user experience.  
   In addition to data display, interaction design is also a key factor that affects user experience. In financial management tools, users frequently interact with the system, including entering data, adjusting budgets, and viewing reports. Complex interaction processes not only reduce user operational efficiency but also cause frustration during use. Kocielnik et al. (2019) emphasized that simple and easy-to-use interaction design is essential for improving user satisfaction. Many existing tools, such as Goodbudget, while using the traditional "envelope budgeting" method, still require a lot of manual operation and data input. This complex operation process undoubtedly increases the user's workload, which in turn reduces their willingness to continue using the tool long-term.  
   Furthermore, the efficiency issues of data input interface design remain a difficult pain point to solve on many platforms. Users need an intuitive input system, but the design of many tools in this area is not ideal. When using these tools, users often need to confirm and operate multiple times to complete simple data input tasks. This cumbersome operation not only affects user satisfaction but also increases user frustration when managing finances.
3. Smart Design and User Control  
   With the development of technology, more and more personal financial tools have begun to integrate intelligent features such as automatic categorization, smart recommendations, and predictive functions. These features use algorithms to help users simplify data input and budget management. However, Kocielnik et al. (2019) pointed out that although intelligent features provide convenience, transparency, and user control issues remain major obstacles in user experience.  
   The application of intelligent features in personal financial tools is mainly reflected in automatic categorization, budget recommendations, and spending reminders. For example, tools like Albert provide automatic savings and personalized financial advice to help users optimize their financial decisions. However, these intelligent features often rely too heavily on algorithms, and users do not understand the transparency of these algorithms. Users want to clearly know how the system makes decisions and be able to manually adjust the algorithm's suggestions. If the system does not provide enough transparency, users may question the accuracy of the algorithm, which in turn affects their trust in the tool.  
   A key challenge in the design of automated features is how to balance user convenience and control. If the system relies too heavily on algorithms and does not provide enough manual adjustment options, users will feel they have lost control of their financial management. This not only reduces user satisfaction but may also cause users to abandon these tools. Therefore, when designing intelligent features, developers should consider how to increase user control options, allowing users to manually adjust categorization, budgets, and other key functions according to their needs.
4. Accessibility and Multilingual Support  
   In a global and diverse user environment, accessibility and multilingual support are factors that cannot be ignored in HCI design. Although Choe et al. (2017) and Kocielnik et al. (2019) did not directly discuss accessibility issues, support for users with different languages and physical disabilities is clearly an important issue to consider in financial management tools. As financial management tools become more global, users may come from different cultural backgrounds with varying technical levels and usage habits.  
   Some financial tools, such as Moneydance, support the needs of international users by allowing the use of multiple currencies and handling cross-border financial transactions. However, the tool's non-cloud-based operation and complex user interface design limit its appeal to global users. Support for different languages, as well as features that accommodate language barriers and visual impairments (such as text magnification and voice input), remain areas where many tools need improvement.  
   Accessibility design is not only about the universality of the technology but also about how to make these tools easy for every user to use. On some platforms, user interfaces are too complex or lack visual guidance, which may confuse or discomfort users with special needs. To address this, enhancing support for visually impaired users, providing clearer visual hierarchies and color contrasts, and using voice-assist technology to help users with mobility difficulties can significantly improve the inclusiveness and usability of financial management tools.

1. **research methods**

The research methods relied solely on surveys and literature review.

The questionnaire is showing below

Financial Management Software User Needs Survey

Thank you for filling in!

1. What is your age range?
   * 17–21
   * 22–30
   * 30–40
   * 40–60
   * 60+
2. What is your occupation?
   * Student
   * Employee
   * Business owner
   * Freelancer
3. What financial management tools do you currently use?
   * Manual bookkeeping
   * Excel spreadsheets
   * Professional financial management software
4. How often do you manage your personal or business finances each month?
   * Daily
   * Weekly
   * Monthly
   * Occasionally
5. What are your primary purposes for managing your finances? (Select all that apply)
   * Budgeting
   * Tracking income and expenses
   * Investment management
   * Tax planning
6. In which areas do you feel existing tools are lacking? (Select all that apply)
   * Unfriendly user interface
   * Limited features
   * Poor data analysis capabilities
   * Lack of mobile support
   * Poor customer support
7. What features would you like to see in financial management software? (Select all that apply)
   * Budgeting and forecasting
   * Real-time data synchronization
   * Data visualization (charts, reports, etc.)
   * Bill reminders and payment management
   * Financial analysis and recommendations
   * Multi-account management
   * Security encryption
8. What data analysis features would you like the software to provide? (Select all that apply)
   * Income and expense trend analysis
   * Investment return analysis
   * Financial health reports
9. What user experience factors are most important to you when using financial management software? (Select all that apply)
   * Ease of use
   * Speed of response
   * Visual design
   * Customer support
   * Data security
10. What is the biggest challenge you face when using financial management tools? (Open-ended question)
11. Do you have any other suggestions or expectations for new financial management software? (Open-ended question)
12. **Findings**
13. Usability challenges arise from complex interfaces and the need for manual updates. Tools like Mint highlight these inefficiencies, reducing the accuracy and user engagement.
14. Poor data visualization and interaction design increase cognitive load. Quicken's outdated design limits its effectiveness, whereas Refresh.me successfully simplifies visuals.
15. Smart features like automatic classification must balance convenience with transparency and user control. Albert users struggle with algorithm transparency, impacting trust.
16. Accessibility and multilingual support are critical but often underdeveloped, limiting the global reach of tools like Moneydance.

**4. Personas**

**Persona 1: Sarah Lee**

* Photo and Name: Sarah Lee
* Demographics:
  + Age: 24
  + Gender: Female
  + Location: China
  + Occupation: University Student
* About: Sarah is a full-time university student pursuing her degree in Economics. She is highly motivated to manage her finances because she lives on a strict budget while balancing her studies and part-time job.
* Goal: Sarah wants to ensure she is saving enough for post-graduation plans and manages her student loan payments efficiently. She also needs to track daily expenses, particularly for food and transportation.
* Pain Points:
  + Finds manual bookkeeping tedious and time-consuming.
  + Lacks knowledge in advanced financial management strategies.
  + Needs more user-friendly software as she is overwhelmed by complex features.
* Skills:
  + Proficient with basic Excel functions but prefers simpler tools.
  + Familiar with using mobile apps for daily tasks.
* Behavioral Variables:
  + Activities: Sarah manages her finances weekly, tracking expenses mainly to stay within her student budget.
  + Attitudes: She views financial management as necessary but prefers tools that don’t overcomplicate the process.
  + Motivations: She is driven by the need to stay financially secure and to minimize student debt.
  + Skills: Moderate financial literacy, focused on personal budgeting.

**Persona 2: David Zhang**

* Photo and Name: David Zhang
* Demographics:
  + Age: 35
  + Gender: Male
  + Location: Beijing, China
  + Occupation: Small Business Owner
* About: David owns a small e-commerce business, and managing his business's finances is a crucial part of his daily routine. He uses a combination of Excel and financial management software to track cash flow, taxes, and business expenses.
* Goal: David aims to streamline his financial processes, reducing the amount of time he spends on bookkeeping and ensuring his business remains profitable.
* Pain Points:
  + Finds it difficult to integrate financial software with other business tools.
  + Struggles with complex financial regulations and taxes.
  + Faces challenges in tracking multiple accounts across business and personal expenses.
* Skills:
  + Proficient with professional financial software.
  + Familiar with accounting principles and software integrations.
* Behavioral Variables:
  + Activities: David manages his finances daily, focusing on balancing his business's cash flow.
  + Attitudes: Sees financial management tools as essential but prefers solutions that offer advanced integrations with accounting tools.
  + Motivations: David is motivated by the need to optimize his business operations and improve financial efficiency.
  + Skills: High financial literacy, especially in business finance management.

Common User Challenges (from Q10 data)

* Concerns about data security and the need for free versions of software.
* Difficulty with maintaining consistent records, particularly remembering to log expenses.
* A general lack of financial knowledge, which creates barriers to effective use of financial tools.

1. **User Journey Map**



