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Digital emancipators or oppressors: Evidence from Mobile Personal Finance Applications

[Subject]

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TIIVISTELMÄ:

Tämä tutkimus pyrkii selvittämään mobiilien henkilökohtaisten taloussovellusten vaikutusta nuorten aikuisten koettuun taloudelliseen hyvinvointiin ja odottamattomiin sivuvaikutuksiin, erityisesti emansipaatioon ja sortoon. Tutkimus tarkastelee ensin näiden sovellusten vaikutusta taloudelliseen hyvinvointiin, tutkien käyttäjien motivaatioita ja tavoitteita näiden sovellusten käytön taustalla. Toiseksi se tutkii odottamattomia sivuvaikutuksia yksilön käyttäytymiseen ja kokemukseen, tarkastellen miten taloudellisen hyvinvoinnin tavoittelu vaikuttaa käyttäjän vapautteen muilla elämänalueilla. Tutkimus on osa DigiConsumers-projektia, joka pyrkii parantamaan nuorten digitaalisia taloustaitoja. Tutkimus toteutettiin kahdessa vaiheessa. Ensimmäinen vaihe käytti eläytymismenetelmäksi kutsuttua menetelmää (MEBS) tiedonkeruuseen. Tämä gradu edustaa toista vaihetta, uudelleen määrittäen tutkimuskysymykset ja analysoi uutta teoreettista viitekehystä. Tutkimus tutkii käyttäjien mobiilien taloussovellusten hyödyntämistä henkilökohtaisessa taloudenhallinnassa. Tämä paljastaa sovellusten käytön keskittyvän muutamisiin käyttötarkoituksiin kuten kulutukseen, lainaamiseen ja talouden seurantaan sekä budjetointiin. Osallistujien demografinen koostumus oletettavasti vaikutti käytettyihin palveluihin. Tutkimus osoittaa, että nykyhetken taloutta koskevat sovellukset ovat käyttäjilleen tärkeämpiä kuin tulevaisuuden taloutta koskevat sovellukset. Vaikka jotkin alueet vaativat parannuksia, käyttäjät saavuttivat tavoitteensa, erityisesti parantuneen taloudellisen hyvinvoinnin budjetointi- ja suunnittelutyökalujen avulla. Näiden sovellusten todettiin sekä emansipoivan että sortavan. Käyttäjät kokivat emansipaation yksinkertaistamalla ja nopeuttamalla tehtäviä, kuten budjetointia, säästämistä ja sijoittamista. Myös helpottunut maksaminen lisäsi emansipaatiota osalla käyttäjiä. Sen sijaan osa kohtasi sortoa impulsiivisen ostamisen, digitaalisen rahan arvon sekaannuksen ja rahansiirtojen liiallisen helpottumisen vuoksi. Tutkimuksessa havaittiin myös PFM-työkalujen epäsuorat vaikutukset henkilökohtaisiin ja sosiaalisiin yhteyksiin. Henkilökohtaisesti työkalut nopeuttivat toimia, tarjosivat vapautusta aika- ja paikkasidonnaisuudesta, mutta aiheuttivat vastaavasti stressiä turvallisuuteen, yksityisyyteen ja käyttäjävirheisiin liittyen. Sosiaalisesti applikaatiot mm. aiheuttivat stressiä sosiaalisen median esittämän kuluttamisen suhteen, mutta paransivat myös viestintää ja jaettuja kokemuksia. Sovellukset voisivat hyödyntää tekoälyteknologiaa ymmärtääkseen paremmin käyttäjiään ja kokonaisuuksia paremmin sekä neuvoakseen käyttäjiä tehokkaasti. Tämä ratkaisu voisi lisätä emansipaatiota eri konteksteissa ja edistää taloudellisia tavoitteita eri tasoilla. On olennaista tutkia, miten teknologiaan pohjautuvaa tavoitteiden optimointia voidaan kehittää eettisesti ja läpinäkyvästi kaikille sidosryhmille.

AVAINSANAT: mobiilisovellukset, päätöksentekijärjestelmät, henkilökohtainen talous, koettu hyvinvointi, emansipaatio, sorto

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Abbreviations

AI	artificial intelligence
CFPB	consumer financial protection bureau
CT	critical theory
IS	information systems
MEBS	method of empathy-based stories
MFS	mobile financial services
MFSA	mobile financial services application
ML	machine learning
PFM	personal finance management
PMFA	personal finance management application
PV	perceived value

1 Introduction

It is a simplification but generally accepted perception that sensible financial decisions lead to favourable results for the individual oneself. From a microeconomic perspective, sound economic behaviour means that an individual's income outweighs spending (Lusardi & Mitchell, 2014). As a whole, this includes the balance of the economy's accumulated wealth and debts. Here, the human life cycle should be considered, e.g. the sufficiency of money even in retirement. The definition can, of course, be extended. However, to make a sensible financial decision, individuals need a reasonable amount of knowledge, i.e. financial literacy, to set their own financial goals and implement relevant actions. In practice, individuals need to plan budget and track basic transactions information. (Howlett et al., 2008; Netemeyer et al., 2018; Torno et al., 2021). Personal finance management (PFM) software can be used as a tool to help individuals in this complicated task. (Bitrián et al., 2021; French et al., 2021)

First versions of Finance management software were developed during the early history of personal home computers. Until the present day, features and usability have significantly increased, and so has the popularity of this type of software. Now, most consumer-targeted software is used as applications on mobile phones and by computer and internet browsers. In this research, the focus is on applications used in mobile phones or smartphones. From a narrower perspective of banking applications, these applications are also called as mobile financial services apps (MFSAs) (Karjaluo et al., 2019). However, the interest of this research is wider than daily financial tasks (current money management) and includes planning and monitoring (financial future).

A wide range of applications are available on the market for persons whose motivation to use these applications can be managing overall finances (e.g. mobile banking) or easing daily use of money (e.g. mobile payments). Applications may also help persons to optimize their long-term financial decision. In principle, these work according to designed definitions to complete one or several tasks. (Torno et al., 2021). However, an

interesting question is how these support individuals' overall conscious goals, which are built from several partially contradictory sub-objectives.

The ubiquitous nature of digital tools as smartphones and applications makes access to information and services accessible for almost anyone. However, this does not necessarily lead to the better financial well-being of persons. That may be due to deficiencies in people's financial skills (i.e., financial literacy) or usability limitations (Torno et al., 2021) in certain applications. Furthermore, some applications may not prioritize users' financial well-being, thereby exacerbating the problem. Thus, investigating this issue presents a formidable challenge for researchers and software developers.

Although the concept of Perceived Financial Well-Being (Netemeyer et al., 2018) includes a broad view of human well-being, it views the issue mainly from an economic perspective. The perspective of this study is that when considering the impact of PMF applications on an individual's life, the overall impact of these digital tools on humans should also be considered. This effect can be viewed, for example, through digital emancipation and oppression.

1.1 Goals and scope of research

This chapter defines the goals and limitations of the research. This chapter also aims to clarify the stages of the research and related concepts at a general level.

1.1.1 Goals and two dimensions of the research

This study aims to increase understanding of mobile personal finance management applications' impact on young adults' perceived financial well-being. In addition, the research aims to increase understanding of unintended IS side effects. In this study, the perspective of side effects is emancipation experienced by users and the opposite as oppression in IS context.

The first task is to consider the effects on well-being limited to financial well-being. This context of financial well-being is closely related to utility, why users are of applications are using these. Practically, the user has a limited concrete goal, but presumably, there is also a broader goal behind it. The perspective here is the perceived financial well-being experience of the individual application user.

The second task is to consider other unintended side effects on an individual's behaviour and experience of their possibilities. These effects of emancipation and oppression can relate to financial context but also some other contexts. The topic of interest is how the optimization of the user's limited concrete goals, or the pursuit of financial well-being, affects the freedom the user experiences in other areas of life.

This research was executed in relation to a multidisciplinary DigiConsumers research project. The DigiConsumers research project aims to enhance young individuals' economic and consumer skills in digital environments. This research was carried out in two phases. The original research team of Vartiainen and Koskelainen utilised empathy-based stories (MEBS) to collect research data in the first phase. This master thesis, i.e. my research, can be seen as the second research phase. In this phase, research questions will be re-defined, followed by an analysis of the new theoretical framework.

1.1.2 Conscious goals and impact to perceived financial well-being

Financial well-being is an essential part of the complete well-being of an individual. Well-being is a personal state (Consumer Financial Protection Bureau (CFPB), 2015), and individuals may have different practical level goals - which may change during their lives. Different goals can evolve with a person's personal experiences. However, the goals are affected by the life situation in which the person lives. Different individuals also set goals with different time perspectives. One sets goals and milestones from studies to retirement age, and the other thinks one year at a time.

Research studies financial well-being as a subjective experience. It captures the concept of Perceived Financial Well-Being and recognises structures of current money management and expected future financial security (Netemeyer et al., 2018). Thus, the study aims to investigate the impact of the PFM applications in this context and structure. The further goal would also be to increase personal agency with IS, promote financial awareness and take ownership of own personal own financial behaviour. The idea is that this also contributes to the financial well-being experienced by individuals. Where possible, research will seek to generate ideas further academic research. For application developers, the purpose is to encourage the invention of new methods and promote the development of IS that can create novel solutions that meet the needs of modern individuals and society.

1.1.3 Making side-effects of emancipation and oppression visible

This research studies the impact of PMF application on individual testing effects phenomena and sets those into context as impacts of digital emancipation. Emancipation has many different meanings. It is a key element in critical theories (A. Young et al., 2021) but is also applied in several different fields of sciences. Emancipation and oppression in the context of IS can be complex and multifaceted. This research does not try to capture phenomenon as a whole but includes a few elements relevant to the subject of empirical material and the chosen theory framework. Recently emancipation and oppression have also been studied in the context of IS from several perspectives (Kane et al., 2021; Miranda et al., 2016; Noble, 2018; Vieira da Cunha et al., 2015; A. Young et al., 2021; A. G. Young, 2018). Essential elements of emancipation are reduction of power asymmetries and increasing freedom, and to make own choices. Oppression can be seen as the opposite of emancipation as it limits liberty to think and act (A. Young et al., 2021).

This approach was chosen for secondary scope because it helps fill gaps from a comprehensive picture of the complex relationship of IS utility perspective and effects on individuals in multiple dimensions of digitalised reality. This perspective believes that IS should be used to reach utility goals and emancipate, not oppress, individuals. This

perspective aims to make side-effects of emancipation and oppression visible. This may allow avoiding unintentional oppressive effects in future IS designs even some paradoxes in intersections of contexts may be challenging to escape.

1.1.4 Research questions

The following two research questions can be formed based on the problem described above.

- **Research question 1:** How users utilise applications and how applications affect users perceived financial well-being?
- **Research question 2:** How do PFM applications emancipate and oppress users?

1.2 Research methods

This study is interpretive research utilising qualitative data collected using the method of empathy-based stories (MEBS). While utilising MEBS, informants are writing short narratives based on the researcher's introductory frame story. A few variations are used in framing stories, which enables researchers to observe how narratives differ when some aspects of the stories are changed. (Eskola, 1997; Särkelä & Suoranta, 2020)

After data collection first analysis cycle begins with an inductive approach. This Data-driven content analysis (Graneheim et al., 2017) is executed in several iterative phases. The analysis proceeded in the following steps: In the first phase the stories were read to get a general understanding of the data. In the second phase, the stories were coded to identify the initial sub-themes. In the third phase, the sub-themes were separated and used to identify the main themes.

As part of the process, data was also used in the structure development method adapted from Gioia et al., (2013). In the first stage, 1st-order terms were developed, 2nd-order

themes were obtained from these, and broader dimensions were derived from these. Ultimately, this model was not used in the final analysis for the instrumental theme (A).

However, this method of building data structure has influenced the analysis using the lens of emancipation and oppression as a theory (B). The goal was to form observations from the research material and create a structure to develop a theory or find an existing suitable theory to use as a lens for analysis. Ultimately, the process led to adoption of an existing theoretical framework adapted to this study.

In this second complementary approach, the steps from coding the source data to creating the data structure are similar, but the further analysis proceeds differently. So that is how it was while analysis A uses an inductive approach, analysis B applies a deductive approach (Graneheim et al., 2017). The phenomena observed here are tested in the selected theoretical framework.

As already stated above, analysis approaches the subject from two angles. The first approach is an analysis on a surface level to answer original research questions regarding the use and aim of the application. This approach connects directly to original data-gathering themes and applications' utility perspectives. The second approach is to analyse material utilising theory lenses.

Lenses utilised were finance, the personal and social contexts (modified from Polyviou et al., 2021), which intersect with components of emancipation (Young et al., 2021). This way, research utilising empirics and the researcher's chosen theory can be seen as interpretative research (Walsham, 2006). Research like this, which examines people's unique experiences in this way, falls within the field of narrative research (Andrews Corinne; Tamboukou Maria et al., 2008).

1.3 Research contribution

The examination of the research results can be divided into two parts, like the perspectives of the research analysis. From the point of view of goal-oriented use of applications, narratives describe the use of tools surprisingly narrowly. Of course, the purpose and functionalities of some applications are quite limited. However, how the research was carried out could have made it possible for responders to bring out more imaginative and innovative ways of use. It can be assumed that the demographic composition of the research group also significantly affects the services used. Research responses on the different themes are strongly related to consumption, how consumption is financed, and consumption monitoring. In the practice and context of this research, applications allow their users to consume and, if necessary, finance their consumption. Users get a hedonistic pleasure from consuming, but the user experience of this enabling tool, the application, is often largely neutral and the experience insignificant.

Research suggests that the target group finds apps affecting current finances more relevant than those impacting future financial scenarios. Despite certain areas needing improvement, services are generally beneficial. Users achieve their intended goals with these applications, with budgeting and planning tools particularly enhancing perceived financial well-being.

Research reveals that PFM systems have significant emancipating but also oppressing effects on users during PFM tasks. Emancipation occurred in budgeting, money transfer, saving, lending, and investment tasks. PFM enhanced these activities by making them more accessible and faster. Respectively oppression emerged as impulsive buying, difficulty understanding the value of digital money, and the extreme ease of money transfers (e.g., lending).

In addition, results revealed that emancipation and oppression were indirectly related to PFM (personal and social contexts). Regarding the personal context, emancipation appeared as speeding up and facilitating actions or liberating individuals from the limits of

time and place, for example. Oppression appeared as the stress of safety, security, privacy, and user error, for example. In terms of the social context, oppression emerged as limiting human interaction and the stress of social media. Emancipation appeared as enhancing communication and sharing experiences with other users.

2 Literature review

This literature review has been carried out by dividing it into research-relevant themes. The first theme is related to the instrumental part of the research object, i.e., digital tools and applications for personal financial management. The second theme then deals with people's financial well-being from a personal perspective. The third theme, in turn, deals with emancipation and oppression in information systems (IS). This latter theme, in turn, is further divided into a general section and another section which opens up to the illustrative concepts of emancipation and oppression under one of the core theories of the study.

2.1 Definitions

The first theme of this literature review is digital tools, software and especially mobile applications, i.e., "apps", which are nowadays used in personal finance management or financial services contexts. The aim is also to give some historical background. This section describes the different applications and their uses.

The second theme is financial well-being from an individual perspective. The aim is also to explain the concept of perceived financial well-being and its main components. It is relevant to understand what key variables are connected to financial well-being. It is also relevant to understand which factors increase well-being and which decrease.

The third theme of the literature review is emancipation and oppression in information systems. These are effects that the IS unintentional may have on individuals on the side of the intended utility effect. It is necessary to dismantle the concept of emancipation into different components and understand how it may appear in different contexts to understand the phenomenon.

2.2 Digital tools for PFM and financial services

The definition of mobile applications, "apps", is presumably relatively unambiguous both in the academic literature and among the general public. We understand that these are software installed (preinstalled or downloaded by the user) on digital mobile devices like phones or tablets. This software is designed to meet one or more needs of the device user. An application can be a crucial part of a device using experience, but it is not part of the device itself as an operating system (Hoehle & Venkatesh, 2015).

The upper concept of the tool is thus defined, so next is necessary to define the context of "personal finance" in which these specialised tools relate. According to Xiao & Tao (2020), personal finance is a variation of consumer finance as well as family finance. Respectively, consumer finance relates to financial functions needed by households. According to Tufano (Tufano, 2009), these functions are: "moving funds, managing risk, advancing funds from the future to today and advancing funds from today until a later date". Based on this definition, personal finance management contains managing overall finances (e.g. mobile banking) or easing daily use of money (e.g. mobile payments).

Additionally, according to the earlier definition of Walker & Garman (1992), the purpose of personal finance is to provide information for individuals to effectively manage money to achieve lifetime goals. Generally, personal finance management includes optimising individuals' long-term financial decisions by information and actions. This research includes applications making decisions affecting short-term and long-term financial positions.

2.2.1 History of PFM tools and digital financial services

Personal finance management software (PFM) emerged alongside early home computers in the 1980s, with software packages offering practical tools like chequebook maintenance and financial analysis (Berlin, 1982). By 1983, around 50 similar products were available, but the introduction of Quicken by Intuit soon dominated the market. For

decades, PFM's focused on monitoring and planning, with a few key players like Quicken. (Smith, 2015). While some programs eventually integrated online bank updates, daily financial tasks (current money management) remained separate from planning and monitoring (financial future).

In some regions, e-banking emerged early for computer use, while mobile banking was adopted later. On the other hand, in some regions, these financial services were introduced directly via mobile devices (Kangasniemi, 2020). Personal finance planning and management features increasingly became part of online banking services, and mobile technology facilitated third-party services independent of banks. Mobile devices held an advantage over computers mainly due to greater accessibility in the 21st century (Riivari, 2005). Despite the currently strong position of mobile services, predicting future technology trends remains challenging.

2.2.2 PMFAs, MFSA and other - archetypes of mobile finance applications

Modern digital tools enable financial planning, implementation of measures, and monitoring. Some tools specialise in one thing; others respond to more than one need. The classification of these instruments is thus complex. Torno et al. (2021) discovered the following ten different groups of archetypes of mobile finance applications:

- App provider specific financial news and analysis
- Advanced budgeting
- Transaction remunerated trading and international money transfer
- Manual budgeting without data sharing
- Transaction authorization
- Credit card and retail payment
- User-account-based individualized informing
- Non-individualized informing
- Investing with advice
- Full-featured mobile banking

Naturally, the functionalities of some groups may overlap. For example, some applications in the "Full-Featured Mobile Banking" group may replace the need for several other separate applications. Still, it can be seen that, as Torno et al.'s (2021) research shows, a wide range of applications is available, and people's needs can also be diverse.

Although Torno et. al. research does not divide these archetypes according to the temporal horizon of the usage goals, these archetypes include applications affecting the present and the future horizon. This question of time horizon is discussed more in the context of financial well-being.

2.3 Financial well-being in individual perspective

There is no one single definition for financial well-being. This is a topic that may also be examined from different perspectives. According to Brügggen et al. (2017), academic studies from different fields are usually missing a clear definition of financial well-being even different variables are well studied. Definitions vary between perspectives of objective, subjective or possibly including both. Brügggen et al. (2017, p.229) define financial well-being as: "The perception of being able to sustain current and anticipated desired living standards and financial freedom."

When financial well-being is observed from a consumer and personal perspective, it can be stated that it is a highly personal state (Consumer Financial Protection Bureau (CFPB), 2015b). Research of Consumer Financial Protection Bureau (CFPB) (2015, p. 5) identified the following capacities to be associated with a state of financial well-being as presented in table 1.

Table 1. The four elements of financial well-being (adapted from CFPB, 2015)

	Present	Future
Security	Have control over day-to-day, month-to-month finances	Have the capacity to absorb a financial shock
Freedom of choice	Financial freedom to make the choices that allow you to enjoy life	On track to meet your financial goals

As this concept is personal and individuals have different values, it is not easy to assess financial well-being ideally with traditional quantitative measures (Consumer Financial Protection Bureau (CFPB), 2015a). However, this does not mean that monetary figures do not matter. Studies such as Diener & Biswas-Diener (2002) or Netemeyer et al. (2018) have shown a link between a person's income and perceived general well-being, with some limitations in general; higher incomes are associated with higher perceived well-being. According to Netemeyer et al., higher income does not increase perceived well-being itself but mitigates the effect of everyday money management stress on well-being. i.e. even a person with a high income may have stress due to everyday money management; this stress is easier to tolerate than when a person has a lower income.

However, expectations on these measurable items can vary significantly. According to Brüggem et al. (2017), demographic characteristics have been proven to affect how individuals evaluate their financial well-being. Brüggem et al. also suggest that persons' financial knowledge or attitudes toward various financial matters can affect how persons perceive financial well-being.

It is worth mentioning that the academic literature shows that general well-being and financial well-being cannot be separated. Economic well-being or lack thereof also affects other aspects of well-being. According to Chou et al. (2016), financial insecurity and a feeling of lack of control can cause depression, anxiety, and physical pain. Additionally, these perceived problems may reduce work opportunities, which weakens a person's financial position.

Regardless of the possibility of different definitions, it can be stated that the concept "Perceived Financial Well-Being" is applicable. This concept of Perceived Financial Well-Being Netemeyer et al. (2018) has been divided into two dimensions: 1) stress related to the management of money today (current money management stress) and 2) a sense of security in one's financial future (expected future financial security). This means that

increased current money management stress decreases perceived financial well-being while a sense of security in one's financial future increases it.

2.3.1 The management of money today

Netemeyer et al. (2018) indicates that short-sighted behaviour and traits like materialism and lack of self-control predict current money stress. Imprudent behaviours, like late invoice payments and impulsive consumption, negatively affect financial positions and increase stress.

Constrained liquidity can damage perceived financial well-being, as living hand-to-mouth is stressful and prevents planning. While associated with liquidity-constrained individuals, Olafsson & Pagel (2018) note that hand-to-mouth behaviour also occurs in non-liquidity-constrained households.

Ruberton et al. (2016) and Netemeyer et al. (2018) argue that liquid money reserves improve financial well-being, regardless of income or total wealth. Sufficient funds for current needs positively correlate with life satisfaction and perceived well-being.

2.3.2 A sense of security in one's financial future

Netemeyer et al. (2018) find that money management stress affects expected future financial security, with everyday stress decreasing expected future security. Sustainable choices are more likely to lead to positive financial outcomes than adverse choices. Reasonable risk-taking is necessary for long-term wealth building, and avoiding prudent risks may hinder retirement fund accumulation (Netemeyer et al., 2018). Low risk-taking can relate to low confidence in financial knowledge (Larsson et al., 2016), leading to irrational retirement savings decisions.

Financial security depends on various factors, with no single formula. Retirement savings needs differ by country, with individual responsibility emphasized in the USA and

compared, for example, to varying European pension systems (Rey-Ares et al., 2018). That way, financial security criteria also depend on institutional and cultural factors.

2.3.3 Financial capacity and how to promote it

Short-term financial well-being relies on factors such as liquidity, while long-term well-being requires investment and controlled risk-taking. Financial capability, encompassing financial literacy, behaviour, and self-efficacy, greatly influences individual actions in personal finance (Xiao & O'Neill, 2016). Knowledge, ability, behaviour, and confidence are essential to achieve financial well-being.

Although financial capability is a broad concept, optimizing one aspect may negatively impact another. The effectiveness of education in improving capabilities remains mixed (Luukkanen & Uusitalo, 2019). Practical financial literacy education positively affects young individuals' debt behaviour, while economic courses may have a negative effect (Brown et al., 2016). Learning from personal experiences can be more relevant than formal education (Hilgert et al., 2003).

Subjective knowledge may sometimes be more impactful than objective knowledge, as increasing objective knowledge could reduce confidence and risk-taking (Hadar et al., 2013). Nevertheless, financial education generally positively affects perceived financial capabilities (Xiao & O'Neill, 2016).

2.4 Emancipation and oppression in information systems

2.4.1 Emancipation

Emancipation has many different meanings. According to Young et al. (2021), it is a crucial element in critical theories. Critical theory (CT) tries to clarify human needs and extend human autonomy in different areas of life. From a background of CT, Alvesson & Willmott have discussed emancipation that is efficiently directed into social relations and, for example, reducing power asymmetries. In social and organisational contexts,

emancipation is liberating from oppression and anti-emancipatory forces (Alvesson & Willmott, 1992).

Another view of emancipation and oppression comes from Freire, who developed emancipatory pedagogy. Young is interpreting Freire's idea that it is a process "through which oppressed groups can achieve emancipation by gaining and promoting awareness of their reality and taking ownership of their struggle." (A. G. Young, 2018, p. 343). Freire started to build his concept of emancipation from the Brazilian post-colonial context. Now emancipation and its contrast to oppression have been taken to many contexts, and later it was applied in other sciences in several different ways.

2.4.2 Oppression

Oppression can be seen as the opposite of emancipation in the context of IS, but also in the larger scope of social studies. Oppression is also mentioned in several conceptualisations of emancipation (in IS field) what Young et al. (2021) identified. There are some variations in definitions of oppression, but a general can be recognised that it limits openness and freedom in individual interactions. Oppression is constraining individuals' freedom harmful way. Oppression affects power dynamics – when in emancipation dynamics are neutral or equal – in oppression dynamics are marginalising individuals.

2.4.3 Emancipation and oppression in IS-Research - overview

Emancipation in information systems (IS) literature is a new idea. Already in 80's Lyytinen and Klein researched human behaviour in information systems. They developed a theory that suggests "...information systems which are designed to increase organizational effectiveness must also increase human understanding and emancipate people from undesirable social and physical constrains, distorted communication and misapplied power" (Lyytinen & Klein, 1985).

In information systems (IS), emancipation has appeared also in articles representing Critical Research. Critical research in IS addresses social aspects such as freedom, power, social control, and values related to information technology's development, use, and impact (Myers & Klein, 2011). Young et al. (2021) have recognised the complexity of the concept of emancipation in IS and identified several different examples. There is no single definition but a large spectrum of statements they have composed in their study.

Polyviou et al. are using the term of digital emancipation. They define it, so that is "IS-enabled state where individuals are set free from time, place and device restrictions in the different contexts (personal, social or work) of their everyday life." (Polyviou et al., 2021, p. 166). Polyviou et al. recognise a need to increase "understanding the balancing effort of the digitally emancipated individual." (2021, p. 165). According to Polyviou et al. (2021), IS offers new ways for individuals to operate in multiple contexts simultaneously, which was impossible before this technological development. A single device such as a mobile phone enables digital emancipation, which may have desired benefits in multiple contexts. However, effects crossing multiple contexts may also contain an unwanted adverse effect in one context.

One takeaway from IS's perspective is that all social relationships involve power, leading to a struggle. In that, previously accepted view, technology itself is not considered to be oppressive, but technologies as tools of power can be used in different ways to affect power dynamics. However, even saying that it requires some more research, Young et al. (2021) also raise the possibility that technologies can be oppressive. On the other hand, they also contemplate if theories of emancipation should be used at all in positive or harmless contexts or should be used only in intensely oppressive contexts. However, it can be said that the IS literature contains varying examples in different contexts, and the concept of emancipation is quite flexible.

2.5 Emancipation and oppression – Concepts and components

Understanding theories of emancipation in IS is helpful to break it into a few relevant concepts. Young et al. (2021) present a breakdown of the issue into four different main concepts: Agency, Dialogue, Inclusion, and Rationality (see table 2).

Table 2. Components of Emancipation (adapted from A. Young et al. 2021).

Relevant Concept	Component of Emancipation	IS Phenomena
Agency	Freedom to act	Systems subverting human users, computer-mediated control of workers, behavioral control, punishment from surveillance
Dialogue	Freedom to express	Democratization of discourse, truth exposure, ideal speech, creative expression, voice-giving
Inclusion	Freedom to belong	Inclusion of marginalized groups, economic inclusion, political inclusion, ICT4D, digital divide
Rationality	Freedom to think	Constrained rationality, ideological control, distorted frames of meaning, manipulation, bias

2.5.1 Agency

Young et al. (2021) refer to various IS phenomena that relate to the concept of agency. Their examples of particular IS phenomena appear to limit freedom to act, which is a corresponding component of emancipation. Demetis & Allen (2018) contemplate agency questioning if highly developed and connected IT artefacts are artefacts anymore. Demetis & Allen (2018) argue that there has been a transformation from artefact to systems. That is an easy argument to accept, but more disturbing is an idea of transformation where people become agents of an (IS) system. There is no doubt that people have transferred more power to technologized decision making but losing agency for IS systems feels exaggerated. However, in domains following allegation may be already true "it is humans that must react to technological stimuli rather than technology that must react to human stimuli." (Demetis & Allen S., 2018)

2.5.2 Dialogue

According to Young et al. (2021), dialogue is a component of emancipation that relates to people's freedom of expression. In one research orientation, this relates to studying how to foster ideal communication between persons. Another trend relates to broadcasting information and its effects on society. According to Miranda et al., digital mass media can be seen as emancipating when it is "permitting widespread participation in public discourse and surfacing of diverse perspectives" (2016, p. 304). Opposite force in that context they call hegemonic which is "contributing to ideological control by a few". In this scope, digital mass media includes traditional digital media and social media.

Miranda et al. (2016) notes that typically, research has seen traditional media as less liberating than new digital media. A study by Miranda et al., confirms this view in some respects, but the study also shows that the issue is more complex than it seems. For example, social media lowers the threshold for people to engage in conversation, increases community inclusion, and allows different ways of revealing the truth. Additionally, social media tends to create bubbles and contribute to problems of narrow-framed and bias. By comparing the media in this way, we can say that the concept of dialogue (as a component of emancipation) is complex. The same media as a dialogue tool can have both emancipatory and oppressive features.

2.5.3 Inclusion

Inclusion as a component of emancipation has many different perspectives. Many streams of IS research are studying the inclusion of marginalized groups. It is tempting to think that development and availability of technology as mobile phones itself would create development in society. That would also mean increasing inclusion, at least from an economic perspective. According to Cibangu et al. (2017), this is not necessarily true in the scope of a specific group. They argue that mobile phones are not necessarily improving productivity and economic development for basic needs. According to Cibangu et al., mobile technology just commodifies humans in some cases.

However, the overall view is different if viewed more broadly than from the perspective of individual groups. According to Aker & Mbiti (2010), mobile phones have generally reduced communication costs in societies where technology has become widely available. Because of this, people have better access to various information such as input prices, output prices, jobs, potential buyers, potential sellers, or political information. This improvement has enhanced economies, for example, from the perspective of agricultural or labour markets by increasing efficiency in specific cases. There is empirical evidence that mobile phones can benefit people and society on that basis. Even Aker & Mbiti are not directly using the terminology of emancipation in their research; we can include this as an empirical example of economic inclusion.

2.5.4 Rationality

Young et al. (2021) defines rationality as a concept of emancipation where an essential component is a freedom to think. From IS research perspective, it is relevant to study how systems are designed and how this affects users' consciousness and decision making. In work context and organisational approach, the dark side of computer-mediated control has been found to offer possibilities to managers and employees. However, it is possible that ill-designed systems guide the course of action to look good but still does not promote sensible goals in the best possible way (Vieira da Cunha et al., 2015). That is avoiding oppression in one dimension, which unfortunately mitigates emancipation achieved on another dimension.

At present, we can find many examples where technologies are emancipating individuals but also oppressing them. Kane et al. interpret oppressing forces so that they may not be caused intentionally and not malicious but are caused by well-meant efforts to enhance social good (Kane et al., 2021). Kane et al. are observing the oppression of IS from the perspective of machine learning (ML) and seeing that the oppressive problem lies in current ML design. As the basic ML model is based on optimising outcome variables, it

optimises variable above user. In that way, optimisation may benefit some populations or organisations in the big picture but not individuals.

On the other hand, according to Kane et al., it is possible to optimise some specific objectives (local optima), but this may lead to other blind spots and have adverse effects on the bigger picture (global optima). One reason is that ML algorithms cannot yet understand and measure abstract factors. For example, promoting inclusion may have several unintended trade-offs of other abstract variables such as privacy or freedom to think.

3 Research Design

When preparing and conducting research, the researcher has many different research methods. The researcher's preferences and experience can influence the method he uses. However, the choice of the research method must start with the problem being investigated at any given time (Järvinen, 2018). Even established research methods and their progression are, of course, simplifications of how research is actually carried out. Often research is a back-and-forth pattern. However, in its simplicity, there are well-established methods for the research process, such linear as Jenkins' model (Jenkins, 2000) or Wallace's cycle (Järvinen, 2018).

Typically, however, different methods start with an idea, carry out literature research, decide on a suitable research strategy, collect data, analyse the data and finally get the research done. This research does not fit directly into any ready-made framework. In hindsight, it could be placed in a frame, but the starting layout was slightly different. This research makes use of the research that was already carried out in part earlier, where the flexibly set research questions led to the collection of data. In terms of theory, however, the situation was still open. This way, research jumps into the Wallace cycle already in motion, where empirically collected observations are already ready. However, the setting is free for different possibilities in terms of theory and analysis.

In this research, it was challenging to adopt any single research philosophy. Research case and research questions may require applying multiple philosophies (Saunders et al., 2007). Both epistemology and ontology are critical perspectives for understanding the themes of emancipation and oppression in information systems. These two directions complement each other and help to outline how information systems can influence the liberation or subjugation of individuals and communities.

3.1 Research case

This study is significantly contributed by empirical material that the previous research group (Vartiainen & Koskelainen) had already collected. In the earlier data collection phase, the researchers had drawn up a preliminary research plan and set preliminary research questions, based on which the data collection was then carried out. However, the previous study did not proceed with theory and into the analysis phase, e.g. due to resource issues. Therefore, at this point, the research team carrying out the research changed. The reporting of this study aims to present these facts openly.

Between the data collection (phase one) and further research (phase two), there was about a year gap due to changes in the team and organising work. This situation also allowed for a slight repositioning of the research perspective. The layout of the research questions has changed slightly during the process. However, overall, the objectives have remained the same. Of course, this is also involved in the final aspect, but originally the purpose of the study was to find out how the Internet and digital tools are affecting individuals personal finance management. In particular, the research looks at the issue from a university freshman perspective.

The initial layout of the research questions (in phase one) was as follows:

- (1) How do the Internet and digital tools affect students' financial management?
- (2) What are the opportunities and / or benefits of using the Internet and digital tools to manage your finances?
- (3) What are the challenges and / or risks associated with using the Internet and digital tools to manage your finances?

The collection of survey data is designed based on these questions and produced actual data to be analysed. Although the final research questions have shaped a bit after first stage data analysis, it does not contradict the process. The actual research questions of this current research (in phase two) are following:

- (1) How users utilise applications and how applications affect users perceived financial well-being?
- (2) How do PFM applications emancipate and oppress users?

3.2 Target group

Target group of this research is 1st year finance students in Finnish university who are participating for course, which is to develop students' abilities to manage their finances. However, our hypothesis is that results of this research are also generalisable into individuals living same kind of situation in life. This target group of the study was selected because this is a relatively cohesive group to represent a set at a new turning point in life. A new stage of independence unites this group of individuals, often including, e.g. moving away from parents to live independently. This means freedom and a new responsibility for one's own life and decisions.

In general, it can be estimated that the group members already know about managing their finances. Presumably, this group is already familiar with managing their finances with digital tools to some extent. However, at this stage, as social safety nets go further, the management of these skills and tools is becoming increasingly essential. This group is also relevant in the context of DigiConsumers research project.

Previous research on mobile and internet banking has shown that younger people tend to be more optimistic about the digital use of these services than older age groups (Laukkanen, 2016). In principle, therefore, the attitudes of this age-uniform group towards the utilization of PFM / MFS applications are expected to be uniform.

3.3 Research process

The process of the research is described in the following two lists per phase. Phase one (see table 3) refers to research by Vartiainen and Koskelainen while phase two (see table 4) refers to my own research.

Table 3. Research phase one - data collection

Phase	Input	Output
1.1: Generating Ideas	Raw Ideas	Initial ideas and scope
1.2: Initial Planning	Initial ideas and scope	1st research plan, initial methods
1.3: Defining Research Questions	Initial ideas ,scope, research plan	Initial research questions
1.4: Drafting Survey	1st research plan, initial research questions	Initial MEBS framework stories
1.5: Planning Data Collection and MEBS	Initial MEBS framework stories	Complete plan to organize MEBS setup
1.6: Organizing MEBS Data Collection	Complete plan to organize MEBS setup	Raw data from MEBS stories responses
1.7: Compiling Received MEBS Data	Raw data from MEBS stories responses	Responses in one Excel sheet (in Finnish)
1.8: Preliminary Analysis	Responses in one Excel sheet	Initial analysis
1.9: Preliminary Summary of Results	Initial analysis	Feedback (summary) for responders

Phase one is not my work; this process presented in the table 3 simplifies the actual process. However, it is useful to present process here to make earlier work visible. My own research uses the contribution of work done by Vartiainen and Koskelainen in phase one.

Table 4 presents my research process for this master's thesis. Phase two utilises some outputs of phase one. The final outputs of phase one are not used in actual research but have inspired this research. The most valuable input from phase one is raw data from MEBS stories responses.

Table 4. Research phase two - analytic research

Phase	Input	Output
2.1: Getting to Know the First Phase of the Research	Initial research questions, responses, feedback	General view and understanding of phase 1
2.2: Initial Research Plan	General view of phase 1	Initial research plan
2.3: Translation of Original Raw Data	Raw data	Translation of raw material into English
2.4: Initial Coding	Research plan, translated raw data	Initial code matrix and summary
2.5: Initial Themes	Initial code matrix and summary	Initial themes (qualitative and quantitative perspective)
2.6: Initial Theory Development	Research questions, initial themes	Basis of initial theory
2.7: Initial Literary Review	Initial research plan	Initial theory development literary review
2.8: Review Status	Initial themes, basis of initial theory, literary review	Found original themes are insufficient
2.9: Additional Theory Development	Identified insufficient themes	Developing additional theoretical lens for 2nd approach
2.10: Additional Coding	Translated raw data, additional theoretical lens	Additional code matrix and summary
2.11: Additional Themes	Translated raw data, additional code matrix and summary	Additional themes (qualitative and quantitative perspective)
2.12: Analysis and Synthesis	Initial themes, basis of initial theory, additional themes	Completing analysis and synthesis in various perspectives
2.13: Iterative Refining Process	Analysis and synthesis	Refining process
2.14: Discussion and Conclusions	Refining process	Completing discussion and conclusions

3.4 Research approach and methods

This research uses the method of empathy-based stories (MEBS) (Eskola, 1997; Särkelä & Suoranta, 2020) as a data-gathering method. This method is described in more detail in later chapters. In terms of the whole research, this research can be positioned as narrative, interpretative, and, in the broadest framework, qualitative research.

Narrative research is a qualitative research approach that focuses on exploring and understanding the stories and experiences of individuals or groups (Andrews Corinne; Tamboukou Maria et al., 2008). Narrative research is not necessarily an easy method - the process does not have a clear beginning and end. However, this method aims to capture the richness, depth, and complexity of human experiences in different contexts. Interpretative research is a slightly broader term that also includes narrative research. Here, data and theory are examined - interpreted - to build a useful contribution.

Interpretative research is a slightly broader term that also includes narrative research. Here, data and theory are examined - interpreted - to build a useful contribution. The method is still quite flexible regarding theory; as Walsham suggests, used theories should be chosen how the researcher feels a theory is insightful for them (Walsham, 2006).

As the previous methods suggest, the upper level of this research is qualitative research. A qualitative research method is a broad term that includes a large variety of different research approaches. Common to these approaches is that information and data are collected primarily on a non-numerical form – i.e., nonquantitative. In qualitative research, research outcomes are typically analytic findings and data synthesis. However, this does not entirely exclude some features typical in quantitative analysis, such as counting statistical frequencies of occurrence. (Saldaña et al., 2011).

3.5 MEBS as research data collection method

This research utilises the method of empathy-based stories (MEBS) as a tool to collect research data. In this method informants are writing short narrative based on introductory frame story provided by the researcher. Few different variations are used in frame stories enabling researcher to observe how narratives are differ when certain elements of stories are changed (Wallin et al., 2019). It should be noted that the changes in the framework report are undoubtedly helpful in terms of the richness of the results. However, the variables are uncontrollable due to differences in the individual logic of the respondents (Särkelä & Suoranta, 2020).

MEBS is a qualitative data collection method that is similar to fictional narrative roleplaying. Earlier years MEBS was referred to as passive or nonactive roleplaying which can be seen modification of active roleplaying study methods. These early forms of MEBS were developed in United States in the 1970s as response to critique of experimental studies. The current form of MEBS originates from Finnish concept of *eläytymismenetelmä* (Wallin et al., 2019). This method has been primarily used in studies of sociology and educational sciences, but usability of method should not be limited into these.

In the typical setup of MEBS, the study participants are asked to connect to the story and imagine themselves in a particular situation and role. Roles can be asked taken on as imagine-self or imagine-target perspectives (Davis et al., 2004). Despite the name of the method, the essential idea is not to imagine emotion. Emphasis is on taking an asked role in a fictional situation. This setup gives significant freedom to study participants to develop a short story that is not personal and liberates them to answer more easily to sensitive subjects. Stories may include some part of actual personal experiences but maybe also construct of imagination. MEBS stories offer a mirror to see possibilities, hopes, threats or values associated with different phenomena. The result can be seen as a subjective constructed view of reality (Wallin et al., 2019). MEBS as a research method

is unsuitable for obtaining accurate facts and statistically generalisable results. Instead, the method helps gain insights and develop new ideas (Särkelä & Suoranta, 2020).

3.5.1 Integrity of data

Unlike quantitative methods, there are no clear guidelines for the number of responses needed in qualitative methods. There is no need to find a statistically significant sample of research data in qualitative methods, unlike in quantitative methods. In qualitative research, the perspective strives for generalizability through research results. However, source data's generalizability is irrelevant (Eskola, 1997). From this point of view, it is not an efficient use of resources to collect a vast number of responses.

According to Eskola, it has been found in several studies that 10-15 stories for each variation of frame stories can be sufficient to reach saturation point. Based on that finding, Eskola suggests that 15 stories are sufficient for each variation of a frame story. Based on this reason, Eskola proposes that it may be more productive to collect stories with different frame story settings than collect many additional stories to the same frame story. However, researchers should understand that the relevant number of stories may depend on the research problem or objective, and they are not limited to any single number (Eskola, 1997). The number of stories is typically limited to one per respondent to ensure data quality (Wallin et al., 2019).

3.5.2 Case selection

In our research data collection by MEBS was organised in a group of university students participating course, which is to develop students' abilities to manage their finances. This course is mandatory for 1st-year finance students, and the course is also available in optional studies for other students and there was few participant students from other main subjects. There was total 191 respondents which 49% were female and 51% male. Data collection was conducted by distributing one of eight alternative stories to each respondent student participating in the survey.

Respondents were then asked to write a story in accordance with this framework report. They were allowed to prepare and return the response electronically without supervision. Respondents were given a deadline to return their response, but otherwise were free to decide the time they would like to respond.

3.5.3 Variations

In this research, we used eight different variations of frame stories. Variations are conducted from variable A as themes and variable B as variations of negative/positive setup. The plan was to distribute the different variations to the respondents approximately equally. In practice, the distribution of responses is somewhat different from that. Nevertheless, this difference is irrelevant from a qualitative research methodological point of view because sufficient responses were obtained from all variations to realise the saturation point. The variation with minor responses has 17 different stories, while the variation with the largest amount has 33 different stories. The average number of stories for each variation is 24 stories.

Of total responders, 49% were identified as female and 51% as male. There are some more differences in single variations of stories, but the difference is still not significant. From the perspective of qualitative research binary gender distribution of responders is very balanced. In frame stories, the narrator or another person in a friend role does not have specified genders or other external identifying features. There are no such elements in actual stories of responders. This is possible because the personal pronoun in the answers written in Finnish is asexual. The situation would be different if the stories were written in English, for example. Figures for each variation are presented in table 5.

Table 5. Stories from X1 to X8

	Saving and Investing	Budgeting	Consumption	Borrowing & Lending	TOTAL
Opportunities and benefits	story X1 n = 18	story X3 n = 22	story X5 n = 22	story X7 n = 24	n = 86
Risks and threats	story X2 n = 27	story X4 n = 28	story X6 n = 17	story X8 n = 33	n = 105
TOTAL	n = 45	n = 50	n = 39	n = 60	n = 191

In all variation basic structure of frame story is that narrator meets a friend who tells that he is using phone to manage his personal finances. Then story continues with description of attitude (negative/positive set-up) which is followed by theme (purpose to use). After this introduction narrator describes what his friend has spoken in this context. Respondent is asked to continue story from that point. All stories were written in Finnish (Appendixes 1 – 4).

For example, of frame story (translation from Finnish to English) in case X1 is as follows:

I met my friend in the morning, and he said he uses his phone to manage his finances. He was excited about the opportunities and benefits of using the phone to save and invest. He said that... (Continue narration).

3.6 Data analysis

It is useful to say that MEBS is primarily a method for data collection while it is not an analysis method. Various methods - largely qualitative methods - can be utilised to analyse data collected by this method. This freedom also applies to the case of our research.

This research has been conducted in a few separate phases. Original research questions were formalised in the first phase, and right after that, a phase of data collection was followed. However, the analysis phase was started significantly later, a year after data

collection. This allowed to take some distance into research and extend research with an additional perspective.

3.6.1 First step of analysis

In the first step of the inductive approach, analysis is performed by initial data coding. The aim is to maintain the integrity of informant-centric terms and themes. Some derived from question variations of MEBS research. Central to the data-driven content analysis is that the material is reduced, and grouped according to differences and similarities. After that, subcategories and upper classes are created based on the material. Finally, these are combined into relevant concepts to build data structure (Graneheim et al., 2017).

The material analysis begins with a careful review of the material and the identification of essential expressions related to the problems and research questions of the research. In this research, we followed this general guideline and coded the research material using the open coding method (Järvinen, 2018b). Probably partly because of multiple variations of frame stories material consist of many similarities and differences. This added to the total number of stories (n=191) set some challenges to the concentration process. On the other hand, this ensured that the saturation point is reached clearly. This fact also provided possibilities to study material from different perspectives and utilise alternative lenses.

3.6.2 Second step of analysis in general

In the second step, we proceed to the actual analysis performed by utilising two different approaches. However, it was necessary to review the material carefully again before that. As the material was once reduced and grouped in the first step analysis, it was possible to utilise this understanding and knowledge captured in that phase. At this time method of axial coding was implemented (Järvinen, 2018a). Because a set of upper classes and

subcategories was relatively abundant, the distilling process and re-evaluation of material were required to form solid, organised data for the following second step analysis.

The methodology presented by Gioia et al. (2013) inspires this separated two approaches of analyse process. This process allows us to maintain the original data structure and analyse the phenomenon first level surface as it appears in data. Then we can do a deeper dive and study informants' experiences from a theoretical perspective.

With this two-approach combination aim is to form an understanding concerning the impressiveness of digital tools on perspective how those were designed. However, tools usually have also unintended uses and effects on humans and society. That is why studying the subject from an alternative perspective is also essential.

3.6.3 Approach A - Utility perspective of applications

The first approach of second step, "A" is to follow original themes of MEBS data collection. This approach uses data-driven content analysis on a surface level to answer original research questions regarding the use and aim of application (e.g., RQ2: "What are the opportunities and / or benefits of using the Internet and digital tools to manage your finances?").

Themes were formed so that upper classes were reflecting four theme variations of original frame stories. The analysis might not need to follow the data collection format, but here it seemed practical. Then this made it possible to form relevant subcategories reflecting actual real-life scenarios. Approach A is primarily interested how these tools are working and succeed in achieving the objectives set out in the application definition.

Approach A is expected to help find an answer to research question 1: "How do mobile PFM applications affect individuals financial management from a practical utility

perspective?". This approach should also support finding evidence for research questions 2 and 4; precise answers cannot be found based on this empirical evidence.

3.6.4 Approach B - Contextual dimensions of digital emancipation

The second approach "B" is to analyse material from a different theory which provides an additional lens to view this subject. The chosen theory is the dichotomy of emancipation and oppression in information systems. The aim here is to deepen the examination of the original research questions and to examine the issue from a sociological perspective. The goal of this approach is to understand better how these digital tools and applications affect the human itself and its well-being.

Themes for approach B are formed based on Polyviou et al. integrated theoretical framework, which includes three different perspectives to define the concept of phenomena: personal, social, work (Polyviou et al., 2021). Our study utilises an adapted version of this model to provide an alternative lens for analysis. The original model is adapted in this study by replacing the perspective of work with a financial perspective.

The utilisation of information systems has multidimensional effects that can contradict the overall human emancipation. In the original study, there was interest in a tensions conflict in which one IS phenomenon may have a positive emancipation effect in one or two dimensions. In contrast, the same phenomenon may negatively affect the third dimension.

This study hypothesises that personal finance plays an equally crucial everyday role here as work. It is detached from the personal or social dimension but has a strong connection. IS phenomena are rarely confined to one dimension but while affect many dimensions. It is reasonably possible to transfer and adapt the model on this basis.

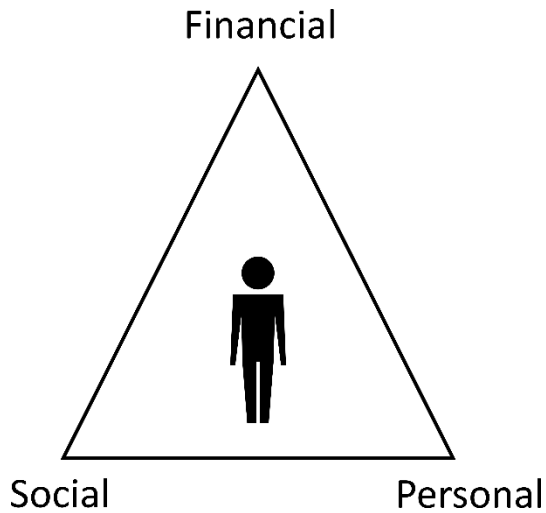


Figure 1 - Contextual dimensions of digital emancipation (adaptation of model presented by Polyviou et al. (2021))

This adapted model aims to study how these tools affect human behaviour and personal, social or financial well-being by oppressing or emancipating a person in these contexts. When the earlier chapter focused on reporting findings from an application utility perspective, here the aim is to see the effect on a person in a larger context. It is interesting question if person can find a balance between tensions of positive and negative emancipation in middle of different contexts.

3.6.5 Approach B - Component of Emancipation

Emancipation and oppression is a complex and diverse phenomena in general and in the context of Information Systems (IS). It includes many different elements, and it is hard to use as a theoretical lens if it is not limited or organised. This study contributes to the components of emancipation found by A. Young et al. (2021). In this organised way, we can analyse emancipation and oppression from different perspectives and dismantle it into components. This concept is presented in literature review section 2.5.

4 Results

The following section presents the findings of the study. First, the findings of the empirical research responses are reviewed. The answers are, therefore, short stories generated by the MEBS method. In this method, the stories are a continuation of the frame narratives. Variation of setups is an essential element of this method. Method and different frame story variations are explained more comprehensively in the Methods section of this report.

However, respondents are allowed to develop the report themselves, with the free frame report only being the starting point for their report. Thus, responses can develop freely in different directions, and it is also possible that not every respondent continues the narrative as expected. Indeed, the actual theme and perspective of a story written by the respondent may differ from what was expected.

The results section covers two different approaches. Approach A is based on data-derived observations. This approach covers results that report findings primarily on the use of applications. The interpretive part of Approach A for perceived economic well-being is included in the Discussion section instead of results. Approach B reports results of interpretive observations made through the lens of emancipation and oppression theoretical framework.

4.1 About received results in general

In some cases, respondents' stories are primarily focused on building a story from a concrete utility perspective. These stories describe the usefulness and possibilities of applications but also the possible limitations of these digital tools. These kinds of findings are mainly easy to observe as they arise from stories with direct expressions.

Stories with negative settings seem to have more diversity outside of purely technical and utility aspects. In pessimistic visions, human behaviour has a more significant role in the outcomes of using a digital tool. These kinds of results can also be found from indirect expressions and between lines.

4.2 The usefulness of applications (Approach A)

This part of the report approaches results from a perspective that directly relates personal finance management with mobile phones and mobile applications. As frame stories used openly four themes as one variable element, It is not surprising that we can recognise these same themes or purposes of applications from respondents' stories. It would be interesting to know if all of these themes would appear the same way in stories if frame stories have not directed respondents towards these themes. Alternatively, would some other themes outside of these appear more significantly in stories?

Despite instructions, actual stories were not strictly limited to frame stories, themes or attitude settings. Most stories focused on an instructed theme, but many stories also included one or more other themes. Some stories answered a question from another view about what can be connected to another theme of possible variations. However, respondents were not informed from other variations, so using another theme can be more coincidental than intentional.

Few stories are not much answering strictly speaking to asked elements of frame stories but are offering another insight of usefulness of applications. Applications may be designed primarily to another purpose but can also have effect to personal finances:

168 : He was particularly excited about the section designed to help treat some addictions affecting their own finances. My friend has been smoking tobacco for six years and is now using the app to get rid of it. He marks in the app how much he has saved every day on the day he hasn't bought tobacco. The application reports how much total savings have been generated over the entire period. The app praises its user for sound financial management and encourages them to get rid of addictions.

4.2.1 Saving and investing

Some MEBS stories do not include reference to the asked theme, but on the contrary, some stories include other relevant themes. For the saving and investing theme, 15 of 18 stories with positive attitude variation included reference to the required theme. In negative attitude story variation, the corresponding figure is 24 of 27. Is it noteworthy that in this story theme, another comparison group has a significantly larger quantity of responses than another. However, this is not a very relevant problem in the context of qualitative research methodology.

There were identified 11 different stories which included saving and investing themes even those stories were expected to focus on another theme. This research can also recognise these stories to study if they offer any additional information to stories written in the requested context. Even these stories are not produced in the same process; it is possible to form one control group from these various stories. Other stories relate following variations: Budgetting-Optimistic, Budgetting-Pessimistic, Consumption-Optimistic, Consumption-Pessimistic, Lending-Optimistic.

Answers cover a quite large variety of saving and investing related services. These serves can be divided into two categories in the perspective of mobile digital tools, which were essentially in the centre of this study and part of frame stories:

1. Services that are made possible by mobile digital tools or at least services nature relates features of these tools
2. Services that can be used by mobile digital tools but not necessarily require those and service do not gain essential benefit from those tools

Usage scenarios

This report discusses more behaviour related findings in section 4.3 (“Emancipating and oppressing effects of applications (Approach B)”). In general, we can see from responses that these digital tools can be used very actively as part of everyday life. At the same time, it is also possible to use these applications relatively passive manner. A typical

passive usage scenario respondent tells it is when a person has a monthly agreement with a bank. In that case, only activities related applications are to monitor the development of return on investment.

17 : He invests the remaining amount every month through Nordea [bank] in a low-risk fund with a monthly savings agreement. He hardly actively monitors his investments, as he has many years of the investment horizon. However, he showed how he could track his investments from Nordea's mobile application if he wanted to.

These kinds of stories appeared in both positive and negative attitude variations of stories. In positive versions emphasis is on responsible long investment horizon when negative versions have criticism over moderate yield and annual management fees.

Purpose: monitoring investment and markets

According to these stories related to saving and investing, an essential usage possibility of application is monitoring investment and markets. Possibilities to use applications to monitor own investments value development and generally to monitor investment markets are closely connected in several stories. In positive attitude variations perspective of a target is usually to be informed when in negative attitude variations of stories, information more usually leads into some actions or information has unwanted side effects:

16 : My friend also mentioned that if you're interested in investing, there are a variety of apps that allow you to track stock prices and see your investments at the touch of a few buttons.

122 : He said that he is actively following the stock trading on the stock exchange from his phone, because the information is always available there. As a result, he had begun to make hasty decisions about his investments depending on the exchange rate fluctuations of the day.

Referring to these stories, the utility of these applications is not possibly optimal. Availability of real-time information can be useful and possible increase retention to service. This information also motivates users to invest, generally positive for long-term saving. On the other hand for some user availability of the information causes compulsory need to react by selling or buying investment products also with a short perspective.

Purpose: Buying and selling investment instruments

Another purpose that is repeated in stories is functionality to buy and sell investment instruments such as stock shares or shares in mutual funds. In both variations of this theme, stories describe the positive characteristic of applications how buying and selling can be done regardless of place and time. Pessimistic variations highlight the threat of impulsive decisions and bad investment decisions. Some optimistic stories are seeing the availability of real-time data as a chance to seize an opportunity. However, most of the optimistic stories avoid describing possibilities very in detail.

144: Utilising the phone has brought the average investor towards a new 24/7 society. Whether to sell or buy a stock or derivative in less than a minute, regardless of location, which is not an overall positive thing for an impulsive person like him. The development of one's own investments must also be monitored far too often, which leads to hasty decisions, as well as exposing him to lobbying for expensive funds offered by a financial institution.

12: He had started investing through Nordnet and is able to follow the stock market simply via his phone. He can quickly invest, for example, in funds and stocks wherever he is.

Social media

References to social media and different online communities seem to be appearing in both story variations. Advice from other persons can help an inexperienced person to start investing. People can share good insight in social media communities, but sometimes it is not easy to evaluate correct information.

143: However, I encouraged him by advising him to search the internet for investment advice and to join investment groups or other forums on Facebook, for example, where other more experienced investors will help him and share his own advice and experiences about the investment world.

126 : One day, a friend told me that he got investment tips on a social media twitter related to a share. Without much discretion, he bought it because the rise was

almost inevitable, according to the man. However, the price fell, and the investment was unprofitable.

However, narratives on investing on social media may tell positive biased success stories and highlight the ease of prosperity, forgetting possible risks.

I19: Trading a stock seems like an exciting option, even though my friend doesn't have enough knowledge to do so. He has seen in social media comments how others make easy money, but at the same time he is aware of the risks of trading. He said trading quickly turns into gambling without enough knowledge, time, and concentration.

Partners and products

Most common investment products are presented in both variations roughly equally. However, references to partners whose services and apps are used have some differences. Generally, banks are favoured more in optimistic variations of stories, but there are also references in pessimistic variation. However, on those pessimistic variations criticism is mostly targeted towards some other element but bank as institution. Target may be for example general cyber security.

I45: ...is concerned about the security of the phone and the user information it collects. Storing his own consumption data on the device, which is constantly connected to the network, was, in his opinion, a distressing idea. For example, he likes Osuuspankki's easy mobile application, which initially made him interested in investing.

Well-established other investment services receive equal mention in both variations. Cryptocurrencies are mentioned only in one critically oriented story. Based on these results, it can be stated that the new technology has not substantially revolutionised what a person chooses as a partner in savings and investment services.

Responses from other frame stories including saving and investing as actual theme

Stories written in connection with other frame stories are not significantly different from those written with the instructed frame story. One noteworthy type is the stories that related to the themes of the two different frame stories. In the stories written in the

consumption frame stories, micro-saving was mentioned as one possible saving product. These work so that a small purchase of investment instruments is made based on, for example, the relative share of the total amount of purchases made in the store.

The stories related to the borrowing frame narratives did not directly introduce new services. However, a link was made between saving and investing services while taking on debt to leverage investments.

Table 6 summarises the various observations made in the coding phase in numerical terms on the theme of Saving and investing. Unlike the previous interpretive section, these numbers also include occurrences in other frame narratives. This illustrates the significance of the finding in the entire data.

Table 6. Different subthemes and other findings in theme of Saving and investing

Theme	Subthemes / Other Findings	Type	Appearances in No. documents
Saving and investing	Monitoring Investment and markets	Target	20
	Doing New Investments or selling old	Target	17
	Finding Investment Targets	Target	2
	Microsavings	Method	3
	Cryptocurrencies	Method	2
	Savings account	Method	3
	Investment funds	Method	7
	Securities portfolio	Method	2
	Shares	Method	6
	Investing related information from social media	Method	4
	Banks	Method	10

4.2.2 Budgeting

Purpose: planning a personal budget and controlling it

One could assume that the essential feature of budgeting tools would be budgeting. However, answers referring to budgeting apps discuss relatively little actual budgeting in detail. What is more, answers emphasise how a user can monitor the budget. In typical case answer proceeds from budgeting frame story directly into monitoring phase:

I58: He was excited about the opportunities and benefits of using the phone to plan revenue and expenses. He said it has helped in particular to understand and identify their own consumption habits, which makes it more transparent where their own earnings are shrinking each month.

Only a few answers describe features or process of budgeting like following example:

I56 : The phone was initially entered with its own monthly amount of money. Rental and other housing expenses were then deducted from the amount. It was then estimated the amount that would be spent on food and other foods on a monthly basis. Of the remaining amount, some had to be saved for possible unexpected expenses and part for amusements.

Because we cannot interview respondents again, it is impossible to know the actual reason for this. One hypothesis is that respondents have not widely used such features, but another question is how advantaged budgeting features are in applications that respondents have used in real life.

However, answers cover budget monitoring features very extensively. Answers discuss possibilities in detail and cover the limitations of application for that purpose. On the side of possibilities, various answers refer to the advantages of automatic data collection from payment transactions. Answers tell about the usefulness of categorising expense types, which is clearly the most often mentioned feature of budgeting applications.

Some answers do not justify why this information is useful, but according to some answers, this kind of categorised spending information helps people see the whole picture

of their spending. This information then enables persons to promote positive consumer behaviour in their life.

165 : He thinks this monitoring of the economy is of great benefit to him. He monitors where he is financially, how much has been spent and for what. This helps him stay in control of his own finances. Without this follow-up, he reportedly always happens that the money just dwindles from his hands unnoticed. This also allowed him to better plan his next month of spending money.

Some answers paint a very optimistic picture of holistic enhancement enabled by this expense information. According to these stories, the information eliminates some expense types and leads bidding of some vital subscriptions. In addition to this, some stories suggest that funds released from expenses can be invested, increasing the total assets and wealth of a person. The previous may be an exaggeration, but in any case, it is a clear example of the multiplier effects of applications at their best if the user makes the best use of them.

169 : He had found that its expenditure consisted mainly of small inconspicuous, and necessary expenses. He mentioned streaming services and café visits as small inconspicuous expenses, while rent, insurance and water billing were essential expenses. Realising this, my friend had kept unnecessary spending to a minimum and found it to be of great importance to his own finances. He had saved a few hundred euros a month at best, which he had decided to invest in funds and stocks. The investments generated additional income for him, so the monthly amount would be even higher if his savings and investment returns were added together. He sees from his phone by category what his expenses are made up of. This has led to him bidding for his subscription, such as the electricity and cell phone subscription. In this way, his financial management has become much more sensible and productive.

There was no significant difference in mentioned application features between positive and negative variations of stories. In positive variations, there was more variation and a more extensive amount of features, but basically, both variations share the same reality. In negative variations, there appears less faith in the usefulness of applications. There also appears many concerns to general threats related to mobile phones and

applications, such as cyber security. Technical limitations as running out of battery also appear in several stories.

181: My friend also said that his phone also runs out of battery very easily, as he uses the phone for many different activities, which is why the phone often shuts down. As a result, when the phone is turned off, he forgets to record his expenses retrospectively from when the phone was closed.

Many answers included negative elements connected to another topic but the topic of the given frame story. A typical example is a reference to the negative easiness of consumption by using mobile payments.

Many stories from a negative perspective mention the limited usability of mobile applications. This criticism relates in most cases to the small screen of mobile phones or the incompleteness of data. It is not surprising that answers compare the usability of mobile applications to budgeting and financial expenses tracking done in Microsoft Excel or equivalent spreadsheet programs used in personal computers. It is not unusual that answers refer to desktop software characteristics missing in these mobile applications. However, many answers are also contrasting applications to the pen and paper system, which may be seen as a surprising substitute in this context.

185: My friend mentioned a small screen as a challenge in managing the economy using only the phone. Working a large file on your phone screen is not always the easiest task. On paper, things would be more precise. However, my friend appreciates that it is easy to keep the phone with you at all times. It's easy to make additions to the plan in application as in contrast that you had to dig the notebook out of the backpack.

Table 7 summarises the various observations made in the coding phase in numerical terms on the theme of budgeting. Unlike the previous interpretive section, these numbers also include occurrences in other frame narratives. This illustrates the significance of the finding in the entire data.

Table 7. Different subthemes and other findings in theme of Budgeting.

Theme	Subthemes / Other Findings	Type	Appearances in No. documents
Budgeting	Information from types of expenses	Target	38
	Forecasting and active analysis of spending	Target	5
	Budget planning and compliance	Target	3
	Automation of data collection	Method	3
	Manual data collection	Method	3
	Comparison with pen and paper	Other	8

4.2.3 Consumption and other perspective related daily use of money

The actual MEBS frame story asks respondents to write a story about how phone applications relate to "daily use of money". This setting is a more or less ambiguous expression and leaves some flexibility to the respondent. In this analysis, the theme is handled as a flexible frame of consumption as most of the answers have that focus.

Most respondents write stories that include elements of consumption, money transaction, or tracking expenses. Shopping offers, discounts or loyalty programs are also nearly connected to these. Features of tracking expenses and relation to budgeting features appear in this theme equally clearly as in stories written in a variation of budgeting themes.

Mobile applications are relevant instruments of payment for these responders. This use appears equally in both positive and negative frame story variations. Utilising different mobile payment applications makes payment transactions more accessible and liberates a person having payment cards or cash with him. This easiness can be seen as a threat or an opportunity depending on perspective.

Some answers are comparing mobile payments, card payments and cash payments in close relation and equal methods. Compared to studies on payment methods, this gives

a slightly peculiar picture of payment methods. In general, however, the role of physical cash as a payment method has declined decisively (de Best, 2022; Finassiala Ry, 2021). Still, some answers are raising the issue of losing the sense of monetary value when turning own consumption from cash to mobile payments.

I107: The Apple Pay feature of the phone has revolutionised his shopping both online and in physical stores. The payment transaction is quick and easy with just one face recognition. He recounted how this ease has dramatically improved his shopping experience by not carrying a wallet and having a hassle with coins at checkout. However, he pointed out that sometimes he doesn't always realise how much money he's actually spending on his phone because physical money doesn't change hands.

Add hand, when interpreting the answers, it should be remembered that the payment of the mobile payment application is typically made by attaching either a debit or credit card. Of these, digitally separated digital payment instruments such as cryptocurrency were hardly mentioned in the responses.

Managing bank accounts, making transactions between accounts, or paying invoices can also be understood as essential elements of "daily use of money". Various MEBS answers refer shortly to the basic functionalities of bank applications. However, the stories generally look at this issue quite superficially and concisely. It seems like that there is no findings of significant criticism or threats but neither bright new ideas. However, generally, tone is positive and a typical narrative tells how these applications enhance management of the overall situation.

I103: Having an online bank is on the phone, he stays better on the map about the status of his accounts. He can see possible e-invoices, the salary statement, the amount of the student loan, and the account balance.

Table 8 summarises the various observations made in the coding phase in numerical terms on the theme of daily use of money. Unlike the previous interpretive section, these numbers also include occurrences in other frame narratives. This illustrates the significance of the finding in the entire data.

Table 8. Different subthemes and other findings in theme of Consumption and other perspectives related daily use of money.

Theme	Subthemes / Other Findings	Type	Appearances in No. documents
Daily use of money	Retail Payments	Target	19
	Tracking (types of) Expenses	Target	16
	Shopping Offers and Discounts	Target	15
	Invoice Payment	Target	11
	Investing	Target	5
	P2P money transfer	Method	5
	Product or Service Price Comparing	Method	2
	Cash vs Digital juxtaposition	Discussion	6

4.2.4 Borrowing and lending

The question presented in Finnish allows the respondent to understand the frame story and develop his story in two ways. It is possible to understand story context as borrowing money "with the intention of returning the same plus interest". It is also possible to understand this in the context of lending out money "for temporary use on condition of repayment" (*Merriam Webster Dictionary, 2022*) Because of this reason, also answer stories cover both sides of temporary money transfers, receiving and giving.

In the perspective of lending, answers identify three to four different types of loan products. Related into respondents situation of life, students loans are emphasised in answers over other bank loans even both have several references. However, these products still have significantly fewer references and shorter stories as two other types of loans:

- a) Instant Credit / Instant Loans
- b) Loan agreements between two individuals i.e. P2P lending and loans.

According to answers, well-established loan products such as student loans and other bank loans do not benefit or suffer significantly from mobile applications. Digital tools may enhance customer experience and speed up the process, but the result is the same, applying for a loan with a mobile application or the traditional way.

However, according to answers, the availability of applications and ease of use may promote using such products as instant loans. According to answers, a person typically applies for an instant loan after a brief consideration without careful consideration of necessity and the cost and other terms of the loan.

I139 : Getting various loans and quick credits have been made even too easy in the digital age. Many young people drift into taking instant loans because they feel they need money fast. Without knowledge and understanding of the terms and consequences of these readily available "loans," you can, in the worst-case scenario, lose your credit history, making life difficult for a long time to come.

According to answers, borrowing money from a friend or lending for another is common and practical. Many stories describe easiness and low threshold. As applications record all transactions, persons can be more confident in repayment. Most stories describe this as a useful and informal activity.

I163: Money can also be quickly borrowed from friends using dedicated apps like Mobile Pay or Pivo. Borrowing money from a friend is more familiar as well as more informal. You can get the money back to your own account quickly and easily, and it's just as quick to pay it back.

Some stories show a possibility that a person can do a small business and take advantage of others need for a quick loan. Both scenarios have been possible without these applications even using hard cash, but digitalisation and mobility take usability way further.

I159: Matti talked about his new enthusiasm, lending money to other people. Matti had invented that the phone is an easy and fast way to lend money to friends with Pivo apps and other phone applications. It is also easy to sign up for these loans, so friends do not forget to have borrowed money after foggy evenings. Matti said

how easy it was to include information of interest and send messages to remind the debtor that now would be a good time to repay his money.

A few stories refer to commercial P2P lending/borrowing services that utilise digitalisation. These services are not commercial substitutes for informal P2P transactions between friends, as crowdfunding typically focuses on more significant amounts, not small, quick loans. However, what is interesting, is how these services enable application users to become a kind of risk investor.

I158: He also said there are services like Fellow Finance where you can lend high-interest rates money to other people. He said he has his own risks here but can choose the riskiness of his loans and thus avoid credit losses. He said that this peer-to-peer market has risen in recent years and with little risk of getting a reasonable return. For example, the amount to be borrowed can be minimal, which means that there is no significant risk to your own finances if the loan is not repaid as agreed.

Table 9 summarises the various observations made in the coding phase in numerical terms on the theme of borrowing and lending. Unlike the previous interpretive section, these numbers also include occurrences in other frame narratives. This illustrates the significance of the finding in the entire data.

Table 9. Different subthemes and other findings in theme of Borrowing and lending.

Theme	Subthemes / Other Findings	Type	Appearances in No. documents
Borrowing and lending	P2P (informal and formal)	Method	22
	Borrowing - Bank Loan	Method	13
	Instant Credit	Method	30
	Student Loan	Method	7

4.2.5 Summary of results for utility themes

This part of the study aimed to determine how users use applications and how applications affect users. Thus, the perspective in the impact analysis here was to determine

the achievement of the visible economic objectives of the applications. It was also of interest to find out whether users use the applications as designed or whether users have found other surprising uses for the applications. The study results also highlighted to some extent the information that helps to answer the second part of this research question, ie the impact on the perceived financial well-being of the user. However, these results are described in the discussion section of the work.

In general, the results can be considered a reliable and representative sample when looking at the use patterns of mobile applications in the personal finances of young university students. With some reservations, the study results can also be generalized to people living at approximately the same stage of life. This means beginning independence of a person but still a carefree stage of life to some extent. Although the narratives are some caricatures, they can be seen in the overview to describe this target group of the study.

The study suggests that the target group finds apps affecting current finances more relevant than those impacting future financial scenarios. Despite certain areas needing improvement, services are generally beneficial. Users achieve their intended goals with these applications, with budgeting and planning tools particularly enhancing perceived financial well-being.

The life situation is reflected in the answers

The general homogeneity of the respondents is also reflected in the results, and the saturation is clearly met. A few essential uses emerge when looking at the results through the opportunities and problems of using the services. There are very outliers. In general, apps are being used as designed - exciting alternative ways do not emerge from the stories.

The life situation of the respondents influences how the applications are used. Although students are now increasingly working alongside their studies, these first-year students

who responded do not do so extensively at this stage. The answers show the scarcity of available funds but, at the same time, pressures of consumption. The characters in the stories would seem to live in one-person households - enjoying freedom alone and bearing responsibility alone.

The stories show which uses of applications the respondents are most or least experienced. This level of experience can be seen in the diversity of narratives, although existing services also significantly impact this. For example, the narratives in the theme of saving and investing describe the uses quite narrowly. The independence of time and place is mentioned as an essential issue - beyond the content of the service. Monitoring the market and one's investments emerges as the primary use. The ability to buy and sell investments is also essential. However, the answers show the ambiguity of the long-term goals. The stories hardly describe the sources of information and the rationale on which the people in the story make their investment decisions. The role of the bank as a partner seems to be essential.

The familiarity of the services appears in the realism of the story

The life situation is also reflected in the stories that describe the borrowing. Some people in the stories have applied for a loan from a bank, yet it is often a state-guaranteed student loan. The answers describe borrowing money from various quick loan companies, whose use in stories is questioned because of the high costs. However, from the point of view of applications, the essential form of borrowing is P2P money transfers, which enable effortless informal borrowing - in the stories, both lending and obtaining a loan. The interpersonal arrangements associated with these transfers can be seen as a financial activity for which the application is not nominally intended but which the applications then make possible.

Based on the stories, the services on the theme of consumption are genuinely familiar to the respondents. This familiarity is reflected in a variety of realistic answers. Users are

present in their daily lives, e.g. payment services in retail and online shopping. Invoice payment services in online banking are also used daily. Good accessibility and data obtained from consumption habits were seen as essential benefits in the possibilities of digital services. Of course, this data, which makes it possible to monitor expenditure, is also widely mentioned in the context of budgeting. The stories also featured various promotions, discount coupons and loyalty programs. Students see Discount Coupons as a positive opportunity in their life situation, and applications make using them effortlessly.

These most mentioned services and features are relatively traditional - they have only transformed traditional consumer services into applications. The use of a standard physical debit and credit card can be replaced by entering the information into the app, while the discount coupons have transformed into apps targeted to this user base. Mobile banking often replaces the online banking traditionally used on a PC or Mac. Of the services most often mentioned in the stories, the purchase behaviour data provided to the user is the only daily service visible to the user that brings something new value and is not just a new look at the old method. Regardless of the current conservative use of applications, the stories do not reveal any particular need for which users would need improvement or a new service in the form of an application.

For the budgeting frame stories, respondents have made some effort to describe the preparation of the budget. However, in many cases, respondents have preferred to focus on issues other than budgeting and monitoring activities. From this, it can be concluded that the budgeting functions are not very familiar to the respondents. The most realistic were stories describing the possibilities for monitoring expenditure. These services are widely used among target groups, although the point of view often seems that it is interesting for the user to keep track of how they have consumed. Controlling consumption would therefore appear to be a secondary issue.

Table 10 summarises the most relevant services according to findings in the study. The table also links themes to the perspective of perceived financial well-being and its

temporal dimensions, present and future. For example, in the responses to the saving and investing theme, three different services were repeated, all of which will affect the economic well-being experienced in the future over time. Correspondingly, the services identified as the most essential in the themes of budgeting and consumption affect the current economic well-being. However, it should be noted that these services also have an indirect effect on the future. The theme of borrowing and lending identified services that have a direct impact at the present and services with a long life cycle affecting the future.

Table 10. Based on the findings of the study, the most relevant services in different themes. Linking themes to the time perspective of perceived economic well-being.

Utility and Service dimensions		Perceived Financial Well-Being	
Theme	Service	Current	Future
Saving and investing	Monitoring Investment and markets		
	Buying and Selling Investments		x
	Investing related information		
Budgeting	Information from types of expenses	x	
	Forecasting and active analysis		
Consumption	Retail Payments		
	Invoice Payments		
	Tracking (types of) Expenses	x	
	Shopping Offers and Discounts		
Borrowing and Lending	P2P (informal and formal)		
	Bank Loan		
	Instant Credit	x	x
	Student Loan		

4.3 Emancipating and oppressing effects of applications (Approach B)

This research follows the qualitative methodology. It is not relevant to measure material with quantitative methods. However, some tabulation and computer-aided connection analysis is utilised to perceive connections and closeness of themes.

Tables 11 present how many different stories coded themes occur together. Themes may appear in different paragraphs where the context might be slightly different, but proximity is evident.

In the integrated theoretical framework of digital emancipation, Polyviou et al. (2021) use three perspectives (work, social, and personal). In our analysis model is adapted so that a financial perspective replaces work. In this analysis process, perspectives are reflected from positive and negative viewpoints; even one perspective includes both viewpoints integrated.

Table 11. Summary of appearances. Impact & Context of emancipation, themes, appearances in No. documents.

Context & Impact	Theme	Appearances in No. documents
Financial - Positive	Cost savings with offers	10
	Enhanced Management	39
	Enhanced money transactions	53
	Enhanced Saving and Investing	24
	Improved Budgetting and Consumption habit	55
	Positive Lending Opportunities	9
Financial - Negative	Bad Consumption Decisions	22
	Bad Investment Decisions	13
	Credit Risks (of P2P credit)	4
	Difficulty understanding value of digital money	11
	Excessive Ease of Money Transfers	26
	Loss of Overview and Control	8
	Negative side of Lending - Run into Debts	30
	Outcome: Financial Difficulties	12
Social - Positive	Enhancing Communication	5
	Shared Experiences	6
	Sharing Economy	1
Social - Negative	Limiting Human Interaction	3
	Stress of Social Medial	2
Personal - Positive	Speed and Ease	51
	Freedom of Time and Place	18
	Behaviour Change Supported by IS	1
	Personalised customer experience	1
Personal - Negative	Technical dependency	25
	Stress of User Error	10
	Stress of Safety and Security	73
	Behaviour Change - Controlled by IS	7
	Digital distraction	4
	Stress of Excessive Information	9
	Stress of Lack of Competence	13
	Stress of Privacy	18
Surveillance and monitoring	8	
Across Contexts - Positive		0
Across Contexts - Negative	Apps Management	6
	Cost of applications	5
	Technical Limitations	25

4.3.1 In the personal context

Themes identified from research material in the personal context focused on negative perspectives, at least in the perspective of variation. A few clear positive perspectives appeared broadly in the material, but significantly more variation on the opposing perspective. The following section reviews the relevant themes in this context.

Ease and speed of use

According to this research material, probably the most common source of positive but also negative emancipation is easiness. It is not very surprising that we can recognise positive emancipation related easiness. Many applications are designed so that they aim to make users life easier in the context of application purposes. Easiness itself is neutral in the perspective of emancipation. However, if easiness enables persons to do things that have not been done if the task is too hard, that easiness is emancipating. This relates to the definition of emancipation by Polyviou et al.:" it also assumes empowerment to do things and implies the users willingness to reach a better state or status" (2021, p. 166). From the perspective of components of emancipation (A. Young et al., 2021), this relates to agency and promotes the freedom to act.

In some stories, personal emancipation related easiness can be understood as better productivity. A person would probably do the task even without this tool, but the person needs to consume less time, and the work outcome is still probably better. In the case of these PFM tools, this will mean , i.e. causing positive emancipation in a personal but also in a financial context. In the original framework of indicative impact of digital emancipation, Polyviou et al. (2021) set productivity into work context, but in adaption of current research, productivity fits well as a positive impact in a financial context. Theme of Speed and Ease can be found in different purposes of applications that increase productivity and emancipate individuals.

I17: According to my friend, it is also easy to check your own financial situation via the phone and mobile banking, and it only takes a minute or two. For example, it is also easy to check the daily share prices if you are interested in investing.

As following example, themes of Speed and Ease and Improved Budgetting and Consumption habit are also often encountered in the same story.

158: My friend was particularly pleased that using the phone to plan income and expenses is so effortless because the phone is convenient to carry with you daily anyway, and creating a budget isn't too time-consuming or challenging.

Negative variations of stories have a more critical view into speed and ease of applications. However, in many stories, one actor may be weak and lack self-control. According to that kind of narrative, applications are too easy for such a person but does not necessarily mean a defective application.

1164: My friend said his brother doesn't understand the responsibility involved in borrowing money. When you run out of money, a new amount is just a few clicks away. If it were more difficult to get a loan and would have to deal with a bank, it would be much less likely for many young people to go into debt. My friend told me that a phone is a great tool for managing his own finances, but for some, this ease is downright a curse.

It is difficult to blame digital tools for this kind of self-harming behaviour. Thus, it does not seem right to say that excessive ease would be an example of oppression in the personal dimension. Freedom to act (Concept of agency as A. Young et al. (2021) defined) realises without restrictions. Actually, it could be questioned if some tools offer too much emancipation in concept of agency when a person can repeatedly make unfavourable choices.

The case of the theme of Speed and Ease demonstrates that diverging impacts of digital emancipation are not limited tensions between dimensions (i.e. not only personal vs social vs financial), but there can be mixed tensions in one context. Freedom of Time and Place has a strong association on parallel impact with Speed and Ease in a personal context. However, in a personal context, Stress of Safety and Security also has a strong association with Speed and Ease but on diverging impact. Table 12 shows a summary of these tensions.

Thus, it is not easy to say how mixed impacts should be evaluated even on the same context. The research method applied in this study does not enable evaluating the significance of positive or negative emancipation impacts. For a single case, as in the following example, analysing the length of the description on the effect may give some direction of each effect significance.

164: For example, paying payments and tracking investments made through the bank can also be conveniently done by phone. In addition to banking applications, there are also applications like Pivo that do not allow you to manage your own bank directly, but it is easy to keep track of daily consumption, in addition to which it also estimates future spending based on past consumption. The phone is a great tool, as it is a small device that usually comes with you when you go somewhere anyway. Anyway, nowadays the phone can handle almost everything on the computer, because it also has access to the Internet. There are numerous applications for managing your finances and they are sure to be developed more and better all the time. However, he reminded that the phone should also be used with caution, as their security is often less than that of various computer applications.

Table 12. Tensions. Different context and found other themes vs. theme of Speed and Ease.

Personal - Speed and Ease [proximity n-pcs]	
Context / Impact	Impact of Digital Emancipation - Effects
Personal - Positive	Freedom of Time and Place [13]
Personal - Negative	Stress of Safety and Security [14] Technical dependency [4] Stress of Excessive Information [3] Stress of Privacy [3] Stress of User Error [2] Stress of Lack of Competence [2] Behaviour Change - Controlled by IS [2]
Financial - Positive	Improved Budgetting and Consumption habit [18] Productivity - Enhancing personal financial management [17] Enhanced money transactions [15] Enhanced Saving and Investing [9] Positive Lending Opportunities [4] Cost savings with offers [2]
Financial - Negative	Negative side of Lending - Run into Debts [5] Excessive Ease of Money Transfers [4] Bad Investment Decisions [4] Bad Consumption Decisions [2] Loss of Overview and Control [2]
Social - Positive	Enhancing Communication [2] Shared Experiences [2]
Social - Negative	Limiting Human Interaction [2]
Across Contexts - Positive	
Across Contexts - Negative	

Freedom of time and place – tensions with other IS phenomenon and contexts

According Polyviou et al. (2021) Liberating a person free from time and place is an essential part of the concept of digital emancipation. This feature is also well found in the stories of this study. It appears in both positive and negative variations of stories and all theme variations. In particular, these responses were relatively most common among responses for budgeting themed frame stories. The reason what makes this freedom of place and time possible is that mobile phones are always with the person wherever he is. Also, services that applications offer are always available, or limitations are rare.

Many stories that reference freedom of time and place compare user experience with cases when services are accessed from a computer. In that kind of narrative, a person experiences freedom, and the quality of service is comparable to a computer traditionally used for these purposes. In that sense, emancipation through freedom of time and place is most obvious in not natively mobile services.

Freedom from time and clearly positively emancipating in personal context. It also has positive emancipating tensions into other contexts. In the same way as easiness, freedom from time and place has positively emancipated tension relating to productivity in the financial context. Table 12 shows a summary of these tensions.

However, according to research material, this may also cause opposing emancipation, i.e. oppression in personal context because of for example stress of excessive information or stress of safety and security / IS phenomenons.

177: On the other hand, my friend praised the phone because it always goes with it and provides real-time information on expenses and income and the current bank account balance. This information makes it easy to plan and control your daily shopping behaviour. Sure, all of this, keeping in mind that following the figures can be stressful.

Freedom of Time and Place makes services more accessible, which relates to the emancipation concept of inclusion. Nevertheless, many services could be used even without this freedom. However, making service independent from time and place makes services more accessible and activates a more extensive user base. In this case, this can realise as positive emancipation on personal context as agency and inclusion but also emancipation on financial context, improving person budgeting and consumption habit.

155: In addition to budgeting in applications, the application will allow the beginning of the month to prepare a budget for mandatory spending and entertainment. The apps' clear and colourful graphics make them meaningful to use and even addictive when challenging yourself high. The phone regularly travels with everyone and is always at hand. The situation of your budget is quick to look directly at the screen, and it no longer happens that the account is empty when you check out the

store. With applications, managing your finances has become part of everyday life and budgeting no longer sounds boring or feels tedious.

Table 13. Tensions. Different context and found other themes vs. theme of Freedom of time and place.

Personal - Freedom of Time and Place [proximity n-pcs]	
Context / Perspective	Impact of Digital Emancipation - Effects
Personal - Positive	Speed and Ease [13]
Personal - Negative	Stress of Safety and Security [5] Stress of User Error [2] Stress of Excessive Information [2] Stress of Privacy [2]
Financial - Positive	Improved Budgetting and Consumption habit [7] Enhanced money transactions [6] Enhanced Management [6] Enhanced Saving and Investing [5]
Financial - Negative	Loss of Overview and Control [2]
Social - Positive	
Social - Negative	
Across Contexts - Positive	
Across Contexts - Negative	Technical Limitations [2]

Stress of Safety and Security

Ease or being free from time and place are such benefits that they inevitably have to come with some price - the risk of giving up something to enjoy these benefits. Many answers included anxiety about cyber security. These concerns are connected also many other themes of emancipation but in the context of sensation of these freedoms, it is a paradoxical cost.

I20: He fears security risks or the loss of his data. He realises that there are many online scams and password thieves who could gain access to his information. Because of this, he should always be guarded and think about what data networks he is using.

Stress of Safety and Security is closely related to Stress of Privacy, which is slightly the same kind of impact oppressing individuals on personal context. These negative impacts are connected to positive emancipation in the financial context but do not explicitly focus on any.

Table 14. Tensions. Different context and found other themes vs. Stress of Safety and Security.

Personal - Stress of Safety and Security [proximity n-pcs]	
Context / Perspective	Impact of Digital Emancipation - Effects
Personal - Positive	Speed and Ease [14] Freedom of Time and Place [5]
Personal - Negative	Technical dependency [17] Stress of User Error [7] Behaviour Change - Controlled by IS [3] Digital distraction [2] Stress of Excessive Information [5] Stress of Lack of Competence [6] Stress of Privacy [14] Surveillance and monitoring [5]
Financial - Positive	Improved Budgetting and Consumption habit [7] Enhanced money transactions [6] Enhanced Management [6] Enhanced Saving and Investing [5]
Financial - Negative	Loss of Overview and Control [2]
Social - Positive	
Social - Negative	
Across Contexts - Positive	
Across Contexts - Negative	Apps Management [3] Cost of applications [4] Technical Limitations [12]

Stress of Privacy, Surveillance and Monitoring

According to this research material, the stress of privacy is a negative feeling what is experienced close to the stress of cyber security. In material, there appears are at least two types of privacy concerns:

- 1) What if someone (a person) can access information and see what they have done
- 2) How information is collected and used, for example, for marketing purposes.

190: In addition to the above, my friend was concerned about the security risks of phones and related applications, as spending money and various entries related to financial management are personal matters. She also wondered how much the administrators of the different applications collect information about the entries he entered.

I95: In addition, he wondered about the security of third-party applications and whether to sell his plans to advertisers, for example.

In the data classification process, the stress of privacy was separated from the stress of surveillance and monitoring. The motivation was to study the possible experience of surveillance as in the meaning of monitoring behaviour and activities. However, In the end, there were few indications separate from the context of privacy, and there is not enough material to interpret the results.

Technical dependency

Some impacts can be seen as technically oriented, where IS is visible as an artefact or a phenomenon. Technical dependency is oppressing impact what brings mobile phones as technical artefacts visible. Many answers include a narrative of misplacing phones, which may cause problems managing personal finance or threat security. The answers show how the idea of such an event is oppressive.

I31: He was also anxious by the thought of if his phone were lost or stolen and how much essential and vulnerable information the phone would contain. Valuable investments could be lost instantly, and all this could be done at the touch of a button.

Similarly, possible technical issues may make the dependency on the device visible in a new way.

I115: However, I feel that it is not too much to rely on technology, but it is also good to keep a small amount of cash with you. This is, for example, due to possible service outages or other similar technological disruptions when using the telephone for financial management purposes.

Stress of User Error

IS helps users to do specific tasks but also requires users to follow rules and processes. If the user fails to act as needed, it may cause IS artefact operating undesirable way. The study recognizes this type of anxiety, which is also related to perceived ease and speed of use as well as safety and security tensions.

I191: While chatting, a friend made me a mobile bank transfer and just stated how easy it is to transfer money today. I didn't pay more attention to what happened. When I got home, I checked my account balance and was surprised why I was 1,000 € richer. I was browsing through the history of events, and, oddly enough, my friend had added two zeros to his payment.

Stress of Lack of Competence

In research, there was possible to identify oppressing stress for two different types of lack of competence. One reason is incompetence using IS artefacts, mobile applications. However, a concern of competence in financial knowledge can also be a significant issue, and it is a separate issue from lack of technical expertise.

I131: He also found several e-invoices distressing. He has received all invoices with the mail in the past and has experienced it as simple. Now he is worried about the new e-invoices. When he doesn't get a concrete bill, he's afraid some invoices will go past him. He suspects that there will incur additional costs in handling his finances online by telephone.

I167: Younger and younger people have a smartphone with applications that can be used to borrow money. While we live in 2020, where young people are pioneers in the use of smartphones and the problems associated with them, not all young people may understand the long-term consequences of indebtedness and the risks involved that really exist.

Digital Distraction

Some answers are raising the issue of digital distraction. Stories are describing situations where distraction caused by mobile applications are disturbing other activities. Two different kind of variations were recognised from stories. One variation describes a situation where other applications prevent a person from utilising a mobile phone to manage personal finance.

I81: My friend also thought that while the phone makes it easy to manage your finances, the phone also acts as a distraction, as you may end up browsing through various apps, making your financial management activities completely forgotten.

Another variation concerns distraction caused by mobile phones, which disturbs the person from focusing on other vital activities.

The latter in particular, but these phenomena generally still occur relatively minor in this narrative material. In the perspective of IS emancipation, digital distraction can be seen as negative emancipation in concept of agency.

Behaviour Controlled by IS

Another example of negative emancipation on concept of agency is the narrative of behaviour control. Stories do not describe rigid behaviour control but attempt to change behaviour in various financial perspectives. Many answers describe such oppressive attempts to influence a person's consumption behaviour.

The stories describe different ways of influencing, such as conventional digital advertising, but especially personalized advertising. The narratives also highlight the idea of applications' goal of influencing investment behaviour.

142: She had also observed that the algorithm of the social media applications she used had excellently tailored the ads targeted to her, which in turn increased the temptation to buy impulsively unnecessary products.

There are concerns in the stories about the functionality of prediction based on the behavioural pattern of programs. When interpreting, a potential concern arises about a self-fulfilling prediction.

193: The use of different applications can lead to tracking, in which case your own financial information can be used, for example, for marketing, which can be a risk in managing your own finances. Applications can also pre-create a budget or estimate of future spending, depending on the past. These can be useful functions, but they involve risks if, for example, the forecast is incorrect.

Stress of Excessive Information

Availability of information can increase perceived financial and personal stress. According to various answers, an application user can develop an addiction where a person compulsively reviews the current budget situation and money available. This may not

promote or disturb achieving financial goals (current money management) but oppress them, limiting freedom of thinking.

I42: And another side effect that didn't directly detract from his investments per se, but instead from his mental health, was that nowadays, phone apps allow him to track his own stocks and funds in real-time. He talked about how he had developed perhaps even a small addiction to constantly monitor the generation of potential returns.

Summary of personal context

Table 15 summarises findings of impacts of digital emancipation in a personal context. Some impacts are related to more than one component of emancipation. The IS purpose context where this research relates reflects findings: References to concept of agency highlights over other concepts. Correspondingly, observations in the concept of Dialogue are missing entirely.

Generally speaking observations focus to agency - how IS enhance individuals perceived ability to meet personal goals. This means positive emancipation in a personal context in the concept of agency. On the other hand, observations reveal various phenomena limiting individuals freedom to act. This means opposing emancipation, i.e. oppression in a personal context in the concept of agency.

Based on evidence, variety of negative impacts are wider than positive impacts. However, applications positive impacts, such as speeding up and facilitating actions or liberating individuals from limits of time and place, appears strongly in the data. These positive effects can be interpreted to balance with the adverse effects. However, to assess the overall effects of emancipation, it is also necessary to consider the relationship of the personal context to other contexts and the impact of all contexts on the person as a whole.

Table 15. Components of emancipation, findings in the material on personal context (adaptation of model presented by Young et al. (2021)).

Relevant Concept	Component of Emancipation	Theme / Impact of Digital Emancipation
Agency	Freedom to act	<ul style="list-style-type: none"> • “Speed and Ease”. Impact: speeding up and facilitating actions. Perspectives: positive and negative • “Freedom of Time and Place”. Impact: Promote accessibility. Perspectives: Positive • “Stress of Safety and Security”, “Stress of Privacy”, “Surveillance and Monitoring”. Impact: limits a person’s ability to act. Perspectives: Negative • “Technical dependency”. Impact: limits actions and options. Perspectives: Negative • “Stress of User Error”, “Stress of Lack of Competence”. Impact: limits determination to act. Perspectives: Negative • “Digital Distraction”. Impact: limits ability to focus and prioritize actions. Perspectives: Negative • “Behaviour Controlled by IS”. Impact: influences a person’s behavior. Perspectives: Negative
Dialogue	Freedom to express	<ul style="list-style-type: none"> • [no observations in this context]
Inclusion	Freedom to belong	<ul style="list-style-type: none"> • “Freedom of Time and Place”. Impact: Promote inclusion. Perspectives: Positive
Rationality	Freedom to think	<ul style="list-style-type: none"> • “Stress of Safety and Security”, “Stress of Privacy”, “Surveillance and Monitoring”. Impact: limit a person’s ability to think. Perspectives: Negative • “Behaviour Controlled by IS”: Impact: manipulates a person’s thinking and choices: Negative • “Stress of Excessive Information”. Impact: interferes with a person’s thinking and choices: Negative

4.3.2 In the social context

From social context perspective, there was significantly less observations compared for example personal context. Nevertheless, this is no surprise. One view is how the research was built. MEBS frame stories were structured, so that the respondent story is told from

first-person view of the respondent, and there are no other additional roles but a friend of the narrator. In all variations, the story should be written so that the narrator's friend tells about his own personal experiences of using a phone to manage personal finances.

However, the paucity of responses related to the social context presumably also tells us something about the economic management applications themselves and how they are used. Based on the answers, the following assumptions could be made as an example:

- a) Personal finances are very private, and therefore there are no social aspects
- b) Applications have very few features with a social dimension
- c) The social functions of the applications are irrelevant from the point of view of personal financial management

Unfortunately, the setup of this study does not provide information to explain this. This offers opportunities for future research.

Because of a relatively low number of observations in a social context, there are no significant findings of intersections with other contexts. Intersecting impacts based on research findings are presented in Appendix 8. The following section reviews the relevant themes in this context.

Enhancing Communication

Research responses include two kind of narratives relating themes of communication. First version describes how a person has obtained information from social media and used it in the investment decision-making process. The Source of information is non-professional. Another version of the narrative illustrates how a person can communicate with professionals and get help with investment decisions or other money-related questions.

18: He also actively follows the financial debate on his phone regarding saving for investing from various sources such as Twitter, Kauppalehti, Taloussanommat,

Talouselämä and Facebook. From these, he constantly gets new investment ideas and tips for saving.

I112: Because you can get just about anything and all services on your phone, in addition to tracking your finances, you can get help and advice quickly. Getting support from professionals relieves stress and helps take your own finances in the right direction.

Shared Experiences

Responses under this theme are partly similar to previous. In this emphasis is sharing some experience. According to stories, applications can enable persons to share investment portfolios and monitor that gamified way.

I4: A friend opened my book-entry account and savings account on the site I recommended. There we have been following our own portfolios together.

Limiting Human Interaction

There is some mention in the responses of the reduced social contact caused by the applications. However, the findings are pretty limited. The most negative narratives are positioned from the perspective of the older age group. Some of the answers are declarative. Based on these findings, it seems like decreased human contact is not experienced negatively but is possibly seen as a natural aspect of the user experience of digital services.

I38: For the older generation, resistance to change on the Internet is easy to understand. After all, dealing with a computer is not the same as a personal face-to-face service. Perhaps face-to-face encounter has been an important added value for older people. My friend is annoyed by communicating with just a robot.

I151: Today, companies like Wolt have introduced MobilePay to make a payment. This allows the customer to pay easily and quickly when ordering without online banking logins or face-to-face encounters with the driver.

Stress of Social Media

Some narratives describe social media as a source of unreliable information as demonstrated earlier, and an element affecting their consuming behaviour. In fact, these mentioned social media services are not personal finance services studied here, but when

they appear in the research material, they are now mentioned as part of a broader phenomenon.

188: People on social media who seem to have a “perfect” life can also pressure their spending. This life may include a lifestyle full of beautiful trips abroad, designer clothes, lavish houses and cars. There may even be a feeling of inferiority if you do not have the same things yourself or it is not financially possible to live a similar life at the moment. It can be difficult to keep your own budget within your own limits amid all this “splendour” and temptation.

Summary of social context

Table 16 summarises findings of impacts of digital emancipation in a personal context. Some impacts are related to more than one component of emancipation. Findings occur evenly across all components of emancipation. On the other hand, the number of different discoveries is generally limited.

In general, there are findings in both positive and negative perspectives in different components. Some themes, such as enhanced communication, have various impacts. Furthermore hand, IS acts as a neutral tool or an intelligent intermediary system in many communication cases. According to this interpretation, IS does not cause emancipation in this neutral role, but individual users may cause emancipation in various contexts by their communication enhanced by IS.

At the same time, in the case of social media, IS can also have an active role. Algorithms of social media can shape visible reality and bias of discussion. According to findings in this research, perceived manipulation of user experience and influence to behaviour is seen as oppressive.

Table 16. Components of emancipation, findings in the material on social context (adaptation of model presented by Young et al. (2021)).

Relevant Concept	Component of Emancipation	Theme / Impact of Digital Emancipation
Agency	Freedom to act	<ul style="list-style-type: none"> • “Enhancing Communication. Impact: speeding up and facilitating actions. Perspectives: positive
Dialogue	Freedom to express	<ul style="list-style-type: none"> • “Limiting Human Interaction”. Impact: limiting possibility to express ideas and emotions. Perspectives: negative
Inclusion	Freedom to belong	<ul style="list-style-type: none"> • “Shared Experiences”. Impact: Promote inclusion. Perspectives: Positive • “Limiting Human Interaction”. Impact: marginalizes from social contact. Perspectives: negative
Rationality	Freedom to think	<ul style="list-style-type: none"> • “Enhancing Communication. Impact: provides information for decision making. Perspectives: positive (and negative in case of disinformation) • “Stress of Social Media”. Impact: influences a person’s behaviour. Perspectives: Negative

4.3.3 In the financial context

As the research design is related to individuals’ personal finances, it is expected that there will be plenty of findings in this context. The individual responses initially yielded a fairly wide range of different findings combined to produce a comprehensive set of phenomena. There are several different features of the positive or negative emancipation caused by IS, but many phenomena also have a strong connection to people's traits and behaviour. Indicating the source of emancipation is not unambiguous.

Table 17. Emancipation in financial context, themes produced from research data, appearances in No. documents.

Context & Impact	Theme	Appearances in No. documents
Financial - Positive	Cost savings with offers	10
	Enhanced Management	39
	Enhanced money transactions	53
	Enhanced Saving and Investing	24
	Improved Budgeting and Consumption habit	55
	Positive Lending Opportunities	9
Financial - Negative	Bad Consumption Decisions	22
	Bad Investment Decisions	13
	Credit Risks (of P2P credit)	4
	Difficulty understanding value of digital money	11
	Excessive Ease of Money Transfers	26
	Loss of Overview and Control	8
	Negative side of Lending - Run into Debts	30
	Outcome: Financial Difficulties	12

Cost savings with offers

Answers describe possibilities to save money in daily consumption by taking advantage of loyalty discounts or discounts offered to students. In these cases, mobile applications replace physical loyalty cards or student IDs. Stories also describe possibilities to receive and use discount vouchers through applications. These narratives are relatively conservative in IS perspective. The most significant added value that applications have is replacing separate physical artefacts with one physical artefact (phone) and collecting applications.

However, the general tone in these findings is very positive. Research can interpret this attitude so that these opportunities for discounts make individuals experience freedom as consumers. Concerning temptations of offers, some of the stories contain criticism of reckless consumption, while others emphasize the potential for savings in consumption. Some of the stories contain both elements.

I16: He also has customer benefit cards from various stores as an app on his phone. He can view his recent purchases and any bonuses or customer benefits he has received in the app. This is also good for saving. You know what you are buying from different stores each month and how much you make impulse purchases at a particular store. There are also financial benefits to be gained from accumulating various bonuses.

Enhanced Management, Improved Budgeting and Consumption habit

This section combines several themes. In the theme design phase, it was decided to combine the theme of improved budgeting and consumption habits. This was done because the themes were very substantially interlinked in a cause-and-effect nature. While reporting results, another theme, improved management, is reported in the same because it was seen that this also seems to be closely related to the same phenomenon.

According to answers, users can experience a sense of enhanced management because of using PFM applications. This experience relates specially to utilising applications with budgeting features. The theme also connects closely to the "Improved Budgeting and Consumption habit" theme, which was identified in the financial context of emancipation.

Some answers described the easiness of managing a budget. Generally, narratives were conscious of some energy needed for this management task, but gains were more significant than pains.

I103: I asked if all that effort was worth it; in my own ear, using all the apps and programs just sounded cumbersome and time-consuming. He replied that this is not the case at all; on the contrary, carrying apps on the phone makes everything easy and hassle-free. The stress of managing your own finances is wholly gone with them.

Enhanced management is emancipating individuals in concepts of agency and rationality. In the concept of agency, IS promotes users to control their lives financially. In the concept of rationality, IS enables users to see overviews and patterns of their finance, allowing them to think without constraints. Various answers clearly present the mitigation of

perceived stress and an increased sense of control. These effects could also be seen as emancipation in a personal context. However, in this research, these impacts are connected to financial context due source of impacts of emancipation.

I112: He feels safer when he knows where to go. Awareness of one's own finances brings a sense of control and thus relieves stress. Budgeting is easier when you can track and be aware of your own consumption behaviour. In addition, once you start tracking your own behaviour, it can be more easily addressed and can be customized if desired. In addition, learn responsibility and prioritization. Learn how to put things first and plan for the future. Money is an issue that limits everyday life and is a significant stressor. When you start mastering it early, your whole life and future become easier.

Enhanced money transactions

The theme of enhanced money transaction was recognised in many answers with different frame stories. The theme appears in 50 of the total 192 answers. Most of the findings relate to optimistic frame stories. According to findings, enhanced money transaction relates to individuals' freedom to act as consumers. In this case, IS enhances users' productivity enabling them to make payments more efficiently. With person to person (p2p) money transactions, IS enhances users' autonomy enabling them to do transactions easily between individuals and letting individuals decide the terms of the transaction. In this perspective, this theme is linked to emancipation in the concept of agency.

According to answers, enhanced money transactions between individuals benefit social consumption and social activities. Enhanced transactions mitigate power asymmetries that would appear in social situations where one person pays on behalf of another, which causes a debt relationship. In a financial context, this can be seen as emancipation in the concept of inclusion, as individuals can belong to the same group of people in a consumer context. On the other hand, this relates to inclusion in the social context when oppressive power relations appear less due to reduced long-term debt relationships between individuals.

I10: Money transfer between friends is also easy with the phone. If you even shop with friends, you don't have to start sharing your purchases from there but everyone immediately puts the money in the person's account who paid the total price.

Furthermore, some of the narratives described the possibilities of transferring and borrowing money as a new threat. Thus, facilitated opportunities to transfer money can contribute to excessive spending or borrowing money. This impact as disadvantageous behaviour can be seen as oppression in concept agency. It would also be oppression in the concept of inclusion due to the marginalisation of incurring debts.

I183: I had spent more on small purchases and other extra purchases than ever before. This could be because the payment instrument, i.e. the telephone, was present at all times and was really easy to use.

Enhanced Saving and Investing

Based on the intersection of themes found from research data, Enhanced Saving and Investing is closely connected to Improved Budgeting and Consumption [15 document relations] habit and Enhanced Management [9 document relations], which are the two most important connected themes in a financial context. In personal context, the two most critical connected themes are Speed and Ease [9 document relations] and Freedom of Time and Place [5 document relations].

Many stories positively describe possibilities of saving and investing as a long-term financial management process. This seems to relate emancipation in the concept of agency as building long-term financial management enables individuals to exert agency now and later accomplish their financial objectives. Striving for financial goals will also support inclusion. On the other hand, in the theme of consumption and budgeting, short-term money management also seems to increase the sense of empowerment and inclusion. (more examples in section 4.22 Budgeting)

This emancipation relates to financial context and is not traditionally requiring IS. However, financial applications certainly support this behaviour making using services easier to use and accessible regardless of place or time. This relation makes connections into

other emancipation themes understandable. Furthermore, some narratives take a slightly critical look at the issue, either directly or between the lines.

I125: After hearing these, my friend said to himself, "You can even manage your investments on the go with your phone." Here he is absolutely right. You'll be able to react to market changes right away, and you won't have to wait to get home to your computer. Quick inspections of investments are also quick and agile.

Positive Lending Opportunities

Some narratives describe enhanced possibilities of lending and borrowing. IS enables persons to improve chances of getting a different kind of loan or credit. It also affects borrowing in one direction from one person to another. Financing opportunities offer a solution to the lack of current assets. In general, the answers here focus on the urgent need for money. However, somewhere there is also a reference to considered long-term borrowing. Despite the time horizon, these lending possibilities can foster economic inclusion.

Answers in this research describe commonly two types of solutions: P2P lending agreements and B2C agreements. Even results of successful lending agreements and transactions ultimately promote individuals' economic inclusion, most answers highlight that IS enables a fast and easy application process. In other words, IS enhances emancipation in the concept of agency.

I87: He returned the next day after bidding for the banks and said his original bank had made the best offer. The initial loan application had also gone through, and he was relieved that everything was finally in order. After going through the loan application, he approved it through a mobile application, and the loan could be drawn down. After the experience, both of us gained confidence in using the phone to manage our own finances and will continue to use it in the future.

Bad Consumption Decisions

According to various narratives, IS enables users to make lousy consumption decisions in many ways. A wrong consumption decision is, of course, an objective view, but that is what it means here a decision that does not support the achievement of a person's short-

term financial goals. This phenomenon is oppression caused by behavioural control (in the concept of agency) but more likely affecting users' cognitions (in the concept of rationality).

According to narratives, direct or subtle actions manipulate users into consumer-friendly behaviour. This behaviour is realized by the ever-present digital tools that make it easy to buy and, if necessary, obtain a loan and credit. This behaviour is also detrimental to saving money for the future - even if it is just as easy with the same tools.

I129: Sometimes, you can make quick consumption decisions for ease of use and transfer even larger amounts without even thinking about it by simply swiping the screen. As a comparison, he thought of a situation where large series of numbers should be entered before money moves anywhere. In that case, the decision should perhaps be considered more, and some of the money could be put aside.

Bad Investment Decisions

IS enables users to access investment markets painlessly. Access gives new possibilities for new users and enhances emancipation in concepts of agency and inclusion. However, easiness also exposes users to risks of impulsive behaviour. The user may get the impression that he should react to the rapid changes in the market. The investment horizon shortens due to IS. This indirect manipulation seems like oppression in the concept of rationality. Nevertheless, it is often not the case that the effect of IS is malicious. The problem is that it does not protect the user from himself.

I27: According to him, buying and selling shares on a mobile phone is so effortless that he always considers selling even in the slightest boom, and can't wait for the right returns. When the phone is always included and ready to use, it is difficult to take a long-term investment approach.

Difficulty understanding value of digital money

Several answers highlight the problem of perceiving the amount and value of money when it is handled exclusively in digital form. Depending on the point of view, this is

some lack of feature or just a feature. Oppression is included if IS were to take particular advantage of the feature. However, there was no clear allegation of intentionality in the reports.

I183: My friend also warned that the sense of reality in the use of money was a little blurred. As all purchases and payments were made from a small screen, he found himself thinking less and less about how much money he was actually spending.

Excessive Ease of Money Transfers

The excessive ease of transferring money is linked in several responses to the themes of excessive consumption and knowing the value of money. The typical narrative is thus as follows: Excessive consumption is easy because the purchase price is not fully perceived, and the transfer of money is easy. The ease applies to both merchant payment and transfers from the savings account to the current account. Since the amount of money spent is not fully perceived, the spiral continues. According to the basic narrative of the responses, consumers and users of the application are weak and impulsive. In the responses, digital tools are not seen as oppressive in this context. However, even though IS is not in this phenomenon's main role, unintended effects are still visible. Impact and perspectives are mixed.

I132 : The phone can be used to pay in so many places today that spending money could get out of control. For example, my friend used the case where he had gone for a walk downtown and intentionally left his wallet at home so he couldn't spend the money. The phone was still found in his pocket to listen to music. While walking downtown, he got lost in the store "just to watch." Before he even realized it, he was paying for the products on his phone at the checkout. So this is a convenient feature, but according to my friend, wasting money has been made way too easy.

Negative side of Lending

The theme of lending in a negative perspective is highlighted over the other negatively themes in the financial context. There is a clear contrast to positive versions in the lending theme. Due to frame stories, both positive and negative versions should produce an

equal amount of recognizable references in their relevant themes. Based on this, it may be interpreted that possibilities of lending were more challenging to imagine than threats and negative perspectives among these informants.

Many answers are seeing a connection with lending and expected financial problems soon. A typical narrative describes a problem caused consumer taking a small loan or credit with high cost or interest. These narratives also typically include a story of impulsive behaviour. The spiral of expensive loans puts a person in financial trouble in these stories.

I172: Borrowing money today is insanely easy, and it only takes five minutes to withdraw a consumer loan. This brings absurd problems to low-educated people, especially young people who are hardly interested in economic matters. Easy money, which can be added quickly and effortlessly, leads to default entries and the loss of credit information for up to years.

The role of IS in these stories is to enable users to take loans or credit quick and easy and turn them into debtors. The problem with digital tools is that they are too attractive and efficient in the application process. Ultimately this causes oppression in the concept of inclusion, reducing economic inclusion and marginalizing users to over-indebtedness.

Summary of financial context

Table 18 summarises the impacts of digital emancipation in a financial context. Some impacts are linked to more than one component of emancipation. Observations occur in all other components of emancipation except the freedom to express.

Furthermore, the number of different phenomena alone does not directly conclude that emancipation or oppression would be more assertive in some context. Some phenomena occur more often than others. For example, the phenomenon of *Enhanced management and Budgeting* (positive emancipation) occurs in 39 different responses while the other two phenomena of oppression occur 35 times. In the qualitative method study,

the comparison of the figures is not particularly relevant, but the figures help interpret the phenomenon.

The general interpretive impression is that IS primarily increases emancipation in this context. However, oppression is also genuinely present, and it is helpful to bring it to the fore - so that the oppression can be completely eliminated, or the effects minimised.

Table 18. Components of emancipation, findings in the material on financial context (adaptation of model presented by Young et al. (2021))

Relevant Concept	Component of Emancipation	Theme / Impact of Digital Emancipation
Agency	Freedom to act	<ul style="list-style-type: none"> • “Enhanced management and Budgeting”. Impact: promotes users' financial control. Perspectives: Positive • “Enhanced money transactions”. Impact: enhances users' autonomy. Perspectives: Positive • “Positive Lending Opportunities”. Impact: IS enables a fast and easy application process. Perspectives: positive • “Excessive Ease of Money Transfers”. Impact: speeding up and facilitating actions. Perspectives: mixed
Dialogue	Freedom to express	<ul style="list-style-type: none"> • [no observations in this context]
Inclusion	Freedom to belong	<ul style="list-style-type: none"> • “Enhanced money transactions”. Impact: mitigate but also intensify power asymmetries. Perspectives: mixed • “Enhanced Saving and Investing”. Impact: increase the sense of empowerment and inclusion. Perspectives: positive • “Positive side of Lending”. Impact: Promote individuals' economic inclusion. Perspectives: positive • “Negative side of Lending”. Impact: reducing economic inclusion. Perspectives: negative
Rationality	Freedom to think	<ul style="list-style-type: none"> • “Enhanced management and Budgeting”. Impact: enables users to see financial overview. Perspectives: Positive • “Bad Consumption Decisions”. Impact: affecting users' cognitions - unfavourable choices. Perspectives: negative • “Bad Investment Decisions”. Impact: indirect manipulation - unfavourable choices. Perspectives: negative

4.3.4 Across contexts

Based on the idea Contextual dimensions of digital emancipation by Polyviou et al. (2021); this research aims to identify also relevant phenomenon that impact users but are not linked to any contextual dimensions (personal, social, financial). However, it would appear that these out-of-context phenomena of emancipation or oppression were relatively rare in the research data. The reason may be that the research classifies phenomena as belonging to a specific context, they could not be found or simply do not occur. Although the findings are narrow, they are reported briefly here.

Apps Management

The challenges of application management emerge from the material. One challenge for respondents is to choose the applications that work best for them. When there are several options, it is difficult to choose one. The stories described the challenge of using multiple applications - albeit for slightly different purposes. Data transfer between applications may not be possible, and manual logging to multiple applications is problematic. These experienced limitations of usability oppress users in the concept of agency.

Cost of applications

A small number of responses expressed concerns about the cost of applications. The answers describe the problem that high-quality applications are chargeable and accumulate a surprising difference in expenditure. In the stories, the cost is described as a one-time payment in the app store. The undesired cost effect of applications can be classified as oppression in the concept of inclusion as costs limits accessibility.

Technical Limitations

The most robust phenomenon in this context is different technical limitations. There can be several reasons for such a technical fault in the device, an error in the application, or a constrain related to the implementation of the IS service on the mobile device.

I35: He had noticed how complicated navigating between different applications was, as multiple applications could not be displayed on the screen simultaneously, unlike a home computer. In his opinion, the user interfaces of banking and savings applications were not intuitive and easy to use to create a safe feeling for their users.

Whatever the reason, these limitations can genuinely cause many problems for IS users. Limitations are often linked to other oppressive phenomena as well. Limitations, in their simplicity, can prevent the user from achieving the goals pursued by applications but can also be associated with fears and threats such as security or error. This phenomenon thus causes oppression directly in the concept of agency and indirectly in many other contexts.

Table 19. Components of emancipation, findings in the material on across contexts (adaptation of model presented by Young et al. (2021)).

Relevant Concept	Component of Emancipation	Theme / Impact of Digital Emancipation
Agency	Freedom to act	<ul style="list-style-type: none"> • “Apps Management”. Impact: Limits usability. Perspectives: Negative • “Technical Limitations”. Impact: Prevents the user from achieving the goals. Perspectives: Negative
Dialogue	Freedom to express	<ul style="list-style-type: none"> • [no observations in this context]
Inclusion	Freedom to belong	<ul style="list-style-type: none"> • “Cost of applications”. Impact: Limits accessibility. Perspectives: Negative
Rationality	Freedom to think	<ul style="list-style-type: none"> • [no observations in this context]

4.3.5 Summary of results for emancipation / oppression in all contexts

Looking at the occurrence of different observations (unique themes) in different contexts linking to the concepts of emancipation examined, one can see the emphasis of the observations on the concept of Agency and Rationality. In addition, it can be seen that oppression is slightly emphasised compared to positive emancipation. Table 20

summarises this data. This does not mean that the total impact of oppression is more substantial than the total impact of emancipation. This finding means that there is more variation in different faces of oppression while evidence from emancipation is more uniform.

Table 20. Components of emancipation, summary of different themes found in all contexts (adaptation of model presented by Young et al. (2021)).

Relevant Concept	Component of Emancipation	Context	Positive	Negative
Agency	Freedom to act	Personal Context	2	8
		Social Context	1	0
		Financial Context	4	1
		Across contexts	0	2
Dialogue	Freedom to express	Personal Context	0	0
		Social Context	0	1
		Financial Context	0	0
		Across contexts	0	0
Inclusion	Freedom to belong	Personal Context	1	0
		Social Context	1	1
		Financial Context	3	2
		Across contexts	0	1
Rationality	Freedom to think	Personal Context	0	5
		Social Context	1	2
		Financial Context	1	2
		Across contexts	0	0
ALL	ALL	TOTAL	14	25

5 Discussion & conclusions

During the research process, the following research questions were formed:

- (3) **Research question 1:** How users utilise applications and how applications affect users perceived financial well-being?
- (4) **Research question 2:** How do PFM applications emancipate and oppress users?

The expansive scope of studying Mobile Personal Finance Applications used by young adults complicates providing a straightforward, comprehensive response to the research problem. Given the multitude of potential technologies and their varied uses, the feasibility of crafting an overarching representation is challenging.

The analysis phase uncovers themes and findings that elucidate the user experience of pertinent applications, mirroring the archetypes observed by Torno et al. (2021). On the other hand, while it is satisfying to get answers to a question asked, in the end, it is not particularly surprising and exciting to get relevant answers to a straightforward question. Users of the study use the tools surprisingly narrowly. It is an interesting question whether all the different demographic groups equally limit the use of applications and services in terms of their needs. It may be reasonable to assume that users are reluctant to use their energy to deploy all possible tools to optimise their finances and use of money in all sorts of ways.

The efficient utilization of applications might be linked to financial competence, and while this study does not discount demographic factors, prior research (Xiao & O'Neill, 2016) has shown that personal finance skills significantly boost financial aptitude. Interestingly, all respondents in this study recently participated in a course to enhance such skills. Though a single course cannot rectify all competence gaps, it is undoubtedly beneficial.

The study indirectly suggests that the full potential of existing apps may be limited due to user-based challenges. Concurrently, designing superior apps is also complicated by these user-centric issues, a view endorsed by previous findings (Lusardi & Mitchell, 2014) highlighting knowledge as the precursor to behaviour rather than the reverse.

The results obtained when analysing and interpreting the responses through selected theoretical lenses can be more attractive than straightforward question of how services are used in practise. In short, from the perspective of perceived financial well-being, there are limitations in applications that would benefit the overall financial well-being of the user. There would be a need to optimise larger entities instead of sub-optimisation. Many things are also technically quite realistically solvable. It may be essential to justify the benefits of the application and the service provider.

However, the tensions revealed by the lens of emancipation between different goals and contexts are a more challenging problem to solve. Some of the problems may be impossible paradoxes, but many problems can be solved with careful service design and a better understanding of human behaviour. As in previous, the important challenge may be related to the conflict of interest between the user and the service provider.

5.1 Personal finance applications: Uses and impact on perceived financial well-being

This research studied the use of applications around a few selected key themes. Services related to themes can affect a user's finances in different ways. The effect can be viewed, for example, from the dimension of a time perspective. The results of this study can also be viewed from a two-sided time perspective presented by Netemeyer et al. (2018), which uses structures of current money management and expected future financial security. According to the results, it can be seen that applications and services affecting the current finances are more relevant to the target group of this study than services affecting the expected future financial situation. Services considered necessary are day-to-day

money management services that make life easier, such as transferring money from one user to another or mobile payments. Of course, this aligns with the fact that existing research (Larson et al., 2016) recognizes young adults' limited interest in saving for the future and has tried to find solutions. On the other hand, services that make a person's consumption data visible and help in budget planning and monitoring are emphasised to increase financial well-being.

Except for the investment theme, the research responses on the different themes are strongly related to consumption, how consumption is financed, and consumption monitoring (Appendix 9). Although the results were very focused, also taking into account the outlier findings, the responses to the study cover a wide range of services. These results also include all ten different cluster mobile personal financial applications, which Torno et al. (2021) identified in their research. In addition to the applications clusters identified by Torno et al., this material has a few additional unique features, such as discount vouchers and loyalty cards. Consistency Torno et al. however, taxonomy supports the validity of the data from this study.

Focusing responses on a few themes or clusters can be expected to be related to target group of respondents. The way users use applications is affected by their actual personal life situation and their perceived value (PV) gained from the application. The most used MFSAs emphasise the performance of a particular necessary task. In answers completing the tasks allows users a hedonistic life, but the applications themselves are merely completing utilitarian purpose. According to Karjaluo et al. (2019), perceived value has two dimensions as utilitarian and hedonic. Utilitarian value is completing a particular task, while hedonic value is an experience of pleasure and fun. In this case, the perceived value of applications seems to be related into utilitarian value.

In the practice and context of this research, applications allow their users to consume and, if necessary, finance their consumption. Users get a hedonistic pleasure from consuming, but the user experience of this enabling tool, the application, is often largely

neutral and the experience insignificant. However, there is a risk of misinterpretation here. Even if the empirical evidence does not directly show it, there is room for the interpretation that the hedonistic value is also related to a tool that enables effortless consumption, as the Chen et al., observations (2019) suggest.

5.2 Personal finance applications: Emancipation and oppression

The study reveals several cross-tensions. There are tensions within and between the same contexts. When a user uses the app for personal financial matters, the impact is rarely limited to the intended direct impact. Using the program and service affects a person's finances in many ways, especially in a personal and social context. An example of emancipation is the ability of applications to free their users from time and place constraints. This may be also beneficial for financial productivity i.e., emancipation in a financial context. On the other hand, the services that are always available may constrain the user's use and thinking, which is an example of opposition.

Is appropriate to look at the user's usage situation and the application through the phenomena associated with it in different contexts. Thus, in the case of a personal finance management application, even a limited use case involves a personal context and a financial context, possibly other contexts. Each context may contain several different phenomena in different components of emancipation.

That is a very similar case to the study by Yun et al. (2012) which examined smartphones at home outside working hours for work purposes. According to this study, increased productivity causes emancipation in the context of work and increased flexibility causes emancipation personal context. However, constant reachability and work-to-life conflict cause stress. In that case, mobile phones have also oppressing effect. The observed phenomenon and mixed tensions between contexts seem to be similar and can therefore be considered transferable.

The applications and their users can be both source and actors of unintended side effects of applications. This leads to the question of responsibility. It is interesting to research and decide how harmful unintended side effects could be eliminated or reduced. In some cases, developing an application and eliminating a side effect may be straightforward. However, an improvement that mitigates oppression in one component or context may cause oppression in another if the effect is pursued straightforwardly. The role and responsibility of the user should not be underestimated here.

It is also essential to understand that users are individuals. This finding is generalisation but can also be clearly seen in the data of this study. Some users want to take more responsibility for their actions. At the same time, these users may be sensitive to a sense of oppression if they consider that IS constrains their freedom to think or act. However, some users value that their actions are guided towards their goals. These users' IS can emancipate while taking some responsibility to automate and optimise users' daily decisions. Based on understanding the differences of users, IS and mobile finance applications must adapt to the liberalistic preferences of individual users. Some users can fully benefit from decision support systems, as others may deactivate such functions completely to maximise their emancipation across different contexts.

One challenge, however, is whether the user can identify their preferences of liberalism and priorities. Knowing ourselves is complex, and it is often the case that someone outside knows us better than we know ourselves. In the context of IS and mobile applications, someone outside may be AI that learns from users' actions and behaviour.

Such technology could help address a significant portion of the challenges of emancipation and oppression that have emerged in this study. This possible solution is also similar to the "emancipatory Assistant (EA)" presented by Kane et al. (2021) in the study. Kane et al. research describes how an EA can work with an individual to help reveal and articulate an individual's actual goals and objectives and to guide to act or make decisions that support those goals.

It seems like revealing and accessing users' goals while avoiding oppression is a universal challenge. This study has addressed the challenge from the perspective of personal finance applications, seeking a solution from that perspective. However, this limited study also shows that the different contrasts are complexly related. Thus, one may wonder whether it makes sense to build various stand-alone solutions for different needs. Indeed, this research suggests a holistic, user-friendly assistant as the ultimate solution, which links through standard interfaces to various aspects of life such as personal finances and its applications and services.

The most widespread technology-related concern in this study was data security and privacy. However, in this threat scenario, technology has a role as a tool, and the real threat was a malicious person. One may wonder whether this attitude climate can be seen as trusting in technological artefacts and the system. Otherwise, this study showed respondents' attitudes toward technology as artefacts that serve the user with varying degrees of success. This thinking may appear a bit naive if, in contrast to (Demetis & Allen S., 2018), suggesting the idea of reversal of roles: roles of IT and human users. When IT artefacts develop into systems, users may turn to a part of the system. The question is, which party has agency, and which reacts? However, respondents to this study did not show a substantial view of agency limiting oppression.

On the other hand, one can think about how easy it is for users to recognize possible situations in which information systems control or unpleasantly limit their thinking. Previous research (A. Young et al., 2021) also recognizes this challenge, so it is unsurprising that, according to this study, users treat applications as simple technology artefacts.

5.3 Recommendations to practitioners and researchers

This section discusses the recommendations for practitioners (software developers and fintech companies) and researchers formed based on the research. The

recommendations consider the needs experienced by the users and, to some extent, the societal perspective.

5.3.1 What users want from financial applications

Based on the research, it can be said, for example, that users need applications that empower them by increasing their control and freedom in terms of both their personal resources such as time and financial matters. This behaviour is supported by adequate but easy-to-understand useful information. Applications should remain helpful but invisible aids without constantly demanding and stimulating the user. Users crave good usability but do not want this at the expense of security.

It is also essential to keep in mind that financial applications include a diverse set of applications which can be set into various subcategories. As Huebner et al. (2018), found in their study, it can also be seen in this study that user expectations vary across different types and purposes of financial applications. From this perspective, it is challenging to univocally say what users expect from applications, consciously or unconsciously.

Users perceive their behaviour as a threat to their valuable and responsible goals. Still, users value features that allow for hedonistic use in applications. Users might benefit from features that actively help them make decisions and lead them to less stressful favourable financial outcomes without giving up hedonistic goals altogether. Karjaluoto et. al. (2019), suggest that the utility value of the application is the most significant element of overall satisfaction, but the hedonistic value relates more closely to engagement. Although this study does not directly examine the matter, similar indications can be seen here.

It is an interesting challenge to develop IS to help the user optimize actions so that they are beneficial to the individual in a sustainable way, provide even hedonistic experiences and are sustainable at the individual and societal level. Also, in this study, it can be seen that in matters related to hedonism, such as consumption, the user's short-term and

long-term goals can be conflicting. In the current state, however, based on the responses, IS mainly considers only one dimension: the application related to consuming encourages consuming, and the application related to saving encourages saving. This experience of contradiction is not really wanted by users but oppresses them in the concept of rationality.

Based on this, it can be argued that users need a unified IS a solution for personal finances. AI technology can be part of the solution to optimize different goals. However, as Kane et al. (2021) suggests, the challenge for ML is to properly understand the user's complex goals and communicate advice to the user in the right way. If successful, this solution will increase emancipation in different contexts and advance goals at different levels. On the other hand, failure to implement can lead to oppression and failure to achieve some goals.

In optimizing the goals, the typical company–customer conflict must also be considered. If financial service providers produce the applications, there are contradictions in the optimality of these goals between the user's and the company's optimality, which causes ethical challenges (Tseng, 2020). From this point of view, a third-party service could have better conditions to act as a neutral party.

5.3.2 Further research

- 1) This research revealed several harmful unintended side effects of mobile financial applications - effects that many other mobile applications also have. However, the question of how these effects can be eliminated or mitigated remains relatively open. To find answer would be interesting and valuable as a new avenue of research.
- 2) One observation in this study is the challenge of optimizing cross-variables concerning a person's goals, e.g. from the point of view of economic well-being or enjoyment. On the other hand, the effects of digital emancipation and oppression are equally challenging to control. The research suggests learning intelligent

ML or AI technology as a solution. However, it is not easy to estimate how users react to more intelligent advisory applications and IS solutions. The following research opportunities can be deduced from this:

- a. It would be interesting to examine how users are generally aware of the current AI technology embedded in services. How do they understand how their data is used in these services?
 - b. Second, it would be helpful to examine the ability of users to accept a trend in which technology would play a more significant role in supporting user decision-making.
 - c. What impact will the development and deployment of ML and AI technologies have on the digital emancipation and oppression experienced by users?
- 3) This research proposes focusing on transparency, regulation, and ethical guidelines for future research. As technology inevitably progresses, its impact on individuals and society becomes more profound. Financial competence and technological skills significantly affect personal finance, a critical part of one's life where early decisions accrue over time. These factors will continually affect short and long-term successes. Organizations and institutions also have vested interests in promoting their positions. It is essential to research how technology-mediated goal optimization can be developed ethically and transparently for all stakeholders. This effort should consider quantifiable economic factors and issues of control, emancipation, and potential oppression within the optimization process.

5.4 Limitations and evaluation of the research

This section assesses the various limitations that apply to this study.

5.4.1 MEBS method

When conducting research, there may be differences in the quality and creativity of responses due to individual motivations of respondents. If specific measures are not required, some answers may be brief and less detailed. A certain superficiality of the answers is a feature of this research method. For example, the charging of apps appears in some stories but then appears unilaterally, referring to the purchase of the app from the app store. Therefore, if the researcher would especially like insight into in-app purchases, and subscription models, the theme of payment should already be introduced in the framework report. However, this is primarily a feature of the MEBS study and not a limitation.

The MEBS story frames of the original data collection were set at a very general level. This is the recommended and best practice for this method. On the other hand, here, as a result, the responses are mainly at a very general level. The study provided information and insight that can be considered reliable and useful at the general level. However, there are few observations outside the main themes that their significance is limited. This study leaves plenty of room for future research. More in-depth information on the IS phenomena and impacts of digital emancipation identified in this study can be obtained with more focused research.

Because an essential part of the empathy method is to examine the differences caused by different setups, it also significantly controls how respondents can respond. As a result, the answers follow the given themes and the positive/negative attitude variation. On the other hand, this setup ensures that different perspectives were brought up in the study. It is certain that thanks to the eight variations, the saturation occurred considerably later than the respondents would have been allowed to write freely on one general theme. On the other hand, because variations control responses, it is questionable to numerically interpret the occurrence and scatter of responses.

This study is misguided in some places in analysis and reporting to pay attention to quantitative factors, although it is not particularly relevant here in this qualitative study. On the other hand, however, this summation can be defended by giving phenomena from individual observations. However, a limitation of this study is that the prevalence and impact of the phenomenon cannot be reliably measured. This will allow the research topic to deepen in more detail in future studies.

5.4.2 Representativeness of the sample

In order to interpret the reliability and generalizability of research results, it is important to take into account the homogeneity of this target group. In this qualitative study, it can be estimated that the number of answers received (approx. 191) describes the attitude of the selected target group to the research questions reliably. However, the representativeness of these results is limited outside this target group. In terms of academic research and practical IS development work, further research should be extended to different target groups.

5.4.3 Language

Regarding the language, two limitations can be pointed out.

- a) How have the respondents understood the framework report (in Finnish) according to which they have then answered (in Finnish)
- b) How did the researcher understand the respondents' stories (in Finnish) and translate them into the language of the study (in English)

A: Misunderstandings of responders

Based on an analysis of MEBS stories, we can see that a frame story can be misunderstood as in real-life communication. Even MEBS frame stories were prepared carefully, there are still potential risks for misunderstanding. Original Finnish language frame story of previously translated case X1 is as follow:

Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli innoissaan mahdollisuuksista ja hyödyistä, joita puhelimen

käyttäminen säästämässä ja sijoittamisessa tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta).

Translation from Finnish to English in case X1 is as follows:

I met my friend in the morning, and he said he uses his phone to manage his finances. He was excited about the opportunities and benefits of using the phone to save and invest. He said that... (Continue narration).

In this case word « *säästämässä* » seemed to cause a few confusions for respondents. The basic form of this word is the verb « *säästää* ». In this research context, the correct meaning is « put aside » or « save [up] money », which should be understood when word « *sijoittamisesta* » which meaning is « investing ». However, some responders has missed proper context and have continued the story in a way that refers that they have understood word in meaning as « not to use, not to spend; not to waste ». This error naturally produces different kinds of stories.

B: Possible incorrect translations of researcher

In the research, the process aimed to avoid mistakes due to language misunderstanding. It should be noted, however, that even though the interpreter of the research answers deals with the answers written in his native language, there may be misinterpretations in the tone and meanings of some of the answers. It should be noted that the source data was translated into the language of the study (Finnish -> English) before it was coded. So the process was: Translation (a) -> coding (b) -> analysis (c). In retrospect, one can wonder if the results would have been affected if the process had been different, i.e. b-a-c or b-c-a.

5.4.4 Research design

The research succeeds in answering the research questions, but in a critical review, it can be stated that the set goals regarding the coverage and depth expected were not achieved. The selected phase one research method produced extensive material, but its generic nature causes challenges in answering the later selected phase two questions. MEBS is a suitable research method to generate ideas and insight. Different variations of

frame stories give the researcher one more tool. However, a general-level question produces a general-level answer.

Unlike here, the whole research process should be planned from the beginning. It can be thought that the researcher tried to analyse the material more deeply than the material or the researcher's experience allowed. Repeating a similar study with more targeted data collection could be interesting.

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Appendixes

Appendix 1. Frame stories related Saving and Investing

Original in Finnish / X1: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *innoissaan mahdollisuuksista ja hyödyistä*, joita puhelimen käyttäminen *säästämisessä ja sijoittamisessa* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English / X1: I met my friend in the morning, and he said he uses his phone to manage his finances. He was *excited about the opportunities and benefits* of using the phone *to save and invest*. He said that... (Continue narration)

Original in Finnish / X2: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *huolissaan haasteista ja riskeistä*, joita puhelimen käyttäminen *säästämisessä ja sijoittamisessa* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English / X2: I met my friend in the morning, and he said he uses his phone to manage his finances. He was *concerned about the challenges and risks* of using the phone *to save and invest*. He said that... (Continue narration)

Appendix 2. Frame stories related Budgeting

Original in Finnish X3: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *innoissaan mahdollisuuksista ja hyödyistä*, joita puhelimen käyttäminen *tulojen ja menojen suunnittelussa* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English / X3: I met a friend in the morning, and he said he uses his phone to manage his finances. He was *excited about the opportunities and benefits* of using the phone *to plan revenue and expenses*. He said that... (Continue narration)

Original in Finnish X4: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *huolissaan haasteista ja riskeistä*, joita puhelimen käyttäminen *tulojen ja menojen suunnittelussa* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English X4: I met a friend in the morning, and he said he uses his phone to manage his finances. He was *concerned about the challenges and risks* of using the phone *to plan revenue and expenses*. He said that... (Continue narration)

Appendix 3. Frame stories related Consumption / Daily use of money

Original in Finnish X5: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *innoissaan mahdollisuuksista ja hyödyistä*, joita puhelimen käyttäminen *päivittäisessä rahankäytössä* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English X5: I met a friend in the morning and he said he uses his phone to manage his finances. He was *excited about the opportunities and benefits* that using the phone in the *daily use of money* brings. He said that... (Continue narration)

Original in Finnish X6: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *huolissaan haasteista ja riskeistä*, joita puhelimen käyttäminen käyttäminen *päivittäisessä rahankäytössä* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English X6: I met a friend in the morning and he said he uses his phone to manage his finances. He was *concerned about the challenges and risks* that using the phone in *everyday money use* brings. He said that... (Continue narration)

Appendix 4. Frame stories related Borrowing

Original in Finnish X7: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *innoissaan mahdollisuuksista ja hyödyistä*, joita puhelimen käyttäminen *rahan lainaamisessa* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English X7: I met a friend in the morning and he said he uses his phone to manage his finances. He was excited about the opportunities and benefits of using the phone to borrow money. He said that... (Continue narration)

Original in Finnish X8: Tapasin ystäväni aamulla ja hän kertoi käyttävänsä puhelintaan oman talouden hallinnassa. Hän oli *huolissaan haasteista ja riskeistä*, joita puhelimen käyttäminen *rahan lainaamisessa* tuo mukanaan. Hän kertoi, että ... (Jatka kertomusta)

Translation in English X8: I met a friend in the morning and he said he uses his phone to manage his finances. He was concerned about the challenges and risks of using the phone to borrow money. He said that... (Continue narration)

