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A framework to facilitate older people in leveraging online financial services

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Abstract. Older people are encountering digital exclusion due to the evolving technological realm. The use of digital financial services among older people aged 65 and over is low in comparison to other age groups. A wide range of challenges are associated with older people's low usage of online financial services. Hence, interventions have to be developed to reduce the exclusion. In order to create interventions, factors which contribute to their challenges have to be identified. This paper elucidates a framework which was developed from qualitative data that could be leveraged to develop potential solutions by focusing on the main factors which could prevent them from fully utilizing digital financial services. Not only would this framework be beneficial for older people but also for intermediaries who assist older people in accessing digital financial information as this tool could aid them in choosing the appropriate solution required to help the individual to use online financial services.

Keywords: Framework, older people, online financial services, digital interactions, digital exclusion

1 Introduction

Advancing technology could act as a threat to those who are digitally excluded as they may have to learn new products as well as the existing products/services to carry out day-to-day tasks and to stay updated with the technological realm. According to the UK ONS data (Office for National Statistics), only 85.5% and 54% of older people aged 65+ and 75+ are recent internet users whereas more than 90% of individuals in all the

other younger age groups are recent internet users [1]. This, in turn, proves older people's seldom use of digital services, including digital financial services (i.e., any website which enables users to conduct financial transactions). ONS data also shows that in 2020, 28.9% of retired older people used the internet over three months ago or they never used the internet [1]. This justifies the importance of identifying potential solutions to minimize the barriers encountered by marginalized individuals such as older people who are aged 65 and over in order to suppress the digital divide and facilitate digital inclusion.

Research reported in this paper is based on the design of a framework which could be leveraged by organisations to comprehend the main attributes that could hinder older people from accessing or seeking online financial information efficiently. The framework was developed after conducting a number of interviews with intermediaries and older people (those aged 65+) in the UK. The developed framework consists of 10 factors which may contribute to the barriers experienced by older people aged 65 and over in their use of online financial services in everyday contexts. These factors were determined through developed personas and literature review. Utilizing this framework would enable individuals such as library staff and information professionals to understand how the factors could positively or negatively influence older people's use of online financial services. This type of framework has not been created for online financial services yet. Therefore, the research question which would be addressed through this paper is what type of theoretical tool would be required to assess and measure the factors that contribute to the obstacles experienced by older people aged 65+.

2 Literature Review

Online financial services provide benefits in various ways, for example, saving money through online shopping discounts, environmental sustainability due to low usage of paper and time can be saved immensely as technology enables us to carry out activities without travelling to a nearby shop or bank [2]. Although such benefits can be derived through the use of online financial services, older people are losing these benefits due to issues such as fear, lack of experience/knowledge, interface issues, lack of digital skills and lack of help [2, 3]. Older people were not born into the digital world; therefore, they are known as digital immigrants; they have to adapt themselves by learning about technological products [4]. However, this is not easily feasible for older people due to diverse obstacles.

Along with the challenges mentioned previously, language is another barrier especially for those who are from ethnic minority groups [5]. English-as-a-second language (ESL) speakers could face more challenges on online services [6]. This, in turn, produces more complexities in teaching them about technology in the English language if they lack digital skills [7]. This could also have an impact on those who lack education. Older people not having higher education and not being employed means that they are less likely to use the Internet [8]; this means that they barely use online financial services. Moreover, those who have low income will not be able to pay for an internet connection which, in turn, promotes digital divide [9]. On top of this, older people could

face further impediments if they lack financial literacy skills. Older people could have difficulties in managing their wealth after retirement [10]. Consequently, they could make inaccurate financial decisions. Older people could have financial autonomy if they comprehend the benefits of online financial services. However, this could only be achieved through financial education [10].

Furthermore, hidden costs are associated with older people and those who assist them with digital financial services; hidden costs such as time, effort and monetary aspects [2]. 86% of youngsters aged 16-24 supported people with online services as digital carers [11]. This percentage clearly shows that digital exclusion is prevalent in the UK and therefore, these hidden costs and challenges can be only diminished if inclusive solutions are developed. Additionally, hidden costs would exist if disabled people continued to experience accessibility issues. Blind and partially sighted people (BPSP) are having complexities in navigating bank websites or apps; therefore, financial service providers have to develop appropriate strategies to enhance equity [12]. Internet use will decline as a result of deteriorating cognitive functions in later life [13]. 58% of older people aged 65-74 and 74% of older people aged 75 and over are incapable of using online banking systems; older adults' age affects their approach towards the internet and usage of the internet in older adults decreases as their age increases [14].

Additionally, psychological barriers such as confidence and fear could have an influence on older people's intention to adopt online services. The higher the confidence, the less worried the older people were about using the internet [15]. Also, fear could hinder them from using technology due to low confidence and lack of knowledge [16]. This indicates that fear would prevent older people from using online financial services if they do not utilize technology in the first place and this barrier could only be minimized through training and formal/informal support.

Another main challenge is the lack of digital skills [3]. If people obtain digital skills, £796 million (per year) could be saved by individuals through transaction benefits by 2025 [17]. Moreover, the European Union (EU) has decided to attain at least 80% of the population with basic digital skills by 2030 [18]. In order to achieve this target, the EU produced a Digital Competence (DigComp) framework where a Digital Skills Indicator (DSI) is applied to monitor digital skills. In this framework, there are 21 competencies categorized in five areas: Problem solving, information and data literacy, digital content creation, safety and communication and collaboration. This framework's purpose is to show the main digital skills that each individual should possess. The DSI concentrates on the technological activities that each individual carries out in the five areas of the framework [18].

In addition to this, the UK government has produced a framework for intermediaries who foster people in enhancing their digital skills; this framework describes five essential components of digital skills that are required for everyday lives – communicating, handling information and content, transacting, problem solving and being safe and legal online [19]. Although these frameworks could be deployed to increase digital skills; it does not address other challenges faced by individuals on online services. Additionally, this type of framework cannot be fully utilized for online financial services. Hence, a

framework is required that would aid in broadly exploring the factors that could contribute to the issues faced by older people on digital financial services.

3 Methodology

In order to develop the framework, 14 semi-structured interviews (7 older people and 7 intermediaries) were carried out. This included older people, digital carers and employees who have worked or are currently working, in organisations that aid vulnerable people with digital services. Participants were recruited through emails which were sent to university students and charity organisations. Older people were asked questions regarding online financial services such as online banking, transport tickets, tickets to events etc. On the other hand, intermediaries were asked questions associated with the challenges they identified while assisting older people. Some interviews were conducted with the help of an interpreter due to participants' language issues. Each participant was asked around 7 or 8 questions; however, a conversational approach was taken to allow participants to discuss any relevant topics and experiences.

Broad themes and codes were formed through thematic analysis of the interview data [20]. Key challenges such as fear, lack of digital skills and interface issues were identified through interviews. Preliminary interview findings of this study have been published [2, 3]. During the interviews, several participants mentioned older people they are familiar with who are facing issues with online financial services. This information was utilized to develop seven personas (Figure 1 provides an example of persona). The name shown on Figure 1 is fictitious since names were not mentioned by the interview participants.

Name: Aamina Muhammed
Age: 70+
Gender: Female
Ethnicity: Pakistani
Occupation: No job; never worked
Marital status: Married

Aamina is part of first generation who migrated to UK with her husband from Pakistan at a young age. She lived majority of her life in UK and she's not educated (i.e., no school/university education). She encountered some domestic violence and she lives by herself. She always needs someone to aid her with online activities. Aamina has children who are in their 40s now.

Aamina is adequate with English language but she is autistic and she has severe anxiety. Therefore, she had difficulties in communicating with people around her. Due to her health condition, staff from mental health organisation provided long explanations to teach her digital financial services. Yet, she had difficulties to comprehend everything in general.

Staff goes to her house three times a week for two hours. If she wanted help with bank-related tasks then she would have to go to the bank to deal with it which consumes a lot of her time. Then she wouldn't have assistance with anything else. Someone told her about online banking and she receives help from staff on digital banking services. Since she doesn't have any digital skills, she faced many issues. For example, she paid for an expensive TV package. Staff told her about how she could receive basic packages on online. But she doesn't trust it; she's happy with what she knows. She doesn't want to phone them up as this could lead to other problems. Aamina wouldn't leave the house without the staff; she always stayed in the house.

She relied on state benefits as she never worked in the UK before. Aamina was being looked after by the state as her children were all grown up. She had a daughter who was in her 30s. She went to university and she also had mental health issues like her mother. She helped her with all the online tasks. Unfortunately, she passed away in 2020 and Aamina lost all the support from the one person who used to help her with everything.

Even though Aamina receives assistance from organisation, she still hasn't been able to grasp the digital skills due to her mental health; she has a routine that she follows. If anything changes, she won't be able to cope really well.

Goals:

- Become more independent by learning some useful services, for example, online TV packages, online banking which could facilitate day to day life.
- Increase trust on online services.

Fig. 1. Example of a Persona

Personas provide a clear vision of the user and it is considered as a HCI (human-computer interaction) tool [21]. A persona describes a potential user's goals, demographic information and other relevant details. It may contain fabricated details to strengthen the persona and to resemble a real-life character [22]. Although personas may contain non-factual information, the personas created for this research encompasses real information as the framework relies on the reliable details obtained from qualitative data. As a result, optimum output would be procured from the framework.

Through thematic analysis of the interview data, factors that contribute negatively to older people's access to digital financial services were discovered. Following the creation of seven personas representing typical attributes obtained from the interviews, a number of factors with a scale ranging from 0 to 5 were developed using the information in one of the personas. As well as this, information gathered through the review of literature was referred to include additional factors in the scale such as financial literacy and access to equipment/connection. Some factors could not be scaled i.e., ethnicity, gender etc. Hence, these were not incorporated. To ensure that the factors could be used to characterize any persona, the scale was tested on all seven developed personas. Each factor was evaluated using a scale of 0 to 5 by assessing the sentences and

contemplating the overall impression generated from each persona. Subsequently, this framework was applied to eight older people's interview transcripts. The 10 factors in the framework can be quantified to understand which factors have positively or negatively influenced older people's access to online financial services.

4 Framework

This framework uses qualitative data to provide a quantifiable understanding of the factors that contribute to the challenges confronted by older people aged 65 and over. The intention is to map any persona or transcript to this framework to measure the issues experienced by the individual and establish possible solutions to aid older people in the use of online financial services.

Exploiting this framework would allow intermediaries to develop new policies/strategies to assist vulnerable people in the society. Moreover, it could lead to making amendments to existing products/services. Also, stakeholders such as organisations and digital carers could produce potential interventions through the utilization of this framework which may contribute to reducing digital exclusion. Not only would this framework identify the factors which could impede older people from the adoption of digital financial services but it would also help to quantify the barriers in order to recognize whether a solution is required for an individual. A tangible impact could be produced through this novel tool which could address the challenges confronted by older people.

A table demonstrating the 10 factors and the associated scale is shown in Table 1 below.

Table 1. Theoretical tool

	Scale					
Factors	**0**	**1**	**2**	**3**	**4**	**5**
Support						
Formal Education						
Language						
Basic digital skills						
Technology experience in occupation						
Disabilities						
Financial literacy						
Confidence						
Access to equipment/connection						
Fear						

4.1 Scale Factors

This section will briefly elucidate the justifications for the inclusion of each attribute portrayed in Table 1 and the semantics of the numbers involved in the scale.

A score of 5 is the maximum value that could be given to a factor and a score of 0 is the minimum value. For instance, a score of 5 for the 'basic digital skills' factor indicates that the person has all the essential digital skills whereas a score of 0 denotes that the individual does not possess any basic digital skills. A six-point scale was chosen instead of a common five-point scale as a few factors required additional options; therefore, consistency was maintained by positioning a six-point scale for all the factors. Also, this scale does not enable neutral scores; individuals rate the factors from 0 to 5.

Support: older people could receive assistance with online services from relatives, friends and volunteer groups [23]. Also, it was evident from the interviews with some older people that they obtain formal support through organisations. Receiving informal support (family, friends or relatives) or formal support (organisations, community centres) could facilitate older people to learn and understand technology. However, this could also mean that they might not carry out the tasks by themselves due to additional support.

A scale of 0: I am significantly dependent on formal/informal support.
A scale of 1: I am moderately dependent on formal/informal support.
A scale of 2: I am somewhat dependent on formal/informal support.
A scale of 3: I am partially dependent on formal/informal support.
A scale of 4: I receive a low level of digital help through formal/informal support.
A scale of 5: I do not receive any formal or informal support for online financial services.

Formal education: this is a factor that can influence older people's adoption of internet; people with higher education utilizes internet [24]. This was also proven through the interviews with older people; someone with a higher level of education may have better learning skills and is more likely to adopt online financial services unless other factors prevent them from using these services, for example, fear.

A scale of 0: no education
A scale of 1: primary education
A scale of 2: secondary education/college
A scale of 3: bachelor's degree
A scale of 4: post graduate degrees
A scale of 5: three or more degrees

Language: people whose first language is not English may encounter language issues in the use of ICT (information and communication technology) [25]. Therefore, this factor could have an influence on the adoption of online financial services. In this tool, speaking is seen as more literate than writing as people from ethnic minority groups may find it easier to learn and understand technology through oral communication due to their difficulties in written communication. Reading is considered more important

than speaking as individuals could learn online financial services through guidelines/instructions even if they have complexities in verbal communication.

A scale of 0: I am not good at reading, writing or speaking in the English language.
A scale of 1: I am only partially good at writing in English.
A scale of 2: I am only partially good at speaking in English.
A scale of 3: I am only partially good at reading in English.
A scale of 4: I am only partially good at reading, writing and speaking in English.
A scale of 5: I have good proficiency in the English language.

Basic digital skills: UK's Department for Education produced a framework which highlights the five essential digital skills that are crucial for life: communicating (e.g., WhatsApp), handling information and content (e.g., using a browser to search information), transacting (e.g., online banking, e-commerce), problem solving (e.g., watching online videos to find a solution, using online chat facilities), being safe and legal online (e.g., not posting anything on online about others without their consent, not sharing login details with anyone) [19].

A scale of 0: I do not have any of the five digital skills listed above.
A scale of 1: I have one out of five digital skills listed above.
A scale of 2: I have two out of five digital skills listed above.
A scale of 3: I have three out of five digital skills listed above.
A scale of 4: I have four out of five digital skills listed above.
A scale of 5: I have all the essential digital skills listed above.

Technology experience in occupation: individuals with a high-level occupation are more likely to use online banking [26]. This denotes that people who had technological experience in their workplace have higher likelihood of adopting digital financial services unless other barriers are preventing them from using such services. A number of interviews have proven that older people who used internet while working are adopting digital services.

UK's Department for Education mentions additional digital skills for work: communicating (e.g., sending emails to co-workers and sharing documents with them), handling information and content (e.g., using a calendar to keep track of the schedule), transacting (e.g., analysis of digital payslips), problem solving (e.g., using software to resolve problems at work), being safe and legal online (e.g., reporting dubious emails to the appropriate team at the workplace) [19].

A scale of 0: I do not have any of the five work-related digital skills listed above.
A scale of 1: I have one out of five work-related digital skills listed above.
A scale of 2: I have two out of five work-related digital skills listed above.
A scale of 3: I have three out of five work-related digital skills listed above.
A scale of 4: I have four out of five work-related digital skills listed above.
A scale of 5: I have all the essential work-related digital skills listed above.

Disabilities: individuals with disabilities have major difficulties in using internet [27]. This emphasizes the need to develop inclusive solutions which, in turn, suggests that

disability is a factor which could contribute to the barriers in the use of digital financial services.

A scale of 0: I have significant health issues/disabilities which completely prevents me from using online financial services.
A scale of 1: I have major difficulties in using the online financial services due to health issues/disabilities but I can use these services through additional support e.g., friends, family etc.
A scale of 2: I have major difficulties in using the online financial services due to health issues/disabilities but I can use these services without additional support.
A scale of 3: I face minor difficulties in using the online financial services due to disabilities/health issues.
A scale of 4: I have a number of health issues/disabilities which may not prevent me from using online financial services.
A scale of 5: I do not have any disabilities/health issues.

Financial literacy: this factor is associated with the knowledge and skills required to evaluate and use financial products which would help them to manage their personal finances efficiently, for example, savings, budgeting, investment, loans etc [28]. In this framework, not using digital financial services suggest that the individual inherits a financial loss from travelling to banks, shops etc which, in turn, means that their financial literacy skills are low.

A scale of 0: I do not possess any financial literacy skills.
A scale of 1: I extremely rarely use digital financial services; therefore, my financial literacy skills are very low.
A scale of 2: I rarely use online financial services; therefore, my financial literacy skills are low.
A scale of 3: I use online financial services occasionally; therefore, my financial literacy skills are below average.
A scale of 4: I use online financial services frequently; therefore, my financial literacy skills are average.
A scale of 5: I have significant financial literacy skills as I always use a variety of online financial services.

Confidence: older people lack confidence in using the internet [15]. This was also a challenge mentioned by older people in the interviews. Thus, it is vital to include this as a factor as this challenge could be addressed through the use of this framework.

A scale of 0: I do not have any confidence in using online financial services.
A scale of 1: I am slightly confident in using online financial services.
A scale of 2: I am somewhat confident in using online financial services.
A scale of 3: I am moderately confident in using online financial services.
A scale of 4: I am very confident in using online financial services.
A scale of 5: I am significantly confident in using online financial services.

Access to equipment/connection (e.g., laptop/smartphone/WIFI): some people may not have access to the internet due to the cost of equipment/connection which would hinder

them from accessing digital financial services [29]. Thus, this is a factor which has to be taken into consideration. According to Ofcom report, 34% of people aged 65 and over do not have access to internet at home in the UK whereas only 1% of 18-24 age group, 1% of 25-34, 3% of 35-44, 2% of 45-54 and 3% of 55-64s do not have internet access at home [11].

A scale of 0: I do not have any reliable access to a device and internet connection to use digital financial services.
A scale of 1: I have very little access to a reliable device and internet connection.
A scale of 2: I have some, but not always reliable, access to a device and internet connection.
A scale of 3: I have good access to a reliable device and internet connection.
A scale of 4: I have very good and reliable access to a device and internet connection.
A scale of 5: I have excellent and very reliable access to a device and internet connection.

Fear: this is a common factor identified by interviewees as a challenge among older people in the use of online financial services. Older people perceive that they'll make mistakes [15]. There could be several reasons why their fear acts as a barrier such as prior experience of financial scams and fear of losing money.

A scale of 0: I have extreme fear when using online financial services or I do not use such services due to my extreme fear.
A scale of 1: I have significant fear when using online financial services.
A scale of 2: I have moderate fear when using online financial services.
A scale of 3: I have somewhat fear when using online financial services.
A scale of 4: I have slight fear when using online financial services.
A scale of 5: I have no fear when using online financial services.

Sometimes factors 'Fear' and 'Confidence' cannot be quantified easily if the individual does not use online financial services or if they have a lack of interest in technology. In this case, other factors could be reviewed to generate a score for 'Fear' and 'Confidence'. For example, a score of 0 could be given for both factors if they received a score of 0 for 'Language' and/or a score of 0 for 'Support' as this indicates that they are receiving immense support from others to carry out digital financial services.

In addition to the factors shown in the framework, task-related complexities is another factor as online tasks could produce varying levels of difficulty. A few interviewees mentioned specific task difficulties, for example, not knowing how to remove items from the basket on an online shopping website and having difficulties with two-factor authentication and processes in international money transfer apps. This clearly shows that task-related complexities are faced by older people who utilizes online financial services. However, this is a broad area that could be investigated as part of future work.

This scale was applied to persona shown in Figure 1. See Figure 2 for the scores given to each factor and the corresponding justifications.

	Scale					
Factors	**0**	**1**	**2**	**3**	**4**	**5**
Support	0					
Formal Education	0					
Language						5
Basic digital skills	0					
Technology experience in occupation	0					
Disabilities		1				
Financial literacy		1				
Confidence	0					
Access to equipment/connection						5
Fear	0					

Support – 0 - because she lives by herself. She had a daughter who used to help her but she passed away in 2020. She doesn't receive help from family. She completely relies on the organisation.
Formal Education – 0 – never had any education.
Language – 5 - she's good with English.
Basic digital skills – 0 – no digital skills.
Technology experience in occupation – 0 – never worked in the UK.
Disabilities – 1 – mental health issues. She follows a strict routine.
Financial literacy – 1 – she started to use digital financial services through the assistance provided by staff.
Confidence – 0 – still receives help from staff on online services.
Access to equipment/connection – 5 – she uses digital banking services. Hence, she has access to equipment.
Fear – 0 – she's scared if she will fall into other problems by dealing with online services.

Fig. 2. Framework applied to persona

4.2 A guide to developing potential interventions

Although the theoretical tool shown in Table 1 has 10 factors, it is not feasible to develop inclusive solutions for each factor that would be useful for every older person. A concrete solution could not be created for factors such as formal education, technology experience in occupation and disabilities – these 3 static factors cannot be improved through solutions, for example, education – an older person's formal education cannot be enhanced; they either received higher secondary education or not.

Potential interventions could be developed to increase formal/informal support, reduce fear and elevate an individual's confidence in the use of digital financial services

to some extent. However, instead of creating a solution for each factor where the individual encounters challenges, assess the scores that the individual gained for basic digital skills, access to equipment/connection, language and financial literacy as conclusive interventions could be developed for these 4 factors. All the other 6 factors could act as indicators which would determine the ideal solution(s) required for the individual's challenges surrounding the 4 main factors.

For instance, see the quantified factors in Figure 2 shown above. 2 out of the 4 main factors have relatively low scores – these factors are basic digital skills and financial literacy. Therefore, an online tool, training or other relevant interventions would be required to enhance these skills in the individual. Having said that, the scores obtained for the other factors demonstrate that she's experiencing some issues such as lack of confidence, fear, disabilities etc. Hence, additional support would be required from organisations. Digital support from organisations would be essential if the developed online tool is a solution as the individual does not receive family support. Also, the online tool should be user-friendly and not complicated as the individual did not receive any education and does not have any prior technological experience. The tool itself could have interfaces where it clearly explains how to improve financial literacy skills, information related to training and step-by-step instructions etc. As well as this, a number of training sessions could increase the individual's confidence and fear. Even though these solutions seem beneficial, the individual has mental health issues which could prevent them from increasing their digital skills fully. Nevertheless, through the assistance of mental health organisation and other relevant interventions, the individual could learn about online banking and other digital financial services.

Developed solutions can have varying levels of help or tasks, for example, training sessions could have 'beginner' levels for people who received a score of 0 for basic digital skills and financial literacy skills; 'difficult' levels could be incorporated for those who experience fewer complexities.

Prioritising the solutions by assessing the 6 factors would lead to a better impact than developing one main solution for all 10 factors. In this way, digital inclusion would be facilitated.

4.3 Workflow

The steps required to carry out this framework is briefly shown below in Figure 3.

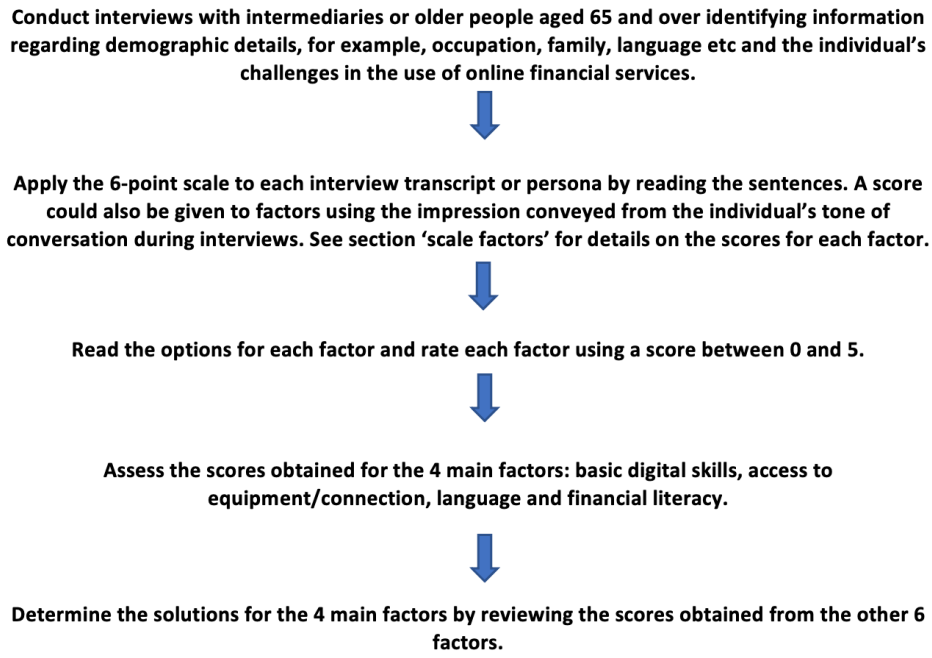

Fig. 3. Workflow

5 Evaluation

In order to test the developed tool, eight semi-structured interviews were carried out with five Chinese older people and three older people from Pakistan. The same questions mentioned in the methodology section were asked during the interviews. An interpreter accompanied the researcher to conduct some of the interviews with Chinese older people. Semi-structured interviews are ideal as this would aid in producing different dimensions of the topic being discussed which would assist in quantifying the factors. Moreover, older people may not be able to fill out the framework itself without assistance; therefore, interviews were considered to be an adequate research method.

Using the transcripts, a score was given to each factor on the framework. The transcripts were successfully mapped onto the framework and a mixed set of varying scores were obtained. Therefore, this framework could be deployed to produce interventions for those facing issues with online financial services.

6 Outcomes

By leveraging this framework, a deeper understanding of the common issues faced by older people aged 65 and over in the use of digital financial services can be measured. Consequently, new solutions could be developed to resolve the identified issues. The tool could lead to further development, for example, technical development, skills development and people-oriented support. In addition to this, individualised solutions could be formed using the scale. Quantified factors would enable intermediaries to generate statistics and analyse patterns, for example, they could identify the most common factor and the least common factor faced by vulnerable people in an organisation. This information could be used to produce specific solutions to improve their use of online financial services.

Older people utilize libraries or organisations to obtain access to these services and therefore it is vital that we understand what challenges people face and determine the solutions required to decrease the barriers. The scores received from the framework could determine the ideal solution required for an individual aged 65 and over which would enhance their use of digital financial services. Thereby, promoting financial inclusion in the society. As more intermediaries commence to use this framework, a positive impact would be emitted through beneficial interventions which would encourage vulnerable people to adopt digital financial services.

7 Conclusion

To sum up, applying this framework to any interview transcript or persona which consists of an individual's background information and their challenges in the usage of online financial services would result in discovering the factors which restrict them from the adoption of digital financial services. Additionally, the quantified factors would show if a solution is required for the individual. If solutions are required, meaningful interventions would be produced by focusing on the 4 main factors and 6 indicators. As aforementioned, possible interventions derived from the use of this framework would address the challenges faced by older people. These solutions could be in the form of recommendations, digital solutions, policies, training or other relevant products/services which would eventually mitigate digital exclusion.

The framework was corroborated through interviews. Therefore, this tool can be utilized by the public, researchers, libraries, developers, organisations and financial providers. Furthermore, researchers could identify new factors through literature review, interviews or other research methods which could be incorporated into the framework. Although this framework could be utilized by a number of stakeholders, this tool contributes to knowledge by uplifting our understanding of the issues faced by older people in society. Consequently, people become more aware of the lack of effective interventions and the issues in existing products.

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