Work Package 4

D.4.1 Test User Report of Usability & Acceptance

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i. INTRODUCTION

The present deliverable follows up on the work delivered under the first work package during the initial stages of implementation of the TRAINUTRI project that sought to reveal end-user requirements. It is the result of the fourth Work Package in the project that comes naturally after the design and integration processes have been concluded – under Work Packages 2 and 3 respectively - and accordingly the first demonstrator of My TRAINUTRI has been developed, providing the overall validation plan of usability and acceptance of My TRAINNTURI.

Pursuant to end-user involvement throughout project implementation, Work Package 4 "Validation and Acceptance users test" brings forward end-users' perspectives on the TRAINUTRI application (My TRAINUTRI) as part of a piloting process that was introduced to test the newly developed system in real-life conditions. *D4.1: "Test User Report of Usability and Acceptance"* covers the background, methodology, procedures and results of the pilot trials that have been conducted with the participation of 10 end-users from Greece, Spain and Switzerland. In this respect, it is expected to enlighten issues of usability and acceptance of My TRAINUTRI based on former research on technology adoption and acceptance that build mainly upon the Technology Acceptance Model.

Part I illustrates the conceptual and methodological framework within which evaluation of the TRAINUTRI system from end-users emerges. Building upon the Technology Acceptance Model the study goes one step further proposing an extended model that consists of six core constructs: perceived usefulness (PU), perceived ease of use (PEOU), perceived safety/ trust (PS/T), technology anxiety, self-efficacy and behavior intention (BI), and three moderators: gender, socio-economic status (education, income and ICT literacy) and physical capacity. These constructs and moderators are considered to affect Behavioral Intention, that is, a user's thoughts and plans of using the TRAINUTRI technology and finally the usage of TRAINUTRI itself. Within this context, 11 hypotheses are developed that are then tested against the results of the TRAINUTRI trials.

Part II provides an overview of the pilot testing process of My TRAINUTRI app outlining: the user trial plan within the TRAINUTRI project, as was initially envisaged and accordingly adapted; the profile and selection criteria of pilot users; the selected pilot sites; the application that is subject to testing and its features; the ethical issues that have been taken into consideration; and the methods and tools utilised for the purposes of this pilot study.

All research tools used in this study for the collection of data, including the Informed Consent form, are provided in the Annexes.

PART I: CONCEPTUAL BACKGROUND

1.1 Technology Acceptance Model

Based upon the theory of reasoned action (TRA: Fishbein & Ajzen, 1975[1]) and the theory of planned behavior (TPB: Ajzen, 1991[2]), the Technology Acceptance Model – TAM (Davis, 1986[3]) investigates the impact of external variables on internal beliefs, attitudes and intentions. It assumes that the actual usage of a technology depends on the individual's intention to use it, which is, in turn, influenced by the perception of the advantages and of the easiness related with technology usage (user's beliefs). The TAM consists of three key variables; Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and potential behavioral intention (BI) of users to adopt the technology. According to Davis' theory, users' beliefs influence their *attitudes* to using a system (i.e., favorable or unfavorable), while users' attitudes influence their *intentions* to use a system, which in turn determine the level of subsequent *usage*.

Although, the TAM has been traditionally used to measure technology acceptance in workplaces, a number of relevant studies and theories have modified and extended it, making it more capable to cope with different aspects of technology acceptance in a variety of settings and contexts. To this end, several external variables and antecedents that affect the two core constructs (i.e. PU and PEOU) have been proposed, some of which are of particular importance for technology acceptance studies with elderly populations. While, little attention has been placed on moderating effects in user technology acceptance (Sun & Zhang, 2006[4]), there is evidence that moderating factors also have a significant role in the TAM (Gefen & Straub, 1997[5]; Sun & Zhang, 2006; Venkatesh et al., 2003[6]).

Despite several arguments against the theoretical contributions of this model to explaining technology adoption, use, or rejection, the theoretical extension of the TAM into the TAM II, as well as its broad application to a variety of populations and settings provide strong evidence that the TAM is a solid model capable of providing a fairly adequate explanation and prediction of user acceptance of IT. It is acknowledged however that meeting the needs of a specific study means making certain modifications and/ or adaptations to the initial TAM.

The following section identifies core issues of technology acceptance by older adults/ seniors, based on which certain hypotheses for our study emerge. These initial assumptions will be later tested

[1] Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley.
[2] Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179–211.
[3] Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. Unpublished doctoral dissertation, Massachusetts Institute of Technology, Cambridge, MA.
[4] Sun, H., & Zhang, P. (2006). The role of moderating factors in user technology acceptance. International Journal of Human–Computer Studies, 64(2), 53–78.
[5] Gefen, D., & Straub, D. W. (1997). Gender differences in the perception and use of email: An extension to the technology acceptance model. MIS Quarterly, 21(4), 389–400.
[6] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478.

against the results of the pilot testing phase, on the basis of which they will be either rejected or supported.

1.2 Technology acceptance by older adults – hypothesis development

Technology adoption in older population groups has been examined extensively in the context of Ambient Assisted Living (AAL) Technologies. Yet, most of the existing research has focused on AAL applications that support users in everyday activities by compensating for individual physical disabilities or provide distance health care services to enable independent living for frail elderly. In these cases, the use of the new technology is moderated by external variables on which the individual is seen to have little or no control at all (functional capacity, health issues).

TRAINUTRI on the other hand, focuses on the "young old" (50 to 65 years old) aiming to raise consciousness on wellness by providing support for the adoption and maintenance of healthy habits. The proactive character of the TRAINUTRI services allows us to suggest that its use is intentional by nature; hence the TAM seems to fit well to the scope and objectives of our study.

Following a similar approach, we operationalize the notion of acceptance by means of the construct of Behavioral Intention to use the system (BI). The two most significant antecedents in explaining an individual's intention to use an Information System as identified by existing theories (TAM[7], Innovation diffusion[8], Theory of planned behavior[9], Unified Theory of Acceptance and Use of Technology[10]) and past studies[11] in the field are *perceived usefulness* (or related constructs such as relative advantage and performance expectancy) and *perceived ease of use* (or related constructs such as complexity and effort expectancy). To the extent that these two antecedents are applicable to Information Systems (IS) in general, we consider them important to determine the acceptance of TRAINUTRI by older adults.

Perceived Usefulness (PU) in our research is defined as the user's beliefs about how useful TRAINUTRI is for achieving and sustaining wellness. Davis predicted that greater perceptions of usefulness would lead to greater intention to use a technology[12]. The suggested relationship between PU and Behavioral Intention (BI) has been supported by a significant body of research revealing that PU is a strong determinant of BI[13]. Relevant work with older adults provides initial evidence that this relationship also holds for older age groups (Phang et al., 2006[14]). Findings form a relevant study carried out under the UTOPIA project[15] suggest that older people may often be motivated by the perceived practical use of computer applications.

Perceived Ease of Use (PEOU) on the other hand, is the extent to which a person believes that using a technology (TRAINUTRI) will be free of effort. It refers to an individual's assessment of the effort

[7] F. D. Davis, R. P. Bagozzi, and P. R. Warshaw, "User acceptance of computer technology: A comparison of two theoretical models," *Manage. Sci.*, vol. 35, no. 8, pp. 982–1003, 1989.
[8] E. M. Rogers, *Diffusion of Innovations*, 4th ed. New York: The Free Press, 1995.
[9] I. Ajzen, "The theory of planned behavior," Organizational Behav. Hum. Decision Processes, vol. 50, pp. 179–211, 1991.
[10] V.Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User acceptance of information technology: Toward a unified view," *MIS Quart.*, vol. 27, no. 3, pp. 425–478, 2003.
[11] King, W. R. & He, J. (2006). A meta-analysis of the technology acceptance model. *Information and Management, 43*, 740-755.
[12] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.
[13] Venkatesh, V., Morris, M.G.: Why don't men ever stop to ask for directions? Gender, social influence and their role in technology acceptance and usage behaviour. *MIS Quarterly* 24, 1 (2000), 115-139.
[14] Phang, C.W., Sutanto, J., Kankanhalli, A., Li, Y., Tan, B.C.Y., Teo, H.H.: Senior Citizens' Acceptance of Information Systems: A Study in the Context of e-Government Services. *Engineering Management, IEEE Transactions* 53, 4 (2006), 555-569.
[15] Eisma R., Dickinson A., Goodman J., Mival, O., Syme A. and Tiwari L. (2003). Mutual inspiration in the development of new technology for older people. In *Proceedings of Include 2003,* London, pp 7:252-7:259.

involved in the process of using the system (Davis, 1989[16]); in other words, it measures the degree of perceived workload in relation to the usage of the system: the higher PEOU, the lower the perceived effort, and vice versa. PEOU has direct impact on perceived usefulness, but not the other way round. It is believed to influence both on BI and PU, supporting the idea that an easier technology is felt as more useful, and induces a stronger intention to use the system. A significant body of research provides evidence that support these interfaces[17]; yet, it should be noted, that the PEOU-PU relationship has been found to hold mainly at the initial stages of technology usage.

Theoretical support for both perceived ease of use and perceived usefulness is provided in several studies with elderly participants, studies investigating communication technology acceptance, and in research featuring both (e.g. Phang et al., 2006[18]; Gilly and Zeithaml, 1985[19]; Ryu, Kim, and Lee, 2008[20]; Mallenius, Rossi & Tuunainen, 2007[21]). In view of the above, we may assume the following:

H1. *Perceived usefulness for the TRAINUTRI system relates positively to behavioral intention to use the TRAINUTRI application/ technology.*

H2. *Perceived ease of use of the TRAINUTRI system relates positively to behavioral intention to use the TRAINUTRI application/ technology.*

H3. *Perceived ease of Use of the TRAINUTRI system relates positively to Perceived Usefulness for TRAINUTRI*

In an attempt to compensate for the limitations that have been identified in the initial structure of the TAM, researchers have suggested several different constructs to extent the theoretical framework of this model. Among the factors of particular importance for the adoption of new technologies by older populations is believed to be perceived safety and trust in the technologies in question[22]. Gefen et al. (citing Luhmann, 1979) argue that trust is central to technology acceptance when the technology itself involves social uncertainty and risk. The idea that perceived safety impacts on the acceptance of technology finds also support in previous work with older individuals on the acceptance of e-government services (Phang et al, 2006[23]).

Safety in general is the state of being "safe", the condition of being protected against physical, social, financial, psychological, etc., damages. Perceived safety is the belief that none of these states is to be affected negatively by the use of the new technology. It refers to the degree of users' confidence that their personal information will be safe, and that all parties involved will not act against their interests. From the perspective of using TRAINUTRI, users need to trust that the information they provide about their daily habits and activities will be treated in a proper way and that their personal

[16] Ibid.
[17] Legris, P., Ingham, I., Collerette, P.: Why do people use information technology? A critical review of the technology acceptance model. *Inf. Management* 40, 3 (2003), 191-204.
[18] Ibid
[19] Gilly, M. C., & Zeithaml, V. A. (1985). The elderly consumer and adoption of technologies. *Journal of Consumer Research, 12*(3), 353–357.
[20] Ryu, M, Kim, S., & Lee, E. (2009). Understanding the factors affecting online elderly user's participation in video UCC services. *Computers in Human Behavior, 25*, 619-632. doi:10.1016/j.chb.2008.08.013
[21] Mallenius, S., Rossi, M., & Tuunainen, V.K. (2007). Factors affecting the adoption and use of mobile devices and services by elderly people—results from a pilot study. Proceeding of6th Annual Global Mobility Roundtable, Los Angeles.
[22] Phang et al,, 2006 (ibid, p.4)
[23] Ibid

information will not be exposed to third parties or misused in any other way. In other words, perceived safety is high when a person feels that the technology fosters a sense of safety.

Thus, we hypothesize that the more trust My TRAINUTRI instills in users, the more people will find it useful and the more willing they will be to use it:

***H4**. Perceived Safety/ Trust in TRAINUTRI has a positive effect on PU of TRAINUTRI.*

***H5**. Perceived Safety/ Trust in TRAINUTRI has a positive effect on BI of TRAINUTRI.*

Similarly, self-efficacy is one of the most important constructs of the TAM with numerous studies documenting its relation to PEOU and ultimately BI[24][25][26]. Efficacy refers to the belief that an individual has the ability to perform a particular behavior[27]. Self-efficacy has been defined by Kinzie, Delcourt, and Powers (1994[28]) as an individual's confidence in his or her ability, which may impact the performance of tasks:

"*Self-efficacy reflects an individual's confidence in his/her ability to perform the behavior required to produce specific outcome and it's thought to directly impact the choice to engage in a task, as well as the effort that will be expended and the persistence that will be exhibited.*" (p. 747).

According to literature, self-efficacy is an important mediator of behavior change with many studies documenting it to be an important determinant of PEOU. This idea is also supported by the social cognitive theory, which asserts that individuals are more likely to engage in a particular behavior, if they believe that they have the capability to perform the behavior (Bandura, 199729). According to Marakas et al. (1998[30]), computer self-efficacy (CSE) is a multi-level construct operating at two distinct levels: at the general computing level (general CSE) and at the specific application level (application-specific self-efficacy). In this study, the term technology self-efficacy will be adopted as it captures in a better way the context of TRAINUTRI (i.e. the system will be accessible either through a computer or a smart phone).

Thus, we assume that technology self-efficacy (meaning information technologies, in general and the TRAINUTRI Android phone and related applications, in particular) relates positively to the adoption of the My TRAINUTRI:

***H6**: Self-efficacy to the TRAINUTRI technology (smartphone/ computer) has a significant positive effect on the PEOU of TRAINUTRI.*

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[24] Agrawal R, Sambamurthy V, Stair R. The evolving relationship between general and specific computer literacy: An empirical assessment. Information System Research. 2000; 11(4): 418- 430.
[25] Venkatesh V, Davis FD. A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science. 2000; 46(2): 186-205.
[26] Venkatesh V, Davis FD. A model of the antecedents of perceived ease of use: development and test. Decision Sciences. 1996; 27(3): 451-480.
[27] Compeau D, Higgins CA. Computer self-efficacy: development of a measure and initial test. MIS Quarterly. June 1995:189-211.
[28] Kinzie, M. B., Delcourt, M. A. B., & Powers, S. M. (1994). Computer technologies: Attitudes and self-efficacy across undergraduate disciplines. *Research in Higher Education, 35,* 745-768.
29 Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman.
[30] Marakas, G.M., Yi, M.Y., Johnson, R.D., 1998. The multilevel and multifaceted character of computer self-efficacy: toward clarification of the construct and an integrative framework for research. Information Systems Research 9, 126–163.

***H7**: Self-efficacy to the TRAINUTRI technology (smartphone/ computer) has a significant positive effect on the BI to use TRAINUTRI.*

In relation to older adults, prior studies have found a positive correlation between age and perceived difficulty of learning a new software application (Morris & Venkatesh, 2000[31]). Senior citizens often have low self-efficacy in the use of new technology (Czaja et al., 2006[32]), while there is also ample evidence that older adults have higher levels of computer anxiety than their younger counterparts (e.g. Laguna & Babcock, 1997[33]; Saunders, 2004[34]), which in turn, are associated with greater reluctance to engage in learning new technologies (Jung et al., 2010[35]). This allows us to assume that among adults, age is negatively associated with self-efficacy and positively associated with technology anxiety.

Computer anxiety is a feeling of discomfort, stress, or fear experienced in actual or imaginary interaction with computer-based technology (Brosnan, 1998[36], Chua, Chen, & Wong, 1999[37], Bozionzelos, 2001[38]). Similarly, technology anxiety refers to a feeling of discomfort, stress or experienced in actual or imaginary interaction with information technologies (IT). Individuals who suffer from technology/ computer anxiety usually display negative behavior and physiological reactions to computers that include among others: avoidance of IT usage (Anderson, 1996[39]); negative comments about computers (Bandura, 1994[40]; IT usage for a minimal amount of time (Bozionelos, 2001[41]). The concept of computer anxiety is similar to "computer avoidance" (Moore, 1989[42]) which results in individuals avoiding the use of computers due to their innate fear of the technology. It is important to note here that computer anxiety is different from negative attitudes toward computers that entail beliefs and feelings about computers rather than one's emotional reaction towards using computers (Heinssen, Glass, & Knight, 1987).

A significant correlation between self-efficacy and technology/ computer anxiety has been found in numerous studies investigating the relationship between the two factors (Joncour, et al, 1994[43];

[31] Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing work force. Personnel Psychology, 53(2), 375–403.
[32] Czaja, S., Charness, N., Fisk, A., Hertzog, C., Nair, S., Rogers, W., et al. (2006). Factors predicting the use of technology: Findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE). Psychology and Aging, 21(2), 333–352.
[33] Laguna, K., & Babcock, R. L. (1997). Computer anxiety in young and older adults: Implications for human–computer interactions in older populations. Computers in Human Behavior, 13(3), 317–326.
[34] Saunders, E. J. (2004). Maximizing computer use among the elderly in rural senior centers. Educational Gerontology, 30, 573–585.
[35] Jung, Y., Peng, W., Moran, M., Jin, S.-A., McLaughlin, M., Cody, M., et al. (2010). Low income minority seniors' enrollment in a Cyber Café: Psychological barriers to crossing the digital divide. Educational Gerontology, 36(3), 193–212.
[36] Brosnan, M. J., 1998. The impact of computer anxiety and self-efficacy upon performance. Journal of Computer Assisted Learning, 14, 223-234.
[37] Chua, S. L., Chen, D. T., & Wong, A.F.L. (1999). Computer anxiety and its correlates: A meta-analysis. Computers in Human Behavior, 15, 609-623.
[38] Bozionelos, N, "Computer anxiety: relationship with computer experience and prevalence", *Computers in Human Behavior*, 17, 2001, pp. 213 – 224.
[39] Anderson, A, "Predictors of computer anxiety and performance in information systems", *Computers in Human Behavior*, 2(1), 1996, pp. 61 – 77.
[40] Bandura, A, "Self-efficacy", In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior,* New York: Academic Press, Vol. 4, 1994, pp. 71-81.
[41] Ibid
[42] Moore, G. C. (1989) *An Examination of the Implementation of Information Technology by End- Users: A Diffusion of Innovations Perspective,* Unpublished Doctoral Dissertation, University of British Columbia.
[43] Joncour, N., Sinclair, K., and Bailey, M, "Computer anxiety, computer experience and self-efficacy", in Proc. Annual Conference of the Australian Association for Research in Education, Newcastle, New South Wales, 1994.

Wilfong, 2004[44]); these findings are complemented by strong evidence of an association between high technology/ computer anxiety and low self-efficacy (Brosman, 1998[45]; Joncour, et al, 1994[46]). This is not surprising, if we consider that as individuals become more confident in their ability to complete computer tasks their level of anxiety about doing those tasks decreases. Taking the above into consideration we assume that:

***H8**: Computer/ technology anxiety is negatively related to (TRAINUTRI) Technology Self-efficacy; the higher the level of technology anxiety the lower the level of self-efficacy.*

Technology/ computer anxiety is considered a major barrier of information technology/ computer and Internet access, especially among seniors, people with low educational level and a part of the female population, while findings from relevant research suggest that these phenomena do not disappear completely with a rise in computer experience.

Research on gender and information technology has often revealed that males tend to have more experience in the use of computers (Brosnan & Lee[47], 1998; Balka & Smith, 2000[48]) and more positive attitudes toward computers/ information technology regardless of their level of familiarity. Contrary, female attitudes become more positive as the level of familiarity with computers increases (Sacks, Bellisimo and Mergendoller, 1993[49]; Newman, et. al., 1995[50]). However, it is also believed that women may be more successful than men in applying what they have learned in computing courses (Gattiker, 1990[51]).

Females not only have more negative attitudes toward computers (Durndell & Thompson, 1997[52]; Whitely, 1997[53]), but also greater technology/ computer anxiety (McIlroy, et al., 2001[54]) than males, while research on technology/ computer self-efficacy has revealed that self-efficacy of males is ommonly higher than that of women (Torkzadeh & Koufteros, 1994[55]). Taking into consideration the above mentioned relationships between technology anxiety, self-efficacy, PEOU and BI, we assume that:

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44 Wilfong, J, "Computer anxiety and anger: the impact of computer use, computer experience, and self-efficacy beliefs", *Computers in HumanBehavior*, 2004, in press.

45 Brosnan, M.J, "The impact of computer anxiety and self-efficacy upon performance", *Journal of Computer Assisted Learning*, 14, 1998, pp. 223-234.

46 Ibid.

47Brosnan, M., & Lee, W. (1998). A cross-cultural comparison of gender differences in computer attitudes and anxiety: The UK and Hong Kong. *Computers in Human Behavior, 14* (4), 559-577.

48 Balka, E., & Smith, R. (2000). *Women work and computerization*, Boston: Kluwer.

49 Sacks, C.H., Bellisimo, Y., and Mergendoller, J. (1993). Attitudes toward computers and computer use: The issue of gender. *ACM Women in Computing*

50 Newman, D. R., Webb, B. & Cochrane, C. (1995) How to measure critical thinking in face-to-face and computer supported seminars through content analysis, IPCT-J, 3(2), 56-77.

51 Gattiker, Urs E. (1990). Technology management in organizations . Sage Publications, Newbury Park, Calif.

52 Durndell, A., & Thompson, K. (1997). Gender and computing: A decade of change? *Computers and Education, 28* (1), 1-9.

53 Whitely, B. (1997). Gender differences in computer related attitudes and behavior: A meta analysis. *Computers in Human Behavior, 13* (1), 1-22.

54 McIlroy, D., Bunting, B., Tierney, K., & Gordon, M. (2001). The relation of gender and background experience to self-reported computing anxiety and cognitions. *Computers in Human Behavior, 17* (1), 21-33.

55 Torkzadeh, G., & Koufteros, X. (1994). Factorial validity of a computer self-efficacy scale and the impact of computer training. *Educational and Psychological Measurement, 54* (3), 813-921.

Other individual differences, such as age/ physical capacity, education and income, also play a significant role in the way information technology is used (Zmud, 1979[56]). This is particularly true for older adults taking into account the wide age-range (e.g. anyone over 60 or 65, and in some cases, anyone over 50) that the term ('older adults' or 'older people') conventionally covers, which suggest a great diversity of the so called older population.

This diversity within the older age groups is intensified by the increased likelihood of illness or age-related impairment among older populations. The most common distinction between populations of elderly people categorises them to a) the young old (50- 64), b) the middle old (65–75) and c) the oldest old (75+). However, the chronological age does not correlate perfectly with functional age, which in our case plays more important role than the former. Functional capacity consists of physical (e.g. vision, hearing or coordination problems), psychological (e.g. dementia or depression), and social (e.g. loneliness/ isolation) aspects. Older adults with functional limitations (such as vision, hearing, memory impairments) are expected to have low levels of self-efficacy and higher levels of technology anxiety that in turn determine PEOU and BI.

***H10**: Decreased functional capacity is positively associated to technology anxiety and negatively related to technology self-efficacy.*

Rogers (1995) on the other hand, found that early adopters of an innovation have higher socioeconomic status than later adopters. Determinant "Socio-Economic Status" (SES) in our research captures three different variables that is income, education and ICT literacy. ICT literacy is defined as: *the skills and abilities that will enable the use of computers and related information technologies to meet personal, educational and labour market* goals (Lowe & McAuley, 2000[57]).

While ICT uptake among older citizens in the EU and USA is increasing, older age groups are less likely to be ICT literate than younger age groups and this divide is expected to continue for the foreseeable future. This is justified by the fact that there have been substantial changes in the nature of employment during the last two decades mainly due to the introduction of computers/ technology. A substantial proportion of occupations have become more technical and varied and older adults find it more difficult to keep up with the ever-increasing technological advances.

ICT literacy is highly correlated with education and income, both key measures of SES (Nakhaie, 1998[58]). SES in turn relates to industry and occupation of employment, which have a major bearing on access to and use of ICT in workplaces (Hughes and Lowe, 2000[59]). On that basis, we may assume that:

***H11**: High Socioeconomic Status (SES) is positively related to Behavioral Intention to use the TRAINUTRI system.*

[56] Zmud, R. W. (1979) "Individual Differences and MIS success: A Review of the Empirical Literature," *Management Science,* Vol. 25, No. 10, pp. 966-979.
[57] Lowe, G.S & McAuley, J. (2000). Information and Communication Technology Literacy Assessment Framework. Adult Literacy and Lifeskills (ALL) Survey, April 2000 Revision
[58] Hughes, K., and G. S. Lowe (2000). Surveying the 'Post-Industrial' Landscape: Information Technologies and Labour Market Polarization in Canada. Canadian Review of Sociology and Anthropology, vol. 37, pp. 29-53.
[59] Hughes, K., and G. S. Lowe (2000). Surveying the 'Post-Industrial' Landscape: Information Technologies and Labour Market Polarization in Canada. Canadian Review of Sociology and Anthropology, vol. 37, pp. 29-53.

The table (Table 1) below provides an overview of the hypotheses that have been developed in the context of the Usability and Acceptance study of TRAINUTRI and will be tested through different research methods (Part II).

Table 1: Research Hypotheses

OVERVIEW OF HYPOTHESES			
H	**Construct 1**	**Construct 2**	**Relation**
01	PU for the TRAINUTRI system	BI to use TRAINUTRI	+
02	PEOU of the TRAINUTRI system	BI to use TRAINUTRI	+
03	PEOU of the TRAINUTRI system	PU for the TRAINUTRI system	+
04	PS/T in TRAINUTRI	PU for the TRAINUTRI system	+
05	PS/T in TRAINUTRI	BI to use TRAINUTRI	+
06	TSE to TRAINUTRI	PEOU of the TRAINUTRI system	+
07	TSE to TRAINUTRI	BI to use TRAINUTRI	+
08	Technology Anxiety	TSE to TRAINUTRI	-
09	Gender	BI to use TRAINUTRI	⇧ / M ⇩ / F
10	Decreased functional capacity	Technology anxiety	+
	Decreased functional capacity	Self-efficacy	-
1	High SES	BI to use TRAINUTRI	+

1.3 Research Model

The research model that our study employs, based on the above analysis, suggests that the acceptance of new technology, in general and My TRAINUTRI, in specific, is affected directly and or moderated by the following factors:

1. Individual differences/ characteristics (ID)
2. Perceived Ease of Use (PEOU)
3. Technology Self-efficacy (TSE)
4. Perceived Safety / Trust (PS/T)
5. Technology Anxiety (TA)
6. Behavior Intention (BI)

1.3.1. Definition of Determinants

Individual Differences (ID): gender, physical capacity, education, income and ICT literacy of older adults, users of TRAINUTRI (*Moderators*).

Perceived Usefulness (PU): is the user's belief about how useful TRAINUTRI is for achieving and sustaining wellness *(Key Variable 1)*

Perceived Ease of Use (PEOU) is the extent to which a person believes that using TRAINUTRI will be free of effort *(Key Variable 2)*

Perceived Safety / Trust (PS/T) is the belief that using TRAINUTRI technology is safe and does not entail any significant risk or danger with respect to the physical, social, financial, psychological, etc. condition of the individual; *(Variable 3, Antecedent of PU)*

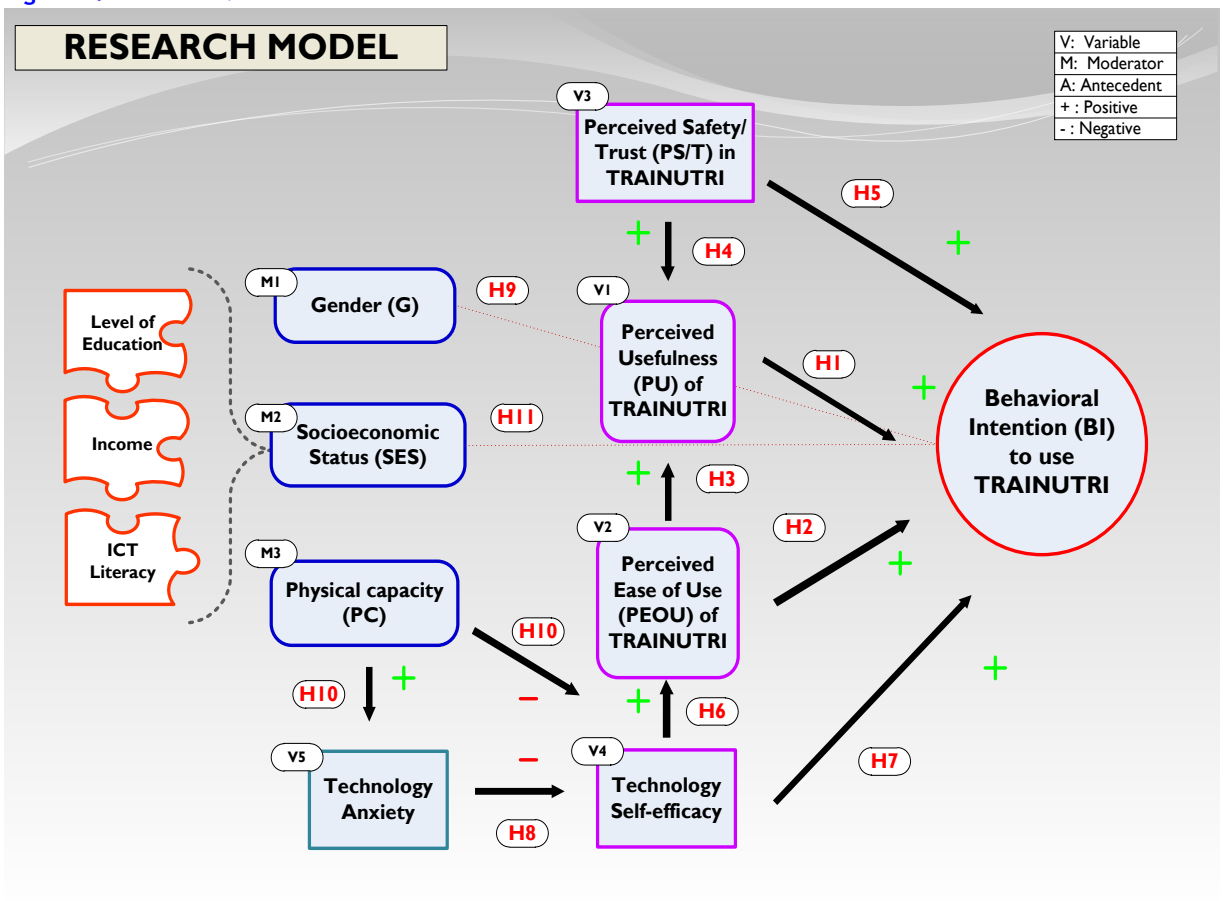
Technology Self-efficacy (TSE) refers to the belief that an individual is capable of using the TRAINUTRI technology in order to achieve wellness TRAINUTRI; (*Variable 4, Antecedent of PEOU)*

Technology Anxiety (TA) refers to feelings of discomfort, stress, or fear experienced in actual or imaginary interaction with the TRANUTRI technology; (*Variable 5, Antecedent of PEOU*)

All these determinants are considered to have an impact on **Behavioral Intention (BI)**; an individual's intention that is to use My TRAINUTRI.

The following figure (Fig. 1) represents the key constructs of our Research Model and their relationships that will be tested.

Figure 1: Research Model



PART II: PILOT TESTING OF TRAINUTRI

Validation of the TRAINUTRI technology and evaluation of user acceptance took place by means of a pilot testing phase involving participants (pilot users) from Spain, Greece and Switzerland. Due to initial delays in contracting procedures at national level and subsequently delays in system integration processes under Work Package 3 that led to the extension of project by 3 months, piloting was postponed for April 2012. Overall, 10 pilot sites were established in the 3 participating countries with each one of them testing My TRAINUTRI for a minimum of 10 days.

The following sections provide an overview of the TRAINUTRI pilot trials, including the means, procedures, methods and tools used to address the research hypotheses outlined in the previous chapter. In this regard, the following aspects are covered:

- Technology tested during the trials; i.e. components /features of My TRAINUTRI;
- Selection criteria of pilot users;
- Pilot sites and participating countries;
- User trial plan before and after its adaptation;
- Ethical considerations;
- Methods and tools used for data collection;

2.1 TRAINUTRI Components / technology tested

The TRAINUTRI system subject to testing during the trials is the result of technology development and integration tasks carried out within work packages 2 and 3 respectively. During these trials, participants tested the first demonstrator of My TRAINUTRI on an Android phone coupled with web-based services offered to users for testing (i.e. social networking platform).

The first demonstrator of My TRAINUTRI was made up of three main components, namely an activity module, a nutrition module and a social networking platform.

The following table (Table 2) provides an overview of the components of My TRAINUTRI at the time of the trials and their features.

Table 2: Overview of components tested

	Component	Modules	Description	Requirements	Functions	Status
My TRAINUTRI	**Activity component (figure 2)**	ALE application	Collects information on physical activity levels	• Users should carry the phone in the front pocket of their trousers • No input needed from the user (apart from the settings configured once before the first start)	Auto start in the morning and auto stop in the evening / night	Configured by the user
					Start monitoring	Manually by the user
					Stop monitoring	Manually by the user
		Activity recognition app	Collects information on physical activity types		Check result for today, for the week of past results	ALE screen
					Compare results with those of friends	On the web site - section: Training
	Nutrition component (figure 3)	n/a	Enables user to record information on meal consumption and check his / her performance	Manual input from the user	Check performance – weekly consumption	Home screen
					Select meal of eating moment	-
					Create eating moment	
					Edit eating moment – add food moments	-
					Get consumption feedback	Automatic when inserting an eating moment
	Social networking component (figure 4)	Groups	Enables user to access his/ her TRAINUTRI network and interact with other users	• Accessed via the android app or • Login to the webserver	Create / update profile	
					Check recent news on the application	Divided into user / friends / all
		Blogs			Check / add / delete friendships	
					Send / Receive message	
		The Wire			Add posts (e.g. to announce status) and / or respond to other users	The Wire (140 characters limit)
					Join / leave groups	Invitation procedure Accept / reject options
		Users			Create new group or edit a group	
					Search option	

Figure 2: Activity app layout

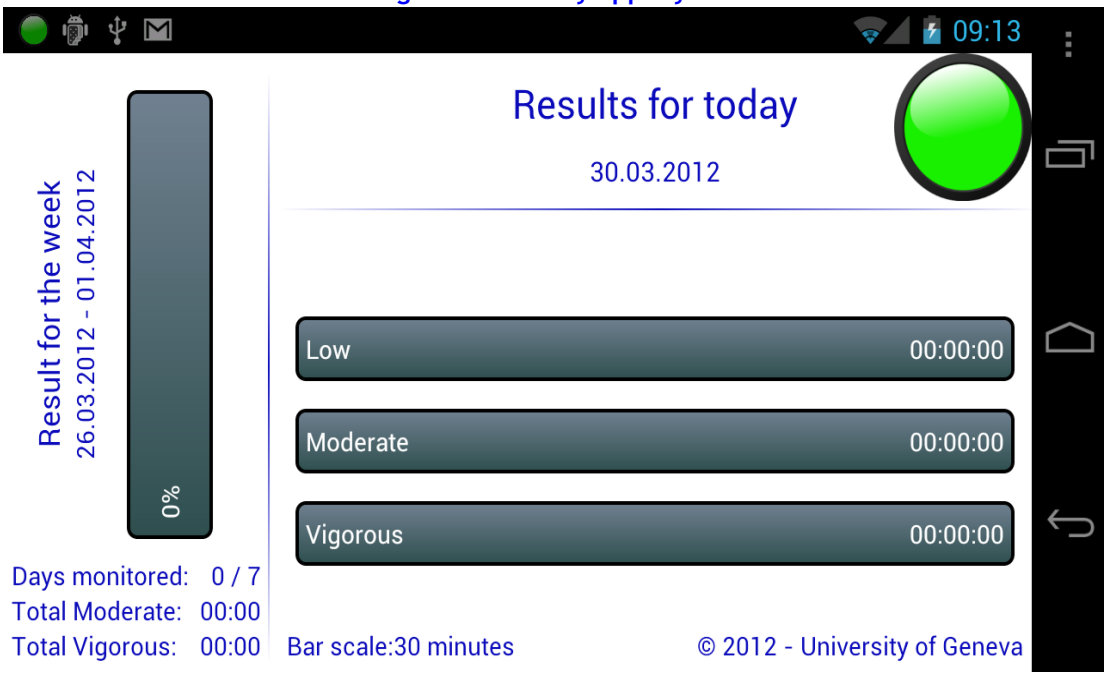


Figure 3: Nutrition app layout

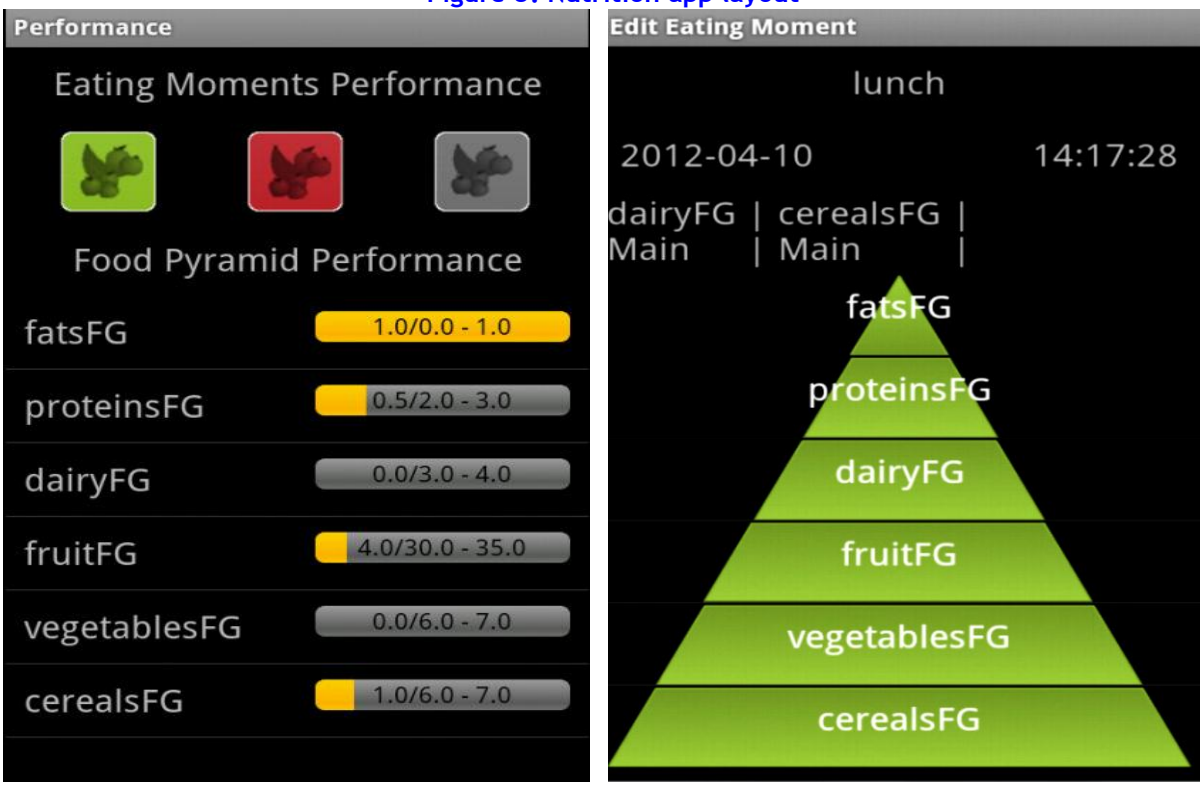
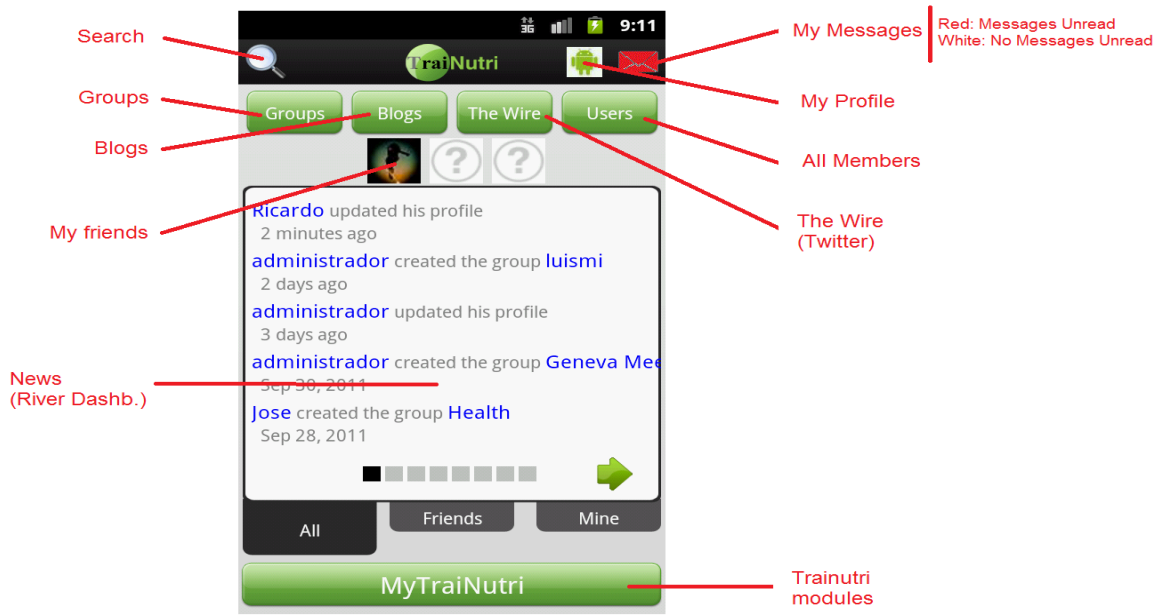


Figure 4: Social networking module layout



2.2 Pilot Users

TRAINUTRI addresses issues of two categories of actors, primary and secondary users:

- ☆ Primary users: older people between 50- 65;
- ☆ Secondary users: family members/ relatives, friends, carers, professionals (doctors, dieticians, personal trainers, etc).

In the pilot testing phase only primary users (i.e. older adults) were involved. Even though the TRAINUTRI project was initially designed for adults between 50 and 65, it is accepted that this age group is closer to middle age than old age. Thus, it was considered reasonable to expand the target audience including also adults older than 65 years old.

According to the initial planning, the minimum number of pilot users involved in the testing of TRAINUTRI would be 6, with at least two participants from each country; the baseline criteria for the selection of the sample (pilot users) that had been initially outlined are presented below:

- **Minimum age of the participants**: 50 years
  Users should ideally be between 50 and 70 years old, but adults older than 70 can also be integrated into the sample;
- **Gender balance:** ideally 50% female and 50% male participants;
- **Education:** balanced mix of participants including those with high level of education and those with low level;
- **ICT capacities:** balanced mix of participants including those with good ICT knowledge and those with poor ICT skills.
- **Income:** balanced mix of participants including high-income users and those with lower income.

2.3 User trials plan

According to the initial planning, each pilot site would involve at least 2 participants in the testing of the TRAINUTRI system during a two-week pilot phase. Each participant would use the first demonstrator of TRAINUTRI for ten days during which time they were to self-report on their experience with My TRAINUTRI in two different instances (one half way through the pilot and one at the end) using diary worksheets. At the beginning of each trial, participants were required to fill in questionnaires to collect socio-demographic data and other important information (provided that the participants have signed the consent form). During this initial interview, the TRAINUTRI system and its features were also demonstrated to the users by the research team. At the end of the pilot use (10^{th} day), participating users were asked to fill in the TRAINUTRI Technology Acceptance Measurement tool providing insights into users' perceptions about the system and exploring the extent of TRAINUTRI technology acceptance once the actual use has occurred by investigating perceived ease of use and perceived usefulness as main determinants for behavioral intention to use TRAINUTRI.

2.4 Pilot sites

Although the initial work plan considered Greece as the only country in which user involvement would occur within TRAINUTRI, a decision made between project partners early in project implementation (WP1 – Task 1.1) specified the engagement of all participating countries - at that point GR, NL, SW and ES) - in end user involvement. Thus, Deliverable 1.1 (D1.1: User Requirements) reflects conditions (i.e. expectations and needs of end-users) in all four EU countries. To ensure consistency, the same approach has been utilised in WP4 with the involvement of all countries represented in TRAINUTRI at that stage of project implementation. It is important to note that certain changes have occurred in the composition of the TRAINUTRI consortium due the withdrawal of the Dutch partner[60]; thus the countries that participated in the pilot testing process were 3 in total (Spain, Greece and Switzerland) instead of 4.

2.5 Adaptation of the (user trials) plan

Pilot testing of My TRAINUTRI was carried out in April 2012 in three different pilot sites, in Spain, Greece and Switzerland respectively.

User trials in Greece and Switzerland ran in parallel, while the pilots in Spain started when the trials in the other two countries had ended. The actual number of participants in the TRINUTRI pilot was 10 consisting of 4 users from Spain, 4 users from Switzerland and 2 users from Greece:

- In **Spain**, pilot testing was conducted in Madrid where two Spanish partners (Planet Media and UPM) recruited 4 pilot users to participate in the trials;
- In **Greece**, testing took place in Athens where KMOP recruited 2 participants via its existing projects for older people;
- Finally, in **Switzerland**, the University of Geneva recruited 4 participants and conducted the study in Geneva.

[60] MobiHealth

All users tested the first demonstrator of the TRAINUTRI application (My TRAINUTRI) using an Android phone, either their own, or one provided by the project team. As there was no budget available for purchasing equipment, the University of Geneva provided to the Greek end-user partner (KMOP) two Android phones to be used by the Greek participants for piloting purposes.

For the selection of participants, different recruitment methods were used. The fact that only the Greek partner was an end-user organisation created certain difficulties to the rest of the consortium in identifying suitable participants. Apart from KMOP (Greek partner) that involved pilot users through its existing programmes and activities, all other partners mainly utilised their personal contacts and acquaintances, such as family members, colleagues, friends etc. Due to these difficulties, not all participants involved by the individual partners covered the minimum criteria defined in the methodology in terms of age. To this end, 3 out 10 participants were below the age of 50, thus not belonging to the target group of TRAINUTRI. Despite that, a decision was made between the participants to use the information collected from these three pilot users as control group data. However, the fact that this element was added after the methodology and accordingly the research tools had been finalised, created certain discrepancies in the methodology of user evaluations (e.g. not all countries are represented in the control group which consists of two users from Spain and one user from Switzerland) that should be taken into account when analysing and interpreting results.

The initial plan to gather information on the users' education, income and physical capacity (to respond to the research questions analysed before) was abandoned due to cultural differences between the participating countries that made the research team believe that these questions would be considered insulting for the Swiss participants. To this regard, the tool that had been developed for this purpose was re-drafted and this type of data were not obtained, thus making impossible the examination of the relevant hypotheses.

Finally, information gathered from the three countries present discrepancies as part of the users (4 users from Switzerland) filled in the User Diary Worksheet only at the end of the trial and not half-way; hence these data are missing from the analysis that follows.

2.6 Ethical issues

Testing TRAINUTRI in real life, as any research involving human subjects, entails certain responsiveness to ethical considerations to ensure that privacy and safety issues of participants are properly treated before, during and after the trial. With regard to the TRAINUTRI trials, two are the main aspects that the research team considered before pilot testing begins:

a) Protection of participants' private sphere (i.e. personal data and information collected) during the trial use and
b) Provision of sufficient information to the participants before, during and after the trial.

As the TRAINUTRI research did not include any medical treatment, the only relevant legal issue was the handling and protection of private data.
In response to the above, the project sought and obtained the informed consent of all pilot users with respect to the fundamental ethical principle of individual autonomy. Informed consent implies that subjects are made adequately aware of the type of information requested from them, why this

information is being sought and for what purpose, how they are expected to participate in the study, and how this will directly or indirectly affect them. In this sense, it's not just a form signed by the participant, but a process in which the subject is fully informed about and has an understanding of the research in which s/he is going to participate and its risks. Consent is essential before enrolling a participant and ongoing once research subjects are enrolled.

Informed consent is shorthand for informed, voluntary and decisionally-capacitated consent. Seeking the consent of an individual to participate in research reflects the right of an individual to self-determination and also his/her fundamental right to be free from (bodily) interference, whether physical or psychological, and to protect his / her personal data; ethical principles that are commonly recognised by Law as legal rights.

An autonomous individual is one who is capable of deliberation and personal choice. The principle of autonomy implies that responsibility for the decision to participate relies on the research subjects who must be given the opportunity to choose what shall or shall not happen to them, making sure that adequate standards for informed consent are satisfied. This means that all researchers within TRAINUTRI would need to make sure that the informed consent of an individual is being sought only under circumstances that provide the prospective participant sufficient opportunity to consider whether or not to participate and that minimize the possibility of coercion or undue influence.

In line with the above principles and standards, the TRAINUTRI research team ensured that all required elements were present when obtaining informed consent from participants and that no exculpatory language existed through which the participant was made to waive or appear to waive any of his/ her legal rights, or released or appeared to release the researcher, the organization / institution or the consortium from liability for negligence.

To ensure that the research subjects of TRAINUTRI provide a truly voluntary and informed consent, consenting was carried out always with the presence of a competent researcher, if possible senior who was responsible of informing the individual about his or her rights, the purpose of the study, the procedures to be undergone, and the potential risks and benefits of participation. Information given to the pilot study participants was always provided in a language understandable to them, both orally and in written. For this purpose, a consent form was drafted, initially in English (Annex I) and accordingly translated to Greek, Spanish and French (all Swiss participants were from the French speaking part of Switzerland). When consenting research subjects, the location where the consent was being discussed, the subject's physical, emotional and psychological capability were taken in due consideration.

The TRAINUTRI research did not involve non-native speaking individuals from any of the three participating countries, illiterate subjects, minors or persons will special needs.

In seeking informed consent within TRAINUTRI, the following information was provided to each participant:

1. purpose / objective of the research
2. procedures involved in the research
3. expected duration of the subject's participation
4. foreseeable risks, discomfort and adverse effects to the subject, including possible psychological, social, or economic harm, discomfort, or inconvenience;

5. description of any specific benefits of the research to society and possibly to the individual human subject which may reasonably be expected from the research;
6. explanations on confidentiality (and limits) of the data;
7. explanations on who is responsible for questions about the research and additional information provided to participants during the study
8. their right to decline to participate and to withdraw from the research once participation has begun and the foreseeable consequences of declining or withdrawing;
9. statement indicating that participation is voluntary
10. Statement regarding the subjects' right to confidentiality and right to withdraw from the study at any time without any consequences

The English version of the consent form that was used in the TRAINUTRI pilot study is provided in Annex I.

2.7 Methods and tools

Following, an overview of the different research methods that the pilot study employed is provided.

2.7.1. User diaries

Diary keeping is an increasingly applied method to Human – Computer Interaction (HCI) research as it offers the possibility to capture user opinions and experiences in the context of actual system use and throughout the day, close in time to the phenomenon studied (Rieman, 1993[61]). A diary study is a quick and inexpensive way of obtaining real-world data about user behavior; according to Palen & Salzman (2002[62]), a diary is a non –intrusive data collection method that yields informative, naturalistic data for research in the field of HCI.

Diaries provide a record of user behavior over a period of time by requiring participants to record their experiences, usually on daily basis, with a specific system/ technology. Diaries are linked to the actual usage and experience and thus represent a more realistic and valid technique for testing the TRAINUTRI system.

The aim of the diary study in our research is to understand how TRAINUTRI is experienced and perceived by users in the context of actual use and how the system can be improved to better meet users' needs. Through the diary study, important design recommendations are expected to emerge for the upgrading of TRAINUTRI (demonstrator 2).

All participants recruited for the pilots were provided with a diary during a briefing session. In this first session, the purpose of the study and the use of the data were explained and informed consent was obtained. The participants received a notebook consisting of 2 worksheets one for each check

[61] Rieman, J. (1993). The diary study: a workplace-oriented tool to guide laboratory studies. Proceedings CHI'93, Conference on Human Factors in Computer Systems, (pp. 321- 326), New York: ACM Press.
[62] Palen, L. & Salzman, M. (2002). Voice-mail diary studies for naturalistic data capture under mobile conditions. Proceedings of CSCW '02, (pp. 87-95), New Orleans, Louisiana, USA.

point during the pilot period. The use of the diary and its content were explained in detail giving the chance to participants to express any doubts or concerns.

The fact that this study addresses issues of older people has certain implications for the use of diaries (Dickinson, Arnott et al. 2007[63]). Processing capacity, education, physical impairments and memory loss can affect the quality of the data when testing a system with older participants, while the lack of prior computer experience when testing a system with older adults often yields general, poorly articulated and non-specific data. To address these limitations, a well- structured diary worksheet was designed aiming to facilitate the recording process for inexperienced users or those facing certain limitations. The diary consisted of 2 identical worksheets in which participants recorded their experiences with TRAINUTRI in two different cases. The diary worksheet was semi-structured including both predefined fields and multiple-choice questions to simplify the process of filling-in the required information for older participants and open ended questions giving the space to participants to express their opinion and thoughts on usability aspects of My TRAINUTRI.

The data that participants recorded in the diary include among other:

- The features of TRAINUTRI that they used and the time spent;
- The tasks performed;
- Their motivation behind they use of My TRAINUTRI;
- The difficulties and usability problems experienced;
- Their perceptions about the TRAINUTRI system and its features (which features they liked/ didn't like and the reasons why);
- Their comment and recommendations about future improvements.

2.7.2 Interviews / questionnaires

Interviews and questionnaires were used at different time points of the pilots:

a) At the very beginning of the pilot phase, a preliminary interview was conducted with each participant to collect socio-demographic data and other general information such as previous experience with and ownership of technology (computers, smart phones, and internet).

b) During the pilots, participants were asked to fill-in a questionnaire (Technology Acceptance Questionnaire) in a single checkpoint at the end of the pilot period (i.e. 10th day).
This questionnaire assessed different usability and acceptance aspects of TRAINUTRI, particularly:
   - Perceived Usefulness (PU);
   - Perceived Ease of Use (PEOU);
   - Perceived Safety / Trust (PS/T);
   - Technology Self-efficacy (TSE);
   - Technology Anxiety (TA);
   - Behavioral Intention (BI).

[63] Dickinson, A., J. Arnott, et al. (2007). "Methods for human-computer interaction research with older people." Behaviour & Information Technology **26**(4): 343-352.

All 6 questionnaire worksheets are constructed according to Likert-type questions. The results that derive from these questionnaires allow the drawing of conclusions with regard to the acceptance of TRAINUTRI by end-users, while assessing the quality of the system and its features from the viewpoint of navigation, handling, etc. Participants were assisted by the research team in filling-in the questionnaire to cope with potential uncertainties about the meaning of questions or other such difficulties.

2.7.3. Research tools

Different research tools have been developed and used during the pilot phase in order to address all previously mentioned hypotheses with respect to usability and acceptance of the TRAINUTRI system. These tools are presented as follows.

A) Pilot User Profile Questionnaire (Annex II)

This tool has been applied during the preliminary interview with the user. Data collected through the User Profile Questionnaire include:

- Demographics (age, gender);
- Socioeconomic Status (occupation);
- ICT literacy (technology use, mobile phone ownership and use, etc).

B) TRAINUTRI Technology Acceptance Measurement Questionnaire (Annex III)

This questionnaire measures TRAINUTRI technology acceptance by users. It consists of 6 different worksheets related to the key constructs (variables) of the theoretical background of this study:

1. Perceived usefulness of the TRAINUTRI system (Questionnaire worksheet 01)
2. Perceived ease of use of the TRAINUTRI system (Questionnaire worksheet 02)
3. Perceived safety/ trust in the TRAINUTRI system (Questionnaire worksheet 03)
4. Technology Self-efficacy (Questionnaire worksheet 04)
5. Technology anxiety (Questionnaire worksheet 05)
6. Behavioral Intention to use TRAINUTRI (Questionnaire worksheet 06)

C) User Diary Worksheet (Annex IV)

The User Diary tool consists of 2 identical worksheets in which participants recorded their experiences with TRAINUTRI in two predefined check points (one half-way and one at the end of the pilot phase). The data recorded in the diary worksheet refer to: the features of TRAINUTRI that they used; the tasks performed; the time spent; the difficulties experienced; their perceptions about the TRAINUTRI system and its features (which features they liked/ didn't like and the reasons why); their comment and recommendations about future improvements, and other.

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ANNEX I: Consent Form

Consent Form

Project title: TRAINUTRI
Approved by European Commission

The actual legislation establishes that the person's participation in a research project and/or experimentation will require enough information about the project as well as the participant's consent to participate in the research. The objectives and characteristics about this research project are detailed below as a prerequisite to the consent's form provision and the voluntary collaboration of the participants in the research.

- OBJECTIVES: The aim of TRAINUTRI is to produce a user-friendly ICT solution that will help older people 50- 65 to adopt a healthier lifestyle by keeping them physically active and actively involved into their health maintenance and enabling them to share and exchange healthy habits related activities, experiences and knowledge .
- increasing their level of knowledge and awareness on wellness and helping them monitor their nutrition and activity daily habits

- **DESCRIPTION OF THE STUDY**: The TRAINUTRI (TRAINing and NUTRItion senior social platform) project is a European-based initiative, co-financed by the European Union within the Ambient Assisted Living Joint Programme. It has two-year duration during which time the TRAINUTRI system will be developed, tested and evaluated in real life conditions.

Participants: Older adults 50- 65 years both men and women. However, older people 65 + may also participate in this research study.

Pilot study: Pilot users will be provided with the TRAINUTRI system (My TRAINUTRI). Selected users will indicate to the researchers whether they need a compatible android phone or they already own one. The first demonstrator of the TRAINUTRI system will be tested primarily through the use of an android phone and secondary through internet (online platform). Prior to the start of the pilot, researchers will conduct a semi-structured interview with each user to collect initial information about their profile, familiarity with and use of smart phones and internet, activity etc. Participants will use the android phone for 10 days in total. Users will test the system as part of their daily life without changing their normal routines. Participants will be requested to fill in a user diary in two instances (checkpoints); when the first half finishes (5th day) and at the end of the pilot use. At the end of the pilot, users will fill in the TRAINUTRI Technology Acceptance Questionnaire to measure the level of acceptance of the new system among the target population.

The researchers will train older participants to use the android phones. Participant's experiences and level of satisfaction will be evaluated using standardised questionnaires, user diaries and semi-structured interviews.

- **SPECIFIC BENEFITS:** Promote older adults wellness by increasing their awareness on nutrition and activity health issues and helping them adopt healthier habits.

- **POSSIBLE RISKS**: Neither.

- **QUESTIONS AND INFORMATION**: Participants will receive information about all the details of the project from the research team and they can ask as many questions as they want to during the duration of the research. They will be able to leave the study at any time.

- **DATA PROTECTION**: All the registered data will be treated confidentially.

This project requires the use and manipulation of personal data that, in any case will be treat following the normative and guarantee its confidentiality. The collaboration in this project is voluntary. This information form is for the participants.

Athens (date) _____

Signed (by the senior researcher of the group asking for the permission)

……

CONSENT FORM

Mr./Mrs._____(the participant)_____

I have read the information form that investigators have given to me. A copy of this form appeared in the reverse of this document, and I have understood all its terms.

I have been informed and I had the opportunity to ask questions about the TRAINUTRI project that has been approved and granted by the European Commission.

I understand that my participation in this study is voluntary and I can leave the study when

- **I want**
- **Without explanations and/or motivations**
- **Without any negative consequences**

For all of this, I GIVE MY CONSENT to participate in this research project.

In …… _____

Signed_____(the participant)_____

ANNEX II: User profile questionnaire

PILOT USER CODE:
1. Do you own a mobile phone?
YES **NO**
2. If yes, is it a smartphone?
YES **NO**
3. If yes, which model do you own? Thanks to give the model like HTC desire, Samsung Galaxy SII, iPhone 4, …
- Android
- iPhone
- Windows Phone
Model: …….
4. Which version of Android do you use? (only if the answer of the previous question is Android)
- 1.6
- 2.01
Other (please specify) ……
5. Since how many years do you use a smartphone *(or a simple mobile phone if your answer to question 2 was no)*?
- Less one year
- 1 year
- 2 years
- 3 years
- 4 years
- Other …
6. In what context do you use a smartphone *(or a simple mobile phone if your answer to question 2 was no)*?
- At work
- For personal use
- Both
7. When you move, where do you carry your phone?
- Pocket's trousers
- Jacket pocket
- Hanging on belt
- Hand bag
- Other …
8. Same question, but when you are sitting
- Pocket's trousers
- Jacket pocket
- Hanging on belt
- Hand bag
- on a table
- Other …
9. How long your phone remains turn on?

- Always
- Switch off during the night
- Switch off during the day
- Other
10. Do you use regularly Internet?
- Very often
- Often
- Sometimes
- Seldom
- Never
11. You usually use Internet for which purpose?
- For the work
- For personal use
- Both
12. Do you use social network?
- Regularly
- Sometimes
- Seldom
- Never
13. What do you think about the social network?
Questions about the study
14. Do you have access to WIFI?
- At work
- At home
- On public place
- Rarely access to WIFI
- No access
- Other
15. What type of data package do you have?
Personal information
16. Name
17. Surname
18. Sex
19. Age
20. email
21. Profession
22. Commentary zone for all remarks and questions about the study

ANNEX III: TRAINUTRI Technology Acceptance Measurement Questionnaire

Questionnaire Worksheet: 01

01. PERCEIVED USEFULNESS (PU) of TRAINUTRI		Strongly agree		Neutral			Strongly disagree	
		1	2	3	4	5	6	7
1	Using the TRAINUTRI system improves the quality of my life							
2	Using the TRAINUTRI system gives me greater control over the status of my health							
3	TRAINUTRI enables me to monitor my physical activity and dietary habits more quickly and efficiently							
4	TRAINUTRI supports critical aspects of my life and increases the level of my daily activity							
5	With TRAINUTTRI I can understand my current status of physical activity with the percent achievement on the week							
6	The social interaction in TRAINUTRI help me keep my motivation high for a better health habits							
7	Using TRAINUTRI makes it easier to adopt healthier habits							
8	Overall, I find the TRAINUTRI system useful in my life							

Questionnaire Worksheet: 02

02. PERCEIVED EASE OF USE (PEOU) of TRAINUTRI		Strongly agree		Neutral			Strongly disagree	
		1	2	3	4	5	6	7
1	I find the TRAINUTRI system cumbersome to use							
2	Learning to use the TRAINUTRI system is easy for me							
3	Finding my way around the TRAINUTRI community is easy							
4	Interacting with the TRAINUTRI system is often frustrating							
5	The TRAINUTRI system is rigid and inflexible to interact with							
6	My interaction with the TRAINUTRI system is							

	easy and understandable							
7	It takes a lot of effort to become skillful at using the TRAINUTRI system							
8	It is difficult for me to understand my nutrition habits after using the TRAINUTRI system							
9	It is difficult for me to understand my physical activity habits after using the TRAINUTRI system							
10	Overall, I find the TRAINUTRI system easy to use							

Questionnaire Worksheet: 03

03. PERCEIVED SAFETY/ TRUST (PS/T) in TRAINUTRI		Strongly agree		Neutral			Strongly disagree	
		1	2	3	4	5	6	7
1	I believe privacy of TRAINUTRI users is protected							
2	I believe personal information stored in TRAINUTRI is safe							
3	I trust TRAINUTRI to keep participants' information secure							
4	I believe personal data recorded in TRAINUTRI are not misused in any way							
5	I believe using TRAINUTRI does not entail any risk							

Questionnaire Worksheet: 04

04. TRAINUTRI TECHNOLOGY SELF-EFFICACY		Strongly agree		Neutral			Strongly disagree	
	I feel confident . . .	1	2	3	4	5	6	7
1	Creating/ editing my profile							
2	Finding the information that I want							
3	Monitoring my physical activity performances							
4	Adding information about my daily food intake							
5	Exchanging messages with other users in the online community							
6	Using the TRAINUTRI smart-phone							

Questionnaire Worksheet: 05

05. TRAINUTRI TECHNOLOGY ANXIETY *(Based on the Computer Anxiety Rating Scale - CARS)*		Strongly agree		Neutral			Strongly disagree	
		1	2	3	4	5	6	7
1	I look forward to using the TRAINUTRI technology							
2	I do not think I would be able to learn how to use TRAINUTRI							
3	The challenge of learning TRAINUTRI is exciting							
4	I feel apprehensive about using TRAINUTRI							
5	I have difficulty in understanding the technical aspects of TRAINUTRI							
6	It scares me to think that I could cause the IT system/ smart phone to destroy a large amount of information by hitting the wrong key.							
7	Anyone can learn to use ICT technology/ TRAINUTRI if they are patient and motivated							
8	I hesitate to use ICT technology for fear of making mistakes that I cannot correct							
9	I have avoided ICT technology because it is unfamiliar and somewhat intimidating to me							
10	I feel ICT technology is necessary tool for achieving personal and educational/ professional goals							

Questionnaire Worksheet: 06

06. BEHAVIORAL INTENTION (BI) TO USE TRAINUTRI	Strongly agree		Neutral			Strongly disagree	
In the near future…	1	2	3	4	5	6	7
I intent to use the TRAINUTRI again							

ANNEX IV: User Diary Worksheet

User code:	
Date	
Please tick the applications of the TRAINUTRI system/ smart phone that you used during the previous days:	
☐ Create/ edit my profile	☐ Check if I achieve the week recommendation goals for physical activity
☐ Register information about my daily food intake	☐ Create/ update my goals
☐ Find information on a group	☐ Get/give advices and tips from/ to other users
☐ Check my physical activity performance of the day	☐ Join a group in the TRAINUTRI community
☐ Contact other users in the TRAINUTRI community	☐
Please describe briefly what you did with TRAINUTRI during the previous days (tasks that you started / completed, goals that you achieved etc).	
Have you been using TRAINUTRI every day?	☐ **Yes** ☐ **No**
If not, please explain why….	
On average, for how you long (approximately) did you use TRAINUTRI during a day?	**minutes**
Overall, how would you assess your experience with the TRAINUTRI Smartphone/ technology?	
☐ Complicated/ difficult	☐ Easy/ Undemanding
☐ Ineffective/ fruitless	☐ Effective/ useful
☐ Disappointing	☐ Motivating
☐ Boring	☐ Interesting

Please describe briefly any problems or negative experiences you encountered while using TRAINUTRI (features that you didn't like, features that you didn't find useful or didn't work well, etc)
Please describe briefly the positive experiences that you had while using TRAINUTRI (features that you liked most, things that went well, features that you found most useful, etc)
From your experience with TRAINUTRI, what do you believe should change/ be upgraded/ be improved in system design?
Any further suggestions/ recommendations that in your opinion would make TRAINUTRI better….
THANK YOU FOR YOUR PARTICIPATION!