Work Package 4

D.4.3 Test Results

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4. 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 as well as the deliverable D41. It is the result of the fourth Work Package in the project that comes natrally 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 presents the results of the pilots, grouped in three main parts according to the different tools and methods that have been used, as described previously in Part II: a) users' profile; b) acceptance of My TRAINUTRI based on the 6 different worksheets of the TAM questionnaire; and c) findings from the diary study (checkpoint 1 & 2). At the end of this section hypotheses are tested against real-world observations and evidence gathered during the pilots and implications on their verifiability or falsifiability are discussed.

Part II summarises the conclusions that can be drawn from the previous analysis and provides recommendations on how to incorporate these conclusions in the next iteration of My TRAINUTRI (2ND demonstrator and / or final product).

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

5. PART I: RESULTS

In this chapter, the data gathered from the TRAINUTRI trials are analyzed and the main findings are discussed. Results presented herein are organized according to the tools and methods used for the collection of data in the different stages of the pilots: user profile questionnaire, TAM questionnaire and User Diary Worksheets.

To this regard, the following aspects are addressed in the sections that follow:

- Overview of the TRAINUTRI pilot users profile, including information on ICT literacy ;
- User acceptance of My TRAINTRI based on the six core constructs of the TAM model that has been adopted;
- Qualitative (self-reporting) enquiry about the use of My TRAINUTRI during the period that the trials lasted (motivation, features used; hours spent, frequency of use, etc);
- Qualitative (self-reporting) enquiry about user experience with My TRAINUTRI (general assessment; positive experiences; usability problems);
- Users' suggestions and recommendations to improve user experience with My TRAINUTRI.

Participants' profile

The sample group of the TRAINUTRI pilot research was almost perfectly gender-balanced with 6 male and 4 female pilot users participating in the trials. Users represented a relatively wide range of age groups taking also into account that the target group age requirement has been expanded to include individuals below the minimum threshold of 50 years old (see 2.5 Adaptation of the users trials plan). To this end, less than 1/3 of the participants were under 45 years old, constituting the control group in our analysis. From the remaining users, individuals aged between 46 and 55 and 61 and 65 were equally represented (almost 1/3), while only one of the users belonged to the age group 56-60.

Table 1: Pilot users

User Code	Gender	Age	Profession	Country	Mobile use	Internet use
GR1	F	54	Lawyer	Greece	Yes	Yes
GR2	M	55	Retired police officer	Greece	Yes	Yes
CH1	M	47	CEO	Switzerland	Yes	Yes
CH2*	F	40	n/a	Switzerland	Yes	Yes
CH3	M	63	Retired	Switzerland	Yes	Yes
CH4	F	63	Retired	Switzerland	Yes	Yes
ES1	F	61	n/a	Spain	Yes	Yes
ES2	M	57	Metal industry	Spain	Yes	Yes
ES3*	M	26	Researcher	Spain	Yes	Yes
ES4*	M	30	Researcher	Spain	Yes	Yes
Total	M = 6 F = 4	<45=3 46-55=3 56-60=1 61-65=3	Working: 5 Retired: 3 n/a: 2	GR:2 CH:4 ES:4	Y: 100% N: 0	Y: 100% N: 0

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

As mentioned in the previous section (Part B), data about users' education, income and physical capacity was not able to be obtained. However, important information was gathered in relation to technology use (particularly focusing on the use of mobile).

Even though all users participating in the study appeared to own a mobile phone, less than half were smartphone owners, out of which the 2/3 own an Android phone and the rest a Window phone. None of the Android phone users had either the 1.6 or the 2.01 version. As expected, the rate of smartphone use was higher among control group participants than sample group 46+ users.

Regarding the length of period that the participants have been using a mobile, more than half of the responders (6 out of 10) reported long term use of mobile phone technology of at least 4 years or more, while the remaining participants indicated a shorter period of use, commonly between 1 and 2 years. Results from the pilot study reveal that though most of sample group 46+ users were not so familiar with the use of Smartphones / Android phones, they had been using simple mobile phones for a long period, longer than the one reported by control group participants.

The majority of participants appeared to use a mobile device mostly for personal reasons (57%), or alternatively for both personal and professional ones (remaining percentage – 43%). None of the respondents indicated using a cell phone use exclusively for professional purposes.

A bit more than half of the responders stated that they place the mobile device in their hand bags, followed by those who keep it in the pockets of their trousers or jacket. These numbers correspond to the participants' gender, meaning that all women use their hand bags, while most men place the mobile in their pocket.

However, when they are not on the move but sitting, the majority of responders (2/3), place their mobile on the table, even though some still leave it in their hand bag or their pocket.

During the day, all of the participants keep their phone on yet 3 out 10 users switch the mobile off for the night.

Even though internet use is also common among participants, only 1/3 of the sample population use internet either regularly, or often, while most of them just use it sometimes (>40%), or even rarely while (~28%). Regular use of internet is particularly common among younger participants, while internet usage patterns among sample group users 46+ ranges from regular to rare.

Similarly to mobile phones, internet seems to be more of a personal tool with more than 70% using internet typically for personal reasons, while the rest represent a combination of personal and professional use.

Social networks are not very popular among the sample population as most of the participating users do not really use social networks or just use them seldom. However, more than half of the responders (60%) are positively disposed towards social networks while those with more negative perceptions represent less than one third of the participants' group.

Two out of three users have Wi-Fi at home, more than 20% at work and only about 10% has access in public spaces.

As for the participant's data package, it is difficult to draw any conclusions as the vast majority did not answer the question, probably due to the fact that they did not know which data package corresponded to their phone. From those who did answer though (~28%), all of them had a data package up to 250mb.

Acceptance of My TRAINUTRI

To measure acceptance of the TRAINUTRI technology by seniors, this pilot study explored users' perceptions and attitude toward My TraiNutri according to six different constructs: Usefulness; Ease of use; Safety / trust; Self-efficacy; Anxiety; and Behavioral intention. Findings in this regard are presented below as per the sample group and the control group of this research.

i. PERCEIVED USEFULNESS (PU) OF TRAINUTRI

In the first worksheet of the "*TRAINUTRI Technology Acceptance Measurement Questionnaire",* users' perception as per the usefulness of TRAINUTRI was explored. As analyzed previously, perceived usefulness has been hypothesized to be one of the basic and important determinants of user acceptance and technology use. An individual will act upon a product based on his/her perception towards it; thus, if the product is perceived as something useful by an individual, a chance is created for that person to obtain the product and use it. Results are presented herein per group; sample group 46+ (Table 4a) and control group (Table 4b).

Perceptions as of My TRAINUTRI's usefulness vary, if we look separately at user responses in each of the variables, though in general we may recognize a somewhat positive tendency towards agreement.

Participants both from the sample group 46+ and the control group did not appear to be sure whether My TRAINUTRI could improve their lives, with the rate of disagreement being higher than the rate of agreement, which corresponded only to 20% of the whole population. Similarly, though nobody openly disagreed about the fact that My TRAINUTRI gives greater control to the user over his/her health, most of the users 46+ kept a neutral position showing again greater tendency towards disagreement than agreement. On the contrary, younger participants group leaned towards agreeing with that opinion.

On the other hand, most of the responders believe that TRAINUTRI enables them to monitor their physical activities and dietary habits more quickly and efficiently. In particular, Spanish users were generally more positive towards this presumed attribute of My TRAINUTRI compared to users from Switzerland and Greece.

Likewise, both sample group 46+ and control group users seemed to appreciate the feedback the Activity module of My TRAINUTRI provides on weekly basis for the percent achievement of the recommended goals. More than half of the participants considered it useful because it helped them gain a better understanding of the status of their health, while the remaining tended towards agreement apart from one participant from Switzerland out of the sample group 46+ who strongly disagreed with the rest of the group.

The majority of the participants agreed that My TRAINUTRI makes monitoring of physical activity and dietary patterns faster and more efficient, as well as the understanding of their current status of physical activity easier. However, they were not that sure, if My TRAINUTRI supposedly could support

critical aspects of their life and increase the level of their daily activity and definitely not positive with the statement that social interaction within the system could keep them motivated for better health habits. In relation to those two last parameters, the Swiss participants were again the ones, who openly declared their disagreement. As for control group users, they were more negative towards the fact that the system supports critical aspects of their life and increases the level of their daily activity, but more positive, compared to the sample group 46+, concerning the incentives that social interaction in My TRAINUTRI provides.

On a positive note though, the majority felt that TRAINUTRI makes it easier to adopt healthier habits and almost 1/3 of the participants found the system as something useful in their daily life; while even users with more neutral position, tended more to believe that My TRAINUTRI might be useful than the opposite. It seems however that these benefits of the system had a greater positive impact on Switzerland and Spain, compared to Greece.

Table 2: Questionnaire Worksheet 2 Perceived Usefulness of TRAINUTRI - sample group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	2	1	2	0	1	1	7
Q2	0	0	2	1	4	0	0	7
Q3	2	2	2	1	0	0	0	7
Q4	0	1	1	3	1	1	0	7
Q5	0	4	2	0	0	0	1	7
Q6	0	0	0	2	4	0	1	7
Q7	0	4	0	2	1	0	0	7
Q8	0	2	4	0	1	0	0	7

Table 3: Questionnaire Worksheet 2 Perceived Usefulness of TRAINUTRI - control group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	0	1	2	0	0	0	3
Q2	0	1	2	0	0	0	0	3
Q3	0	2	1	0	0	0	0	3
Q4	0	0	0	1	1	0	1	3
Q5	0	2	1	0	0	0	0	3
Q6	0	0	2	1	0	0	0	3
Q7	0	1	1	0	1	0	0	3
Q8	0	0	3	0	0	0	0	3

To gain a better understanding of end-users' views on My TRAINUTRI's usefulness the mean score of all items/ variables is extracted separately for each participant (Table 6). Apart from one user from the control group who clearly believed that My TRAINUTRI is useful, all other participants were not exactly convinced about the usefulness of My TRAINUTRI. However, participants scored relatively well in perceived usefulness with most of them (60%) being only marginally neutral, but with clear

tendency towards positive (values less than 3,6); percentage which corresponds to 3/4 of the sample group 46+ and 2/3 of the control group.

As it seems, the Spanish users found My TRAINUTRI more useful than Greek and Swiss participants, which may be linked to the fact that the Spanish trials started later than in the other two countries when many of the problems encountered (e.g. crashing events) had been solved. What's also interesting is that all users who seemed unable to decide (neutral assessment: 4) come from the sample group 46+.

Table 4: PU Mean score

WQ1	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
Q1	4	3	2	4	7	6	4	2	4	3
Q2	5	5	3	3	5	5	3	4	2	3
Q3	2	3	1	2	4	3	1	2	3	2
Q4	3	4	2	7	5	6	4	4	5	4
Q5	2	3	7	3	2	2	3	2	2	2
Q6	5	5	7	3	5	4	4	5	4	3
Q7	4	5	2	3	2	4	2	2	5	2
Q8	3	5	2	3	2	3	3	3	3	3
MEAN	3,5	4,1	3,25	3,5	4	4,1	3	3	3,5	2,75

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

ii. *PERCEIVED EASE OF USE (PEOU) OF TRAINUTRI*

Worksheet 2 of the "*TRAINUTRI Technology Acceptance Measurement Questionnaire*", explores the ease of use of My TRAINUTRI, which is the second key construct in the model that this study follows. Ease of use is very important, when it comes to introducing a new product to the market. If an individual has the opportunity to try the product (My TRAINUTRI) or has already obtained it, ease of use will play a significant role on whether the person will eventually decide to buy the product or correspondingly continue using it and whether he or she will suggest it to somebody else. Results are presented herein per group; sample group 46+ (Table 5a) and control group (Table 5b).

First of all, it was important to investigate, whether My TRAINUTRI was considered more of a burden by the participants - in relation to its size, weight, etc - or contrary they perceived it as a practical instrument that can be easily embedded in the user's daily life and routine. On this subject, neither Greek users nor Spanish did find the system cumbersome, however, the majority of the Swiss participants, either found it difficult to move the TRAINUTRI mobile device or leaned towards this direction (Table 5a). Despite the younger age, similar difficulties were also encountered by the control group.

When it comes to the easiness of learning the system, all participants agreed that My TRAINUTRI is quite easy to learn. However, there are certain aspects of the application that seem to have created

difficulties in the users. For example, finding your way around the TRAINUTRI community was assessed as a tricky task by 40% of users – all of them from Switzerland and Spanish. It looks like only Greeks did not face these difficulties as they were the only ones, who thought it was easy to "move around" the TRAINUTRI community. It should be mentioned that more than 25% of the participants did not answer to this question.

As for the control group, 2/3 of the younger participants did not consider the use of My TRAINUTRI in general, nor navigation in the TRAINUTRI platform, in specific that easy with most of them facing difficulties in finding their way around the online community. One would expect that My TRAINUTRI would be easier for younger adults, being more familiar with new technologies and social media. However, this also means that younger individuals have more experiences to compare with and r more knowledge about technological advances, thus having far more expectations from new products.

Apparently Spain confronted more difficulties with the system than the other two countries, as half of the Spanish users found that interaction with TRAINUTRI was often frustrating; while half of the Greek users and more than half of the Swiss thought that it was a rather easy system to interact with. As far as the control group is concerned, even though one third of the users strongly believed that the system was not frustrating to interact with, the rest were found to be more negative towards that belief.

When asked, if interaction with My TRAINUTRI is rigid and inflexible, the Spanish participants kept a more neutral position, tending more though to agree with this statement, which was also the case for the one third of the Swiss users. The rest of the Swiss sample along with the Greek users evidently had opposite perceptions on this.

The control group was split, once again, between the 1/3 of the users that did not consider the system to be rigid and the rest, who moved towards the opposite direction.

It is very interesting to notice that even though half of the participants from Spain found interaction with TRAINUTRI frustrating, they also found it rather easy and understandable, which was also the case for their fellow participants from the other two countries, who either agreed –most of them- or leaned towards agreement.

Findings recorded for the control group are also very interesting; the one third, who did not consider the system to be rigid and inflexible, at the same time did not believe that it is easy and understandable, while the exact opposite occurred for the remaining 2/3, meaning that the ones who actually found the system to be rigid, stated that it is not easy and understandable.

Furthermore, the majority of users 46+ neither believed that it takes a lot of effort to become skillful at using TRAINUTRI, nor found it difficult to understand their nutrition habits after using the system. The only ones, who disagreed with the latter, were the Swiss, constituting however a small percentage. On the contrary, the majority of the control group had opposite perceptions, meaning that they leaned towards considering My TRAINUTRI difficult to become skillful at, as well as to understand their nutrition habits.

Similarly, the Swiss sample 46+ did not appear convinced if My TRAINUTRI gives the possibility to users to easily understand their physical activity habits, while data from the Greek and the Spanish users support this perception.

Generally though, more than half of the users in the sample group 46+ that TRAINUTRI is easy to use, contrary to the control group, where only 1/3 found it to be so.

Table 5: Questionnaire Worksheet 2 Perceived Ease of Use of TRAINUTRI - sample group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	1	1	0	2	3	0	7
Q2	1	6	0	0	0	0	0	7
Q3	0	1	1	1	0	1	1	5
Q4	0	1	0	1	1	1	2	6
Q5	0	1	2	0	1	2	1	7
Q6	1	3	3	0	0	0	0	7
Q7	0	0	0	1	2	3	1	7
Q8	1	0	0	1	0	5	0	7
Q9	0	0	1	1	1	4	0	7
Q10	1	4	2	0	0	0	0	7

Table 6: Questionnaire Worksheet 2 Perceived Ease of Use of TRAINUTRI - control group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	1	1	0	0	**0**	1	3
Q2	1	**0**	0	0	1	1	0	3
Q3	1	0	0	0	2	0	0	3
Q4	0	1	1	0	0	0	1	3
Q5	0	1	1	0	0	0	1	3
Q6	1	**0**	0	0	1	1	0	3
Q7	0	0	2	0	0	**0**	1	3
Q8	1	1	1	0	0	**0**	0	3
Q9	0	0	0	1	1	**1**	0	3
Q10	1	**0**	0	1	1	0	0	3

Again here, the mean score of response items is extracted separately for each participant (Table 9). My TRAINUTRI scored rather high in Perceived Ease of Use with 70% of the population finding the application easy and undemanding. What's really interesting is that both users that expressed negative attitudes are from the control group which means either that younger users found My TRAINUTRI indeed difficult or that they thought that it ought to be easier.

Questionnaire Worksheet 2 included both positive and negative items. For consistency reasons, values of negative response items have been reversed (Table 9).

Table 7: PEOU Mean Score

QW2	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
Q1**	2	2	3	1	6	5	2	3	6	5

Q2	2	2	1	1	2	2	2	2	6	5
Q3	3	2		1	7		6	4	5	5
Q4**	2	4	1	1	1		6	3	6	5
Q5**	2	2	6	1	3	1	5	5	5	6
Q6	3	2	1	1	3	2	2	3	6	5
Q7**	2	2	1	1	4	3	3	2	5	5
Q8**	2	2	2	6	7	2	2	4	5	7
Q9**	2	2	5	4	4	3	2	2	3	2
Q10	2	2	1	1	3	2	2	3	5	4
MEAN	2,2	2,2	2,3	1,8	4	2,5	3,2	3,1	5,2	4,9

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**
****Values in items Q1, Q4, Q5, Q7, Q8 and Q9 have been reversed for consistency**

iii. *PERCEIVED SAFETY / TRUST (PS/T) IN TRAINUTRI*

Perceived safety / trust (Worksheet 3 - *"TRAINUTRI Technology Acceptance Measurement Questionnaire")* refers to the level of comfort of users. Users in general form their own perception about the security of a product and when this perception is confirmed, their trust is enhanced and consequently they are more likely to use it, particularly if the services provided are useful to them. Again here, findings are presented below per group; sample group (Table 6a) and control group (Table 6b).

Analysis of the data in this section reveals that the majority of the sample group 46+ (2/3) believe that users' privacy is protected and that personal information stored in My TRAINUTRI is both safe and not misused in any way. Apart from one user, all other responders felt that My TRAINUTRI does not entail any risk and trust it to keep their information secure.

The Greek sample was split in half between strong agreement and neutral position; trend that was steady throughout this section. On the other hand, Spanish users generally had a positive attitude towards My TRAINUTRI's safety, which was also the case for most of the Swiss users (2/3). However, one of the Swiss users did not answer any of the questions in this section explaining that there wasn't enough information (privacy indication, privacy screen, etc) on which one could base his/her judgement ("no basis for judgement").

The same trend was observed in the control group, where one of the users – again from Switzerland - did not respond to this section due to lack of information to be able to assess the system's safety.
These differences between country samples are a reminder that culture, education, income and other such factors intervene in user's perceptions and should be taken into account when interpreting results.

The above findings could be an indication that the level of awareness on and familiarity with safety issues differs from country to country. In Switzerland for example, being one of the most advanced EU countries, we may find greater public awareness on technology safety issues, thus Swiss people are more cautious, when confronted with new technologies. Opposite implications may be drawn for Greek users, yet in this case also further testing is required in order to be able to make safe conclusions.

Table 8: Questionnaire Worksheet 3: Perceived Safety / Trust (PS/T) in TRAINUTRI - sample group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations*
Q1	0	4	1	1	0	0	0	6
Q2	1	3	1	1	0	0	0	6
Q3	1	4	0	1	0	0	0	6
Q4	2	2	1	1	0	0	0	6
Q5	3	2	0	1	0	0	0	6

***Participant CH1 did not provide any answers to this whole section**

Table 9: Questionnaire Worksheet 3: Perceived Safety / Trust (PS/T) in TRAINUTRI - control group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations*
Q1	1	**0**	0	1	0	0	0	2
Q2	1	0	0	1	0	0	0	2
Q3	1	**1**	0	1	0	0	0	2
Q4	0	**1**	0	1	0	0	0	2
Q5	**0**	1	1	0	0	0	0	2

***Participant CH2 did not provide any answers to this whole section**

Again here, the mean score has been extracted for each participant to assist in our understanding of users' overall perception as of My TRAINUTRI's safety. As it seems, pilot users did not show concerns for their safety when using My TRAINUTRI. Apart from one user 46+, all other users from the sample group appeared to consider My TRAINUTRI safe, while the control group splits between neutral and positive. However, we shouldn't forget that data are missing for two participants who felt unable to provide such judgement due to the lack of information / evidence.

Table 10: PS/T Mean score

QW3	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
Q1	+	0			+	+	+	+	0	+
Q2	+	0			+	+	+	+	0	+
Q3	+	0			+	+	+	+	0	+
Q4	+	0			+	+	+	+	0	+
Q5	+	0			+	+	+	+	+	+
MEAN	1,2	4			2	2	2,4	1,6	3,8	1,6

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

iv. *TRAINUTRI TECHNOLOGY SELF-EFFICACY*

The effect of technology self-efficacy has been defined as the belief that one is capable of performing in a certain manner to attain a certain set of goals when interacting with technology. Self-efficacy in My TRAINUTRI was examined in Worksheet section 4 of the questionnaire. Results are presented as follows per group: sample group 46+ (Table 7a) and control group (Table 7b).

Data obtained from this section reveal that the majority of users were rather neutral as far as their confidence in performing certain tasks with My TRAINUTRI is concerned, slightly tending to a more positive attitude in some cases. The high rate of neutral responses might be interpreted either as avoidance to take a stand (e.g. to protect oneself from exposing what is perceived as incapability) or as indication that more facts are needed for users to make a judgement (e.g. use of My TRAINUTRI for a longer period).

However, part of the sample group clearly stated how confidence they feel in performing different tasks. Almost 30% of the sample, parted by Greeks and Spanish participants felt rather confident in creating or editing their profile, while the percentage of those who reported the opposite is a little bit lower than 15% mainly corresponding to Swiss users.

On the other hand, participants who belong to the control group seemed to be quite confident with this task, which may be explained by the fact that they are younger and thus more familiar with social networking profiles.

Apparently, finding the information that you want in My TRAINUTRI, turned to be a trickier than expected task. The vast majority (~85%) of the participants kept a more neutral position on this, yet part of the Swiss users, reported not feeling sure whether they could make it.

More or less, the same results derive when examining participants' confidence in exchanging messages with other users in the online community. Although the majority of participants maintained their neutrality, more than 30% of the sample, consisting exclusively by Swiss users, felt unsure about this task, while the rest of the Swiss participants, failed to answer to that specific question. Responses from our sample reflect actually the fact that the TRAINUTRI social networking service had a limited number of members at the time of the pilots, thus most of the pilot users did not use these features having nobody to communicate with.

On the other side, users were more self- confident as far as monitoring of physical activity performance through the activity module is concerned. More than half of the sample agreed that they feel confident in doing so on their own, while the rest remained, once again, neutral, although most of them leaned towards agreement.

Contrary perceptions have been reported on the use of the Nutrition app when adding information about the food consumption ("Eating moments"). In general, users expressed more negative views with almost half of them – mostly Spanish and Swiss users- feeling unable to add information related to daily food intake and only a small percentage close to 15% stating the opposite. These results can be easily interpreted, if we take into account that repeated failures of the Nutrition app. were reported by the participants during the trials.

Finally, more than 40% of the participants felt confident using the TRAINUTRI smartphone / android phone and even those who were more hesitant in their answers, tended to share the same perception.

As for the control group, all users showed high level of self-confidence regarding their capability to use the TRAINUTRI smartphone. Being younger, it is believed that they are more familiar with smartphone / android environments and their use.

Table 11: Questionnaire Worksheet 4: TRAINUTRI Technology Self-efficacy – sample group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	2	2	2	0	1	0	7
Q2	0	0	3	2	1	1	0	7
Q3	1	3	2	1	0	0	0	7
Q4	0	1	2	0	1	2	1	7
Q5	0	0	2	2	0	1	1	6
Q6	1	2	3	1	0	0	0	7

Table 12: Questionnaire Worksheet 4: TRAINUTRI Technology Self-efficacy – control group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	1	2	0	0	0	0	0	3
Q2	0	1	2	0	0	0	0	3
Q3	0	1	2	0	0	0	0	3
Q4	0	1	1	0	0	1	0	3
Q5	0	1	0	1	1	0	0	3
Q6	2	0	1	0	0	0	0	3

In general, participants scored relatively well in self-efficacy (either positive or tending to positive) with the exemption of on user you was found neutral and one user who had a low score, both of them belonging to the sample group 46+. As one would expect, higher scores of self-efficacy were recorded among the control group (Table 15).

Table 13: TSE Mean score

QW4	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
Q1	2	3	4	2	6	4	3	2	1	2
Q2	3	5	3	2	6	4	3	4	3	3
Q3	2	4	3	3	1	2	2	3	3	2
Q4	3	3	2	2	7	6	6	5	3	6
Q5	3	3		2	7	6	4	4	4	5
Q6	2	3	1	1	4	3	3	2	3	1
MEAN	2,5	3,5	2,6	2	5,1	4,1	3,5	3,3	2,8	3,1

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

v. *TRAINUTRI TECHNOLOGY ANXIETY*

Linked to self-efficacy is technology anxiety that was examined in Worksheet 5 of the TRAINUTRI questionnaire. Individuals with higher levels of Technology Anxiety usually use fewer technology related services, while it has been found to influence overall levels of satisfaction, intentions to use a technology related product again and the likelihood of participating in positive word-of-mouth, for those individuals who have a satisfying initial experience. In this sense, the technology anxiety worksheet sought to discover the level of anxiety of users in the TRAINUTRI technology. Results are presented below both for the sample group 46+ (Table 8a) and the control group (Table 8a).

Users participating in the trials presented in general low levels of anxiety with regard to the TRAINUTRI technology, mostly showing enthusiasm for using the system and relaxed disposition, even certainty that they would be able to learn how to use My TRAINUTRI.

Control group users, on the other hand, were generally indifferent towards the TRAINUTRI technology presented and most of them were not quite sure whether they could manage to use it.

As for motivation, only one participant from Greece seemed to find learning of TRAINUTRI exciting, as the rest of the users were neutral towards that statement. Correspondingly, one out of three control group users also viewed learning of My TRAINUTRI exciting.

Additionally, users' responses did not reveal any apprehension about using the system and generally, it looks like most of the users did not encounter many difficulties in understanding the technical aspects of My TRAINUTRI. It should be mentioned though that in this last variable, none of the Swiss participants provided an answer.

Likewise, none of the users expressed fear that s/he could cause the smartphone to destroy information by hitting the wrong key, which is consistent with the fact that most of the users did not show hesitation to use the system. Only one user from Spain seemed to hesitate to use ICT technology for fear of making mistakes, while also avoiding ICT technology which was perceived as something unfamiliar and somewhat intimidating.

Despite this small percentage of Spanish participants, who did present certain anxieties, the rest of the sample felt quite comfortable with the TRAINUTRI technology. The majority of users (6 out of 7 users in the sample group) believe that anyone can learn to use ICT technology, as long as they are patient and motivated, while in the end all of them generally felt that ICT technology is a necessary tool for achieving personal, educational and professional goals.

Concerning the control group, one out of three users revealed some level of anxiety when thinking that destruction of information could be caused due to personal fault, while not being that sure that anyone can just learn to use this type of technology, simply by being patient and motivated.

Compared to the sample group 46+, younger users constituting the control group did not find My TRAINUTRI that useful tool for achieving different goals in life.

Table 14: Questionnaire Worksheet 5: TRAINUTRI Technology Anxiety – sample group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	2	3	2	0	0	0	7
Q2	0	0	0	1	0	4	2	7
Q3	0	1	0	6	0	0	0	7
Q4	0	0	0	0	2	3	2	7
Q5	0	0	0	2	2	2	0	6
Q6	0	0	0	0	0	4	3	7
Q7	4	2	0	0	1	0	0	7
Q8	0	1	0	0	1	2	3	7
Q9	0	1	0	0	1	2	3	7
Q10	0	4	2	1	0	0	0	7

Table 15: Questionnaire Worksheet 5: TRAINUTRI Technology Anxiety – control group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	Total observations
Q1	0	0	1	2	0	0	0	3
Q2	0	0	0	1	1	0	1	3
Q3	0	1	1	1	0	0	0	3
Q4	0	0	0	1	1	0	1	3
Q5	0	1	0	1	0	0	0	2
Q6	0	0	1	0	1	0	1	3
Q7	0	1	1	0	1	0	0	3
Q8	0	0	0	0	1	2	0	3
Q9	0	0	0	1	0	1	1	3
Q10	1	0	1	1	0	0	0	3

As previously, the mean score of response items is extracted separately for each participant (Table 18). In line with the overall tendency that participants showed in the previous worksheet (Technology self-efficacy), pilot users demonstrated low levels of technology anxiety. The majority of users both from the sample group 46+ and the control group did not show any anxiety at all, while the remaining scored just slightly above 3.

Questionnaire Worksheet 5 included both positive and negative items. For consistency reasons, values of negative response items have been reversed (Table 18).

Table 16: TA Mean score

QW5	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
Q1	2	4	2	4	3	3	4	3	4	3
Q2**	2	2	1	1	4	1	2	2	4	3
Q3	2	4	4	4	4	4	4	4	3	2
Q4**	2	2	1	1	2	1	3	3	4	3

Q5**	2	3			2	4	4	3	6	4
Q6**	2	2	1	1	2	1	2	1	5	3
Q7	2	5	2	3	1	1	1	1	5	2
Q8**	2	3	1	2	2	1	6	1	2	3
Q9**	2	3	1	2	2	1	6	1	1	4
Q10	2	3	2	3	3	4	2	2	1	4
MEAN	2	3,1	1,5	2,1	2,5	2,1	3,4	2,1	3,5	3,1

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**
****Values in items Q2, Q4, Q5, Q6, Q8 and Q9 have been reversed for consistency**

vi. BEHAVIORAL INTENTION (BI) TO USE TRAINUTRI

Behavioral intention indicates whether an individual is ready or not to perform a specific behavior. In this sense, Questionnaire Worksheet 6 examined users' intention to use My TRAINUTRI in the future. Results are presented herein both for the sample group 46+ (Table 9a) and the control group (Table 9b).

Almost one third of the participants (~28,5%) expressed their intention to use TRAINUTRI again, while the rest kept a more neutral position, with a positive disposition though, which was also the case for the control group. Even though not definite,

Table 17: Questionnaire Worksheet 6: Behavioral Intention (BI) to use TRAINUTRI – sample group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	TOTAL observations
Q1	0	2	5	0	0	0	0	7

Table 18: Questionnaire Worksheet 6: Behavioral Intention (BI) to use TRAINUTRI – control group

	F(1)	F(2)	F(3)	F(4)	F(5)	F(6)	F(7)	TOTAL observations
Q1	0	0	3	0	0	0	0	3

vii. OVERALL TAM SCORES

Looking into the overall score of each participant in all 6 worksheets constituting the TAM questionnaire (Table 21) adds substantially to our understanding of the level of acceptance of My TRAINUTRI among end-users (sample group 46+ and control group participating in the TRAINUTRI pilot).

Participants' scores ranged from 2,2 (lower) to 3,6 (higher) with sample group 45+ users showing greater acceptance of My TRAINUTRI (mean score of the whole group: 2,8) than the control group (mean score of the whole group: 3). Most of the users are close to acceptance – being marginally

neutral and showing clear tendency towards a positive attitude - but not yet completely there which implies that certain improvements should be introduced to My TRAINUTRI before launching it to the market. Data gathered from the diary study (presented as follows) are expected to shed light into the areas – features of My TRAINUTRI that need upgrading.

Taking into consideration that pilot users tested just the first demonstrator of My TRAINUTRI these findings suggest a first good starting point for My TRAINUTRI that might have good predictions of gaining its place in the market, provided that all necessary improvements have been applied first.

Table 19: Overall TAM score per participant

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
QW1 (PU)	3,5	4,1	3,25	3,5	4	4,1	3	3	3,5	2,75
QW2 (PEOU)	2,2	2,2	2,3	1,8	4	2,5	3,2	3,1	5,2	4,9
QW3 (PS/T)	1,2	4			2	2	2,4	1,6	3,8	1,6
QW4 (TSE)	2,5	3,5	2,6	2	5,1	4,1	3,5	3,3	2,8	3,1
QW5 (TA)	2	3,1	1,5	2,1	2,5	2,1	3,4	2,1	3,5	3,1
QW6 (BI)	2	3	2	3	3	3	3	3	3	3
MEAN	2,2	3,3	2,3	2,5	3,4	3	3	2,7	3,6	3
TAM SCORE	+	+	+	+	+	+	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

3. User Diary

User diaries were selected as a self-reporting method to measure user experience with My TRAINUTRI over a 10-day period that each trial lasted[1]. Even though, initial intention was to collect data on daily basis, the idea was rejected due to certain doubts that the Swiss side expressed. In view of this, two different checkpoints were selected for data collection; one half-way the trial and one at the end.

Data obtained through the diary study focused on (a) which applications the users had been using; (b) why (motivation – reasons behind the use); and (c) for how long; (d) how they would assess their experience with My TRAINUTRI; (e) what difficulties they might have encountered (usability problems – negative experiences); (f) positive experience they might have had, as well as (g) their suggestions on possible changes/ improvements/ upgrades in My TRAINUTRI and (h) general recommendations. Results are presented hereinafter for each worksheet separately.

i. Diary worksheet 1 (half-way)

The User Diary Worksheet 1 was given to the participants to fill out, halfway in the pilot phase, in order to obtain information related to the abovementioned parameters.

It should be mentioned that all the Swiss users of the sample, decided not to fill in the Diary at that point. but only once at the end of the pilot phase, so we have no picture of what they thought about TRAINUTRI in the middle of the pilot phase and whether their attitude changed.

Hence, findings reported below as per the first half of the trial correspond only to Greek and Spanish pilot users, while results related to the control group are rather weak taking into account that lack of data from the Swiss participants results to a two-member control group.

a. Applications used

During the first half of the trial, all participants from Greece and Spain showed interest in creating/editing their profile, registering information about their daily food intake and checking their physical activity performance with My TRAINUTRI during the day.

Contacting other users was low in users' preferences with only half of Greek sample presenting any interest in this feature. It should be mentioned that the TRAINUTRI community (social networking services of My TRAINUTRI) featured only few members and the time, which limited users' opportunities for social interaction.

Similarly, features such as checking the achievement level of week recommendation goals for physical activity, finding information on a group and even joining a group in the TRAINUTRI community were partially used, but only by Spanish users (corresponding to 50% of the Spanish sample).

[1] In some cases the duration of the trials in Greece and Switzerland was extended to compensate for the days lost due to system failure during the first weekend from the commencement of the trials.

No participant spent any time creating or updating his/her goals or giving advice and tips to other users.

As far as participants in the control group are concerned, interest was mainly shown for creating/editing their profile, checking the physical activity performance of the day and contacting other users. Registering information about their daily food intake and joining a group were also reported, to less extent though.

b. *Motivation / reasons for using the TRAINUTRI system*

Motivation behind the use of My TRAINUTRI laid both on physical and nutrition issues, while for more than half of the sample, social networking was also part of the reasoning (registering and editing their profile, interacting with the social network / contacting other users). The same exact reasons were also recorded for the control group.

c. *Use of TRAINUTRI*

All (Greek and Spanish) pilot users used My TRAINUTRI on daily basis with Greeks spending on average 30-60 min per day, while Spanish users were split between the two edges, 0-30 min and more than 3hrs.

Use of My TRAINUTRI by the control group remained at low levels with an average duration of 0-30min on daily basis.

d. *Assessment of experience with TRAINUTRI*

As part of the Diary Worksheet, users were asked to assess their experience with My TRAINUTRI during the first half of the trials. Users were able to choose more than one item from a predefined list. It seems that despite the problems encountered during the trial (e), most of the users from Greece and Spain found My TRAINUTRI easy and undemanding, as well as effective/useful, while half of them found it interesting and only one user motivating. The only negative account to this regard came from a Greek user who assessed My TRAINUTRI as boring. It should be mentioned here that the same person also considered it interesting, which is rather contradictory.

Concerning the control group's experience with My TRAINUTRI during the first half, both users agreed that it is motivating and interesting. However, they had opposite opinions as far as complexity and effectiveness is concerned; i.e. one of the younger users found My TRAINUTRI complicated and ineffective, while the other easy and effective.

e. *Usability problems/negative experiences*

As far as negative experiences and problems encountered during the first half are concerned, almost all users reported facing application crashing events and functionality issues related mainly to the Nutrition module and the social networking service.

Complexity issues, as well as content related shortcomings were also reported by part of the Spanish sample linked in all cases to the use of the Nutrition module (e.g. "the nutrition part was difficult to use"; "incomplete content of nutrition features"). Apart from the above, part of the Spanish users

also referred to the limited opportunities for interaction that the TRAINUTRI community offers due to the low number of users – registered members at the time of the trials.

It is worth mentioning that only one user from Greece didn't report any problems or negative experiences while using TRAINUTRI. This could mean either that the user was not so strongly engaged in the use of My TRAINTURI as maybe the other users were or that the problems that s/he encountered were not considered important enough to report them.

Looking into the control group, we find common problems with those that the rest of the sample faced; negatives experiences reported by the control group had to do exclusively with application crashing events and functionality issues.

f. Positive experiences

Monitoring of physical activity via the activity module (ALE app) gathered by far most of the positive 'votes' among the sample group 46+ with almost everyone indicating having a positive experience with this feature. Apart from one user who reported having positive experiences with both the nutrition and physical activity monitoring modules, there was no other indication of positive experience with the nutrition app. This is easily explained by the fact that most of the problems that users encountered relate to the nutrition module.

Positive comments on the Nutrition application came only from the Spanish side, while Greek users did not seem to be so fond of the specific features of My TRAINUTRI.

Other aspects of My TRAINUTRI that have been positively assessed by part of the sample group include the social networking features of My TRAINUTRI and its ease of use, while one of the users also indicated that if the TRAINUTRI community had more users, it would be more motivating to exercise oneself.

More practical aspects of the system, such as the easy initial steps for installing and using the application, as well as the fact that the integration with the web based service is quite simple, seemed to have drawn all the positive votes of the control group.

g. Changes/Improvement/Upgrade of the system design

Additionally to the above items, the Diary Worksheet provided space to the participants to input on possible changes / improvements/ upgrades in My TRAINUTRI that they would recommend and/ or consider necessary based the experience they had.

Apart from one user who kept a neutral attitude throughout the first diary record, all other users felt that certain aspects of My TRAINUTRI should be improved and/ or upgraded. Almost all users pointed out that a more user friendly design is needed to improve user experience with My TRAINUTRI. Specific suggestions from the participants include the need for better configuration within the nutrition features, as well as for design of a more attractive user interface. These results represent both the Greek and the Spanish users. However, the Spanish users also indicated functionality aspects of My TRAINUTRI that need improvement mostly focusing on the performance of the nutrition module, as well as the insufficient translation of some modules in Spanish.

Similar are the views of the control group who identify functionality issues as the first priority in terms of improved system design followed by a more user friendly environment.

h. Suggestions/Recommendations

Similar to the above were the suggestions provided by users also in this section. Once again, participants from Greece stressed out the need for a more user friendly environment, while the Spanish users were split between improved functionality issues (esp. of the nutrition features) and increased interactivity in the TRAINUTRI community (i.e. increased number of users).

Recommendations from the control group present some interest as younger users seem to have focused on more practical aspects. To this end, two are the issues that should be addressed in order to improve user experience with My TRAINUTRI; the high battery consumption and the confusing user interface of the web service.

ii. Diary worksheet 2 (end of trial)

The User Diary Worksheet 2 was handed out to the participants at the end of the trials in order to reflect experience with My TRAINUTRI as users became more familiar with the use of the application and compare findings with those deriving from User Diary Worksheet 1. The structure of Diary Worksheet 2 followed the same logic as the first worksheet analyzed before and information gathered is grouped alike according to 8 sub-categories. Results presented below reflect all three countries participating in this pilot study.

a. Applications used

Overall, the majority of the Greek and Spanish participants (2/3) - both from the sample group 46+ and the control group - started using more features of My TRAINUTI during the second half compared to the first. However, no conclusions can be drawn for the Swiss sample.

In the second half of the trials, monitoring of physical performance of the day ranked higher in user preferences than any other feature of My TRAINUTRI with all participants from Greece, Spain and Switzerland using the specific module.

Even though, Greek and Spanish participants continued creating/editing their profile in the TRAINUTRI platform at the same rate, its use dropped compared to Diary Worksheet 1 due to the complete lack of interest that the Swiss users showed in social networking features (profiling, checking / joining groups).

Likewise, the percentage of those registering information about their daily food intake dropped as only one out of 4 Swiss users showed some interest in this feature, while the rate of pilot users

contacting other users in the TRAINUTRI community fell to zero as no one used it during the second half.

Interestingly enough, features such as creating/updating one's goals and giving advice and tips to others remained as indifferent as in first Diary Worksheet with no one form the study participants using them. The fact that

The entry of the Swiss sample was basically recorded only in the fields of registering information about one's daily food consumption and checking daily physical activity performance, as well as the achievement level of weekly recommendation goals. It should be noted that Swiss users showed a clear preference to physical activity related tasks with half of the Swiss participants using solely these features of My TRAINUTRI and nothing more. In fact, their entry in this second part of the pilots marked a substantial increase in checking the achievement level of weekly recommendation goals for physical activity, where the rate doubled. However, this increase in not merely attributed to the Swiss sample as Greek users also gained interest in this task contributing that way to the recorded increase in the usage rate. Other than that, Greek participants maintained most of their positions, apart from completely losing interest in contacting other users in the TRAINUTRI community.

Despite the lack of interest in social networking features from Switzerland, their use partially increased due to the greater interest that Spanish users showed in finding information on groups in the TRAINUTRI community.

The control group also presented variations compared to Worksheet 1 as use of applications related to finding information on a group and checking the achievement of weekly recommendation goals were recorded for the first time.

Similarly to the sample 46+ group, the control group also dropped its interest in creating/editing the user profile and contacting other users in the TRAINUTRI community. Correspondingly, the percentages for joining a group increased, even though slightly, while there was no interest shown for creating or updating goals, as well as for giving advice to others.

On the contrary, interest in checking the physical activity performance of the day was reduced among control group users, while the registration of information about the daily food intake was increased.

b. Motivation / reasons for using TRAINUTRI system

Again here, motivation behind the use of My TRAINUTRI concerned both physical activity- and nutrition-related issues for the majority of the sample 46+ group. However, physical activity issues stood also alone as a reason to use My TRAINUTRI; this shift is attributed to the interest that most of the Swiss users (2/3 of the Swiss sample 46+ group) developed in this respect. Nutrition related issues as a standalone reason never appeared in this second phase of the trials as was also the case in the first half.

Consistent to the results of Worksheet 1, Spanish users maintained their interest in social networking features of My TRAINUTRI, in general and the profiling features, in particular. Apparently Switzerland was also using the system for some other reasons, which were never specified though.

The control group followed the same trend as is the case for the sample 46+ group showing increased interest only in physical performance issues.

c. *Use of TRAINUTRI*

Apart from one user from Spain, all other participants continued to use My TRAINUTRI on a daily basis. It should be noted that according to the user from Spain who stood out, daily use of My TRAINUTRI was not possible because the mobile phone was running out of battery very quickly,

Compared to first Diary Worksheet, there is a steady increase in the number of users who spend at least one to three hours or more with My TRAINUTRI, most of who usually use it for more than three hours during a day. This increase is attributed both to the entry of the Swiss users and the increased interest that part of the Greek sample 46+ showed in using the system (from 30-60 min to 1-3 hrs). While the rate of 30 – 60 min use dropped, there is still a more or less steady percentage of users who did not spend more than 30 min per day.

Interestingly enough, the trend in the control group remained the same with all participants using My TRAINUTRI for a minimum duration of 0-30 min (per day).

d. *Assessment of experience with TRAINUTRI*

Participants' responses in assessing their experience with My TRAINUTRI fall within the same range as in the first half of the pilot. However, certain variations do exist; most importantly, there is shift of the population from an easy and undemanding experience during the first half to an interesting experience during the second half. This shift corresponding to almost 1/3 of the sample population is once again attributed to the entry of the Swiss users.

Pilot users continued to consider My TRAINUTRI easy and undemanding, though to a smaller percentage, while the number of users who found the system motivating doubled due to the Swiss input.

Apparently the TRAINUTRI experience was still considered effective/useful by part of the sample 46+, yet the rate dropped by 50%, both because user's opinion shifted and the number of users participating in the second Worksheet increased.

For a small percentage, experience with My TRAINUTRI was also described negatively; though "boring" disappeared from the list during the second half of the trials, "disappointing" emerged within the Spanish group.

Even after the second half of the pilot, the control group still thought of user experience with My TRAINUTRI as motivating, while it looks like it became much less interesting.

Opinions within the control group shifted both in a positive and negative way; while My TRAINUTRI was seen as more effective and less ineffective as the trails reached their end, at the same time it was also considered more complicated rather than easy and undemanding.

e. *Usability problems/Negative experiences*

Though problems with system failures and functionality problems continued to bother participants during the second half of the trials, the percentage dropped. Again here, unexpected crashing events and failure of the nutrition module were mostly reported by the users ("nutrition app fails to start"; "in case of error input you cannot edit the information – i.e. meals"). Consistent with the first Worksheet is also the rate of the users who experienced difficulties in using the nutrition module, either because it was too complex, or because the content was too poor.

Other types of problems equally caught the attention of users also in this second phase, such as the limited opportunities for interaction that the social networking service offered due to the small number of users (issue that was also addressed in Worksheet 1). However, in this second period, the psychological aspects of user interaction with My TRAINUTRI were also considered with one user reporting that the low level of activity that the application recorded caused him/her frustration.

Prevalence of functionality problems similar to above (e.g. crashing events) remained high within the control. Yet, complexity and other types of problems such as the bulky size of the mobile device were also added in this second half.

f. Positive experiences

As far as positive experiences with My TRAINUTRI are concerned, it seems that the opportunity to monitor one's physical activity remained high in users' preferences. Though, Greece stopped feeling that enthusiastic about the specific feature that space was covered and surpassed by Switzerland increasing its ratio among the population group.

Likewise, the percentage of those who appreciated the fact that they could monitor both their physical activity and nutrition habits with My TRAINUTRI increased by 50%. On the contrary, the rate of users indicating other aspects of My TRAINUTRI as being positive – such as social networking- dropped by 25% simply because the Swiss participants didn't show any particular interest in them.

Results from the control group are closer this time to those of the sample group 46+. In this case also, monitoring physical activity performance prevailed among the control group as a standalone action, followed by monitoring both physical activity and nutrition habits.

Apparently, the nutrition-related features of My TRAINUTRI did not drag any particular attention, either from the sample 46+ or from the control group.

g. Changes/Improvement/Upgrade of the system design

Suggestions for improved functionality of My TRAINUTRI prevailed once again in the second Worksheet as was also the case in the first half of the pilot; suggested improvements / upgrades mostly focus on the Nutrition app (ranging from general suggestions, such as the prevention of crashing events, to more specific ones, such as the improved quality of nutrition related content and the use of grams when registering daily food intake).

Although, the percentage of users who indicated that more user friendly design solutions should be introduced to the application, dropped, a steady part of the sample 46+ – represented by the Greek users – insisted on this suggestion even after the second half of the trials had ended.

In this second Diary Worksheet, users suggested also possible improvements in other, more specific, areas, such as:

- the possibility to place the mobile elsewhere, apart from the pocket of the trouser
- the addition of recommendations on recipes
- presentation of the daily physical activity performance results also in graphs

Similar are the suggestions made by the control group users who also focused on the nutrition related features of My TRAINUTRI both in terms of improved functionality and environment and increased easiness / less complexity.

h. Suggestions/Recommendations

In this last section, Swiss participants did not provide any input, thus findings correspond only to Greek and Spanish users.

As far as the rest of the users are concerned, they repeated more or less the same comments and suggestions mentioned above (g), indicating additionally though the need to attract more users in the TRAINUTRI community so to make the application more motivating.

As for the control group, suggestions remained the same as in the first half of the trial, still focusing on the fact that the battery consumption of the system should be lower.

iii. Implications on the research hypotheses

This section examines the validity of the research hypotheses outlined in Part A. In this respect, the relationship between different constructs (see 1.3.1) is crosschecked based on the data gathered from the pilot users. It is accepted the size of our size and the amount of data gathered are too small to determine whether our results are statistically significant and thus apply statistical tests to evaluate the relations between our variables. In this respect, no safe conclusions can be drawn as of the verifiability and falsifiability of our hypotheses. However, even though data gathered during the TRAINUTRI pilot cannot provide strong evidence towards the acceptance or rejection of the research hypotheses, certain implications emerge, if we look at the recorded tendencies of the sample population.

First we examine, if the users are positively or negatively disposed towards TRAINUTRI with respect to its usefulness, ease of use, the technology itself, etc. To do so, we look at each pilot user's responses per construct separately; each response is given either a positive or a negative sign/symbol; tendency towards agreement (rate ≤3,6) is recorded as agreement, while tendency towards disagreement (rate ≥4,6) is perceived as disagreement.

≤3,6: tendency to positive: +
≥4,6: tendency to negative: -

Whether a response tends to be positive or negative is always defined in relation to the type of question – statement to which the user has responded (e.g. positive vs negative statement). From the combination of the different items under each construct, the general tendency of the user is derived.

Then, the relationships between the different constructs are crosschecked; as stated in the previous part, not all hypotheses can be examined due to unavailability of certain categories of data. Information about users' education, income and physical capacity was not able to be gathered; yet, data on technology use, ownership etc do exist and are considered part of the construct Socio-Economic Status (SES).

In each table the following symbols appear:

+ : positive
- : negative
0 : neutral

Below we look at each hypothesis separately.

3.4.1 Hypothesis 1: PU - BI

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

Table 20: PERCEIVED USEFULNESS (PU)

QW1	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
MEAN	3,5	4,1	3,25	3,5	4	4,1	3	3	3,5	2,75
PU	+	0	+	+	0	0	+	+	+	+

≤3,6: tendency to positive: +
≤4,6: tendency to negative: -

More than half of the participants (7/10) found TRAINUTRI useful, while the remaining 4 users split between neutral and negative perceptions. The majority of participants 46+ (4 out of 7) showed a positive tendency, two times more that those who had more of a negative impression about the usefulness of My TRAINUTRI.

No negative observations appear in the control group with 3 out of 3 participants showing positive disposition towards My TRAINUTRI's usefulness.

Table 21: PU - BI relationship

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
PU	+	0	+	+	-	0	+	+	+	+
BI	+	+	+	+	+	+	+	+	+	+

Examination of users who showed positive tendency toward PU of My TRAINUTR reveals that all of them expressed the intention to use TRAINUTRI again. This finding implies that a user is more likely to use TRAINUTRI again, if s/he believes that it is actually useful, thus our hypothesis seems to be acceptable (to the extent that we are able to draw any conclusion). Yet again, users who indicated either neutral or negative inclination also expressed a positive tendency their intention to use TRAINUTRI in the future, which means that further testing is required for the acceptance of this hypothesis.

3.4.2 Hypothesis 2: PEOU – BI

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

Table 22: PERCEIVED EASE OF USE (PEOU)

QW2	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
MEAN	2,2	2,2	2,3	1,8	4	2,5	3,2	3,1	5,2	4,9
PEOU	+	+	+	+	0	+	+	+	-	-

≤3,6: tendency to positive: +
≤4,6: tendency to negative: -

7 out of 10 users found the TRAINUTRI system easy in its use. Interestingly enough, both users with negative disposition belong to the younger group (control group). One would expect that younger users would face less difficulty in using TRAINUTRI, thus being more positive towards its ease of use. However, young persons are more familiar with new technologies, therefore having higher expectations from new products. This suggests that youngsters use different criteria for the evaluation of TRAINUTRI than seniors that should be taken into account, if the application is to be adapted to the needs of younger segments of the population in the future.

Table 23: PEOU – BI relationship

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
PEOU	+	+	+	+	0	+	+	+	-	-
BI	+	+	+	+	+	+	+	+	+	+

Again here, all users positively disposed towards My TRAINUTRI's ease of use responded that they intend to use the application again. Even though this reflects to some extent the validity of the second hypotheses, the fact that the remaining two users gave the same answer implies that the relationship of the two constructs should be further tested on a wider scale.

3.4.3 Hypothesis 3: PU – PEOU

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

Table 24: PU-PEOU

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
PU	+	0	+	+	-	0	+	+	+	+
PEOU	+	+	+	+	+	+	+	+	-	-

A positive relationship between perceived ease of use and usefulness of TRAINUTRI does exist for half of the sample population (5 out 10 participants, of which only one belongs to the control group). As for the other half, 3 participants found TRAINUTRI easy to use yet not necessarily useful (1 participants was negatively disposed towards TRAINUTRI usefulness, while two were neutral), while the remaining two participants despite believing that use of TRAINUTRI was not easy they still

considered it useful. These differences in the other half of the sample imply that even though ease of use might play a significant role in one's perception as of the system's usefulness, it can't stand alone as the only determining factor, which means that other factors seem to take also effect in this relationship.

3.4.4 Hypothesis 4: PS/T – PU

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

Table 25: PERCEIVED SECURITY/ TRUST (PS/T) IN TRAINUTRI

QW3	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
PS/T	+	0			+	+	+	+	0	+
BI	+	+	+	+	+	+	+	+	+	+
MEAN	1,2	4			2	2	2,4	1,6	3,8	1,6
PS/T	+	0			+	+	+	+	0	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**
****Participants CH1 and CH2 did not provide any answers to this whole section**

≤3,6: tendency to positive: +
≤4,6: tendency to negative: -

Overall, respondents (8 participants due to the lack of data from the two Swiss users) found My TRAINUTRI safe to use with only two users being neutral and all other positively disposed towards My TRAINUTRI's security and trust in.

Table 26: PS/T - PU

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
PS/T	+	0			+	+	+	+	0	+
PU	+	-	+	+	-	0	+	+	+	0

Responses from pilot users do not reveal a strong relationship between perceived trust in and usefulness of TRAINUTRI. A positive relationship between the two constructs applies only to 3 participants who both appeared to trust TRAINUTRI and also found it useful. The remaining 5 users present mixed perceptions that create doubts as for the validity of the hypothesis (no conclusions can be drawn for the two participants who didn't respond to the PS/T questionnaire).

3.4.5 Hypothesis 5: PS/T – BI

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

Table 27: PS / T - BI

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

Contrary, perceived security – trust in TRAINUTRI seems to have a direct impact in one's intention to use TRAINUTRI in the future. All participants who expressed trust in TRAINUTRI stated that they intend to use the system again. However, this is also the case for the two participants who were found neutral when it comes to security – trust in TRAINUTRI (one from the sample group 45+ and one from the control group).

3.4.6 Hypothesis 6: TSE – PEOU

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

Table 28: TRAINUTRI Technology Self-efficacy (TSE)

ITEM	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
MEAN	2,5	3,5	2,6	2	5,1	4,1	3,5	3,3	2,8	3,1
TSE	+	+	+	+	-	0	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

≤3,6: tendency to positive: +
≤4,6: tendency to negative: -

Apart from two participants who were negative and neutral respectively, all other users presented high self-efficacy as of the TRAINUTRI technology. Based on the literature, we would expect that users from our sample group 46+ would show lower levels of self-efficacy. However, here we should take into account that the target group of TRAINUTRI belongs to the young old and they could even be considered middle aged instead of seniors, as well as the fact that all participants were using mobile phones (not necessarily android though) before they start using My TRAINUTRI.

It is worth noting that all participants from the control group showed high self-efficacy in My TRAINUTRI that can be explained by the greater level of familiarity and comfort that younger adults commonly have when it comes to new technologies similar to the one that TRAINUTRI is built on (i.e. android phones, web based social networking platforms, etc). These findings are consistent with the belief that the younger an adult is the higher his/ her self-efficacy in technology is expected to be.

Table 29: TSE - PEOU

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
TSE	+	+	+	+	-	0	+	+	+	+
PEOU	+	+	+	+	+	+	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

A clear positive relationship between TRAINUTRI technology self-efficacy and perceived ease of use exists with 8 out 10 participants having high self-efficacy and at the same time perceiving My TRAINUTRI easy in its use.

3.4.7 Hypothesis 7: TSE – BI

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

Table 30: TSE - BI

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
TSE	+	+	+	+	-	0	+	+	+	+
BI	+	+	+	+	+	+	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

Again here, high self-efficacy seems to have a positive effect to participants' intention to use the application in the future. As in the previous case, 8 out 10 participants who have high self-efficacy stated that they intend to use My TRAINUTRI again.

3.4.8 Hypothesis 8: Technology Anxiety – TSE

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.*

Table 31: TRAINUTRI Technology Anxiety (TA)

ITEM	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
MEAN	2	3,1	1,5	2,1	2,5	2,1	3,4	2,1	3,5	3,1
TA	+	+	+	+	+	+	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

≤3,6: tendency to positive: +
≤4,6: tendency to negative: -

All study participants (10 out of 10 users) showed low levels of technology anxiety as far as the TRAINUTRI technology is concerned. Though evidence from the literature suggest that older people are more prone to higher levels of technology anxiety, the fact that all pilot users in this study were already familiar with the use of mobile phone before the start of the trials has probably played a significant role in the recorded levels of anxiety.

Table 32: TA - TSE

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
TA	+	+	+	+	+	+	+	+	+	+
TSE	+	+	+	+	-	0	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

Indeed the negative relationship between Technology Anxiety and Technology Self-efficacy seems to be verified by participants' responses. With all users showcasing low technology anxiety, only two of

them do not present high self-efficacy. Thus we presume that if participants had high level of technology anxiety, their self-efficacy would be significantly lower.

3.4.10 Hypothesis 09: Gender – BI

***H9**: Males will have higher behavioral Intention on using the TRAINUTRI technology than females.*

Table 33: Gender - BI

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
GENDER	F	M	M	F	M	F	F	M	M	M
BI	+	+	+	+	+	+	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

No distinction between male and female participants can be made as users of both genders showed a behavioral intention to use My TRAINUTRI in the future.

3.4.10 Hypothesis 10: Functional capacity – Technology Anxiety & Self-efficacy

Not tested

3.4.11 Hypothesis 11: SES

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

'*Socio Economic Status*' is determined by a three-fold construct consisting of education, income and ICT literacy. The first two types of data were not able to be collected, thus there is no clear implication as far as the relationship of SEE and Behavioral Intention is concerned. Yet, data collected on users' ICT literacy may provide some evidence on users' intention to use My TRAINUTRI in the future.

Table 34: ICT Literacy - BI

CONSTRUCT	GR1	GR2	CH1	CH2*	CH3	CH4	ES1	ES2	ES3*	ES4*
ICT	+	+	+	+	+	+	+	+	+	+
BI	+	+	+	+	+	+	+	+	+	+

***Participants marked in red, constitute the control group (1 from Switzerland, 2 from Spain)**

The fact that all study participants were familiar with the use of technology and especially mobile phones seems to have played a major role in their intention to use My TRAINUTRI again (10 out of 10 participants).

3.4.12 Overview of hypotheses tested

The following table (Table 31) provides an overview of the hypotheses that have been tested with regard to the implications that come out from this study and related recommendations.

Table 31: HYPOTHESES TESTED

H	Construct 1	Construct 2	Relation	Implications on…		Recommendations
01	PU	BI	+	√	Acceptance	*Further testing*
02	PEOU	BI	+	√	Acceptance	*Further testing*
03	PEOU	PU	+	√	Acceptance	*Further testing*
04	PS/T	PU	+	x	Rejection	*Further testing*
05	PS/T	BI	+	√	Acceptance	*Further testing*
06	TSE	PEOU	+	√	Acceptance	*Further testing*
07	TSE	BI	+	√	Acceptance	*Further testing*
08	TA	TSE	-	√	Acceptance	*Further testing*
09	Gender	BI	M ⇧ / F ⇩	x	Rejection	*Further testing*
10	Decreased functional capacity	TA	+	?	Not tested	*n/a*
		TSE	-	?	Not tested	*n/a*
11	High SES	BI	+	?	Not tested	*n/a*
11*	ICT Literacy	BI	+	√	Acceptance	*Further testing*

Returning to the hypotheses posed at the beginning of this study, it is now possible to state that implications on acceptance arise for a number of relationships initially identified within this work without however being able to make safe conclusions on any of these assumptions prior to further testing (due to the limitations to which this research is subject). To the extent that the present study allows us, we come to an understanding of which are the factors that play a determining role in the adoption of My TRAINUTRI and how are they associated to behavioral intention to use the new application.

Taken together, our findings suggest a positive role of perceived usefulness and perceived ease of use – the two key constructs of the TAM model that our study employed- in promoting behavioral intention to use My TRAINUTRI. Therefore we may accept that the more useful My TRAINUTRI is perceived by an adult the more likely s/he is to use it. Similarly, greater perception of ease of use leads to greater intention to use My TRAINUTRI. Perceived ease of use is, in turn, found to have a

causal effect on perceived usefulness of My TRAINUTRI, which means that the easier My TRAINUTRI is felt the more useful is perceived, inducing a stronger intention to actually use the system. According to participants' input, My TRAINUTRI's ease of use was mainly attributed to the easy installation / configuration steps and the little effort, if not none, that monitoring of physical activity required.

Perceptions of safety and trust in using My TRAINUTRI also turned out to be strong drivers of acceptance confirming the assumption that perceived safety / trust has a direct positive influence on an adult's intention to use of My TRAINUTRI. Even though perceived safety/trust is found to have a direct control on behavioral intention, the positive relationship that it was expected to have with perceived usefulness is not validated.

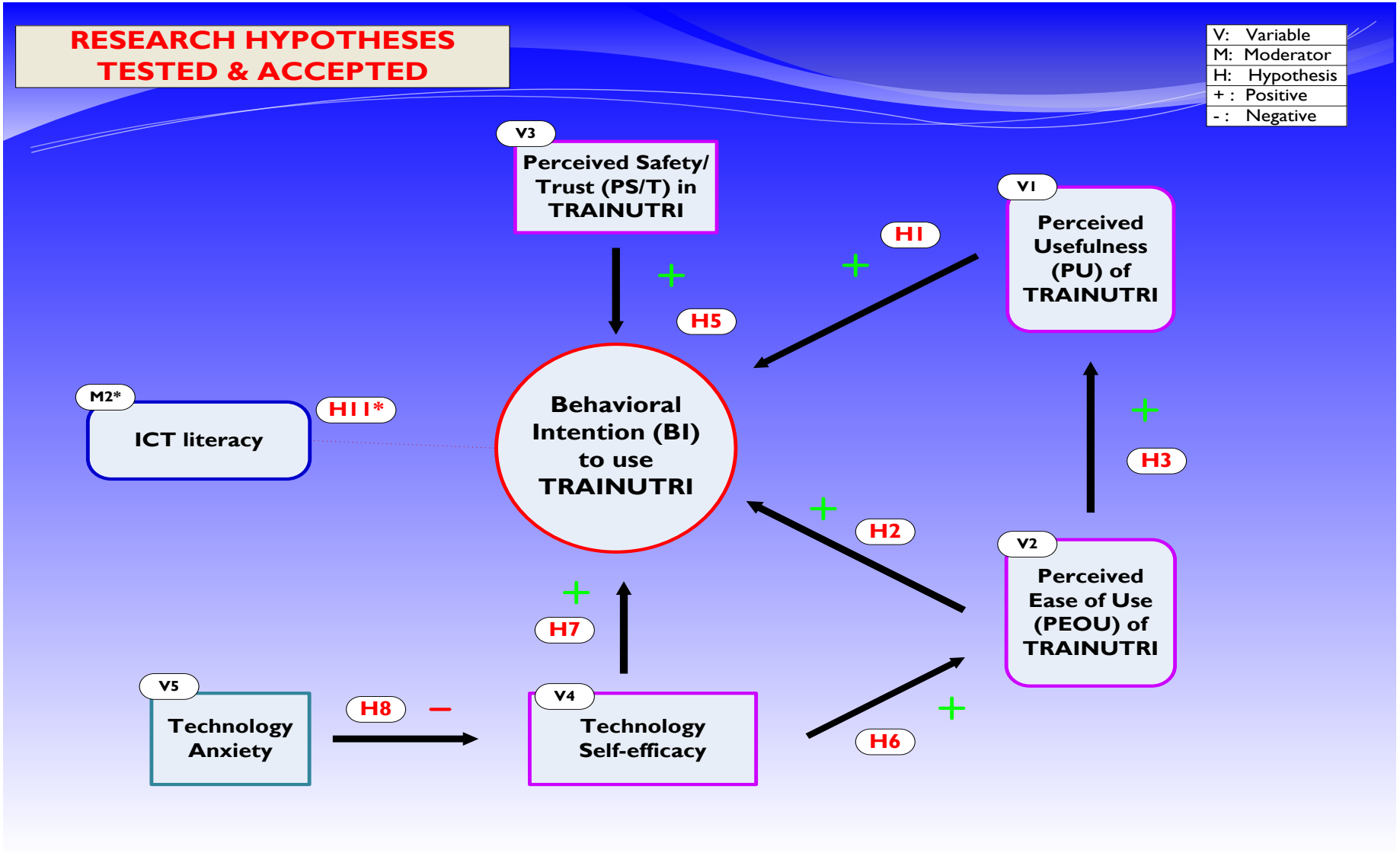
Equally important seems to be the role of self-efficacy to the (TRAINUTRI) technology in the adoption of My TRAINUTRI by influencing both on perceived ease of use and behavioral intention to use the system; while, in turn, self-efficacy itself is being influenced by technology anxiety, which remained though in low levels among the study population.

While, no conclusions can be drawn as far as the influence of socioeconomic status in use of My TRAINTURI is concerned, our findings suggest that behavioral intention to use My TRAINUTRI is being moderated and filtered by ICT literacy (one of the main elements of SES in this study).

Gender finally, did not account for differences in behavioral intention to use My TRAINUTRI - at least among the participants in this study - as both female and male showed seemed to be equal in their receptivity to the use My TRAINUTRI in the future.

The following figure (Fig. 6) illustrates the relationships between different constructs of this Research Model for which implications on acceptance exist after testing.

Figure 1: Research model updated



PART II: CONCLUSIONS & RECOMMENDATIONS

Deliverable 4.3 reports on the findings of the pilot testing process of My TRAINUTRI - an application developed within the two-year AAL project *"TraiNutri - Training and Nutrition Senior Social Platform"* to help seniors adopt healthy habits by keeping them physically active and actively involved in their health maintenance – based on the research hypotheses, methods and tools that Parts I & II outline.

In order to measure user experience with my TRAINUTRI, 10 field trials were conducted during a 1-month period with the participation of pilot users from Greece, Spain and Switzerland. All 10 participants involved in the pilot tested the first demonstrator of My TRAINUTRI in real-world usage settings for a 10-day period, which was in some cases extended in response to unpredicted circumstances that occurred at that time. All in all, the pilot phase lasted one month with the Swiss and Greek pilots running in parallel at first, followed by a second round of Spanish trials once the first pilots had been concluded.

The TRAINUTRI pilots aimed at exposing My TRAINUTRI to real use under circumstances that can be observed and followed to gain insight into usability and acceptance of the TRAINUTRI technology before it is actually taken into broader use, as well as unveil errors, weaknesses or drawbacks, major or minor, within the system that should be taken into consideration for the development of the 2nd demonstrator and / or the final product.

Pilot trials within TRAINUTRI were designed to give the most reliable understanding of user experience with My TRAINUTRI accepting that user experience is a subjective state and therefore it cannot be objectively measured. This was achieved by evaluating user experience in situations as close to actual usage as possible using methods that do not disturb or change real-world conditions; i.e. by collecting information and data at the time that user experience occurs so that they do not depend on the memories of the user which is utterly unreliable; and by using different methods in different phases of user experience evaluation within the pilots to obtain data that reveal details and characteristics of user experience with MY TRAINUTRI from different viewpoints.

Certain limitations should be taken into account in relation to this pilot study when interpreting results. Among them, we distinguish the following:

- First and foremost, the nature of user experience measurement itself: it is accepted that an unbiased evaluation of user experience is very difficult, if not impossible, as mere measurement of a situation – phenomenon has effects on the phenomenon itself;

- Second, the small sample size, largely dependent on the limited resources available (i.e. technology equipment – android phones) which means caution should be applied as the findings might not be transferable to overall senior populations;

- Third, variation in sample group selection occurring between the initial definition of the criteria that research subjects should meet and the profile of the study participants that were actually recruited - due to the difficulties that non end-user organizations faced in enrolling suitable pilot users – which inevitably resulted to the adaptation of the research plan with the addition of a small control group consisting of 3 younger adults – participants (below 46 years old);

- Fourth, the effect that the limited duration of the pilot trials naturally had on user experience, as users participating in the pilot were aware that My TRAINUTRI would be part of their lives only for a limited time of period, thus we may assume that their commitment to adopt the application as an integral part of their lives is likely to have been weak;

- Fifth, discrepancy in data collection processes between the participating countries, resulting in some cases to high missing data rates for specific countries.

For the purposes of the pilot, an android phone with My TRAINUTRI already installed was provided to participants who did not own such a mobile device, while the rest had the application installed on their own (android) phone. Three were the main components tested during the trials: a) Activity component (ALE app); b) Nutrition component; and c) Social networking component / platform. Support (including technical support) was provided to the participants on demand by the research team in charge of the respective pilot site.

Data were collected by means of questionnaires and self-reporting diary worksheets that were conducted at three measurement points; at the outset of the pilot, half-way and at the end of the trial. In the first case, acceptance of My TRAINUTRI was being measured, while in the latter user experience and user satisfaction - usability issues were mainly examined.

All in all, study participants from Greece, Spain and Switzerland showed a positive tendency towards acceptance of My TRAINUTRI without however taking a clear position. Pilot users found My TRAINUTRI more easy and safe than useful showing at the same time high self-efficacy in the technology involved in the trials and accordingly low levels of technology anxiety. The fact that 8 out of 10 pilot users were found to be only marginally neutral – again, clearly tending to positive – shows that participants were considering the possibility to use My TRAINUTRI in the future though not feeling quite sure if they would do so. These findings suggest that there is still room for improvement before achieving wide acceptance of the new product among the target population.

The results from the pilot study make several contributions to this regard, enlightening usability aspects of My TRAINUTRI that may explain the reasons behind the TAM results. Data from the trials indicate that in terms of actual usage the majority of the users showed a clear preference toward the activity component (ALE app.), opposite to what has been recorded for the nutrition module, though motivation behind the use of My TRAINUTRI seemed to lay both to physical activity and nutrition drives. Three are the main factors that seem to have played a major role in this; a) the fact that the ALE app. run automatically (simply by having the android phone in your pocket) and did not require any kind of manual input from the user; b) the tangible results that ALE provided on a daily basis to the user; and c) its better performance compared to the other two components as it was the only module that kept running without problems or reported failures throughout the pilots.

Similarly, although social interaction also appeared among the reasons to use My TRAINUTRI, the actual usage of the social networking platform remained in low levels, mainly due to the small number of users that the platform featured at the time of the pilot that limited participants' opportunities for actual interaction with other users.

Usage rates of the different components of My TRAINUTRI varied as the pilots progressed depending both on internal and external conditions at the time of use. Even though valid conclusions can't be drawn from the comparison made between the first half and the second half of the trials (due to the

lack of data form the Swiss sample for the first half), it seems that users' experience during the first half, either positive or negative, determined to a large degree user behavior and interaction with the system during the second half.

As one would expect, during the first of the trials, time spent with My TRAINUTRI was devoted by users in familiarizing themselves with the system. Participants both from the sample group 46+ and the control group initially started experimenting with the basic features of each application (creating/ editing profile, checking daily physical activity performance and registering information about their daily food intake), while showing low level of interest to features related to the achievement of goals and social interaction (contacting other users, joining a group, etc).

As the trials progressed in the second half and eventually came to an end, users spent more time with My TRAINUTRI and experimented with more features. At the end of the second period, participants showed more clear preferences to certain features of My TRAINUTRI (physical activity performance), others were gradually abandoned, in part (creating/ editing user profile; registering daily food intake) and in some cases even completely (contacting other users), while new trends also emerged (checking the achievement of weekly recommendation goals for physical activity where the rate doubled). However, it is important to note that one should be very cautious when interpreting these findings as lack of data from the Swiss sample for the first half causes major concerns as for the validity of the data (data incomparability).This simply means that some of the findings reflect the mere increase in the number of users participating in data collection (diary study) during the second part of the pilots and not an actual variation of the recorded rates between the first and the second half.

In essence, the entry of Swiss users in the second half marked a significant increase in the use of physical activity related features (checking daily performance and achievement level of weekly recommendation goals) in which participants from Switzerland were mostly, if not only, interested. However, it is safe to conclude that the increase that has been noted in checking the level of achievement of weekly recommendation goals for physical activity is not a mere result of the larger sample size, but corresponds to an actual increase of usage among participants for which comparable data exist; i.e. Greek and Spanish samples (mainly attributed though to the increased interest among Greek participants); as is also the case with the higher usage rate of social networking features that has been recorded, attributed, in this case, to the increased interest that the Spanish sample showed compared to the first half in searching for information online about groups in the TRAINUTRI community.

Though, similar trends have also been reported for the control group, there are two main patterns that actually differentiated the younger group from the sample group 46+: a) the gradual loss of interest by part of the control group sample in checking daily activity performance, which implies that it's more difficult to keep younger adults engaged in the use of the activity module. Taking into account that My TRAINUTRI has been designed for seniors (50 – 65 years old) this is a rather logic assumption; and b) the increased interest among control group users in registering information about their daily food consumption despite the repeated problems that had been reported during the first half (from the whole sample population).

Monitoring performance on daily activity seems to be an easy and undemanding task that captured the attention of all users (both from the sample group 46+ and the control group) during the course of the pilots. ALE was the only module used by the whole group of participants (sample and control

group) and the main reason why most of the users assessed their experience with My TRAINUTRI positively. Its effortless use that did not require any user input, but rather run automatically once configured in the beginning of the trial - so participants simply had to carry it on them - and its reliable performance throughout the trials seem to have contributed the most to this.

Findings from the second half indicate that the overall good first impression that ALE made on pilot users created favorable conditions that kept it high in user preferences until the end of the trials. What was first seen as easy and undemanding it gradually became interesting which may explain why the activity app. gathered even more positive votes during the second half. Looking into the usage patterns that participants developed during the trials we may argue that positive experience with specific features of My TRAINUTRI provided users with motivation to use more features of the same type or category as the pilots progressed. To this regard, our findings suggest that the positive experiences that users had with ALE when checking daily performance probably served as trigger factor to start experimenting with more activity related features during the second half, in particular checking the achievement level of weekly recommendation goals. The assumption that the activity module was considered motivating is further confirmed, if we look into the responses of Swiss participants who used almost exclusively this module and in this sense they described My TRAINUTRI as motivating and interesting.

Contrary, interest levels in the Nutrition module ranged from very low to low mainly due to persistent usability issues (i.e. crashing events) that caused problems to almost all pilot users, the unnecessary complexity in its use and the poor content. Despite repeated efforts to fix these problems, they issues were never completely solved during the course of the trials, which might explain why almost no one reported having positive experiences with the nutrition application even though the majority of participants continued using it also in the second half. These results suggest that the nutrition application might not have been fully mature at the time of the trials to be tested in real-world environments.

Similar problems were also encountered at first with the social networking application; however these problems were gradually eliminated and the platform starting performing more reliably as the time passed. As the pilot in Spain started later than the other two countries, usability problems with the social networking component were faced mostly by Greek and Swiss participants. One can easily recognize these conditions in the usage patterns that our study revealed among the study population.

Although, all participants initially showed some interest to the profiling services of the platform, its rate dropped during the second half, which makes us believe that social network profiling (creating or editing your profile) in My TRAINUTRI might be easy and interesting, but it can't stand alone as the mere activity of the user in the platform's environment. As the online platform featured only a handful of users, opportunities for social interaction actually were very limited, which is probably why users' interest started deteriorating. Nonetheless, users did not abandon the social network but rather experimented with more features mainly related to the online groups in the TRAINUTRI web service (looking information about a group – joining a group); a trend that emerged mainly among the Spanish sample during the second half of the trials. This implies that the better performance of the social network app. at that time allowed users to navigate more into the platform's environment. Still, the limited activity that the social network had took its toll onto user perceptions about their experience with the platform.

Interestingly enough, almost all sample group participants 46+ assessed their experience with My TRAINUTRI positively despite the different problems encountered during the course of the trials. Apart from one user who found the overall experience My TRAINUTRI disappointing, all other participants considered it easy / undemanding, interesting, useful or motivating. One source of weakness in this study which could have affected the measurement of user perceptions in this regard, is that most of the participants form Spain and Switzerland were recruited from the close environment of the researchers; thus they could have been biased in assessing My TRAINUTRI (response bias) consciously, or subconsciously, giving responses that they think would please the researchers.

Contrary to the sample group 46+, almost all users from the control group gave by the end of the trials both negative and positive feedback as per their experience with TRAINUTRI. Though all control group participants considered My TRAINUTRI motivating and most of them interesting and effective, its use was rather complicated for the majority and in some cases even ineffective. As it seems, younger adults are more difficult to please and have higher expectations from new technologies than seniors, being more familiar with their use.

Although user experience was generally assessed in a positive way, several problems and usability issues were mentioned by the participants, the majority of which were concentrated on the crashing events and operational errors that caused My TRAINUTRI (or specific components of the application) to stop working in more than one occasions. As a result, most of users' responses and suggestions for further improvements had more of a general nature (e.g. improve performance; solve errors – technical problems; prevent crashing events; etc) and did not go deeper into more specific characteristics of the application. It should also be noted that many of the participants did not actually provide suggestions as was requested, but rather repeated the problems they had encountered when using My TRAINUTRI.

Even so, users' feedback adds substantially to our understanding of what changes and improvements should be incorporated into the next demonstrator of My TRAINUTRI before the final product is actually released to the market. Comments and recommendations raised by pilot users fall under the following broad categories:

- Suggestions on the nutrition module

Most of the comments and recommendation provided by users centred around the nutrition features of My TRAINUTRI. Apparently, performance of the nutrition component during the trials was considered poor, thus many of the comments stressed the need for an overall improvement of the nutrition module from both a design and content perspective. In particular, participants felt that better configuration is needed within the nutrition features of My TRAINUTRI, as well as that more work should be done as per the quality of the content; in this regard, participants highlighted that:

- The content of the 'Eating Moments' features and accordingly meal consumption feedback provided to users should be more detailed;
- More options should be provided to the users, such as recommendations on recipes and selection of grams when creating / editing / saving an 'Eating Moment';
- User interface of the nutrition module should be more attractive and should be upgraded.

- Suggestions on the social networking component

Users' feedback on how to improve the TRAINUTRI social network focused not so much on design – even though there was a general feeling that the web interface should be improved and its use should be less complicated - but rather on other more practical aspects such as the need to attract more users, more visits and thus more social interaction in the TRAINUTRI platform.

- Suggestions on the activity module

Not many of the recommendations received related to the activity module, probably because most of the users seemed to be generally satisfied with this component and did not face many problems. However, there is room for improvement that according to users should be directed at providing more detailed and rich feedback to users (by providing for example graphical illustrations of physical activity performance during the day).

- General suggestions

Other than the above recommendations that focus on specific components of My TRAINUTRI, participants provided also ideas and suggestions on how to improve experience with My TRAINUTRI in general. In this respect, pilot users indicated that:

- Battery consumption should be reduced to allow longer use of My TRAINUTRI during the day;
- The size of the mobile device should be smaller and the weight lighter;
- Accessibility of non-English speaking users to My TRAINUTRI should be improved by providing better translation of the different components;
- Users should be able to carry the mobile device in other body locations as well apart from the pocket of their trousers;
- A more user-friendly environment should be designed.

To sum up, My TRAINUTRI scored relatively well in Technology Acceptance Measurements with the study population showcasing positive, yet not definite, tendency to use the application again in the future. Learning to use My TRAINUTRI and interaction with it was considered rather easy and understandable, though many users faced difficulties in finding their way in the TRAINUTRI community, while others felt even frustrated when interacting with the system. Participants seemed to appreciate most the easy initial installation and configuration steps of the application and the little effort that some of the components required, particularly the Activity module; What comes as a surprise is that the use of My TRAINUTRI seems to have troubled more control group users than older participants, which supports the idea that younger adults do not only have different needs, but also different expectations.

Up to now, we have accepted that perceived usefulness is key determinant in the adoption of new technology in general and My TRAINUTRI in specific. Consistent with the paradigm that sees a positive relationship between perceived ease of use and perceived usefulness, My TRAINUTRI was considered fairly useful by the participants who appeared to believe that the easily digested feedback that My TRAINUNTRI provides (monitoring of daily habits and weekly activity performance) is quick and efficient, promoting healthier lifestyle decisions that can ultimately lead to the adoption of healthier habits.

Despite these somewhat encouraging sings, the diary study revealed a number of usability problems and shortcomings in system design that will need to be addressed, before the product is released in the market. Among them we distinguish the repeated crashing events and system failures that had a noticeable impact on users' experience with the first demonstrator of My TRAINUTRI; the complicated menu and navigation; the fact that the design of the interface was not considered user-friendly, nor attractive; the poor content; and the limited opportunities for social interaction that the platform provided. Data collected from end users enlighten these issues and in this sense, help us guide the re-design process of My TRAINUTRI by looking into users' perceptions, thoughts and ideas and translating them into recommendations (Table 37).

Once these recommendations have been introduced to the design of My TRAINUTRI more rigorous testing is needed, better baseline and end-of-study measures, and larger sample sizes of end-users over a longer period of time to truly gauge not only the level of acceptance among the target populations, but also the impact that My TRAINUTRI has on the adoption of healthier habits and ultimately user's wellbeing.

Table 35: Recommendations

No	COMPONENT	OBSERVATIONS	RECOMMENDATIONS	MEASURES
01	SOCIAL PLATFORM	Difficult navigation around the web interface	Users should be able to find what they want within three clicks / moves	Streamline navigation keeping clear hierarchy in menus and links so that users can search easily for specific content
				Include context sensitive help for all controls. Short (one or two sentence) control-tips can be used as simplified instructions - Use message boxes to guide the user through single steps of the application
		Complicated menu		Minimize the steps needed to complete a certain task (e.g. move from A to B)
				Design clear and instructive labels and icons and ensure consistency throughout the platform
		Limited opportunities for social interaction	Engage more users – increase the number of registered members & visitors	Develop marketing – customer engagement strategies, both country wide and EU wide
				Use other social media to attracts visitors and potential users
02	NUTRITION MODULE	Poor performance	Eliminate crashing events	Make the design more reliable and less prone to failure
		Poor content	Enrich and upgrade the content of the nutrition module	Add new categories and themes (e.g. recommendations on recipes)
				Provide more choices – options to users (e.g. more option in data input, more detailed output feedback, more control over configuration options etc)
		Complicated use/ menu	Simplify the structure / design of the module	Provide a manual or add message boxes to guide users
				Minimize the number of steps required to complete a task – ideally not more than 3 steps

		Not engaging nor attractive user interface	Make the design more attractive and user-friendly	Consistency between pages, functions, options, color scheme, general layout, links, font types, sizes, heading, labels, menu items, captions, etc
				Clear layout; consistent graphics, images and typography
				Context-sensitive visual design
03	**ACTIVITY MODULE**	Gradual decrease in users' interest (mostly younger users)	Enhance and enrich output feedback delivered to users	Provide more options to users (e.g. being also able to manually add activities that are unable to be inferred by My TRAINUTRI)
				Include analysis software capable of outputting a range of graphical views and reports
		Output feedback is not detailed		Supplement output delivered to users with additional content (e.g. feedback on calorie expenditure) and deliver feedback via multiple modalities including tactile, text, vibratory and auditory signals, and images
				Provide combined output from multiple sensors (e.g. activity and nutrition) and context sources
		Frustration caused by low performance feedback		Provide positive feedback and motivate users via reminders (e.g. of their goals) and stimulating prompts
				Supplement output feedback with coaching messages and options offering advice and suggestions (e.g. through an embodied conversational agent)
04	**MY TRAINUTRI APPLICATION**	Safety issues are not addressed by the app itself	Provide information on the policies and standards that My TRAINUTRI follows	My TRAINUTRI should explicitly state the privacy policy
				Give control to the user over security settings (e.g. setting pin/lock code; disabling/enabling location tracking and data sharing, etc).

				Provide information about the developer (e.g. contact details)
		Design is not user-friendly	Optimize the look and feel of My TRAINUTRI	The visual design should reflect the context
				Ensure consistency between pages, functions, options, color scheme, general layout, links, font types, sizes, heading, labels, menu items, captions and so on
				Clear layout; consistent graphics, images and typography
				Include shortcuts and more than one way to perform an action to increase efficiency.
			Help users recognize, diagnose, and recover from errors	Display clear and human-readable error messages
			Improve accessibility for non-English speaking users	Make the content available in more languages
				Improve translation, especially in Spanish
05	**MY TRAINUTRI MOBILE DEVICE**	Battery consumption is high	Make the design more user-friendly – increase user comfort – optimize user experience	Extend battery life
		The device is bulky		Use smaller and lighter android phones
		Subjects are required to position the phone in the same body location		Provide more options for positioning the phone