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***WRS Document***

***Final Phase II***

**Team T-MIP**

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# Revision History

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| --- | --- | --- | --- |
| **Version** | **Date** | **Comments** | **Author** |
| 0.0 | February 23, 2012 | Initial draft including document layout and some domain and functional requirements | Taraneh |
| 0.1 | February 24, 2012 | Add Introduction | Ian |
| 0.2 | March 02, 2012 | Add Problem, Goal, Stakeholders and Domain Requirements sections | Ian |
| 0.3 | March 06, 2012 | Add Summary, Domain Issues  | Ian |
| 0.4 | March 07, 2012 | Add Functional requirements Issues | Taraneh |
| 0.5 | March 07, 2012 | Revised Domain Issues | Ian |
| 0.6 | March 08, 2012 | Revised Functional requirements and Traceability Matrix | Taraneh |
| 0.7 | March 09, 2012 | Issues with Non-Functional Requirements and revised requirements | Pooria |
| 0.8 | March 09, 2012 | Reviewed  | TaranehMaironIanPooria |
| 1.0 | March 09, 2012 | First formal version to turn in | T-MIP |
| 1.1 | March 21, 2012 | Updated version which include User Manual and updated Traceability Matrix  | Mairon |
| 1.2 | March 22, 2012 | Review requirements | T-MIP |
| 1.3 | March 22, 2012 | Update revised functional requirements and issues with them | Taraneh |
| 1.4 | March 23, 2012 | Updated Domain rqmts with Screen Reader | Ian |
| 1.5 | March 23, 2012 | Review requirements | T-MIP |
| 1.6 | March 23,2012 | Update revised non-functional requirements | Pooria |
| 1.7 | March 23, 2012 | Add Creeping Rates and Why We’re The Best | Ian |
| 1.8 | March 23, 2012 | Formal version to turn in (Final Phase 1) | Mairon |
| 1.9 | April 17, 2012 | Add 3 new functional requirements | Taraneh |
| 1.10 | April 18, 2012 | Add 1 new non-functional requirement | Pooria |
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| 2.0 | April 19, 2012 | Formal version to turn in  | Taraneh |
| 2.1 | May 15, 2012 | Add new functional requirements for iTalk | Taraneh |
| 2.2 | May 16, 2012 | Reviewed | T-MIP |
| 3.0 | May 17, 2012 | Final Document | T-MIP |

# Project responsibilities

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Phase 1** | **Deliverables** | **Ian** | **Taraneh** | **Mairon** | **Pooria** |
| **Introduction** | X |  |  |  |
| **Preliminary Definition** | X | X |  | X |
| **Functional Requirements** |  | X |  |  |
| **Non-Functional Requirements** |  |  |  | X |
| **Mockups** |  |  | X |  |
| **User Manual** |  |  | X |  |
| **Scenario**  |  |  | X |  |
| **Improved Understanding**  | X | X | X | X |
| **Presentation** | X |  |  |  |

# Introduction

HELPeople is a project whose mission is to improve the quality of life for those with communicative disabilities by employing assistive technologies that can be implemented on personal mobile devices.

The elderly, particularly the large Baby Boomer population, are entering their golden years just as the Smartphone era takes off. The emergence of mobile devices always connected to the internet can bring many benefits to, as well as challenges for, this significant growth market.

Fortunately, most people in this demography are already familiar with the personal computer. Many use it daily to do things like E-mail, search for information on the World Wide Web, network with family and friends, etc. However, performing these tasks on smaller handheld devices can be intimidating and difficult for them, especially as the effects of age such as impaired vision and memory begin to take their toll.

Leveraging existing mobile applications as well as those yet to be invented, HELPeople aims to provide a simplified yet unified interface through which any user, old or young, with or without disabilities, can easily accomplish many of their important daily tasks using their mobile devices.

# ISSUES WITH PRELIMINARY DEFINITION GIVEN

## Domain Issues

In this section we will cover the issues related to requirements collected in section 5 that we observed. The issues related to domain, stakeholders, functional and non-functional objectives have been addressed.

**Issue IDR1:**

|  |  |
| --- | --- |
| **Description** | System shall provide multiple input methods.Issue Type: IncompleteWhat are those inputs? How should they be configured? |
| **Options** | 1: Touch by default; Voice on demand2: Touch and Text by default; Voice on demand3: Touch and Text by default; Voice on demand; Camera per app |
| **Decision** | Option 3: Touch and Text always available by default; Voice input can be invoked on demand; and Camera input available as needed by a specific app |

**Issue IDR2:**

|  |  |
| --- | --- |
| **Description** | System shall provide multiple output methodsIssue Type: IncompleteWhat are those outputs? How are they configured? |
| **Options** | 1: Visual display (icons, images, etc.)2: Visual plus Audio (spoken words in a selectable language)3: Audio only (i.e. “Non-Visual” profile)4: Vibration (“Silent” mode) |
| **Decision** | Option 1 by default; Option 2 or 3 can be configured via user profile; and Option 4 can be configured as an app-specific setting. |

**Issue IDR3:**

|  |  |
| --- | --- |
| **Description** | System shall provide API to integrate with other appsIssue: Vague, IncompleteDoes not specify how this can be accessed by User |
| **Options** | 1: Let user switch from one App to another manually2: Create one common interface that hides integration details from User |
| **Decision** | Option 2. But also provide a mechanism for user to move easily between Apps manually.  |

**Issue IDR6:**

|  |  |
| --- | --- |
| **Description** | System shall provide Text To Speech (TTS) functions: Issue: Vague, IncompleteHow many languages to support? |
| **Options** | 1. As many languages as supported natively by device’s OS
2. Only one language (pre-configured)
3. Only one language (user-configurable)
 |
| **Decision** | Only support English in first version. If demand exists, add other languages. |

**Issue IDR7:**

|  |  |
| --- | --- |
| **Description** | System shall provide Screen Reader functions.Issue: IncompleteWhat type of functionalities will be needed? Which browsers will be supported? |
| **Options** | 1: Web browser only. 2: Screen Menus only. 3: Both.4: Multiple web browser support  |
| **Decision** | Option 3: Provide a Screen Menu reader AND a Web Browser reader for the default Browser that comes with the device (i.e. Safari for iOS, Chrome for Android)Other browsers may be supported in future if demand exists |

**Issue IDR8:**

|  |  |
| --- | --- |
| **Description** | System shall support multiple mobile OS’s.Issue: VagueWhich ones? Why? |
| **Options** | 1. Apple iOS
2. Google Android
3. Microsoft Windows Mobile
4. Symbian
 |
| **Decision** | Option 1 & 2. iOS and Android only. This is to maximize market potential but keep development scope manageable. |

## Functional Requirements Issues

**Iss****ue IFR1:**

|  |  |
| --- | --- |
| **Description** | “Provide a tool to user so s/he can interact with the product and give commands to do certain tasks via speech or by touch”Issue type: ambiguous, incompleteWhich certain tasks user can do via command? What’s the tool? What are the other input methods? |
| **Options** | Option 1:* User can use the product by touching the icons

Option 2:For each group of people dedicate a user profile:* If the user is visually impaired so he should be able to give certain commands by voice like “open Calendar” to use this app.
* If the user is mute then there would be an option to choose the menus by touch or for certain commands use text as an input method
 |
| **Decision** | HELPeople! Will provide 3 types of input for users to interact with product as user profiles so user can choose among below options as input method:1. Touch
2. Voice
3. Text

We chose option 2 to have all of them so user can choose between different types of interaction based on his need. Commander would be available to accept voice requests and respond them back in voice. The other option would be keyboard input which user can type his request and HELPeople will interpret it to a command and do the request. By default all menus would be available visually. |

**Issue IF****R2:**

|  |  |
| --- | --- |
| **Description** | “Generating speech output for those who are visually impaired so that the user can hear rather than seeing the pictures or menus”Issue type: ambiguousWhen product needs to generate speech output? Is it only applicable for visually impaired users? Is it possible to show the pictures along with voice output? |
| **Options** | Option 1:* Set the configuration for visually impaired users so they can hear the outputs rather than showing them the picture or icon
* Speech generation is available when the input method is also with voice

Option 2:* Have flexible configuration so user can choose between different input and outputs
* Configuration should be available for all types of people not restricted to those who are visually impaired so use can choose to have voice output or use touch or keyboard
 |
| **Decision** | We chose Option 2. Regardless of user type, various output methods (audio, text, visual) should available for user to choose among them. So we decided to put setting regarding output of the product in configuration as user profiles therefore there would be 3 options for users to choose either visually see the menus of hear them by audio output. Screen reader would be available for blind people that read the screen while user goes to different pages of the product in order to help them choose a menu. |

**Issue** **IFR3:**

|  |  |
| --- | --- |
| **Description** | “Provide a way for user to select categories via touch or speech”Issue type: redundantThe way which user is going to select one menu would be the same as available input methods, which is redundant of IFR1. |
| **Options** | Option 1:* User can choose input method as voice or keyboard or touch
* For all sections of the product this would be available as input method
 |
| **Decision** | User would be able to choose the icons and menus of the system with touch or by typing the command in keyboard or by voice command. All of these are input methods to the system and is applicable for choosing a menu, opening an application, set a reminder in calendar, exit an application and etc. |

**Issue IF****R4:**

|  |  |
| --- | --- |
| **Description** | “Providing an easy access to most common in use apps or favorite ones”Issue type: ambiguous, incompleteWhat would be the easy access? Is it a different tool or it would be in same product? |
| **Options** | Option 1:* Put the applications od our product under certain categories

Option 2:* Categorize the applications in 4 groups and also give an option to user to put most commonly used applications or his favorite ones in separate section to have easy and fast access rather than going to each category and find them.
* It maybe difficult for elder people to find applications that they use the most, like medication, under defined categories. Or for those who are suffering from memory loss they can forgot which application was under which category. So this option will give them easy access.
 |
| **Decision** | We decided to choose option 2 and put “H” button available in all screens of HELPeople so the user can have easy access to favorite applications that he uses the most. |

**Issue IF****R5:**

|  |  |
| --- | --- |
| **Description** | “Change the settings and configuration according to their need”Issue type: vague, incompleteBy Setting does it mean general setting or options available for each application?  |
| **Options** | Option 1:* Set default setting in the product in time of installation for once according to user’s need

Option 2:* Define “configuration” section in the product with various settings so the user would be able to set the setting according to their desire
 |
| **Decision** | We defined configuration section available in all pages with an icon. For first page the setting would be general setting for the product like output/input method but for other pages the setting will refer to configuration of that specific application. So we split this function to 2 separate requirements. |

**Issue IF****R6:**

|  |  |
| --- | --- |
| **Description** | “Allow changing and managing applications in HELPeople!”Issue type: vague “Allow changing” is vague so we need to describe it in a better way |
| **Options** | Option 1:* Define fixed list of applications according to our understanding of the product

Option 2:* Define flexible list of apps and let the user to manage apps by listing, removing, adding apps to the product. These applications would be those that are in non-native apps so there is a possibility to integrate them within the product.
 |
| **Decision** | We chose option 2 to give flexible environment for user to manage apps according to its desire. So he would be able to add apps, which he’s using them the most or removing those that are interested for him. We split this function to 2 different requirements as add and remove. And also we added 2 more requirements for enabling and disabling native apps. So we give this option to the user that he would be able to disable/enable native applications also. |

**Issue** **IFR7:**

|  |  |
| --- | --- |
| **Description** | “Providing a way to remember their family members and friends”Issue type: ambiguous, incompleteWhat would be the way to remember people’s face? Does it mean remembering them via picture or by name?  |
| **Options** | Option 1:* People who are suffering from memory loss can have a list consist of the names of family members or friends in their phone

Option 2:* People who are suffering from memory loss can have a list of the names together with pictures of any relative person stored in their phone.
 |
| **Decision** | We chose the second option to have an application to store family tree together with the picture of members so that the people who are suffering from memory loss would be able to remember them as they can see family/friend’s picture associated to that name. We decided to have one specific requirement for storing pictures in the phone and another requirement for describing family tree. |

**Issue IFR****8:**

|  |  |
| --- | --- |
| **Description** | “People who are suffering from memory loss should be able to remember places they visited before or remind their parking place”Issue type: incompleteIs this feature only available for those who are suffering from memory loss? |
| **Options** | Option 1:* Limit Backtrack application only to specific user (memory loss)

Option 2:* Make this application available for general use
 |
| **Decision** |  We chose the second option. So Backtrack application would help people to remind previous places they’ve visited before so that they can take a picture and store it in the phone together with the name of that place. The same would be applicable for remembering the parking lot, which would be useful to find where user parked his/her car. |

**Issue IF****R9:**

|  |  |
| --- | --- |
| **Description** | “Assist them to remind their medication/food/drink and etc”Issue type: incomplete, ambiguousHow to assist user to store medical information rather than a reminder? “Them” refers to which group? Don’t use “ect”, be concise  |
| **Options** | Option 1:* Users can use the built-in reminder/calendar of their phone to remind them about their medication or appointments

Option 2:* Develop new application to store medical information and medication
 |
| **Decision** | We decided to have dedicated native application regarding medical information for the user, so he/she can keep track for personal medical info like medical history, allergies, operations, disease and so on. |

**Issue IF****R10:**

|  |  |
| --- | --- |
| **Description** | “Assist them to remind their scheduled meetings/appointments”Issue type: ambiguous, incompleteReminder only for meeting or user can use it also for medication |
| **Options** | Option 1:* Develop separate reminder application to schedule ad set appointments or meetings

Option 2:* Use the same calendar exist of the phone to set reminder for meetings/medication and much more.
 |
| **Decision** | We decided to use the same calendar exist on the phone but we deliver more input methods to the user such as voice to set his/her reminder. Whether it’s a reminder about a medication or is about eating food, drinking water (for those who are suffering from memory loss) or an appointment. They can schedule an event to remind them the activities by alarm. |

**Issue IFR****11:**

|  |  |
| --- | --- |
| **Description** | “Providing a way for family members to add reminders in users calendar” Issue type: ambiguous, incomplete“Providing a way” is vague. Family members are the only group who can add reminders? Are they able to add only reminders to the calendar? |
| **Options** | Option 1:* User would be able to add reminder/events to his calendar

Option 2:* Authorized user such as a family member should be able to enter reminder for the user as well
 |
| **Decision** | As elder people or people who are suffering from memory loss may not be able to add reminder or any event on their calendar so we thought it would be very helpful that authorized user like a family member should be able to add any event or reminder in user’s calendar by accessing this application via remote connection over internet or by sms. |

**Issue IF****R12:**

|  |  |
| --- | --- |
| **Description** | “Placing emergency calls”Issue type: incompleteHow can product place emergency call? |
| **Options** | Option 1:* Put emergency icon in main menu so it would be accessible for the user

Option 2:* Place emergency icon in all pages as an icon so the user can use it whenever needed
* User should be able to call 911
* User should be able to call/text a predefined family number
* User should be able to call/text a doctor
 |
| **Decision** | We chose option 2 so that we give 3 different options to the user in case of emergency. By Pressing emergency button he can either call 911 which he needs to confirm it again, or he can choose between calling/texting a family member or a doctor without confirmation. |

**Issue IFR1****3:**

|  |  |
| --- | --- |
| **Description** | “User should be able to listen to music”Issue type: incompleteHow user should be able to listen to music? Is it available for all users. |
| **Options** | Option 1:* All users apart from those who are not able to listen to music (suffering from hearing loss) should be able to listen to their music

Option 2:* Integrate to external music app.

Option 3:* Remove the option of music for this product
 |
| **Decision** | We chose to have first option so that user should be able to listen to his stored music on the phone. Integration to external/online music application would bring difficulties. In case user call a music app then he will lose the application control because the external application will call in top of our product so he won’t have further access to HELPeople rather than closing the external app and reopen HELPeople. We decided to have this function as a User interface requirement and mention different categories, which we will have in the product as Health, Entertainment, Life, and Phone. |

**Issue IFR****14:**

|  |  |
| --- | --- |
| **Description** | “Users who are visually impaired should be able to surf the web”Issue type: incompleteWe should define how they can surf the web? Which tool? |
| **Options** | Option 1:* User an existing tool for helping to surf the internet

Option 2:* Use already developed tool of “Web reader” which is powerful for reading web pages.
 |
| **Decision** | We will give the option for users who are visually impaired to be able to surf the web. So we will use “Web reader” tool that can convert the web pages to standard structured html pages and read the content of each page for the user, basically it will show what appears in the screen for blind user. We decided to move this requirement to domain requirement section as it’s a service rather than a function. |

**Issue IFR****15:**

|  |  |
| --- | --- |
| **Description** | “Mute user should be able to communicate to others via HELPeople”Issue type: ambiguousHow mute user should be able to communicate via our application? |
| **Options** | Option 1:* User can use motions to communicate with others

Option 2:* User can communicate to others by typing in HELPeople and text to speech application will convert it to voice
 |
| **Decision** | We will give the option for users who are mute to type in iTalk application and app will convert text to speech. Moreover speech to text would be also available for those who have hearing difficulties, so then can use iTalk speech to text converter to convert voice to text for them in order to understand what others say. |

**Issue IFR****16:**

|  |  |
| --- | --- |
| **Description** | “User should be able to use camera to recognize objects or family and friends”Issue type: incompleteDidn’t mentioned how to use camera to recognize the people he knows |
| **Options** | Option 1:* User can have the family or friends pictures stored in his device

Option 2:* Application should help user to identify the friends and family members by capturing their photo and match them to already stored pictures in contact list
 |
| **Decision** | We chose second option. For those who are suffering from memory loss and they can’t remember their family members or friend’s face, they can capture a picture from those people and match them with the ones which they had it already it their phone and “Recognition” application will show the name of the person together with any defined note related to him/her. |

**Issue IF****R17:**

|  |  |
| --- | --- |
| **Description** | “User should be able to keep track of his meal and nutritional info”Issue type: ambiguous, incompleteHow to keep track of his meal? What else can user keep track of |
| **Options** | Option 1:* Search in internet to find out what would be the nutrition info about the meal he take and write them down in his notes

Option 2:* Dedicate an application to keep track of every meal, exercise and weight and provide information regarding the nutrition’s of his/her food.
 |
| **Decision** | Option 2 would be better idea so that he can easily have all of the information in one dedicated application. He can also set reminders to remind him when to take his medicine or when to drink or eat. |

**Issue IFR****18:**

|  |  |
| --- | --- |
| **Description** | “User should be able to use HELPeople for entertainment purpose”Issue type: ambiguousWhat is entertainment? All users will have this section? |
| **Options** | Option 1:* User can have access to Games or other entertainment apps installed in his phone

Option 2:* User can access to Games or chatting with friends in Skype or check latest movies in Movie Theatre via HELPeople.

  |
| **Decision** | We chose to provide this option in our product so for some of the profiles who are willing to have this feature it would be possible to access entertainment section instead of going to each app itself. We decided to have this function as a User interface requirement and mention different categories, which we will have in the product as Health, Entertainment, Life, and Phone. |

**Issue IFR19:**

|  |  |
| --- | --- |
| **Description** | “User should be able to use a torch to help him/her in dark places”Issue type: ambiguousUser will use torch or can use an application, which provide a function of torch? |
| **Options** | Option 1:* User can use phone’s screen to have light in dark places

Option 2:* User can have a flashlight provided in HELPeople product to use it in dark places and can manage it through this product

  |
| **Decision** | We chose to provide 2 options and according to device capabilities application will either use phone’s screen as light source or device’s flash **LED**. So if the device has the flash then it will use this as a flashlight if not then it will use the screen. |

**Issue IFR20:**

|  |  |
| --- | --- |
| **Description** | “User should be able to use magnifier in the product wherever needed”Issue type: ambiguous, vagueUser will use magnifier or the product will have a magnifier for user to use it? |
| **Options** | Option 1:* User can tap and expand the screen to have bigger view of the screen

Option 2:* Product will provide a magnifier as an application so user can use it in case he has difficulties in reading small texts

  |
| **Decision** | Although HELPeople designed to have large icons so that elder people with visual difficulties can recognize them easily but it will also provide a magnifier within the product so in case someone needs to read texts which s/he needs to wear his/her eyeglasses can use this instead.  |

**Issue IFR21:**

|  |  |
| --- | --- |
| **Description** | “Each menu should be available by minimum clicks”Issue type: ambiguous, incompleteWhat is the minimum clicks? Where would be the start point to count the clicks? |
| **Options** | Option 1:* No Limitation for steps

Option 2:* To reach each menu by maximum 3 clicks from the main menu
 |
| **Decision** | To increase accessibility and usability of the product we chose to put some limitations on layers of access to each menu. So we put maximum 3 layers to reach to each menu from the main menu. |

## Non Functional Requirements Issues

**Issue INFR1:**

|  |  |
| --- | --- |
| **Description** | “Installation time should be quick enough”Type of issue: ambiguousHow QUICKLY it should be? Assumption: HELPeople is already downloaded in the device  |
| **Options** | 1. Product should install its entire component less than a minute.2. We should not consider the installation time |
| **Decision** | We selected option 1 so entire component get install completely |

**Issue INFR2:**

|  |  |
| --- | --- |
| **Description** | Product should consume less battery powerType of issue: ambiguousHow LESS it should be?  |
| **Options** | 1. Product should use 4% - 8% of total battery per hour while it’s running. 2. We should not consider the power consumption |
| **Decision** | We selected option 2 for the first release, till further versions |

**Issue INFR3:**

|  |  |
| --- | --- |
| **Description** | Product should occupy less memory spaceType of issue: ambiguousHow Less it should be?  |
| **Options** | 1. Product should use no more than 5 MB after installation.2. We should not consider the size of it |
| **Decision** | We selected option 1 for less capacity usage |

**Issue INFR4:**

|  |  |
| --- | --- |
| **Description** | User interface should be easy to useType of issue: ambiguousHow EASY it should be?  |
| **Options** | 1. Menu items should be viewed in list/icon format depends on user preference. 2. Applications are categorized in folder and subfolder format3. All applications could line in alphabetical format. |
| **Decision** | We selected option 1 and 2 in order to be more user friendly |

**Issue INFR5:**

|  |  |
| --- | --- |
| **Description** | Applications should be properly categorized Type of issue: ambiguousHow properly it should be?  |
| **Options** | 1. Applications are categorized in most frequent use to least2. Applications are categorized according to their functionality  |
| **Decision** | We selected option 2 for simplicity |

**Issue INFR6:**

|  |  |
| --- | --- |
| **Description** | Visually it should be easy for our target user to seeType of issue: ambiguousHow colorful it should be?  |
| **Options** | 1. Each application should be represented by a simple icon that resembles its functionality2. Each application should be represented by a dynamic icon that resemble its functionality3. Each application should be accompanied by a text name that describe its function4. Screen should have no more than 7-8 colors. 5. Font should be simple and large enough  |
| **Decision** | We selected option 1, 3, 4 and 5 to make the interface more simple and attractive.  |

**Issue INFR7:**

|  |  |
| --- | --- |
| **Description** | Product should be updatableType of issue: ambiguousHow does the user know when to update? |
| **Options** | 1. Any time that there is a new version of the product, the user will be notified.2. The system automatically updates the product to its latest version.3. The user can manually install the updates.  |
| **Decision** | We selected option 1and 2  |

**Issue INFR8:**

|  |  |
| --- | --- |
| **Description** | While using, product should respond quickly to commandType of issue: vague, incomplete What does respond really mean?How is quickly defined?  |
| **Options** | 1. After each user command the system will notify the user that it has successfully received the command and is in the process of executing it.2. For any interaction, system shouldn’t take more than 1000 ms to respond3. It shouldn’t be a concern to consider respond time  |
| **Decision** | We have selected option 1 and 2 to have maximum time respond  |

**Issue INFR9:**

|  |  |
| --- | --- |
| **Description** | Essential applications should be reachable all the time.Type of issue: ambiguousHow it should be reachable?What are the essential applications |
| **Options** | 1. Emergency, Favorite Folder, Commander are available in one consistent location in all screens.2. Any Essential application is in a folder in the main menu.  |
| **Decision** | We selected option 1 to make our product more efficient  |

**Issue INFR10:**

|  |  |
| --- | --- |
| **Description** | User should be able to personalize the applicationsType of issue: ambiguousWhich application the user can personalize? What does personalization means? |
| **Options** | 1. To give them predefined settings to choose from for user profiles
2. Offer open settings (any setting)
 |
| **Decision** | We decided to give combination of both options to the user so the s/he can customize the setting according to his need. So if the user selects “Audio Profile” then by default the input method would be audio and microphone icon would be available in the main screen. Or the user can set to use microphone in the system whenever he wants to give audio command and after that he can switch to keyboard or touch again but changing the setting. |

# WRS

## W

### Problem

The mobile app market already has a multitude of applications targeting the elderly to help them do many important daily tasks. These apps are generally categorized under Health Care; many have been very well developed and are extremely useful.

But because modern mobile devices such as Smartphone’s and tablets rely on a touch screen as their main mode of input, they represent a significant obstacle for older people, especially those with visual and/or motor degradations.

Furthermore, the visual nature of web browsers, mobile or otherwise, makes it increasingly difficult for poor-sighted people to access information on the web. And, of course, for those who are nearly or totally blind it is nearly impossible to do on today’s smart phone.

### Goal

Our goal is to make “smart” mobile devices even “smarter”. Our objective is NOT to reinvent apps that have already been created. Instead, we aim to make those existing apps work even better and allow them to help many more needy users.

We intend to accomplish our goal by making those apps accessible to people with various communicative impairments such as poor vision, hearing, or memory degradations.

### Improved understanding of Domain, Stakeholders, Functional and Non-Functional objectives

#### Stakeholders

The elderly population, being our main target user group, represents the most important stakeholder. However, because age affects different people in different ways, it is not easy to generalize what their needs are. Therefore, from a system requirements perspective, we shall limit our scope to some of the most common needs, and perhaps extend the product in future versions to accommodate more requirements.

A related group of stakeholders are those who help care for the elderly. These could be family members, caretakers, doctors, etc. Our product will make it easy also for them to assist the person under their care with everything from installing the product to using it on a day-to-day basis.

A third group of stakeholders are those in the public space whom the elderly might need to call upon in case of emergencies, such as Fire, Police, Ambulance, etc. Again, our product will make it easy for the needy to contact help and for emergency personnel to obtain the necessary biodata about that person quickly and accurately.

On the Product Development side, other stakeholder groups whose needs also need to be taken account are: Investors; Sales/Marketing; Management; Engineering; Support.

Last, but not least, are other mobile app makers on the market with whom we have a symbiotic relationship. They have a critical role to play in the success of our product and, conversely, we can help them reach a larger market segment than what they currently have.

#### Definitions

The following terms regarding different **App Types** shall be used within the context of this product to mean specific things:

1. **Resident** – any app that physically resides on the device, which can be:
	1. **Native** – is built into this product
	2. **Non-Native** – is not a part of this product and can be:
		1. **Integrated** – can communicate with this product via an API
		2. **Standalone** – is not integrated with this product at all
2. **Non-Resident**
	1. **Web-based** (e.g. Pandora)
	2. **Network-based** (e.g. Teleconferencing)

#### Domain Requirements

The types of services (DRs) that the system shall provide are listed below:

1. Input (DR1)
2. System shall provide touch-based input mode by default (DR1.1)
3. System shall provide voice-based input as a supplement (DR1.2)
4. System shall provide image-based input as a supplement (DR1.3)
5. System shall provide text-based input, e.g. keyboard (DR1.4)
6. Output (DR2)
7. System shall provide image- and language-based output by default (DR2.1)
8. System shall provide audio-based output as a supplement (DR2.2)
9. System shall provide vibration-based output as a supplement (DR2.3)
10. Interface (DR3)
11. System shall provide an API through which other apps may communicate with it in both directions. (DR3.1)
	* System is not required to support apps that cannot be integrated via this API
12. System shall provide a common interface through which user can invoke, command, and receive responses from native and integrated apps (DR3.2)
13. GPS (DR4)
	1. System shall have full access to the built-in GPS (DR4.1)
	2. System shall support non-native apps that rely on GPS (DR4.2)
14. Bluetooth (DR5)
	1. System shall support native and integrated apps that use the built-in Bluetooth (DR5.1)
	2. System shall support remote devices that can pair with the built-in Bluetooth (DR5.2)
15. Text To Speech (DR6)
16. System shall provide an audio-based menu description for native and integrated apps (DR6.1)
17. System shall have ability to convert lines of text to audio output in at least one language (default English) (DR6.2)
18. Web Reader (DR7)
	1. System shall provide a web-reader service that can be integrated with a mobile web browser to describe the web page content in audio format, and be able to accept navigation commands from the user via voice. (DR7.1)
19. OS Support (DR8)
	1. System shall support Apple iOS (DR8.1)
	2. System shall support Google Android (DR8.2)
20. Screen Reader (DR9)
	1. System shall have a Screen Reader service to read screen menus and translate menu items into an audio format in at least one language (default English) (DR9)

## RS

### Functional RS – Improved understanding of Software System Requirements: FRs

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| **RID** | **Requirements Specification** |
| RFR1 | User shall be able to select input method among various user profiles, which can be any combination of voice, text and visual. By default visual is always available. |
| RFR2 | User shall be able to select output method among various user profiles, which can be any combination of audio, text and visual. By default visual is always available. |
| RFR3 | Product shall have a dedicated button on all screens to provide access to the most used or favorite apps |
| RFR4 | Product shall have set of user-configurable app-specific settings for individual native and integrated apps. |
| RFR5 | Product shall have a set of user-configurable general settings. |
| RFR6 | User shall be able to add a non-native applications to the product (app is resident on device) |
| RFR7 | User shall be able to remove an integrated application from the product (not from the device) |
| RFR8 | User should be able to disable a native application |
| RFR9 | User should be able to re-enable a disabled native application |
| RFR10 | Product shall be able to store pictures in a common repository that can be accessed by other apps (native and integrated). |
| RFR11 | Product shall have an app that allows user to store family information including at least: names, photos, contact info and relation. |
| RFR12 | Product shall have an app that allows user to go back to a previous location via GPS and with, optionally, a photo. |
| RFR13 | Product shall have an app that allows user to store medical information about him/herself and/or family members. |
| RFR14 | Product shall have an app to remind user of daily activities. |
| RFR15 | Authorized person (e.g. family member) should be able to add reminders to user’s calendar remotely |
| RFR16 | The system shall provide a button to dial 911 and simultaneously call or text a doctor or family member in case of emergency. |
| RFR17 | Product shall have an app that converts text (English) into audio format. |
| *RFR 17.1* | iTalk application shall have predefined greetings and frequently used phrases. |
| *RFR 17.2* | iTalk application shall provide add greeting functionality so that the user can add new phrases to the list. |
| *RFR 17.3* | iTalk application shall accept text input from user and convert it to speech. |
| *RFR 17.4* | iTalk application shall accept voice input and convert it to text. |
| *RFR 17.5* | iTalk application shall provide save history option so that user can save the previous output texts.  |
| *RFR 17.6* | iTalk application shall provide app instruction so that the user can read how to use the application. |
| *RFR 17.7* | iTalk application shall provide information about current version, publisher and a description of the application. |
| RFR18 | Product shall have an app that allows user to match objects and faces against pictures and contacts stored on the device. |
| RFR19 | Product shall have an app that allows user to store nutritional information about foods and to keep track of user’s diet plan. |
| RFR20 | The Main User Interface shall organize the Product into four Main Categories for easy access: Health, Entertainment, Life, and Phone. |
| RFR21 | Product shall provide the functionality of a flashlight to user. |
| RFR22 | Product shall provide a magnifier available in each application screen |
| RFR23 | Each menu of the product will be accessible with no more than 3 clicks form the main menu. |

### Non-functional RS -Improved understanding of Software System Requirements: NFRs

**RNFR1:** Installation time should be quick enough so its entire component installed less than a minute.

**RNFR2:** Product power consumption is not into first version consideration.

**RNFR3:** Product should occupy no more than 5MB space

**RNFR4:** User interface should be easy to use, in such a way that “Menu items should be viewed in list/icon format depends on user preference” and “Applications are categorized in folder and subfolder format”

 See User Manual **Entertainment Center** section

**RNFR5:** Application should be properly categorized in such a way that applications are categorized in most frequent use to least

See User Manual **Main Menu** section

**RNFR6:** Visually it should be easy for our target user to see in such a way that “Each application should be represented by a simple icon that resembles its functionality” and “Each application should be accompanied by a text name that describe its function and “Screen should have no more than 7-8 colors” and “Font should be simple and large enough”

 See User Manual section **Key section** and **communication**

**RNFR7:** Product should be updateable so that “Any time that there is a new version of the product, the user will be notified” and “The system automatically updates the product to its latest version.”

**RNFR8:** While running, product should respond quickly to command so that “After each user command the system will notify the user that it has successfully received the command and is in the process of executing it” and “. For any interaction, system shouldn’t take more than 1000 ms to respond”

**RNFR9:** Essential applications should be reachable all the time. For instance Emergency, Favorite Folder, Commander are available in one consistent location in all screens.

**RNFR10:** User shall be able to customize input and output interaction types by either choosing one of the available user profiles or changing the setting manually from the “Settings” section anytime.

# Traceability MAtrix

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| **Preliminary Definition** | **Issues with requirement** | **Improved Requirement** | **User Manual** |
| DR1 | IDR1 | DR1.1, DR1.2, DR1.3 | N/A |
| DR2 | IDR2 | DR2.1, DR2.2, DR2.3 | N/A |
| DR3 | IDR3 | DR3.1, DR3.2 | N/A |
| DR4 | - | DR4.1, DR4.2 | N/A |
| DR5 | - | DR5.1, DR5.2 | N/A |
| DR6 | IDR6 | DR6.1, DR6.2 | N/A |
| DR7 | - | DR7.1 | N/A |
| DR8 | IDR8 | DR8.1, DR8.2 | N/A |
| DR9 | - | DR9 | N/A |
| FR1 | IFR1 | RFR1 | Section 3 |
| FR2 | IFR2 | RFR2 | Section 3 |
| FR3 | IFR3 | RFR1 | Section 3 |
| FR4 | IFR4 | RFR3 | Section 5.1 |
| FR5 | IFR5 | RFR4, RFR5 | Section 6 |
| FR6 | IFR6 | RFR6, RFR7 | Section 6 |
| - | - | RFR8, RFR9 | Section 6 |
| FR7 | IFR7 | RFR10, RFR11 | Section 8 |
| FR8 | IFR8 | RFR12 | Section 10 |
| FR9 | IFR9 | RFR13 | Section 8 |
| FR10 | IFR10 | RFR14 | Section 8 |
| FR11 | IFR11 | RFR15 | Section 8 |
| FR12 | IFR12 | RFR16 | Section 5.4 |
| FR13 | IFR13 | RFR20 | Section 9 |
| FR14 | IFR14 | - | - |
| FR15 | IFR15 | RFR17 | Section 10 |
| - | - | RFR 17.1 | Section 13 |
| - | - | RFR 17.2 | Section 13 |
| - | - | RFR 17.3 | Section 13 |
| - | - | RFR 17.4 | Section 13 |
| - | - | RFR 17.5 | Section 13 |
| - | - | RFR 17.6 | Section 13 |
| - | - | RFR 17.7 | Section 13 |
| FR16 | IFR16 | RFR18 | Section 10 |
| FR17 | IFR17 | RFR19 | Section 8 |
| FR18 | IFR18 | RFR20 | Section 9 |
| FR19 | IFR19 | RFR21 | Section 10 |
| FR20 | IFR20 | RFR22 | Section 10 |
| FR21 | IFR21 | RFR23 | - |

# CREEPING RATES

After several rounds of review and refinements, our team was able to add and remove a number of important requirements, with a net increase of about 15% in total number of requirements, the most of which were concentrated in the Functional area.

Due to the small size of our team (4-person), it is inconceivable that we can in future versions do much more than 20% without degradation in accuracy.

# WHY WE THINK OUR SOLUTION IS BEST?

We truly believe that by leveraging the power of other apps on the market, our solution of providing an integrated User Interface has the most potential for providing the most functionality (even those not yet imagined) for the least amount of cost and disruption to the user’s system.

The simplicity of our approach, combined with our capability to bring many more applications to an ever-larger segment of users, is unique among the many competing solutions developed in the past.