A Demonstration of 4D Digital Avatar Infrastructure for Access of Complete Patient Information

Project acronym: MyHealthAvatar

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ABSTRACT:
This document reports the results of the performed evaluation activities by extending the Task 9.3 focused on Usability with additional focus on Functionality, Efficiency, Compatibility, Reliability, Security, Portability, Quality in Use.

KEYWORD LIST:
evaluation, usability, functionality, efficiency, compatibility, reliability, security, portability, quality in use

[1] **R**=Report, **P**=Prototype, **D**=Demonstrator, **O**=Other

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1 Executive Summary

This document reports the activities and presents the results of the Task 9.3: Usability and evaluation of scenarios and use cases to be realized.

The second chapter is presenting a detailed overview of the MyHealthAvatar (MHA) scenarios validation and evaluation activities performed in a way similar to medical software validation process which is accomplished through a series of tasks that were planned and executed at various stages of the software development life cycle. In general terms, the presented and widely used validation and evaluation criteria were adapted from the Food and Drug Administration (FDA)'s General Principles of Software Validation publication and aligned to MHA project's tasks and activities.

The next chapter is focused on general validation criteria list which has been elaborated in direct linkage with the requirements and functionalities mentioned in the Annex 11 of the EudraLex, The Rules Governing Medicinal Products in the European Union, Volume 4, Good Manufacturing Practice, Medicinal Products for Human and Veterinary Use.

The fourth chapter is describing in details the accepted and followed criteria-based assessment approach for the evaluation of all MHA uses cases, functionalities, demos and scenarios.

The fifth chapter is one of most important achievement for the entire MHA project and platform. Here are reported in concrete details all evaluation results. It is very important to mention the complexity of the performed evaluation activities. This task has been successfully extend and it covers not only the **usability** but as well the important evaluation topics bellow:

- Functionality
- Efficiency
- Compatibility
- Reliability
- Security
- Portability
- Quality in use

Each topic has been addressed by specific, concrete and understandable set of questions.

Due to different reasons (possibility to read the document, complexity of evaluation process, data analysis/presentation restrictions, etc.) some evaluation results are presented in conclusion chapter in the way of concluding tables with average (mean) values.

Tasks and Activities

1.1 Usability Activities and Evaluation Tasks

MHA scenarios validation and evaluation activities were performed in a way similar to medical software validation process which is accomplished through a series of tasks that are planned and executed at various stages of the software development life cycle. In general terms, the presented and widely used validation and evaluation criteria were adapted from the Food and Drug Administration (FDA)'s General Principles of Software Validation publication[3] and aligned to MHA project's tasks and activities.

1.2 Demos, Scenarios and Use Cases Life Cycle

According to the developmental process as elaborated in Task 9.1 demonstrators will be shown at every step of the developmental process. At the end of the project those scenarios that are defined in WP9 will be demonstrated in a full functioning version (Task 9.3). For demonstrators (Task 9.1 Definition of demos) development the developers established and implemented a software life cycle strategy appropriate for their scenario and organization. In general terms, the selected tool/software life cycle covers the tool/software from its birth to its retirement. The major activities in a typical software life cycle model include the following:

- Quality Planning
- System Requirements Definition and Specification
- Design
- Construction or Coding
- Testing
- Installation
- Operation and Support
- Maintenance
- Retirement

Verification, testing, and other usability/evaluation tasks that support software validation have been implemented during each of the above activities. A life cycle process organizes these demos development activities in various ways and provides a framework for monitoring and controlling the demos development project. Several software life cycle models (e.g., waterfall, spiral, rapid prototyping, incremental development, etc.) are well known and have been actively implemented by MHA project partners.

For each of the software life cycle activities, there are certain "typical" tasks that support the conclusion that the software is validated. However, the specific tasks to be performed, their order of performance, and the iteration and timing of their performance will be dictated by the specific software life cycle model that is selected and the safety risk associated with the software application. For very low risk applications, certain tasks may not be needed at all. However, MHA

[3] General Principles of Software Validation, Guidance for Industry and FDA Staff. Source: http://www.fda.gov/RegulatoryInformation/Guidances/ucm126954.htm [December 2015]

demo developers have considered each of these tasks and defined and documented in the related deliverables which tasks are or are not appropriate for their specific application (scenario/use case).

The chapters bellow are generic and are not intended to prescribe any particular MHA demo and MHA scenario/use case life cycle description or any particular order in which tasks were performed.

1.2.1 Quality Planning

Design and development planning should culminate in a plan that identifies necessary tasks, procedures for anomaly reporting and resolution, necessary resources, and management review requirements, including formal design reviews. A software life cycle model and associated activities should be identified, as well as those tasks necessary for each software life cycle activity. The plan should include:

- The specific tasks for each life cycle activity;
- Enumeration of important quality factors (e.g., reliability, maintainability, and usability);
- Methods and procedures for each task;
- Task acceptance criteria;
- Criteria for defining and documenting outputs in terms that will allow evaluation of their conformance to input requirements;
- Inputs for each task;
- Outputs from each task;
- Roles, resources, and responsibilities for each task;
- Risks and assumptions; and
- Documentation of user needs.

1.2.2 System Requirements Definition and Specification

Requirements development includes the identification, analysis, and documentation of information about the device and its intended use. Areas of special importance include allocation of system functions to hardware/software, operating conditions, user characteristics, potential hazards, and anticipated tasks. In addition, the requirements should state clearly the intended use of the software.

WP2 of MHA project has elaborated and presented the user needs and requirements for the MHA technological and clinical infrastructure. The complexity of the domain, which is addressed by the project necessitated that a spiral process of requirements analysis, elicitation, documentation and validation is adopted. Specific techniques have also been selected for the elicitation, negotiation and agreement of requirements as well as their validation. These techniques were scenarios and demos (prototyping). The tasks from WP2 have defined scenarios as detailed use cases, and provided the user requirements necessary to guide the activity in all the other work packages.

1.2.3 Design

The software design specification is a description of what the software should do and how it should do it. Due to the complexity of the project and in order to enable persons with varying levels of technical responsibilities to clearly understand design information, the design specification may contain both a high level summary of the design and detailed design information. The complete software design specification constrains the programmer/coder to stay within the intent of the agreed upon requirements and design. A complete software design specification will relieve the programmer from the need to make ad hoc design decisions.

The software design specification should include:

- Software requirements specification, including predetermined criteria for acceptance of the software;
- Software risk analysis;
- Development procedures and coding guidelines (or other programming procedures);
- Systems documentation (e.g., a narrative or a context diagram) that describes the systems context in which the program is intended to function, including the relationship of hardware, software, and the physical environment;
- Hardware to be used;
- Parameters to be measured or recorded;
- Logical structure (including control logic) and logical processing steps (e.g., algorithms);
- Data structures and data flow diagrams;
- Definitions of variables (control and data) and description of where they are used;
- Error, alarm, and warning messages;
- Supporting software (e.g., operating systems, drivers, other application software);
- Communication links (links among internal modules of the software, links with the supporting software, links with the hardware, and links with the user);
- Security measures (both physical and logical security); and
- Any additional constraints not identified in the above elements.

The activities and more information regarding MHA demos and scenario/use cases design are reported in WP3 (Architecture and integration).

1.2.4 Construction or Coding

Coding usually involves the use of a high-level programming language, but may also entail the use of assembly language (or microcode) for time-critical operations. The source code may be either compiled or interpreted for use on a target hardware platform. Decisions on the selection of programming languages and software build tools (assemblers, linkers, and compilers) should include consideration of the impact on subsequent quality evaluation tasks (e.g., availability of debugging and testing tools for the chosen language). Some compilers offer optional levels and commands for error checking to assist in debugging the code. Different levels of error checking may be used throughout the coding process, and warnings or other messages from the compiler may or may not

be recorded. However, at the end of the coding and debugging process, the most rigorous level of error checking is normally used to document what compilation errors still remain in the software. If the most rigorous level of error checking is not used for final translation of the source code, then justification for use of the less rigorous translation error checking should be documented. Also, for the final compilation, there should be documentation of the compilation process and its outcome, including any warnings or other messages from the compiler and their resolution, or justification for the decision to leave issues unresolved.

Source code should be evaluated to verify its compliance with specified coding guidelines. Such guidelines should include coding conventions regarding clarity, style, complexity management, and commenting. Code comments should provide useful and descriptive information for a module, including expected inputs and outputs, variables referenced, expected data types, and operations to be performed. Source code should also be evaluated to verify its compliance with the corresponding detailed design specification. Modules ready for integration and test should have documentation of compliance with coding guidelines and any other applicable quality policies and procedures.

Source code evaluations are often implemented as code inspections and code walkthroughs. Such static analyses provide a very effective means to detect errors before execution of the code. They allow for examination of each error in isolation and can also help in focusing later dynamic testing of the software. Documentation of the procedures used and the results of source code evaluations should be maintained as part of design verification.

1.2.5 Testing by the Developer

Software testing entails running software products under known conditions with defined inputs and documented outcomes that can be compared to their predefined expectations. It is a time consuming, difficult, and imperfect activity. As such, it requires early planning in order to be effective and efficient.

Test plans and test cases should be created as early in the software development process as feasible. They should identify the schedules, environments, resources (personnel, tools, etc.), methodologies, cases (inputs, procedures, outputs, and expected results), documentation, and reporting criteria. The magnitude of effort to be applied throughout the testing process can be linked to complexity, criticality, reliability, and/or safety issues (e.g., requiring functions or modules that produce critical outcomes to be challenged with intensive testing of their fault tolerance features). Descriptions of categories of software and software testing effort appear in the literature, for example IEEE Computer Society Press, Handbook of Software Reliability Engineering.

1.2.6 User Site Testing

Testing at the end-user site is an essential part of the software validation activities. The Quality System regulation requires installation and inspection procedures (including testing where appropriate) as well as documentation of inspection and testing to demonstrate proper installation.

Terms such as beta test, site validation, user acceptance test, installation verification, and installation testing have all been used to describe user site testing. For purposes of this document,

the term "user site testing" encompasses all of these and any other testing that takes place outside of the developer's controlled environment. This testing should take place at a user's site with the actual hardware and software that will be part of the installed system configuration. The testing is accomplished through either actual or simulated use of the software being tested within the context in which it is intended to function.

User site testing should follow a pre-defined written plan with a formal summary of testing and a record of formal acceptance. Documented evidence of all testing procedures, test input data, and test results should be retained.

2 Clinical Evaluation/Validation

2.1 General Evaluation / Validation Criteria

The general validation criteria list has been elaborated in direct linkage with the requirements and functionalities mentioned in the Annex 11 of the EudraLex, The Rules Governing Medicinal Products in the European Union, Volume 4, Good Manufacturing Practice, Medicinal Products for Human and Veterinary Use.[4]

This annex applies to all forms of computerised systems used as part of a GMP regulated activities. A computerised system is a set of software and hardware components which together fulfil certain functionalities.

Requirement	Met by
	General
Risk Management	Risk management should be applied throughout the lifecycle of the computerised system taking into account patient safety, data integrity and product quality. As part of a risk management system, decisions on the extent of validation and data integrity controls should be based on a justified and documented risk assessment of the computerised system.
Personnel	There should be close cooperation between all relevant personnel such as Process Owner, System Owner, Qualified Persons and IT. All personnel should have appropriate qualifications, level of access and defined responsibilities to carry out their assigned duties.
Suppliers and Service Providers	When third parties (e.g. suppliers, service providers) are used e.g. to provide, install, configure, integrate, validate, maintain (e.g. via remote access), modify or retain a computerised system or related service or for data processing, formal agreements must exist between the manufacturer and any third parties, and these agreements should include clear statements of the responsibilities of the third party. IT-departments should be considered analogous.
	Project Phase
Validation	• **The validation documentation and reports should cover the relevant steps of the lifecycle.** Manufacturers should be able to justify their standards, protocols, acceptance criteria, procedures and records based on their risk assessment. • Validation documentation should include change control records (if applicable) and reports on any deviations observed during the validation process. • An up to date listing of all relevant systems and their GMP functionality (inventory) should be available. • For critical systems an up to date system description detailing the physical and logical arrangements, data flows and interfaces with other systems or processes, any hardware and software pre-requisites, and security measures should be available. • User Requirements Specifications should describe the required

[4] Annex 11, EudraLex, The Rules Governing Medicinal Products in the European Union, Volume 4, Good Manufacturing Practice, Medicinal Products for Human and Veterinary Use. Source: http://ec.europa.eu/health/files/eudralex/vol-4/annex11_01-2011_en.pdf [December 2015]

	functions of the computerised system and be based on documented risk assessment and GMP impact. User requirements should be traceable throughout the life-cycle. • The regulated user should take all reasonable steps, to ensure that the system has been developed in accordance with an appropriate quality management system. The supplier should be assessed appropriately. • For the validation of bespoke or customised computerised systems there should be a process in place that ensures the formal assessment and reporting of quality and performance measures for all the life-cycle stages of the system. • Evidence of appropriate test methods and test scenarios should be demonstrated. Particularly, system (process) parameter limits, data limits and error handling should be considered. Automated testing tools and test environments should have documented assessments for their adequacy. • If data are transferred to another data format or system, validation should include checks that data are not altered in value and/or meaning during this migration process.
Operational Phase	
Data	Computerised systems exchanging data electronically with other systems should include appropriate built-in checks for the correct and secure entry and processing of data, in order to minimize the risks.
Accuracy Checks	• Data should be secured by both physical and electronic means against damage. Stored data should be checked for accessibility, readability and accuracy. Access to data should be ensured throughout the retention period. • Regular back-ups of all relevant data should be done. Integrity and accuracy of back-up data and the ability to rest or the data should be checked during validation and monitored periodically.
Printouts	• It should be possible to obtain clear printed copies of electronically stored data. • For records supporting batch release it should be possible to generate printouts indicating if any of the data has been changed since the original entry.
Audit Trails	Consideration should be given, based on a risk assessment, to building into the system the creation of a record of all GMP-relevant changes and deletions (a system generated "audit trail"). For change or deletion of GMP-relevant data the reason should be documented. Audit trails need to be available and convertible to a generally intelligible form and regularly reviewed.
Change and Configuration Management	Any changes to a computerised system including system configurations should only be made in a controlled manner in accordance with a defined procedure.
Periodic evaluation	Computerised systems should be periodically evaluated to confirm that they remain in a valid state and are compliant with GMP. Such evaluations should include, where appropriate, the current range of functionality, deviation records, incidents, problems, upgrade history, performance, reliability, security and validation status reports.

Security	• Physical and/or logical controls should be in place to restrict access to computerized system to authorised persons. Suitable methods of preventing unauthorised entry to the system may include the use of keys, pass cards, personal codes with passwords, biometrics, restricted access to computer equipment and data storage areas. • The extent of security controls depends on the criticality of the computerised system. • Creation, change, and cancellation of access authorisations should be recorded. • Management systems for data and for documents should be designed to record the identity of operators entering, changing, confirming or deleting data including date and time.
Incident Management	All incidents, not only system failures and data errors, should be reported and assessed. The root cause of a critical incident should be identified and should form the basis of corrective and preventive actions.
Electronic Signature	Electronic records may be signed electronically. Electronic signatures are expected to: • have the same impact as hand-written signatures within the boundaries of the company, • be permanently linked to their respective record, • include the time and date that they were applied.
Batch release	When a computerised system is used for recording certification and batch release, the system should allow only Qualified Persons to certify the release of the batches and it should clearly identify and record the person releasing or certifying the batches. This should be performed using an electronic signature.
Business Continuity	For the availability of computerised systems supporting critical processes, provisions should be made to ensure continuity of support for those processes in the event of a system breakdown (e.g. a manual or alternative system). The time required to bring the alternative arrangements into use should be based on risk and appropriate for a particular system and the business process it supports. These arrangements should be adequately documented and tested.
Archiving	Data may be archived. This data should be checked for accessibility, readability and integrity. If relevant changes are to be made to the system (e.g. computer equipment or programs), then the ability to retrieve the data should be ensured and tested.

2.2 GCP Validation Criteria

Good Clinical Practice (GCP) is an international ethical and scientific quality standard for designing, recording and reporting trials involving human subject participation. Compliance with this standard provides public assurance that

- The rights, safety and wellbeing of trial subjects are protected
- The clinical trial data are credible

This is a statement of ethical principles developed by the World Medical Association. Requirements for the conduct of clinical trials in the European Union (EU), including GCP and good manufacturing practice (GMP) and GCP or GMP inspections, are implemented in:

- The Clinical Trial Directive (Directive 2001/20/EC)
- The GCP Directive (Directive 2005/28/EC)

The basic principles of GCP are:

1. Clinical trials should be conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki and that are consistent with GCP and the applicable regulatory requirement(s).
2. Before a trial is initiated, foreseeable risks and inconveniences should be weighed against the anticipated benefit for the individual trial subject and society. A trial should be initiated and continued only if the anticipated benefits justify the risks.
3. The rights, safety and well-being of the trial subjects are the most important considerations and should prevail over interests of science and society.
4. The available nonclinical and clinical information on an investigational product should be adequate to support the proposed clinical trial.
5. Clinical trials should be scientifically sound and described in a clear, detailed protocol.
6. A trial should be conducted in compliance with the protocol that has received prior Institutional Review Board (IRB)/Independent Ethics Committee (IEC) approval/favourable opinion.
7. The medical care given to, and medical decisions made on behalf of, subjects should always be the responsibility of a qualified physician or, when appropriate, of a qualified dentist.
8. Each individual involved in conducting a trial should be qualified by education, training, and experience to perform his or her respective task(s).
9. Freely given informed consent should be obtained from every subject prior to clinical trial participation.
10. All clinical trial information should be recorded, handled, and stored in a way that allows its accurate reporting, interpretation and verification.
11. The confidentiality of records that could identify subjects should be protected, respecting the privacy and confidentiality rules in accordance with the applicable regulatory requirement(s).
12. Investigational products should be manufactured, handled, and stored in accordance with applicable Good Manufacturing Practice (GMP). They should be used in accordance with the approved protocol.
13. Systems with procedures that assure the quality of every aspect of the trial should be implemented.

3 Implementation and Continuous Evaluation Activities

3.1 Criteria-Based Assessment

Criteria-based assessment gives a measurement of quality and is derived from ISO/IEC 9126-1 Software engineering - Product quality. The check list below is adapted from the Software Evaluation Guide elaborated by Mike Jackson, Steve Crouch and Rob Baxter from The Software Sustainability Institute[5].

Requirement	Sub-requirement	Met by
Usability	Understandability	Easily understood?
	Documentation	Comprehensive, appropriate, well-structured user documentation?
	Buildability	Straightforward to build on a supported system?
	Installability	Straightforward to install on a supported system?
	Learnability	Easy to learn how to use its functions?
Sustainability and maintainability	Identity	Project/software identity is clear and unique?
	Copyright	Easy to see who owns the project/software?
	Licensing	Adoption of appropriate licence?
	Governance	Easy to understand how the project is run and the development of the software managed?
	Community	Evidence of current/future community?
	Accessibility	Evidence of current/future ability to download?
	Testability	Easy to test correctness of source code?
	Portability	Usable on multiple platforms?
	Supportability	Evidence of current/future developer support?
	Analysability	Easy to understand at the source level?
	Changeability	Easy to modify and contribute changes to developers?
	Evolvability	Evidence of current/future development?
	Interoperability	Interoperable with other required/related software?

Appendix 2 presents the extended version of the suggested for implementation criteria-based assessment check-list.

3.2 General Questions

The table below presents all questions and answer choices used in evaluation events/activities by all MHA partners. This set of question has been included in all evaluation forms and it is conventionally named “General Questions”.

Questions	Answers
Please select your gender	Male Female
Please select your age range	< 20 20 - 35 36 - 45

[5] Software Evaluation Guide, By Mike Jackson, Steve Crouch and Rob Baxter from The Software Sustainability Institute, http://software.ac.uk [December 2015]

	46 - 55 56 - 65 > 65
What is your highest level of education?	No Academic qualifications Elementary school Vocational qualification Higher degree
Have you ever had a job in healthcare?	Yes as a Provider (e.g. nurse, doctor, etc.) Yes as a Researcher (e.g. university, public health, etc.) Yes as Other (e.g. hospital manager, health charity, pharmacist, etc.) No
Do you have any long term health conditions?	No Prefer not to say Diabetes Asthma Fibromyalgia Effects of stroke Epilepsy HIV/AIDS Glaucoma Heart disease Chronic bronchitis or emphysema High blood pressure Back problems and/or arthritis Anxiety or depression Alzheimer's disease or other dementia Migraine headaches Problems related to alcohol or drugs Cancer Bowel disorder Thyroid condition Urinary incontinence Cataracts Sexually transmitted disease Other:
How would you rate your computer skills?	Novice 1 2 3 4 5 6 7 8 9 10 Expert
Are you a member of any of the following social networking services?	Facebook Twitter LinkedIn Google+ XING Other:
Have you ever participated in other MyHealthAvatar project surveys?	Yes No
Where have you heard about MyHealthAvatar	The media (e.g. newspaper, radio, television)

before?	The Internet (e.g. news article, Google) The hospital (e.g. GP) Word of mouth (e.g. friend or relative) Meeting, workshop (e.g. presentation) Survey invitation (e.g. e-mail) Other:
Have you ever heard anything about Electronic Health Records (EHR)?	Yes No

3.3 Criteria Based Evaluation Questions

Criteria based evaluation questions have the goal to cover not only the usability evaluation. We focused our efforts on coverage of additional evaluation topics, and in special:

- Functionality
- Efficiency
- Compatibility
- Reliability
- Security
- Portability
- Quality in use

Each topic is addressed by specific, concrete and understandable set of questions. Every answer represents a scale from 1 to 5 where 1 is “Low” and 5 is “High”.

Software / Application name		Rating (1 low, 5 high)				
	(software/application quality characteristics)	1	2	3	4	5
Functionality	Can software perform the tasks (say what task)					
	Are functionalities displayed sufficient (say what expected)					
	Are these results as expected (say what are expected results)					
	Can these service interact with the MHA platform (say what expected)					
	Is the system compliant with standards (say what standard)					
Efficiency	How quickly does the Service interact? (say what expected)					
	Does the system utilize CPU and memory efficiently (we may not need this for user evaluation)					
Compatibility	Do you know other similar tools If yes is this tool better than the other you know?					
Usability	Does the user comprehend how to use the system easily?					
	Can the user learn to use the system easily?					
	Can the user use the system without much effort					

	Does the interface look good?					
	Does the interface provide all required information?					
	Is the usage of the application intuitive?					
Reliability	Have most of the faults in the software been eliminated over time?					
	Is the software capable of handling errors?					
	Can the services resume working & restore lost data after failure?					
Security	Are data accessible only to authorized users?					
	Does the system prevent unauthorized access?					
Maintainability	Can the software be tested easily?					
Portability	Can the software be moved to other environments?					
	Can the software be installed easily?					
	Can the software easily replace other software?					
Quality in use	How accurate and complete is the software for the intended use?					
	Does the software improve the time or reduce resource for the intended goal?					
	Does the software satisfy the perceived achievement of pragmatic goals					
	Can the software harm people in the intended context of use?					

4 Scenarios/Applications Evaluation Results

4.1 Introduction

This chapter presents the collected results of the main MHA Evaluation questionnaire with evaluation forms bellow:

- General Questions
- Sign up/in and Setting (Web Application)
- Sign up/in and Setting (Mobile Application)
- Data Collection (Web Application)
- Data Collection (Mobile Application)
- Data Visualization (Web Application)
- Data Visualization (Mobile Application)
- Diary (Mobile Application)
- Toolbox (Web Application)

Note: Due to high number of collected data, all tables and related charts are presented without numbers, please use as reference the text chapter number or page number.

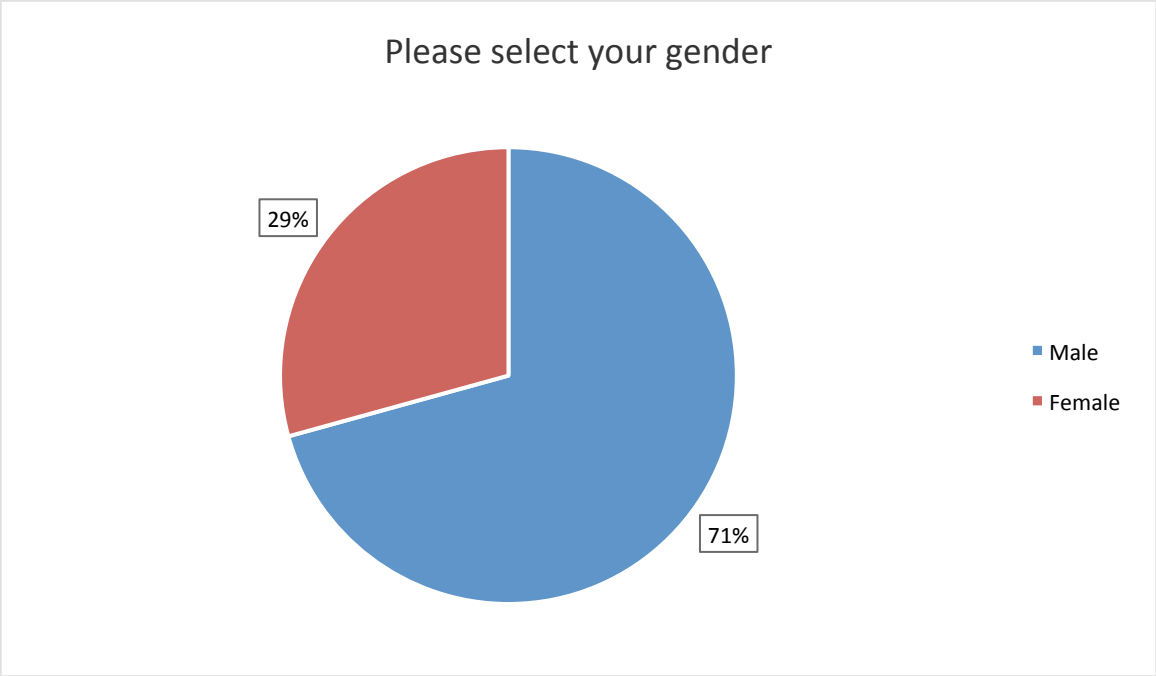
4.2 General Questions

General Questions evaluation form has the following questions:

- Please select your gender
- Please select your age range
- What is your highest level of education?
- Have you ever had a job in healthcare?
- Do you have any long term health conditions?
- How would you rate your computer skills?
- Are you a member of any of the following social networking services?
- Have you ever participated in other MyHealthAvatar project surveys?
- Where have you heard about MyHealthAvatar before?
- Have you ever heard anything about Electronic Health Records (EHR)?

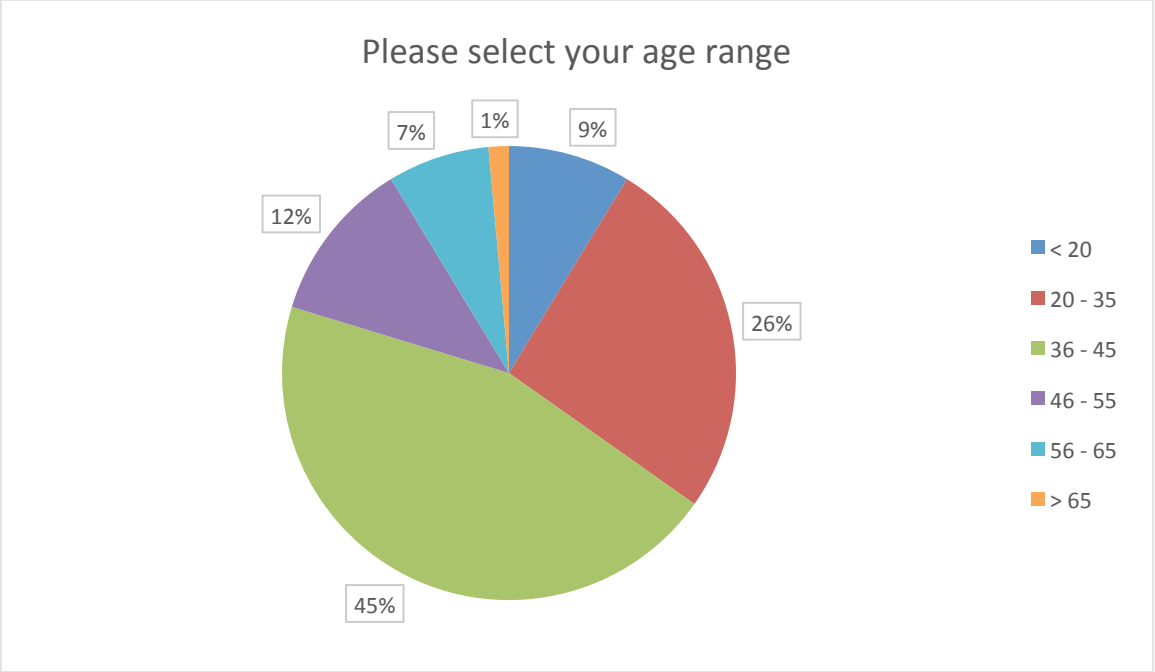
4.2.1 Please select your gender

Answer	Count	Percentage, %
Female	41	29
Male	99	71



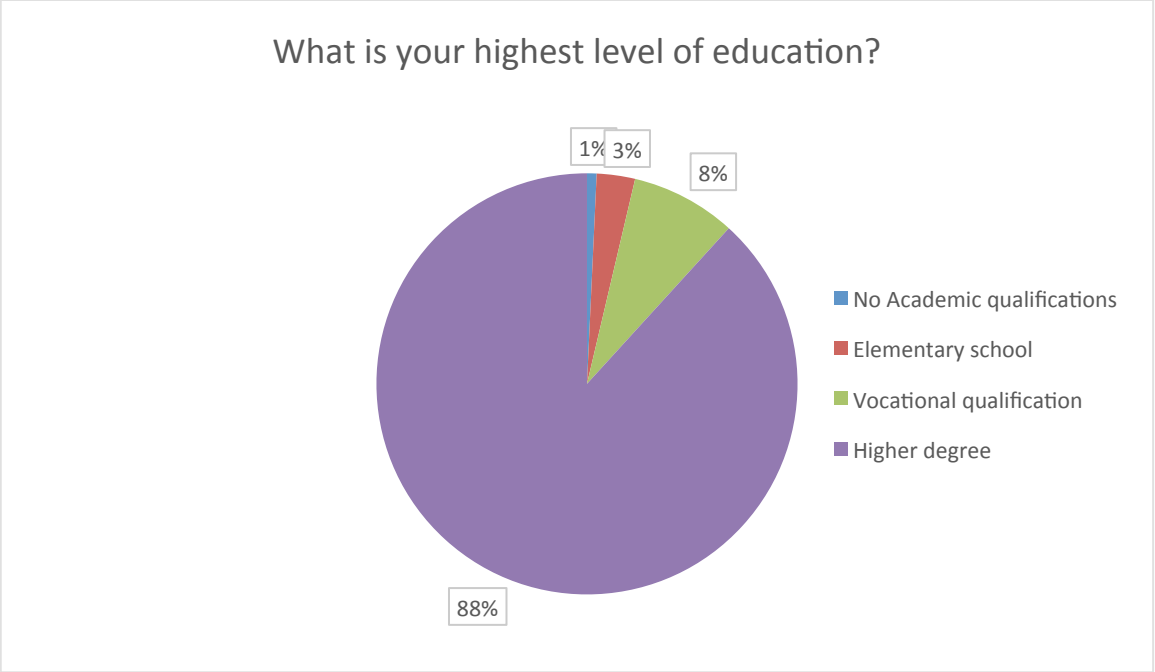
4.2.2 Please select your age range

Answer	Count	Percentage, %
< 20	6	9
20 - 35	18	26
36 - 45	31	45
46 - 55	8	12
56 - 65	5	7
> 65	1	1



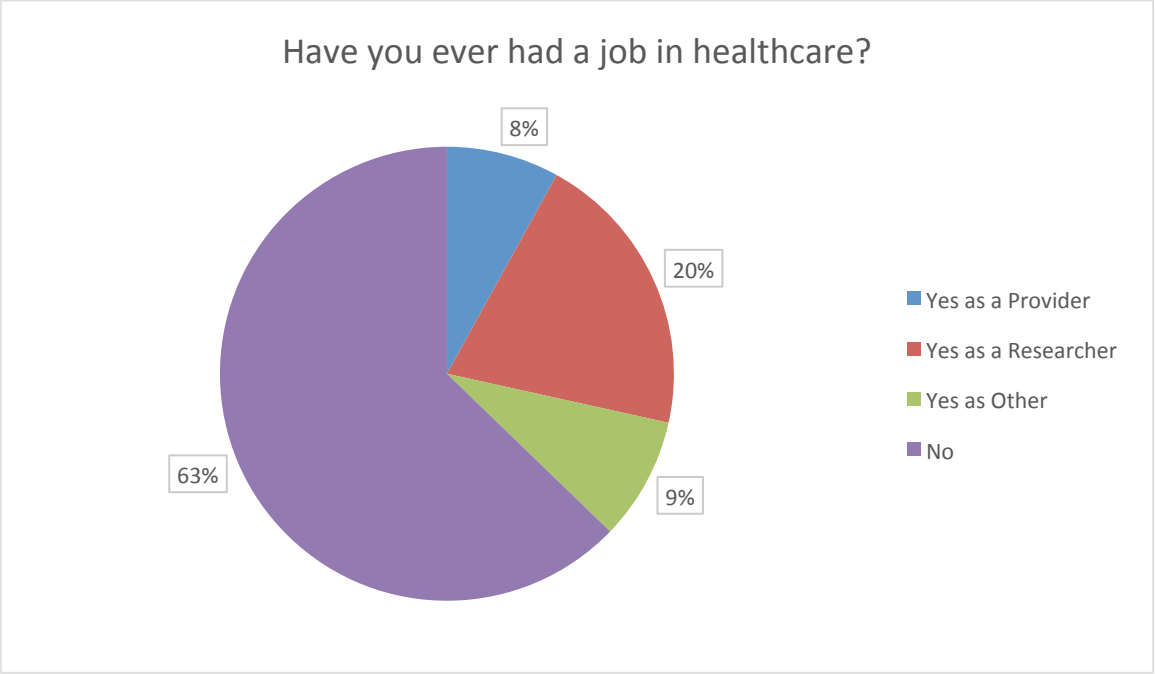
4.2.3 What is your highest level of education?

Answer	Count	Percentage, %
No Academic qualifications	1	1
Elementary school	4	3
Vocational qualification	11	8
Higher degree	120	88



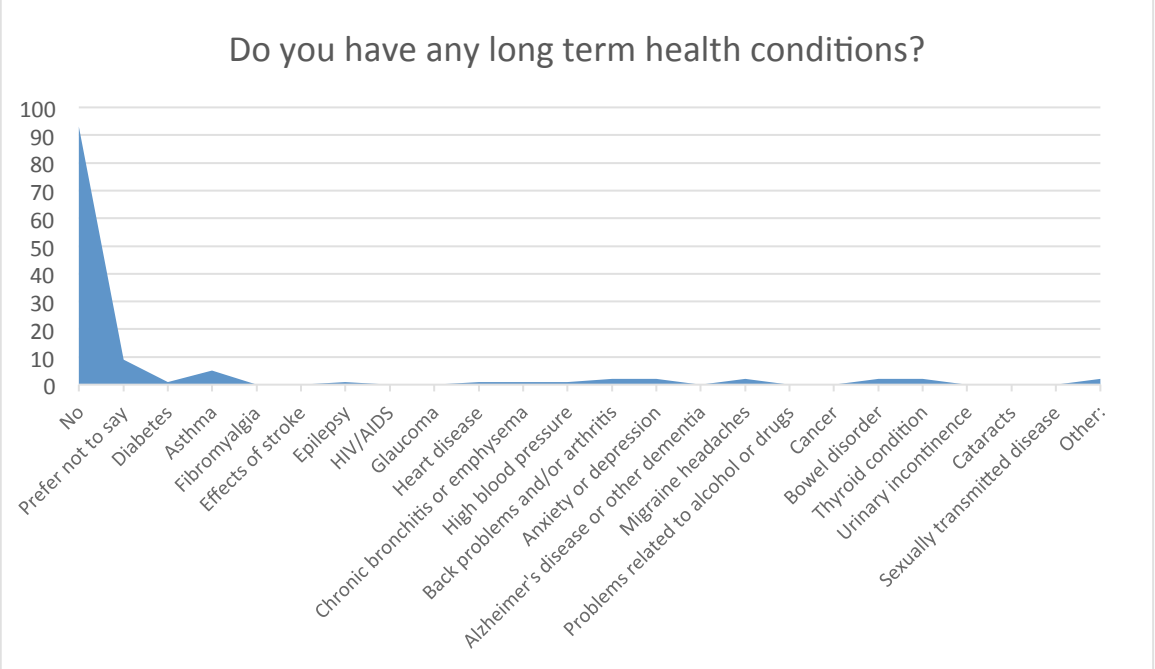
4.2.4 Have you ever had a job in healthcare?

Answer	Count	Percentage, %
Yes as a Provider (e.g. nurse, doctor, etc.)	11	8
Yes as a Researcher (e.g. university, public health, etc.)	28	20
Yes as Other (e.g. hospital manager, health charity, pharmacist, etc.)	12	9
No	86	63



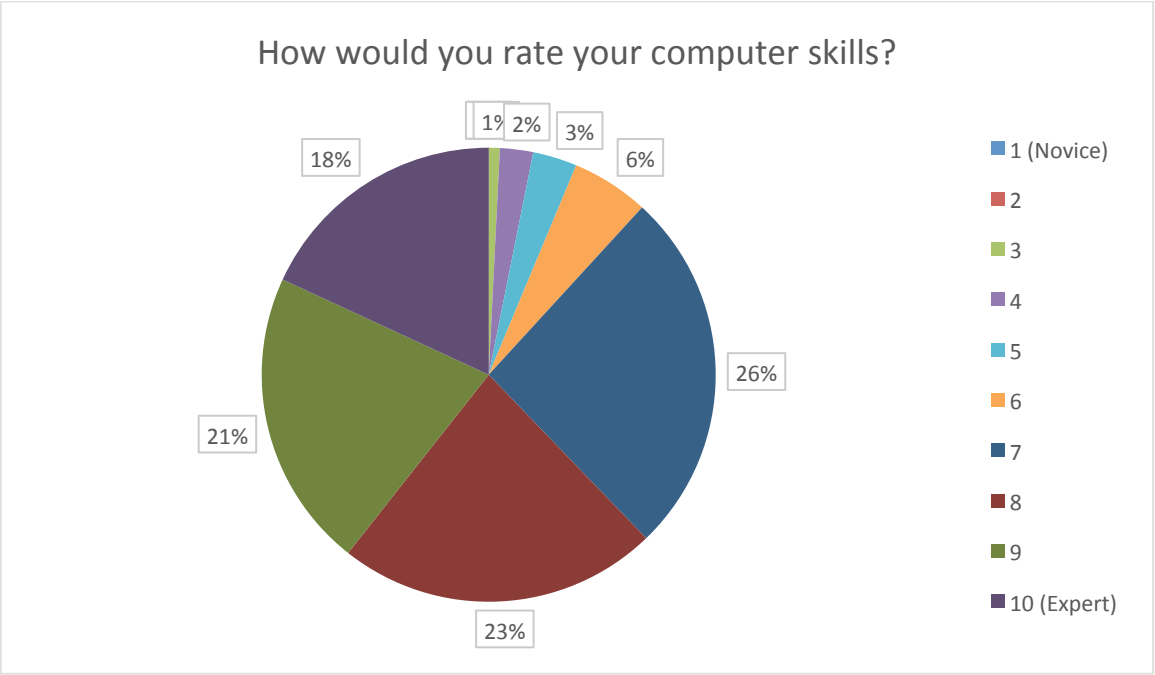
4.2.5 Do you have any long term health conditions?

Answer	Count	Percentage, %
No	93	75
Prefer not to say	9	7
Diabetes	1	1
Asthma	5	4
Fibromyalgia	0	0
Effects of stroke	0	0
Epilepsy	1	1
HIV/AIDS	0	0
Glaucoma	0	0
Heart disease	1	1
Chronic bronchitis or emphysema	1	1
High blood pressure	1	1
Back problems and/or arthritis	2	2
Anxiety or depression	2	2
Alzheimer's disease or other dementia	0	0
Migraine headaches	2	2
Problems related to alcohol or drugs	0	0
Cancer	0	0
Bowel disorder	2	2
Thyroid condition	2	2
Urinary incontinence	0	0
Cataracts	0	0
Sexually transmitted disease	0	0
Other:	2	2


Do you have any long term health conditions?
100
90
80
70
60
50
40
30
20
10
0
No
Prefer not to say
Diabetes
Asthma
Fibromyalgia
Effects of stroke
Epilepsy
HIV/AIDS
Glaucoma
Heart disease
Chronic bronchitis or emphysema
High blood pressure
Back problems and/or arthritis
Anxiety or depression
Alzheimer's disease or other dementia
Migraine headaches
Problems related to alcohol or drugs
Cancer
Bowel disorder
Thyroid condition
Urinary incontinence
Cataracts
Sexually transmitted disease
Other:

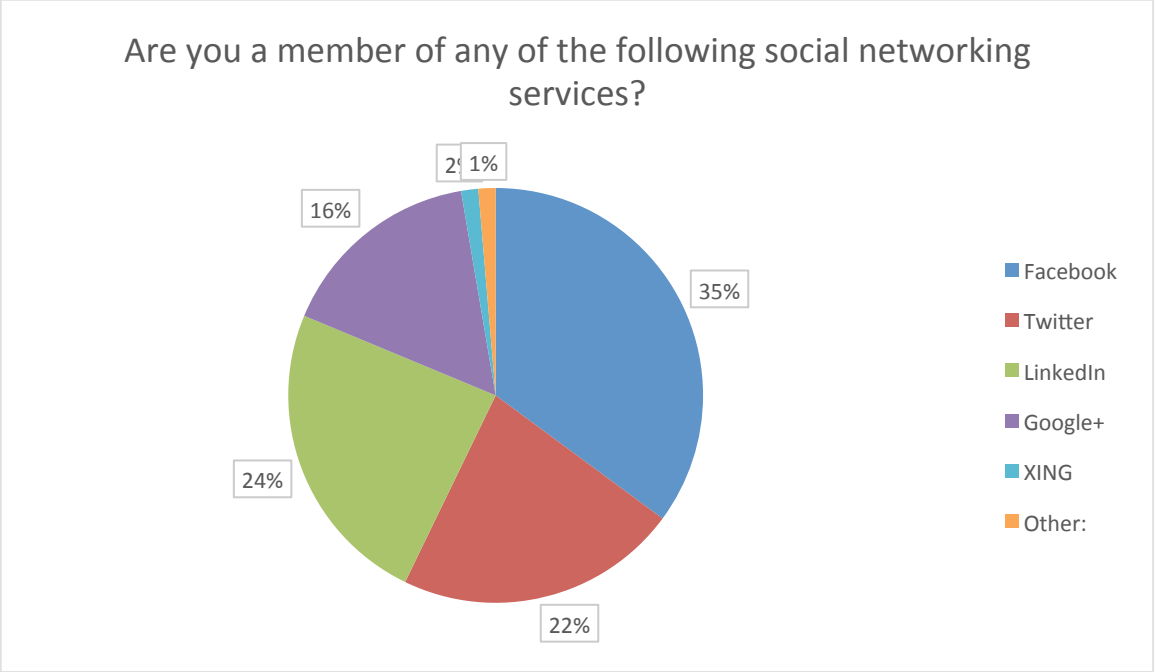
4.2.6 How would you rate your computer skills?

Answer	Count	Percentage, %
1 (Novice)	0	0
2	0	0
3	1	1
4	3	2
5	4	3
6	7	6
7	33	26
8	29	23
9	27	21
10 (Expert)	23	18



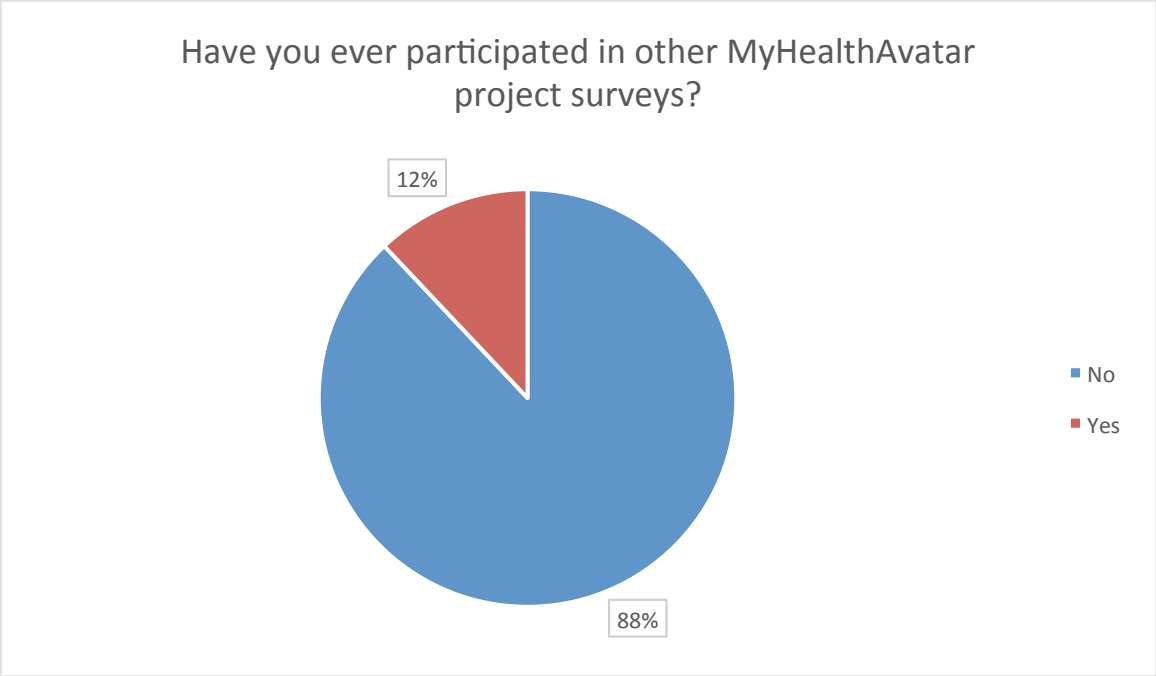
4.2.7 Are you a member of any of the following social networking services?

Answer	Count	Percentage, %
Facebook	105	35
Twitter	66	22
LinkedIn	72	24
Google+	48	16
XING	4	1
Other:	4	1



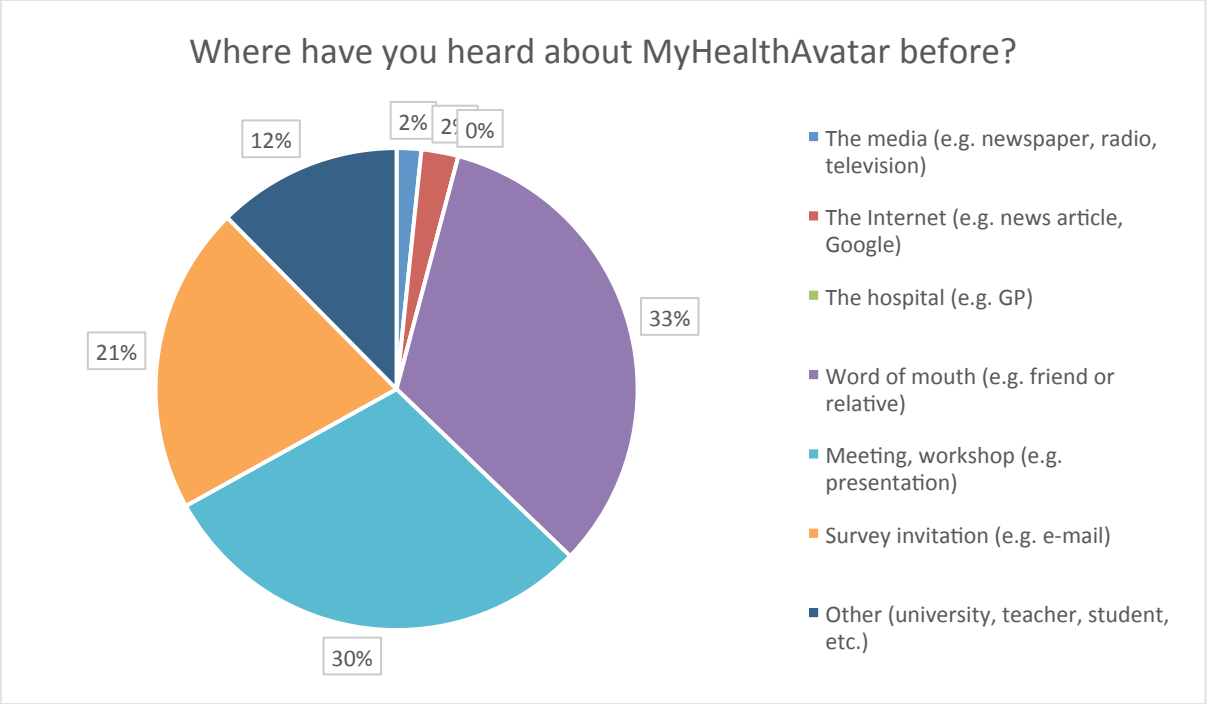
4.2.8 Have you ever participated in other MyHealthAvatar project surveys?

Answer	Count	Percentage, %
No	117	88
Yes	16	12



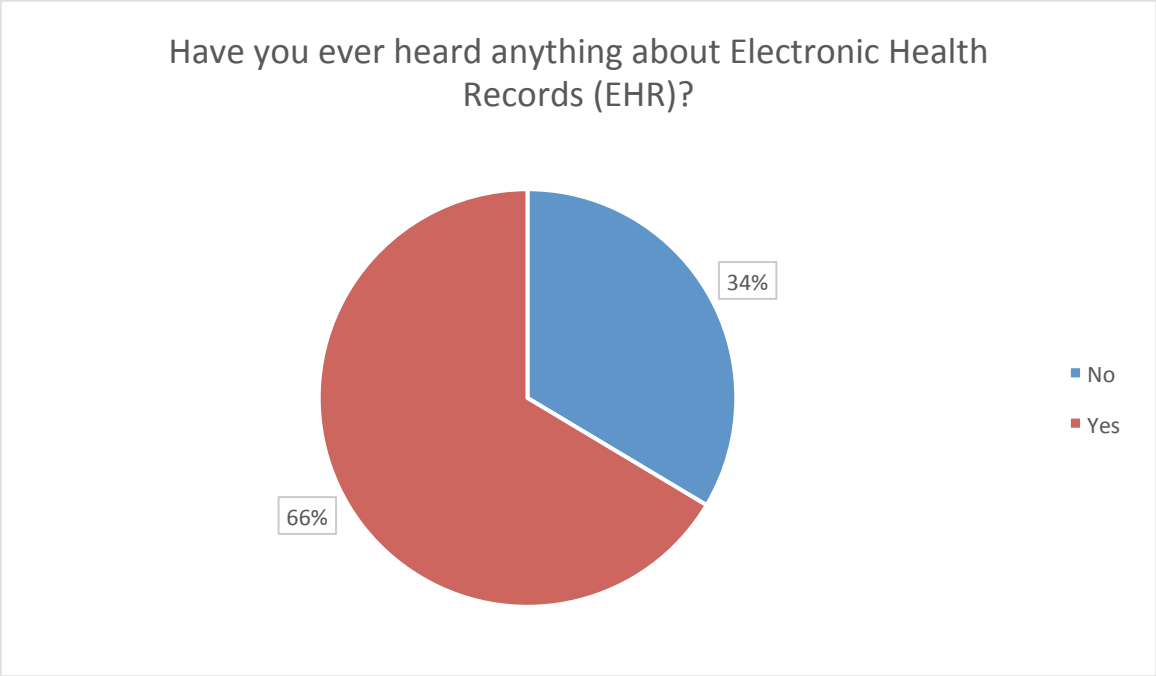
4.2.9 Where have you heard about MyHealthAvatar before?

Answer	Count	Percentage, %
The media (e.g. newspaper, radio, television)	2	2
The Internet (e.g. news article, Google)	3	2
The hospital (e.g. GP)	0	0
Word of mouth (e.g. friend or relative)	40	33
Meeting, workshop (e.g. presentation)	36	30
Survey invitation (e.g. e-mail)	25	21
Other (university, teacher, student, etc.)	15	12



4.2.10Have you ever heard anything about Electronic Health Records (EHR)?

Answer	Count	Percentage, %
No	45	34
Yes	89	66



4.3 Sign up/in and Setting (Web Application)

Sign up/in and Setting (Web Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can the application register a new user and log in easily?

Is the log in page user friendly?

Can you change the settings of the application easily?

Section: Efficiency

How quickly does the Service interact?

Compatibility

Do you know other similar tools? If yes is this tool better than the other you know?

Section: Usability

Can you comprehend how to use the system easily?

Can you learn how to use the system easily?

Can the user use the system without much effort?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the application intuitive?

Section: Reliability

Is the software capable of handling errors?

Can the services resume working & restore lost data after failure?

Section: Security

Do you think your data is secure?

Does the system prevent unauthorized access?

Section: Portability

Can the application be moved to other environments?

Section: Quality in Use

How accurate and complete is the application for the intended use?

Does the application improve the time or reduce resources for the intended goal?

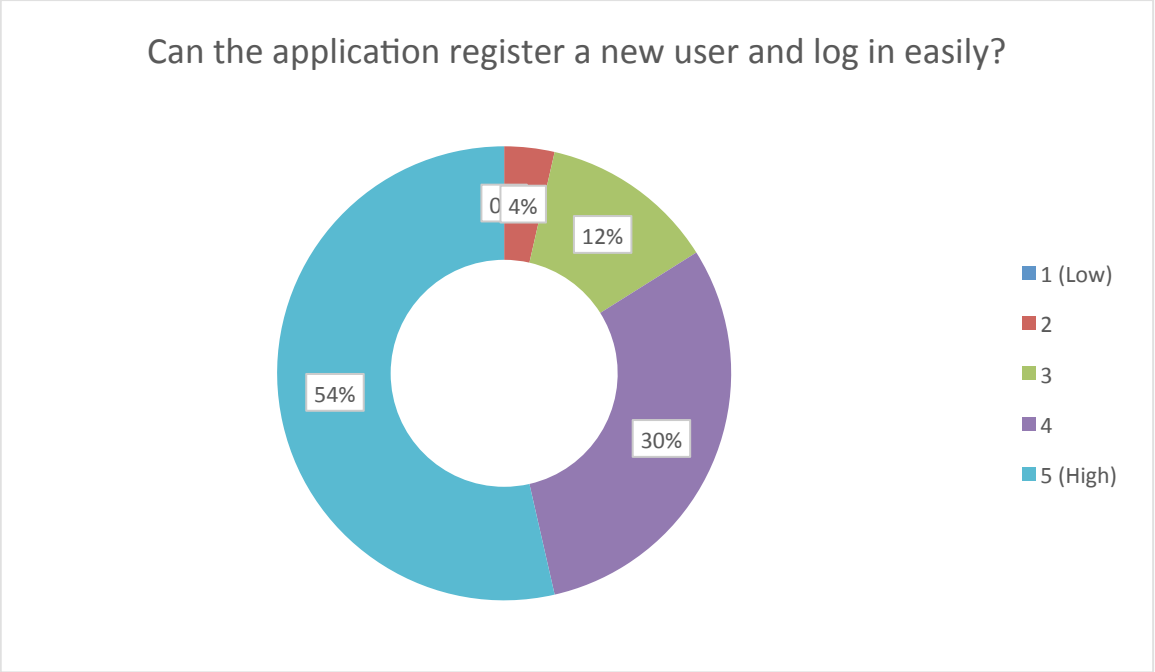
Does the application satisfy the perceived achievement of pragmatic goals?

Can the application harm people in the intended context of use?

4.3.1 Can the application register a new user and log in easily?

Mean: 4,3

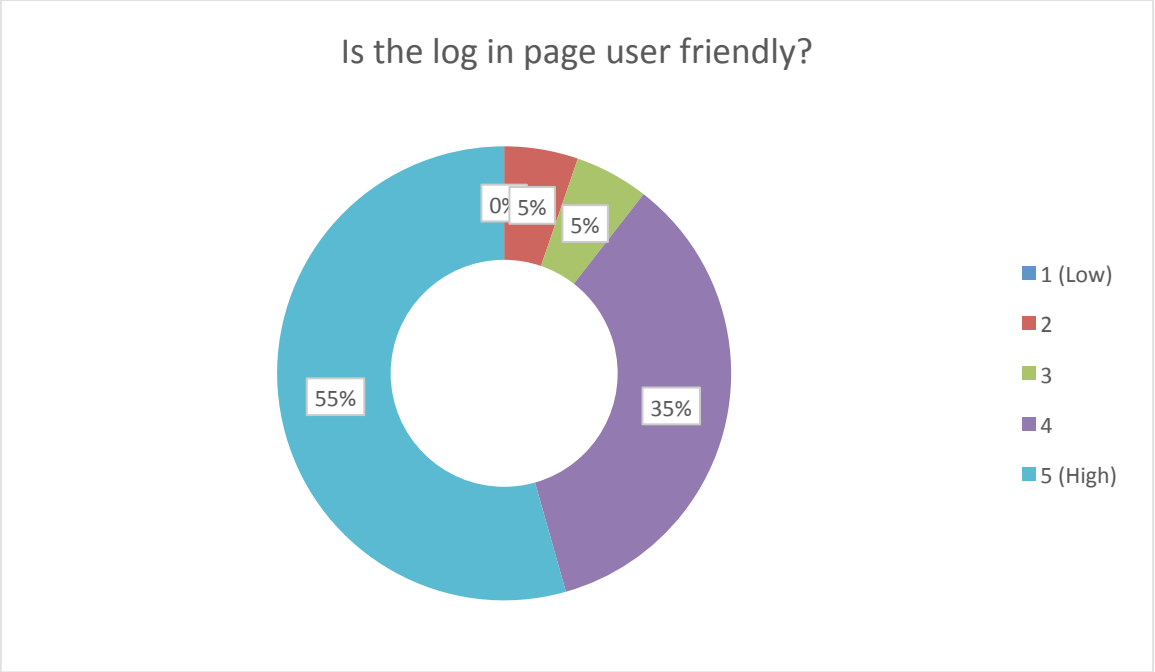
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	4
3	7	13
4	17	30
5 (High)	30	54



4.3.2 Is the log in page user friendly?

Mean: 4,4

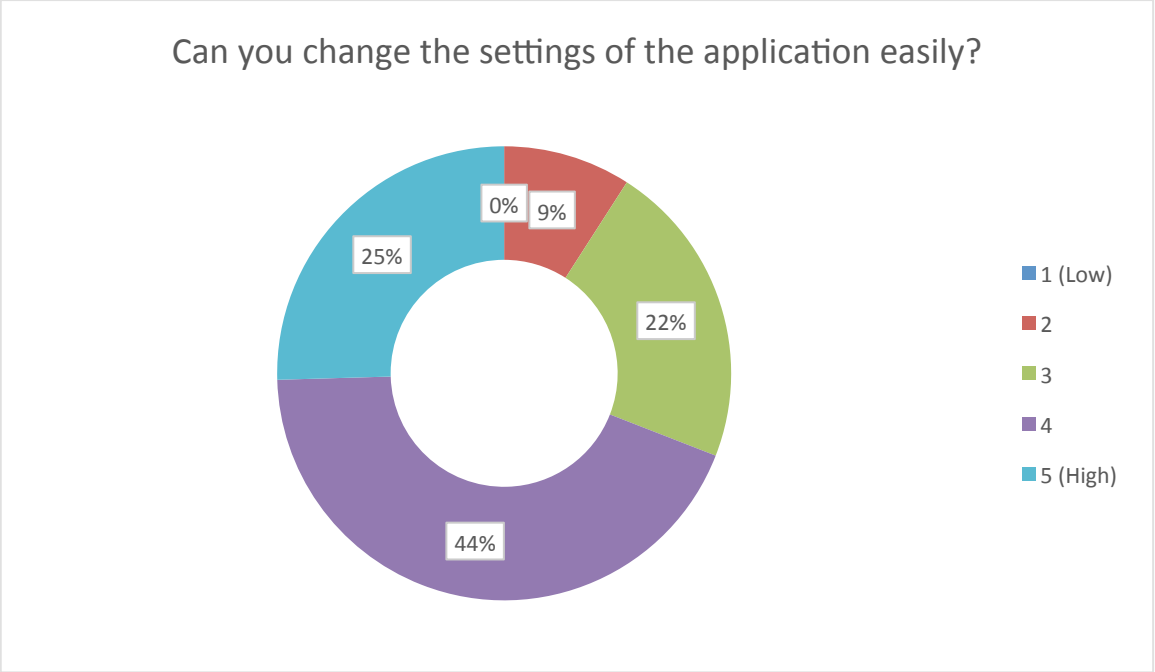
Answer	Count	Percentage, %
1 (Low)	0	0
2	3	5
3	3	5
4	20	35
5 (High)	31	54



4.3.3 Can you change the settings of the application easily?

Mean: 3,9

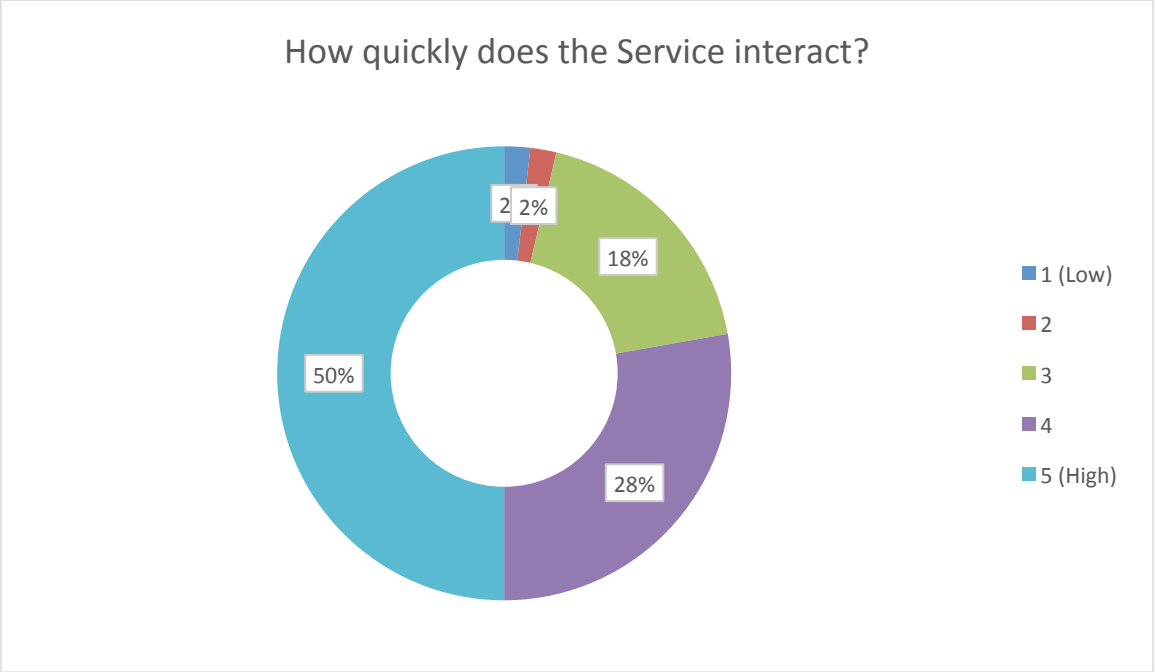
Answer	Count	Percentage, %
1 (Low)	0	0
2	5	9
3	12	22
4	24	44
5 (High)	14	25



4.3.4 How quickly does the Service interact?

Mean: 4,2

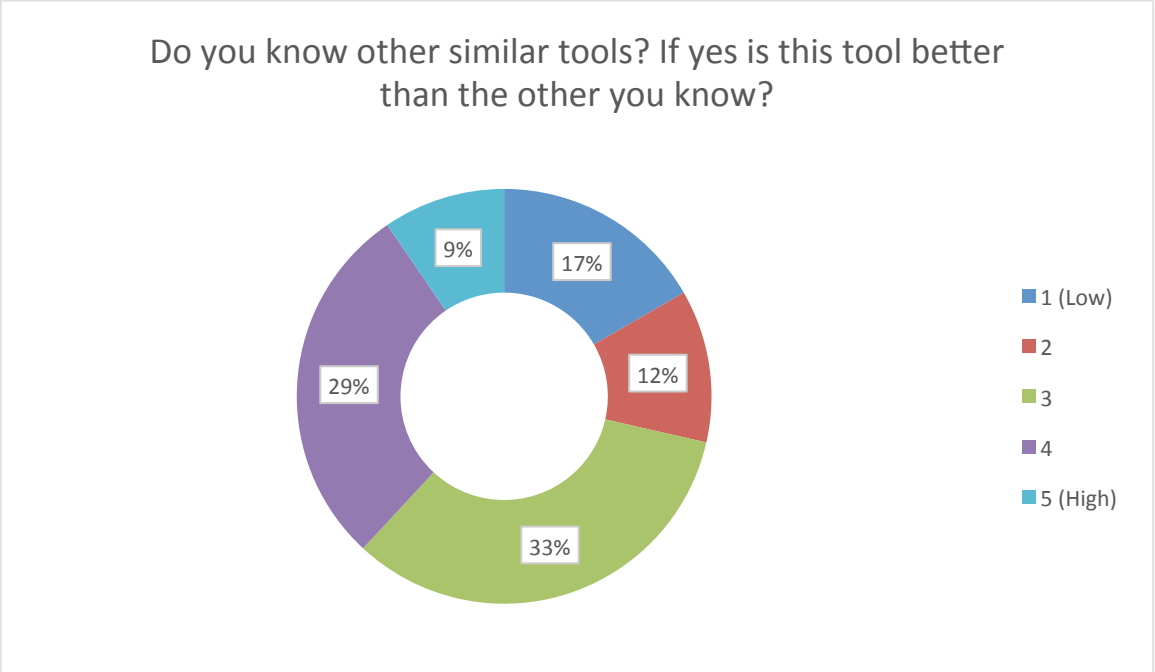
Answer	Count	Percentage, %
1 (Low)	1	2
2	1	2
3	10	19
4	15	28
5 (High)	27	50



4.3.5 Do you know other similar tools? If yes is this tool better than the other you know?

Mean: 3,0

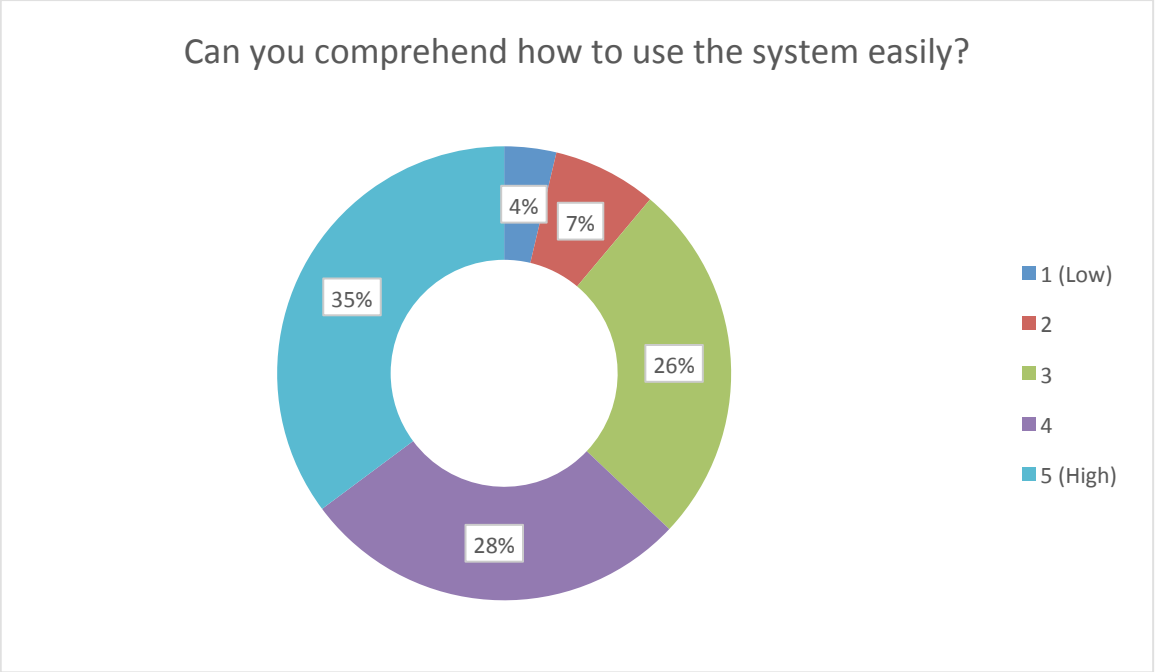
Answer	Count	Percentage, %
1 (Low)	7	17
2	5	12
3	14	33
4	12	29
5 (High)	4	10



4.3.6 Can you comprehend how to use the system easily?

Mean: 3,8

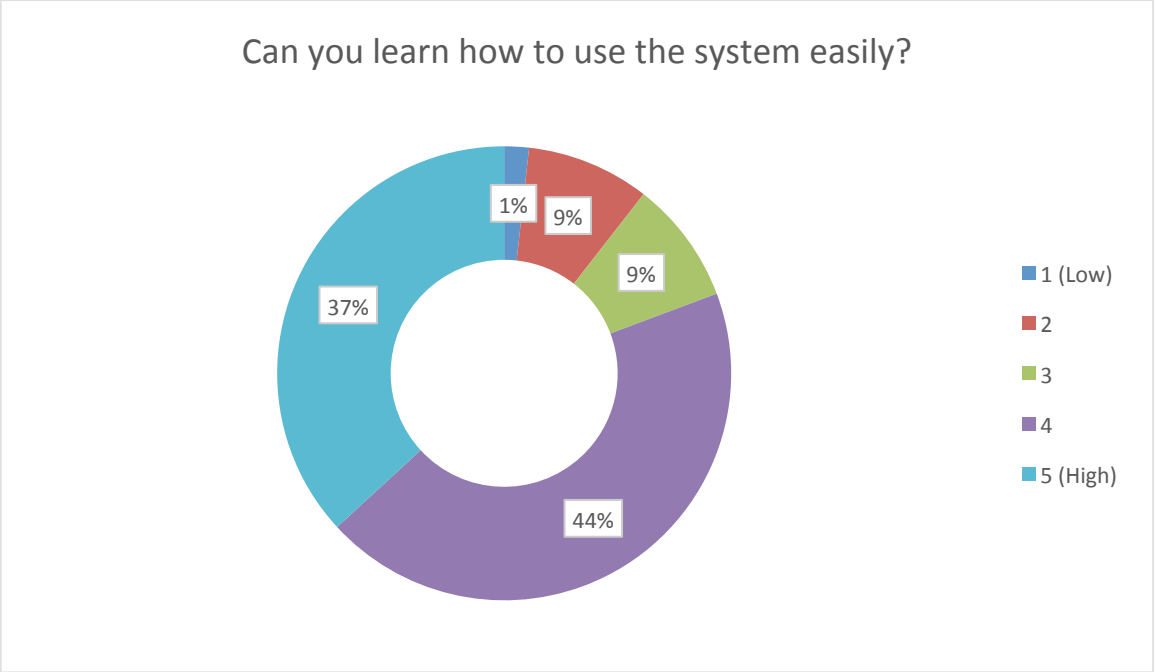
Answer	Count	Percentage, %
1 (Low)	2	4
2	4	7
3	14	26
4	15	28
5 (High)	19	35



4.3.7 Can you learn how to use the system easily?

Mean: 4,1

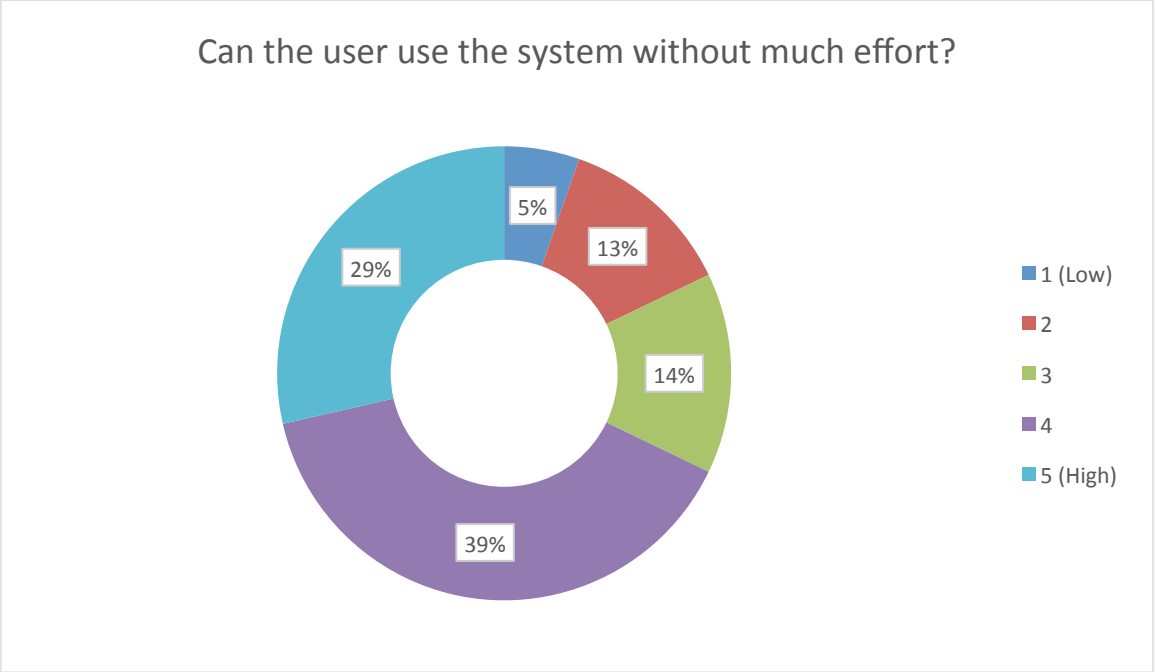
Answer	Count	Percentage, %
1 (Low)	1	2
2	5	9
3	5	9
4	25	44
5 (High)	21	37



4.3.8 Can the user use the system without much effort?

Mean: 3,7

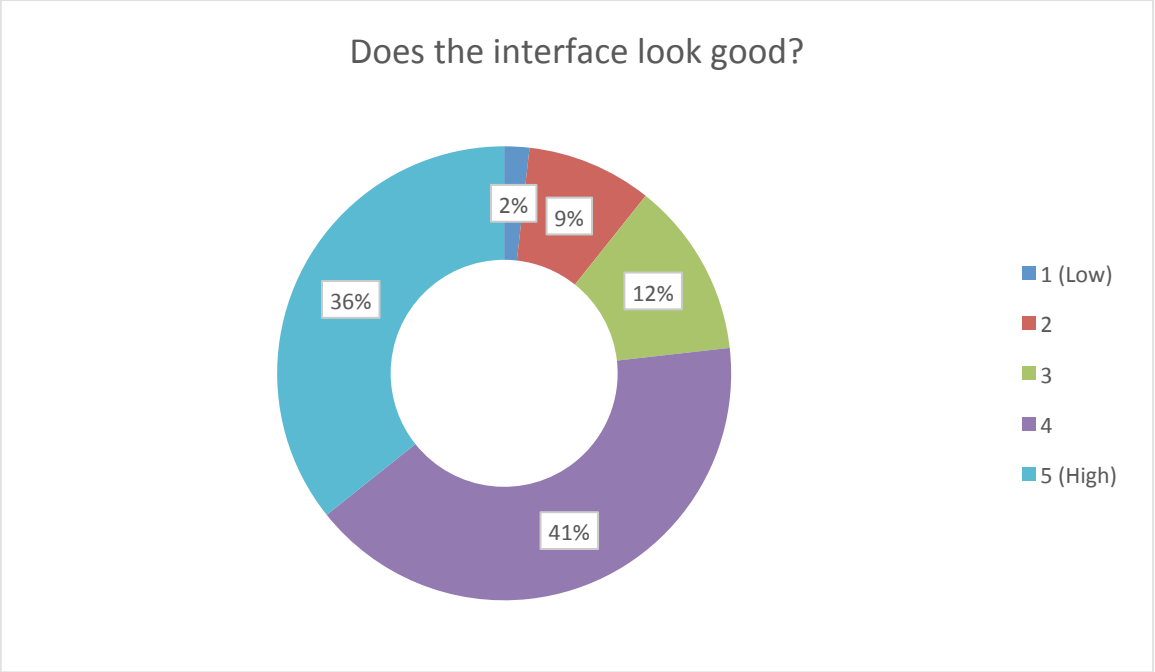
Answer	Count	Percentage, %
1 (Low)	3	5
2	7	13
3	8	14
4	22	39
5 (High)	16	29



4.3.9 Does the interface look good?

Mean: 4,0

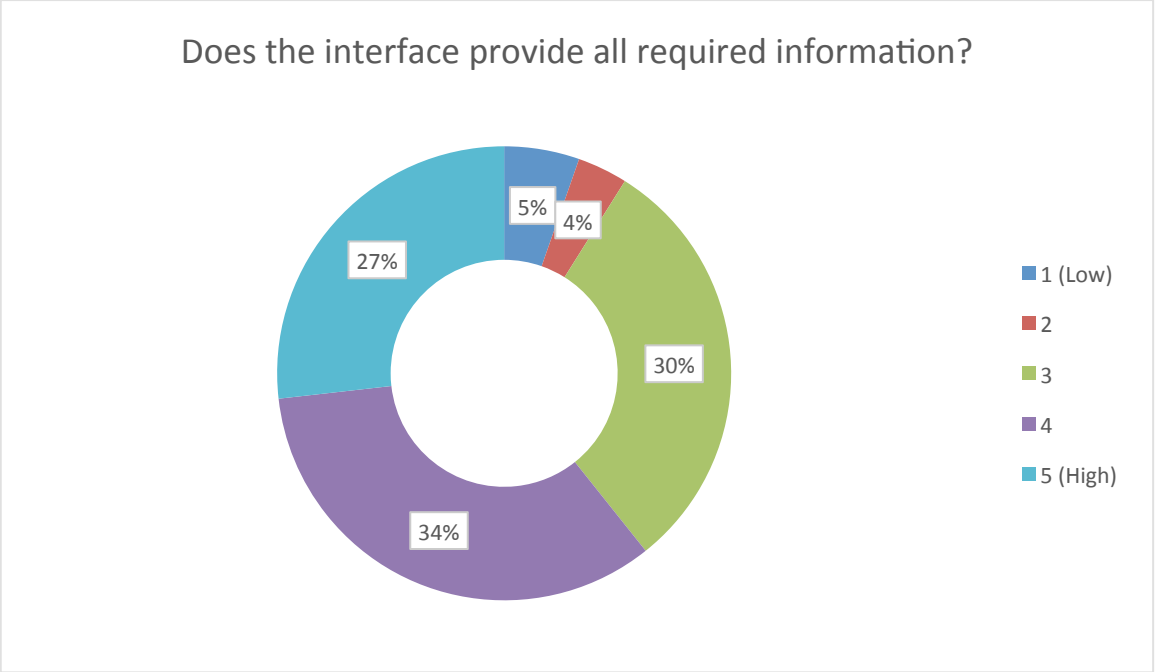
Answer	Count	Percentage, %
1 (Low)	1	2
2	5	9
3	7	13
4	23	41
5 (High)	20	36



4.3.10Does the interface provide all required information?

Mean: 3,7

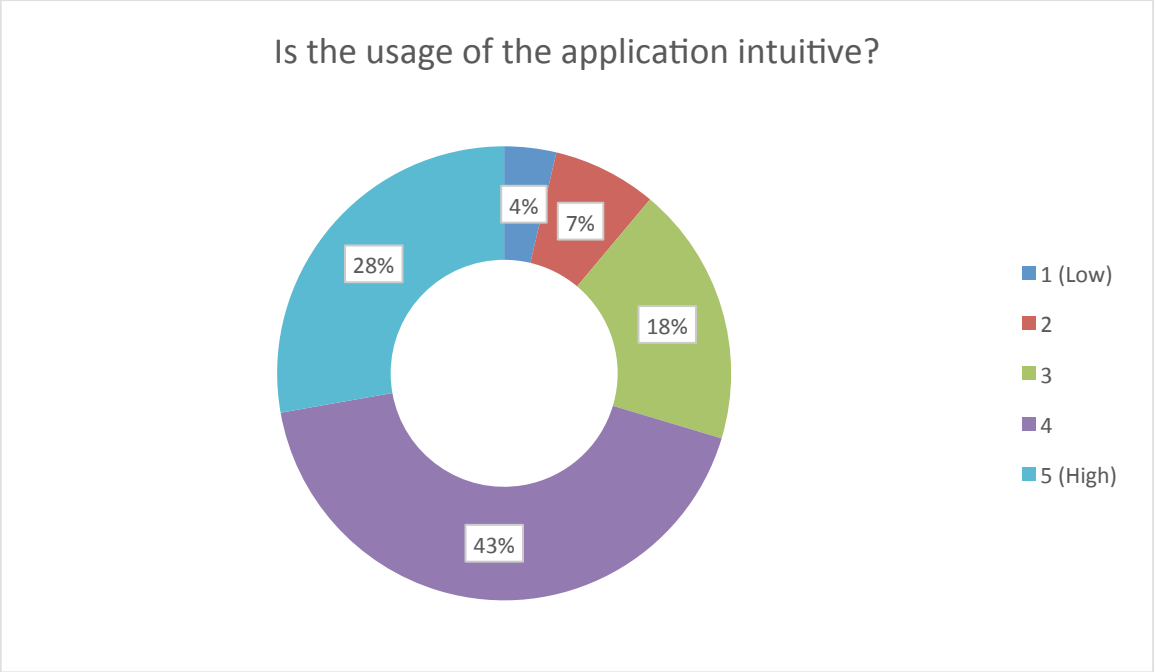
Answer	Count	Percentage, %
1 (Low)	3	5
2	2	4
3	17	30
4	19	34
5 (High)	15	27



4.3.11 Is the usage of the application intuitive?

Mean: 3,8

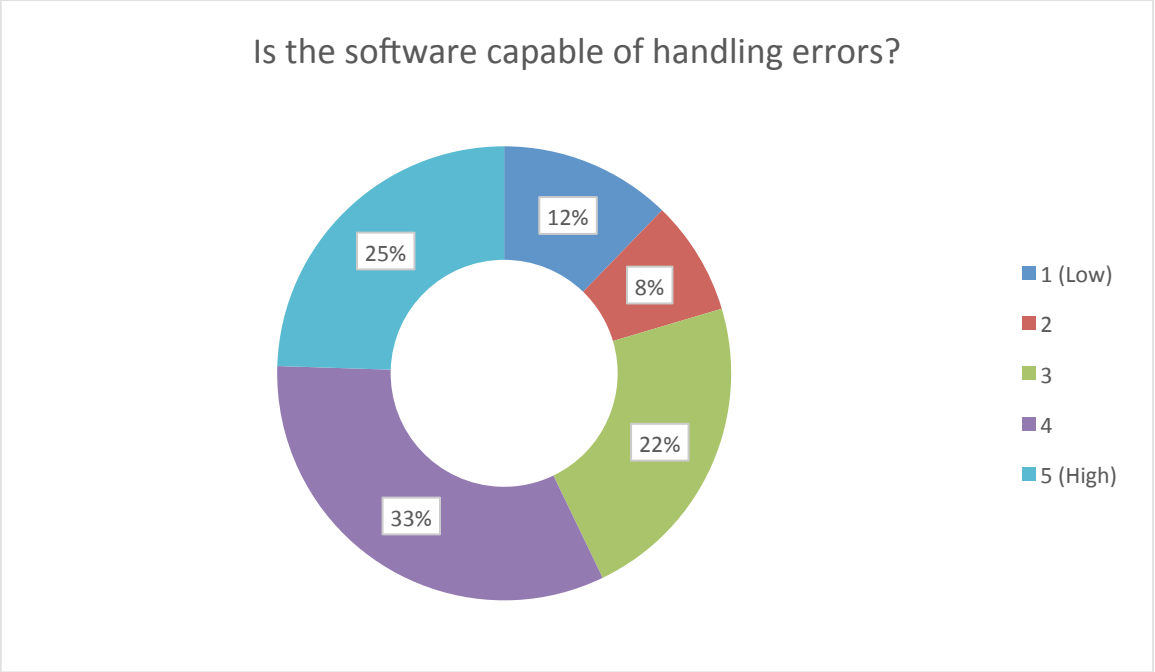
Answer	Count	Percentage, %
1 (Low)	2	4
2	4	7
3	10	19
4	23	43
5 (High)	15	28



4.3.12Is the software capable of handling errors?

Mean: 3,5

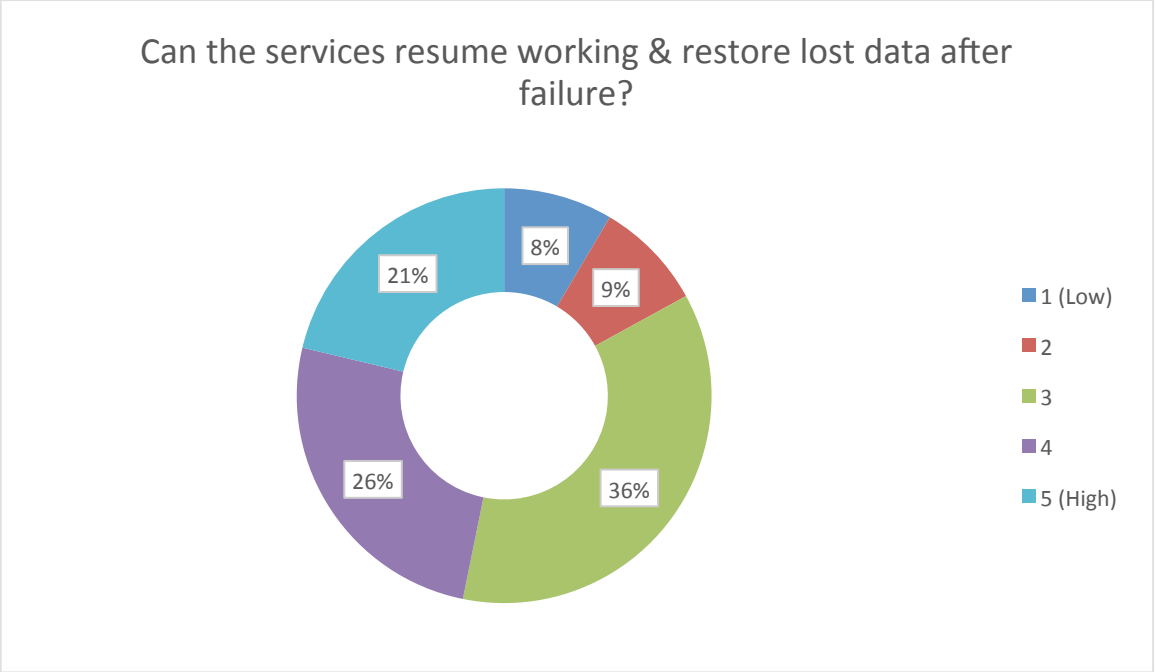
Answer	Count	Percentage, %
1 (Low)	6	12
2	4	8
3	11	22
4	16	33
5 (High)	12	24



4.3.13Can the services resume working & restore lost data after failure?

Mean: 3,4

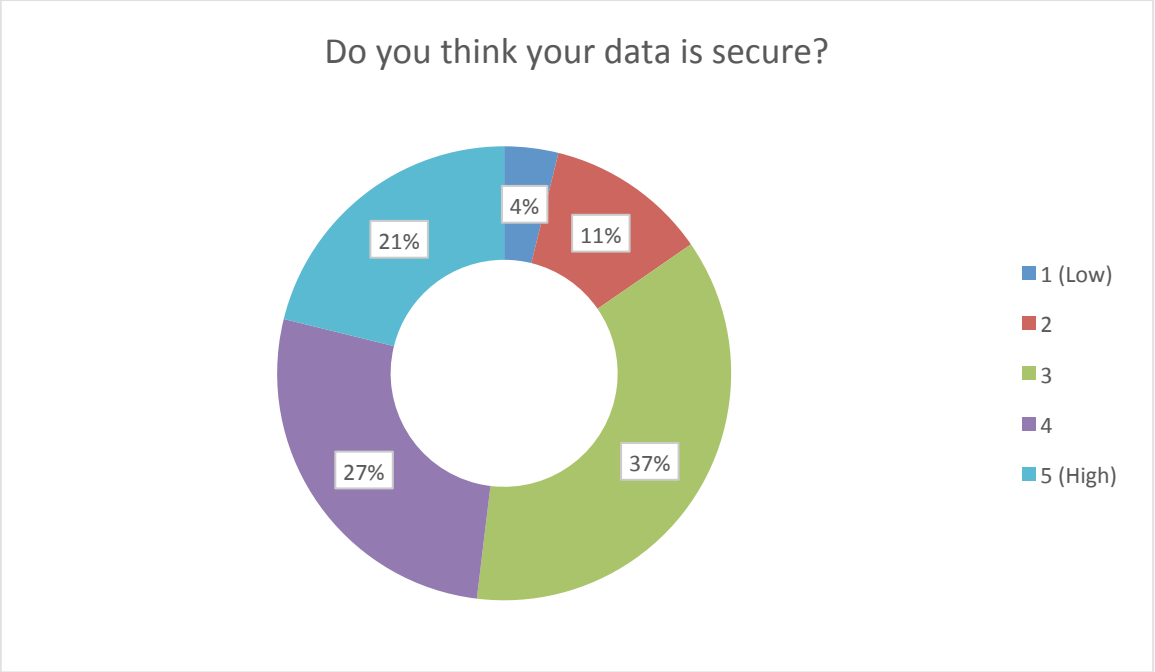
Answer	Count	Percentage, %
1 (Low)	4	9
2	4	9
3	17	36
4	12	26
5 (High)	10	21



4.3.14Do you think your data is secure?

Mean: 3,5

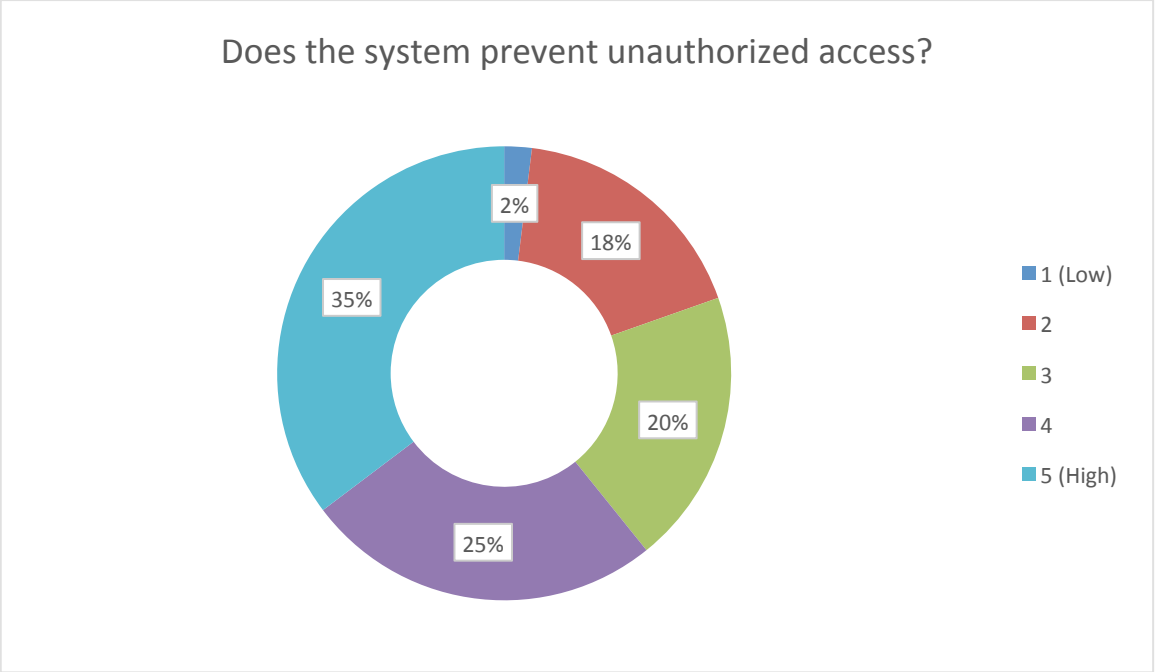
Answer	Count	Percentage, %
1 (Low)	2	4
2	6	12
3	19	37
4	14	27
5 (High)	11	21



4.3.15Does the system prevent unauthorized access?

Mean: 3,7

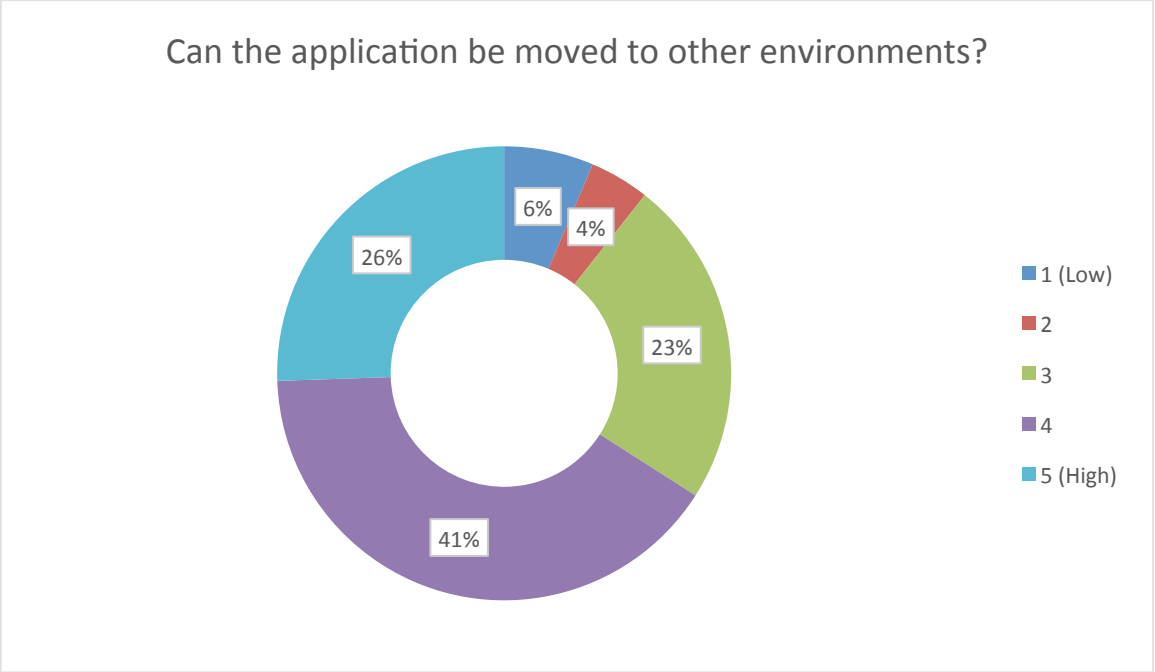
Answer	Count	Percentage, %
1 (Low)	1	2
2	9	18
3	10	20
4	13	25
5 (High)	18	35



4.3.16Can the application be moved to other environments?

Mean: 3,7

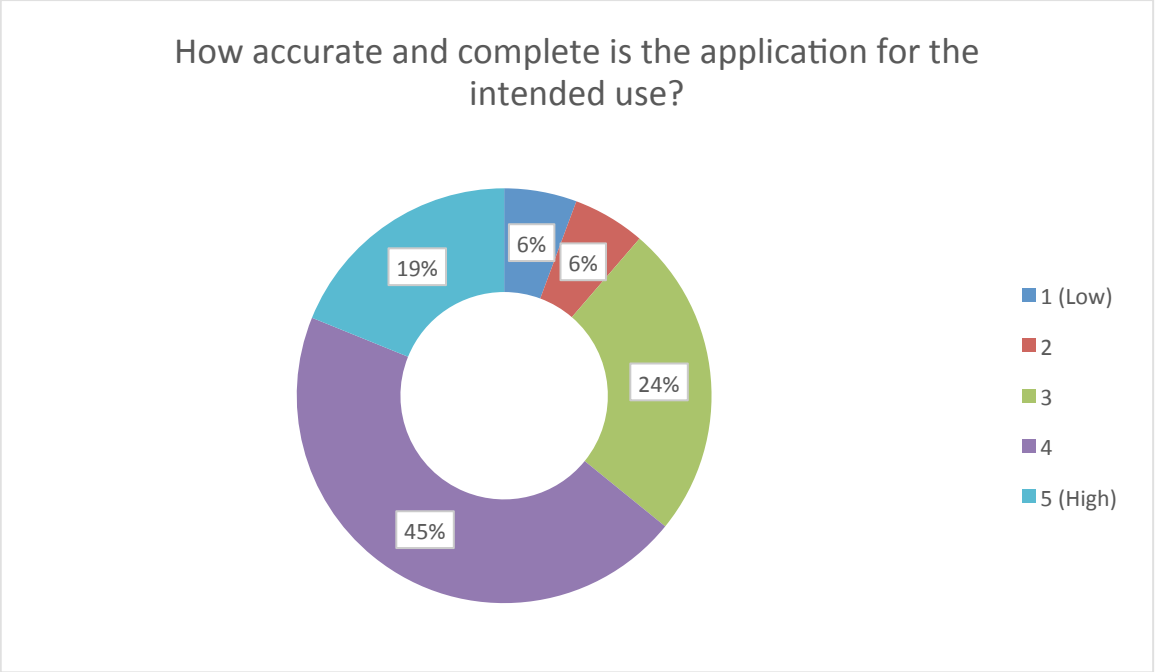
Answer	Count	Percentage, %
1 (Low)	3	6
2	2	4
3	11	23
4	19	40
5 (High)	12	26



4.3.17How accurate and complete is the application for the intended use?

Mean: 3,7

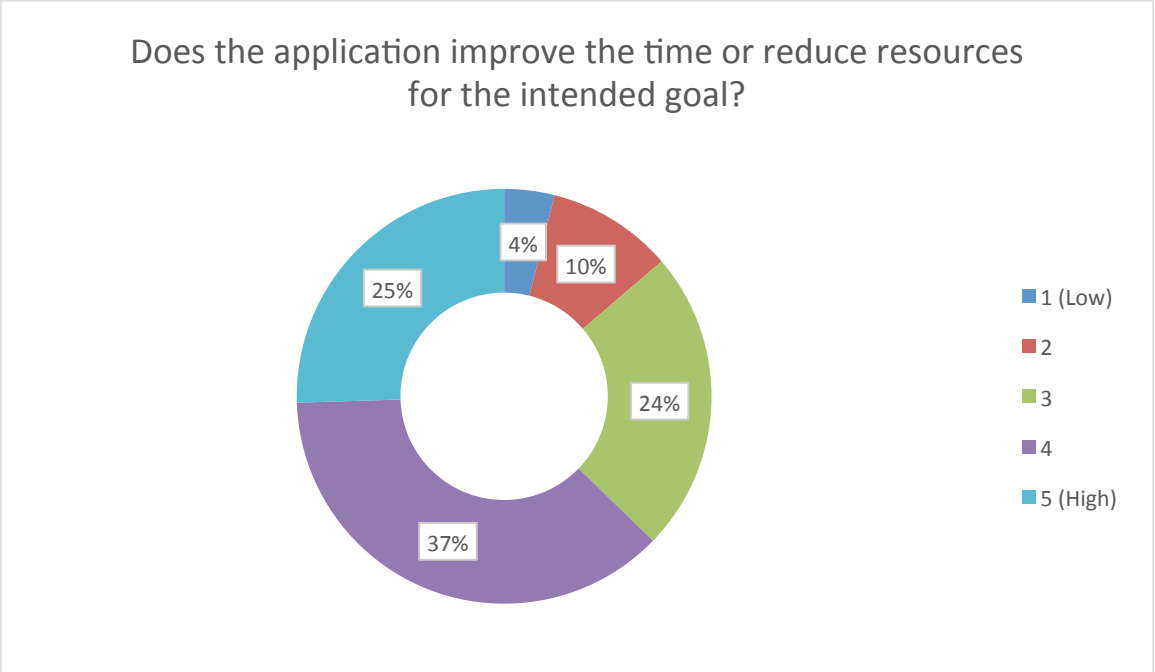
Answer	Count	Percentage, %
1 (Low)	3	6
2	3	6
3	13	25
4	24	45
5 (High)	10	19



4.3.18Does the application improve the time or reduce resources for the intended goal?

Mean: 3,7

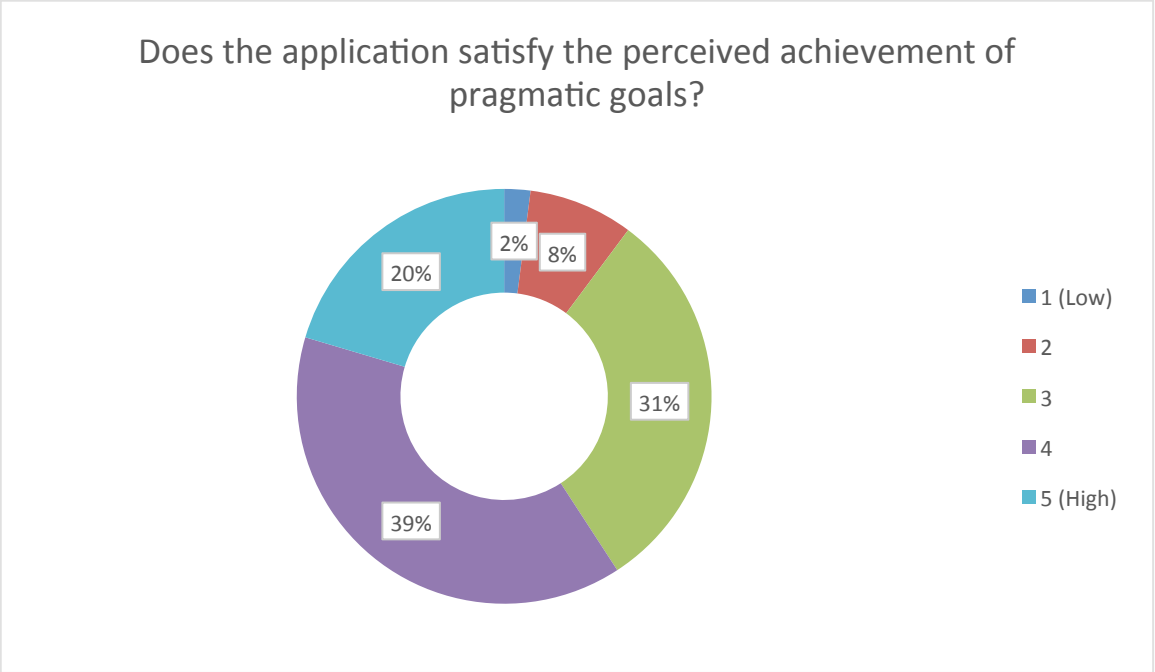
Answer	Count	Percentage, %
1 (Low)	2	4
2	5	10
3	12	24
4	19	37
5 (High)	13	25



4.3.19 Does the application satisfy the perceived achievement of pragmatic goals?

Mean: 3,7

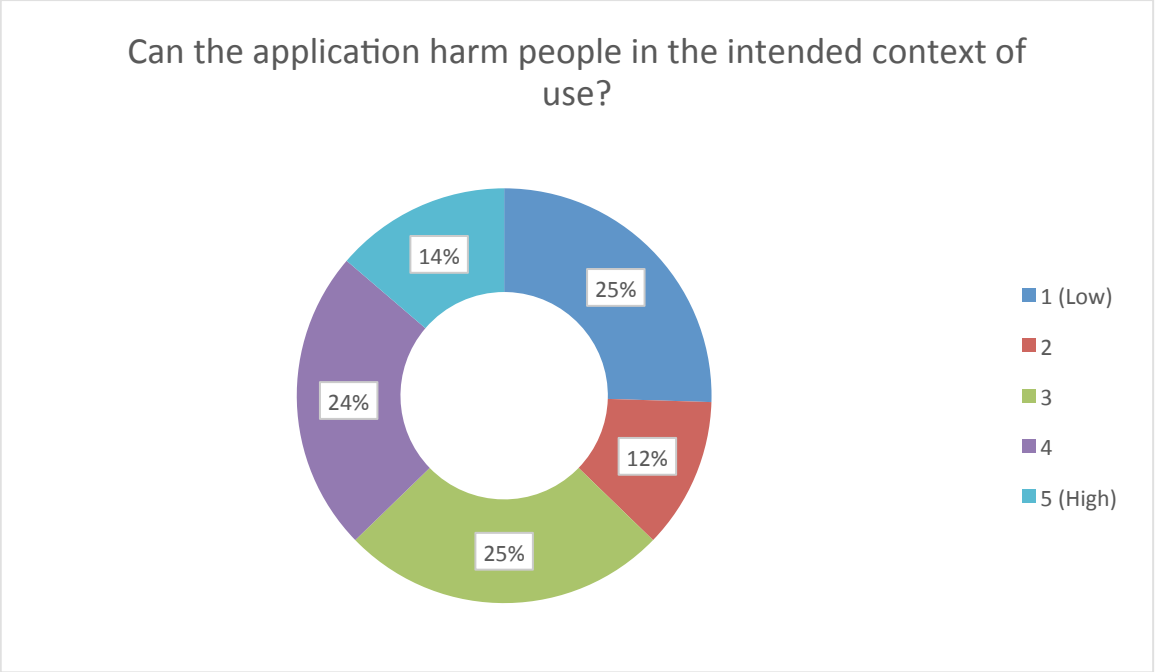
Answer	Count	Percentage, %
1 (Low)	1	2
2	4	8
3	15	31
4	19	39
5 (High)	10	20



4.3.20Can the application harm people in the intended context of use?

Mean: 2,9

Answer	Count	Percentage, %
1 (Low)	13	25
2	6	12
3	13	25
4	12	24
5 (High)	7	14



4.4 Sign up/in and Setting (Mobile Application)

Sign up/in and Setting (Mobile Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can the application register and log in easily?

Is the log in page friendly to use?

Can you change the setting of the application easily?

Section: Efficiency

How quickly does the application interact?

Section: Compatibility

Do you know other similar tools? If yes, is this tool better than the other tool(s) you know?

Section: Usability

Do you think it's easy to use the application?

Can you learn how to use the application easily?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the application intuitive?

Section: Security

Do you feel your data are secure?

Section: Quality in Use

How accurate and complete is the application for the intended use?

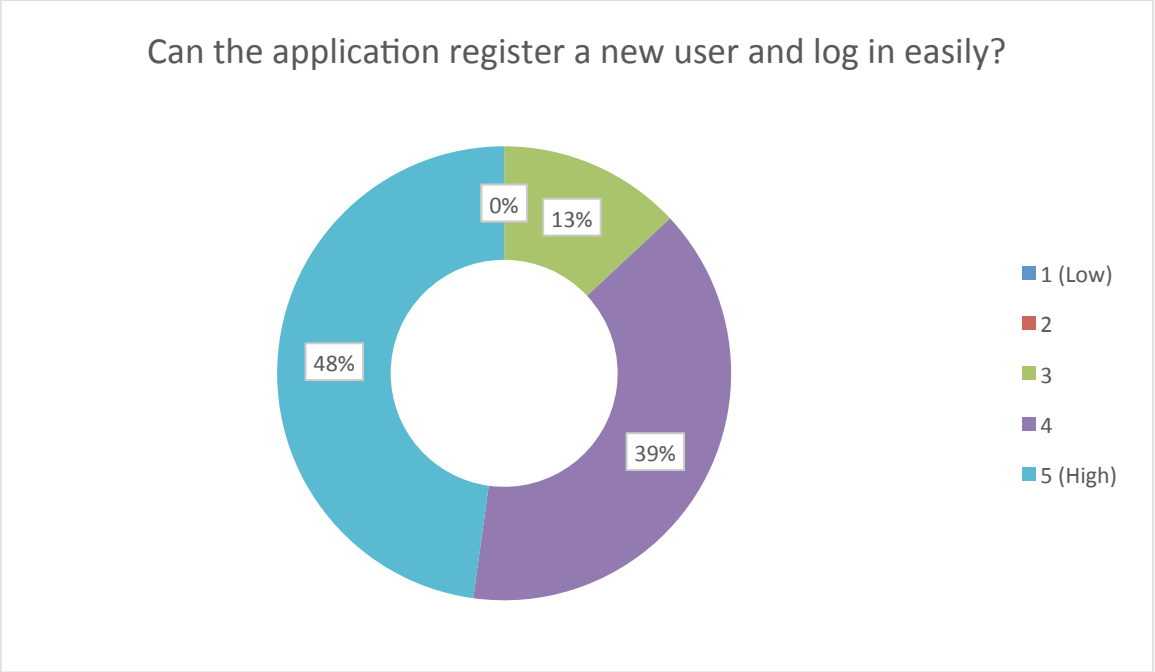
Does the application save you time?

Can the application harm people in the intended context of use?

4.4.1 Can the application register and log in easily?

Mean: 4,3

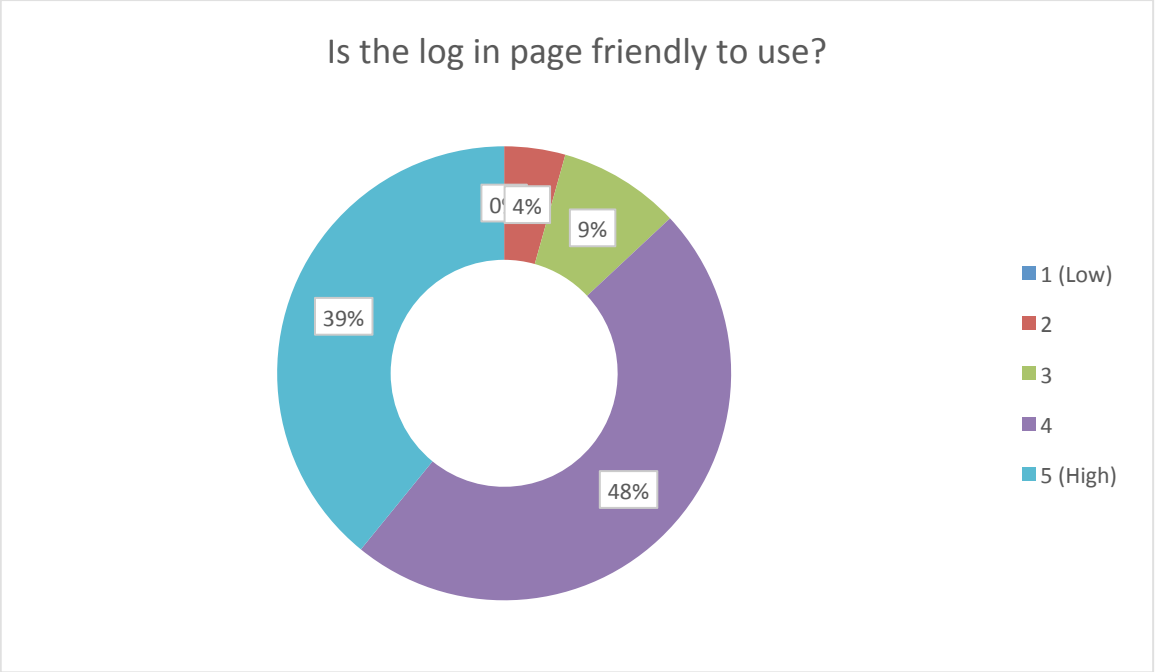
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	3	13
4	9	39
5 (High)	11	48



4.4.2 Is the log in page friendly to use?

Mean: 4,2

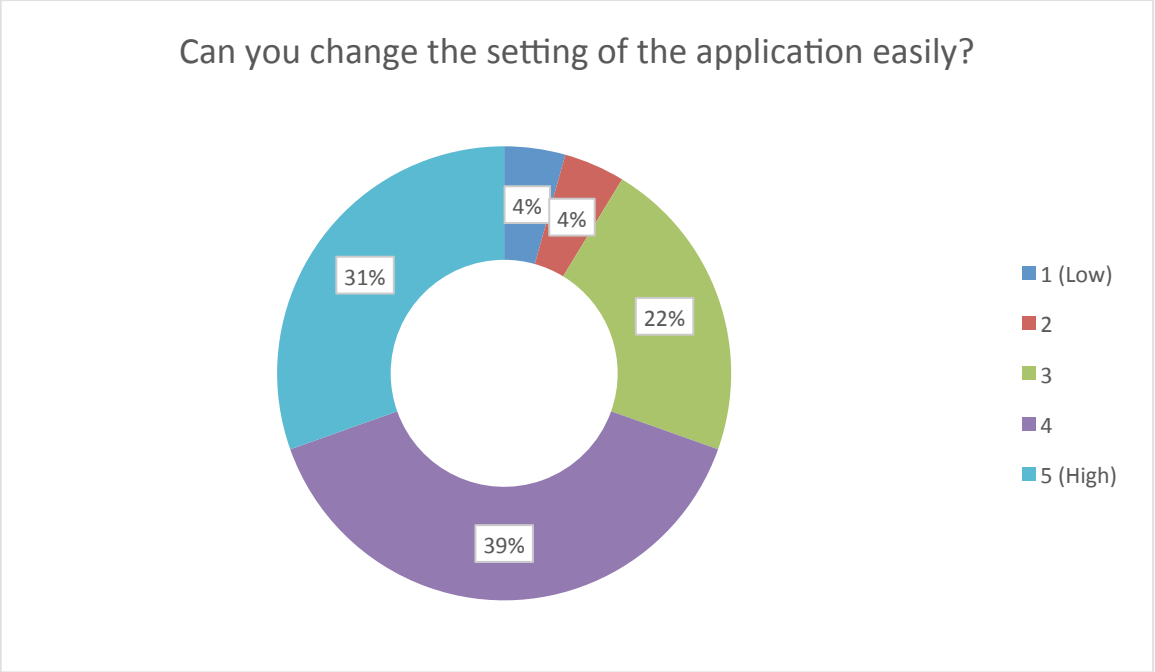
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	4
3	2	9
4	11	48
5 (High)	9	39



4.4.3 Can you change the setting of the application easily?

Mean: 3,9

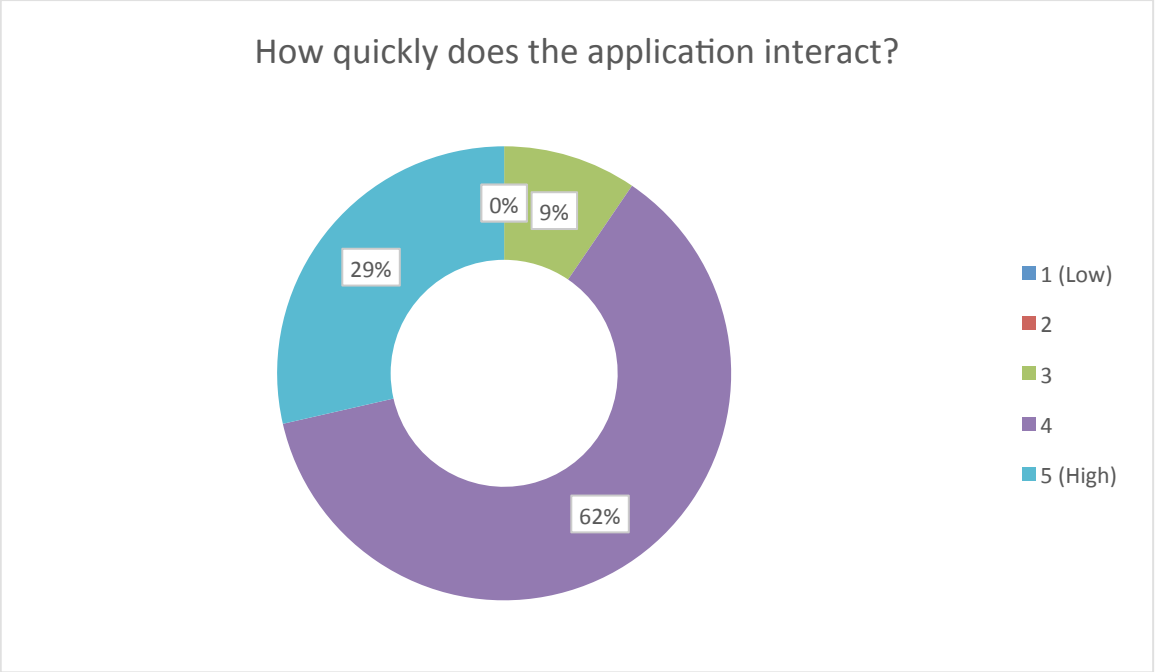
Answer	Count	Percentage, %
1 (Low)	1	4
2	1	4
3	5	22
4	9	39
5 (High)	7	30



4.4.4 How quickly does the application interact?

Mean: 4,2

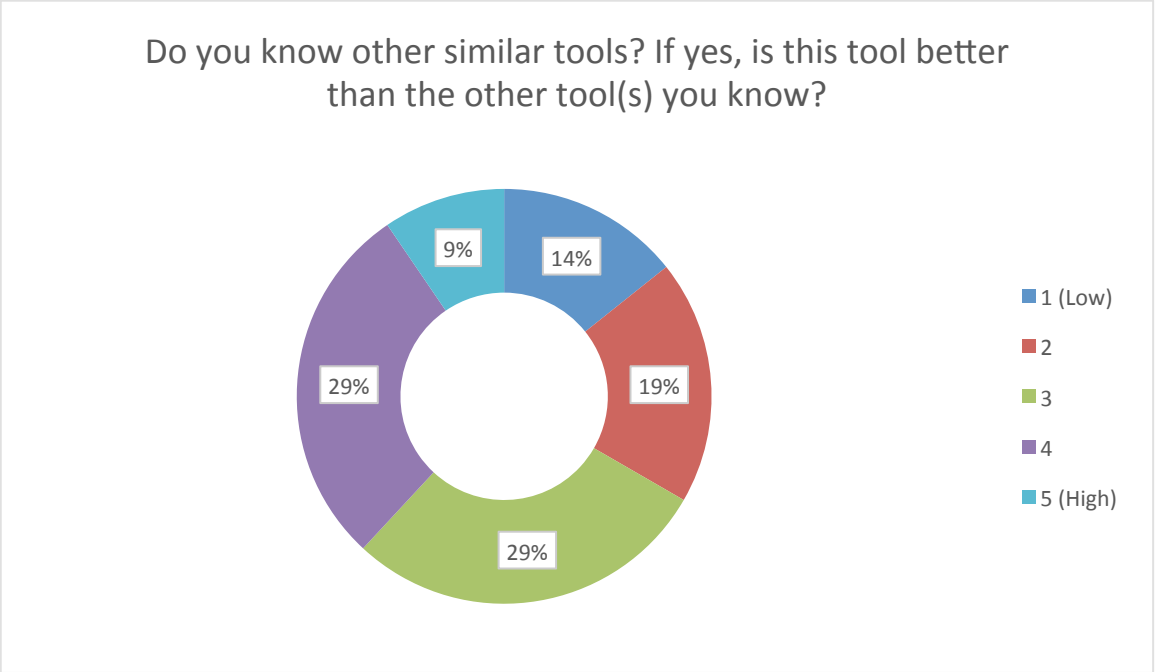
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	2	10
4	13	62
5 (High)	6	29



4.4.5 Do you know other similar tools? If yes, is this tool better than the other tool(s) you know?

Mean: 3,0

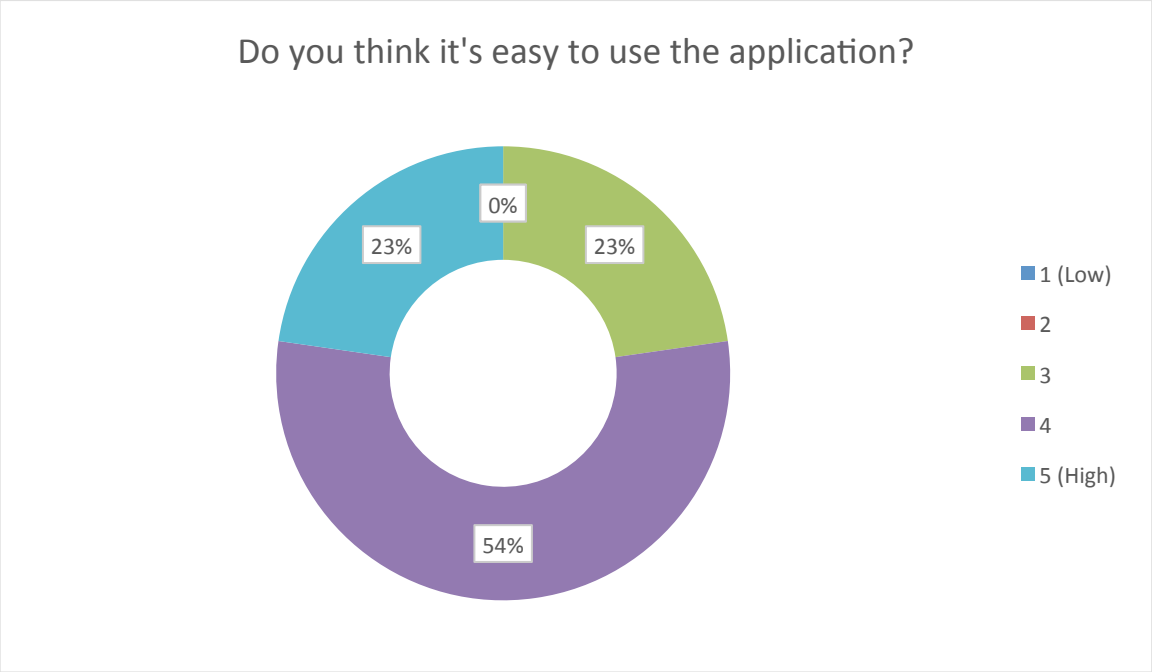
Answer	Count	Percentage, %
1 (Low)	3	14
2	4	19
3	6	29
4	6	29
5 (High)	2	10



4.4.6 Do you think it's easy to use the application?

Mean: 4,0

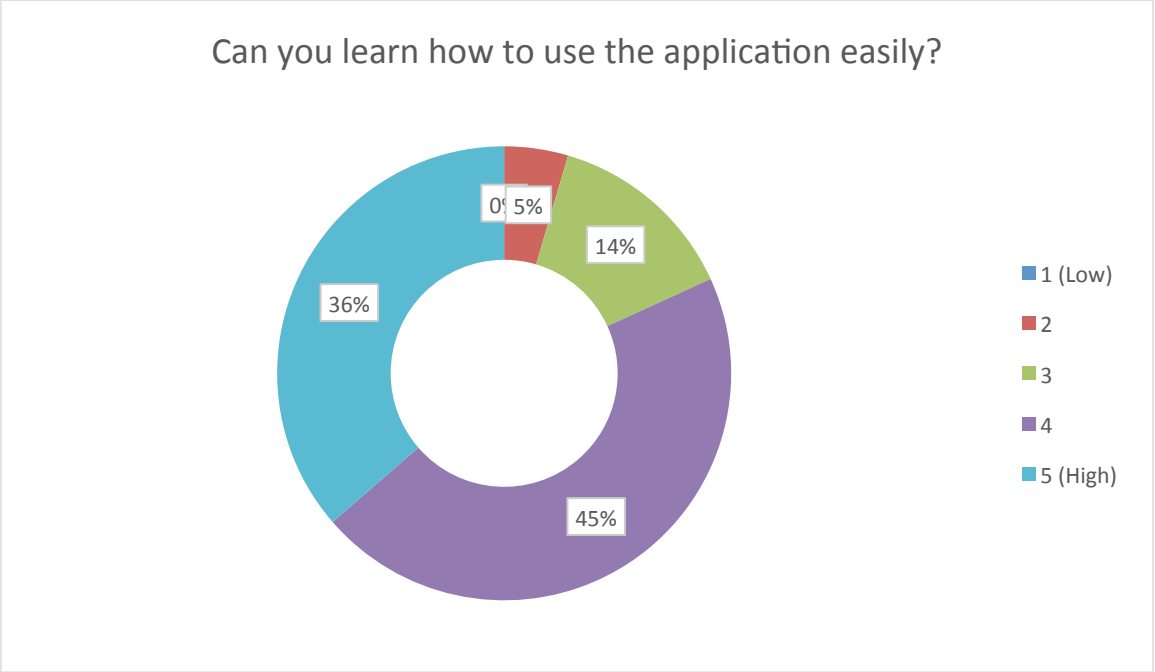
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	5	23
4	12	55
5 (High)	5	23



4.4.7 Can you learn how to use the application easily?

Mean: 4,1

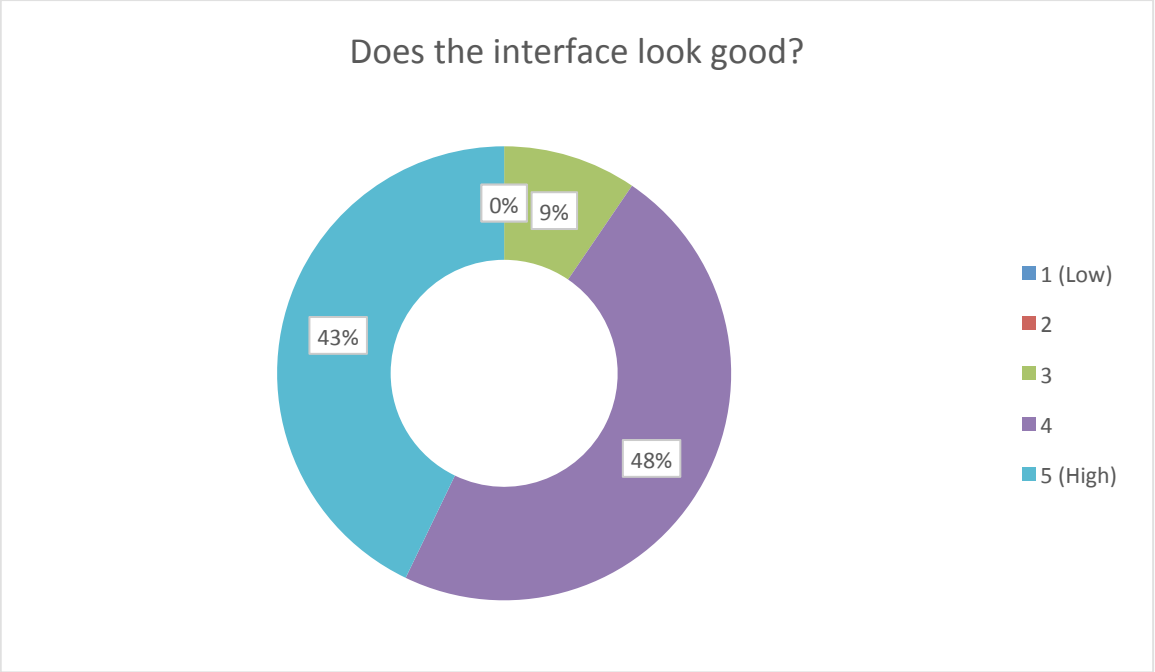
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	5
3	3	14
4	10	45
5 (High)	8	36



4.4.8 Does the interface look good?

Mean: 4,3

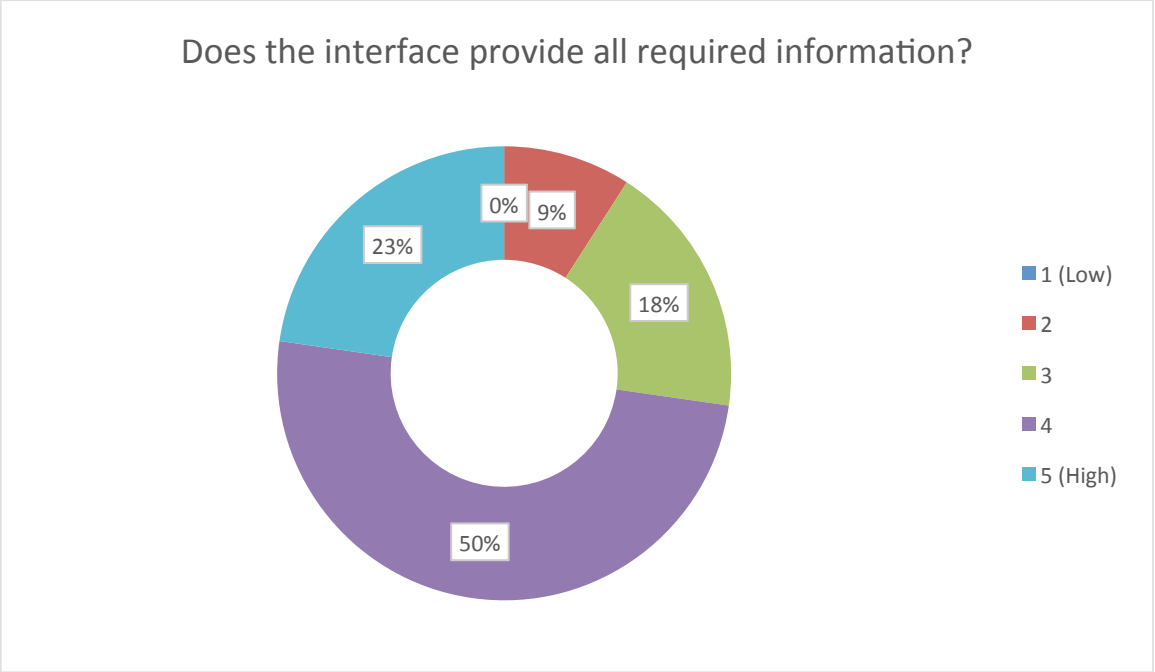
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	2	10
4	10	48
5 (High)	9	43



4.4.9 Does the interface provide all required information?

Mean: 3,9

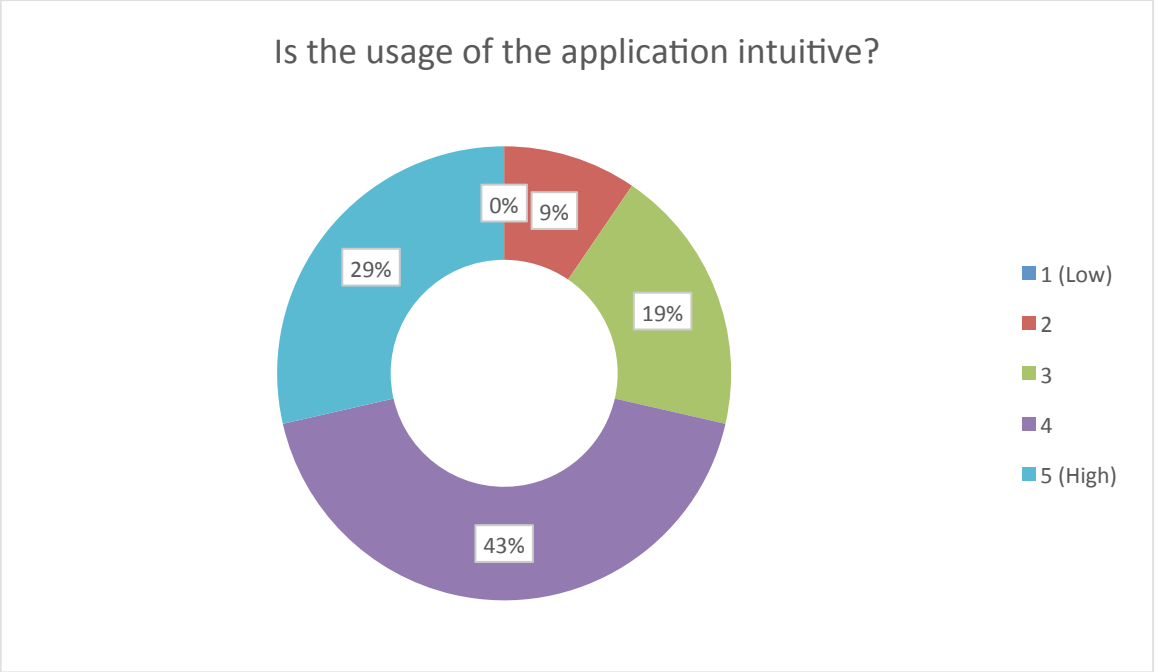
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	9
3	4	18
4	11	50
5 (High)	5	23



4.4.10Is the usage of the application intuitive?

Mean: 3,9

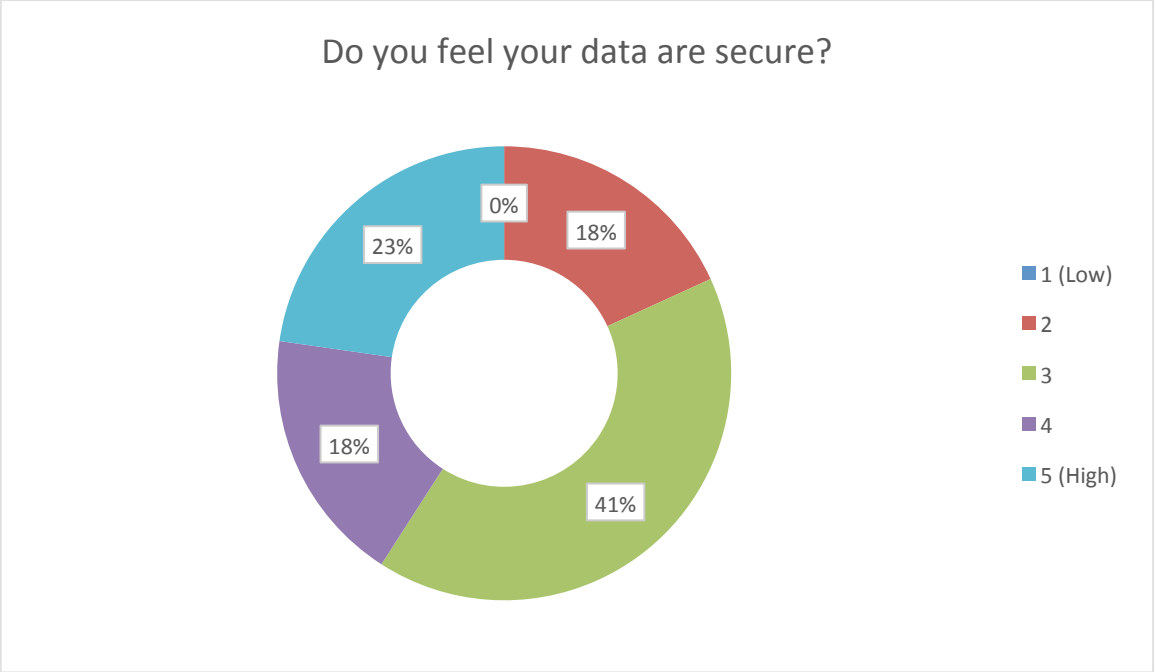
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	10
3	4	19
4	9	43
5 (High)	6	29



4.4.11Do you feel your data are secure?

Mean: 3,5

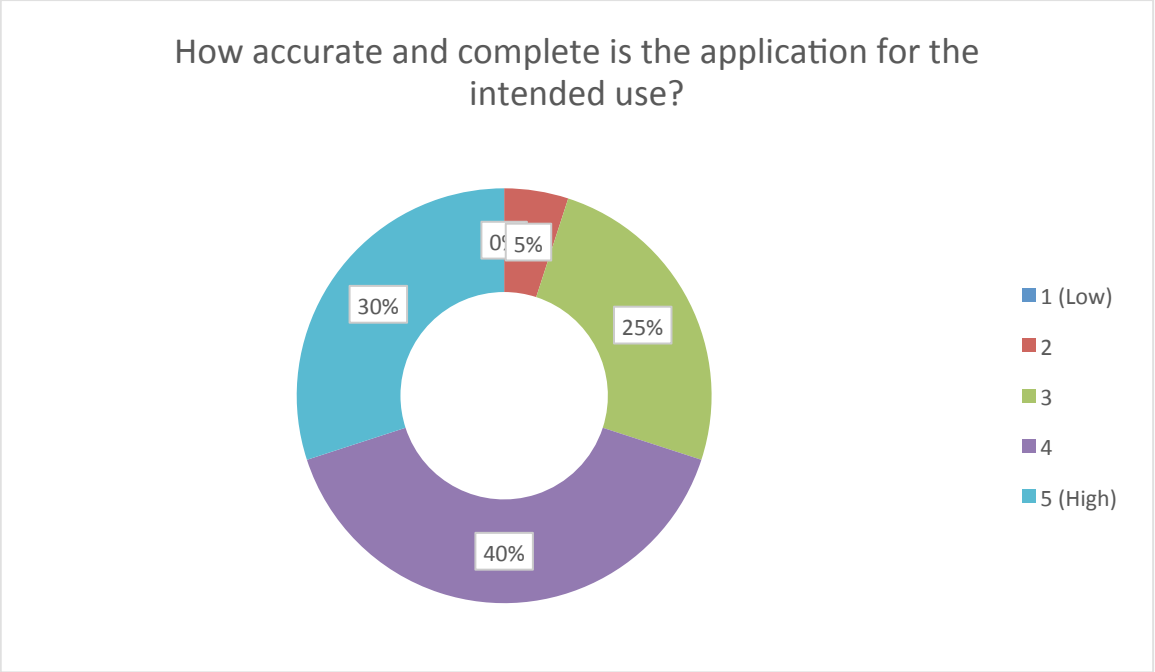
Answer	Count	Percentage, %
1 (Low)	0	0
2	4	18
3	9	41
4	4	18
5 (High)	5	23



4.4.12How accurate and complete is the application for the intended use?

Mean: 4,0

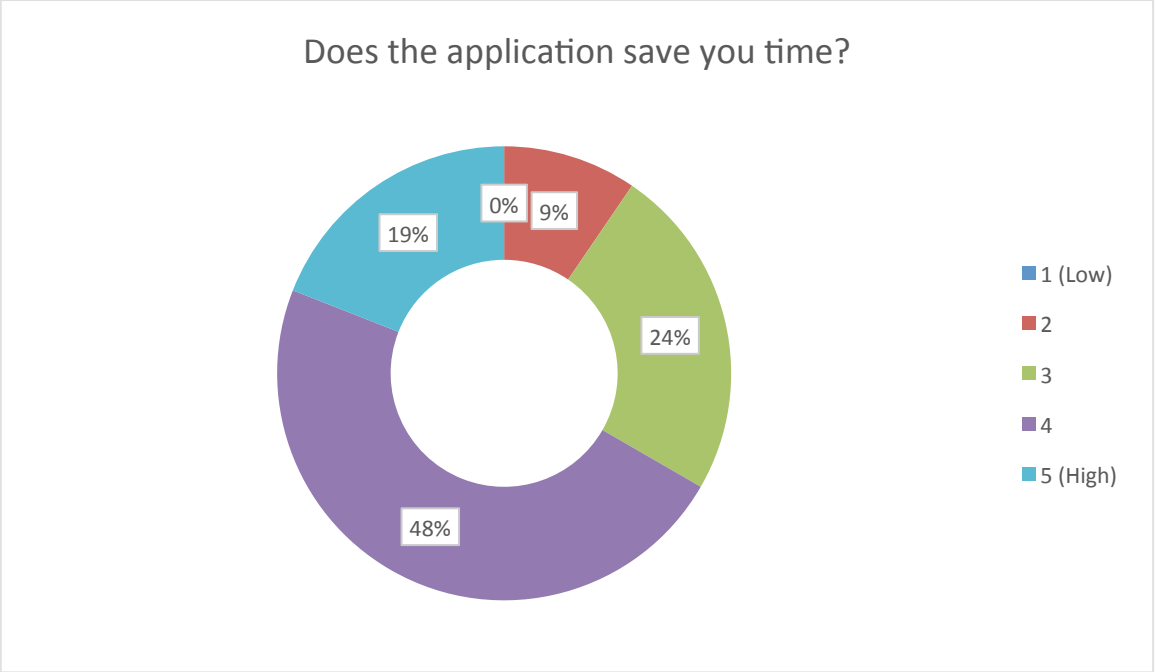
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	5
3	5	25
4	8	40
5 (High)	6	30



4.4.13Does the application save you time?

Mean: 3,8

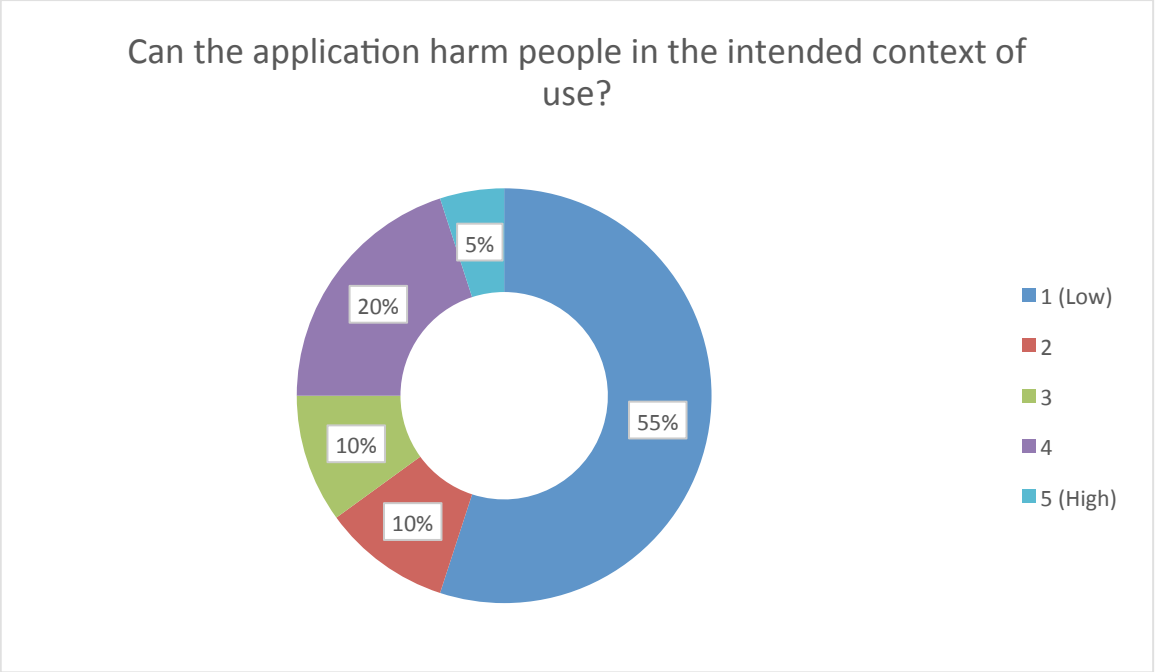
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	10
3	5	24
4	10	48
5 (High)	4	19



4.4.14Can the application harm people in the intended context of use?

Mean: 2,1

Answer	Count	Percentage, %
1 (Low)	11	55
2	2	10
3	2	10
4	4	20
5 (High)	1	5



4.5 Data Collection (Web Application)

Data Collection (Web Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can this application collect data easily?

Is the user interface for the data collection user friendly?

Does the data collection work as expected?

Section: Efficiency

How quickly does the application interact?

Section: Compatibility

Do you know other similar tools? If yes is this tool better than the other you know?

Section: Usability

Do you know how to use the application easily?

Can you learn to use the application easily?

Can you use the application without much effort?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the application intuitive?

Section: Security

Do you feel your data are secure?

Section: Portability

Can the application easily replace other software?

Section: Quality in use

How accurate and complete is the software for the intended use?

Does the software improve the time or reduce resource for the intended goal?

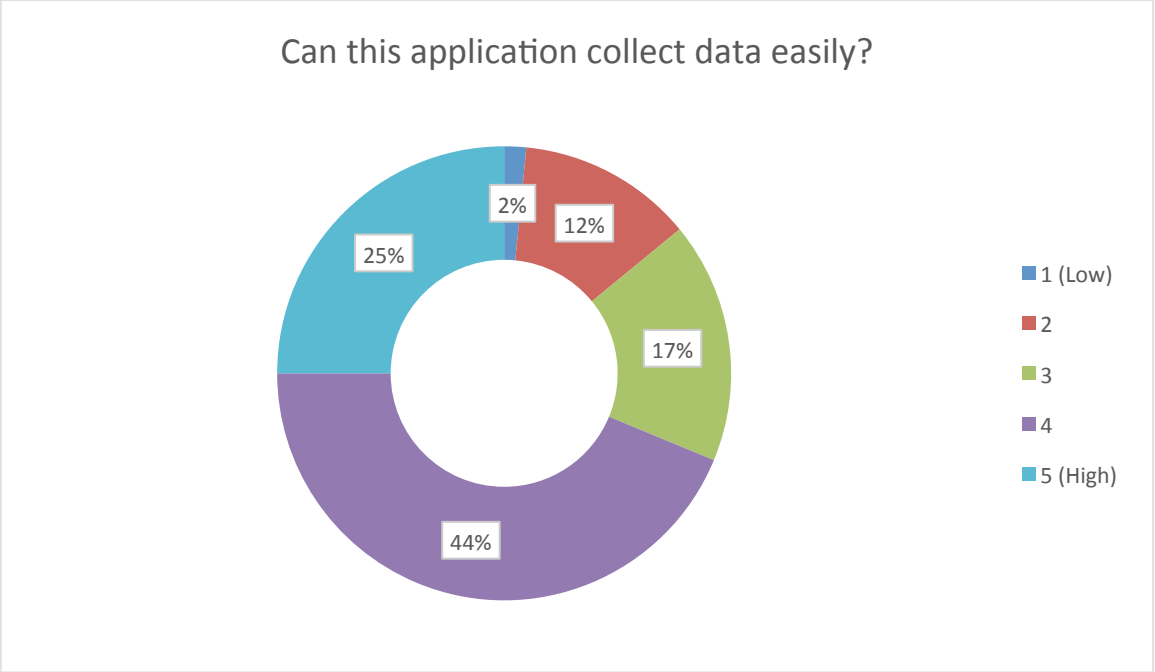
Does the software satisfy the perceived achievement of pragmatic goals?

Can the software harm people in the intended context of use?

4.5.1 Can this application collect data easily?

Mean: 3,8

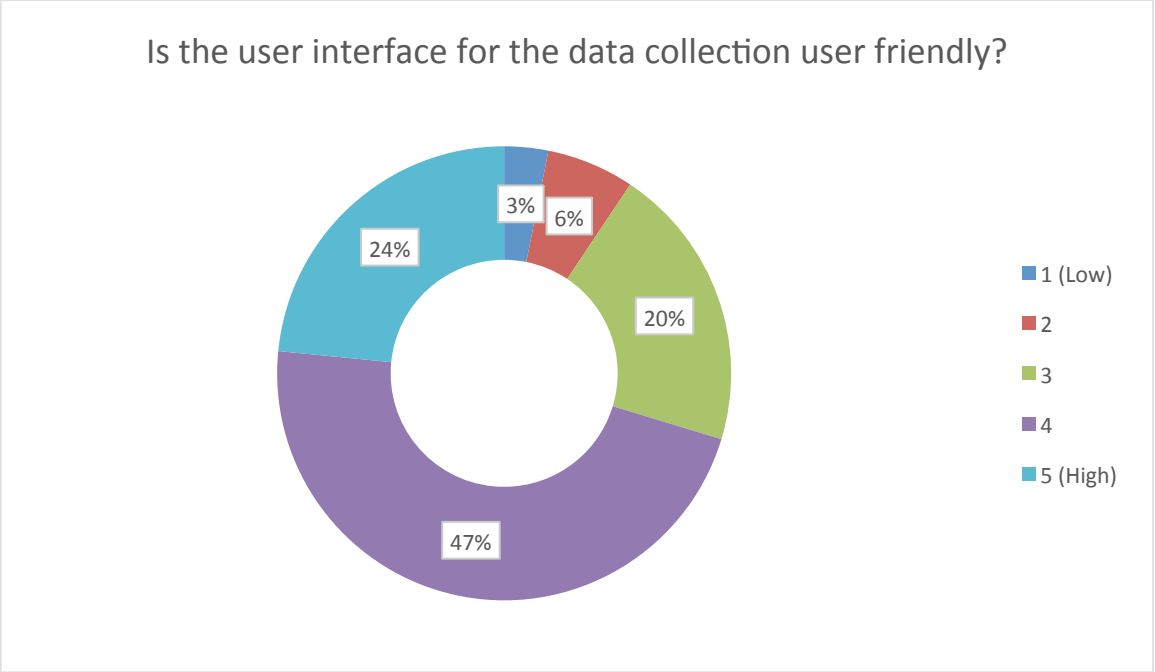
Answer	Count	Percentage, %
1 (Low)	1	2
2	8	13
3	11	17
4	28	44
5 (High)	16	25



4.5.2 Is the user interface for the data collection user friendly?

Mean: 3,8

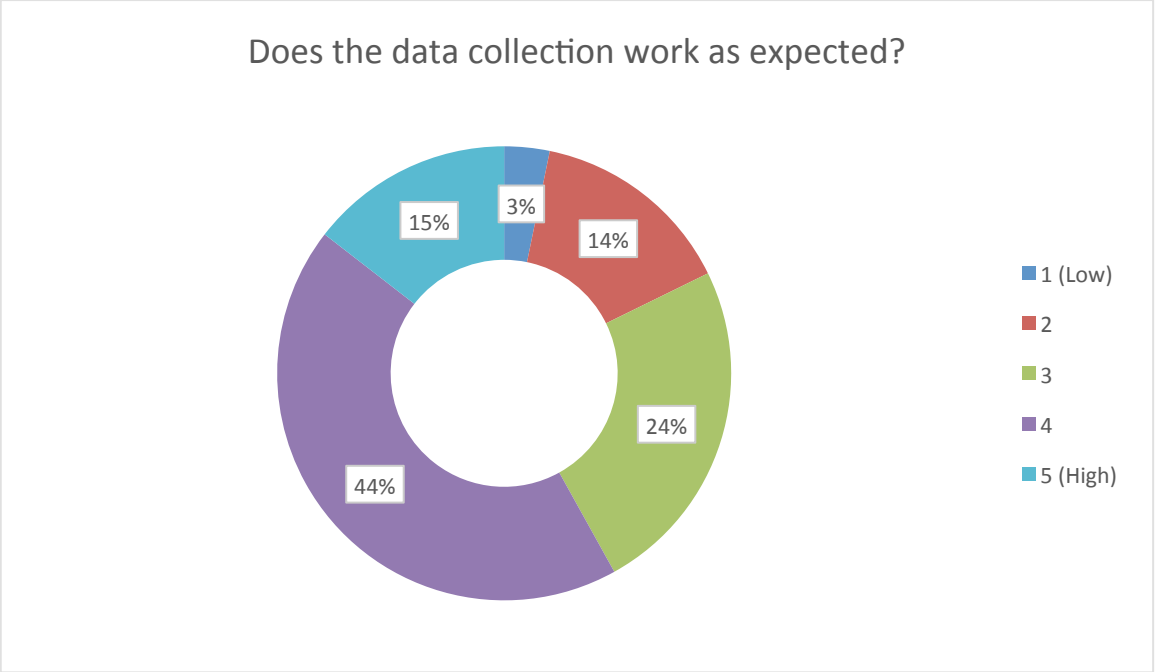
Answer	Count	Percentage, %
1 (Low)	2	3
2	4	6
3	13	20
4	30	47
5 (High)	15	23



4.5.3 Does the data collection work as expected?

Mean: 3,5

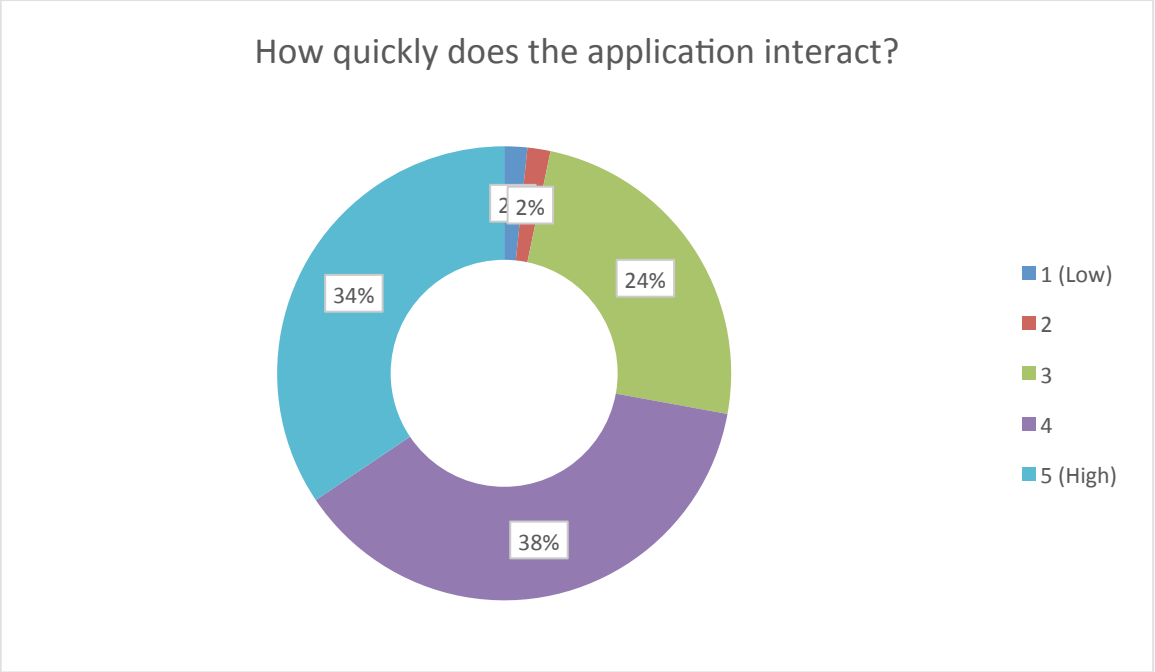
Answer	Count	Percentage, %
1 (Low)	2	3
2	9	15
3	15	24
4	27	44
5 (High)	9	15



4.5.4 How quickly does the application interact?

Mean: 4,0

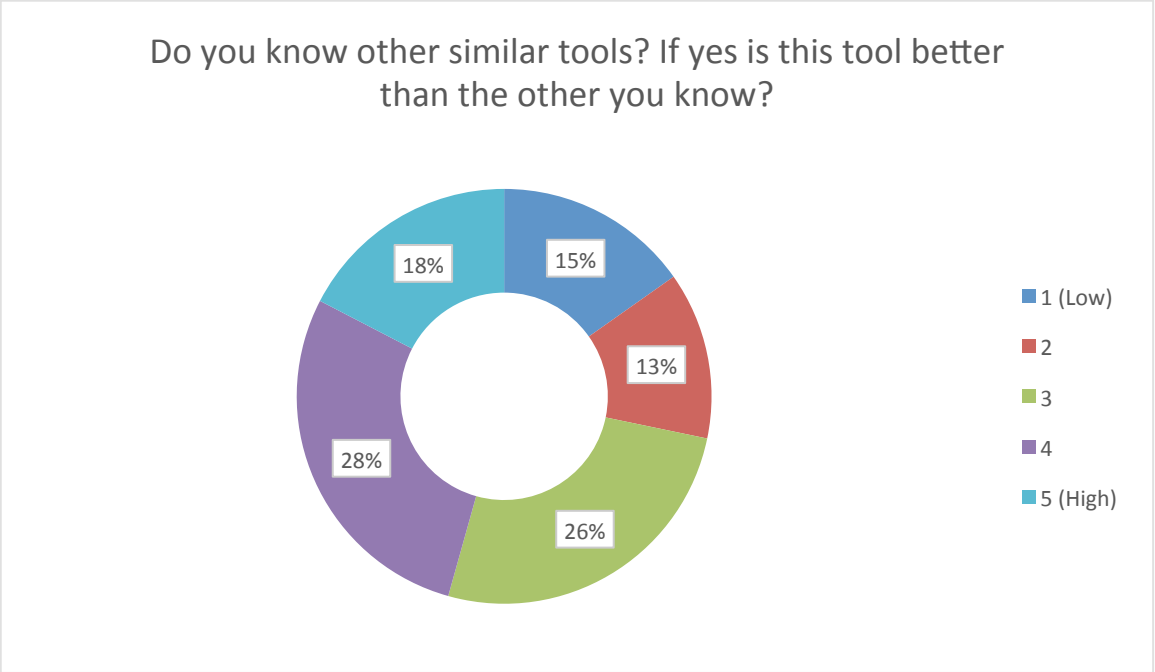
Answer	Count	Percentage, %
1 (Low)	1	2
2	1	2
3	15	25
4	23	38
5 (High)	21	34



4.5.5 Do you know other similar tools? If yes is this tool better than the other you know?

Mean: 3,2

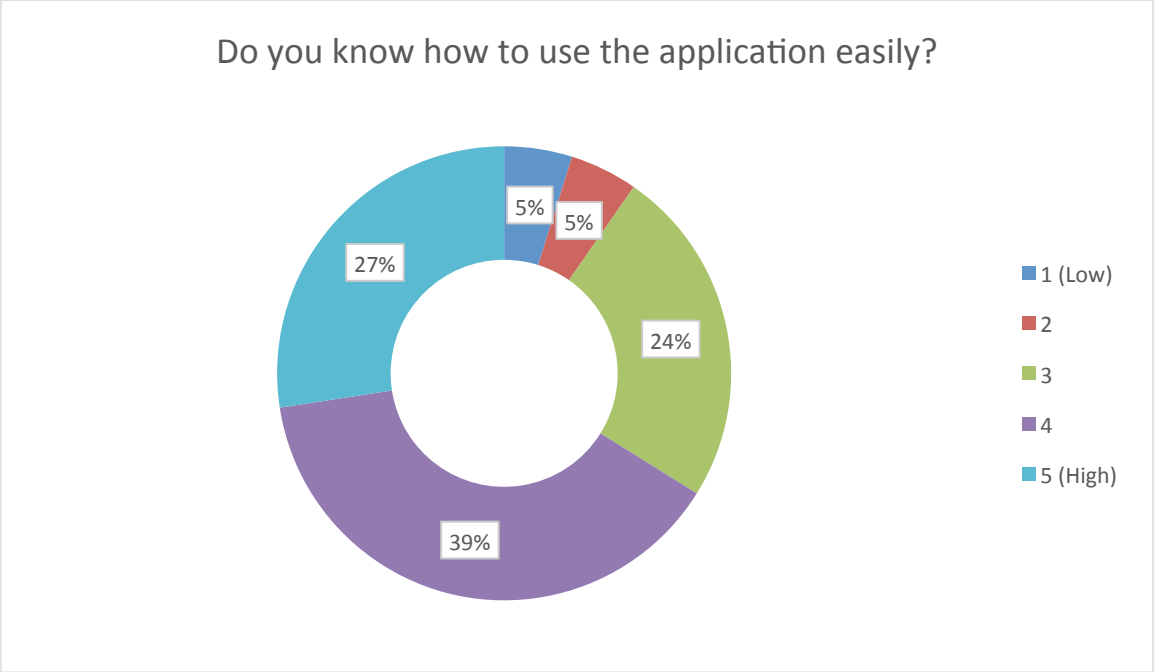
Answer	Count	Percentage, %
1 (Low)	7	15
2	6	13
3	12	26
4	13	28
5 (High)	8	17



4.5.6 Do you know how to use the application easily?

Mean: 3,8

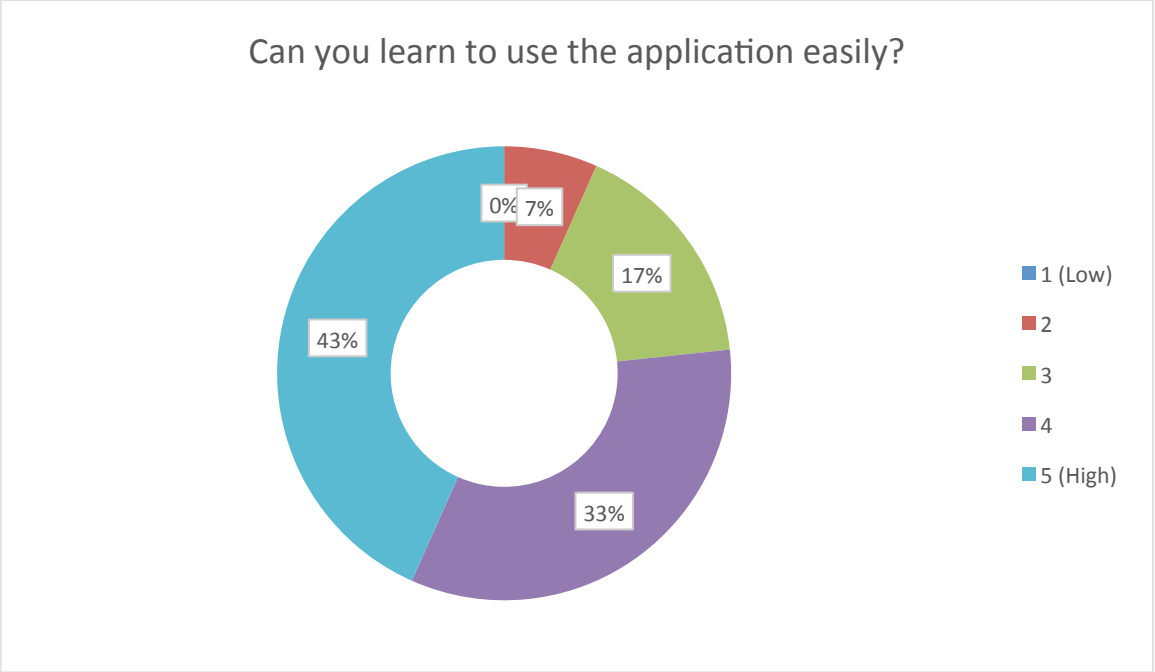
Answer	Count	Percentage, %
1 (Low)	3	5
2	3	5
3	15	24
4	24	39
5 (High)	17	27



4.5.7 Can you learn to use the application easily?

Mean: 4,1

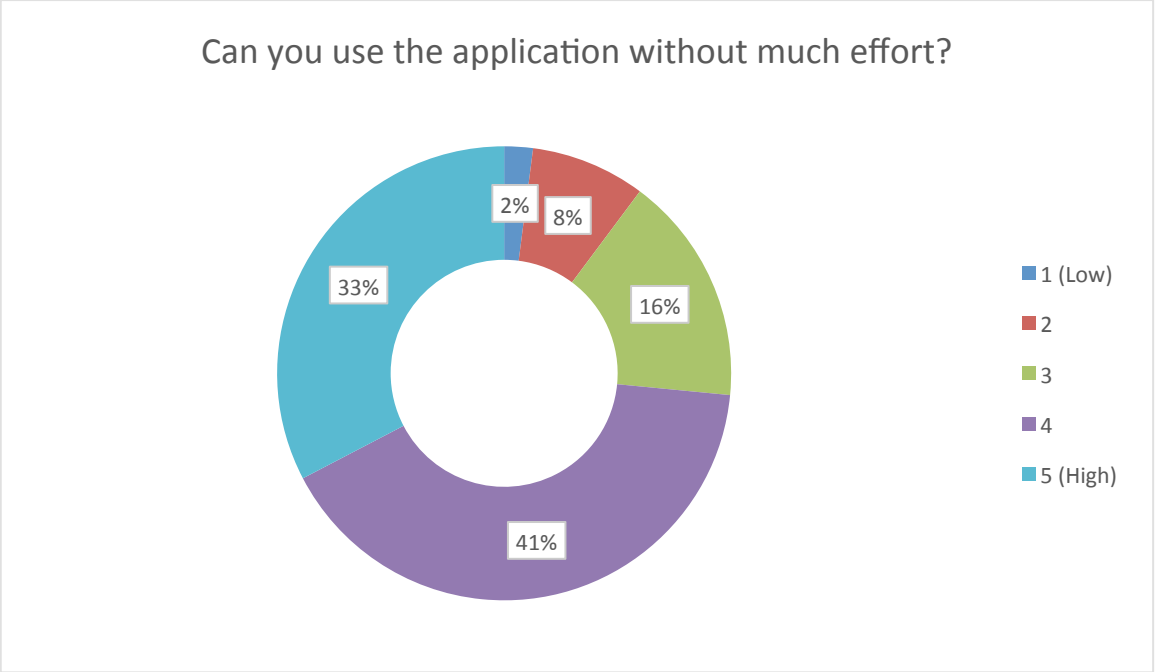
Answer	Count	Percentage, %
1 (Low)	0	0
2	4	7
3	10	17
4	20	33
5 (High)	26	43



4.5.8 Can you use the application without much effort?

Mean: 3,9

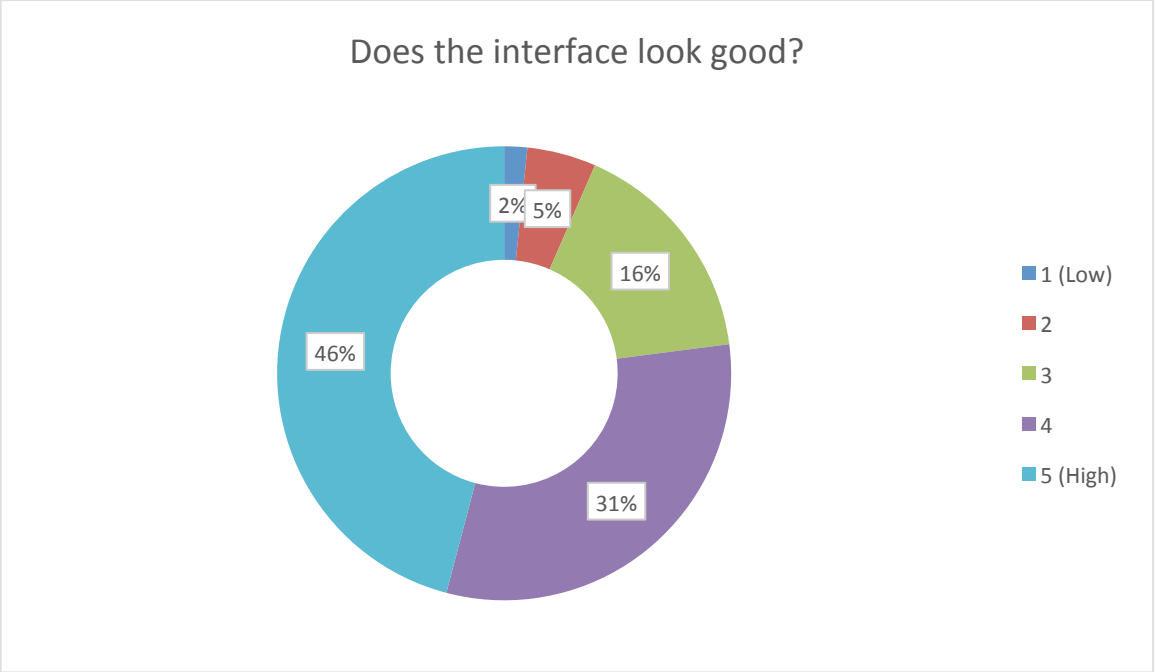
Answer	Count	Percentage, %
1 (Low)	1	2
2	4	8
3	8	16
4	20	41
5 (High)	16	33



4.5.9 Does the interface look good?

Mean: 4,1

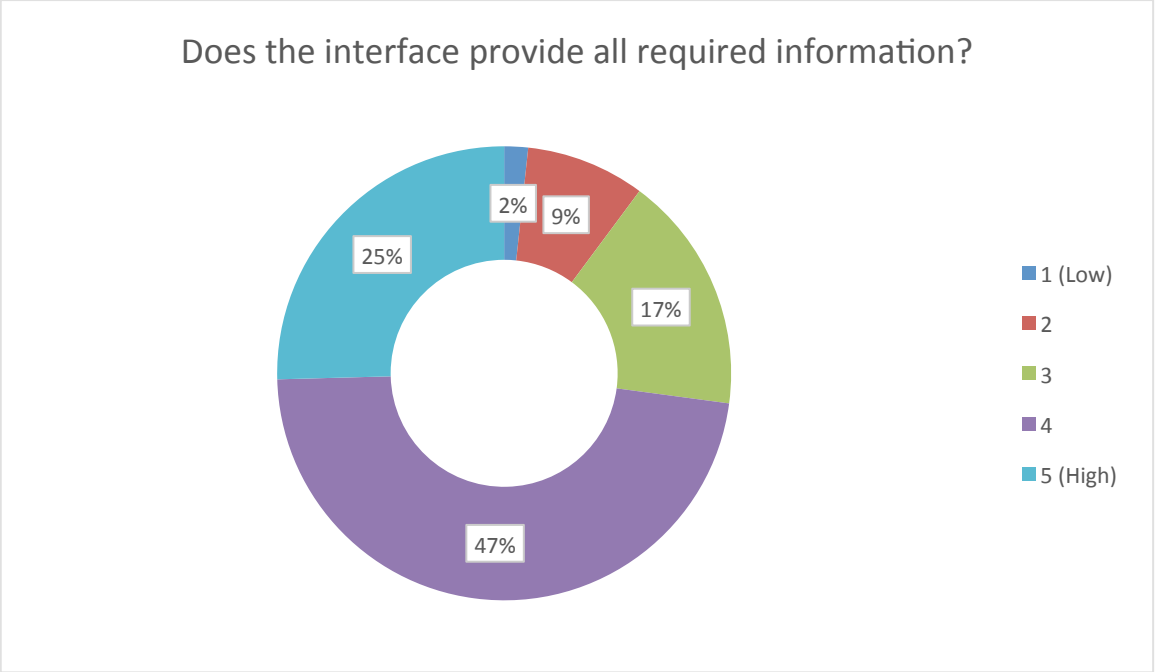
Answer	Count	Percentage, %
1 (Low)	1	2
2	3	5
3	10	16
4	19	31
5 (High)	28	46



4.5.10Does the interface provide all required information?

Mean: 3,9

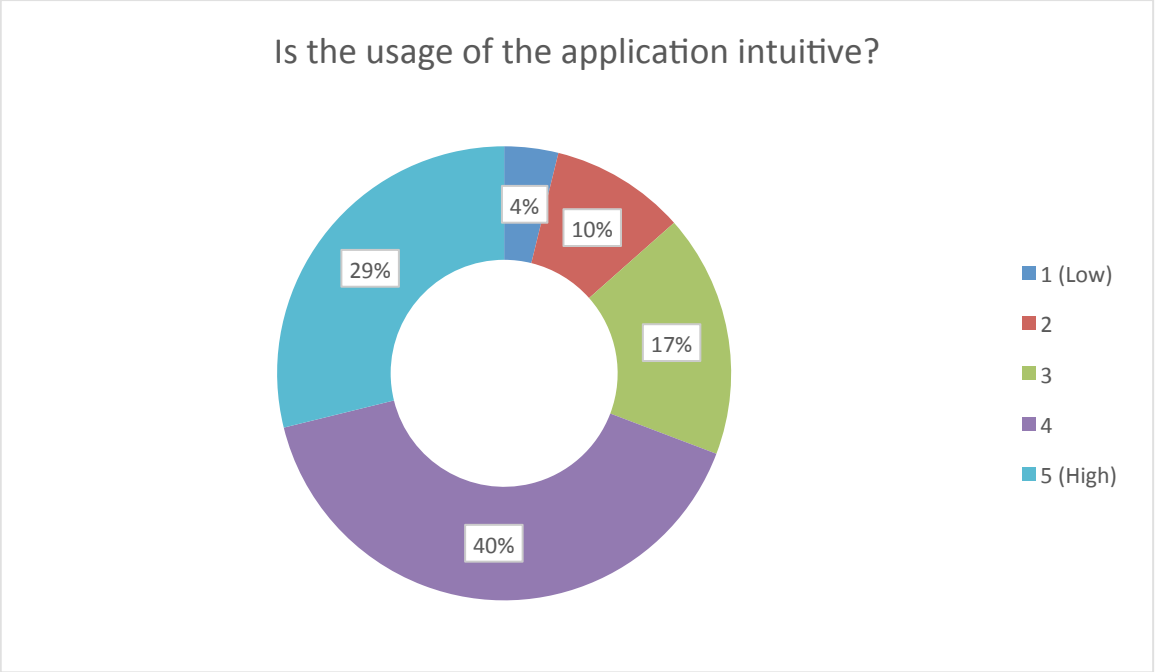
Answer	Count	Percentage, %
1 (Low)	1	2
2	5	8
3	10	17
4	28	47
5 (High)	15	25



4.5.11Is the usage of the application intuitive?

Mean: 3,8

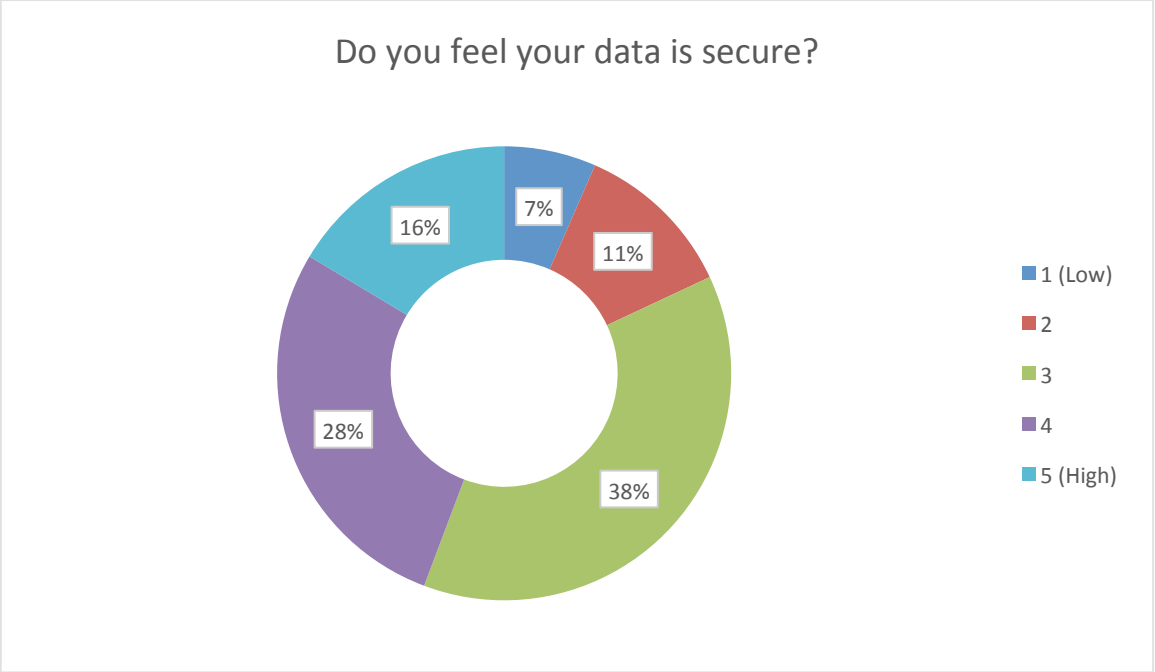
Answer	Count	Percentage, %
1 (Low)	2	4
2	5	10
3	9	17
4	21	40
5 (High)	15	29



4.5.12Do you feel your data are secure?

Mean: 3,4

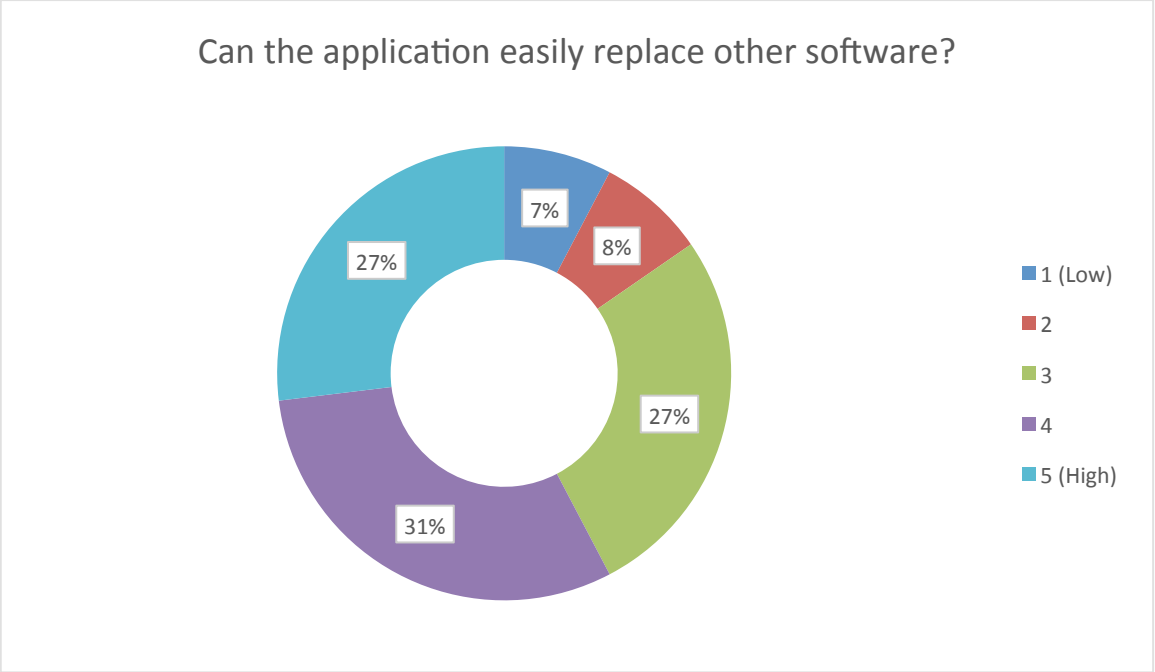
Answer	Count	Percentage, %
1 (Low)	4	7
2	7	11
3	23	38
4	17	28
5 (High)	10	16



4.5.13Can the application easily replace other software?

Mean: 3,6

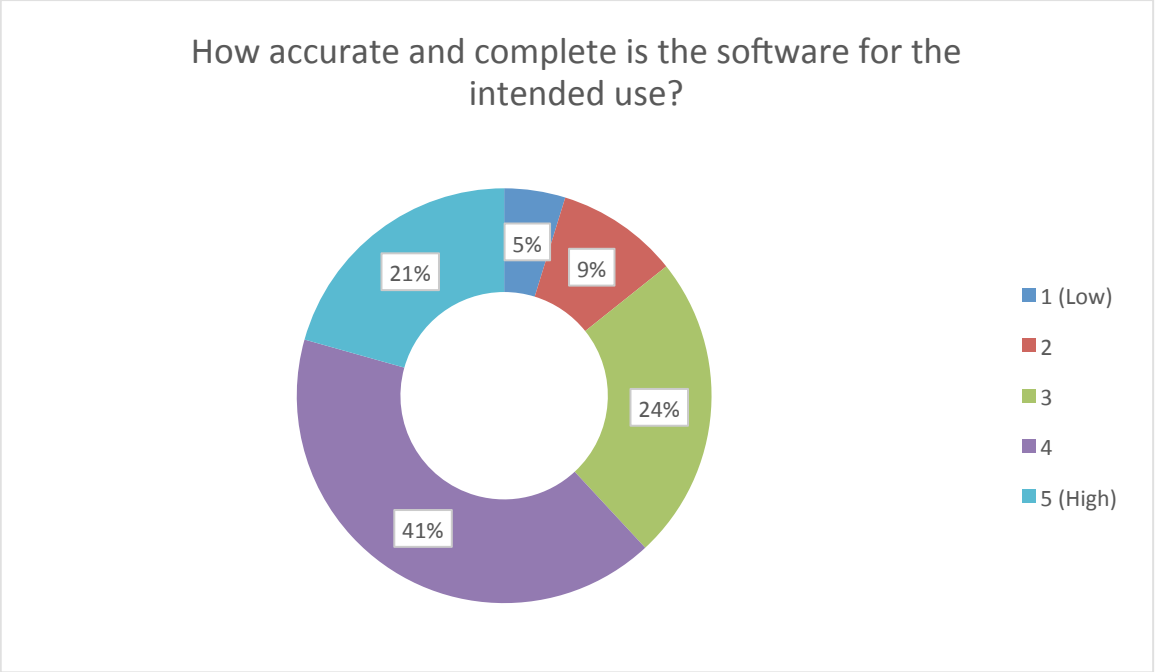
Answer	Count	Percentage, %
1 (Low)	4	8
2	4	8
3	14	27
4	16	31
5 (High)	14	27



4.5.14How accurate and complete is the software for the intended use?

Mean: 3,6

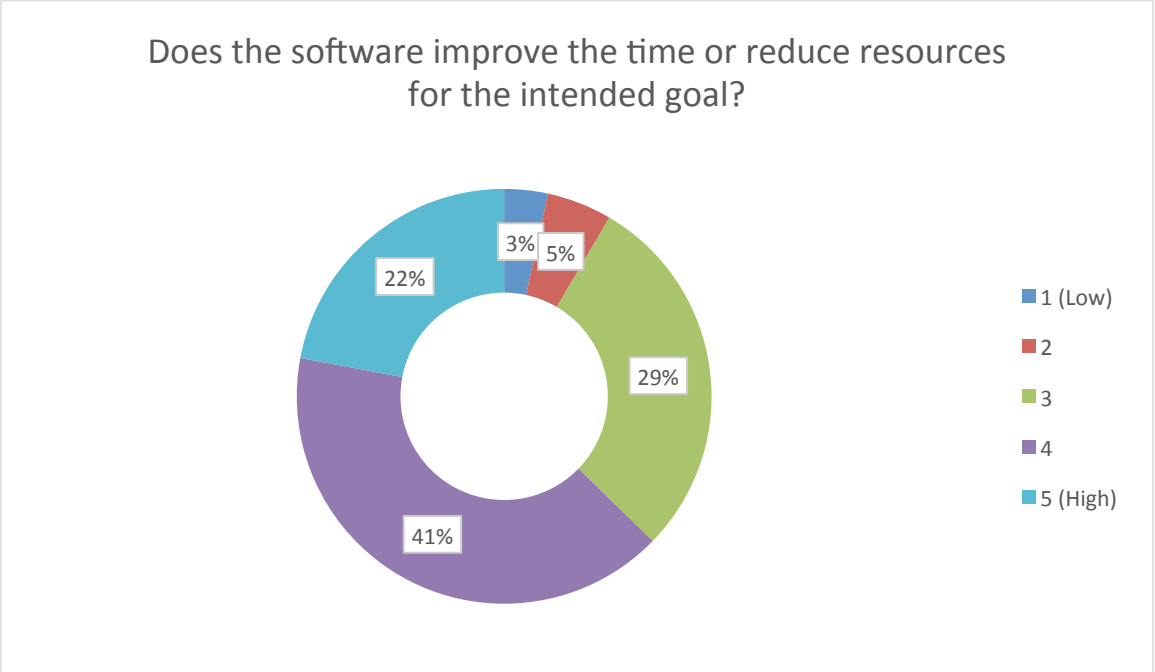
Answer	Count	Percentage, %
1 (Low)	3	5
2	6	10
3	15	24
4	26	41
5 (High)	13	21



4.5.15 Does the software improve the time or reduce resource for the intended goal?

Mean: 3,7

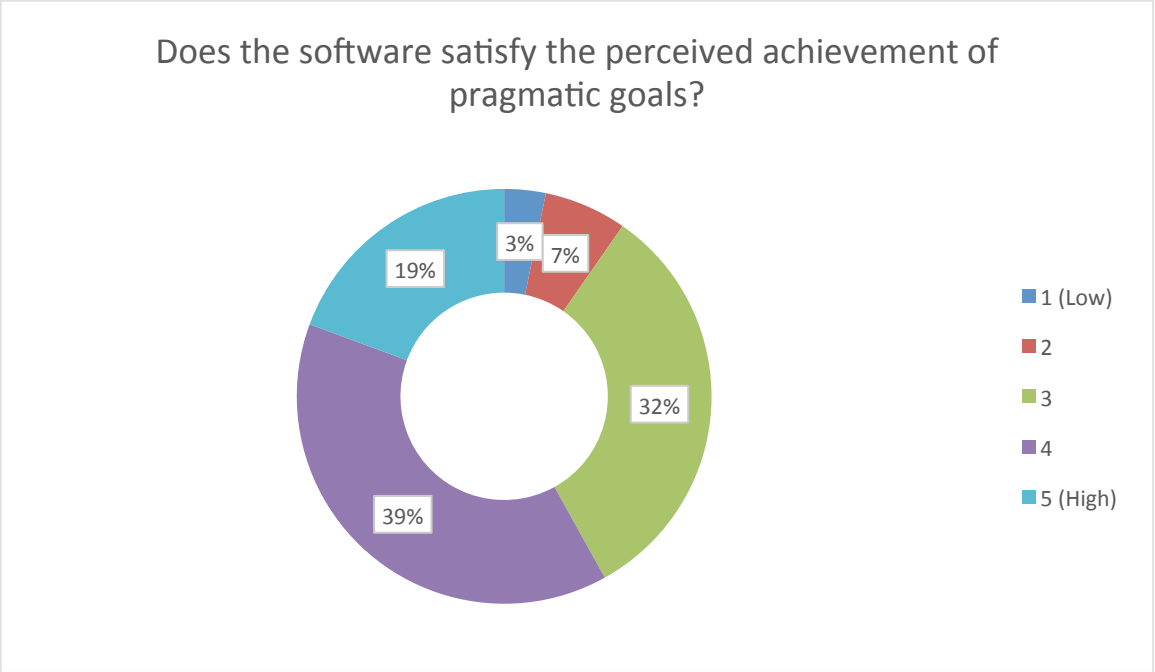
Answer	Count	Percentage, %
1 (Low)	2	3
2	3	5
3	17	29
4	24	41
5 (High)	13	22



4.5.16Does the software satisfy the perceived achievement of pragmatic goals?

Mean: 3,6

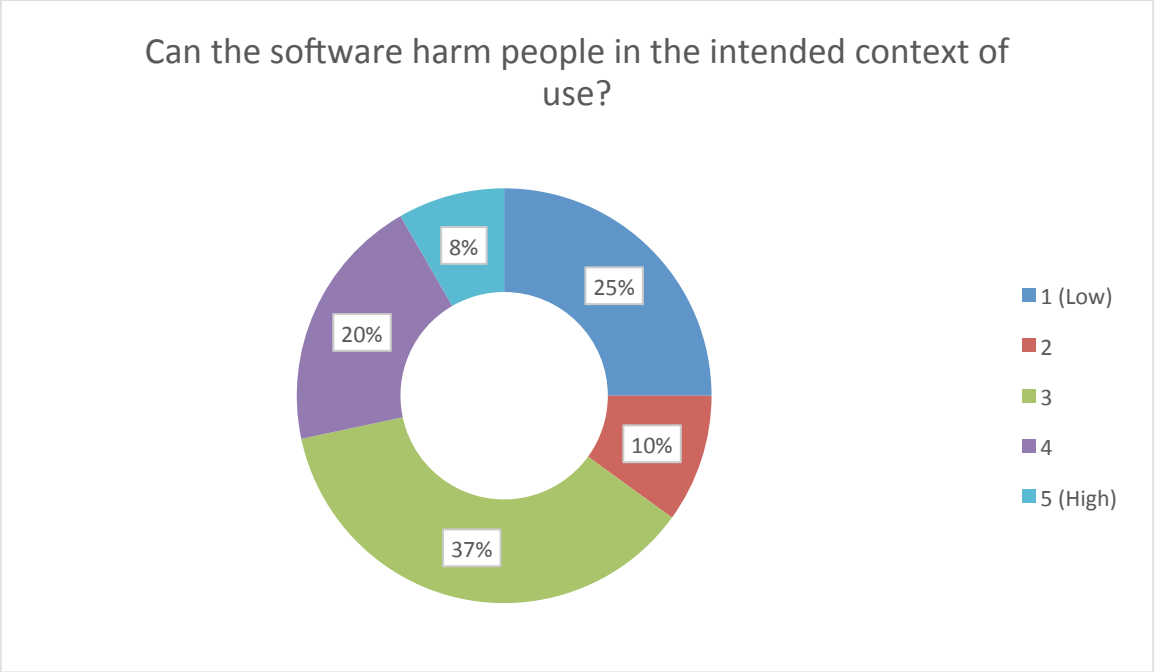
Answer	Count	Percentage, %
1 (Low)	2	3
2	4	6
3	20	32
4	24	39
5 (High)	12	19



4.5.17Can the software harm people in the intended context of use?

Mean: 2,8

Answer	Count	Percentage, %
1 (Low)	15	25
2	6	10
3	22	37
4	12	20
5 (High)	5	8



4.6 Data Collection (Mobile Application)

Data Collection (Mobile Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can this application collect your data easily?

Is the user interface for data collection user friendly?

Does the data collection work as expected?

Section: Efficiency

How quickly can you interact with the application?

Section: Compatibility

Do you know other similar tools? If yes is this tool better than the other tool(s) you know?

Section: Usability

Do you know how to use the application easily?

Can you learn to use the application easily?

Can you use the application without much effort?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the application intuitive?

Section: Security

Do you feel your data are secure?

Section: Portability

Can the application easily replace other software?

Section: Quality in use

How accurate and complete is the software for the intended use?

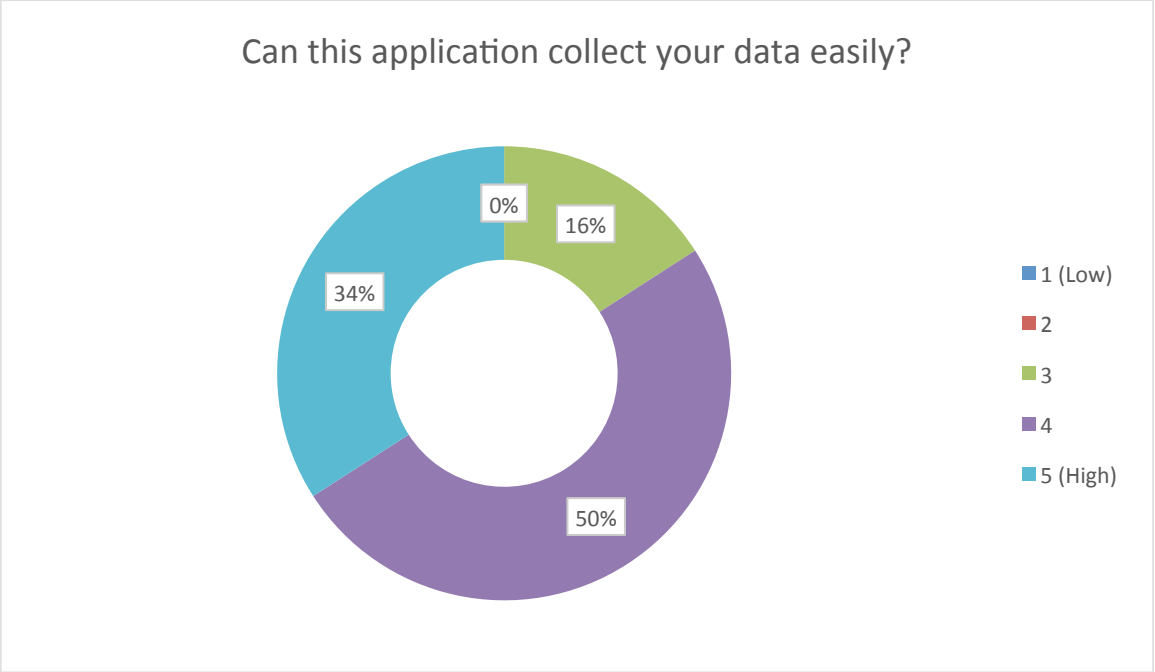
Does the application save you time?

Can the application harm people in the intended context of use?

4.6.1 Can this application collect your data easily?

Mean: 4,2

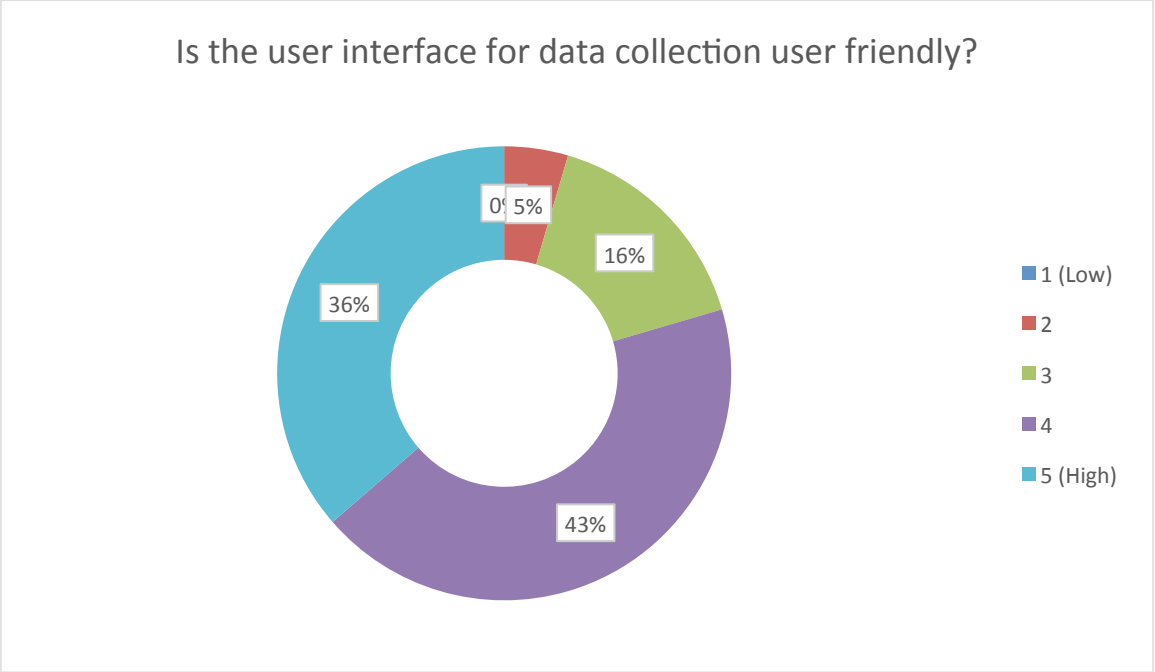
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	7	16
4	22	50
5 (High)	15	34



4.6.2 Is the user interface for data collection user friendly?

Mean: 4,1

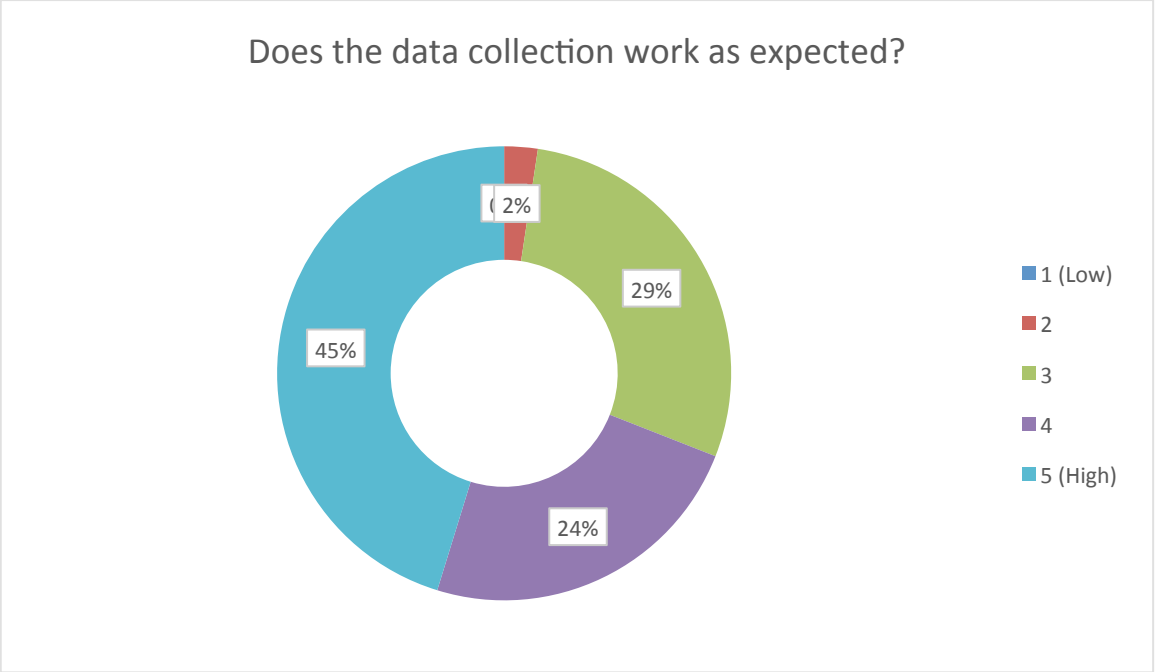
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	7	16
4	19	43
5 (High)	16	36



4.6.3 Does the data collection work as expected?

Mean: 4,1

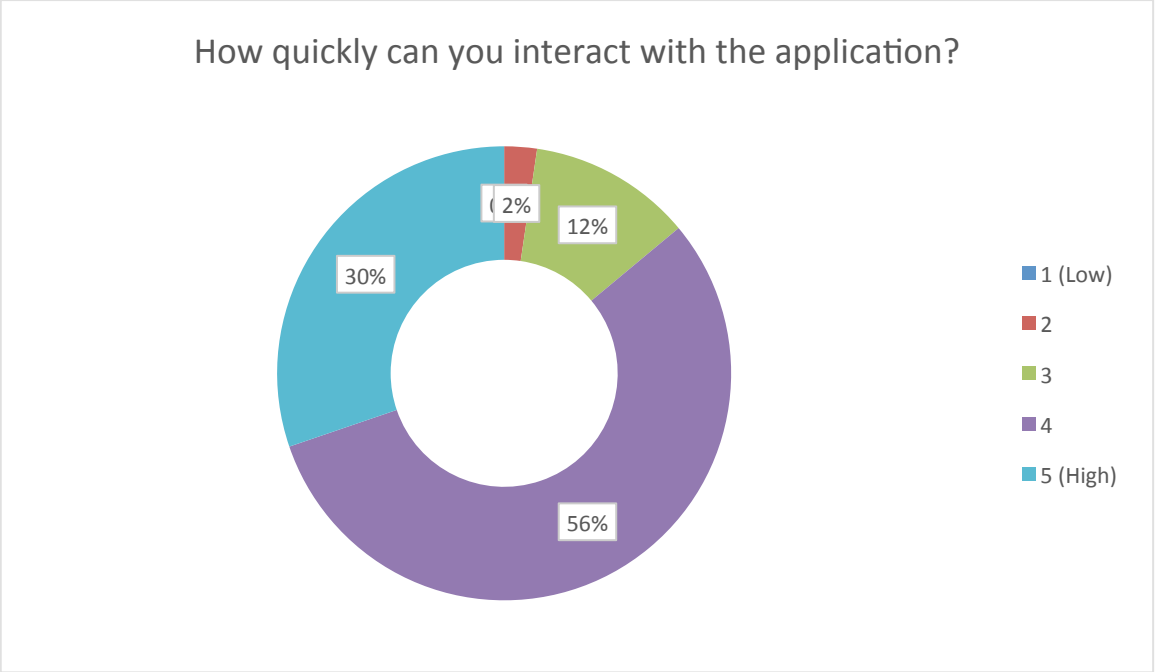
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	12	29
4	10	24
5 (High)	19	45



4.6.4 How quickly can you interact with the application?

Mean: 4,1

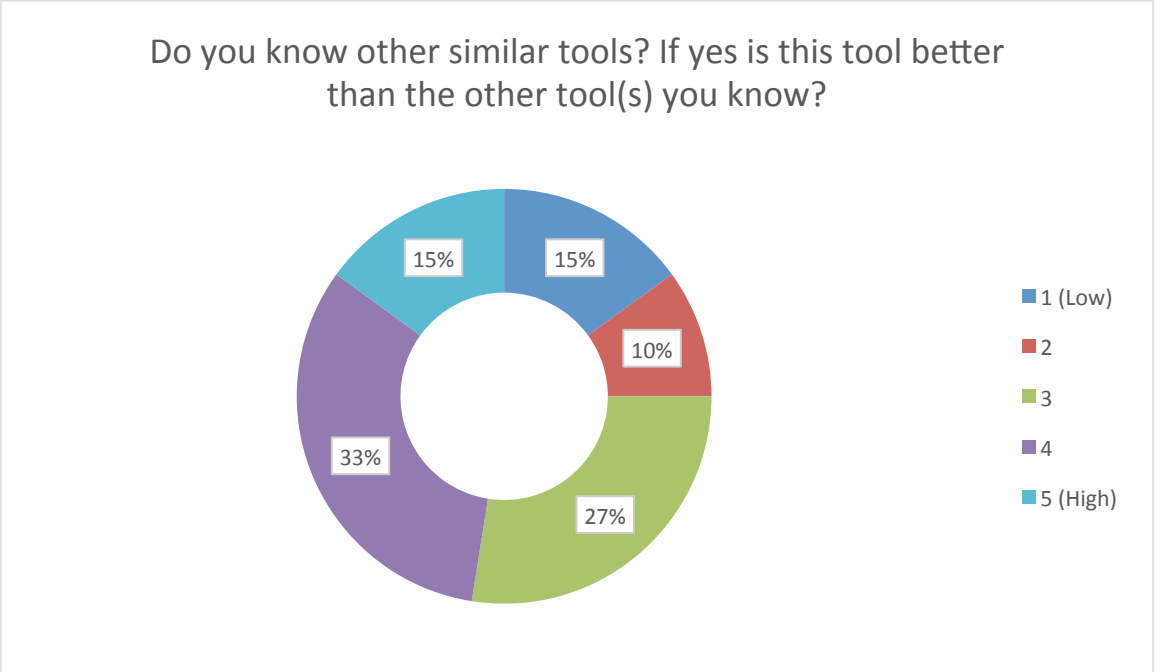
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	5	12
4	24	56
5 (High)	13	30



4.6.5 Do you know other similar tools? If yes is this tool better than the other tool(s) you know?

Mean: 3,2

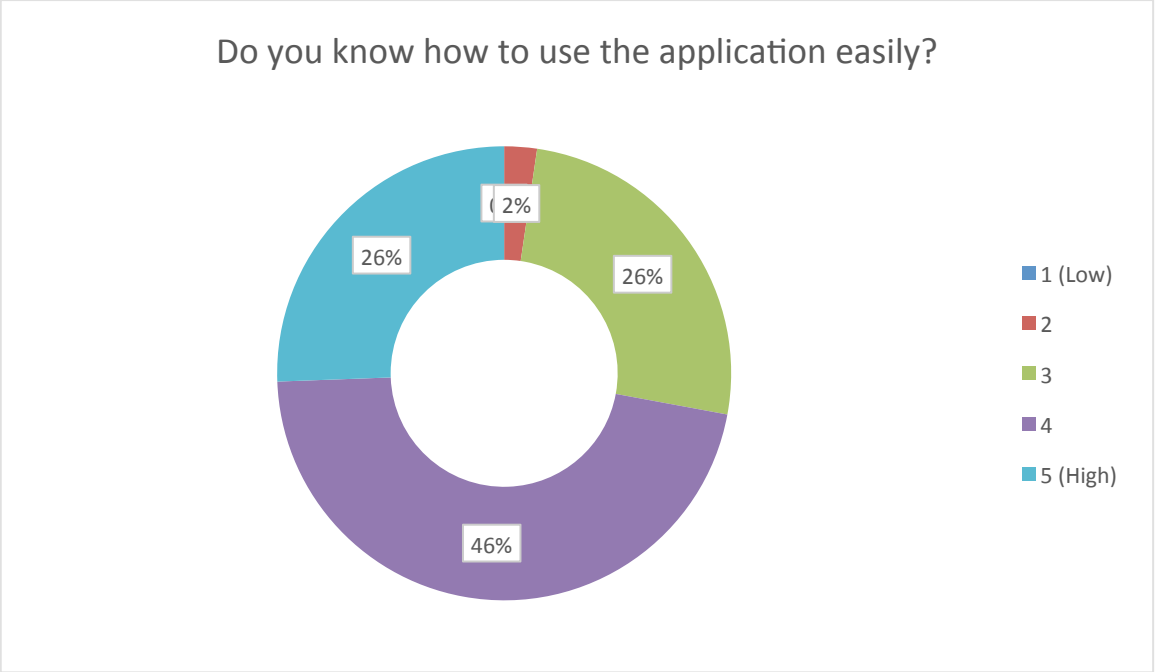
Answer	Count	Percentage, %
1 (Low)	6	15
2	4	10
3	11	28
4	13	33
5 (High)	6	15



4.6.6 Do you know how to use the application easily?

Mean: 4,0

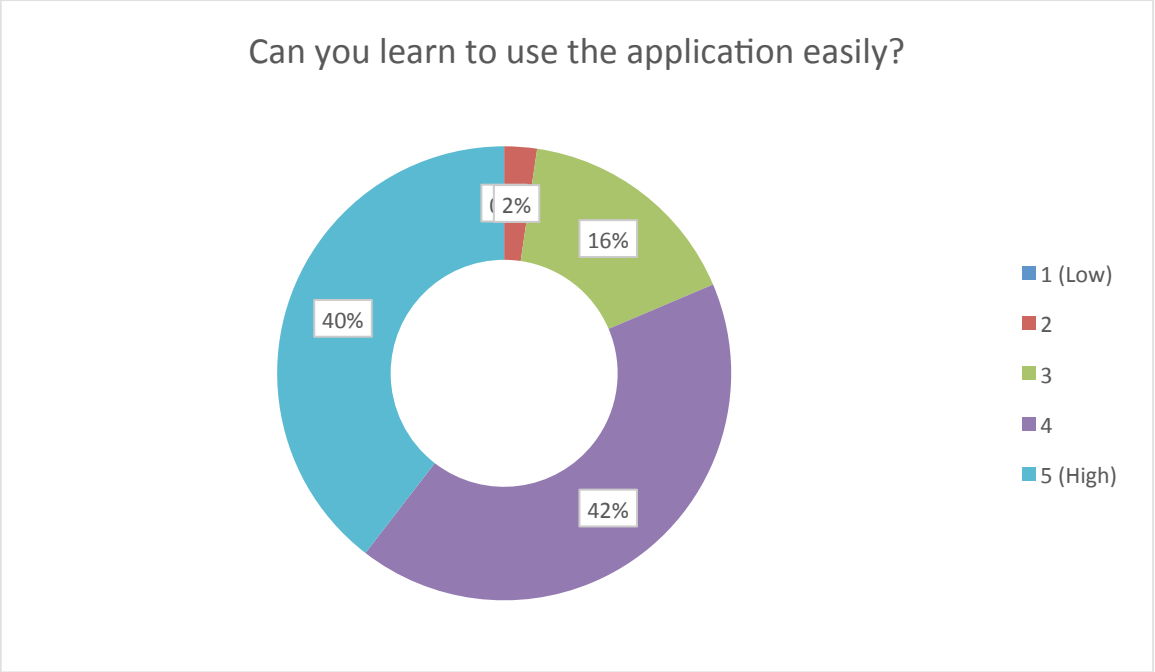
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	11	26
4	20	47
5 (High)	11	26



4.6.7 Can you learn to use the application easily?

Mean: 4,2

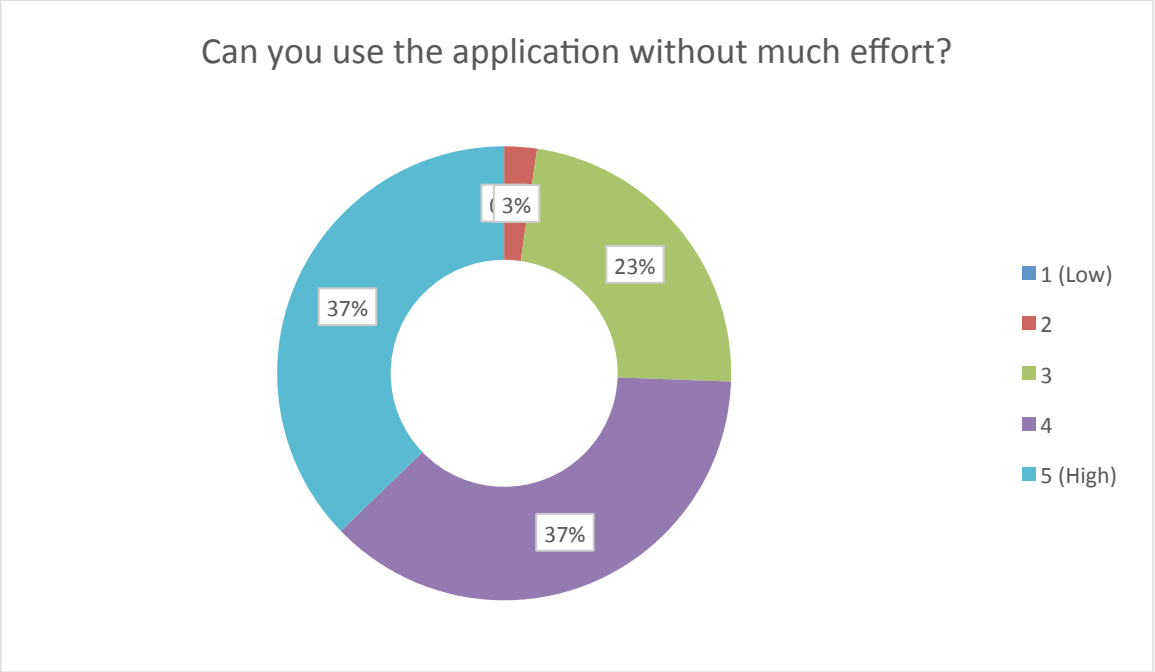
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	7	16
4	18	42
5 (High)	17	40



4.6.8 Can you use the application without much effort?

Mean: 4,1

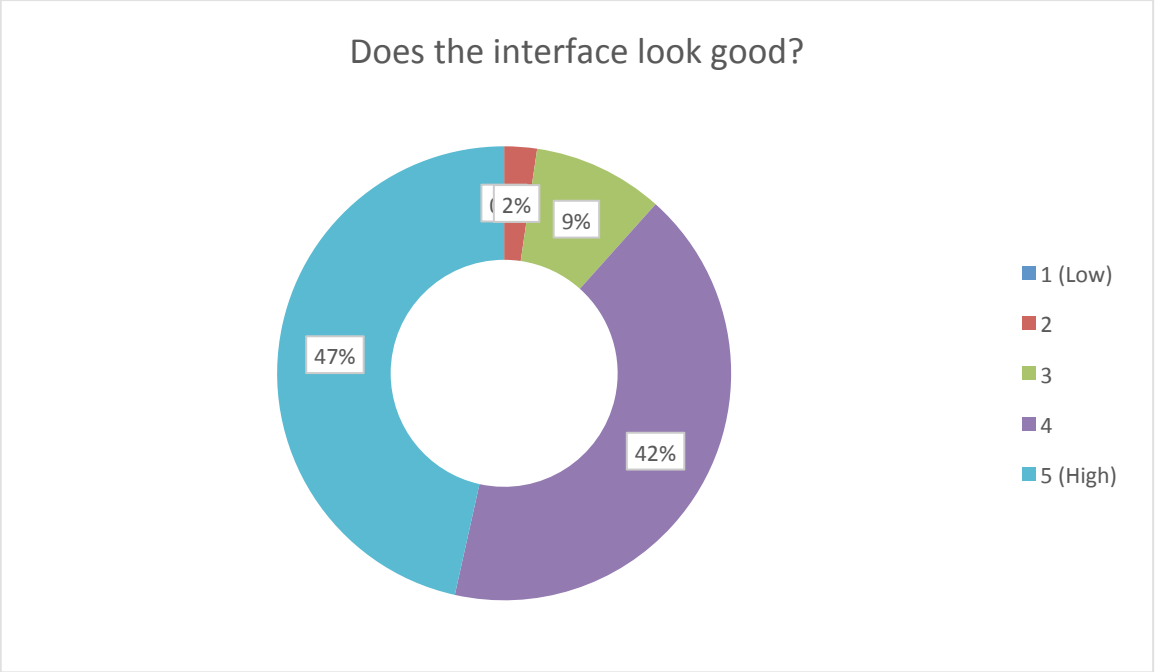
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	10	23
4	16	37
5 (High)	16	37



4.6.9 Does the interface look good?

Mean: 4,3

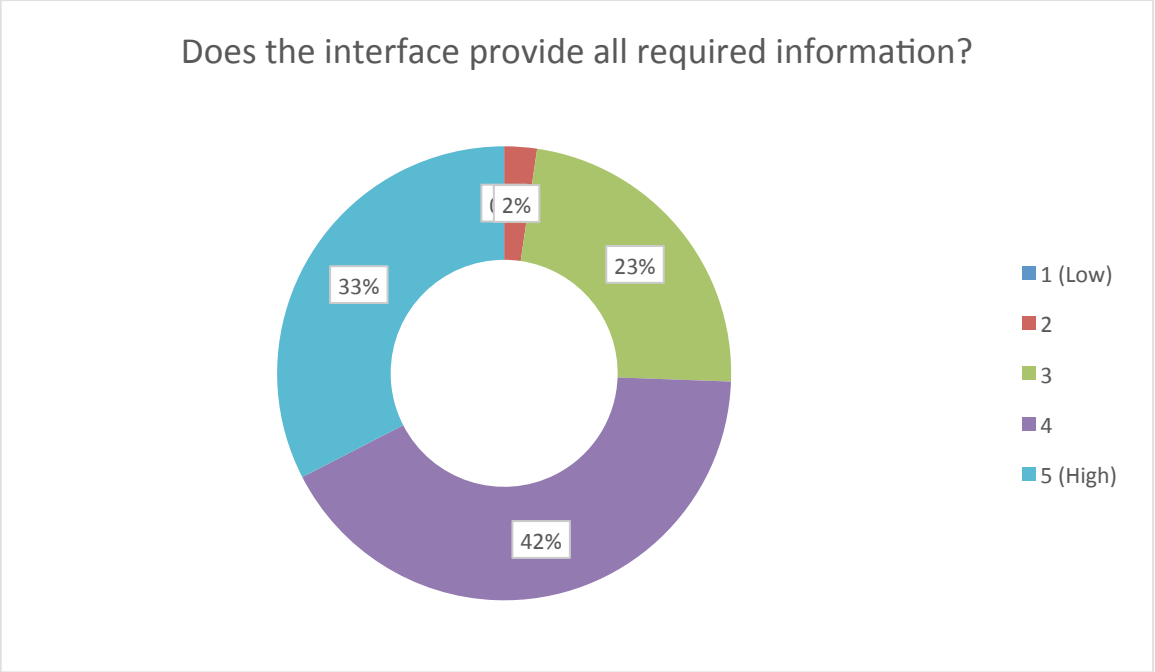
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	4	9
4	18	42
5 (High)	20	47



4.6.10Does the interface provide all required information?

Mean: 4,0

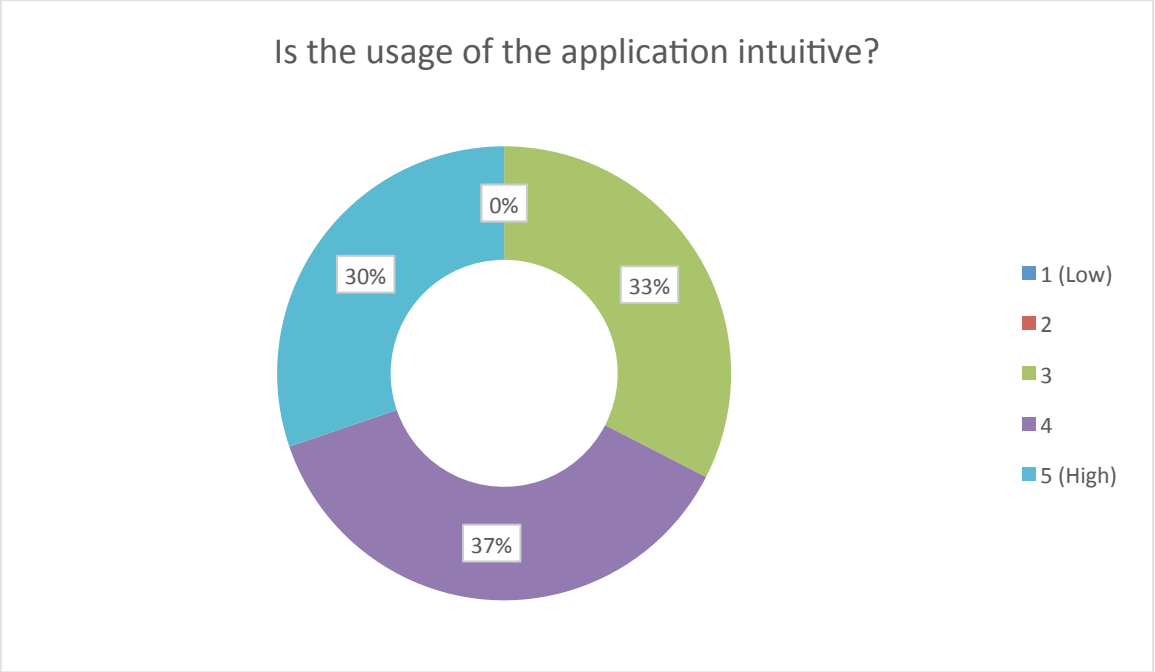
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	10	23
4	18	42
5 (High)	14	33



4.6.11Is the usage of the application intuitive?

Mean: 4,0

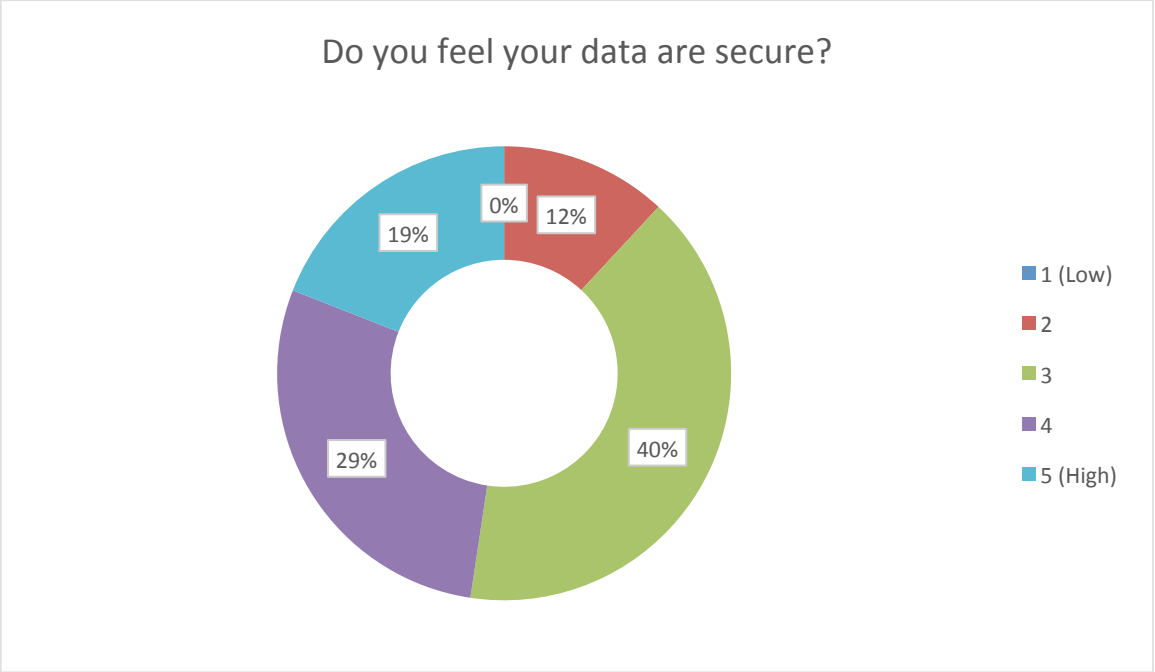
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	14	33
4	16	37
5 (High)	13	30



4.6.12Do you feel your data are secure?

Mean: 3,5

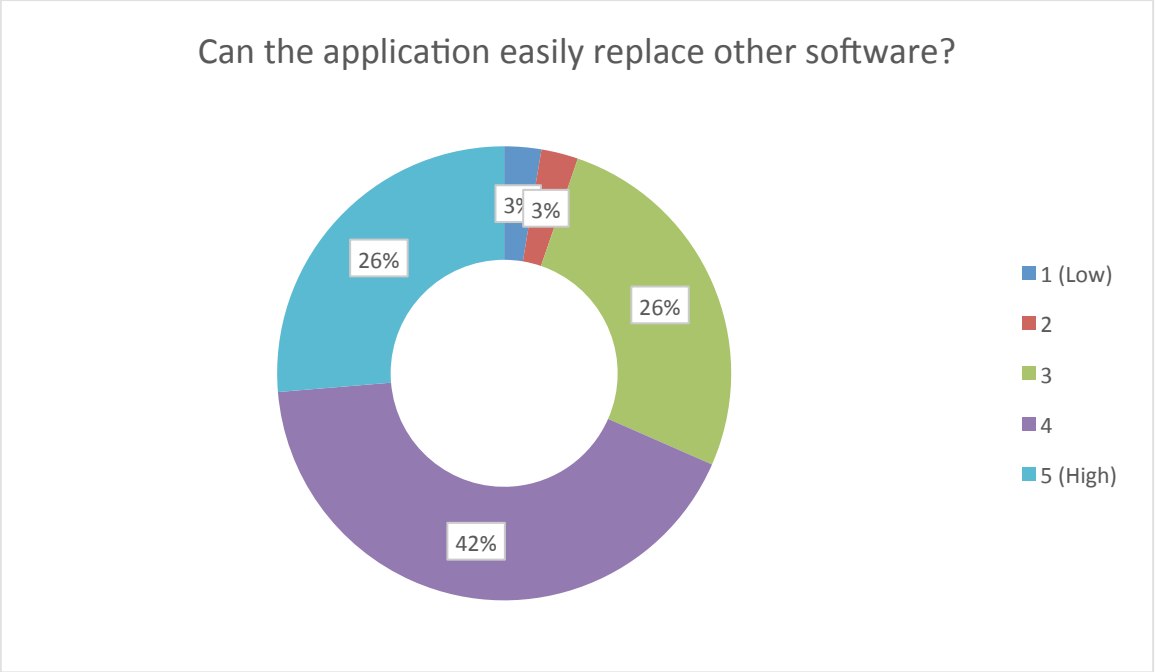
Answer	Count	Percentage, %
1 (Low)	0	0
2	5	12
3	17	40
4	12	29
5 (High)	8	19



4.6.13Can the application easily replace other software?

Mean: 3,9

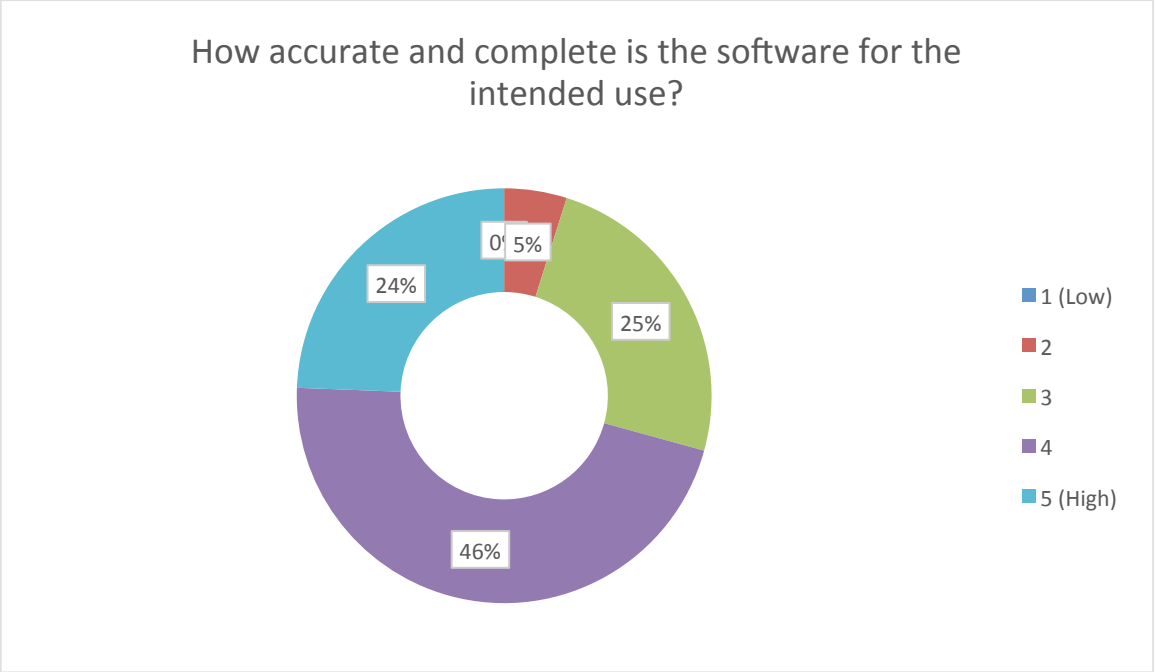
Answer	Count	Percentage, %
1 (Low)	1	3
2	1	3
3	10	26
4	16	42
5 (High)	10	26



4.6.14How accurate and complete is the software for the intended use?

Mean: 3,9

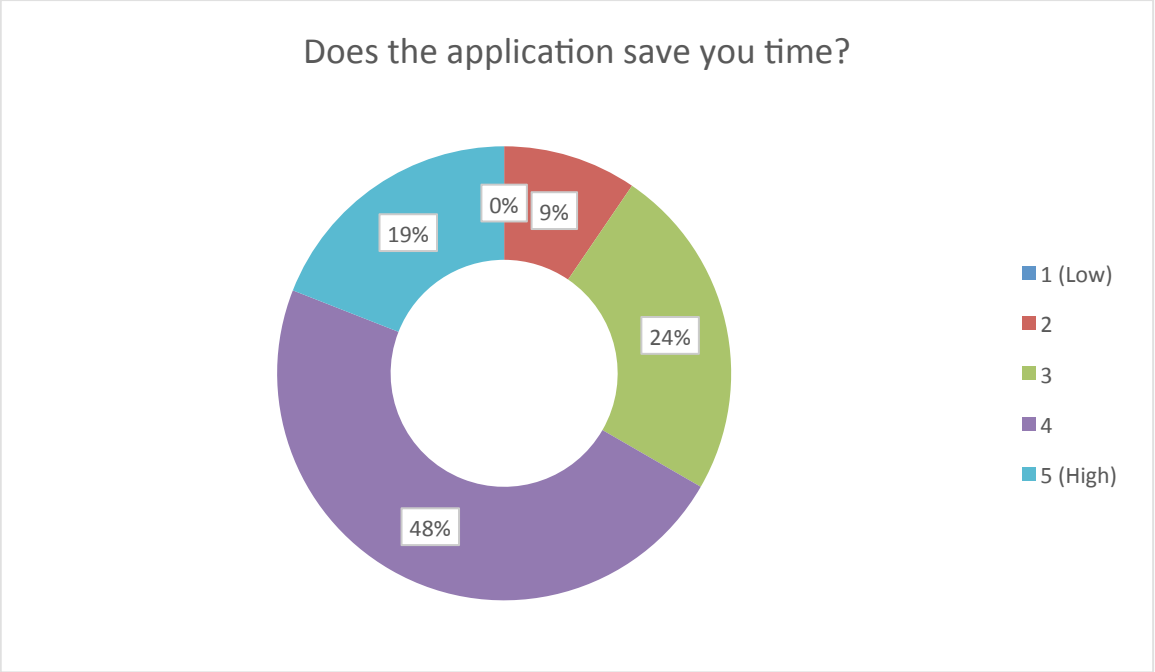
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	10	24
4	19	46
5 (High)	10	24



4.6.15Does the application save you time?

Mean: 3,8

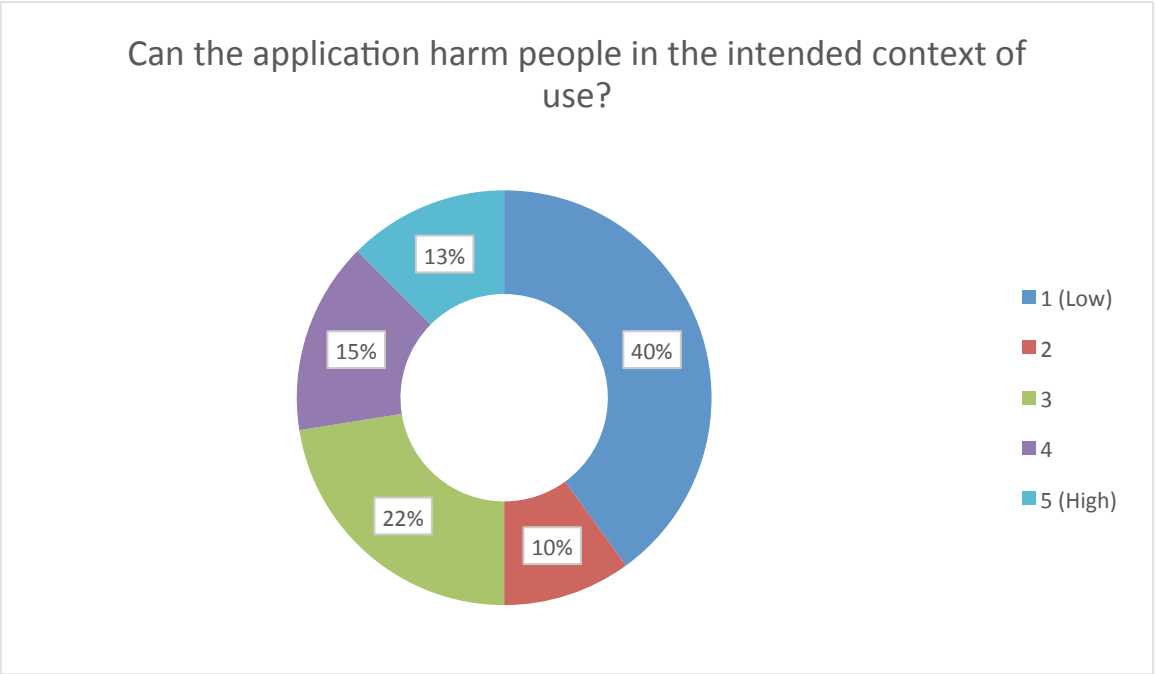
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	10
3	5	24
4	10	48
5 (High)	4	19



4.6.16Can the application harm people in the intended context of use?

Mean: 2,5

Answer	Count	Percentage, %
1 (Low)	16	40
2	4	10
3	9	23
4	6	15
5 (High)	5	13



4.7 Data Visualization (Web Application)

Data Visualization (Web Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can this module effectively visualize the data?

Are the visualization results as expected?

Can you understand your data better through the visualization?

Can this module interact with the MHA platform?

Section: Efficiency

How quickly does the module interact?

Section: Compatibility

Do you know other similar modules? If yes is this tool better than the other you know?

Section: Usability

Do you how to use the module easily?

Can you learn how to use the module easily?

Can you use the module without much effort?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the module intuitive?

Section: Security

Are data accessible only to authorized users?

Does the module prevent unauthorized access?

Section: Portability

Can the module be moved to other environments?

Section: Quality in use

How complete is the module for the intended use?

Does the module improve the time or reduce resource for the intended goal?

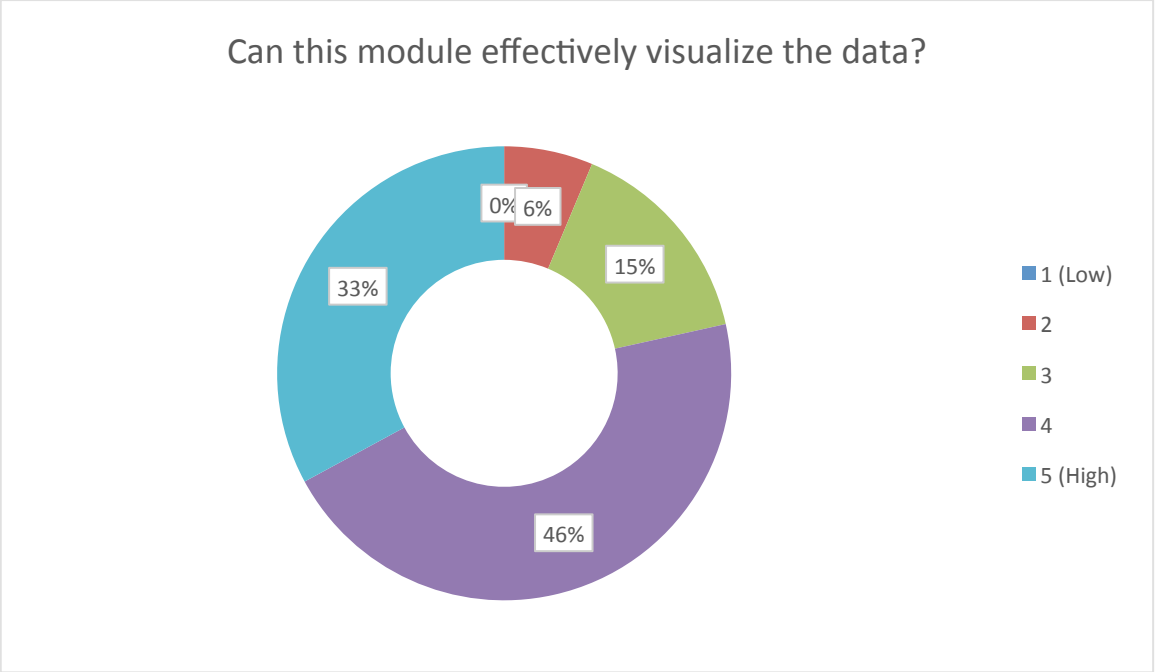
Does the module satisfy the perceived achievement of pragmatic goals?

Can the module harm people in the intended context of use?

4.7.1 Can this module effectively visualize the data?

Mean: 4,1

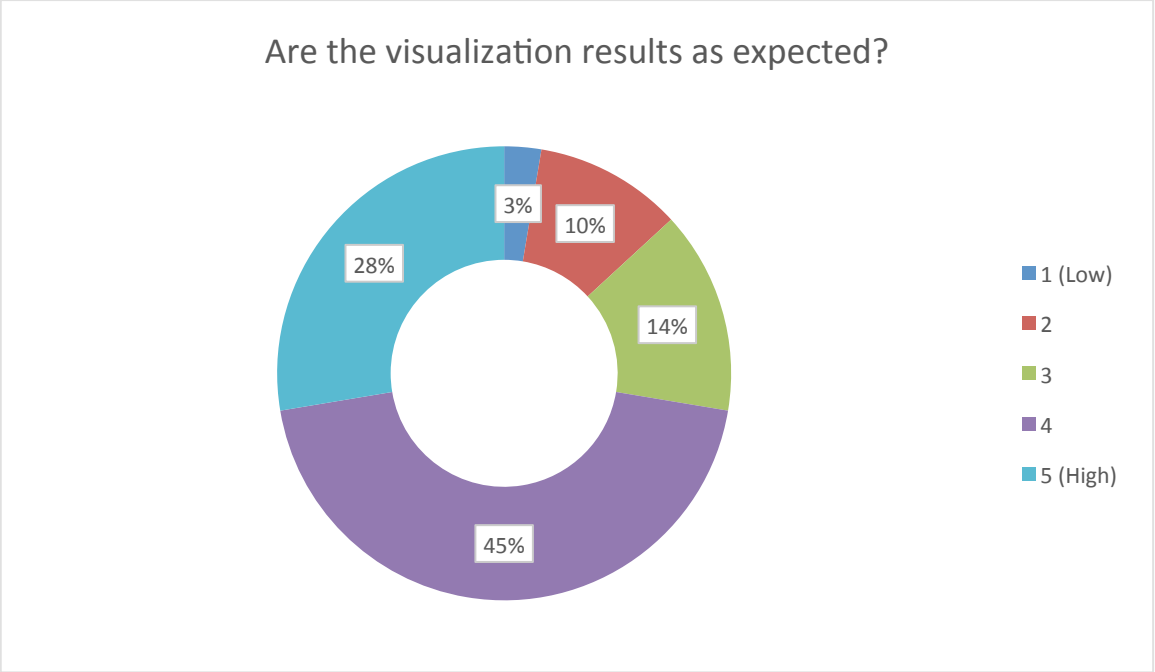
Answer	Count	Percentage, %
1 (Low)	0	0
2	5	6
3	12	15
4	36	46
5 (High)	26	33



4.7.2 Are the visualization results as expected?

Mean: 3,8

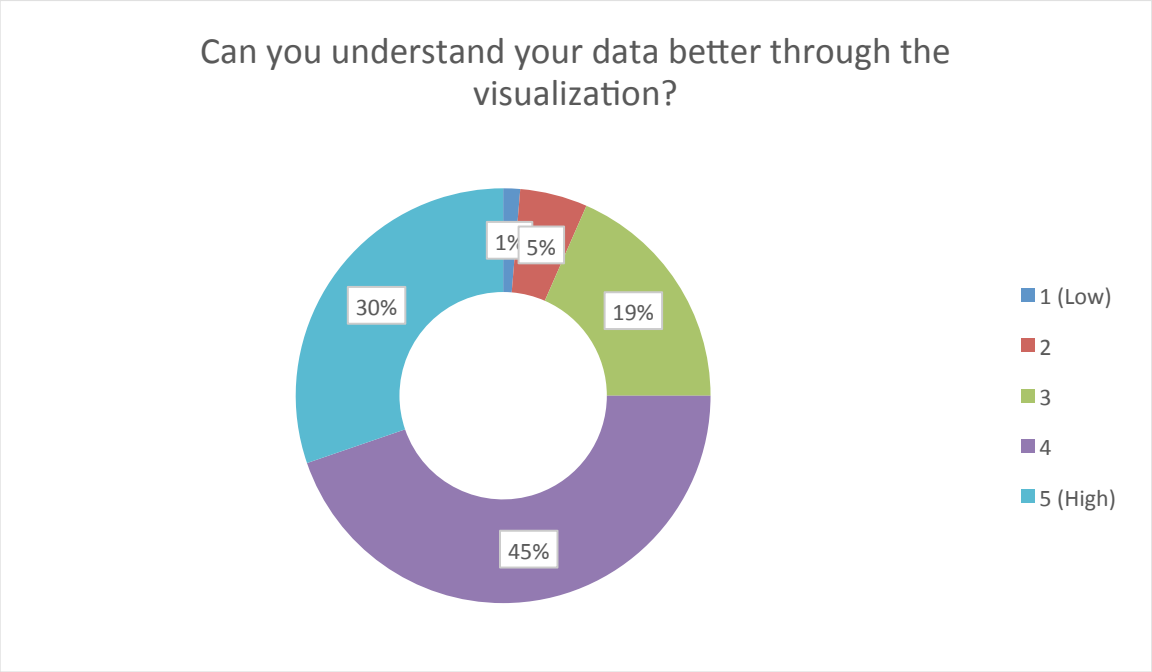
Answer	Count	Percentage, %
1 (Low)	2	3
2	8	11
3	11	14
4	34	45
5 (High)	21	28



4.7.3 Can you understand your data better through the visualization?

Mean: 4,0

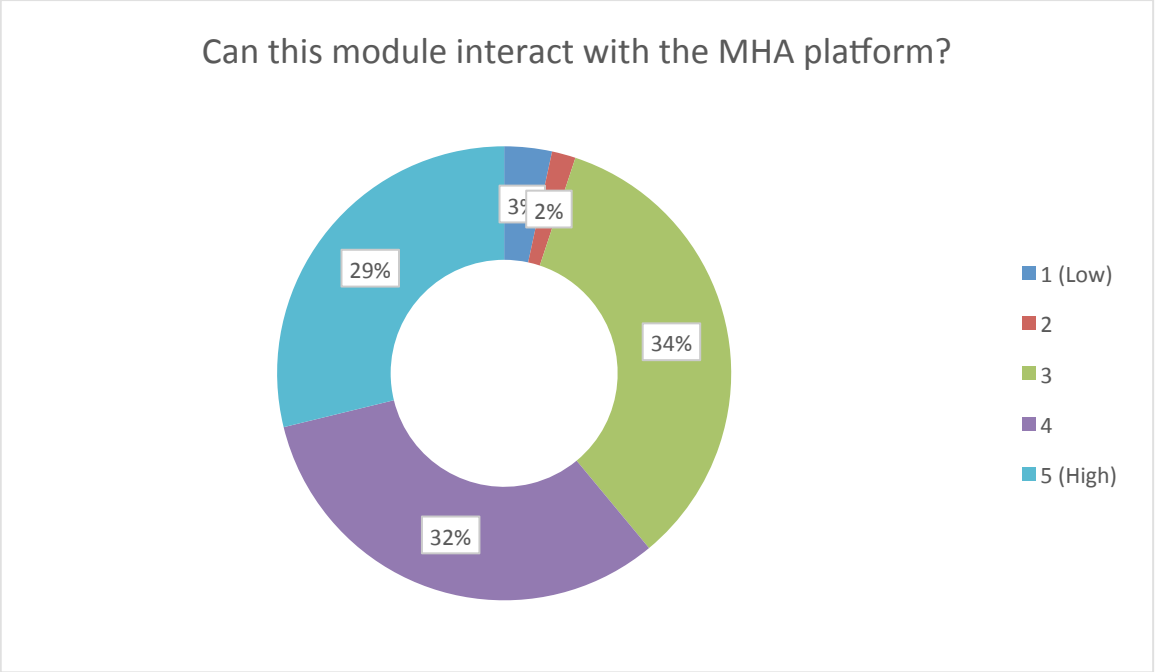
Answer	Count	Percentage, %
1 (Low)	1	1
2	4	5
3	14	18
4	34	45
5 (High)	23	30



4.7.4 Can this module interact with the MHA platform?

Mean: 3,8

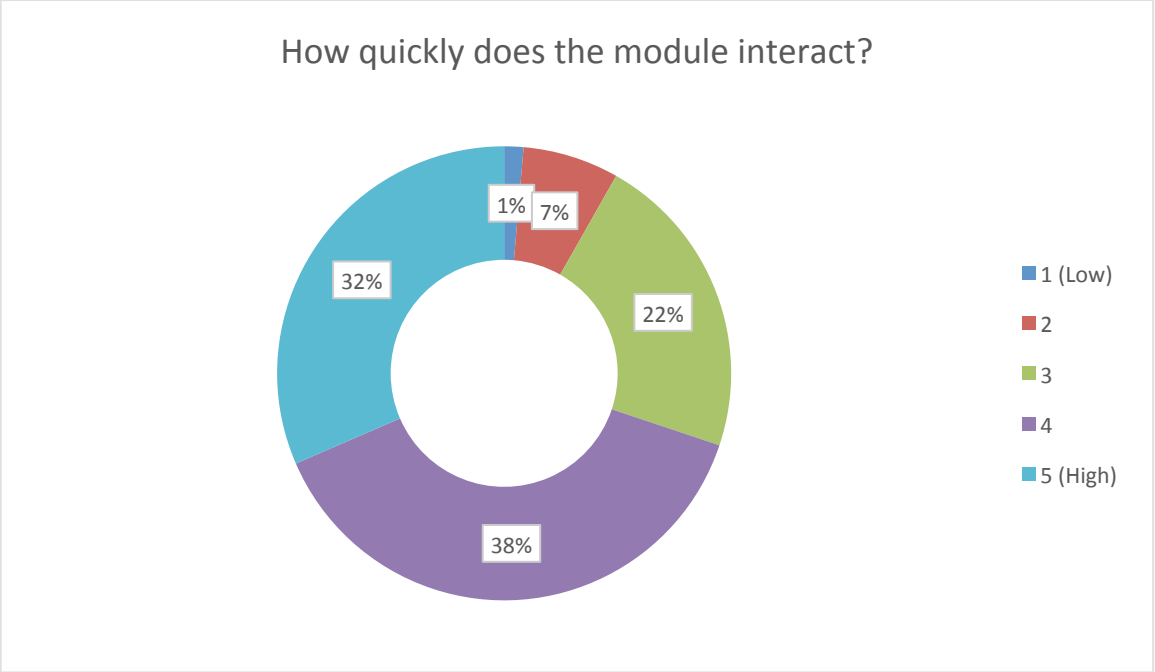
Answer	Count	Percentage, %
1 (Low)	2	3
2	1	2
3	20	34
4	19	32
5 (High)	17	29



4.7.5 How quickly does the module interact?

Mean: 3,9

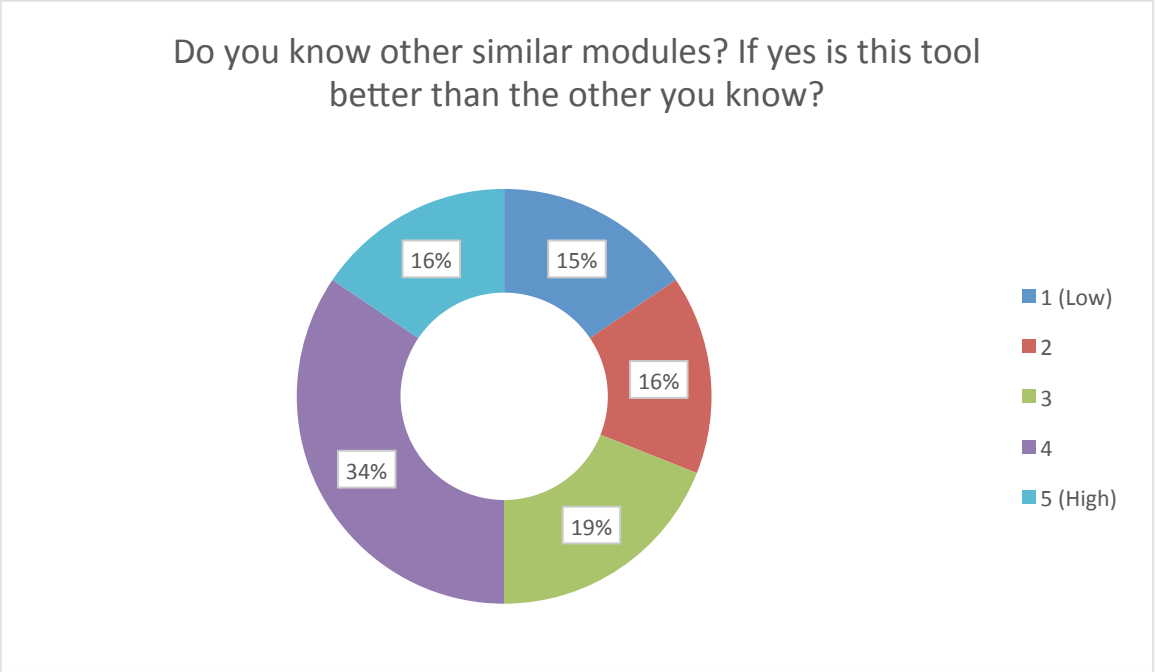
Answer	Count	Percentage, %
1 (Low)	1	1
2	5	7
3	16	22
4	28	38
5 (High)	23	32



4.7.6 Do you know other similar modules? If yes is this tool better than the other you know?

Mean: 3,2

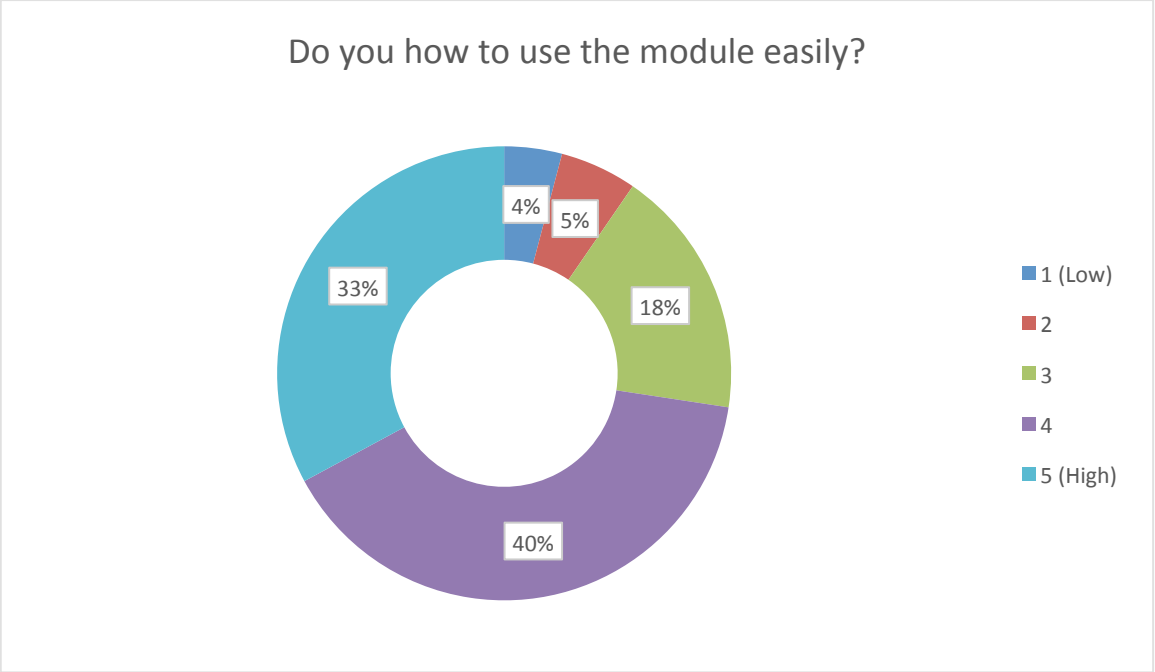
Answer	Count	Percentage, %
1 (Low)	9	16
2	9	16
3	11	19
4	20	34
5 (High)	9	16



4.7.7 Do you how to use the module easily?

Mean: 3,9

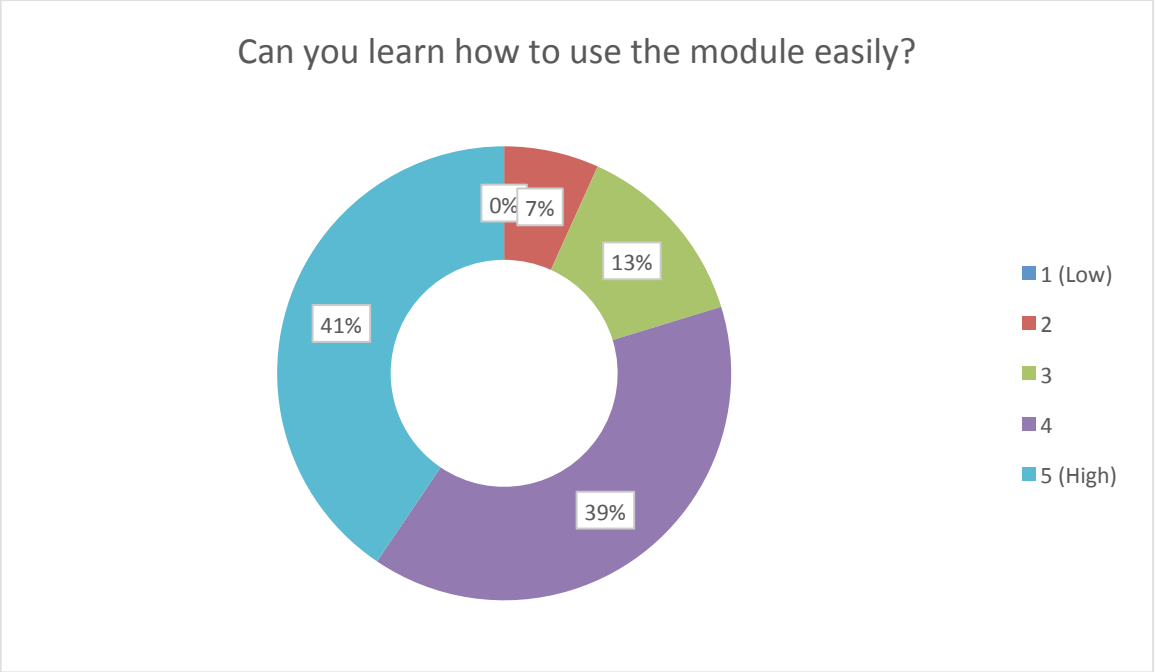
Answer	Count	Percentage, %
1 (Low)	3	4
2	4	5
3	13	18
4	29	40
5 (High)	24	33



4.7.8 Can you learn how to use the module easily?

Mean: 4,1

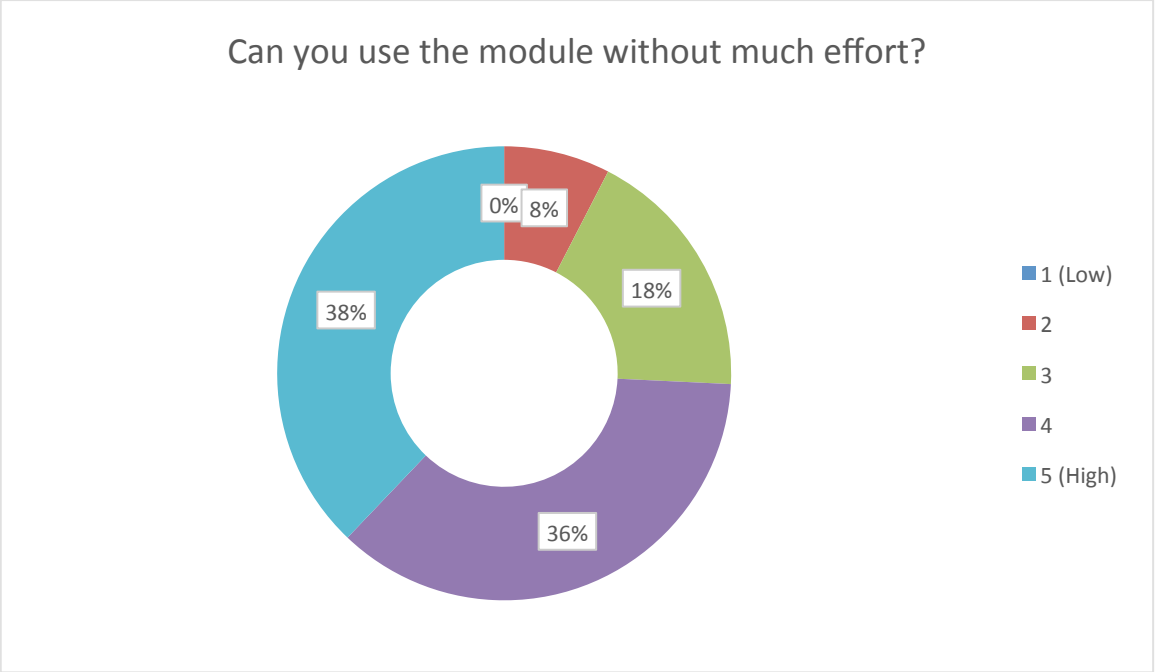
Answer	Count	Percentage, %
1 (Low)	0	0
2	5	7
3	10	14
4	29	39
5 (High)	30	41



4.7.9 Can you use the module without much effort?

Mean: 4,0

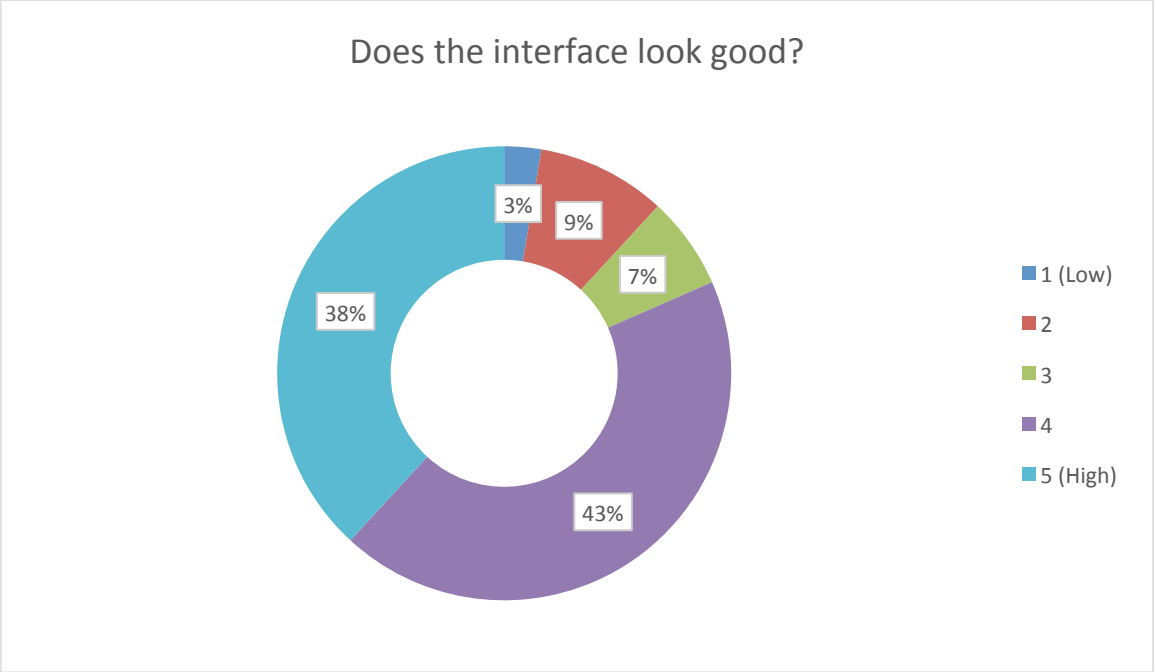
Answer	Count	Percentage, %
1 (Low)	0	0
2	5	8
3	12	18
4	24	36
5 (High)	25	38



4.7.10Does the interface look good?

Mean: 4,1

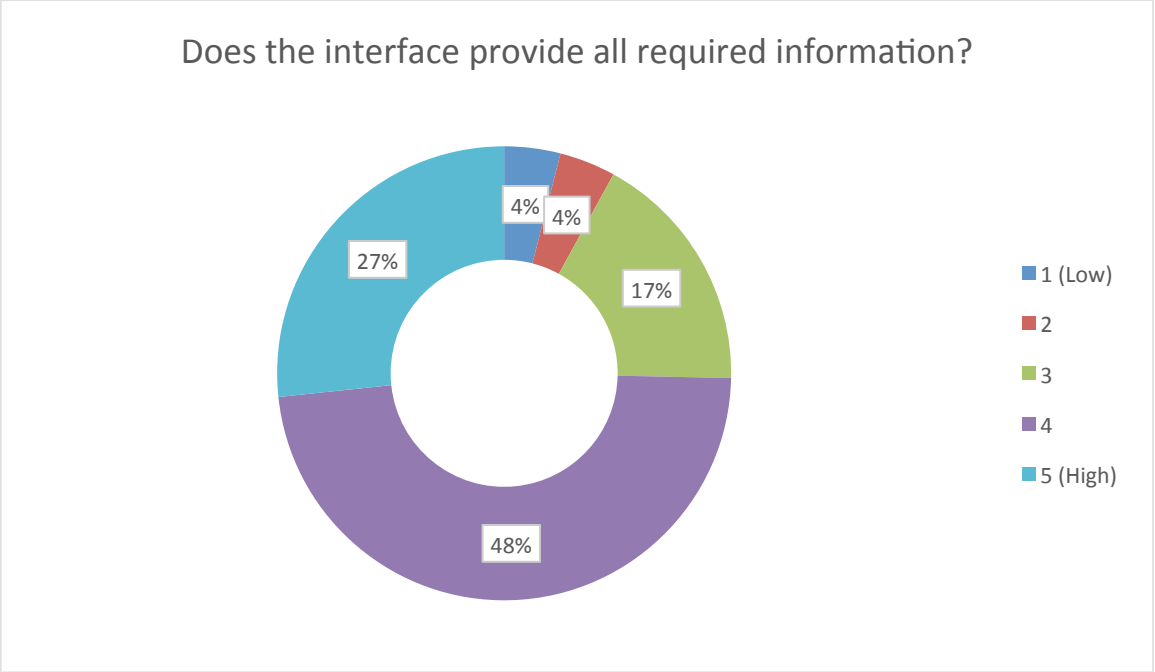
Answer	Count	Percentage, %
1 (Low)	2	3
2	7	9
3	5	7
4	33	43
5 (High)	29	38



4.7.11Does the interface provide all required information?

Mean: 3,9

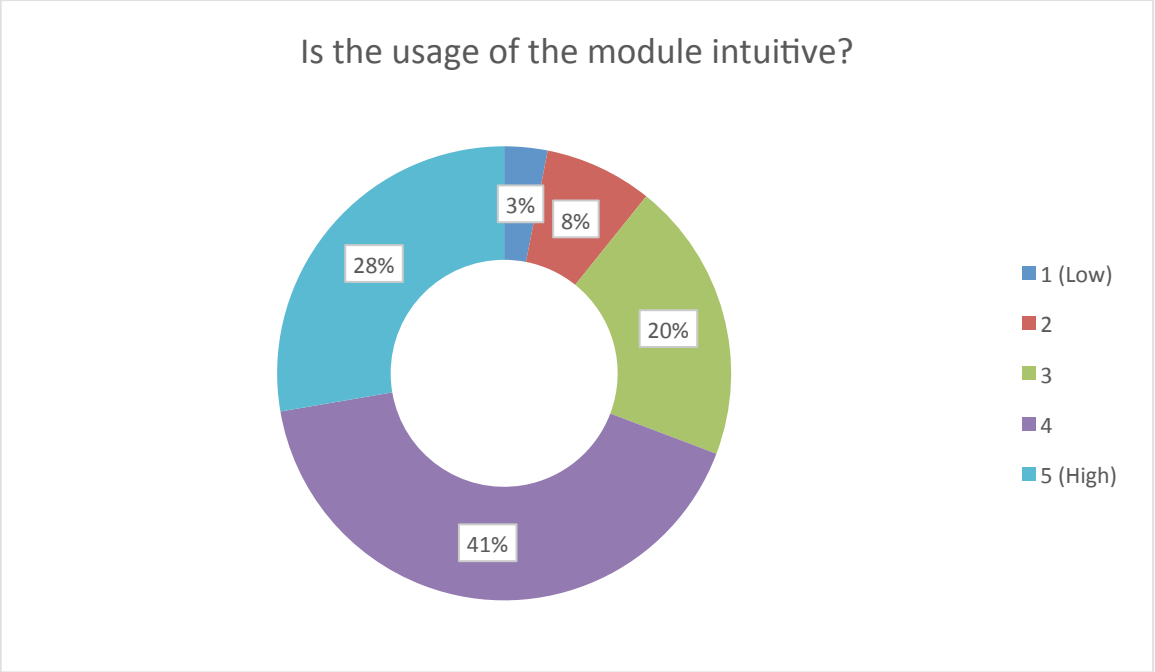
Answer	Count	Percentage, %
1 (Low)	3	4
2	3	4
3	13	17
4	36	48
5 (High)	20	27



4.7.12Is the usage of the module intuitive?

Mean: 3,8

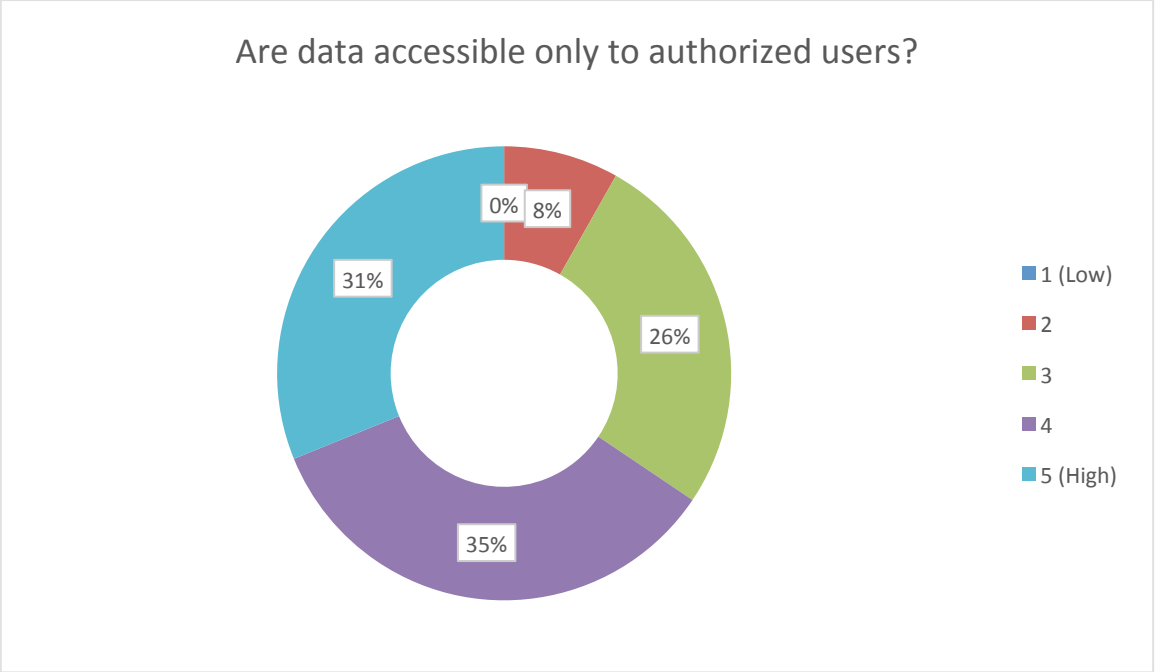
Answer	Count	Percentage, %
1 (Low)	2	3
2	5	8
3	13	20
4	27	42
5 (High)	18	28



4.7.13Are data accessible only to authorized users?

Mean: 3,9

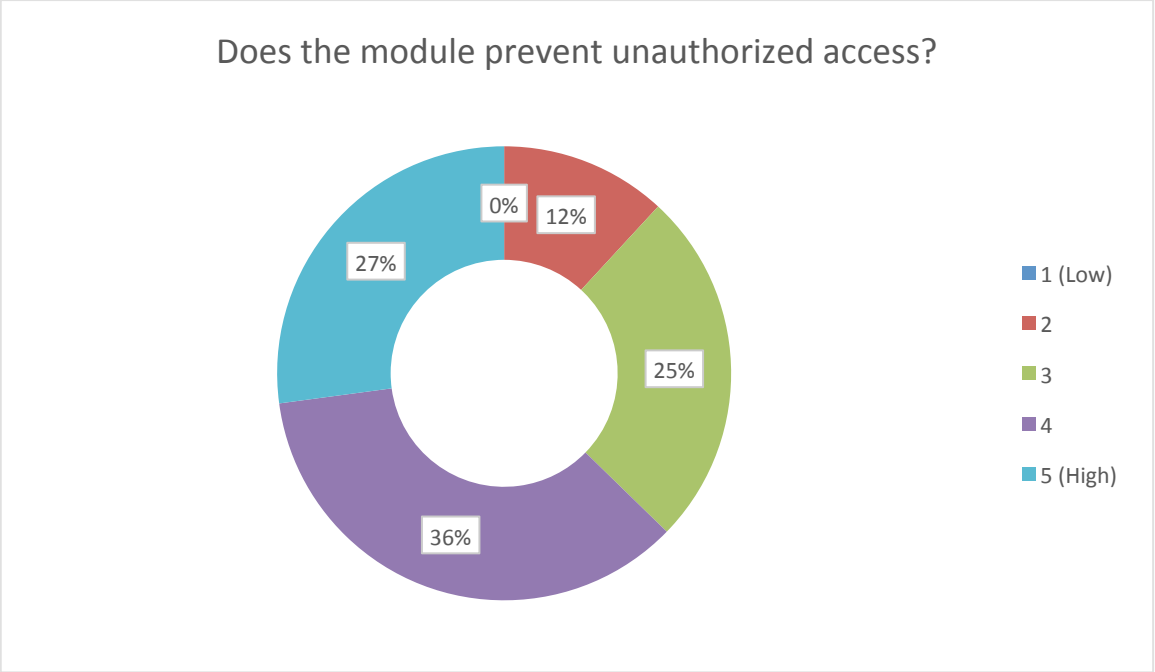
Answer	Count	Percentage, %
1 (Low)	0	0
2	5	8
3	16	26
4	21	34
5 (High)	19	31



4.7.14Does the module prevent unauthorized access?

Mean: 3,8

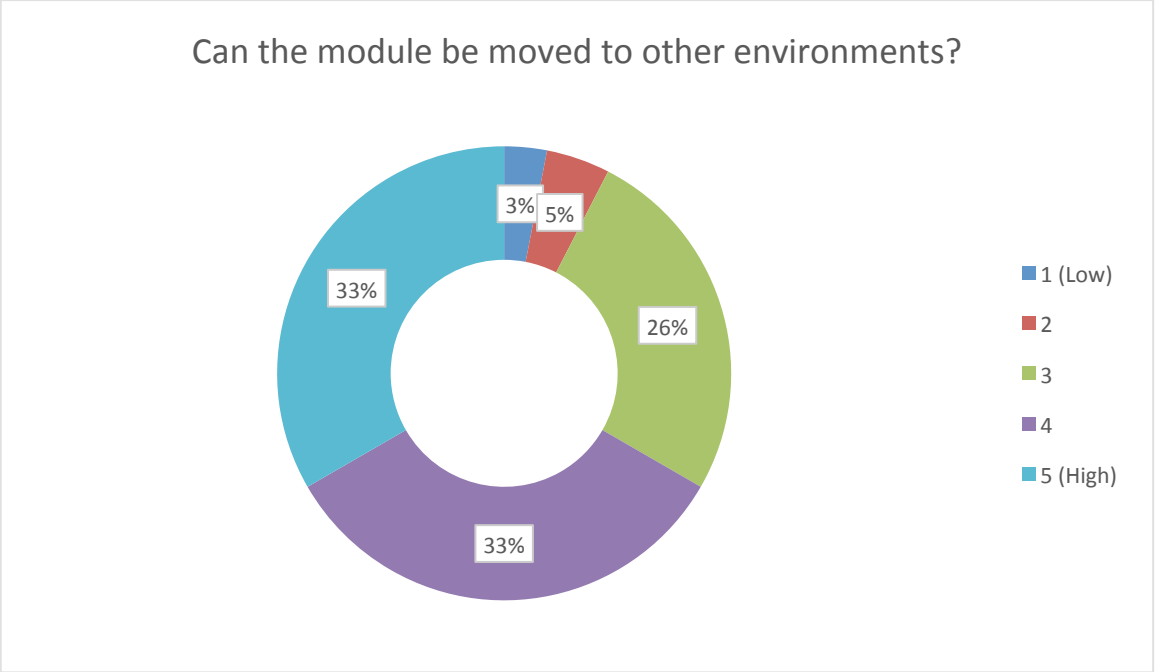
Answer	Count	Percentage, %
1 (Low)	0	0
2	7	12
3	15	25
4	21	36
5 (High)	16	27



4.7.15Can the module be moved to other environments?

Mean: 3,9

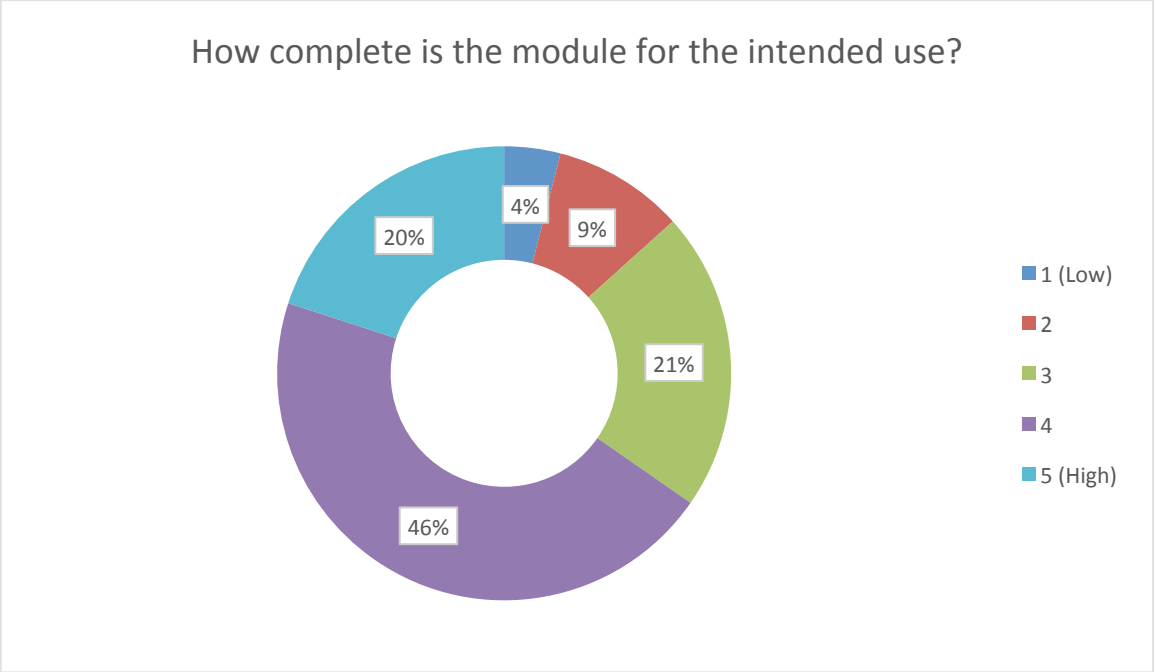
Answer	Count	Percentage, %
1 (Low)	2	3
2	3	5
3	17	26
4	22	33
5 (High)	22	33



4.7.16How complete is the module for the intended use?

Mean: 3,7

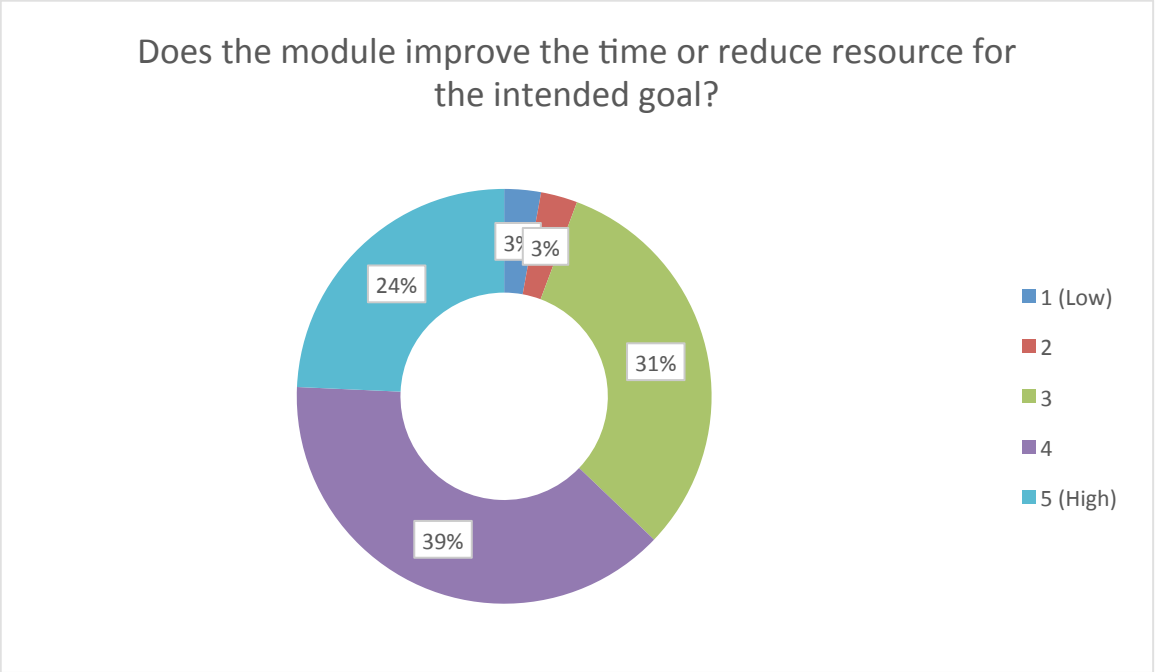
Answer	Count	Percentage, %
1 (Low)	3	4
2	7	9
3	16	21
4	34	45
5 (High)	15	20



4.7.17 Does the module improve the time or reduce resource for the intended goal?

Mean: 3,8

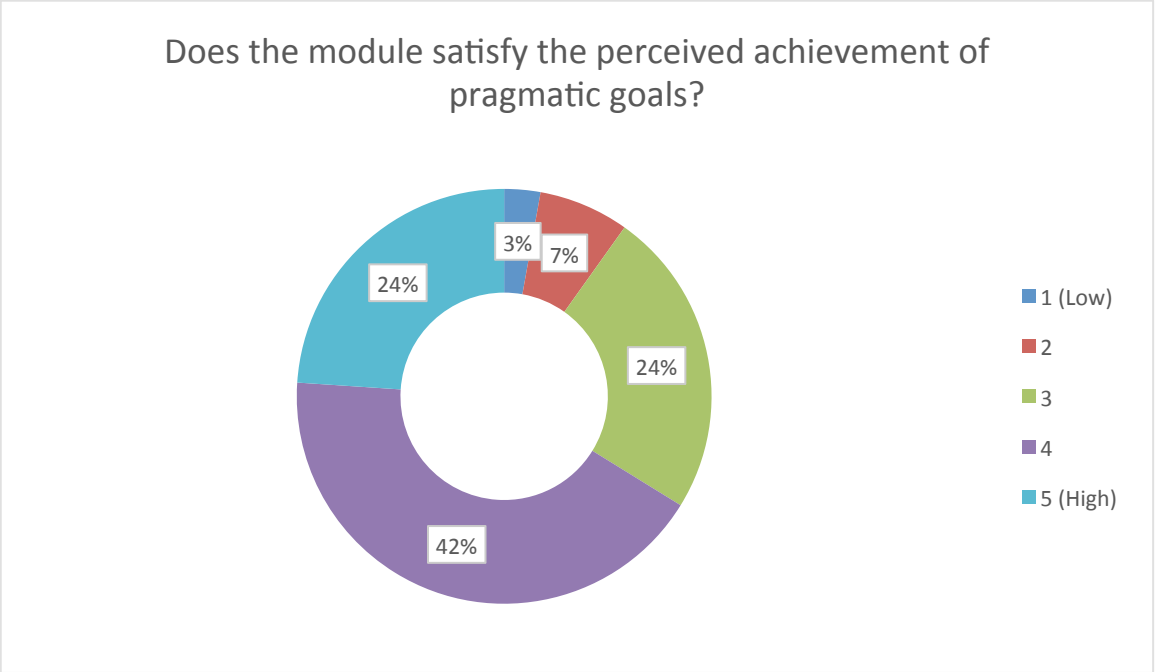
Answer	Count	Percentage, %
1 (Low)	2	3
2	2	3
3	22	31
4	27	39
5 (High)	17	24



4.7.18Does the module satisfy the perceived achievement of pragmatic goals?

Mean: 3,8

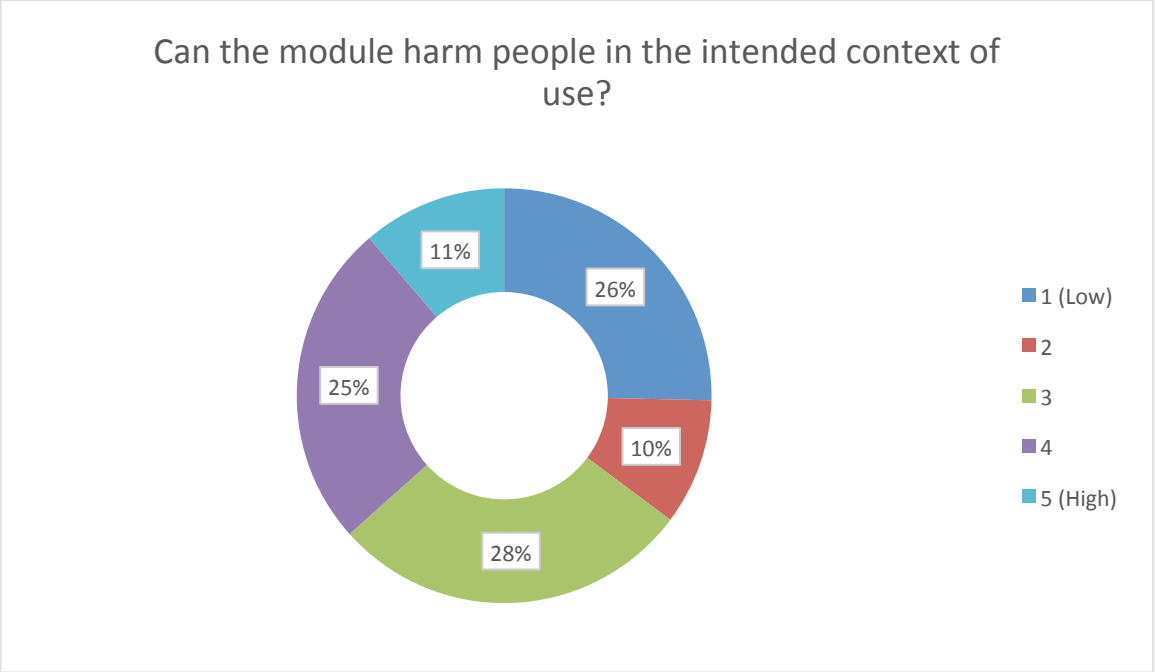
Answer	Count	Percentage, %
1 (Low)	2	3
2	5	7
3	17	24
4	30	42
5 (High)	17	24



4.7.19Can the module harm people in the intended context of use?

Mean: 2,9

Answer	Count	Percentage, %
1 (Low)	18	25
2	7	10
3	20	28
4	18	25
5 (High)	8	11



4.8 Data Visualization (Mobile Application)

Data Visualization (Mobile Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can this module effectively visualize the data?

Is the outcome of the visualization as expected?

Can you understand your data better?

Section: Efficiency

How quickly can you interact with the application?

Section: Compatibility

Do you know other similar modules? If yes, is this tool better than the other(s) you know?

Section: Usability

Can you use the application easily?

Can you learn how to use the application easily?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the application intuitive?

Section: Security

Do you feel your data are secure?

Section: Quality in use

How complete is the application for the intended use?

Does the application save you time?

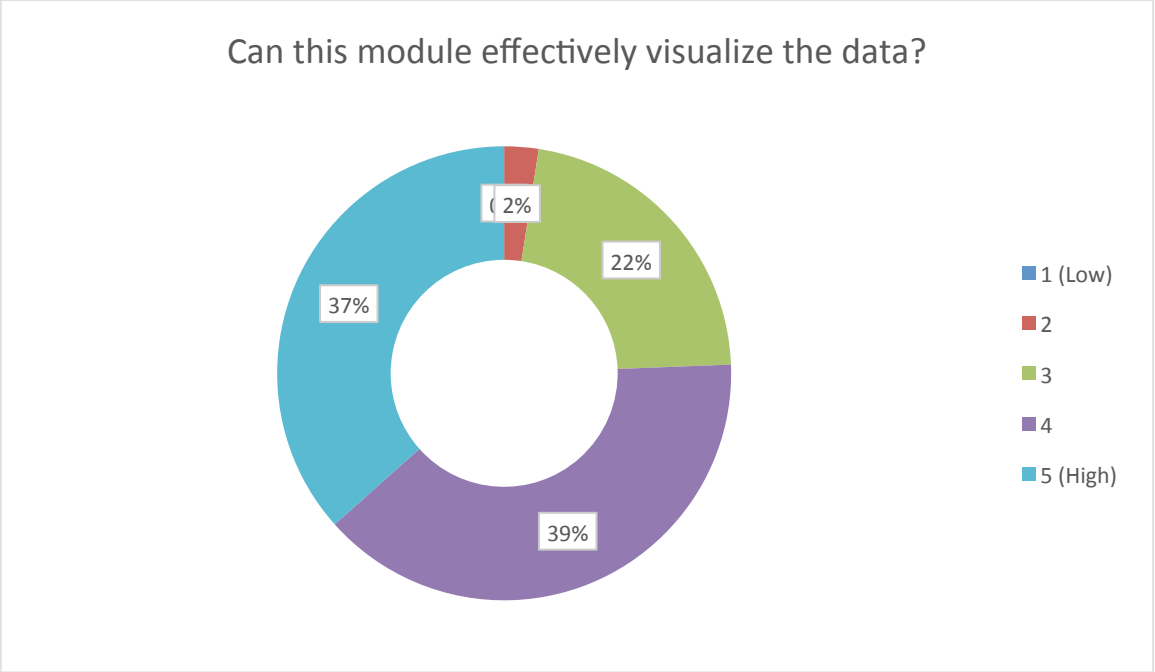
Can the application harm people in the intended context of use?

Do you think this application is user friendly?

4.8.1 Can this module effectively visualize the data?

Mean: 4,1

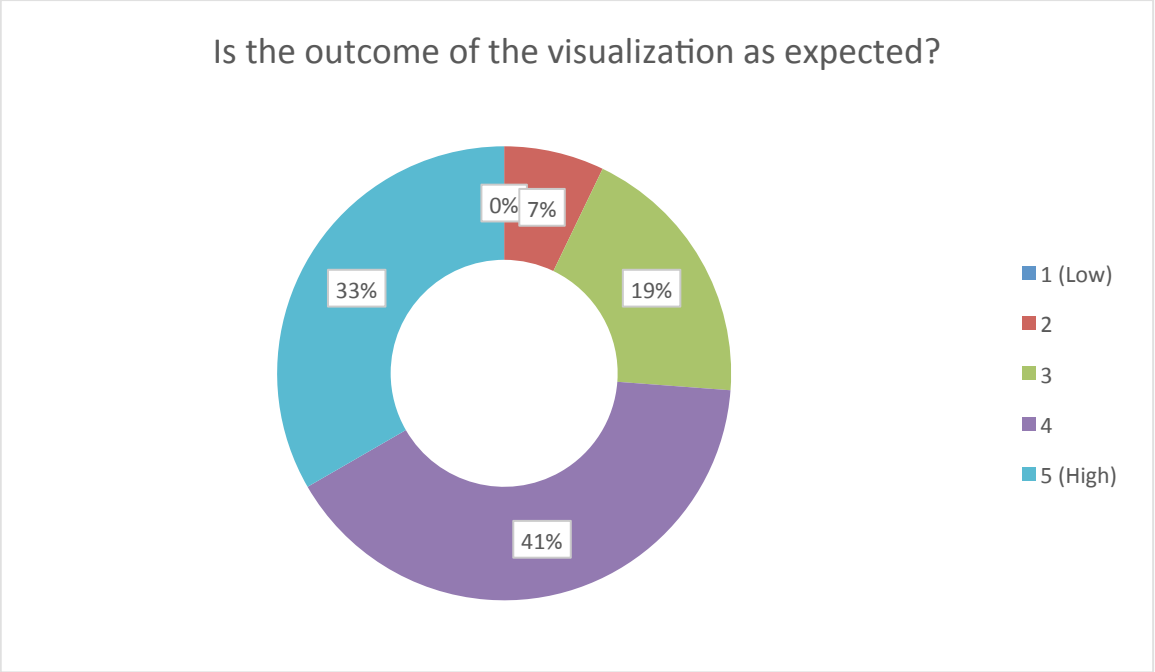
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	9	22
4	16	39
5 (High)	15	37



4.8.2 Is the outcome of the visualization as expected?

Mean: 4,0

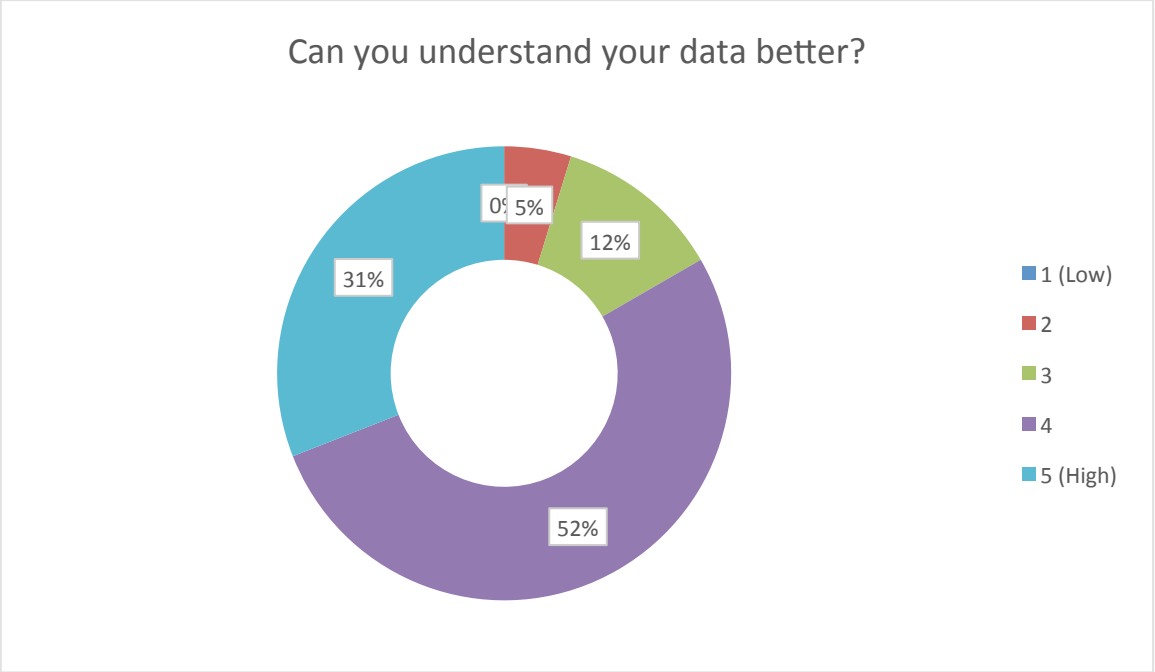
Answer	Count	Percentage, %
1 (Low)	0	0
2	3	7
3	8	19
4	17	40
5 (High)	14	33



4.8.3 Can you understand your data better?

Mean: 4,1

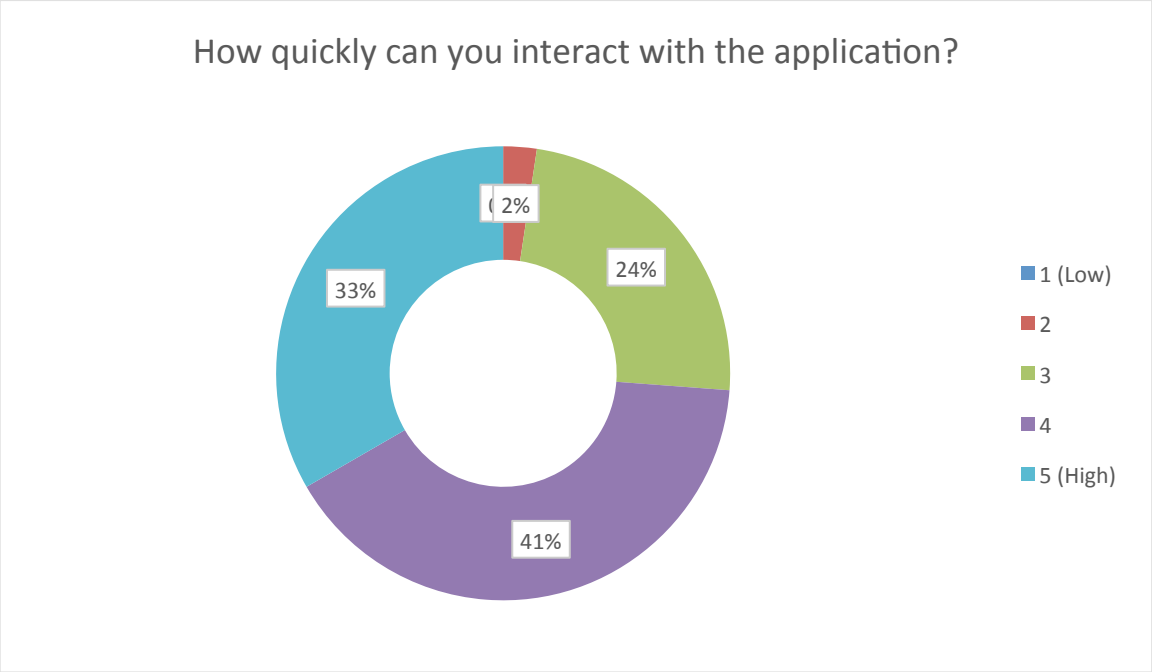
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	5	12
4	22	52
5 (High)	13	31



4.8.4 How quickly can you interact with the application?

Mean: 4,0

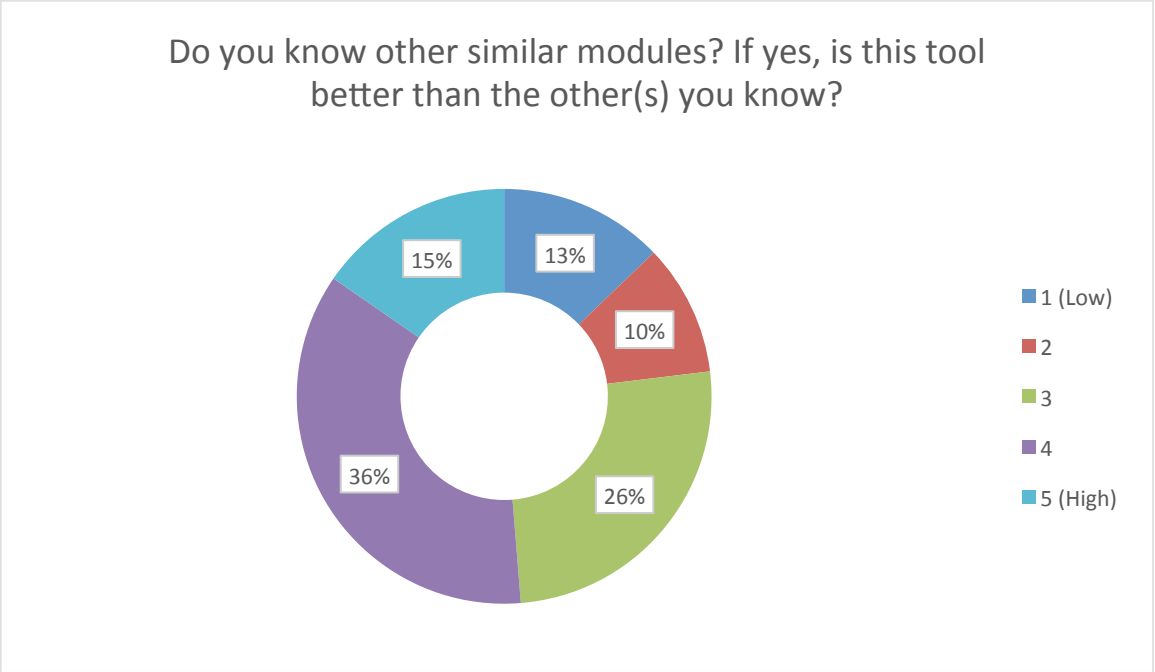
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	10	24
4	17	40
5 (High)	14	33



4.8.5 Do you know other similar modules? If yes, is this tool better than the other(s) you know?

Mean: 3,3

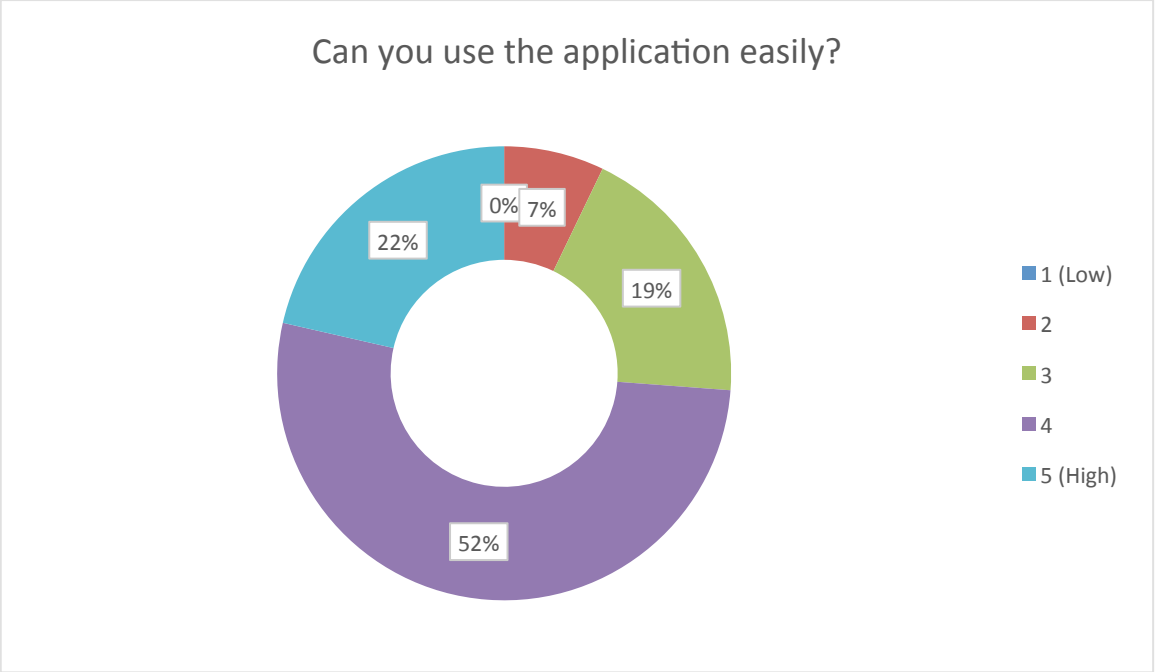
Answer	Count	Percentage, %
1 (Low)	5	13
2	4	10
3	10	26
4	14	36
5 (High)	6	15



4.8.6 Can you use the application easily?

Mean: 3,9

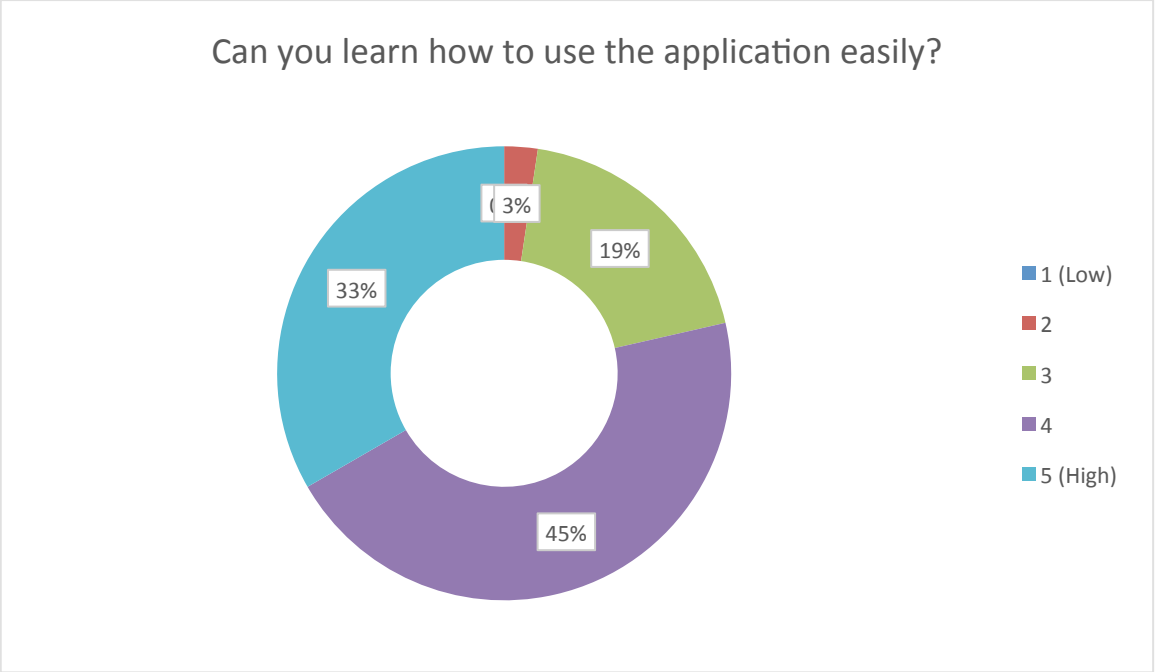
Answer	Count	Percentage, %
1 (Low)	0	0
2	3	7
3	8	19
4	22	52
5 (High)	9	21



4.8.7 Can you learn how to use the application easily?

Mean: 4,1

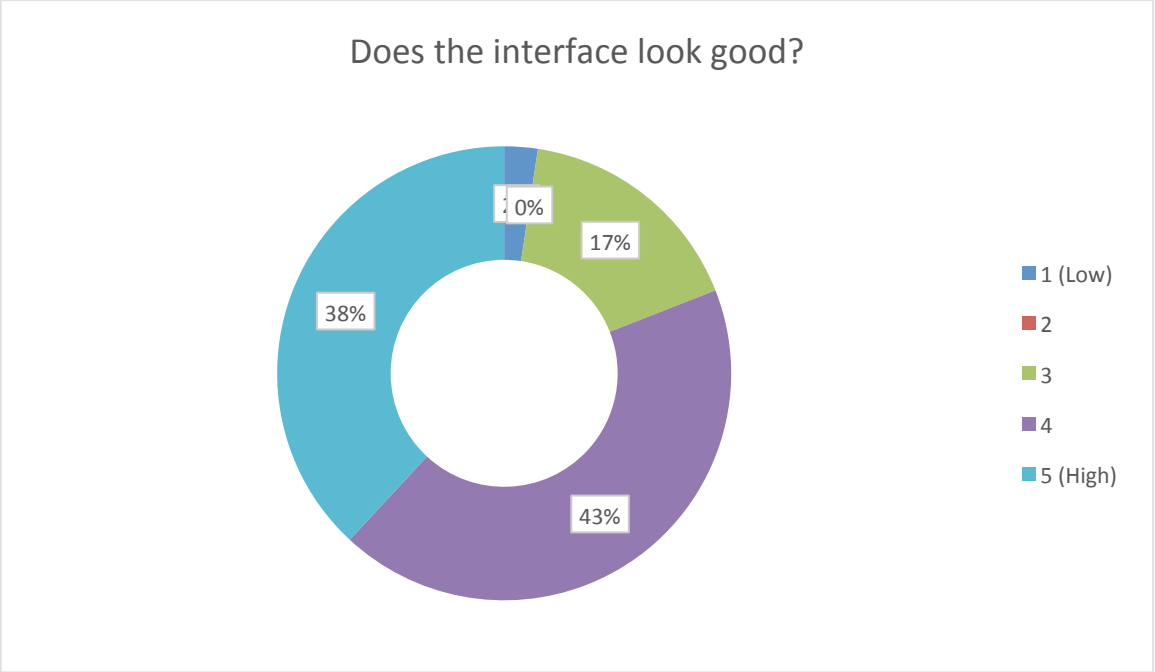
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	8	19
4	19	45
5 (High)	14	33



4.8.8 Does the interface look good?

Mean: 4,1

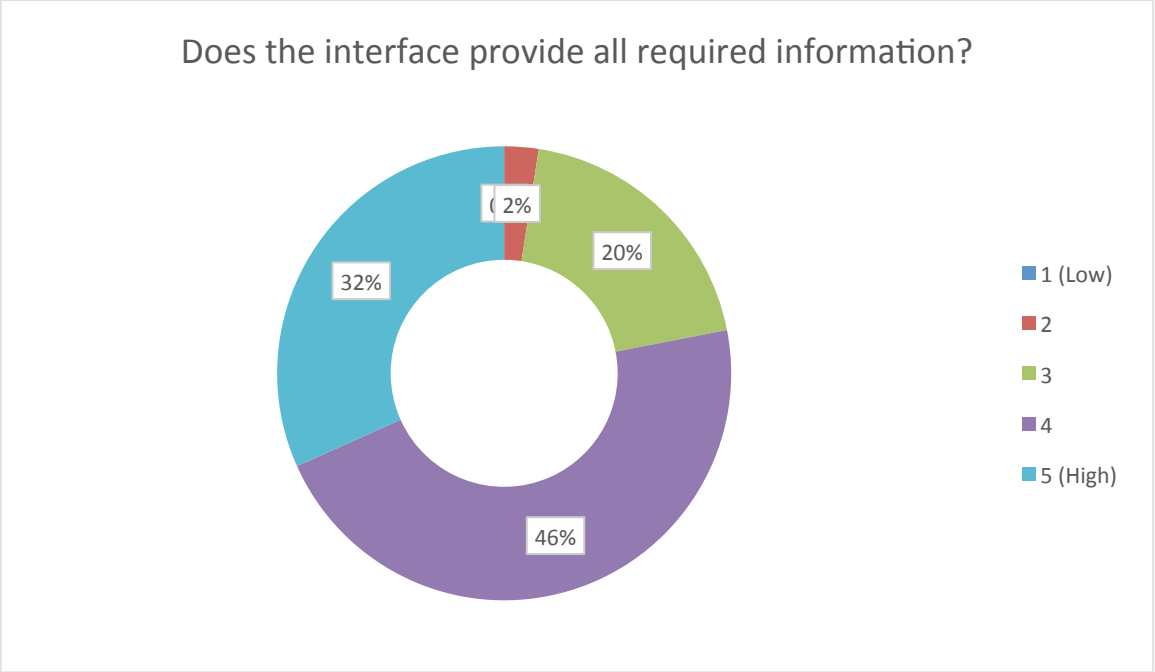
Answer	Count	Percentage, %
1 (Low)	1	2
2	0	0
3	7	17
4	18	43
5 (High)	16	38



4.8.9 Does the interface provide all required information?

Mean: 4,1

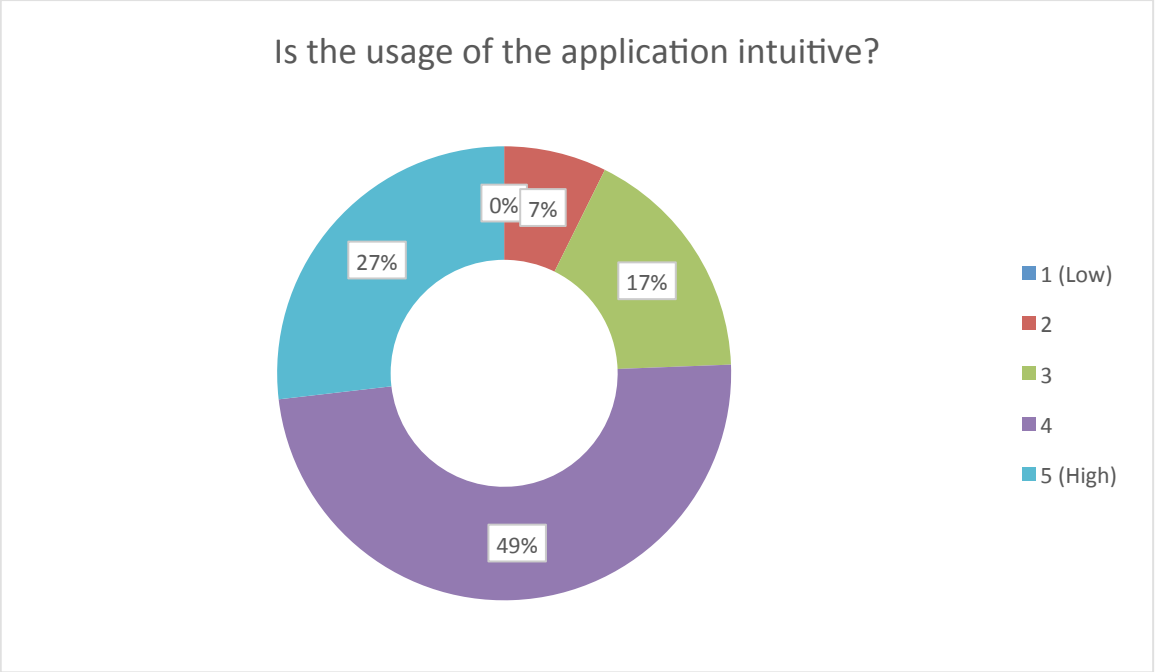
Answer	Count	Percentage, %
1 (Low)	0	0
2	1	2
3	8	20
4	19	46
5 (High)	13	32



4.8.10Is the usage of the application intuitive?

Mean: 4,0

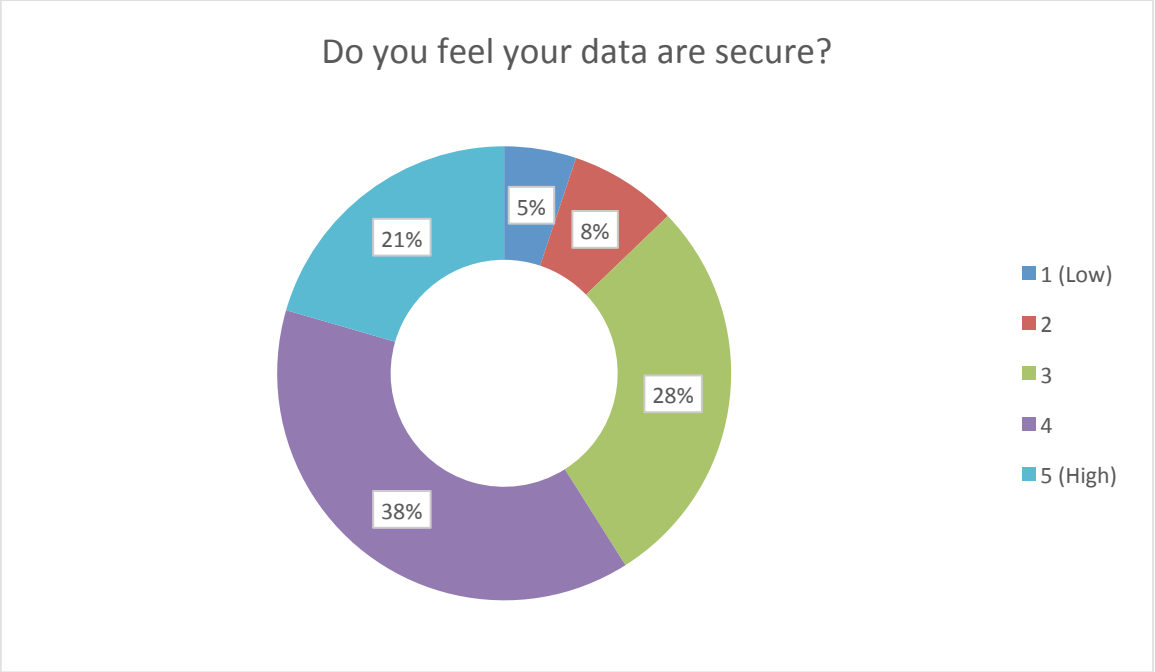
Answer	Count	Percentage, %
1 (Low)	0	0
2	3	7
3	7	17
4	20	49
5 (High)	11	27



4.8.11Do you feel your data are secure?

Mean: 3,6

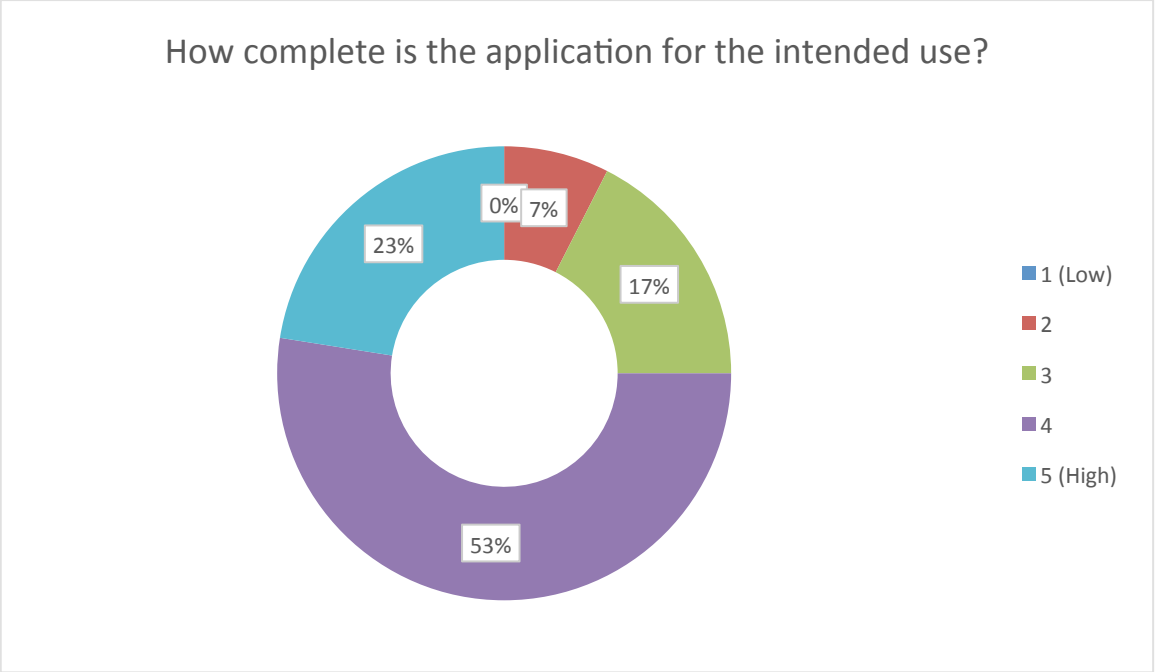
Answer	Count	Percentage, %
1 (Low)	2	5
2	3	8
3	11	28
4	15	38
5 (High)	8	21



4.8.12How complete is the application for the intended use?

Mean: 3,9

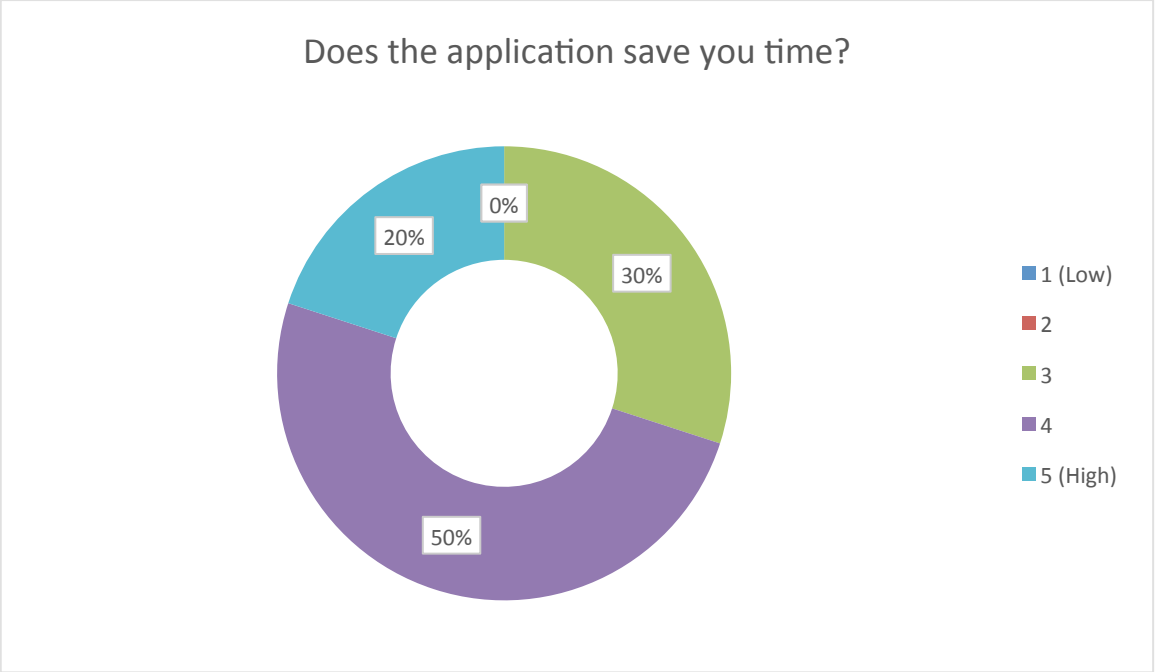
Answer	Count	Percentage, %
1 (Low)	0	0
2	3	8
3	7	18
4	21	53
5 (High)	9	23



4.8.13Does the application save you time?

Mean: 3,9

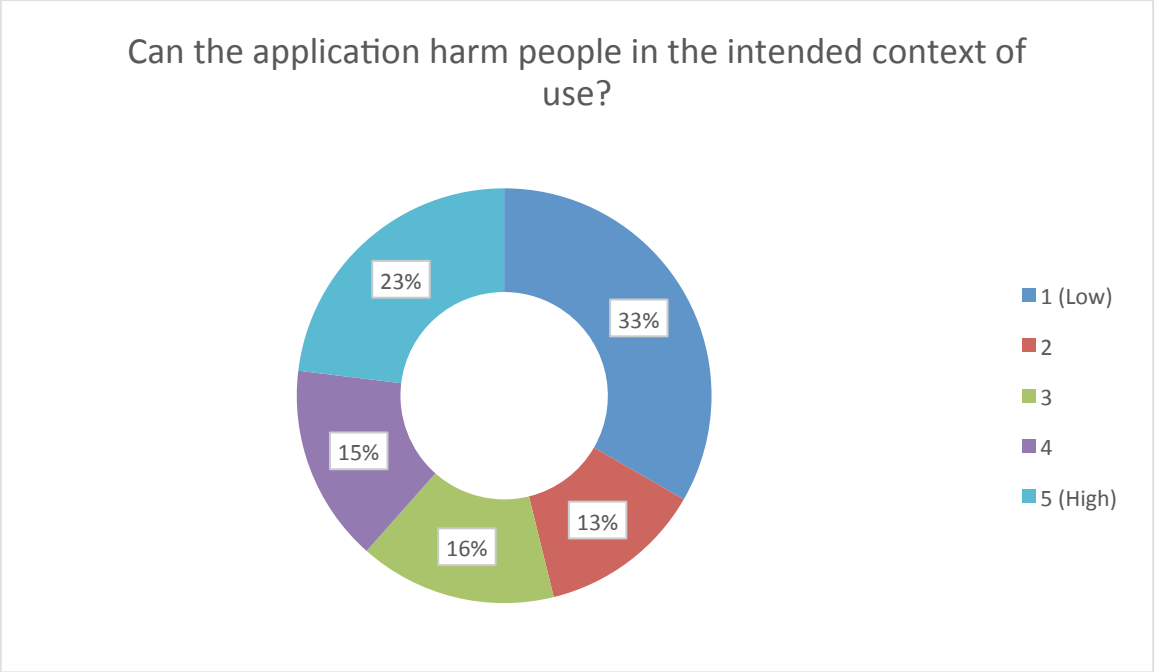
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	12	30
4	20	50
5 (High)	8	20



4.8.14Can the application harm people in the intended context of use?

Mean: 2,8

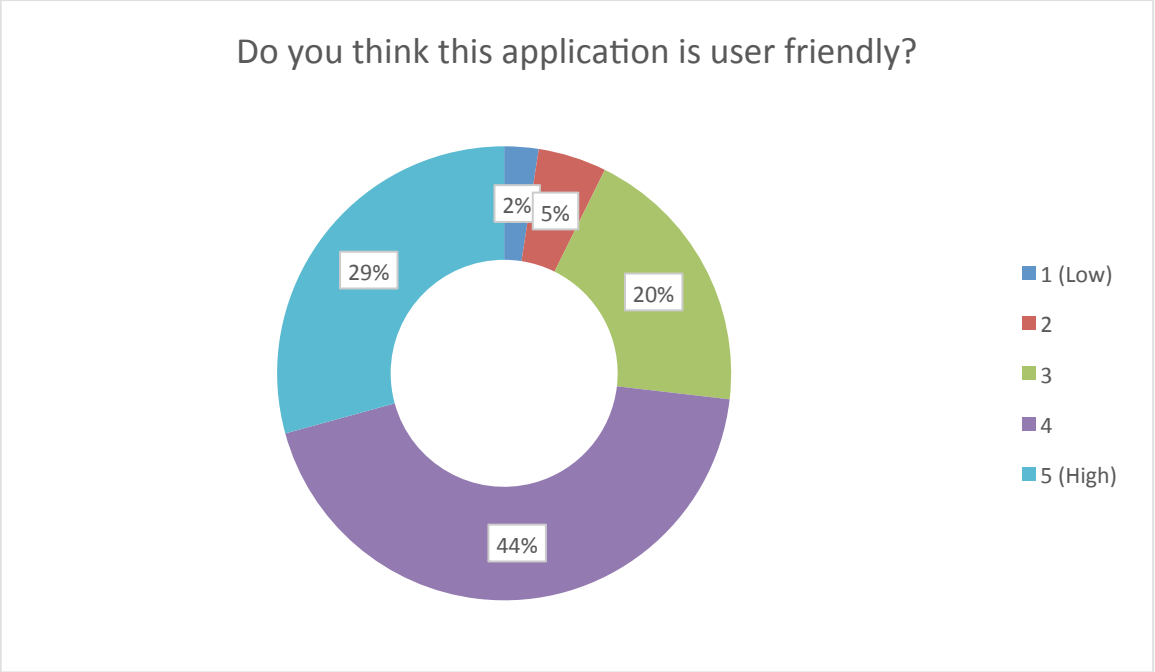
Answer	Count	Percentage, %
1 (Low)	13	33
2	5	13
3	6	15
4	6	15
5 (High)	9	23



4.8.15Do you think this application is user friendly?

Mean: 3,9

Answer	Count	Percentage, %
1 (Low)	1	2
2	2	5
3	8	20
4	18	44
5 (High)	12	29



4.9 Diary (Mobile Application)

Diary (Mobile Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can this application record your data easily?

Are the functionalities displayed sufficient?

Does the diary work as expected?

Section: Efficiency

How quickly can you interact with the application?

Section: Compatibility

Do you know other similar tools? If yes, is this tool better than the other tool(s) you know?

Section: Usability

Do you understand how to use the application easily?

Can you learn to use the application easily?

Can you use the application without much effort?

Does the interface look good?

Is the usage of the application intuitive?

Does the interface provide all the required information?

Section: Reliability

Can the service resume working & restore data after the phone was restarted?

Section: Security

Do you feel your data are secure?

Section: Portability

Can the application easily replace other software?

Section: Quality in use

How accurate and complete is the application for the intended use?

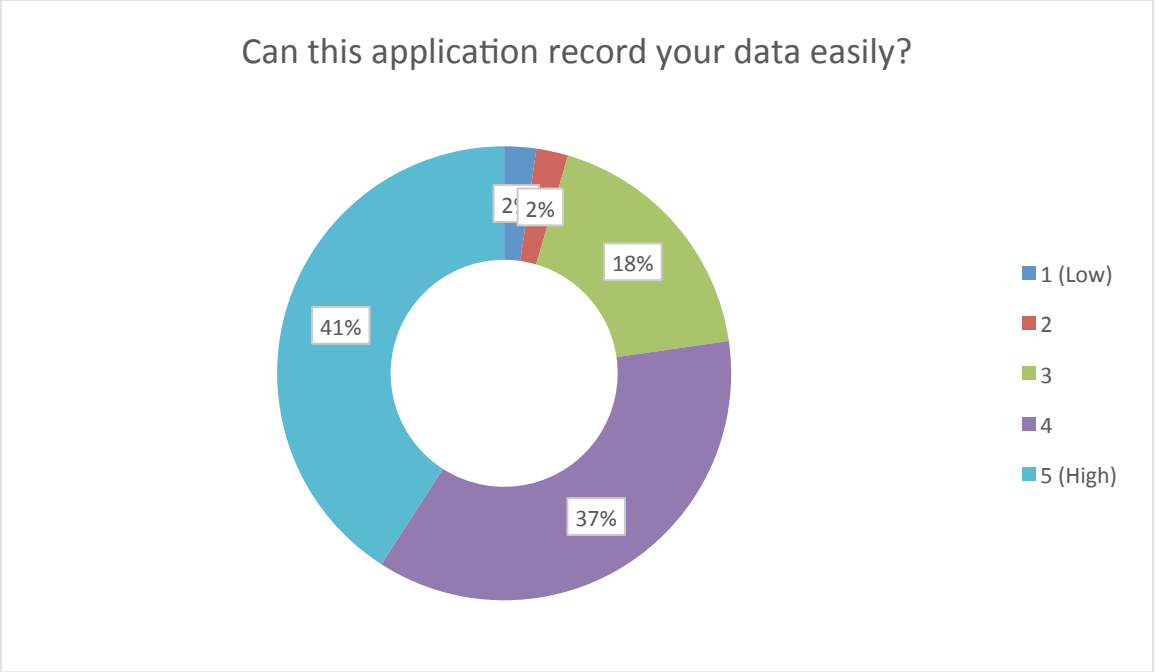
Does the application improve the time or reduce resource for the intended goal?

Can the application harm people in the intended context of use?

4.9.1 Can this application record your data easily?

Mean: 4,1

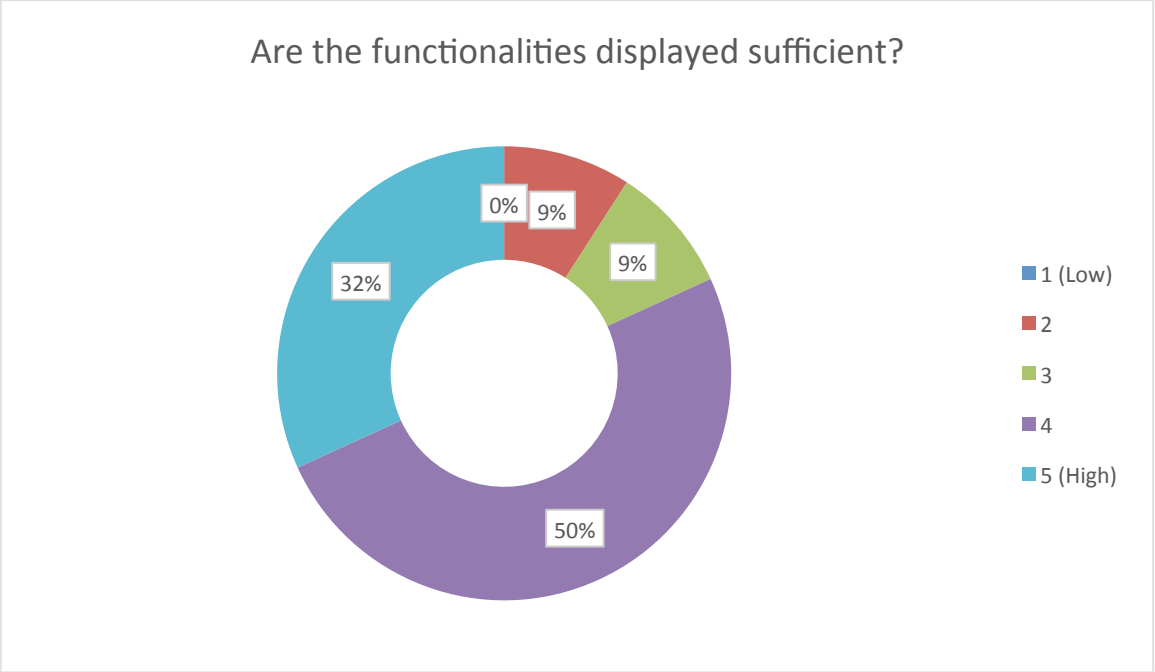
Answer	Count	Percentage, %
1 (Low)	1	2
2	1	2
3	8	18
4	16	36
5 (High)	18	41



4.9.2 Are the functionalities displayed sufficient?

Mean: 4,0

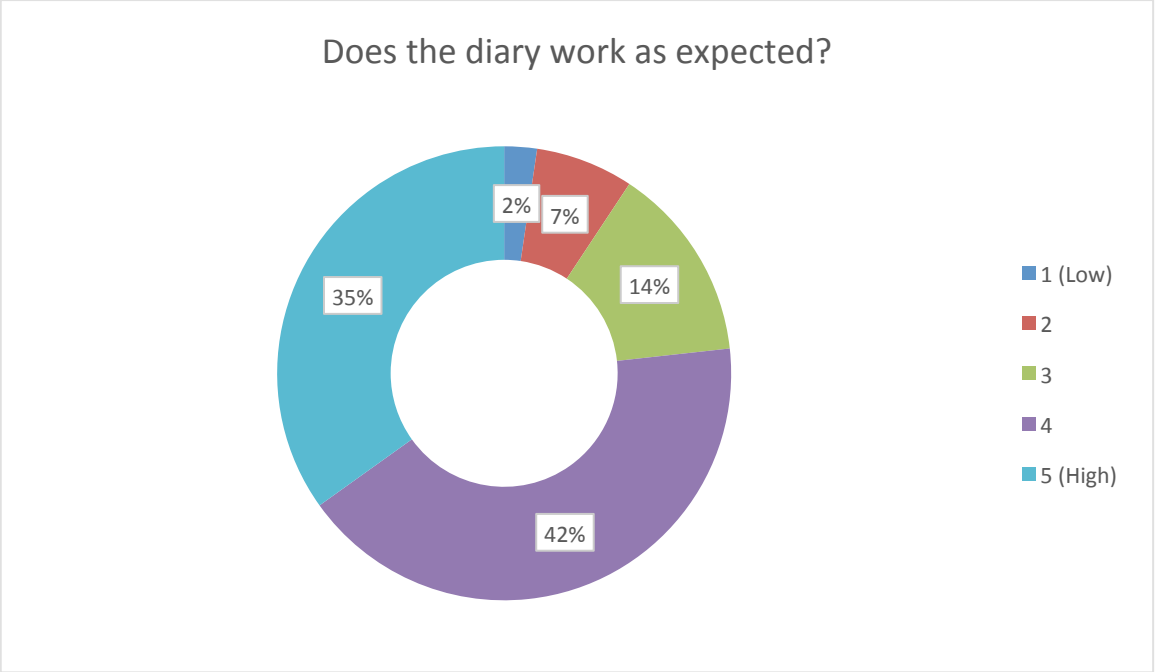
Answer	Count	Percentage, %
1 (Low)	0	0
2	4	9
3	4	9
4	22	50
5 (High)	14	32



4.9.3 Does the diary work as expected?

Mean: 4,0

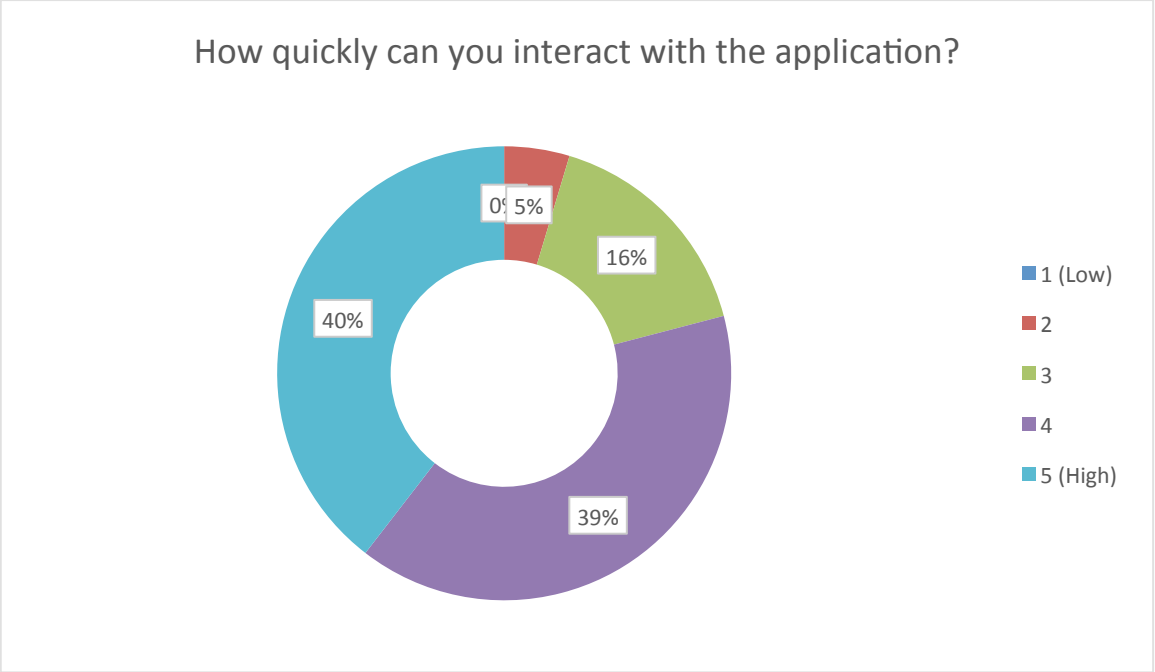
Answer	Count	Percentage, %
1 (Low)	1	2
2	3	7
3	6	14
4	18	42
5 (High)	15	35



4.9.4 How quickly can you interact with the application?

Mean: 4,1

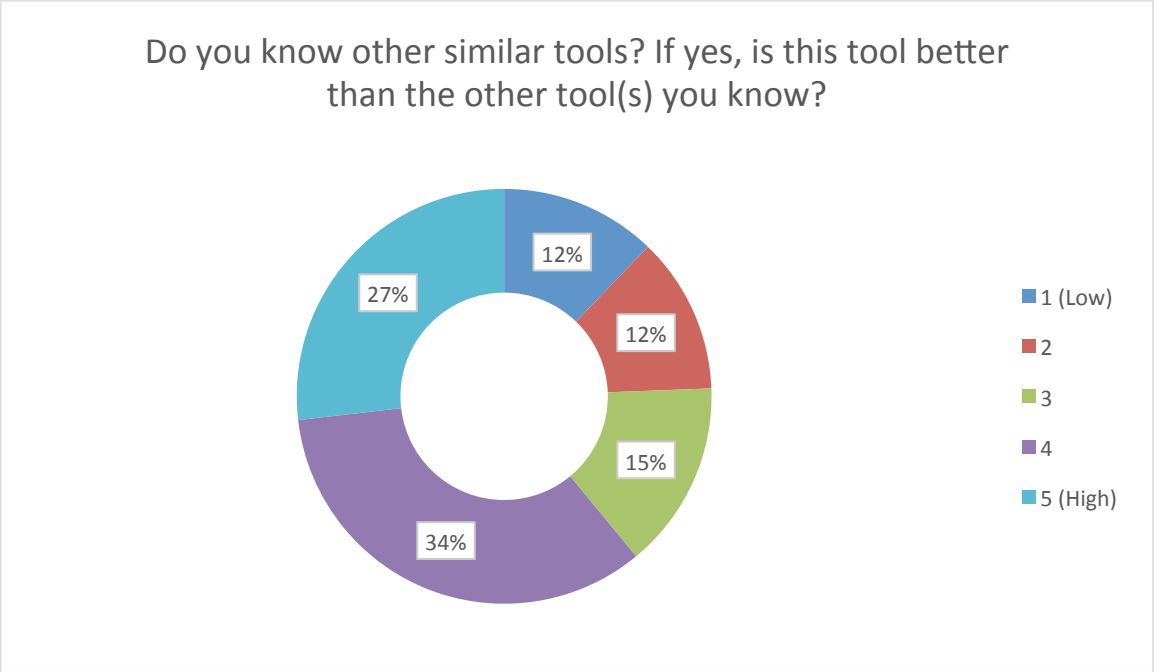
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	7	16
4	17	40
5 (High)	17	40



4.9.5 Do you know other similar tools? If yes, is this tool better than the other tool(s) you know?

Mean: 3,5

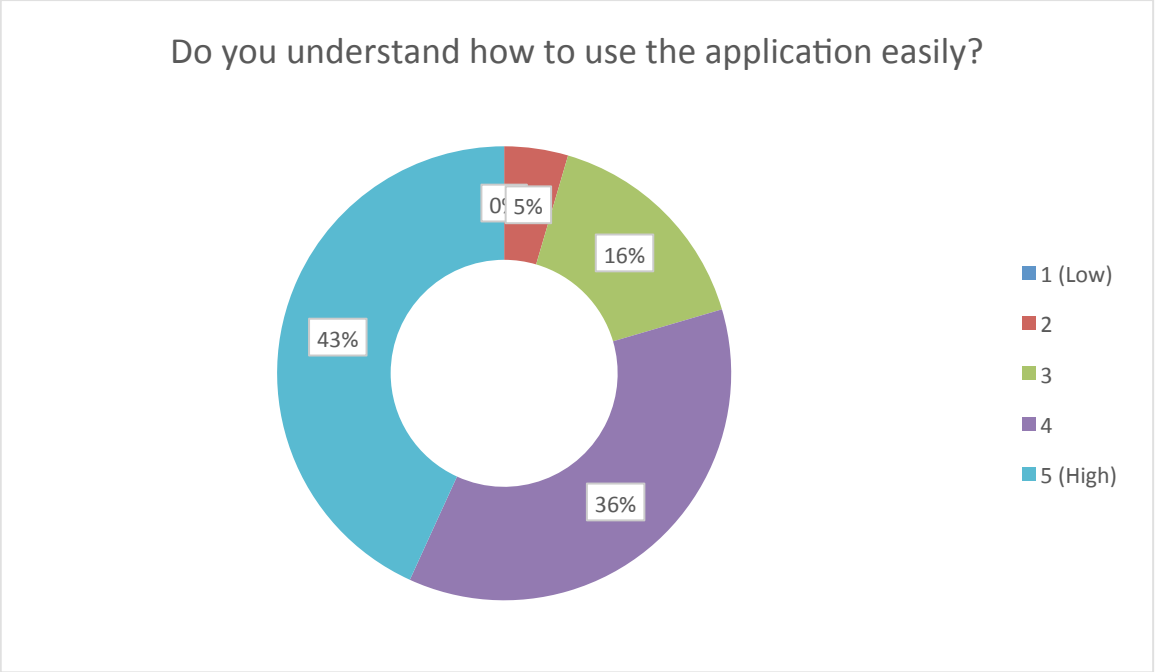
Answer	Count	Percentage, %
1 (Low)	5	12
2	5	12
3	6	15
4	14	34
5 (High)	11	27



4.9.6 Do you understand how to use the application easily?

Mean: 4,2

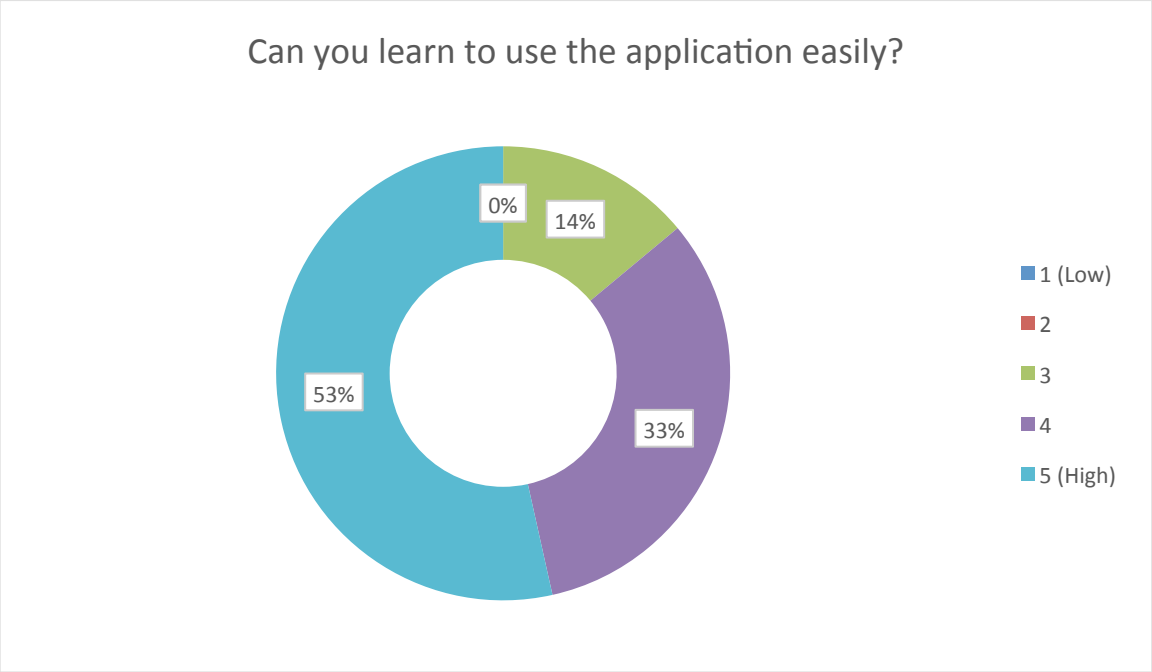
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	7	16
4	16	36
5 (High)	19	43



4.9.7 Can you learn to use the application easily?

Mean: 4,4

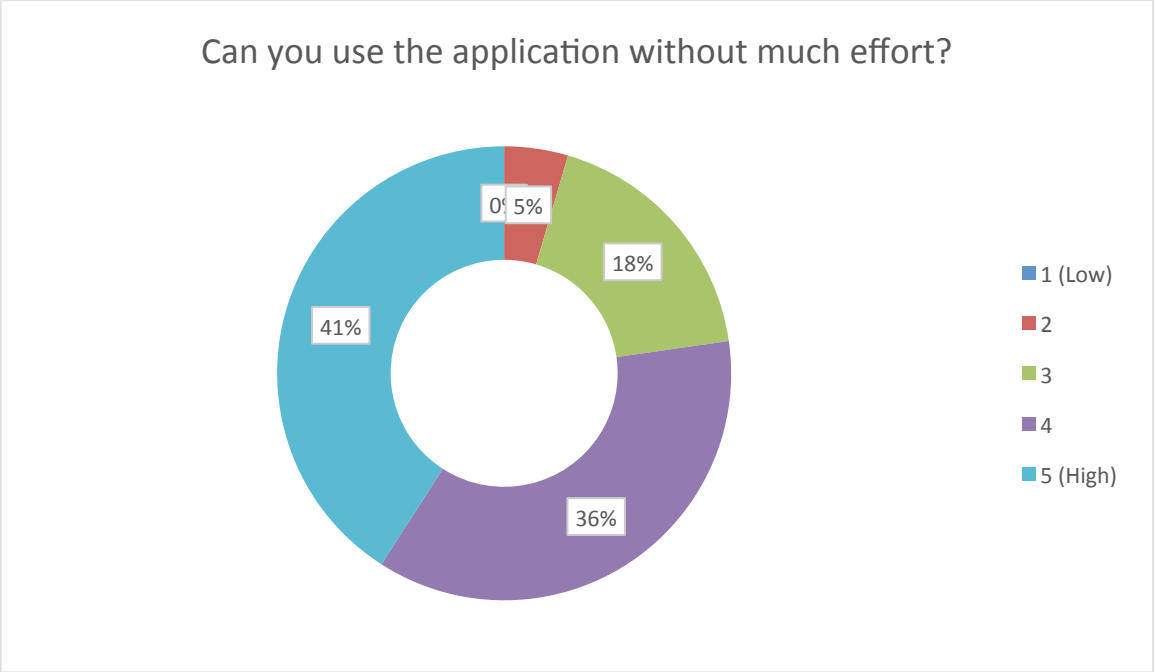
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	6	14
4	14	33
5 (High)	23	53



4.9.8 Can you use the application without much effort?

Mean: 4,1

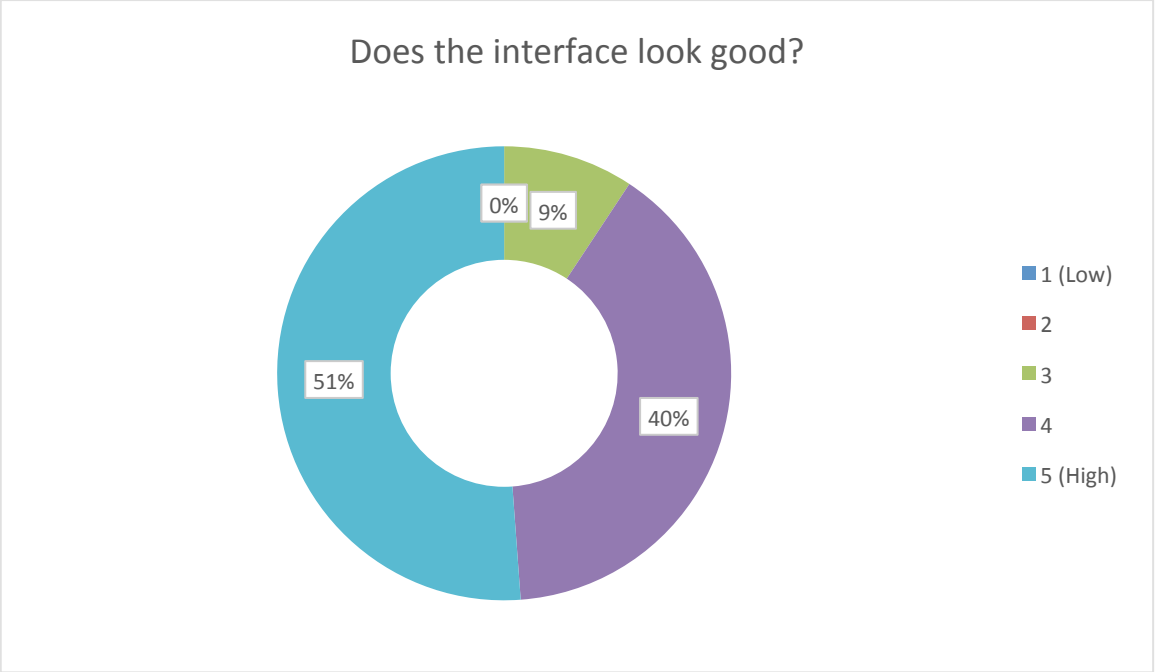
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	8	18
4	16	36
5 (High)	18	41



4.9.9 Does the interface look good?

Mean: 4,4

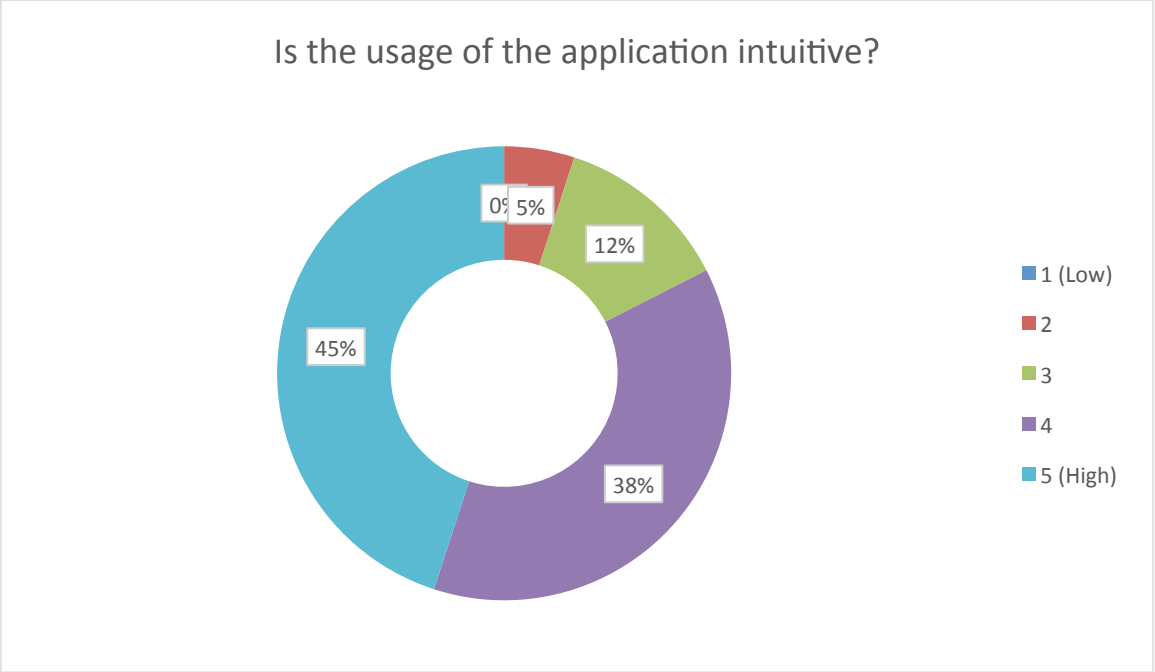
Answer	Count	Percentage, %
1 (Low)	0	0
2	0	0
3	4	9
4	17	40
5 (High)	22	51



4.9.10 Is the usage of the application intuitive?

Mean: 4,2

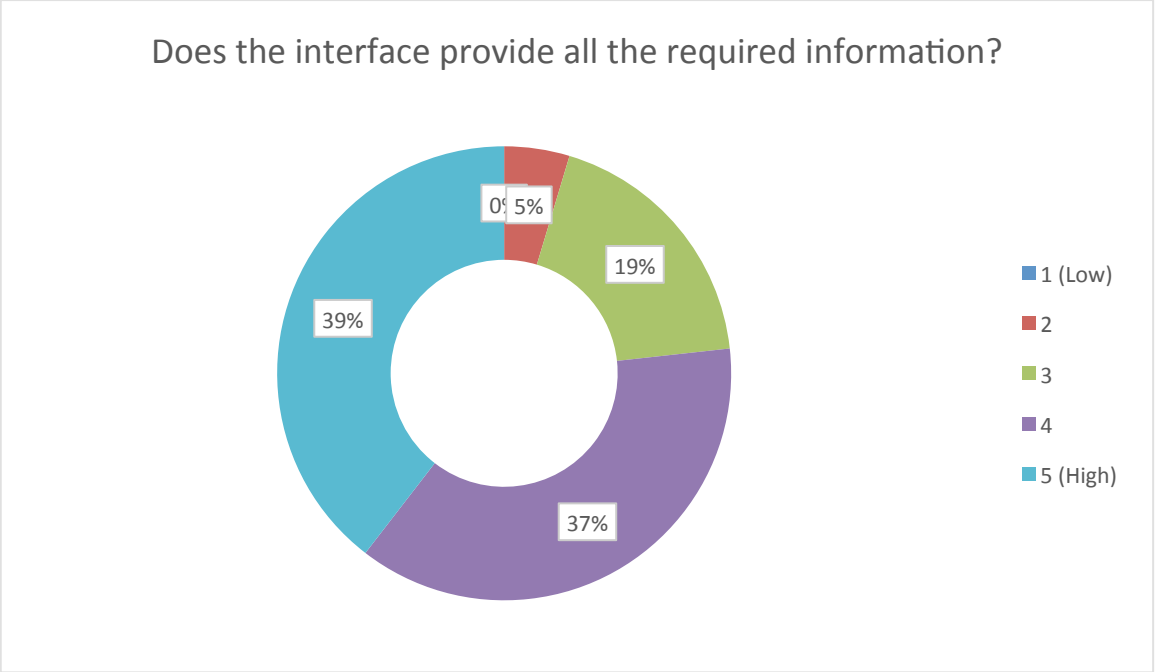
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	5	13
4	15	38
5 (High)	18	45



4.9.11 Does the interface provide all the required information?

Mean: 4,1

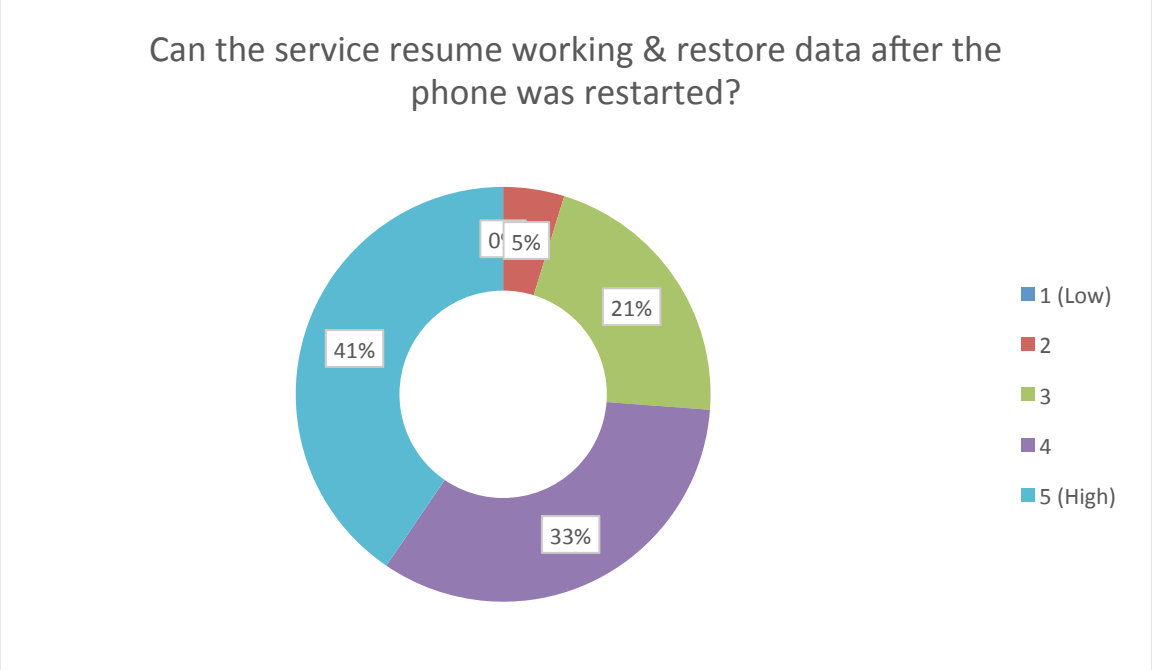
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	8	19
4	16	37
5 (High)	17	40



4.9.12 Can the service resume working & restore data after the phone was restarted?

Mean: 4,1

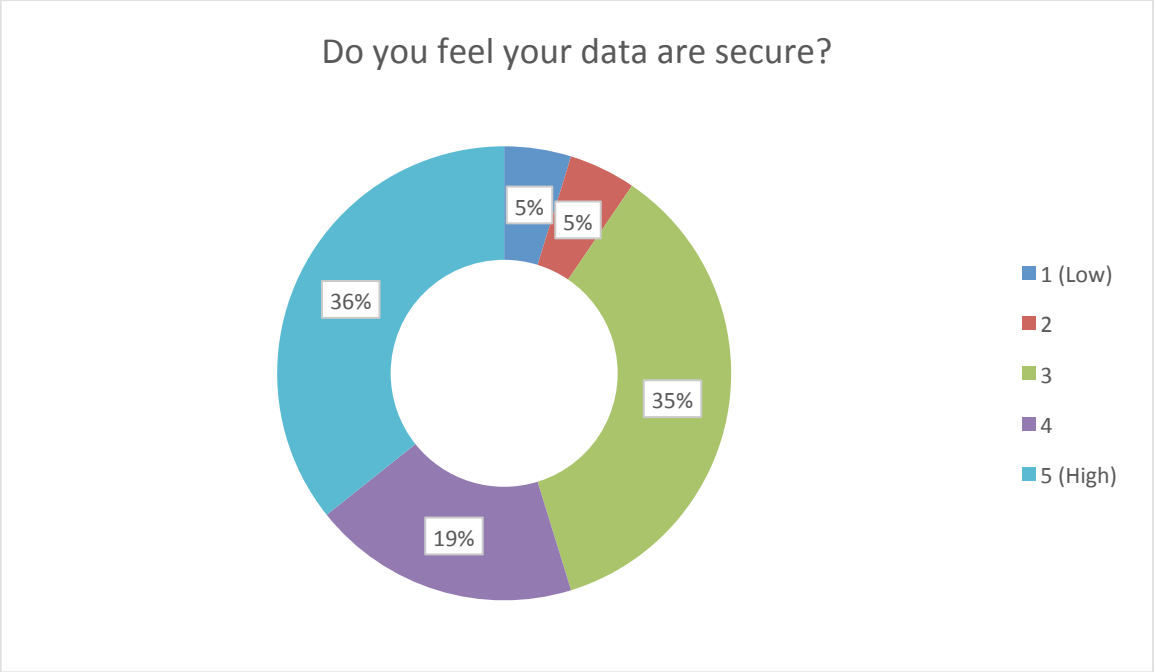
Answer	Count	Percentage, %
1 (Low)	0	0
2	2	5
3	9	21
4	14	33
5 (High)	17	40



4.9.13 Do you feel your data are secure?

Mean: 3,8

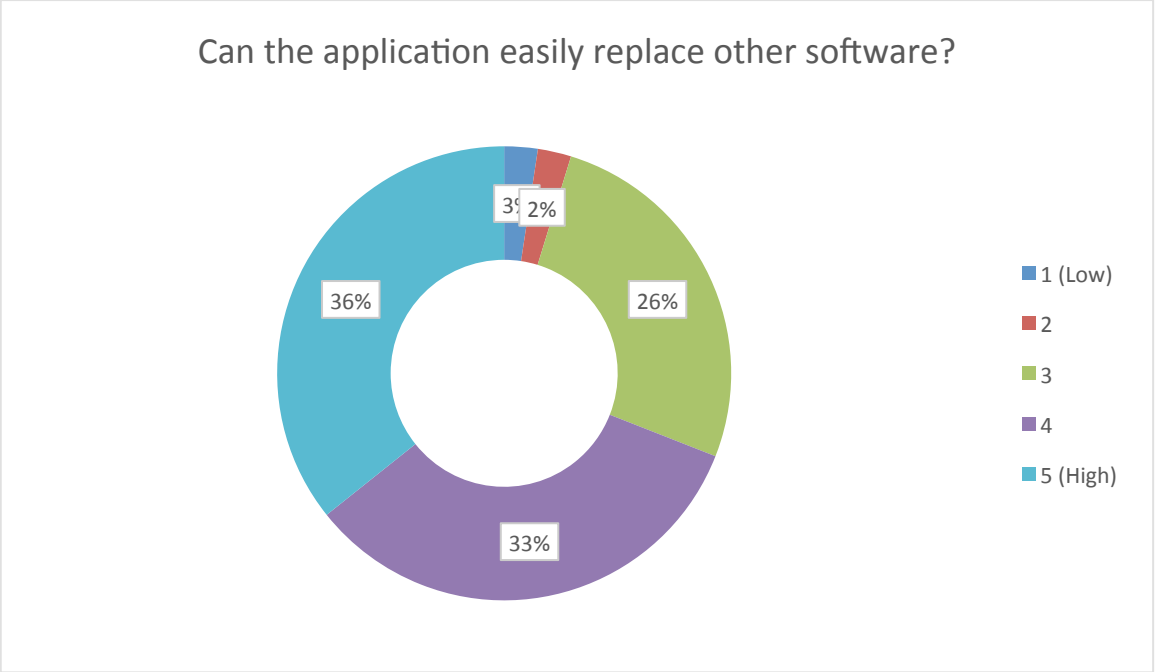
Answer	Count	Percentage, %
1 (Low)	2	5
2	2	5
3	15	36
4	8	19
5 (High)	15	36



4.9.14 Can the application easily replace other software?

Mean: 4,0

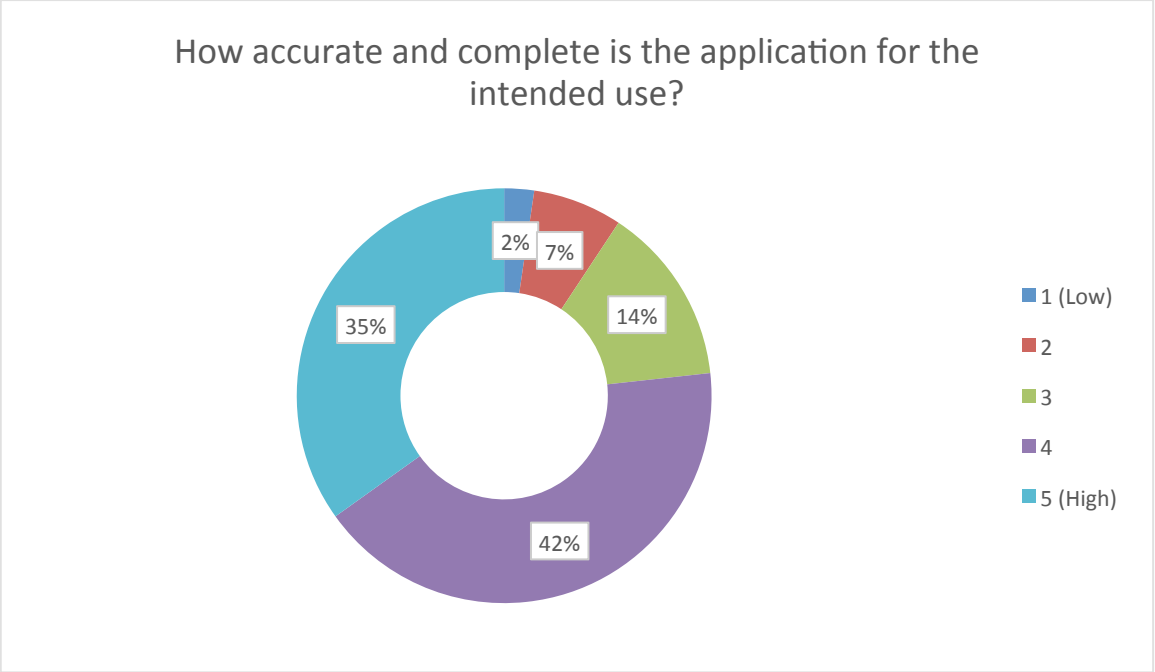
Answer	Count	Percentage, %
1 (Low)	1	2
2	1	2
3	11	26
4	14	33
5 (High)	15	36



4.9.15 How accurate and complete is the application for the intended use?

Mean: 4,0

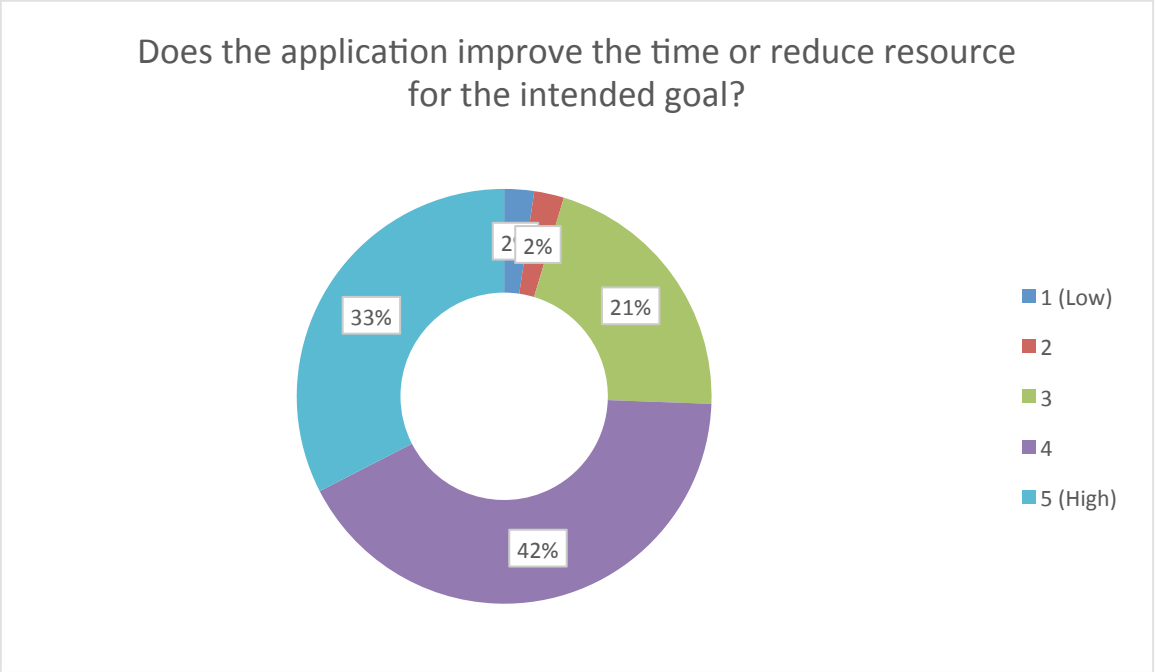
Answer	Count	Percentage, %
1 (Low)	1	2
2	3	7
3	6	14
4	18	42
5 (High)	15	35



4.9.16 Does the application improve the time or reduce resource for the intended goal?

Mean: 4,0

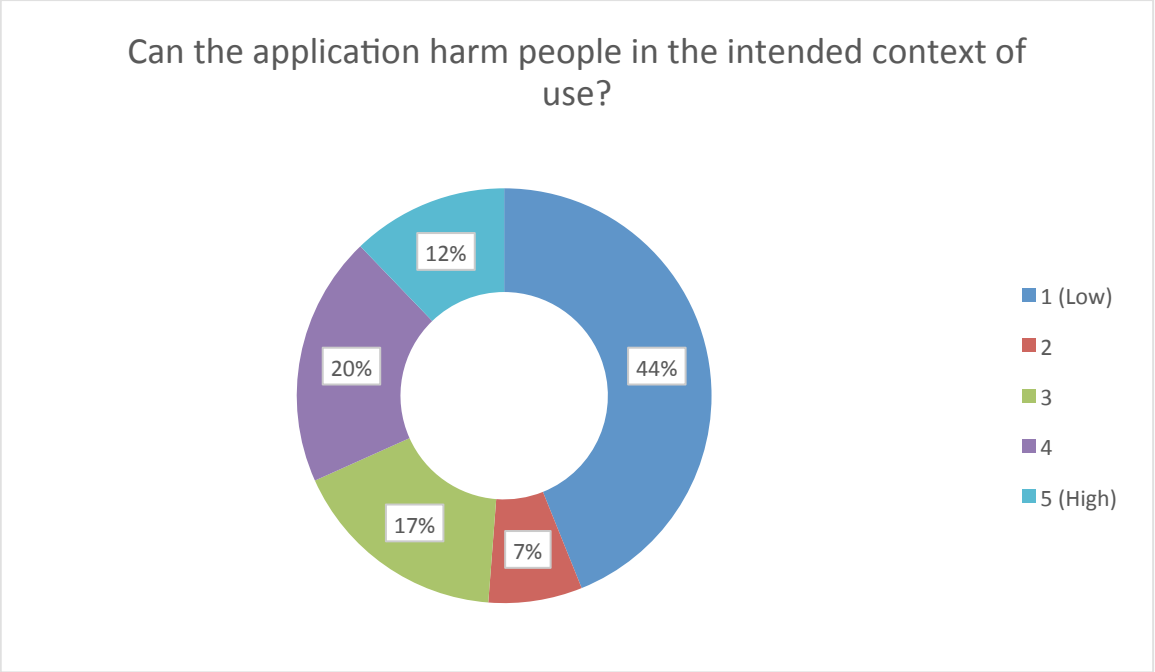
Answer	Count	Percentage, %
1 (Low)	1	2
2	1	2
3	9	21
4	18	42
5 (High)	14	33



4.9.17 Can the application harm people in the intended context of use?

Mean: 2,5

Answer	Count	Percentage, %
1 (Low)	18	44
2	3	7
3	7	17
4	8	20
5 (High)	5	12



4.10 Toolbox (Web Application)

Toolbox (Web Application) evaluation form has the following sections with the related scale (from 1 “Low” to 5 “High”) questions:

Section: Functionality

Can the toolboxes perform the tasks required?

Can the toolboxes interact with the MHA platform?

Section: Efficiency

How quickly does the Service interact?

Section: Compatibility

Do you know other similar tools? If yes is this tool better than the other you know?

Section: Usability

Do you how to use the toolboxes easily?

Can you learn to use the toolboxes easily?

Can you use the toolboxes without much effort?

Does the interface look good?

Does the interface provide all required information?

Is the usage of the toolboxes intuitive?

Section: Security

Do you think your data are secure?

Section: Quality in use

How complete are the toolboxes for the intended use?

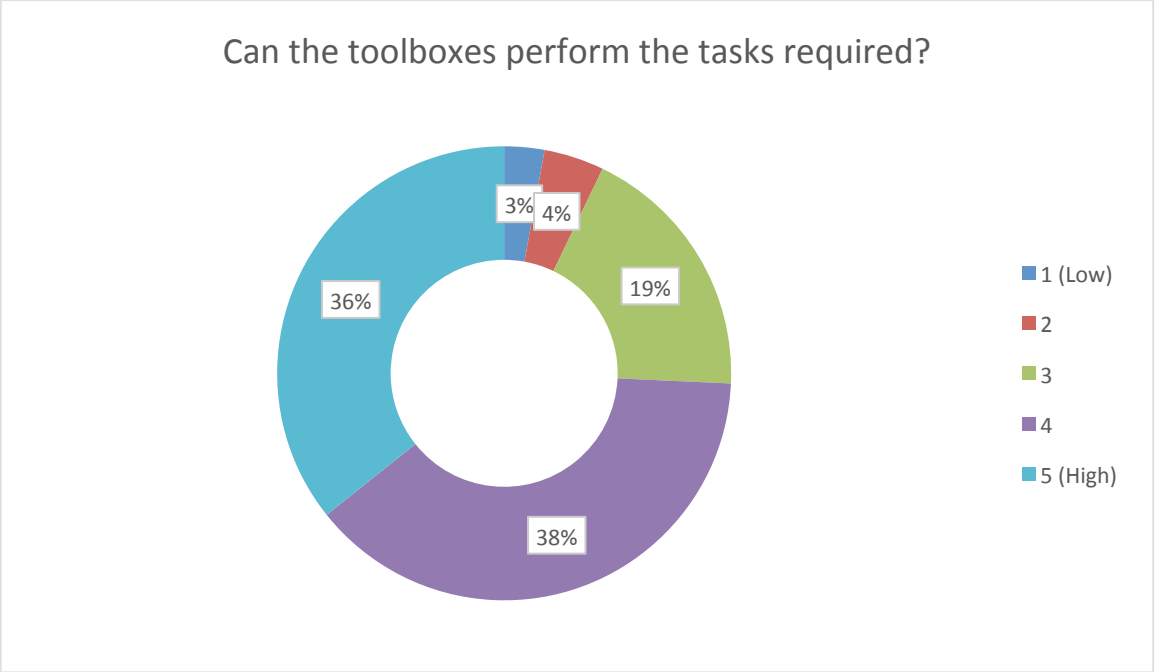
Does the toolboxes improve the time or reduce resource for the intended goal?

Does the toolboxes satisfy the perceived achievement of pragmatic goals?

4.10.1 Can the toolboxes perform the tasks required?

Mean: 4,0

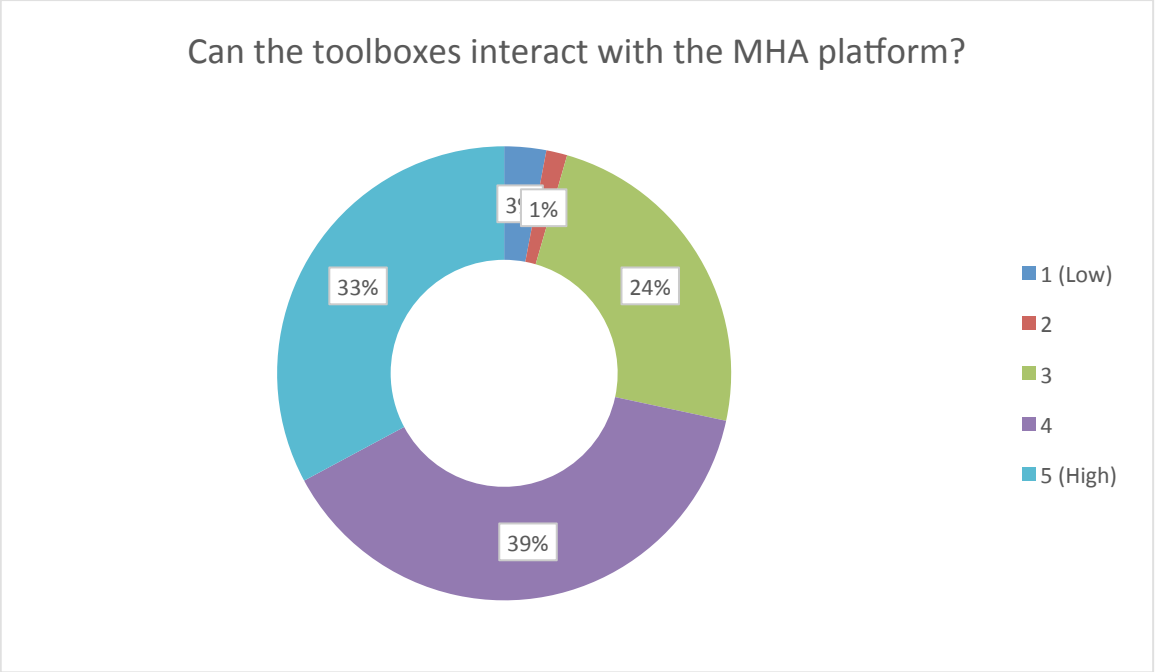
Answer	Count	Percentage, %
1 (Low)	2	3
2	3	4
3	13	19
4	27	39
5 (High)	25	36



4.10.2 Can the toolboxes interact with the MHA platform?

Mean: 4,0

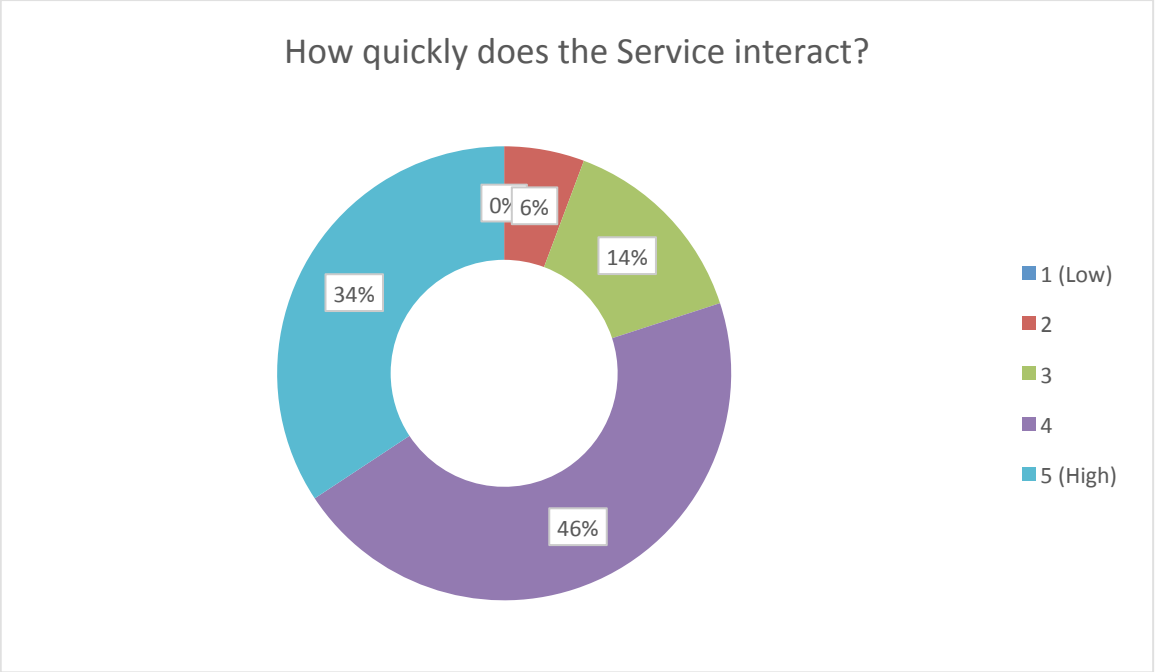
Answer	Count	Percentage, %
1 (Low)	2	3
2	1	1
3	16	24
4	26	39
5 (High)	22	33



4.10.3 How quickly does the Service interact?

Mean: 4,1

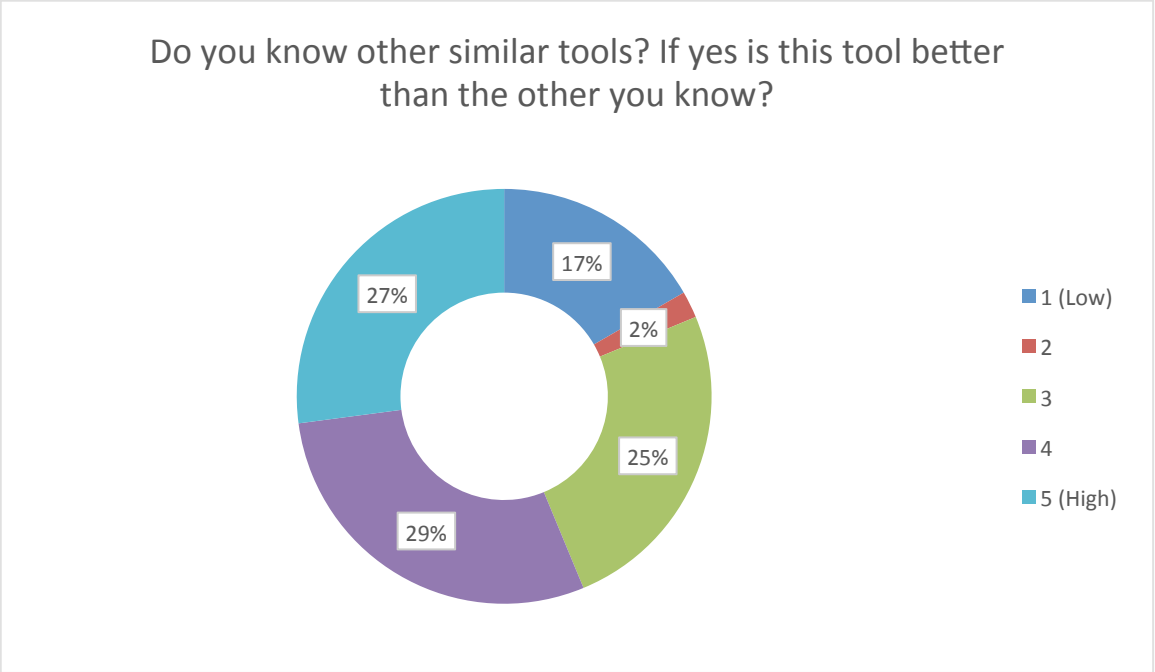
Answer	Count	Percentage, %
1 (Low)	0	0
2	4	6
3	10	14
4	32	46
5 (High)	24	34



4.10.4 Do you know other similar tools? If yes is this tool better than the other you know?

Mean: 3,5

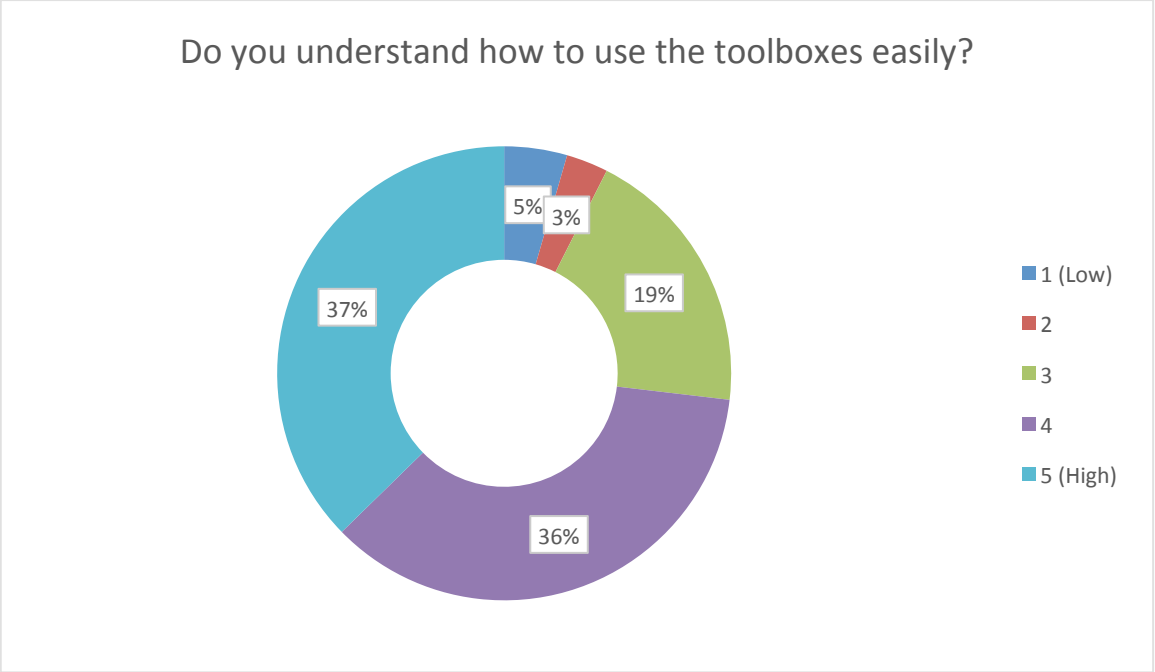
Answer	Count	Percentage, %
1 (Low)	8	17
2	1	2
3	12	25
4	14	29
5 (High)	13	27



4.10.5 Do you understand how to use the toolboxes easily?

Mean: 4,0

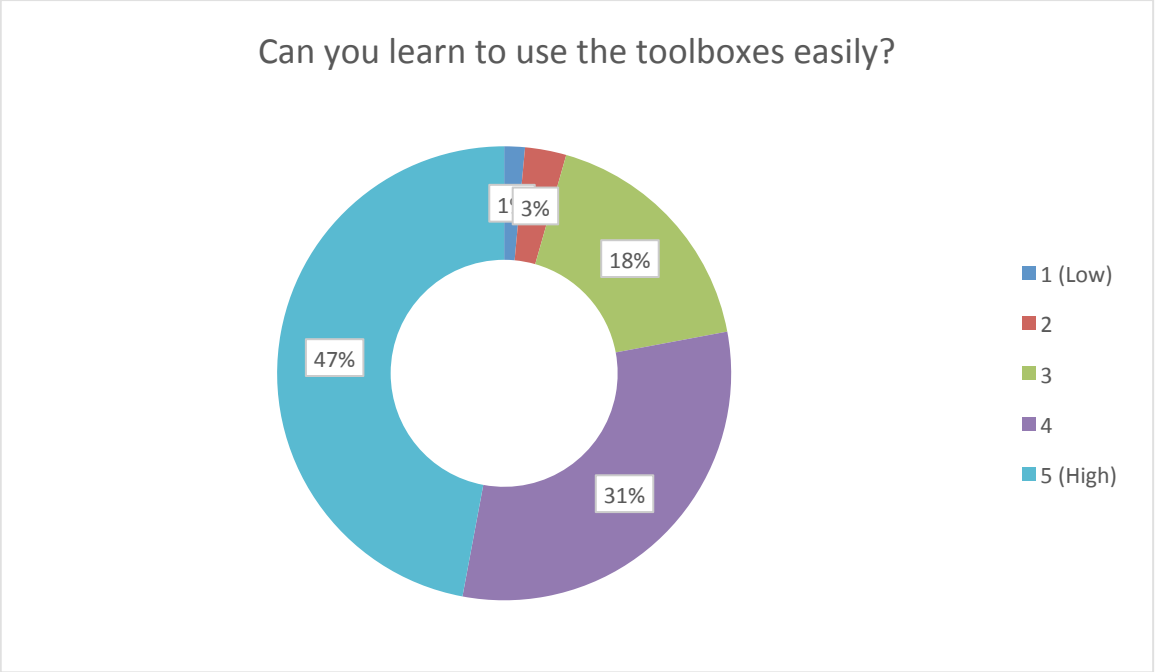
Answer	Count	Percentage, %
1 (Low)	3	4
2	2	3
3	13	19
4	24	36
5 (High)	25	37



4.10.6 Can you learn to use the toolboxes easily?

Mean: 4,2

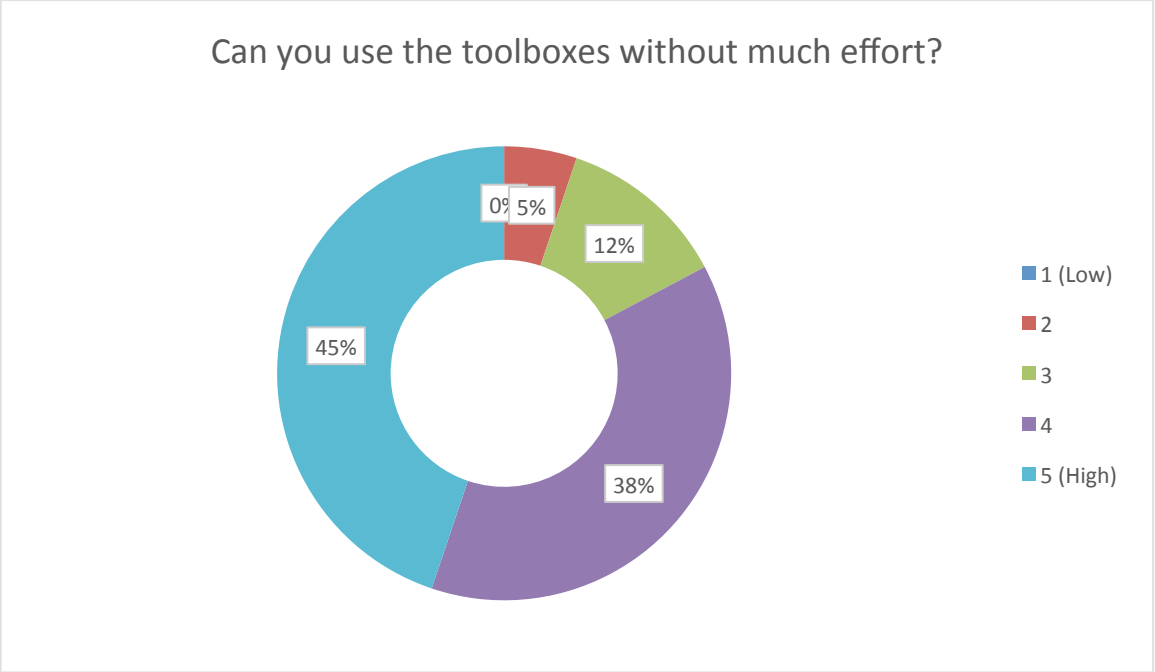
Answer	Count	Percentage, %
1 (Low)	1	1
2	2	3
3	12	18
4	21	31
5 (High)	32	47



4.10.7 Can you use the toolboxes without much effort?

Mean: 4,2

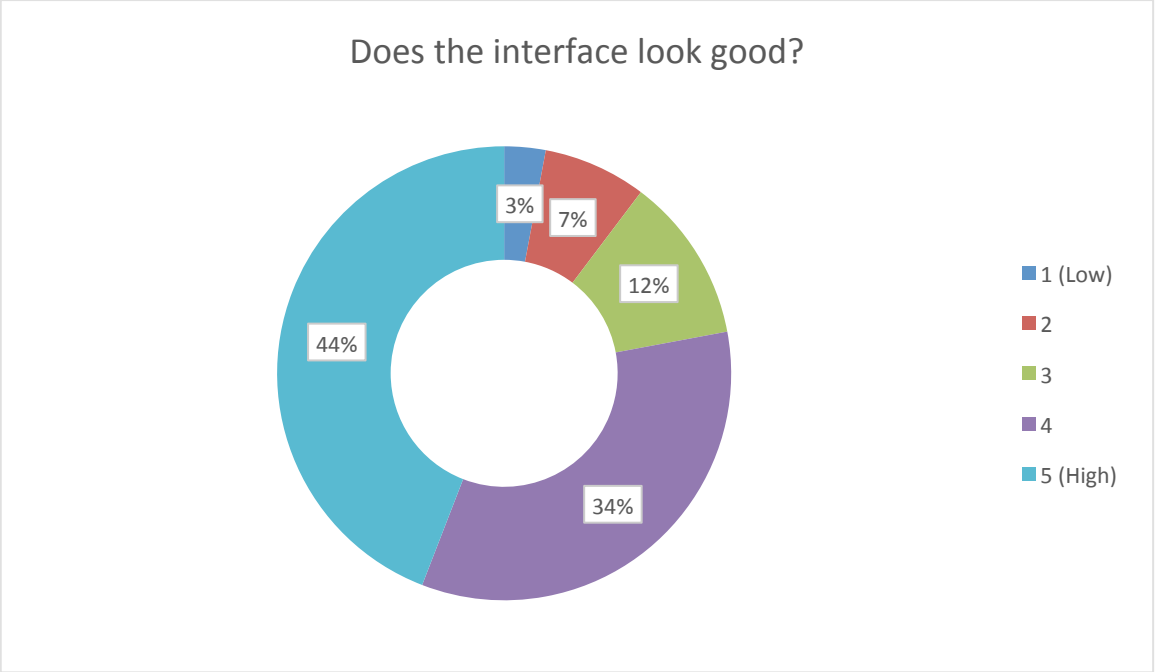
Answer	Count	Percentage, %
1 (Low)	0	0
2	3	5
3	7	12
4	22	38
5 (High)	26	45



4.10.8 Does the interface look good?

Mean: 4,1

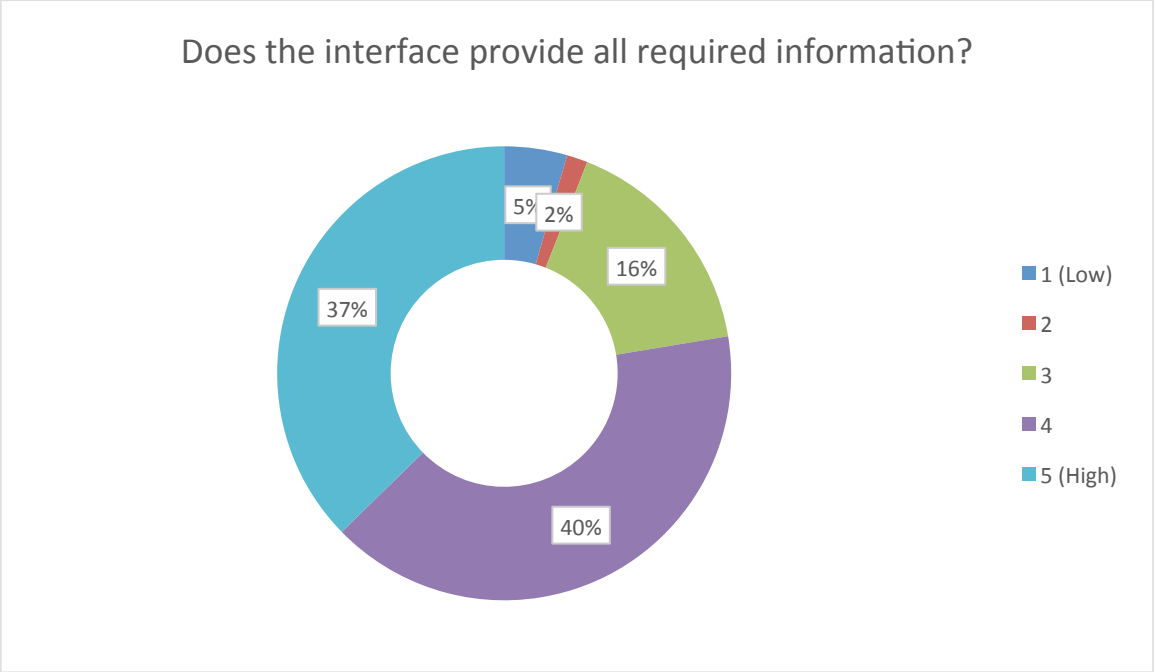
Answer	Count	Percentage, %
1 (Low)	2	3
2	5	7
3	8	12
4	23	34
5 (High)	30	44



4.10.9 Does the interface provide all required information?

Mean: 4,0

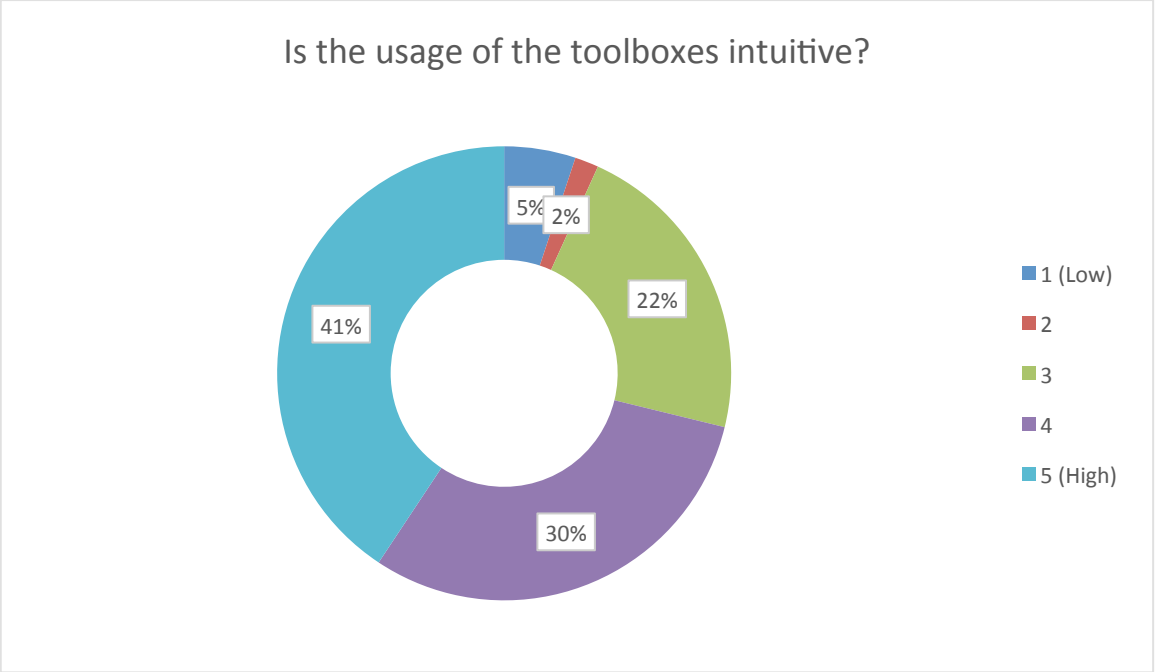
Answer	Count	Percentage, %
1 (Low)	3	4
2	1	1
3	11	16
4	27	40
5 (High)	25	37



4.10.10 Is the usage of the toolboxes intuitive?

Mean: 4,0

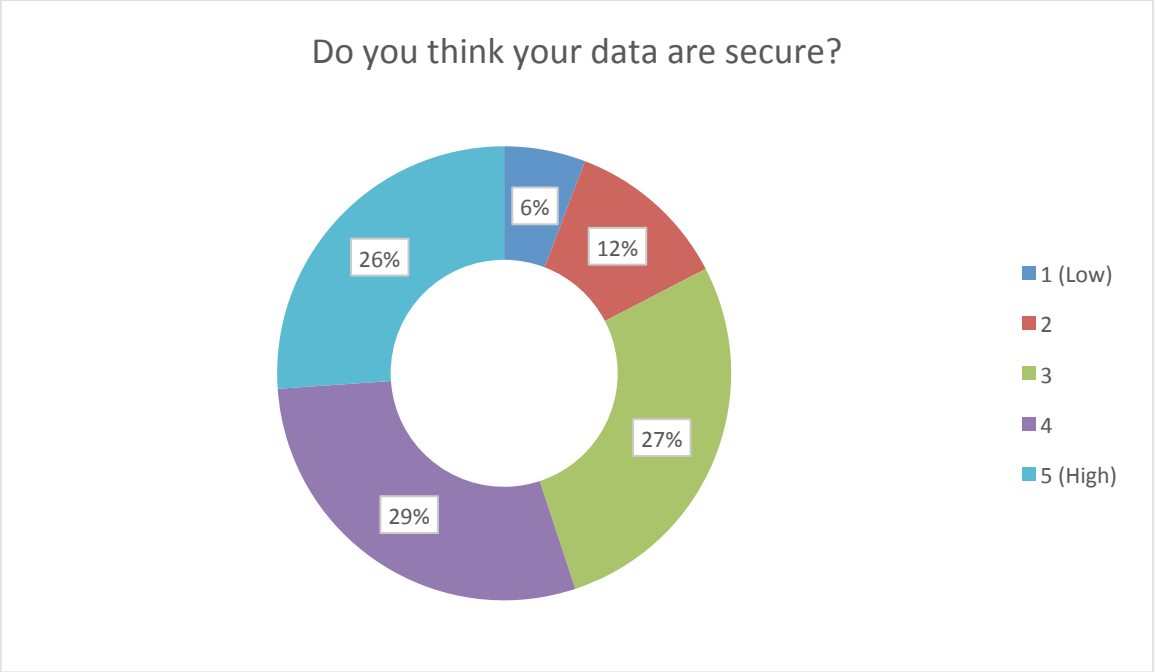
Answer	Count	Percentage, %
1 (Low)	3	5
2	1	2
3	13	22
4	18	31
5 (High)	24	41



4.10.11 Do you think your data are secure?

Mean: 3,6

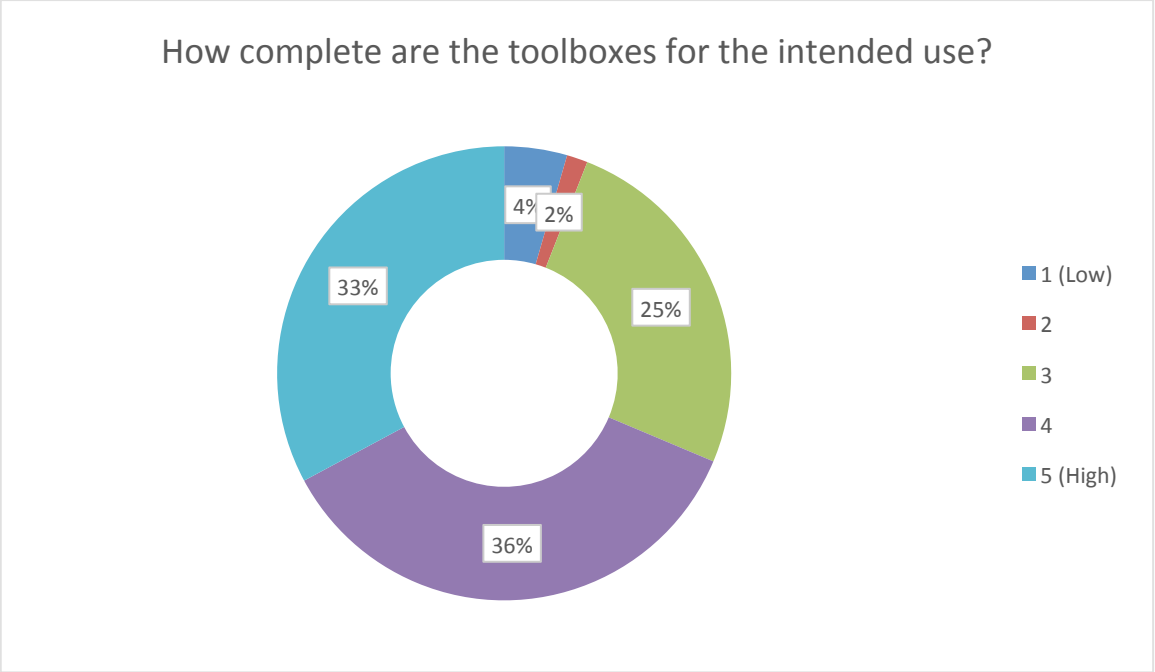
Answer	Count	Percentage, %
1 (Low)	4	6
2	8	12
3	19	28
4	20	29
5 (High)	18	26



4.10.12 How complete are the toolboxes for the intended use?

Mean: 3,9

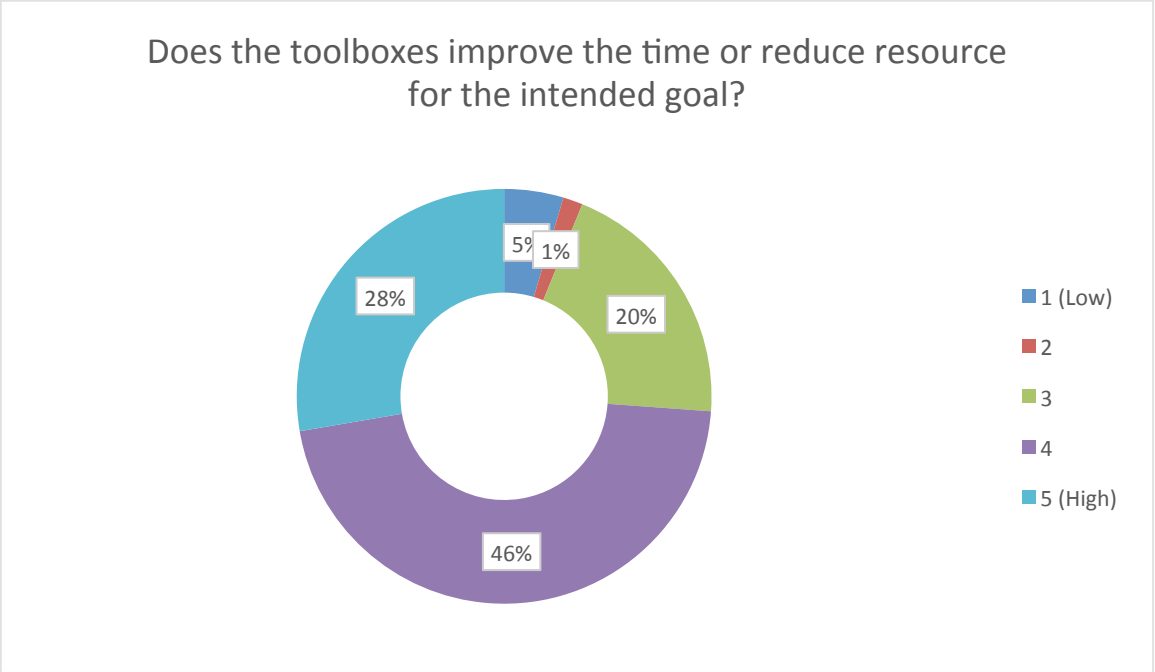
Answer	Count	Percentage, %
1 (Low)	3	4
2	1	1
3	17	25
4	24	36
5 (High)	22	33



4.10.13 Does the toolboxes improve the time or reduce resource for the intended goal?

Mean: 3,9

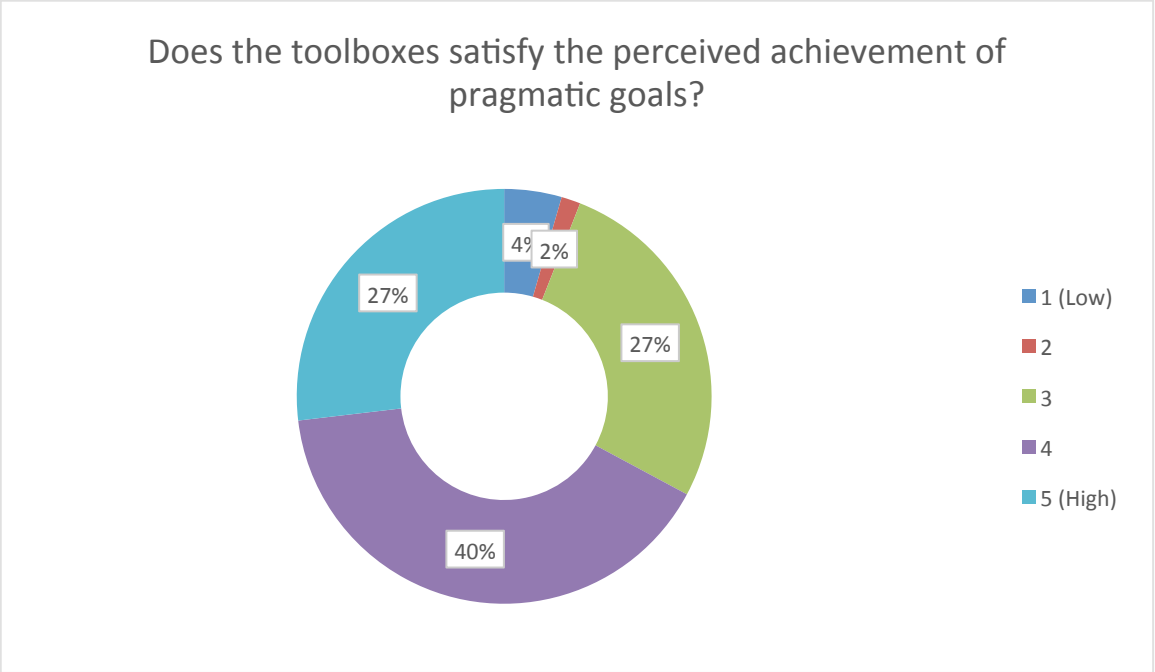
Answer	Count	Percentage, %
1 (Low)	3	5
2	1	2
3	13	20
4	30	46
5 (High)	18	28



4.10.14 Does the toolboxes satisfy the perceived achievement of pragmatic goals?

Mean: 3,8

Answer	Count	Percentage, %
1 (Low)	3	4
2	1	1
3	18	27
4	27	40
5 (High)	18	27



5 Conclusions and Recommendations

5.1 Main Conclusions

The initial task to report the usability and evaluation of the developed MHA scenarios and use cases has been widely extended by covering the additional topics bellow:

- Functionality
- Efficiency
- Compatibility
- Usability
- Reliability
- Security
- Portability
- Quality in use

Each evaluation topic has been addressed by specific, concrete and understandable question or set of questions. We are proud to present the concluding results in the way of concluding tables with average (mean) values (please see the chapters bellow with concluding tables).

We paid a special attention to the profile of MHA survey respondents and all collected results are presented in details in chapter **5.2 General Questions**.

The general conclusions are (based on **156 survey participants** from main "MyHealthAvatar Evaluation Survey"):

- 29% of survey respondents are female and 71% are male;
- the main (41 %) age range of survey respondents is 36 - 45 years;
- 88% of respondents selected higher degree as their highest level of education;
- most of the respondents 63% don't have a job related to healthcare sector;
- 75% of respondents selected "No" from the long term health condition question;
- most of the respondents have advanced computer skills (Chapter 5.2.6 How would you rate your computer skills?);
- 88% or respondents didn't participate in our previously conducted surveys;
- only 21% of survey respondents have heard about MHA from survey invitations, others have been aware about MHA (30% from a meeting, 33% - 'word of mouth', etc.);
- 66% of survey respondents are aware about Electronic Health Record term.

5.2 Evaluation Toolkit

Evaluation Toolkit represents a web based page tool elaborated with the main goal to allow all project members and survey participants to have a prompt access to MHA evaluation forms. The main structure of the Evaluation Toolkit page is (Figure 1):

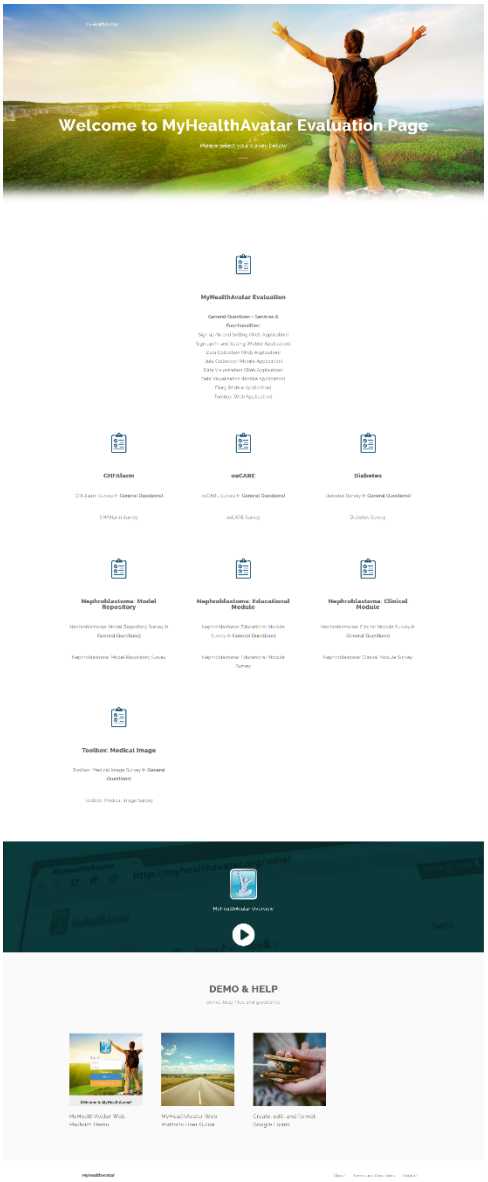


Figure 1

- Top section – MHA image with welcome text and web link to MHA project web site
- Middle Top Section – Direct web link s to all available survey forms (Google forms)
- Middle Bottom Section – introduction video about MHA platform
- Bottom – Demo and Help section with end-user guidelines, MHA demo and help files

The usage of Evaluation Toolkit page was very active by all project partners and survey participants. It allowed us to have a unified view on all evaluation forms/surveys and in special a quick access to:

- MyHealthAvatar Evaluation Survey with:
  - General Questions plus Services & Functionalities:
    - Sign up/in and Setting (Web Application)
    - Sign up/in and Setting (Mobile Application)
    - Data Collection (Web Application)
    - Data Collection (Mobile Application)
    - Data Visualization (Web Application)
    - Data Visualization (Mobile Application)
    - Diary (Mobile Application)
    - Toolbox (Web Application)
- CHFAlarm Survey
  - CHFAlarm Survey (+ General Questions)
  - CHFAlarm Survey withput
- oaCARE Survey
  - oaCARE Survey (+ General Questions)
  - oaCARE Survey
- Diabetes Survey
  - Diabetes Survey (+ General Questions)
  - Diabetes Survey
- Nephroblastoma: Model Repository Survey
  - Nephroblastoma: Model Repository Survey (+ General Questions)
  - Nephroblastoma: Model Repository Survey
- Nephroblastoma: Educational Module Survey
  - Nephroblastoma: Educational Module Survey (+ General Questions)
  - Nephroblastoma: Educational Module Survey
- Nephroblastoma: Clinical Module Survey
  - Nephroblastoma: Clinical Module Survey (+ General Questions)
  - Nephroblastoma: Clinical Module Survey

The main conclusion is that Evaluation Toolkit allowed us to quickly access all complex MHA surveys and to collaborate efficiently with all project members and survey participants.

5.3 Scenarios/Applications Concluding Tables

The top and most important concluding achievements of this document with direct impact for the next development, improvements, acceptance, usage and exploitation of MHA platform are the concluding tables bellow.

Each table represents the summary and in special the simple average value (mean value) for particular scale question answer from 1 to 5 where 1 is “Low” and 5 is “High”.

5.3.1 Sign up/in and Setting (Web Application)

Question	Mean Value
Functionality	
Can the application register a new user and log in easily?	4,3
Is the log in page user friendly?	4,4
Can you change the settings of the application easily?	3,9
Efficiency	
How quickly does the Service interact?	4,2
Compatibility	
Do you know other similar tools? If yes is this tool better than the other you know?	3,0
Usability	
Can you comprehend how to use the system easily?	3,8
Can you learn how to use the system easily?	4,1
Can the user use the system without much effort	3,7
Does the interface look good?	4,0
Does the interface provide all required information?	3,7
Is the usage of the application intuitive?	3,8
Reliability	
Is the software capable of handling errors?	3,5
Can the services resume working & restore lost data after failure?	3,4
Security	
Do you feel your data are secure?	3,5
Does the system prevent unauthorized access?	3,7
Portability	
Can the application be moved to other environments?	3,7
Quality in use	
How accurate and complete is the software for the intended use?	3,7
Does the software improve the time or reduce resource for the intended goal?	3,7
Does the software satisfy the perceived achievement of pragmatic goals?	3,7
Can the software harm people in the intended context of use?	2,9

5.3.2 Sign up/in and Setting (Mobile Application)

Question	Mean Value
Functionality	
Can the application register and log in easily?	4,3
Is the log in page friendly to use?	4,2
Can you change the setting of the application easily?	3,9
Efficiency	
How quickly does the application interact?	4,2
Compatibility	
Do you know other similar tools? If yes, is this tool better than the other tool(s) you know?	3,0
Usability	
Do you think it's easy to use the application?	4,0
Can you learn how to use the application easily?	4,1
Does the interface look good?	4,3
Does the interface provide all required information?	3,9
Is the usage of the application intuitive?	3,9
Security	
Do you feel your data are secure?	3,5
Quality in Use	
How accurate and complete is the application for the intended use?	4,0
Does the application save you time?	3,8
Can the application harm people in the intended context of use?	2.1

5.3.3 Data Collection (Web Application)

Question	Mean Value
Functionality	
Can this application collect data easily?	3,8
Is the user interface for the data collection user friendly?	3,8
Does the data collection work as expected?	3,5
Efficiency	
How quickly does the application interact?	4,0
Compatibility	
Do you know other similar tools? If yes is this tool better than the other you know?	3,2
Usability	
Do you know how to use the application easily?	3,8
Can you learn to use the application easily?	4,1
Can you use the application without much effort?	3,9

Does the interface look good?	4,1
Does the interface provide all required information?	3,9
Is the usage of the application intuitive?	3,8
Security	
Do you feel your data are secure?	3,4
Portability	
Can the application easily replace other software?	3,6
Quality in use	
How accurate and complete is the software for the intended use?	3,6
Does the software improve the time or reduce resource for the intended goal?	3,7
Does the software satisfy the perceived achievement of pragmatic goals?	3,6
Can the software harm people in the intended context of use?	2,8

5.3.4 Data Collection (Mobile Application)

Question	Mean Value
Functionality	
Can this application collect your data easily?	4,2
Is the user interface for data collection user friendly?	4,1
Does the data collection work as expected?	4,1
Efficiency	
How quickly can you interact with the application?	4,1
Compatibility	
Do you know other similar tools? If yes is this tool better than the other tool(s) you know?	3,2
Usability	
Do you know how to use the application easily?	4,0
Can you learn to use the application easily?	4,2
Can you use the application without much effort?	4,1
Does the interface look good?	4,3
Does the interface provide all required information?	4,0
Is the usage of the application intuitive?	4,0
Security	
Do you feel your data are secure?	3,5
Portability	
Can the application easily replace other software?	3,9
Quality in use	
How accurate and complete is the software for the intended use?	3,9
Does the application save you time?	3,8

Can the application harm people in the intended context of use?	2,5

5.3.5 Data Visualization (Web Application)

Question	Mean Value
Functionality	
Can this module effectively visualize the data?	4,1
Are the visualization results as expected?	3,8
Can you understand your data better through the visualization?	4,0
Can this module interact with the MHA platform?	3,8
Efficiency	
How quickly does the module interact?	3,9
Compatibility	
Do you know other similar modules? If yes is this tool better than the other you know?	3,2
Usability	
Do you how to use the module easily?	3,9
Can you learn how to use the module easily?	4,1
Can you use the module without much effort?	4,0
Does the interface look good?	4,1
Does the interface provide all required information?	3,9
Is the usage of the module intuitive?	3,8
Security	
Are data accessible only to authorized users?	3,9
Does the module prevent unauthorized access?	3,8
Portability	
Can the module be moved to other environments?	3,9
Quality in use	
How complete is the module for the intended use?	3,7
Does the module improve the time or reduce resource for the intended goal?	3,8
Does the module satisfy the perceived achievement of pragmatic goals?	3,8
Can the module harm people in the intended context of use?	2,9

5.3.6 Data Visualization (Mobile Application)

Question	Mean Value
Functionality	
Can this module effectively visualize the data?	4,1
Is the outcome of the visualization as expected?	4,0

Can you understand your data better?	4,1
Efficiency	
How quickly can you interact with the application?	4,0
Compatibility	
Do you know other similar modules? If yes, is this tool better than the other(s) you know?	3,3
Usability	
Can you use the application easily?	3,9
Can you learn how to use the application easily?	4,1
Does the interface look good?	4,1
Does the interface provide all required information?	4,1
Is the usage of the application intuitive?	4,0
Security	
Do you feel your data are secure?	3,6
Quality in use	
How complete is the application for the intended use?	3,9
Does the application save you time?	3,9
Can the application harm people in the intended context of use?	2,8
Do you think this application is user friendly?	3,9

5.3.7 Diary (Mobile Application)

Question	Mean Value
Functionality	
Can this application record your data easily?	4,1
Are the functionalities displayed sufficient?	4,0
Does the diary work as expected?	4,0
Efficiency	
How quickly can you interact with the application?	4,1
Compatibility	
Do you know other similar tools? If yes, is this tool better than the other tool(s) you know?	3,5
Usability	
Do you understand how to use the application easily?	4,2
Can you learn to use the application easily?	4,4
Can you use the application without much effort?	4,1
Does the interface look good?	4,4
Does the interface provide all the required information?	4,1
Is the usage of the application intuitive?	4,2
Reliability	

Can the service resume working & restore data after the phone was restarted?	4,1
Security	
Do you feel your data are secure?	3,8
Portability	
Can the application easily replace other software?	4,0
Quality in use	
How accurate and complete is the application for the intended use?	4,0
Does the application improve the time or reduce resource for the intended goal?	4,0
Can the application harm people in the intended context of use?	2,5

5.3.8 Toolbox (Web Application)

Question	Mean Value
Functionality	
Can the toolboxes perform the tasks required?	4,0
Can the toolboxes interact with the MHA platform?	4,0
Efficiency	
How quickly does the Service interact?	4,1
Compatibility	
Do you know other similar tools? If yes is this tool better than the other you know?	3,5
Usability	
Do you understand how to use the toolboxes easily?	4,0
Can you learn to use the toolboxes easily?	4,2
Can you use the toolboxes without much effort?	4,2
Does the interface look good?	4,1
Does the interface provide all required information?	4,0
Is the usage of the toolboxes intuitive?	4,0
Security	
Do you think your data are secure?	3,6
Quality in use	
How complete are the toolboxes for the intended use?	3,9
Does the toolboxes improve the time or reduce resource for the intended goal?	3,9
Does the toolboxes satisfy the perceived achievement of pragmatic goals?	3,8

5.4 Demos Concluding Tables

Demos concluding tables are presenting the evaluation results and in special simple average value (mean value) for every question applicable to MHA demos or high-end use cases/scenarios.

We are proud to acknowledge the support and assistance provided by MHA project partners. Only with joint efforts we managed to cover the evaluation results summarized in the concluding tables chapters bellow, and in special:

- CHFAlarm
- oaCARE, oaCare+
- Diabetes
- Nephroblastoma: Model Repository
- Nephroblastoma: Clinical Module
- Nephroblastoma: Educational Module

5.4.1 CHFAlarm

CHFAlarm demo was evaluated by 22 volunteers. The table below presents the results from the evaluation reports summarizing the mean (and SD) score values for each individual question. In general we see that the users believe that the platform has very good functionality and can efficiently respond to all tasks utilizing all necessary resources without harming them. According to the users evaluation, the system is able to reliably and efficiently share information with MHA (process of syncing is transparent and secure) and has a friendly and usable interface since users found easy to use it with not much effort. They found easy the way there were able to navigate from one screen to the other and monitor alerts. Security was of great concern and portability as expected wasn't an issue since this is a web based application. Lastly most of the users reported that the software can deliver the intended goals and be used without harming people. They feel this tool allows them to be able to use validated models for risk assessment both in real time (short term) and in long term. One comment (stated by many) was the possibility of porting (and creating) similar applications to other types of mobile operating systems (like Apple in iPhone iOS).

Question	Mean Value
Functionality	
Can software perform the tasks required?	4,7
Can software perform "Real-time monitoring and recording of patient's vital signs" (i.e. heart rate and oxygen saturation)?	4,5
Can software perform the detection of abnormal measurements?	4,5
Can software perform the provision of risk assessment models for self-health status assessment?	4,5
Is the result as expected?	4,4
Does the application records, detects and displays alert events?	4,6

Does the application notify the user every time an alert event occurs?	4,7
Does the application calculates and displays risk probabilites based on the models?	4,7
Can the system interact with MyHealthAvatar platform, sending and receiving data?	4,6
Does the application uses OAuth 2.0 protocol to access MyHealthAvatar APIs?	4,7
Efficiency	
How quickly does the system respond?	4,7
Does the system utilize resources efficiently?	4,7
Compatibility	
Can the system share resources without loss of its functionallity?	4,6
Can the system share information/data with other MyHealthAvatar components?	4,5
Usability	
Does the user comprehend how to use the system easily?	4,7
Is the navigation through pages straightforward and smooth?	4,6
Is it straightforward to install the app on a supported system?	4,7
Can the user learn to use the system easily?	4,6
Can the user use the system without much effort?	4,7
Does the interface look good?	4,7
Reliability	
Have most of the faults in the software been eliminated over time?	4,3
Is the software capable of handling errors?	4,5
Can the software resume working & restore lost data after failure?	4,3
Security	
Does the system provide adentification access wherever is needed?	4,5
Are data accessible only to authorized users?	4,7
Can the system trace actions uniquely?	4,5
Does the system prevent unauthorized access?	4,4
Maintainability	
Can faults be easily diagnosed?	4,6
Can the software be easily modified?	4,4
Can the software continue functioning if changes are made?	4,4
Can the software be tested easily?	4,5
Portability	

Can the software be moved to other environments?	4,3
Can the software be installed easily?	4,4
Does the software comply with portability standards?	4,4
Can the software easily replace other software?	4,4
Quality in Use	
How accurate and complete is the software for the intended use?	4,6
Does the software improve the time or reduce resources for the intended goal?	4,5
Does the software satisfy the perceived achievements of pragmatic goals?	4,6
Can the software harm people in the intended contexts of use?	1,5

The following table includes only the medical expert's opinion (we had 7 medical experts participating in the evaluation of this demo use case). The results do not differ significantly from the previous concluding table. It is important to mention that medical experts appreciated the fact that patients were able to monitor their status and empower themselves with the ability to continuously monitor their risk assessment in real time and also perform long term assessment with certified and validated models. Security was again reported to be of great importance for this app. The system was able to deliver its goals according to the expert's assessments. The experts were more concerned with the interaction of MHA but they found that the system can perform the described tasks without hearting the users.

Question	Mean Value
Functionality	
Can software perform the tasks required?	4,6
Can software perform "Real-time monitoring and recording of patient's vital signs" (i.e. heart rate and oxygen saturation)?	4,6
Can software perform the detection of abnormal measurements?	4,1
Can software perform the provision of risk assessment models for self-health status assessment?	4,1
Is the result as expected?	4,1
Does the application records, detects and displays alert events?	4,6
Does the application notify the user every time an alert event occurs?	4,6
Does the application calculates and displays risk probabilities based on the models?	4,6
Can the system interact with MyHealthAvatar platform, sending and receiving data?	4,3
Does the application uses OAuth 2.0 protocol to access MyHealthAvatar APIs?	4,6

Efficiency	
How quickly does the system respond?	4,6
Does the system utilize resources efficiently?	4,6
Compatibility	
Can the system share resources without loss of its functionality?	4,6
Can the system share information/data with other MyHealthAvatar components?	4,6
Usability	
Does the user comprehend how to use the system easily?	4,6
Is the navigation through pages straightforward and smooth?	4
Is it straightforward to install the app on a supported system?	4,4
Can the user learn to use the system easily?	4,5
Can the user use the system without much effort?	4,6
Does the interface look good?	4,8
Reliability	
Have most of the faults in the software been eliminated over time?	4,3
Is the software capable of handling errors?	4,6
Can the software resume working & restore lost data after failure?	4,4
Security	
Does the system provide identification access wherever is needed?	4,6
Are data accessible only to authorized users?	4,6
Can the system trace actions uniquely?	4,4
Does the system prevent unauthorized access?	4,4
Maintainability	
Can faults be easily diagnosed?	4,8
Can the software be easily modified?	4,6
Can the software continue functioning if changes are made?	4,4
Can the software be tested easily?	4,4
Portability	
Can the software be moved to other environments?	4
Can the software be installed easily?	4,4
Does the software comply with portability standards?	4,4
Can the software easily replace other software?	4,4
Quality in Use	
How accurate and complete is the software for the intended use?	4,6
Does the software improve the time or reduce resources for the intended goal?	4,6
Does the software satisfy the perceived achievements of	4,8

pragmatic goals?	
Can the software harm people in the intended contexts of use?	2,2

5.4.2 oaCARE, oaCare+

This demo use case scenario was evaluated in total by 18 volunteers. Below are presented the results from the evaluation reports summarizing the mean values for each individual question. In general we see that the users believe that the platform has very good functionality and can efficiently respond to all tasks utilizing all necessary resources. The system is able to reliable and efficiently share information with MHA (including imaging data) and has a friendly and usable interface since users found easy to use it with not much effort. Security of great concern and portability (as expected is not an issue since this is a web based application). Lastly most of the users say that the software can deliver the intended goals and use without harming the people.

Question	Mean Value
Functionality	
Can software perform the tasks required?	4,6
Can software perform the tasks of providing to patients an easy-to-use way of managing and monitoring their medical data related to the knee osteoarthritis?	4,7
Can software perform the tasks of providing to clinicians the required functionality to view the patient's medical data over the time?	4,7
Is the result as expected?	4,7
Does the system present activity, weight, pain and imaging data of the patient?	4,8
Does the system allow patients to update their profile and directly communicate with their physician via messages?	4,5
Does the system allow patients to fill out questionnaires for extracting pain and quality of life information?	4,5
Does the system allow physicians to view their patients' medical data?	4,4
Does the system allow physicians to set up new care plans and view history of existing care plans?	4,3
Does the system allow physicians to send messages to their patients?	4,4
Does the system allow physicians to upload educational material?	4,1
Can the system interact with MyHealthAvatar platform, sending and receiving data?	4,4
Does the system uses OAuth 2.0 protocol to access MyHealthAvatar APIs?	4,2
Efficiency	
How quickly does the system respond?	4,5

Does the system utilize resources efficiently?	4,3
Compatibility	
Can the system share resources without loss of its functionality?	4,7
Can the system share information/data with other MyHealthAvatar components?	4,6
Usability	
Does the user comprehend how to use the system easily?	4,5
Can the user learn to use the system easily?	4,5
Can the user use the system without much effort?	4,4
Does the interface look good?	4,7
Reliability	
Have most of the faults in the software been eliminated over time?	4,1
Is the software capable of handling errors?	4,5
Can the software resume working & restore lost data after failure?	4,3
Security	
Does the system provide identification access wherever is needed?	4,5
Are data accessible only to authorized users?	4,4
Can the system trace actions uniquely?	4,5
Does the system prevent unauthorized access?	4,5
Maintainability	
Can faults be easily diagnosed?	4,2
Can the software be easily modified?	4,5
Can the software continue functioning if changes are made?	4,6
Can the software be tested easily?	4,6
Portability	
Can the software be moved to other environments?	4,6
Can the software be installed easily?	4,7
Does the software comply with portability standards?	4,6
Can the software easily replace other software?	4,3
Quality in Use	
How accurate and complete is the software for the intended use?	4,6
Does the software improve the time or reduce resources for the intended goal?	4,5
Does the software satisfy the perceived achievements of pragmatic goals?	4,5
Can the software harm people in the intended contexts of use?	1,7

The following table includes only the medical expert's opinion (6 medical experts participated in the evaluation of this demo use case). The results do not differ much from the previous analysis. We are proud to mention that medical experts appreciated the ability to monitor their patients through an usable and efficient application (oaCare+). Security is of great importance. The system is able to deliver its goals. The experts were more concerned with the interaction of MHA but they found that the system can perform the described tasks without harming the end-users.

Question	Mean Value
Functionality	
Can software perform the tasks required?	4,5
Can software perform the tasks of providing to patients an easy-to-use way of managing and monitoring their medical data related to the knee osteoarthritis?	4,7
Can software perform the tasks of providing to clinicians the required functionality to view the patient's medical data over the time?	4,5
Is the result as expected?	4,7
Does the system present activity, weight, pain and imaging data of the patient?	4,6
Does the system allow patients to update their profile and directly communicate with their physician via messages?	4,5
Does the system allow patients to fill out questionnaires for extracting pain and quality of life information?	4,8
Does the system allow physicians to view their patients' medical data?	4,3
Does the system allow physicians to set up new care plans and view history of existing care plans?	4,5
Does the system allow physicians to send messages to their patients?	4,2
Does the system allow physicians to upload educational material?	4,2
Can the system interact with MyHealthAvatar platform, sending and receiving data?	3,8
Does the system uses OAuth 2.0 protocol to access MyHealthAvatar APIs?	4
Efficiency	
How quickly does the system respond?	4,7
Does the system utilize resources efficiently?	4,7
Compatibility	
Can the system share resources without loss of its functionality?	4,7
Can the system share information/data with other MyHealthAvatar components?	4,7
Usability	
Does the user comprehend how to use the system easily?	5
Can the user learn to use the system easily?	4,3

Can the user use the system without much effort?	4
Does the interface look good?	4,7
Reliability	
Have most of the faults in the software been eliminated over time?	4,3
Is the software capable of handling errors?	4,7
Can the software resume working & restore lost data after failure?	4,7
Security	
Does the system provide identification access wherever is needed?	4,3
Are data accessible only to authorized users?	4,7
Can the system trace actions uniquely?	4,3
Does the system prevent unauthorized access?	4,7
Maintainability	
Can faults be easily diagnosed?	4
Can the software be easily modified?	4,5
Can the software continue functioning if changes are made?	5
Can the software be tested easily?	5
Portability	
Can the software be moved to other environments?	4,7
Can the software be installed easily?	5
Does the software comply with portability standards?	4,3
Can the software easily replace other software?	4,7
Quality in Use	
How accurate and complete is the software for the intended use?	4,7
Does the software improve the time or reduce resources for the intended goal?	4,7
Does the software satisfy the perceived achievements of pragmatic goals?	5
Can the software harm people in the intended contexts of use?	2,3

5.4.3 Diabetes

At the time of working on this document the diabetes evaluation activities are planned to collect the input from 3 top diabetes professionals from UK hospital and their patients.

All required evaluation actions are prepared (web-, paper-based evaluation forms). The table below are to be updated with collected mean value data and the collected text comments from survey respondents.

Question	Mean Value

Profile	
Have the MHA platform and app already provided sufficient profile information of patients for diabetic care?	3,7
Physical activity	
Have the MHA platform and app already provided a good service for collecting and providing information about physical activities of diabetic patients?	3,7
Biochemistries	
Have the MHA platform and app already provided sufficient biochemistires information of patients for diabetic care?	3,7
Medication and clinical visit reminders	
Have the MHA platform and app already provided a good service for the reminding of medication and clinical visit for diabetic patients?	4,3
Food intake and calorie calculation	
Have the MHA platform and app already provided a good service for collecting and providing information about food intake and calorie consumption of diabetic patients?	4,3
Patient advice	
Have the MHA platform and app already provided a good service for patient advices?	4,0
Access by medical professionals	
Have the MHA platform and app already provided easy access to patient information by medical professionals?	3,7
Efficiency	
How quickly does the system respond?	5
Usability	
Does the user comprehend how to use the system easily?	5
Can the user learn to use the system easily?	4,7
Can the user use the system without much effort?	4,3
Does the interface look good?	4,7
Does the interface provide all required information?	4,3
Is the usage of the application intuitive?	4,7
Reliability	
Have most of the faults in the software been eliminated over time?	4,0
Is the software capable of handling errors?	4,0
Can the software resume working & restore lost data after failure?	3,7
Quality in Use	
How accurate and complete is the software for the intended	4,0

use?	
Does the software improve the time or reduce resources for the intended goal?	4,7
Does the software satisfy the perceived achievements of pragmatic goals?	4,7
Can the software harm people in the intended contexts of use?	1,0

5.4.3.1 Feedback from Mrs. Emma Wilkinson, Senior Research Fellow at the Institute of Health Research and Institute for Diabetes in Older People. 4th March 2016

General comments

The system has a great potential for research. It is an open and extendable system in which a lot of future work can be built on. In addition to the existing questionnaires (namely the quality of life questionnaires) available on the platform, more questionnaires could be added for monitoring patient behaviour in diabetes self-management.

The risk assessment and management could be potentially compatible with other health risk checks and monitoring carried out within the NHS e.g. Healthchecks.

To make the system more effective, more attention should be paid towards patient education and support, to improve their health literacy and self-awareness. There is potential to use MHA in outreach work to improve access for particular population groups with high risk of diabetes and where there may be barrier to access.

Data sharing and ethics are important. Probably we could think about a more informative way to inform users about their risks and to get their consent. Also to consider this in relation to making the data sharing compatible with NHS data systems.

More attention could be paid towards multiple linguistic support in order to offer help to patients that do not speak English. The visual aspect of MHA and the potential for it to include information in video format and in different languages means it could be used to overcome some language barriers in accessing information.

Indirect feedback 1

From GP1

The platform and the app have included a lot of useful information relevant to diabetes care. At the moment, good IT skills are required by the users in order to learn how to use the tools provided by the project.

Nearly all the GPs in the local area use Systemone so it would be helpful if MyHealthAvatar could be linked to Systemone.

SystmOne is a centrally hosted clinical computer system developed by Horsforth-based TPP (The Phoenix Partnership). It is used by healthcare professionals in the UK predominantly in Primary Care.

The system is being deployed as one of the accredited systems in the government's programme of modernising IT in the NHS.

Indirect feedback 2

From GP2

While the platform and the app are informative, the current level of information is too overwhelming for an average person to consume. Especially there is too much medical related information which may not be well interpreted by the average citizens.

It has a big emphasis on physical activity data, feedback and risk calculations rather than lifestyles and wellbeing. The market for the former is a crowded one so future application would have to consider who would use and pay for it.

The potential of the platform for self-directed and supported behavior change addressing psychological, emotional and goal oriented activities should be explored.

Other feedback

5.4.3.2 Other profile information of patients for diabetic care?

0. Maybe include a point for patients to record blood sugars through the day as well.
1. data on various degrees of chronic renal failure
2. presence of fatty liver, liver steatosis
3. osteopenia
4. presence of polycystic ovaries syndrome syndrome (PCOS)
5. amenorrhea
6. high cholesterol (total and/or LDL), high triglycerides
7. body mass index, body fat

Note: Through the clinical contact, Andrew N. Margioris, Professor http://clinchem.med.uoc.gr/margioris.html, who was one of the experts evaluated the MHA system from the perspective of diabetes, we are trying to arrange a trial of the MHA for diabetes patient care at his clinics. This can only happen after the official completion of the project. More details could be reported in the final reporting.

5.4.4 Nephroblastoma: Model Repository

Model repository evaluation of Nephroblastoma high-end scenario has been performed by 21 respondents (researchers and healthcare professionals) familiar with cancer models. The collected results are summarized in the concluding table below. The main evaluation activities were performed during February and March 2016 month.

Question	Mean Value
Functionality	
Can this web application store models?	4,6
Can this web application store model attributes? (parameters, etc.)	4,4

Can this web application store data to use with the models?	4
Can this web application search and present stored data?	3,7
Can this web application retrieve data in files?	4,1
Can this web application alter its stored data?	4,3
Efficiency	
How quickly does the repository respond to the user requests?	4,6
Is the application comprehensible?	3,2
Is support of a technical person needed in order to use this application?	3,3
Compatibility	
Do you know other similar application? If yes, is this tool better than the other you know?	2,5
Usability	
Can you comprehend the application's functionalities?	3,7
Can you learn to use the application easily?	2,9
Can you use the application without much effort?	3,7
Does the interface look good?	2,3
Does the interface provide all required information?	3,1
Reliability	
Have most of the faults in the software been eliminated over time?	2,6
Is the software capable of handling errors?	3,3
Can the services resume working & restore lost data after failure?	3,3
Portability	
Can the web application be easily accessed from any pc?	5
Security	
Are data accessible only to authorized users?	4,7
Do you think the uploaded data are secure?	3,7
Does the system prevent unauthorized access?	4,3
Maintainability	
Can the software be tested easily?	3,2
Quality in Use	
How accurate and complete is the software for the intended use?	3,2
Does the software improve the time or reduce resource for the intended goal?	4
Does the software satisfy the perceived achievement of pragmatic goals?	3,7
Can the software harm people in the intended contexts of	1,5

use?

5.4.5 Nephroblastoma: Clinical Module

Clinical Module of Nephroblastoma high-end scenario has been performed by 9 respondents (healthcare professionals) familiar with cancer models. The collected results are summarized in the concluding table below.

Question	Mean Value
Functionality	
Can the web application call the Nephroblastoma Oncosimulator?	4,8
Can the web application perform an execution of the Nephroblastoma Oncosimulator successfully?	4,9
Can the application fetch the clinical data (image files) from an outside source (CHIC data repository) successfully?	4,8
Can the user set model input through the application?	4,8
Can the user submit an execution of the Nephroblastoma Oncosimulator model through the web service?	4,8
Is the user interface for execution submission of Oncosimulator user friendly?	4,4
Is the presentation of the results satisfying?	4,1
Is the NEPH-UC clinically relevant?	4,4
Efficiency	
Is the application comprehensible?	4,4
Can you learn how to use the system easily?	4,7
Is support of a technical person needed in order to use this tool?	3
Compatibility	
Is the model running and the results presented independently of the software (windows version/web browsers) available on user's pc?	4,3
Can the system exchange data fluently with external modules?	4,1
Do you know other similar tools? If yes is this tool better than the other you know?	2,4
Usability	
Is the execution of the model easy?	4,9

Is the execution time consuming?	2
Can the tool resume working & restore lost data after failure?	3,9
Does the interface provide all required information?	4,2
Is the produced report useful?	4
Reliability	
How accurate and complete is the software for the intended use?	4
Is the output trustful?	3,9
Are the results presented sufficient for clinical purposes?	4
Portability	
Can the tool be easily accessed from any pc?	4,9
Security	
Do you think your data are secure?	4
Are data accessible only to authorized users?	4,1
Does the system prevent unauthorized access?	4
Quality in Use	
How accurate and complete is the software for the intended use?	4,3
Does the software improve the time or reduce resource for the intended goal?	4,7
Does the software satisfy the perceived achievement of pragmatic goals?	4,4
Can the software harm people in the intended contexts of use?	2,1

5.4.6 Nephroblastoma: Educational Module

Educational Module of Nephroblastoma high-end scenario has been performed by 10 respondents (researchers and healthcare professionals) familiar with cancer models. The collected results are summarized in the concluding table below.

Question	Mean Value
Functionality	
Can the toolbox interact with the MHA platform?	4,1
Can the user set model input through the application?	5
Can the user submit an execution of the Nephroblastoma Oncosimulator model through the tool?	4,9
Is the user interface for execution submission of Oncosimulator user friendly?	4,4
Is the presentation of the results satisfying?	4,7
Is the use case educational?	4,3

Efficiency	
Is the tool comprehensible?	4,5
Can you learn how to use the system easily?	4,7
Is support of a technical person needed in order to use this tool?	1,6
Compatibility	
Is the tool running and the results presented independently of the software (windows version/web browsers) available on user's pc?	4,5
Do you know other similar tools? If yes is this tool better than the other you know?	2,2
Usability	
Is the execution of the model easy?	4,8
Is the execution time consuming?	2,3
Can the tool resume working & restore lost data after failure?	2,3
Does the interface provide all required information?	3,8
Reliability	
How accurate and complete is the software for the intended use?	4,1
Is the output trustful?	4,5
Are the results presented sufficient for educational purposes?	4,2
Quality in Use	
Does the software improve the time or reduce resource for the intended goal?	3,8
Does the software satisfy the perceived achievement of pragmatic goals?	4,1
Can the software harm people in the intended contexts of use?	1,4

5.5 Recommendations

The main recommendations for the next MHA platform development and exploitation are in direct linkage with collected and presented evaluation results.

All project partners were informed regularly about the evaluation results and some actions where discussed in the frames of regular MHA project meetings.

The main focus of this task was the evaluation activity focused on Usability evaluation. The recommendation to focus on additional evaluation topics (Functionality, Efficiency, Compatibility, Reliability, Security, Portability, Quality in Use) has been accepted by all MHA project partners and has been reported in this document.

Despite the main focus of this task on Usability evaluation activities we would recommend all project partners to pay a special attention to:

- "security" question results. Most of the responses to the question "Do you feel your data are secure?" have a value between 3 and 4 (from scale 1 to 5), it is a good achievement, nevertheless, this result is lower by comparing with other answers.
- all questions with lower values. As an example could serve the results to the question "Do you know other similar modules/tools/applications? If yes, is this module/tool/application better than the other(s) you know?"
- demo concluding tables. All final evaluation results related to demos concluding tables are recommended to be analyzed by the demos developers and, if applicable, to implement the required changes and adjustments.
- "General Questions" results. For the convenience reasons, the Chapter 4.2 is presenting the detailed description of the profile of the main MHA survey respondents.

Additional recommendations are related to next evaluation activities and results:

- MHA partners are recommended to follow up the evaluation of MHA platform after 6 or 12 months of MHA exploitation;
- Next evaluation activities are to be launched after an agreed evaluation methodology and only in case of sufficient resources;
- The presented in this document evaluation questions and forms could be reused for next follow-up evaluation activities.

Appendix 1 – Abbreviations and acronyms

EC	European Commission
GCP	Good Clinical Practice
MHA	MyHealthAvatar
SOA	Service Oriented Architecture

Appendix 2 - Detailed software evaluation reports

Usability

Understandability How straightforward is it to understand: • What the software does and its purpose? • The intended market and users of the software? • The software's basic functions? • The software's advanced functions?	**Yes/No, supporting comments if warranted**
High-level description of what/who the software is for is available.	
High-level description of what the software does is available.	
High-level description of how the software works is available.	
Design rationale is available – why it does it the way it does.	
Architectural overview, with diagrams, is available.	
Descriptions of intended use cases are available.	
Case studies of use are available.	

Documentation Looking at the user documentation, what is its • Quality? • Completeness? • Accuracy? • Appropriateness? • Clarity?	**Yes/No, supporting comments if warranted**
Provides a high-level overview of the software.	
Partitioned into sections for users, user-developers and developers (depending on the software).	
States assumed background and expertise of the reader, for each class of user.	
Lists resources for further information.	
Further information is suitable for the level of the reader, for each class of user.	
Is task-oriented.	
Consists of clear, step-by-step instructions.	
Gives examples of what the user can see at each step e.g. screen shots or command-line excerpts.	
For problems and error messages, the symptoms and step-by-step solutions are provided.	
Does not use terms like "intuitive", "user friendly", "easy to use", "simple" or "obviously", unless as part of quotes from satisfied users	

States command names and syntax, says what menus to use, lists parameters and error messages exactly as they appear or should be typed.	
Uses `teletype-style fonts` for command-line inputs and outputs, source code fragments, function names, class names etc.	
For Java, the package names of classes are stated the first time a class is mentioned.	
English language descriptions of commands or errors are provided but only to complement the above.	
Plain-text files (e.g. READMEs) use indentation and underlining (e.g. === and ---) to structure the text.	
Plain-text files (e.g. READMEs) do not use TAB characters to indent the text.	
API documentation e.g. JavaDoc or Doxygen, documents APIs completely e.g. configuration files, property names etc.	
Is held under version control alongside the code.	
Is on the project web site.	
Documentation on the project web site makes it clear what version of the software the documentation applies to.	

Buildability How straightforward is it to: • Meet the pre-requisites for building the software on a build platform? • Build the software on a build platform?	**Yes/No, supporting comments if warranted**
Web site has instructions for building the software.	
Source distributions have instructions for building the software.	
An automated build (e.g. Make, ANT, custom solution) is used to build the software.	
Web site lists all third-party dependencies that are not bundled, along with web addresses, suitable versions, licences and whether these are mandatory or optional.	
Source distributions list all third-party dependencies that are not bundled, along with web addresses, suitable versions, licences and whether these are mandatory or optional.	
Dependency management is used to automatically download dependencies (e.g. ANT, Ivy, Maven or custom solution).	
All mandatory third-party dependencies are currently available.	

All optional third-party dependencies are currently available.	
Tests are provided to verify the build has succeeded.	

Installability How straightforward is it to: • Meet the pre-requisites for the software on a target platform? • Install the software onto a target platform? • Configure the software following installation for use? • Verify the installation for use? Note that in some cases build and install may be one and the same.	**Yes/No, supporting comments if warranted**
Web site has instructions for installing the software.	
Binary distributions have instructions for installing the software.	
Web site lists all third-party dependencies that are not bundled, along with web addresses, suitable versions, licences and whether these are mandatory or optional.	
Binary distributions list all third-party dependencies that are not bundled, along with web addresses, suitable versions, licences and whether these are mandatory or optional.	
Dependency management is used to automatically download dependencies (e.g. ANT, Ivy, Maven or custom solution).	
All mandatory third-party dependencies are currently available.	
All optional third-party dependencies are currently available.	
Tests are provided to verify the install has succeeded.	
When an archive (e.g. TAR.GZ or ZIP) is unpacked, it creates a single directory with the files within. It does not spread its contents all over the current directory.	
When software is installed, its contents are organised into sub-directories (e.g. docs for documentation, libs for dependent libraries) as appropriate.	
All source and binary distributions contain a README.TXT with project name, web site, how/where to get help, version, date, licence and copyright (or where to find this information), location of entry point into user	

doc.	
All GUIs contain a Help menu with commands to see the project name, web site, how/where to get help, version, date, licence and copyright (or where to find this information), location of entry point into user doc.	
All other content distributed as an archive contains a README.TXT with project name, web site, nature, how /where to get help, date.	
Installers allow user to select where to install software.	
Uninstallers uninstall every file or warns user of any files that were not removed and where these are.	

Learnability How straightforward is it to learn how to achieve: • Basic functional tasks? • Advanced functional tasks?	**Yes/No, supporting comments if warranted**
A getting started guide is provided outlining a basic example of using the software.	
Instructions are provided for many basic use cases.	
Instructions are provided supporting all use cases.	
Reference guides are provided for all command-line, GUI and configuration options.	
API documentation is provided for user-developers and developers.	

Sustainability and maintainability

Identity To what extent is the identity of the project/software clear and unique both within its application domain and generally?	**Yes/No, supporting comments if warranted**
Project/software has its own domain name.	
Project/software has a logo.	
Project/software has a distinct name within its application area. A search by Google on the name plus keywords from the application area throws up the project web site in the first page of matches.	
Project/software has a distinct name regardless of its application area. A search by Google on the name plus keywords from the application area throws up the project web site in the first page of matches.	
Project/software name does not throw up embarrassing “did you mean…” hits on Google.	
Project/software name does not violate an existing trade-mark.	
Project/software name is trade-marked.	

Copyright To what extent is it clear who wrote the software and owns its copyright?	**Yes/No, supporting comments if warranted**
Web site states copyright.	
Web site states who developed/develops the software, funders etc.	
If there are multiple web sites then these all state exactly the same copyright, licencing and authorship.	
Each source code file has a copyright statement.	
If supported by the language, each source code file has a copyright statement embedded within a constant.	
Each source code file has a licence header.	

Licencing Has an appropriate licence been adopted?	**Yes/No, supporting comments if warranted**
Web site states licence.	
Software (source and binaries) has a licence.	
Software has an open source licence.	

Software has an Open Software Initiative[6] (OSI)-recognised licence.	

Governance To what extent does the project make its management, or how its software development is managed, transparent?	**Yes/No, supporting comments if warranted**
Project has defined a governance policy.	
Governance policy is publicly available.	

Community To what extent does/will an active user community exist for this product?	**Yes/No, supporting comments if warranted**
Web site has statement of number of users/developers/members.	
Web site has success stories.	
Web site has quotes from satisfied users.	
Web site has list of important partners or collaborators.	
Web site has list of the project's publications.	
Web site has list of third-party publications that cite the software.	
Web site has list of software that uses/bundles this software.	
Users are requested to cite the project if publishing papers based on results derived from the software.	
Users are required to cite a boilerplate citation if publishing papers based on results derived from the software.	
Users exist who are not members of the project.	
Developers exist who are not members of the project.	

Accessibility To what extent is the software accessible?	**Yes/No, supporting comments if warranted**
Binary distributions are available (whether for free, payment, registration).	
Binary distributions are freely available.	
Binary distributions are available without the need for any registration or authorisation of access by the project.	
Source distributions are available (whether for free, payment, registration).	

[6] http://www.opensource.org/

Source distributions are freely available.	
Source distributions are available without the need for any registration or authorisation of access by the project.	
Access to source code repository is available (whether for free, payment, registration).	
Anonymous read-only access to source code repository.	
Ability to browse source code repository online.	
Repository is hosted externally to a single organisation/institution in a sustainable third-party repository (e.g. SourceForge, GoogleCode, LaunchPad, GitHub) which will live beyond the lifetime of any current funding line.	
Downloads page shows evidence of regular releases (e.g. six monthly, bi-weekly, etc.).	

Testability How straightforward is it to test the software to verify modifications?	**Yes/No, supporting comments if warranted**
Project has unit tests.	
Project has integration tests.	
For GUIs, project uses automated GUI test frameworks.	
Project has scripts for testing scenarios that have not been automated (e.g. for testing GUIs).	
Project recommends tools to check conformance to coding standards.	
Project has automated tests to check conformance to coding standards.	
Project recommends tools to check test coverage.	
Project has automated tests to check test coverage.	
A minimum test coverage level that must be met has been defined.	
There is an automated test for this minimum test coverage level.	
Tests are automatically run nightly.	
Continuous integration is supported – tests are automatically run whenever the source code changes.	
Test results are visible to all developers/members.	
Test results are visible publicly.	
Test results are e-mailed to a mailing list.	
This e-mailing list can be subscribed to by anyone.	

Project specifies how to set up external resources e.g. FTP servers, databases for tests.	
Tests create their own files, database tables etc.	

Portability To what extent can the software be used on other platforms?	**Yes/No, supporting comments if warranted**
Application can be built on and run under Windows.	
Application can be built on and run under Windows 7.	
Application can be built on and run under Windows XP.	
Application can be built on and run under Windows Vista.	
Application can be built on and run under UNIX/Linux.	
Application can be built on and run under Solaris.	
Application can be built on and run under RedHat.	
Application can be built on and run under Debian.	
Application can be built on and run under Fedora.	
Application can be built on and run under Ubuntu.	
Application can be built on and run under MacOSX.	
Browser applications run under Internet Explorer.	
Browser applications run under Mozilla Firefox.	
Browser applications run under Google Chrome.	
Browser applications run under Opera.	
Browser applications run under Safari.	

Supportability To what extent will the product be supported currently and in the future?	**Yes/No, supporting comments if warranted**
Web site has page describing how to get support.	
User doc has page describing how to get support.	
Software describes how to get support (in a README for command-line tools or a Help=>About window in a GUI).	
Above pages/windows/files describe, or link to, a description of “how to ask for help” e.g. cite version number, send transcript, error logs etc.	
Project has an e-mail address.	
Project e-mail address has project domain name.	
E-mails are read by more than one person.	
E-mails are archived.	
E-mail archives are publicly readable.	
E-mail archives are searchable.	

Project has a ticketing system.	
Ticketing system is publicly readable.	
Ticketing system is searchable.	
Web site has site map or index.	
Web site has search facility.	
Project resources are hosted externally to a single organisation/institution in a sustainable third-party repository (e.g. SourceForge, GoogleCode, LaunchPad, GitHub) which will live beyond the lifetime of the current project.	
E-mail archives or ticketing system shows that queries are responded to within a week (not necessarily fixed, but at least looked at and a decision taken as to their priority).	
If there is a blog, is it is regularly used.	
E-mail lists or forums, if present, have regular posts.	

Analysability How straightforward is it to analyse the software's source release to: • To understand its implementation architecture? • To understand individual source code files and how they fit into the implementation architecture?	**Yes/No, supporting comments if warranted**
Source code is structured into modules or packages.	
Source code structure relates clearly to the architecture or design.	
Project files for IDEs are provided.	
Source code repository is a revision control system.	
Structure of the source code repository and how this maps to the software's components is documented.	
Source releases are snapshots of the repository.	
Source code is commented.	
Source code comments are written in an API document generation mark-up language e.g. JavaDoc or Doxygen.	
Source code is laid out and indented well.	
Source code uses sensible class, package and variable names.	
There are no old source code files that should be handled by version control e.g. "SomeComponentOld.java".	
There is no commented out code.	

There are no TODOs in the code.	
Auto-generated source code is in separate directories from other source code.	
How to regenerate the auto-generated source code is documented.	
Coding standards are recommended by the project.	
Coding standards are required to be observed.	
Project-specific coding standards are consistent with community or generic coding standards (e.g. for C, Java, FORTRAN etc.).	

Changeability How straightforward is it to modify the software to: • Address issues? • Modify functionality? • Add new functionality?	**Yes/No, supporting comments if warranted**
Project has defined a contributions policy.	
Contributions policy is publicly available.	
Contributors retain copyright/IP of their contributions.	
Users, user-developers and developers who are not project members can contribute.	
Project has defined a stability/deprecation policy for components, APIs etc.	
Stability/deprecation policy is publicly available.	
Releases document deprecated components/APIs in that release.	
Releases document removed/changed components/APIs in that release.	
Changes in the source code repository are e-mailed to a mailing list.	
This e-mailing list can be subscribed to by anyone.	

Evolvability To what extent will the product be developed in the future: • For a future release? • Within a roadmap for the product?	**Yes/No, supporting comments if warranted**
Web site describes project roadmap or plans or milestones (either on a web page or within a ticketing system).	
Web site describes how project is funded/sustained.	
Web site describes end dates of current funding lines.	

Interoperability To what extent does the software's interoperability: • Meet appropriate open standards? • Function with required third-party components? • Function with optional third-party components?	**Yes/No, supporting comments if warranted**
Uses open standards.	
Uses mature, ratified, non-draft open standards.	
Provides tests demonstrating compliance to open standards.	