



D8.2 Market Survey Report

V2.5

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Definition of the key terms	
Market survey	An investigation into the state of the market for a particular product or service, including an analysis of consumers' needs and preferences
Sample	Subset of the population
Sampling frame	Survey's population
Sampling strategy	Description of the steps to be followed for sampling and recruiting individuals
Search plan	Description of how search units will be systematically retrieved from a source of sampling and evaluated to compose the sampling frame
Search unit	Characterises how one or more units of observation can be retrieved from a specific source of sampling
Source of sampling	Database (automated or not) which valid subpopulations of the target audience can be systematically retrieved and randomly sampled
Target audience	The members of the population who are potential participants of the survey
Unit of observation	It is the individuals answering the survey

Abbreviations	
CRO	Chief Research Officer
CTO	Chief Technology Officer
CSO	Chief Science Officer



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Executive summary

This deliverable provides the design of the market survey to be conducted to identify market opportunities and Q-Rapids potential adopters, gathering early feedback from them.

In its first version (v1.0, M6), it included the protocol used for the survey design and the final version of the questionnaire.

In the second version (v2.0, M12) we included the analysis of the results obtained at end of October 2017. Although there is no version scheduled until M24 (October 2018), we revised the content in order to include the analysis of the results obtained at month M15 (January 2018). This analysis was used as an input for the deliverable *D8.3 - Analysis of the Opportunities* scheduled and delivered at the end of M15 (January 2018).



1 Introduction

1.1 Motivation

This document presents the design of the market survey to be conducted to understand the opportunities that the current state of the practice brings and thus identify potential Q-Rapids adopters by gathering early feedback from them. Its motivation stems from the need of including them in the future dissemination and exploitation events as well as to identify the potential stakeholders for the Q-Rapids open community. The survey will be opened in May 2017, and the results will be included in updates of this document.

1.2 Intended audience

This document is classified as “public”. Therefore, the audience is not restricted to the partners’ staff who participate in the project and the Commission Services, remarkably the Project Officer and reviewers assigned to Q-Rapids. Instead, it is open to the general public.

1.3 Scope

The scope of this document is the full Q-Rapids project, concretely for WP8 tasks along its entire timeline starting at M7.

1.4 Relation to other deliverables

This deliverable is not directly related to any other, but it impacts all deliverables of WP8 as explained next. The plan for this deliverable was included in deliverable *D8.1 – Exploitation and innovation plan* (M3). Information about potential adopters can be used in the exploitation events. The analysis of the answers will help to identify relevant stakeholders for the deliverable *D8.3 - Analysis of opportunities*. The relevant stakeholders are also needed for the deliverable *D8.7- Q-Rapids community*.

1.5 Structure of the deliverable

This deliverable is organized into the following sections. Section 2 presents the methodology followed in the survey design. Section 3 describe the research objectives leading the questionnaire design. Section 4 defines the survey target audience. Section 5 defines the protocol followed to identify the potential participants. Section 6 and Section 7 describe the questionnaire design and implementation. Section 8 includes the description of the validation threats taken into account in the design. Section 9 includes the analysis of the results for the answers at end of October 2017.

The complete questionnaire is included in Annex A. Annex B includes the invitation letter used for the questions pilot. In Annex C we included the poster we use to disseminate the survey. Annexes from D to G include some detailed analysis complementing the results section (Section 9).



2 Methodology

Conducting a survey is a complex activity that is endangered by many factors. Therefore, several authors have proposed methodologies with well-defined steps and protocols to reduce the likelihood of such dangers. In this market survey, we have adopted the methodology proposed by Kasunic [Kasunic 2005] that organises the process for designing a questionnaire-based survey around seven steps:

- Identify the research objectives.
- Identify and characterise the target audience.
- Design the sampling plan.
- Design and write the questionnaire.
- Pilot the questionnaire.
- Distribute the questionnaire.
- Analyse the results and write the report.

These steps are elaborated in the next sections. The extent to which these steps are covered will change as the deliverable undergoes through updates.

3 Research Objectives

The aim of this market study is to gather early feedback from potential Q-Rapids adopters. As we are in the initial phase of the project, we plan two stages to survey the market, using a different instrument in each one. At the first stage, the purpose is to conduct a short, generalist survey, which allow us to gather information about the acceptance of the project ideas to identify potential adopters/users and the critical points of the project. When the project has tangible results, the purpose is to conduct a more detailed survey about the concrete project outcomes.

We designed the objectives of this survey based on to the Oxford dictionary definition; a market study is “An investigation into the state of the market for a particular product or service, including an analysis of consumers’ needs and preferences”. Therefore, we are not going to use it for discovering market segments.

The objectives addressed at the first stage are:

- O1: To understand the current way of working of potential Q-Rapids adopters.
- O2: To understand the level of interest towards the project results.
- O3: To understand the level of interest towards the emergence of a Q-Rapids open community.
- O4: To identify the deployment and licensing models (not addressed in v1.0).

The first objective is meant to gather information about the state of the market, including the consumers’ needs and preferences. The second and the third are meant to gather information about the interest of the consumers of becoming users of the project results. Concretely, the second aims to know if the project is aligned to their needs and the third to identify potential users and collaborators on Q-Rapids artefacts.

To refine these goals, we use the GQM⁺ strategy method [Basili-et-al 2007]. This method describes goals in terms of *purpose*, *focus*, *object*, *viewpoint*, and *context*. Using it, the following sentence can be eventually formed: Analyse *object* for the purpose of *purpose* with respect to *focus* from the point of view of *viewpoint* in the context of *context*.

For each objective identified in this section, the subsequent subsections detail the refined goals using the GQM⁺ template. The goals in GQM⁺ are described to develop a quality model. In this market survey, the purpose is not the same, so we use a variant for the values for purpose: instead of GQM⁺ values (Specify, Measure, Assess, Improve, Estimate, Monitor, Control, Manage and Predict) we use Identify and Validate.



3.1.1 Current way of working (O1)

Table 1 Goal: Identify current use & satisfaction of data gathering

Purpose	Identify	Focus	Current use & satisfaction
Object	Data gathered from participants' project and processes		
Viewpoint	Top Management, Product Manager, Product Owner		
Context	Evidence-based strategic decisions		

Table 2 Goal: Identify current use & satisfaction of quality management processes

Purpose	Identify	Focus	Current use & satisfaction
Object	Participants' processes/practices/tools		
Viewpoint	Top Management, Enterprise Architects, Product Manager, Product Owner, Risk Manager, Requirements Engineer, Software Developers		
Context	Managing quality processes		

Table 3 Goal: Identify current use & satisfaction of strategic decisions

Purpose	Identify	Focus	Current use & satisfaction
Object	Participants' processes/practices/tools		
Viewpoint	Top Management, Enterprise Architects, Product Manager, Product Owner, Risk Manager		
Context	Strategic decisions		

3.1.2 Project results (O2)

Table 4 Goal: Validate the project hypothesis definition

Purpose	Validate	Focus	Definition
Object	Project hypothesis		
Viewpoint	Top Management, Project Manager, Product Manager, Product Owner		
Context	Evidence-based strategic decisions and quality management		

Table 5 Goal: Identify the interest on automated data gathering

Purpose	Identify	Focus	Interest
Object	Unified automated data gathering artefacts		
Viewpoint	Top Management, Product Manager, Product Owner		
Context	Evidence-based strategic decisions		

Table 6 Goal: Identify the interest on the QR management processes

Purpose	Identify	Focus	Interest
Object	Improved QR management processes in the context of rapid/agile development		
Viewpoint	Top Management, Enterprise Architects, Product Manager, Product, Risk Manager, Requirements Engineer, Software Developers		
Context	Business processes definition		

Table 7 Goal: Identify interest on Strategic Dashboard

Purpose	Identify	Focus	Interest
Object	Strategic Dashboard Tool		
Viewpoint	Top Management, Enterprise Architects, Product Manager, Product Owner, Risk Manager		
Context	Strategic decisions		



3.1.3 Q-Rapids Open Community (O3 Identify current use & satisfaction of data gathering)

Table 8 Goal: Identify the interest on the Open Q-Rapids Community

Purpose	Identify	Focus	Interest
Object	Open Q-Rapids Community		
Viewpoint	Top Management, Enterprise Architects, Product Manager, Product Owner, Risk Manager		
Context	Participating on the community activities		

Table 9 Goal: Identify current Q-Rapids related communities

Purpose	Identify	Focus	Current
Object	Open Communities related to Q-Rapids		
Viewpoint	Top Management, Enterprise Architects, Product Manager, Product Owner, Risk Manager		
Context	Making relation to other communities		

3.1.4 Deployment and licensing models

Table 10 Goal: Identify possible options for tools deployment

Purpose	Identify	Focus	The possible options
Object	Dashboard deployment (including data gathering artefacts)		
Viewpoint	Top Management, IT Manager		
Context	Security of the automatic gathered data. Costs (hardware)		

Table 11 Goal: Identify possible options for tools license model

Purpose	Identify	Focus	The possible options
Object	Dashboard license model (including data gathering artefacts)		
Viewpoint	Top Management, IT Manager		
Context	Costs (maintenance)		

4 Target Audience

According to the detailed goal definition included in the previous section, the population is determined by the different roles described in the Viewpoint fields:

- Top Management referent to the technologies (CTO, CIO, CSO). These roles can recommend the organisation of the Q-Rapids tools for improving the processes in the company. Chief Research Officer (CRO) or Research Director and Chief Information Officer (CIO) could recommend the Q-Rapids products to be used in the company, the tool for supporting decisions and processes to improve the development process. The Chief Technology Officer could be interested in using the Q-Rapids tools and processes to improve the products of the organisation.
- Enterprise Architects. As responsible for the organisation's processes, they could be interested in the improved quality management processes.
- Product Managers. They could use the Q-Rapids tools to monitor the products quality and helping them to explore the possibilities to include new quality requirements in the products.
- Product Owners. They could use the Q-Rapids tools to support the requirements prioritisation.
- Requirements Engineer. They could use the Q-Rapids tools to manage the Quality Requirements, and the processes to improve the requirement management in agile/rapid software development processes.
- Software Developers. They could visualise the implication of their work at the strategic level.



5 Survey Design

5.1 Source of sampling, search unit and population

We will use a convenient sample, selecting individuals from the consortium members' network. The information about the selected individuals is not included in this deliverable for privacy issues. We complement this convenient sample providing open access to the survey to the groups of interest (search unit) included in the DoA: EU ITEA Framework, N4S (Need for Speed) Findland and the Q-Rapids account.

Complementing these groups, we will search potential groups of interest in LinkedIn groups (search unit: Groups) following the search plan described in Section 5.2.

After the design of the first version of the survey, included in the first version of this deliverable (v1.0), we decided only to open the survey to selected individuals from the consortium members' network. In an initial search of the candidate LinkedIn groups, we realised that the members profile was more technical. Therefore, we considered that this source of respondents could be more appropriate when the project has tangible results. Unit of observation and unit of analysis

The unit of observation is formed by the individuals answering the survey. We are going to gather the following information: organisation, role, contact information (name and email), experience in rapid/agile software development processes and experience in requirements management. We also included a question to characterise the organisation software development process. All the fields are optional.

5.2 Search Plan

In order to maximise the target communities, we complement the source of sampling defined in Section 5.1 with a search in the LinkedIn groups [deMello-et-at 2015] that can be related to the Q-Rapids areas. The search question for establishing the sampling frame is: "Which are the groups from LinkedIn on decision-making related to software quality?".

5.2.1 Search string

We will use the following list of terms:

"strategic decision" OR "performance management" OR "performance measurement" OR "dashboard"
--

We will search each term separately and retrieve the following information: Name, Description and number of members. In an initial test, we gathered the following numbers:

- "strategic decision": 31 groups.
- "performance management": 1121 groups.
- "performance measurement": 75 groups.
- "dashboard": 148 groups.

5.2.2 Exclusion Criteria

We will organise the group selection into two steps. The first step is meant to select the groups using the gathered information from the search (name, description and number of members), applying the following exclusion criteria [deMello-et-at 2015]:

- focused on promoting specific organizations, or provided by them, not to disseminate specific events;
- description vague or out of the scope of the search question;
- less than 10 members;
- driven to headhunting and job offering;
- represents LinkedIn' subgroups, since the sampling frame must be composed by groups of interest;



- non-English language, since English is default in international forums.

In the second step, we will check the group's rules and a sample of its members to:

- exclude groups that explicitly prohibits the execution of studies;
- exclude groups where the members do not correspond to the survey target audience (see Section 4).

5.3 Instrumentation

A Q-Rapids researcher will send a subscription request. If accepted, a message will be post in the group to ask for participation, including a recruiting message and the survey URL.

To support the dissemination of the survey, we designed a poster to be used in some dissemination and exploitation events (see Annex C).

6 Questionnaire Design

6.1 Questions Design

Making the questionnaire attractive to the potential respondents is an important challenge. Dilman et al. [Dilman-et-at 2014] give some indications related to different aspects to be considered when designing an electronic survey:

- Have a clear idea regarding what to measure. The questions will be designed following the survey objectives described in Section 3.
- The type of information to gather. There are some types of questions easier to answer, for example the age. On the contrary, questions asking for opinion have more difficulty because the respondent is not prepared for them and the context can influence in the answer.
- Taking special attention if the survey needs information from the past. This survey does not include this kind of questions.
- Considering the "Social desirability". We need to avoid questions that lead the respondent to answer the most "social desirable" instead of his/her desires. In this survey, if we were asking simply if the respondent wants to use a tool to get better quality software, s/he could be tempted to answer affirmatively regardless of his/her real interest in such tool.
- Acquiescence. People tend to agree with the interviewer.
- Questions type. Open-ended questions are not appropriate for mobile devices (e.g. mobile phones).
- Avoid "if" statements: ask only if the respondent can answer. It is better splitting the question into two, in the first one asking for the needed characteristic, and only if the answer is affirmative, the second question is presented.
- Ask one question at a time; avoid complex questions asking more than one thing.

6.2 Questions

Besides the specific questions surveying about the survey objectives, there will be an initial set of questions to gather information about the respondent, and a final open question meant to gather any comment that the participant wants to include.

Inspired by the GQM⁺ approach [Basili-et-al 2007], for each objective, we defined the set of questions that would help us to know if it is achieved (Section 3). In this case, we are asking for the respondent opinion. Please note that we are not trying to measure concrete objects, in other words we are not going to define metrics. The following subsections define the information needed to fulfil the research objectives; the final set of questions is documented in Section 7 (Survey Implementation).



6.2.1 Current way of working (O1)

Gathering information related the following objectives:

- O1.1: Identify the *current use* and the *satisfaction level* of data gathered from project and processes in the strategic decisions
 - Identify the current use of data gathered
 - Identity the satisfaction level of the current data gathered
- O1.2: Identify the *current processes/practices* and *tools* for quality management and their *satisfaction level*
 - Identify the current processes/practices
 - Identify the satisfaction level of the current processes/practices
 - Identify the current tools
 - Identify the satisfaction level of the current tools
- O1.3: Identify *current processes/practices* and *tools* for taking strategic decisions and their *satisfaction level*
 - Identify the current processes/practices
 - Identify the satisfaction level of the current processes/practices
 - Identify the current tools
 - Identify the satisfaction level of the current tools

6.2.2 Q-Rapids Ideas and Results (O2)

Gathering information related the following objectives:

- O2.1: Validate the project hypothesis about evidence-based strategic decisions and quality management (not at this stage)
- O2.2: Identify the *interest in unified automated data gathering* artefacts to support evidence-based strategic decisions
 - Identify the different data sources
 - Interest in using automatic data gathered tools
- O2.3: Identify the *interest on improved QR management processes* in the context of rapid/agile software development processes
 - Identify the interest of using the quality management processes
- O2.4: Identify the *interest on a Strategic Dashboard Tool* that uses automatic data to support strategic decisions
 - Identify the most used strategic indicators
 - Identify the interest of using the Strategic Dashboard

6.2.2.1 Strategic Indicators

In order to gather information about the most used strategic indicators (O2.4), we followed a conductive approach. Instead of having an open question asking the most used strategic indicators, the survey shows a list of possible strategic indicators to be ranked by the respondent. The strategic indicators included in the survey are: Time-to-market, Maintenance costs, Customer/user satisfaction, Business value, Reactiveness to changes, Productivity, Software quality, Predictability, Project visibility, and Project risk.

This list has been gathered from different sources. We used the 10th annual state of agile report¹ (10AR) and the use cases (UC). From the 10AR, we selected some of the agile success and metrics identified for

¹ <https://versionone.com/pdf/VersionOne-10th-Annual-State-of-Agile-Report.pdf>



how is success measured with agile initiatives? (10AR-Met) and some of the improvements from implementing agile (10AR-Imp).

Table 12. Strategic Indicators candidate list

	Measuring Success	Improvement	UC	UC	UC	UC
Delivery on time	X		X		X	
Product quality	X	X	X		X	X
Customer/user satisfaction	X		X	X	X	X
Business/Product Value	X		X		X	
Productivity	X	X	X		X	X
Project Visibility	X	X				X
Predictability (estimations accuracy)	X	X		X		
Process Improvement	X		X			
Reactiveness to changes (ability to manage changing priorities)		X				
Time to market (faster)		X	X		X	
Team morale		X				
Project Risk		X				
Improved Business/IT alignment		X				
Maintainability		X				X
Distributed teams management		X				
Product Cost			X			X
Customization/Reusability			X	X		
Security			X			
Development Time (related to time-to-market)			X			
Time to production (related to time-to-market)				X		
Usage understandability						X
Testability/Testing Coverage (related to Quality)					X	X
Robustness (related to Quality)						X
Non-Regression (related to Quality)						X
Consistency						X
Stability (related to Quality)						X
Reliability (related to Quality)					X	X
Efficiency (related to productivity)					X	
Process Quality					X	
Requirements Reliability					X	
Knowledge sharing/Common understanding				X		

We dismissed some options because we considered that they are too technical (Maintainability - 10AR-Imp, Reusability from UC) or too vague (Team morale and distributed teams management from 10AR-Imp). We also dismiss on-time delivery from 10AR-Met to avoid confusions with time-to-market from 10-Imp.

6.2.3 Q-Rapids Open Community (O3)

Gathering information related to the following objectives:

- O3.1 Identify the *interest on a potential Open Q-Rapids Community*



- Identify stakeholders interested in receiving information about the Q-Rapids results
- Identify stakeholders interested in participating in the community
- O3.2 Identify the *current Open Communities related to Q-Rapids related*
 - Identify current communities measuring software quality
 - Identify current communities managing quality in software development processes

6.2.4 Deployment and License Model (O4)

Not for the initial stage

6.3 Piloting the Questionnaire

The first version included 39 questions to gather detailed information for each research objective. This number is not considering the initial questions for characterizing the respondent and the final open question. After an internal pilot (inside WP8), we decided that we needed to shorten the questionnaire down to around 20 questions. We made the following changes:

- In general, we gave priority to know the current way of working in front of the level of satisfaction.
- For strategic decisions (O1.3), we gave priority to know the current tools in front of the current processes/practices.
- We dismissed some of the objectives that can be included in future surveys. In particular, we removed the questions related to gathering information to validate the project hypothesis (O2.1).
- We reordered the questions. In the first version, we grouped the questions following the order of the research objectives defined in Section 3. For each objective, we included questions related to the three project results (dashboard, data gathering and processes). We realised that we were asking for the same project result twice. The final version groups the questions by project results.

After the internal pilot phase, we had a set of 23 questions in an optimised distribution. We used this new version to conduct a second round of piloting inside the consortium. It was made by the scientific work package leaders (or their representatives), to review that we had the right questions, and by the dissemination leader. As a result of the second piloting, we needed to replace and add some questions with a new version containing 26 questions.

We finally, performed a third pilot (from May 10th to May 15th) before we had the final version of the survey. We involved two set of people:

- Inside the consortium. We asked at least one person in each industrial partner to answer the questionnaire.
- Convenient sample. We selected two people from our local network that were not aware about the project. We needed to check that the questionnaire was understandable for people not involved in the project.

This third piloting was performed answering the electronic version of the survey (see next section). In order to gather feedback, we asked the respondents to take notes as: when they don't understand a question, when some option is missing, if they are uncomfortable answering something, too long questionnaire, etc. We send the invitation letter included in the Annex B.

We get feedback from six people, five from the consortium and one from outside the consortium. We made the following changes:

- We changed the 5-likert scale values from 1 (very much) to 5 (none) to 1 (none) to 5 (very much)
- We rephrase all the sentences starting by "To what extent do you consider the following XXX is affecting YYY" for more direct questions like "How much XXX affect the YYY?"



One of the respondents pointed out that we did not included information regarding the data processing protocol and data protection. We included a paragraph related to the personal data protection law that applies and a link to the detailed information at UPC:

- “In accordance with the provisions of Spanish Organic Law 15/1999, of December 13 on Personal Data Protection, you are informed that your personal data collected by this form will be processed and stored in the file "Research"¹ owned and controlled by the UPC to carry out a proper management of the research for the Q-Rapids Framework definition and for inform you about the results of this survey. This data will not be shared with any organization outside the Q-Rapids project. By answering this survey, you accept this privacy policy. Likewise, you may exercise the right to access, rectify, cancel or object to the personal details collected and stored by the UPC by writing to the email: grapids@essi.upc.edu”
- ¹<https://www.upc.edu/normatives/ca/proteccio-de-dades/fitxers-i-finalitats-daquests/recerca/recerca>

7 Survey Implementation

We implemented the survey using the LimeSurvey tool, an Open Source Software for developing professional online surveys (<https://www.limesurvey.org/>).

It was implemented and deployed at the UPC servers, at the following URL:

<http://www.essi.upc.edu/~e-survey/index.php?sid=38773&lang=en>

It is also accessible through the Q-Rapids website, there is a direct link in the *Home* and *Contact* pages:

www.q-rapids.eu/market-survey

The survey is organised into eight pages:

1. A welcoming page, introducing the questionnaire.
2. Respondent characterization (demographics).
3. Strategic Dashboard: questions gathering information about the current way of working (O1.1) and the interest in the project results (O2.1).
4. Data Gathering: questions gathering information about the current way of working (O1.2) and the interest in the project results (O2.3).
5. Relationship between Strategic Indicators and Data Sources.
6. Quality Management Processes: questions gathering information about the current way of working (O1.3) and the interest in the project results (O2.3).
7. Q-Rapids Open Community: questions gathering information about the interest on participating in the open community we aim to create around the project (O3.1) and potential current communities that can be related with ours (O3.2).
8. Closing.

The full set of questions are included in Annex A.

8 Threats to Validity

8.1 Specification Error

In order to assure that we are asking what we needed, we defined the concrete set of goals to identify the concepts of interest. This helped us to have a specific idea of what we wanted to measure, minimising the



fact that we can forget some questions and we are sure that the questions we have are measuring the concepts we wanted to measure (GQM⁺ approach).

8.2 Questions understandability

To minimise the understandability problem, we present first the questions related to the project results that includes some examples that could lead the respondents to think only in these examples. Initially, we considered the inverse order to avoid the respondent answer only about the examples. However, as some of the concepts are related to high-level decisions, the questions can be difficult to understand, thus we decided that giving the respondents some examples first would help them to better understand the questions.

8.3 Project bias

To minimise the bias that could have introduced by the knowledge we have about the project, we included in the piloting phase some people from outside the project consortium without any knowledge of the project. We needed to check if the questions were self-explanatory and the vocabulary used was the right one. If we only had piloted the questionnaire inside the consortium, we would not know if the people piloting the questionnaire understood the questions because we used the same vocabulary used in the proposal and in the meetings during this period.

9 Result Analysis

The survey has been open (i.e., accepting responses) since July 2017 until end of December 2017. During this period, we received 34 answers (21 full responses and 13 incomplete answers). This section included the analysis based on the data on January 8th, 2018.

Combining the fact that we have incomplete answers and none of the questions are mandatory, not always the sum of the different answers for a question is 34.

9.1 Respondent characterization

Regarding the experience in rapid/agile software development, most of the respondents (47.6%) have more than 7 years of experience.

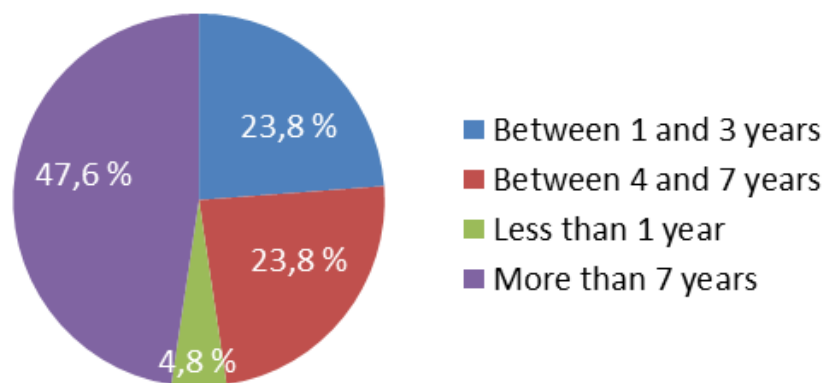


Figure 1. Experience in rapid/agile software development

Regarding the experience in requirements management, roughly half of the respondents had more than 6 years of experience (47.7%). Contrary, 19% of respondents had little experience varying from range 1 to 5 years and 28.6% less than 1 year.

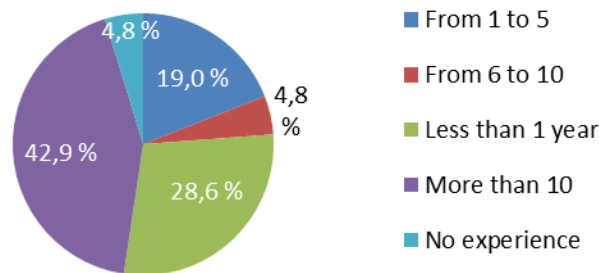


Figure 2. Experience in requirement management

Two-thirds of the respondents (66.7%) use an exclusive development methodology responding negatively to the question related to using a mixed methodology. 61.9% of the respondents consider that they use agile methodologies whereas few (4.8%) consider that they are using waterfall.

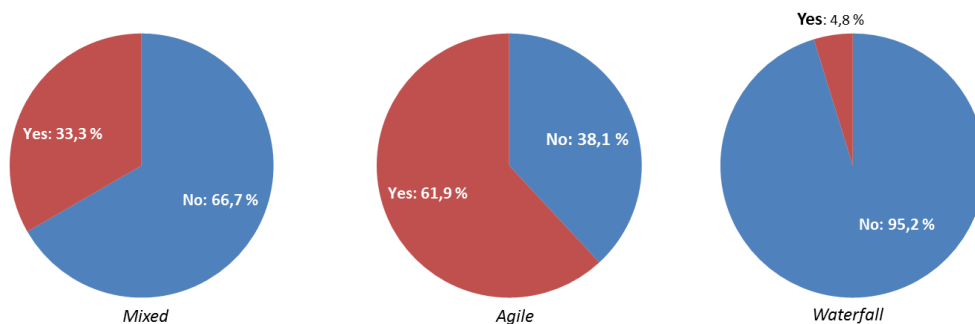


Figure 3. How would you describe your software development process? (Mix of waterfall and agile)

To the options given for certain development methodologies, more than half of respondents use an agile methodology or DevOps. Only one respondent (4.8%) selected the option "Others", specifying "Firm-specific agile and incremental)"

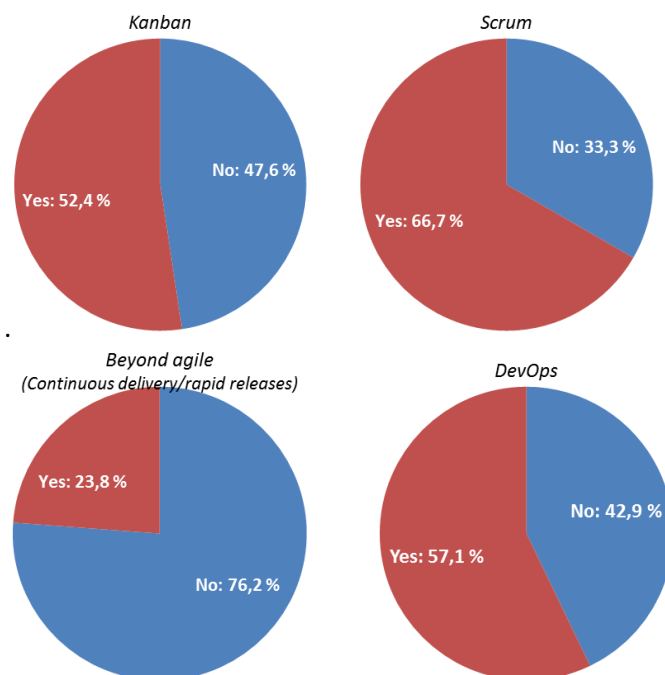


Figure 4. How would you describe your software development process?



Although the respondents are not using mixed methodologies when we asked for mixing agile and waterfall, the answers related to agile/rapid concrete methodologies show that they use mixed agile/rapid methodologies. The majority uses more than one agile/rapid methodology (64%), 32% of them mixes three methodologies. It is worth to mention that four respondents (18%) selected all the agile/rapids options provided. The following figure shows the number of respondents (y-axis) using one, two, three or four methodologies (x-axis).

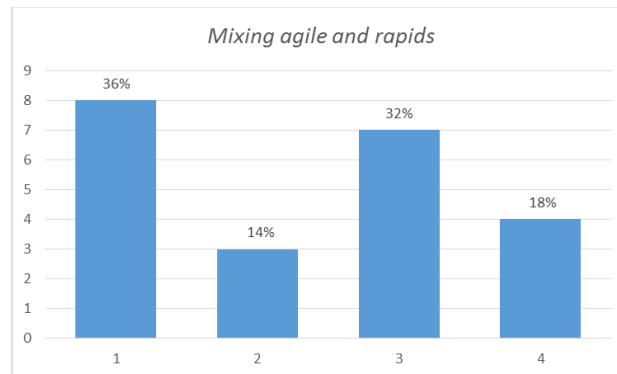


Figure 5. How would you describe your software development process? (Mixing agile/rapids options)

Table 13 includes the details about which methodologies have been combined. The most used methodology is Scrum (37.2%), followed by Kanban (23.5%), and DevOps (27.4%).

Table 13. Combining agile/rapids software development methodologies

Kanban	Scrum	Continuous delivery/Rapid releases	DevOps	
		X		1
	X			1
X	X	X	X	4
X	X		X	3
X				1
X	X		X	3
	X		X	2
X	X	X	X	4
	X			1
X	X		X	3
X	X	X	X	4
X	X		X	3
	X		X	2
X	X	X	X	4
X	X		X	3
X	X		X	3
	X			1
	X			1
	X			1
	X		X	2
	X	X	X	3
X				1
12	19	6	14	



As a summary of current way of working over 95% of the respondents are using agile/rapid software development processes. Over 70% of respondents have used rapid/agile software development practises over four years. For agile/rapid software development, Scrum (some 67%), DevOps (57%), and Kanban (52%) are used as methods the most. The share of mixed waterfall and agile methods is low (33%). Few of respondents see their companies using so far continuous delivery/ rapid release models (25 %). Only 5 % of respondents are using firm-specific agile and incremental practises.

9.2 Strategic Dashboard

9.2.1 Current way of working (O1.1)

All the strategic indicators included in the survey are considered affected by the software and process quality. Most of them (Time-to-market, Maintenance costs, Customer/user satisfaction, Business value, Reactiveness to changes, Productivity, Software quality, Predictability, Project visibility, and Project risk) are considered positively (from “somehow” to “very much”). An ordinal scale included five ordered options: *Marginally, Slightly, Somehow, Significantly, and Very much*).

Table 14. How much does software and development process quality affect the following strategic indicators?

	Somehow or more	Significantly or more	Very much
Time-to-market	23	20	7
Maintenance costs	25	21	9
Customer/user satisfaction	25	21	5
Business value	24	19	4
Reactiveness to changes	24	18	4
Productivity	24	20	6
Software quality	24	22	12
Predictability	23	15	3
Project visibility	22	17	3
Project risk	22	18	3

Half of the respondents have a dashboard and they use it (50%), these tools have been in-house developed. One has a tool that he or she does not use, and two do not use any tool.

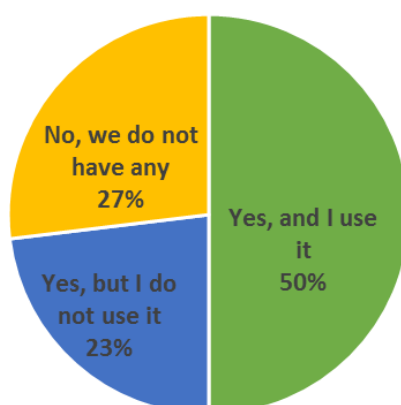


Figure 6. Do you have a Dashboard tool?

From the respondents having and using a dashboard or a tool that supports their decisions, JIRA was mentioned directly all with the combinations with other tools or practices more than half of the respondents, on the other hand in-house tools were mentioned by some 24% of the respondents and Trello by some 14%.

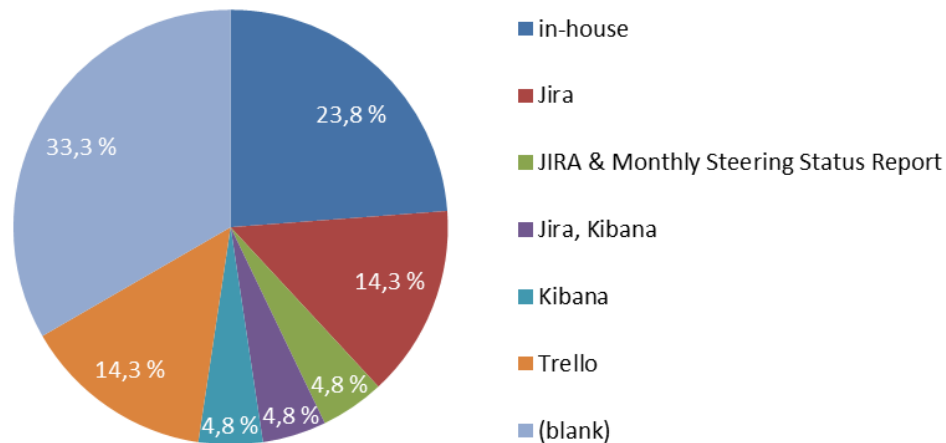


Figure 7. Which tool (please write "in-house" if it is a software produced in-house)?

Majority of the respondents (some 57%) are not mentioning any TOP3 functionality, however rest of the answers were divided equally within the practises being mentioned.

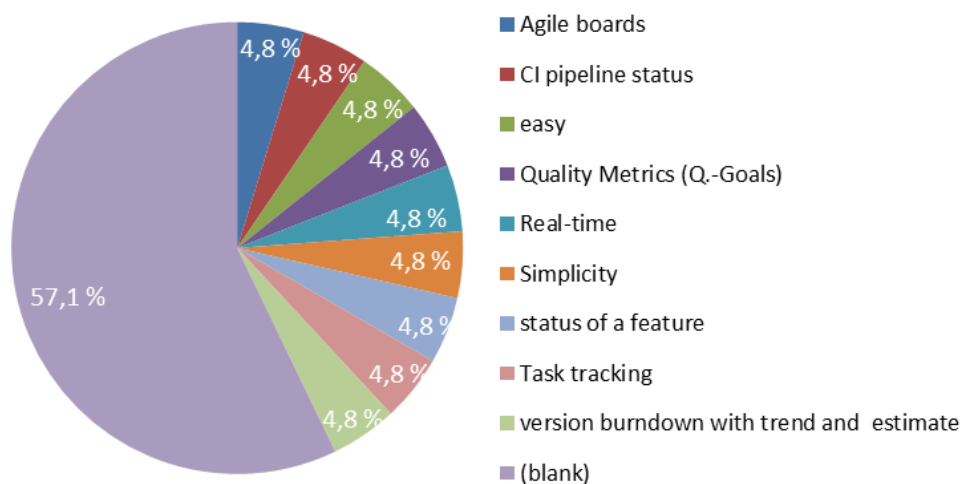


Figure 8. Which are the TOP3 functionalities of this tool that you use more frequently?

9.2.2 Interest in the project results (O2.1)

Most of the respondents could be interested in the Q-Rapids dashboard. Half of the respondents already has some tool supporting their decisions. Finally, for those respondents not having any tool, four out the six (66,6%) would like to have one.

9.3 Data Gathering

9.3.1 Current way of working (O1.2)

All the data sources included in the survey are affecting the strategic indicators. The data sources having more impact are *issue tracker systems, product behaviour, quality of service, and test tools*, being characterised mostly as "very much" (in an ordinal scale of *Marginally, Slightly, Somehow, Significantly, and Very much*). The data sources considered as "somehow" affecting are *software code repositories, project management tools, product usage, and static code analysis*. The least considered sources, characterised as "marginally" or "slightly", are documentation systems and communication tools. Annex D included detailed



information for each of the data sources regarding the impact degree and some examples of possible data from this type of data source that could be used.

Regarding the way they currently gather data, almost all the respondents (92%) gather data automatically and manually. The organizations gathering most of the data automatically (54%) are greater than gathering data manually (38%). Organizations gathering all the data automatically and do not gathering data at all are marginal (8% in total).

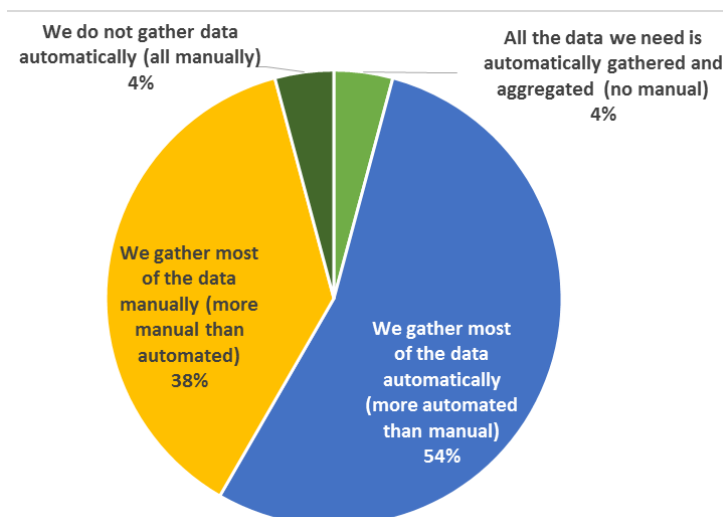


Figure 9. How the data is gathered in the organizations?

Any respondent provided any data source not related to the tools included explicitly in the survey.

9.3.2 Interest in the project results (O2.3)

We do not include explicitly any question asking for the interest of the data gathering, but the answers related to their way of working (previous section) confirm that their current way of working is aligned to the data sources we are taking into account in the project.

9.4 Relationship between Strategic Indicators and Data Sources.

One of the tasks of the project is connecting the data sources with the strategic indicators. We will use the answers for this question to check if our findings fit with the practitioner's expectations.

Table 15 includes the aggregation of the all the answers. According to this table, almost all the data sources seems to be useful for all the strategic indicators in some way. The data source that seems to be more useful is issue tracker systems, followed by project management tools and test tools. The less useful are documentation systems and communication tools. The only combinations that do not have any vote (marked in red) are documentation systems for assessing time-to-market, software code repositories for assessing customer/user satisfaction, and static code analysis for assessing business value.



Table 15. Results analysis: Data sources used for measuring strategic indicators

	Sofw. code rep.	Issue tracker systems	Project mng. tools	Product usage	Product behaviour	Quality of Service	Static code anal.	Docum. system	Comm. tools	Test tool
Time-to-market	4	11	14	4	4	1	4	0	1	11
Maintenance costs	8	12	7	2	2	4	4	4	1	10
Customer/user satisfaction	0	9	2	13	15	12	1	2	7	4
Business value	2	1	7	12	9	8	0	1	2	1
Reactivity to changes	5	8	8	3	4	1	2	4	4	10
Productivity	9	11	14	1	2	2	4	4	5	9
Predictability	3	5	10	3	2	2	1	3	2	6
Software quality	8	15	1	3	4	7	14	6	1	18
Project visibility	2	12	13	1	1	2	1	5	6	6
Project risk	2	13	10	4	3	3	4	1	1	11
	43	97	86	46	46	42	35	30	30	86

9.5 Quality Management Processes

9.5.1 Current way of working (O1.3)

In the following questions the factors of importance for management of the quality requirements was addressed from several points of view. Next table represents the answers and the factors addressed followed by the detailed pies of the answers.

The more important topic for management of quality requirements is *“The quality requirements get hidden in the development process (i.e. lack of transparency related to quality requirements)”*, where the 76% of the respondents select very much or significance as the important topics for quality requirements. Followed by *“The lack of focus on quality requirements has negative impact later on”*, with the 71%.

The less important topics are *“The quality requirements are difficult to implement together with functional requirements”*, rated as slightly or marginally by the 38% of the respondents. Followed by *“Quality requirements have no priority in development process”* and *“Quality requirements are difficult to communicate”*, both rated by the 33.3% of the respondents.

Annex E includes detailed information about the concrete answers for each topic.



Table 16. Factors of importance for quality requirements management

Factor of importance	Significant & very much	Marginally & slightly	Conclusion
It is difficult to see the value of quality requirements	43,3 %	23,8 %	Statement applies, but not strongly
Quality requirements are difficult to identify/specify	47,7 %	14,3 %	Statement applies, however share of somehow answers high
Quality requirements are difficult to communicate	23,8 %	33,3 %	Statement does not apply
Unclear requirements to manage quality requirements	52,4 %	9,6 %	Clear statement, however share of somehow answers high
Quality requirements are too abstract (and hard to understand)	38 %	19 %	Statement applies, share of somehow answers highest
Quality requirements are too implicit (and not made explicit)	47,6 %	23,8 %	Statement applies, however share of somehow answers high
Quality requirements have no priority in development process	51,4 %	33,3 %	Statement applies, however share of marginal and slightly 1/3 rd
The lack of focus on quality requirements has negative impact later on	71,5 %	4,8 %	Statement applies clearly
The quality requirements get hidden in the development process (i.e. lack of transparency related to quality requirements)	76,2 %	14,3 %	Statement applies clearly
The quality requirements are difficult to implement together with functional requirements	28,5 %	38,1 %	Statement applies marginally, share of somehow answers very high
The quality requirements are difficult to test / validate	42,9 %	14,3 %	Statement applies, however share of somehow answers high
The customer does not know what quality requirements they want	66,7 %	9,5 %	Statement applies clearly
The customer demand quality requirements that cannot be fulfilled	33,4 %	28,5 %	Statement applies marginally, share of somehow answers highest
Missing documentation / instructions for managing quality requirements	33,4%	14,3%	Statement applies marginally, share of somehow answers very high

Most of the respondents follow some kind of requirements management process (76,2%), systematic and well defined or ad-hoc processes. Only one respondent select the "Others" option, detailing that "We have firm-specific practices that are not ad-hoc/unstructured, but don't necessarily follow any specific commonly-known methodology".

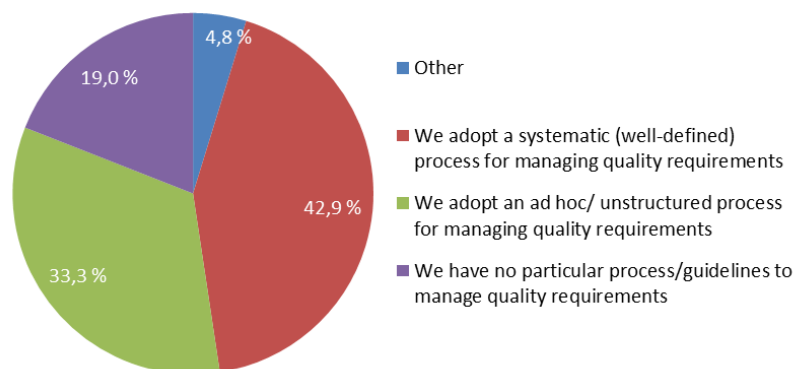


Figure 10. Which statement describes better the quality requirement management in your software development process?



17 includes all the activities reported as important and missing in the processes adopted by organizations in their quality requirements management. Annex F contains the details about how these activities have been rated.

Table 17. Could you briefly describe the TOP 3 most important/missing activities you use for managing quality requirements?

Important Activities	Missing Activities
Definition of quality goals	Planning
Definition of metrics for QG	Control
Continuous tracking of these metrics	Assurance
Review	Real time tracking and trend to understand if development is on track to complete on time and budget with the agreed content of the SW increment
Prioritization	Categorisation for quality requirements to understand the effects of them
Scheduling/planning	Clear analysis and comparison to data of previous project/products
handle those same way than other requirements	time and money to do things well
requirements analysis	people who take pride in their work
lessons learned from previous projects	Having the product's User eXperience designed by an expert
customer feedback	Allocating a fixed time slot for code maintenance.
Communicate	Providing traceability for business decision motivators.
Test	Make quality requirements explicit
Document	Somehow structure the process a little, but keeping it agile enough
User feedback from in-house usage	Proper test data
Code reviews and manual tests before new functionality deployment	
Adding detected error logs to the backlog	
Automated tests to assess some quality requirements	
Continuous customer feedback to assess quality problems early	
Product and log monitoring to detect quality problems early	
Make performance testing always	

Regarding the management of the functional and non-functional requirements, the majority of the respondents manage functional and non-functional together. Only one respondent selected the option "Others", detailing that *"Depends on the quality attribute. Some of them are cross-cutting and, hence, managed separately. Others are specific to a functionality and managed as part of it"*.

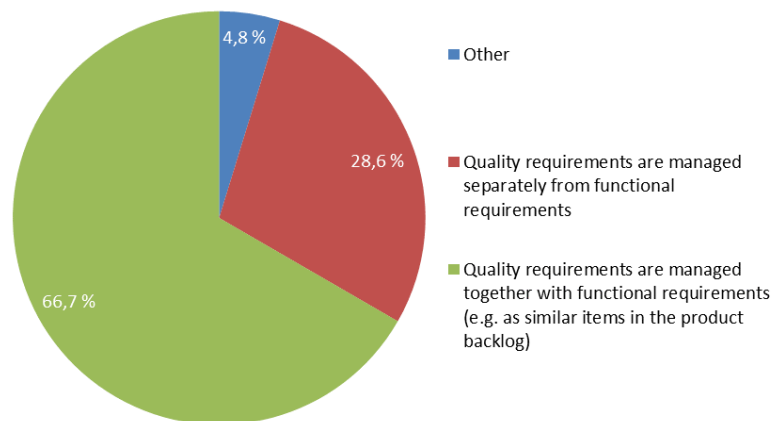
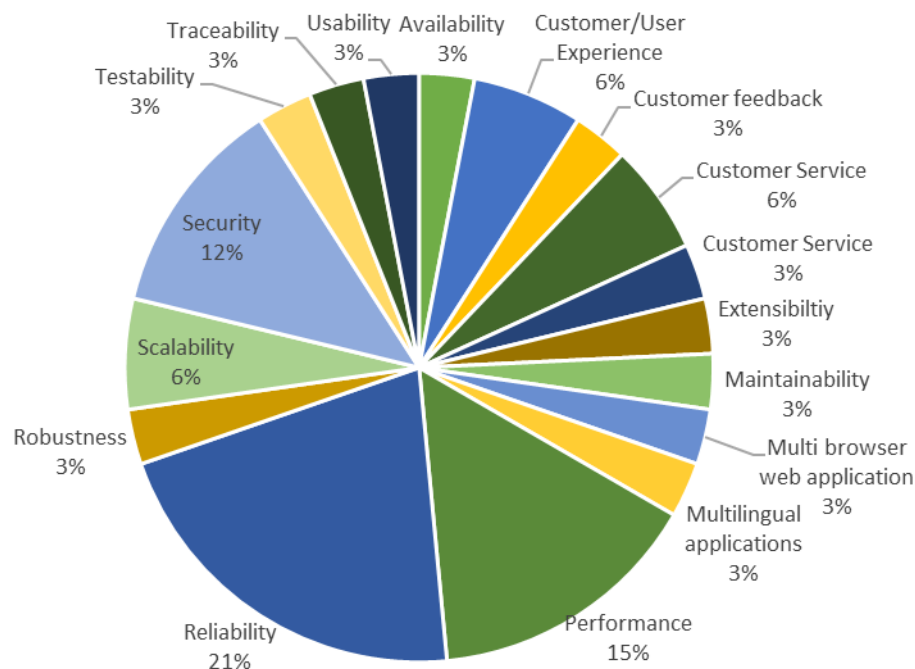


Figure 11. Which statement describes better the quality requirements management in your software development process?

The quality requirements more reported are reliability (21%), performance (15%), and security (12%). Customer/user experience, customer service, and scalability have been mentioned twice (6%). The rest have been mentioned once (3%). The following chart includes a summary of the quality requirements reported by the respondents. In order to aggregate the data, we suit up some of the respondent's answers, e.g. renaming "Key performance indicators reached" and "Fast web application response" by Performance. We also remove some of the answer, e.g. "error statistics". The exact naming and rates are detailed in Annex G.



Related to the quality requirements management, there is a similar number for respondents considering that sometimes (42,9%) or very often (38,1%) the functionality is more important than quality.

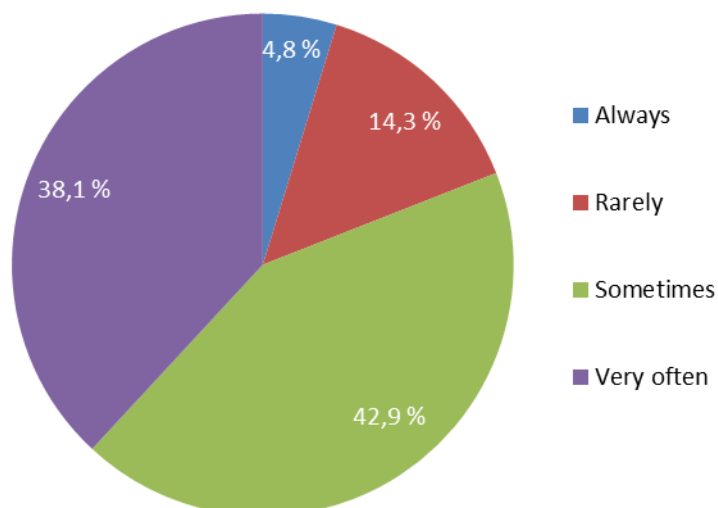


Figure 12. Functionality is first, quality comes later on - To what extent are the following statements true for your organization/department/team?

The following charts detail the answers relate to the difficulty of management quality requirements. We asked the respondents if the quality management is difficult (chart of the left) and if it is easy (chart on the right). We get similar numbers saying that sometimes is difficult (71,4 %) and sometimes is easy (61,9 %).

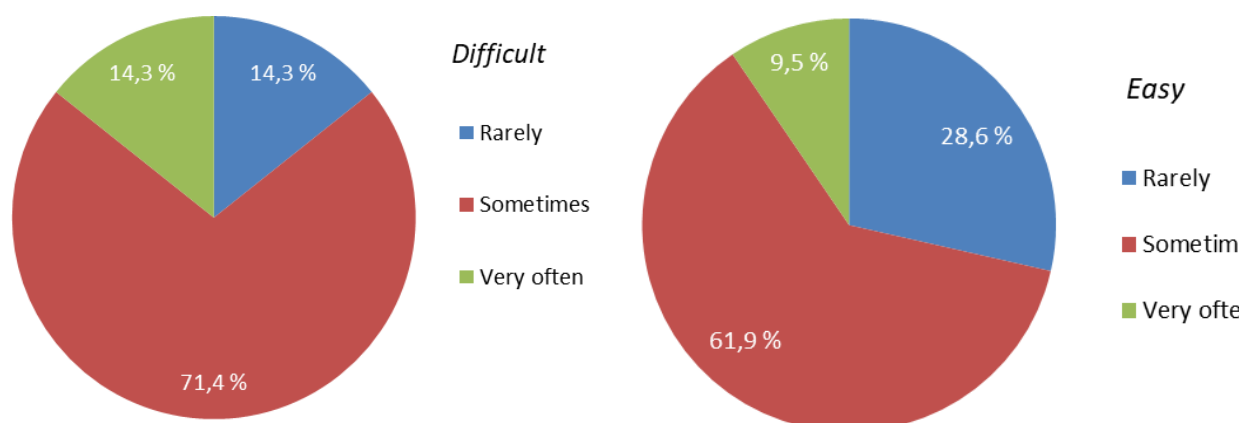


Figure 13. Quality requirements are difficult/easy to manage - To what extent are the following statements true for your organization/department/team?

When we ask about the importance of the quality requirements depending on their precedence, customer or internally. 33% consider them always important when they come from customer and 19% always important when they come internally. We have similar numbers when we analyze the “very often” answer (57,1% from customers and 47.6% internally).

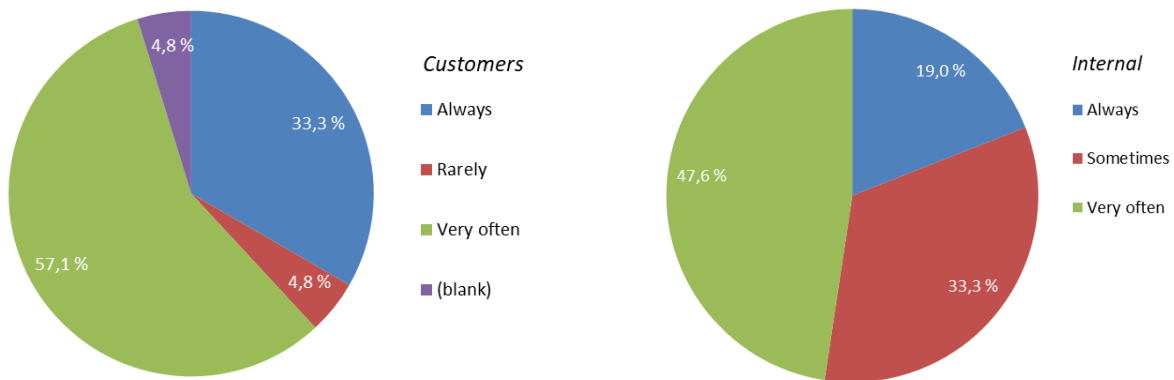


Figure 14. Quality requirements coming from the customers are important - To what extent are the following statements true for your organization/department/team?

The respondents consider quality requirements for their products development. Most of them consider them in each and every product feature (chart on the left), 85,7 % if we consider very often and sometimes answers. It is consistent to the 81% of respondents that never or rarely do not concern about quality (chart on the right).

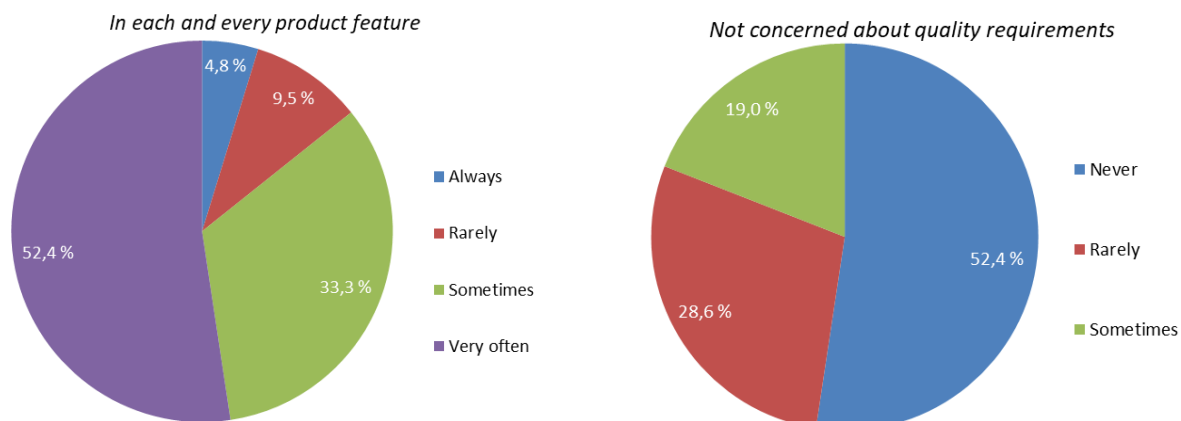


Figure 15. Quality requirements are considered in each and every product feature/Not considered - To what extent are the following statements true for your organization/department/team?

When we ask respondents explicitly for concrete quality requirements difficult to manage, the most mentioned was usability, some of the reasons are “what is easy for me, might not be easy for the end user” and “Because it consumes many resources (time, financial, humans)”. Maintenance, extensibility, reliability and scalability are also mentioned. Some of the answers were not related to concrete quality requirement, but to difficulties that can apply to some of them, e.g. “Extreme quality requirements (e.g. extreme security requirements, very high availability requirements, etc)”, “Following trend of things that require manual input (e.g. field testing) or complex system to automate data gathering (e.g. power consumption testing)” or “Things without clear measurement values, that one needs to turn into values in able to judge them.”

When we asked for easy to manage requirements, only maintainability and customer satisfaction have been explicitly. Most of the answers refer to requirement that can be easily monitored, e.g. “management is easy for requirements of which follow up is integrated in an issue tracking system, test management tool or project management tool”, “With clear understandable values that can be measured automatically using tools” or “Requirements you can automatically test”.



9.6 Q-Rapids Open Community

9.6.1 Interest on participating in the Q-Rapids open community (O3.1)

The answers reveal some interest in the potential open community that could be created around the project results. The most interesting point would be *Receiving information through the Q-Rapids newsletter (general project information)* and *Receiving information related to Q-Rapids tools and guidelines for managing quality requirements (specific information related to the project results)*. Some of the respondents checked the option to subscribe to the newsletter option given at the end of the survey.

The activities that cause less interest are *Participating in the development of the Q-Rapids tools and guidelines* and *Participating in future surveys*.

9.6.2 Potential current communities related to Q-Rapids (O3.2)

We did not get any feedback for related open communities.

9.7 Survey Quality

We include the following questions related to the quality of the survey itself. We ask the respondents to rate the following qualities using a 5-likert scale (from the strongly disagree to strongly agree).

Four respondents fulfil these questions; this low number of answers do not allow provide any strong conclusion. Nevertheless, it is worthy to mention that all the respondents “agree” (4) in the clearness of the questions.

For the qualities related to easy to respond and completeness, we cannot infer any conclusion.

Conclusion

The first version of this document reported the market survey design making emphasis in the design protocol and the survey implementation. The survey was open just after the first deliverable was submitted.

The second version of the deliverable reports some minor changes that were made before the survey was open and the results of the first answered received.

The low number of answers (four complete and three incomplete) do not provide enough evidence to infer strong conclusion. Nevertheless, we can identify some material to be considered in the project:

- Providing a dashboard for monitoring strategic indicator could help practitioners in their decision-making processes.
- The strategic indicators that we are facing in the project could be appropriate.
- The data sources that we are using in the project are aligned to the data sources used by practitioners.
- The information gather related to the quality requirements challenges can be used in the project to focus on the more challenging activities.
- Related to the open community creation, we need invest our efforts having a good communication channels.

Related the quality of the survey, we can only say that the respondents agree on the clearness of the questions.



References

- [Dillman-et-al 2014] Don A. Dillman, Jolene D. Smyth, Leah Melani Christian. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method* (4th edition). Wiley (2014).
- [Kasunic 2005] Marc Kasunic. *Designing an Effective Survey*. Report at Carnegie Mellon University, ref. CMU/SEI-2005-HB-004 (2005).
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- [Vasili-et-al 2007] Victor Basili, Jens Heidrich, Mikael Lindvall, Jürgen Münch, Myrna Regardie, Dieter Rombach, Carolyn Seaman, Adam Trendowicz. Bridging the Gap between Business Strategy and Software Development. In *Proceedings of the 28th International Conference on Information Systems*, Montreal 2007 (ICIS 2007)

Annex A. Questionnaire

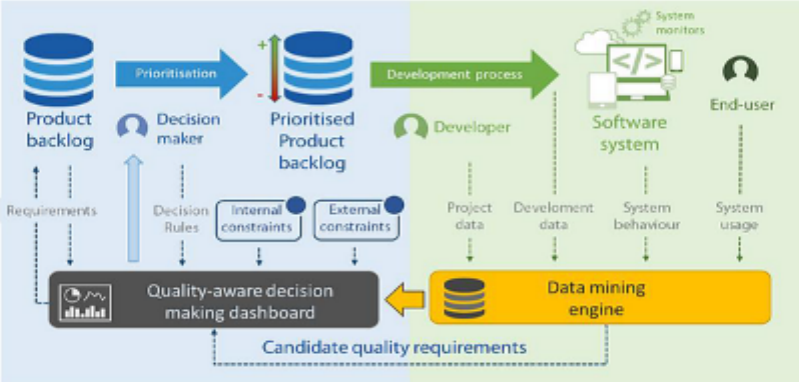
Not all the questions are always shown. We include the question codes in this Annex because they are used in showing conditions for some of the questions (specified into brackets). This codes will not be shown to the respondents. The following images shows the survey pages.

Q-Rapids Adoption

Dear Respondent,

Q-Rapids is a research project funded by the European Commission through the H2020 programme. The Q-Rapids consortium is composed by 3 research partners (UPC-BarcelonaTech, University of Oulu and Fraunhofer) and 4 industrial partners (Nokia, Bittium, Soiteam and iTTI) from 5 different countries (Spain, Finland, Germany, France, Poland). You can find detailed information at www.q-rapids.eu

The project will deliver the Q-Rapids Framework. This framework will support a methodology to smartly elicit and manage software product quality in the context of rapid software development processes. The framework will be fed by an evidence-based, quality-aware rapid development process, characterised by the integrated management of Quality Requirements (also known as Non-Functional Requirements) and functional requirements. The impact of requirements into the development process will be assessed through a dashboard that will present some key strategic indicators to facilitate decision making.



We need your assistance to identify the key topics related to the decision making process supported by automated data gathering. We are at the beginning of the Q-Rapids Framework definition, therefore your early feedback will be useful for prioritising the techniques to be included.

This survey consist of four parts:

1. Demographic data in order to be able to characterize the respondents' profile.
2. Questions about the three areas of the project: strategic indicators, data sources and quality management process.
3. Questions about your possible interest in the project results and about communities built around the project areas.
4. Open space to include any comment you consider convenient

In accordance with the provisions of Spanish Organic Law 15/1999, of December 13 on Personal Data Protection, you are informed that your personal data collected by this form will be processed and stored in the file "Research"¹ owned and controlled by the UPC to carry out a proper management of the research for the Q-Rapids Framework definition and for inform you about the results of this survey. This data will not be shared with any organization outside the Q-Rapids project. By answering this survey, you accept this privacy policy. Likewise, you may exercise the right to access, rectify, cancel or object to the personal details collected and stored by the UPC by writing to the email: qrapids@essi.upc.edu

Thank you for your contribution,

Q-Rapids team

¹ <https://www.upc.edu/normatives/ca/proteccio-de-dades/fitxers-i-finalitats-daquests/reerca/reerca>

Next >>
Exit and clear survey
Load unfinished survey

Figure 16. Survey page 1: Welcome



Q-Rapids Adoption

0% 100%

Respondent Characterisation

Organization

Role in your organization

Contact information

Experience in rapid/agile software development
Choose one of the following answers

- ☐ No experience
- ☐ Less than 1 year
- ☐ Between 1 and 3 years
- ☐ Between 4 and 7 years
- ☐ More than 7 years

How would you describe your software development process?
Check any that apply

- ☐ Waterfall
- ☐ Agile
- ☐ Mix of waterfall and agile
- ☐ Kanban
- ☐ Scrum
- ☐ Beyond agile (continuous delivery, rapid releases)
- ☐ DevOps
- ☐ Other:

Experience in requirements management (e.g. decide new features, requirements prioritisation, ...)
Choose one of the following answers

- ☐ No experience
- ☐ Less than 1 year
- ☐ From 1 to 5
- ☐ From 6 to 10
- ☐ More than 10

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Exit and clear survey

Resume later

Figure 17. Survey page 2: Respondent Characterization



Q-Rapids Adoption

0% 100%

Q-Rapids Strategic Dashboard

How much does software and development process quality affect the following strategic indicators?

	Marginally	Slightly	Somehow	Significantly	Very much
Time-to-market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customer/user satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reactiveness to changes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Productivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Software quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Predictability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project visibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Does your organization have a Dashboard or any other kind of tool that supports you to make decisions?
Choose one of the following answers

☐ Yes, and I use it

☐ Yes, but I do not use it

☐ No, we do not have any

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Next >>

Exit and clear survey

Resume later

UNIVERSITAT POLITÈCNICA DE CATALUNYA

BARCELONATECH

Figure 18. Survey page 3 (I): Strategic Dashboard



Does your organization have a Dashboard or any other kind of tool that supports you to make decisions?
Choose one of the following answers

☒ Yes, and I use it
☐ Yes, but I do not use it
☐ No, we do not have any

Which tool (please write "in-house" if it is a software produced in-house)?

Which are the TOP 3 functionalities of this tool that you use more frequently?

1st


2nd

3rd

<< Previous Next >>

Exit and clear survey

Resume later



UNIVERSITAT POLITÈCNICA DE CATALUNYA

Figure 19. Survey page 3 (II): Strategic Dashboard - Do you have a Dashboard? Yes, and I use it

Does your organization have a Dashboard or any other kind of tool that supports you to make decisions?
Choose one of the following answers

☐ Yes, and I use it
☒ Yes, but I do not use it
☐ No, we do not have any

Which tool (please write "in-house" if it is a software produced in-house)?


How much do the following characteristics affects on your decision for not using the tool?

	Marginally	Slightly	Somehow	Significantly	Very much
Functionality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Usability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accuracy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<< Previous Next >>

Exit and clear survey

Resume later



UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

Figure 20. Survey page 3 (III): Strategic Dashboard - Do you have a Dashboard? Yes, but I do not use it



Does your organization have a Dashboard or any other kind of tool that supports you to make decisions?
Choose one of the following answers

☐ Yes, and I use it

☐ Yes, but I do not use it

☒ No, we do not have any

Would you like to have a tool that supports you to make decisions?
Choose one of the following answers

☒ Yes, I would like

☐ No, I would not like

☐ I don't know

Which would be the TOP 3 functionalities you think could help you to use it in your decision making activities?

1st

2nd

3rd

[<< Previous](#) [Next >>](#)

[Exit and clear survey](#)

[Resume later](#)

Figure 21. Survey page 3 (IV): Strategic Dashboard - Do you have a Dashboard? No, I do not



Q-Rapids Adoption

0% 100%

Data gathering

How much do the following sources affect to the strategic indicators in your decisions?

	Marginally	Slightly	Somehow	Significantly	Very much
Software code repositories (e.g. the lines of code, the number of comments)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Issue tracker systems (e.g. the number of bugs, new features per release)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project management tools (e.g. spent time per release)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product usage (e.g. spent time per feature, feature usage order)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product behavior (e.g. logs)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality of Service (e.g. network monitoring)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Static code analysis (e.g. code rules, complexity metrics)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation system (e.g. the number of pages in a wiki)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication tools (e.g. the number of post in a message board)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Test tool (e.g. tests passed)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which one of the following statements describes better the data gathering approach that you use in your decisions related to product evolution?
Choose one of the following answers

- ☐ All the data we need is automatically gathered and aggregated (no manual)
- ☐ We gather most of the data automatically (more automated than manual)
- ☐ We gather most of the data manually (more manual than automated)
- ☐ We do not gather data automatically (all manually)

Could you give us some example of data you use in your decisions (automatic or manually gathered)?

Figure 22. Survey page 4 (I): Data Gathering



☐ We gather most of the data manually (more manual than automatic)
☐ We do not gather data automatically (all manually)

Could you give us some example of data you use in your decisions (automatic or manually gathered)?
 Check any that apply

? For each category, give us some example and for what kind of decisions you use this data.

<input type="checkbox"/> Software code repositories (e.g. the lines of code, the number of comments)	<input type="text"/>
<input type="checkbox"/> Issue tracker systems (e.g. the number of bugs, new features per release)	<input type="text"/>
<input type="checkbox"/> Project management tools (e.g. spent time per release)	<input type="text"/>
<input type="checkbox"/> Product usage (e.g. spent time per feature, feature usage order)	<input type="text"/>
<input type="checkbox"/> Product behavior (e.g. logs)	<input type="text"/>
<input type="checkbox"/> Quality of Service (e.g. network monitoring)	<input type="text"/>
<input type="checkbox"/> Static code analysis (e.g. code rules, complexity metrics)	<input type="text"/>
<input type="checkbox"/> Documentation system (e.g. the number of pages in a wiki)	<input type="text"/>
<input type="checkbox"/> Communication tools (e.g. the number of post in a message board)	<input type="text"/>
<input type="checkbox"/> Test tool (e.g. tests passed)	<input type="text"/>
Other: <input type="text"/>	<input type="text"/>

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 Exit and clear survey
 Resume later

Figure 23. Survey page 4 (II): Data Gathering

Q-Rapids Adoption

0% 100%

Strategic Indicators and Data Sources

Select the most important data sources (columns) for each Strategic Indicator (rows)

	Software code repositories	Issue tracker systems	Project management tools	Product usage	Product behaviour	Quality of Service	Static code analysis	Documentation system	Communication tools	Test tool
Time-to-market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customer/user satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reactivity to changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Predictability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Software quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project visibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<< Previous Next >>
 Exit and clear survey
 Resume later

Figure 24. Survey Page 5: Strategic Indicators and Data Sources



Q-Rapids Adoption

0% 100%

Quality Management Processess

Rate how important each of the following topics are for management of quality requirements

	Marginally	Slightly	Somehow	Significantly	Very much
It is difficult to see the value of quality requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements are difficult to identify/specify	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements are difficult to communicate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unclear responsibilities to manage quality requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements are too abstract (and hard to understand)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements are implicit (not made explicit)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements have no priority in development process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The lack of focus on quality requirements has negative impacts later on	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements get hidden in the development process (i.e. lack of transparency related to quality requirements)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements are difficult to implement together with functional requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality requirements are difficult to test/validate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customers does not know what quality requirements they want	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customers demand quality requirements that cannot be fulfilled	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Missing documentation/instructions for managing quality requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which statement describes better the quality requirement management in your software development process?
 Choose one of the following answers

☐ We adopt a systematic (well-defined) process for managing quality requirements

Figure 25. Survey page 6 (I): Quality Management Processes



requirements																																																					
<p>Which statement describes better the quality requirement management in your software development process? Choose one of the following answers</p> <p> <input type="radio"/> We adopt a systematic (well-defined) process for managing quality requirements <input type="radio"/> We adopt an ad hoc/ unstructured process for managing quality requirements <input type="radio"/> We have no particular process/guidelines to manage quality requirements <input type="radio"/> Other: <input style="width: 100px;" type="text"/> </p>																																																					
<p>Which statement describes better the quality requirements management in your software development process? Choose one of the following answers</p> <p> <input type="radio"/> Quality requirements are managed together with functional requirements (e.g. as similar items in the product backlog) <input type="radio"/> Quality requirements are managed separately from functional requirements <input type="radio"/> Other: <input style="width: 100px;" type="text"/> </p>																																																					
<p>What are the TOP 3 Quality Requirements in your product?</p> <p>1st <input style="width: 100px;" type="text"/></p> <p>2nd <input style="width: 100px;" type="text"/></p> <p>3rd <input style="width: 100px;" type="text"/></p>																																																					
<p>To what extent are the following statements true for your organization/department/team?</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #e0f2f1;"> <th></th> <th>Never</th> <th>Rarely</th> <th>Sometimes</th> <th>Very often</th> <th>Always</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Functionality is first, quality comes later</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td style="text-align: left;">Quality requirements are difficult to manage</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td style="text-align: left;">Quality requirements are easy to manage</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td style="text-align: left;">Quality requirements coming from the customers are important</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td style="text-align: left;">Quality requirements internally identified are important</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td style="text-align: left;">Quality requirements are considered in each and every product feature</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td style="text-align: left;">We are not concerned about quality requirements</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td><input type="radio"/></td> </tr> </tbody> </table>							Never	Rarely	Sometimes	Very often	Always	Functionality is first, quality comes later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Quality requirements are difficult to manage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Quality requirements are easy to manage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Quality requirements coming from the customers are important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Quality requirements internally identified are important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Quality requirements are considered in each and every product feature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	We are not concerned about quality requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Quality requirements coming from the customers are important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																																																
Quality requirements internally identified are important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																																																
Quality requirements are considered in each and every product feature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																																																
We are not concerned about quality requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>																																																
<div style="display: flex; justify-content: center; gap: 10px;"> << Previous Next >> </div> <div style="display: flex; justify-content: center; gap: 10px; margin-top: 5px;"> Exit and clear survey </div> <div style="display: flex; justify-content: center; gap: 10px; margin-top: 5px;"> Resume later </div>																																																					

Figure 26. Survey page 6 (II): Quality Management Processes



Which statement describes better the quality requirement management in your software development process?
Choose one of the following answers

☒ We adopt a systematic (well-defined) process for managing quality requirements

☐ We adopt an ad hoc/ unstructured process for managing quality requirements

☐ We have no particular process/guidelines to manage quality requirements

☐ Other:

Could you briefly describe the TOP 3 most important activities you use for managing quality requirements?

1st

2nd

3rd

Figure 27. Survey page 6 (III): Quality Management Processes – Using a quality requirements process

Which statement describes better the quality requirement management in your software development process?
Choose one of the following answers

☐ We adopt a systematic (well-defined) process for managing quality requirements

☐ We adopt an ad hoc/ unstructured process for managing quality requirements

☒ We have no particular process/guidelines to manage quality requirements

☐ Other:

Which statement describes better the quality requirements management in your software development process?
Choose one of the following answers

☐ Quality requirements are managed together with functional requirements (e.g. as similar items in the product backlog)

☐ Quality requirements are managed separately from functional requirements

☒ Other:

Figure 28. Survey page 6 (IV): Quality Management Processes – Not using a quality requirements process



Q-Rapids Adoption

0% 100%

Q-Rapids Open Community

Would you be interested in participating in the Q-Rapids Open Community to share knowledge about tools and guidelines for managing quality requirements.

	Marginally	Slightly	Somehow	Significantly	Very much
Receiving information through the Q-Rapids newsletter (general project information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Receiving information related to Q-Rapids tools and guidelines for managing quality requirements (specific information related to the project results)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in dissemination/exploitation events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in future surveys	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being a user of the Strategic Dashboard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being a user of the automatic gathering tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being a user of the Q-Rapids tools and guidelines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in the development of the Q-Rapids tools and guidelines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you know any Open Community measuring the quality of software products or software development processes?

? Please, write the name of contact information

Do you know any Open Community, which addresses quality management in software development processes?

? Please, write the name of contact information

Would you recommend any Open Community as target for a project like Q-Rapids?

? Please, write the name of contact information

Figure 29. Survey page 7: Open Community



Q-Rapids Adoption

0% 100%

Final Considerations

Do you have any further comment you would like to give us?

Could you provide us your contact information (name and email address)?

Please provide us some short feedback on the survey. To what extend the following statements are true?

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
The questions are clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The questions were easy to respond	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The set of questions was complete for the topic of the survey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

☐ If you have provided your e-mail, you can receive the Q-Rapids newsletter selecting this checkbox

<< Previous

Submit

Exit and clear survey

Resume later

UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

Figure 30. Survey page 8: Final Considerations



Annex B. Pilot Invitation Letter

Dear colleague,

You have been selected to pilot the Q-Rapids market survey. We need your assistance to make the survey as clearly as possible.

We kindly ask you to answer all the survey and provide us as much feedback as possible about your reactions, comments and suggestions. Here you have a list of examples of the kind of comments you can provide us:

- Is there some question or some part of the survey which is not clear?
- Is there any question or some part of the survey which is too long or tedious to answer?
- Is there any questions that misses some possible answer?
- Which questions have been harder to answer?
- Is there any question you would prefer not to answer? Why?
- Is the survey too long? Or too boring? If so, in which question did you get this feeling? Would you suggest to remove some part or some style change?

The questions include a code that will be removed in the public version. You can use this code to refer to a specific question. All the questions are optional, but we need that you include the name of the company and your role in the Respondent Characterization page. It will be really helpful if you can measure the time you needed for answering the survey, ideally at the level of page.

The survey is accessible in the following URL:

<http://www.essi.upc.edu/~e-survey/index.php?sid=38773&lang=en>

Thank you for your contribution,

Lidia López (WP8 Team)



Annex C. Market Survey Poster

Q-Rapids – EU Horizon 2020
Quality-Aware Rapid Software Development
<http://www.q-rapids.eu/>



WHAT IS THE QUALITY MANAGEMENT LEVEL IN YOUR SOFTWARE DEVELOPMENT PROCESS?

HELP US TO KNOW HOW YOU MANAGE QUALITY...
HELP US TO KNOW HOW YOU WOULD **LIKE** TO MANAGE QUALITY...

PLEASE, ANSWER OUR SURVEY



<http://www.q-rapids.eu/market-survey>

ADOPTING AGILE...

- Accelerates product delivery
- Enhances the ability to manage changing priorities
- Increases productivity

CHALLENGES OF MANAGING QUALITY IN AGILE...

- Quality is hidden in the original requirements
- Difficult management in the backlog
- Late consideration in the product life cycle

AGILE NEEDS TOOLS PROVIDING...

- Rapid Feedback
- Real-time Quality
- Increased Transparency
- Visibility to the Product Backlog priorities



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732253.





Annex D. Data Sources Detailed Results

SoftwareCode Repositories data source

Software code repositories (e.g. lines of code, number of comments) were not affecting to the strategic indicators much as somehow, slightly and marginally responses were representing some 70% of the answers. Also several ways of working were mentioned, however blank was over 70% of answers mentioned.

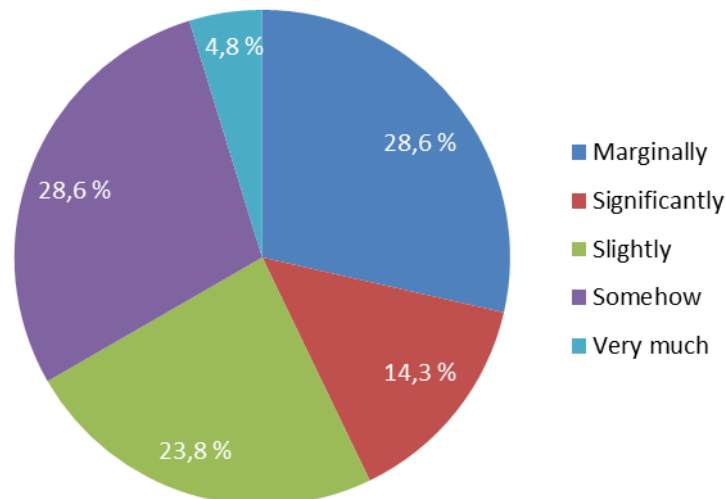


Figure 31. Software code repositories - How much do the following sources affect to SIs in your decisions?

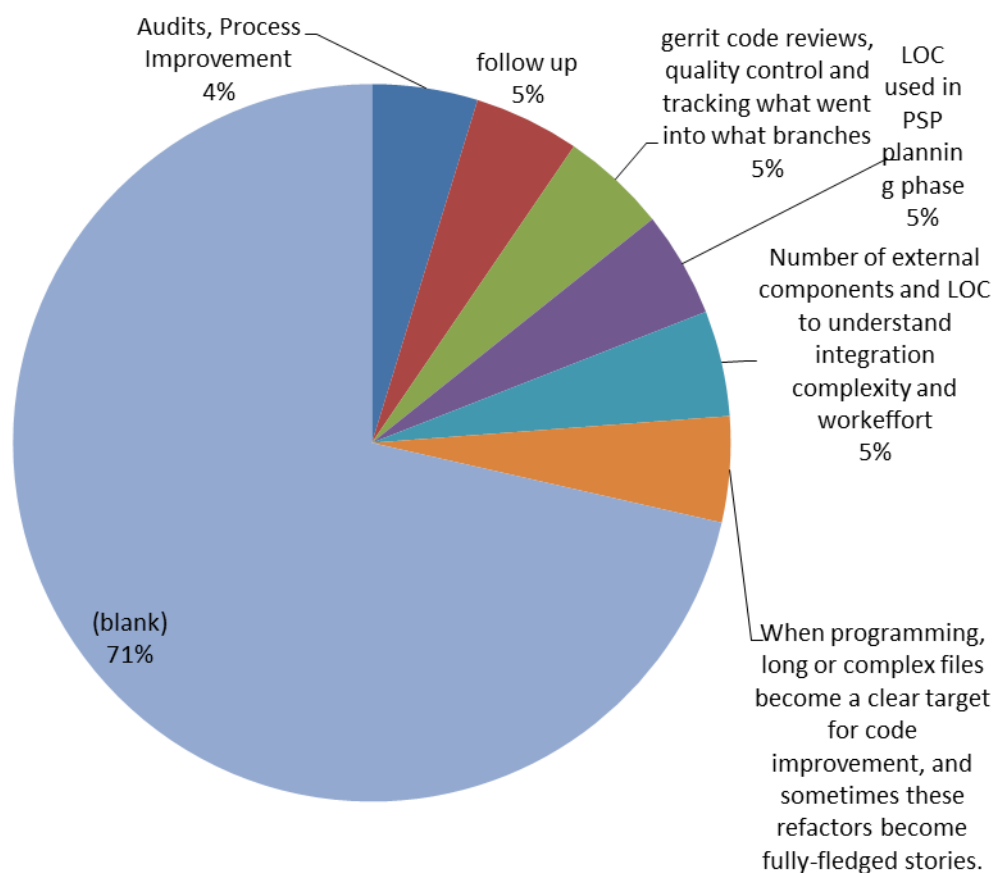


Figure 32. Software code repositories - Could you give us some example of data you use in your decisions?

Issue Tracking Systems data sources

Issue tracking systems (e.g. number of bugs, new features / release) were affecting a lot to the strategic indicators much as significant and very much responses were representing over 80% of the answers. Also multiple ways of working were mentioned with even percentage of the responses.

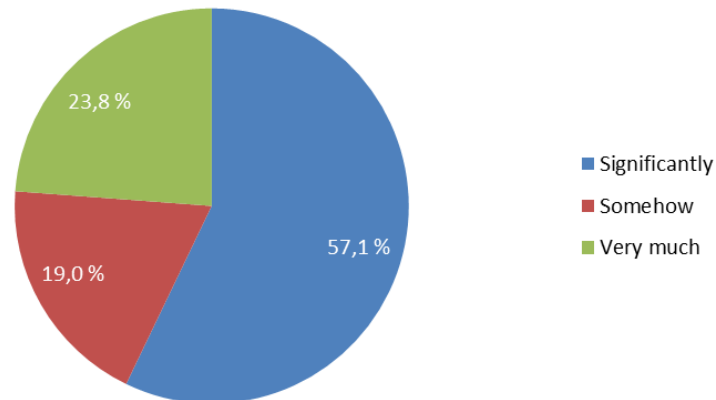


Figure 33. Issue tracking systems - How much do the following sources affect to SIs in your decisions?

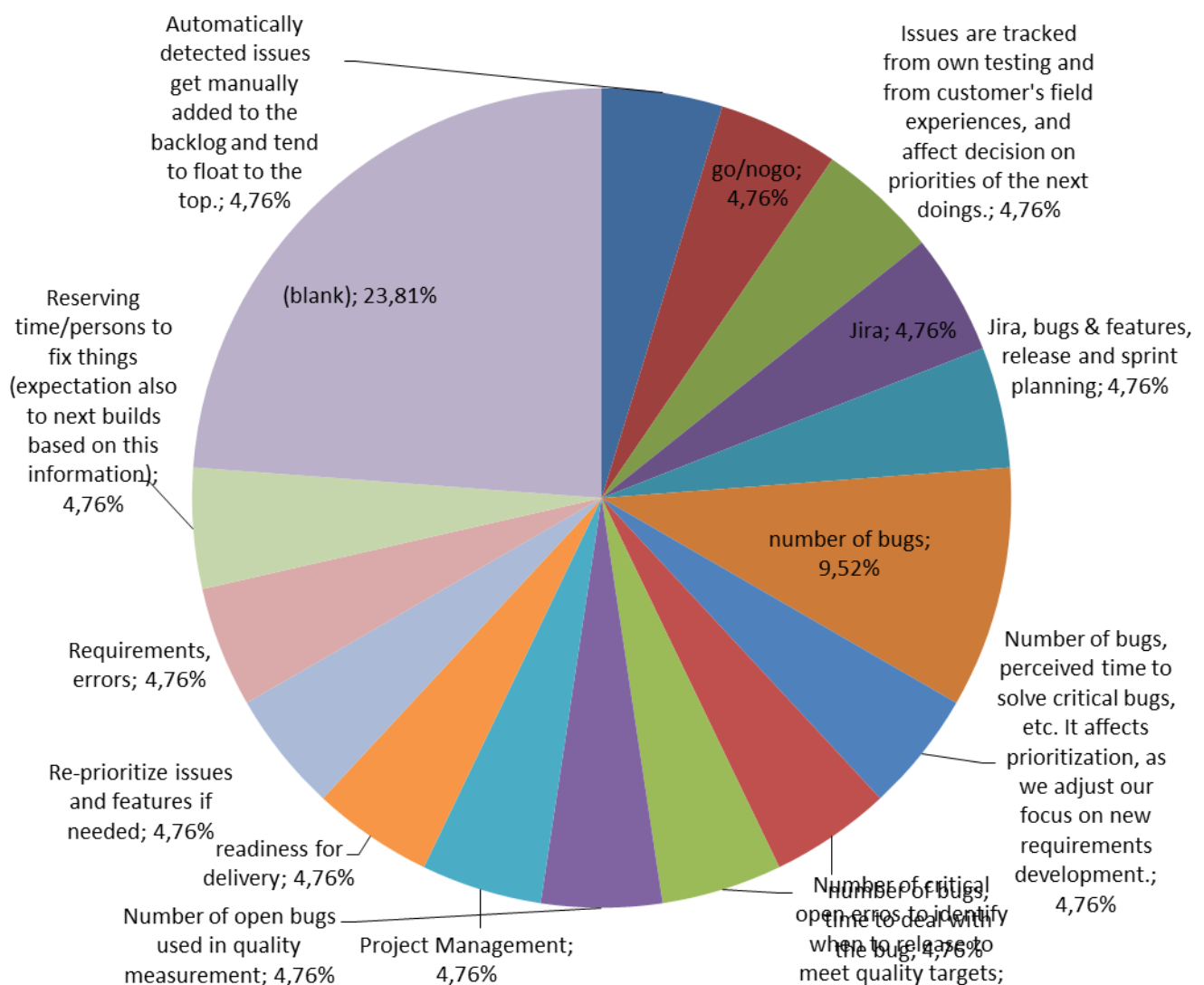


Figure 34. Issue tracking systems - Could you give us some example of data you use in your decisions?

Project Management Tools data source

Project Management Tools (e.g. spent time per release) were not affecting a lot to the strategic indicators much as significant and very much responses were representing over 80% of the answers. Also multiple ways of working were mentioned with even percentage of the responses.

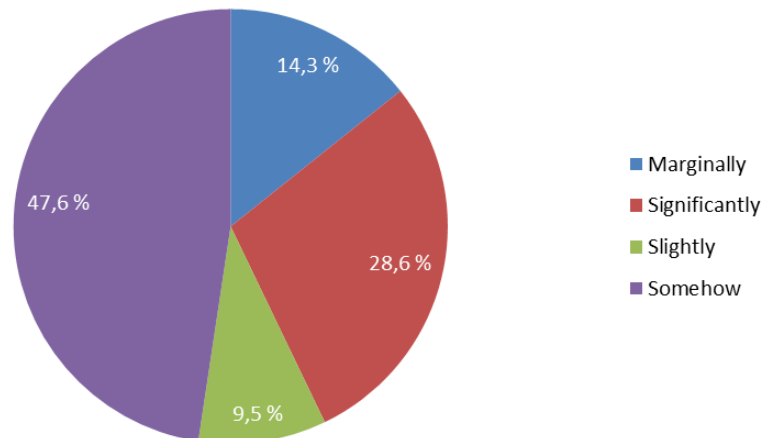


Figure 35. Project management tool- How much do the following sources affect to SIs in your decisions?

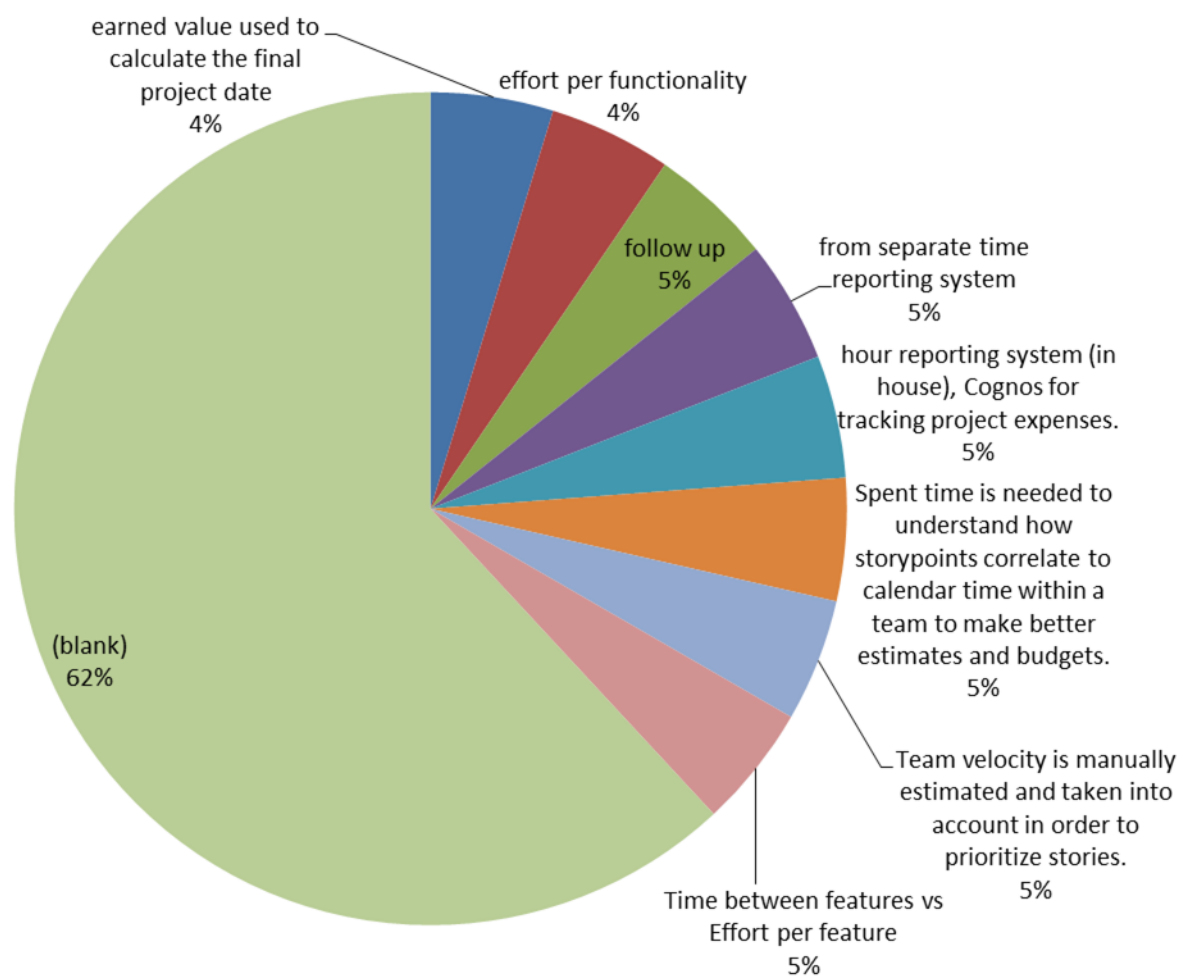


Figure 36. Project management tool - Could you give us some example of data you use in your decisions?

Product Usage data source

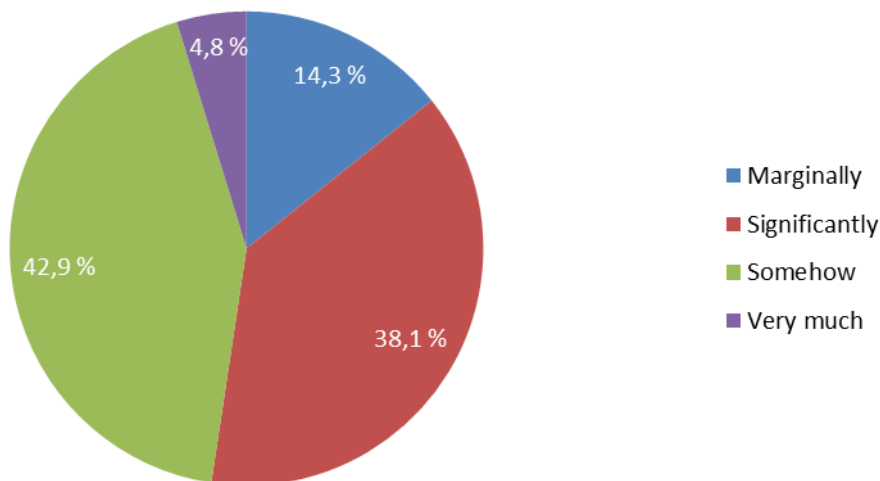


Figure 37. Product usage - How much do the following sources affect to SIs in your decisions?

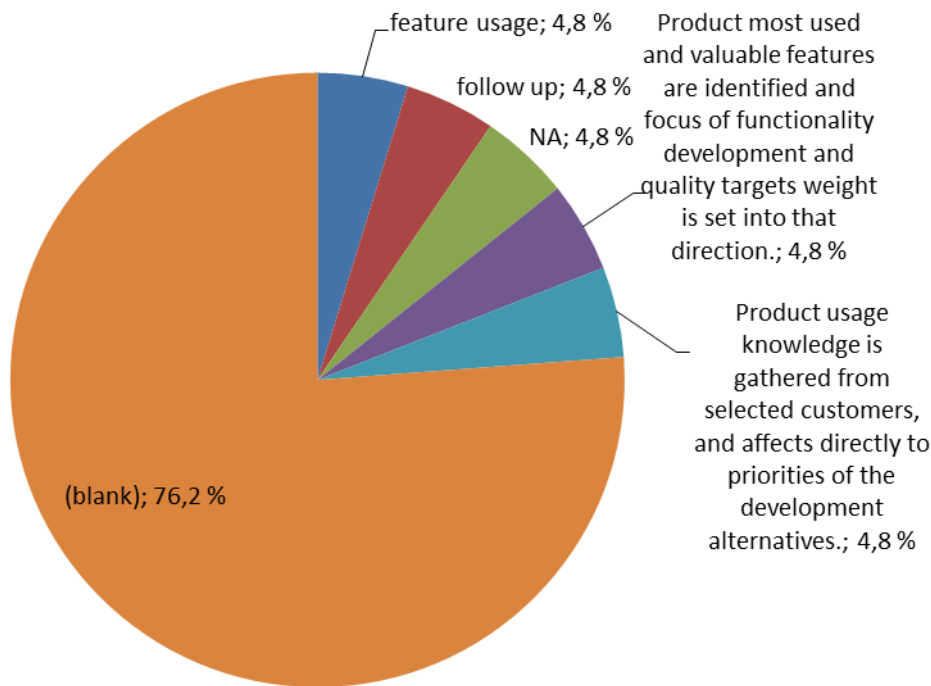


Figure 38. Product usage - Could you give us some example of data you use in your decisions?



Product Behaviour data source

Product behavior (e.g. logs) was seen affecting positively to the strategic indicators much as significant and very much responses were representing over 62% of the answers. Also multiple ways of working were again mentioned with even percentage of the responses.

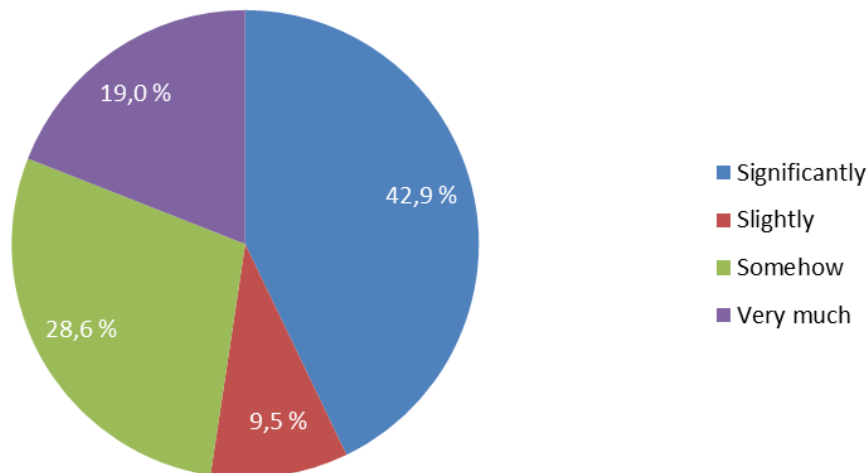


Figure 39. Product behavior - How much do the following sources affect to the SIs in your decisions?

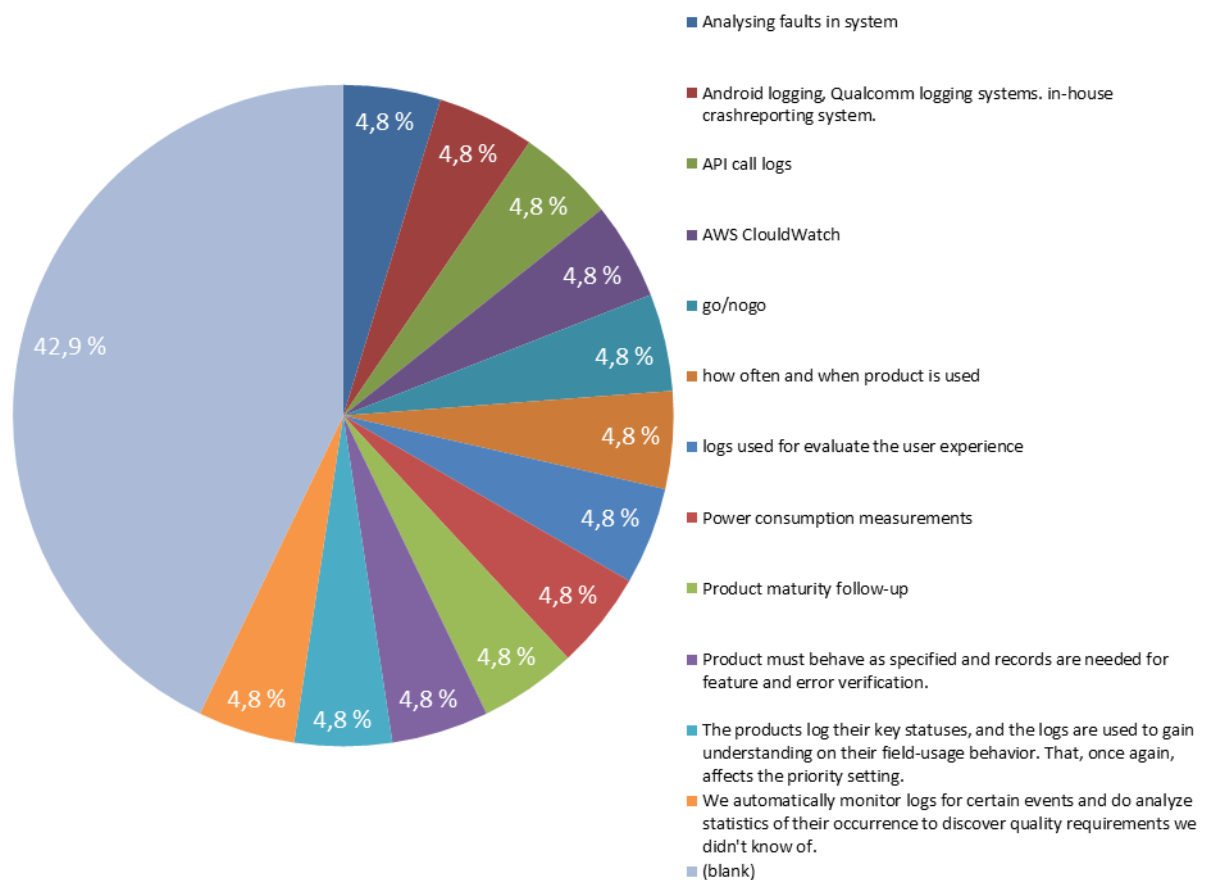


Figure 40. Product behavior - Could you give us some example of data you use in your decisions?

Quality of Service data sources



Quality of Service (e.g. network monitoring) was seen affecting positively to the strategic indicators much as significant and very much responses were representing over 57% of the answers. Again multiple ways of working were mentioned with even percentage of the responses.

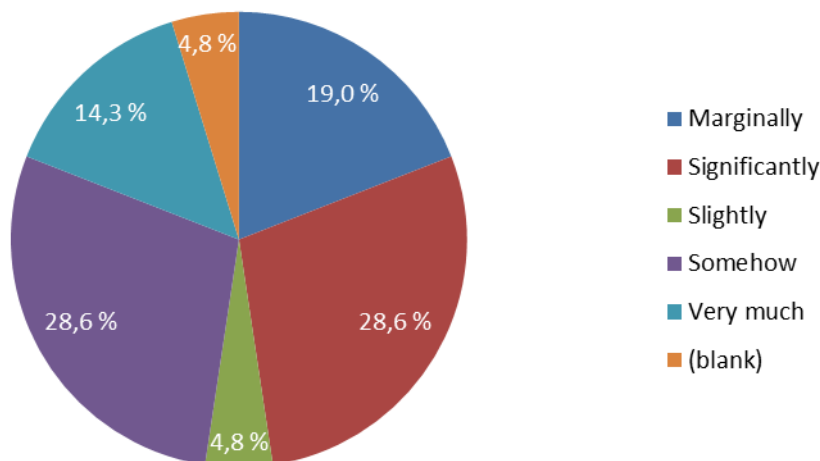


Figure 41. Quality of Service - How much do the following sources affect to SIs in your decisions?

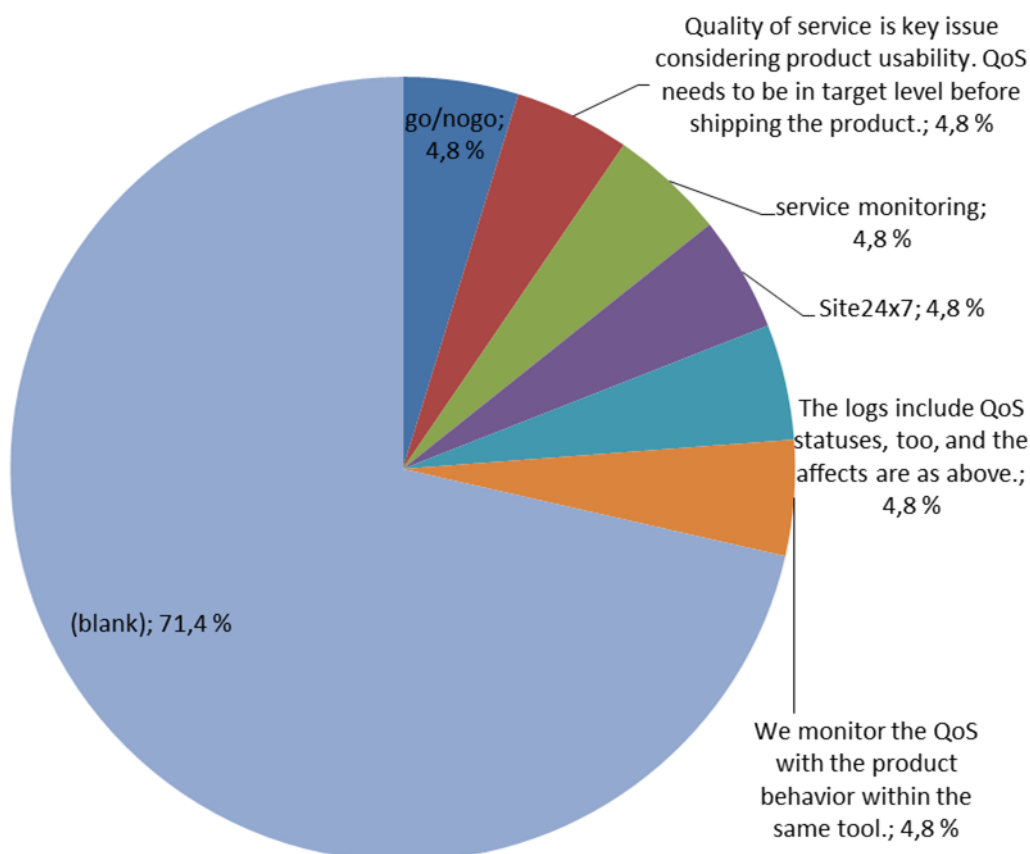


Figure 42. Quality of Service - Could you give us some example of data you use in your decisions?

Static Code Analysis data sources

Static Code Analysis (e.g. code roles, complexity metrics) was seen affecting slightly positively to the strategic indicators much as significant and very much responses were representing some 34% of the answers and marginally 4%. Again multiple ways of working were mentioned with even percentage of the responses.

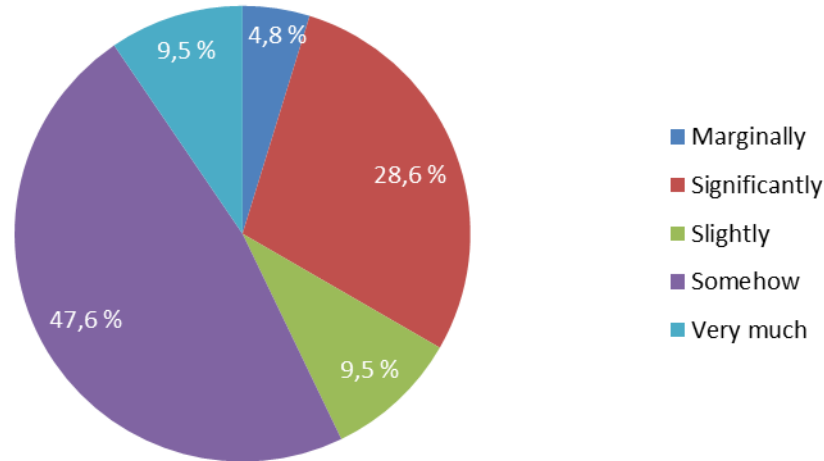


Figure 43. Static Code Analysis - How much do the following sources affect to the SIs in your decisions?

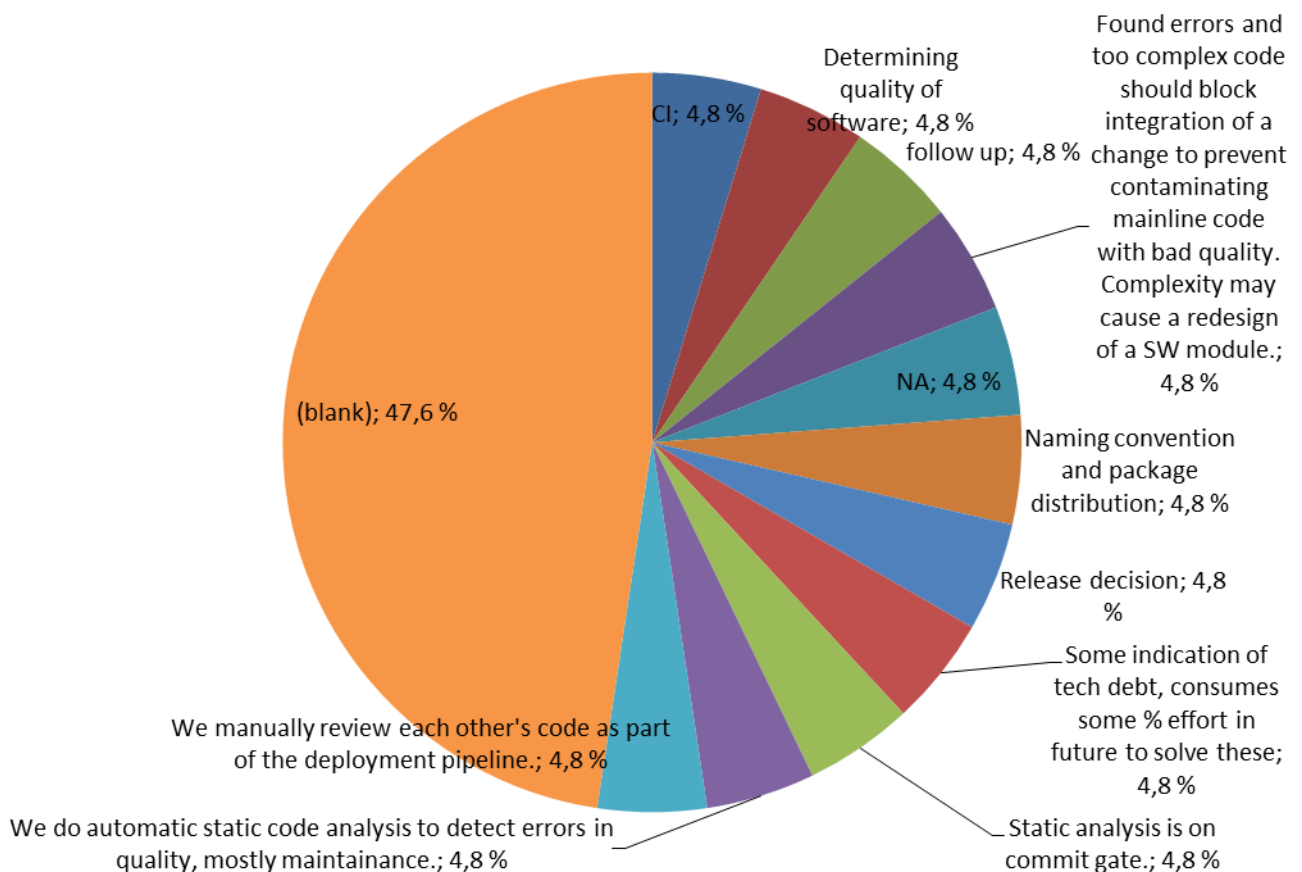


Figure 44. Static Code Analysis - Could you give us some example of data you use in your decisions?

Documentation System data sources

Documentation system (e.g. number of pages in wiki) was seen affecting positively to the strategic indicators much as marginally and slightly responses were representing some 62% of the answers.

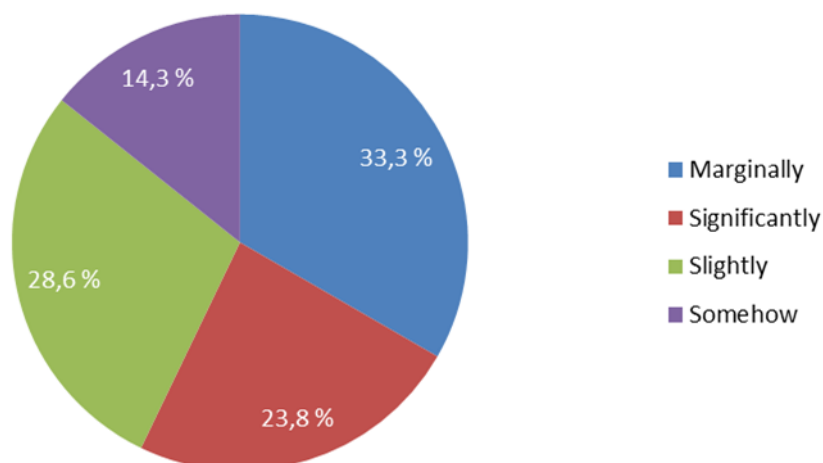


Figure 45. Documentation system - How much do the following sources affect to the SIs in your decisions?

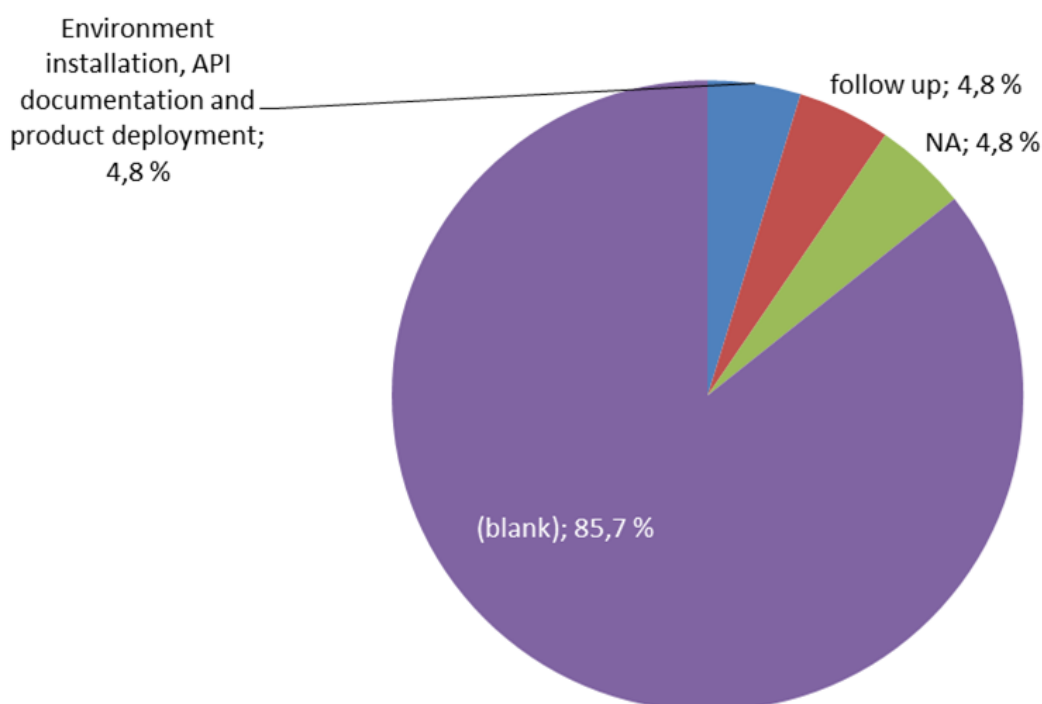


Figure 46. Documentation system - Could you give us some example of data you use in your decisions?

Communication Tools data source

Communication tools (e.g. number of posts in the messaging board) were seen affecting only slight positively to the strategic indicators much as marginally and slightly responses were representing some 58% of the answers. 28% of respondents saw the matter as of significant meaning.

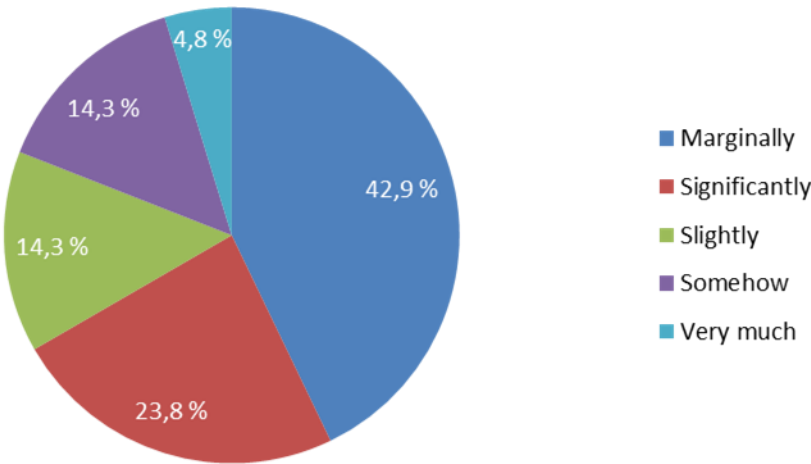


Figure 47. Communication tools - How much do the following sources affect to the SIs in your decisions?

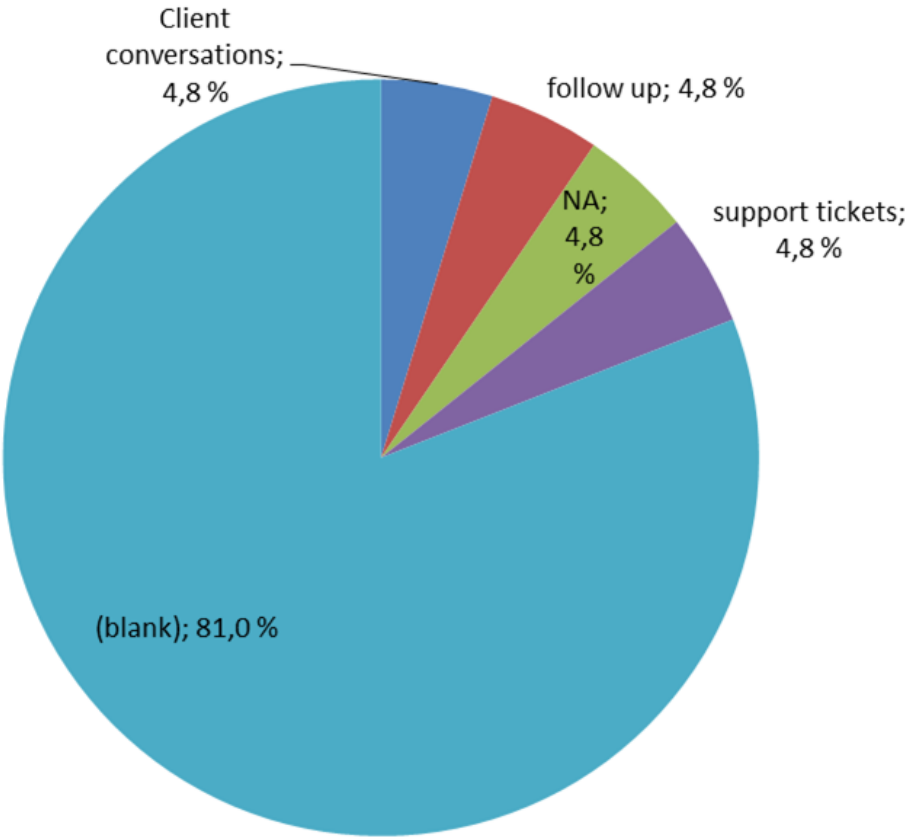


Figure 48. Communication tools - Could you give us some example of data you use in your decisions?

Test Tools data source

Test tools (e.g. test passed) were seen affecting very positively to the strategic indicators much as very much and significant responses were representing over 80% of the answers. Also several data sources were mentioned evenly.

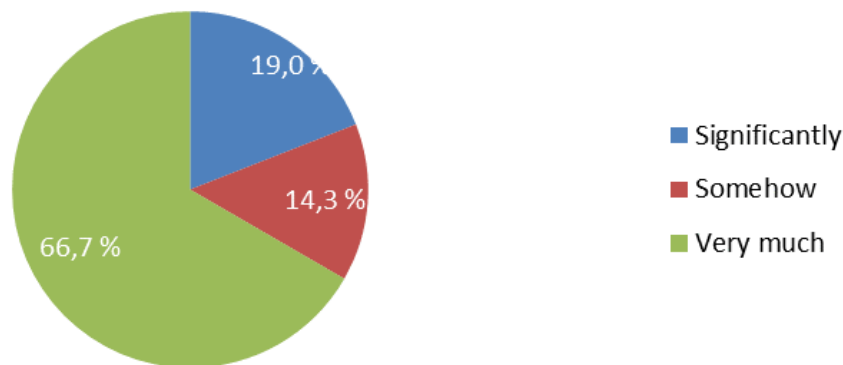


Figure 49. Test tool - How much do the following sources affect to the SIs in your decisions?

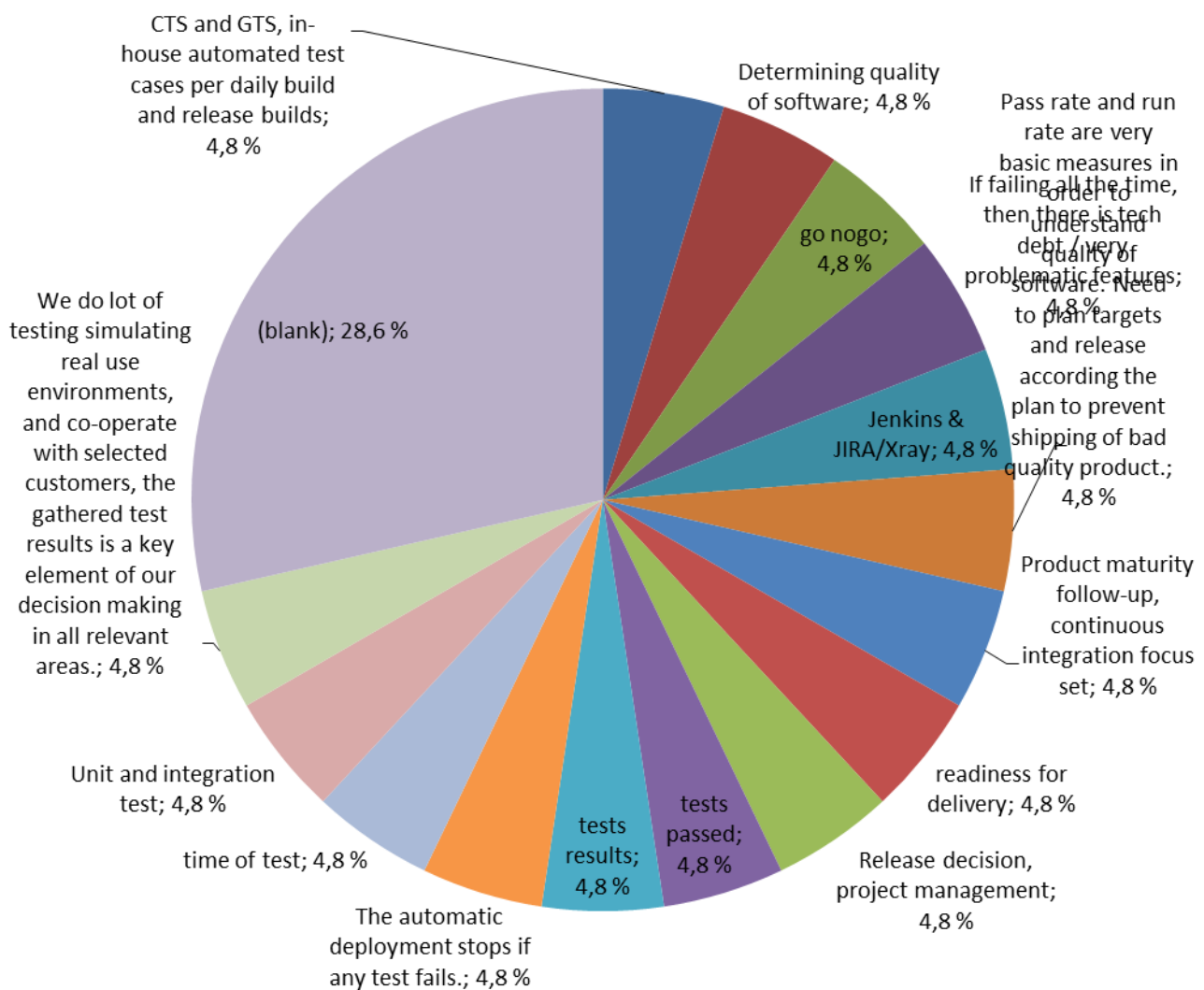


Figure 50. Test tool - Could you give us some example of data you use in your decisions?



Annex E. Topics for Management Quality Requirements Detailed Results

The following figures detail the rated importance for the topics related to quality requirements management. The possible answers that the respondents were available are: *Marginally*, *Slightly*, *Somehow*, *Significantly*, and *Very much*.

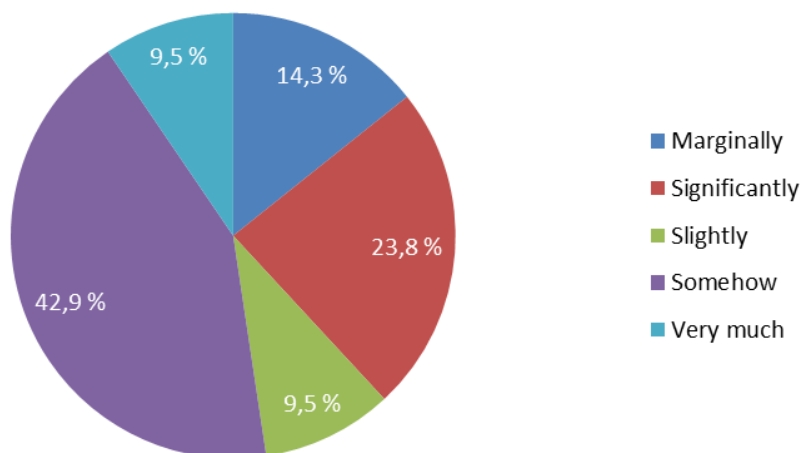


Figure 51. It is difficult to see the value of quality requirements - Importance Rate

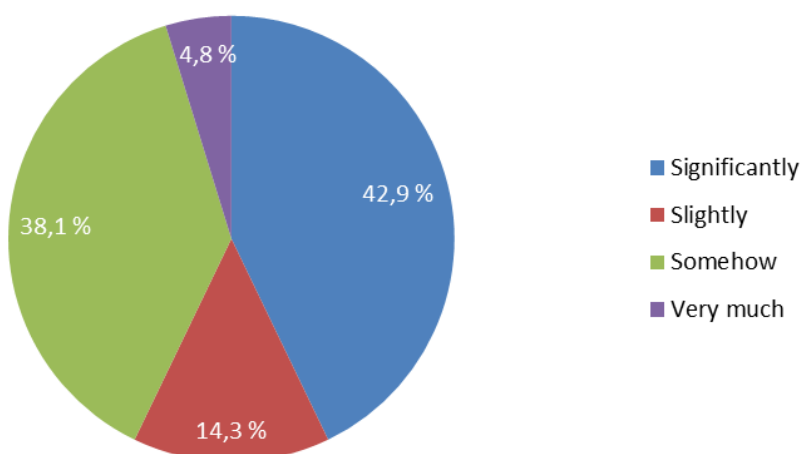


Figure 52. Quality requirements are difficult to identify /specify – Importance Rate

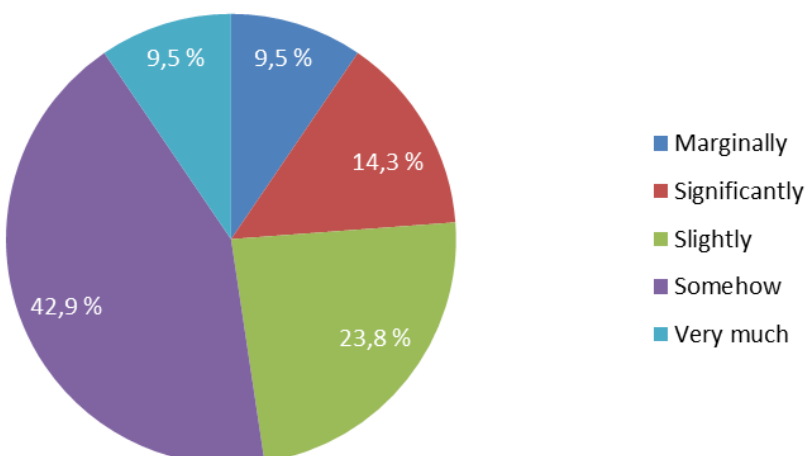


Figure 53. Quality requirements are difficult to communicate – Importance Rate

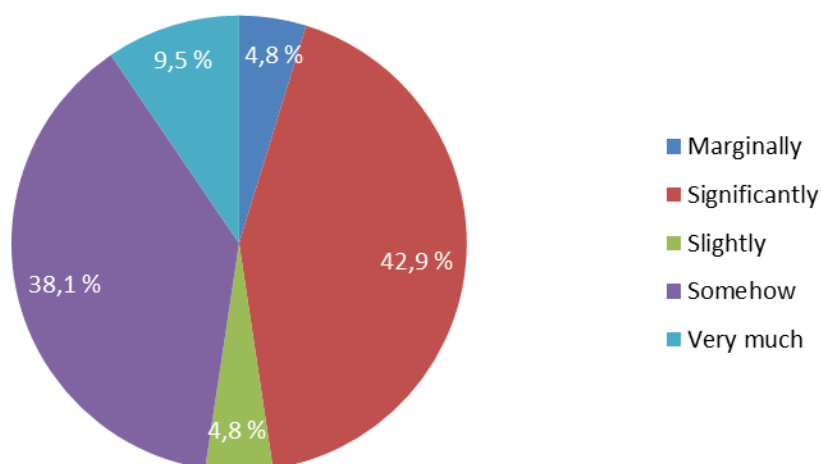


Figure 54. Unclear requirements to manage quality requirements – Importance Rate

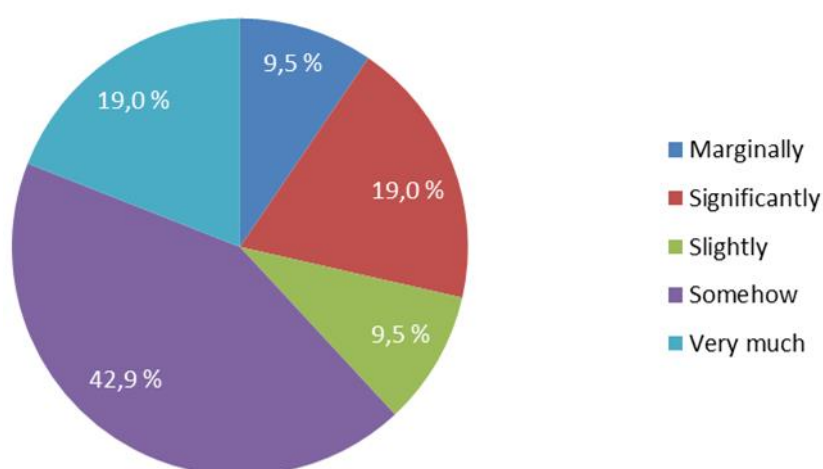


Figure 55. Quality requirements are too abstract (and hard to understand) – Importance Rate

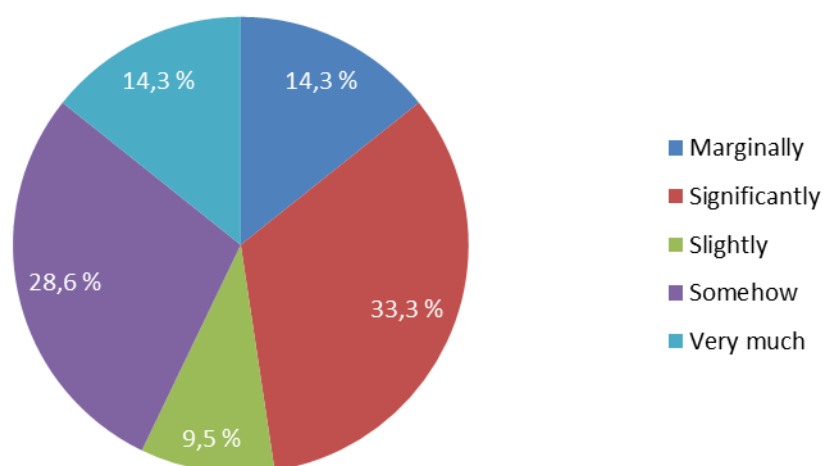


Figure 56. Quality requirements are too implicit (and not made explicit) – Importance Rate

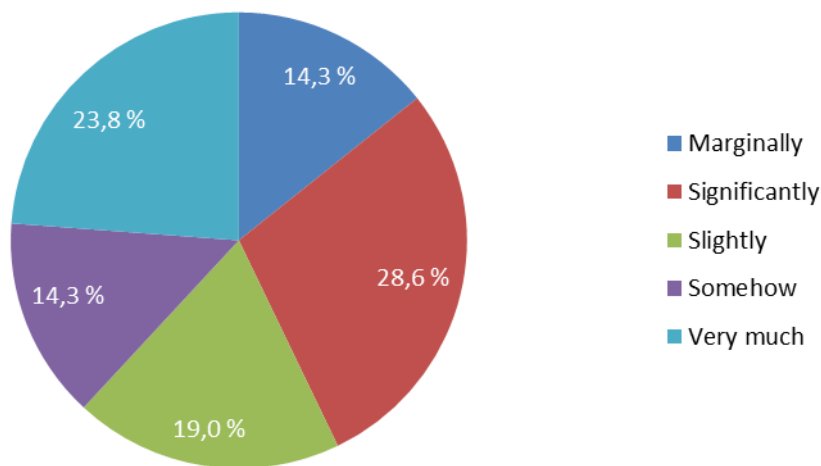


Figure 57. Quality requirements have no priority in development process – Importance Rate

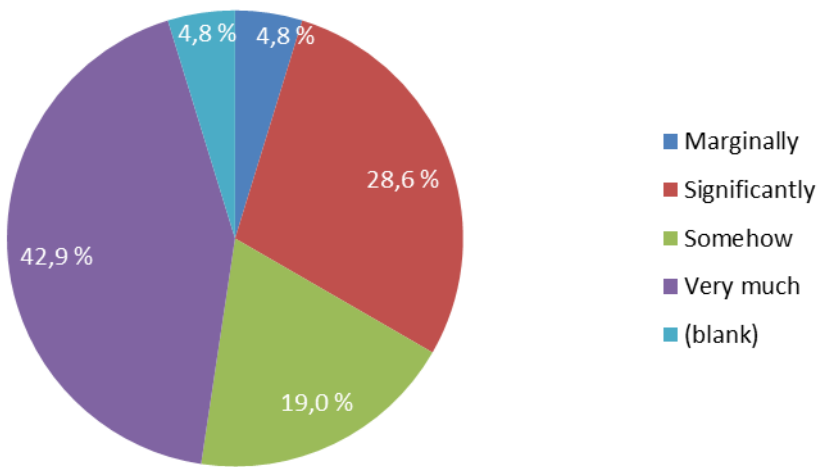


Figure 58. The lack of focus on quality requirements has negative impact later on – Importance Rate

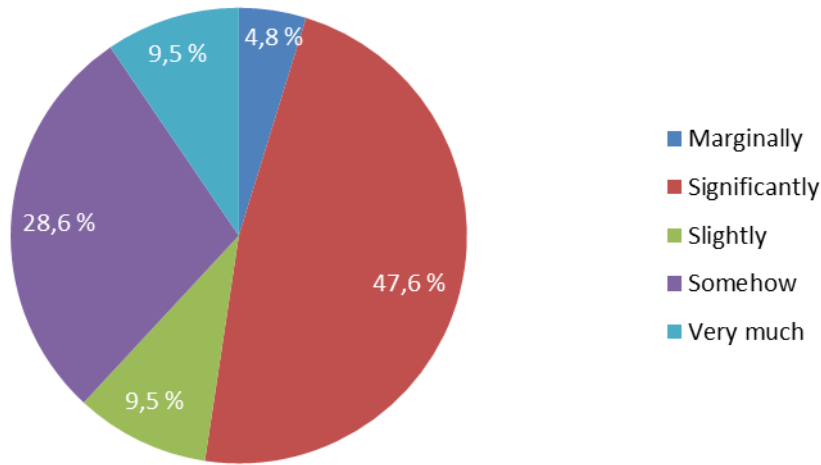


Figure 59. The quality requirements get hidden in the development process – Importance Rate

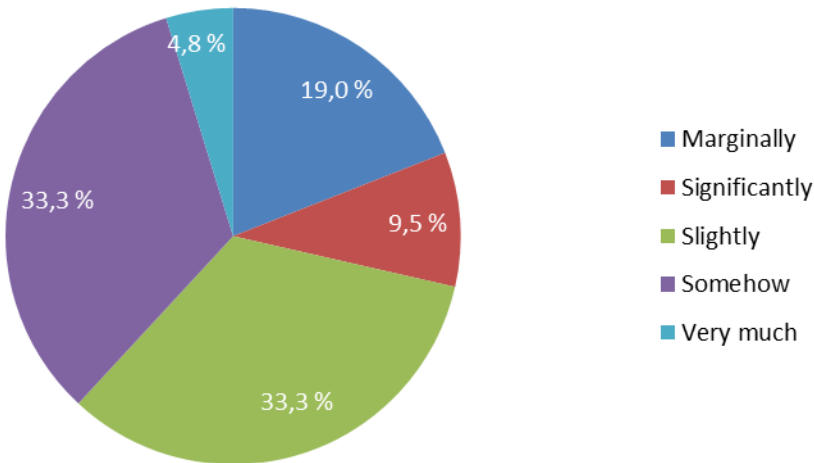


Figure 60. The quality requirements are difficult to implement together with functional requirements – Importance Rate

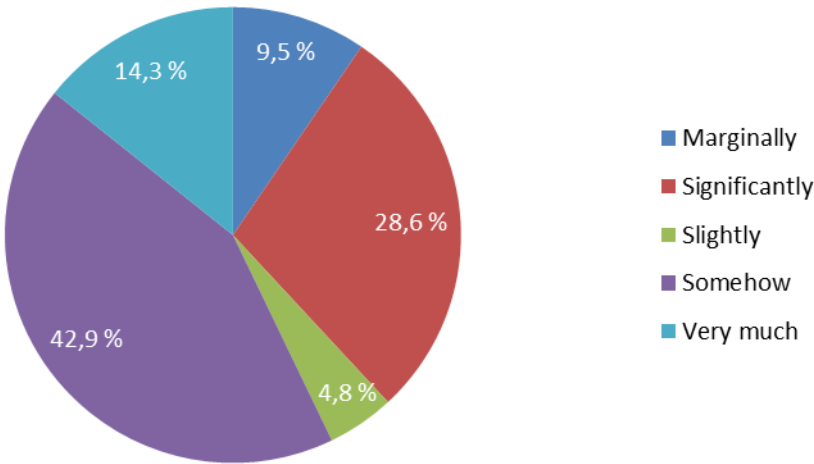


Figure 61. The quality requirements are difficult to test / validate – Importance Rate

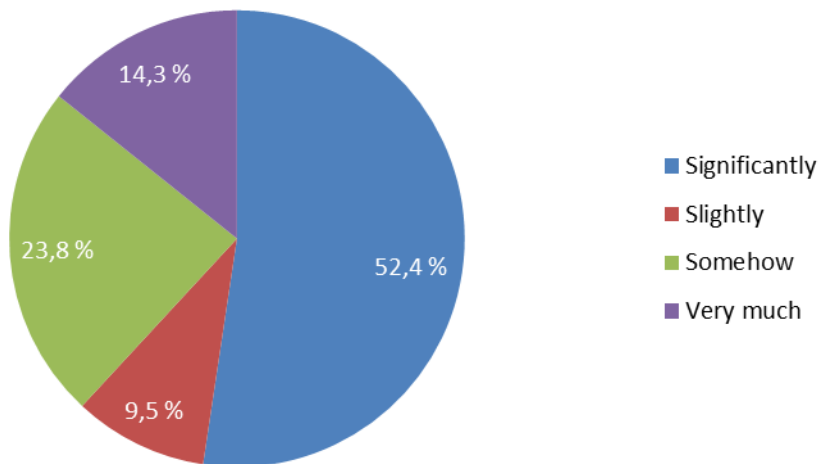


Figure 62. The customer does not know what quality requirements they want – Importance Rate

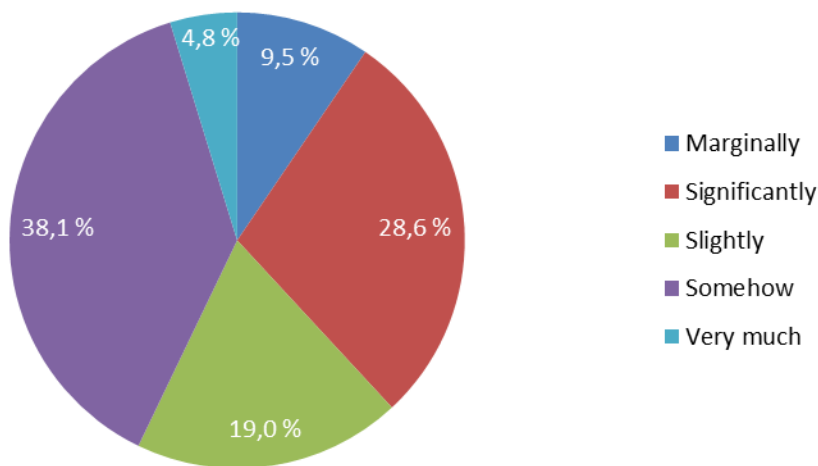


Figure 63. The customer demand quality requirements that cannot be fulfilled – Importance Rate

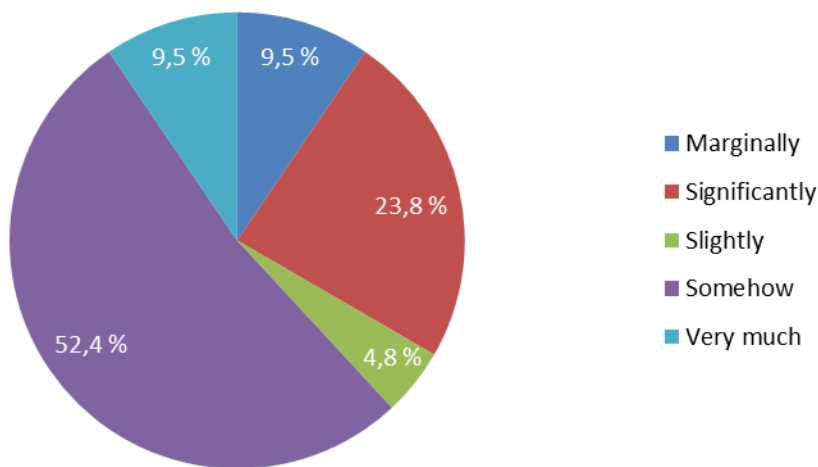


Figure 64. Missing documentation / instructions for managing quality requirements – Importance Rate



Annex F. Activities in Quality Requirements Management Processess

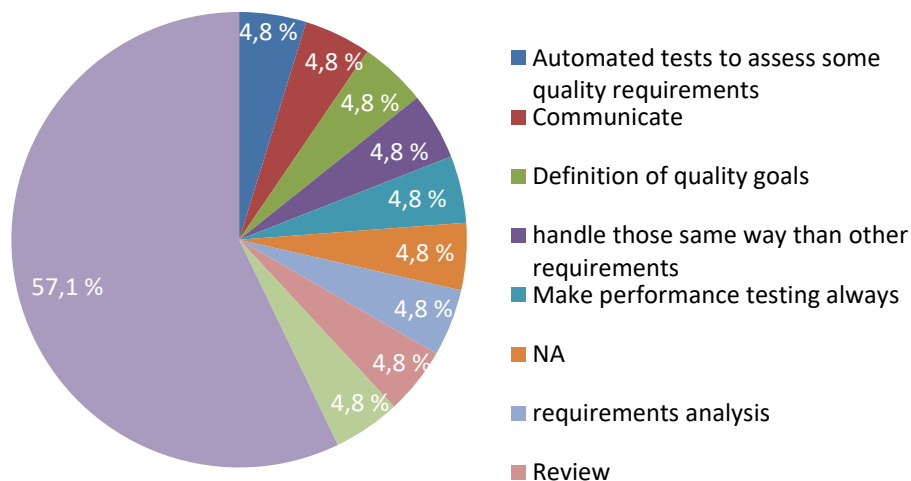


Figure 65. Could you briefly describe the TOP3 most important activities you use for managing quality requirements?

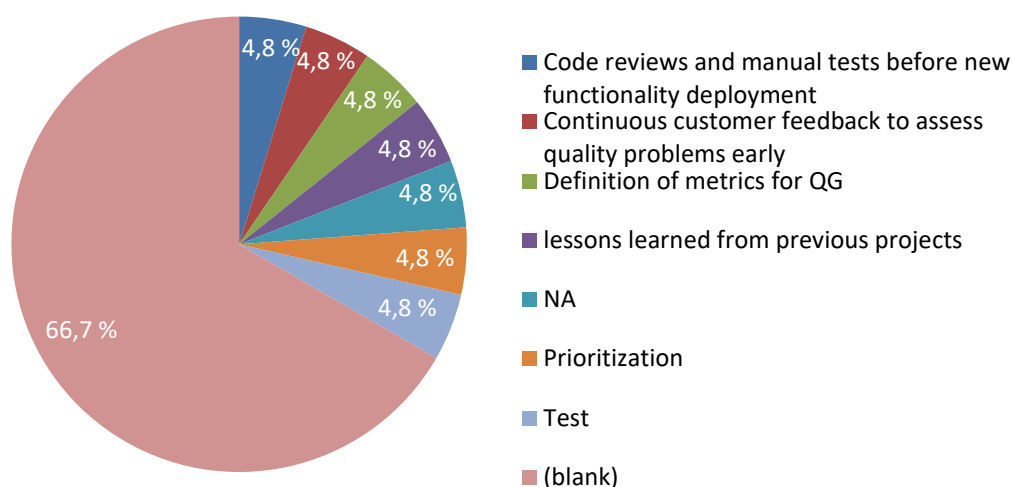


Figure 66. Could you briefly describe the TOP3 most important activities you use for managing quality requirements (2nd)?

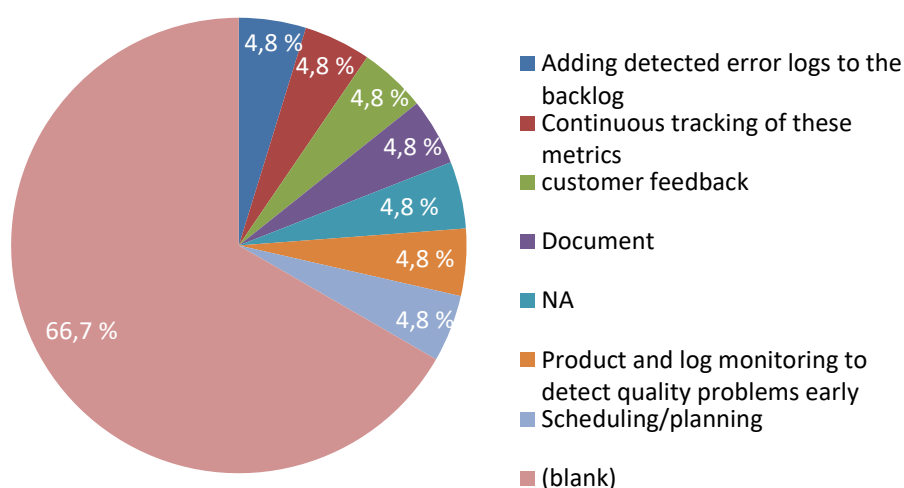


Figure 67. Could you briefly describe the TOP3 most important activities you use for managing quality requirements (3rd)?

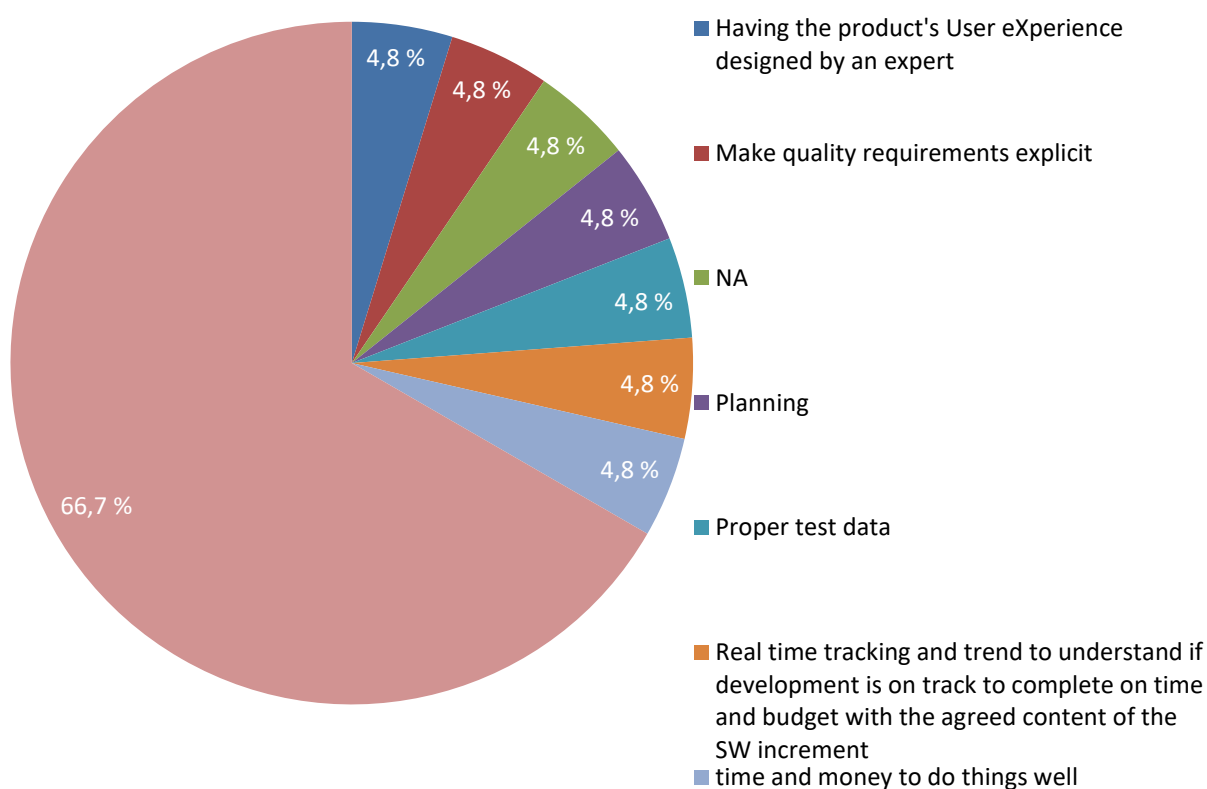




Figure 68. Could you briefly describe the TOP3 most important activities you miss that could help you to manage quality requirements (1st)

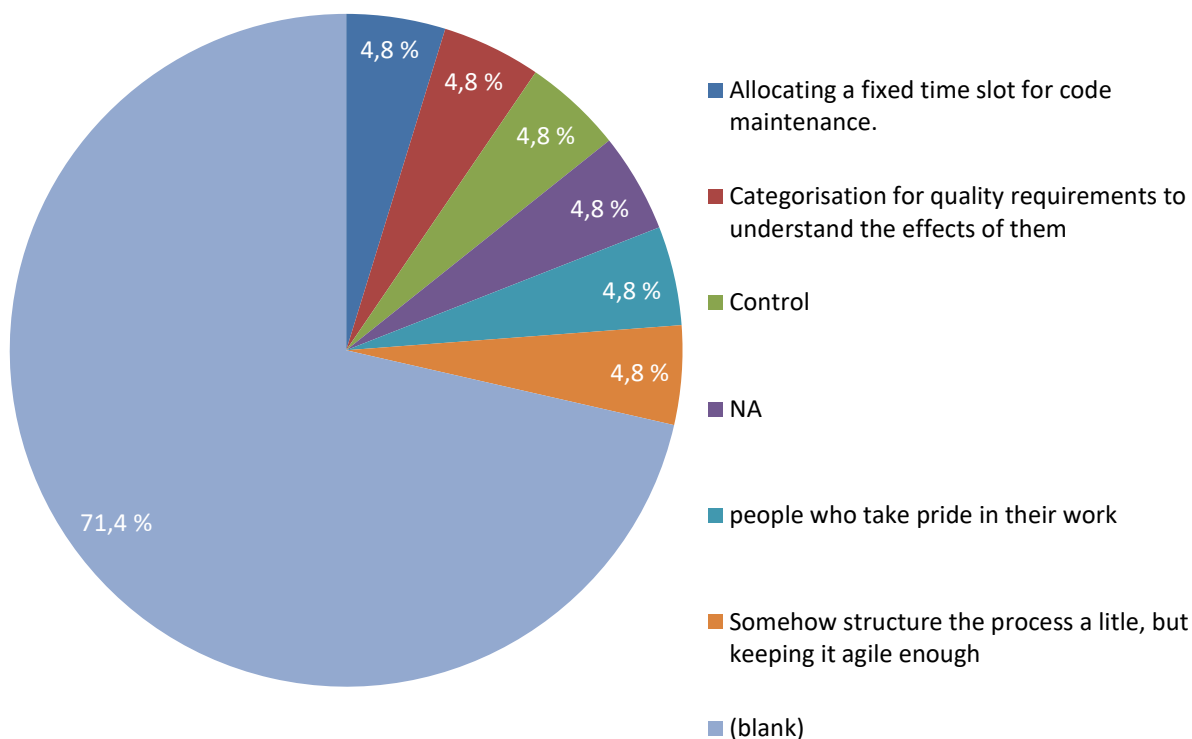


Figure 69. Could you briefly describe the TOP3 most important activities you miss that could help you to manage quality requirements (2nd)

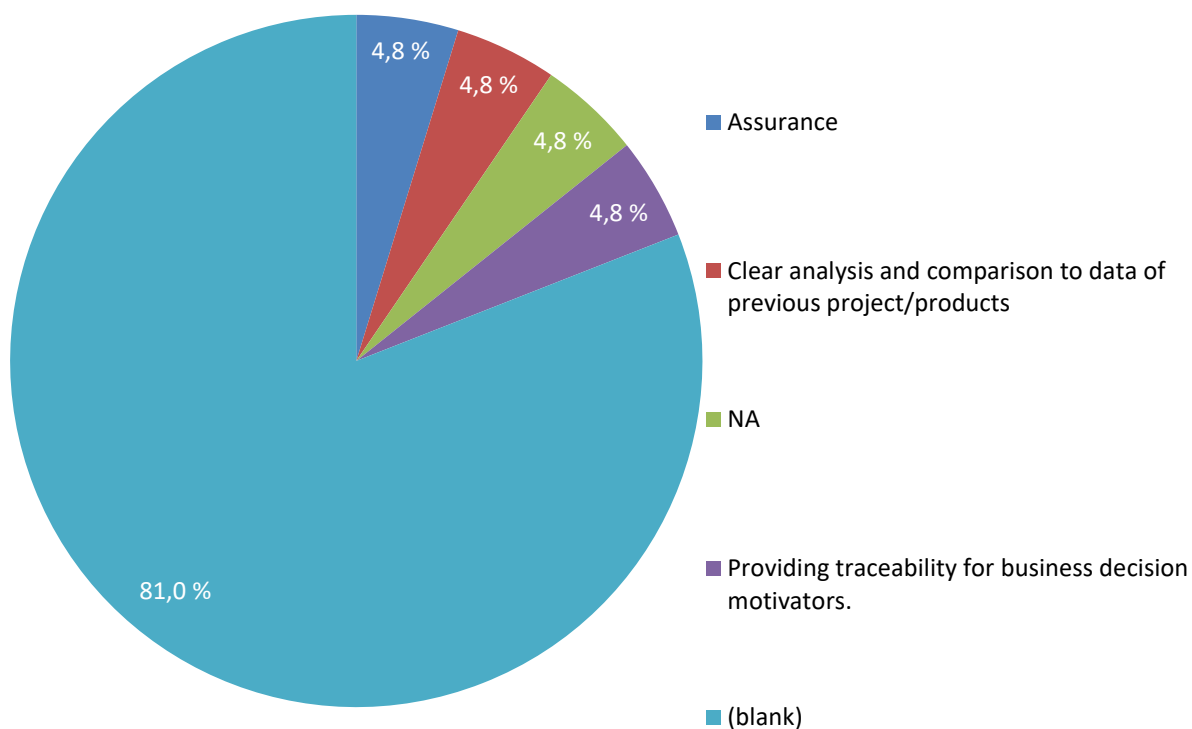


Figure 70. Could you briefly describe the TOP3 most important activities you miss that could help you to manage quality requirements (3rd)

Annex G. Quality Requirements

What are the TOP3 Quality Requirements in your product (1st)?

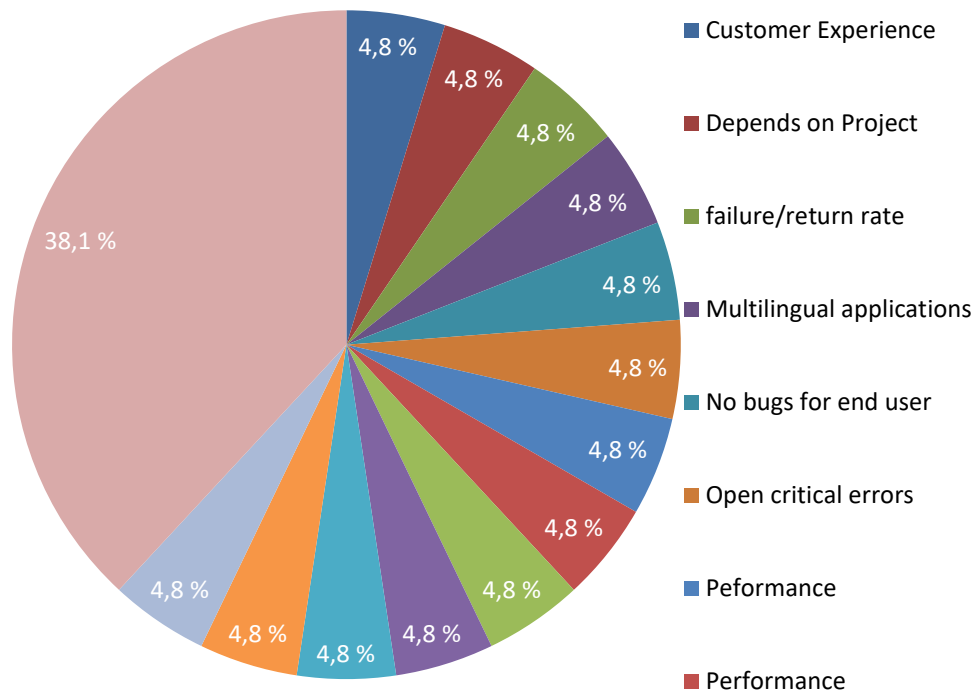


Figure 71. What are the TOP3 Quality Requirements in your product (1st)?



What are the TOP3 Quality Requirements in your product (2nd)?

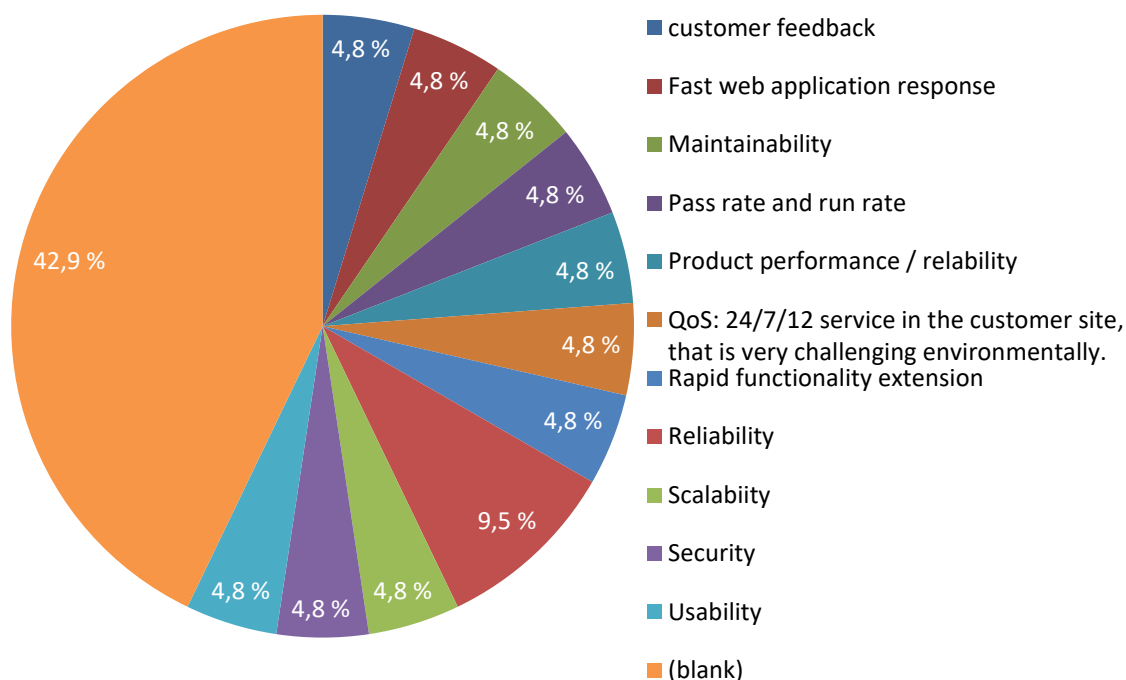


Figure 72. What are the TOP3 Quality Requirements in your product (2nd)?

What are the TOP3 Quality Requirements in your product (3rd)?

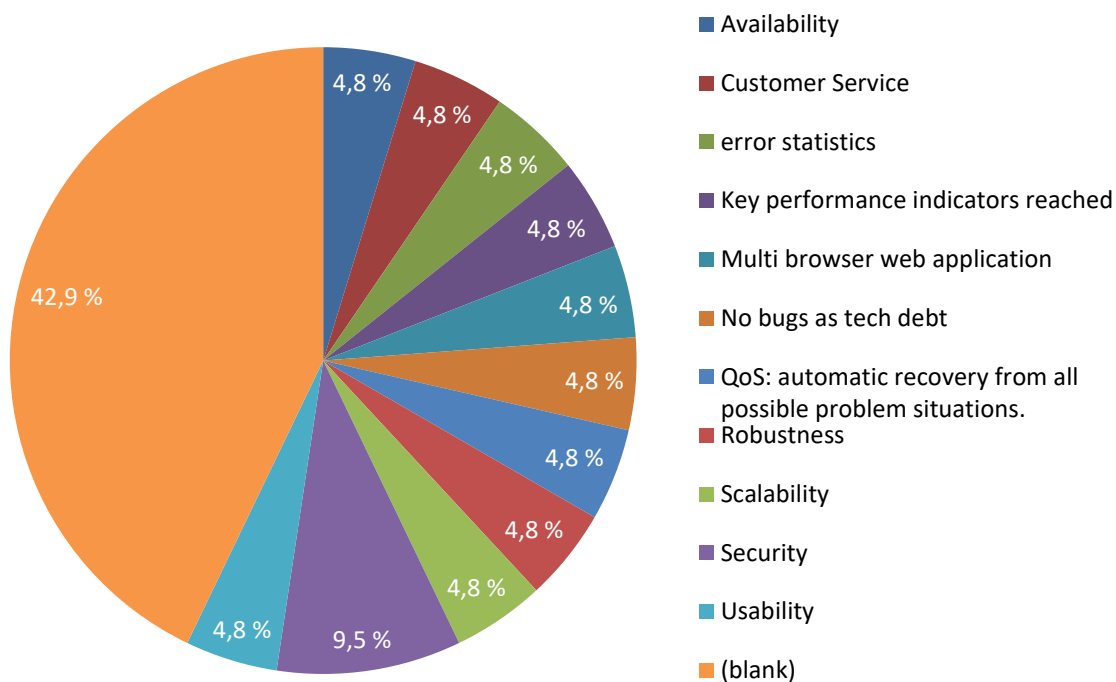


Figure 73. What are the TOP3 Quality Requirements in your product (3rd)?

