Survey Protocol

Title: A Survey on Personality and Decision-Making in Software Engineering
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Abstract:

Software development involves many activities, among which decision-making is an essential one. Various factors can impact a decision-making process, and it is essential to understand them to improve the process. Since people make decisions, some human aspects are amongst such impacting factors. One such aspect is the decision maker's personality. This research aimed to investigate the relationship between decision-making and personality within the context of software project development. We conducted survey research that gathered data about the personalities, decision-making styles, and decision-making self-efficacies of 102 Brazilian software engineers.
Keywords: decision-making, personality, software engineering.

More information about the study is available at: https://github.com/fabianafmendes/DMSxPersonality

Introduction

The investigation phase's main goal was to understand the relationship between personality and decision-making in the software-engineering context. The SLR conducted in the discovery phase pointed to a lack of software engineering studies that discuss the relationship mentioned above; therefore, this phase's contribution is the generation of knowledge in this specific field.

This survey has an **exploratory** nature, because it was not possible to find studies that provided some theoretical support for the creation of hypotheses. Therefore, the survey detailed herein was guided by exploratory research questions instead of hypotheses.

Case study and formal experiment were also considered as potential research methods; however, a formal experiment was discarded due to the inability to generate hypotheses and the complexity related to the experiment design – for example, selecting participants with a wide spectrum of personality combinations. A case study could be another option; however, the results would not have the same generalization power as survey research. Therefore, considering all the existing limitations, a survey was judged to be the best method to address the research goal.

This section presents the survey design, which includes the research question, goal, timeline, population, variables, data-collection instrument, pilot, and support tools. The statistical approaches used to analyze the survey data are presented in Chapter 5.

Survey goal and research questions

This survey's main goal was to understand the relationship between personality and two aspects of decision-making: **style** and **self-efficacy**. Table 1 presents the survey goal using the GQM (Goal-Question-Metric) template defined in Basili et al. (2014).

Table 1. Survey goal using the GQM.

Type	Goal
Analyze: *(object of study)*	Decisions made in the software-engineering context and individuals involved in these decisions.
To: *(purpose)*	Understand the relationship between decision-making and personality.
With respect to: *(focus)*	Decision maker's personality, decision-making style, and decision-making self-efficacy.

From the point of view of: *(viewpoint)*	Anyone who is involved in the decision-making.
In the following context: *(environment)*	Software engineering practice.

Table 2 presents the research questions, along with their corresponding objectives.

Table 2. Research questions and their objectives.

ID	Research Question	Objectives
RQ-SRV1	What is the relationship between *decision-making style* and personality?	(1) Investigate whether decision-making style (DMS) and personality variables (factors and facets) are related. If so, quantify the strength of the relationship. (2) Verify if personality factors can be used to explain the variation in DMS. If so, quantify the percentage of variation explained and the accuracy of the prediction. (3) Verify if any demographic variable moderates the relationship between DMS and personality factors.
RQ-SRV2	What is the relationship between *decision-making self-efficacy* and personality?	(1) Investigate whether decision-making self-efficacy (DMSE) domains and personality variables (factors and facets) are related. If so, quantify the strength of the relationship. (2) Verify if personality factors can explain the variation in DMSE domains. If so, quantify the percentage of variation explained and the accuracy of the prediction. (3) Verify if any demographic variable moderates the relationship between DMSE domains and personality factors.

Survey timeline

This survey was executed from March 2018 to June 2020, as shown in the timeline of Table 3.

Table 3. Survey execution timeline.

Time	Survey phase
Mar − Jun 2018	Survey planning
Jun − Jul 2018	Instrument design
Jun 2018	Survey pilot
Jun 2018	Participant recruitment
Jul − Sep 2018	Data collection

The survey instrument is composed of questionnaires that have been used many times before however, because all the survey participants are Brazilian, the questions were translated into Portuguese. Furthermore, since the instrument is long, the questionnaire distribution strategy was tested using the **survey pilot**. These activities were executed during the **instrument design phase**.

During the **recruitment phase**, a message (see Appendix 1) with the research goal and other details related to the survey was sent to 344 people. The message also asked the individual to suggest other people who could participate in the survey. We sent an email with the questionnaire link only to those who agreed to participate.

The **data-collection phase** started when we sent the questionnaire link to the participants. We also sent three follow-up reminders to increase the dataset size.

In order to provide feedback to the survey participants, we created a report for every person who requested it and who filled all four parts of the survey. The report briefly explained the theory behind the questions and the participant's score for the five personality facets, decision-making style, and decision-making self-efficacy domain.

We received feedback for 15 of the 61 participants we sent a report to, discussing their experience in answering the survey. Some stated that they had never thought about how they make decisions before the survey. Others said that the survey helped them to think about factors that can influence their decisions. Some confirmed that the report

describes their decision-making and personality characteristics accurately. The template of the survey report is presented in Appendix B.

Population and sample

This survey targeted professionals who are **involved** in the decision-making process in software engineering. We defined three categories of such professionals, which are presented here:

- **Business-related:** people who know about the business and contribute with requirements or any other business knowledge needed to understand the software characteristics.
- **Management-related:** people who perform any task related to software project management.
- **Technical-related:** people who perform any task necessary to develop the software directly (e.g., requirements engineers, software architects, developers, and testers).

From the authors' point of view, these three categories are concise and complete, and they summarize the main roles of software development. They were motivated by the work of Schwaber and Sutherland (2017), who define teams as being composed of team leaders (management-related professionals), team members (technical-related professionals), and product owners (business-related professionals).

The criteria for selecting the survey population are summarized below:

- The participant should be involved in the decision-making process in the software-engineering context.
- The participant should be actively engaged professionally in one or more of the three defined roles (business, management, or technical).

All the participants were Ph.D. candidate's acquaintances; therefore, we used a **non-probabilistic convenience sample**. They were contacted via email or other online-messaging tools (such as Facebook and LinkedIn messengers). Participation in the survey was on a voluntary basis, and only those respondents who agreed to participate received a link to the data-collection instrument (an online questionnaire).

We also executed snowballing in two different ways. We sent a message to the Ph.D. candidate´s acquaintances who did not comply with the criteria to select the survey population and we asked them to contact others who might also be willing to participate in the study. We also asked the Ph.D. candidate´s acquaintances who complied with the criteria and agreed to participate in the survey to contact others to participate in the survey. Therefore, we performed a **non-probabilistic snowballing**.

In total, 344 people were contacted, out of which 138 agreed to participate (40.12%). The survey was divided into four parts. Among those who agreed to participate, 102 answered only the first part (73.91%), and 63 participants answered all four parts of the survey (46.38%). Table 4 summarizes the sampling statistics.

Table 4. Sampling numbers.

Description	Number	Percentage
Received invitation	344	-
Accepted invitation	138	40.12% success rate
Number of answers per questionnaire part		
Part I	102	73.91% of the 138 who accepted the invitation
Part II	74	53.62 % of the 138 who accepted the invitation
Part III	63	46.38 % of the 138 who accepted the invitation
Part IV	63	46.38 % of the 138 who accepted the invitation

The survey response rate was high (73.91%); however, only 63 participants (46.38%) completed all four parts. Another important number is related to the snowballing procedure; 30 out of 102 people who answer Part 1 were contacted through snowballing; and 19 from 63 participants answered all four parts were also from snowballing.

We analyzed the data of questionnaires that were answered entirely. In other words, even though we collected some data related to decision-making style on Part I and II, they were discarded during the data analysis. Therefore, the total amount of data points on the decision-making style variable was only 63.

The distribution of the participants' roles is shown in Table 5. Note that a mixed role characterizes those who perform more than one role during a software-development activity.

Table 5. Distribution of participants by defined roles.

Role	Number	Percentage
Business	6	5.9%
Management	18	17.6%
Technical	51	50.0%
Mixed (more than one role)	27	26.5%
Total	102	100.0%

The participant distribution shown in Table 5 supports the usual composition of a software development team in practice: the largest number of people in technical roles, followed by management and business roles, respectively.

Data-collection instrument

The survey data-collection instrument is a questionnaire with four parts. Part I gathers personal information, part II gathers personality data, part III gathers data on DMSE, and finally, part IV gathers data on DMS. The questionnaire was self-administrated through an online tool. All the questions are closed-ended, which means that the participant should choose one of the listed alternatives.

The **personal information** part aims to characterize the participants' demographics. It includes questions about gender, age, education level, experience, and role in the project. This first part has six questions in total, and the estimated time to complete it ranges from 5 to 10 minutes.

The **personality assessment** part is a questionnaire proposed by Johnson (2014), which has already been used in many studies (Halim, Atif, Rashid, & Edwin, 2017; Kanij, Merkel, & Grundy, 2015; Salleh, Mendes, Grundy, & Burch, 2009). It measures the five factors (agreeableness, conscientiousness, extraversion, neuroticism, and openness) and their corresponding facets (six per factor, resulting in 30 facets in total; see Fig. 3 for the complete list of facets). The questionnaire is in the public domain and available on the Web[1]. It comes in two versions; one contains 300 items, while the other has 120. We used the latter version; despite the former's superior reliability by comparison, the shorter version can be completed more quickly (between 10 to 20 min). Because of the total time required to answer all four questionnaires, it was important to choose the version that requires less amount of time to be filled.

The **decision-making self-efficacy** part used the questionnaire proposed by Myburgh et al. (2015). This questionnaire is based on the premise that self-efficacy beliefs influence decision-making efficacy. These beliefs relate to some abilities required to execute decision-making activities. The questionnaire contains 30 statements distributed across four domains, and it has been validated in two studies conducted by Myburgh et al. (2015). It was chosen due to its validity, and because it measures the decision-maker's capacity to make decisions objectively.

Finally, the **decision-making style** part assesses how much the lead decision-maker allows other people to participate in the decision process. The model proposed by Vroom and Yetton (1973) defines 10 decision-making styles: five for individual problems and five for group problems (see Section 1.1 for an overview).

The Vroom-Yetton model contains two perspectives: normative and descriptive. This survey employs the latter model, which consists of 30 problems (Glube, 1978 Appendix B) and a scale to compute others' level of participation in the decision-making process, the decision-making style.

The estimated time for completing the decision-making style part ranged from 1.5 to 3 hours (3 to 6 minutes per case). The total time required to fill out all four parts was between 2 and 4 hours. This duration is rather long, and it motivated us to divide the data-collection procedure into four parts, as presented in Table 6.

[1] http://www.personal.psu.edu/~j5j/IPIP/

Table 6. Survey questionnaire distribution.

Part	Questionnaire
1	- Personal information (6 questions);
	- Personality (120 items);
	- Decision-making self-efficacy (30 items)
2	- Decision-making style (12 cases)
3	- Decision-making style (9 cases)
4	- Decision-making style (9 cases)

We set the answering sequence for the four different parts strategically. During the first part, the respondents completed three questionnaires. In this manner, even if they decided not to continue participating in the survey, we had enough data to analyze the relationship between personality and decision-making self-efficacy.

Furthermore, the cases in the decision-making style part were ordered from shortest to longest, based on the number of words in each case description. We employed this strategy to motivate the respondents to continue answering the questions.

The original language of the personality, decision-making self-efficacy, and decision-making style questionnaires is English; however, since the participants' native language is Brazilian Portuguese, it was necessary to translate the questions. The student translated them, and the text was reviewed twice, as described below.

During the survey-pilot sessions, we took notes when the participants had any difficulty understanding the questionnaire, and we later provided alternative translations to these parts.

After the survey pilot, a third-party person (TPP) reviewed the questionnaire. The TPP's mother tongue is Brazilian Portuguese, but she is also proficient in English. She compared the original text to its translated version, noting any parts where the meanings differed. In some cases, she provided an alternative translation, whereas in others, she explained the problem. She was always available for discussion when we reviewed her comments.

Variables

This survey focuses on the relationship between personality and decision-making in the context of software engineering. Fig. 8 shows the variables for which we collected data. Personality, decision-making self-efficacy, and decision-making style were measured on an interval (or continuous) scale; age, education level, and experience were measured on an ordinal scale, and role on a nominal scale (Wohlin et al., 2012, pp. 39–40).

In this survey, the dependent variables are those related to decision-making (i.e., decision-making self-efficacy domains, and decision-making style). The independent variables are those associated with personality (i.e., personality factors and facets). Finally, the moderation factors are the demographic variables (i.e., age, role, education level, and experience). Fig. 8 shows the abovementioned variables, which are discussed in the following sections.

Personality

The personality variables in this survey are the factors and facets presented in Fig. 1. In total, this survey has 35 personality variables: five factors and 30 facets (six facets per factor).

This research uses the IPIP-NEO-120, a questionnaire created by Johnson (2014) and derived from the set of items in the NEO-PI. The IPIP-NEO is available on the Web[2] , and it is in the public domain. It comes in two versions: one contains 300 items, while the other has 120. Within this thesis's context, we adopted the latter version, because it is reliable for measuring personality, and it can be completed more quickly (between 10 to 20 min). Note that the time required to answer the IPIP-NEO questionnaire had to be considered very carefully, as our population is comprised of very busy industry professionals.

[2] http://www.personal.psu.edu/~j5j/IPIP/

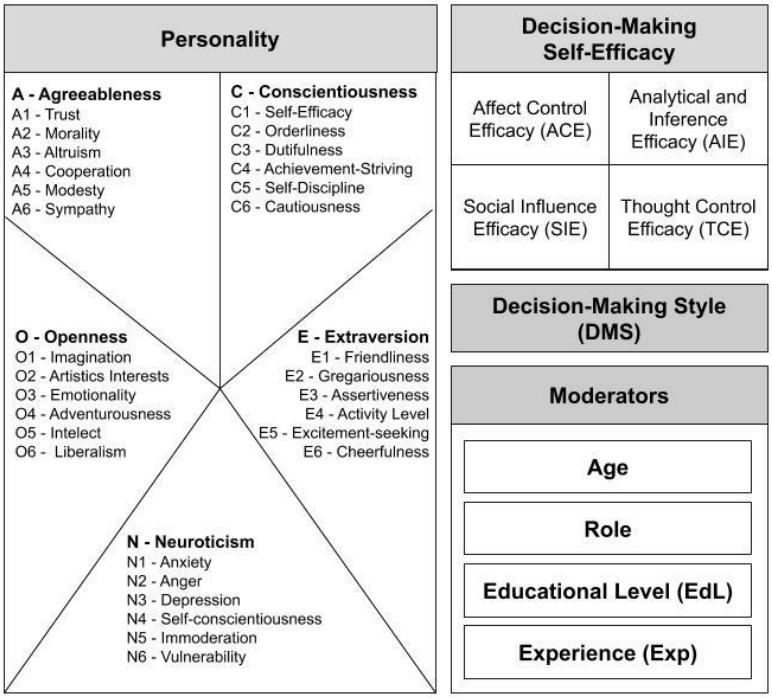

Fig. 1. Survey variables.

Each item in the personality questionnaire is simultaneously related to one factor and one facet; moreover, each item can be + or −keyed. A +keyed item adds a value between 1 ("very inaccurate") and 5 ("very accurate") points to the personality score (factor and facet); and for a −keyed item, the score attribution is inverted[3], as shown in Table 7.

Table 7. Score calculation for personality variables.

Chosen alternative	+keyed	−keyed
Very accurate	5	1
Moderately accurate	4	2
Neither inaccurate nor accurate	3	3
Moderately inaccurate	2	4
Very inaccurate	1	5

Table 7 shows the rules for score calculation. Since the questionnaire has 24 items per personality factor, the theoretical score varies from 24 to 120: and since the questionnaire has 4 items for each personality facet, the questionnaire produces a score between 4 and 20.

Decision-Making Self-Efficacy

The decision-making self-efficacy theory defines four domains, and each domain represents one variable in this survey. The associated questionnaire contains 30 statements and collects data for the four variables that represent the respective domains. The participants need to select a number from 0 to 100 for each statement. The number expresses how confident they are that they can regularly perform the action described. Fig. 2 shows the scale employed in the questionnaire.

[3] https://ipip.ori.org/newScoringInstructions.htm

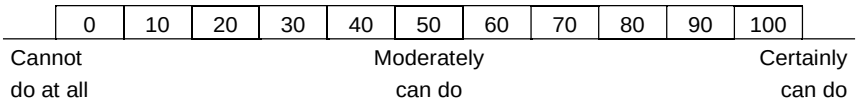

Fig. 2. Decision-making self-efficacy questionnaire scale.

Each domain has its own final score, which is related to the number on the scale that the respondent chose for each item. The score is calculated using the sum of the chosen number for each statement related to the domain:

$$gross.score = \sum_{number.items}^{1} chosen.number$$

The gross score is then divided by the total number of items in the domain:

$$final.score = gross.score/number.items$$

Therefore, the final score is a number between 0 and 100. Table 8 shows the number of items in the questionnaire for each decision-making self-efficacy domain and the maximum gross score possible.

Table 8. Domains, number of items in the questionnaire per domain, and gross score.

Domain	Number of items	Max. gross score
Affect Control Efficacy (ACE)	9	900
Analytical and Inferential Efficacy (AIE)	11	1100
Social Influence Efficacy (SIE)	5	500
Thought Control Efficacy (TCE)	5	500

Decision-Making Style

The questionnaire used to collect data on the decision-making style variable contains 30 problems. The participant chooses one of five available alternatives, which are the same for all problems. The alternatives are shown in Table 9, along with the added score if the alternative is chosen.

Table 9. Alternatives and their scores added to the final decision-making style score (Vroom & Jago, 1988 Chap. 7).

ID	Description	Added score
AI	You solve the problem or decide yourself using the information available to you at the present time.	0
AII	You obtain any necessary information from subordinates, then decide on the solution to the problem yourself. You may or may not tell them the purpose of your questions or give information about the problem or decision you are working on. Their input is clearly in response to your request for specific information. They do not play a role in the definition of the problem or in generating or evaluating alternative solutions.	1
CI	You share the problem with the relevant subordinates individually, getting their ideas and suggestions without bringing them together as a group; then you make the decision. This decision may or may not reflect their influence.	5
CII	You share the problem with your subordinates in a group meeting. In this meeting, you obtain their ideas and suggestions. You then make the decision, which may or may not reflect their influence.	8
GII	You share the problem with your subordinates as a group. Together, you generate and evaluate alternatives and attempt to reach an agreement (consensus) on a solution. Your role is much like that of a chairman, coordinating the discussion, keeping it focused on the problem, and making sure that the critical issues are discussed. You can provide the group with information or ideas, but you do not try to "press" them to adopt "your" solution; you are willing to accept and implement any solution which has the support of the entire group.	10

The questionnaire has 30 problems (Glube, 1978); therefore, each participant can have a decision-making style score between 0 and 300:

$$DMStyle.score = \sum_{30}^{1} chosen.alternative.score$$

Higher scores indicate a more participative decision-making style, and lower scores a less participative style.

Despite the questionnaire proposed by Vroom and Jago (1988) deal with two types of problems (individual and group, Section), the investigation presented herein focuses only on **group problems**.

Pilot survey

According to Kasunic (2005, p. 76), the pilot can expose problems or weaknesses related to the questions, questionnaire layout, process, and technology used. Since the most complex questionnaires had been created and frequently used before this survey (personality, decision-making self-efficacy, and decision-making style questionnaires), the pilot's focus was **not** on the questions' content. The pilot aimed to verify:

- the estimated time reported to complete the survey;
- the clarity and understandability of the questionnaires;
- the arrangement of the questionnaires and the decision-making style cases; and
- any opportunities for improvement of the survey execution process.

Three people participated in the pilot survey using the language that they feel more comfortable with. Table 10 presents their respective profiles.

Table 10. Profiles of pilot participants.

Participant ID	Language	Population Category	Experience
1	English	Technical-related professional	Six months' experience as a tester in three projects that include software development. Software is one of the project results that need to be tested.
2	Brazilian Portuguese	Management-related professional	Two years and one month as a software project manager. Planning and controlling the schedule, people management, and quality management are some of the tasks performed.
3	Brazilian Portuguese	Management-related professional	Seven years of experience in traditional project management and four years in agile projects. Among the usual activities performed are, for example, schedule control and communication management.

The participants were observed while they answered the survey, and they were allowed to interact with the researcher. These interactions were counted and classified according to type. The data collected during the pilot were used to assess the questions' understandability, list any difficulties that the respondents might face, and improve the survey execution process.

The participants interacted with the researcher 93 times. Fig. 3 shows the percentage breakdown of interactions per participant and by type. The interactions resulted in many changes to the data-collection strategy: for example, the tool for collecting the answers, the format of the questions, the disposition of the cases in the decision-making style questionnaire, and the questionnaire translations were all improved upon.

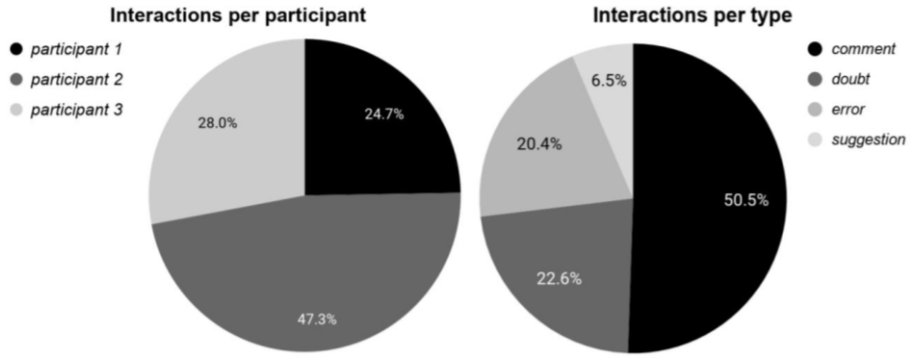

Fig. 3. Pilot statistics.

Furthermore, during the observation, we recorded the time that each participant took to answer each questionnaire. This information was used to verify the estimated time for completion, which was compared with the reported figure in the literature. This time was also used to decide the distribution of the questionnaires across the four parts. Table 11 presents the time that each participant spent on each questionnaire and the time reported in the literature (Johnson, 2014; Vroom & Yetton, 1973).

Table 11. Time required to complete the questionnaires.

Questionnaire	Pilot Study Respondents			Literature	
	1	2	3	Min	Max
Personal information	1 min 40 sec	9 min 3 sec	4 min 6 sec	-	-
Personality	10 min 40 sec	43 min 12 sec	23 min 1 sec	10 min	20 min
Decision-making efficiency	4 min 35 sec	10 min 31 sec	7 min 30 sec	-	-
Decision-making style	1 h 45 min	2 h 46 min	1 h 17 min	1 h 30 min	3 h

Support tools

We used Webropol[4] to support the survey data collection. Although Webropol provides some data-analysis features, we decided to choose another more specific tool for this purpose, the IBM SPSS Statistics Version 25[5]. The IBM SPSS Modeler Version 18.2.1.0 was used to conduct the cross-validation-related procedures.

Strategies to deal with potential survey errors

Regarding the types and sources of survey error, Blair, Czaja, and Blair (2014, pp. 23–25) present three reasons that can interfere with an accurate representation of the survey population: sampling error, sample bias, and non-sampling error.

The **sampling error** or sample variance refers to the fact that the survey sample cannot accurately reflect the population's characteristics accurately, which is controlled by the sample size. A larger survey population is preferable. In this survey, snowballing was used to expand the survey population and, therefore, to deal with this error.

According to the same authors, surveys can also have three general types of **sample bias**: coverage, selection, and nonresponse (Blair et al., 2014, p. 23). In terms of *coverage bias*, the main problem of this survey population is the geographical distribution. The whole survey population is Brazilian, although some of the participants work in other countries. Another coverage problem is that most of the survey population hold technical roles. These characteristics can impact the generalization power of the survey results.

In order to deal with *selection bias*, during the planning phase, we defined the roles and criteria for selecting the survey population. Using this strategy, we reduced the selection bias. Finally, for *nonresponse bias*, we first sent

[4] http://w3.webropol.com
[5] https://www.ibm.com/products/spss-statistics

a message asking for a commitment to survey participation. We sent the survey instrument only to those who agreed to participate. Furthermore, we also sent four reminders to increase the response rate (check Table 24).

The last group of reasons mentioned by Blair et al. (2014, pp. 23–25) is the **non-sampling error**. According to the authors, there are three sources of error in this category: interviewer, response, and coding. *Interviewer errors* are related to the survey administration; for example, the researcher may fabricate data. This survey used an automatic tool to collect data; it exports a file with all the responses. This file was made available to the supervisors upon request; in this manner, they could verify any possibility of data fabrication.

It is important to mention that the variable related to education level was changed after data collection; this **does not characterize cheating** but a correction in the data. In Brazil, there are post-bachelor courses, usually one year in duration, with classes during the weekends. Through these courses, students acquire a more profound knowledge of specific subjects, such as agile methodologies and web development. Ten participants marked the "other" option and described the subject in which they have specialized. We decided to merge these 10 responses into the "bachelor's degree" category, because these are not degree programs.

The *response error* is related to the accuracy of the response given. It relates to respondent comprehension and knowledge of the questions and their alternatives, as well as their sincerity in answering the questionnaire. During the pilot study, one of the goals was to assess the questionnaire's clarity and understandability. Furthermore, the researcher guaranteed the anonymity of the responses; in this way, we protected the survey participants from any repercussions that might result from an honest answer.

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Appendix 1 - Invitation for survey participation

Hello <Name_of_the_person>,

I am a Ph.D. candidate at the University of Oulu (Finland). The main goal of my Ph.D. research is to investigate the relationship between personality and decision-making, considering the Software Engineering context.

In this stage of my research, I will execute a survey, and, because of this, I am searching for people that work in software development projects and perform one of the following group of roles:

1. **Business-related professionals:** People who know about the business and contribute to the project as sources of requirements or any other business knowledge required to perform the software development.
2. **Management-related professionals:** people that perform any task related to software development management.
3. **Technical-related professionals:** people that perform any task necessary to develop the software directly, such as requirement engineers, software architects, software coders, and testers.

The main problem is because the questionnaire takes too much time to be answered (about 4 hours) e I can not decrease the time to answer it. Because of this, I've contacted people individually, asking if he/she can participate in my survey and/or provide me some people names that could participate in my survey. The survey will be answered during four-session with a duration of one hour each. When the participant finishes one session, I will send the material related to the next session.

Do you work in a software development project performing one of the groups of roles I've described before? If so, may you answer my questionnaire? Is it possible that you provide me some names of people you know that could answer my questionnaire?

If you accept my invitation, please, let me know which of the three groups of roles you are. I will send you the material for the first session in July.

Furthermore, if you decide to provide me some names to participate in this survey, please talk to the person before giving me her/his information and check if the person is really committed to answering my questionnaire. I am sure that your personal invitation will change her/his mind about participating or not in this survey.

Appendix 2 – Template of Survey Participation Report (English)

Survey Participation Report

The relationship between personality and decision-making

Researcher: Fabiana Freitas Mendes (e-mail)
Participant e-mail: <e-mail>

1. Introduction

This survey research aims to investigate the relationship between personality and decision-making; therefore you answered the personal information questionnaire and also three others. The questionnaires collected information about your personality traits, your perception of your own decision efficacy, and your decision-making style. This report will present your score in all these three aspects.

It is important to note that your score **was not** compared statistically to other people with the same characteristics as you (gender, age, country, for example) and, therefore, it is not possible to draw many conclusions about your data. Therefore, **do not** take the information presented in this report as a perfect assessment of your personality, decision-making self-efficacy, and decision-making style. This report aims only to inform your personal results.

The remaining report is organized as follows. First, we present your score for each personality factor, then your score for each decision-making self-efficacy domain, and, finally, your score in decision-making style

2. Personality

Many models aim to describe how the human personality is, one of them is the *Five Factor Model* (FFM). This model summarizes the human personality in five main personality traits: agreeableness, conscientiousness, extraversion, neuroticism (emotional stability), and openness. Following is presented some adjectives related to people who have a high score in the personality factors abovementioned.

- **Agreeableness**: good-natured, soft-hearted, trusting, courteous.
- **Conscientiousness:** careful, reliable, hardworking, organized.
- **Extroversion:** sociable, talkative, fun-loving, affectionate.
- **Neuroticism:** worried, insecure, nervous, high-strung.
- **Openness**: original, independent, creative, daring.

The human personality can be assessed in many ways, including a questionnaire, which is the method employed in this research. There are also many questionnaires to assess human personality adherent to FFM. This research employs the 120 items questionnaires available at: https://ipip.ori.org/.

If you want to answer this same questionnaire, however with your results compared statistically to a set of people with the same profile as you, visit the link: http://www.personal.psu.edu/~j5j/IPIP/ipipneo120.htm. This comparison is important to conclude about your personality traits.

The score you got for each personality factor is shown in Figure 1. The maximum score possible is 100, and as close to 100 closer you are to the adjectives showed before.

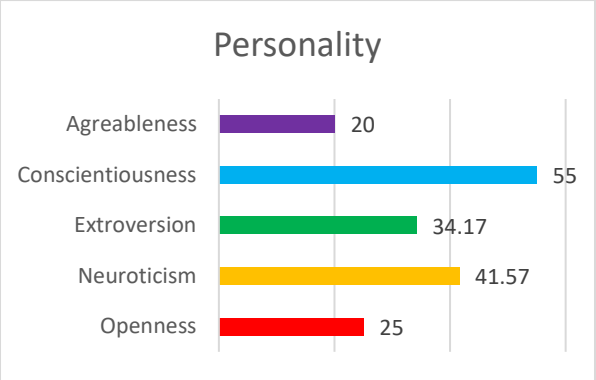

Figure 1: Your score for each personality factor

3. Decision-Making Self-Efficacy

The decision-making self-efficacy is measured through statements that represent your beliefs about aspects of decision making: (1) affect control efficacy; (2) analytical and inferential efficacy, (3) social influence efficacy; and (3) thought control efficacy[6].

These beliefs reflect the individual's performance expectations and also how much effort someone needs to perform a decision. Furthermore, it also measures the tendency to keep the decision even when there is opposition[6].

The score you got for each decision-making self-efficacy domain is shown in Figure 2. The maximum score possible is 100, as close to 100 better is your efficacy in the domain.

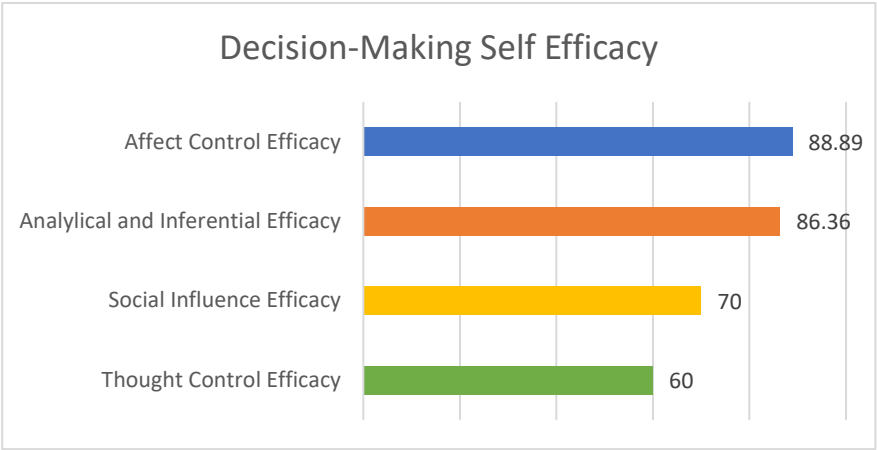

Figura 2: Pontuação obtida em cada um dos quatro aspectos da eficácia da tomada de decisão

4. Decision-Making Style

The decision-making style is related to how many people you allow to participate in your decision-making process. If you get a small score, most probably you tend to make a decision without considering other people's opinions. If you get a high score, your decisions are based on group consensus, and it means that you consider what the group thinks about the problem[7]. Your score is **XXX**. The maximum score possible is 300.

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[6] Myburgh W, Watson MB, Foxcroft CD. Development and validation of a managerial decision-making self-efficacy questionnaire. SA Journal of Industrial Psychology. 2015;41(1):01-15.

[7] Vroom VH, Yetton PW. Leadership and decision-making. University of Pittsburgh Pre; 1973 Jun 15. Disponível em: http://digital.library.pitt.edu/islandora/object/pitt%3A31735057897062/viewer#page/1/mode/2up.

Appendix 3 – Template of Survey Participation Report (Brazilian Portuguese)

Relatório de Participação de Survey

O relacionamento entre personalidade e tomada de decisão

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E-mail d@ Participante: <e-mail>

1. Introdução

A pesquisa de doutorado relacionada ao survey que você participou tem como objetivo investigar o relacionamento entre personalidade e tomada de decisão; por isso você respondeu, além do questionário que coletou suas informações pessoais, três outros questionários. Esses questionários avaliaram três itens: sua personalidade, a percepção que você tem da eficácia das decisões que você toma, e seu estilo de tomada de decisão. Esse relatório irá apresentar sua pontuação em cada um desses itens.

Perceba que aqui será apresentada apenas a pontuação que você obteve. Sua pontuação **não está** comparada estatisticamente com pessoas que possuam as mesmas características que você (sexo, idade, país de nascimento, por exemplo) e, por isso, não é possível fazer conclusões precisas. Dessa forma, **não** considere esse relatório como uma perfeita avaliação de suas características nos três itens apresentados. **Esse relatório é apenas informativo.**

O restante do documento está organizado como se segue. Primeiro serão apresentadas suas pontuações nos cinco fatores de personalidade avaliados, depois nas quatro subescalas de eficácia da decisão e, finalmente, a sua pontuação em estilo de tomada de decisão.

2. Personalidade

Existem diversos modelos que têm como objetivo sistematizar a personalidade humana, um deles é o *Five Factor Model* (FFM, Modelo de Cinco Fatores). Esse modelo considera cinco principais traços de personalidade e considera que a personalidade humana pode ser caracterizada considerando apenas esses cinco principais traços: neuroticismo (estabilidade emocional), extroversão, amabilidade, conscienciosidade (senso de responsabilidade) e abertura à experiência. A seguir são apresentados alguns adjetivos para pessoas que tem uma pontuação alta em cada um dos cinco fatores de personalidade.

- Neuroticismo: preocupado, inseguro, nervoso.
- Extroversão: sociável, conversador, divertido, afetuoso.
- Amabilidade: bem humorado, de bom coração, confiável, cortês.
- Conscienciosidade: cuidadoso, confiável, trabalhador, organizado.
- Abertura à experiência: original, independente, criativo, ousado.

A personalidade humana pode ser avaliada de diversas maneiras, incluindo através de questionários, como está sendo feito nessa pesquisa de doutorado. Existem diversos questionários para se avaliar a personalidade humana considerando o FFM. Esta pesquisa de doutorado utiliza um questionário de 120 itens disponível em: https://ipip.ori.org/.

Caso você queira responder o mesmo questionário respondido no survey, porém deseja ter seus resultados comparados estatisticamente com um conjunto de outras respostas visite o link: http://www.personal.psu.edu/~j5j/IPIP/ipipneo120.htm. Essa comparação é importante para que se possa, de fato, concluir sobre seus traços de personalidade. O questionário bem como o resultado serão apresentados em inglês.

A pontuação que você recebeu em cada um dos cinco fatores do FFM é apresentada na Figura 1. Considere que a pontuação máxima possível para cada um dos fatores é 100.

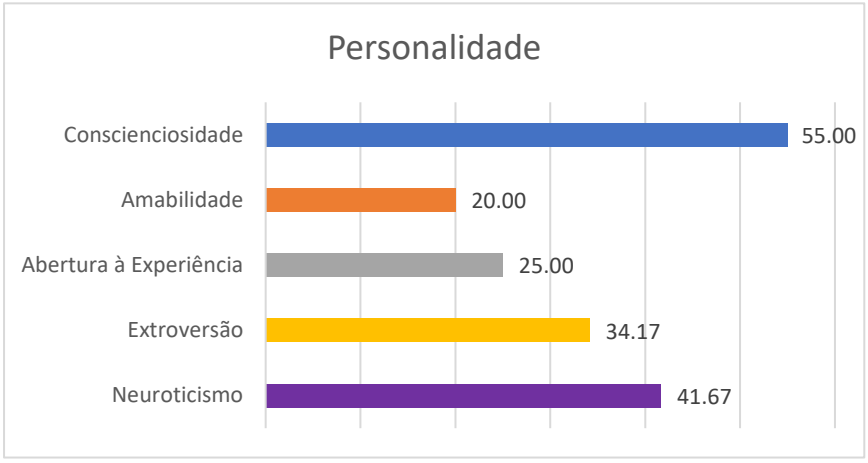

Figura 1: Pontuação obtida em cada um dos cinco fatores de personalidade

3. Eficácia da Tomada de Decisão

A eficácia da tomada de decisão no questionário é medida através de afirmações que representam crenças a respeito de quatro aspectos da tomada de decisão: (1) eficácia do controle da emoção; (2) eficácia do controle do pensamento; (3) eficácia analítica e inferencial; e (4) eficácia da influência social[8].

De acordo com os autores do questionário, essas crenças refletem a expectativa individual de desempenho e o quanto de esforço uma pessoa pode despender em uma atividade bem como sua tendência de perseverar nela quando existem obstáculos[1].

A pontuação que você recebeu em cada um dos quatro aspectos da eficácia na tomada de decisão é apresentada na Figura 2. Considere que a pontuação máxima possível para cada um dos aspectos é 100.

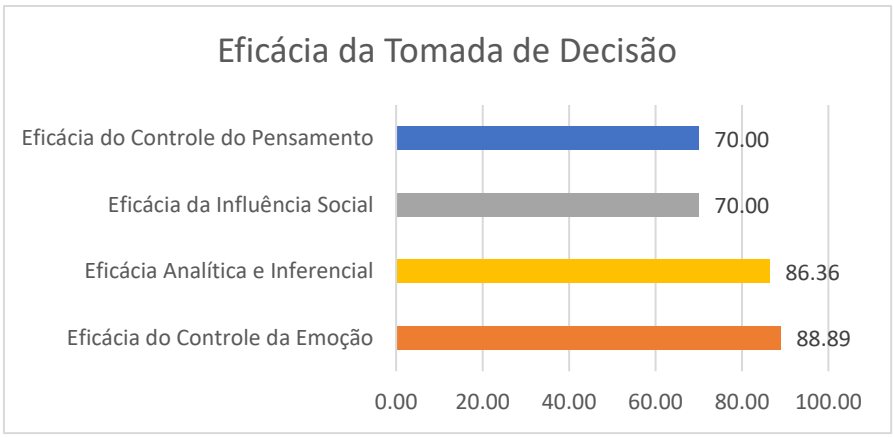

Figura 2: Pontuação obtida em cada um dos quatro aspectos da eficácia da tomada de decisão

[8] Myburgh W, Watson MB, Foxcroft CD. Development and validation of a managerial decision-making self-efficacy questionnaire. SA Journal of Industrial Psychology. 2015;41(1):01-15.

4. Estilo de Tomada de Decisão

O estilo de tomada de decisão considera o quanto você permite que outras pessoas participem no seu processo de tomada de decisão. Em um dos extremos está alguém que toma a decisão sem coletar informações ou consultar qualquer pessoa e, no outro extremo, pessoas que tomam decisões que são na verdade o consenso do que o grupo pensa a respeito de determinado problema[9].

O questionário que você respondeu, tenta pontuar em que posição entre cada um desses extremos você está. Sua pontuação nesse quesito foi **XXX**. Considere que a pontuação máxima possível é 300.

[9] Vroom VH, Yetton PW. Leadership and decision-making. University of Pittsburgh Pre; 1973 Jun 15. Disponível em: http://digital.library.pitt.edu/islandora/object/pitt%3A31735057897062/viewer#page/1/mode/2up.