

Relationship between Personality Types Conceptualized by C. G. Jung and Latvian IT Specialist Preferences

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Abstract. General people's personality types, as well as idiosyncrasies and cognition and perception characteristics specific to each type, are a common research item, especially in such areas as pedagogics, human resource management, etc. Personality traits characteristic for individuals and teams of certain specific avocations (i.e., project teams), however, are a much less explored subject. In this area, the amount of conducted research is congruent with the geopolitical location and directly correlates with the possibility of finding practical applications for the findings of said research. This study presents the initial findings of such research, within the scope of which the idiosyncrasies common for IT specialists were explored using the Myers-Briggs Type Indicator (MBTI) model. These initial findings can be used as the foundation for further study on the subject, helping to create a general Latvian IT specialist's personality profile, and, possibly, identifying the areas that need development, while taking into consideration the tendencies and requirements of the Latvian IT market, as well as those of the labour market worldwide.

Keywords: Personality types, MBTI, psychological profiles, human factors in software engineering, user profile.

1 Introduction

Individual traits of IT specialists and teams can differ due to regional (nationality, culture, geographical location), historical, and various other reasons. It is common for different countries and regions to have different tendencies and development levels in both IT and other industry spheres. Hence, results of a study conducted on a specific group (students, IT specialists, etc.) in one region will not necessarily be replicated in other regions or countries, should identical studies take place there. In order to identify professional development opportunities, for example, for IT specialists and project teams, it is necessary to conduct the research based on the data obtained from the relevant region – in this case, Latvia. This study conducts an initial evaluation of character traits and idiosyncrasies common for Latvian IT specialists (working both individually and in teams) in order to determine whether results obtained in Latvia have any major differences from the results obtained via similar studies in other countries, and to set a course for future research on the subject.

Having better knowledge of the common personality traits and characteristic features can enable the use of more precise and appropriate personnel selection and management methods, which could, in turn, make it possible to improve the results of international business

collaborations, as well as work efficiency, process effectiveness, etc. For example, hypothetically, possessing the information that business analysts are more prone to “introvert” personality type would make it possible to better plan their training – possibly, including such elements as communication and presentation skills, emotional intelligence, and many others. All of these elements, while essential for a business analyst who is to communicate with clients, are rarely possessed by people with “introvert” personality type.

IT project management in Latvia is a relatively new discipline. The International Project Management Association has been operating since 1965, whereas in Latvia, a similar organization was founded and “IT Project Management” was recognized as a real profession only in the year 1999. Latvian IT project managers are less experienced. This results in the area of human resources (HR) issues being one of the most troublesome aspects of IT projects. Quite frequently misunderstandings and even conflicts arise, due to the fact that team members have a wide range of drastically different personalities, which, in turn, generate obstacles for mutual understanding.

The Myers-Briggs Type Indicator (MBTI) model was used for obtaining data and analysis of it. MBTI is a renowned and widely used model that provides pre-existing data gathering and analysis tools [1]. MBTI is a personality profiling instrument that is based on the theory of personality types described by Carl Jung, Isabel Briggs Myers, and Katharine Briggs [1]. This theory states that many of the valuable differences between people are a result of natural preferences that everyone has for different ways of perceiving information, as well as for different ways of judging and making decisions [1]. Those natural differences play a role in achieving IT project success.

The MBTI tool has been used for different purposes in many studies and countries for decades. This gives an opportunity to compare the results obtained in Latvia with the research results and practice in other countries, for example, Cuba [2].

The paper is structured as follows: in Section 2 related work is discussed; in Section 3 a research method is presented; in Section 4 MBTI Personality properties are systemized; in Section 5 development of personality test is described; in Section 6 survey results are analysed; finally, in Section 7 brief conclusion and directions of future work are presented.

2 Related works

Psychological assessment instruments have been used for over sixty years and have reached a mature stage for predicting career selection and behaviour. Many of these instruments are based on the theories of C. Jung and S. Freud. In particular, MBTI has been one of the most popular tools used for ascertaining personality types, especially because the instrument has been supported by extensive data [3]. The Myers-Briggs Type Indicator has been applied in several researches to study different dimensions of human personalities in software engineering.

The MBTI tool sets and describes four basic areas of personality (dimensions or dichotomies). Each dimension will be described in Section 4 of this paper.

The authors of [2] have developed a valuable mapping of job requirements and skills for software engineering experts, namely, system analysts, designers, programmers, testers, and maintenance engineers to MBTI personality characteristics. However, this study omits other roles in software engineering field, e.g., project managers.

In [4] the authors represent a common picture on the majority of the MBTI preferences present inside software engineering, and show a large preference towards thinkers and judges. However, the results presented in [4] are generic. On average there are 57.24% of the respondents with a judging preference, 51.50% with a sensing thinking preference, and 49.14% showing an introverted thinking preference [4].

The aim of the study presented in [2] was to establish the personality profile of Cuban software engineers according to the MBTI. Analysis of the study shows that the most prominent personality type is a combination of extroversion, sensing, thinking and judging [2].

In [5] the authors present the review that concludes that the changes in the complexity of software processes and products have created new roles and demanded new skills for software engineers. The authors conclude that much more analysis is needed to draw a final conclusion about personality in software engineering [5].

The authors in [5] explore the personality traits of software development practitioners by using a classification schema based on the personality traits extended on the Myers-Briggs type indicator. The authors use Situational context cards as a methodology for identifying personality traits of software development practitioners. The authors argue that the social characteristics of individuals directly affect team success and, therefore, building an effective team configuration model can have a large effect on productivity. The findings of [5] confirm that individuals in teams that are using a plan driven methodology are found to have more judging characteristics (J) and the individuals in teams using an agile approach are found to have more of the perceiving trait (P).

The authors of the paper [6] present personality types, temperament and team diversity analysis to determine software engineering (SE) teams performance using rough set analysis. The authors state that the uncertainties in understanding the interrelationships between these attributes with team performance can be further overcome by developing a predictive team performance model.

In paper [7] authors argue that most studies in software engineering should give much more weight to human factors. In particular empirical software engineering studies involving human developers should always consider collecting psychometric data on the humans involved. They focus on personality as one important psychometric factor and present initial results from an empirical study investigating correlations between personality and attitudes to software engineering processes and tools.

The main results from our systematic review [8] are that there are gaps in the existing Behavioural Software Engineering research and that the research has been unbalanced.

Conclusions from related works can be summarized in this way:

- Human factors play an important role in software engineering, especially in complex projects;
- Personality profiling, as a human factor analysis tool, is often used;
- MBTI is a well recognized tool for human factor analysis;
- MBTI profiling in the IT sector shows particular trends on a global scale;
- Further research is required in order to draw sound conclusions, especially regarding team performance;
- There is no research about MBTI profiling in the IT domain of Latvia.

3 Research method and tasks

In order to reach the goal of the study, a survey (based on the questionnaire) was used. The survey was created based on the existing MBTI profiling tool (questions and results computation algorithm).

As the authors mentioned in the introduction, the aim of this research is Latvian IT specialist profiling. To achieve this goal the following tasks were put forward:

- Perform MBTI dimension analysis to understand the personality types and to understand if MBTI personality dimensions can be useful in the creation of a survey for Latvian IT specialists.

- Create and send the survey to Latvian IT specialists. In order to cover different IT companies and roles, gather at least 35 responses to get first insights into personality profiles. In the next studies, a more comprehensive survey with more respondents will be performed. The results will provide the following information about each participating individual:
 - Calculated Jungian/MBTI personality preference type;
 - Preferred modelling tool;
 - Competence area.
- Perform result analysis by determination of:
 - Most popular preference types (of 16 possible options) – if such will emerge;
 - Overall trends towards popular and unpopular types and dichotomies over different roles/competences;
- Attempt to validate the results obtained by their compliance with the related works;
- Attempt to construct a generic profile for a Latvian IT specialist.

The process and the results of task execution will be described in the next sections.

4 Exploring personality properties of IS development team

In this section there are four tables. Each of them represents characteristics attributed to specific MBTI dimension (dichotomy): Extravert/Introvert, Sensory/Intuitive, Thinkers/Feelers, Judging /Perceiving. We analysed dimension characteristics described in papers: [6], [9], and [10]. The papers link back to original works and textually describe key characteristics attributed to each dichotomy. In order to avoid an overlap in descriptions and clarify the area that is addressed, we systematized them into tables. One table was used for each dichotomy. Table 1 reflects Extravert/Introvert dichotomy. Table 2 reflects Sensory/Intuitive dichotomy. Table 3 reflects Thinkers/Feelers dichotomy.

Table 1. Dimension Extravert/Introvert

Name	ID	Source	Extravert	Introvert
Energy source	1	[6]	From being around people	By being alone
Problem solving	2	[6]	Pick up the phone and call someone	Think about the situation
	3	[6]	Connect with people	Introspection
Energy direction (Or attention)	4	[6], [10]	Mainly toward the outer world	Mainly toward one's inner world
	5	[6]	Chooses people	Solitude
Energy	6		Expenditure	Conservation
Tutoring guidelines	7	[6]	Practical learning based on examples	Observation-oriented
Leadership style	8	[6]	Interactive	Reflective

Table 2. Dimension Sensory/Intuitive

Name	ID	Source	Sensory	Intuitive
Focus	1	[6]	Detail oriented,	Big picture, abstract
Approach to details	2	[6]	Fine details	Overall feel and look
Solution approach	3	[6]	Realism , practical solutions	New invention or process
Focus is	4	[6]	What can be perceived by the five senses	Perceiving patterns and interrelationships
	5	[6]	Clear, tangible data	Speculative information
How a person prefers to gather and make sense of information	6	[10]	Inclined towards information that is sense based (sight, sound, taste, touch, smell)	More abstract and less rational perceptions about people and things
Leadership style	7	[6]	Administrative	Visionary

Table 3. Dimension Thinkers/Feelers

Name	ID	Source	Thinkers	Feelers
Decision-making	1	[1], [6]	Practical, objective criteria	Values, emotional clues
	2	[3]	Cold and reserved	Care about how actions make them feel or others feel.
	3	[6]	Antisocial	Warm and friendly nature, people persons
	4	[10]	Facts and fairness	Empathetic and people-focused
Basing conclusions on	5	[6]	Logical analysis	Personal or social values
Focus on	6	[6]	Objectivity and detachment.	Understanding and harmony
Leadership style	7	[6]	Logical	Harmonious

Table 4 reflects Judging/Perceiving dichotomy. All tables share a similar structure: for each opposite characteristic description we attributed “Name” and gave identifier “ID”. Subsequent columns represent source number and characteristics taken from the source.

Table 4. Dimension Judging/Perceiving

Name	ID	Source	Judging (Rational)	Perceiving (Irrational)
Environment	1	[6], [10]	Structured	Experience
	2	[6]	Ordered	Does not like to limit options
	3	[6]	Predictable	Ever-changing workplace
	4	[6], [10]	Regulated	Flexible working , can work in a mess
	5	[6]	Work first and play later	Prefer to work in chaos
	6	[6]	Urgent to make decision	Keeps options open
	7	[6]	Fixed, Values deadlines	Open ended
Preference for	8	[6]	Decisiveness and closure	Flexibility and spontaneity
Organize the world around them	9	[10]	Organized	Carefree, spontaneous ways
Leadership style	10	[6]	Plan driven	Flexible

In the next task of this research, authors use those personality properties as criteria to choose (validate) the most appropriate survey - the one that supposedly will demonstrate Latvian IT specialists’ profiles from the MBTI perspective.

5 Development of personality test - survey

The first task was evaluation of the MBTI tool as a means of personality profiling. The authors found that MBTI is widely discussed, has a controversial reputation with a multitude of praising articles and many unflattering ones. For this study, the MBTI tool was chosen primarily because of its popularity and the fact, that it has earned a strong reputation as a practical tool for career evaluation. The second task was to create a survey or select the best from existing ones. As one of the goals was to evaluate MBTI for suitability and many surveys were available, the authors chose to evaluate existing ones for applicability.

For this purpose, we studied a wide range of surveys available on the Internet, which use a variety of algorithms. The most popular MBTI surveys did not have open-source algorithms, which forced us to choose from non-premium surveys that had algorithms readily available (see Appendix A for details). The goal was to take the best available MBTI survey algorithm and to create a Web-based survey including script for result computation (personality assessment). The assessment of validation was based on the requirement for questions and algorithms to match general principles of MBTI (Tables 1 to 4). The other factor was the number of questions. Many

tests have up to 250 and more questions and are very time consuming. In order to increase a number of responses, we chose a short version with only 32 questions, i.e., “Open Extended Jungian Type Scales 1.2” (available via <http://personality-testing.info/>). For answers, a scale from one to five was given for each question (questions typically consisted of one short sentence). Ten to twenty minutes were enough to complete the survey. The third step was to choose appropriate respondents.

6 Survey/research results and analysis

Respondents were chosen randomly, a link to the survey and an invitation were sent individually to each person, using social networks and e-mail. As was previously mentioned, the survey consisted of 32 questions, all of which are available in Appendix A. "Survey details (Open Extended Jungian Type Scales test for Latvian IT specialists)".

In an initial survey designed to get the first impression on Latvian IT specialist preferences, from approximately 100 invitations sent, 35 respondents submitted answers to the questionnaire. This amount of respondents gives the possibility of coming up with preliminary results. However, for final conclusions more survey iterations with bigger respondent pools are intended.

Results from the 32 personality questions were calculated in accordance with the algorithm into results for dichotomies.

The survey results for each dichotomy are displayed in the chart below (Figure 1). Eight questions contributed to the calculation of each dichotomy (four total dichotomies: each individual chart is given in Figure 1 – Energy, Information, Decisions, Lifestyle). Detailed analysis and comparison with other surveys and research results is also presented in this section.

The first block (see Figure 1) of the Survey according to MBTI theory represents Energy source: even split between “Extraverts“ and “Introverts“. Second Information Perception: almost even split between “Sensory“ and “Intuitive“ types. Third represents Decision Making Preferences: strong trend towards “Feeling“ vs. “Thinking“ preference. Fourth is Lifestyle: majority of respondents were grouped within “Judging” preference, with minority falling into “Perceiving” category.

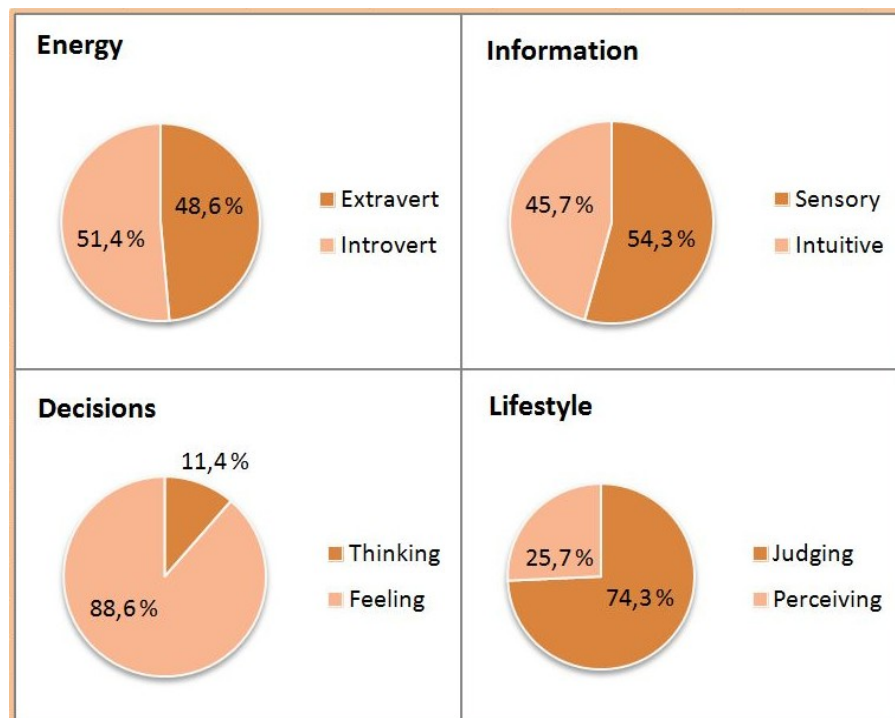


Figure 1. Distribution by dichotomies (total: 35)

Distribution of full profiles is presented in Figure 2. 10 types are remaining from the 16 initial ones, because 6 of them received zero selections in the survey. The survey indicated that the most popular types are ENFJ (Extroverted, Intuitive, Feeling, Judging) and ISFJ (Introverted, Sensory, Feeling, Judging).

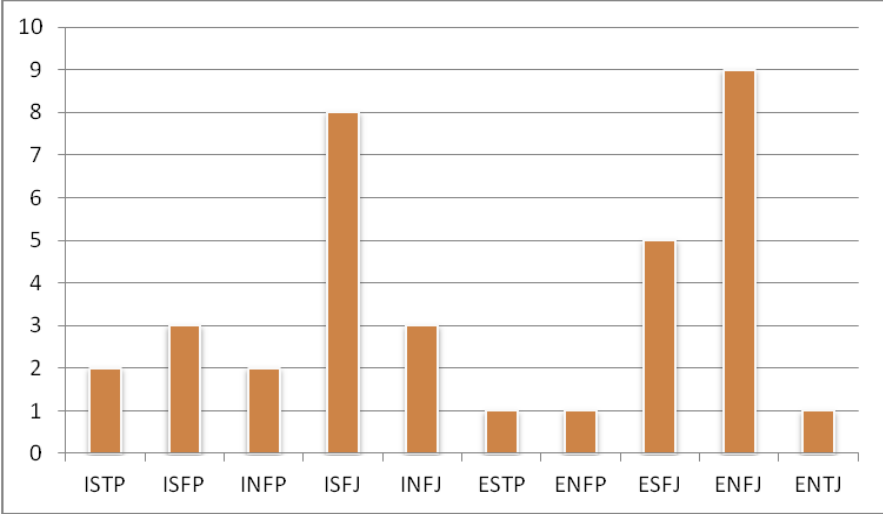


Figure 2. Personality type distribution (total: 35)

This section goes on to present a comparison of the results of the above described survey with other IT specialist personality profiling survey results.

Paper [4] demonstrates, that:

- “Thinkers” representing an average (mean) of 80.3% of reported results, compared to 19.7% of Feelers. In the current Latvian IT specialist study situation, it was opposite (Thinkers - 11%, Feelers - 89%). This could be due to multiple reasons:
 - Survey was quite time consuming (32 questions), it was sent to more than hundred individuals, and, probably, feelers were ones that opted in more often due to their relatively friendlier nature and people-focused decision making;
 - High popularity of agile methods in Latvia, where feeling was dominating also in other surveys (many performers of plan-driven projects would prefer the use of agile approaches);
 - Survey's characteristics (relatively small number of questions, small number of respondents);
 - Possible unreliability of the MBTI tool;
 - Possibly some other factors, of which the authors are not aware.
- 60/40% split between introverted and extraverted preference - Results in this study are quite close, with 51.4% introverted, 48.6% extroverted preference.
- 67% / 33% (Judging/Perceiving) - strong trend towards judging preference - again, results are very close: 74.3% / 25.7% (Judging/Perceiving).

In [2] the personality profile of Cuban software engineers was presented. In Table 5 this profile is compared to the results obtained in Latvia.

Table 5. Dimension Judging/Perceiving

Cuban profile	Latvia profile	Match
extroversion	introversion	No
sensing	sensing	Yes
thinking	feeling	No
judging	judging	Yes

From the information reflected in Table 5 we can conclude that profiles do not match, while the judging preference is dominating in the IT field in both countries. Article [5] confirms that individuals in teams that are using a plan driven methodology are found to have more judging characteristics (J) and for the individuals in teams using an agile approach are found to have the perceiving trait (P). A question about methodology was not included in the survey, yet in Latvia sequential (waterfall) methodologies are still more widely used than integrative (agile) ones; in this way the survey confirms previous results.

Besides personality preferences, the survey included two extra questions:

- Title or main competence area;
- Preferred modelling tools.

The results regarding these questions are aggregated by personality types and presented in Tables 6 and 7.

Table 6. Distribution by competence area

Role	ENFJ	ENFP	ENTJ	ESFJ	ESTP	INFJ	INFP	ISFJ	ISFP	ISTP	Total
Business Analyst							1		1		2
Consultant				1	1			2			4
Database Administrator						1					1
Finance										1	1
IT Manager								1			1
N/A		1									1
Project Manager				1				2	1		4
Software Developer	6			1		1		3		1	12
System Analyst			1								1
System Manager				1							1
Team Lead	1								1		2
Test Engineer	2			1		1	1				5
Total	9	1	1	5	1	3	2	8	3	2	35

Table 7. Distribution by preferred modelling tools

Tool	ENFJ	ENFP	ENTJ	ESFJ	ESTP	INFJ	INFP	ISFJ	ISFP	ISTP	Grand Total
ARIS Architect & Designer	1										1
brain, paper and code	1										1
do not use						1					1
Lucidchart									1		1
MS Visio	3			3	1	2		4	2	1	16
MS Visio, ARIS Architect & Designer	1										1
MS Visio, BizAgi								1			1
MS Visio, Pencil				1							1
N/A		1									1
Paper :-)								1			1
SPARX Enterprise Architect	1							1			2
SPARX Enterprise Architect, MS Visio							1				1
(blank)	2		1	1			1	1		1	7
Grand Total	9	1	1	5	1	3	2	8	3	2	35

Table 7 demonstrates that for modelling, “Sensory” types strongly prefer commonly used MS VISIO tools, which indirectly proves the point: that the opposite “Intuitive” preference can be linked to new inventions/creativity and willingness to experiment.

7 Conclusions

The results of the survey that was conducted, analysed, and discussed in this paper, show that the Latvian IT specialist profile (Persona) typically identifies with a “Judging” preference: it is

someone who prefers a structured, ordered, regulated environment, is eager to make decision, and values deadlines. In terms of energy source, it seems that there are two distinct groups with opposite preferences, and it is not possible to reveal a clear profile. There is a similar situation with information perception: there is an equal split between ones that prefer fine details and realism and those who are more focused on the big picture, abstraction, overall look, and feel.

The results obtained raise questions on whether there are any other character traits common to individuals with similar results – i.e. project roles, etc. Future studies also need to confirm the existence of diametrically opposite profiles. If such are confirmed, it will mean that project management in Latvia will need to incorporate a broader spectrum of PM and communication techniques in order to find a better approach to vastly diverse personnel. A training/development course for each personality type also needs to be created in accordance with the individual values and motivational factors relevant to it.

The results obtained are insufficient for discovering the reasons behind such differences in personality types, and the respondent pool is not large enough for conclusively stating that all the main elements of a general IT specialist's profile have been discovered. Comparing the results of this study to results obtained by a similar study in Cuba shows that the personality profile of a Latvian IT specialist tends to differ from the one of a Cuban. Further studies need to repeat the data gathering process but with a bigger respondent pool; a division/segmentation of the respondents based on their roles in the project team; and analysis of the correlation between project management technique and personal profile differences. This, in turn, would allow further studies on the subject to identify future development possibilities, as well as the strong and weak points of Latvian IT specialists compared with the IT specialists of other countries, and how the situation could be improved.

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Appendix A. Survey details

Survey was set up using Google forms engine:

https://docs.google.com/forms/d/1SFCX_isr5PVzFPamLZ1UZCeLWc7BiytoAY_cqvJkHxA

Questions:

Q1	makes lists	1	2	3	4	5	relies on memory
Q2	sceptical	1	2	3	4	5	wants to believe
Q3	bored by time alone	1	2	3	4	5	needs time alone
Q4	accepts things as they are	1	2	3	4	5	unsatisfied with the ways things are
Q5	keeps a clean room	1	2	3	4	5	just puts stuff where ever
Q6	thinks "robotic" is an insult	1	2	3	4	5	strives to have a mechanical mind
Q7	energetic	1	2	3	4	5	mellow
Q8	prefer to take multiple choice test	1	2	3	4	5	prefer essay answers
Q9	chaotic	1	2	3	4	5	organized
Q10	easily hurt	1	2	3	4	5	thick-skinned
Q11	works best in groups	1	2	3	4	5	works best alone
Q12	focused on the present	1	2	3	4	5	focused on the future
Q13	plans far ahead	1	2	3	4	5	plans at the last minute
Q14	wants people's respect	1	2	3	4	5	wants their love
Q15	gets worn out by parties	1	2	3	4	5	gets fired up by parties
Q16	fits in	1	2	3	4	5	stands out
Q17	keeps options open	1	2	3	4	5	commits
Q18	wants to be good at fixing things	1	2	3	4	5	wants to be good at fixing people
Q19	talks more	1	2	3	4	5	listens more
Q20	when describing an event, will tell people what happened	1	2	3	4	5	when describing an event, will tell people what it meant
Q21	gets work done right away	1	2	3	4	5	procrastinates
Q22	follows the heart	1	2	3	4	5	follows the head
Q23	stays at home	1	2	3	4	5	goes out on the town
Q24	wants the big picture	1	2	3	4	5	wants the details
Q25	improvises	1	2	3	4	5	prepares
Q26	bases morality on justice	1	2	3	4	5	bases morality on compassion
Q27	finds it difficult to yell very loudly	1	2	3	4	5	yelling to others when they are far away comes naturally
Q28	theoretical	1	2	3	4	5	empirical
Q29	works hard	1	2	3	4	5	plays hard
Q30	uncomfortable with emotions	1	2	3	4	5	values emotions
Q31	likes to perform in front of other people	1	2	3	4	5	avoids public speaking
Q32	likes to know "who?", "what?", "when?"	1	2	3	4	5	likes to know "why?"

Algorithm for result computation:

Fill in the below equations using the values (1-5) you gave on the previous page.

$$IE = 30 - \frac{\quad}{(Q3)} - \frac{\quad}{(Q7)} - \frac{\quad}{(Q11)} + \frac{\quad}{(Q15)} - \frac{\quad}{(Q19)} + \frac{\quad}{(Q23)} + \frac{\quad}{(Q27)} - \frac{\quad}{(Q31)} = \underline{\quad}$$

$$SN = 12 + \frac{\quad}{(Q4)} + \frac{\quad}{(Q8)} + \frac{\quad}{(Q12)} + \frac{\quad}{(Q16)} + \frac{\quad}{(Q20)} - \frac{\quad}{(Q24)} - \frac{\quad}{(Q28)} + \frac{\quad}{(Q32)} = \underline{\quad}$$

$$FT = 30 - \frac{\quad}{(Q2)} + \frac{\quad}{(Q6)} + \frac{\quad}{(Q10)} - \frac{\quad}{(Q14)} - \frac{\quad}{(Q18)} + \frac{\quad}{(Q22)} - \frac{\quad}{(Q26)} - \frac{\quad}{(Q30)} = \underline{\quad}$$

$$JP = 18 + \frac{\quad}{(Q1)} + \frac{\quad}{(Q5)} - \frac{\quad}{(Q9)} + \frac{\quad}{(Q13)} - \frac{\quad}{(Q17)} + \frac{\quad}{(Q21)} - \frac{\quad}{(Q25)} + \frac{\quad}{(Q29)} = \underline{\quad}$$

If IE is more than 24, you are extroverted (E), otherwise you are introverted (I).

If SN is more than 24, you are intuitive (N), otherwise you are sensing (S).

If FT is more than 24, you are thinking (T), otherwise you are feeling (F).

If JP is more than 24, you are perceiving (P), otherwise you are judging (J).

Combine the four letters to get your personality type (e.g. I, S, F, P => ISFP).