«KROK» UNIVERSITY

Qualification Scientific work
based on the manuscript rights

OSAKWE IKENNA

UDC 005.83:159.942

DISSERTATION

Formation of the project team by the criterion of potential subjective well-being of the candidates in the project

Field of study 07 Management and business administration
Major 073 Management
Educational Program “Project and Program Management”

Submitted to obtain the degree of Doctor of Philosophy of "KROK" University.
The dissertation contains the results of own research. The use of the ideas, results and texts of other authors is followed by appropriate citation.

_____ I. Osakwe

Supervisor Medvedieva Olena, DrSc, Professor

Kyiv- 2019

TABLE OF CONTENTS

INTRODUCTION

Research relevance. Modern projects environment tendencies are changing the role of personality as human resource of companies and their projects expecting them to dispose competence to be effective still in modern complex environment. It becomes visible in stable statistics of the project failures and crucial role of human factor in these failures. Project management methodologies became more human and competence oriented which led to introduce such new managerial parameter focused on personalities' state as a reason and factor of effective teamwork, as subjective well-being (SWB). This opens another angle of focus from where project team management can be viewed differently, basically as the study of what makes up the life of a person from their perspectives, their approaches, and these determine their reactions to events that take place in their lives, varying from person to person as it is deeply individualistic.

Employees' SWB is a major key player in the effectiveness and results of their performance because it helps the project manager and the stakeholders to understand fully what it takes to get the very best out the project team and get the desired maximum result especially if the organization is project-oriented. The major practical issue with project team forming with organizations is that they recognize the importance of SWB, but are unable to find its units or standards or even anything related directly to the measurement or determination of SWB in the context of forming the project team.

Within the traditional approach, SWB is used to monitor progress and to inform policy, or, rather, 'ill being', in terms of depression rates and in the provision of cognitive behavioral therapy. Thus a deep theoretical base to understand, scan, interpret and propose ways to correct the personal SWB of the project team members are developed in works of Ed Diener, Shigehiro Oishi, Richard E. Lucas, Mihaela MAN, Constantin TICU, Hao Zhang, Jia Tan, Teresa Del Pilar Rojas, Fred Luthans and Bruce J. Avolio, James B. Avey, Steven M. Norman, Jan-Emmanuel De Neve U, Louis Tay and others.

Unlike the traditional approach, utilizing SWB as a selective parameter exposes actual unsolved tasks. First of all, it is interpreting SWB as a factor for the project teamwork, regarding person involved to the particular project as a team member and the team as a

whole; based on that grounding the SWB-indicators system, methods to scan every project team candidate and then to configure the most rational team. The most “weak” and theoretically unsolved point of the scanning candidates and further finding the project team combination is the scale. For these two stages, the scale should be common. By today the fact was fixed that SWB scales are subjective, means incomparable, non-adequate for further manipulations when selecting team members. Among selective methods, utilized in the project team management, the closest methods in the context of SWB approach were proposed by Rach V. A., Lysenko D.E., Alatoom M. Nevertheless, they contain principal ideas suitable for SWB approach and require further studies. Thus, by now, formation of project teams based on the SWB approach requires is a less developed, and that is why this topic and theoretical task is relevant, vital and can be considered preferable.

The goal and tasks of the study. The research goal is to ground scientific approach to forming of a project team based on the subjective well-being parameter.

To achieve this goal, the following scientific tasks are defined:

- to consider SWB as a factor when forming the project team: what it reflects for a team member and what for the team as a whole;
- to propose the system for representing SWB-indicators based on holistic approach reflecting different aspects of a person in a team and in the project;
- to suggest the method of constructing candidate’s personal SWB-profile based on ranking the proposed SWB-indicators;
- to propose the method of configuring the project team, which ignores the compliance of the team's integral characteristics with the ideal requirements, but allows to find out the most rational configuration by SWB-indicators;
- to develop the evaluation scale and the method for evaluation of coherence (commonness) of personal profiles of candidates;
- to carry out the experimental verification of the proposed approach.

Object of a research is processes of managing a project team.

Subject of a research is a process of forming a project team based on SWB parameter.

Methods used. Principally the research is based on the provisions of the verbal analysis of decisions in purpose to collect the original data from the candidates to a project

team in the verbal form that is customary for them, to check if they are contradictory and, if necessary, to have them corrected by a candidate. In this case, the data are fixed as a ranked series, the importance, or the priority of the elements of a series is determined by a candidate himself. Unlike the existing methods for verbal analysis, the author's approach involves the application of the systematic quartile models for obtaining and processing the original data.

The following methods are used in the research: *historical, comparative analysis, graphical modeling* (when justifying and interpreting SWB as a critical parameter for the formation of a project team in the current environment of projects, chapter 1, subchapter 2.1); semantic text analysis, graphical modeling, graphical system modeling, context analysis (when substantiating the rational number of SWB-indicators and the approach to their presentation simultaneously in three contexts based on three quartile system models, subchapter 2.2); *verbal decision analysis, ranking, mathematical modeling* (when developing way to present a personal SWB-profile of the team candidate, subchapter 3.1); *pairwise comparison, rank correlation, mathematical modeling, heuristics* (when developing methods for comparing profiles of the team candidates and configuring the more coherent profiles (subchepter 3.2); *surveys, computer simulations, graphical modeling, statistical analysis* (when developing an assessment scale for the coherence of potential project team members depending on their quantity, subchapter 3.3); *surveys, ranking, computer simulation, rank correlation, comparative analysis* (when verifying the method to configure the project team based on the personal SWB-profiles, subchapter 3.4).

Scientific result and new findings. The main scientific result is the development of methodological principles for the formation of a project team based on the parameter of subjective well-being. The novelty of the scientific result of the study is as follows:

firstly:

SWB is considered as an indicator to construct a project team forming criterion, which reflects the subjective vision of the significance of particular SWB-indicators considering the project value for the candidate, the application of which allows to identify and compare the attitude of the candidates to SWB, the similarity of which determines the comfort of their interaction in the project team;

the estimation scale of coordination of the members of the project team, depending on their number, was constructed based on the results of the pilot experiment on the basis of the formed 288 theoretically possible teams of 2 to 10 people, for each of them the maximum and minimum values of the coefficient of coherence were determined. This allowed the determination of the limits of the coherence coefficient, within which there were five uniform zones (high, high enough, acceptable, undesirable, dangerous coherence), and beyond them, two zones (ideal and unacceptable coherence), and to assess the level of consistency configured project teams from existing applicants;

improved:

the method of constructing candidate's personal SWB-profile that, unlike the known methods of forming the profile as a result of direct ranking of the indicators, provides multi-stage (iteration) ranking: in the first stage - ranking of three quartile models; on the second - ranking of elements in the model with the highest rank; on the third - ranking of indicators in each element of the model with the highest rank by the degree of their importance for the candidate. Indicators form the ranked lists are integrated based on the rule, according to which the first indicator of an element with a lower rank is less important than the indicator k, and more important than the indicator with the number k+1 of the element of the model with a higher rank. The integration procedure continues until a single list of 27 indicators is designed. This makes it possible to match the candidates' profiles to determine their similarity;

the method of configuring the project team, which, unlike the known methods of forming teams based on the compliance of the team's integral characteristics with the ideal requirements, involves a pairwise comparison of the SWB profiles of the applicants with the profile of the base applicant, which each candidate alternates. For each pair comparison, the sum of the total rank for the first five (the final rank of zone 1) and the next eight (the final rank of zone 2) of the profile indicators are calculated. The overall rank of the profile is determined by the higher value of the two ranks, provided that the difference between them is 2 and 3 ranges in zones 1 and 2, respectively, otherwise it is equal to zero. For each base applicant, combinations of theoretically possible teams with a defined number of members are determined. For each conditional team, the coefficient

of coherence is calculated as the average normalized value of the weighted sum of the total ranks. The weighting is based on the Pareto principle. Of all the conditioned teams, the team with the highest value of the coefficient of co-ordination is selected. This allows you to configure the team with the maximum possible consistency from the existing applicants, taking into account the greatest impact on the consistency of the team more significant for the contenders of profile profiles;

further development has come to the system for representing SWB-indicators, due to taking into account the three contexts of their consideration (social, psychological, workplace) and the application of system quartile model within the each context, the grouping of SWB-indicators by the elements of the model, which allowed by identifying the relationships between individual SWB-indicators in the elements of the quartile model are justified to reduce the number of known SWB-indicators from 42 to 27 and to develop check templates based on three system models to determine the attitude of the candidates to the SWB and further usage when constructing personal SWB-profiles of the team candidates.

Practical value. Utilizing of the research findings and recommendations provides forming a project team from a limited number of candidates with the maximum possible degree of compatibility, thus to identify its strengths and weaknesses by subjective well-being parameter prior to the beginning of the teamwork. Due to the invariance, they are applicable in projects of any classes, types, kinds, and other contextual features. The most significant practical result of the research is the methodic of the project team forming based on the SWB parameter, which introduces developed approach, models and methods.

The research findings and recommendations were introduced in practical activities within the educational master program on project management for English speaking students in “KROK” University. Personal students’ SWB-profiles were built as a base to configure their teams for small, medium and large educational projects. Basic findings became a part of the educational courses “Leadership, communications and knowledge management”, “Human resources and team management”.

Personal contribution of the researcher. Scientific positions, developments and conclusions of the dissertation work are the result of the author's own research in the field of assessing the economic security of economic entities on the example of IPO enterprises.

Approbation. The main results of the dissertation, conclusions and proposals were discussed, discussed and approved at five international conferences.

Publications. The main provisions of the dissertation are set out in 13 works, of which 4 scientific articles have been published in professional editions of Ukraine, 1 article in foreign edition and 1 article in Ukrainian edition indexed in Scopus data base, 7 - conference materials. The total volume of publications is 8.26 a.sh., of which personally the author owns 6.28 a.sh.

Structure and scope of work. The dissertation consists of introduction, three chapters, conclusions, list of references and attachments, placed on 152 pages. The text body is presented on 117 pages, it contains 21 tables and 20 figures. The list of references includes 137 sources and placed on 14 pages, 10 attachments placed on 22 pages.

CHAPTER 1.
THE RESEARCH PROBLEM AS FOR THE FORMING THE PROJECT TEAM BY SUBJECTIVE WELL-BEING AS A CRITERIA

1.1. Practical aspects of the project team formation by subjective well-being as a criteria

In this new age if technological developments and evolution trends in management in which change has remained the number one constant, it is vital that we take note of the key trends that change the environment in modern projects. We must first note that project management was introduced to solve a problem first within America. "As American workers return from World War II, businesses prepare for an unprecedented era of prosperity. Driven by the need to remain competitive during boom times, project management professionals are tasked with finding ways to keep employees engaged, efficient, and motivated" [1]. According to Toney Sisk towards the early 1960s, business organizations began to see the importance of putting together work done to be around understanding the critical need for communication and integrate work across multiple aspects of their organizations. Thus the expansion of the project management ideology further expanded. Project management gradually spread across every sphere of life and continued to evolve up till this day. To look at the modern trends of project management and how it has been in recent times and age, we will have to look a little more into environment factors, the external influences that shape up and affect project management in different ways. Some of these would be economies, uncertainties, changes, instability, complexities, and weather. Indeed they are way too many to mention, but we have to start somewhere and limit it for the sake of focus on this research. Looking at them with some more level of details, we will now examine how a few of them can affect projects and their management.

Economies: the greatest undeniable trend in the economic sector of the world today is the globalization era. It is the new wave of ideology fast sweeping through every international business driving towards the world being a global village where economics changes are no longer viewed from the microscopic point but macroscopic with respect of its ripple effect on the world economies. "…Industry-driven advancements, major shifts in

the global economy and global events can have a profound, structural effect on a multitude of professions. Major global changes bring about a realization that 'We cannot continue to do what we have always done.' The full impact of the global financial crisis that began in 2008 on all aspects of the economy may take years, or even decades to fully understand. It is arguably true that the crisis has "left its mark" on attitudes towards the project management profession (as it has on many other professions). Some changes have been challenging at an individual level, such as the struggle for many to maintain gainful employment [2]. In their research they explained that after the 2008 downturn of the world economy, there was a sudden awakening that led to organizations rethinking their approaches to almost everything to avoid finding themselves in similar situations as earlier and for some of them, this led to the recognition of project management as a major way to surety control and effectiveness of plans and initiatives undertaken. This is to say that its an era of knowledge. Knowledge economy basically rules the economic world. When it comes to managing projects they went further to categorize the key impacts on project management caused by financial crisis into three areas: Changes to the Profession, Changes to Methodology, and Changes to the Professional. Furthermore, he explained Changes to the Profession saying that changes to the profession created risk management making Organizations who were not conversant with management of project risk management practices to explore extensively on how to manage and minimize their risks. It also created a larger sense of planning the project portfolio in organizations as well as more emphasis on qualifications. Credentialing of staff member became of great importance to ensure proper experience and exposure to the right experience required for their projects being managed right.

To him, Changes To The Methodology Of Project Management meant a lot more emphasis on the genuineness of proper effective governance, strict control for approval of expenditures and all changes which must be sustained overtime while the risk management approach will help them not avoid risks but pro-actively manage it. This should make selected competent managers learn to do more with less, which is resource control and management.

Changes To And Impacts On The Professional for him meant that people now take up less paying jobs because the offers are less than used to be because of the growing rate of under-employment, not to mention the new trend of contracting out projects to reduce organizational responsibilities [2].

Matthew Nickasch 2008 referred to this present economy as "Do more with less, and deliver it faster,". According to him, “"Do more with less, and deliver it faster," proclaim the organizational leaders dealing with the effects the 'new economy'. A project manager's nightmare, the times are quickly changing, and the need to make a full glass of orange juice out of a quarter-sized orange is becoming an unfortunate reality. We've discussed the predicted impacts of the economic downturn on enterprise telephony, but have not explored how future projects and deployments are expected to succeed or fail under these new financial times. In my opinion, the threat of project 'scope creep' is becoming a silent and ever-emerging problem. Dealing with anxious organizational leaders, the potential of having little-to-no implementation budget in the near future is sending project managers and implementers into a tailspin” [3].

Uncertainties and Changes: Kreye, Melanie and Balangalibun, Sarah defined uncertainty as “a potential deficiency in any phase or activity of the process, which can be characterized as not definite, not known or not reliable” [4]. If uncertainty is not addressed it can have an impact on project governance and result in the neglect of issues that are related to measurement and evaluation. They further defined uncertainty to be understood as a lack of knowledge and arises in events that are “unpredictable, ambiguous, equivocal, or lacking information. While they explained change as something managed within the organization and the rate of occurrence determines whether it is continuous or discontinuous. However the trend of changes cannot be predicted as factors leading to it could even include unexpected factors like natural disasters, global warming and many more. Note that your inabilities to manage changes and uncertainties whether at the short run or the long run will determine the project management success. This is because they come without prior warnings sometimes and if they meet you unprepared could crush the project.

So, we can conclude about the main tendency of modern projects environment. It became more complex and changeable, less predictable and controlled. This might influence the general tendency of the projects success and failure.

Project failures are so many and sometimes they are unique due to the fact that projects are dynamic. It is difficult to generalize project failure because different project require different methods and environments, however some authors and researchers have been successful in going into the details of different kinds and aspects of projects. Some of these we shall be looking at right now based on the analysis of Project Journal by PURNA CHANDRA DEY [5, 6, 7].

1. One out of six IT projects has an average cost overrun of 200% and a schedule overrun of 70%. Around 45% of companies admit that they are unclear about the business objectives of their IT projects. (Harvard Business Review 2004)
2. Based on an IBM study, about 40% projects meet budget, schedule and quality goals. (Harvard Business Review 2004)
3. Only around one-third of all projects were successfully closed as per the time and budget set, during the past one year. (Standish Group)
4. About 75% of IT Executives expect their software projects to fail because they believe it will not work. (Geneca)
5. The US economy loses $50-$150 billion because of failed IT projects every year. (Gallup Business Review)
6. 50% of all Project Management Offices shut down within three years. (KeyedIN)
7. High performing organizations are able to successfully close 89% of their projects whereas low performing organizations complete only 36%. (Project Management Institute)
8. 80% of “high-performing” projects are led by a certified project manager. (PricewaterhouseCoopers, Insights and Trends: Current Programme and Project Management Practices 2012)
9. Around 33% projects meet failure due to lack of involvement from senior management. (University of Ottawa)
10. More than 90% of organizations perform some type of project postmortem or closeout retrospective. (The Standish Group: CHAOS Research Report 2013)

11. The average large IT project runs 45% over budget, 7% over time, and delivers 56% less value than expected. (Project Management Institute: Pulse of the Profession 2015)

12. Only 64% of projects meet their goals. (Project Management Institute: Pulse of the Profession 2015)

13. In just a 12 month period 49% of organizations had suffered a recent project failure. In the same period only 2% of organizations reported that all of their projects achieved the desired benefits. 86% of organizations reported a shortfall of at least 25% of targeted benefits across their portfolio of projects and many organizations failed to measure benefits so they are unaware of their true status in terms of benefits realization. (KPMG – Global IT Project Management Survey 2005)

Project managementworks.co.uk gave a summary to it and even went further to enumerate reasons for project failure as stated in table 1.1: average % of features delivered – 69%; average cost overrun – 59%; average time overrun – 74% .

Table 1.1 - Reasons for project failure

Small Projects (less than $1 million)	Large Projects (more than $10 million)
76% are successfully	10% are successful
20% are challenged	52% are challenged
4% fail	38% fail

Source: borrowed from [6].

The modern resolution (On-time, On-budget, with a satisfactory result) of all software projects FY2011-2015 within the new CHAOS database by Jennifer Lynch we have a table below:

Table 1.2 - Table of Statistics of projects Executed

Features	2011	2012	2013	2014	2015
SUCCESSFUL	29%	27%	31%	28%	29%
CHALLENGED	49%	56%	50%	55%	52%
FAILED	22%	17%	19%	17%	19%

Source: borrowed from [8].

The above statistics show that projects success and failure rates are practically fairly stable and still within the same range. This would mean that there hasn't been anything new that caused a drastic change in the level of success, failures and challenged projects. However the above statistics works best for Agile projects [8]. But the statistics also show that there hasn't been significant changes in practical application in projects.

Haven looked at the list of reasons for failures in attachment 1, it became realistic that some of the reasons were similar and as such needed to adjusted, merged or removed for instance numbers 2,3,11,17,2832,47 Lack of clear Senior Management and Ministerial ownership and leadership and lack of effective management, Ill-defined senior management ownership and leadership, Lack of contact with senior management levels in the organization, Bad Stakeholder Management are highly similar and should be combined into Lack of clear Senior Management and Ministerial ownership and leadership. Numbers 4,14,34 and 43 about project management risk management should be combined. So also numbers 5,15,20,22 and 29; 1,9 and 10; 7,8 and 18; 24,30 and 33; 25,31 and 42; 13,19,21,23,28,32 and 36. They have all been merged respectively into a similar singular point and can be found in attachment 1. The results of such manipulations can be found in table A1. From the above we can see what some authors have written about reasons for failure few of which are stated above. However all texts written above can be classified into five as stated below:

1. leadership chain relationship problems
2. Project approach and methodology management problems
3. Project team relationship management
4. Erroneous costs/financial implications

5. Cultural and ethical misalignment

In making these classifications, it becomes easier to understand the reasons for failure and the most frequent is the weak-point which in this case is leadership chain relationship problems followed closely by Project team relationship management and Cultural and ethical misalignment. From the description of classifications, we infer that the greatest reason for project failure is human resource management.

This makes it a necessity to understand the dynamics of project team and project team management as well as their differences.

In this research we accept following definition of the Project Team and statements: 'The Project Team is a collective term describing all the people that are involved to work on the project, from planning, executing to closing.

- The Project Team includes the Project Management Team.
- Other sub-sets in the project team may include: design team, specialty teams.
- In small projects, the whole team may be responsible for project management and there is NOT a single Project Management Team defined' (Edward Chung).

From the definition this means we can conclude correctly that the project team consists of more than just one aspect or angle of a team. Its a full body that makes up the system cutting across so many sections of the team.

As a result; different approaches will definitely expectedly give birth to different PT management development and evolutions and relationships with respect to methodologies.

In order to manage projects more effectively this has had to be done. Its not exactly a new approach as of today. "It has been more than 60 years from people using computer technology in project management. The hardware and software technology have been developed during these 60 years. The development have promoted the information industry progress, and also changed the project management approach. But now, the traditional project management software cannot satisfy the modern management for their limitation" [9].

However in managing the project team and the projects at large, there has been many softwares developed for that. The idea of it is to help the monitoring of project stages from step to step. It follows a detailed pattern that enables the project manager and stake holders

understand what point the team is at and what stages of steps are next and what is required. Most of all it gives them a time and cost estimate to easily understand what more is needed to be done.

How did these changes affect the Project Management methodologies? They became more soft, slightly human, more aware and sensitive to the fact that it takes people to achieve the goals for example, in the course of this, PMBOK added a new chapter to its original approach, which is the stakeholders management chapter. This now involves the various human factors that make up the projects while the Japanese P2M had always had the human and environmental approach. We will look into this with some more details starting with PMBOK (tabl. …), ICB and P2M.

Table 1.3 - Changes between PMBOK 3rd, 4th and 5th editions

PMBOK Edition	3RD (2004)	4th (2008)	5th (2013)
Number of Process groups	5 Process Groups	5Process Groups	5 Process Groups
Knowledge areas	9 Knowledge Areas • Integration Management • Scope Management • Time Management • Cost Management • Quality Management • Human Resource Management • Communications Management • Risk Management • Procurement Management	9 Knowledge Areas • Integration Management • Scope Management • Time Management • Cost Management • Quality Management • Human Resources Management • Communications Management • Risk Management • Procurement Management	10 Knowledge Areas • Integration Management • Scope Management • Time Management • Cost Management • Quality Management • Human Resources Management • Communications Management • Risk Management • Procurement Management • Stakeholder Management

Continuation of the table 1.3

Number of Processes	44 Processes	42 Processes	47 Processes
Chapter 4	4.1 Develop Project Charter 4.2 Develop Preliminary Project Scope Statement 4.3 Develop Project Management Plan 4.4 Direct and Manage Project Execution 4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control 4.7 Close Project or Phase	4.1 Develop Project Charter 4.2 Develop Project Management Plan 4.3 Direct and Manage Project Execution 4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control 4.6 Close Project or Phase	
Chapter 5 Project Scope Management	5.1 Scope Planning 5.2 Scope Definition 5.3 Create WBS 5.4 Scope Verification 5.5 Scope Control	5.1Colect Requirements 5.2Define Scope 5.3Create WBS 5.4Verify Scope 5.5Control Scope	5.1Plan Scope Management 5.2Collect Requirements 5.3Define Scope 5.4Create 5.5Validate Scope 5.6Control Scope
Chapter 6 Project Time Management	6.1 Activity Definition 6.2 Activity Sequencing 6.3 Activity Resource Estimating 6.4 Activity Duration Estimating 6.5 Schedule Development 6.6 Schedule Control	6.1Define Activities 6.2Sequence Activities 6.3Estimate Activity Resources 6.4Estimate Activity Durations 6.5Develop Schedule 6.6Control Schedule	6.1Plan Schedule Management 6.2Define Activities 6.3Sequence Activities 6.4Estimate Activity Resources 6.5Estimate Activity Durations 6.6Develop Schedule 6.7Control Schedule

End of the table 1.3

Chapter 7 Project Cost Management	7.1 Cost Estimating 7.2 Cost Budgeting 7.3 Cost Control	7.1Estimate Costs 7.2Define Budget 7.3Control Costs	7.1Plan Cost Management 7.2Estimate Costs 7.3Determine Budget 7.4Control Costs
Chapter 10 Project Communications Management	10.1 Communications Planning 10.2 Information Distribution 10.3 Performance Reporting 10.4 Manage Stakeholders	10.1Identify Stakeholders 10.2Plan Communications 10.3Distribute Information New Process 10.4Manage Stakeholder Expectations 10.5Report Performance	Moved to 13.1 10.1Plan Communications Management 10.2Manage Communications 10.3Control Communications Moved to 13.3 Became Tool and Technique of 10.2
	12.1Plan Purchases and Acquisitions 12.2 Plan Contracting 12.3Request Seller Responses 12.4 Select Sellers 12.5 Contract Administration 12.6 Contract Closure	12.1Plan Procurements 12.2Conduct Procurements 12.3Administer Procurements 12.4Close Procurements	
Chapter 13 Project Stakeholder Management			13.1Identify Stakeholders 13.2Plan Stakeholder Management 13.3Management Stakeholder Engagement 13.4Control Stakeholder Engagement

Source: developed by author.

PMBOK created a new chapter on project stakeholder management contrary to its initially being just a part of chapter 10 and then further expanded it into sub-chapters. 13.1

Identify Stakeholders 13.2 Plan Stakeholder Management 13.3 Management Stakeholder Engagement 13.4 Control Stakeholder Engagement which is only in the last chapter.

Using NCB, Behavioral competences for project team. ICB has its own slightly different approach to projects management. They view it in terms of behavioral competencies. So also is their views to reasons for project failures and personality issues. Based on ICB approach failures are often related to ineffective team working sometimes caused by aggressive project environment because of fast changes and turbulence. To be effective in such environment, project team members should have specific competences (NCB, Behavioral competences) although these competencies have not exactly been the same over the years as they have changed with editions, therefore some things were added and some others removed. Taking a look at ICB 2.0. 3.0 and 4.0. The similarities are there as well as deductions as shown below according to Ósk Sigurðardóttir [7]. Personality based model of competences and changes with progressive editions of ICB (table 1.4).

Table 1.4 – Analysis of soft competences in editions of ICB

ICB 2	ICB 3	ICB 4
PERSONAL ATTITUDE	BEHAVIOURAL COMPETENCES	•PERSONAL COMPETENCES
•Ability to communicate	•Leadership	• Engagement
•Initiative,engagement,enthusiasm, ability of motivation	•Engagement & motivation	• Self-control
•Ability of getting in contact, openness	• Self-control	• Credibility
•Sensibility, self-control, value appreciation	• Assertiveness	• Inventiveness
•Conflict solving,argumentation culture, fairness	• Relaxation	• Leadership
•Ability of finding solutions, holistic thinking	• Openness	• Self reflection
•Loyalty, solidarity, readiness for helping	• Creativity	• Personal relations
•Leadership abilities	• Results orientation	
•Logic	• Efficiency	
•Systematic and structured thinking	• Consultation	
•Absence of errors	• Negotiation	
•Clearness	• Conflict & crisis	

Continuation of the table 1.4

•Common sense	• Reliability	
•Transparency	• Values appreciation	
•Overview	• Ethics	
•Balanced judgment		
•Horizon of experience		
•Skillfulness		
		•SOCIAL COMPETENCES:
SOCIAL:		•Personal communication
•Teamwork		• Cultural awareness,
•Leadership		• Conflicts and crisis,
•Communication		• Team work
•Conflicts and crisis		• Negotiation

Source: Adjusted based on reference 7

From the above you will notice that there has considerably been reduction in competencies as the editions have progressed. But the difference between ICB3 and ICB 4 is what I am most concerned about as it has removed the non-professional essence in its competences.

Considering P2M. it offers the following characteristics

(1) “Applicability deduced from practical experience

(2) Reflection of Japanese cultural, structural and industrial strength

(3) Avoidance of too meticulous Definitions and practices, thus providing leeway for case-to-case applications

(4) Setting of rules to utilize human intelligence and IT potentials

(5) Emphasis of total thinking rather than segmentation and precise combination of management elements”[10].

It has always had a special approach project management. It is most of all about human resource in project team.

But beside traditional, New PM Methodologies appeared, reflecting new flexible tendencies - Agile and SCRUM. According to Agilemethodology.org Agile is “not a

methodology! The Agile movement seeks alternatives to traditional project management. Agile approaches help teams respond to unpredictability through incremental, iterative work cadences and empirical feedback" [11]. This means that it is not a methodology, its more of an approach, a movement, a new perception that deals more with the people. "Agile project management focuses on continuous improvement, scope flexibility, team input, and delivering essential quality products. Agile project management methodologies include scrum, extreme programming (XP), and lean, among others. These methodologies all adhere to the Agile Manifesto and the 12 Agile Principles, which focus on people, communications, the product, and flexibility" [12]. This is a straight way to show that it is based on people and their interactions, all its focus is basically about the people.

So, we can conclude about the main tendency of modern projects environment is changing the role of personality as HR of companies and their projects. They are expected to dispose competence, not just qualification, to be still effective in such complex environment. PM methodologies became more human and competence oriented. This led to introduce new managerial parameters focused on personalities' state as a reason and factor of effective working – Fulfillment, Happiness, WB.

This however, opens another angle of focus from where PT management can be viewed differently.

Fulfillment could be defined as the achievement of something desired, promised, or predicted.

Happiness: could be defined as the state of being happy. In practice, when it comes to managing a project, the team and stake holders generally, happiness has hardly ever been been defined into an official term except as a feeling or derivative from success of a project. But kenneth Fung in October 2014 shed some deeper light on the concept of happiness in project management when he wrote " …happiness is in your actions that bring the greatest happiness for the greatest number of people. As a Project Manager, happiness is not just about bringing happiness to the project sponsor. It is about bringing happiness to everybody, the stakeholders. As Project Manager, it is about have the sense of accomplishment of a hard day of work. We may be exhausted but we are HAPPY" [13].

Happiness is one of the factors hardly considered in many organizations as a major factor. Although Linsay Scott claimed in 2014 that only 28% of project managers are happy with their jobs[14]. Nelson Hart, in his work on the happy project manager, conducted an experiment on project managers and its relation to their work and claimed the number based on his experiment of happy project managers from among the selected people was 38%. He came up with strengths of the profession and ways of improving happiness (indicators that can be used) in the job as a project manager after experimenting with nearly 400 people and having a 56% response rate. Below is his result:

"Key strengths of the profession supporting happiness at work which reported in this initial test survey included:

1. interesting and challenging work
2. strong personal resources: self confidence, vitality, personal health, and supportive personal relationships

Important opportunities for improvement in PM happiness at work included:

1. achievability of job
2. stress levels
3. lack of cooperation between/among teams
4. good friends at work (a leading indicator of employee engagement and discretionary effort
5. constructive feedback
6. job security
7. well managed organizations"[15]

On this note I add, that an unhappy project manager can never produce a happy product team. The opportunities presented by the author can be used in his opinion as indicators to improve happiness in a project manager and the ripple will be on the team and stakeholders.

Christiaan Verwijs, the Agile coach, Scrum Master and Developer, refers to happiness metrics as a primer in software development companies. He seemed to see happiness metrics as approaching happiness as a goal not a right. To him, 'Agile emphasizes teamwork in software development and recognizes its human aspect. Delivering innovative, high quality software at a steady pace requires motivated, involved and happy teams. The happiness

metric was developed to measure happiness as an indicator of team well-being. The assumption is that happiness is strongly correlated with team well-being. So, a team that's happy, will also be more efficient, more cohesive, and more ready for the tasks at hand and will deliver higher quality software. If people are unhappy, something needs to be done' [16].

Finally on this, Kelly Waters wrote a review on the Clever by Rob Goffee and Gareth Jones, who work alongside Gary Hamel at the London Business School. His review of this book presents happiness on the part of the intelligent members of the team as a different function in terms of what makes them happy. He states that 'the basic idea of the book is that the smartest, cleverest, most creative people in your organization don't want to be led. Or at least they certainly don't want to be managed… in order to be competitive and innovate in your chosen marketplace. You need more Clever people than ever before and you need a different style of leadership to get the best from them.

Don't try to tell Clever people what to do. Certainly don't try to tell them how to do it. Instead set a clear goal that excites them, motivate them by explaining the importance and benefit of achieving it, give constraints (for instance time and budget), and provide whatever support they might need, occasionally stroking their ego. Then stand back and watch the results! This is the essence of leading Clever people. Your role as a leader of 'Clevers' is to inspire and engage them, maybe guide them, but not to manage them' [58]. This would mean that in this case, happiness is not achieved as a goal but as an understanding of the principle behind leading this sort of definitely complex team by including happiness in the normal, usual activities.

Finally, we should consider well-being. According to Edward Diener 'SWB (SWB) is the scientific term for happiness and life satisfaction-thinking and feeling that your life is going well, not badly'[17]. Teresa Del Pilar Rojas defined it as an individual's experience of affective reactions and cognitive judgments(18). This could also be viewed as how people experience their individual lives with respect to emotional, logical as well as cognitive judgments. It therefore encompasses moods and emotions as well as evaluations of one's satisfaction with general and specific areas of one's life(17). Although it is very person for there to be the existence of similarities. SWB according: The Science of Happiness and Life

Satisfaction (SWB) is defined as ‘a person’s cognitive and affective evaluations of his or her life’(19,20).

I can conclude that this basically is the study of what makes up the life of a person from their perspectives, their approaches, and these determine their reactions to events that take place in their lives. It varies from person to person as it is deeply individualistic.

Based on this, For the most part of HRM, SWB is an undeniable part which determines the life and fulfillment of a team or practitioners. With respect to human resource management Mihaela MAN wrote “SWB has a stable temporal component that is able to generate interest of practitioners in the field of human resources management to incorporate this variable into predictive models of professional performance, models which will become employable in the processes of human resources management. At the same time, due to the fact that this component also has part which may be modeled after the persons have been employ edit may increase the prospective of future effects of SWB on other variables such as: job satisfaction, task performance, organizational citizenship behavior, etc”[21]. As a category of HRM, it is such a vital part because it summarizes the unspoken real needs of members of a project team, staff members and the general stakeholders. But then for the most of HRM, its never really detailed enough as we will look into such in further chapters and sub-chapters to come.

What is the main idea: This is the aspect of management of human resource that affects the level of comfort and ease with which team members work within the organisation. This could be in policies, relationships and many more. Hao Zhang Jia Tan tutored by Jonas Söderlund mentioned six parts of HR management that involved well-being of the team or members of organisation especially in trust building. They are (1) Selection practices and internal promotion, (2) Employee voice, (3) Employee involvement, information sharing, (4) High compensation contingent on performance; (5) Extensive training, learning and development, (6) Greater involvement in decision making and work teams. While promotion (flows), involvement, compensation on performance, training and development are actually four core area of HRM” [22].

According to Ed Diener et al “the person’s cognitive and affective evaluation of their own lives. This evaluation includes the emotional response to an event as well as cognitive

judgments on satisfaction and fulfillment. SWB is a broad concept that includes experiencing pleasant emotions, low levels of negative moods and high level of life satisfaction"[23]. The main idea of SWB in HRM is to get your team or members of staff working with you from a point of ease and total satisfaction. It is showing concern for their concerns thereby winning them to focus on your focus as a project manager or leader or boss.

So, an employee's SWB related to the effectiveness and resultiveness of the organization. UKESSAYS in march 2015, explained the idea of SWB of staff in an organization to show and focus on the experiences of people positively to involve cognitive judgments (satisfaction with life) and affective reactions (positive and negative affects)[24]. However the level of importance attached to SWB of staff of an organization to a good extent will affect the quality of professional result you get from it. Mihaela MAN researched on this and wrote that "a series of studies has been carried out regarding the relationship between professional performance and SWB, and this has revealed that SWB has a positive relationship with professional performance; moreover, it is a predictor for the latter. It has also been determined that the relation between SWB and professional performance is stronger than the relationship between job satisfaction and professional performance; SWB has been found to be a better predictor for professional performance than job satisfaction"[21]. This means that the result of very good SWB processes and activities will result in better results and effectiveness in an organization.

C. Elliot et al researched and agreed with other authors in stating that the support of leaders felt more comfortable to employees and made them more committed to work with general higher well-being while in contrast staffs with poor SWB (negative and abusive) produce the opposite[25]. Based on these then the SWB of an employee is a major key player in the effectiveness and results of their performance.

As a result; it is very important that SWB is taken seriously with respect to its relational effect on the modern economy concept of the 21st century. Christopher J. Boyce believes that personality and its issues will ultimately have a resounding effects on the quality of decisions taken economically and the understanding of this will account for the heterogeneity in individual preferences and characters exhibited[26]. It is to this effect that

modern fast growing economies like that of the United Arab Emirates now have ministry of happiness. One of the six targets of this ministry is to promote the country and make it known as a happy place by initiating projects to that effect but its first task is to harmonize government plans which is another way of saying make the people happy with what we are doing. The result is evident, the country is a fast developing and growing modern economy[27]. We can conclusively say boldly that it is therefore very vital that SWB is considered a vital part of any economy that seeks modernization and development.

This could be the reason SWB and happiness now is the mainstream in general management, and many organizations have special departments or this special function within HR department. So many organizations have evolved to becoming good at putting their employees first. We will look at a few of them and what they did based on the research of fortune leadership ranking for the year 2016.

Google. Number 1 fortune leadership best companies 2016. Google has been on the list of Fortunes 100 best companies to work for in at least last 10 years in a row. “One Googler explained, "The company culture truly makes workers feel they're valued and respected as a human being, not as a cog in a machine." As of september 2011, Jennifer Patterson said that Emotional well-being is the most important part of making Googlers the healthiest employees on the planet”. As of 2016 report of fortune leadership on the top companies in the world, Google came first, thanks to the well-being goals and approaches[28,29,30].

Robert W. Baird: number 6 in fortune 2016 best companies and became number 4 in 2017. This company deals in the stock market. Fortune referred to it as ‘employee owned financial services firm’ which has a strong culture and unconditional respect for all employees. No executed treatment of any form, not even in size of office at the head quarters or parking space. Everyone is anyone.

MILWAUKEE, September 6, 2013 wrote Baird was recently recognized as one of the nation’s newest Platinum Well Workplace Award winners by the Wellness Council of America (WELCOA) and Wellness Council of Wisconsin. The Platinum Award represents the apex of results-oriented workplace wellness programming and is presented to organizations forging new ground by linking health promotion objectives to business outcomes. The award acknowledges Baird’s commitment to excellence in the pursuit of

enhancing employee health and well-being. It also recognizes quality and excellence in work site wellness criteria. Only a handful of employers have attained the Platinum designation. Baird received the Gold designation in 2010'' in the reviews of people who worked there, they wrote about the well-being concern of the organization for all, the insurance policies, vacation policies and how that the benefits of the company are quite expensive. The company seems to have a policy of the employees first[28,31,32].

Edward Jones: ranked number 10 at Fortunes. According to Fortunes Edward JOnes, 'with more than 11,900 brokerage offices advising some 7 million individual investors, the firm fosters camaraderie by hosting summer regional meetings for financial advisors and their families at a resort for a weekend full of music, food, games and swimming and golf, business meetings and award presentations. When they started this practice in 1988, about 3,000 employees attended. Last year, 229 regional gatherings drew more than 37,000 employees'. According to Edward Jones.com; they have so many benefits for their staff besides all the fun stuffs above that relaxes the staff and help their general well being. For instance

- Dental and vision
- Life insurance and disability
- Paid holidays and vacation
- Paid sick leave
- Tuition reimbursement
- Security purchases with discounted commissions

In a review, they were referred to as a Great place to work for. Great Culture and great teamwork environment. limited personal growth potential."[28,33,34]

W. L. Gore & Associates: being a synthetic fabric manufacturer of Gore-Tex and Glide dental floss with a long culture of making wealth while doing it with fun and this goes as far back in time to the 1950s and 60s. a time when Bill and Vieve Gore invited all associates over to their home for the annual company picnic. Jeffrey Nielsen - 2011 - Business & Economics

W. L. GORE & ASSOCIATES Freedom to be creative and constantly learning is a key peer based practice. This freedom can be risky but W.L. Gore has created the right habits to

make it work'. The company majors on the ability of the employees to make the right affordable judgment fort themselves and the company as well as strategic directions for their well-being [2012] referred to them as a World-class organizations that retitle their employees help create workplaces alive. P. Brione saw it from the perspective of work democracy. Freedom in its essence within organizations[28,35,36,37]. However we look at it, the truth remains that these principles got these companies to fortune 100. Today they are recognized for the well-being of their employees. Especially if the organization is project-oriented.

Such organizations function with certain characteristic features. Hao Zhang et al wrote concerning SWB of employees in PBO focusing basically on how it neglected but an important aspect of the organization, the necessity of bring up the well-being issue of the employees and how it has impact on the organization. It was based on this and other researches that they presented four major features of SWB of employees in project based organizations[22]. These four areas were:

1. Flows: this is a momentary experience that is characterized by a period of intense focus, high enjoyment (either during or after), and a sense of time standing still[38]. Mihalyi C et al explained that flows was once grouped into nine dimensions and later into three by another author. The initial dimensions were challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration on task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience but the later author grouped them as intrinsic motivation, enjoyment, and absorption.

Flow not only lifts the spirit momentarily, but it has also been found to build psychological capital over time, which is a major component of human growth [2003]. Positive Psychology program referred to the activities which are in themselves rewarding as self goals whose results are the experience of flow which not only lifts the spirit of a person or employee momentarily but is also a psychological capital as a component of human growth[39]. Hao Z et al [22] argued that Flow is a core area of HRM that includes the in-and-out flows of human resources both internally and externally across organizational boundaries but Mihalyi C et al explained the the origin of a flow experience in an organization is a product of balance in challenges and skill exhibited in specific assignments

and also discovered that flow had a strong involvement and accounted for variance in work enjoyment, self-efficacy, engagement, and positive affect but that the relationship between positive leadership and flow is weakened by employee attitudes[38]. Positive psychology believed that flow can be experienced while performing a hobby and that the two fundamentals of flow are a challenging task and the possession of the required skill to get it done. They believe that although motivation could also create a level of flow, but its not a flow at its best[39].

2. Performance: performance as one area of human resource management practices includes “design of work settings that allow for high performance and enhancement of proper and motivating work conditions[22]. According to Hao Zhang et al, three mechanisms could have effects on work performance of an employee in a project based organization. The first will be by affecting the cognitive abilities and processes of the employees which in turn enables them to think more creatively and become somewhat more effective in solving problems of the organization; the second is by influencing the attitude to work of the employees thereby raising their willingness to collaborate and be co-operative while the third is to improve the physiology and general health state of the employees. Although some may argue that this area of HRM practice also included three major things,appraisal, feedback and reward systems however he also presented that practices that develop trust among employees can develop trust among them and improve their performance using high compensation contingent on performance. They stated that this means if employees performance results in enhanced organizational performance, workers should be appropriately and equitably rewarded for their effort.[38]

3. Involvement: Based on the research of Hao Zhang et al, involvement was presumed to include involvement in decision-making process and individual influence on work and work condition. Their study showed that the level of access to information, rewards, power increase and experience of knowledge employees have determines their level of satisfaction which is a part of their well-being and that their level of self involvement in decision making affects to the level of stress and life-work balance.

Liang-Chih Huang et al [2016] “suggested the need to strengthen the desired behaviors in employees through strengthening their motivation by direct incentives or connecting to

their behaviors and that the organizations are able to encourage employees to identify with the goals of organization and to exert effort to achieve them through HR systems which was based on the theory of planned behavior"[40].Hao Zhang et al however concluded it by stating that "this means the purpose of life is more than just work. Thus, making employees more involved into work can improve employees‟ wellbeing"[22].

4. Development: Hao Zhang and Jian Tan discussed that developmental activities have goals to give HR lont-term competence development in dimensions with a career plan beneficial to both the individuals and the organization and that developments based on strength enhance employee well-being reliably. As such the competence development of an employee could facilitate the well-being of an employee which could enhance the ability of the individual to meet psychological needs like competence, relatedness autonomy.

They suggested that employers make sure that talented employees remain in front of their professional expertise which is achievable by training them to be more work effective. As such training, learning and development strengthen the importance of developing deep knowledge of employees when employees‟ well-being is aimed to be enhanced[22]. Definitely one can now say that Competence development for employees in project based organization helps the general especially the psychological well-being of the employee.

But then how this is used and at what point could differ depending on certain situations of the project. Just as we have researched in above 1.1.3.1, SWB criterion can be used in project based organizations. But due to the fact that the basic difference between project based organizations and non-project based organization is that by design, project based organizations are built around a project. A project has specific start date and estimated or expected finish time. This requires that they mostly employ project managers to manage projects on their behalf knowing that the team is new and fresh, the enthusiasm still present and the willingness to make a mark will always be there for so many considering that the assignments are time constrained. While in the case of non-project based organizations they could go on with the same employees over a very long period of time. This gives non-project based organization the weakness of motivation being decreased over time. They may have manpower at their disposal but despite that they gradually become easily vulnerable to the point of becoming less enthusiastic about the job and their roles due to the monotonous

nature of the job yet most companies will have issues getting rid of them due their expertise and level of experience. In order words, they require a fresh sense of motivation and innovation[41,42].

On this note, non-project based organizations will be in greater need of SWB as it will strengthen the commitment and willingness of the project team as well as employees at the long run.

The CEO of iOpener and author of Happiness at Work,Jessica Pryce-Jones told Forbes, "Happiness at work is closely correlated with greater performance and productivity as well as greater energy, better reviews, faster promotion, higher income, better health, and increased happiness with life. So it's good for organizations and individuals, too." Techbeacon.com investigated this further saying iOpener developed questionnaires, conducted focus groups, and aggregated results from 3,000 respondents across all disciplines in 79 countries. Over 10 percent of the respondents were in IT. The numbers say it all. The happiest employees are: 180 percent more energized; 155 percent happier with their jobs; 150 percent happier with life; 108 percent more engaged; 50 percent more motivated [43].

From the above, happiness/SWB must then be a vital part of project management team. Should it take a central point, constitute a discussion for the team and management? ‘We don’t talk about emotions. We draw them’ [Kelly Waters, 4 July 2013 Agile Teams [44]. The agile idea of happiness/SWB is slightly different from the generic human ideology of happiness. It seems to approach it from the result perspective rather than from the target point of view. This is achievable using different variations like measurable happiness. According to Measurable Happiness by MIREK WOZNIAK on JUNE 27, 2013, ‘The Happiness Chart is a kind of universal mood indicator. We draw shapes on our whiteboard after each stand-up to tell others about our day. Green goes for “happy”, blue for “so-so” and red means “sad”. That’s it! And it works – a couple of times in a row show that something’s wrong. Get up and do something about it. If paired with a project management tool, you may evaluate which tasks your team drudged through and which made their day.

The chart is 100% transparent, just hanging on the wall for everyone to see. Maybe a passer-by got a solution that the whole team was looking for last week? Or a cute cat picture to lighten the atmosphere'? [45] This chart is also known as happiness metrics. Scruminc.com refers to it as Happiness Metric – The Wave of the Future stating that 'Happier people are about 12% more productive.'[46] Crisp's consultants, the author of the Crispe's blog also refered to it as 'an index measuring the level of happiness in a group or organization at a given moment. The level of happiness says quite a lot about a group and how well everything is going regarding its goals, and I find it to be a very nice metric to use to monitor the team during product development. A happy team and members are productive and are working towards their mutual goal to deliver the product' [47,48]. Obviously, happiness has a resultant effect on the tone of employee and work place.

Let's consider the importance to use SWB when forming team in projects.

Team formation means talking, discussing, asking and answering, being ready for brainstorming or working harder than usual, listening and asking for suggestions, respecting and following the indications received, keeping the morale as high as possible and motivating people when necessary[42,49]. With regards to the project team and its formation , lots of emphasis has been laid on the composition of the team, their Professional competence, the Level of responsibility of the team members, challenges encountered by the team, the factors that accounts for the success or failure of the project, the level of involvement of team members in the planning and design of the project as well as the level of monitoring of the project[50] but hardly really on the SWB of the potential project team especially touching on the criteria of what they consider very vital.

Like earlier shown in this research it is easy to notice that a lot has been done in the project team selection project management field. It is so easy to get a team to work. Ranging from the works by PMBOK to individual, ICB and many others. In all of these SWB has been mentioned indirectly in all as a factor in managing projects, yet non has been able to make it a factor in selection or formation of project team. This may largely be accrued to the fact that it is an immeasurable concept that exists in the minds of many but without a method or unit of measurement may be almost impossible to put to work for most organization.

The major issue with project team selection with organizations and researchers is that they recognize the importance of SWB but are unable to find its units or standards or even anything related directly to the measurement or determination of SWB of a prospective project team. However SWB is so important IN THE FORMATION OF A PROJECT TEAM because it helps the project manager and the stake holders to fully understand what it takes to get the very best out the project team and get the desired maximum result.

1.2 Theoretical aspects of the PT formation by SWB criteria

In real practice for the most parts of project team formation across different approaches, one thing has remained consistent, its based on qualifications. They mostly are focused on development of team rather than formation. Lets take a look at some of these scientific approaches like PMBOK on the five steps of team development using Tuckman's Team development Model. these are: Forming; Storming; Norming; Performing; Adjourning.

However we are most concerned about the first step, WHICH IS FORMING [51,52]. This the stage on which the team meets to learn about the projects and individual responsibilities, the downside is that at this level team members are less open and trusting [53].

In some more details, PMBOK method of acquiring a project team could be summarized in table 1.5 based on [54]:

Table 1.5 - PMBOK method of acquiring a project team

Acquire Project Team		
Inputs	Tools	Outputs
1)Project management plan 2)Enterprise environmental factors 3)Organizational process assets	1)Pre-assignment 2)Negotiation 3)Acquisition 4)Virtual teams 5)Multi-criteria decision analysis	1)Project staff assignments 2)Resource calendars 3)Project management plan updates

Source: Borrowed from Reference 54

In approach PMBOK presented tools that was mostly about getting qualified team to work by picking from within the existing staff and in a case where they do not have then outsourcing becomes the other option. For the most parts the team is selected from among the existing [54].

To approach it from another perspective of picking from within the already existing team in which case the Human resource department of the company does the bulk of the work. In order to achieve this there are 8possible steps that could be used to create a project team as below

1. Analyze the project task and break it into its component steps. Note down each of the work skills necessary to complete these tasks.

2. Think about any particular requirements you will have on this project, such as the ability to work to tight deadlines or an availability to put in overtime.

3. Speak to your human resources professional or to the employees' direct supervisors for guidance on which workers in your company have the relevant skills.

4. Ask supervisors also for a rating on these employees of their communications skills and ability to work cooperatively with others.

5. List out several potential team members under the heading of each skill.

6. Pick out those employees who have the right mix of skills and personal attributes. If you are not sure about a particular choice, conduct an informal interview with the potential candidates to get a sense of what kind of commitment they would have to the project if they were chosen.

7. Analyze your potential team to make sure you have the right mix of "idea" people and "detail" people. You need both inspirational team members and team members who know how to implement.

8. Avoid personality clashes. Even if you believe the individuals concerned are both skilled in the right areas, if they won't work well together, you will waste time and energy on needless conflict"[55].

But then, its all about skill and right positioning or rather categorization based on skill despite the fact that Beth Winston believed that 'you need the right mix of skills and of personalities to ensure the task gets done with the minimum friction and the maximum'.

The following tips would be really useful in Choosing Effective Project Team Members: excellent communicator; knowledge of project management principles; highly organized; strong ability to read people; accurate estimating skills; self-assured.

In the end these were qualities to look for in a project team members [56], quite contrary to the researches of Beth Winston. However staff acquisition as a term in team formation can be defined as 'the process of getting the human resources needed assigned to and working on the project' but the things to consider when picking a team by this means should include previous experience, personal interests, personal characteristics, availability, and

competencies and proficiency while your sources of these team members may come from endless sources if you so choose for instance from negotiations with managers and other project teams, pre-assignment from another project, or even from outside the organisation. Based on this, the source of selection or formation won't really seem to be an issue provided the qualities are gotten right [57].

P2M: This perspective holds that a project manager organizes the projects based on the commands and rights authorized by the head of executive organization or rather the stake holders. The project team and structure of the organization should be determined by scope, time cost, level of technical difficulty and contract type while the organization of the projects depend on these conditions and executive organization.

IPMA: this methodology believes that the responsibility of getting the right mix in project team belongs to three sets of people:

1. the project manager whose job is to analyze the project and provide the requirements for the people and developing the team using the Tuckman's five stages

2. the project sponsor who make sure that the right team members are selected from the existing department to ensure the success of the project

3. the project team members themselves who get the job done(Reinhard Wagner).

Based on this approach, the project manager and the sponsors or rather the project stake holders should be most interested in forming the project team with a **mixture allowing dynamic growth that will go on throughout the project life-cycle and successfully achieve the expected result from them**[58].

PMI and Agile: this methodology also uses the same approach as PMBOK which is the Tuckman's five stages. It emphasizes the value of the team, development of commitment and effectiveness within the team and the art of continuity for the team. Its scientific approach is not anything new while Agile does more of creation of effectiveness within the team. Its a way of making the most out of the team, but when it comes to formation of a new team and dynamism in terms of method or scientific approach, it seems silent there also[58,59]. An agile team is a cross-functional group of people that have everything, and everyone, necessary to produce a working, tested increment of product. Dedicate these people to the team, and as a rule, do not move them between or across teams as demand ebb

and flow'. The very definition of an agile team is getting in the way of forming agile teams, mostly because we misunderstand what a project actually is[60,61]. As such Agile team also does not present a way of forming the team but rather a way of making the team(existent) agile.

Based on our research context forming the PT we consider on the state of selecting team members among candidates. Despite different approaches (qualification or competence based or others) traditional conceptual model of this process is used, that includes three big components: set of candidates as input, selection itself and PT as combination of selected candidates. Selection process includes two general components: system of indicators and method of selection (including mechanisms and instruments of testing, measuring, evaluation, final decision making).

Considering these components, just as we mentioned above, so many authors and methodologies have their several approaches to indicators and criteria for forming a team.

One approach to it holds the perspective that certain qualifications and standards must be met by members for a project team to be created PMBOK[54,62] . These are: Experience; Level of interest; Personal Qualifications; Availability; Knowledge.

Beyond the above, a project team should be selected based on qualifications and what is needed. As such "the goal of this step is to identify a possible pool of team members based on the task skills needed for team effectiveness. Task skills refer to the individual capabilities that enhance one's ability to act effectively in broadly defined performance task domains Accordingly; such skills are "trans-portable" across teams and performance domains. Different team members have different levels of different skills, but the team, as a whole would possess all required task work skills"[51,64]. This is to say that the team should be a complete package, but then the individual team members may not have it all. This is because a project is only as successful as the people behind it. In which case they were emphatic about the qualities of the individual team members if they are to belong to the team (Brightwork).

Companies should strive to have project team members embody each of the following six characteristics: Excellent Communicator; Knowledge of Project Management Principles; Highly Organized; Strong Ability to Read People; Accurate Estimating Skills; Self-Assured.

However some members could have foundations but need the above skills to be sharpened[56]. Based on these, its easy to deduce that the bulk of the team formation and selection methods are based on merits, experience and qualifications.

As we also mentioned above, different methodologies are used to select and form PM teams. The central one is taxonomy of ICB which gives a new and redefined perspective to this whole concept. Its character and behavior focused and sheds greater light on the idea of SWB as criteria and a factor in project team management.

There could be general approaches to this, but we must bear in mind that projects differ, locations and nature of projects differ one from another. General researches so far has shown and will keep showing approaches that can be used generally not dynamically. But researches develop other selection mechanisms to satisfy needs of particular projects. As such specifically dynamic projects require more specialized approaches.

In the scientific perspective the task of selection team members is the task to develop a new scientific approach that can not only be used generally but designed to be adjustable into dynamic projects as well.

This will mean adjusting the traditional approach, researching further and producing new approach to elevate SWB. According to Edward Diener ‘SWB (SWB) is the scientific term for happiness and life satisfaction—thinking and feeling that your life is going well, not badly’[65]. Further researches of Edward Diener collaborated with other authors, they defined subjective well being as ‘a person’s cognitive and affective evaluations of his or her life’[17] as quoted by Brian Albuquerque. Positive psycology program however defines it differently, as ‘an individuals experience of affective reactions and cognitive judgments’. It approaches it believeing that “SWB looks at satisfaction generally, as well as a sense of satisfaction to that particular person’s standard. Assessing life satisfaction involves past experience and future expectations. Scoring high involves having “pleasant emotions, low level of negative mood, and high life satisfaction”[90] but the definitions of Diener, Lucas, & Oishi, 2002 were re-echoed in defining SWB by Carmel Proctor as ‘the personal perception and experience of positive and negative emotional responses and global and (domain) specific cognitive evaluations of satisfaction with life. It has been defined as “a person’s cognitive and affective evaluations of his or her life”[23]. in general it is easy to

note that most of these definitions are simply the words and works of Edward Dierner re-echoed and rewritten by most of these authors. For instance Satabdi Roy Choudhury defined SWB at first as referring ‘to a combination of a cognitive judgement of satisfaction with life, the frequent experience of both positive moods and emotions and as well as the experience of pessimistic emotions’. btu then also went further to state hence, SWB may be considered “a general area of scientific interest rather than a single specific interest construct”[19].

Teresa Del Pilar Rojas defined it as an individuals experience of affective reactions and cognitive judgments(66). This could also be viewed as how people experience their individual lives with respect to emotional, logical as well as cognitive judgments. It there encompasses moods and emotions as well as evaluations of one's satisfaction with general and specific areas of one's life[67]. I could say that this basically the study of what makes up the life of a person from their perspectives, their approaches, and these determine their reactions to events that take place in their lives. It varies from person to person as it is deeply individualistic. Although it is very person for there to be the existence of similarities. SWB according: The Science of Happiness and Life Satisfaction (SWB) is defined as ‘a person’s cognitive and affective evaluations of his or her life’ [17,68)] Although I would rather use the term fulfillment considering that it consists of a lot more than just an aspect of a persons life. For him the concept refers to technical perspective of sensation as to defining well-being to be basically about maximizing pleasure and minimizing pain as much as possible[66]. He believed in the school of thought that SWB belonged to the Hedonic perspective not the eudiamonic. The two perspectives are explained as being the two general perspectives of research on well-being:: the hedonic approach, which focuses on happiness and defines well-being in terms of pleasure attainment and pain avoidance; and the eudaimonic approach, which focuses on meaning and self-realization and defines well-being in terms of the degree to which a person is fully functioning (Ryan RM 2001).

But that SWB is characterized by both objective and subjective concepts but ‘may be conceptualized only as an internal subjective experience of each particular individual. Understanding the category of well-being as the combination of its two aspects allows the formation of two approaches to its specification, measurement, and evaluation’[67]. In their

research they believed that the methods to creating the factors, measuring and evaluating subject well-being should totally differ stating that ‘they should be more complex, more individualized, more directed by different vectors of influence and impact, based upon deep philosophical, ethical, moral, and psychological principles and categories, and, thus, they should be less material, less tangible, less quantitative, and more subjective. The subjective aspect of well-being can be described via such categories as respect and self-respect, confidence, satisfaction, harmony, harmonious physiological and psycho-emotional state, awareness of the purport of life and the person’s own meaning and significance in the social and political systems and in the universe, the feeling of love, affection, friendship, necessity, the person’s own place, implementation of the person’s calling, etc.’[67].

However, in their research, they enumerated three basic reasons for ill-being with respect to SWB. They are

1. The elimination of the moral basis of the social, political, and economic interaction, and the construction of the said interaction on the basis of the objectivist philosophy .

2. The construction of economy on the principles of Keynesian theory of economic relations aimed at boosting consumers’ demand, which, together with the ideas of market fundamentalism and the modern individualist culture, have formed a consumer society whose main priority is its individual subjective benefit;

3. The idealisation of democratic society not as one based on solidarity, mutual understanding, mutual respect, voluntary simplicity for the sake of public welfare and well-being, but as a society of personal rights, liberties, and needs isolated from those of others, which, in result, has led to the creation of the individualistic society, or the socalled social atomism, where every person acts to their own personal advantage.[67] Ofcourse the above revolves around entire aspects of life of a person. Looking into details of

Using notion “happiness”, Christiaan Verwijs, the Agile coach, Scrum Master and Developer, states that there is no formalized approach for measuring happiness in Agile Teams, the most common method is to ask team members to periodically rate their current happiness on a scale from 1 to 5 and this can be done on a daily basis.to achieve this some questions are answered to facilitate discussions within the team, such as:

- How happy are you with your company? (1-5)

- What feels best right now? (open question)
- What feels worst right now? (open question)
- What would increase your happiness? (open question)

Christiaan believed that there are so many things to like about this which includes

- They emphasize the human aspect of software development
- They provide input for retrospectives
- They can extend beyond just Scrum Teams
- They allow individual retrospection
- They allow scientific analyses

Despite all of the above, he argued that happiness metrics are sub-optimal. Below are his reasons: 1. Happiness is too subjective; 2. The Happiness metric is not task-oriented; 3. The Happiness metric is not team-oriented; 4. The Happiness metric does no justice to the reality of the work environment; 5. Happiness metrics are (statistically) bad metrics; 6. So, the Happiness metric is measuring the wrong thing.

Equivocally he explains it stating ‘I already implied this between the lines, but I don't like the happiness metric because it is measuring the wrong thing (and also in the wrong way). Although happiness is certainly important, I believe that a Scrum Team can benefit more from a task- and team-oriented measure that does do justice to the nature of the work environment. What is it that we really want to know as a Scrum Team?

- Are members enthusiastic and energetic about their team and their work?
- Are members willing to take one for the team?
- Are members proud of their team and their work?
- Are members happy to be part of the team?
- Are members feeling valuable to the team?
- Are members happy with their tasks?

I strongly believe that in a cohesive, well-running team, people are willing to go the extra mile even if it makes them (a bit) unhappy for the duration of the task’ [45].

In the end, Christiaan provided an alternative: TEAM MORALE (‘the enthusiasm and persistence with which a member of a team engages in the prescribed activities of that group' (Manning, 1991).). He gave the following reasons for it:

- Morale is more task-oriented
- Morale is more team-oriented
- Morale includes happiness, but more subtle
- Morale is less susceptible to mood
- Morale is not as biased:

Further analyzing this he wrote: Teams with High Morale usually have the following traits:

- Members are willing to help each other out, no matter the nature of the task;
- Members are proud of their team (and usually tell the outside world) and the work they do;
- Members will go the extra mile individually or for the team, even if it means staying late to finish the sprint;
- Members will persist (not give up), even in the face of high work-pressure, difficult technical problems, nasty bugs or a difficult sprint;
- Members are generally happy in the team and enjoy working there, on a whole;

Teams with Low Morale usually have the following traits:

Members withdraw from team activities or don't participate at all;

- Members are not proud of what their team does or are even ashamed;
- Members will stick to a 9-5 (or less) mentality, even though a bit of overwork might turn the tide;
- Members become focused on doing only their part, and nothing more ('this is not what I was hired for');
- Members will easily give up in the face of trouble;
- Members are generally unhappy in the team and don't enjoy working there, on a whole;

According to him, in measuring team morale, 8 points should be noted. They are as follows:

1. I am enthusiastic about the work that I do for my team
2. I find the work that I do for my team of meaning and purpose
3. I am proud of the work that I do for my team

4. To me, the work that I do for my team is challenging
5. In my team, I feel bursting with energy
6. In my team, I feel fit and strong
7. In my team, I quickly recover from setbacks
8. In my team, I can keep going for a long time

To calculate the morale of an individual member, we average the score on the eight questions. Team Morale is the average of the individual averages. For those interested, the alpha coefficient (an indicator of reliability) for this scale is very high (0.90, N=2471).

Brian Albuquerque suggested that for a psychologist to do measure SWB, they will be measuring how people think and feel about their lives. As such he enumerated three components of SWB as stated below:

1. life satisfaction
2. positive affect
3. negative affect

Another author stated that "the hallmark of measures of SWB (SWB) is that they are obtained through self-reports: people are asked to evaluate their lives as a whole or some aspect of it. The questions can be relatively straightforward and a widely used one simply asks: 'Taking all things together, would you say you are …: very happy, quite happy, not very happy or not at all happy'. More elaborate measures use multiple items to target a specific part of SWB and consequently render more reliable results single-item measures do (thought at an expense)"[69] .

In the process of finding a measurement scale for SWB, Paul D et all stated that SWB (SWB) **is beginning to be used to monitor progress and to inform policy; or, rather, 'ill being', in terms of depression rates and in the provision of cognitive behavioral therapy**. More is now needed on the positive side of the well-being coin. Policy appraisal using SWB has interested academics and it is now interesting policymakers too. More is now required. We need to measure all three well-being accounts, separately. We also need to measure SWB in different ways. There have been many attempts to classify the different ways in which in SWB can be measured for policy purposes. We distinguish between four

broad categories of measure: Evaluation; Experience; Eudemonic'; ONS (Office of the National Statistics) [70].

Evaluation: in this method of measuring SWB, the people are assessed using data of their lives. This approach requires a level of information made available to make information appraisal as well as the cognitive reflection on their life. In doing this questions are asked and their opinion graded based on certain scales to understand their definition of quality living. Lucy Tinkler et al explained that to get this measurement general happiness questions are used instead of satisfaction or SWB which in this case yields the same results in terms of impact of key variables. Paul Dolan et al explained how it is done explaining that respondents would be required to provide overall assessment of life satisfaction or particular areas of their life like health, job, relationships or any other and evaluated on scale 0 to 10. 0 being worst possible life for them and 10 being best possible[71,72].

This information is now taken and used to evaluate the SWB of these people.

Experience: this approach to measuring SWB aims at assessing the emotional quality of the life if the individuals. It is closely related to the undiluted account of well-being of the mental state of the person which is dependent on the feelings of that person at a given time. This quality is often measured in terms of the frequency, intensity and emotional affects at the particular given time such as anger, excitement etc. This method approach SWB as being a function of pain and pleasure which is SWB indicator which makes things and situations good or bad[71,72].

This information can be collected over time in a dairy format by asking the individuals questions or doing general survey of questioning their feelings over a short referenced period of time. This can pick up any form of emotion including the positives and the negatives.

The eudemonic approach: is a measuring theory that is based on the need of individual lives psychologically to define its meaning and sense of control over their lives and in connection to others around them, autonomy, contentedness, good personal relationships, sense of purpose, vision and achievement which will in turn affect the well-being of every individual involved. This is seen as a measure of flourishing or success. It is also sometimes referred to as functioning or psychological approach to measuring SWB. This approach

tends to measure SWB from the psychological perspective of the individuals involved as the major indicator.

ONS approach to measuring SWB: this approach is also referred to as the balanced approach and this is because it takes into account the other different ways of measuring SWB. This method simply adopted the various methods and adapted them together to create a balance and general thoughts to achieve the same goal except this time it is more detailed.

To achieve this, questions are grouped according to type of SWB measure (evaluative, experience and eudemonic) and depending on the level of detail that they provide and how they could relate to different purposes of public policy. The most general measures can be used for overall monitoring.[71,72].

ONS included four SWB questions covering evaluative, eudemonic and experience measures of well-being. The four questions are as follows:

• overall, how satisfied are you with your life nowadays? (experience)

• overall, how happy did you feel yesterday? (positive affect)

• overall, how anxious did you feel yesterday? (negative affect)

• overall, to what extent do you feel the things you do in your life are worthwhile? (Eudemonic)[72].

What are the features and/or difficulties of measurement and evaluation?

In order to measure SWB or even recommend any particular measurement, Paul D recommended that certain things be taken into serious consideration.

1. Salience: prevalent questions depend on individuals and what they had been asked before. As such there is no standard question that is stable at all times and may get the same answer for all individuals.

2. Scaling: the changes in methods of scaling with respect to differences in population and situations. This means there is no universal scale that functions universally. Life satisfaction scales may be responded to and interpreted in different ways by people at different ages with varied responsibilities. In relation to things like the income, health and family, reactions to the scale will differ depending on individuals and population.

3. Selection: it is very important that people partaking in this are selected right. People have different approaches to life satisfaction and this could be the reason for varied

responses and results from asking them questions. The level of satisfaction and aspect you are looking towards should determine the kind of people you select.

However the most populous ways of measuring subjective well being is explained in different ways by different authors. This is probably because they got the enumerations from the same authors. Below are the two ways considered by them

- life satisfaction can be measured using a questionnaire such as the 5 item satisfaction with life questionnaire or the Satisfaction With Life Scale (SWLS);
- affectivity can be measured by for example, the PANAS [positive affect negative affect schedule];
- the Experience Sampling Method[69,73,75].

Brian Albuquerque added that the above two measures can be categorized as examples of self-report measures but could be affected by some factors. As such the experience sampling method could be useful in which case the family friends of a person is brought in to give accounts of various events both negative and positive.

Using the self-report measures method of measuring SWB, Brian added the following factors as being able to affect the scores of SWB:

- situational factors,
- the type of scales that are used,
- the order in which the items are presented, and
- the mood of the respondent at the time when the measurement was taken.

With this Brian concluded that SWB is a hugely complex field. Whilst research evidence shows personality to be a strong influence on SWB and certain traits are linked to SWB.

1.3 Concluding the scientific goal and tasks of the research

Deep analysis of practical and theoretical issues of PT formation by SWB criterion conducted above we used as a base to formulate following conclusions and statements.

In modern environment of projects SWB of the PT became one of the most useful managerial category to approve that project goes in the right direction to achieve stated goals and produce expected values within planed time and resource limits. It helps to measure the SWB of project team members and to predict the level of productivity as well as its maximization. The base for such prediction is just general statistical dependencies, such as "Happier people are about 12% more productive". Unfortunately we could not find scientifically based dependencies or models that describe properly influence of happiness, fulfillment or well-being of the PT on traditional project managerial parameters – quality, time, and resources. Besides, such influence might be different for different types and kinds of projects in different fields with different environment, level of complexity, risk, changes etc. We could not find such classification or related researches yet.

The most known type of projects where SWB is recognized greatly is Agile-projects. Within this methodology they talk about happiness of the team. The reason is very changeable environment, necessity to communicate and interact with different people, what is more important - to be creative and to work-out the expected value being under the pressure of schedule and budget. Although projects are dynamic and mostly unique in scope and planning, goals and framework, it is necessary to note that there are definitely going to be similarities, sometimes in methods and other in approaches. We understand also that in different projects the necessity to consider SWB might be different. Some special coefficient might be introduced to measure projects in this context.

The feature is that traditionally SWB is used to monitor the PT after the project has begun. But there is a great necessity to use this criterion from the project very beginning in order to provide involving to the PT those people who are able to be effective (productive) because of being happy in this project. It is the idea of our research. Here is very important to mention that SWB-approach to select PT is not controversial to traditional qualification/competence approach. SWB-approach should support

qualification/competence approach. And SWB-evaluation of candidates should describe the future team of competent members from the perspective to have emotional and psychological abilities and coordination, not just certifications or qualifications and be able to carry out responsibilities with full dedication yielding the desired result all through the project life cycle.

So, the practical issue of this research is related to the task to use SWB as a criterion when forming the project team to select future team among candidates.

Conceptually general model of forming PT as a process with input (set of candidates) and output (defined project team members very alike by their SWB attidudes in the context of a project) is absolutely applicable, but should be re-phrased in terms of using SWB as a criterion.

In theoretical terms task of forming PT by SWB criterion breaks on two sub-tasks: to evaluate each candidate, and then to find best (most rational) combination of candidates based on comparing their grades.

Using SWB at the very beginning of the project allows finding out factors that can provide feeling of well-being of candidates in the project in future. Thus in this case best (most rational) combination means combination of candidates who are most alike by grades, thus have more common base to provide appropriate conditions to feel well-being in project.

Evaluating candidates means using of indicators. Analysis shows numerous indicators that are used by practicians and researchers in the context of happiness. Traditionally their combination depends on conceptual understanding of SWB within particular scientific or practical approach. So, for the purpose of our research such approach should be selected and grounded, and appropriate indicators should be compiled. We understand and support proved opinion that no standard indicators that are stable at all times for all candidates. They can vary from project to project. But to have a chance to create and try our method of the PT forming we consider a task to shape more universal indicators perceptible and acceptable for majority of personalities. We suggest to make it based on system approach, thus as a result we expect to shape a system of indicators, rational by quantity, surplus but rational at the same time.

The subject of evaluation should be a person him- or herself producing self-report. It's absolutely natural that person can provide most reliable assessment rather than expert or machine (computer).

Current results in our research gave as a base to analyze two distinguishing approaches when forming PT – qualification/competence and SWB by following criteria: context (starting point and focus) of evaluation; final result of implementing indicators; subjective/objective nature of scales used; vector (object) of measuring and evaluation; subject of evaluation; possibility to compare.

Table 1.6 – Analysis of Qualification vs SWB Approach

№	Criteria	qualification/competence approach	SWB approach
1	Context (starting point and focus) of evaluation	starting point is a project; project causes expectations from the candidate	starting point is a person of candidate; person causes his (her) expectations from the project
2	Final result of implementing indicators	Understanding features of person to provide his (her) success in project; objective nature	Understanding features of project to provide that person fells well-being in project; subjective nature
3	Subjective/objective nature of scales used	Objective	Subjective
4	Vector (object) of measuring and evaluation	Features of a candidate are measured. Actual marks should be compared to "ideal" or "norm"	Attitude to well-being; person assigns subjective ideal (norm) based on his (her) understanding
5	Subject of evaluation	Stage of individual evaluation – expert; Stage of finding rational combination - expert	Stage of individual evaluation – person (self-report); Stage of finding rational combination - expert
6	Possibility to compare with marks of other people	Comparable	Non-comparable

Source: developed by author

As one can see from the table above, qualification/competence and SWB approaches look contrary different, presenting two sides of one coin. It gives us base to state that

methods created for the purpose of qualification/competence approach are not acceptable for using within SWB approach. On the contrary, they should be unusual, more soft, human oriented, at the same time more holistic, entire oriented.

The most “weak” and theoretically unsolved point of the evaluating candidates and further finding their most rational combination for the PT is choosing of scale. For these two stages the scale should be common.

For the first task (individual evaluation) most of researchers use fuzzy scales. It’s caused by nature of SWB: it’s obviously easier for a person to evaluate something related to happiness, fulfillment or well-being avoiding numerical scales. This is because feelings are hard to measure. They have no definite determinant to view physically and be certain of its grading.

Many researchers have concluded also the fact that SWB scales may be responded to and interpreted in different ways by people at different ages with varied responsibilities. In other terms, the scale will differ for different indicators of different persons. When some scale is selected to evaluation stage, it means that each person will interpret it subjectively. Thus, there is no common base to compare answers of candidates, no way to consider answers of candidates comparable, no way to consider them adequate for further manipulations when selecting team members. In this case, the point is to find such scale that allows avoiding this weak feature.

Analyzing numerous researches we could not find any method of evaluation that matches all features of SWB-evaluation.

Some methods allow evaluating candidate only on the stage of individual evaluation, but do not consider the need and possibility to compare results of individual evaluation for finding better combination of candidates.

The SWB of project team members has not been taken into consideration in most organizations, both in developed and developing parts of the world. This situation means that the methods of project team selection will have to be restructured to consider the SWB of team members as individuals and as a group. SWB in teams is a less developed aspect of project team selection and that is why this topic actuality is vital.

All current results give us a reason to conclude about the object, subject, main goal and tasks of the research.

Object of research: processes of managing a project team.

Subject: process of forming a project team based on SWB-approach.

Goal: to ground scientific approach to forming of project team based on SWB-approach.

To accomplish the goal, the following tasks have been set:

- to considere SWB as a factor when forming the project team: what it reflects for a team member and what for the team as a whole;
- to propose the system for representing SWB-indicators based on holistic approach reflecting different aspects of a person in a team and in the project;
- to suggest the method of constructing candidate's personal SWB-profile based on ranking the proposed SWB-indicators;
- to propose the method of conFigure uring the project team, which ignores the compliance of the team's integral characteristics with the ideal requirements, but allows to find out the most rational conFigure uration by SWB-indicators;
- to develop the evaluation scale and the method for evaluation of coherence (commonness) of personal profiles of candidates;
- to carry out the experimental verification of the proposed approach.

CHAPTER 2.
CONCEPTUAL BASELINES TO FORM A PROJECT TEAM BY SUBJECTIVE WELL-BEING AS A CRITERIA

2.1 Subjective well-being as a criteria to form a project team

Human resource management in developing economies still has a lot to learn and develop. In my personal observation of developing economies with emphasis on Nigeria, majority of the wasted resources on project has a lot to with management of personnel. If this is however addressed properly, less money will spent on projects and still attain maximum result with the little resources available while maximizing personnel at the same time. One major way this is possible is by categorization method.

A class may include one or more positions [76,77]. To achieve this, a project manager must have a deeper sense of knowledge of his project team, he must know what each is capable of and believe in such persons as well as other members of the team. According to PMBOK, the first part of human resource management is to work on the project team plan. Now let's take a look at the perspective of PMBOK on this.

The PMBOK 5TH edition being an improvement on the 4th deals extensively on the performance of the project team, organizational processes, work performance, output and many more beginning with developing human resource plan. However, in a peculiar developing economy like that of Africa taking Nigeria as a case study, it will be discovered that it's not just enough. You will achieve better results when the love of the staff for the job is full and the place of their full dedication as a result of fulfillment is not in doubt. According to PMBOK 5th edition, The Human Resource Management Plan oversees Input to the Manage Project Team process and is Used to identify team members' roles and responsibilities as it Defines roles, responsibilities, level of authority and required level of competency for each team member, As input to Manage Project Team process, provides a clear indication of what is expected of each team member [78,79]. According to EDWARD E, GERALD E. (1992), the concept of skill and the capabilities of individuals are basic to

human resource practice. The most common approach to human resource management is based on job descriptions. Needed skills are discovered by analyzing the jobs in the organization. Job evaluations typically rate job value on the basis of skill level. Their approach to HRM believed that training systems enhance job-related skills that are identified through the job description process. Selection systems hire employees who have the skills needed to perform the jobs available in the organization. Labor contracts in organized settings usually codify these human resource practices and job descriptions in the form of labor contracts while Síle F. scientifically proposed that human resource (HR) policies are, in the main, centrally determined and developed and that in the HRM system, the Human Resource Planning, Recruitment, Selection Promotion should come before Training and development which afterwards Rewards/Pay Industrial Relations Equality Health, Safety and Welfare Personnel Administration [80,81].

We propose a scientific approach which necessitates that training and selection should come before promotion and be referred to as categorization which is a part of recruitment. This is necessary because promotion should not come before training especially in developing economies unlike the developed in which available skills are developed like Edward E focused on.

Methodology behind this: this involves the development of the model of Skill Discovery Process which will reflect a basic relationship between project team member's personal skill and its discovery. When that is achieved a new model, which is the model Project Team Categorization Process is created, this model shows an interrelations between project team grouping/categorization and its performance. In order to achieve this, the methods of analysis and graphic simulating were used.

This research shows that finding best individual project team member skills, certain processes will have to be undergone by the project team members as individuals under the supervision of the project or H.R manager to produce this discovery but noting that they all have different things that motivate them especially finances. Once that is done the performance as a team can be improved greatly under managerial influence and resource supply and management following a set of three more stages namely Test, Positioning and Grouping resulting in enhanced performance of team.

Categorization is the process of arranging or classifying in a particular order. It implies that concepts or something is classified into categories based on the commonalities and usually for some specific purpose. Categorization is fundamental decision making, in all kinds of interaction with the environment and in language. The classification of positions is based on analysis of the duties performed, responsibilities, supervision received or exercised, organizational structure, and qualifications necessary to perform those duties

In addition to the already existing processes used to Manage Project Team processes, the Key skills of effective team management framework should also include categorization and conforming (understanding where they belong and selling the vision to them in a way the buy it, see what you see and do it with joy) as well as the ability to make them accept and understand your project goals, vision, and targets. By so doing, the project team can open up as to what they are capable of that can help the project both professionally and casually. It was Nelson Mandela (a South African) who said "If you *talk to a man* in a *language* he understands, that goes to *his* head. If you *talk* to him in *his language*; that goes to *his* heart."[82]. This would mean understanding the terms, mindsets, focus and points of view of each member of the team and being able to channel their experiences and knowledge in favor of the project.

His language in this case of project management refers to what makes him happy (his communicative reception). It is a system of communication of thoughts and feelings through a system of arbitrary signals [83]. This is peculiar and differs person to person. Human relations management includes understanding the language of the workforce as a group and as individuals. Some project team members are motivated by passion, result driven focus and many others by financial incentives. Financial incentives is for many a major source of motivation, how much is paid and how it is paid. For a project team to be formed effectively and efficiently, there are certain things that must be put into perspective beyond the project itself [84]. The project team members must also be looked into. Their level of interest in the job, conditions that can make them most comfortable and interested and most of all their level of love freely lavished upon the job.

Employees/laborers/workforce love and fulfillment in an assignment is a function of how well they are able to fit into and get engaged in the role in their language/communicative

style. For example, fitting a person with communicative skills and loves talking in a place that requires focus and utmost silence will create a gap in the person as silence is not his 'language'. So also a person who loves seclusion and silence when he is put in a communicative position will do it grudgingly, not meet targets and will not be fulfilled in that arm of the organization. It is therefore vital that the project manager puts each person where they belong thereby 'speaking to them in their language'.

HR has the business to engage the project team such that they are eager to learn, share and execute existing or new knowledge. In a developing economy, some factors should be noted as influences that could affect human resource management for projects in such economies which could include political, economic and competitive advantage.

The work environment - creating an enabling environment, setting realistic and achievable targets for the staff, competitive compensation and a general sense of well-being will create engaged staff , who will love their jobs, be easier to manage and respond better to training basically because the environment makes it even further conducive beyond their love for the job.

Financial security- for most people within developing economies, the reason for working extra hard is to attain a height of financial security. That has remained a major cutting edge that a lot of companies have over the others.

Family incentives: this could include health insurance covers, full expense paid visit or vacation with family during breaks from project site. This is another incentive that ensures the commitment of staff within a project period especially for project involving high risks.

Having looked at that in a general sense, I will like to specifically address the need for the staff /workforce to love what they do as this will keep them naturally motivated to maintain a steady flow and continuously meet target as they work not just with their brains but also their hearts. In order to achieve this, we have developed a model that consists of processes that should help a project manager to ease his categorization processes. Fitting them according to what they love most: find what they love doing the most and link it to their work. It is important that you identify the strengths of each employee and ensure that their current roles maximize those strengths while you train on their weaknesses. To do this, there are things the project manager must put into consideration, like the development of the

personal skills of the project team members and that of the project team in general. These two may seem alike but in reality have different sets of processes even though when successful, they yield similar results in the project which is easing management and adding comfort to the work. Now we look at the first, development of project team member skills.

To develop the skills in project team members and find their best practices, the following processes will come in handy:

- development of effective communication base among team members and between management;
- team member training in numerous skills available;
- exercising and testing the team [competency assessment];
- observation and monitoring [identification].

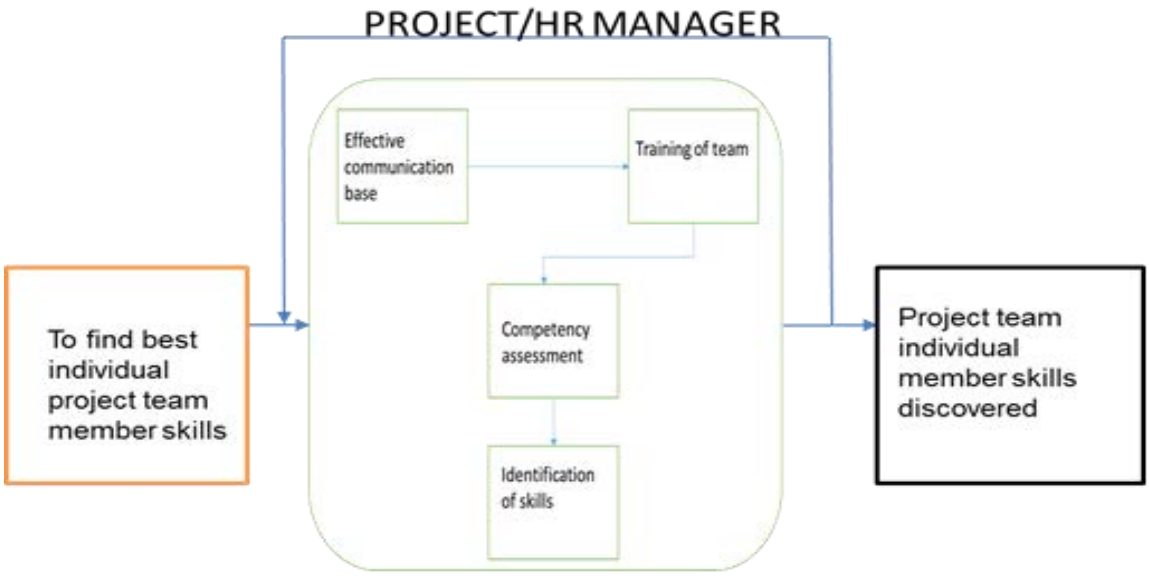


Figure 2.1 - Model Skill Discovery Process

Source: developed by author.

Once a good communication base is established, training of team proceeds before competence assessment and identification of skills of individual team members. This sets everything in motion for the result of best practice for individual project team member [85,86,87]. Having followed the above processes, the result will be discovering the

individual skills. This process could have yielded best practice but in the project management world, no two projects nor project environments are exactly the same.

Best practice: A best practice is an idea that asserts that there is a technique, method or process – through research and application – that is more effective at delivering a particular outcome than any other technique, method or process. A best practice is an optimal way currently recognized by industry to achieve a stated goal or objective [88]. However, that it worked in one project doesn't guarantee that it will work in the next. Note that the above is simply be grouped as being in the discovery stage for the next Figure . 2.2.

The previous model in Figure . 2.1 deals with skill discovery and enhancement for individual members of the team, but not the team in general. There however can be another approach to this, which in turn not only classifies the individuals but also the team into where they belong with ease. This the reason we now propose another model below shows us more of that and how it works (Figure 2.2).

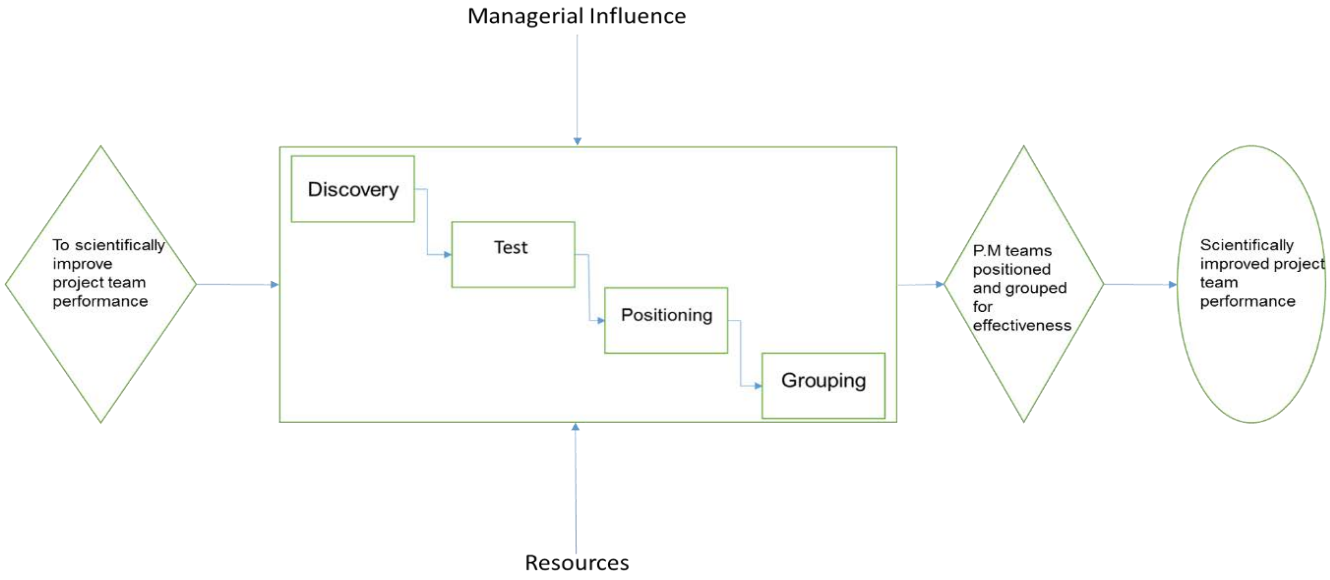


Figure 2.2 - Model Project Team Categorization Process

Source: developed by author.

From the above, there it can be seen that there are four major stages using this approach which are: Discovery, Test, Positioning, Grouping.

Based on the above, the end result will be scientifically improved project team performance. The project manager will use the scientific approach to produce improved project team performance having followed the scientific processes. In this research, we suggested an approach to project team categorization. The features of this approach which stresses that team member training is highly necessary and should come before promotion and be referred to as categorization which is a part of recruitment. The advantage of this approach is that it helps the project manager to have the opportunity to discover the true skills of his staff before putting them on the job. Haven come this far in researches. We will still proceed to further develop and create practical instruments and test this approach.

The general concept behind the creation of this model and this project is to have a set of applicants who are already qualified and experienced, probably already working with the organization but need to be grafted into a project team aimed at maximal result. Using the criteria of SWB this team will now go through series of questions aimed at getting a deeper sense of what their preferences are.

Research into issues related to the formation of project teams has always been, and remains, relevant regardless of the spheres of activity. For example, in the space sphere, special attention is paid to the ability of members to establish and maintain interpersonal relationships [89]. NASA funds the entire research direction "The risk of the efficiency and mental (behavioral) deterioration due to inadequate cooperation, coordination, communication and psychosocial adaptation in a team". Within such research, all the means, both terrestrial and within a spacecraft, which maintain proper psychosocial state of members of already formed teams, are studied in detail. However, the procedures of the evaluation and selection of candidates for space projects are described in open sources only in general terms.

It is emphasized in paper [89] that it will take years to see the first significant results towards the development of a standard set of methods for measuring, especially oriented to psychological and team factors. This situation also applies to all other spheres of activity. That is why the issue of the development of an effective method for selection of project management team members is even more important than it might be for one particular industry.

The scientific literature uses different terms in the formulation of activities for team formation : selection, composition, formation, design. Usually, such studies as [89] only enumerate a series of personal characteristics (including technical, communication, and holistic) that are desirable for a candidate to a project team. However, detailed descriptions of the algorithm for selection, translation of verbal descriptive characteristics into some numeric forms for future comparison, the application of measurement and comparison scale as most important but are virtually not found in literature.

Thus, in paper [90], 47 attributes required for an effective project manager were analyzed, their ranking by their importance for males and females was explored with a view to identifying gender differences in the perception of competences. For most projects, the central issue is how to use the importance of indicators for separate individuals to determine their future compatibility for working in a team. The study [90] also uses the concept of constructing a personal profile for candidates, however, such a profile consists only of formal attributes (age, sex, education, nominal education, work experience, etc.), without capturing individual personal preferences that affect the perception of the world in general.

Other studies, such as [91], analyze the impact the nature of the team development and availability of external intervention on its effectiveness, using so-called "a group development questionnaire". The tool developed in [91] is of interest to study maturity of already formed teams but is not applicable without significant modifications for the task of selecting compatible team members. The studied sample acts as a meaningful limitation of work [91]. The study participants were selected exclusively among the employees of the Swedish public sector. It does not allow extension of the obtained knowledge to other spheres of activity without their experimental verification.

Article [92] describes a ready toolset for scanning the information about the candidate in the form of a check-list template. The template contains three categories: knowledge, practical experience, features of character. The section "knowledge" is divided into three types: general management, project management, subject area (industry). This division corresponds to widely used approaches concerning the classification of competences. Paper [92] does not contain any comparison of the profiles of candidates, transfer of verbal data of check-lists to numeric data using relevant scales. However, the practice needs not only

algorithms of descriptions of candidates, but also their comparison and selection based on the compatibility parameters for further work in a project.

Similarly to paper [90], article [93] examines the attributes inherent of whole cultures. Three cultural groups were separated: multi-active, reactive, and linear-active. In the contemporary context of rapid globalization, international projects become an everyday reality. Accordingly, the interaction of stakeholders from different ethnic background really requires a certain universal uniting marker in the process of the project team formation. Attempts to measure and take into consideration the ability of an individual to adapt to multicultural environment are made by introducing the concept of Cultural Intelligence [93]. In this approach, the identity is assigned the Cultural Quotient (CQ). The higher the CQ, the better adaptability to cultural diversity. However, paper [93] contains no information about how to conFigure ure a team by cultural coefficient. The feasibility of "labeling" whole nations in the form of one of the three possible characteristics (multi-active/ reactive/ linear-active) seems disputable.

While there are enough descriptive techniques, experimental verifications of selective methods are found in the literature more rarely. That is why papers [94, 95], in which the method of selection of teachers for the educational program is based on the social judgment theory, are of particular interest. Six psychological models: Extraversion, Agreeableness, Conscientiousness, Resilience, Self-regulation, and Cognitive Ability are applied as personality attributes in them. When separating candidates into clusters, the people expressing social opinion regarding the candidates used different attributes of the six possible as the leading ones for three different clusters. In the application of such a method of selection, the goal is to get the answer to the question how likely is it that a candidate will succeed in the teaching profession. It is not enough for a project team. In a project, it is important to know that selected members of a team will succeed in working together.

It is noted in study [95] that "... team members with different personalities are unlikely to follow strict rules to regulate their behavior … but it is not worse for the effectiveness of the whole team, if it is dysfunctional in general". This statement confirms the relevance of our intention to put forward the criterion of SWB as a unifying parameter to identify those candidates who have common value preferences.

Such methods are developed to create more effective, efficient, and comfortable project teams. Paper [96] analyzes the factors influencing the efficiency of teams. Such studies, though not focused on selective methods, are a valuable source of information about the factors that support the unity of team members. Thus, paper [96] studied inter-institutional research teams, consisting of representatives of academic circles. Three studied factors presumably influencing the team productivity were separated: Knowledge-sharing, Team conflict, Emotional intelligence. Paper [96] contains the most valuable material about which mathematical tools and software products were used for processing experimental data. However, there is no information on how teams were formed, and how candidates were selected. In paper [96], the selection was limited merely to representatives of one sphere of activity (education), albeit with international participants. From the conclusions reached by the authors of [96], it follows that:

– on the one hand, emotional intelligence directly affects both the ability to disseminate knowledge among participants of joint projects, and conflict management;

– on the other hand, in the educational environment emotional intelligence by itself does not affect the performance of teams. This relates to that the representatives of academic circles are "educated people with a high socio-economic status and self-identity, ... who can manage and appropriately express their emotions". That is why it should be borne in mind that "the elite of a society has certain dignity". Teachers have "a sense of professional morals" and the desire "to bring benefits to teamwork". Team members with higher social status easily managed their emotions, while subordinates sharply reduced the team performance due to the problems with knowledge exchange and team conflicts;

– emotional intelligence "was, however, both in direct and indirect aspects, a key factor in such structure of relationships in the work of the members of academic community".

In paper [96] it was shown that belonging to the academic field served as the source of unity of the members of the studied teams. Therefore, the **criterion of SWB is a really universal invariant criterion not dependent on social, economic, cultural, gender, age, and status belonging.**

In sport, within some sporting disciplines, competitions are held in both in teams and among individuals. In team sports, athletes’ personal qualities will not be decisive in the

absence of the team cohesion. Similar logic is the basis for the classification of available techniques of team formation in article [97]. The need for the developments for compiling personal profiles of candidates and for the formed teams was shown. In addition, it focuses on the analysis of already formed teams, but not at the stage of their formation.

The main mission in the formation of a project management team (hereinafter referred to as "team)" is reduced to the choice of "right" people from many candidates. Only thanks to this, a team will be able to work effectively as a well-coordinated, self-organizing system, thereby making a significant contribution to the success of a project under conditions of high uncertainty and turbulence. Analysis of multiple characteristics of an effective team [98, 99] suggests that the degree of its effectiveness is directly proportional to activity and intensity of the demonstration by its members of the competencies of project managers (engineering, contextual and, especially, behavioral [100]). It is common to consider SWB of team participants caused by the positive working atmosphere as one of the key factors of such activity and intensity [101]. Most often, SWB implies a comprehensive measure of individual happiness, which takes into consideration not only economic aspects, but also non-economic ones [102]. The latter imply equal positive relationships and trust among team members, effective working communications, sense of belonging to the whole (team, project, and organization), sense of psychological security. At the same time, SWB acts as a factor of formation of a positive working atmosphere in a team. According to the research [103,104], it is a value structure of consciousness of its participants, has a distinct focus on their value preferences. Commonness of team members by their value preferences of SWB stands as the single basis, on which positive working atmosphere relies and by which it is maintained. In this context, it is appropriate to use SWB as the criterion of "rightness" of candidates in formation of project teams. This is especially significant for the teams of international projects in view of multi-culture and diversity of worldviews and "backgrounds" of their participants. SWB in them acts as an integral indicator of value orientation, reflexing over cultural and mental differences. At the same time, in some societies, the parameter of SWB is regarded as a system-forming personality value. Based on empirical experience, such societies include the countries in Africa.

Let's consider a conceptual model of how to form a project team by SWB criteria. Methodologically it can (and definitely should) remind general approach to selection people from the set of applicants. From this point of view the model is to include three basic components: set of applicants, "selection core" and set of team members. Main role belongs to the component "selection core", which transform set of applicants into set of team members (Figure 3.2).

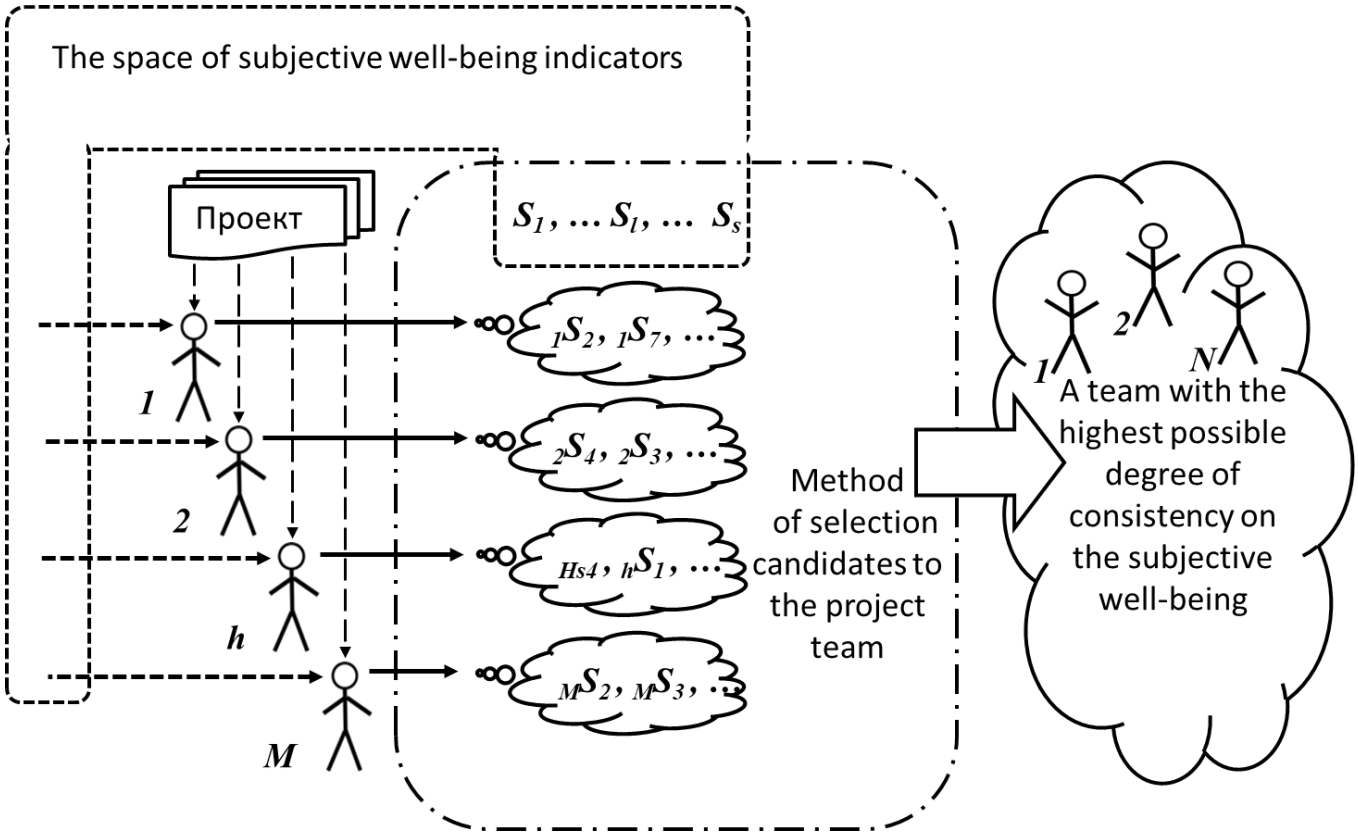


Figure 2.3 - Conceptual model of forming a project team by SWB criteria

Source: developed by author.

This model developed with the soul aim of helping project managers achieve the goal of project team formation from the perspective of SWB. This basically has to take a few steps namely, creation of list of applicants, then screening of applicants using a set of indicators to determine the result which is a project team with members who are very alike, coherent by criteria of SWB.

This coherence appears based on how applicants' consider the value of the particular project as a whole. This general value of a project arise a special subjective attitude of each candidate to SWB in this project. The similarity of such attitudes determines the comfort of their interaction in the project team. Based on this, the issues related to the development of the system of indicators, procedures for evaluating and selecting candidates to a team by this criterion remain unresolved.

2.2 System of indicators to select project team members by subjective well-being as a criteria

There are many indicators of SWB presented by numerous researches in numerous sources. Our study allowed us to list almost 40 of them, though one can find even more. Moreover, mostly all these indicators are used to measure the present state of a project team as a factor of its effectiveness. However, what is really most important now for the project teams – is to build them by the criteria of happiness from the very beginning. This approach is rather differs from the qualification or competence ones because it deals with another side of team members as personalities, ignoring their functions and roles in project.

This initial list of indicators includes following positions (due to literature analysis):

1) participation in decision making;
2) trust of organization;
3) anticipated growth;
4) responsibilities;
5) recognition;
6) addressing grievances;
7) initiation and leadership;
8) satisfied with the given right to put forward my opinions;
9) satisfied with the leaders in my workplace as positive role models;
10) empowerment;
11) satisfaction & personal achievement;
12) satisfied employee assistance policy (e.g.- lunch & transport etc.) of the company;
13) satisfied and think I've been awarded right set of duties, as per my ability;
14) satisfied & able to maintain a healthy balance between work and family life;
15) reward and recognition;
16) monetary benefits;
17) appreciation;
18) being fair and impartial;
19) recognition and rewards for my outstanding;

20) satisfactory performance appraisal policy of the company;

21) satisfactory leave policy of the company;

22) satisfactory long term benefit & insurance policies of the company;

23) job security;

24) satisfied with the existing salary structure of the company;

25) satisfied with the compensation i get & i think it matches with my responsibility;

26) sympathetic help with personal problems;

27) workplace environment;

28) satisfied with the working environment of the company;

29) satisfied with job location;

30) satisfied with work relationships with the people around me;

31) satisfied with the present working hour;

32) satisfied with various activities in the firm & love participating in them;

33) happy with my work responsibilities;

34) the feel of being loved;

35) safety and security;

36) a mixture of formal and informal approach;

37) tactful discipline;

38) creativity in job and challenges;

39) personal interest and hobbies;

40) non-frequent changes;

41) the feel of belonging;

42) Non-exhaustive work environment.

Considering uniqueness of each person and relying on our own experience, all indicators in this list are multi-ciphered, do not have only one universal understanding. Bearing this in mind, we suggest method based on principles of a system approach. This method includes following steps.

Step 1. To select metrics of vision fulfillment indicators (FI) with different contexts. In our case we suggest that the number of metrics should be three. It goes from positions of trial concept of integrity (entire), presented in [105,106]: three components (“ratio”,

"emotio", "intuitio") are required and enough minimum to describe integrity. Next question is "What are those metrics to describe fulfillment fulfillment indicators"? The first metric we suggest basing on our intuitional understanding is directly related to job and working place. Another two metrics are most close by context and developed within psychology and sociology: metric based on Maslow's pyramid [107] and metric based on main social roles of a person [108].

Step 2. To group indicators of fulfillment within each metric. In order to implement this we suggest four groups of indicators gathered in the system. Thus we constructed three system models presented below (Figure 2.4), which integrate components (group of indicators) to reach transformation (goal in the model) from ungrouped project team SWB-indicators to the result being the grouped project team SWB-indicators.

The three models below show a grouping based of different areas of importance to individuals who are to work in the team. It helps us to know which aspects of their lives they consider most important and which is next to it. The indicators in the groupings also helps us get a better insight to their ideas of fulfillment in a project team.

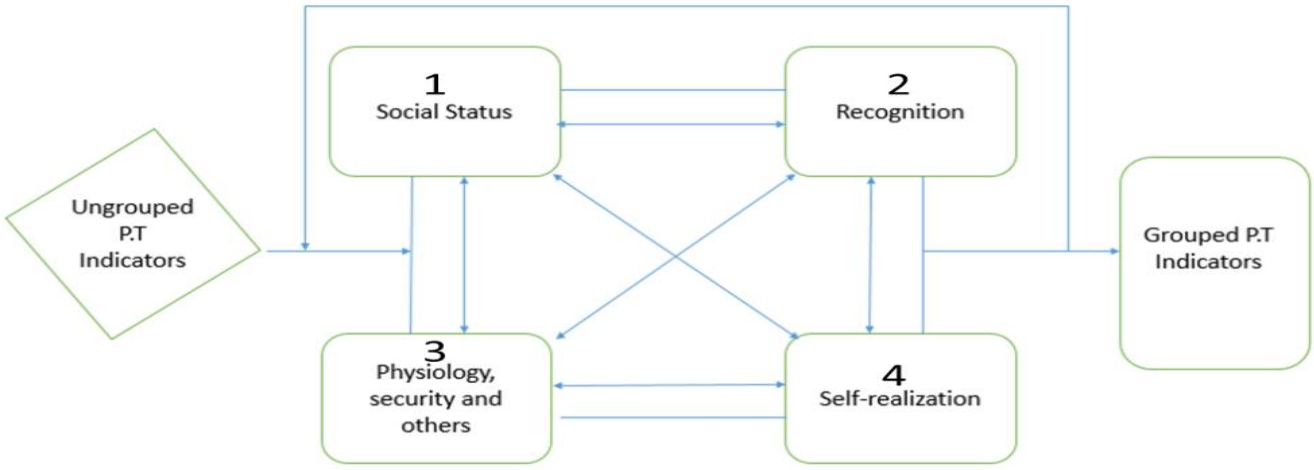


Figure 2.4 - System model of fulfillment indicators in psychological context (model A)
Source: developed by author using system quartile model from [109].

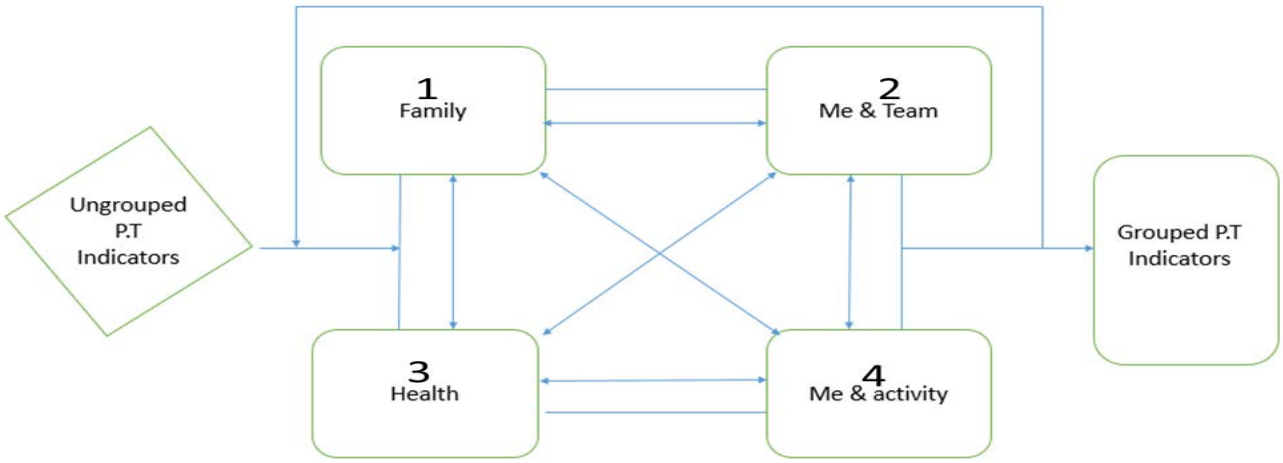


Figure2.5 - System model of fulfillment indicators in sociological context (model B)
Source: developed by author using system quartile model from [109].

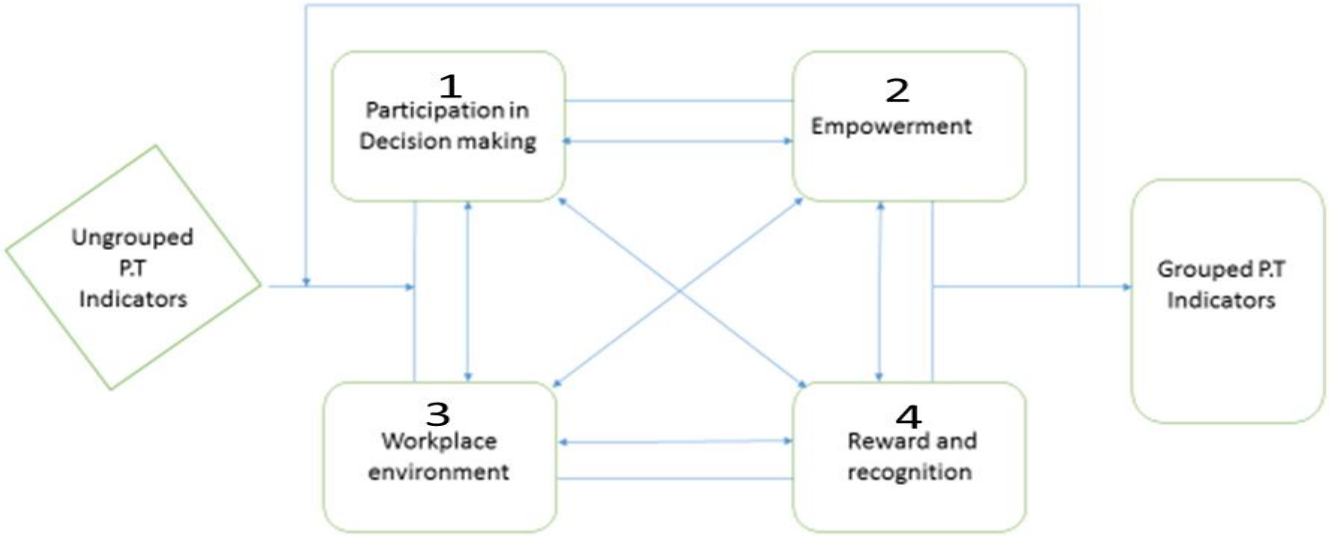


Figure ure 2.6 - System model of fulfillment indicators in job context(model C)
Source: developed by author using system quartile model from [109].

Implementing this step, we grouped 42 indicators within three mentioned models (tabl. 2.1).

Table 2.1 - Initial 42 SWB-indicators grouped within three models

N	Indicators	Ref.	Group in the model		
			A	B	C
1.	Participation in Decision making	23	2	3	1
2.	Trust of organization	21	2	3	1
3.	Anticipated growth	21	3	3	1
4.	Responsibilities	21	3	2	2
5.	Recognition	21	2	2	3
6.	Addressing grievances	21	1	2	4
7.	Initiation and leadership	21	4	3	1
8.	satisfied with the given right to put forward my opinions	22	2	2	1
9.	satisfied with the leaders in my workplace as positive role models	22	4	3	1
10.	Empowerment	22	3	2	2
11.	satisfaction & personal achievement	22	3	1	2
12.	satisfied employee assistance policy of the company	22	4	4	4
13.	satisfied & able to maintain a healthy balance between work and family life	22	1	1	3
14.	Reward and recognition	22,23	2	3	3
15.	Monetary benefits	21	4	1	3
16.	Appreciation	21	2	2	3
17.	Being fair and impartial	21	4	2	4
18.	satisfactory performance appraisal policy of the company	22	2	3	3
19.	Satisfactory leave policy of the company	22	1	1	3
20.	satisfactory long term benefit & insurance policies of the company	22	4	4	3
21.	Job security	20	4	3	4
22.	satisfied with the existing salary structure of the company	22	4	1	3
23.	satisfied with the compensation given	22	3	3	3
24.	Sympathetic help with personal problems	20	1	2	3
25.	satisfied with the working environment of the company	22	4	3	4
26.	satisfied with job location	22	4	3	4
27.	satisfied with work relationships with the people around me	22	1	2	4
28.	satisfied with the present working hour	22	4	3	4
29.	satisfied with various activities in the firm & love participating in them	22	1	3	4
30.	happy with my work responsibilities	22	3	3	2
31.	The feel of being loved	21	1	2	4

Continuation of table 2.1

32.	Safety and security	21	4	4	4
33.	A mixture of formal and informal approach	16	4	3	4
34.	Tactful discipline	20	4	2	4
35.	Creativity in job and Challenges	21	4	3	4
36.	Personal interest and hobbies	21	1	1	4
37	Non-Frequent changes	21	4	3	4
38	The feel of belonging	21	1	2	4
39	Freedom to select team on special assignments	*	3	2	2
40	Regular health hazard for all team members	*	4	4	3
41	Allowed to try new things	*	3	3	2
42	Non-exhaustive work environment	*	1	4	4

Source: developed by author.

Step 3. To analyze indicators in different groups in different models. Further analysis was targeted on searching connections between fulfillment indicators in different models using graphical method. Result of such search is presented in Figure 2.7.

As one can see, each indicator with certain number in certain model was connected with indicators same by number in another two models. In order to reflect different perspectives we constructed relations for three cases: when base model was A, B and C.

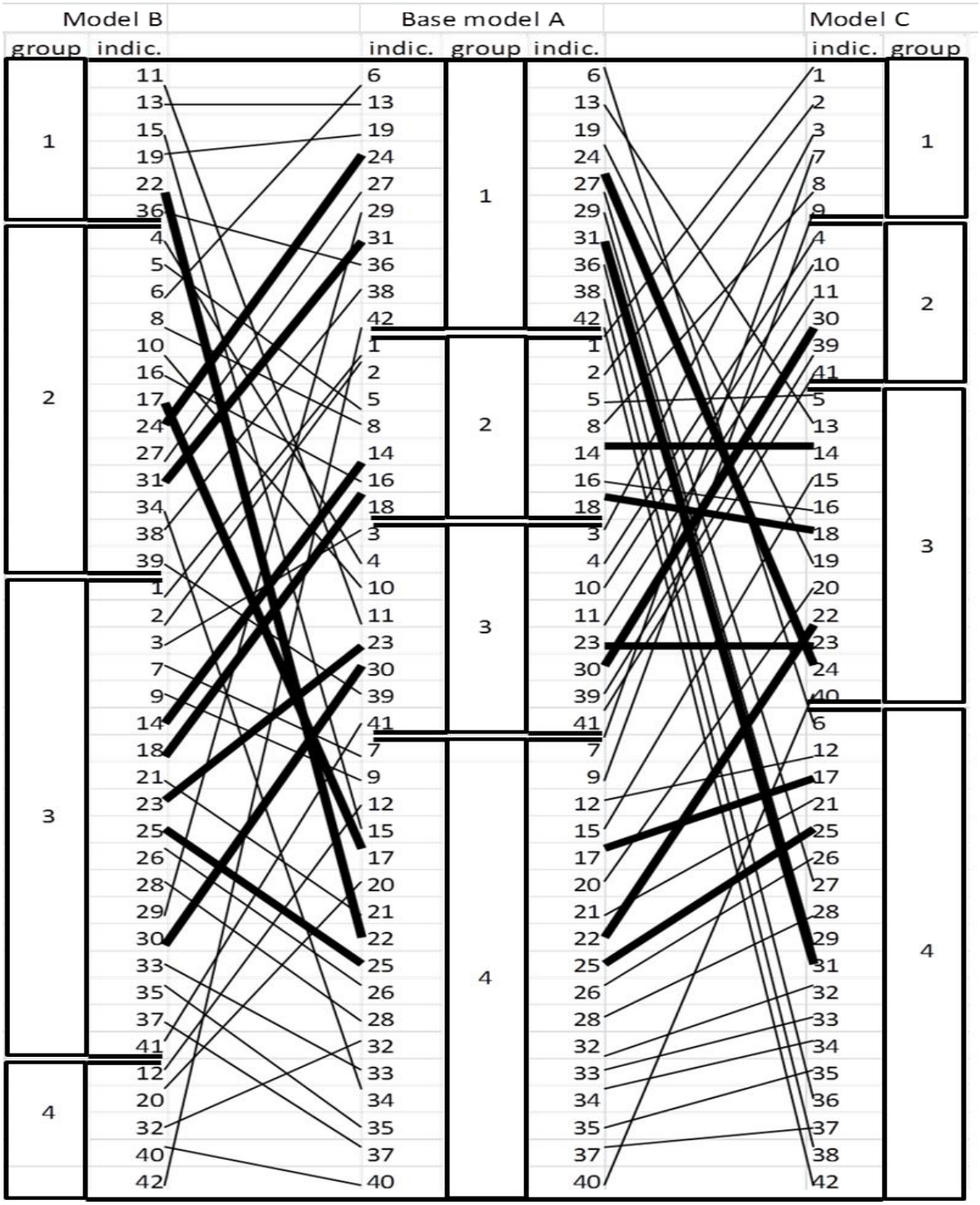


Figure ure 2.7 - Graphic presentation of interconnections between indicators of three models

Source: developed by author.

As a final result of analysis we found out surplus indicators in groups within each considered metric. Also relations between groups in different models within different metrics were fixed due to existence of the same indicators. This allowed adjusting quantity

of indicators in groups in order to achieve some balance as all groupings in practice are as important as the other. These initial and final results are shown in the tab. 2 and 3.

Table 2.2 - Initial quantity of indicators in groups within three models

Groups	Models with groups of indicators		
	A	B	C
1	10	6	6
2	7	13	6
3	8	18	12
4	17	5	18

Source: developed by author.

42 Indicators streamlined to 27 indicators using Graphic presentation of interconnections between indicators of three model.

Table 2.3 - Final quantity of indicators in groups within three models

Groups	Models with groups of indicators		
	A	B	C
1	6	6	6
2	6	8	6
3	8	8	8
4	7	5	7

Source: developed by author.

Step 4. To adjust the list of indicators. Basing on searched relations on previous step we excluded surplus indicators and added missing ones.

Final adjusted list of indicators with explanations of their essence in context of each model is shown in tab. 2.4.

Table 2.4 - Understanding the perspectives of each indicator (adjusted list) in each model

N	INDICATORS	Maslow Pyramid based system of Indicators A	Sociologically based system of Indicators B	Job based Systems of Indicators C
1	Participation in Decision making	Recognized as a vital part of decisions	Consulted before decisions on activities	Always involved in decisions about activities
2	Trust of organization	Noted for results	Believe in his decisions on what to be done and how	Opinion respected and considered worthy
3	Anticipated growth	Realizing personal dreams in the company	There are future expectations	Part of the goal and plan setters
4	Responsibilities	Allowed to discover their abilities	Well defined duties and boundaries	Empowered to carry out responsibilities
5	Recognition	Seen as efforts are put in	Efforts are appreciated	Rewarded with deserved honor
6	Addressing grievances/satisfied with work relationships with the people around me	Maintaining a good working atmosphere	Ensuring the tempo within the team is always warm	Ensuring an environment that is friendly
7	Initiation and leadership	Using of original thoughts to get results	Bringing in innovative activities	Being part of the leadership
8	satisfied with the given right to put forward my opinions	Full Freedom of expression	Existence of Collective team voicing	Their voices are listened to
9	satisfied with the leaders in my workplace as positive role models	Leadership being the first to act and go forward	Inspiring the team by your actions	Comfortable with the leadership team
10	Empowerment	Bringing the best out in them	The permission to do what needs to be done	Empowered to get things done
11	satisfaction & personal achievement	Fulfilling personal goals	Comfortable family goals thriving	Allowed to dream and achieve

Continuation of the table 2.4

12	satisfied employee assistance policy of the company	Working conditions should be made easier by leadership	Healthy working atmosphere	Comfortable atmosphere to ease the job
13	satisfied & able to maintain a healthy balance between work and family life	Enough time to have a life outside of work	Enough time for family	Rewards with breaks and time offs
14	Monetary benefits	Availability of Financial rewards	Availability of Financial incentives	Appreciated monetarily
15	Appreciation	Recognized as Important	Feel valued by the team	Desired and accepted
16	Satisfactory leave policy of the company	Yearly leave at least	Leave to join family fully for a while	Enough time to get refreshed again
17	satisfactory long term benefit & insurance policies of the company	Insurance benefits of working with the company	Health protection and danger prevention	Hazard concerns covered by organization
18	satisfied with the existing salary structure of the company	Ok with payment time, procedure and amount	Enough pay considering nature of job	Good pay
19	satisfied with various activities in the firm & love participating in them	Work activities made sociable	Comfortable with activities	Interesting available activities to aid the job
20	happy with my work responsibilities	Good job prescriptions	Satisfied with responsibilities	Fair division of labour
21	The feel of being loved and belonging	Very socialized work place	Team loving themselves	Love environment
22	Safety and security	Safety of team a priority	Health hazard prevention	Good security consciousness
23	Personal interest and hobbies	Allowed to have fun while working	Allowed to make work fun	Allowed environment to unwind
24	Freedom to select team on special assignments	Allowance to choose who you can work with	Having a friendly relational team	Empowered to make team choices
25	Regular health hazard for all team members	Routine general tests	Ensuring the team is healthy	Keeping the team healthy

End of the table 2.4

26	Allowed to try new things	Not on a tight leach	Allowed to try new methods	Freedom in taking new steps
27	Non-exhaustive work environment	Working but not overworked	Work without getting exhausted	Working without feeling used up

Source: developed by author.

Now adjusted list of SWB-indicators is ready to be used when selecting applicants in the project team. For that case we propose method including following steps:

1) applicants are expected to rank groups of indicators and indicators itself within each proposed metric (model);

2) this information is an input to start selection by processing procedure (all indicators within all models combined) directed to get sets of ranked indicators for each applicant;

3) this allows to process all gotten sets of ranked indicators from all applicants combined and produce range of ranked most important indicators for the team (team indicators);

4) team indicators then should be used as criteria to select applicants to the team, as a result the team members would be defined;

5) members of finally built team should then discuss how their expectations related to fulfillment indicators will be implemented in this project, what is the mechanism (or mechanisms) of such implementation;

6) discussed and agreed mechanism will be taken as a base to organize the way of working and interacting in the project in order to provide all of the team members fulfilled till the project end.

Besides the three contexts we considered, there is a possibility of considering other contexts. One of such contexts can be the project context. Each project is unique, that is why dissemination and interpretation of its indicators will be appropriate. The main requirement for the use of our method is keeping of selected indicators as well as dividing them into four groups. Extending or reducing their amounts as well as dividing them into less amount of groups will not allow the use of such models within our method.

To conclude this chapter, haven established the importance of SWB in the formation of a project team, we had to go further to categorize all interactions within the project environment including human and non-human interactions thereby classifying them into perspectives grouped by their similarities.

The major focus of this chapter was in the understanding of the language of happiness and the individuality of happiness and the sense of SWB. We looked into the system of communication and how that the concept of happiness differs from person to person and the idea of collective team members being happy and individually and collectively is a major factor in forming a project team. For a project team to be formed effectively and efficiently, there are certain things that must be put into perspective beyond the project itself if its to be a project team that enjoys SWB as a fundamental factor. These things consist majorly of the driving focus of these team members, some of which could be result orientation, financial incentives, family times, work ethics and environment and lots more.

We created a conceptual model for the formation of a project team by SWB as a criteria with the soul aim of helping project managers achieve the project team formation goal. We sub-divided the process of doing this into few steps, namely creation of list of applicants, then screening of applicants using a set of indicators to determine the result which is a project team with members who are very alike, coherent by criteria of subjective well-being.

Furthermore, we listed out factors in details that can affect the SWB of candidates based on past numerous researches and numerous sources and those factors were called indicators. We established 42 indicators at first and after streamlining, we decided to reduce the number by either merging or eliminating similar indicators and in the end we were left with distinct 27 basic indicators which we further approached in three reflections that we called system models. The three we created were as follows:

- System model of fulfillment indicators in psychological context (model A)
- System model of fulfillment indicators in sociological context (model B)
- System model of fulfillment indicators in job context(model C)

At this point, the next thing will be to create methods to form a project team using SWB as a criterion.

CHAPTER 3.
METHODS TO FORM A PROJECT TEAM BY SUBJECTIVE WELL-BEING AS A CRITERIA

The developed methods are based on the provisions of the verbal analysis of decisions [110]. The merits of this method are the possibility to collect the original data from the candidates to a project team in the verbal form that is customary for them, to check if they are contradictory and, if necessary, to have them corrected by a candidate. In this case, the data are fixed as a ranked series, the importance, or the priority of the elements of a series is determined by a candidate himself. Unlike the existing methods for verbal analysis, the author's approach involves the application of the systematic quartile models for obtaining and processing the original data [111]. This model was successfully applied in different systematic studies. The procedure of the formation of systematic models in the context of our research was described in more detail in paper [112].

3.1 Method of constructing candidate's personal SWB-profile

Initial baselines and assumptions

Based on our suggestions in chapter 2, we put forward a working assumption: each person can express his/her idea of SWB by placing ratings on basic indicators. The ambiguous meaning of the basic indicators of the verbal way of representing them, etc., makes the task of determining the actual value of an indicator for a particular candidate a rather difficult task. To solve it we will use the method of ranking verbal information, based on the natural multidimensionality of the interpretations of any indicator of happiness. We assume the following:

1) each indicator has several semantic contexts;

2) the context of the indicator depends on the context of the group of indicators to which it belongs;

3) in different groups, the same indicator has a different rating score (different rank of importance).

Introduction of categories used

For the semantic grouping of information (both primary and resulting from its processing - secondary) we introduce the concept of "category". A category is an element term that is used when verbally describing the procedure for forming a project team and acts as a system-assembling component for symbolic notation of concepts (categorical symbols) that are used in our method. To enumerate the formalized notation, we use the logic of the first appearance of a symbol, that is, the symbol that is then used is described first, which is then used in the description of subsequent input characters.

With the semantic concretization of information, which reflects the categorical symbols, in the future we will use the template shown in Figure .3. 1.

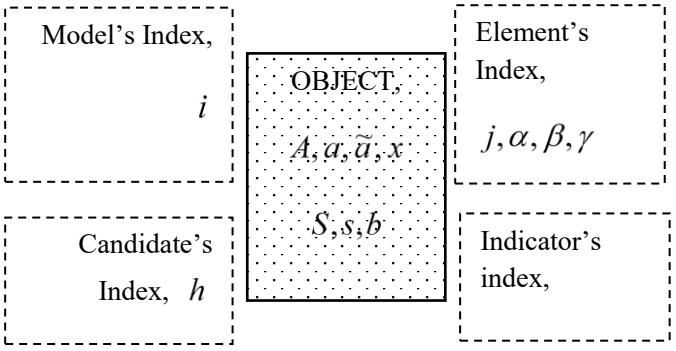


Figure 3.1 - Placement scheme of object's indices

Category «Pretender/applicant»:

q – amount of candidates;

Q – set of numbers of candidates, $Q = \{1,2,...,q\}$;

h – Current number of an candidates, $h \in Q$.

Category «System model»:

n – amount of system models;

N – set of numbers of system models, $N = \{1,2,...,n\}$;

i – current number of a system model, $i \in N$;

${}^{i}A$ – i-system model, $i \in N$;

$\left\{{}^{1}A, {}^{2}A, ..., {}^{i}A, ..., {}^{n}A\right\}$ – the set of all system models.

A graphical representation of the system model is shown in Figure .3.2 and utilized from [Rossoshanskaya O.V. (2000)].

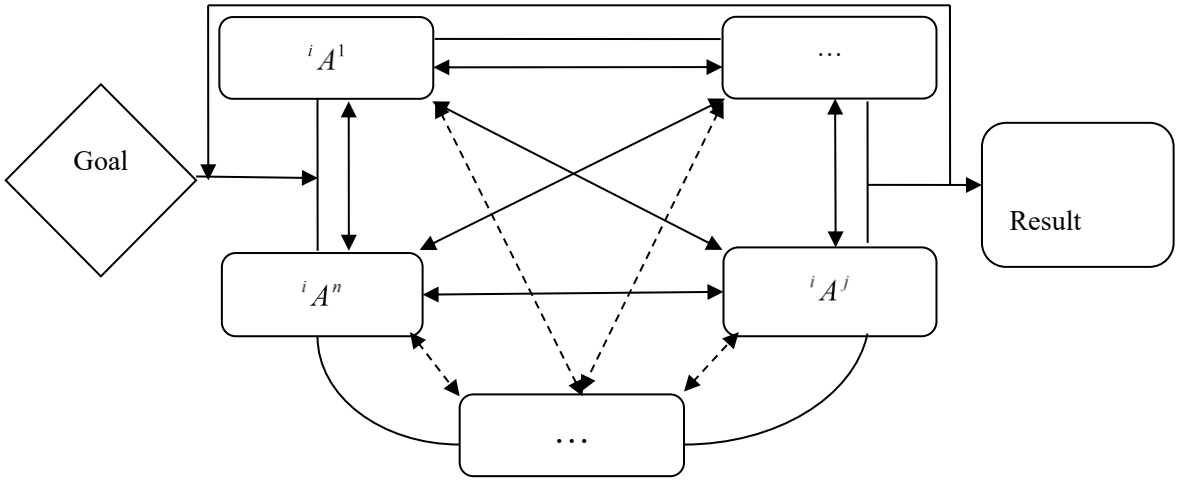


Figure 3.2 - System model with n elements

Category «An element of a system model »:

m – number of elements in a system model *(the same for all system models,* $m = 4$*)*;

M – set of elements' numbers in a system, $M = \{1,2,...,m\}$;

j – current number of an element from a system model, $j \in M$;

$^{i}A^{j}$ – j-element in i-system model, $i \in N$, $j \in M$;

^{i}b – amount of connections between all elements in i-system model, $i \in N$;

$\{^{i}A^{1}, ^{i}A^{2}, ..., ^{i}A^{j}, ..., ^{i}A^{m}\}$ – set of all elements in i-system model, $i \in N$, $j \in M$.

Category « An indicator of a system model»:

s – number of indicators of a system model, *(the same for all system models,* $s = 27$ *)*;

S – set of numbers of indicators of a system models, $S = \{1,2,...,s\}$;

l – current number of an indicator of a system model, $l \in S$;

a_l – l- indicator of a system model, $l \in S$;

$\{a_1, a_2, ..., a_l, ..., a_s\}$ – set of all indicators of a system model, $l \in S$.

Category «Element's indicator in a system model»:

$^{i}s^{j}$ – number of indicators in j-element in i-system model, $i \in N$, $j \in M$;

${}^{i}S^{j}$ – set of numbers of indicators of j-element in i-system model, ${}^{i}S^{j} = \{1,2,...,{}^{i}s^{j}\}$, $\bigcup_{j=1}^{m} {}^{i}S^{j} = S$, $i \in N$, $j \in M$;

k – current number of an element's indicator of a system model, $k \in {}^{i}S^{j}$, $i \in N$, $j \in M$;

${}^{i}a_{k}^{j}$ – k-indicator of j-element in i-mode;, l – the number of this indicator in general list of indicators of a system model, $k \in {}^{i}S^{j}$, $i \in N$, $j \in M$;

$\{{}^{i}a_{1}^{j}, {}^{i}a_{2,}^{j}, ..., {}^{i}a_{k}^{j}, ..., {}^{i}a_{i_{s^j}}^{j}\}$ - set of all indicators of j-element in i-model, $k \in {}^{i}S^{j}$, $i \in N$, $j \in M$.

Matching/Alignment (match making, blending, correlation) of categories «An element of a system model», «An indicator of a system model» u «Element's indicator in a system model»:

$\forall i \in N$, $s = \sum_{j=1}^{m} {}^{i}s^{j}$ – number of indicators of any system model is equal to the amount of indicators of j-element in i-system model;

$\forall i \in N$, $\{a_1, a_2, ..., a_l, ..., a_s\} = \bigcup_{j=1}^{m} \{{}^{i}a_{1}^{j}, {}^{i}a_{2,}^{j}, ..., {}^{i}a_{i_{s^j}}^{j}\}$ – the set of all indicators of any system model is equal to union of sets of all indicators of j-element in i-model;

${}^{i}a_{k,l}^{j}$ – k-indicator of j-element in i-system model, l – the number of this indicator in the general list of indicators of a system model, $k \in {}^{i}S^{j}$, $i \in N$, $j \in M$, $l \in S$;

${}^{i}A^{j} = \{{}^{i}a_{k,l}^{j}\}$ – element of a system model ${}^{i}A^{j}$ is defined by the set of k-indicators ${}^{i}a_{k,l}^{j}$, $k = \overline{1,{}^{i}s^{j}}$, $i \in N$, $j \in M$, $l \in S$.

Fixing a candidate's choice of a system model:

${}_{h}^{i}A$ – i-system model has been chosen by a candidate h, $i = const$, $h = const$, $i \in N$, $h \in Q$;

${}_{h}^{i}A^{j}$ – j-element in i-system model that has been chosen by h-candidate, $i = const$, $h = const$, $i \in N$, $h \in Q$, $j \in M$;

${}_{h}^{i}a_{k,l}^{j}$ – k-indicator of j-element in i-system model that has been chosen by h-candidate, l – is the number of this indicator in general list of indicators in system model, $i = const$, $h = const$, $k \in {}^{i}S^{j}$, $i \in N$, $h \in Q$, $j \in M$, $l \in S$.

Category «An indicator of system model's element ranked by a candidate »:

${}_h^i\widetilde{a}_{k,l}^j$ – k -indicator that has been ranked of j -element in i -model chosen by a candidate h, l – is the number of this indicator in general list of indicators in system model, $i = const$, $h = const$, $k \in {}^iS^j$, $i \in N$, $h \in Q$, $j \in M$, $l \in S$.

Category «Pair comparison of indicators' groups»:

α, β, γ – triplet of numbers of indicators' groups (model's elements), preference setting inputs, $\alpha, \beta, \gamma \in {}^iS^j$, $i \in N$, $j \in M$;

$\left\langle {}_h^iA^\alpha, {}_h^iA^\beta, {}_h^iA^\gamma \right\rangle$ – triad of elements of i -system model chosen by h -*candidate*, $i = const$, $h = const$, $\alpha, \beta, \gamma \in {}^iS^j$, $i \in N$, $h \in Q$, $j \in M$;

${}_h^ix^{\alpha\beta}$ – preference of indicators' group of element ${}_h^iA^\alpha$ over group of indicators of element ${}_h^iA^\beta$ executed by candidate h;

${}_h^ix^{\beta\gamma}$ – preference of group of indicators of element ${}_h^iA^\beta$ over group of indicators of element ${}_h^iA^\gamma$ executed by candidate h;

${}_h^ix^{\gamma\alpha}$ – preference of group of indicators of element ${}_h^iA^\gamma$ over group of indicators of element ${}_h^iA^\alpha$ executed by candidate h;

${}_h^ix^j$ – strength of group of indicators of the element ${}_h^iA^j$ (the number of preferences);

${}_h^ic$ – the number of cyclical triads in i -system model that has been chosen by a candidate h.

Core idea and steps of the method

The starting point of the method for the construction of candidates' personal profiles is the collection of original data from candidate () in the form of his preferences regarding the indicators of SWB as detailed in attachment B. A candidate is asked to choose one model from a set of systematic quartile models(Figure . 3.1,). Systematic models contain the same number of basic indicators of SWB (), to each of which the basic number() is assigned. The models differ in the content context and the way the basic indicators inside the model between its elements are grouped.

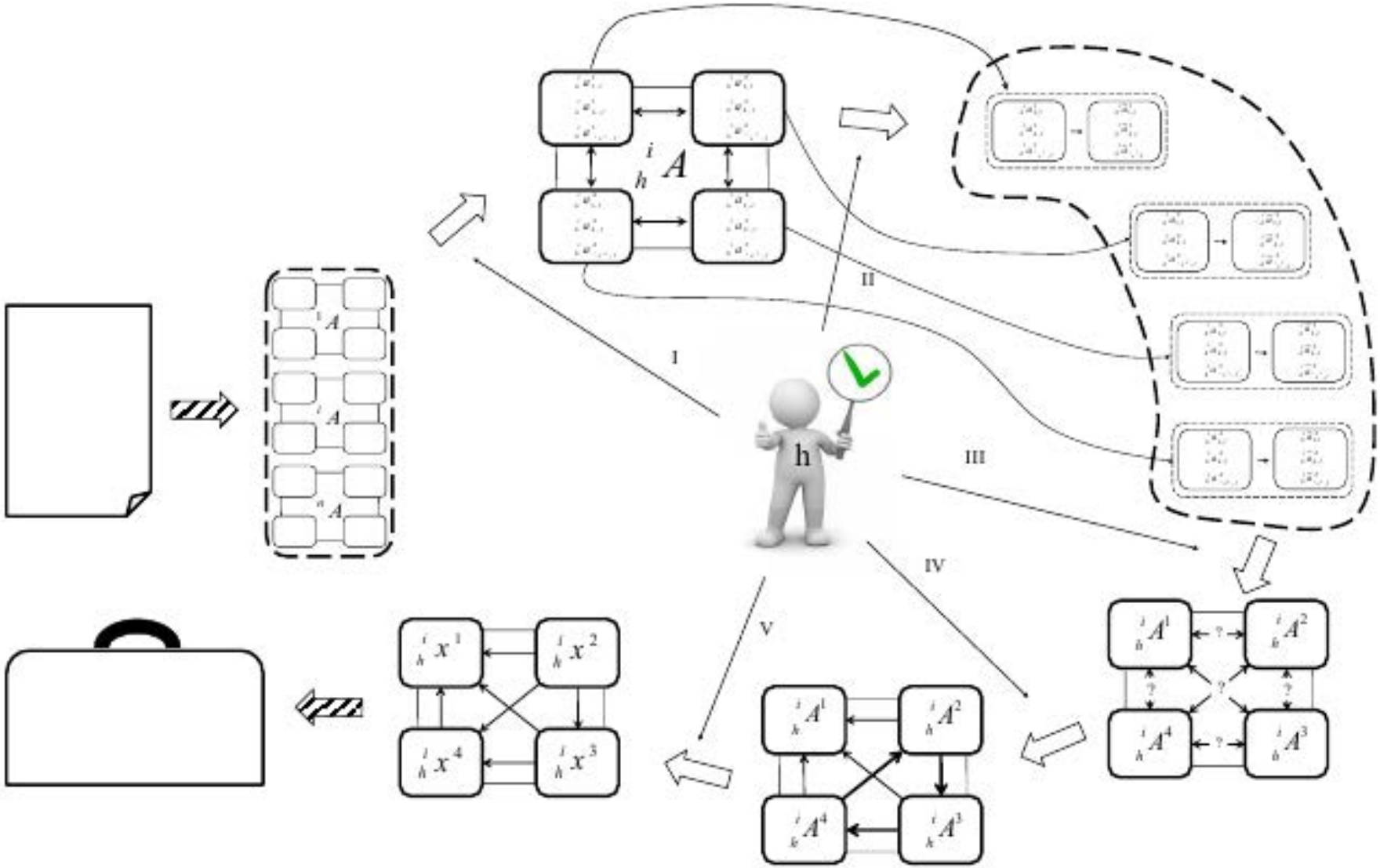


Figure 3.3 - The conceptual model of the method of constructing a personal profile of the project team candidate based on the criteria of SWB based on ranked assessments

Let's consider each of these steps in more details.

Step 1. Selection of the most preferred system model from the candidate's values.

Let there are n system models, that contain equal number of elements (m) and equal amount of the same indices (s). These models describe the one whole, which was conditionally allocated from the real world in different contexts. Indices are spread through m elements of the model in different ways. The principle of the indicators distribution through the elements depends on the context of the model.

Based on the importance of a context every applicant of a project team chooses from n models the one that is more preferable for him or her.

Formally, the problem of choosing a system model can be formulated as follows.

Given:

${}^1A, {}^2A, ..., {}^iA, ..., {}^nA$ – the set of system models, $i = 1,2,...,n$, where n – the number of models. Let define the set N as the set of system models' numbers $N = \{1,2,...,n\}$.

Each ${}^iA$ model has the same amount of equal m elements ${}^iA^j$, $i = 1,2,...,n$, $j = 1,2,...,m$. Like set N, let define set M as the set of system elements' numbers $M = \{1,2,...,m\}$. In what follows we will consider four-elements models, $m = 4$.

The number of connections ${}^ib$ in model ${}^iA$ can be counted as ${}^ib(m) = m \cdot (m-1)/2$ (hereby, in four-elements model there are ${}^ib(4) = 4 \cdot (4-1)/2 = 6$ connections).

All system models contain the same number of indicators s, $s = 27$. $\{a_1, a_2, ..., a_l, ..., a_s\}$ – set of all indicators of the system model, $l \in S$, where S – set of system indicators' numbers, $S = \{1,2,...,s\}$.

Each ${}^iA^j$ element of the model contains its own amount ${}^is^j$ of indicators ($\forall i \in N$, $s = \sum_{j=1}^{m} {}^is^j$) and can be presented as the set (Figure .3.4).

System model's element ${}^iA^j$ is defined by the set of indicators ${}^iA^j = \left\{ {}^ia^j_{k,l} \right\}$, where ${}^ia^j_{k,l}$ – k-indicator of j-element in i-system model, l – The number of this indicator in the general list of indicators of the system model, $k \in {}^iS^j$, $i \in N$, $j \in M$, $l \in S$.

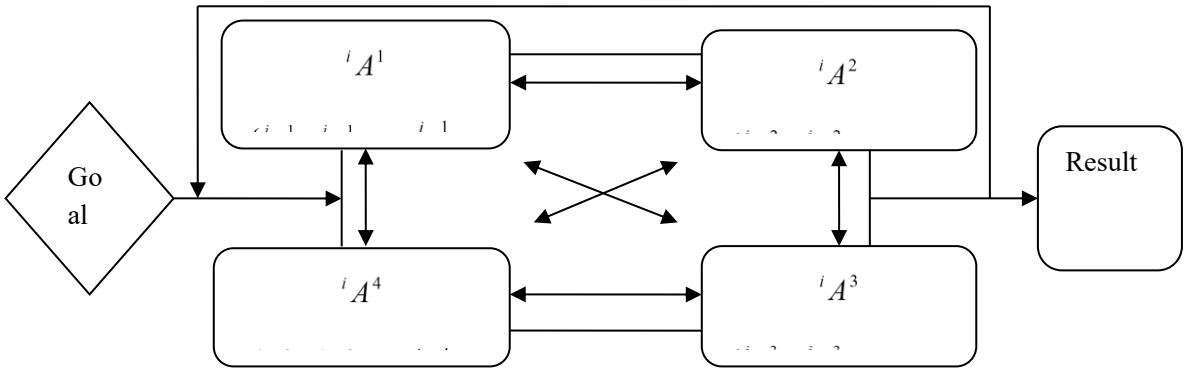


Figure 3.4 - Four-elements system model ${}^{i}A$

Step 2. Ranking of indicators within each element of the selected system model.

After having chosen the most preferable model ${}^{*}A$, a candidate ranks indicators $\{...,{}_{h}^{i}a_{k,l}^{j},...\}$ of each j-elements of the model. Ranking of indicators is carried out by minimax method. *Let explain this problem:*

The element of the chosen model ${}_{h}^{i}A^{j}$ contains the initial list of indicators $\{...,{}_{h}^{i}a_{k,l}^{j},...\}$. According to the minimax method, the ranking occurs iteratively, and there is the following transformation of the indices:

1) The candidate is asked to determine the least valuable indicator from the whole set ${}^{*}s^{j}$ of indicators of j-element. In the ranked row this indicator has the last (largest) number:

$$ {}_{h}^{i}\tilde{a}_{i_{s^j},l}^{j} = \min\underbrace{\{...,{}_{h}^{i}a_{k,l}^{j},...\}}_{{}^{i}s^{j}\ \text{indicators}} \rightarrow \underbrace{\{...,...,...,{}_{h}^{i}\tilde{a}_{i_{s^j},l}^{j}\}}_{\text{ranked row}} \qquad (3.1) $$

2) The selected indicator is removed from the initial list. This way, the remaining non-ranked row consists of $({}^{i}s^{j}-1)$ indicators. Then the applicant is asked to determine the most valuable indicator from the resulting set. This indicator has the first number in the ranked row:

$$ {}_{h}^{i}\tilde{a}_{1,l}^{j} = \underbrace{\min\{...,{}_{h}^{i}a_{k,l}^{j},...\}}_{({}^{i}s^{j}-1)\ \text{indicators}} \rightarrow \underbrace{\{{}_{h}^{i}\tilde{a}_{1,l}^{j},...,...,{}_{h}^{i}\tilde{a}_{i_{s^j},l}^{j}\}}_{\text{ranked row}} \qquad (3.2) $$

3) Then the procedure is repeated. The indicator selected in the previous step is deleted, and in the remaining set the applicant alternately determines the lowest and most valuable indicator:

$$ {}_h^i\widetilde{a}^j_{i_{s^j-1},l} = \min\underbrace{\{...,{}_h^i a^j_{k,l},...\}}_{({}^i s^j-2)\ \text{indicators}} \rightarrow \underbrace{\left\{{}_h^i\widetilde{a}^j_{1,l},...,{}_h^i\widetilde{a}^j_{i_{s^j-1},l},{}_h^i\widetilde{a}^j_{i_{s^j},l}\right\}}_{\text{ranked row}} \quad (3.3) $$

$$ {}_h^i\widetilde{a}^j_{2,l} = \min\underbrace{\{...,{}_h^i a^j_{k,l},...\}}_{({}^i s^j-3)\ \text{indicators}} \rightarrow \underbrace{\left\{{}_h^i\widetilde{a}^j_{1,l},{}_h^i\widetilde{a}^j_{2,l},...,{}_h^i\widetilde{a}^j_{i_{s^j-1},l},{}_h^i\widetilde{a}^j_{i_{s^j},l}\right\}}_{\text{ranked row}} \quad (3.4) $$

… till full transfer.

As a result, we get the ranked row $\left\{{}_h^i\widetilde{a}^j_{1,l},{}_h^i\widetilde{a}^j_{2,l},...,{}_h^i\widetilde{a}^j_{i_{s^j-1},l},{}_h^i\widetilde{a}^j_{i_{s^j},l}\right\}$, where ${}_h^i\widetilde{a}^j_{1,l}$ – the most valuable indicator, and ${}_h^i\widetilde{a}^j_{i_{s^j},l}$ – the least valuable indicator for the applicant.

Step 3. Pairwise comparison of groups of indicators of the elements of the system model.

At the next stage of profile construction, a candidate is asked to compare in pairs the groups of ranked indicators. The result can be presented as a table of preferences with two inputs α and β and composed of “ones” and “zeros”:

1, if the group of indicators α is more preferable than the group of indicators β ($\alpha > \beta$),

0, if the group of indicators β is more preferable than the group of indicators α ($\alpha < \beta$).

Example. For a fixed number of i -system model when $m = 4$ the outcome of expressed preferences can be the following (Table. 2):

Table 3.1 - Example of a preference table for $m = 4$

Group of indicators		β					Number of preferences, ${}_h^i x^j$
		${}_h^i A^1$	${}_h^i A^2$	${}_h^i A^3$	${}_h^i A^4$		
α	${}_h^i A^1$	–	0	1	1	→	2
	${}_h^i A^2$	1	–	1	0	→	2
	${}_h^i A^3$	0	0	–	1	→	1
	${}_h^i A^4$	0	1	0	–	→	1

Source: developed by author

Step 4. Check the preferences of the groups of indicators for consistency.

The main diagonal is free and the inputs (entrances/places) below, strictly speaking, are redundant. From the analysis of Table 1 on horizontal lines, the group of indicators ${}_h^i A^1$ is more preferable, than ${}_h^i A^3$ and ${}_h^i A^4$, but not than ${}_h^i A^2$. Let summarize the values in the table cells horizontally and get the total number of points for each group of indicators. Let mark it with ${}_h^i x^j$ – strength of group of indicators of element ${}_h^i A^j$ (the number of preferences given by h applicant in j-group of indicators in i-system model).

It is clear that the sum of such strengths is equal to the number of connections between the elements of the system model:

$$\sum_{j=1}^{m} {}_h^i x^j = {}^i b = \frac{1}{2} m(m-1) \qquad (3.5)$$

And there are only $2^{\frac{1}{2}m(m-1)}$ different tables of preferences.

The geometrical representation of the comparison results is more obvious. Let apply the graph theory for the example given above. The Figure ure has the form of a regular quadrangle, with all its connections (Figure . 3.5,). The direction of the arrows indicates six preferences. Therefore ${}^i x^j$ is equal to the number of arrows (Half-degree of the vertex outcome), coming out from the vertex ${}^i A^j$.

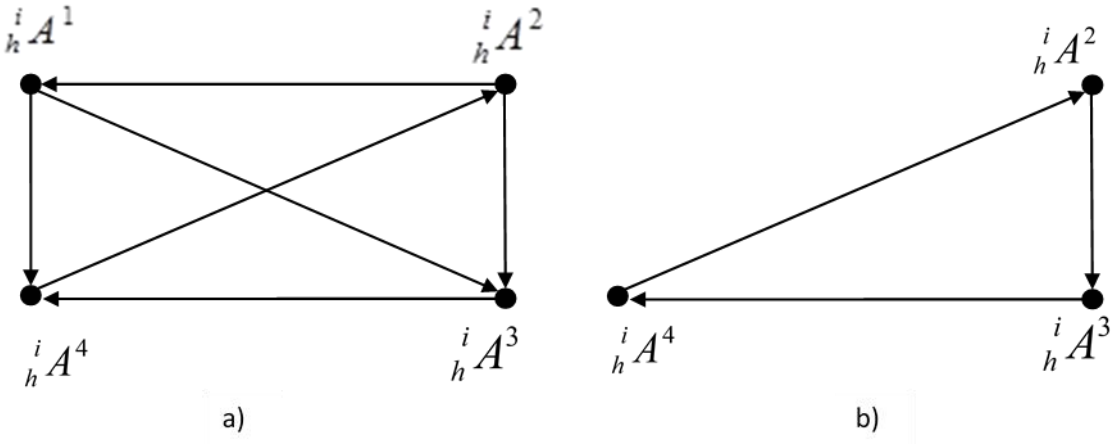


Figure 3.5 - Graphical representation of comparison results

a) graph based on the data from the table 1

b) triad distinguished from the graph

The first question to be answered is whether the candidate is consistent in his or her judgments. For this, in the graphic representation of the comparison results, we need to distinguish the triads of elements with connections between them. Each allocated triad is analyzed for the presence of cyclicity in it (Figure 3.5, b). For a model with many elements, hence a large number of triads, the less cyclic triads are in them, the more consistent preferences' judgments can be considered.

For a group of three elements, the result of an inconsistent (unsound) candidate is a cyclic triad. For a large group, a big amount of judgments can be considered more consistent in case there will be as less cyclic triads as possible. Total number of triads is equal to the number of combinations of m with 3: $\frac{m!}{(m-3)!3!}$ (when $m=4$ the number of triads is equal to $\frac{4!}{(4-3)!3!}=4$).

For the considered variant of judgments, it is clear that with the four triads from our example the following $\left\langle {}_h^i A^2, {}_h^i A^3, {}_h^i A^4 \right\rangle$ and $\left\langle {}_h^i A^1, {}_h^i A^2, {}_h^i A^4 \right\rangle$ are cyclical triads. Number of cycles c is related to the number of points by the relation:

$$ {}_h^i c = \frac{1}{2} m(m-1)(2m-1) - \sum_{j=1}^{m} \frac{\left({}^i x^j\right)^2}{2}. \qquad (3.6)$$

Let apply formula (2) to our example:

$$ {}_h^i c = \frac{1}{2}4(4-1)(2\cdot 4-1) - \sum_{j=1}^{m}\left[\frac{2^2}{2}+\frac{2^2}{2}+\frac{1^2}{2}+\frac{1^2}{2}\right] = 7-5=2. $$

The received answer coincides with our previous statements about the presence of two cyclic triads.

To identify the presence of cyclic triads on the basis of the preference table without analyzing the geometric model, we present the table in the form of a matrix.

General form of the matrix with the size $m \times m$, where m is the number of groups of indicators being compared will be:

$$ \begin{pmatrix} {}_h^i x^{11} & {}_h^i x^{12} & \dots & {}_h^i x^{1\beta} & \dots & {}_h^i x^{1m} \\ {}_h^i x^{21} & {}_h^i x^{22} & \dots & {}_h^i x^{2\beta} & \dots & {}_h^i x^{2m} \\ \dots & \dots & \dots & \dots & \dots & \dots \\ {}_h^i x^{\alpha 1} & {}_h^i x^{\alpha 2} & \dots & {}_h^i x^{\alpha\beta} & \dots & {}_h^i x^{\alpha m} \\ \dots & \dots & \dots & \dots & \dots & \dots \\ {}_h^i x^{m1} & {}_h^i x^{m2} & \dots & {}_h^i x^{m\beta} & \dots & {}_h^i x^{mm} \end{pmatrix}. $$

For our example, the matrix has such form: $\begin{pmatrix} - & 0 & 1 & 1 \\ 1 & - & 1 & 0 \\ 0 & 0 & - & 1 \\ 0 & 1 & 0 & - \end{pmatrix}$.

Let construct the transitivity rule for the triad $\left\langle {}_h^i A^{\alpha}, {}_h^i A^{\beta}, {}_h^i A^{\gamma} \right\rangle$, where α, β, γ are any triple of indicators' numbers:

$$ \forall \left\langle {}_h^i A^{\alpha}, {}_h^i A^{\beta}, {}_h^i A^{\gamma} \right\rangle : \quad {}_h^i x^{\alpha\beta} = 1 \wedge {}_h^i x^{\beta\gamma} = 1 \Rightarrow {}_h^i x^{\gamma\alpha} = 1 \Big| {}_h^i x^{\alpha\beta} = 0 \wedge {}_h^i x^{\beta\gamma} = 0 \Rightarrow {}_h^i x^{\gamma\alpha} = 0. $$

From this rule, we can formulate a criterion for cyclicity in the triad:

The triad is cyclic if the transitivity rule is implemented.

This means that if the sum of the triad estimates $\left\langle {}_h^i A^{\alpha}, {}_h^i A^{\beta}, {}_h^i A^{\gamma} \right\rangle$ ${}_h^i x^{\alpha\beta} + {}_h^i x^{\beta\gamma} + {}_h^i x^{\gamma\alpha}$ *is equal to 0 or 3, then there is a cyclical triad. That is, the candidate is inconsistent in his or her judgments. If the sum of the estimates is equal to 1 or 2, then there is a cyclical triad, and the candidate is consistent in his or her judgments.*

The reasoning for the Figure ures in the criterion (0 or 3, 1 or 2) can be easily seen by considering the model shown in Figure ure 6. By observing the clockwise rule when

rounding the nodes, it is seen that if the bypass (rounding) arrow coincides with the model arrow, the comparison results' value in the matrix will be equal to 1, otherwise it is 0.

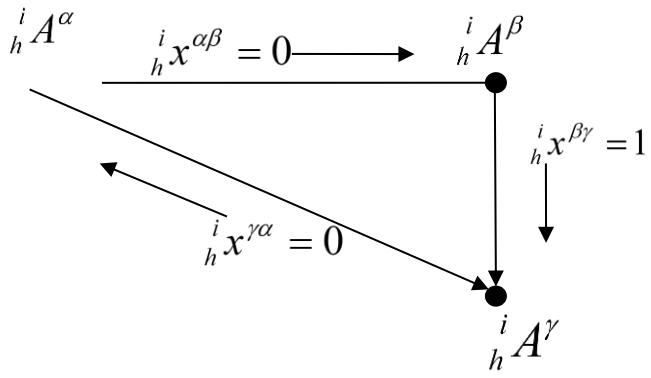


Figure 3.6 - The sequence of selecting estimates from the preference table (the triad is not cyclical)

Step 5. Correcting the preferences of the elements of the system model.

Let's return to our example and list possible triads: $\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{2},{}^{i}_{h}A^{3}\right\rangle$, $\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{2},{}^{i}_{h}A^{4}\right\rangle$, $\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{3},{}^{i}_{h}A^{4}\right\rangle$ and $\left\langle {}^{i}_{h}A^{2},{}^{i}_{h}A^{3},{}^{i}_{h}A^{4}\right\rangle$. For each triad, the sum of the estimates can be calculated (table. 3.2).

Table 3.2 - An example of calculating the sum of triad estimates

Triad $\left\langle {}^{i}_{h}A^{\alpha},{}^{i}_{h}A^{\beta},{}^{i}_{h}A^{\gamma}\right\rangle$	Sum of estimates ${}^{i}_{h}x^{\alpha\beta}+{}^{i}_{h}x^{\beta\gamma}+{}^{i}_{h}x^{\gamma\alpha}$		Cyclicity
$\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{2},{}^{i}_{h}A^{3}\right\rangle$	${}^{i}_{h}x^{12}+{}^{i}_{h}x^{23}+{}^{i}_{h}x^{31}$	0+1+0=1	No
$\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{2},{}^{i}_{h}A^{4}\right\rangle$	${}^{i}_{h}x^{12}+{}^{i}_{h}x^{24}+{}^{i}_{h}x^{41}$	0+0+0=0	Yes
$\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{3},{}^{i}_{h}A^{4}\right\rangle$	${}^{i}_{h}x^{13}+{}^{i}_{h}x^{34}+{}^{i}_{h}x^{41}$	1+1+0=2	No
$\left\langle {}^{i}_{h}A^{2},{}^{i}_{h}A^{3},{}^{i}_{h}A^{4}\right\rangle$	${}^{i}_{h}x^{23}+{}^{i}_{h}x^{34}+{}^{i}_{h}x^{42}$	1+1+1=3	Yes

To eliminate inconsistency in the applicant's answers, he or she is proposed to re-evaluate a couple of groups of indicators in each cyclic triad. To do this, in a cyclic triad it is necessary to select a pair, the change in which will not lead to cyclicity in other triads. In other words, if the estimate ${}^{i}_{h}x^{\alpha\beta}=1$ Will be changed to the estimate ${}^{i}_{h}x^{\alpha\beta}=0$, It is necessary to apply the cyclicity criterion to all triads that contain ${}^{i}_{h}x^{\alpha\beta}$.

In our example, we can change the estimate ${}^{i}_{h}x^{12}=0$ for ${}^{i}_{h}x^{12}=1$, then sum of estimates for the triad $\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{2},{}^{i}_{h}A^{4}\right\rangle$ will be equal to 1+0+0=1. The same way ${}^{i}_{h}x^{23}=1$ can be changed for ${}^{i}_{h}x^{23}=0$, then sum of estimates for the triad $\left\langle {}^{i}_{h}A^{2},{}^{i}_{h}A^{3},{}^{i}_{h}A^{4}\right\rangle$ will be equal 0+1+1=2. Estimates ${}^{i}_{h}x^{12}$ and ${}^{i}_{h}x^{23}$ are presented in triad $\left\langle {}^{i}_{h}A^{1},{}^{i}_{h}A^{2},{}^{i}_{h}A^{3}\right\rangle$. After the changes, the sum of the estimates for it will not change: 1+0+0=1. Thus, we got rid of cyclicity without violating the criterion of cyclicity in other triads.

As a result, we get a new table of preferences (table 3.3) and a new preference polygon (Figure .3. 7).

Table 3.3 Preference table with fixed pairs ${}^{i}_{h}x^{12}$ and ${}^{i}_{h}x^{23}$

Group of indicators	${}^{i}_{h}A^{1}$	${}^{i}_{h}A^{2}$	${}^{i}_{h}A^{3}$	${}^{i}_{h}A^{4}$	Points ${}^{i}x^{j}$
${}^{i}_{h}A^{1}$	–	1	1	1	3
${}^{i}_{h}A^{2}$	0	–	0	0	0
${}^{i}_{h}A^{3}$	0	1	–	1	2
${}^{i}_{h}A^{4}$	0	1	0	–	1

Source: developed by author

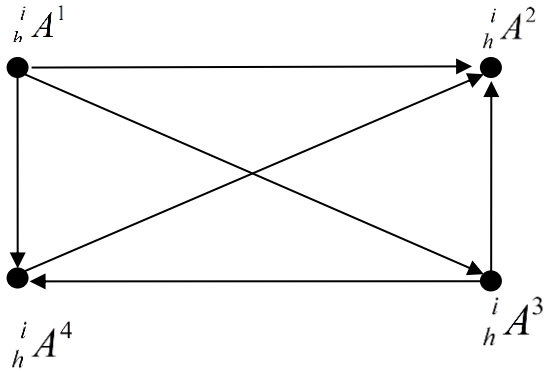


Figure 3.7 - Polygon preference with fixed pairs ${}^{i}_{h}x^{12}$ and ${}^{i}_{h}x^{23}$

Similarly, without violating the cyclicality criterion, we can offer the applicant to change the preference ${}^{i}_{h}x^{24}$ and ${}^{i}_{h}x^{34}$. But the change of x^{41} will lead to the appearance

of cyclicity in the triad $\left\langle {}_h^i A^1, {}_h^i A^3, {}_h^i A^4 \right\rangle$, therefore this pair of groups of indicators cannot be presented for reassessment.

Analysis of all methods to compare groups of indicators in pairs make it possible to reveal that there can be one or two cyclic triads in a four-element system model. In this case, the distribution of the number of preferences will be the following {3; 1; 1; 1} or {2; 2; 1; 1} accordingly. The options for placing such triads are shown in Figure ure 8. In the absence of cyclic triads, the distribution of preferences has the next form {3; 2; 1; 0}.

In the first case, when there is one cyclic triad (Figure . 8, a), we can offer the applicant to change one preference in any pair of groups of indicators (${}_h^i x^{23}$ or ${}_h^i x^{34}$ or ${}_h^i x^{42}$). In this case, the preference values will be changed as follows:

${}_h^i x^1 = 3$, ${}_h^i x^2 = 0$, ${}_h^i x^3 = 2$, ${}_h^i x^4 = 1$, if to change the preference in the group ${}_h^i x^{23}$;

${}_h^i x^1 = 3$, ${}_h^i x^2 = 1$, ${}_h^i x^3 = 0$, ${}_h^i x^4 = 2$, if to change the preference in the group ${}_h^i x^{34}$;

${}_h^i x^1 = 3$, ${}_h^i x^2 = 2$, ${}_h^i x^3 = 1$, ${}_h^i x^4 = 0$, if to change the preference in the group ${}_h^i x^{42}$.

In the second case, when there are two cyclic triads (Figure ure 8, b), we can offer the candidate to change one preference that applies to both cyclic triads (${}_h^i x^{41}$), or in a pair of other preferences in the cyclic triads ([${}_h^i x^{12}$, ${}_h^i x^{34}$] or [${}_h^i x^{12}$, ${}_h^i x^{13}$] or [${}_h^i x^{34}$, ${}_h^i x^{42}$]). Preference values will change as follows:

${}_h^i x^1 = 3$, ${}_h^i x^2 = 2$, ${}_h^i x^3 = 1$, ${}_h^i x^4 = 0$, if to change the preference in the group ${}_h^i x^{41}$;

${}_h^i x^1 = 1$, ${}_h^i x^2 = 3$, ${}_h^i x^3 = 0$, ${}_h^i x^4 = 2$, if to change the preference in the pair of groups [${}_h^i x^{12}$, ${}_h^i x^{34}$];

${}_h^i x^1 = 0$, ${}_h^i x^2 = 3$, ${}_h^i x^3 = 2$, ${}_h^i x^4 = 1$, if to change the preference in the pair of groups [${}_h^i x^{12}$, ${}_h^i x^{13}$];

${}_h^i x^1 = 2$, ${}_h^i x^2 = 1$, ${}_h^i x^3 = 0$, ${}_h^i x^4 = 3$, if to change the preference in the pair of groups [${}_h^i x^{34}$, ${}_h^i x^{42}$].

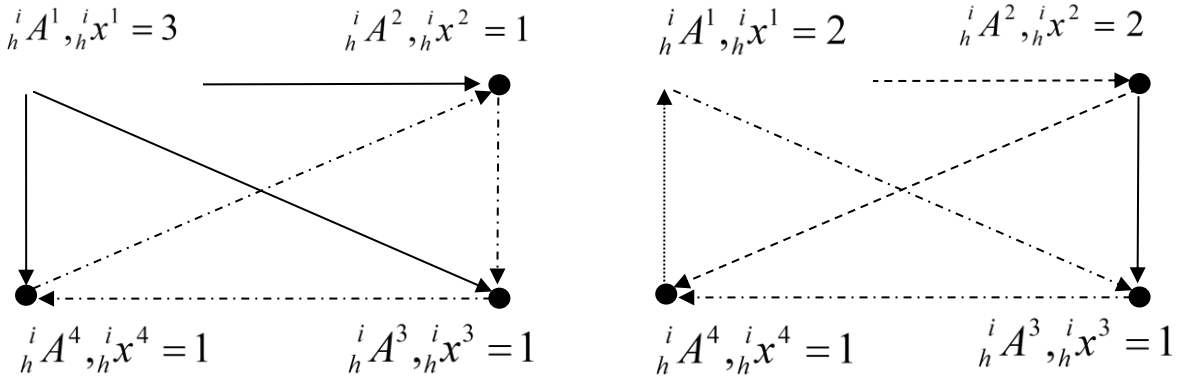


Figure 3.8 - Variants of placement of cyclic triads in a four-element system model ${}_h^i A$: a) One cyclic triad; b) Two cyclic triads

After eliminating contradictions, we get an ordered series of groups of indicators. The basis of ordering is ${}_h^i x^j$ For each element ${}_h^i A^j$.

This information for each applicant is his/her personal profile on the criterion of SWB. It serves as a basis for solving the next task - the formation of a team on this criterion.

All described steps that we introduced in the form of indicative model(Figure . 3.9). This allows us to formalize further procedures in a developed method.

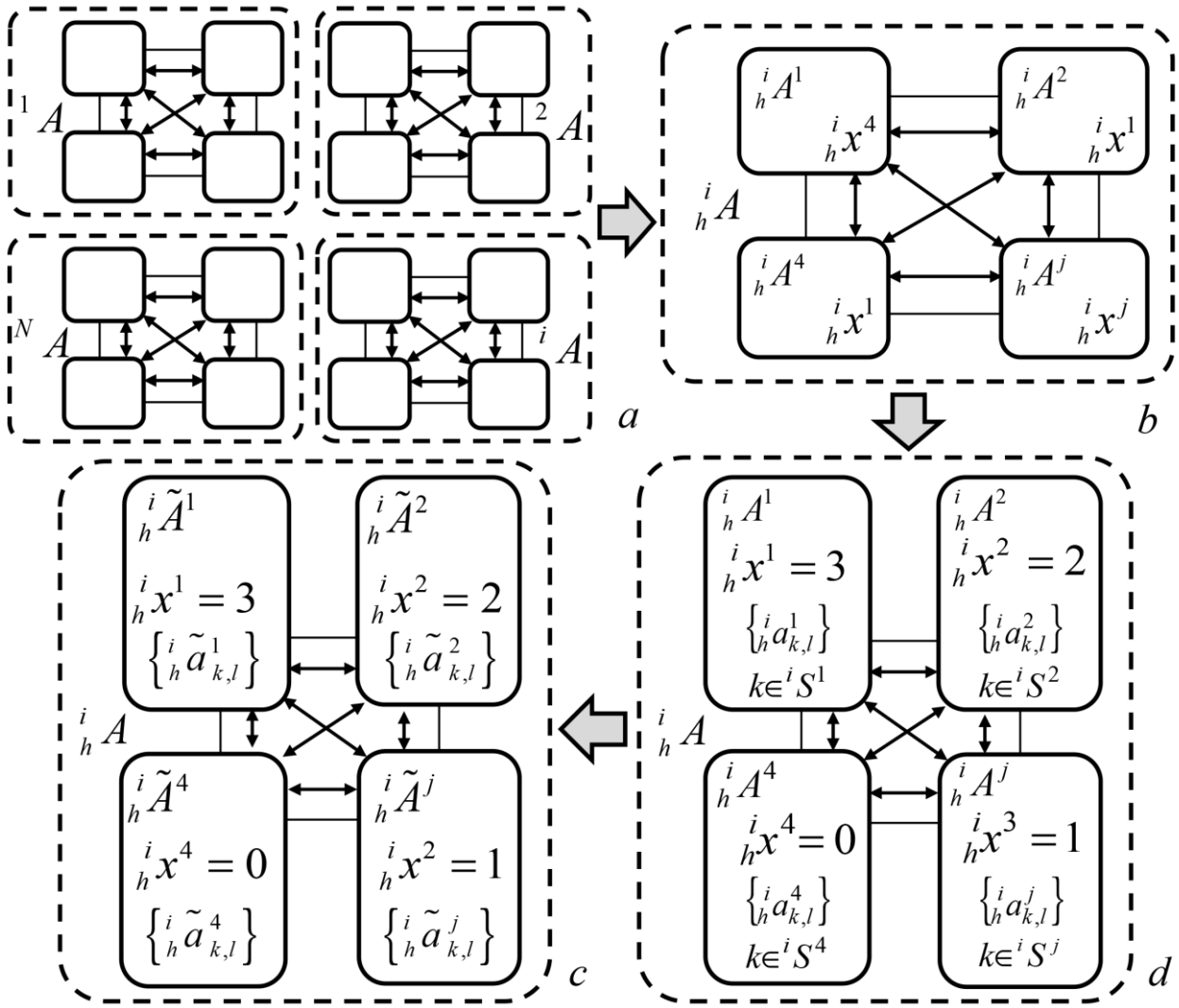


Figure 3.9 - Stages in identification of candidate's preferences regarding the indicators of SWB

a – set of systematic quartile models; *b* – the most preferable model for h candidate; *c* – ranking of the elements of the most preferable model; *d* – ranking of the indicators of SWB within the elements of the selected model

Let us represent the result of implementing the procedure for collecting data from candidate *h* about his preferences regarding the indicators of SWB (Figure 3.9) in the form of table 3.4

Table 3.4 - Original data on candidate's preferences

No. of the rank of an indicator in the elements of the model	Elements of system ${}_h^i\tilde{A}^j$, arranged in descending order of importance			
	${}_h^i\tilde{A}^1$ $\left({}_h^i x^{\,1}=1\right)$	${}_h^i\tilde{A}^2$ $\left({}_h^i x^{\,2}=2\right)$	${}_h^i\tilde{A}^3$ $\left({}_h^i x^{\,3}=3\right)$	${}_h^i\tilde{A}^4$ $\left({}_h^i x^{\,4}=4\right)$
1	${}_h^i\tilde{a}_{1J}^1$	${}_h^i\tilde{a}_{1J}^2$	${}_h^i\tilde{a}_{1J}^3$	${}_h^i\tilde{a}_{1J}^4$
2	${}_h^i\tilde{a}_{2J}^1$	${}_h^i\tilde{a}_{2J}^2$	${}_h^i\tilde{a}_{2J}^3$	${}_h^i\tilde{a}_{2J}^4$
…	…	…	…	…
${}_h w^j$	…	…	…	…
…	${}_h^i\tilde{a}_{i_{s^1}-1J}^1$	${}_h^i\tilde{a}_{i_{s^2}-1J}^2$	${}_h^i\tilde{a}_{i_{s^3}-1J}^3$	${}_h^i\tilde{a}_{i_{s^4}-1J}^4$
${}^i s^j$	${}_h^i\tilde{a}_{i_{s^1}J}^1$	${}_h^i\tilde{a}_{i_{s^2}J}^2$	${}_h^i\tilde{a}_{i_{s^3}J}^3$	${}_h^i\tilde{a}_{i_{s^4}J}^4$

Source: developed by author

Each of the columns of the indicators of elements of system ${}_h^i\tilde{A}^j$ is a ranked list that is actually presented in the ordinal scale. This scale also permits, in addition to the procedures for computation and comparison of sizes of categories (in our case – ranked lists of indicators of the elements of system ${}_h^i\tilde{A}^j$), to form judgements like "more than" and "less than". We will use the last procedure to form the profile of a candidate in the form of a single list of basic indicators of SWB, in which indicators are listed in order of descending of importance for a candidate. The original lists are presented in Table 1. In order to integrate them into a single list, taking into account the importance of the elements of a model, we will introduce the following rule of integration: *indicators of element* ${}_h^i\tilde{A}^{j+1}$ *are integrated in turn in the orderly series of element* ${}_h^i\tilde{A}^j$, *beginning with number k. That is, indicator* ${}_h^i\tilde{a}_{1J}^{j+1}$ *stands in the series after indicator* ${}_h^i\tilde{a}_{kJ}^j$, *and indicator* ${}_h^i\tilde{a}_{2J}^{j+1}$ *– after indicator* ${}_h^i\tilde{a}_{k+1J}^j$.

The rule is based on the assumption that the first indicator of the element of a model with a lower rank is less important than the indicator with number *k*, and more important than the indicator with number *k*+1 of indicators of the element of a model with a higher rank. Parameter *W* assigns the beginning of the zone of the list of indicators of a model with a higher rank of importance ${}_h^i\tilde{A}^{m-1}$, from which the integration of indicators from the list of the elements of the model with a lower rank ${}_h^i\tilde{A}^m$, begins.

The integration is implemented by the method of reverse motion (from the element with lower importance ${}_h^i\tilde{A}^m$ to the element with the higher importance ${}_h^i\tilde{A}^{m-1}$). Ordered indicators of element ${}_h^i\tilde{A}^m$ are integrated with similar indicators of element ${}_h^i\tilde{A}^{m-1}$. As a

result, the intermediate orderly series of indicators from the elements of models ${}_h^i\tilde{A}^{m-1}$ and ${}_h^i\tilde{A}^m$. is formed. For this series, which consists of $({}^is^{m-1}+{}^is^m)$ indicators, the values of the importance rank for each of them is calculated as follows:

$$ {}^iw^{m-1,m} = {}^iw^{m-1} \bigcup {}^iw^m, \tag{3.7} $$

$$ {}^iw^{m-1}({}_h^ia_{kJ}^{m-1}) = \text{at}\,(k \le W, k);\ \text{else}(2k - W), \tag{3.8} $$

$$ {}^iw^m({}_h^ia_{kJ}^m) = 2k + W - 1. \tag{3.9} $$

Then his intermediate orderly series is integrated with a series of indicators of element ${}_h^i\tilde{A}^{m-2}$ according to the rule described above. This procedure is repeated until the indicators of the most important for a candidate element of system ${}_h^i\tilde{A}^1$. are integrated. The visually described procedure is shown in Table 3.5.

The last column of the table is the profile of candidate *h*, which consists of the ordered by him basic list of indicators of SWB from the corresponding rank of importance from 1 to *s*. It should be noted that the profile of a candidate ${}_hA$ does not contain the information about what systematic model this profile was based on (there is no upper left index of the number of systematic model). The indicators of the profile of candidate ${}_h\tilde{a}_{kJ}$. do not contain this information either. That is why we will subsequently use indexes of candidates (lower left index) and rating *k* of the base indicator l (lower right indexes).

The procedure of uniting the lists using judgments like "more than" and "less than", used during the integration actually is a procedure of conversion of an ordinal scale into an interval scale [113]. During this procedure, there occurs the division of the distance between neighboring ranks, not represented explicitly in the ordinal scale. Due to this, the difference between new ranks decreases on average by two times. For such a scale, it is possible to perform an operation of conditional averaging (alignment) of distances between ranks, thanks to which the ordinal scale will be converted into the interval scale. And this makes it possible to apply mathematical operations such as addition, subtraction, division, etc. to the ranks [114]. This assumption is justified by the fact that the mathematical and logical

operations with quantitatively represented fuzzy data, used in the research, by their nature are classified as soft computations.

Table 3.5 - Formation of individual rating set of indicators

No. of the rank of importance of indicator in the candidate's profile	Order of formation of the candidate's profile				Profile of candidate ${}_{h}A$
	${}_{h}^{i}\tilde{A}^{4}$	${}_{h}^{i}\tilde{A}^{3}$	${}_{h}^{i}\tilde{A}^{2}$	${}_{h}^{i}\tilde{A}^{1}$	
1	–	–	–	${}_{h}^{i}\tilde{a}_{1J}^{1}$	${}_{h}\tilde{a}_{1J}$
2	–	–	–	${}_{h}^{i}\tilde{a}_{2J}^{1}$	${}_{h}\tilde{a}_{2J}$
…	–	–	–	…	…
k	–	–	–	${}_{h}^{i}\tilde{a}_{kJ}^{1}$	${}_{h}\tilde{a}_{kJ}$
k+1	–	–	–		${}_{h}\tilde{a}_{k+1J}$
k+2	–	–		${}_{h}^{i}\tilde{a}_{k+1J}^{1}$	${}_{h}\tilde{a}_{k+2J}$
k+3	–	–	${}_{h}^{i}\tilde{a}_{2J}^{2}$		${}_{h}\tilde{a}_{k+3J}$
…	–	–	…	…	…
…	–	–	${}_{h}^{i}\tilde{a}_{kJ}^{2}$	…	…
…	–	${}_{h}^{i}\tilde{a}_{1J}^{3}$	…	…	…
…	–	…	…	${}_{h}^{i}\tilde{a}_{i_{s^1}J}^{1}$	…
…	–	…	${}_{h}^{i}\tilde{a}_{k+1J}^{2}$	–	…
${}_{h}w$	–	${}_{h}^{i}\tilde{a}_{2J}^{3}$	…	–	…
…	–	…	…	–	…
…	–	…	${}_{h}^{i}\tilde{a}_{i_{s^2}J}^{2}$	–	…
…	–	${}_{h}^{i}\tilde{a}_{kJ}^{3}$	–	–	…
…	${}_{h}^{i}\tilde{a}_{1J}^{4}$		–	–	…
…		${}_{h}^{i}\tilde{a}_{k+1J}^{3}$	–	–	…
…	${}_{h}^{i}\tilde{a}_{2J}^{4}$	…	–	–	…
…	…	…	–	–	…
…	…	${}_{h}^{i}\tilde{a}_{i_{s^3}J}^{3}$	–	–	…
s–1	${}_{h}^{i}\tilde{a}_{i_{s^4}-1J}^{4}$	–	–	–	${}_{h}\tilde{a}_{s-1J}$
s–2	${}_{h}^{i}\tilde{a}_{i_{s^4}J}^{4}$	–	–	–	${}_{h}\tilde{a}_{sJ}$

Source: developed by author

3.2 Method of configuring the project team based on personal SWB-profiles

An analysis of sources makes it possible to draw a conclusion about the existence of two key selective approaches to team formation.

The first approach ("element") is aimed at identifying if a candidate meets the assigned reference values of the indicators. This method of selection involves a clearly determined reference model, procedures for measuring indicator values of a candidate, comparing them with reference values. The candidates with the highest scores are selected to the team. A typical example of this approach is outlined in [115, 116-119].

The second approach ("holistic") also involves the use of a reference model. However, the obtained estimates of candidates are used for the search for the most rational conFigure uration of a team as a holistic system. Under this approach, the concept of a complementary team is used as a key concept [120, 121-126].

It is possible to identify two shortcomings that are common for these approaches. The approaches do not imply the comparison between profiles that are based on studies of self-attitude [127], that is, by a candidate himself. In addition, they do not imply a procedure for assessing the integrity of a team, when the profiles of all candidates are selected in turn as a reference profile. There have been found no studies, in which similar problems would be raised and solved in the context of the project team formation. The closest in this sense are the methods proposed in studies [128] and [129]. Thus, in paper [128], the team formation method is based on the selection of potential candidates based on the professional experience of completed works and their further ranking relative to the model of the "ideal" executor of this work. The provisions of the research were not used in [128], the method for final decision making about the choice of a candidate was not detailed. Paper [129] addressed the issues of formation of soft (educational) projects based on the ranking by the participants of the competences formed in a project as indicators of their values. To do this, the author used the concept of the function of presence developed in [130]. However, under this approach, another problem was solved – the transformation of participants' profiles in the form of ranked series into work packages and project works. This is significantly different from the problem of identifying the rational team configuration.

Based on the foregoing, it can be argued that the insufficiently developed methods for the formation of project teams, focused on taking into account of "soft" team factors, necessitates further research in this direction. The studies of the formation of project teams according to the criterion of SWB as the most invariant indicator of "softness" can be considered preferable.

The next step in the formation of a project management team by the criterion of SWB is the procedure of comparison of candidates' profiles. To do this, the method is developed, based on the idea of calculating the overall total rank to evaluate the initial orientation of a candidate in the field of project management. Evaluation is carried out based on results of ranking by a candidate of 27 basic competencies according to their importance and influence on the result of the project implementation [131]. The calculation involves determining the sum of ratings by those competencies, the rating of which, specified by a candidate, differs from the basic (specified) rating by more than 9 positions. At summing, the higher value of rating between the basic one and the one selected by a candidate is selected. The value of the overall total rank, which proved that the tested candidate has the competence of starting susceptibility of a project manager, should be less than 130. According to our calculations, this makes up 23.2 % from the maximum theoretically possible value of the overall total ranking.

The proposed method for comparing profiles implies the similar comparison of the ratings of two candidates. In this case, the profile of the supposed project manager, to which index $_{hb}A$ is assigned, is chosen as basic. Table 3 shows an example of comparison of the profile of a candidate $_{h}A$ with the profile of a project manager.

In the table the rating of a candidate relative to the indicator of a project manager lb, which is equal to *k*, is designated as $v(k,lb)$ (Table 3, column 4). Analysis of the results of more than 400 options of calculations of the overall total rank showed the expediency to use not all the list from *S* indicators, but only 2 zones, in order to determine the coincidence degree. Details about depicting these two zones are shown are shown in attachment B. Zone I consists of the first five most significant indicators for candidate, and zone II of seven less significant indicators. The total of the number of indicators that are taken into consideration for determining the overall total rank is equal to half of all S=27 indicators (considering

rounding to integer). At the same time, to increase the stringency of requirements to the magnitude of deviation of candidate's ranks from the manager's rank, in the first zone the permissible magnitude of deviation z=2, and in the second zone z=3.

Table 3.6 - Comparison of the profile of candidate ${}_{h}A$ with the profile of a project manager

No. of summing zone	Rank of basic indicator in the project manager's profile	Basic indicators of a project manager ${}_{hb}\tilde{a}_{k,lb}$	Rank of basic index of project indicator in candidate's profile ${}_{h}\tilde{a}_{v,lb}$	The difference by module between ranks $\Delta_{k,v}=\lvert k-v\rvert$	Data for generalized rank
Zone I, z=2	1	${}_{hb}\tilde{a}_{1,lb}$	$v(1,lb)$	$\lvert 1-v(1,lb)\rvert$	0 *and* max$(1,v(1,lb))$
	2	${}_{hb}\tilde{a}_{2,lb}$	$v(2,lb)$	$\lvert 2-v(2,lb)\rvert$	0 *and* max$(2,v(2,lb))$
	3	${}_{hb}\tilde{a}_{3,lb}$	$v(3,lb)$	$\lvert 3-v(3,lb)\rvert$	0 *and* max$(3,v(3,lb))$
	4	${}_{hb}\tilde{a}_{4,lb}$	$v(4,lb)$	$\lvert 4-v(4,lb)\rvert$	0 *and* max$(4,v(4,lb))$
	5	${}_{hb}\tilde{a}_{5,lb}$	$v(5,lb)$	$\lvert 5-v(5,lb)\rvert$	0 *and* max$(5,v(5,lb))$
	Overall total rank of zone I (equal to the sum of column 6)				${}_{h}\Delta_{I}$
Zone II, z=3	6	${}_{hb}\tilde{a}_{1,lb}$	$v(6,lb)$	$\lvert 6-v(6,lb)\rvert$	0 *and* max$(6,v(6,lb))$
	…	…	…	…	…
	13	${}_{hb}\tilde{a}_{13,lb}$	$v(13,lb)$	$\lvert 13-v(13,lb)\rvert$	0 *and* max$(13,v(13,lb))$
	Overall total rank of zone II (equal to the sum of column 6)				${}_{h}\Delta_{II}$
	14	${}_{hb}\tilde{a}_{14,lb}$	$v(14,lb)$	–	
	…	…	…	–	
	k	${}_{hb}\tilde{a}_{k,lb}$	$v(k,lb)$	–	
	…	…	…	–	
	$s-1$	${}_{hb}\tilde{a}_{s-1,lb}$	$v(s-1,lb)$	–	
	s	${}_{hb}\tilde{a}_{s,lb}$	$v(s,lb)$	–	

Source: developed by author

Data for column (6) of the table are calculated from formula:

$$\Delta_{k,v}=\text{at}\,(\lvert k-v(k,lb)\rvert<z;0);\text{else}(\max(k,v(k,lb))). \tag{3.10}$$

By comparing the profiles, we obtain two indicators: ${}_h\Delta_I$ and ${}_h\Delta_{II}$ - generalized total ranks in zone I and II, respectively. Example of the calculation of indicators is presented in attachment C.

Within the framework of the method for determining the coherence of personal profiles of candidates, the described procedure is performed for all candidates to a project management team. In practice, during the implementation of international projects, the situation of choosing a project manager after the formation of a project team can occur. Then all candidates are considered as a potential manager one by one, and the similar procedure of comparison of candidates' profiles is performed.

It is usually recommended to include from 2 to 10 people into a project management team [132]. It is therefore necessary to calculate the indicator reflecting the degree of coherence of all team members by their assessment of the importance of indicators of SWB. We propose to use the mean value of the weighted average sum of overall total ranks of zones I and II, shown in Table 3, as the main component of the method for the calculation of such an indicator:

$$ {}_h\bar{\Delta}_{III} = \frac{0{,}8\sum_{h=1}^{H} {}_h\Delta_I + 0{,}2\sum_{h=1}^{H} {}_h\Delta_{II}}{H-1}. \qquad (3.11) $$

Variants of calculation ${}_h\bar{\Delta}_{III}$ for different amount of members are presented in attachment D.

The numeric values of weighing the coefficients are determined based on the Paretto principle. During formation of a project management team, it makes it possible to take into consideration the proximity of coherence of the importance of the first five indicators of SWB even to greater extent.

Given the number of indicators in zones I and II, the theoretically calculated value of the sum of generalized total rank ${}_h\bar{\Delta}$, can vary from minimum value of 0 to maximum value of 273. To find the maximum permissible value ${}_h\bar{\Delta}$, we will use the magnitude of the relative value of the threshold total rank in the method-analogue for assessment of the initial orientation of a candidate in the field of project management, which is 23.2 % of the

maximum possible. By analogy, for our case, maximum admissible value $_h\bar{\Delta}$, must be equal to 64. More stringent conditions to the difference in the candidates' ranks in the proposed method make it possible to raise this value and accept it as equal to 70. This enables normalizing of $_h\bar{\Delta}$. Based on the normalized basic component, the heuristic formula of the coefficient of coherence of a project team by the criterion of SWB was proposed:

$$\hat{K}_{swb} = 1 - \frac{0{,}8\sum_{h=1}^{H} {}_h\Delta_I + 0{,}2\sum_{h=1}^{H} {}_h\Delta_{II}}{70(H-1)}. \qquad (3.12)$$

In the situation of the best degree of coherence among team members by the importance of indicators of SWB in zones I and II, coherence coefficient has the value of 1, while in its complete absence – 0.

3.3 Evaluation scale and the method for assessment of coherence of personal profiles of candidates

To form evaluation judgments about the degree of coherence of candidates' preferences (potential team members) in terms of the indicators of SWB, it is necessary to develop an evaluation scale. The degree of its usefulness and adequacy depends on how much the judgments that are generated, while using it, will correspond to actual feeling by team members of their SWB in joint activities. That is why, to build such a scale, we will use the results of the pilot social experiment, within which the information in the form of results of ranking the system models, their elements and indicators of SWB, were obtained. 32 respondents from 7 African countries took part in the experiment. The selection of representatives of these countries is related to the fact that when selecting the basic indicators for system models in [112], mental preferences of the residents of the African continent were taken into account.

Each participant of the experiment implemented all procedures implied by the sequence of identification of the candidate's preferences regarding the indicators of SWB (Figure . 3.1).

32 profiles were constructed based on the collected data in the course of the experiment. Then the profile of each candidate was accepted as overall ratings, and overall total ratings for all the other candidates were calculated in the reference to it. The obtained information was used to form the teams by the criterion of minimizing $_{h}\bar{\Delta}$ mean weighted sum of overall total ranks of zones I and II. As a result, 288 theoretically possible teams, combined into nine groups, were formed. The groups differed by the number of team members from 2 up to 10 people. For each group, the minimum and maximum values $_{h}\bar{\Delta}.$ were determined. The upper and lower curves correspond to these values in Figure . 2. For the teams with a different number of members, the section between the minimum and maximum values of $_{h}\bar{\Delta},$ is divided into five equal areas. The boundaries of the areas of the teams with different numbers of members are connected with one another. As a result, we obtained four curves, which are located between the upper and the lower curves.

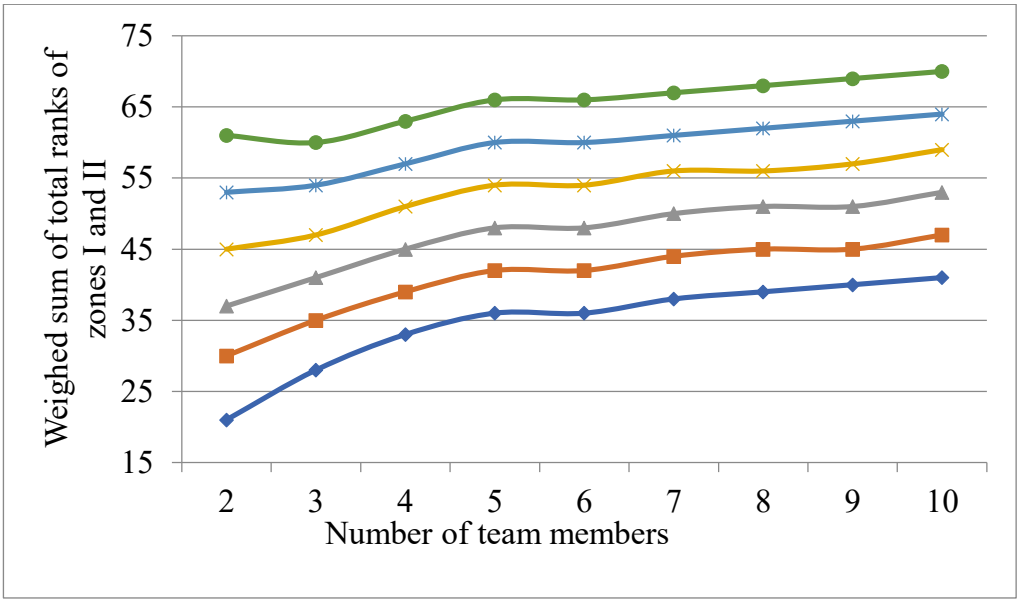


Figure 3.10 - Boundaries of intervals of the uniform distribution of the field of the experimentally determined values $_{h}\bar{\Delta}_{\prime\prime\prime}$ for the teams with a different number of members

An analysis of Figure . 2 shows that at an increase in the number of team members, there is a tendency of increasing the average weighted sum of overall total ranks. In this case, absolute variation between minimum and maximum values decreases. Maximum value $_{h}\bar{\Delta},$ reaches 70 for a team of 10 people. It does not exceed the previously calculated maximum value $_{h}\bar{\Delta}.$

Figure 3.10 shows the curves of coefficient of coherence of project team $\bar{K}_{swb},$ plotted based on smoothed data of Figure . 3.12 with the use of the formula (6). Correlation factor between the data from Figure . 3.12 and the data obtained using Figure . 3, made up (−0.99). Each zone is represented by a linguistic variable, the name of which reflects the degree of coherence of the project team members based on the criterion of SWB. The totality of zones is an estimation scale of the team coherence.

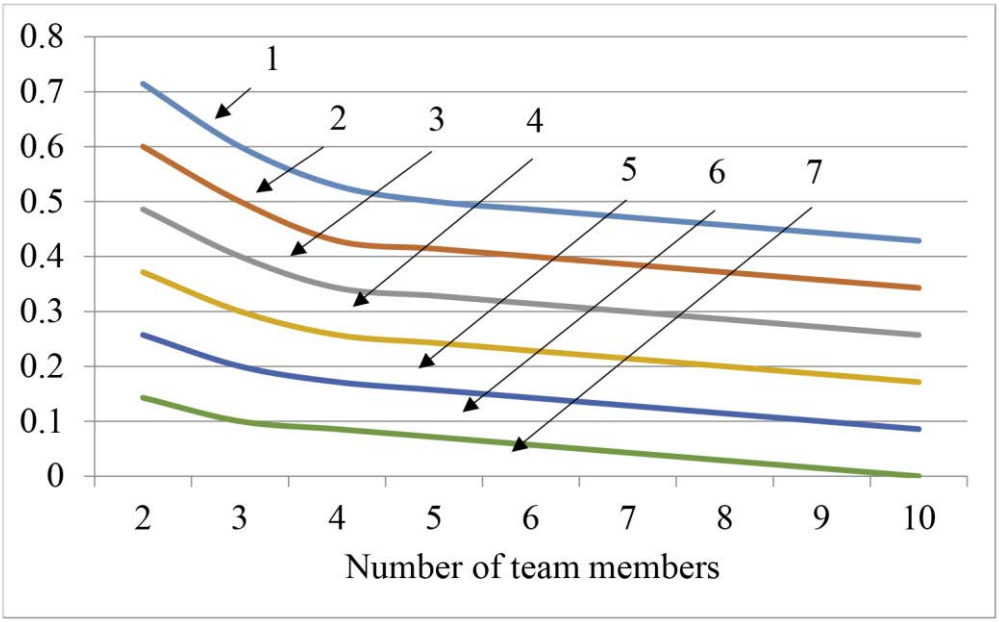


Figure 3.11 - Zones of coherence of project team members: 1 – ideal; 2 – high; 3 – rather high; 4 – admissible; 5 – undesirable; 6 – dangerous; 7 – non-admissible

Let us analyze the types of team distribution through applying the proposed zones (degrees) of coherence of a project team (Figure . 3). The information in Figure . 4 shows that the modal values $\hat{K}_{swb}$ in all groups except the first group are in the zone of a rather high coherence.

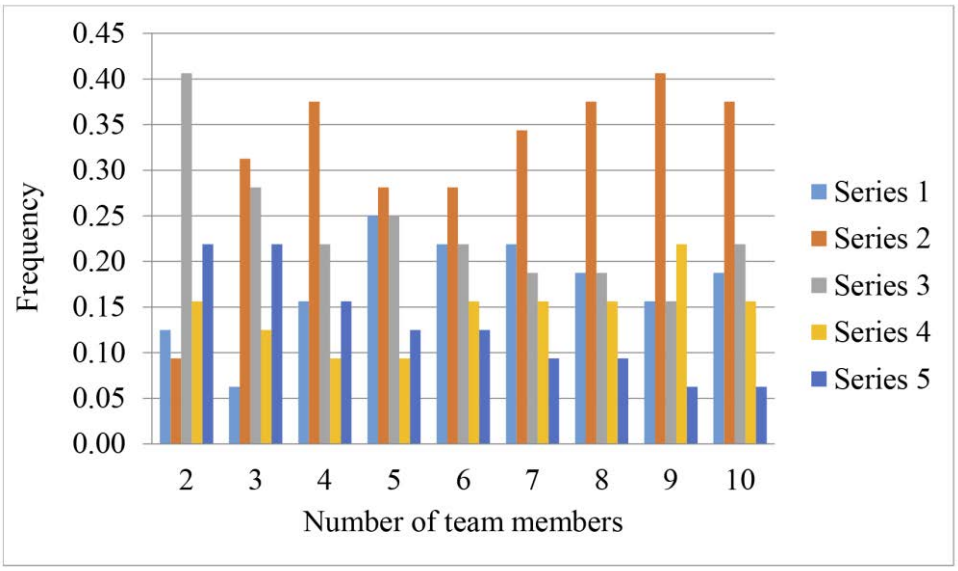


Figure 3.12 - Distribution of teams with different number of members by degree of coherence: Series 1 – high, Series 2 – rather high, Series 3 – admissible, Series 4 – undesirable, Series 5 – dangerous

The number of such teams depends on the number of their members and ranges from 28 % to 41 %. Uniting the data about the areas with high and rather high compatibility shows that the number of the teams of four members and above exceeds 50 (Figure . 5).

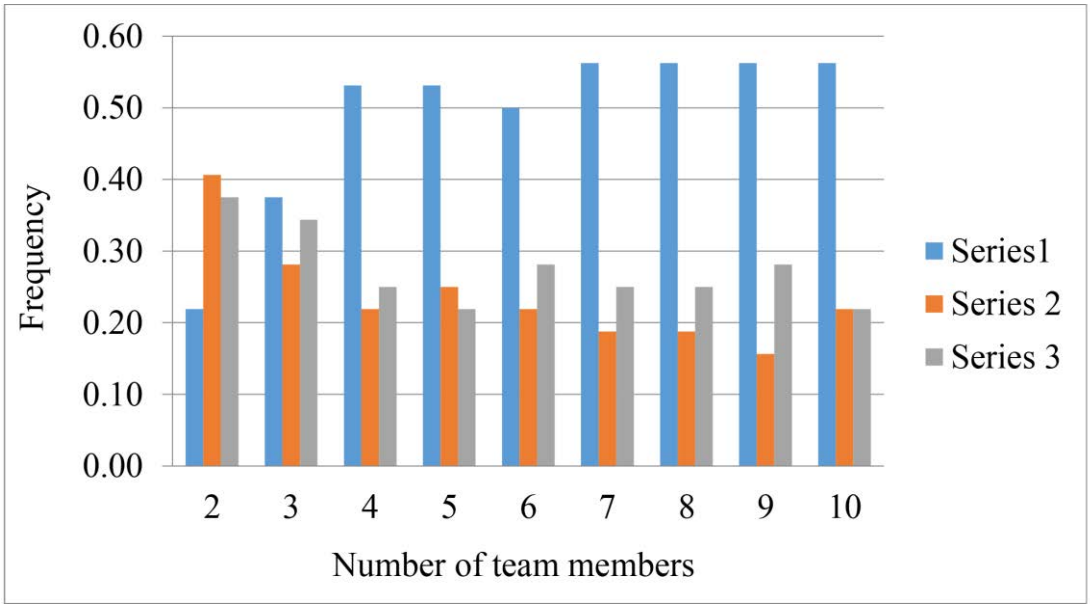


Figure 3.13 - Distribution of teams with different number of members by the groups of coherence degree: Series 1 – high and rather high, Series 2 – non-admissible, Series 3 – undesirable and dangerous

It should be noted that the number of teams consisting of 4–10 people located in the undesirable and dangerous zones is in the range of 22–28 %, and for small teams of 2–3 people – 34–38 %. This suggests that there is a high probability to form a team of 4 – 10 people with a high and rather high coherence degree from the same number of candidates by the criterion of SWB. It is much more difficult to select a coherent team from 2–3 people.

3.4 Experimental verification of the method for selection the candidates to a project team by the criterion of subjective well-being

At this stage of the study, it is necessary to answer the question of how adequate the information that is produced by the proposed method is. In other words, the extent to which the theoretically identified members of a theoretically coherent team are actually similar (close) according to the criterion of SWB. It is possible to verify it in practice only sometime after the team formation, relying on expert evaluation of team members themselves regarding their SWB in a project in general and the similarity with other team members. In this respect, the method requires long-term full-scale testing in projects of varying scale, complexity level, risk, innovation, in different subject areas, implemented in different environments, especially given the international context. Within the study, we conducted pilot testing for initial evaluation of the adequacy of the results of the method.

To do this, the students of a higher educational establishment were involved. By virtue of specific organization and the activity environment, students jointly implement a variety of educational projects, constantly interact to perform various project tasks, as well as other activity beyond their frames. This is what gives grounds to consider them as experts in relation to each other in matters of evaluation of similarity relative to the indicators of SWB.

All the tested who were the representatives of African countries, were grouped according to the criterion of duration of joint activities in educational projects before the pilot testing began. Thus, team 1 consisted of five people with the experience of two-month joint activities, and team 2 consisted of seven people who had the experience of a year-long joint work.

At the first phase of the pilot testing, the preferences concerning the indicators of SWB by the proposed method were gathered from every team member. Based on these data, their personal profiles were constructed and the following indicators were calculated: overall total rank for indicators of zone I ($_h\Delta_I$) and II ($_h\Delta_{II}$); their sum ($_h\Delta_I + _k\Delta_{II}$), as well as the mean value of the weighted sum of the overall total ranks of the zones ($_h\bar{\Delta}$, Tables 4, 5). Initial data for tables are presented in attachments E, F.

Table 3.7 - Indicators of individual profile of team members 1

Project manager	Indicators	Team members				
		1.1	1.2	1.3	1.4	1.5
1.1	$_h\Delta_/$	0	67	49	89	64
	$_h\Delta_{//}$	0	90	87	103	115
	$_h\Delta_/ + _k\Delta_{//}$	0	157	136	192	179
	$_h\bar{\Delta}$	0	71.6	56.6	91.8	74.2
1.2	$_h\Delta_/$	81	0	64	70	62
	$_h\Delta_{//}$	99	0	145	127	91
	$_h\Delta_/ + _k\Delta_{//}$	180	0	209	197	153
	$_h\bar{\Delta}$	84.6	0	80.2	81.4	67.8
1.3	$_h\Delta_/$	45	61	0	101	70
	$_h\Delta_{//}$	96	141	0	112	110
	$_h\Delta_/ + _k\Delta_{//}$	141	202	0	213	180
	$_h\bar{\Delta}$	55.2	77	0	103.2	78
1.4	$_h\Delta_/$	94	77	76	0	88
	$_h\Delta_{//}$	125	122	120	0	126
	$_h\Delta_/ + _k\Delta_{//}$	219	199	196	0	214
	$_h\bar{\Delta}$	100.2	86	84.8	0	95.6
1.5	$_h\Delta_/$	67	54	89	77	0
	$_h\Delta_{//}$	98	97	104	147	0
	$_h\Delta_/ + _k\Delta_{//}$	165	151	193	224	0
	$_h\bar{\Delta}$	73.2	62.6	92	91	0

Source: Developed by author

Table 3.8 - Indicators for individual profile of team members 2

Project manager	Indicators	Team members						
		2.1	2.2	2.3	2.4	2.5	2.6	2.7
2.1	$_h\Delta_/$	0.0	72.0	90.0	64.0	50.0	42.0	14.0
	$_h\Delta_{//}$	0.0	83.0	96.0	37.0	128.0	96.0	118.0
	$_h\Delta_/ + _k\Delta_{//}$	0.0	155.0	186.0	101.0	178.0	138.0	132.0
	$_h\bar{\Delta}$	0.0	74.2	91.2	58.6	65.6	52.8	34.8
2.2	$_h\Delta_/$	61.0	0.0	84.0	56.0	82.0	52.0	53.0
	$_h\Delta_{//}$	109.0	0.0	97.0	93.0	112.0	118.0	97.0
	$_h\Delta_/ + _k\Delta_{//}$	170.0	0.0	181.0	149.0	194.0	170.0	150.0
	$_h\bar{\Delta}$	70.6	0.0	86.6	63.4	88.0	65.2	61.8
2.3	$_h\Delta_/$	78.0	49.0	0.0	71.0	33.0	41.0	65.0
	$_h\Delta_{//}$	125.0	128.0	0.0	150.0	89.0	98.0	104.0
	$_h\Delta_/ + _k\Delta_{//}$	203.0	177.0	0.0	221.0	122.0	139.0	169.0

End of table 3.8

	$_{h}\bar{\Delta}$	87.4	64.8	0.0	86.8	44.0	52.4	72.8
2.4	$_{h}\Delta_{I}$	57.0	44.0	89.0	0.0	85.0	60.0	68.0
	$_{h}\Delta_{II}$	59.0	118.0	141.0	0.0	143.0	112.0	98.0
	$_{h}\Delta_{I}+{}_{k}\Delta_{II}$	116.0	162.0	230.0	0.0	228.0	172.0	166.0
	$_{h}\bar{\Delta}$	57.4	58.8	99.4	0.0	96.6	70.4	74.0
2.5	$_{h}\Delta_{I}$	74.0	63.0	43.0	82.0	0.0	58.0	57.0
	$_{h}\Delta_{II}$	105.0	126.0	111.0	129.0	0.0	72.0	83.0
	$_{h}\Delta_{I}+{}_{k}\Delta_{II}$	179.0	189.0	154.0	211.0	0.0	130.0	140.0
	$_{h}\bar{\Delta}$	80.2	75.6	56.6	91.4	0.0	60.8	62.2
2.6	$_{h}\Delta_{I}$	38.0	65.0	67.0	55.0	37.0	0.0	42.0
	$_{h}\Delta_{II}$	106.0	99.0	70.0	120.0	62.0	0.0	61.0
	$_{h}\Delta_{I}+{}_{k}\Delta_{II}$	144.0	164.0	137.0	175.0	99.0	0.0	103.0
	$_{h}\bar{\Delta}$	51.6	71.8	67.6	68.0	42.0	0.0	45.8
2.7	$_{h}\Delta_{I}$	20.0	60.0	75.0	73.0	36.0	36.0	0.0
	$_{h}\Delta_{II}$	118.0	87.0	116.0	103.0	121.0	73.0	0.0
	$_{h}\Delta_{I}+{}_{k}\Delta_{II}$	138.0	147.0	191.0	176.0	157.0	109.0	0.0
	$_{h}\bar{\Delta}$	39.6	65.4	83.2	79.0	53.0	43.4	0.0

Source: developed by author

Then a list of short-term educational projects was determined for each team separately. The projects were implemented within three months. After this each team member evaluated all the other members of their team, with who they interacted during the project. The essence of the evaluation was to establish the scores for all 27 basic indicators of SWB by a five-point scale. The score reflected their expert opinion on the importance of a certain basic indicator (5 – very important, 1 – absolutely unimportant) for a team member. In team 1, each team member gave 135 scores immediately after the completion of the projects (attachment G), and in team 2 – 189 scores three months after completion of the projects (attachment H). Based on the obtained scores and the ranking priorities of the importance of basic indicators of SWB of a team member, who was conventionally (alternately) accepted as a project leader, the following indicators were calculated: overall total basic indicators for zones I ($_{h}^{p}\Delta_{I}$) and II ($_{h}^{p}\Delta_{II}$); the sum of the zone total scores ($_{h}^{p}\Delta_{I}+{}_{k}^{p}\Delta_{II}$), as well as the mean value of the weighted sum of the overall total scores ($_{h}^{p}\bar{\Delta}$, Tables 6, 7). Initial data for tables is presented in attachment J, I.

Table 3.9 -Indicators of assessing the importance of basic indicators of SWB for team members 1

Project manager	Indicators	Team members					$r_{n\Delta,\ {}^{p}_{h}\Delta}$
		1.1	1.2	1.3	1.4	1.5	
1.1	${}^{p}_{h}\Delta_{/}$	0	20	20	18	17	0.863
	${}^{p}_{h}\Delta_{//}$	0	33	34	28	29	– 0.862
	${}^{p}_{h}\Delta_{/}+{}^{p}_{\kappa}\Delta_{//}$	0	53	54	46	46	– 0.941
	${}^{p}_{h}\bar{\Delta}$	0	22.6	22.8	20	19.4	0.884
1.2	${}^{p}_{h}\Delta_{/}$	18	0	21	16	14	0.934
	${}^{p}_{h}\Delta_{//}$	24	0	35	31	21	0.997
	${}^{p}_{h}\Delta_{/}+{}^{p}_{\kappa}\Delta_{//}$	42	0	56	47	35	0.968
	${}^{p}_{h}\bar{\Delta}$	19.2	0	23.8	19	15.4	0.967
1.3	${}^{p}_{h}\Delta_{/}$	21	21	0	19	2	0.503
	${}^{p}_{h}\Delta_{//}$	29	34	0	26	7	0.365
	${}^{p}_{h}\Delta_{/}+{}^{p}_{\kappa}\Delta_{//}$	50	55	0	45	9	0.055
	${}^{p}_{h}\bar{\Delta}$	22.6	23.6	0	20.4	3	0.584
1.4	${}^{p}_{h}\Delta_{/}$	18	23	23	0	20	0.913
	${}^{p}_{h}\Delta_{//}$	17	17	17	0	15	– 0.666
	${}^{p}_{h}\Delta_{/}+{}^{p}_{\kappa}\Delta_{//}$	35	40	40	0	35	– 0.977
	${}^{p}_{h}\bar{\Delta}$	17.8	21.8	21.8	0	19	0.940
1.5	${}^{p}_{h}\Delta_{/}$	23	16	24	22	0	0.981
	${}^{p}_{h}\Delta_{//}$	32	25	32	31	0	0.274
	${}^{p}_{h}\Delta_{/}+{}^{p}_{\kappa}\Delta_{//}$	55	41	56	53	0	0.564
	${}^{p}_{h}\bar{\Delta}$	24.8	17.8	25.6	23.8	0	0.978

Source: developed by author

Table 3.10 -Indicators for assessing the importance of basic indicators of SWB for team members 2

Project manager	Indicators	Team members							
		2.1	2.2	2.3	2.4	2.5	2.6	2.7	$r_{h\Delta,\ {}^{p}_{h}\Delta}$
2.1	${}^{p}_{h}\Delta_{I}$	0.0	19.0	12.0	16.0	19.0	18.0	16.0	0.511
	${}^{p}_{h}\Delta_{II}$	0.0	29.0	24.0	21.0	32.0	23.0	24.0	0.856
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	0.0	48.0	36.0	37.0	51.0	41.0	40.0	0.897
	${}^{p}_{h}\overline{\Delta}$	0.0	21.0	14.4	17.0	21.6	19.0	17.6	0.719
2.2	${}^{p}_{h}\Delta_{I}$	15.0	0.0	15.0	9.0	18.0	16.0	11.0	0.567
	${}^{p}_{h}\Delta_{II}$	13.0	0.0	23.0	22.0	26.0	26.0	10.0	0.803
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	28.0	0.0	38.0	31.0	44.0	42.0	21.0	0.922
	${}^{p}_{h}\overline{\Delta}$	14.6	0.0	16.6	11.6	19.6	18.0	10.8	0.940
2.3	${}^{p}_{h}\Delta_{I}$	12.0	3.0	0.0	20.0	8.0	9.0	12.0	0.795
	${}^{p}_{h}\Delta_{II}$	13.0	8.0	0.0	24.0	22.0	18.0	11.0	0.657
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	25.0	11.0	0.0	44.0	30.0	27.0	23.0	0.725
	${}^{p}_{h}\overline{\Delta}$	12.2	4.0	0.0	20.8	10.8	10.8	11.8	0.768
2.4	${}^{p}_{h}\Delta_{I}$	8.0	5.0	10.0	0.0	14.0	7.0	1.0	0.740
	${}^{p}_{h}\Delta_{II}$	13.0	10.0	16.0	0.0	21.0	14.0	14.0	0.864
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	21.0	15.0	26.0	0.0	35.0	21.0	15.0	0.885
	${}^{p}_{h}\overline{\Delta}$	9.0	6.0	11.2	0.0	15.4	8.4	3.6	0.828
2.5	${}^{p}_{h}\Delta_{I}$	19.0	22.0	18.0	18.0	0.0	13.0	21.0	0.833
	${}^{p}_{h}\Delta_{II}$	30.0	31.0	31.0	28.0	0.0	21.0	34.0	0.888
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	49.0	53.0	49.0	46.0	0.0	34.0	55.0	0.898
	${}^{p}_{h}\overline{\Delta}$	21.2	23.8	20.6	20.0	0.0	14.6	23.6	0.875
2.6	${}^{p}_{h}\Delta_{I}$	7.0	9.0	8.0	8.0	7.0	0.0	15.0	0.619
	${}^{p}_{h}\Delta_{II}$	18.0	28.0	12.0	17.0	23.0	0.0	22.0	0.664
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	25.0	37.0	20.0	25.0	30.0	0.0	34.0	0.733
	${}^{p}_{h}\overline{\Delta}$	9.2	12.8	8.8	9.8	10.2	0.0	16.4	0.679
2.7	${}^{p}_{h}\Delta_{I}$	20.0	20.0	18.0	17.0	19.0	19.0	0.0	0.593
	${}^{p}_{h}\Delta_{II}$	29.0	34.0	28.0	24.0	31.0	32.0	0.0	0.827
	${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$	49.0	54.0	46.0	41.0	50.0	51.0	0.0	0.830
	${}^{p}_{h}\overline{\Delta}$	21.8	22.8	20.0	18.4	21.4	21.6	0.0	0.729

Source: developed by author

As one can see, for the prevailing majority of the team members, the values of the overall total rank of zone I is smaller than those of zone II. The teams, where project managers are team members 1.4, 2.2 and 2.3 are the exception.

The scores (${}^{p}_{h}\Delta$, ${}^{p}_{h}\Delta$, (${}^{p}_{h}\Delta_{I}+{}^{p}_{h}\Delta_{II}$) and ${}^{p}_{h}\overline{\Delta}$), calculated based on the empirical data, by their nature completely correspond to similar indicators, calculated within the proposed method (${}_{h}\Delta$, ${}_{h}\Delta$, (${}_{h}\Delta_{I}+{}_{h}\Delta_{II}$) and ${}_{h}\overline{\Delta}$). From our studies, this makes it possible to calculate correlation

factors $r_{h\Delta_I\,h\Delta}$ between the similar indicators of Tables 4–7 to prove the existence or the absence of the relation between them. Calculation results are shown in Table 8, the analysis of which makes it possible to draw the following conclusions. Out of the four indicators that were explored for verification of matching of the results obtained based on the developed method, and the estimates of importance of the basic indicators, the indicator of the mean value of weighed sum of the overall total ranks of zone I and II $_h\bar{\Delta}.$ has its highest value at the least variation. This proves the correctness of its selection as the main component of the heuristic formula of calculation of the coefficient of compatibility of a project team according to the criterion of SWB.

Table 3.11 - Statistical characteristics for coefficients of correlation between the indicators of estimates of importance, obtained using the developed method and based on judgments of team members as experts

Statistical characteristics	Indicators for evaluation of the importance of basic indicators of SWB			
	$_h\Delta_I$	$_h\Delta_{II}$	$_h\Delta_I + {}_k\Delta_{II}$	$_h\bar{\Delta}$
Minimum value	0.503	−0.862	−0.977	0.584
Maximum value	0.981	0.997	0.968	0.978
Mean value	0.737	0.472	0.463	0.824
Standard deviation	0.172	0.617	0.708	0.128
Median	0.767	0.734	0.781	0.852
Power of relation for mean value by Chaddock scale	High, closer to mean	Mean	Mean	High, closer to very high

Source: developed by author

Insignificant deviations from of medians from mean values is observed for the generalized total rank zone I $_h\Delta_I$ and the weighted sum of the overall total ranks $_h\bar{\Delta}.$. This indicates that five most important indicators of a candidate are determining for the coefficient of compatibility of a project team.

The higher and more stable values of statistical characteristics for $_h\bar{\Delta}$ in comparison with $_h\Delta$ prove the necessity of taking into consideration indicators of zone II when determining $\bar{K}_{swb}$.

It should be noted that the time lag in assessing the importance of indicators of SWB decreases the magnitude of correlation factors. This is due to the natural process of forgetting details that are fresh in memory immediately after the completion of projects. However, at the same time, the validity of residual information is retained. The external observation of the work of project teams showed high coherence of team 2. They have obtained better results within the shorter period of time. The team was more productive. Objectively, this fact reflects the number of theoretically possible combinations of teams consisting of two people, which can be formed based on team 2 and which will get to the zone of a rather high compatibility (team 2.1–2.7) and of admissible compatibility (teams 2.3–2.5, 2.6–2.5). For these zones, value $_h\bar{\Delta}$ lies within the range of 28–36 and 36–44, respectively. In addition, for this team, it is also possible to form three teams that fall into the undesirable zone ($_h\bar{\Delta} = 44-52$), but still not to the dangerous zone. For team 1, such combinations are not available. The best theoretically possible team 1.1–1.3 gets to the dangerous zone.

Comparison of the values $_h\bar{\Delta}$ for team 1.1–1.3 and 1.3–1.1 shows that its value depends of the selection of the base of comparison (selection of a project manager). Thus, for team 1.1–1.3 $_h\bar{\Delta} = 56{,}6,$ and for 1.3–1.1 $_h\bar{\Delta} = 55{,}2.$ There are such examples also in team 2. For the theoretically possible team 2.6–2.7 $_h\bar{\Delta} = 45{,}8,$ and for 2.7–2.1 $_h\bar{\Delta} = 43{,}4.$ In this case, the team changed the zone of coherence – it transferred from the undesirable zone to the admissible zone. For given examples, the difference in indicators $_h\bar{\Delta}$ is not very big. However, for the team of members 2.6 and 2.5, a change in the project manager is very significant (for team 2.6–2.5 $_h\bar{\Delta} = 42,$ and for 2.5–2.6 $_h\bar{\Delta} = 60{,}8$). This fact must be taken into consideration when a project manager is appointed.

An analysis of the research results allows us to state that the main advantage of the developed method of the team conFigure uration by the criterion of SWB is its invariance with respect to the activity areas of project teams, their gender, national and other features. The undoubted advantage of this method is the possibility to select a project team from a limited number of applicants with the maximum possible degree of compatibility. In this

case, due to this determining compatibility prior to the beginning of the team work, it is possible to identify its strengths and weaknesses by the criterion of SWB.

As a disadvantage, we should note that the method does not take into account a possible change in the priority of the importance of indicators of social well-being in team members in the process of the project implementation.

The invariance of the developed method makes it possible to recommend it for the use in the formation of project teams of any classes, types, kinds, and other contextual features.

The proposed method was a logical addition to the methods of project teams formation [115.120.123].

Further improvement of the method and its development is seen in the creation of the computer toolset of its support It is planned to apply the mathematical apparatus for determining the degree of harmony of the state of socio-economic systems (analogue of the entropy method), developed by the authors for the problems of description of management of innovative development of project-oriented enterprises. In addition, it is necessary to explore further the problems of application of the method with more team members and with higher cultural (mental) and other heterogeneity, in projects of different subject area, different levels of complexity, scale, and risk.

To finalize that chapter, **we concluded about following**:

1. At the stage of formation of personal profiles of candidates to the project management team, a distinctive conceptual feature of the proposed method is the application of the method of candidates' self-analysis by ranking the same set of 27 indicators of subjective well-being. This makes it possible to avoid the need to formalize and agree (average) unique rating scales of candidates or to develop the universal knowingly inaccurate scale. The application of this approach provides the necessary accuracy and increases reliability of the obtained information. The representation of the indicators using three systematic quartile models was substantiated. The proposed procedure for formalization of personal profiles of candidates allows making their pair-wise comparison.

2. Pair-wise comparison of candidates' profiles implies the calculation of mean value of the weighted sum of overall total ranks of the indicators of two zones. The first zone

contains five most important indicators of subjective well-being, and the second zone – following by importance seven indicators. One of the compared profiles is selected as the reference profile and sets the priority of the indicators of subjective well-being. The result of comparison of the profiles is the parameter that takes the value of zero at the difference between ranks of less than the assigned magnitude (2 for the first zone, 3 for the second zone). If the difference of ranks exceeds 2 and 3 respectively, the parameter takes the value of the highest rank of the indicators of subjective well-being. Calculated parameters are added together for each zone separately. After this, the mean value of the weighted sum of the overall total ranks of the zones is determined.

3. The results of the pair-wise comparison of personal profiles of candidates are used to calculate the integral indicator – coefficient of coherence of a project team by the criterion of subjective well-being. The heuristic formula was proposed to calculate it. Its main component is the mean value of the weighted sum of overall totals ranks of the first and second zones of indicators of subjective well-being.

4. The most important element of the method for the configuration of a project team is the developed estimation scale of coefficient of coherence of team members in the form of seven interval zones. The scale is constructed based on the generalized empirical results of the pilot social experiment. The coefficient of correlation between the boundaries of the interval zones and experimental data is (−0.99). Each zone corresponds to a different degree of coherence: ideal, high, rather high, admissible, undesirable, dangerous, and unacceptable. At the increase in the number of team members from two to ten, the boundary values of the zones of coherence coefficient decrease by 35–40 %.

5. The experimental validation of the method was carried out during formation of international teams of educational projects. The representatives of seven countries of the African continent participated of the teams consisting of 5 and 7 members. The workability of the method was proved by the high value of correlation between the theoretically calculated values of the coefficient of coherence of the teams and the experimentally derived estimates of coherence of the team participants. At the mean value of correlation factor of 0.824, its standard deviation for 13 teams was 0.128.

CONCLUSIONS

When considering SWB as a factor when forming a project team, what it reflects for a team member and what works for the team as whole; we proposed a system for representing SWB indicators based on a holistic approach which reflected the different aspects of a person in a team and in the project;

-we created a list of indicators 42 in total but found that the most effective diversity that covered all aspects of SWB were less and so we reduced it to 27 indicators of SWB.

- we also suggested the method for the construction of a candidate's personal SWB profile which is based on ranking the proposed SWB indicators.

In order to do this, we first had the candidates rank three quartile models, then ranked the elements within the system models and thirdly ranking the elements within the highest ranked model based on the degree of importance as considered by the candidate.

We proposed the method of configuration of the project team which ignores the compliance of the team's integral characteristics with the ideal requirements, but allows us to find out the most rational configuration by SWB indicators.

To achieve this, we did a pairwise comparison of the SWB profiles by first selecting a base applicants presumably the project manager or the ideal candidate and compare them to all other candidates alternatively. In each comparison, we used the total number of indicators in that zone to calculate the ranking in comparison to the basic candidate. The first zone total rank sum being five (because zone 1 had 5 indicators), zone 2 being 8. The higher values between the two ranks determined the overall rank of the profile provided that the difference between them is 2 and 3 range in zone 1 and 2 respectively, otherwise it was equal to zero. All applicants were made base applicants at one time or the other while all other applicants were made alternate. For each base applicant, combinations of theoretically possible teams with defined number of members were ascertained.

We then calculated the coefficient of coherence as the average normalized value of the weighed sum of total ranks. The team with the highest value of coefficient co-ordination was selected. With that the team had maximum consistency and similarities in indicator characteristics.

When considering the development of the evaluation scale and the method for evaluation of coherence (commonness) of personal profiles of candidates; we proposed a method for the configuration of a project team which ignored the compliance of the team's integral characteristics with the ideal requirements but allowed us to find out the most rational configuration using SWB indicators. In doing this:

-we first estimated the scale of coordination of the members of the project team. We had 32 candidates total and conducted experiments with them, using the results of the experiments which gave us the profile list of each candidate, we took further steps.

- based on the results, we created 288 theoretically possible teams of 2 to 10 people for each of the maximum and minimum values of the coefficient of coherence was determined.

- we determined the limits of the coherence coefficient, within which there were five uniform zones (high, high enough, acceptable, undesirable, dangerous coherence), and beyond them, two zones (ideal and unacceptable coherence), and to assess the level of consistency configured project teams from existing applicants

We carried out experimental verification of the proposed approach. The essence was to establish 27 basic indicators of SWB by a five-point scale. We did this by getting the expert opinion of the candidate during the experiment grading all other team members (5 - very important, 1 - absolutely unimportant).

Using developed methods and expert opinions we obtained statistical characteristics for coefficients of correlation between the indicators of estimates of importance. We then externally observed the work of the project teams (1 and 2). Team 2 showed higher coherence, better and faster productivity. The team was more productive. Objectively, this fact reflects the number of theoretically possible combinations of teams consisting of two people, which can be formed based on team 2 and which will get to the zone of a rather high compatibility (team 2.1–2.7) and of admissible compatibility. As a result, this determining compatibility prior to the beginning of the team work, it is possible to identify its strengths and weaknesses by the criterion of SWB.

REFERENCES

1. Taylor Joe JR.(2008), *Late 20th Century Project Management Improvements*, Retrieved from, https,//joetaylorjr.com/late-20th-century-project-management-improvements/

2. Vizard Timothy, Gareth Rusgys (2014) , *Personal Well-being Survey User Guide, 2013-2014 Dataset*, Retrieved from , https,//www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=12&cad=rja&uact=8&ved=0ahUKEwi16Muul4_WAhUDYpoKHVmYDD4QFghNMAs&url=https%3A%2F%2Fwww.ons.gov.uk%2Fons%2Fguide-method%2Fmethod-quality%2Fspecific%2Fsocial-and-welfare-methodology%2Fsubjective-wellbeing-survey-user-guide%2Fpersonal-well-being-survey-user-guide--2013-2014-dataset.pdf&usg=AFQjCNHT5OUoAhuyCGJaMp3749KBJa-ITw

3. Nickasch Matthew , (2008), *CONSIDERING CONVERGENCE, Network World*, Retrieved from , https,//www.networkworld.com/article/2233334/security/the-new-economy-s-impact-on-project-management.html

4. Kreye, Melanie; Balangalibun, Sarah(2015), *Uncertainty in project phases, A framework for organisational change management*, Technical University of Denmark, Retrieved from , http://orbit.dtu.dk/files/110807142/Uncertainty_in_project_phases.pdf

5. Purna CHANDRA DEY,(2015,) *Why Projects Fail?*, KNOWLEDGE BASE, Retrieved from , http://blog.planningproapp.com/author/purna/page/3/

6. Project Journal, *Why Do Projects Fail?*, (2015), Retrieved from, https,//projectjournal.co.uk/2015/09/25/why-do-projects-fail/5

7. Ósk Sigurðardóttir(2013), Bringing Out the Best, Validating the ICB-3 Behavioural Competence Assessment Survey for the Maturation of the Project Management Profession,University of Reykjavík / MPM – Program / Final Project MPM, Retrieved from , http://skemman.is/stream/get/1946/16293/36544/1/

8. Lynch Jennifer(2015), *Standish Group Chaos Report - Q&A*, Retrieved from , https,//www.infoq..3com/articles/standish-chaos-2015

9. Xiaofeng Song1,a,Yang Cao2,b,Xiaoqian Li, Xiaofeng Song1,a,Yang Cao2,b,Xiaoqian Li, (2013), *The Application of Computer Technology in Project Management,* Applied

Mechanics and Materials Vols. 347-350 pp 362-365, Retrieved from , https,//search.proquest.com/openview/f9ab213ac799ea0b69eb558621a9cad7/1.pdf?pq-origsite=gscholar&cbl=2029177

10. Guidebook of Project & Program Management for Enterprise Innovation(2001) Revision 1. P2M, Project Management Professionals Certification Center (PMCC)

Retrieved from , http://www.pmprofy.com/files/756/p2m.pdf

11. Agile methodology*, Understanding the Agile Methodology,* Retrieved from , http://agilemethodology.org/

12. Layton C. Mark , *Agile Project Management For Dummies*, 2nd Edition, AGILE PROJECT MANAGEMENT FOR DUMMIES CHEAT SHEET, Retrieved from ,http://www.dummies.com/careers/project-management/agile-project-management-for-dummies-cheat-sheet/

13. Fung Kenneth(2014), *What is HAPPINESS? How does it relates to Project Management?*, The HAPPINESS and Project Management / Success Blog, Retrieved from , https,//www.projectmanagement.com/blog-post/11036/What-is-HAPPINESS--How-does-it-relates-to-Project-Management--

14. Lindsay Scott (2014), *Project Management Confidence index*, Retrieved from , https,//www.arraspeople.co.uk/camel-blog/pm-careers-advice/just-28-of-project-managers-are-happy-in-their-current-role/

15. Hart Nelson, Tag, *Happiness at work*, Retrieved from , https,//nelsonhartllc.com/news/tag/happiness-at-work-2/

16. Verwijs Christiaan, Agile Teams, *Don't use happiness metrics, measure Team Morale*, Retrieved from , https,//blog.agilistic.nl/agile-teams-dont-use-happiness-metrics-measure-team-morale/

17. Diener Edward, Happiness, *The Science of SWB* , Retrieved from , http://nobaproject.com/modules/happiness-the-science-of-subjective-well-being

18. Rojas Teresa Del Pilar(2016), *SWB, Your Life, Your Happiness*, Retrieved from , https,//positivepsychologyprogram.com/subjective-well-being/

19. Diener Ed et al, *Subjective well being, Three Decades of Progress,* Retrieved from , http://stat.psych.uiuc.edu/~ediener/Documents/Diener-Suh-Lucas-Smith_1999.pdf

20. Diener Ed et al, *SWB, The science of Happiness and Life Satisfaction*" Retrieved from , https,//greatergood.berkeley.edu/images/application_uploads/Diener-Subjective_Well-Being. pdf http://earchive.tpu.ru/bitstream/11683/35366/1/dx.doi.org-10.1016-j.sbspro.2014.12.479.pdf

21. Mihaela MAN, Constantin TICU, *SWB AND PROFESSIONAL PERFORMANCE*, Retrieved from , http://www.armyacademy.ro/reviste/rev2_2015/Man.pdf

22. Hao Zhang, Jia Tan(2012), *Discuss employee wellbeing in project based organizations from a human resource management perspective*, ISRN LIU-IEI-FIL-A--12/01238--SE, Retrieved from , http://www.diva-portal.org/smash/get/diva2,556592/fulltext01.pdf

23. Diener Ed , Shigehiro Oishi, and Richard E. Lucas, *PERSONALITY, CULTURE, AND SWB, Emotional and Cognitive Evaluations of Life*, http://itari.in/categories/higherpurpose/personality_culture.pdf

24. UKEssays-Essays-Management, *Impact of Organizational Communication on Employee Performance*(2015), Retrieved from , https,//www.ukessays.com/essays/management/impact-of-organizational-communication-on-employee-performance-management-essay.php

25. Ince C. Elliot , R. Blake Jelley Stacey L. MacKinnon, *LEADERSHIP'S, EFFECTS ON EMPLOYEE WELL-BEING,* SYNTHESIZING THE QUALITATIVE EVIDENCE, Retrieved from , http://www.smu.ca/webfiles/C.ElliotInceR.BlakeJelleyStaceyL.MacKinnon.pdf

26. Boyce J. Christopher (September 2009) ,*SWB, An Intersection between Economics and Psychology*, Retrieved from, http://www2.warwick.ac.uk/alumni/services/eportfolios/psrfbb/chris_boyce_thesis_-_corrected.pdf

27. H.H. SHEIKH MOHAMMED BIN RASHID AL MAKTOUM, *Ministry of Happiness Dubai*, Retrieved from , https,//www.happy.ae/en

28. Fortune, *100 Best Companies to Work For - http://fortune.com/best-companies/2016/*

29. Google reviews, Retrieved from, https,//www.glassdoor.co.uk/Reviews/Google-Reviews-E9079.htm

30. *Great place to work*, Retrieved from , http://reviews.greatplacetowork.com/google-inc

31. Baird W. Robert & Co., *Amazing Culture with Amazing People"* Retrieved from , https,//www.glassdoor.co.uk/Reviews/Robert-W-Baird-and-Co-Reviews-E19350.htm

32. Baird, *A great place to work*, Retrieved from , http://reviews.greatplacetowork.com/baird

33. Baird W. Robert & Co. Incorporated, These 15 Companies Know How to Keep Employees Happy, *How they keep employees happy, setting culture "rules*, Retrieved from , http://www.snacknation.com/blog/how-to-keep-employees-happy/

34. Milwaukee (2017,), *Baird Ranks No. 4 on FORTUNE's 2017 100 Best Companies to Work For*, Employee-owned firm's second time among the top 5 companies, Retrieved from , http://www.rwbaird.com/news/baird-ranks-4-on-fortunes-2017-100-best-companies-to-work-for

35. Gore's no-bosses philosophy gives associates room to improve, Best Companies to Work For in Greater China 2014, (2015), Retrieved from, https,//www.cpjobs.com/hk/article/gore%E2%80%99s-no-bosses-philosophy-gives-associates-room-to-improve-best-companies-to-work-for

36. Gore W. L. & Associates, Inc., *Why employees say this is a great place to work,* Retrieved from, http://reviews.greatplacetowork.com/w-l-gore-associates-inc

37. Gore, Our Culture, *About Gore*, Retrieved from , https,//www.gore.com/about/culture

38. Csikszentimihalyi Mihalyi, *9 Dimensions to Flow*, The flow centre, Retrieved from , http://theflowcentre.com/9-dimensions-to-flow/

39. Luthans Fred and Avolio J. Bruce, James B. Avey, Steven M. Norman, *Positive Psychological Capital, Measurement and Relationship with Performance and Satisfaction*, Retrieved from , http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1010&context=leadershipfacpub

40. Liang-Chih Huang et al, *High performance work systems, employee well-being, and job involvement, an empirical study, emerald insight*, Retrieved from ,

http://www.emeraldinsight.com/doi/abs/10.1108/PR-09-2014-0201?mbSc=1&mobileUi=0&fullSc=1&fullSc=1&journalCode=pr

41. Jan-Emmanuel De Neve U Ed Diener,Louis Tay(2013), *The Objective Benefits of SWB*, Retrieved from , http://eureka.sbs.ox.ac.uk/5466/1/SSRN-id2306651.pdf

42. Thomas, Michael et al(2008), *Developing an effective project, planning and team formation combined*,Project Management Journal, Retrieved from , https,//www.pmi.org/learning/library/developing-effective-project-planning-team-building-5580

43. Techbeacon (2015). Lessons from agile, *Happier teams are more productive, so spread the cheer, The Slack Effect*.. Internet source, http://techbeacon.com/lessons-agile-happier-teams-are-more-productive-so-spread-cheer

44. Waters Kelly, (2013) *We don't talk about emotions. We draw them* , Retrieved from , http://www.101ways.com/we-dont-talk-about-emotions-we-draw-them/

45. Mirek Wozniak (2013), *How we work pt. 2, Measurable Happiness*. Retrieved from, http://blog.lunarlogic.io/2013/measurable-happiness/

46. Happiness Metric (2014) – *The Wave of the Future*. Retrieved from , https,//www.scruminc.com/happiness-metric-wave-of-future-2/

47. Crisp's Blog. *The Happiness metric and a few others*. Retrieved from , http://blog.crisp.se/2011/10/19/anderslaestadius/the-happiness-metric-and-a-few-others

48. Waters Kelly. Clever, Agile Leadership, Agile Teams, (2012). Retrieved from, http://www.allaboutagile.com/clever/

49. Project MANAGEMENT.COM, (2016) , *The Five Stages of Project Team Development*, Retrieved from , https,//project-management.com/the-five-stages-of-project-team-development/

50. Villanova University (2012), *Risk, Monitoring and controlling Process groups*, Retrieved from , https://www.villanovau.com/resources/project-management/pmbok-monitoring-controlling-process-group/#.WbDvVbIjHIU

51. Abudi Gina,(2010,) *THE FIVE STAGES OF TEAM DEVELOPMENT,* A CASE STUDY, Retrieved from , https,//www.projectsmart.co.uk/the-five-stages-of-team-development-a-case-study.php

52. Velopi (2011), *The Stages of Project Team Development*, Retrieved from , http://www.velopi.com/news/the-stages-of-project-team-development-

53. Huether Derek (2010), *Team Building Techniques – 5 Stages,* Retrieved from, http://www.derekhuether.com/2010/06/02/team-building-techniques-5-stages/

54. Safari*,* 9.2 *Acquire Project Team, Retrieved from* , https,//www.safaribooksonline.com/library/view/a-guide-to/9781935589679/sub9.2.xhtml

55. Winston Beth, *How to Pick Project Team Members*, Chron.com, Retrieved from , http://smallbusiness.chron.com/pick-project-team-members-42562.html

56. Ta'Rikah Jones (2014), *6 Tips for Choosing Effective Project Team Members*, Retrieved from, https://www.brightwork.com/blog/6-tips-choosing-effective-project-team-members#.WbEBvrIjHIU

57. Mathis Keith (2011), *The 5 Phases of the Vendor Selection Process*, PM Hut, , 5 Phases of the Vendor Selection Process B *THE.PROJECT.MANAGEMENT.HUT*, Retrieved from , https,//pmhut.com/the-5-phases-of-the-vendor-selection-process

58. WAGNER Reinhard, *FORMING PROJECT TEAMS – THE RIGHT MIX IS KEY TO SUCCESS*, BEST PRACTICES FEATURED OPINIONS, IPMA, Retrieved from , http://blog.ipma.world/forming-project-teams-the-right-mix-is-key-to-success/

59. Businessballs.com, *Tuckman forming storming norming performing model*, Retrieved from , http://www.businessballs.com/tuckmanformingstormingnormingperforming.htm

60. Cottmeyer MIKE (2015) , *WHAT IS AN AGILE TEAM AND HOW DO YOU FORM THEM?*,Retrieved from , https,//www.leadingagile.com/2015/02/what-is-an-agile-team-and-how-do-you-form-them/

61. Scaled Agile(2018), *Agile Teams* , Retrieved from , http://www.scaledagileframework.com/agile-teams

62. Rowley Jerome (2013), 5th Edition PMBOK Guide–Chapter 9, *Tuckman's Team Development Model* , Retrieved from , https,//4squareviews.com/2013/06/22/5th-edition-pmbok-guide-chapter-9-tuckmans-team-development-model/

63. Sharon De Mascia, *Identifying the Skills/Attitudes of the Project Team and Selecting the Project Team*, Chapter 1 of Project Psychology, The Project Team, Skills and Attitudes,

Retrieved from , http://www.gpmfirst.com/books/project-psychology/project-team-skills-and-attitudes

64. Jill Nemiro, Beyerlein M. Michael , Lori Bradley , (2015) *The Handbook of High Performance Virtual Teams, A Toolkit for collaborating accross boundaries*, Retrieved from , https,//books.google.co.uk/books?isbn=1119177820

65. RANDY J. LARSEN and MICHAEL EID, *Ed Diener and the Science of Subjective Well-Being*, Retrieved from , http://nobaproject.com/modules/happiness-the-science-of-subjective-well-being

66. Rojas Teresa Del Pilar (2016), *Positive psycology program, SWB, Your Life, Your Happiness*, Retrieved from, https,//positivepsychologyprogram.com/subjective-well-being/#subjective-wellbeing-definition

67. Alatartseva Elena, GalinaBarysheva(2015), *Well-being, Subjective and Objective Aspects, Procedia* - Social and Behavioral Sciences, Volume 166, , Pages 36-42, Retrieved from , http://www.sciencedirect.com/science/article/pii/S1877042814066178

68. Diener Ed, *Overview of SWB Scales*, Retrieved from , https,//internal.psychology.illinois.edu/~ediener/scales.html

69. André van Hoorn, A SHORT INTRODUCTION TO SWB, ITS MEASUREMENT, CORRELATES AND POLICY USES, *Is happiness measurable and what do those measures mean for policy?* , Retrieved from , https,//www.oecd.org/site/worldforum06/38331839.pdf

70. Waldron Sam(2010), *Measuring Subjective Wellbeing in the UK Working Paper*, Measuring Subjective Wellbeing in the UK, Retrieved from, http://www.mas.org.uk/uploads/artlib/measuring-subjective-wellbeing-in-the-uk.pdf

71. Dolan Paul, Richard Layard and Robert Metcalfe (2011), *Measuring Subjective Wellbeing for Public Policy*, Recommendations on Measures Special Paper, Retrieved from , http://cep.lse.ac.uk/pubs/download/special/cepsp23.pdf

72. Tinkler Lucy and Stephen Hicks(July 2011), *Measuring SWB*, Retrieved from , Office for National Statistics, Supplementary Paper,

73. WeD,Briefing Paper (2008) *Wellbeing Indicators, Measuring What Matters Most,* Retrieved from, http://www.bath.ac.uk/soc-pol/welldev/research/bp/bp2-08.pdf

74. Watson David et al (1988)*Positive and Negative Affect Schedule, Development and Validation of Brief Measures of Positive and Negative Affect* Retirved from, http://www.skidmore.edu/~hfoley/Handouts/PANAS&SWLS.pdf

75. Dolan Paul, Robert Metcalfe, *The relationship between innovation and subjective wellbeing*, Research Policy, GModel RESPOL-2719, Retrieved from , http://pauldolan.co.uk/wp-content/uploads/2012/06/The-relationship-between-innovation-and-subjective-wellbeing.pdf

76. County of San Bernadino (2009), *Welcome to Human Resources*, Human Resources, Retrieved from, http://www.sbcounty.gov/hr/ClassFaq.aspx

77. Categorize, Retrieved from*,* http://dictionary.reference.com/browse/categorization

78. STS Sauter Training and Simulation S.A.(2012) , Comparing PMBOK® Guide 4th Edition, PMBOK® Guide 5th Edition, and ISO 21500

79. Managing Project Human Resources (PMBOK Guide Fifth Edition), http://quizlet.com/24375642/managing-project-human-resources-pmbok-guide-fifth-edition-flash-cards/

80. EDWARD E. GERALD E. (1992), *A SKILL-BASED APPROACH TO HUMANRESOURCE MANAGEMEN*T

81. Síle Fleming, CPMR Discussion Paper 16 *From Personnel Management to HRM, Key Issues and Challenges*

82. Itziar L. (2014)Mappingignorance , *Mandela was right the foreign language effect*, Retrieved from, http://mappingignorance.org/2014/02/03/mandela-was-right-the-foreign-language-effect/

83. The Free Dictionary by Farlex , *language*, Retrieved from, http://www.thefreedictionary.com/language

84. Motivating Employees Through Performance Incentives, Retrieved from, http://2012books.lardbucket.org/books/an-introduction-to-organizational-behavior-v1.1/s10-05-motivating-employees-through-p.html

85. Rhonda B, (2013), BRIGHT HUB PROJECT MANAGEMENT*,IMPLEMENTING BEST COMMUNICATION PRACTICES WITH YOUR PROJECT TEAM*,

http://www.brighthubpm.com/resource-management/60211-communicating-effectively-with-your-project-team/

86. Dave N. PROJECTSMART.CO.UK, Project Communication, *how to keep your team engaged and informed*, http://www.projectsmart.co.uk/project-communications-how-to-keep-your-team-engaged-and-informed.php

87. Michael S., Business improvement Architects, Optimize Organizational performance, *Use competency assessment to close project management skill gap*, https,//www.bia.ca/articles/UseCompetencyAssessmentstoCloseProjManSkillGaps.htm

88. Gina A. (2009). *Developing a Project Management Best Practice*, Retrieved from, http://www.ginaabudi.com/articles/developing-a-project-management-best-practice/

89. Landon, L. B., Slack, K. J., Barrett, J. D. (2018). *Teamwork and collaboration in long-duration space missions, Going to extremes,* American Psychologist, 73 (4), 563–575. doi, https,//doi.org/10.1037/amp0000260

90. Aretoulis, G. (2018). *Gender Based Perception of Successful Construction of Project Managers' Attributes*. Social Sciences, 7 (7), 112. doi, https,//doi.org/10.3390/socsci7070112

91. Jacobsson, C., Nissling, L., Skar, L., Archer, T. (2017). *The Effect of Teambuilding on Team Development*, A Quasi-Experiment within a Swedish State Authority. Clinical and Experimental Psychology, 03 (03). doi, https,//doi.org/10.4172/2471-2701.1000164

92. Udo, N., Koppensteiner, S. (2004). *What are the core competencies of a successful project manager*? Project Management Institute, PMI® Global Congress. Prague. Retrieved from, https,//www.pmi.org/learning/library/ore-competencies-successful-skill-manager-8426

93. Hassan, M. K., Ilyas, M. A. B. (2016). *Change agility across different cultures*. Project Management Institute, PMI® Global Congress. Barcelona. Retrieved from, https,//www.pmi.org/learning/library/change-agility-different-cultures-10188

94. Sautelle, E., Bowles, T., Hattie, J., Arifin, D. N. (2015). *Personality, resilience, self-regulation and cognitive ability relevant to teacher selection.* Australian Journal of Teacher Education, 40 (4). Retrieved from, https,//ro.ecu.edu.au/cgi/viewcontent.cgi?article=2575&context=ajte

95. Prewett, M. S., Brown, M. I., Goswami, A., Christiansen, N. D. (2016). *Effects of Team Personality Composition on Member Performance, A Multilevel Perspective*. Group & Organization Management, 43 (2), 316–348. doi, https,//doi.org/10.1177/1059601116668633

96. Wu, M., Chen, Y.-H. (2014). *A factor Analysis on Teamwork Performance* -an Empirical Study of Inter-instituted Collaboration. Eurasian Journal of Educational Research, 55, 37–54. doi, https,//doi.org/10.14689/ejer.2014.55.3

97. Mathieu, J. E., Tannenbaum, S. I., Donsbach, J. S., Alliger, G. M. (2013). A *Review and Integration of Team Composition Models*. Journal of Management, 40 (1), 130–160. doi, https,//doi.org/10.1177/014920

98. Wysocki, R. K. (2001). *Building Effective Project Teams.* John Wiley & Sons, 384.

99. Banister-Hazama, D., Moreci, J., England, K. (2012). *Increase project team effectiveness, step-by-step,* PMI Global Congress Proceedings.

100. International Project Management Association (IPMA)(2015), *Individual competence baseline for project, programme and portfolio management* (2015), 431. Retrieved from, http://products.ipma.world/ipma-product/icb/read-icb/

101. World Happiness Report (2017). Retrieved from, http://worldhappiness.report/ed/2017/

102. Cheung, C., Davis, J., Cui, Q. (2017). *Happiness for project managers, framework and empirical analysis*. 33rd Annual Association of Researchers in Construction Management (ARCOM) Conference Proceedings. 2017. Retrieved from, http://pm.umd.edu/wp-content/uploads/2017/09/Happiness-for-project-managers-Framework-and-empirical-analysis-2017-ARCOM-vf-2-FINAL.pdf

103. Schwartz, S. H., Sortheix, F. M. (2018). *Values and subjective well-being*. Handbook of well-being. Salt Lake City, UT, DEF Publishers. Retrieved from, https,//www.nobascholar.com/chapters/51/download.pdf

104. Dzhidaryan, I. (2013). *Psychology of happiness and optimism*. Moscow, Institute of Psychology, Russian Academy of Sciences, 268.6313503014

105. Баранцев Р. Г. Тринитарный критерий целостности // Академия Тринитаризма. М., Эл. № 77–6567. URL: www.trinitas.ru/rus/doc/0226/002a/02260063/htm

106. Баранцев, Р.Г. Тринитарная методология в Синергетике [Электронный ресурс] / Р.Г. Баранцев // Академия Тринитаризма. – М. , Эл. №77-6567, публ.10989. – 09.02.2004. – Режим доступа: www.trinitas.ru/rus/doc/0016/001a/00160064.htm.

107. Saul McLeod. *Symply psychology. Maslow's Hierarchy of Needs.* Retrieved from, http://www.simplypsychology.org/maslow.html.

108. Kanasz Tatiana. *Emotion and Value Perspectives in Sociological Investigation of Happiness*. Retrieved from, http://www.nbpublish.com/library_get_pdf.php?id=25438.

109. Rossoshanskaya, O. V. (2000). *Management model of higher education in modern conditions*. Project Management and Development Production, 2 (2), 123–127

110. Larichev, O. I. (2006).*Verbal analysis of decisions*. Moscow, Science, 181.

111. Rossoshanskaya, O. V. (2000). *Management model of higher education in modern conditions*. Project Management and Development Production, 2 (2), 123–127

112. Rach, V., Osakwe, I. (2017). *Method to Create Personal Profile of the Project Team Candidate by the Criteria of Well-being Based on Ranking Procedures*. International Journal of Innovative Research and Development, 6 (12), 219–232. doi, https,//doi.org/10.24940/ijird/2017/v6/i12/120374-284704

113. Panina N. V. *Technological social research*. Kyiv, Scientific Opinion, 1996. 233 p.

114. Hili Dzh. *Statistics, sociological and marketing research*. Kyiv, DiaSoftUP; St. Petersburg, Peter, 2005. 638 p.

115. Rossoshanskaya, O. V., Biryukov, O. V. (2010). *Forming management team for the project realization per competence approach*. Modification of the production of production, 1 (33), 127–146.

116. Сулім-Тимовті А. О. Оцінка та визначення трудових ресурсів проектно-орієнтованих організацій при плануванні проектів: автореф. дис. ... канд. техн. наук: 05.13.22. Дніпропетровськ. Придніпр. держ. акад. буд-ва та архіт. 2011. 20 с.

117. Бірюков О. В. Контекстна оцінка компетентності команди управління проектом: автореф. дис. ... канд. техн. наук: 05.13.22. Київ. Нац. ун-т буд-ва і архіт. Київ. 2012. 23 с.

118. Сабадош Л. Ю. Методи управління забезпеченням людськими ресурсами проектів та програм за компетентнісним підходом : автореф. дис. ... канд. техн. наук:

05.13.22. Харків. Нац. аерокосм. ун-т ім. М.Є. Жуковського "Харків. авіац. ін-т". 2014. 21 с.

119. Крамський С. О. Моделі та методи формування проектної команди на прикладі екіпажу морського судна: автореф. дис. ... канд. техн. наук: 05.13.22. Одеса. Одес. нац. мор. ун-т. 2014. 20 с.

120. Cherepaha, G. S. (2010). *Product-environmental approach to forming the project team within discipline "dynamic leadership in project management*". Modification of the production of the production, 2, 2 (34), 59–73.

121. Шипулін О. І. Методи планування людських ресурсів проекту на основі функціонального резервування: автореф. дис... канд. техн. наук: 05.13.22. Харків. Нац. аерокосм. ун-т ім. М.Є.Жуковського "Харк. авіац. ін-т". 2009. 19 с.

122. Гордєєва І. О. Формування комплементарної команди для управління ризиками інноваційних проектів: автореф. дис. ... канд. техн. наук: 05.13.22. Київ. Київ. нац. ун-т буд-ва і архіт. 2010. 20 с

123. Філатов А. С. Формування крос-функціональної команди для управління соціальними проектами в швидкозростаючій організації: автореф. дис. ... канд. техн. наук: 05.13.22. Київ. Київ. нац. ун-т буд-ва і архітектури. 2015. 20 с.

124. Харута В. С. Методи та моделі формування команди проекту побудови пасажирських маршрутних систем міст: автореф. дис. ... канд. техн. наук : 05.13.22. Київ. Нац. трансп. ун-т. 2015. 21 с.

125. Косенко Н. В. Моделі та методи формування команди проекту з урахуванням професійних і особистісно-психологічних характеристик: автореф. дис. ... канд. техн. наук : 05.13.22. Харків. Харків. нац. ун-т міськ. госп-ва ім. О.М. Бекетова. 2015. 20 с.

126. Шерстюк О.Д. Моделі та методи компетентнісно-рольового формування команди проекту: автореф. дис. ... канд. техн. наук : 05.13.22. Одеса. Одеський нац. політехн. ун-т. 2017. 21 с.

127. Pantileevs, S. R. (1991). *Self-Relation as an Emotional Evaluation System*. Moscow, Izd-vo MGU, 100.

128. Lysenko, D. E. (2008). *Adaptation of the use case method to support the process of selection and placement of project personnel*. Information processing systems, 1 (68), 20–23.

129. Alatoom, M. (2014). *The method of planning the content of soft projects according to the criterion of the importance of the formed competencies*. Project management that develops Production, 3 (51), 116–129.

130. Rach, V. A. (2014). *Methodological metrics of project management science*. Project Management That Development Production, 3 (51), 18–26.

131. Bushuev, S. D., Morozov, V. V. (2000). *Dynamic leadership in project management*. Kiev, Ukrainian Project Management Association, 312.

132. Burgan, S. C., Burgan, D. S. (2014). *One size does not fit all, Choosing the right project approach.* PMI Global Congress Proceedings, Project Management Institute. Phoenix.

133. PMI Global Standard: A guide to project management Body Of knowledge PMBoK Guide 3th Edition, Retrieved from, http://www.physics.rutgers.edu/~ransome/muse/project/reference/PMBOK3rdEnglish.pdf

134. PMI Global Standard: A guide to project management Body Of knowledge PMBoK Guide 4th Edition, Retrieved from, https://www.works.gov.bh/English/ourstrategy/Project%20Management/Documents/Other%20PM%20Resources/PMBOKGuideFourthEdition_protected.pdf

135. PMI Global Standard: A guide to project management Body Of knowledge PMBoK Guide 5th Edition, Retrieved from, http://dinus.ac.id/repository/docs/ajar/PMBOKGuide_5th_Ed.pdf

136. ICB IPMA competent Baseline version 3.0 Retrieved from, http://miroslawdabrowski.com/downloads/IPMA/IPMA%20-%20ICB%20v3.0.pdf

137. Individual Competence Baselines for Project, Programme and Portfolio Management, IPMA Publications Version 4.0, Retrieved from, http://products.ipma.world/wp-content/uploads/2016/03/IPMA_ICB_4_0_WEB.pdf

ATTACHMENTS

Attachment A

Questionnaire to collect initial data from the project team candidate

The questionnaire contains spaces where the candidate can place numbers in order of their preferences regarding SWB-indicators.

The first step is for the candidate to select most preferred system by marking it as 1, the next in order of preference and the least followed as 3.

System model of fulfillment indicators in psychological context (model A)

This refers to the indicators that represent the psychology of a candidate. How they think, view working and how it affects their mind for example, their ability to experience self-realization, recognition physiology, security as well as their social status within the job and how it affects their psychology

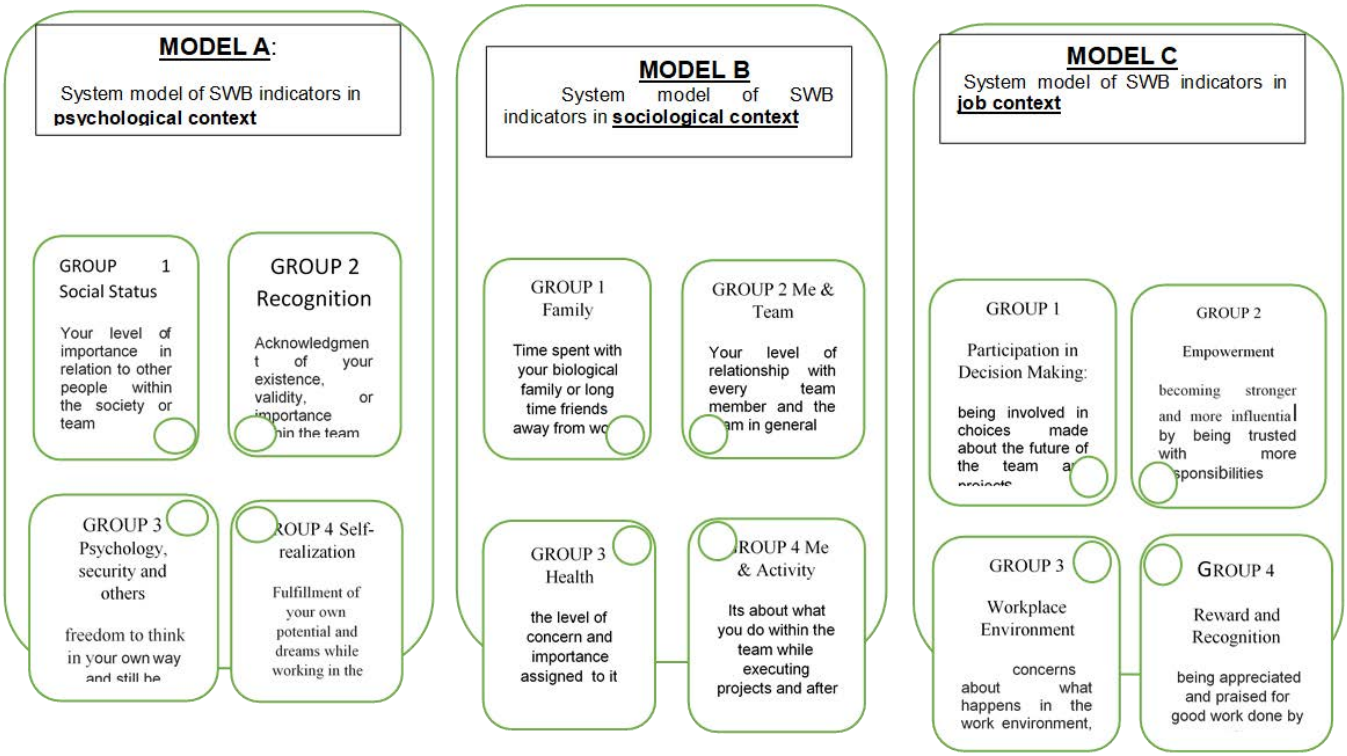
System model of fulfillment indicators in sociological context (model B)

This basic deals with the relationships within the job and the candidate. This could include his family life, team members, his health and other activities. Its all about activities involving the candidate socially.

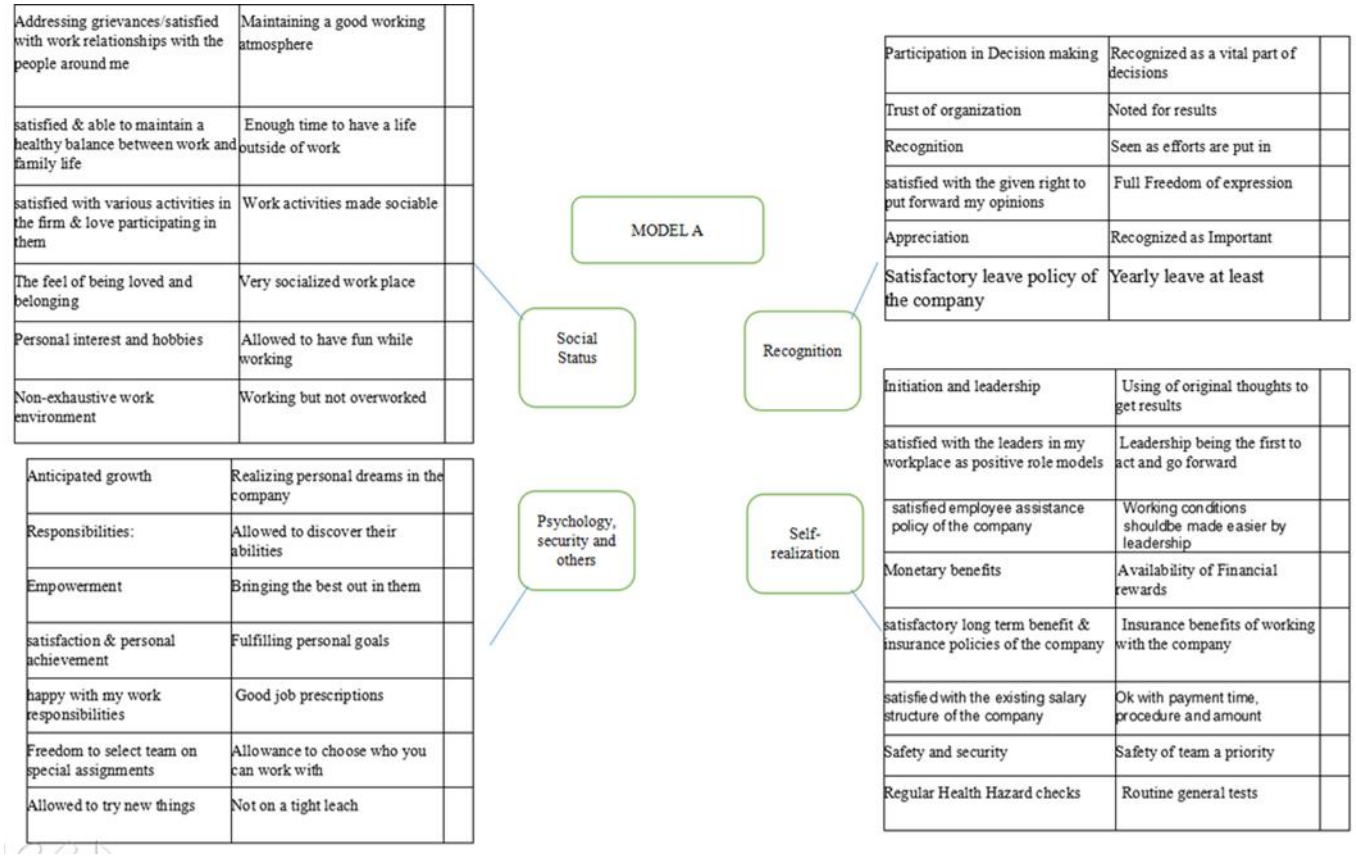
System model of fulfillment indicators in job context(model C)

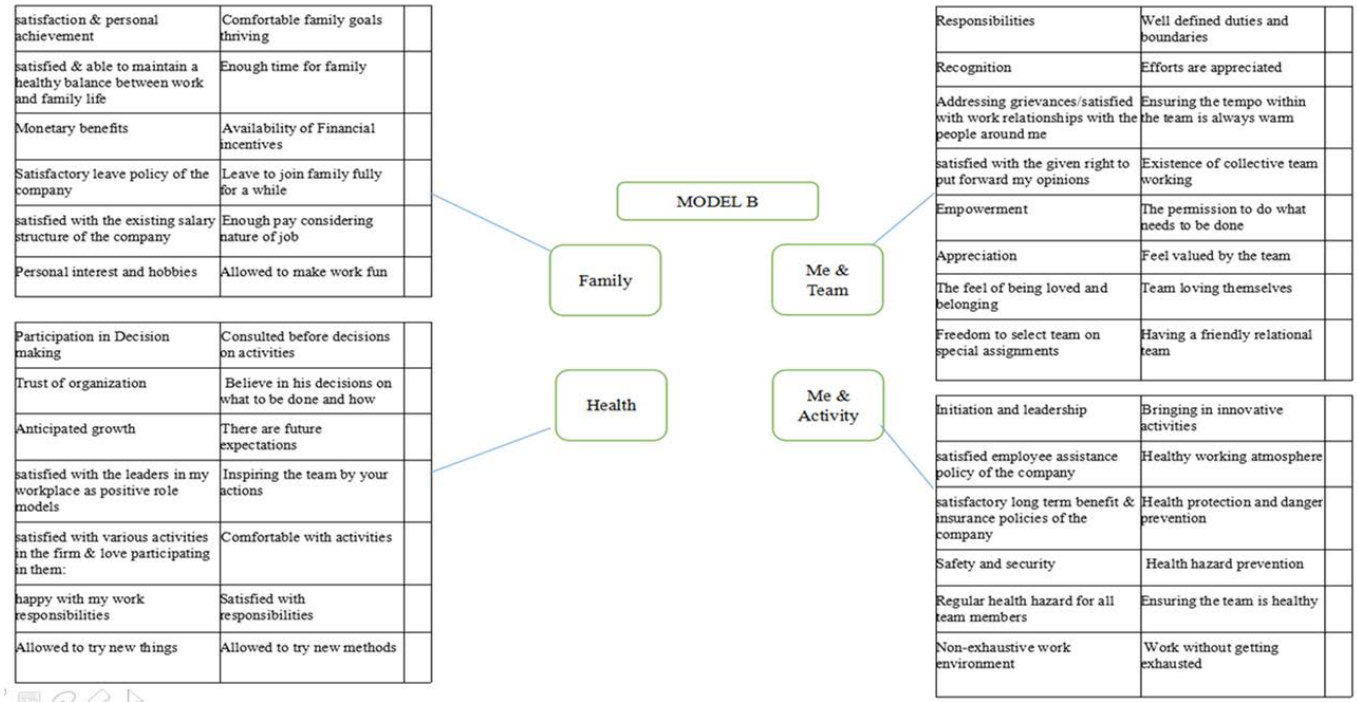
This basically is about the candidate and their job. The events and characters that is brought to the job like participation in decision making, empowerment, work place and its environments as well as rewards and recognition in the working processing. These are indicators that basically involve the job and its environment exclusively.

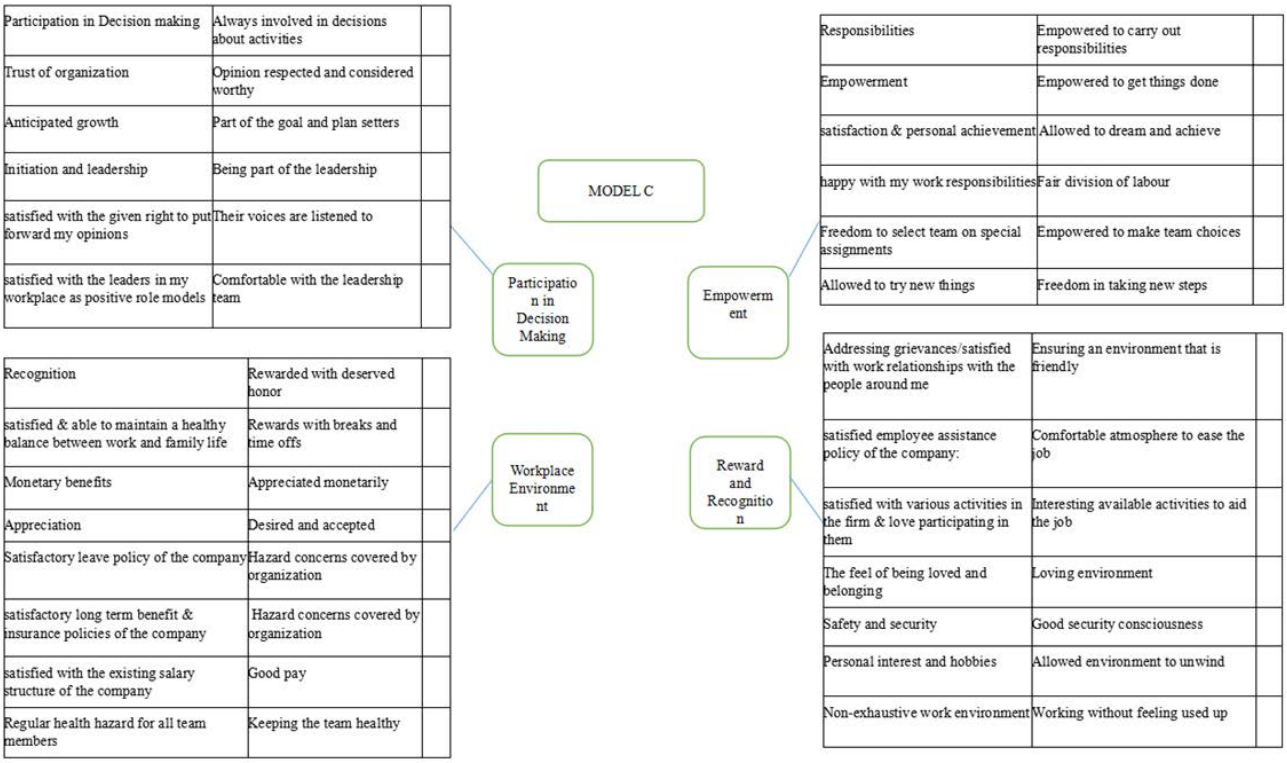
Once this is done the candidate proceeds to doing the same with the groups which were four in number. However, in this case the candidate graded only the groups that were in the most preferred system (number 1).



The final step is about ranking SWB-indicators according to the order of importance where 1 is the most important.






MODEL C
Participation in Decision Making
Empowerment
Workplace Environment
Reward and Recognition
Participation in Decision making
Always involved in decisions about activities
Trust of organization
Opinion respected and considered worthy
Anticipated growth
Part of the goal and plan setters
Initiation and leadership
Being part of the leadership
satisfied with the given right to put forward my opinions
Their voices are listened to
satisfied with the leaders in my workplace as positive role models
Comfortable with the leadership team
Responsibilities
Empowered to carry out responsibilities
Empowerment
Empowered to get things done
satisfaction & personal achievement
Allowed to dream and achieve
happy with my work responsibilities
Fair division of labour
Freedom to select team on special assignments
Empowered to make team choices
Allowed to try new things
Freedom in taking new steps
Recognition
Rewarded with deserved honor
satisfied & able to maintain a healthy balance between work and family life
Rewards with breaks and time offs
Monetary benefits
Appreciated monetarily
Appreciation
Desired and accepted
Satisfactory leave policy of the company
Hazard concerns covered by organization
satisfactory long term benefit & insurance policies of the company
Hazard concerns covered by organization
satisfied with the existing salary structure of the company
Good pay
Regular health hazard for all team members
Keeping the team healthy
Addressing grievances/satisfied with work relationships with the people around me
Ensuring an environment that is friendly
satisfied employee assistance policy of the company:
Comfortable atmosphere to ease the job
satisfied with various activities in the firm & love participating in them
Interesting available activities to aid the job
The feel of being loved and belonging
Loving environment
Safety and security
Good security consciousness
Personal interest and hobbies
Allowed environment to unwind
Non-exhaustive work environment
Working without feeling used up

Attachment B

Grounding the key parameters of the proposed selective method

At this point, we were presented with a problem of how to list the 27 indicators in order of preference knowing that they were scattered among 4groups. This gave birth to the listing indicator K. Using an algorithm on excel, we made K=2, 3 and 4. if K=2 this meant that the first two priorities on the candidates selected group 1 preference will come first before the first priority on group 2 of the candidates selected priority then return to group 1 to take the next priority, after which we move to group 3 then back to one and go on to group 1, 2,3 and then group 4. With this we created a list of three orders K=2, K=3 and K=4.

When we had achieved this, we needed to achieve some deviations in order to understand the standard level of differences between candidates in comparison to all other selected 32 candidates using K=2, K=3 and K=4 as well as varied numbers of indicators N=5, N=13 and N=27. The deviations were 2,3,5; 3,3,3; 3,6,9; 6,6,6; 9,9,9 or 12,12,12.

We worked with all the parameters, for instance K=2, N=5, deviation D=2,3,5; then K=2, N=5, D=3,3,3 and all the others. We experimented results for all the variations D being the deviations in different zones, initially three zones for number of indicators N and K. We did this using a correllaton co-efficient.

Table B.1 - Parameters of correlation of N, K and values of deviation for 54 experiments

		2,3,5	3,3,3	3,6,9	6,6,6	9,9,9	12,12,12
N= 5	K=2	1	2	3	4	5	6
	K=3	19	20	21	22	23	24
	K=4	37	38	39	40	41	42
N=13	K=2	7	8	9	10	11	12
	K=3	25	26	27	28	29	30
	K=4	43	44	45	46	47	48
N=27	K=2	13	14	15	16	17	18
	K=3	31	32	33	34	35	36
	K=4	49	50	51	52	53	54

01 K=2 N=5 2,3,5	5/14/2018 3:23 PM	XLSX Worksheet	90 KB
02 K=2 N=5 3,3,3	5/14/2018 3:24 PM	XLSX Worksheet	90 KB
03 K=2 N=5 3,6,9	5/14/2018 3:25 PM	XLSX Worksheet	90 KB
04 K=2 N=5 6,6,6	5/14/2018 3:25 PM	XLSX Worksheet	90 KB
05 K=2 N=5; 9,9,9	5/14/2018 3:26 PM	XLSX Worksheet	90 KB
06 K=2 N=5; 12,12,12	5/14/2018 3:28 PM	XLSX Worksheet	89 KB
07 K=2 N=13; 2,3,5	5/30/2018 1:51 AM	XLSX Worksheet	93 KB
08 K=2 N=13; 3,3,3	5/14/2018 3:28 PM	XLSX Worksheet	93 KB
09 K=2 N=13; 3,6,9	5/14/2018 3:29 PM	XLSX Worksheet	93 KB
10 K=2 N=13; 6,6,6	5/14/2018 3:30 PM	XLSX Worksheet	93 KB
11 K=2 N=13; 9,9,9	5/14/2018 3:31 PM	XLSX Worksheet	93 KB
12 K=2 N=13; 12,12,12	5/14/2018 3:31 PM	XLSX Worksheet	92 KB
13 K=2 N=27; 3,3,3	5/14/2018 3:32 PM	XLSX Worksheet	96 KB
14 K=2; N=27; 2,3,5	5/14/2018 3:32 PM	XLSX Worksheet	95 KB
15 K=2; N=27; 3,6,9,	5/14/2018 3:33 PM	XLSX Worksheet	96 KB
16 K=2; N=27; 6,6,6	5/14/2018 3:35 PM	XLSX Worksheet	96 KB
17 K=2; N=27; 9,9,9	5/14/2018 3:37 PM	XLSX Worksheet	96 KB
18 K=2; N=27; 12,12,12	5/14/2018 3:37 PM	XLSX Worksheet	95 KB
19 K=3; N=5; 2,3,5	5/14/2018 3:38 PM	XLSX Worksheet	90 KB
20 K=3; N=5; 3,3,3	5/14/2018 3:39 PM	XLSX Worksheet	90 KB
21 K=3; N=5; 3,6,9	5/14/2018 3:40 PM	XLSX Worksheet	90 KB
22 K=3; N=5; 6,6,6	5/14/2018 3:41 PM	XLSX Worksheet	90 KB
23 K=3; N=5; 9,9,9	5/14/2018 3:41 PM	XLSX Worksheet	89 KB
24 K=3; N=5; 12,12,12	5/14/2018 3:41 PM	XLSX Worksheet	89 KB
25 K=3; N=13; 2,3,5	5/14/2018 3:42 PM	XLSX Worksheet	93 KB
26 K=3; N=13; 3,3,3	5/14/2018 3:43 PM	XLSX Worksheet	93 KB
27 K=3; N=13; 3,6,9	5/14/2018 3:43 PM	XLSX Worksheet	93 KB
28 K=3; N=13; 6,6,6	5/14/2018 3:44 PM	XLSX Worksheet	93 KB
29 K=3; N=13; 9,9,9	5/14/2018 3:45 PM	XLSX Worksheet	93 KB
30 K=3; N=13; 12,12,12	5/19/2018 11:49 PM	XLSX Worksheet	92 KB
31 K=3; N=27; 2,3,5	5/20/2018 4:45 PM	XLSX Worksheet	98 KB
32 K=3; N=27; 3,3,3	4/24/2018 11:29 AM	XLSX Worksheet	96 KB
33 K=3; N=27; 3,6,9	4/24/2018 11:29 AM	XLSX Worksheet	96 KB
34 K=3; N=27; 6,6,6	4/24/2018 11:37 AM	XLSX Worksheet	96 KB
35 K=3; N=27; 9,9,9	4/24/2018 11:28 AM	XLSX Worksheet	96 KB
36 K=3; N=27; 12,12,12	4/24/2018 11:28 AM	XLSX Worksheet	95 KB
37 K=4; N=5; 2,3,5	5/4/2018 6:10 PM	XLSX Worksheet	90 KB
38 K=4; N=5; 3,3,3	4/26/2018 10:04 AM	XLSX Worksheet	90 KB
39 K=4; N=5; 3,6,9	4/26/2018 10:06 AM	XLSX Worksheet	90 KB
40 K=4; N=5; 6,6,6	4/26/2018 10:24 AM	XLSX Worksheet	90 KB
41 K=4; N=5; 9,9,9	4/26/2018 2:00 PM	XLSX Worksheet	90 KB
42 K=4; N=5; 12,12,12	4/26/2018 2:15 PM	XLSX Worksheet	89 KB
43 K=4; N=13; 2,3,5	4/25/2018 9:40 PM	XLSX Worksheet	93 KB
44 K=4; N=13; 3,3,3	4/25/2018 10:59 PM	XLSX Worksheet	93 KB
45 K=4; N=13; 3,6,9	4/26/2018 5:36 AM	XLSX Worksheet	93 KB
46 K=4; N=13; 6,6,6	4/26/2018 4:38 AM	XLSX Worksheet	93 KB
47 K=4; N=13; 9,9,9	4/26/2018 4:55 AM	XLSX Worksheet	92 KB
48 K=4; N=13; 12,12,12	4/26/2018 5:11 AM	XLSX Worksheet	92 KB
49 K=4; N=27; 2,3,5	4/24/2018 11:31 AM	XLSX Worksheet	96 KB
50 K=4; N=27; 3,3.3	4/24/2018 11:34 AM	XLSX Worksheet	96 KB
51 K=4; N=27; 3,6,9	4/24/2018 11:37 AM	XLSX Worksheet	96 KB
52 K=4; N=27; 6,6,6	4/24/2018 11:40 AM	XLSX Worksheet	96 KB
53 K=4; N=27; 9,9,9	4/24/2018 11:46 AM	XLSX Worksheet	96 KB
54 K=4; N=27; 12,12,12	4/24/2018 11:47 AM	XLSX Worksheet	96 KB

Figure B. 1 - List of files with experiments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14 K=2; N=27; 2,3,5																
Basic	current															
	Paulus	Alexis	Mahmou	Matthew	Salih Mil	Samuel T	Chris Kar	Mussa G	Awoliyi F	Yakubu A	Bayush N	Julio Patı	Anne	AKWARA	SUNDUS	CHRISTI
1 Paulus	0	346	275	363	356	308	365	305	369	348	180	271	308	214	270	31
2 Alexis	346	0	260	312	272	284	334	276	281	263	424	286	350	337	278	36
3 Mahmoud Sasso	275	260	0	270	359	320	283	332	291	297	350	327	197	270	309	25
4 Matthew	363	312	270	0	321	376	215	269	219	356	362	399	166	286	408	33
5 Salih Milad	356	272	359	321	0	311	364	374	420	304	289	292	250	369	239	35
6 Samuel Toyin oluwanukola	308	284	320	376	311	0	342	309	335	252	293	241	338	280	177	30
7 Chris Kangie	365	334	283	215	364	342	0	299	134	273	351	212	228	318	357	25
8 Mussa Guma	305	276	332	269	374	309	299	0	291	317	305	340	402	357	333	30
9 Awoliyi Peter Oluwagbolahan	369	281	291	291	420	335	134	291	0	352	326	215	183	355	352	23
10 Yakubu Apaji	348	263	297	356	304	252	273	317	352	0	349	330	336	269	326	38
11 Bayush Mamo Dinka	180	424	350	362	289	293	351	305	326	349	0	269	267	255	290	30
12 Julio Patricio	271	286	327	399	292	241	212	340	215	330	269	0	301	351	277	36
13 Anne	308	350	197	166	250	338	228	402	183	336	267	301	0	264	301	25
14 AKWARA OKIEMUTE MICHAEL	214	337	270	286	369	280	318	357	355	269	255	351	264	0	222	23
15 SUNDUS ALSHAHAIM	270	278	309	408	239	177	357	333	352	326	290	277	301	222	0	21
16 CHRISTELLE MPONE	316	362	255	330	358	304	254	304	239	384	307	368	258	233	218	
17 Gali M. Amaud Marius	300	399	420	284	284	305	311	222	318	370	234	340	266	290	311	25
18 Amaiian Joseph Tobiah	197	390	253	355	362	183	332	292	342	297	217	342	282	236	319	20
19 Mohamed Alwami	282	262	238	382	331	306	287	251	286	327	353	366	359	283	280	197
20 Haytham	316	243	327	361	297	245	362	331	321	239	209	314	238	193	203	413
21 DENNIS	206	296	193	269	428	311	251	241	295	315	305	366	287	128	253	278
22 OMOLOBA OLUWATOSIN	357	302	266	281	220	268	309	345	330	303	328	341	252	356	283	260
23 Vandi Sheku Sheriff	330	346	292	295	284	299	153	309	164	274	341	208	271	321	392	256
24 Anastasia Imaah	306	321	305	258	318	342	321	272	272	282	272	255	232	331	273	361
25 Kapeleka	268	247	342	310	288	343	290	347	255	223	300	293	319	231	249	255
26 Mputu Sangamayi Regine	280	178	222	274	309	311	319	255	250	353	362	321	353	309	323	261
27 Banza Ngoy Dorhee	342	298	356	270	256	295	276	347	277	270	354	228	306	220	304	202
28 Moses Henry	246	298	260	340	281	368	248	298	295	269	276	281	281	286	158	333
29 Reta Beamlak	137	234	223	271	370	288	284	255	367	325	306	261	282	186	274	238
30 Wale- Adeyemo	303	256	322	369	293	167	362	318	265	268	333	357	309	289	322	277
31 Med Sheriff	237	307	314	199	284	343	290	260	351	305	300	297	307	279	313	379
32 AGUMBAIDE IDRIS	280	357	271	276	294	378	185	234	308	240	242	232	349	325	342	313

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
	Gali M. A	Amaijan	Mohame	Haytham	DENNIS	OMOLOB	Vandi Sh	Anastasi	Kapeleka	Mputu S	Banza Ng	Moses H	Reta Bea	Wale- Ad	Med She	AGUMBA
1 Paulus	346	300	197	282	316	206	357	330	306	268	280	342	246	303	237	280
2 Alexis	399	390	262	243	296	302	346	321	247	178	298	298	234	256	307	357
3 Mahmoud Sasso	420	253	238	193	193	266	292	305	342	222	356	260	223	322	314	271
4 Matthew	284	355	382	361	269	281	295	258	310	274	270	340	271	369	199	276
5 Salih Milad	284	362	331	297	428	220	284	318	288	309	256	281	370	293	284	294
6 Samuel Toyin oluwanukola	305	183	306	245	311	268	299	342	343	311	295	368	288	167	343	378
7 Chris Kangie	311	332	287	362	251	309	153	321	290	319	276	248	284	362	290	185
8 Mussa Guma	222	292	251	331	241	345	309	272	347	255	347	298	255	318	260	234
9 Awoliyi Peter Oluwagbolahan	318	342	286	321	295	330	164	272	255	250	277	250	367	265	351	308
10 Yakubu Apaji	370	297	327	239	315	303	274	282	223	353	270	269	325	268	305	240
11 Bayush Mamo Dinka	234	217	353	209	305	328	341	272	300	362	354	276	306	333	300	242
12 Julio Patricio	340	342	366	314	366	341	208	255	293	321	228	281	261	357	297	232
13 Anne	266	282	359	238	287	252	271	232	319	353	306	281	282	309	307	349
14 AKWARA OKIEMUTE MICHAEL	290	236	283	193	128	356	321	331	231	309	220	286	186	289	279	325
15 SUNDUS ALSHAHAIM	311	319	280	203	253	283	392	273	249	323	304	274	274	322	313	342
16 CHRISTELLE MPONE	253	209	197	413	278	260	256	361	255	261	202	333	238	277	379	313
17 Gali M. Amaud Marius	0	267	136	309	264	278	188	224	343	342	263	313	360	334	141	348
18 Amaiian Joseph Tobiah	267	0	222	276	251	326	259	339	262	333	305	360	252	221	289	348
19 Mohamed Alwami	136	222	0	297	304	313	242	326	309	295	267	298	285	264	277	339
20 Haytham	309	276	297	0	243	441	413	220	221	360	251	313	391	192	359	319
21 DENNIS	264	251	304	243	0	380	258	285	200	258	268	289	250	260	302	229
22 OMOLOBA OLUWATOSIN	278	326	313	441	380	0	275	324	299	276	232	281	339	349	219	371
23 Vandi Sheku Sheriff	188	259	242	413	258	275	0	342	263	269	281	252	279	307	231	280
24 Anastasia Imaah	224	339	326	220	285	324	342	0	297	202	333	268	320	364	277	185
25 Kapeleka	343	262	309	221	200	299	263	297	0	282	197	220	250	157	297	291
26 Mputu Sangamayi Regine	342	333	295	360	258	276	269	202	282	0	296	219	229	314	379	308
27 Banza Ngoy Dorhee	263	305	267	251	268	232	281	333	197	296	0	345	263	273	304	314
28 Moses Henry	313	360	298	313	289	281	252	268	220	219	345	0	269	368	327	251
29 Reta Beamlak	360	252	285	391	250	339	279	320	250	229	263	269	0	385	241	258
30 Wale- Adeyemo	334	221	264	192	260	349	307	364	157	314	273	368	385	0	379	348
31 Med Sheriff	141	289	277	359	302	219	231	277	297	379	304	327	241	379	0	327
32 AGUMBAIDE IDRIS	348	348	339	319	229	371	280	185	291	308	314	251	258	348	327	0

Figure B.2 - Example of Experiment 14

Based on this, we did come correlations. We correlated the numbers so as to understand what is workable and what is not.

Take for example the correlation between K=2-3, K=2-4 and K=3-4. This means that K=2 was correlated against K=3 across the whole deviations. Below is the result in tabular form and in graphical form.

Table B.2 - Correlations co-efficients for K=2-3

		2,3,5	3,3,3	3,6,9	6,6,6	9,9,9	12,12,12
K=2-3	N=5	0,9031	0,8759	0,8759	0,8433	0,6780	0,5128
	N=13	0,9438	0,9473	0,8758	0,8868	0,8883	0,8319
	N=27	0,8848	0,7481	0,8558	0,8545	0,8550	0,7634

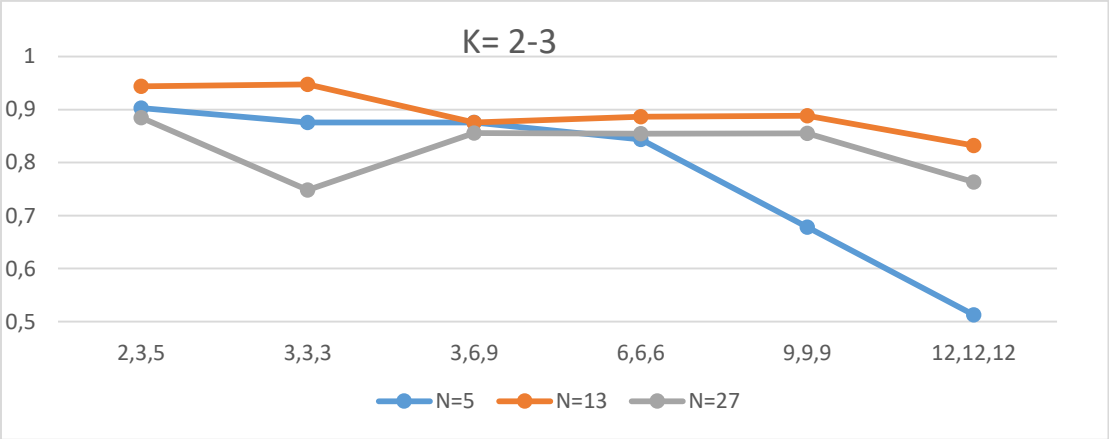


Figure B.3 - Graph of the correlation coefficient for K=2-3

Table B.3 - Correlations co-efficients for K=2-4

K= 2-4		2,3,5	3,3,3	3,6,9	6,6,6	9,9,9	12,12,12
	N=5	0,9031	0,8759	0,8759	0,8433	0,6780	0,5128
	N=13	0,9213	0,9223	0,9088	0,9262	0,8864	0,8183
	N=27	0,9022	0,7801	0,8241	0,8599	0,7871	0,6855

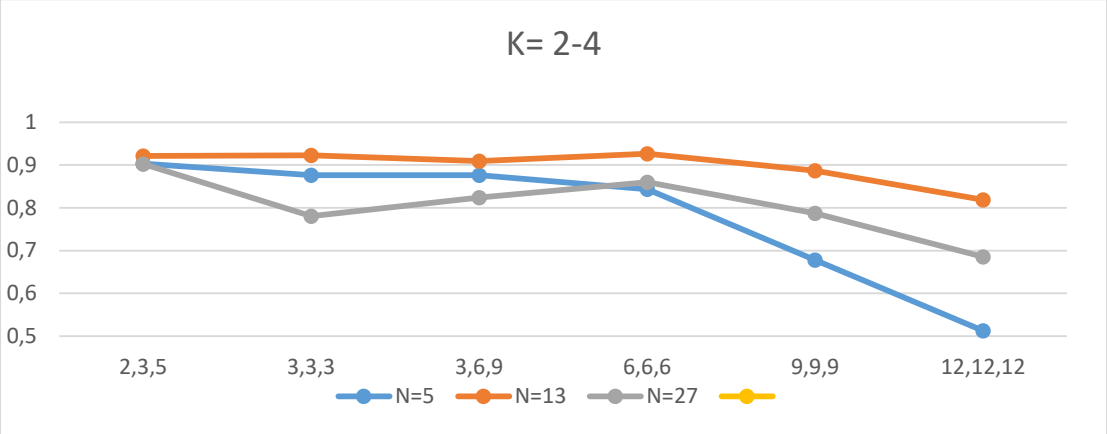


Figure B.4 - Graph of the correlation coefficient for K=2-4

Table B.4 - Correlations co-efficients for K=3-4

K= 3-4		1	2	3	4	5	6
	N=5	1	1	1	1	1	1
	N=13	0,9458	0,9458	0,9021	0,8992	0,8691	0,7684
	N=27	0,9393	0,9506	0,9199	0,9117	0,9122	0,7555

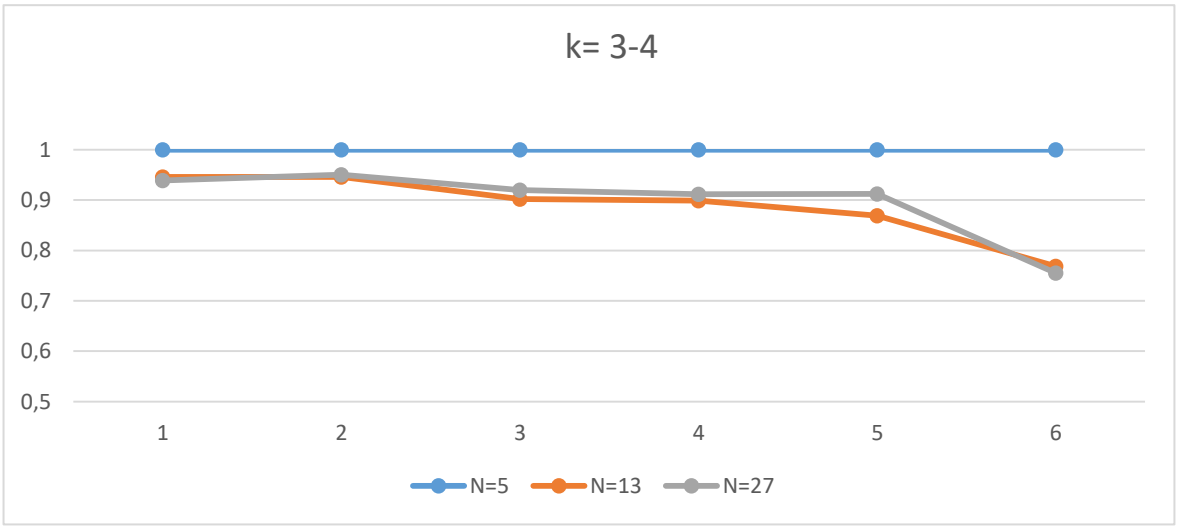


Figure B.5 - Graph of the correlation coefficient for K=3-4

However, in a bid to get the best deviation and the best number of indicators, we had to separate them. For example, K=2 and N=5 gave below and subsequent variants with their results follow

Table B.5 - Correlations co-efficients for K=2, N=5

K=	1-2	1-3	1-4.	1-5.	1-6.	2-3	2-4/	2-5.	2-6.	3-4.	3-5.	3-6.	4-5.	4-6.	5-6.
N=5	0.942	0.942	0.664	0.535	0.311	1.00	0.605	0.481	0.224	0.605	0.481	0.2241	0.779	0.565	0.671

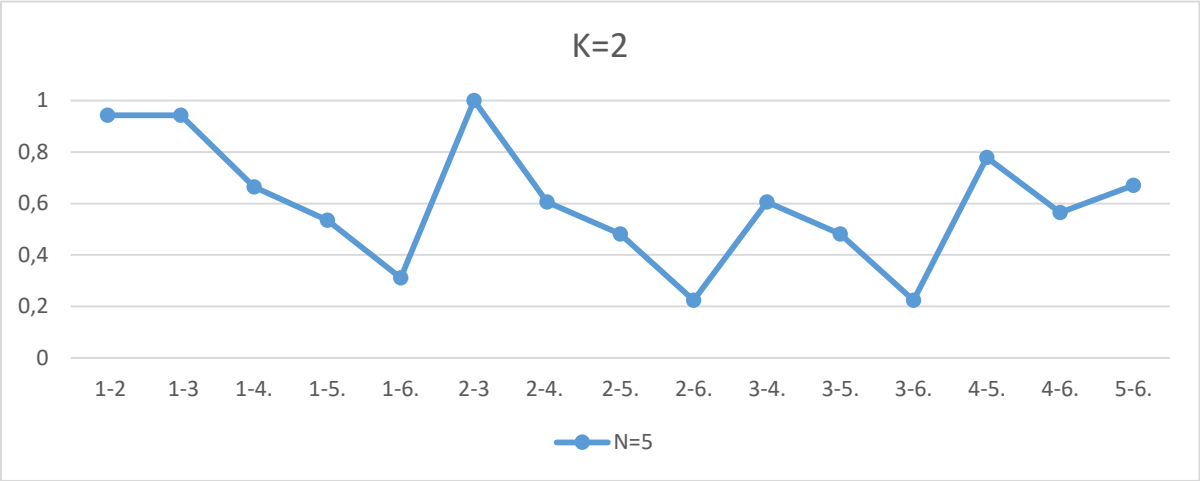


Figure B.6 - Graph of the correlation coefficient for K=2, N=5

Table B.6 - Correlations co-efficients for K=2, N=13

K=2	7-8	7-9	7-10	7-11	7-12	8-9	8-10	8-11	8-12	9-10	9-11	9-12	10-11	10-12	11-12
N=13	0.992	0.890	0.815	0.709	0.552	0.900	0.807	0.713	0.550	0.932	0.829	0.644	0.842	0.567	0.567

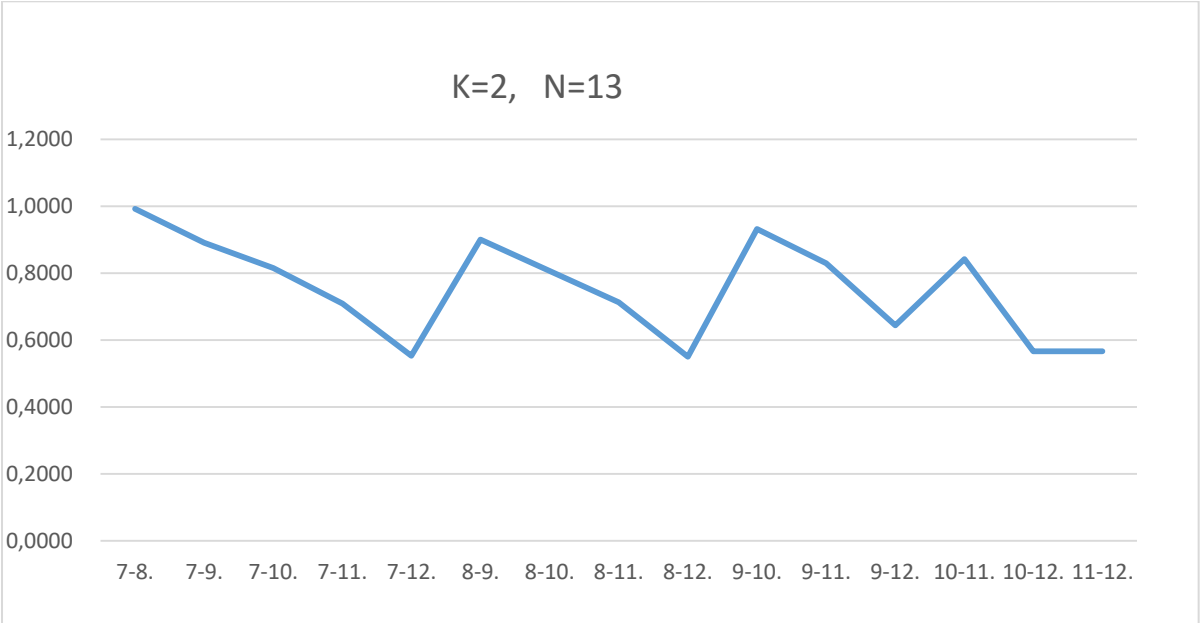


Figure B.7 - Graph of the correlation coefficient for K=2, N=13

Table B.7 - Correlations co-efficients for K=2, N=27

K=2	13-14	13-15	13-17	13-18	14-15	14-16	14-17	14-18	15-16	15-17	15-18	16-17	16-18	17-18
N=27	0.878	0.898	0.841	0.800	0.948	0.945	0.975	0.868	0.948	0.950	0.830	0.912	0.772	0.875

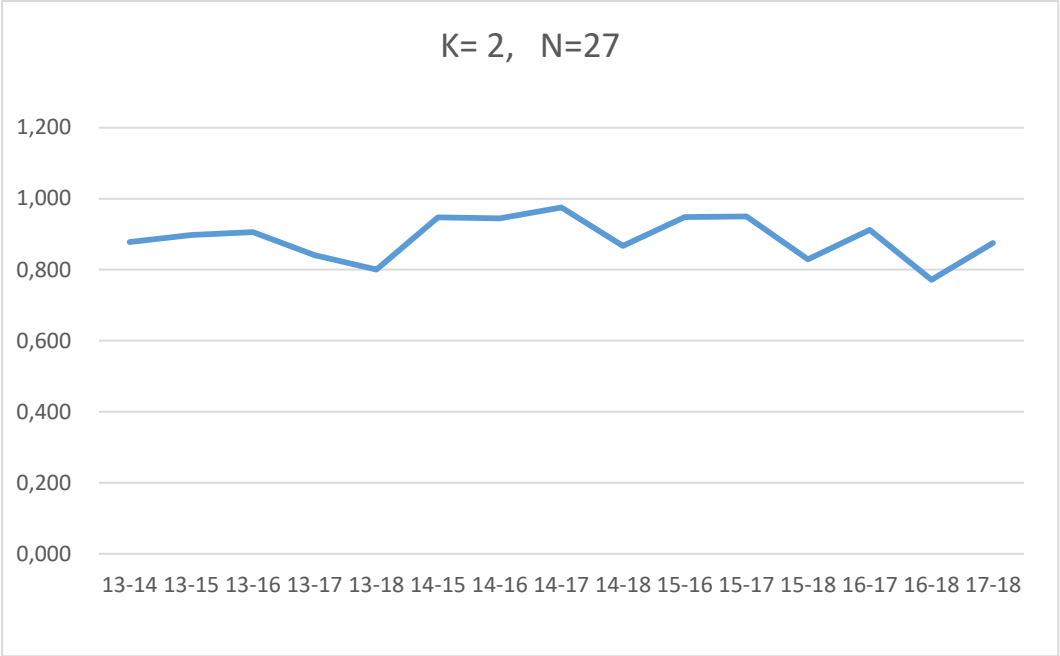


Figure B.8 - Graph of the correlation coefficient for K=2,N=27

Table B.8 - Correlations co-efficients for K=3, N=5

K=3	19-20	19-21	19-22	19-23	19-24	20-21	20-22	20-23	20-24	21-22	21-23	21-24	22-23	22-24	23-24
N=13	0.935	0.935	0.561	0.584	0.317	1.000	0.530	0.580	0.307	0.530	0.580	0.307	0.825	0.616	0.672

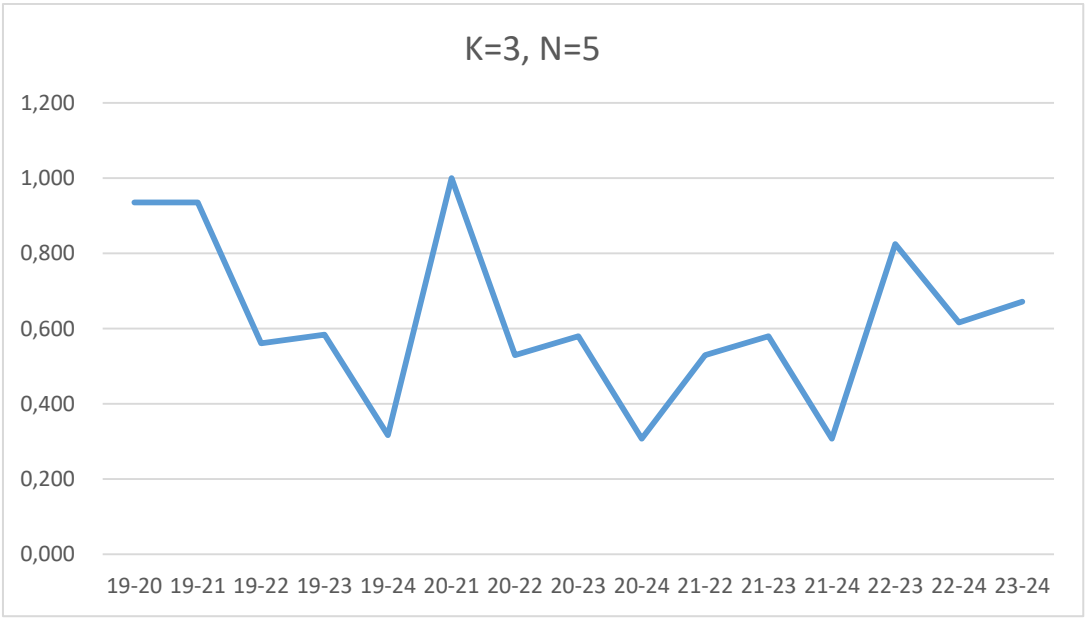


Figure B.9 - Graph of the correlation coefficient for K=3, N=5

Table B.9 - Correlations co-efficients for K=3, N=13

K=3	25-26	25-27	25-28	25-29	25-30	26-27	26-28	26-29	26-30	27-28	27-29	27-30	28-29	28-30	29-30
N=13	0.988	0.899	0.805	0.726	0.590	0.916	0.801	0.736	0.580	0.883	0.799	0.533	0.854	0.543	0.718

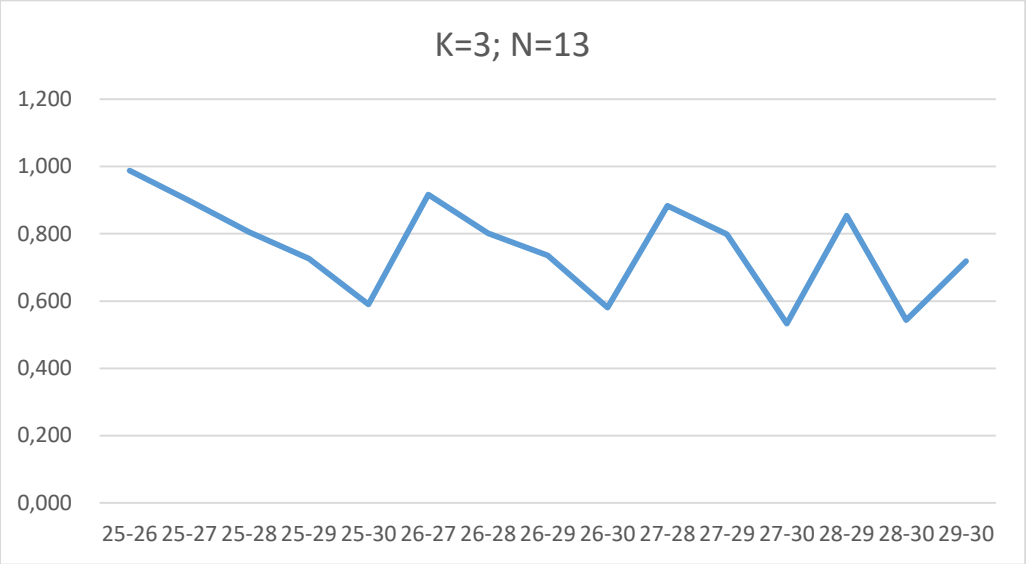


Figure B.10 - Graph of the correlation coefficient for K=3, N=13

Table B.10 - Correlations co-efficients for K=3, N=27

K=3	31-32	31-33	31-34	31-35	31-36	32-33	32-34	32-35	32-36	33-34	33-35	33-36	34-35	34-36	35-36
N=27	0.973	0.973	0.918	0.852	0.743	0.896	0.893	0.863	0.777	0.931	0.933	0.752	0.934	0.712	0.806

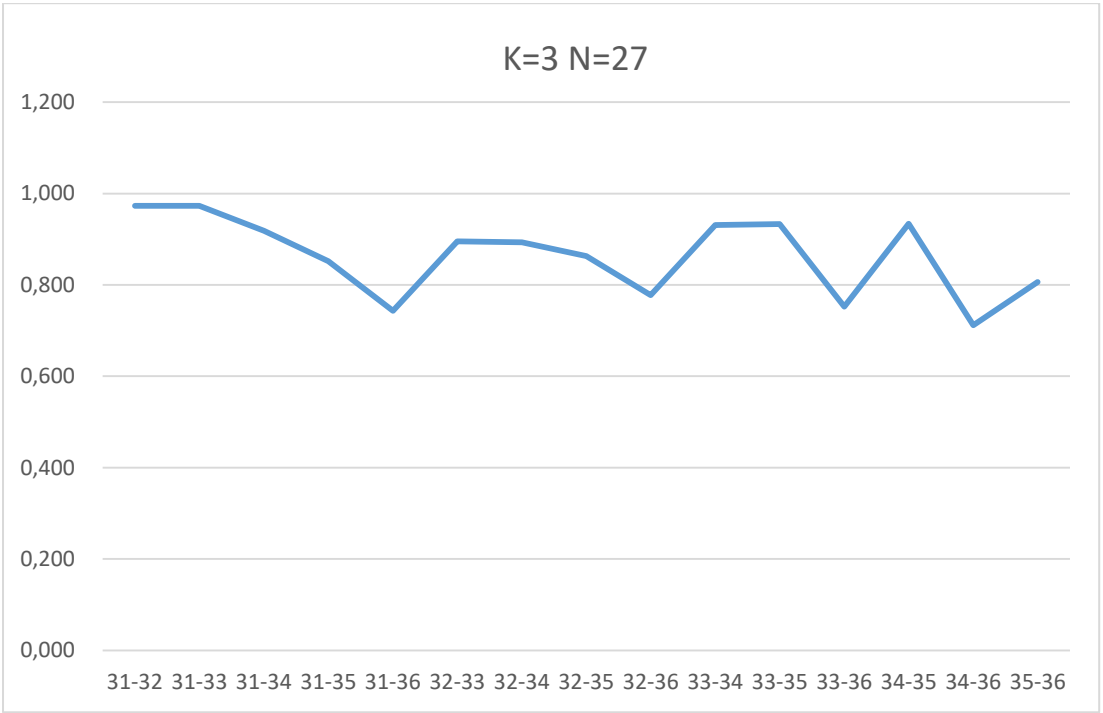


Figure B.11 - Graph of the correlation coefficient for K=3, N=27

Table B.11 - Correlations co-efficients for K=4, N=5

K=4	37-38	37-39	37-40	37-41	37-42	38-39	38-40	38-41	38-42	39-40	39-41	39-42	40-41	41-42
N=5	0.935	0.935	0.561	0.584	0.317	1.000	0.530	0.580	0.307	0.530	0.580	0.307	0.825	0.672

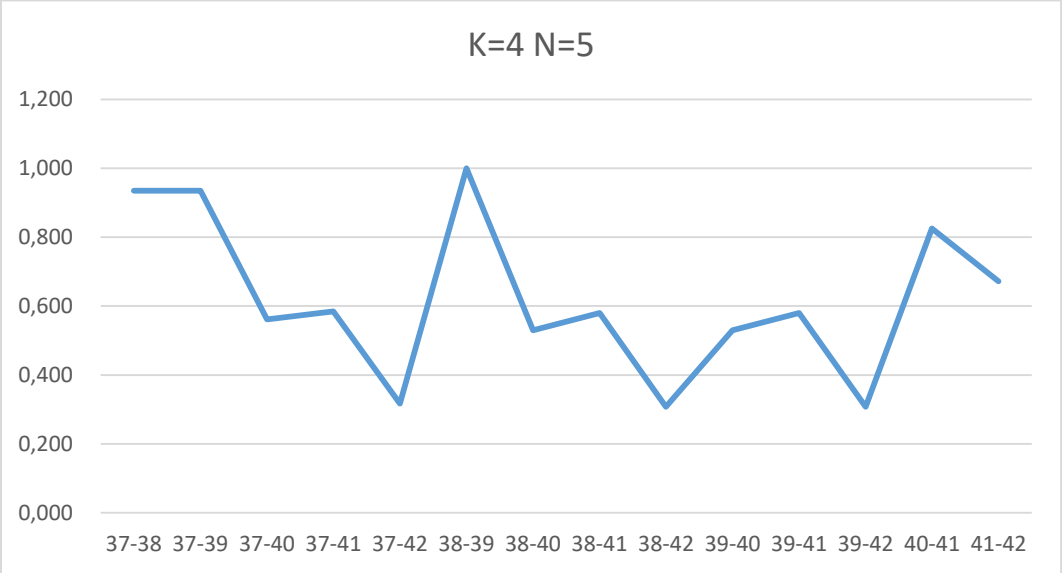


Figure B.12 - Graph of the correlation coefficient for K=4, N=5

Table B.12 - Correlations co-efficients for K=4, N= 13

K=4	43-44	43-45	43-46	43-47	43-48	44-45	44-46	44-47	44-48	45-46	45-47	45-48	46-47	46-48	47-48
N=13	0.987	0.901	0.791	0.769	0.611	0.922	0.791	0.790	0.632	0.883	0.811	0.592	0.831	0.525	0.780

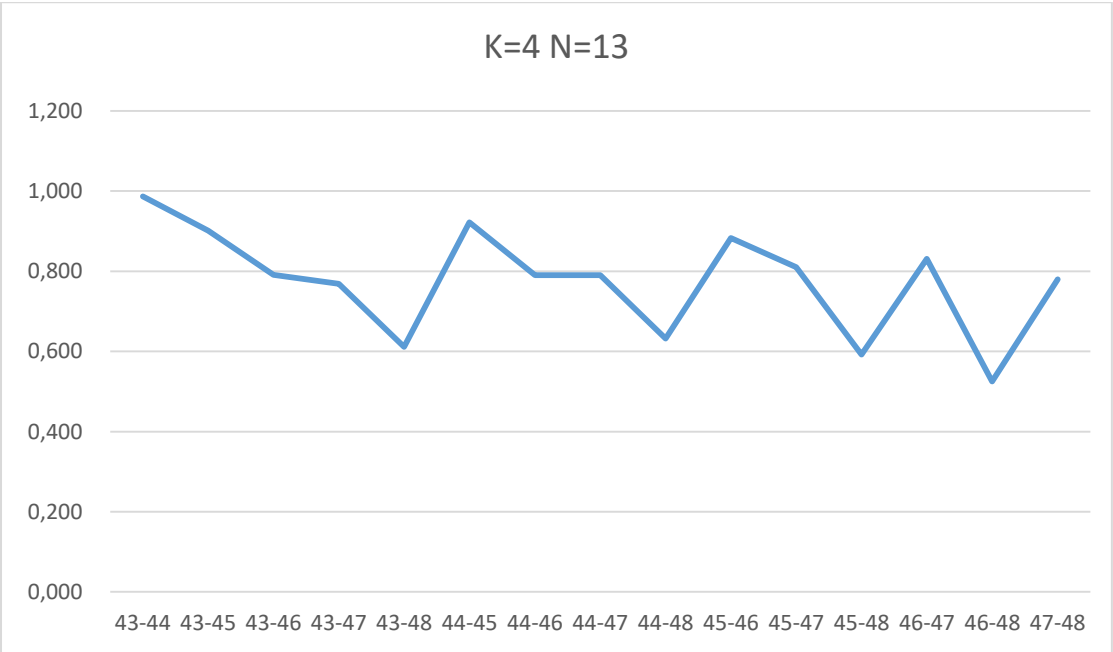


Figure B.13 - Graph of the correlation coefficient for K=4, N=13

Table B.13 - Correlations co-efficients for =4, N=27

K=4	49-50	49-51	49-52	49-53	49-54	50-51	50-52	50-53	50-54	51-52	51-53	51-54	52-53	52-54	53-54
N=27	0.979	0.895	0.927	0.869	0.726	0.920	0.913	0.879	0.760	0.931	0.941	0.796	0.916	0.736	0.837

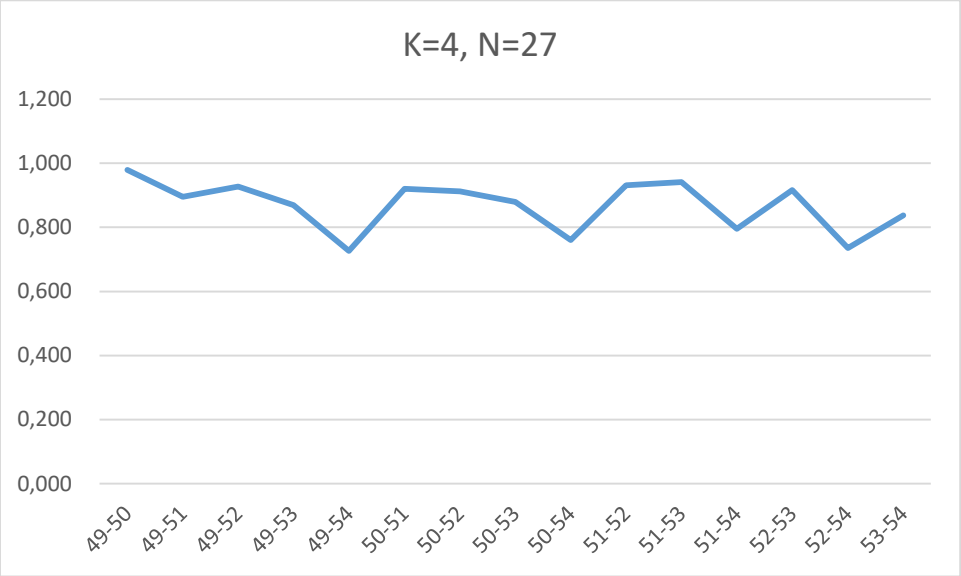


Figure B.14 - Graph of the correlation coefficient for K=4, N=27

From all of the above, it can deduced that N=13 is the best number if indicators for all the candidates. Looking at the graphs above, all N=5 and N=27 had a high level of irregularities but N=13 does not.

Attachment C

Example of calculating of generalized total ranks $_{h}\overline{\Delta}_{\xi m} = {}_{h}\overline{\Delta}_{\xi m} = 0,8 \; 0,8 \sum_{h=1}^{H} \sum_{h=1}^{H} \Delta_{h}$

current				basicS1	14	9	11	17	10	22	23	25	3	7	21	18	20	12	2	4	19	24	15	26	27	1	13	5	6	8	16	current				
1	27		1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	12	-11	12	2	
2	6		2	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	9	-7	9		
3	22		3	11	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	-23	26		
4	19		4	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	18	-14	18		
5	7		5	10	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	-2	7		
6	21		6	22	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	3	
7	10		7	23	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	-3	10		
8	13		8	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	14	-6	14		
9	9		9	3	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	-13	22		
10	23		10	7	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	10		
11	20		11	21	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	11		
12	14		12	18	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	-4	16		
13	2		13	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	11	2	0		
14	25		14	12	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20				
15	26		15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	13			72	0.45
16	18		16	4	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19			89	0.55
17	15		17	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	4			161	
18	17		18	24	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24				
19	4		19	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	17				
20	12		20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	15				
21	5		21	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	1				
22	3		22	1	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23				
23	1		23	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	8				
24	24		24	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	21				
25	16		25	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	2				
26	11		26	8	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27				
27	8		27	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	25				
					12	9	26	18	7	3	10	14	22	5	6	16	11	20	13	19	4	24	17	15	1	23	8	21	2	27	25			161		

Attachment D

Example of variants of $_{h}^{p}\Delta_{j}$ calculation for different amounts of member

				1.3											2.3					
1	1	0	0	0							1	2	0	0	0					
2	19	116	41	75	41	41	75	75	47.8		2	1	144	79	65	79	79	65	65	76.2
3	30	137	58	79	99	49.5	154	77	55		3	30	135	63	72	142	71	137	68.5	70.5
4	14	134	54	80	153	51	234	78	56.4		4	31	169	93	76	235	78.3	213	71	76.9
5	2	161	72	89	225	56.3	323	80.8	61.2		5	10	165	84	81	319	79.8	294	73.5	78.5
6	8	149	56	93	281	56.2	416	83.2	61.6		6	22	189	98	91	417	83.4	385	77	82.1
7	5	181	84	97	365	60.8	513	85.5	65.8		7	20	168	73	95	490	81.7	480	80	81.3
8	12	150	53	97	418	59.7	610	87.1	65.2		8	19	170	73	97	563	80.4	577	82.4	80.8
9	18	144	44	100	462	57.8	710	88.8	64		9	29	192	94	98	657	82.1	675	84.4	82.6
10	20	161	61	100	523	58.1	810	90	64.5		10	26	164	64	100	721	80.1	775	86.1	81.3
				6.3											7.3					
1	6	0	0	0							1	7	0	0	0					
2	20	87	34	53	53	53	53	53	53		2	13	119	67	52	67	67	52	52	64
3	19	105	43	62	96	48	115	57.5	49.9		3	10	102	47	55	114	57	107	53.5	56.3
4	29	126	48	78	144	48	193	64.3	51.3		4	9	90	33	57	147	49	164	54.7	50.1
5	18	126	44	82	188	47	275	68.8	51.4		5	28	106	30	76	177	44.3	240	60	47.4
6	30	133	48	85	236	47.2	360	72	52.2		6	12	106	29	77	206	41.2	317	63.4	45.6
7	15	153	65	88	301	50.2	448	74.7	55.1		7	5	149	68	81	274	45.7	398	66.3	49.8
8	16	158	70	88	371	53	536	76.6	57.7		8	2	189	96	93	370	52.9	491	70.1	56.3
9	24	160	70	90	441	55.1	626	78.3	59.8		9	24	141	43	98	413	51.6	589	73.6	56
10	31	147	55	92	496	55.1	718	79.8	60		10	21	157	56	101	469	52.1	690	76.7	57
				11.3											12.3					
1	11	0	0	0							1	12	0	0	0					
2	12	111	44	67	67	67	67	67	67		2	11	111	48	63	48	48	63	63	51
3	4	120	47	73	114	57	140	70	59.6		3	7	93	21	72	69	34.5	135	67.5	41.1
4	19	165	83	82	197	65.7	222	74	67.3		4	9	109	36	73	105	35	208	69.3	41.9
5	28	133	47	86	244	61	308	77	64.2		5	25	140	67	73	172	43	281	70.3	48.5
6	25	191	104	87	348	69.6	395	79	71.5		6	28	109	36	73	208	41.6	354	70.8	47.4
7	20	125	32	93	380	63.3	488	81.3	66.9		7	6	135	54	81	262	43.7	435	72.5	49.4
8	2	165	71	94	451	64.4	582	83.1	68.2		8	27	150	64	86	326	46.6	521	74.4	52.1
9	27	147	52	95	503	62.9	677	84.6	67.2		9	1	147	60	87	386	48.3	608	76	53.8
10	17	165	69	96	572	63.6	773	85.9	68		10	32	130	41	89	427	47.4	697	77.4	53.4
				16.3											17.3					
1	16	0	0	0							1	17	0	0	0					
2	22	87	43	44	44	44	44	44	44		2	8	84	26	58	26	26	58	58	32.4
3	8	139	67	72	111	55.5	116	58	56		3	29	117	32	85	58	29	143	71.5	37.5
4	29	129	56	73	167	55.7	189	63	57.1		4	19	114	23	91	81	27	234	78	37.2
5	4	129	55	74	222	55.5	263	65.8	57.6		5	4	134	40	94	121	30.3	328	82	40.6
6	3	153	75	78	297	59.4	341	68.2	61.2		6	26	191	97	94	218	43.6	422	84.4	51.8
7	32	148	66	82	363	60.5	423	70.5	62.5		7	18	141	46	95	264	44	517	86.2	52.4
8	27	128	38	90	401	57.3	513	73.3	60.5		8	13	158	60	98	324	46.3	615	87.9	54.6
9	31	134	43	91	444	55.5	604	75.5	59.5		9	21	167	68	99	392	49	714	89.3	57.1
10	24	141	48	93	492	54.7	697	77.4	59.2		10	28	151	47	104	439	48.8	818	90.9	57.2

Attachment E

Initial data to calculate the average of weighted sum of general final ranks for the team 1 based on developed method

	Basic	current				
	K=2 N=5; zone =2, first zone					
	Basic	current				
		Mohamm	Gregory o	Farhan Mu	Gladys	Akanimor
	Mohamm	0	67	49	89	64
			90	87	103	115
			157	136	192	179
	Gregory o	81	0	64	70	62
		99		145	127	91
		180		209	197	153
	Farhan Mu	45	61	0	101	70
		96	141		112	110
		141	202		213	180
	Gladys	94	77	76	0	88
		125	122	120		126
		219	199	196		214
	Akanimor	67	54	89	77	0
		98	97	104	147	
		165	151	193	224	

Attachment F

Initial data to calculate the average of weighted sum of general final ranks for the team 2 based on developed method

	K=2 N=5; zone =2, first zone	1	3	4	5	7	8	9
	Basic	Azegbea Mattl	Paulus	Salih Milad	Mussa Guma	Yakubu Apaji	Awoliyi Peter	Julio Patricio
1	Azegbea Matthew	0	72	90	64	50	42	14
			83	96	37	128	96	118
			155	186	101	178	138	132
3	Paulus	61	0	84	56	82	52	53
		109		97	93	112	118	97
		170		181	149	194	170	150
4	Salih Milad	78	49	0	71	33	41	65
		125	128		150	89	98	104
		203	177		221	122	139	169
5	Mussa Guma	57	44	89	0	85	60	68
		59	118	141		143	112	98
		116	162	230		228	172	166
7	Yakubu Apaji	74	63	43	82	0	58	57
		105	126	111	129		72	83
		179	189	154	211		130	140
8	Awoliyi Peter Oluwagbolahar	38	65	67	55	37	0	42
		106	99	70	120	62		61
		144	164	137	175	99		103
9	Julio Patricio	20	60	75	73	36	36	0
		118	87	116	103	121	73	
		138	147	191	176	157	109	

Attachment G

Example of reflection of the expert opinions as for the importance for the team members of the SWB-indicators for team 1

Candidates/ Indicato	Onwaeze Chidi	Akaninwor Sunny	Raji Abiodun	Mujahid Farhan	Egharevba Gregory	Mwerinde Gladys	Arabi Emmanuel	Park johg Johgsoo	Agboola Remi	Iretor Igho
Participation in Decision making	5	5	5	5	5	5	5	5	5	5
Trust of organization	5	5	5	5	5	5	5	5	5	5
Anticipated growth	4	4	4	5	4	4	4	4	4	4
Responsibilities	4	4	4	5	5	4	4	4	3	4
Recognition	3	4	3	4	3	4	3	3	3	3
Addressing grievances/satisfied with work relationships with the people around me	5	5	5	5	5	4	4	4	3	3
Initiation and leadership	4	4	4	5	5	4	3	4	3	4
satisfied with the given right to put forward my opinions	3	4	4	4	4	4	4	3	3	3
satisfied with the leaders in my workplace as positive role models	4	4	3	4	4	4	3	3	4	3
Empowerment	3	3	4	4	3	3	3	3	3	3
satisfaction & personal achievement	4	4	3	4	3	3	4	4	4	3
satisfied employee assistance policy of the company	2	3	3	3	3	3	3	3	3	2
satisfied & able to maintain a healthy balance between work and family life	3	4	4	4	4	4	4	3	3	2
Monetary benefits	4	3	3	4	4	3	3	4	3	3
Appreciation	3	3	4	3	3	4	3	3	4	3
Satisfactory leave policy of the company	2	4	4	4	4	3	3	4	3	3
satisfactory long term benefit & insurance policies of the company	3	3	4	4	4	3	3	4	3	3
satisfied with the existing salary structure of the company	4	4	4	4	5	4	4	4	4	3
satisfied with various activities in the firm & love participating in them	3	3	2	4	4	3	3	3	3	2
happy with my work responsibilities	3	4	3	5	5	4	4	5	3	4
The feel of being loved and belonging	4	3	3	4	4	4	3	4	3	3
Safety and security	3	3	3	4	4	3	4	3	3	2
Personal interest and hobbies	5	2	3	5	4	4	4	3	4	3
Freedom to select team on special assignments	3	3	3	5	5	4	3	4	4	3
Regular health hazard for all team members	3	2	2	4	4	3	3	3	3	4
Allowed to try new things	2	1	2	4	4	3	3	3	2	3
Non-exhaustive work environment	3	2	3	4	4	4	3	3	2	2
	94	93	94	115	111	100	95	98	90	85

Attachment H

Example of reflection of the expert opinions as for the importance for the team members of the SWB-indicators for team 2

	Candidates /Indicato	Azegbea Matthew	Afolabi Mathew Olutosin	Emmanuel Comfort Omoghele li	Iyambo Paulus Shoopala	Milad Salih Mohamed Saad	Mussa Gumaa Ibrahim Suliman	Tacula Miguel Bernardo	Yakubu Apaji	Omoloye Esther Oluwadur otimi	Obateru Funmilayo Janet	Awoliyi Peter Oluwagbol ahan	Villahute Molohgua Julio Patricio
1	Participation in Decision making	4	4	3	4	3	3	5	5	4	4	4	5
2	Trust of organization	4	3	3	3	4	4	4	4	3	3	4	4
3	Anticipated growth	3	3	4	4	3	3	4	4	3	5	5	4
4	Responsibilities	4	4	3	3	4	3	4	3	4	5	4	4
5	Recognition	4	3	3	4	2	3	5	4	3	4	3	3
6	Addressing grievances/satisfied with work relationships with the people around me	5	4	3	4	3	4	4	5	4	5	3	4
7	Initiation and leadership	4	4	3	4	4	3	4	4	5	3	4	4
8	satisfied with the given right to put forward my opinions	4	3	4	3	4	2	4	5	3	4	5	4
9	satisfied with the leaders in my workplace as positive role models	4	4	3	5	4	2	4	4	3	3	3	5
10	Empowerment	4	4	2	4	3	3	4	5	4	3	3	5
11	satisfaction & personal achievement	4	4	4	3	4	4	5	3	3	4	4	4
12	satisfied employee assistance policy of the company	4	5	3	4	3	3	4	4	4	3	4	4
13	satisfied & able to maintain a healthy balance between work and family life	4	4	3	5	3	4	4	3	3	4	4	5
14	Monetary benefits	4	3	4	4	4	3	3	4	4	3	3	4
15	Appreciation	4	4	3	5	3	4	4	3	3	4	3	4
16	Satisfactory leave policy of the company	4	3	3	4	3	3	4	4	4	4	4	5
17	satisfactory long term benefit & insurance policies of the company	4	4	3	5	4	2	5	5	5	4	4	3
18	satisfied with the existing salary structure of the company	3	4	4	4	3	3	4	4	3	3	4	4
19	satisfied with various activities in the firm & love participating in them	4	3	4	3	3	4	5	4	3	4	3	4
20	happy with my work responsibilities	4	4	3	4	4	4	3	3	4	4	3	4
21	The feel of being loved and belonging	3	3	3	5	4	3	4	3	3	3	3	3
22	Safety and security	3	4	4	4	3	4	5	4	4	4	3	4
23	Personal interest and hobbies	3	4	3	5	4	3	4	3	3	3	4	4
24	Freedom to select team on special assignments	4	3	4	4	3	4	5	3	3	4	4	3
25	Regular health hazard for all team members	4	4	3	5	3	4	4	4	4	4	3	4
26	Allowed to try new things	4	4	3	4	3	4	5	3	3	3	4	5
27	Non-exhaustive work environment	3	3	4	4	3	5	4	4	4	3	3	4

Attachment I

Initial data to calculate the average of weighted sum of general final ranks for the team 1 based on experts opinions

	Basic	current					
		Mohamm	Gregory o	Farhan Mu	Gladys	Akanimor	Sumy
	Mohamm	0	20	20	18	17	
			33	34	28	29	
			53	54	46	46	
	Gregory o	18	0	21	16	14	
		24	0	35	31	21	
		42	0	56	47	35	
	Farhan Mu	21	21	0	19	2	
		29	34	0	26	7	
		50	55	0	45	9	
	Gladys	Mohamm	Egharevba	Mujahid F	Mwerinde	Akaninwor	Sunny
		18	23	23	0	20	
		17	17	17	0	15	
		35	40	40	0	35	
	Akanimor	23	16	24	22	0	
		32	25	32	31	0	
		55	41	56	53	0	

Attachment J

Initial data to calculate the average of weighted sum of general final ranks for the team 2 based on experts opinions

	1	3	4	5	7	8	9
Basic	Azegbea Matt	Paulus	Salih Milad	Mussa Guma	Yakubu Apaji	Awoliyi Peter	Julio Patricio
Azegbea Matthew	0	19	12	16	19	18	16
	0	29	24	21	32	23	24
	0	48	36	37	51	41	40
Paulus	15		15	9	18	16	11
	13	0	23	22	26	26	10
	28	0	38	31	44	42	21
Salih Milad	12	3	0	20	8	9	12
	13	8	0	24	22	18	11
	25	11	0	44	30	27	23
Mussa Guma	8	5	10	0	14	7	1
	13	10	16	0	21	14	14
	21	15	26	0	35	21	15
Yakubu Apaji	19	22	18	18	0	13	21
	30	31	31	28	0	21	34
	49	53	49	46	0	34	55
Awoliyi Peter Oluwagbolahar	7	9	8	8	7	0	15
	18	28	12	17	23	0	22
	25	37	20	25	30	0	34
Julio Patricio	20	20	18	17	19	19	0
	29	34	28	24	31	32	0
	49	54	46	41	50	51	0