

## INVESTIGATING THE EFFECT OF TEAM GROUPING PRINCIPLES ON PROJECT SUCCESS: A CASE STUDY

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### ABSTRACT

Time is money, an expression very often used these days. As we know, deadlines and budgets form a critical part of any project. It is for this reason that the researcher decided to investigate the effect that project team composition has on project success. The reality however is that project teams are formed randomly or by availability of personnel and not with due regard to individual competency and the efficiency of team roles. This often leads to project failure. The research aim was to identify and apply various methods used to compose an optimal project team. One of the factors that influences teamwork within the project team is the behaviour of team members. Dr. R. Meredith Belbin developed a Self Perception Inventory (SPI) which is a tool used to determine the preferred team role for every team member. This SPI was applied to the chosen sample and the outcome, which is a report of the individual's preferred team role, was compared to the actual role these individuals performed in one of their unsuccessful projects. The result of the study showed that when individuals are not applied within their preferred team roles it could have a negative effect on the chances for project success.

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## 1. INTRODUCTION

Time is money, an expression very often used these days. As we know, deadlines and budgets form a critical part of any project. It is for this reason that the researcher decided to investigate the effect that project team composition has on project success.

The problem stated in the study was: Project teams are formed randomly or by availability of personnel and not with due regard to individual competency and the efficiency of team roles which tends to lead to project failure.

To fully understand the above mentioned problem it is necessary to understand what a project is and what factors has an influence on the success of the project. A very important concept to investigate is that of team composition and the importance of team roles on project success.

After a comprehensive literature study was done, it was found that the following methods are currently being used to compose project teams. The following methods were detected:

- Availability of personnel and random composition
- Grouping performers together
- Grouping certain personalities together
- Appointing team members in their preferred team roles

The purpose is now to investigate the impact that appointing team members in a project team according to their preferred team roles have on the successful completion of projects.

### 1.1 Research Questions

#### 1.1.1 *What are team roles?*

“A tendency to behave, contribute and interrelate with others in a particular way.” (<http://www.belbin.com>). Belbin and his team conducted a study which involved observing teams with different compositions. They came to a conclusion that team success depends on behaviour of the member rather than a factor like intellect. The contributions brought forth by the team members were called “Team Roles”.

#### 1.1.2 *Are there any instruments available in the marketplace that can assist in determining the preferred team roles of every team member and can it be utilised in the organisation?*

The researcher went to the literature and found two possibilities.

The first instrument is called the Management Team Roles indicator (MTR-i). [6] This instrument uses personality tests to determine an individual’s preferred team role. The second instrument is called the Belbin Self-Perception Inventory (SPI). The SPI on the other hand determines the behaviour of the team member. Many factors were considered and it was decided that the Belbin SPI will be the preferred instrument. [1]

#### 1.1.3 *What effect will preferred team roles have when composing a project team?*

A list of testimonies is given below to emphasise the effect that preferred team roles have when composing a project team:



- The Globe and Mail is a Canadian newspaper. They discovered the value of the team role principle. On the brink of extinction they had to determine shortfalls and attend to it. 3Circle Partners identified that Team Role Analysis was needed and helped them to compile balanced teams according to every team member's strengths and weaknesses. This new team-based structure helped them to identify and implement a number of major innovations in the newspaper. The Globe and Mail is now viewed as one of the most successful newspapers in North America. [2]
- A certain Real Estate agent was employed by a real Estate Agency. He was placed in a Co-ordinator role. The performance of his team went downwards and the income was very low. He then took the Belbin Team Role training and discovered that his behaviour corresponds with that of a Resource Investigator. He employed a person with strong Co-ordinator skills and he pursued the Resource Investigator route and in a short time became the most successful division in the company. They doubled the profits within six years. [3]
- A certain mid-level consultant in a small consulting firm was frustrated by lack of career progress. He then participated in a Team Role Analysis together with the 3Circle Partners. After understanding the nine team roles of Belbin he realized that he was employed in a position where he had to perform the role of a Shaper (someone who makes things happen and also thrives on pressure). His profile report however showed that he should utilize his talents in the Resource Investigator role (an extroverted person with a lot of contacts, and uses those contacts to find resources for the task at hand). When this consultant corrected the mismatch between the two team roles, he became a partner in a Big 3 consulting firm. [2]

The outline of the remainder of the paper will address the following topics:

- Population and sampling frame
- The instrument used
- Data collection and analysis
- Results
- Conclusions and recommendations

## 2. POPULATION AND SAMPLING FRAME

The chosen population for this study refers to the Condition Assessment Technologies (CAT) section of a case study organisation. This section forms part of the greater Transnet Freight Rail (TFR) where they monitor train and infrastructure conditions such as bearing temperatures on wagons and stresses in the rail. The parameters of the population to be measured are the projects completed and the success thereof.

The researcher chose a specific team (non-random) within the CAT section to analyse the outcome of the project that they were involved in. A sample like the mentioned one is a purposive sample [5].

The chosen team was involved in a project deemed to have failed. The reason why this project was not successful was because it was way behind schedule and not within the set budget. The question to be answered is: would the outcome of the project have been successful if the project team was composed in a different way?

### 3. RESEARCH INSTRUMENT USED

There were two instruments that came to the fore after the literature review had been done. The two instruments are the Management Team Roles indicator (MTR-i) [6] and the Belbin Self-Perception Inventory (SPI). [1]

After investigating the MTR-i instrument, it was discovered that the questionnaire is registered as a personality questionnaire. Only persons which are registered as a psychologist at the South-African Medical and Dental Council may administer and interpret the results of the personality questionnaire.

The Belbin SPI [1], which is not a psychometric test is however available for research purposes at no cost. This means that the person interpreting the inventory does not need to be a registered psychologist. It measures the behaviour of the team members and as a result assigns them their preferred roles within the project team. It is for this reasons that the Belbin SPI will be used as the preferred instrument for collecting the necessary data to present the team members with their preferred team roles.

In order to have complete confidence in the instrument to be used for this study, it is necessary to investigate the reliability and validity of that instrument. The reliability of an instrument refers to the dependability and stableness of the instrument to be used.

Furnam et al. started experiments to prove this point [4]. They calculated from the ipsative and non-ipsative of the SPI the values for the Cronbach's Alpha ( $\alpha$ ), but were not satisfied with the outcome. Since this is not a personality test, they proposed a new formula to be used to better calculate the reliability of the SPI. From this they proved that the reliability for the Belbin SPI is acceptable.

Validity is a measure of the quality of the research instrument to be used.

In a study done by Balderson & Broderick (1996) the conclusion was reached that the Belbin SPI has very high face validity (Fisher; Macrosson; Sharp, 1996).

Team Roles									
Team Role	CF	CO	IMP	ME	PL	RI	SH	SP	TW
Cronbach $\alpha$ (with zeros)	.46	.41	.23	.40	.54	.44	.66	.48	.53
Cronbach $\alpha$ (7 scored items)	<u>.67</u>	<u>.79</u>	<u>.56</u>	<u>.60</u>	<u>.72</u>	<u>.78</u>	<u>.68</u>	<u>.65</u>	<u>.76</u>
n (number of respondents) for $\alpha$ with (7 scored items)	161	133	358	124	86	126	482	84	197

For Cronbach  $\alpha$  with zeros, n = 5003

**Table 1:  $\alpha$  Value, without null entries and using weighted inter-item correlation [4]**

After all of the above were considered it was confirmed that the Belbin Self-Perception Inventory will be used for this study.

### 4. DATA COLLECTION AND ANALYSIS

The researcher utilised Microsoft Excel to put the Self-Perception Inventory (SPI) available in [1] into an electronic format and distributed it via e-mail to all the team members involved in the identified project.

The researcher planned and conducted an interview with the team leader of the chosen project to determine the actual roles that every team member performed. The history of the project, the overall performance of the team members and the progress of the project was also discussed.

It is important to firstly verify that every team member's inventory was completed correctly.

The method applied to analyse the data of the completed SPI's was by means of a program written in Microsoft Excel using the Visual Basic Editor. The answers obtained from the SPI were imported into a calculation table. Every answer is awarded a value. These values are added up and referenced to a set list. It is now possible from this list to determine the preferred team role of every team member. The results of the analysis were given in the form of a report.

## 5. RESULTS

The report obtained from the completed SPI's, contains a list of every team member's preferred team roles. Each team member received his or her own report. A copy was also given to the team leader as an aid to more effectively compose a future project team and this should increase the probability for the team to complete the project successfully.

Team member	Outcome	Role 1	Role 2	Role 3	Role 4
Team member A	SPI	PLT	SH	IMPL	TW
	Interview	CO	M/E	SH	RI
Team member B	SPI	IMPL	C/F	SP	CO
	Interview	M/E	SP	IMPL	C/F
Team member C	SPI	M/E	PLT	RI	C/F
	Interview	CO	SP	M/E	IMPL
Team member D	SPI	PLT	SH	M/E	CO
	Interview	SP	IMPL		

**Table 2: Results obtained from the SPI and the interview concerning the chosen CAT team**

PLT = Plant, CO = Co-ordinator, IMPL = Implementer, M/E = Monitor and Evaluator, SP = Specialist, SH = Shaper, C/F = Completer and Finisher, RI = Resource Investigator, TW = Team Worker

## 6. CONCLUSIONS AND RECOMMENDATIONS

It is evident from Table 2 that the team members from the chosen project were not utilised in their preferred team roles as determined by Belbin's SPI. The researcher drew a conclusion that, should the chosen team for this study have been composed with preferred team roles in mind, the project team could have functioned more optimally and the project might have been a success.

This qualitative study proved the concept of appointing team members in their preferred team roles to be a successful way of improving the success rate of a project. It is recommended that a quantitative study be done to further explore this field. The possibility of predicting project success by using SPI results might also be investigated.

The possibility of higher accuracy and reliability due to adding more questions to the SPI might also be investigated.

## 7. REFERENCES

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