Selection of Ideal Project Managers based on PROMETHEE and the Special Profile of the Decision Maker

The current research is:

- Considering the personal assessment and preferences of the decision maker with emphasis on the gender of the decision maker

- Ranking and identifying the most efficient Project Manager (PM) based on personality attributes

- Implementing PROMETHEE methodology

Selection of Ideal Project Managers based on PROMETHEE and the Special Profile of the Decision Maker

- The paper firstly analyzes PMs and their role, responsibilities and the required personality characteristics and attributes of what is considered a successful PM

- The results of a structured questionnaire survey are highlighted

- The survey evaluated the importance of the project managers' required attributes based on 497 responses from Greek engineers

- Emphasis is provided on the variations in personality scores among male and female decision makers

Selection of Ideal Project Managers based on PROMETHEE and the Special Profile of the Decision Maker

- The survey was carried out via emails and interviews with project engineers

- The results of the independent sample T – test identified the differences among male and female decision makers regarding the required attributes of competent PMs

- Visual PROMETHEE was applied, in an effort to identify and highlight the most effective Project Manager

- The implementation considered the managers' scores regarding specific personality attributes

- Decisions are taken based on the special characteristics of the decision maker

Methodological Approach

- The aim of the current study was to provide a methodology for examining the way that decision makers' preferences influence the ranking of available PMs

- Seven PMs were randomly created to act as case studies

- PROMETHEE is implemented in order to rank the selected PMs based on their personality and the decision makers' profiles

- The proposed methodology relies on the personality traits

- Specific personality traits were used as the selection criteria

Methodological Approach

- These namely included the following seven: Capability of Assigning Responsibilities, Integrity, Ethics, Justice, Methodical, Responsible, Punctuality

- A questionnaire survey among 497 engineers was used to estimate the required weights per criterion (personality trait)

- The weights were estimated as the mean values originating from the questionnaire survey

- The research implemented independent sample T test in order to identify which of the initial 47 criteria have significantly different values among male and female decision makers

- The attributes with the greater statistically significant variations in scores among male and female engineers were identified (7 in number)

- These criteria were used to compare the rankings of PMs based on Visual PROMETHEE

Independent Sample t-Test based on Gender

- An independent-samples *t*-test was conducted to compare the required personality characteristics' scores for project managers assigned by female and male survey-participating engineers

- Mean and standard deviation among male and female respondents per PMs' attributes were calculated

- Levene's test for equality of variances has taken place, in order to choose the appropriate data to interpret, based on the validity of the assumption of equal variances

- The data reveals that there was a statistically significant difference in the scores assigned by male and female engineers

Ranking	Attributes	Minimum	Maximum	Mean
1	Capability of Risk Evaluation	1.00	5.00	4.53
2	Promptness on Solution Provision	1.00	5.00	4.53
3	Collaborative Team Spirit	2.00	5.00	4.51
4	Conflict Management	1.00	5.00	4.49
5	Organizational Skill	1.00	5.00	4.47
6	Communication Skills	1.00	5.00	4.46
7	Scheduling Capability	1.00	5.00	4.45
8	Perception of Time	1.00	5.00	4.43
9	Effectiveness	1.00	5.00	4.43
10	Perception of The Whole Picture	1.00	5.00	4.41
11	Leadership Capabilities	1.00	5.00	4.38
12	Decisiveness	2.00	5.00	4.37
13	Promptness on Decision Making	2.00	5.00	4.37
14	Capability of Predicting	1.00	5.00	4.36
15	Responsible	1.00	5.00	4.35
16	Experience	1.00	5.00	4.32
17	Punctuality	1.00	5.00	4.31
18	Practical Way of Thinking	2.00	5.00	4.31
19	Capability of Considering Alternative Scenarios	1.00	5.00	4.30
20	Capability of Outsourcing	1.00	5.00	4.30
21	Conflict Resolution	1.00	5.00	4.25
22	Methodical	1.00	5.00	4.24
23	Strategic Capability	1.00	5.00	4.22
24	Diligent	1.00	5.00	4.19
25	Flexible	1.00	5.00	4.18
26	Hardworking	1.00	6.00	4.14
27	Capability of Assigning Responsibilities	1.00	11.00	4.13
28	Perception of Scale	1.00	5.00	4.07
29	Respected	1.00	5.00	4.06
30	Dynamic	1.00	5.00	4.06
31	Integrity	1.00	5.00	4.04
32	Persistence	1.00	6.00	4.03
33	Justice	1.00	5.00	4.02
34	Self Confidence	1.00	5.00	3.97
35	Ethics	1.00	5.00	3.97
36	Inventive	1.00	6.00	3.95
37	Self-Control	1.00	5.00	3.88
38	Diplomacy	1.00	5.00	3.86
39	Patient	1.00	5.00	3.83
40	Politeness	1.00	5.00	3.71
41	Commitment	1.00	5.00	3.69
42	Understanding	1.00	5.00	3.62
43	Capable of Psychological Evaluation	1.00	5.00	3.61
44	Social Consciousness	1.00	5.00	3.31
45	Creative	0.00	5.00	3.30
46	Inspiration	0.00	5.00	3.19
47	Friendliness	1.00	5.00	3.17
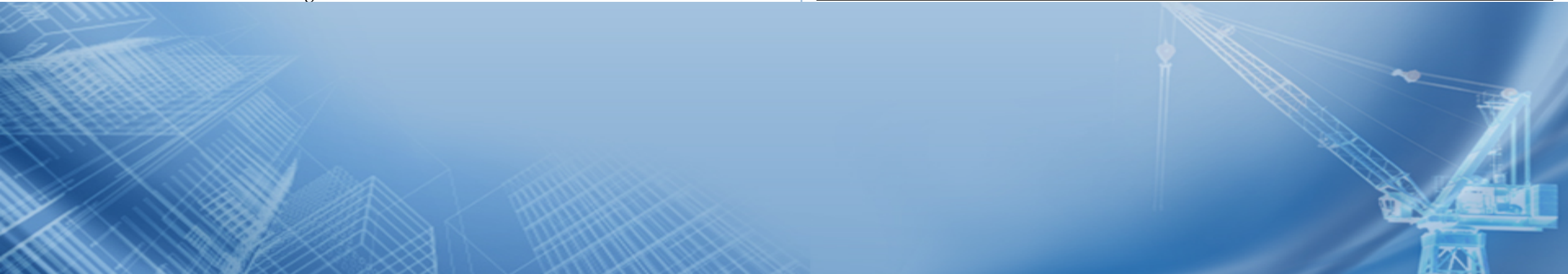
Average Scores per Personality Trait According to Female Engineers

Attribute	Mean Score
Capability of Assigning Responsibilities	4,31
Integrity	4.26
Ethics	4.19
Justice	4.26
Methodical	4.42
Responsible	4.58
Punctuality	4.50

Average Scores per Personality Trait According to Male Engineers

Attribute	Mean Score
Capability of Assigning Responsibilities	4.01
Integrity	3.89
Ethics	3.82
Justice	3.86
Methodical	4.12
Responsible	4.19
Punctuality	4.19

PMs Profiles (Scores per Personality Trait)

	Capability of Assigning Responsibilities	Integrity	Ethics	Justice	Methodical	Responsible	Punctuality
PM1	5	4	3	2	1	2	3
PM2	4	5	4	3	2	1	2
PM3	3	4	5	4	3	2	1
PM4	2	3	4	5	4	3	2
PM5	1	2	3	4	5	4	3
PM6	2	3	4	5	4	3	2
PM7	3	4	5	4	3	2	1

PMs Ranking Based on Net Flow Considering Female Engineers Preferences

	Phi+	Phi-	Phi
PM1	0.4792	0.4255	0.0537
PM7	0.462	0.4438	0.0183
PM6	0.4607	0.4451	0.0156
PM5	0.4527	0.4516	0.001
PM2	0.4479	0.4564	-0.0085
PM4	0.4447	0.4826	-0.0378
PM3	0.4195	0.4618	-0.0423

PMs Ranking Based on Net Flow Considering Male Engineers Preferences

	Phi+	Phi-	Phi
PM1	0.4812	0.4237	0.0576
PM7	0.4643	0.4414	0.0229
PM6	0.4613	0.4444	0.0169
PM5	0.4519	0.4526	-0.0008
PM2	0.4479	0.4567	-0.0088
PM4	0.4421	0.4847	-0.0426
PM3	0.4179	0.463	-0.0452
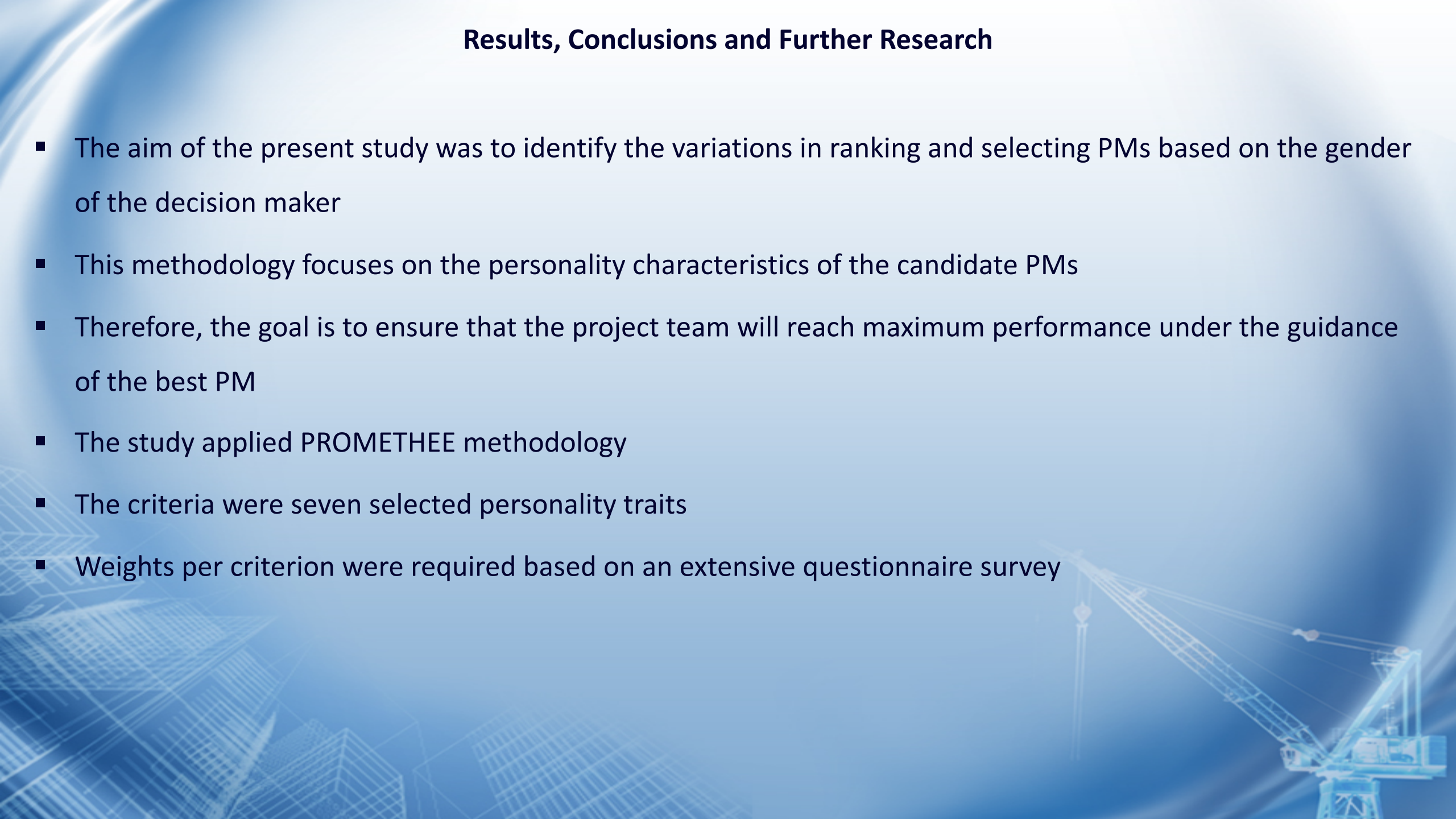
Discussion

▪ The attribute "Responsible" is assigned in both cases the highest score

▪ The attribute "Ethics" receives in both cases the lowest score

▪ The PM_1 is ranked as the best project manager

▪ The PM_1 is the one that scores the higher net / total Phi.

▪ In this case PM_1 had a score of 0.0576, 0.0537 based on the male and female preferences correspondingly

▪ It is interesting to note that the ranking in both male and female engineers remains identical in both male and female engineers – decision makers

▪ Finally, it is worth mentioning that in the case of female engineers four PMs have positive flows whereas in the case of male engineers – decision makers three PMs have positive flows.

Profile of the "Preferred" PM1

	Capability of Assigning Responsibilities	Integrity	Ethics	Justice	Methodical	Responsible	Punctuality
PM1	5	4	3	2	1	2	3
	Very Good	Good	Average	Bad	Very Bad	Bad	Good

Results, Conclusions and Further Research

- The aim of the present study was to identify the variations in ranking and selecting PMs based on the gender of the decision maker

- This methodology focuses on the personality characteristics of the candidate PMs

- Therefore, the goal is to ensure that the project team will reach maximum performance under the guidance of the best PM

- The study applied PROMETHEE methodology

- The criteria were seven selected personality traits

- Weights per criterion were required based on an extensive questionnaire survey

Results, Conclusions and Further Research

- The results of the analysis successfully ranked the available PMs

- The results identified the most promising PM based on the total performance on the seven selected personality traits (PM1)

- This approach relies on the personality of the PM and on the preferences of male and female decision makers without considering his technical skills and knowledge

- Emphasis is placed on the ability of the PM to work inside a project team and cooperate in the best possible way with the project personnel

- This methodology puts priorities on the human capital and collaboration

Results, Conclusions and Further Research

- Finally, it is worth mentioning that the top ranked PM is the one that scores exceptionally well in the "Capability of Assigning Responsibilities" personality trait.

- The focus of the current approach is on the soft skills

- Selecting a PM that is "customized" to the "preferences" of the team would maximize team performance and as a result the project performance would be optimum

- This is an additional benefit for the society, especially in the delivery of public infrastructure projects

Results, Conclusions and Further Research

- A more holistic approach should integrate both the personality characteristics' and technical skills' assessment in the final decision and selection of the most efficient PM

- A limitation of the proposed method is that the traits scores are specifically evaluated for Greek people

- Therefore, application in another country would require a corresponding survey appropriate for the specific country's citizens

- As part of a future research effort, a larger sample of engineers would be the first priority, in the case of assigning scores to the personality traits

- In addition, the analysis could be based on the scores of more criteria (considering all criteria identified through independent T test analysis or all 47)

- This new approach would require more effort

- In the current study, only seven personality traits were used as the selection criteria

- Finally, alternative methodologies and approaches could be examined for evaluating the weights

- This could provide alternative rankings of the PMs but most importantly allow for useful comparisons between methodologies