Exploring Power Distance in Organizations Undergoing Agile Transformations

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ABSTRACT

Power distance is defined as the degree to which members of a society expect and accept the unequal distribution of power among people. In organizations undergoing agile transformation, high power distance can result in restricted communication, reduced collaboration, and resistance to change—factors that can negatively impact software quality. However, identifying latent behaviors associated with this high power distance is not always straightforward. This paper presents how the **I**nstrument for **D**iagnosing **P**ower **D**istance (IDPD) was developed and evaluated in an industrial setting. The research method adopted was Design Science Research (DSR) and followed guidelines for the development of psychometric scales. The IDPD's measurement items are based on manifestations of power distance related to human factors, elements of organizational culture, and process-related aspects identified through a systematic literature review. The instrument was preliminary evaluated by a panel of experts, applied in a case study with two agile organizations, and validated through a survey. The experts considered the IDPD items to be clear, relevant, and adequate for measuring power distance in agile contexts. The case study diagnosis indicated that high power distance had little to no effect on elements of organizational culture and human factors. However, process execution and improvement may be affected by high power distance. The participants considered the results relevant and indicated their intention for future use of the IDPD. The survey preliminarily showed good psychometric indices. Initial evidence suggests that the IDPD can be used to diagnose power distance in agile organizations or organizations undergoing agile transformation.

KEYWORDS

Power Distance, Agile Transformation, Human Factor, Psychometric Scales, Hofstede, National Culture, Agile Software Development

1 Introduction

Agile transformations are related to the transition from traditional software development processes to agile methodologies, impacting all areas of organizations [2]. High power distance can hinder the adoption of agile methodologies, which value collaboration and shared responsibility [13]. Power Distance measures "the degree to which members of a society expect and accept the unequal distribution of power among people." According to Hofstede's findings [8], cultures with a high power distance index (PDI) tend to accept power and autocratic authority centralization. Conversely, cultures with a low PDI prefer more egalitarian and participatory structures.

To assess power distance, Hofstede et al. [8] used a questionnaire on hierarchy, authority, and decision-making to reveal cultural attitudes toward power inequalities. Applying this same instrument to agile teams would only capture participants' acceptance of inequalities, not whether high or low power distance exists in that context. For project managers, this makes it difficult to recognize the presence and impact of high power distance, which can hinder agile practices and transformations. Moreover, high power distance often emerges through subtle behaviors that are not easy to detect.

In this paper, we summarize the research method used to develop the **I**nstrument for **D**iagnostics of **P**ower **D**istance (IDPD) in agile organizations [10]. The IDPD is composed of a psychometric scale that considers manifestations (or symptoms) that indicate the presence of high or low power distance during interactions among members or teams of an organization [11]. This scale is not an index like the one proposed by Hofstede [8], which assesses the acceptance of high power distance by national cultures. The IDPD allows the diagnosis of manifestations of high or low power distance in agile contexts and supports managerial action.

In addition to the introduction, this paper is composed of Section 2, which presents the research method and Section 3, which presents the conclusions.

2 Research Method

The research method was based on Design Science Research (DSR) [7], which is carried out through three iterative cycles: Relevance, Design, and Rigor. The execution of the cycles was supported by three learning iterations [1]. Figure 1 provides an overview.

During the *Relevance Cycle*, the problem and motivation were identified. The inspiration came from a conversation with an expert in agile-at-scale implementations, who highlighted how cultural and organizational differences impact agile teams. He shared an example from his experience in a country where a culture of submission hindered open communication about workload issues.

The *first learning iteration* was executed in this cycle. The results of the systematic literature review [11] allowed us to identify operational definitions of Power Distance, that is, how the construct is manifested. In the end, 15 manifestations, 31 effects and 36 possible treatments for high power distance were identified. Seven manifestations are associated with human factors (M01 – Decision making, M02 – Autonomy, M03 – Collaboration, M06 – Empowerment, M10 – Feedback, M12 – Trust and M14 – Communication), six are associated with elements of organizational culture (M04 – Centralized hierarchical structure, M07 – Lack of transparency, M08 – Management behavior, M09 – Resistance to Sharing Knowledge, M11 – Lack of access to stakeholders and M15 – Leadership style), and two

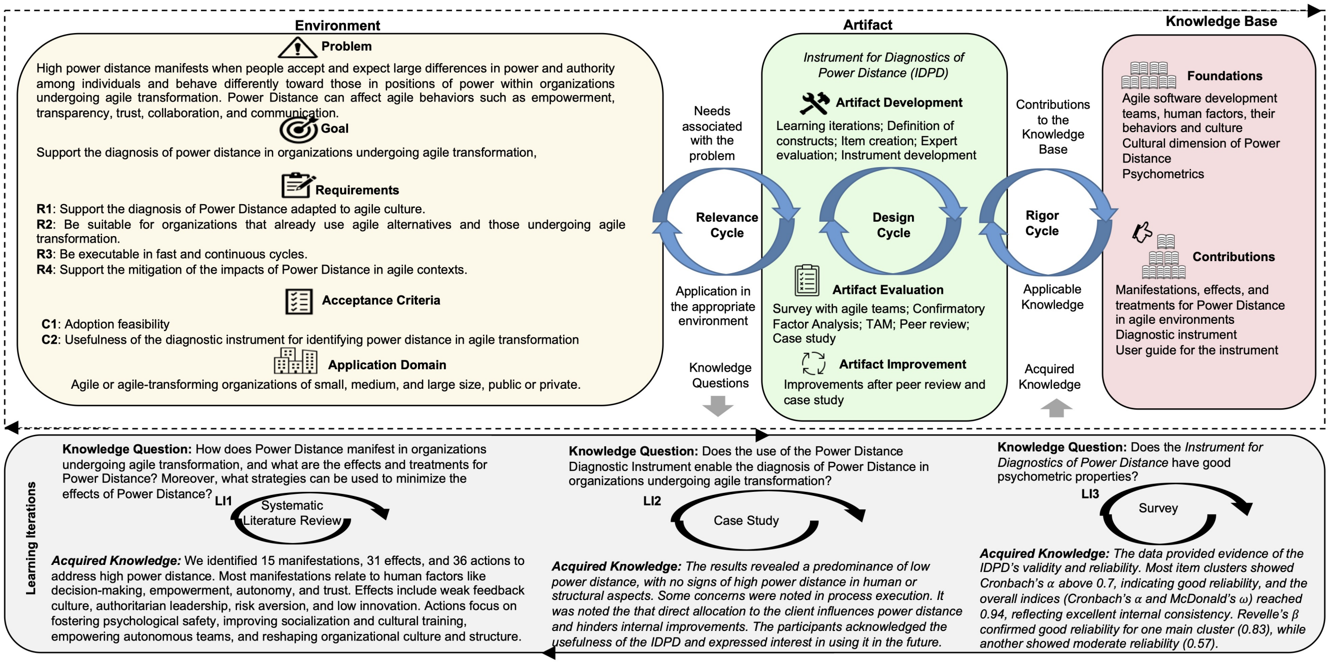

Figure 1: Overview of the Design Science Research cycles in this work – based on [9]

are associated with the execution and improvement of processes by teams (M05 – Software process execution and M13 – Process improvement). Examples of effects include, for example, silence and resilience to discuss failures, the use of indirect communication to avoid open conflicts, and direct feedback and teams with little control over the scope and frequent interruptions caused by operational managers. Examples of treatment include paying special attention to socialization and cultural training when integrating new team members, creating a psychologically safe and trusting environment, and proposing a decentralized hierarchical structure.

During the *Design Cycle*, to achieve the research goal, an *artifact* was developed to diagnose the manifestation of Power Distance in agile organizations, named IDPD (Instrument to Diagnose Power Distance). The design was guided by four requirements and two acceptance criteria, as presented in Figure 1. The IDPD core element is a psychometric scale to measure Power Distance. The psychometric scale development model [3, 6] was followed to create it. The IDPD creation and evaluation process is described in [12].

The IDPD features a questionnaire with items defined for each identified manifestation of Power Distance, with two items assigned to each manifestation. For instance, the items associated with M01 – Decision Making are: IT01 – Decisions within my team are made considering the contributions of members, and IT02 – Leaders and managers do not usually make decisions that are the team's responsibility. The IDPD items were evaluated by a panel of expert judges with experience in agile methods and managing multicultural teams. Reviewers played a role in refining the items, ensuring they were clear and representative of the different manifestation.

The IDPD presents an executive report containing (i) a summary of the manifestations (Figure 2), (ii) a radar graph (Figure 3), (iii) summaries of each item (Figure 4), and (iv) consolidation of answers to two open questions: "How do you perceive the impacts of high Power Distance on your team?" and "What do you think can be done to reduce high Power Distance and its effects on your team?"

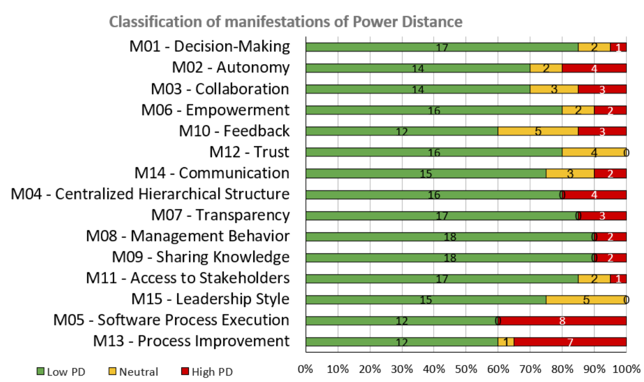

Figure 2: Example summary of responses by manifestation

During the *second learning iteration*, three case studies (one of which is described in [12]) provided evidence that the IDPD was useful for diagnosing Power Distance. The use of the IDPD helped identify points of attention in process execution within teams working on projects with external clients, as well as in institutionally defined processes with limited agile team involvement. Due to the richness of the diagnosis, participants expressed their intention to use the instrument in the future.

During the *third learning iteration* we analyzed data (n = 71) from a survey together with the case study responses [10]. The results

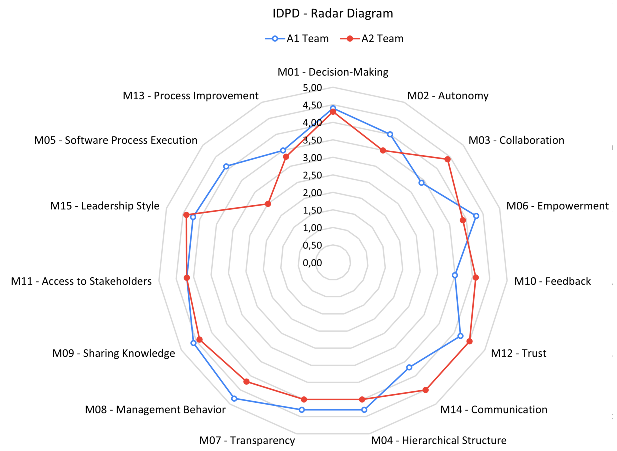

Figure 3: Example chart of power distance manifestations

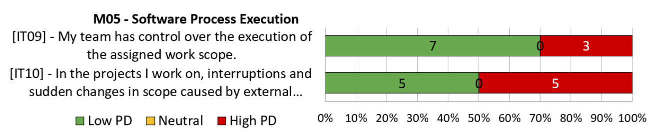

Figure 4: Detailed example of items for manifestation M05

indicate preliminary evidence of validity and reliability of the IDPD. The analysis of polychoric correlations [5] showed a predominance of moderate positive correlations between items, suggesting consistency in the measured perceptions. Reliability was calculated using Cronbach's α, Revelle's β, and McDonald's ω indices [4, 14]. Normally, a reliability value above 0.70 is acceptable, and a value above 0.8 is considered desirable [4, 14]. Most of the identified clusters showed a Cronbach's α above 0.7, suggesting good reliability. Both Cronbach's and McDonald's indices showed values of 0.94 for the full set, reflecting excellent internal consistency. The iclust algorithm simulation identified different item groupings, with the two main ones being C27 and C28. Most of the identified clusters presented a Cronbach's α above 0.7, suggesting good reliability. Revelle's index (β) for cluster C27 was 0.83, indicating good reliability, while cluster C28 had a value of only 0.57, indicating moderate reliability.

The analysis of the survey's open-ended responses also identified reasons why high Power Distance impacts were not perceived (e.g., openness, leadership style, and sense of belonging), perceived impacts of high Power Distance (e.g., knowledge loss, rework, and lack of transparency), and suggestions for reducing Power Distance and its effects (e.g., increasing stakeholder involvement, breaking hierarchical barriers, and promoting the agile mindset).

During the *Rigor Cycle*, the stages were grounded in relevant literature, including articles, books, dissertations, and other materials on Power Distance. The communication stage involves presenting the research results to academic and industrial communities, with some findings already published [11, 12]. More information on the IDPD is available at [10].

3 Conclusion

This paper presents the research method used to develop the IDPD (**I**nstrument for **D**iagnosing **P**ower **D**istance), based on Design Science Research (DSR) and guided by psychometric scale development principles. The primary contribution to industry is making the IDPD available. In three case studies, the IDPD assessment provided a comprehensive view of leaders' and team members' perceptions of power distance in their organizations. The contribution to academia lies in the results reported on the IDPD and the insights they provide into the manifestations and effects of power distance in agile contexts. Future work will explore whether agile collaboration reduces power distance and if traditional organizations present different results.

ACKNOWLEDGMENTS

The authors are grateful for the financial support of UNIRIO (PPQ-UNIRIO 04/2024), FAPERJ (Grant E-210.231/2021, E-211.437/2021, and CNPq (Grant 311676/2025-1).

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