Understanding the Factors Affecting the Adoption of Project Portfolio Management Software Through Topic Modeling of Online Software Reviews

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ABSTRACT

Whilst a broad range of project portfolio management (PPM) tools is developed to enable and automate the PPM processes, there is a limited understanding of the factors affecting their adoption and deployment in organizations. This research presents a systematic approach that integrates the topic modeling with technology-organization-environment (TOE) framework to identify the salient factors affecting the adoption of PPM software from online software reviews. The proposed approach consists of four main steps: reviews collection and preprocessing, factors prediction, factors ranking, and factors integration into TOE framework. The online software reviews used in this study were gathered from Gartner and included 877 reviews for 13 widely used PPM software tools. The results of this research revealed that several factors could affect the adoption decision of PPM software in organizations. These results provide several theoretical and practical implications, and thus should help both researchers and practitioners in the deployment of more user-accepted PPM software and practices.

KEYWORDS

Decision Support, Environmental Factors, Online Software Reviews, Organizational Factors, Project Portfolio Management Software, Technological Factors, Technology Adoption, Topic Modeling

INTRODUCTION

In the current dynamic and turbulent business ecosystem, projects are often recognized as a cornerstone of almost every organization’s work. Many organizations view projects as the main vehicle for delivering organizational strategy and gaining competitive advantage (PMBOK, 2017). Nevertheless, organizations handling different projects with different scopes, complexities and timelines experience ongoing challenges in managing their project portfolios (Pedersen & Nielsen, 2011; Wan & Saade, 2018). They are constantly challenged to optimize projects investments across business units, ensure alignment of appropriate resources with business needs, and demonstrate the business value of projects to stakeholders (Blichfeldt & Eskerod, 2008; Bolat, Kuo'demir, Uslu, & Temur, 2017; McDonough & Spital, 2003). At the same time, portfolio managers continue to struggle in their quest to keep projects and portfolios under control. Common issues include ad-hoc prioritization decisions, inconsistent

DOI: 10.4018/IJITPM.2019070106

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approaches to planning and managing projects, and lack of visibility into resource availability and utilization across projects (Ajjan, Kumar, & Subramaniam, 2013). To cope with these challenges, organizations are required to deploy project portfolio management (PPM) software and foster a full-scale portfolio management culture among project and portfolio managers (Chen, C., Nakayama, Shou, & Charoen, 2018; Hasna & Raza, 2010). The main objective of PPM software is to ensure that with scarce resources and limited time, the organization manages the most optimal mix of projects that support their strategic objectives and deliver maximum business value (Kock & Georg Gemünden, 2016). With the support of PPM software, organizations are enabled to evaluate, select and prioritize new projects; accelerate, kill or de-prioritize existing projects; and allocate or reallocate resources so as to maximize the contribution of projects to the overall success and productivity of the organization (Sharda, Delen, & Turban, 2017).

Recent years have witnessed a marked proliferation in the number and variety of PPM tools that today’s organizations use. Gartner reported that the market size of PPM software is estimated to grow to reach $4.63 billion by 2020, with a compound annual growth rate of 12.9 percent from 2015 to 2020 (Stang, Light, & Jones, 2017). The major forces driving organizations to deploy PPM software can be attributed to the varied needs and requirements of PPM professionals and stakeholders, structural changes in today’s business ecosystem, increasing complexity and scope of projects, and the demand for real-time collaboration and integrated task management (Gerogiannis, Fitsilis, & Kameas, 2013). The proliferation in cloud services and mobile technologies has also greatly contributed to the widespread adoption and deployment of PPM tools within organizations of any type and size. When implemented successfully, PPM tools have the potential to offer increased business benefits to the organization at a portfolio level rather than at an individual asset level, while mitigating associated risk and, most importantly, ensure alignment of projects to the business strategy according to the organization’s resources and capabilities (Ajjan et al., 2013). The Project Management Institute (PMI) reported that organizations with mature PPM software utilization completed 35% more of their project portfolios successfully, while wasting less time and money (Stang et al., 2017).

Even though the importance of implementing PPM software tools is well acknowledged in practice, our understanding of the factors underpinning their adoption in organizations is still limited. In spite of potential benefits of PPM tools, such as increased productivity, effectiveness and efficiency of portfolio management processes (Bani Ali, Anbari, & Money, 2008), the praxis show that the implementation of PPM software solutions within organizations has experienced high failure rates (Ajjan, Kumar, & Subramaniam, 2016). Dutta (2006) reported that once organizations implement a PPM software solution, they often find that their usage experience is less than optimal, and that they are not getting the results and benefits that seemed promised by the software solution. Project managers are also dissatisfied with the quality of information and reports produced by PPM tools (Innotas, 2015). Many organizations are not able to make PPM tools an effective means for decision-making and linking portfolio management with organizational strategy and long-term goals, due to technological, managerial, and organizational issues (Aguilera, Villalobos, & Dávila, 2018; Ajjan et al., 2013; Chen, C. et al., 2018; Gerogiannis et al., 2013). The motives for such failures are not so clear and still need further investigated. Thus, the need for a systematic and deliberate study on the factors underpinning the successful adoption and deployment of PPM software in organizations is crucial.

The main purpose of this research is to develop a framework synthesizing the main factors influencing the organizational adoption of PPM software. These factors were identified through the application of topic modeling and text analytics techniques to online software reviews posted by practitioners on their perceptions and experiences with using PPM tools. The online software reviews were gathered from Gartner.com, and included 1160 reviews for 13 popular PPM tools (Gartner, 2017). The factors emerged through the application of topic modeling were ranked based on their distribution and weight in the online software reviews. Then, they were synthesized into a conceptual framework based on the technology-organization-environment (TOE) framework (Tornatzky & Fleischer, 1990). The findings of this study are intended to not only contribute to the advancement of knowledge on
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