

Cost Overruns

Subjects: Management

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The general consensus is that cost underestimation, also more commonly referred to as cost overrun, is prevalent, e.g.,. While it is acknowledged that cost overruns are a pervasive problem, the solutions presented are limited, and have attracted substantial attention in the media, with stakeholders, including the general public and academic scholars. At this point, it is not certain how cost overrun is defined, why it happens, or how to best circumvent it.

Keywords: cost overruns ; ideological distancing ; encapsulation ; empiricism ; behavioural ; infrastructure ; public sector ; project management ; mega projects

1. Introduction

The new millennium (2000) heralded multiple breakthroughs in the field of project management (PM). In the 1950s, it began as an engineering and optimisation tool, and has grown by accommodating a multiplicity of disciplines in an ad hoc manner ^[1]. In its present form, PM is taking the shape of a research field, with opportunities to bring different disciplines to concentrate on a specific phenomenon of study, specifically, projects ^[2]. However, advancements in both practice and theory have made limited strides to consistently improve cost performance of projects. Large projects and mega-projects have been confronted with the recurring unsolved problem of cost overruns ^[3]. The wide publicity of the misuse of taxpayers' money has provoked outcry, placing the topic as a central issue for reflection, critique, and theory building. This tumult has engaged the attention of the two dominant disciplines in PM, which view the problem from different epistemic settings.

As recent as 2019, contemporary PM has been consumed in constructive criticism between the advocates of two leading ideologies, the conventional empirical (technical) and the evolving behavioural social sciences schools of thought (SOT). This tension began to unfold at the beginning of the new millennium, in 2002, from the publication of the article "Underestimating costs in public works: error or lie" ^[4]. This article sparked a controversy within the engineering community by using some conspicuous words, "Error or Lie", as root causes of cost overruns in the context of major transportation projects. "Error", referring to optimism or delusion in cost estimation, is based on psychological and behavioural sciences, while "lie", or strategic misrepresentation of costs by practitioners, is based on a conventional, mainstream empirical sciences field. The ideological distance between these two disciplines further increased in 2018, when the advocates ^[5] of mainstream empirical SOT decided to critically discredit and reject the behavioural attributions of the advocates of the social sciences school ^[6]. This unfolding debate on the root causes of cost overruns requires further investigation to determine whether different epistemologies can be co-joined within the PM frame.

2. Lack of theoretical convergence in PM

The earliest model was the optimisation school of thought, which was practiced during the aerospace era of the 1950s, and is still being used today. It is based on the well-established conventional empirical model of engineering and applied mathematics, with an emphasis on meeting deadlines, staying under budget, and adhering to specifications ^{[7][8]}. This school (tradition) was developed to answer how projects are planned and managed. It brought about rationalistic, logic-based planning, formal processes, and analytical techniques to predict future outcomes. According to ^[9], there was a need to positively impact the bureaucratic stakeholders of these sophisticated and high-end projects by careful upfront planning to select the optimal technologies, detailed scheduling of project activities, and prearranged integration of components in the final system.

A decade later, in the 1960s, limitations were revealed in the optimisation school. While the intellectual contribution of an individual is essential to increasing performance and productivity ^[10], engaging the subjectivity of the human element proved to be a necessary ingredient to increase productivity ^[11]. Thus, the discipline of PM expanded to include a more active role for the project manager. This gave rise to a new line of thinking and theorising through the factor tradition. The emerging factor tradition recognised that managing a project was not a sufficient guarantee of project success. This

tradition has evolved to answer the question of what determines project success. Hence, there is a need for PM to address the issues that limit successful project outcomes by identifying the key factors.

Each tradition is rooted in its own custom, leading to the emergence of several theories held together without a strong set of common core principles and ideas ^[12]. The theory of projects is limited if it is dependent solely on empirical insights and needs to be driven by a particular theoretical perspective ^[13]. A number of characteristic features were attached to the various schools: (1) project definitions differed, (2) project management was swayed by different opinions, (3) research was influenced by different key questions, (4) there was pluralism, and (5) a diverse range of disciplines entered to influence PM.

The forerunner to the arrival of many schools or traditions is the apparent streamlining and specialisation of each individual school and the separate institutionalisation promoting individual concepts. Through the process of specialisation and fragmentation, several subdisciplines evolved ^{[14][15]} with each fragment purporting to identify some epistemological links to cushion its institutional framing. The subdisciplines co-evolved to become attached to particular research questions, associations, journals, and universities ^[16]. Though scholarly publications are demanding and time consuming, there is little incentive to integrate bodies of knowledge if research specialisation is reflected and supported by institutional specialisation, as in the case of management subdisciplines ^[1]. In this process, an inherent tension develops between competing entities that strive for their own space and expression, leaving little room for integration ^{[1][12][17][18][19]}.

A basic characteristic of each school is its ability to portray a unique project definition. This provided the means to grow into a specialised field, entrenching itself with its distinct *modus operandi*. Reflecting on the number of schools within PM, there is reasonable evidence suggesting that several theories will emerge to explain PM. These theories rely on diverse theoretical foundations, spanning a spectrum from applied mathematics to psychology and political science ^[2].

It is challenging to bring logical coherence to the varied theoretical alignments existing within PM. The ability to effectively design and integrate a comprehensive program in academic research to fit a wide range of knowledge is a daunting task ^{[20][21][22][23]}. Team members from contrasting disciplines can fall prey to culture clashes, as individuals try to maintain their sometimes-conflicting norms and values ingrained in their epistemic communities ^{[24][25]}. In the pursuit of holding together a multi-faceted PM discipline, an ideological divide surfaced. This is as communities have their own methods of defining problems, sourcing, and interpreting data, even if there is a common interest in the subject at hand.

Rouleau and Séguin ^[26] commented on the development of this parallel problem which leads to ideological distancing, where self-referential ideologies may, and sometimes wilfully, side-line important perspectives and interpretations ^[16]. The promotion of such ideologies can lead to encapsulation—the limited sharing of ideas and concepts from related disciplines bearing similar ideologies ^[16].

Such ideological distancing and encapsulation of PM notwithstanding, there exist different strains of theories, some of which were fundamentally conceived with foundational intellectual roots that can evolve into a unique model capable of describing universal events, or at least endeavour to unfold generic traits. Thus, the original “mainstream projects” carried the argument as far as certainty, and with the extension of PM, some ideologies introduced uncertainty, a necessary factor to be included in the new dispensation to further extend aleatory and episteme profiling ^[27].

In science, two theories emerge to explain the theoretical fundamentals and, consequently, divide the world of physics into two halves—the deterministic and the probabilistic—the former headed by the famous Albert Einstein and the latter from the followers of quantum theory, a fundamental mathematical model in probabilities. Science took centre stage in the last century of the last millennium, when the deterministic, led by Einstein, challenged the probabilistic of quantum theory fame in a prolonged war of words to justify which mathematical model was superior in explaining the universality of physics. In the 21st century, a similar paradigm shift arrived in project management, noted as Kuhnian's paradigm shifts in the fields of behavioural science and project management ^[6].

The contrasting development of conventional empirical evidence model and behavioural social science research on root causes of cost overruns on major transportation projects, and by extension major projects, serve to challenge existing theory and motivate new ideas and thinking ^[28]. Although seeking solutions to the same problem, there exists a parallel divergent path that inhibits the sharing of domains, ideas, and concepts of mutual interest ^{[29][30][31]}. As time progressed, it became evident that these neighbouring disciplines failed to recognise each other's contribution to their shared research agenda ^{[4][5][32][9][33][34]}, despite the increasing clamour for convergency by many ^{[35][36][37][38]}. This creates an ideal phenomenon of interest, and a contemporary case through which to examine and extract theory about the tensions and facilitators of cross integrating neighbouring disciplines in PM.

From the turn of the new century, the critique between the leading scholars of PM continued, with the debate focusing on large monetary injections in mega projects [3]. As projects moved from the mega to the tera age, costs could run in the billions of dollars. Any underestimation in a project can lead to an appreciable amount of cost overrun, which has become a central focus in PM's debate. As infrastructure works and large-scale projects become prevalent and are undertaken by governments and private contractors, public funds (taxpayer money) attract the attention of the entire citizenry.

3. Conclusions

Scholarly arguments followed the lines of the two main theoretical traditions concern with cost overruns: the first tradition has intellectual roots in engineering science and applied mathematics, primarily concerned with the planning techniques and conventional mechanism of on time, within budget, and to a fixed schedule. The other tradition has its intellectual roots in the social sciences, such as sociology, organisation theory, and psychology, especially interested in the organisational and behavioural aspects of project organisations [2]. The feud ignited when behavioural scientists concluded that the cost overrun phenomenon is not technically rooted but resides mainly in political and psychological explanations; delusion (optimism) and deception (strategic misrepresentation) are the dominant explanations.

Encapsulation is an unintentional mechanism, but a subtle device that gives the illusion of sharing empirical domains and related vocabulary of mutual interest in the topic; however, it hinders rather than promotes cross-fertilisation. To remove the pseudo-dichotomous stance, encapsulation, and ideological distancing, we propose the cross-fertilisation of ideas through the creation of project ideological space with transitional boundaries.

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