

# The relationship between human capital and time performance in project management: A path analysis

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## Abstract

This paper uses a causal path model to measure the relationship between project management human capital (PMHC) and project time performance. Human capital is an established branch of economic theory concerned with the value embodied in the firm's human resources. Project managers' knowledge and experience are considered important in determining project outcomes and these facets are assessed using a human capital framework. The path analysis confirms the central research hypothesis that performance will improve with increased investment in human capital. The results are significant because they confirm that the education and training of project managers is important in influencing the time delivery of construction projects.

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## 1. Introduction

What makes project delivery successful is a topic of much academic debate. It is generally agreed that to be considered successful, a project must be fit for purpose and it must have achieved its delivery targets. Though project management (PM) literature often considers wider objectives [1,2], the central PM delivery targets remain time, cost and quality. In view of this, the PM discipline has three key responsibilities. First, to ensure that the project mission is appropriately defined [2]. Second, to quantify appropriate targets for the mission. Third, to organise and mobilise resources to accomplish the specified mission, within the quantified targets.

PM has a poor track record considering these responsibilities [1,3,4]. Adams and Brown [4] concluded that PM failed to deliver added value. The recent inquiry surrounding the Scottish Parliament project adds currency to this issue [5]. Nevertheless, we still expect that PM *should* deliver projects successfully. The tools and the body of knowledge that support PM are extensive. Moreover, PM has proved itself in industries other than construction (for example, the Boeing 777 project in the aviation industry [6]). This suggests that PM can be successful and that the problem in construction may be one of implementation.

There are many issues in implementation; however, of central importance is *capability*. Capability can be viewed as a function of education and experience. If these are deficient, there is a high probability that a project mission will be inappropriately specified from the outset, with the result that time, cost and quality targets will be compromised from the beginning. If this is the case, it is highly improbable that the resource base will be organised and mobilised to deliver time, cost and quality targets successfully.

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This paper examines capability, measured in human capital (HC) terms, and it evaluates the relative importance of HC as a causal factor influencing time performance. The paper is structured as follows. First we address the issue of capability and HC in a PM context and we develop a theoretical framework for evaluation. We operationalise this framework using a path model to interrogate a dataset drawn from the UK and the Saudi Arabian construction industries. The reasons for selecting the UK and Saudi Industries for the sample are explained and the data is subsequently presented and analysed and the findings are discussed.

## 2. Capability and human capital

Capability is an attribute which, although easily defined, is intractable from a measurement perspective. It is an attribute concerned with the qualities that individuals or organisations possess. It follows that capability addresses whether or not individuals (and organisations) possess the necessary levels and combinations of knowledge and skill to complete the tasks that they are responsible for.

Evaluating the knowledge and skill attributes of individuals and of organisations is an area addressed by human capital (HC) theory.

HC theory addresses the *worth* of an organisation's human resource base in the context of performance. HC focuses on the value that is added to an organisation's business, ultimately in terms of profitability, solely by its stock of human resources.

That a firm's performance will be influenced by its human capital is not a new concept [7]. In theory, we can expect that the higher a firm's stock of human capital, the more successful the firm will be and the greater its competitive advantage over its rivals will be, and *vice versa*. The strategic importance of HC in terms of achieving enhanced performance is now becoming increasingly recognised [8,9]. However, despite this, a precise understanding of how significant HC's role is in determining performance, remains unclear, and is the subject of much research in various industries [8,10].

The use of HC principles in evaluating PM implementation is new. We consider it to be an approach that has merit solely because the size of HC's influence upon performance remains unclear in a wider context, as mentioned above. But there are three additional reasons why we consider the application of HC principles to be particularly suitable.

First, PM is a discipline that is dependent upon a number of interrelated *management* skills. These skills have been variously defined, however, they can be distilled into three categories [11,12]. El-Saaba [12] identifies:

- (i) human skill;
- (ii) conceptual and organisational skill; and,
- (iii) technical skill.

El-Saaba [12] quantified the relative importance of each. His results indicated human skill was the most important,

though conceptual and organisational skills were also determined to be significant. Technical skill was considered to be of lesser significance. El-Saaba's work confirms that successful PM must be strongly focused on the mobilisation and motivation of human resources.

Other resources must be managed, but people represent the primary resource directly influenced by the activities of PM. If people are to be managed successfully, the project manager must rely on knowledge and experience. Working with people involves personal judgement and decision making that is not easily learned and cannot be solely based on systems or tools. A project manager needs to be more 'socially orientated' than 'functional' [12]. Thus, we argue there are strong *a priori* grounds for hypothesising that successful project management relies almost entirely on the HC that is embodied within the project manager as an individual, or on that which is embodied within their firm.

Second, as is increasingly acknowledged [1,2,13], project management is concerned with the provision of leadership. Again, we can expect this to cause project manager to depend on personal knowledge and experience that informs them *how* to lead in a continuously changing project environment.

Third, PM is a service orientated activity. Unlike the contractors or designers that the project manager leads, the primary output of PM is not a product or a physical output, but a management service. Hitt et al. [8], Laursen et al. [10], Pennings et al. [14] and Richard [15] observe that service based organisations are characterised by a strong reliance upon the knowledge and experience that is embodied in their personnel. We argue that PM, by its very nature, depends almost exclusively on the knowledge and experience that is embodied in the person of the project manager or in the personnel of the PM organisation.

These three points all suggest that the capability to discharge PM activities can be considered to be almost exclusively reliant upon the stock of HC represented in the project manager and/or the PM team. Therefore, we expect there to be a highly significant relationship between HC in PM and performance in construction projects. The adoption of an HC framework is a new approach in this area.

## 3. Theory

We have suggested that PM capability is best assessed by examining HC and that HC concerns an evaluation of knowledge and skill. Knowledge and skill must be accumulated by learning and learning can take place in a number of ways.

There are three main vehicles that contribute to learning in the area of construction PM. Learning can take place by direct study of the construction industry and of the specific body of knowledge that exists on the subject. Learning can also take place by doing, and lastly, learning can take place by observing others who are 'doing'.

We can formalise the accumulation of knowledge and skill in the PM area using the following expression:

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