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# Design and construct IT Performance architecture: settle the IT productivity paradox from critical realism

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## Abstract

This article conceptualizes Information Technology (IT) performance architecture with dynamic performance process and performance structure, and try to settle the IT productivity paradox from critical realism. Two assessment principles are presented: that IT performance assessment procedures should include in the dynamic implementation process in which IT performance are produced by unique individual enterprises, and that assessments should tap IT systems that are possessed by the individual enterprises being assessed and that causally contribute to their overt implementation experiences and actions. The limitations of traditional IT performance assessment strategies based on between-enterprises performance metrics are discussed in light of these principles. The article then outlines an alternative strategy in which performance architecture are designed and constructed in dynamic procedure that is sensitive to the potentially idiosyncratic performance of individual enterprise. The authors argue that IT system performance assessment can be considered under the IT performance architecture.

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## 1. Introduction

Information technologies (IT) have been used more than two decades. Increasing business functions and processes are supported by information systems. Both researchers and practitioners are faced with critical issues to understand and assess the enterprise performance generated by IT. For this reason the IT performance generated by IT has been for long time a key research theme.

Since Brynjolfsson proposed “The productivity paradox of information technology” which imply there has been very little empirical evidence of a positive association between IT investment and business performance [1]. Until now, IT productivity paradox in information system research seems thoroughly unresolved. There no fully convincing answers are available, for example, how exactly do similar enterprises got different IT performance with similar IT system? Why might a given enterprise show considerably different appraisals across using the same IT system? Why different companies using different IT system show the similar performance indexes? What does exactly IT give rise to these outcome difference?

To assess an enterprise's IT performance, what you do-or so many seem to agree-is to hand out one of those five dimensions of benefits: operational, managerial, strategic, IT infrastructure and organizational, with multiple possible benefit categories within each dimension [2]. After some test scoring, the enterprise's IT performance is assessed: The enterprise may prove to be cost reduction, increased business flexibility, better decision-making etc. This technology is so simple, and the database cited in its support is so consistent, that it might appear to be what the scholars or the managers need: a valid, efficient, cost-effective tool for assessing the enterprise's IT performance.

Some IS scholars suggest that this measurement strategy may be inadequate. Only know what it is not enough, we need to know why. Some focus on the interaction of people and technology in both the development and use of IT. Case studies examining IT business value within specific organizations are adopted [3]. Some researchers focus on the identification and deeper understanding of the internal and external factors which can increase the business value generated by IT, such as top management support, business process redesign, new human skills, innovations, etc [4]. In this article, we use the social-cognitive theories [5] to provide a IT performance architecture.

For these reasons it is necessary to study empirically the performance generated by IT in the ‘real life’ of the enterprises adopting them, and also to recognize and understand the structures and processes that affect IT performance, so that we can put forward ways of increasing it. In this direction in the following section 2 of this paper is briefly presented the target of an enterprise's IT performance assessment and two assessment principles. Then in section 3 is proposed a kind of IT Performance architecture to show the structures and processes which produce the result. Next in section 4 is outlined four guidelines that constitute a social-cognitive theory of IT performance assessment. Finally in section 4 the conclusions of the above literature reviews are outlined.

## 2. What Is the Target of IT performance Assessment

Two principles for defining the target of an enterprise's IT performance assessment procedure can be identified. They are independent of any particular theoretical stance; that is, it is hard to imagine any theoretical stance that would fail to hold these two principles.

*Principle one: IT performance Assessment Is the Assessment of enterprises.*

The first principle is the simple statement that the aim of analysis in IT performance is enterprises. Enterprises have their own structure and environment. IT performance assessment must include the assessment of characters that are unique to enterprises. The point here is that a complete IT performance assessment of enterprises must include in those characters that are uniquely organizations. Otherwise one is not assessing enterprises, but machines.

What are these characters? Firstly, enterprise is a system. As a system, it is a whole made up of interrelated parts [6]. All of the relationships between its parts are created by various pertinent flows, including information flow, matter flow, fund flow, energy flow, fund flow, personnel flow, etc [6]. Its behavior and performance is determined and governed partly by its input flow and relationship flows.

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