Utility-Based Knowledge Work Productivity Assessment

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ABSTRACT

This paper presents a utility-based productivity assessment model for evaluating knowledge worker productivity, with the goal of examining the assessment process for knowledge workers with varying levels of knowledge intensity. The authors conduct an experiment to discover effects from knowledge intensity on managerial assessments of knowledge worker performance. The model presented allows for the quantification of evaluator's risk attitudes and preference, as well as relative weights for three chosen productivity metrics. The results indicate that managers' risk attitudes vary with respect to both different metrics, and to different levels of knowledge intensity.

Keywords: Knowledge Intensity, Knowledge Work, Productivity Assessment, Utility Assessment, Utility Model

INTRODUCTION

Knowledge based productivity is an important source of value creation, leading to the potential success and survival of organizations. Productivity of systems of Knowledge Work (KW) have the potential to have large impacts on organizational performance. By many accounts the modern economy is comprised of at least 85% knowledge work (Savage 1996). An economy’s ability to improve standards of living over time largely depends on its ability to raise its output on a per worker basis. Since Taylor, manual workers’ productivity has been increasing steadily at an average rate of approximately 3% compounded per annum, equivalent to a fifty-fold increase over this period (Drucker, 1999). Behav-
ioral scientists, experimental scientists, organizational psychologists, industrial engineers, social economists, corporate accountants, business managers all want to pursue practical methodologies to evaluate and improve work productivity (Pritchard et al. 2012).

Pritchard et al. (2012) identify five purposes of productivity measurement. First, to compare large groups of organizations to one another, in order to determine which classes or types of organizations are more productive. Second, compare themselves to similar organizations to assess their competitive position. Third, use a management information system for strategic planning and policy-making. Decisions that will be made impact the allocation of resources to various organizational functions as well as with the growth or reduction of these functions. Fourth, control the movement and timing of both material resources and output produced. Fifth, use resultant measurements as a motivational tool. These purposes, present a useful set of guiding principles upon which we will present our approach below.

Many studies on productivity evaluation methodologies are based on the most common definition of productivity, that of output divided by input (e.g., Tuttle & Romanowski, 1985; Ray & Sahu, 1989; Picard, 1998; Grönroos & Ojasalo, 2004; Tangen, 2005; Erne, 2011). However, there are many additional challenges related to the characteristics of knowledge work, such as work tasks’ ambiguity, invisible inputs and uncertain outputs, such that KW productivity is generally difficult to calculate directly. Further, we remark that in practice, there are no standard general methods for aggregating KW performance (Xiao et al. 2012, Ramirez & Nemhbad 2004). In this paper we present a potentially useful framework to overcome several common limitations of KW productivity assessment.

In the next section, we outline several classes of KW productivity assessment methodologies, followed by a KW productivity framework based on utility theory. We then demonstrate the practical value of this approach using data from practicing experts. We will address the research question of whether and how Knowledge Intensity (KI), a measure of both the requisite quantity and quality of individual knowledge (Eschenbach et al. 2006), affects KW performance evaluators, and how they value various productivity metrics.

**KW PRODUCTIVITY ASSESSMENT METHODOLOGIES**

KW productivity has become a critically necessary and strategic research area (Drucker 1999). For example, Sink (1985) points out that specific answers to the question of what productivity is and whether or not it is a necessary or important measure of system performance depends on the specific type of organizational system (manufacturing or service) and the specific unit of analysis (individual, work group or division). Important research contributions in this area have spanned related topics in behavioral science, industrial engineering, social
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