Land Use Policy 28 (2011) 38–46

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Measuring quality performance of cadastral survey and deeds registration work processes

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ARTICLE INFO

Article history:
Received 19 December 2009
Received in revised form 10 March 2010
Accepted 19 April 2010

Keywords:
Quality performance
Cadastral survey examination
Deeds examination
Process yield
Root causes

ABSTRACT

When land parcel boundaries are surveyed for purposes of registration in most southern African countries, the cadastral survey records and diagrams prepared have to be examined and approved by the Surveyor General first before they can be registered in the Deeds Registries. For such records to be approved, their quality must conform to requirements stipulated in relevant acts and regulations. Where regulatory requirements are not met, the records are rejected and returned for corrections and resubmission. From a cross-organizational context, poor quality documents lodged upstream have the effect of congesting examination processes downstream as records are rejected and returned backwards due to quality failure. The paper proposes a quality performance measurement model to analyze quality performance in land administration work processes. The developed model is tested on 2 survey examination and approval sites and 3 deeds registration sites in Namibia, Zimbabwe and South Africa. Based on below expected quality results obtained at one of the sites, a root cause analysis was conducted to establish recurring and underlying causal factors upon which quality improvement strategies can be built on.

Introduction

Cadastral Surveyors in Southern Africa claim professional status and yet in many cases more than half their work is rejected first time round. Imagine doctors having more than half their prescriptions returned for amendments. Not only does this high rejection rate have internal costs but also in the wider picture, it affects the rate of investment and development in the overall national economy. Furthermore, it contributes to the overall costs of cadastral surveys, which can then exceed the market value of the land being surveyed.

When land parcel boundaries are surveyed for purposes of registration in countries such as Namibia, Zimbabwe and South Africa, the cadastral survey records and diagrams prepared have to be examined and approved by the Surveyor General first before they can be registered in the Deeds Registry. For such records to be approved, their quality must conform to requirements stipulated in relevant acts and regulations. Where regulatory requirements are not met, the records are rejected and returned for corrections and resubmission.

A previous study of cross-organizational business (work) processes (CBPs) associated with subdivision of property within municipalities in Namibia, Zimbabwe and South Africa, Chimhamhiwa et al. (2009) found the quality of submitted records to be a critical performance measurement dimension for improved end to end delivery of land administration (LA) CBPs. In that study, improved quality of lodged documents was viewed as both an enabler of internal results (reduced costs and time) and external performance (improved customer satisfaction and society). While quality can be viewed as a multi dimensional construct (Garvin, 1987), two perspectives common in most literature are; product and service quality.

From a LA products and work process context, quality can be viewed as the conformance of submitted work to legislative specifications. For example, in parcel subdivision, draft permits lodged with municipalities for permit approval must fulfil planning regulations while cadastral survey records submitted for survey examination to the Surveyor General, must conform to land survey acts and regulations. Similarly, draft deeds submitted to the Deeds Registry for deeds examination and approval, must comply with deeds registration legislation. The different legislations, in this regard, prescribe the manner in which the various types of LA work (permit drafts or cadastral surveys) are performed as well as the form in which resultant records

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doi:10.1016/j.landusepol.2010.04.007

are prepared for lodgement. Two quality control procedures that can be deduced from the above work processes examples are; self-checking of work (by practitioners, before lodgement) and next station (downstream) checking of lodged records (by legally designated institutions, e.g. Surveyor General or Deeds Registry).

Assuming that the cadastral surveys or deed drafts are indeed properly executed and that records are prepared and lodged in accordance with laid out specifications, it seems reasonable to expect the examination of such records at next stations to proceed with high levels of conformance. However, empirical observations from a number of southern African countries and some previous studies (e.g. Chimhamhiwa, 2006), suggest that a significant proportion of lodged documents do not, in many cases, meet these requirements first time. Taking this viewpoint, one is often from an operational and process delivery perspective, interested in the volume of acceptable output (process yield) as a measure of the output quality of a given work process versus the fraction of rejected products returned for amendments. Wu and Liao (2009) defined process yield as that proportion of work process product units that conform to requirements. Measurement of process yield enables the determination of current levels of quality performance, which can lay the basis for comparisons against expected (or desired) output. Where results are found to be outside desired ranges, interventions can then be planned.

The objectives of this paper are twofold. First, we aim to develop a quality performance measurement model that can be used to measure and compare quality performance in LA work processes. To test the applicability of our developed model, we used 2 key sub processes of the parcel subdivision CBP common in Southern Africa; survey examination and approval and deeds examination and approval, described in our earlier work (Chimhamhiwa et al., 2009). Based on the results obtained for survey examination and our observations from previous studies (Chimhamhiwa and Lemmen, 2001; Chimhamhiwa, 2006), we proceed in the second objective to investigate root causes of poor quality of lodged cadastral survey records. This was done in order to reveal recurring and underlying causes upon which interventions can be built.

This work returns to the same sites of our previous (Chimhamhiwa et al., 2009) study. Survey examination is analyzed using the cases of the Surveyor General Departments of Harare (in Zimbabwe) (site 1) and Windhoek (Namibia) (site 2) while deeds examination uses the cases of the Deeds Registries of Harare (site 3), Windhoek (site 4) and Pietermaritzburg (South Africa) (site 5). The root cause analysis was conducted using only the case of site 1.

The measurement of quality performance in LA work processes and the systematic identification of root causes of recurring error contributors have not to our knowledge been explored. An illustration of their use with case examples may provide an approach for institutions desiring a method to manage and improve LA work process quality and/or investigate casual factors associated with the delivery of poor quality in LA.

The rest of this paper is structured as follows. In the next section, we review literature on quality management and measurement. Based on our review, key elements that are relevant for quality performance measurement for LA work processes are derived. A quality performance measurement model is subsequently developed. Furthermore, descriptions of quality control activities at the case study sites are provided. The next section, presents the methodology used to accomplish the objectives of the paper, while in section 4, the results for both quality measurement and root cause analysis are presented. The last section concludes the paper and highlights issues for further research.

Background and context

In most organizations quality is a central component of strategic plans and management systems. Quality in mainstream industry is viewed as a source of competitive advantage. However, several perspectives of quality can be constructed depending on what is being investigated. This multi faceted nature makes it difficult to have a universal definition of quality (Sousa and Voss, 2002) hence different definitions are used under different circumstances. In this paper, our focus is explicitly on work product(s) quality, with conformance (through quality control) being a central goal. For product conformance to be managed and improved, it must be defined in ways that can be measured. To our knowledge, studies on quality measurement of LA work processes are however scarce. Thus, our development of a quality performance measurement model is informed mainly by work in mainstream quality management. We review in the next section some key studies that are central in that regard.

The field of quality management (and measurement) is perhaps different compared to other disciplines. It has a few individuals who have dominated theory development and implementation processes in many organizations that they have achieved a “guru” status (Miller, 1996). Some of these experts and their works are discussed here. Juran (1986) and Juran and Gryna (1998) suggested that managing for quality is anchored on the trilogy of; (1) quality planning, (2) quality control and (3) quality improvement. Quality planning establishes the quality goal(s) desired under given operating conditions while quality control determines what to control, develops measurement criteria and establishes measurement limits. Quality improvement seeks to identify specific areas for improvement, organizes for discovery of causes of poor quality and suggests remedies. Shewhart (1939), one of the first to provide insight into data collection, analysis and presentation in the quality discipline, outlined 3 steps in quality control processes; (1) the specification of what is wanted, (2) the production of things to satisfy the specification, and (3) the inspection of the things produced to see if they satisfy the specification. Deming (1986), a proponent of Shewhart, developed a 14 point philosophy for effective quality management and what became to be known as the Deming wheel of quality improvement (otherwise known as the PDSA (Plan–Do–Study–Act) cycle). He argued that the PDSA cycle can be used to analyze and measure work process quality in order to identify variations that cause products to deviate from requirements. In addition, the PDSA’s continuous feedback loop helps managers identify and change parts of work processes that need improvement. Hales and Chakravorty (2006) describe how Deming’s style of quality management is implemented in a plastics company, while Hillmer and Karney (2001) make a case for the usefulness of the theory as a guide for decision making in present day organizations.

From an error cause removal perspective, Crosby (1979) developed and popularized the ‘zero defects’ quality philosophy, a way of thinking and doing things that reinforces the notion that errors are unacceptable in work activities hence things should be done right the first time. The philosophy represents a change in work perspective where flaws that allow defects to occur in work systems are proactively addressed. Greene and Vent (2008) implemented a cardiothoracic program with a zero defects goal as part of an initiative to improve quality in healthcare services. Their results suggest that zero defects are achievable though work practises must be hardwired into everyday activities to ensure reliability. Shingo (1986) suggested the use of mechanical devices (poka yoke) to eliminate mistakes or defects in work processes. He argued for combining source inspection, where each item is inspected for defects before it is passed onto the next stage with poka yoke (or mistake proofing) devices. He further advocated for the analysis of production