

# IS practitioners' views on core concepts of information integrity

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## Abstract

Based on a review of the literature on data quality and information integrity, a framework was created that is broader than that provided in the widely recognized international control guideline COBIT [ISACA (Information Systems Audit and Control Association) COBIT (Control Objectives for Information Technology) 3rd edition. Rolling Meadows, IL: ISACA, 2000], but narrower than the concept of information quality discussed in the literature. Experienced IS practitioners' views on the following issues were gathered through a questionnaire administered during two workshops on information integrity held in Toronto and Chicago: definition of information integrity, core attributes and enablers of information integrity and their relative importance, relationship between information integrity attributes and enablers, practitioners' experience with impairments of information integrity for selected industries and data streams and their association with stages of information processing, major phases of the system acquisition/development life cycle, and key system components. One of the policy recommendations arising from the findings of this study is that the COBIT definition of information integrity should be reconsidered. Also, a two-layer framework of core attributes and enablers (identified in this study) should be considered.

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*Keywords:* Information integrity; Data quality; Data integrity

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## 1. Introduction

An entity's information assets constitute a significant proportion of an entity's market value (ITGI, 2001) making this a key enterprise asset that needs to be governed effectively.<sup>1</sup> Not only

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<sup>1</sup> Weill and Ross (2004) identify the following six key enterprise assets: Human, Financial, Physical, IP, Information and IT, and Relationships.

are investors willing to pay for good governance—Newell and Wilson (2002) report premiums averaging 10–12% in market value when moving from worst to best on corporate governance—but effective governance is the single most important predictor of the value an organization generates from its information and IT asset (Weill and Ross, 2004). Information is increasingly easy to collect and digitize and is increasingly being incorporated in services and products. Information and information technology represent a significant expense in most enterprises; however, it is hard to value or price, has a decreasing half-life and has increasing risk exposure. Senior executives' accountability for the integrity of company financial information under the Sarbanes-Oxley Act of 2002 is a topic of great angst in the business community and a CICA publication aimed at Boards of Directors lists data integrity<sup>2</sup> as one of 20 key issues that Directors should be concerned with (CICA, 2002). The impact of information integrity impairments can be far-reaching and costly in money, time, resources, reputation and customers (Betts, 2001; Redman, 1998; Wang et al., 1995). Small mistakes made by the most well-meaning employee can have a catastrophic effect, propagating errors throughout the organization. For example, Fannie Mae's 3Q 2003 FAS 149 spreadsheet-based calculations understated the value of mortgage loan commitments by \$1.3 billion. Fannie Mae attributed this to "human error".<sup>3</sup> A national survey in 2003 of all accredited U.S. medical records managers found that 4–7% of records (depending on region) had significant errors that resulted in over and under-reimbursement of billing claims.<sup>4</sup> Yet a 2001 survey (PricewaterhouseCoopers, 2001) found a dangerous complacency about data management: 2/3 of Boards do not address it; 2/3 place responsibility for it solely on the CIO or IT department; 1/2 of CEOs do not see it as a strategic issue; 1/3 of respondents believe management does not place enough importance on it; and, only 1/3 are very confident about the quality of their own data and even less are very confident about the quality of others' data.

To address information integrity impairments in an organized and rigorous manner requires a comprehensive framework that can be used to guide management risk assessments and control deployment and guide assurance providers on the criteria to be addressed by information integrity oriented assurance services. However, a limitation of today's control and assurance frameworks established by the accounting and auditing professions is that they have focused almost exclusively on financial information. As the focus of information integrity control and assurance efforts expands to other decision-related information beyond financial statements, a need arises for a comprehensive generally accepted definition of information integrity and a control framework linked to such a definition. Thus, one of the objectives of this study is to define and validate a general purpose framework that can be used for controlling and auditing information integrity.

The research approach used in this study involved three stages. First, an extensive review of literature in this area was conducted to identify key attributes of information integrity (ITGI, 2004) and related issues. Then, two focus groups of experienced practitioners were brought together to discuss the documented findings extracted from the literature review. Part of the

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<sup>2</sup> The terms data quality, data integrity and information integrity are used in the literature, sometimes interchangeably, sometimes to convey different meanings. In this paper, information integrity is used except when referring to sources that refer to this concept using one of the other terms.

<sup>3</sup> <http://www.oliviertravers.com/archives/2003/11/06/billions-hidden-in-spreadsheets/>; <http://www.louisepryor.com/showTopic.do?topic=41> [accessed December 29, 2004].

<sup>4</sup> Lorence, D.P. The Perils of Data Misreporting. *Communications of the ACM*, November 2003, 85–88.

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