

A Financial Reporting Ontology Design According to IFRS Standards

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Abstract

International Financial Reporting Standards (IFRS) are issued by International Accounting Standards Board (IASB) in order to ensure transparency, accountability and efficiency to financial markets from the entire world. According to a recent published study, 119 countries from the 143 analysed countries require IFRS standards for all or most of the domestic publicly accountable entities (financial institutions and companies) that are listed in their capital markets. In this article, a financial reporting ontology according to IFRS standards is presented. Its role is to facilitate both teaching activity of the academic staff from a university and the activity of experts from the Romanian accounting domain. Thus, the way the IFRS standards are applied in Romania is initially analysed and the design process of the proposed ontology is presented, afterwards. The ontology has been created using the Protégé ontology editor.

Keywords: *financial reporting ontology; IFRS standard; Protégé ontology editor*

JEL Classification: *C63; C8; M41*

Introduction

Accounting represents the language of business. The better a manager understands the accounting information, the better he can manage his own business. The accounting information is used to make decisions both by internal decision makers (companies' managers) and by external decision makers (investors, shareholders, fiscal experts, auditors and expert accountants etc.).

International Financial Reporting Standards (IFRS) have been adopted to improve financial and accounting communication and to create a healthy business environment both nationally and globally.

IFRS standards are elaborated by International Accounting Standards Board (IASB) in order to ensure transparency, accountability and efficiency to financial markets from the entire world. Many standards that belong to IFRS standards are known under their previous name of International Accounting Standards.

According to a recent study published by Pacter (2016, pp. 28), 133 jurisdictions from those 143 national jurisdictions that were analysed (93%) acknowledge and adopt IFRS standards as the single accepted accounting regulations. In addition, 119 jurisdictions require IFRS standards for

all or most of the domestic publicly accountable entities (financial institutions and companies) that are listed in their capital market.

This article brings forward a financial reporting ontology according to IFRS standards.

The way the IFRS standards are applied in Romania is further analysed and the ontology design process, using the Protégé ontology editor, is described.

Application of IFRS Standards in Romania

Initially, IFRS standards were optionally applied by the multinational companies. Afterwards, they were required as compulsory regulations at national or superstate jurisdictions level, such as Romanian case.

Application of IFRS standards in Romania has been generated by the need to ensure the conformity of the national regulations from the accounting domain with the European Union regulations (Căruntu and Lăpăduși, 2011).

According to the Order no. 881/2012 issued by the Ministry of Public Finance “the companies whose securities are admitted to trading on a regulated market are required to apply IFRS standards at the preparation of their individual annual financial situations, starting with the financial exercise from 2012” (Ministry of Public Finance, 2012a).

Because from 1.01.2013 IFRS standards are used as the basis of accounting, the Ministry of Public Finance has issued the Order no. 1286/2012 to approve the “accounting regulations compliant with the IFRS standards, applicable to companies whose securities are admitted to trading on a regulated market” (Ministry of Public Finance, 2012b). The order was modified and completed subsequently by the Order No. 1690/2012 (Ministry of Public Finance, 2012c), respectively Order no. 150/2015 (Ministry of Public Finance, 2015).

IFRS standards contain (International Accounting Standards Board, 2015; Pacter, 2016):

- International Financial Reporting Standards;
- International Accounting Standards;
- Standards Interpretations.

The process of IFRS standards adoption and national accounting regulations replacement is considered one of the most important processes from the financial reporting system, existing in the world economy. This process does not represent an attempt of reorganizing the chart of accounts or a technical accounting and financial reporting problem (Kosarkoska and Mircheska, 2012).

In recent years, analyses upon the impact of IFRS standards adoption on the companies' performances, on accounting quality and on the costs, have been achieved (Agustini, 2016; Albu and Albu, 2012; Căruntu and Lăpăduși, 2011; Ionașcu, Ionașcu and Munteanu, 2011; Ionașcu, et al., 2014; Pășcan and Țurcaș, 2012; Pășcan, 2015; Procházka, 2016). A study has been also made to determine if financial managers appropriately record transactions in accordance with IFRS standards (Bierstaker, Kopp and Lombardi, 2016). The result of this study has shown that financial managers do not correctly apply and do not understand the standards requirements, only 40% of the study participants correctly answering to the questionnaire questions.

Testing the effects that the IFRS standards adoption has on the accounting data quality is necessary, but is not enough (Pășcan, 2015). According to this study, the effects of IFRS standards adoption on accounting quality should be analysed taking into account also the factors that are specific to country, respectively to organization where these standards are applied.

The advantages and disadvantages of IFRS standards adoption in Romania has been identified and analysed in the specialty literature (Albu and Albu, 2012; Căruntu and Lăpăduși, 2011; Ionașcu, Ionașcu and Munteanu, 2011; Ionașcu, et al., 2014; Pășcan and Țurcaș, 2012; Pășcan, 2015).

The advantages are represented by:

- decreasing the attracting capital cost, investors having more confidence in financial reporting;
- increasing the accounting information transparency;
- training the accounting specialists in explaining rules;
- intensifying the activity of the companies that provide software applications as a result of the existing information systems updating;
- increasing the comparability grade of the financial information;
- consolidation of the results at subsidiary or activity domain level.

Regarding the disadvantages, these are:

- the complexity of IFRS implementation process;
- the existence of some internal and external specialists that can define and apply the IFRS implementation procedures;
- the awareness of the responsibilities the management and the specialists have in the standards application process.

Financial Reporting Ontology Develop

Knowledge represents an important concept both for accounting and artificial intelligence systems. People use concepts from the accounting domain in their daily activity without always knowing what their significance is.

In order to facilitate the financial situations preparation activity of the specialists from the accounting domain according with the IFRS standards, as well as in order to help the students from the accounting study programmes to understand the specific concepts of the domain, the role and the importance of each IFRS standard, a financial reporting ontology has been elaborated.

There is not a single right methodology to develop ontologies and it cannot be obtained a single right result (Sachs, 2006).

In order to model the domain and to identify the relevant entities from the domain and the relationships between them, the knowledge engineer must analyse and organize these domain entities into fundamental concepts and relationships between these concepts (Gerber, Gerber and Van der Merwe, 2015; Guarino, Oberle and Staab, 2009).

The author has used for the prototype ontology develop, the ontology life cycle model (Figure 1) created by Neuhaus (2013, pp. 4), the prototype ontology being, currently, in reuse phase.

The phases of the financial reporting ontology design are:

- determining the ontology domain and scope;
- reusing existing ontology;
- enumerating important terms for the ontology;
- defining classes and class hierarchy;
- defining facets for properties;
- creating instances.

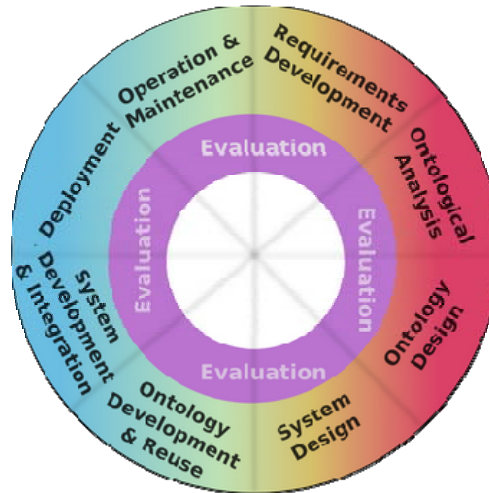


Fig. 1. Ontology life cycle model

Source: Neuhaus et al., 2013.

The ontology domain is represented by the accounting domain and, more specially, by the conformity with the IFRS standards and its scope is to facilitate the activity of the domain specialists. Although in the speciality literature are presented ontologies designed for the accounting domain (Aparaschivei, 2007; Gerber, Gerber and Van der Merwe, 2015; Hoffman, 2006; Shue, Chen and Shiue, 2009), the ontology described in this article treats exclusively the IFRS standards. For this reason, the author has built the ontology from scratch.

After the discussions with the expert accountants and after studying the IFRS standards, the following important terms for the ontology have been identified: IFRS standard, IAS standard, scope, definitions, standard objective, exceptions, effective date etc.

The author has selected among the terms identified in the previous phase only those that represent the fundamental concepts for the modelled domain and with these terms, he has defined the ontology classes and class hierarchy, using Protégé ontology editor (Pătrașcu, 2016; Sachs, 2006; Tănăsescu, 2013).

The proposed ontology is composed of 23 classes (Figure 2):

- 8 abstract classes: *Regulation*, *Standard*, *Interpretation*, *Balance_Sheet_Item*, *Assets_Item*, *Liabilities_Equity_Item*, *Non-Current_Assets*, *Current_Assets*;
- 15 concrete classes: *IFRS_Standard*, *IAS_Standard*, *IFRIC_Interpretation*, *SIC_Interpretation*, *Intangible_Assets*, *Tangible_Assets*, *Financial_Assets*, *Stocks*, *Claims*, *Investment_Securities*, *Liquid_Assets*, *Owners_Equity*, *Long-Term_Liabilities*, *Current_Liabilities*, *Data*.

After defining classes and class hierarchy, the author has defined the classes' properties that describe their characteristics and attributes, as well as those properties facets.

Two of those 23 classes from the financial reporting ontology will be further presented: *Regulation* class and *Standard* class.

Regulation class (Figure 3) is an abstract class that derives two abstract subclasses that inherit its five properties. The five properties are:

- 4 string properties (*name*, *presentation*, *scope* and *symbol*);
- 1 instance type property of *Data* class (*effective_date*).

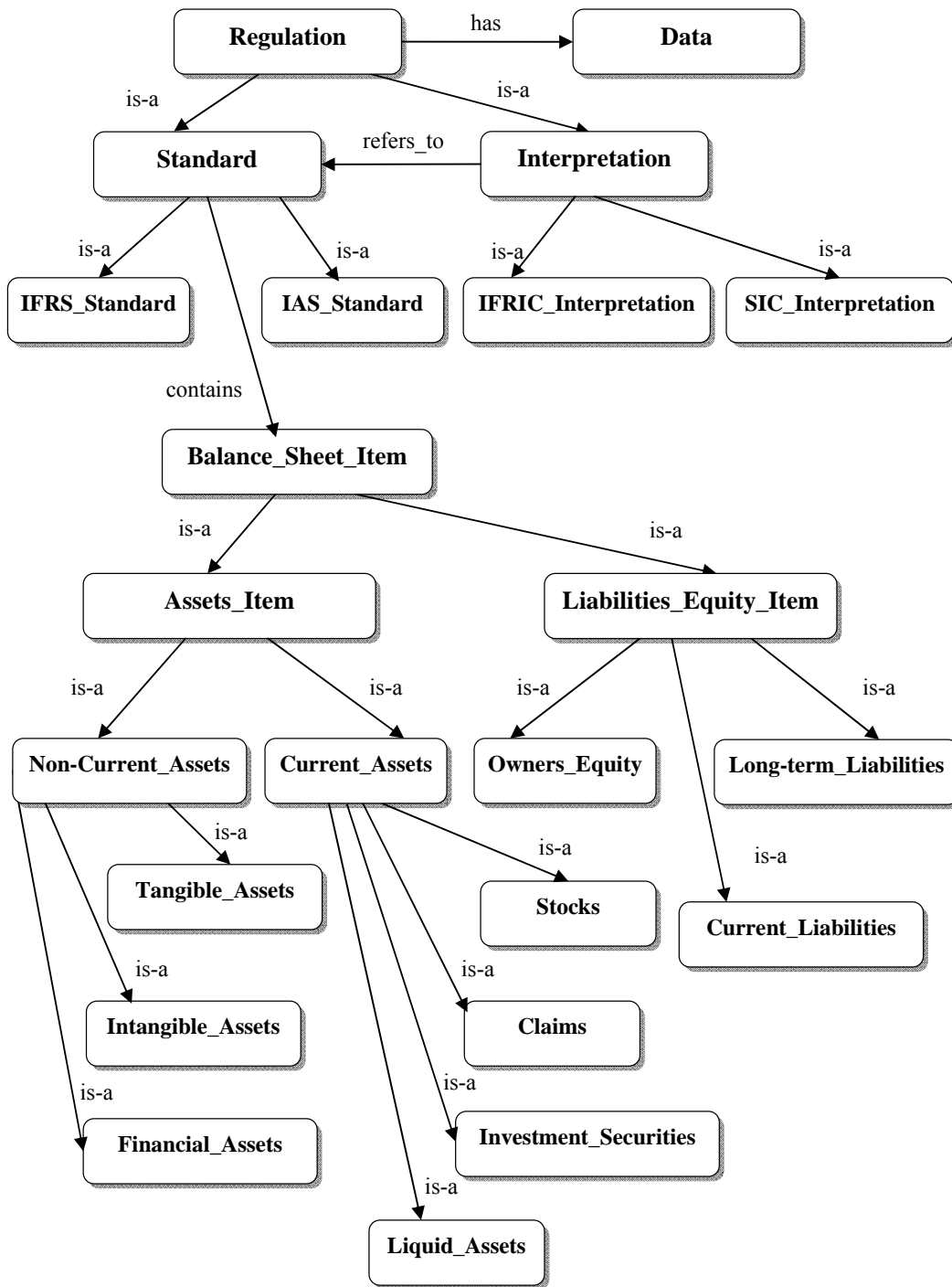


Fig. 2. Ontology class hierarchy

Source: made by author

● Regulation (instance of :STANDARD-CLASS)

Name
Regulation

Documentation

Role
Abstract ●

Template Slots

Name	Cardinality	Type
effective_date	required single	Instance of Data
name	required single	String
presentation	single	String
scope	single	String
symbol	required single	String

Fig 3. Regulation class

Source: made by author.

Standard class (Figure 4) is an abstract class, subclass of *Regulation* abstract class, that inherits the 5 properties of its superclass but, also, contains 6 proper properties (*application_guide*, *exceptions*, *exemptions*, *objective*, *terms* and *withdrawn_standard*). This class has, also, two subclasses: *IFRS_Standard* concrete class and *IAS_Standard* concrete class.

● Standard (instance of :STANDARD-CLASS)

Name
Standard

Documentation

Role
Abstract ●

Template Slots

Name	Cardinality	Type
application_guide	single	String
effective_date	required single	Instance of Data
exceptions	single	String
exemptions	single	String
name	required single	String
objective	single	String
presentation	single	String
scope	single	String
symbol	required single	String
terms	multiple	Class with superclass Balance_Sheet_Item
withdrawn_standard	single	String

Fig. 4. Standard Class

Source: made by author.

The last phase of the financial reporting ontology design process is the instances creation. In Figure 5, a fragment from an instance creation form for the *IFRS_Standard* concrete class is presented.

IFRS 5 (instance of IFRS_Standard, internal name is IFRSOntology_ENG_Instance_1)

Symbol: IFRS 5

Effective Date: 31/3/2004

Withdrawn Standard: IAS 35

Name: Non-current Assets Held for Sale and Discontinued Operations

Objective: The objective of this IFRS is to specify the accounting for assets held for sale, as well as the presentation and disclosure of discontinued operations. In particular, the IFRS requires: (a) assets that meet the criteria to be classified as held for sale to be measured at the lower of carrying amount and fair value less costs to sell, and depreciation on such assets to cease; (b) assets that meet the criteria to be classified as held for sale to be presented separately in the statement of financial position and the results of discontinued operations to be presented separately in the statement of comprehensive income.

Terms: Current_Assets, Non-Current_Assets

Fig. 5. IFRS 5 instance creation

Source: made by author.

Conclusions

This article presents the way the IFRS are applied in Romania and the phases of the financial reporting ontology design, according to those standards.

The financial reporting ontology describes the fundamental concepts from the accounting domain and the relationships between them and provides the following advantages:

- is a good teaching tool for the students from accounting study programmes due to the diversity of concepts that are used at its creation;
- shares the accounting knowledge between people and software applications;
- reuses and analyses the knowledge from the accounting domain.

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