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Semantic Digital Model Based XBRL for Financial Reporting: Indonesia SMEs Case

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Abstract: ***One of the challenges faced by SMEs to develop their business is access to capital. SMEs are required to be ready to present the financial performance in the financial statements to the owners of the funds. As a new information standard and technology supporting the accounting internationalization and the globalization of financial report, XBRL has not been concerned by SMEs and accounting personnel in the time that the information develops so quickly. The functions of XBRL are discussed in the article to enhance the accounting information quality, which indicates that Indonesia should well grasp the demands of the economic development and the promotion function of the accounting information processing technology to the accounting.***

Keywords: Accounting Information**,** Financial Reporting, IFRS, SMEs, XBRL

1. Introduction

One of the challenges faced by SMEs to develop their business is access to capital. SMEs are required to be ready to present the financial performance in the financial statements to the owners of the funds as the lenders in the money market and the investors in capital market, whether domestic and global [1].

Results of a preliminary study of some SMEs have been done those are almost the majority of SMEs have not been able to present financial statements in accordance with Financial Accounting Standards (GAAP) applicable to SMEs i.e financial accounting standards for entities without public accountability (ETAP) [2]. Function of accounting activities undertaken at SMEs only bookkeeping such as a simple economic transaction entries in debit and credit side. But a view of SMEs already routinely perform adequate financial reporting in accordance with GAAP ETAP, particularly the medium businesses have been listed at the Indonesia stock exchange [1]. They develop their business overseas in order to market their products and services.

The diversity of SMEs financial information system that has not been referred to GAAP-ETAP and international financial reporting standards (IFRS) [3]. For example, certain companies report sales data without an Interm of money unit or other indicator scale, while other companies report sales data in IDR millions or other currency. Likewise, the currency in which the financial information unit of a particular company in the local currency, while other companies present financial information in units of US $ or others [3] and [4].

Adoption of global accounting standards, namely IFRS on financial reporting has several benefits. The accuracy of the analysis done by financial analysts increased after the entity adopts IFRS [3] and [5]. Using IFRS allows comparisons between entities those are domiciled in two or more different places (example: compare the operating entity in Indonesia and which operates in Australia) [5].

The need for the exchange of financial information among SMEs diversity as well as with stakeholders such as the Banker, the Tax Officer, investors, suppliers and others. Then it is necessary to build a model information system technology (IST) which can accommodate the exchange of financial information as a mediator between heterogeneous resources to achieve inter operbilit as among heterogeneous financial information sources [6] and [7].

Regulatory authorities such as Bank Central of Indonesia (BI), Financial Services Authority (FSA) or OJK, Capital Market Supervisory Agency (Bapepam) and the Indonesia Stock Exchange (IDX) are institutions in Indonesia which could also act as a recipient of financial information of banks and public companies in sending financial information for company or organization, including SMEs [8]

They are required to submit a report to the regulatory authority or regulator.

Extensive business reporting language (XBRL) is an XML-based language for the electronic communication of business information / finance. It is designed to increase the exchange, aggregation and analysis of company data that require disclosure, through a unique tagging structure that provides interoperability [9]. But the proliferation of many XBRL taxonomy, in accordance with accounting principles differ, could risk the purpose of standardization, comparative and re-usability of information sought by XBRL. It is important to develop standards of accounting information exchanged globally as a unique foundation, where the XBRL taxonomy can be formed.

So it becomes possible to compare financial information from different countries. This is possible because of the similarity of rules and accounting principles that are used by entities to facilitate the comparison of financial information between the entities concerned. With the increasing number of financial information disclosed in the financial statements

and the comparability between the financial statements of the company with other entities can cause a decline in capital costs incurred by the entity as well as investors and other stakeholders [7]. [8], and [9].

Impact of adoption of IFRS on the company's management, according [2] and [10] are: management has high accountability in running the company, the financial statements of entities can be used for decision making all parties because it produces quality information, more relevant, crucial and accurate, the financial statements of the company will be more easily understood, easily comparable and produce more valid information about the assets, liabilities, equity, income and expenses of an entity, assist investors in investing their estimates on the company based on data from company financial statements in the previous year, and the high level of disclosure of financial statements of a company that have an impact on the low cost of capital. In line with these, IFRS taxonomy was created to establish a common ground for international companies and create a platform that will enhance the benefits of XBRL [10].

The role of the recipient's financial information in its implementation is set default information in the form of XBRL taxonomy. The receiving party information also make the process of information in XBRL format received. On the other hand, the shipper financial information plays submit report data in the form of XBRL documents (XBRL instance document) based on predefined taxonomy. According to [7], [9] and [10], the benefits of using XBRL in the business world are: increase the usefulness of the electronic reporting system, facilitating the publication of the report does, because XBRL can be reprocessed into a desired format stakeholders, whether PDF, HTML, Excel, TXT, improving the ease of access to financial information, to accelerate business decision making for investors, improve the effectiveness and efficiency of the auditing process is integrated and transparent.

XBRL features include three components [5] and [10]:

1) A Taxonomy, then XBRL acts like a dictionary, defines a common language, with descriptions and classifications for the content of XBRL documents. Similar to the dictionary, specify the XBRL tags (words) which will be used, semantics (meaning), and how it is defined (data types, structures, and relationships with one another) and the rules and formulas to be applied. i.e Accounting Equation (Assets = Liabilities + Equity).
2) A document, XBRL is an XML document, according to the XBRL format and usually contains the information required in financial reporting and disclosure period. Each element of data in XBRL documents marked with identification tags, which are defined in the XBRL taxonomy. So every piece of information in a XBRL document has a definition of what it is, what it means, and what are the rules?
3) Tools XBRL, XBRL itself is a complex syntax layered on top of XML and is not intended to be used without XBRL tools or processor. XBRL tools fulfill a dual role: to protect the user from the complexity of the syntax and taxonomy, helped in the creation, viewing, and management of XBRL documents, facilitates interoperability of data in the system, allowing automated collection, validation, extraction, and manipulation of XBRL documents, and ease of management to adapt to change business environment.

It can be concluded that XBRL is basically an attempt to add a standardized description ("tagging") on the business and financial information (including financial statements) to improve electronic reporting system.

XBRL is designed to increase the exchange, aggregation and analysis of company data that require disclosure, through a unique tagging structure that provides interoperability is important for developing world accounting standards as the basis of unique where taxonomy XBRL can be formed, so that it becomes possible to compare financial information from different countries [10]. Research conducted by [6] still draws on research [10] is about XBRL technology. Thus discussing the motivations and basics of ontology representation of business reporting data and metadata structure as defined in the eXtensible Markup Language (XBRL) standard. The main motivation for ontology representation is enhanced potential for integrated analytical applications that build quantitative report data is combined with structured data and unstructured from additional sources[9].

Interoperability definition given by the Institute of Electrical and Electronic Engineers (IEEE, 2010) Is the ability of two or more systems or components to exchange information, and use the information that has been exchanged [11]. While other organizations, namely Web Services Interoperability Organization states that 'interoperable' means corresponding to multiple operating systems and multiple programming languages. While [9] states that interoperability can be achieved if there are three things, namely: (1) systems involved can work in real time (2) The software can operate on different systems (portable), and (3) Data can be exchanged between different systems.

Finally it can be concluded that the technical aspects of interoperability is in the form of the ability to communicate between machines and between programs.

Ontology as "a formal and explicit specification of a shared concept (a formal, explicit specification of a shared conceptualization)". Ontology is a clear specification of a set of concepts that describe a certain area of knowledge shared by the users of the system in question [9]. Ontology is an explicit specification of a conceptualization and computer science perspective, Ontology can be seen as a data model that represents a set of concepts within a domain and the relationships between concepts. Ontology is a hierarchical structure that contains the class definition, between relationships (relationships), characteristic or property, and governance rules (rules) in force in a field of knowledge. Ontologies can be seen as a shared vocabulary and represent the consensus of the community on a plot of specific knowledge.

This paper describes specifically developing a taxonomy

and ontology to financial data representation of SMEs exporter in Indonesia with a high level of diversity- based XBRL.

2. Research Method

Survey is conducted to 44 SMEs exporters listed on SMESCO's members which are location based in Jakarta, Depok, Bekasi and Tangerang area. Mostly their activities are handycraft and creative industry. Primary data is collected through openness deep interviewing to the book keeper, data entry, information system manager or financial managers of SMEs. Beside secondary data is gathered from financial transaction records of SME. Financial data only are identified the elements of a comprehensive Income Statement which is consisted nominal accounts such as income/revenue and expense/cost accounts. These accounts always change their balances during daily operations and must be closed (Closing entry) at ending business operational periodic of SMEs.

Finally all data are analyzed by using qualitative descriptive method and F inference statistic test. Scenario Tests conducted by [12]:

1) Scenario mapping test of data sources and common ontology
2) Scenario user (respondent) test with the XBRL Taxonomy manually
3) Scenario results of the mapping test with the XBRL Taxonomy automatically.

3. Research Result

Scenario mapping test of data sources and common ontology is began with a view experiments. These were conducted by two parameters: the source of the data and common ontology. Completeness ontology used was 50%, 75% and 100%. The method used is Recall, Precision, and F-Measure. In the regulation No. VII G.7 [7]: Presentation and disclosure of financial statements of the Issuer or a public company, the income statement consists of two components, namely;

1) Components of Income
2) Components of Other Comprehensive Income.

The terminology used in the trials using a Capital Market Supervisory Board Standards is only a component of income statement. Then for trials using IDX standards using these two components. Due to many SMEs use Capital Market Supervisory Board standard containing components of income alone.

Then at this stage of simulation analysis needs to run the test. The tools are used as follow:

1) Protege,
   a) Used for manufacturing ontology Financial Reports Loss profit SMEs,
   b) used for the manufacture of common ontology as a mediator between users and data sources
2) SPARQL, is used to perform queries against the data on common ontology and data sources
3) XML, the language used for XBRL
4) XBRL, to interactive financial data presentation.

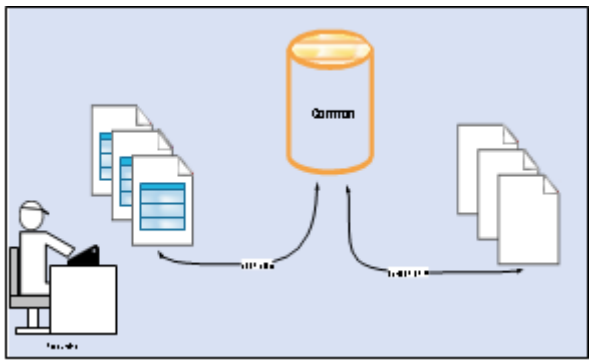

Figure 1: UserView Mapping, Common Ontology and Data source

Selection of initial data to establish a common ontology is done by making a combination of the terms of financial income statement data on SMEs. Diversity can be said about the same terminology in the observation of the existing data so that the data used as a common ontology is based on 44 standard data and Bapepam and IDX. Data sources totaling 44 data was created in OWL representation. In making this common ontology using the mapping in the form of equivalent property. Figure 1 above describes the mapping is done with 2 mapping process that is User View against common ontology common ontology and data sources.

A 100% completeness of the data in Figure 2 is a term meaning the entire terminology used is that of the common ontology. Completeness of data means that 75% use the terminology of only 75 percent of the existing terminology in common ontology. Likewise, the completeness of the data of 50% means that the terminology used only 50 percent of the total existing terminology in common ontology.

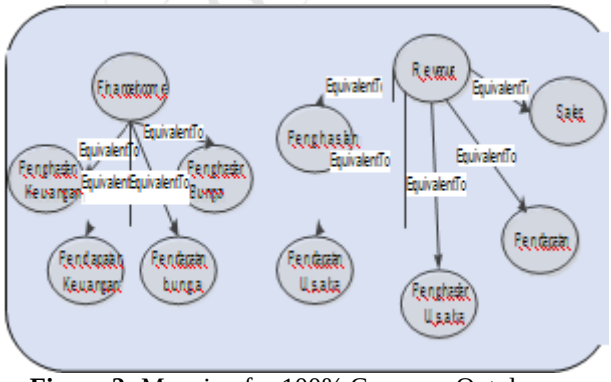

Figure 2: Mapping for 100% Common Ontology Completeness

Results of experiments conducted by the completeness of the ontology 100% with UserView used are Capital Market Supervisory Board Standard and IDX standards. For completeness, the results in combination with common terminology ontology of 100% can be seen in the attachment. The trials were conducted on 44 of income statements completeness of SMEs with common ontology 100%, there are 44 income statements data that matches the result of a combination of mapping the financial statements, meaning that all data can be drawn.

For completeness, the results in combination with the terminology common ontology of 75% can be seen in the attachment. Reduction completeness terminology is to reduce the overall terms of terminology, the terminology as much as 55 reduction is carried out as many as 14 terminology resulting income statements can not be drawn as many as 32 income statements and which can be drawn only by 12 financial reports.

While the majority of common ontology mapping with completeness 50% percent. Reduction completeness terminology is to reduce the overall terms of terminology, the terminology as much as 55 reduction is done is as much as 28 terminology resulting income statements can not be drawn as many as 37 income statements and which can be taken away just as much as 7 income statements.

Experiments performed by the user in this case is that the expert respondents accounting done by providing financial statements printed income of SMEs and perform equalization element of the taxonomy as an example in figure 3 below.

Experiments were done automatically by the system XBRL done by going through the process as in figure 4. In this testing, users upload a file financial statements income manifold SMEs excel format and then perform mapping system automatically after the pick taxonomy that will be used as a standard and output produced according to the taxonomy, and it generates a file into XBRL format and output that can be viewed in accordance with the selected standard or taxonomy.

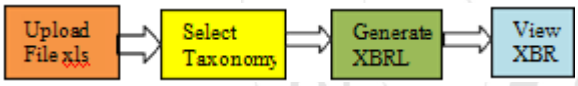

Figure 4: Automatic Processing Into Mapping by User's views

For example, when uploading a file, the file in the financial statements are suppose terminology such as follows
Operating Revenues 838624
Selling Expenses 324876

Then the system will automatically perform the mapping of the terminology so that "revenue" would be recognized by the "revenue" is the standard or the taxonomy is selected, followed by the file generated into XBRL format and the results that can be seen will look like;
Revenue 838624
Cost of Sales 324876

Beside result analysis of scenarios user test (respondents) automatically based on processing times show that number of 44 Income Statements only took 20 minutes for both standards. To assess the results of experiments performed is used by Recall, Precision and F- Measure.

Number of Data	Ontology Completeness	Both Standards		
		Recall	Precision	F-Measure
44	50 %	0,15	1	0,26
	75 %	0,27	1	0,42
	100 %	1	1	1

UMKM A
Laporan Laba Rugi
Untuk Tahun Yang berakhir
31 Desember 2005

		TAKSONOMI
Pendapatan Usaha	838624	Revenue
Beban Penjualan	324876	Cost Sales
Laba Rugi Kotor	513748	**Gross Profit**
Beban Usaha	37990	Operating Expenses
Laba Rugi Usaha	475758	**Operating Income (Loss)**
Penghasilan Beban Lain-lain	21098	Other Income (Expenses)
Bagian Laba Rugi Perusahaan Asosiasi	5678	Equity in Net Earnings Associates
Laba Rugi Sebelum Pajak Penghasilan	502534	**Income (Loss) Before Tax**
Beban Penghasilan Pajak	56781	Tax Expense
Laba Rugi Dari Aktifitas Normal	445753	**Income (Loss) Normal Activities**
Pos Luar Biasa	23098	Extraordinary Items
Laba Rugi Bersih	422655	**Net Income (Loss)**

Figure 3: Taxonomy of User's View

Explanation in figure 3 is applicable here as an investor respondents who received the financial statements of SMEs A and investors use Bapepam and IDX standards as a reference.

Result analysis of scenarios user test (respondents) manually based on processing times show that number of 44Incomestatementstook300minutesforbothstandards.

4. Conclusions

Interoperability occurs in accounting environment, in this case the exchange of financial statement information. The diversity problems of SMEs's financial statements are interchangeable. These happen not only diversity in the format of the report but also the diversity of semantics. Then interoperability has the ability to solve this semantic diversity. Efforts are being made to solve the problem of diversity for the extraction format from the format presented by SMEs. Thus the Table (excell) format into a format which can be read by the recipient of the information such as lenders, investors, creditors, regulators and other interested parties. Efforts to address the diversity of semantic ontology approach have done by mapping terminology between the financial reports of SMEs' multiple data sources with the terminology is used by Capital Market Supervisory Board Standar and IDX standars.

The testing has done successfully, i.e interoperability is achieved between the data source with a high level of diversity and the data can be represented by XBRL. Having said that for 44 SMEs's Income statements case.

Some issues for the future research are suggested presenting another types of financial statements such as financial position and cash flows; a Taxonomy used in this study is a standard taxonomy Capital Market Supervisory Board Standar. Happing said that the next working could be to use different taxonomies and developing their own taxonomy adapted to the needs. Since those refer to the general accepted accounting principles, mainlyIFRS.

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