A Proposed Model for Generating a Financial Report based on Integration between ERP Systems and (XBRL) Language

Mohamed Fathy Yehia
Department of Information Systems,
Helwan University, Egypt

Mohamed Ibrahim Mare'y
Professor of Information Systems,
Helwan University, Egypt

Samir Abo El-Fotouh Saleh
Professor of Accounting Information System,
Mansoura University, Egypt

ABSTRACT
The main idea of the study is how XBRL will increase financial information integrity for creditors and investors? In XBRL, identification tags are assigned to data objects so, computer software can handle them effectively. XBRL is simple to extend and may be utilized on a variety of platforms, software formats, and technologies. These XBRL features make the complicated and ever-changing financial reporting process more efficient and cost-effective. As a result, it's gaining in popularity in public financial reporting. ERP systems with built-in XBRL tagging and standard mapping functionalities may eliminate repetitive data and data mistakes, as well as increase overall XBRL pre-filing information quality. However, accountants' lack of knowledge and comprehension of XBRL may have an impact on its implementation in ERP systems. The training costs involved with implementing an ERP system are expensive.

General Terms
XBRL language and ERP systems.

Keywords
Enterprise resource planning (ERP); extensible business reporting language (XBRL).

1. INTRODUCTION

When XBRL became a part of accounting language in 1998, it signaled a new era for corporate reporting as a result of globalization of business practice and the 21st century age of technology progress and its confluence with innovation. This breakthrough, which spawned new business models [1], spurred the development of a single reporting standard capable of mapping semantics to financial data, which has garnered the approval of international accounting standard setters in major countries. It's a phenomena that's gotten the endorsement of regulators, leading software firms, and technological specialists from all around the financial markets [2].

Using XBRL, an accounting-specific markup language, interactive data is created by "tagging" financial data. The current XBRL tagging process converts financial data from a document (Word or Excel) into a "document" or computer file with XBRL codes. A Fundamental Revolution In Financial Reporting Will Follow The Filing Of The Resulting Computer-Readable Electronic Document. Efforts based on the data that has been saved [3].

The Electronic Accounting Disclosure of Accounting Information And Transparency Through The Internet Has Encountered Many Problems, The Most Important of Which are the Different Versions of the Writing, Which Differ From One Company To Another, Some Use PDF, and other Use EXCEL or WORD or HTML. it is Difficult to Compare the Information Contained in these Formats, Which in Turn Increases Costs, Inefficiencies and Weaknesses in the Decision-Making Process, as a result of Developments in Internet Technology, the Language of The Electronic Financial Report has been Developed Through Electronic Date Interactive (EDI) to Extensible Business Reporting Language (XBRL), Which Is A System Based on The Internet in the Accounting Disclosure of Accounting Information Through a Set Of Methods, Such as (EXCEL, Power Point) Increasing the Effectiveness of Accounting Disclosure of Accounting Information and Thus Increasing the Trust of Users.

Extensible Business Reporting Language (XBRL) is an XML-based language for marking financial data, allowing firms to handle and distribute data more effectively and precisely. Many ERP software businesses and worldwide accounting organizations use the XBRL initiative to facilitate global financial reporting. The goal of this research study is to construct a complete report by parsing the XBRL file within ERP systems.
There are five sections to this study. Section two, the prior study, follows the introduction. The research technique is detailed in Section three, which breaks down the phases of the proposed strategy. The recommendations and results are discussed in Section four and finally, the conclusions and future works.

2. LITERATURE REVIEWS

Seokyoun Hwang, Jongkyum Kim, et al, 2021. This research produced a filing lags of ICW firms are increased more than those of non-ICW firms after the XBRL mandate. Particularly and observe that the increased filing lags for ICW firms are centered on the first year of detail tagged XBRL disclosure. The results also show that ICW firms tend to use the grace period in their XBRL disclosures and that the length of the grace period used by ICW firms is longer than that of non-ICW firms. In addition, the significant increase in filing lags of ICW firms is driven primarily by smaller firms, not by large firms. In sum, the results of this study imply that the XBRL mandate is more burdensome to firms with ICWs, particularly to smaller firms. Furthermore, our additional analyses reveal that the XBRL mandate has affected firms' filing behaviors differently depending on firm characteristics such as firm size. Overall, our findings indicate that the impact of ICWs on the timeliness of financial reporting is greater under the mandated XBRL disclosure. [4].

Feng Guo, Xin Luo, Xinlei Zhao, et al, 2021. This research produced an indicate that ERP can mitigate the negative effect of extension taxonomies on XBRL reporting quality, which highlights the importance of the ERP system in a complicated XBRL reporting environment. And have changed the way accounting information is collected, stored, processed, and disseminated. Although most ERP systems integrate an extensible Business Reporting Language (XBRL) component in their core modules, little research has examined how ERP systems affect the quality of XBRL filings. Using unique data from branch-level ERP implementation. [5].

Andrea Caputo, Francesca Bartolacci, Michela Soverchia, et al, 2020. This research produced a reveal a scarcity of studies devoted to explicating the consequences of XBRL implementation on financial reporting outside the SEC's XBRL mandate and listed companies' contexts. Also, some papers' results question the usefulness of the language on the decision-making process. The overall lack of literature concerning the impact of XBRL on financial statement preparers, especially with reference to SMEs, is evident. Moreover, the consequences on corporate governance choices and the relevant internal decision-making processes are rarely debated. [6].

Dirk Beerbaum, 2020. This research produced an enables major gains by distributed technology and elimination of traditional intermediaries such as auditors or banks. In the last twenty years a technological revolution also occurred fueled by the widespread diffusion of the internet. With regard to Financial Reporting, this trend also generated the development of Extensible Business Reporting Language (XBRL), which many accounting experts expect to revolutionize financial reporting since it allows corporate financial information to be aggregated, transmitted and analyzed quicker and more accurately. Blockchain and XBRL combined may represent a "centauromachy". [7].

Eötvös Loránd, 2019. This paper proposes a general framework for legacy ERP system integration based on ontology learning to tackle this challenge. Initially, the related literature is reviewed from the perspective of system integration and ontology learning, then an integration framework based on ontology learning is given, and the basic workflow and ontology learning process are analyzed and illustrated, the ontology learning methods were proposed to achieve (semi-)automated construction of ontologies. [8].

Roslee Uyob, Aidi Ahmi, et al, 2019. This research produced a found that a study regarding the XBRL impact has shown slightly increase until 2014 but has not grown much since then. There are a few perspectives that have been discovered to investigate on how XBRL affected certain users of the financial reports. This study will give a general picture of the current research on the impact of XBRL, the trend, and future direction of the research related to the XBRL, This study aims to identify the research trends on the impact of XBRL and issues related to it. Forty-six articles related to the impact of XBRL was extracted from the Scopus database and Google Scholar. [9].

Elizabeth Blankespoor, 2019. This research produced a the processing costs of market participants can be significant enough to impact firms‟ disclosure decisions, Examination of the disclosure increase by footnote type suggests that both regulatory and non-regulatory market participants play a role in monitoring firm disclosures. These results hold in a difference-in-difference design using matched non-adopting firms as controls, as well as two additional identification strategies. [10].

Jeong-Bon Kim, Joung W. Kim, Jee-Hae Lim, 2018. This research produced that absolute discretionary accruals decrease significantly from the preto the post-XBRL period, suggesting that XBRL adoption constrains earnings management via discretionary accrual choices. Our analyses further reveal that the use of standardized official XBRL elements significantly reduces the levels of discretionary accruals, while the use of customized extension elements does not, suggesting that the former discourages accrual-based earnings management, while the latter does not. Our results are robust to a variety of sensitivity checks. [11].

Table 1. Comparison between literature reviews

Researchers	Objectives	Results
Seokyoun Hwang, Jongkyum Kim, et al, 2021.	Produced a filing lags of ICW.	The results our analyses the filing lags of firms with ICWs are longer than those of firms without ICWs for their first detail tagged XBRL disclosure.
Feng Guo, Xin Luo, Xinlei Zhao, et al, 2021.	Produced an indicate that ERP can mitigate the negative effect of extension taxonomies on XBRL reporting quality.	Our results indicate that ERP can mitigate the negative effect of extension taxonomies on XBRL reporting quality.
Andrea Caputo, Francesca Bartolacci, Michela Soverchia, et al, 2020.	Produced a reveal a scarcity of studies devoted to explicating the consequences of XBRL.	The results reveal a scarcity of studies devoted to explicating the consequences of XBRL implementation on financial reporting outside the SEC's XBRL.
Dirk Beerbaum, 2020.	Produced an enables major gains by distributed technology and elimination of traditional intermediaries such as auditors or banks.	Our results show that absolute discretionary accruals decrease significantly from the robust the post-XBRL period.
Eötvös Loránd, 2019.	Proposes a general framework for legacy ERP.	The process of ontology construction is a precondition of the system integration based on ontology learning.
Roslee Uyob, Aidi Ahmi, et al, 2019.	Impact has shown slightly increase until 2014.	The results hold in a difference-in-difference there design using matched non-adopting firms as controls.
Elizabeth Blankespoor, 2019.	Impact firms‟ disclosure decisions.	These findings suggest that the processing costs of market participants can be significant enough to impact firms' disclosure decisions.
Jeong-Bon Kim, Joung W. Kim, Jee-Hae Lim, 2018.	Produced that absolute discretionary accruals decrease significantly from the preto the post-XBRL.	These results reveal that the adoption of XBRL can limit the opportunistic behavior of management in presenting financial reporting.

Most previous studies indicated how well XBRL adapted to

ERP, resulting in disclosure, transparency, and reporting in Excel- word- power point format. This research paper differs from previous studies in focusing on the outputs of integration between XBRL with ERP, so that this study focused on the ease of preparing the financial report resulting from this integration, which is in the form of a financial report in the form of a web user interface. This allows users to easily manipulate an XBRL file by parsing its elements inside an Oracle database and reading and extracting all the facts inside the file without having to know how this language or the tags in it work. What distinguishes this final report generating from this integration is easy to read and understand.

3. THE PROPOSED FRAMEWORK

In this section, present the proposed framework in detail. divided the proposed framework into six sequential stages, the first stage is the Data sets ,the second stage is Preprocessing & Filtering, the third stage is ORACLE DB & Python Language ,the fourth stage is the Parse File(Save into (DB), Insert File (DB), Read(DB)), the Fifth stage to get the json text it's extension http , and in the final stage is Financial Report (Web UI) . As shown in **Figure 1.**

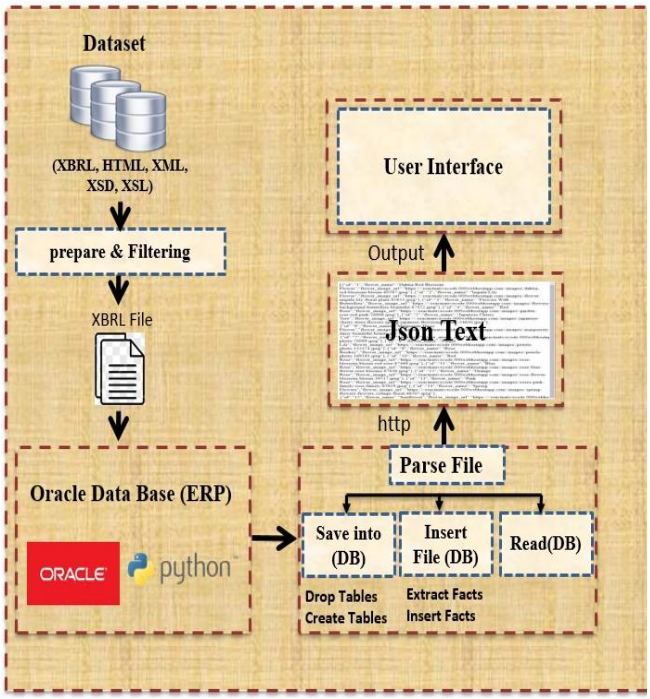

Figure 1. The Proposed Framework

3.1. Dataset description

A data set (or dataset) is a collection of data. In the case of tabular data, a data set corresponds to one or more database tables, where every column of a table represents a particular variable, and each row corresponds to a given record of the data set in question. The data set lists values for each of the variables, such as for example height and weight of an object, for each member of the data set. Data sets can also consist of a collection of documents or files. Some other issues (real-time data sources, non-relational data sets, etc.) increases the difficulty to reach a consensus, No tabular datasets can take the form of marked up strings of characters, such as ('html', 'xml', 'xbrl', 'xsd', 'xsl').

3.2. Preparing & Filtering

The nature of the work of this stage: There are many files of different types, but here the researcher are working on one specific type, which is (XBRL), due to the importance of this type in accurate accounting transactions that cause great problems for accountants, due to the change of terminology that has the same meaning and the role it plays in same file; From here should went to work on the (XBRL) file to standardize the accounting terminology in the file. Upload the file and then allow the file with the extension XBRL to be uploaded only, read configuration file and store the result in the variable named in Oracle Data Base (ERP).

3.3. ORACLE DB & Python Language

XBRL Extension to Oracle DB extends Oracle Database to serve as a comprehensive platform for managing XBRL content. There is a growing volume of XBRL content to be stored, managed, and queried efficiently. XBRL Extension to Oracle DB helps you manage XBRL content. It lets you create multiple XBRL repositories and project XBRL data relationally or query it in various ways.

3.4. Parse file

At this point: The XBRL file is worked with the function for parsing an XBRL file to a set of basic elements in the form. Then save the data of the XBRL file from the model to the DB, so that if the file already exists, the elements are extracted directly without parsing. As shown in **Figure 2.**

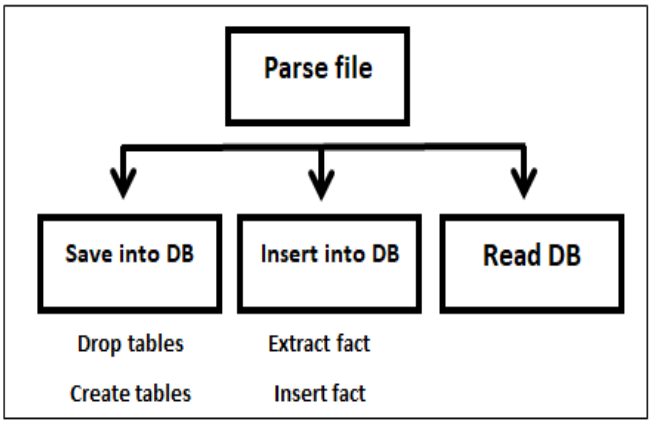

Figure 2. Process of Parsing file

The stage of inserting a file into the DB: It is the stage responsible for confirming the existence of the file in the DB through the ID. If it exists, the facts are extracted and saved in the list; If it does not exist, a new file is inserted into the DB. Then the file and facts are read from the DB, (json) returns a string of all the facts saved in the database.

3.5 Json text

This file is the result of an XPRL file being parsed with all the facts, elements, and values, but in an unformatted format and is not easily recognized. As shown in Figure 3.

[[1, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityRegistrantName", "ABC Company"], [2, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityCentralIndexKey", "0000000001"], [3, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityFilerCategory", "Large Accelerated Filer"], [4, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityCurrentReportingStatus", "Yes"], [5, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityVoluntaryFilers", "Yes"], [6, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityWellKnownSeasonedIssuer", "No"], [7, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "EntityPublicFloat", "1000000.0"], [8, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "DocumentType", "10-K"], [9, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "AmendmentFlag", "false"], [10, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "DocumentFiscalPeriodFocus", "FY"], [11, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "DocumentFiscalYearFocus", "2010"], [12, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "DocumentPeriodEndDate", "2010-12-31"], [13, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "CurrentFiscalYearEndDate", "--12-31"], [14, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "CashAndCashEquivalentsPolicyTextBlock", "

Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. \n\t\tNulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.

"], [15, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "ReceivablesPolicyTextBlock", "

Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. \n\t\tNulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede. \n\t\tProin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. \n\t\tNulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.

"], [16, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "InventoryPolicyTextBlock", "

Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus.

"], [17, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "InventoryFinishedGoods", "5347000.0"], [18, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "InventoryFinishedGoods", "1147000.0"], [19, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml", "InventoryWorkInProcess", "244508000.0"], [20, "D:\\xbrl2oracle-master\\uploads\\abc-20101231_All\\abc-20101231.xml",

Figure 3. Json text

3.6 End user Financial Report (Web UI)

The XBRL file to be parsed is entered into the Oracle database, and then some Functions are performed using the Python programming language, XBRL provides significant benefits in the preparation, analysis, and communication of business information, XBRL offers greater efficiency and improved accuracy and reliability for all those involved in supplying or using financial data. With growing adoption of XBRL, and with financial reports being generated on a regular basis. It can help you improve operations on aggregated business and financial reports such as business intelligence (BI); and online analytical processing (OLAP), Such as extracting the financial report in the form of Web UI which is the final output of the researcher. As shown **in Figure 4.**

ID	File	Fact Name	Fact Value
1	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityRegistrantName	ABC Company
2	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityCentralIndexKey	0000000001
3	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityFilerCategory	Large Accelerated Filer
4	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityCurrentReportingStatus	Yes
5	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityVoluntaryFilers	Yes
6	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityWellKnownSeasonedIssuer	No
7	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	EntityPublicFloat	1000000.0
8	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	DocumentType	10-K
9	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	AmendmentFlag	false
10	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	DocumentFiscalPeriodFocus	FY
11	D:\xbrl2oracle-master\uploads\abc-20101231_All\abc-20101231.xml	DocumentFiscalYearFocus	2010

Figure 4. End user financial report

4. RECOMMENDATIONS AND RESULTS

The results of this research indicate the generation of a type of financial reports in an easy and simple format (WEB UI). It is the final form of the report and the final output of the proposed model for merging between XBRL and ERP. This form was reached by making an HTTP server and making a FORM that is filled with a specific data, such as choosing the file whose contents are to be analyzed, then writing the URL of the location of the XBRL file on the computer, then writing the name of database, then USERNAME & PASSWORD for database. Here, the file to be analyzed is inserted into the database and then through a set of Python Functions such as Save To DB - Insert TO DB - Read DB and also through a set of queries in Python & SQL language, all the facts of XBRL file or some are extracted via HTTP server and The final report appears (End User Financial Report).

5. CONCLUSION

This paper explained how to integrate XBRL and ERB. The results indicate how to generate a report in the form of Web UI listing all the facts contained in the XBRL file; Using oracle database for data set coming from ORACLE DB system .The dataset is fetched from the official website of XBRL and then the file is parsed into facts through a ready-made library that is updated every period and works by integrating python language with an Oracle database and then using an HTTP server to produce a financial report in the web

user interface.

6. FUTURE WORK

For future work, it would be interesting to use the latest techniques such as cloud and mobility when implementing ERP. it also would be interesting to co-accreditation of ERP and BI systems for improving the quality of financial reporting , through ERP capabilities to integrate all available data into a common database, and the advantages of new business intelligence tools, which play an important role in enhancing the quality of financial reporting using data collected from systems Enterprise resource planning.

There is a dearth of research's looking at the influencing factors on the adoption of integration between SAP and XBRL so it would be good to expand in research at the influencing factors on the adoption of SAP with XBRL language .

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