FOM Hochschule für Oekonomie & Management
University Centre Essen

Group Project

in the study course Applied Project I

on the Topic

Solution Design on for peer group analysis with different frameworks

by

Agnishwar Das
Sagnik Patra
Shubham Kolpe
Tamal Chakraborty
Abhishek Pandve

II

First Assessor Prof.	Prof. Dr. Dirk Stein
Matriculation number	547965
	550496
	550476

| Delivery date | 2021-07-16 |

Table of Contents

1. **Introduction**

    1.1.   Importance of The Topic

    1.2.   Problem Statement

    1.3.   Research Questions

    1.4.   Planned Output of The Assignment

2. **Theoretical Foundation**

    2.1.   Literature Review on peer group analysis

    2.2.   Why world have different reporting framework?

    2.3.   Financial statement and their elements

        2.3.1   Balance sheet

        2.3.2   Income Statement

        2.3.3   Statement of Cash Flow

    2.4   Literature review on ESEF, US GAAP, JAPANESE GAAP and IFRS

        2.4.1 ESEF

        2.4.2 US GAAP

        2.4.3 Japanese GAAP

        2.4.4. IFRS

List of Figures

VI

Table Directory

List of abbreviation

ESEF – European single electronic framework
XBRL - extensible Business Reporting Language
 IFRS - International Financial Reporting Standards
SEC – Securities and Exchange Commission
EBA – European Banking Authorities
IASC – International accounting standards committee
GAAP – Generally accepted accounting principles
FASB – Financial accounting standards boards
ESMA – European securities and markets authorities
IASB – International accounting standards boards
PnL – Profit and Loss
xHTML– Extensible hypertext markup language
ASBJ – Accounting standards board of Japan
FSAJ – Financial services agency of Japan
FASF – Financial accounting standards foundation
FSA – Flexible spending accounts
FPIs – Foreign private issuers

1.Introduction

1.1 Importance of the topic :

Companion bunch investigation is a fundamental piece of evaluating a cost for a specific stock in research. The accentuation here is on making an examination, implying that the friend bunch constituents ought to be pretty much indistinguishable from the being inspected, particularly as far as the in principle and capitalization regions. Monetary revealing is a legitimate need in a few nations and are standard practices that precisely duplicate an organization's accounts as formal records to partners. Monetary announcing incorporates benefits, capital, incomes, costs, and capital, and gives top to bottom understanding in to the organization's monetary data.

The International Financial Reporting Standards or IFRS experience's applying of public bookkeeping principles when a few organizations depend on cross-line exchanges. It gives an excellent and globally recognized arrangement of bookkeeping guidelines and the IFRS is needed in more than 140 locales and allowed in some more. It was an extremely long way from the underlying advancement of the XBRL (extensible Business Reporting Language)standard in 1998 to the first-run through required distribution of computerized monetary reports dependent on the International Financial Reporting Standards(IFRS)this year. The affirmation of the IFRS scientific categorization in March 2017 by the United States Securities and Exchange Commission brought about a law" Final Rule: Interactive information to work on monetary announcing" designated in 2014 being additionally pertinent to all non-US companies("non-homegrown"). Interestingly, the IFRS scientific categorization worked in an open arrangement by exactly 10,000 organizations that by and large laid their yearly reports dependent on IFRS and are recorded on the New York Stock Exchange. The open type of the IFRS scientific classification recommends that interestingly, these organizations needed to "decipher" their XBRL unstructured yearly reports into an organized way sourcing the IFRS scientific categorization. Report things that are not included the IFRS scientific classification should be included this open structure as organization explicit components in the scientific classification and distinguished thusly. The organized proper lows for advanced preparing and investigation of these yearly reports rather than move to PDF or Word design. Up to that point, just shut structure IFRS scientific classifications have been used by organizations, specifically banks, for example, the European Banking Authority's F in Rep scientific categorization. To the shock of many market members, the SEC's underlying staged execution, which incorporated a two-year execution, was supplanted by an entire one-time execution including point by point labeling.

'Worldwide" norms are defined as US GAAP, the for the most part acknowledged bookkeeping p of the United States of America (US), or IAS (International Accounting Standards, presently portrayed as IFRS) created by the IASC. As worldwide undertakings have expanded, the similarity of monetary data between firms from various nations has become a significant issue. Standard setters and controllers from numerous nations has gotten associated with drives to arrange detailing prerequisites, for example, the improvement of worldwide guidelines and guidelines through the IASC and the global association of protections commission. These exercises recommend basically a few firms need uniform necessities to help them in creating more similar fiscal summaries. One approach to further develop likeness and straightforwardness in monetary announcing is to observe a typical detailing standard.[1]

1Cp. https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-646X.2004.00102.x, Accessed on 28/06/2021.

There is the further significant monetary announcing framework in the United States. This framework depends on necessities of the New York Stock Exchange and is esteemed by all stock trades over the world. US GAAP are bookkeeping rules utilized for readiness and show monetary data for assortment of substances. US GAAP isn't on paper in law, however the

Security and Exchange Commission (SEC) necessitates that it ought to be maintain monetary announcing in traded on an open market organizations. The Financial Accounting Standards Board (FASB) is the top most

expert in building up bookkeeping standards and rules for public, privately owned businesses, and non-benefit elements, too since 1973 and supplanted the Accounting Principles Board, and the Committee on Accounting Procedure. The US GAAP is an arrangement of monetary

revealing which propelled the monetary detailing harmonization measure toward the finish of the last

century. The upsides of this framework depends on speculation of methods, which were acknowledged, and utilized throughout time. It is the huge data hotspot for monetary dynamic, since this framework isn't impacted by personal assessment rules

Abstract
Financial reporting is on the move to step into digitalisation, while Extensible Business Reporting Language (XBRL) is the computer language, which many accounting experts assume to revolutionize digital corporate disclosures, since it qualifies corporate disclosures to be aggregated, transferred, analysed faster and in more detail and enhances transparency in financial reporting (Alles and Piechocki 2009; Debreceny et al. 2007; Alles and Debreceny 2012). At European level signs become more noticeable that structured digital reporting using XBRL will be portion of future European Single Electronic Standard (ESEF) for financial reporting (Buck-Heeb 2016). XBRL allows electronic dissemination which is designed to facilitate universally educated investors (Dombalagian 2015), aids to overcome the issue of information overload and complexity (Gerding 2016). ESEF is strategically planned to be constructed on the IFRS Taxonomy delivered by the International Accounting Standards Board (IASB), as projected by the European Securities and Markets Authority (ESMA), which has initiated an European-wide consultation, in which the public was questioned to review and provide annotations to the proposal of the ESMA, which ended on 18 January 2016. This article offers the results of the analysis to the 110 commentaries, which were submitted to ESMA during this consultation phase. The individual commentaries were summarized into stakeholder clusters. The evaluation of the clustered comments has revealed that the majority of commentators support the implementation of the ESEF. The solutions of the commentators can be reconciled with the finding in the academic literature about XBRL. Only a minute number of commentators discard the proposals fully or are against single recommendations from the ESMA. Critics of the proposed ESEF can be clustered into several types. The background for the consultation of ESMA, is the modified provision of the Transparency Directive, effective 1 January 2020, according to which all annual financial reports will have to be submitted in a common electronic reporting format: This regulation targets at facilitating submissions for issuers and enriching analysis and peer comparisons for investors and regulators.[2]

---

[2]Cp. https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-646X.2004.00102.x, Accessed on 28/06/2021.

1.2 Problem Statement:

The peer group analysis of different frameworks of companies which doesn't have a common electronic reporting standard to compare.

1.3 Research Question:

How an effective solution design can be developed for peer group analysis with different framework and how can we compare them in a collective approach using a common analytical solution?

1.4 Planned Output:

Proof of concept regarding data collection, cleaning, analysis process from a backend perspective and a Solution Design for a user Interface incl. Recommendation for plan of action.

2.Theoretical Foundation

2.1 Literature Review on peer group analysis :

Peer group analysis is a process involving the comparison of entities that share similar characteristics. Peer group is a both a social group and a primary group of people who have same interest such as social status, age background.

A peer groups contain a number of people or other entities that share one or more similar characteristics. Peer groups are used in a number of different fields, such as finance and marketing, as well as sociology. Peer group analysis or peer comparison involves an apples-to-apples comparison. Comparisons allow professionals to identify trends and anomalies in behavior and outcomes and give them opportunity to figure out efficiencies and opportunities. Peer analysis of the competitors is very important for each company for understanding the competition's level and the strategy. This is going to implement to sustain in the market. For this we are going to do following step wise process:

1. we have to identify the relevant peers. For example, identify the same IT industry.
2. Then we are going to analyze the peers
3. Finally, analysis the report and conclude

Our methodology includes creation of custom peer groups for a selected client. The peer companies are identified on various criteria like industry, business-line, portfolio size, geography (regional, national, and international), size of business (like in terms of revenue), performance criteria, etc. AMR implements a more innovative approach to work out the peers. Instead of considering the asset size and geography, we consider other more relevant and accurate criteria like earning strength, operating strategy, funding strategy, and other business practices.[3]

Once the peer is identified, certain factors like entry/exit parameters, key players, intensity of competition, and market mechanism are analyzed and documented for the client. The peer companies are compared based on criteria like financial ratios, business model, capital ratios, asset quality ratios, market ratios, performance ratios, etc. The peers are then ranked as per these criteria and make the client conscious of the business challenges and methods to supersede its competitors. Lastly, we offer our client with a documented compilation of specific measures to be taken for better results and success in the market.

We are going to create custom peer groups for a selected client. The peer companies are identified on various criteria like industry-wise, business-line, portfolio size, geographical wise, business size (revenue terms), etc. We implement a more appropriate approach to analyze the peers. We focus on other relevant criteria such as strength of earning, operating strategy, funding strategy rather than the geography and asset size.

3Cp. https://www.computerworld.com/article/2590100/peer-group-analysis.html, Accessed on 06/06/2021.

After analyzing the peer, some factors like entry or exit parameters, key players, competition's intensity, and market mechanism are analyzed and documented for the customer. The peer companies are differentiated based on financial ratios, business model, capital ratios, asset quality ratios, market and performance ratios, etc. After that we are going to rank to peers as per the criteria and inform the client about conscious of the business challenges and methods to replace its competitors. Finally, we offer the client with a documented anthology of particular measures that is to be taken for the better results and success in the global market.[4]

2.2 Why world have different reporting framework?

Accounting standards are different in different countries because two markets do not seem to be the identical. Each market will address their accounting standards differently because of the difference of cultures and the legal tradition. in a way that the country will need.[5]

What are the benefits of a single set of international accounting standards?

Globally it had be easier for investors to differentiate financially how companies are performing if an international accounting standard were set. With the complexity of accounting standards, it makes international business difficult to understand.[6]

4Cp. Ennett, S. T., & Bauman, K. E., peer group structure,1993,pp,226-236.

5Cp. https://courses.lumenlearning.com/boundless-accounting/chapter/the-accounting-concept/, Accessed on 10/07/2021.

6Cp. https://benyoss4.medium.com/the-importance-of-frameworks-2c4a04d20ac5, Accessed on 09/06/2021.

2.3 Financial statements and their elements:

The objective of financial statements is to supply information about an entity's assets, liabilities, equity, income and expenses. Financial transactions and other events produce to changes within the entity's assets, liabilities and equity. These changes, combined with the results of transactions and other events from previous periods, bring about to the entity's assets, liabilities and equity at the period end. Financial statements incorporate statements, including a balance sheet, Income statement, and financial statement of cash flow.

2.3.1 Balance sheet:

Balance sheet is a statement of the assets, liabilities and equity of a business or other organization at a particular point of time. A balance sheet can also be described as a snapshot of a company's financial condition that summarizes a company's state financially that make up a company's financial statement. This has main three sections:
1. Assets
2. Liabilities
3. Equity
The differences between assets and the liabilities is the equity of the company. It is known as net assets or net worth or Capital.

Assets	Liabilities	Equity
Cash	Loan	Retained earning

Assets: Assets are nothing but resources of the company which they are going to convert the assets into liquidity in future if a company is having more assets means that company value will also increase because in future the company sell this asset and make money from it. All these assets will come under the balance sheet if a company is having good assets means they can generate a good cash flow in future. There are different types of assets the following are the few types of asset current assets, fixed assets, financial asset and intangible assets. Short-term assets are the current assets and short-term assets are nothing, but I have if a company is having any assets and it should have to be sell to any one and then the money should have to be credited in less than one year and it's known as short-term assets. For a company want to sell any product or any asset to anyone means they must regenerate the money in less than one year mean it comes under short term asset, because to reduce their short-term liabilities. short-term assets and current assets are very important for any company to calculate any ratios like turnover ratio current ratio measuring and the liquidity of the company.

Liabilities: Liabilities are nothing but taking loan and doing the business for the company to grow in their business in multiple prospects, it is like a credit card for any individual however if the company is increasing their liabilities means it is very danger to the company this may affect their balance sheet .There are two types of financial liabilities one is short-term liability and the other

is long-term liabilities short-term liabilities are which is also known as current liability within the period of 12 months all these liabilities are comes under short-term liability or current liabilities ,long-term liabilities are which is having time period more than one year most of the companies are having an over a decade for these liabilities. These liabilities are used to calculate the important financial ratio for the company. Other financial liabilities are also referred as short-term debt for any company. If any financial report is shown all the liabilities means it will be a lot of pages so many of the investors unable to read that lengthy page so that's the reason financial taxonomy has decided few of their liabilities comes under other current liabilities. So that investors can easily read the balance sheet of any company.

Equity: Equity refers to the amount of capital or the amount of money raised by the company by way of issuing shares to the open for public that the main reason to issue shares to the public is to expand its business and to add to the competitor to advantage.

<div align="center">Assets = Liabilities + Owner's equity</div>

Apple Inc.

CONSOLIDATED BALANCE SHEETS

(In millions, except number of shares which are reflected in thousands and par value)

	September 28, 2019	September 29, 2018
ASSETS:		
Current assets:		
Cash and cash equivalents	$ 48,844	$ 25,913
Marketable securities	51,713	40,388
Accounts receivable, net	22,926	23,186
Inventories	4,106	3,956
Vendor non-trade receivables	22,878	25,809
Other current assets	12,352	12,087
Total current assets	162,819	131,339
Non-current assets:		
Marketable securities	105,341	170,799
Property, plant and equipment, net	37,378	41,304
Other non-current assets	32,978	22,283
Total non-current assets	175,697	234,386
Total assets	$ 338,516	$ 365,725
LIABILITIES AND SHAREHOLDERS' EQUITY:		
Current liabilities:		
Accounts payable	$ 46,236	$ 55,888
Other current liabilities	37,720	33,327
Deferred revenue	5,522	5,966
Commercial paper	5,980	11,964
Term debt	10,260	8,784
Total current liabilities	105,718	115,929
Non-current liabilities:		
Term debt	91,807	93,735
Other non-current liabilities	50,503	48,914
Total non-current liabilities	142,310	142,649
Total liabilities	248,028	258,578
Commitments and contingencies		
Shareholders' equity:		
Common stock and additional paid-in capital, $0.00001 par value: 12,600,000 shares authorized; 4,443,236 and 4,754,986 shares issued and outstanding, respectively	45,174	40,201
Retained earnings	45,898	70,400
Accumulated other comprehensive income/(loss)	(584)	(3,454)
Total shareholders' equity	90,488	107,147
Total liabilities and shareholders' equity	$ 338,516	$ 365,725

Its figure is representative only for a specific time or date generally the end of the accounting period.

2.3.2 Income Statement:

An income statements shows the financial company for a given time period. It shows the company's revenue and cost. Therefore, a good indication has the strength of the company. It is also called Profit & Lost or PnL Statements or Revenue and expense statements. Income statements are prepared for part of a company's financials. All public companies are required to submit them quarterly regulated by the SEC. Usually income statement is more complex to put together and are handled by professional accountants, controllers or CFO'S and follow the GAAP. The objective of this report is to present, in a summary but formal form, the financial results of the entity concerning a particular time period. As a result, Income statement describe the financial performance of the organization by defining the most determinant factors of the financial result: revenues & expenses. These components are indicative of the financial and operational transactions that have contributed to the change in the organization's owner's equity during the accounting period.[7]

Income Statement for Apple Inc (AAPL)					
$ 116.12 ▲ 0.01 (+0.01%)		Volume: 14.67m		11:44 AM EST Nov 12, 2015	
Statement: Income Statemer ⌄ View: Annual ⌄					
Income [+]					in Millions of Dollars
	09/2015	09/2014	09/2013	09/2012	09/2011
Operating Revenue	233,715	182,795	170,910	156,508	108,249
Adjustments to Revenue	N/A	N/A	N/A	N/A	N/A
Cost of Revenue	128,832	104,312	99,849	84,569	62,617
Gross Operating Profit	**93,626**	**70,537**	**64,304**	**68,662**	**43,818**
Selling/General/Admin Expense	(14,329)	(11,993)	(10,830)	(10,040)	(7,599)
Research & Development	(8,067)	(6,041)	(4,475)	(3,381)	(2,429)
EBITDA (Operating Income Before Depreciation)	**84,505**	**61,813**	**55,756**	**58,518**	**35,604**
Depreciation & Amortization	(11,257)	(7,946)	(6,757)	(3,277)	(1,814)
Operating Income	**73,248**	**53,867**	**48,999**	**55,241**	**33,790**
Interest Income	2,921	1,795	1,616	1,088	519
Other Income, Net	(903)	(431)	1,156	(566)	(104)
Total Income Before Interest Expense (EBIT)	**73,248**	**53,867**	**48,999**	**55,241**	**33,790**
Interest Expense	(733)	(384)	(136)	–	N/A
Income Before Tax	**72,515**	**53,483**	**50,155**	**55,763**	**34,205**
Income Taxes	(19,121)	(13,973)	(13,118)	(14,030)	(8,283)
Minority Interest	–	–	–	–	–
Net Income from Continuing Operations	**53,394**	**39,510**	**37,037**	**41,733**	**25,922**
Net Income from Discontinued Operations	–	–	–	–	–
Net Income from Total Operations	**53,394**	**39,510**	**37,037**	**41,733**	**25,922**
Normalized Income	53,394	39,510	37,037	41,733	25,922
Extraordinary Income/Loss	–	–	–	–	–
Special Income/Charges	–	–	–	–	–
Income from Cum. Effect of Acct Change	–	–	–	–	–
Income from Tax Loss Carryforward	–	–	–	–	–
Other Gains	–	–	–	–	–
Total Net Income	**53,394**	**39,510**	**37,037**	**41,733**	**25,922**

2.3.3 Statement of Cash Flows:

A Cash Flow statement shows the cash position of a company basically it tells investors and stake holders how much cash went in and out of the company in a given period of time. The aim of this statement is to present the firm's total net cash flow which is the balance

---

7Cp. https://www.wikiaccounting.com/elements-financial-statements/, Accessed on 08/07/2021.

of the firm's cash flows related to operating, investing and financing activities during a period.

Net Cash Flows is the difference between the overall amounts received (cash inflows) and also the total amounts paid out (cash outflows) over a period. The structure and the format of Statement of Cash Flows are imposed by the principles of International Accounting Standard (IAS) 7 and by ASC 230 issued by FASB. The objective of this standard is to confirm that all entities provide information about historical changes in cash and cash equivalents by means of statement of cash flows and also to classify cash flows during the period under cogitation into the three aforementioned categories.

The cash flow statement has three main factors:
1. CASH FLOW FROM OPERATIONS
2. CASH FLOW FROM INVESTING
3. CASH FLOW FROM FINANCING

A Cash Flow statement is not a complete image of a company. It ignores payments and receipts made on credit, outstanding loans and more. It is a very useful tool for a shareholders and managers to understand the actual cash position of a company. Cash and cash equivalent segments come under the balance sheet top line for any company it is very important to maintain their grow for long prospect of journey. cash and cash equivalent come under the current asset. In cash and cash equivalents segments there are different types the following are the main types of cash foreign currency, cash equivalent credit, inventory if any company is having good cash reserves means they can reduce their short-term debt.[8]

8Cp.   https://www.investopedia.com/ask/answers/031815/how-are-three-major-financial-statements-related-each-other.asp,   Accessed   on 13/05/2021

Apple Inc.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS (Unaudited)
(In millions, except number of shares which are reflected in thousands and per share amounts)

	Three Months Ended		Six Months Ended	
	March 31, 2018	April 1, 2017	March 31, 2018	April 1, 2017
Net sales	$ 61,137	$ 52,896	$ 149,430	$ 131,247
Cost of sales [1]	37,715	32,305	92,096	80,480
Gross margin	23,422	20,591	57,334	50,767
Operating expenses:				
Research and development [1]	3,378	2,776	6,785	5,647
Selling, general and administrative [1]	4,150	3,718	8,381	7,664
Total operating expenses	7,528	6,494	15,166	13,311
Operating income	15,894	14,097	42,168	37,456
Other income/(expense), net	274	587	1,030	1,408
Income before provision for income taxes	16,168	14,684	43,198	38,864
Provision for income taxes	2,346	3,655	9,311	9,944
Net income	$ 13,822	$ 11,029	$ 33,887	$ 28,920
Earnings per share:				
Basic	$ 2.75	$ 2.11	$ 6.69	$ 5.50
Diluted	$ 2.73	$ 2.10	$ 6.63	$ 5.46
Shares used in computing earnings per share:				
Basic	5,024,877	5,225,791	5,068,877	5,262,226
Diluted	5,068,493	5,261,688	5,113,140	5,294,841
Cash dividends declared per share	$ 0.63	$ 0.57	$ 1.26	$ 1.14
[1] Includes share-based compensation expense as follows:				
Cost of sales	$ 257	$ 217	$ 509	$ 446
Research and development	$ 666	$ 575	$ 1,312	$ 1,164
Selling, general and administrative	$ 425	$ 425	$ 823	$ 863

2.4. Literature review on ESEF, US GAAP, JAPANESE GAAP, and IFRS:

2.4.1 ESEF:

Suppose we have 2019 financial account which we filed. We created a PDF that we placed on a website for investors and stakeholders, and we filed it in a local store mechanism. Now the PDF was great for 2019, but for accounts starting in 2020, PDF will not be allowed for filling format. This is because we cannot compare this PDF and they are not transparent. This causes real issues especially the different languages and currencies in the Eu. That is where the European single electronic format comes in. with the ESEF the whole 2020 report must be an xHTML . If one

company is listed on a regulatory basis. ESEF especially very easy and helpful for Investors as well as for Analysts to understand the AFRs of any company. This way to compare companies results in the same platform though it is good for Investors and Analysts it costs too much time and money for companies to change their AFRs format. It is also a great opportunity for those ESEF software supplier companies who are providing these tools and services. ESEF refers for Eu 's single digital form, and it is a new reporting format that is causing a lot of confusion in EU regulated markets. It's compulsory for whole annual financial reports. Financial reports increase transparency regardless language structure and format. Simply send us your annual and consolidated financial statement as word or opd app document. All subsequent steps handled by ESEF service for conversion to the ESEF format including IXBRL tagging to the submission to the regulator. Financial reports are a communication tool used to present a company's financial position and business performance among other mandatory and voluntary disclosures. In the era of digitalization financial reports have also been faced the transformation from only human readable to both human and machine-readable documents. The XBRL standard plays a crucial role in that convergence. The IASB and IFRS Foundation have developed a structured classification system of IFRS disclosures in digital reporting – IFRS Taxonomy. The IFRS Taxonomy is based on the XBRL standard According to the Transparency Directive, listed firms in EU regulated markets must prepare yearly Begin Match to source 19 in source list: Eugenio Virguti, Andrea Fradeani, Marco Venuti. financial reportsEnd Match using Begin Match to source 19 in source list: Eugenio Virguti, Andrea Fradeani, Marco Venuti. the European Single Electronic Format (ESEFEnd Match), which was created by the European Security and Market Authority. launched an initiative Better Communication in Financial 10 Reporting a decade ago. The initiative still connects several ongoing projects meaning that the financial reports improvement is not easy to achieve, but it is rather a long-term process. To bring the benefits of reporting digitalization closer to the interested public, but also national standard-setters and preparers, this paper summarizes all the above taxonomies. Using the deductive method of description, the IASB's initiative Better Communication in Financial Reporting is briefly described. As to one of the initiative's ongoing project, emphasis has been given to the IFRS Taxonomy. Since the IFRS Taxonomy Begin Match to source 20 in source list: Indrit Troshani, Joanne Locke, Nick Rowbottom. is based on End Match the Begin Match to source 20 in source list: Indrit Troshani, Joanne Locke, Nick Rowbottom. XBRLEnd Match standard, the Begin Match to source 20 in source list: Indrit Troshani, Joanne Locke, Nick Rowbottom. XBRL is also End Match described. Finally, Begin Match to source 20 in source list: Indrit Troshani, Joanne Locke, Nick Rowbottom. The End Match ESEF is presented due to the fact that all listed companies on the EU regulated market will have to report based on that technical standard. This paper is intended primarily to preparers to facilitate the understanding of the electronic formats which 56 are possibly the future of reporting not only for listed companies but also for the SMEs. Accounting profession challenges continuous changes coming either from accounting standards amendments or legislative, which includes technical changes such as overall digitalization. Accordingly, all stakeholders of the accounting profession must continuously follow the legislation and digitalization changes.4 The rapid development of information technology (hereinafter: IT) transforms the way of performing business and at the same time creates opportunities for numerous innovations that ultimately improve performance of the enterprise. In the future IT has substantially improved our ability to acquire, store, analyse, and process massive amounts of data, as well as our ability to change business processes and monitor the business process.. The widespread application of digital technologies in all spheres of business has immeasurable positive effects on the company's efficiency and operability. Wang and Gao (2012)

confirmed that Digital technology (including hardware and software) is increasingly being used by businesses all over the world to increase the efficiency and effectiveness of their operations.. The impact of digitalization is particularly visible, among other things, in the field of accounting and especially financial reporting. Published financial statements 4 4 Cp. Fredi,A.et.al,ESEF,2020,pg.111. 4 Cp.ubai 11 are an important tool for communication between different stakeholders. However, the way of informing the investors and other interested business public about financial stability, business performance, social responsibility, and all other financial and non-financial information has changed significantly in recent years. Namely, for years it was considered that the most efficient way to communicate with users is to publish financial statements via the Internet, most often by publishing individual/consolidated financial statements, annul reports and/or other non-financial, sustainability reports on the enterprise's. A reason for this can be found in the fact that the Internet has been recognized as a communication channel that, in the context of financial reporting, offers benefits for both preparers and users. companies have a relatively cheap and easy way to disclose information and users have quick access to that information. However, in addition to the aforementioned obvious benefits of publishing relevant information via the Internet, the extraction and conversion of those data would often be time-consuming. Furthermore, based on such unstructured information, no significant analyses could be done without additional effort and cost. Troshani et al. (2019) adds that the current practice of publishing financial and other corporate reports on websites results in high information search and processing costs due to created data access inefficiencies. It is well known that the reports presented on the 57company's websites in electronic form are not actually interactive nor digital.The answer to the observed shortcomings in the field of financial reporting can be found in new technologies that allow easier reading and use of various individual data to apply quality analyses of financial stability and business performance regularly conducted by investors, creditors, credit rating agencies and all other interested users. One of the tools that enables the digitization of accounting information is eXtensible Business Reporting Language (hereinafter: XBRL). Higgins and Harrell (2003) have claimed almost 20 years ago that XBRL will transform the whole world of Internet reporting because it is freely available and will be embedded in software applications used by companies incorporating agreed financial reporting standards. XBRL is considered as the business and reporting language of the future. Shan and Troshani (2021) see it as the key technology underpinning digital 12 corporate financial reporting. Numerous benefits and advantages of using XBRL have been recognized in the literature, mostly including increased accessibility and enhanced availability of financial reports, cost efficiency both for preparers and users, improved comparability through standardization, easier regulatory compliance, and increased transparency.5 XBRL reporting is used worldwide, either on a voluntary or mandatory basis. Although its application in digital financial reporting had been mostly voluntary, today more and more countries prescribe mandatory application of the XBRL taxonomy for those enterprises that are listed on organized capital markets to ensure transparency and easier access to information. For example, in the US and Japan regulators have imposed an obligation to submit digital financial statements in XBRL format to listed companies (Shan & Troshani, 2021), however its more significant application in the European Union is still expected. The acceptance of XBRL and the corresponding IFRS taxonomy for the impending European Single Electronic Format (hereinafter: ESEF) will mark a significant step forward in its adoption for listed company reporting throughout Europe's approximately 7,000 companies. The software allows an issuer to supply inline XBRL files that suits ESEF requirements The software allows an

analyst to consume data submitted following the ESEF requirements .The company provides services to supply inline XBRL files that suit ESEF requirements.[9]

XBRL reporter our ideal solution in the process of preparing financial statements in XBRL format from 1st jan,2020 all companies listed on the European union public markets are obligated to markup their annual consolidated financial statements with XBRL tax and report them to the local regulators in an electronic format for European companies it means sharing statements with the European Financial Supervision authority by a dedicated validation gauging reporting system for companies traded publicly. The use of the XBRL format will enable quicker aggregation of the reported data and making them accessible to investors, analysts and regulators for comprehensive analysis. Many financial institute and investor can get the benefits from this extensible Business Reporting Language(XBRL). It improves the standard of the business reports, reduce the cost of the compliance with reporting regulations and data-quality assurance services. It will also improve the communication between the investors and market. With the help of the extensible Business Reporting Language (XBRL) financial data can be optimized for machine creation, publication and extensible Business Reporting Language (XBRL) enables supply chains of information for business reporting to communicate among players more efficiently. More overly we can easily analysis the company and compare the companies in a single sector and easily make their decision on the company. XBRL provides the transparency of the financial report. It will give the asymmetry information in the stock market condition.

XBRL Architecture

XBRL architecture has three parts
1. XBRL specification
2. XBRL taxonomy
3. XBRL instance

1. XBRL specification it explains the structure and syntax rules of the XBRL. The developers of XBRL taxonomy should satisfy by the XBRL specification.

2. XBRL taxonomy is a hierarchical dictionary in certain reporting-area it explains the specific tags which are used by individual item of data.

3.XBRL instance is an electronic format of financial report to XBRL specification and XBRL taxonomy.

 XBRL TAXONOMY
XBRL Taxonomy is a combination of link Bases and taxonomy schemas both are using XML syntax, specification and documentation.
 Necessity of XBRL taxonomy extension
After announcement of extensible Business Reporting Language (XBRL) document every country has given a set of guidelines for extensible Business Reporting Language (XBRL) documentation using IFRS and again it becomes difficult for the companies to report their financial report. Some group of people conduct a survey on XBRL in those reports most of them felt difficult to

[9]Cp. Fradeani, A., Venuti, M., & Virguti.,THE EU ESEF MANDATE,2020,pp,111.

implement the eXtensible Business Reporting Language (XBRL) so, that they decide to conduct a practical session on eXtensible Business Reporting Language (XBRL) to give an overview of it and form that survey they decided to extend the taxonomies based on IFRS standards by extending this taxonomy we can reduce the general financial taxonomy.

Methods of XBRL taxonomy extension
Most of the analyst gave they idea to extend the taxonomy because to understand easily about company and analysis their financial reports. Their idea is to add more general financial terms in the eXtensible Business Reporting Language (XBRL) report and focusing on the quality, reliability, validity

WHAT DOES INTRDUCTION OF ESEF MEAN FOR COMPANIES?

Firstly, including in their reporting processes one additional step of mapping financial statement items to the ESEF taxonomy.
Secondly, implementing a tool or service to generate financial statements in XBRL format.
Thirdly, providing staff with appropriate training on ESEF requirements.
Fourthly, ensuring that reports in electronic format are correct.
Fifthly, introducing changes to communication process with investors and analyst to consider the new reporting method.

Digital reporting is more than just a technical matter which requires implementation of a new tool as it entails a need for a good understanding of the ESEF taxonomy and the complexities which arise from application of IFRS and the required IFRS disclosures. XBRL reporter is an easy-to-use application in MS word allowing you to markup financial reports and generate them in XBRL format. The application has a user-friendly interface and offers taxonomy supports in many languages. Marking up with XBRL tags fits into existing process of preparing financial statements. Creating taxonomy extensions is simple and innate. The correctness of the marking up is ensured by the ESEF compliant validations embedded in the application extended by a set of additional controls to ensure the appropriate quality of the document. The verification and audit are supported by a clear report summarizing the marked-up items and the tags assigned to them. Tailor made professional support in the process of XBRL implementation is provided by the authors of the application who are expert accountants and IT specialist. Using XBRL reporter will ensure a fast and easy reporting process complaint with the ESEF requirements, XBRL reporter support in digital reporting.

KEY REQUIREMENTS:

All annual financial reports will be prepared un xHTML. xHTML is a part of XML markup languages, and extended versions of Hypertext Markup Language. Web pages are formulating with the help of this language. It is human readable.

The annual reports accommodate consolidated IFRS financial statements, issuers will markup these consolidated financial statements with the help of XBRL tags.

The third key requirement is that XBRL tags which will be embedded in the xHTML document using the inline XBRL technology. This inline XBRL allows tagged data's XBRL benefits to be combined with a human readable report presentation, which is under control of the preparer.

Focus	Main Findings	Sample/ Country	Author of Study	Method
Mandatory XBRL Filings	Level of accruals decreased post-XBRL; information acquisition costs are lowered	Shanghai Stock Exchange and Shenzhen Stock Exchange, China	(Wang and Seng 2014)	Statistical analysis of Financial Statements ex and post-XBRL implementation
Comparison of Taxonomies	Comparison of commercial and industrial taxonomies: XBRL reports are about 90 to 95% accurate.	67 companies consisting of commercial and industrial corporations which prepare their financial statements under US GAAP	Bovee et al. (2002)	Theoretical model
Quality assessment of XBRL Filings	Metrics are developed for the evaluation of completeness and relevance of the XBRL standard. Results show quality issues in the taxonomies	Study based on 500 companies' US GAAP taxonomies	Zhu and Wu (2011).	Empirical
Corporate Governance	Voluntary filers with the SEC using the XBRL format are associated with superior CG and operating performance relative to their peers	Authors use a CG index to rank companies.	Bhattacharya (2008)	Empirical

Receivables from financial services

Account receivables is one of the liquid type of assets it consist of both capital principle and outstanding balances of the financial report it consider both long term and short term receivables from the customer and supplier. It reported on companies balance sheet as current assets with the

investment payment. When a company have excess of free cash flow they will diversify the money interest bearing is nothing but giving money to someone like giving credit to some other company investing excess money in gold or Fixed deposit, for this type of deposit we have to check for few things like interest rate, security, capital of the security of the investment.[10]

2.4.2 US GAAP:

US-GAAP stands for Generally Accepted Accounting Principles. These are the set of standards and rules that regulates how accountants such as one create financial statements right so this is one can imagine for us as an accountant is the air we breathe. This is the reason for existence and the way people earn a living. This is the basic accounting principles and guidelines of the USA . US GAAP provides the more detailed framework and comprehensive accounting rules, standards .

History of Generally Accepted Accounting Principles (USGAAP):

US-GAAP originally consisted of a series of individual regulations that were eventually systematized by the Financial Accounting Standards Board (FASB).
They were developed to enable external investors to obtain better information about companies.
The results from the US GAAP rules for accounting recognized accounting standard are considered worldwide, as well as the International Financial Reporting Standards (IFRS).

THE BASIC PRINCIPLES OF GENERALLY ACCEPTED ACCOUNTING PRINCIPLES: US-GAAP principles are based on the three principles. That's:

BASIC ASSUMPTION: There are a number of concepts or rules of accounting. They are well known and referred to by many as the accounting concepts. These concepts and rules are fundamental in preparing the final accounts of an entity and even to a certain extent the accounting concepts help us make the final accounts relevant and reliable to its users.

 Business entity concept: Business entity concept expresses from an accounting perspective that; the business is regarded as being separate from the owner or owners in other words business has a totally separate identity to its owners. The concept is applied to the accounts of a business.More specifically , the concept can refer to the process of recording and reporting of final accounts. Additionally, the buisness entity concept also distinguishes tat the finals accounts of a business should only include the activities and transactions of the business.It also states that accounts do not include the personal activities.

Going concern concept: It's an accounting term for an organization that has the resources needed to continue operating indefinitely until it provides prove to the contradictory.
Money management concept: It emphasize the fact that in accounting and economics generally, every recorded event or transaction is measured in terms of money, the local current money unit of measure.

Accounting period concept: This period is a period that covers certain accounting functions, that can be either a calendar year but also a quarter or month.

Accrual concept: Financial statements are prepared under the Accruals Concept of accounting which requires that income and expense must be recognized in the accounting periods to which they relate rather than on cash basis.

BASIC PRINCIPLES:

Revenue realization concept: This is the concept that revenue can only be realized once the underlying goods or services associated with the revenue have been rendered, respectively.

Matching concept: The Matching concept principles implies that the related revenues and expenses must be matched in the same period.

Full disclosure concept: This principles states that all relevant and important information for understanding of an organization's financial statement must be included in public organization fillings.

Dual aspect concept: This principles states that every business transaction requires recordation in two different accounts. For examples, goods purchased for cash has two aspects which are:
Giving of cash
Receiving of goods

Historical cost concept: Historical cost is the original cost of an asset, as recorded in an entity's accounting records.

Balance sheet equation concept: This is a basic accounting equation that states that assets equal liabilities plus equity. This implies the sum of the assets should equal the sum of the liabilities plus the capital invested.

Verifiable objective evidence concept: This principle requires that each recorded business transactions in the books of accounting should have an adequate evidence to support it.

3. MODIFYING PRINCIPLES:

Materiality concept: This concept implies that an accounting standard can be ignored if the net impact has a small impact on the financial statements.

Consistency concept: It means that accounting method once adopted must be applied consistently in future.

Conservatism concept: This is a principle that requires company accounts to be prepared with the caution and high degrees of verification.

Timeliness concept: It refers to the provision of information to users quickly for them to take action. It is important in four areas of business that are Timeless of financial statement, timeless of Variance Analysis, Timeless of Responsibility Reporting and Timeliness of Regulatory Reporting.

Industry practice concept: This states that companies in certain industries can use different accounting practices. For example, the financial statements of organizations will vary somewhat if they are in gaming, insurance, medical care or utility industries.

GOAL Of GAAP :

The aim of the annual financial statements according to the Generally Accepted Accounting Principles (US-GAAP) is to create a uniform standard for financial reporting.

The annual financial statements according to US-GAAP do not contain a dividend measurement function.

In the USA, the annual financial statements under commercial law and tax law are completely different. The annual financial statements have no influence on the amount of tax. When applied to non-profits and government organizations, the goal of the GAAP is to ensure complete transparency on the part of the reporting entities.

Structure of Annual Financial:

The regulations for the annual financial statements of the Generally Accepted Accounting Principles (US-GAAP) consist of five sub-areas:
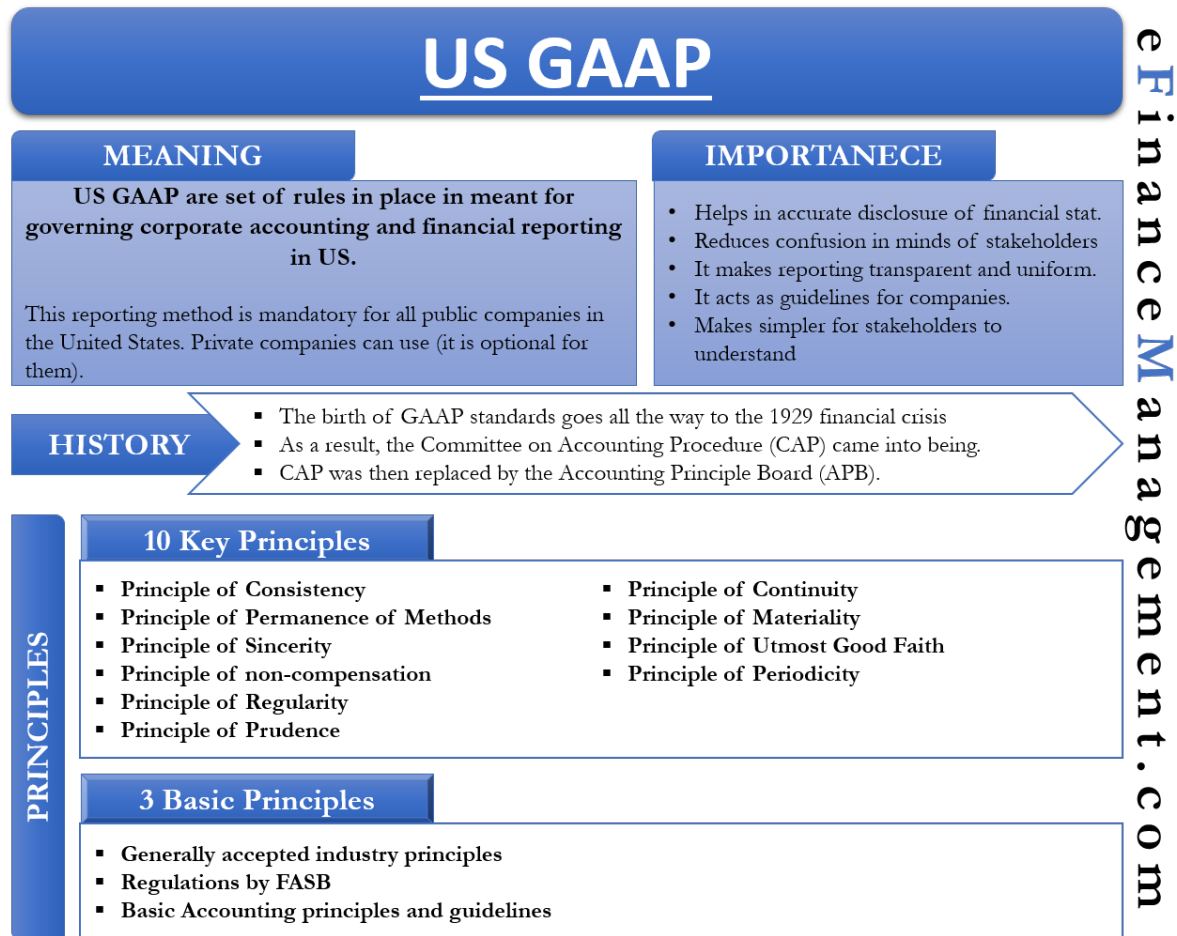
Balance Sheet

Income Statement

Equity statement

Cash flow statement

Management report

HGB provide for the balance sheet and income statement as basic components, expandable to include a cash flow statement, a statement of equity and a management report.

US GAAP

MEANING

US GAAP are set of rules in place in meant for governing corporate accounting and financial reporting in US.

This reporting method is mandatory for all public companies in the United States. Private companies can use (it is optional for them).

IMPORTANECE

- Helps in accurate disclosure of financial stat.
- Reduces confusion in minds of stakeholders
- It makes reporting transparent and uniform.
- It acts as guidelines for companies.
- Makes simpler for stakeholders to understand

HISTORY

- The birth of GAAP standards goes all the way to the 1929 financial crisis
- As a result, the Committee on Accounting Procedure (CAP) came into being.
- CAP was then replaced by the Accounting Principle Board (APB).

PRINCIPLES

10 Key Principles

- Principle of Consistency
- Principle of Permanence of Methods
- Principle of Sincerity
- Principle of non-compensation
- Principle of Regularity
- Principle of Prudence
- Principle of Continuity
- Principle of Materiality
- Principle of Utmost Good Faith
- Principle of Periodicity

3 Basic Principles

- Generally accepted industry principles
- Regulations by FASB
- Basic Accounting principles and guidelines

eFinanceManagement.com

2.4.3 JAPANESE GAAP

 Financial statements are prepared, in accordance with accounting principles generally accepted in Japan (Japanese GAAP). Japanese generally accepted accounting principles (GAAP) are one of the four sets of accounting standards listed companies in Japan can currently choose to their consolidated financial statements, use of IFRS, U.S. GAAP, and Japan's Modified International Standards (JMIS).JMIS are the new set of accounting standards begin launched by ASBJ in 2015 .Accounting Standards are developed by the Accounting Standards Board of Japan (ASBJ) and are designated as Japanese GAAP by the Financial Services Agency of Japan(FSAJ).

1.Standard-setting body:

The Standards Advisory Council, set up by the FASF, discusses matters related to the operations of the Account Standards Board of Japan (ASBJ). ASBJ is responsible for the development and deliberation of accounting standards in Japan.

2. Standards Issued by the ASBJ:

After following the Due Process Rules the types of Accounting Standards can be classified as follows:

Accounting Standards	Basic rules underlying the accounting and disclosure
Implementation Guidance	Interpretations of Accounting Standardand practical guidance when applying Accounting Standards.
Practical Solutions	Tentative treatment for areas where Accounting Standards do not exist and practical treatment for areas where there is urgent need for guidance.

3. Technical Committee Meetings:

The Technical Committee develops documents related to the management and operation of Japanese GAAP certification programs. The chair and the members are selected by the Board of Director. At present, tis committee consists of three subcommittees: Certification subcommittee, Agricultural products subcommittee and Livestock subcommittee.

4. IFRS adoption in Japan:

Since 2010, companies that meet certain criteria have been permitted to voluntarily apply IFRS Standards for consolidated financial statement in Japan. The FSA adapted its Cabinet Office ordinances and eliminated certain requirements in order to increase further applications of IFRS Standards in Japan. For this, the number of companies eligible to apply IFRS Standards was increased, and generally all listed and unlisted companies are allowed to apply IFRS Standards for consolidated Financial Statements.

Criteria for which a Company may Voluntarily apply IFRS standards :

A company may voluntarily apply IFRS Standards if it covers the following criteria under the current regulation:
The company discloses, in its Annual Securities Report, information regarding specific efforts to ensure that the consolidated financial statement will be prepared in congruence with "Designated IFRS."
The company allocates executives or employees with sufficient knowledge about "Designated IFRS" and put in place a structure to ensure that the consolidated financial statement will be prepared properly in accordance with Designated IFRS.

The commissioner of FSA designated a set of IFRS Standards that is called Designated IFRS.
The number of listed companies voluntarily adopting IFRS:

According to the Tokyo Stock Exchange, on 30th June,2016 the number of listed companies voluntarily adopting IFRS Standards (including those companies that officially announced that they are adopting) is 115, and an extra 22 companies have revealed that they are planning to adopt IFRS Standards in their report statement . The number of voluntarily adoption IFRS is continuously increasing day by the day in Japan.
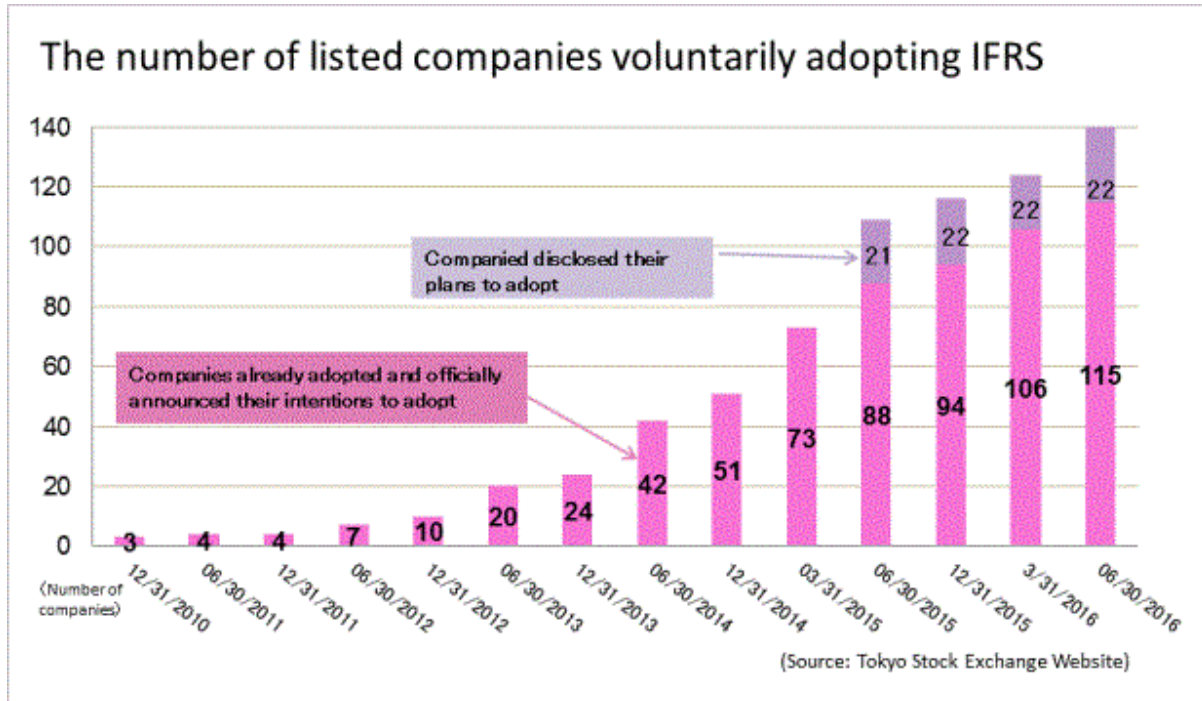
IFRS adoption in Japan will affect US division: Japanese Foreign Private Issuers (FPIs) have used US GAAP or JAPANESE GAAP. But over the years IFRS has slowly but surely gained momentum in Japan.
The Financial Services Agency (FSA), the Japanese financial regulatory body, has allowed Japan's listed companies to adopt IFRS from 2010. The FSA alleviated regulations for adopting IFRS in 2013. For this, the number of companies that either have applied or have decided to apply IFRs has increased day by day.

Number of listed companies in Japan applying either US GAAP or IFRS
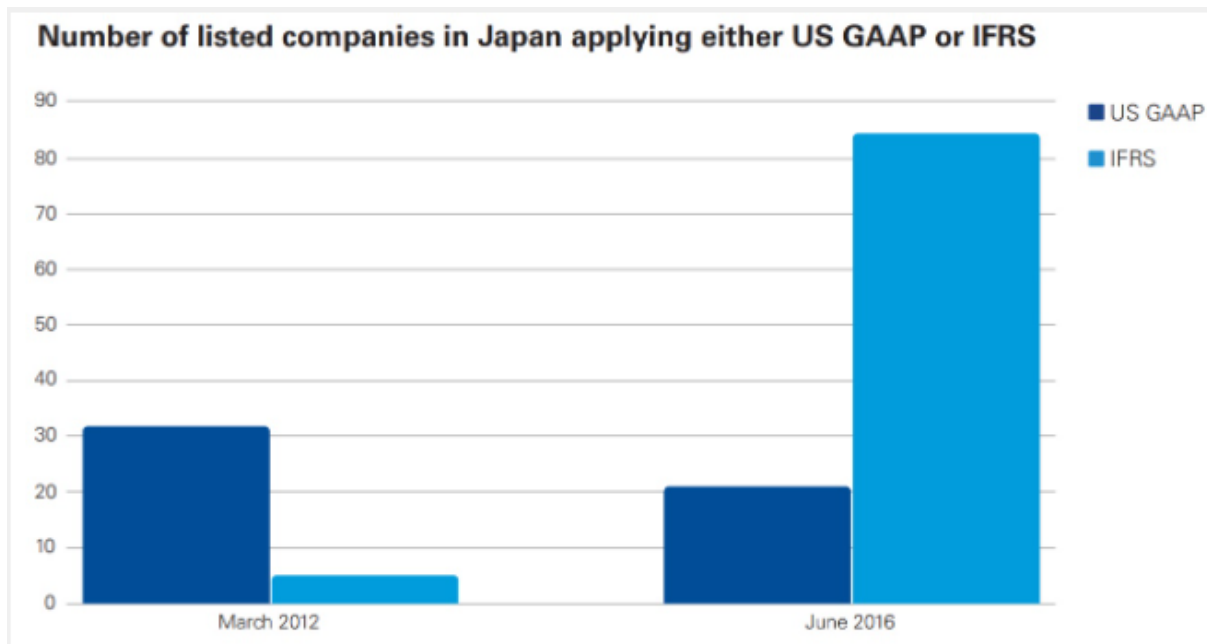
In this figure, the number of Japanese companies applying US GAAP has been decreasing.
This trend has direct results for US subsidiaries of JAPANAESE GAAP. JAPANESE GAAP allows many companies to consolidate their financial statement under US GAAP or IFRS, with a few adjustments. Therefore, US subsidiaries of Japanese company have been often reporting their financial statement under US GAAP whether the company was a JGAAP or USGAAP preparer. There is no such permission under IFRS. So, if any Japanese companies adopt IFRS, their US subsidiaries will also need to change to IFRS for consolidation purpose.

5.Exposure Drafts and Discussion Papers:

When developing accounting standards, the ASBJ is required to request the views of electors in a sufficient and appropriate manner.
When the ASBJ develops a new Accounting Standard or modifies an existing Accounting Standard, the ASBJ generally supplies an Exposure Draft and requests comments from the general public. Exposure Drafts and Discussion Papers normally have a certain period of two-three months or longer. However, considering the significance of the proposals, the ASBJ may vote to have a shorter comment period.
Responses are received in Exposure Drafts and Discussion Papers, together in terms of the respondents. It will be available on the FASF website. Responses received are considered by the ASBJ in a periodic manner and the results of the ASBJ's considerations will be made available on the FASF website.

6. Theoretical Framework :

As numerous distinctions in the bookkeeping climate of a nation may bring about issues identified with the understanding and use of IFRS, it is especially fascinating to analyze the bookkeeping climate of a country that is considered not quite the same as the institutional setting in which IFRS are created. Japan has a unique bookkeeping climate and system that generally has a standing of being centered around satisfying the needs of lenders and insiders. Japan is typically remembered for the Continental European model as particular from the Anglo-American model of bookkeeping, which is generally reflected in IFRS. In any case, the quantity of components that impact bookkeeping and their individual significance fluctuates incredibly in existing structures like that of, Gray, and Salter. So Compared to this load of hypotheses and Wallace hypothesis gives an all encompassing examination of the bookkeeping climate in Japan. The investigation of bookkeeping in a specific country in its regular setting and the investigation of the communication in its more extensive institutional settings Wallace additionally characterized the bookkeeping climate as multidimensional framework in which nobody factor possesses a dominating situation as it is significant on the grounds that it permits all analysts to consider the entirety of the nearby and worldwide settings. Their structure underscores the connections among the ecological components which impacts bookkeeping. It likewise envelops following five discrete however cooperating measurements. Their structure underscores the connections among the ecological components which impacts bookkeeping. It likewise envelops following five discrete however cooperating measurements

2.4.4. IFRS:

International Financial Reporting Standards (IFRS) set common rules so that financial statement can be consistent, transparent and comparable around the world. These standards are designed as a Common Global Language for Business Affairs These standards are particularly important for companies that have dealing in other countries are progressively replacing other various national accounting standards. IFRS is a set of rules that must be followed by Accountant to maintain Books of Accounts. The rules will make the book comparable, understandable Reliable and Relevant for internal and external users. These standards are still sometimes called by their original name that is International Accounting Standards (IAS).
List of IFRS Standards: There are total 17 IFRS Standards.

IFRS	IFRS Standard
1	First-time Adoption of International Financial Reporting Standards
2	Share-based Payment
3	Business Combinations
4	Insurance Contracts
5	Non-current Assets Held for Sale and Discontinued Operations
6	Exploration for and Evaluation of Mineral Resources
7	Financial Instruments: Disclosures

8	Operating Segments
9	Financial Instruments
10	Consolidated Financial Statements
11	Joint Arrangements
12	Disclosure of Interests in Other Entities
13	Fair Value Measurement
14	Regulatory Deferral Accounts
15	Revenue from Contracts with Customers
16	Leases
17	Insurance Contracts

IFRS VS GAAP:

The largest difference the US GAAP (Generally Accepted Accounting Principles) and IFRS is that IFRS is principle-based while GAAP is rule-based.

BASIS FOR COMPARISON	GAAP	IFRS
Acronym	Generally Accepted Accounting Principles	International Financial Reporting Standard
Meaning	A collection of commonly followed accounting rules and standards for financial report.	International Financial Reporting Standards (IFRS)set common rules so that financial statement can be consistent, transparent and comparable around the world.
Developed by	Financial Accounting Standard Board (FASB)	International Accounting Standard Board (IASB)
Based on	Rules	Principles
Inventory Valuation	FIFO, LIFO and Weighted Average Method.	FIFO and Weighted Average Method.
Extraordinary items	Shown below.	Not segregated in the income statement.

| Development cost | Treated as an expense | Capitalized, only if certain conditions are satisfied. |
| Reversal of Inventory | Prohibited | Permissible, if specified conditions are met. |

3. Research Design

3.1 Literature Analysis:

DATA COLLECTION: For peer group analysis, we select one sector (IT Industry) in DAX 30, SEC, filings.xbrl.org, Dow Jones, yahoo finance from that sector we selected the company's name. And then we selected 30 companies in a same sector. IT Industry is our selected sector.

We choose European share market index, USA share market index, Japan Share market index. We choose this website because these are one of the leading share market economy , which consist of 30 major companies.

In Germany the DAX 30 mainly beside on information Technology Company so we choose this sector. And it will come under ESEM framework.

CHOOSEN COMPANY: Among 30 companies we mainly selected 4 companies.

1. UBER

2. AAPL.INC

3. PNE AG

4. HITACHI

3.1.1 Document Analysis :

The Solution Design was created while keeping the industry standards in mind. The design includes peer group analysis, a term coined by Richard J. Bolton and David J. Hand
From Imperial College, London.

The Solution Design on for Peer Group Analysis is a practically new tool for data mining situation behaviors. The tool detects individual objects that begin to behave in a way distinct from objects to which they had previously been similar.

A target object is selected and is compared with all other objects. Using either external comparison criteria or internal criteria summarizing earlier behavior patterns of each object. Summarization of the peer group at each subsequent time point. Data process mining is the intension of the tool, involving cycling between the detection of objects that behave in anomalous ways and the detailed examination of those objects.
Particular applications can be tuned of several aspects, size of the peer group inclusive.

We apply the tool in various situations and illustrate its use on a set of extracted data.
Let us suppose that we have observations on N objects, where each observation is a sequence of d values, represented by a vector, x_i, of length d. The ninth value of the observation, occurs at a fixed time point t_j. Let $P_i(t_j)$ = {Some subset of observations (x_i) which show behavior similar to that of x_i at time t_j}. Then $P_i(t_j)$ is the peer group of object i, at time j. This group may be defined on the basis of either internal information (information contained in the sequences (x_1,...,x_N)) or external information (information from other sources, such as geodemographic
information in the case that the objects are people). In this paper we are concerned with peer groups defined using internal information, so we restrict our discussion to this case. Once the peer group has been identified, its future behavior is used as a basis against which to compare the future behavior of the target object.

3.1.2 Approach of the Solution Design:

The Solution Design was created while keeping the industry standards in mind. The design includes peer group analysis, a term coined by Richard J. Bolton and David J. Hand
From Imperial College, London.

The Solution Design on for Peer Group Analysis is a practically new tool for data mining situation behaviors. The tool detects individual objects that begin to behave in a way distinct from objects to which they had previously been similar.

A target object is selected and is compared with all other objects. Using either external comparison criteria or internal criteria summarizing earlier behavior patterns of each object. Summarization of the peer group at each subsequent time point. Data process mining is the intension of the tool, involving cycling between the detection of objects that behave in anomalous ways and the detailed examination of those objects.
Particular applications can be tuned of several aspects, size of the peer group inclusive.

We apply the tool in various situations and illustrate its use on a set of extracted data.

Let us suppose that we have observations on N objects, where each observation is a sequence of d values, represented by a vector, x_i, of length d. The jth value of the ith observation, x_{ij}, occurs at a fixed time point t_j. Let $P_i(t_j)$ = {Some subset of observations (x_i) which show behavior similar to that of x_i at time t_j}. Then $P_i(t_j)$ is the peer group of object i, at time j. This group may be defined on the basis of either internal information (information contained in the sequences ($x_1,...,x_N$)) or external information (information from other sources, such as geodemographic

information in the case that the objects are people). In this paper we are concerned with peer groups defined using internal information, so we restrict our discussion to this case. Once the peer group has been identified, its future behavior is used as a basis against which to compare the future behavior of the target object.

Tools used are:

Beautiful Soup
Blue Prism
Parse Hub
Integration Method
Word Press for design and website hosting

A brief description of the tools:

Beautiful Soup:

According to the documentation of Beautiful Soup "Beautiful Soup is a Python library for pulling data out of HTML and XML files".

We have used the 4.9.0 version in this project. Since the much popular version Beautiful Soup version 3.0 is no more in development, we have chosen to involved the version 4.

The structure of the code is as follows:

```python
from bs4 import BeautifulSoup
soup = BeautifulSoup(html_doc, 'html.parser')

print(soup.prettify())
# <html>
#  <head>
#   <title>
#    The Dormouse's story
#   </title>
#  </head>
#  <body>
#   <p class="title">
#    <b>
#     The Dormouse's story
#    </b>
#   </p>
#   <p class="story">
#    Once upon a time there were three little sisters; and their names were
#    <a class="sister" href="http://example.com/elsie" id="link1">
#     Elsie
#    </a>
#    ,
#    <a class="sister" href="http://example.com/lacie" id="link2">
#     Lacie
#    </a>
#    and
#    <a class="sister" href="http://example.com/tillie" id="link3">
#     Tillie
#    </a>
#    ; and they lived at the bottom of a well.
#   </p>
#   <p class="story">
#    ...
#   </p>
#  </body>
# </html>
```

Blue Prism:

Blue Prism needs no introduction. It is 'the' most popular Robotic Process Automation tool used by the industry and by far. Robotic Process Automation is a form of Business Process automation technology based on Artificial Intelligence. To say it is solely based on Artificial Intelligence will be wrong, most other Robotic Process Automation tools are based on metaphorical software tools and Digital Workers. Robotic Process Automation is sometimes referred to as software Robotics not to be confused with Robot Software.

The Blue Prism tool automates the process of extracting the data from the from the data collected from websites such as https://finance.yahoo.com/sector/ms_technology.

The Robotic Process Automation then pushes the data into machine Learning Algorithm and understands the parsed process. The Machine Learning algorithm analyses the process data then sends it back to the RPA (Robotic Process Automation).

Finally, the data is pushed to the last phase, and with the help of Matplotlib the final output is displayed.

Parse Hub:
Parse Hub is a free and easy web scrapping Graphical User Interface tool used for complex but generic web scrapping techniques. We have used this tool as the go-to method for data collection and web scrapping.

Web Scraping or Web Harvesting is a type of data scrapping used for extracting data from websites. Web scraping a web page involves extracting and fetching data from the target websites. Few websites may use a secure protocol where web scrapping may turn out to be complex or not possible. However, the website we have used, although complex, the scrapping was possible with Parse Hub.

Word Press for design and website hosting:

WordPress is a free and open sourced content management system (CMS). A tweet from the WordPress CEO said, "it is now being used by 41.1% of the top 10 million websites". This alone speaks for the popularity of the tool.

We have installed the WordPress on a web server on our local machine running the Darwin Operating System (macOS). The software package used was wordpress.org.

The Robotic Process Automation (RPA) was used as a plugin with the WordPress website, where the backend was also based on the RPA model and the machine learning algorithm

3.2 Qualitative and quantitative content analysis :

Subjective and quantitative substance investigation are free methodologies that are progressively incorporated in programming situated in large information examination. content investigation has likewise been extraordinarily helped by the improvement of program that recognize and match terms and help with coding. Systematic reviews and meta-analysis are also provided by content analysis.

3.2.1 Uses of content analysis

Content examination has also been greatly assisted by the development of computer software that identify and match terms and assist in coding. Many of these programmes changed manual content analysis, for the most part as it has become uncomplicated to convert documents to searchable files. Numerous understudies additionally use a portion of the components of content investigation, in spite of the fact that they frequently not understand, then, at that point looking through bibliometric information bases, for example, google researcher and web of science then seeking references and information on subjects. systematic reveal of literature is driven by content analysis and can form the bases of meta/analyses of data from different publication therefore content can rudimentary research tool that can be applied in a range of different settings and since the first stage in research project development as a result of literature identification.

while the lead of content analyses is countless, the main downside is the potential influence of the researcher. Historically, content analysis has regarded as an impartial and unremarkable means of generating a quantitative illustration of the content of different media that is by counting the number of times a word materialize or the amount of space assigned to a particular theory or story in the media However, it has set off increasingly acknowledge that researcher prejudice and inferences with respect to messages, analysis and interpretation are two things which is in acceptance of the research goals or hypotheses. let alone their interpretation, means that the perspective has necessary matter of judgement bias has the data collection with potential.

In tourism content analysis has been used in different conditions. One of the earliest studies as conducted by Richter (1980) who conduct article of CB media research from few daily newspapers in the Philippines. It stated that tourism might have been used as a publicity tool in the Philippines to promote the countries beauty and ignore the fact that martial law had been proclaimed.

In systematic literature review Content analysis can be a functional to identify trends as part of the conduct. For example, to find how various theme will come out and how some themes will work in the content analysis we have to do systematic analysis on content analysis with the help of system analysis and meta-data analysis.

Categorized different publications on some themes like crisis in tourism to detect different themes emerged over time and some themes, such as biodiversity loss, while noted in other literatures part of tourism literature on crisis had not been part of same literature while noted in other literature which Is in different way of objectives in different conditions. With some other procedures like meta-analysis we can adapt and control those literatures and categorized them in part of content analysis of data

But similar study managed on medical tourism and different subcategories of data which is carried by the systematic analysis that found that over half of all literature on the subject had been conducted in the two years prior to the review and that there was remarkable lack of overlap between the tourism and medical. Narrative literature review do not compulsory use an overt structured methodology to work through the applicable deliberate survey is hence a thorough a reproducible exploration technique which is as of late coming to be used to an extraordinary content in the travel industry research. In specific cases the aftereffects of an efficient survey can likewise give the premise of a meta/examination in which different factual techniques are utilized to join the consequences of various investigations that arrangement with the very factors to create a more grounded end than that can be gotten from any of the investigations all alone. Content investigation has been frequently utilized in the travel industry to distinguish various understandings of ideas. led a substance examination of ecotourism definitions. Through their examination they recognized segments that there by and large settled upon, for example, non/destructive or instructive and contrasted their discoveries and the consequences of a quantitative report wherein ecotourism administrators were interrogated concerning different issues encompassing the theme. exceptionally powerful found that according to a worldly point of view, the information showed that the years going from where the most useful as far as the improvement of eco the travel industry definitions, and all the more explicitly some of the most exhaustive of these were authored. Preservation, training, morals, maintainability, effects and neighborhood benefits were the factors that were better addressed in the later definitions showing a changing accentuation in how the term has been conceptualized additional time. attempted a substance investigation of articles on visiting companions and family members the travel industry to likewise distinguish subjects and patterns in the writing on the idea over the long run.

Ethnicity utilized substance investigation to look at the substance of blog sections to recognize positive and negative view of Austria as a travel industry objective, and contrasted these and other examination into Austria objective picture. Site content is additionally a critical core interest. to recognize the picture portrayals of Macau on the Web by dissecting the substance of an assortment of web data sources. attempted a comparative investigation of Dubai/based sites, however including pictures just as text. more explicit topical investigation of sites has embraced by picture utilized a substance examination to take a gander at the food part of sites in as, while the sites of Canadian clinical the travel industry organizations that has promoted global medical care at the end of the day picked the commercial hub. Business and government data, for example, yearly

reports and file additionally give a rich wellspring of data that can be contemplated by means of content examination. Chen and Peng the C (2 data from China Ks top G= lodging the board organizations. Coles consolidated a substance investigation of 99 aircrafts documentation with key/data with 66 carriers including three of the four market/driving low passages carriers. more the methodology has used by who taken a gander at online data and yearly reports of voyage/line organizations to recognize the e1tent to which biosecurity measures were used in polar cruising. utilized a substance examination of the Intergovernmental Board on Environmental Change 3IPCC4 appraisals to produce a period series investigation of the e1tent to which the travel industry had been perceived in the evaluations and corresponding to that themes.

Examination was led to perceive the difficulties that numerous organizations are looking in creating Twitter crusades. Content examination was directed to investigate the Twitter channels of globally perceived organizations. Different terms were assembled dependent on five image character measurement's structure that is utilized to depict the qualities of a given brand into five measurements: Genuineness, skill, complexity, and toughness. Assessment investigation was likewise led utilizing the Sentiment Dictionary that is utilized to perform basic substance examination. The consequences of the substance investigation featured two fundamental components, word decision and media type, for the accomplishment of an advertising effort on Twitter. These two components ought to be thought about while fostering a web-based media promoting plan. Content examination has seen fast development and acknowledgment because of the PC supported content investigation. It has gotten simpler to perform content examination because of the simple accessibility of electronic messages, accordingly making it simpler to investigate with exactness and speed. Content examination can be traced all the way back to 1920s in the United States of America, where a huge amount of information from broad communications, for example, radio and paper was broke down. For instance, the occasions a book, like the name of an ideological group, was rehashed in the paper was tallied and broke down. Notwithstanding, this was not idiot proof as it couldn't distinguish the inert importance, and it just checked the occasions a word rehashed. Later in fostered an interaction that had the option to recognize the dormant significance and philosophical substance by applying quantitative examination. Since the time then, at that point, content investigation has been utilized to decipher the content and to come to a legitimate end result of the coming of the web and mechanical headway, content investigation has acquired specific importance. Throughout the long term, numerous things have changed, and a couple have stayed consistent. PCs are currently used to assemble, dissect, and present a huge measure of information with lightning pace and exactness. Content examination of the huge information delivered by web-based media, online substance, and cell phones has taken higher importance. Content investigation has taken over as the most At the point when you set off to do content examination, the main thing to recognize is that it's difficult to be far reaching. Regardless of how diligently you attempt, you can't dissect content in all conceivable manners. I'll illustrate, with a model. Suppose that you deal with a radio broadcast. It's on air for 18 hours per day, and nobody individual appears to know precisely what is communicated on each program. So, you conclude that during April all projects will be taped. Then, at that point you will pay attention to the tapes and do a substance examination. First issue: 18 hours per day, for 30 days, is 540 hours. On the off chance that you work a 40-hour week, it will require right around 14 weeks to play the tapes back. In any case, that is just tuning in - without stopping for content examination! So, all things being equal, you get the tapes translated. The vast majority express around 8,000 words each hour. Consequently, your record has up to 4 million words – around 40 books the size of this one. Presently the substance investigation can start! You make a definite investigation: many pages

of tables and rundowns. When you've completed (after a year?) someone asks you a straightforward inquiry, for example, "Which level of the time are ladies' voices heard on this station?" In the event that you haven't expected that inquiry, you'll need to return to the record and arduously ascertain the appropriate response. You track down that the sex of the speaker hasn't generally been recorded. You make a gauge (a couple of days' works, assuming you're fortunate) you're asked a subsequent inquiry, for example, "What amount of that time is discourse, and what amount is singing?" Uh oh! The interpreter didn't try to incorporate the verses of the melodies broadcast. Presently you'll need to return and pay attention to that load of tapes once more famous technique contrasted with studies, interviews, and different types of examination. Never has content investigation got more significant consideration in numerous fields of examination than as of now. It has been embraced and is reaching out all over into numerous disciplines. The motivation behind content examination is to 'figure out the real story.' It intends to decide answers to questions where the content infers something, and not really express. Content investigation is an exploration that can break down human correspondences, how individuals plan their lives, what individuals think about something, and how individuals respond to something. Content investigation has gotten an option in contrast to the conventional requests of the broad communications, which was then utilized for popular assessment research. The substance examination utilizes strategies to the information, pictures, printed text, sounds, web-based media, articles, books, diaries and the web – essentially to get what individuals mean, what individuals empower and what does the data passed on by them say to the business or the general public on the loss. Content investigation can be applied to examine any piece of content that is composed or verbal. Content examination is associated with an assortment of fields like governmental issues, human conduct, promoting, writing, wellbeing, brain research, and significantly more. Content examination is likewise showing a nearby connection between the phonetic elements and mental perspectives, accordingly prompting the improvement of man-made consciousness.

Instances of the Uses of Content Analysis

For instance, a brand can find arising patterns with the utilization of content examination. Content from online discussions is acquired from different sources like news, inputs, sites, tickets, online conversation, web-based media, and audits. When the information is free, the information must be cut and diced utilizing calculations and demonstrated numerical models. Points, connections, and tone powers are dissected to distinguish examples, relationships, and deductions at different levels Content examination can be acted in three unique techniques: ordinary, coordinated, and summative. There are three distinct methodologies, they expect to comprehend and investigate the importance of content. They do have explicit contrasts, which is overwhelmingly in the coding framework.

Customary Content Analysis

It is called inductive class advancement; this methodology is utilized when the current hypothesis or examination on some random subject is restricted. Here information is utilized as a source to show up at classifications instead of utilizing any of the previous classifications. In this methodology, the explores depend totally on the information to show up at new bits of knowledge. A large portion of the subjective examination strategies utilize this way to deal with contemplate and dissect.

2. Coordinated Content Analysis

In this methodology, research depends on a current hypothesis. This methodology of content examination is utilized to approve or additionally investigate the all existing hypothesis. This strategy should be possible. One way is to begin coding the information dependent on the foreordained codes from the prior approach. Another way is to survey the current codes and allot new codes for the content that couldn't be ordered in the past technique. The guided substance examination plans to center and stretch out the prior hypothesis to decide the key ideas.

3. Summative Content Analysis

In this methodology, the expressions of text will be at first tallied and looked at, trailed by additional translation of the substance. The summative substance investigation targets tracking down the hidden implications of the content or words. In this methodology, the examination begins via looking for a specific book and checking the occasions it shows up and further attempts to comprehend the major setting for the utilization of the words either unequivocal or in its roundabout terms. Summative substance investigation is a nonreactive technique for contemplating the wonder of revenue.

The methodologies of content investigation rely upon the examination purposes that may require diverse exploration plans and different procedures of examination. The examination should take the decision of utilizing a regular or summative or coordinated methodology in the wake of thinking about the reason and the strategies.

3.2.2 Qualitative Content Analysis:

There are a lot of normalized strategies for quantitative substance investigation formalized in a few readings material outside of geology, undeniably less is expounded on subjective substance examination—anyplace. All things considered, there is abundantly expounded on the general classification of literary examination. There are inquiries regarding the suitability of utilizing the expression "content investigation" concerning subjective exploration, recommending that maybe printed examination or a connected term ought to be utilized all things considered. A few specialists professing to lead content examination may rather utilize terms like interpretive investigation, hermeneutic investigation, ethnographic examination, talk examination, grounded hypothesis, basic examination, or semiotic examination large numbers of these covering with, or all the more ordinarily referred to among their experts as, "literary investigation." A contributor to the issue may come from a basic misconception of wording, however another chance is that subjective substance investigation is a really remarkable philosophy that essentially shares epistemological and ontological components of its subjective cousins just recorded. It is hard to tell which is the situation, in any case, since diary articles seldom take into account a sufficient elaboration of approach.

One of the evaluates against subjective message investigators is that the last will in general overemphasize the makers and crowds of (messages) as opposed to the actual messages. In fact, accentuating makers and crowds is seen by the subjective experts to be one of the significant qualities of their methodology explicitly, that the examination focal point is fittingly around individuals engaged with message creation and utilization since these include power relations. Some contend that the contrasts among quantitative and subjective substance investigation are basically incompletely an issue of degree—for instance, that subjective substance experts around profound (idle) which means, though quantitative examiners more around surface (show) which means. It is more normal the situation, however, that these professionals advocate in a general

sense various ways to deal with sociology. Coming to next point is a rundown of attributes that, however they might be available in quantitative substance examination, they are by and by most generally found in subjectively situated substance investigation. Abstract substance examination is a specific strategy from quantitative substance assessment. This sort of examination is useful for separating a great deal of verbal data accumulated through gatherings or its get-togethers and moreover offers openings for estimation of classes. Its limitation to a coding manual makes it less suitable for remaking significance making measures and for profoundly open-finished examination questions. Accordingly, it is less reasonable for formative mental examination that is worried about the transient idea of marvels that should be recreated. projective substance assessment is typically used in nursing science research, the trustworthiness of its use has not yet been strategy surveyed. There is a constant interest for amazing and clear strategies for evaluating content assessment considers. A more connected with discussion about the idea of emotional substance assessment disclosures is moreover required, particularly as a couple of articles have been disseminated on the authenticity and steadfastness of quantitative substance examination than abstract substance examination. While many standardized strategies are available for performing quantitative substance assessment, this isn't the circumstance for abstract substance examination. the upside of subjective examination is the extravagance of the gathered information and such information should be deciphered and coded in a substantial and dependable way. In the accompanying segments, we examine reliability issues related with the association stage. In this stage, it is fundamental to consider whether the classifications are all around made, what the degree of understanding is, and how to check the reliability of the investigation. As a component of the association stage, a clarification of how the ideas or classifications are made ought to be given to show the reliability of study. Depicting the ideas and how they have been made can regularly be testing, which may block a total examination, especially if in the event that the scientist has not preoccupied the information, or such a large number of various sorts of things have been assembled. Likewise, an enormous number of ideas for the most part shows that the scientist has been not able to bunch the information, that is, the reflection cycle is deficient, and classifications may also in this case, for this situation, the specialist should proceed with the gathering to recognize any likenesses inside and contrasts between classifications. Fitting the material into a model of correspondence: It ought to be resolved on which part of the correspondence will be made, to parts of the communicator (his encounters, conclusions sentiments), to the circumstance of text creation, to the socio-social foundation, to the actual content or with the impact of the message. Rules of investigation: The material is to be broke down bit by bit, adhering to rules of technique, formulating the material into content insightful units. Classes in the focal point of investigation: The parts of text translation, following the examination questions, are putted into classifications, which were painstakingly established and reconsidered inside the cycle of investigation (input circles). Standards of dependability and legitimacy: The technique has the assumption to be between emotionally understandable, to contrast he results and different investigations in the feeling of triangulation and to do checks for unwavering quality. For assessing the between coder dependability we use in subjective substance investigation (in spite of quantitative substance examination) just prepared individuals from the task group and we decrease the norm of coder understanding.

The partition among enthusiastic and quantitative methodologies takes after the separation among human and man-made scholarly ability. Quantitative evaluation utilizes unequivocal information sources, for example, as a different types of elements advantage things, and so forth we can interface with an electronic model to yield an unmistakable outcome, like the reasonable worth of

a stock or a check income driven new development. Moreover, for the present, an individual purpose to make the program that sorts it out, and that joins a solid level of energetic judgment. Whenever they are modified, nevertheless, PCs can perform quantitative assessment in bits of a second, while it may take even the most skilled and altogether set up people minutes or hours. Dynamic evaluation can sound essentially like "zeroing in on your gut," and to be sure different passionate analysts would battle that sentiments have their perceive in the interim. That doesn't mean, notwithstanding, that it's beginning and end with the exception of a cautious framework. Definitely, it can devour generally extra time and.

energy than quantitative evaluation Clients are the solitary gathering more urgent to an organization's prosperity than the board and workers since they are the wellspring of its income. Amusingly, if an organization puts clients' inclinations before investors, it could be a superior long haul speculation. In the event that attainable, it's a smart thought to have a go at being a client. Let's assume you're thinking about putting resources into a carrier that has gotten control over costs, beat profit gauges in three successive quarters, and plans to repurchase shares. At the point when you attempt to really utilize the aircraft, nonetheless, you discover the site bug-ridden, the client support delegates cantankerous, the additional charges trivial, and your kindred angry. The negative experience discloses to you that the organization has an absence of need for its clients and to be cautious making an interest in the carrier. An organization's plan of action and upper hand are fundamental parts of subjective investigation. What gives the firm a suffering advantage over its adversaries? Has it imagined another innovation that contenders will discover hard to duplicate, or that has protected innovation security? Does it have a novel way to deal with tackling an issue for its clients? Is its image worldwide perceived positively? Does its item have social reverberation or a component of sentimentality? Will there still be a business opportunity for it in twenty years? On the off chance that you can conceivably envision another organization stepping in and doing what this one improves, then, at that point the boundary to section might be excessively low. The idea behind quantitative assessment is to measure things; the idea behind emotional examination is to get them. The last requires an extensive view and a reality based in general record. Setting is basic. For example, a President who left school would be an admonition on occasion, yet Imprint Zuckerberg and Steve Occupations are exceptions. Silicon Valley is, notwithstanding, a substitute beast. A look at McDonald's Corp's two or three years earlier would have uncovered to you nothing about a moving toward response against unassuming, unfortunate food. On the other hand, a totally emotional system is weak against twisting by weak sides and individual risk

3.2.3 Quantitative content analysis :

Quantitative substance investigation is an examination strategy wherein highlights of printed, visual, or aural material are methodologically ordered and recorded with the goal that they can be broke down. Broadly utilized in the field of correspondence, it likewise has utility in a scope of different fields. Integral to content investigation is the way toward coding, which includes adhering to a bunch of guidelines about what highlights to search for in a content and afterward making the

assigned documentation when that element shows up. Leading an effective substance investigation requires cautious regard for unitizing (sectioning the writings for examination), testing (choosing a fitting assortment of units to dissect), dependability (various specialists making codes reliably), and authenticity (using a coding plan that enough tends to the foreordained miracles). Quantitative substance examination is the conscious and replicable appraisal of pictures of correspondence, which have been existed numeric characteristics as demonstrated by genuine assessment rules, and the assessment of associations including those characteristics using quantifiable procedures, to portray the correspondence, draw enlistments about its significance, or construe from the correspondence Quantitative examination is portrayed as an exact evaluation of wonders by get-together quantifiable information and performing obvious, numerical, or computational strategies. Quantitative evaluation aggregates data from existing and potential clients utilizing examining strategies and passing on the web reviews, online outlines, studies the aftereffects of which can be portrayed as mathematical. After cautious view of these numbers to expect the conceivable predetermination of a thing or association and make changes as necessities be. Quantitative result research is the part organized in the human sciences utilizing the quantifiable frameworks utilized above to amass quantitative information from the evaluation study. In this examination strategy, agents and analysts pass on numerical structures and speculations that relate to the entirety under question. Quantitative appraisal designs are pragmatic, elaborate, and usually, even investigational. The outcomes accomplished from this examination philosophy are legitimate, unquestionable, and reasonable. Information assortment happened utilizing a planned system and drove on more noteworthy models that address the whole people.

Figure 1Qualitative data for employee
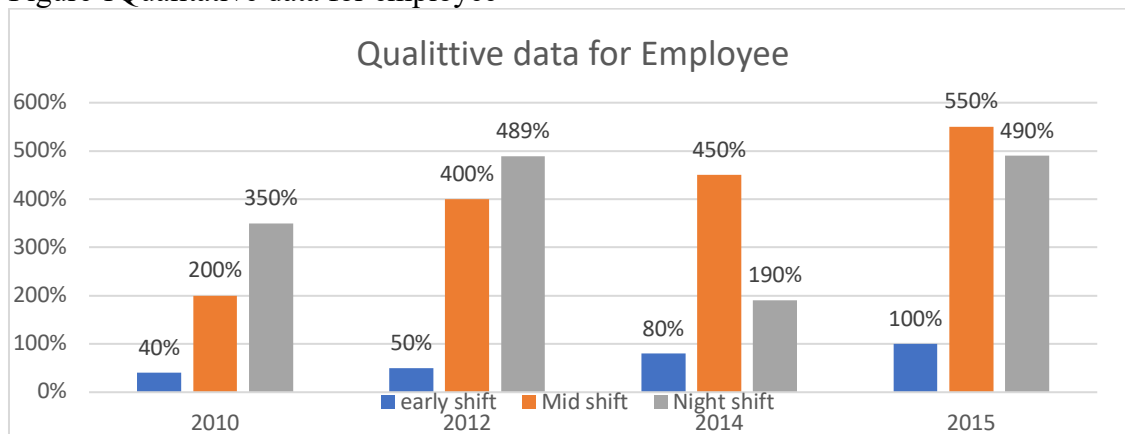
Source: Own representation

3.2.4 Primary quantitative research methods :

Fundamental quantitative assessment is the most by and large used system for coordinating measurable reviewing. The specific component of fundamental assessment is that the researcher work around social occasion data directly as opposed to depending upon data accumulated from as of late done research. Fundamental quantitative assessment setup can be isolated into three further indisputable tracks, similarly as the cooperation stream. An advantage of utilizing quantitative information is that they can without much of a stretch be summed up by utilizing insights or diagrams, and along these lines can measure up to other exploration discoveries and are not difficult to dissect. In view of this they are additionally simple to recreate. Be that as it may,

the subjective strategy utilized permitted the examination to be taken past the limits of a research facility and gives rich knowledge into what distinctive social qualities can mean for mentalities. Quantitative information will in general be less significant than subjective information, as subjective information can give us more insight regarding research. In any case as I would see it, quantitative information is the best strategy for information assortment, as it is more logical and can be utilized in insights which is vital in research.

Expressive Design This kind of quantitative exploration depicts the current status of a variable or a marvel. The expert doesn't begin with an idea notwithstanding he would like to cultivate one exclusively after the data is assembled. Data grouping is for the most part observational in nature. Correlational arrangement researches the association between factors using authentic assessments. In any case, it doesn't simply look for a conditions and consistent outcomes in the circumstance, which is the explanation it can moreover be considered as observational to the extent data arrangement. Quantitative substance examination is an exploration strategy wherein highlights of text based, visual, or aural material are methodologically arranged and recorded so they can be dissected. Generally utilized in the field of correspondence, it likewise has utility in a scope of different fields. Integral to content examination is the way toward coding, which includes adhering to a bunch of guidelines about what highlights to search for in a content and afterward making the assigned documentation when that element shows up. Directing a fruitful substance investigation requires cautious regard for unitizing (dividing the writings for examination), testing (choosing a suitable assortment of units to break down), dependability (various specialists making codes reliably), and legitimacy (utilizing a coding plan that sufficiently addresses the predefined marvels).

3.3 Project Planning

The Project Planning was conducted in a typical free-style way. Each member was assigned a certain task, which he/she would complete on a given deadline.

Soon after the data collection and Web Scraping was done, the RPA model was built.

As discussed on the Solution Design section, the Robotic Process Automation (RPA) model was built upon the software BluePrism.

Now, since we have the data and the RPA tool, we needed a machine learning model from scratch, with particular needs.

Hence, a Machine Learning model was built, using the following libraries:

    Pandas
     NumPy
     Scikitlearn
     Tensorflow

Matplotlib
NLP
IBM Watson

The Machine Learning model carried out the following responsibilities:

Importing the parsed data from the Robotic Process Automation tool (RPA)

Analyzing the data for errors
The Error or unidentifiable data is removed or stored for future implementation
The Primary task of the Machine Learning model is to detect anomaly on the financial data collected of peer companies
To visualize the anomaly in a simplified manner using matplotlib

The model however faced certain limitations:

Unable to detect exceptions on anomaly
Self-generative story telling is missing
The visualization tunning is manual

Although with limitations, the model performed well and suits the needs of the Project.

3.4 Turning Points

There were numerous turning points during the project, some of them are as follows:

The new and improved Solution Design

The primary turning point of the project was when the Solution Design was improved. The older Solution Design lacked most of the features and was not as accurate as the present one. However, the integration of the Robotic Process Automation (RPA) took some time. This was a manual and tedious process in the first Solution Design as it didn't support the RPA.

ParseHUB

The discovery of the ParseHub software was an important turning point. Up until this point we were stuck with Beautiful Soup and its complex design implementation. However, ParseHub

didn't only make the job easy, but also it made it faster. Turns out, the motto of the ParseHub tool was to save time.

The Machine Leaning model

The Machine Learning model is built in-house and from scratch. The amount of features it handles matches up with the industry standard. Not only the model handles everything with proper buffer, it also handles with great accuracy.

3.5 REFERENCE MODELS

The Solution Design models is inspired from IBM's Unified Method Architecture.
IBM uses in house methods for Solution Design like OpenUP.

OpenUP is a lean Unified Process that applies incremental approaches and iteratives withing a structured lifecycle. An agile, pragmatic collaborative nature is followed by OpenUP for software development.

IBM designed it's in house engine for the Solution Design. This paper was published in 2008 with Machine Learning models were less popular. The model was relied on software development, which remains a popular method till date. However, the design they implemented is not legacy material and is still used and implemented today. This was the primary focus and motivation of our solution design; IBM calls it the branch design. We do not have a fancy name for this, but end results are similar.

With the help of Beautiful Soup, we scrapped the ESEF websites for financial data, which was present in their relevant PDF and JSON format. After the successful importation of the data, the Robotic Process Automation pushes the data into the machine learning model. A buffer is created so that the data can stay in the memory while the model processes the data. The final output is then shown on the website created, with the help of matplotlib.
We have also used Tableau for visualization and key finding; however, the process is manual.

The same strategy is applied in the IBM's Solution Design, although with expert software engineering. The IBM model has a dedicated engine which follows an agile philosophy.

Although, to compare both the models, our Machine learning model is industry agnostic. Hence it can be expanded and further remodeled with updated objectives.

To side with the IBM's Solution Design, given that it gets feed into fresh and clean data, the model may work with better accuracy against the our Machine Learning model as there was not enough data to be trained.

However, they have introduced Method Framework, which increases the reusability of the Solution Design. Further study also proves this model is affective against GAAP (USA)
But is a proprietary design with open sourced elements.
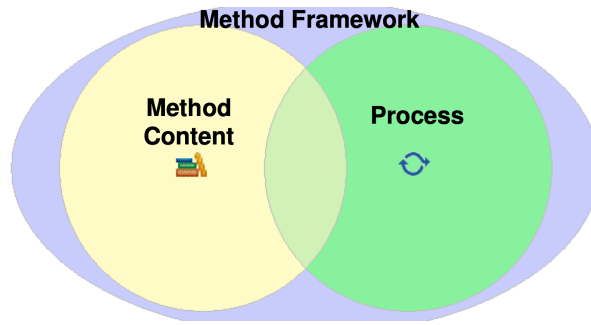
We have hence taken inspiration from the Method Framework as it uses open sourced software to build our machine Learning model.

Method Content represents the primary reusable building blocks of the method that exist outside of any predefined lifecycle. Process shows the assembly method content into a sequence or workflow (represented by a work breakdown structure) used to organize the project and develop a solution.

Method Content is made up of: Roles , Tasks , Work Products , Delivery Processes , Capability Patterns , Activities .

4. Research Results :

Research Results projects between 20 IT companies:

The model was able to detect anomaly within companies. One of such companies were Amazon, whose capital was projected to reduce during the pandemic but the opposite happened.

5. Projection of Results

We have compared and analyzed over 40 peer companies specifically from IT, who uses different frameworks for their accounting standard.

The frameworks include: (but not exclusive to)

ESEF
GAAP – USA
GAAP – Japan

The Machine Learning model understands the difference between the frameworks and the exclusivity among the different standards of accounting. An inbuild translator from Parse Hub is used to translate the Non English accounting standards into English.

The financial statements in any annual report consists:
Balance sheet
Profit and loss statement
Cash flow statement
Statement showing changes in equity

After strict manual evaluation, the data is pushed into the model to be analyzed.

Since the data collected are financial reports from the DAX index and type of data obtained is json and pdf format, in financial reports lots of data about the company's current financial strength and the future prospects of the company will be available but for the analysis and comparison the required data will be financial statements.

The final step in the solution Design is showcasing the results to the users, to make the users more readable and comparable, used interactive dashboards so that it makes users very comfortable in comparing.
Since the solution is peer group comparison if the user feels comfortable in comparing the financial statements, then it makes more meaningful for the proof of concept.

6. Conclusion and Outlook

OUTLOOK:

The Solution Design successfully detects the anomaly between the peer companies and analyses them. The model also finds similar and polar patterns amongst the peers.

We can safely say, the output of the results and the detection of the anomaly was successfully done by the Solution Design. With a little recharge and a quick email from Richard J. Bolton , Imperial College, we found out, this implementation was conducted successfully although with scope of improvement.

The Model successfully identifies the issue as it is intended to. It identifies the anomaly pattern within peer companies. Although the cleaner the data the better was the outcome.

Let us have an outlook, how the tools and the model performed:

To start with Parse Hub:

 The single most important tool for this project. It mined complex data from Deutsch and non-Deutsch websites. The translator was in-built into the tool. Thus, saving we saved time from implementing a translator and used the resource on other fronts.

The Machine Learning Model:

The Machine Learning Model Worked flawlessly for job. In fact, we are positive, with open sourcing, it can further expand its capabilities and become industry agnostic.

Robotic Process Automation (RPA):
The Robotic Process Automation worked as it was intended without fail.

To obtain a better conclusion, we have used the following minimization method:

$$D_1\left(S_{i1}, S_{j1}\right) = \left(S_{i1} - S_{j1}\right)\left(S_{i1} - S_{j1}\right)'$$

CONCLUSION:

A point of view:
The project satisfies the needs of the subject and the discipline. It covers wide range of topics across Machine learning , Automation , Big Data , Data handling and Data Harvesting.
We are positive about the project, and especially proud of the Solution Design implementation and integration.

With different kinds of data available and on different formats, it was really a challenge to a harvest and extract them from their sources. From our studies we also found out, the financial data is available in static format, thus, limiting its further capabilities for case studies. Majority of the time was invested into harvesting this data, but at the end, it was successful.

In summary, the European Securities and Markets Authority (ESMA) developed regulatory technical standards (RTS) for European regulated market companies to report their annual financial reports (AFRs) in one single format called the to specify one electronic reporting format called the European Single Electronic Format (ESEF) from financial years beginning on or after January 2020.

The scope of the application of this framework could lead to a future where improvements in the financial statements analysis or even revamping the current IFRS notes could potentially provide more meaningful insights to an investor or a user.

European Securities and Markets Authority (ESMA) has proposed that annual financial reports should be published in a digital format using XHTML (eXtensible Hypertext Markup Language). IFRS consolidated financial statements must also be marked up with tags using iXBRL technology (inline eXtensible Business Reporting Language).

The objectives of the new regulation are there has to be a greater scope of comparability through this single reporting format. Also there has to be a better impact in processing of the data. This also aids in Automated preparation and analysis of company reports. Assistance in Easy conversion into other formats such as Excel. The Ultimate goal is to provide higher level of transparency for Annual Financial Reports (AFR) and IFRS consolidated financial statements.

Future of the project:

We have designed the Machine Learning Model and the Solution Design in such a way , that it becomes industry agnostic in future. We have high hopes that open sourcing it will expand its possibilities. The git hub community has always prioritized open sourcing of software and design tools.

Same goes for the Machine Learning model , as of now , it is designed to only detect financial data , but with little tinkering , this can be expanded to literally anything and the same level of accuracy can be achieved.

The agnostic nature of the model was tried on an text analysis project, where the text is converted into numeric and binary digits. We were pleased with the outcome of the project, as there was no extra training needed for the model to adapt the new type of data, which is text in this case. The accuracy was commendable, given the model was not trained for this kind of data.

Thus, we can conclude and say, we are positive about the expansion of the Solution Design and the Machine Learning model , with this , the future of the project. All thanks to its industry agnostic nature of the Machine Learning model , which makes it flexible for any kind of data which can either be tabulated or converted in numeric.

Bibliography

Financial Accounting Standards Board. 2021. "US GAAP Financial Reporting Taxonomy Release Notes." FASB: Financial Accounting Standards Board. FASB US GAAP Financial Reporting Taxonomy Release Notes. January 31, 2021. https://www.fasb.org/cs

Financial Accounting Standards Foundation. 2021. "About Japanese GAAP−Accounting Standards Board of Japan- Financial Accounting Standards Foundation." Financial Accounting Standards Foundation. July 15, 2021. https://www.asb.or.jp/en/jp-gaap/about.html.

AMR-Allied Market Research. 2021. "Analysis of Peer Groups." Market Research Company - Allied Market Research. Allied Market Research. 2021. https://www.alliedmarketresearch.com/peer-analysis.

Corporate Finance Institute-CFI. n.d. "IFRS-IFRS Standards in Accounting." Corporatefinanceinstitute.Com. CFI. Accessed July 15, 2021. https://corporatefinanceinstitute.com/resources/knowledge/accounting/what-are-ifrs-standards/.

Debitoor. n.d. "US-GAAP." Debitoor Research Program. Accessed July 16, 2021. https://debitoor.de/lexikon/us-gaap.

IFRS Foundation. 2021. "IFRS - IFRS Standards and IFRIC Interpretations." IFRS Foundation. 2021. https://www.ifrs.org/issued-standards/list-of-standards/.

Investopedia. 2021. "International Financial Reporting Standards (IFRS)." Investopedia.Com. Gordon Scott. March 31, 2021. https://www.investopedia.com/terms/i/ifrs.asp.

Key Differences. 2015. "GAAP and IFRS - Key Differences." Key Differences. Surbhi S. December 4, 2015. https://keydifferences.com/difference-between-gaap-and-ifrs.html.

Kostyuk, Alexander, Helen Kostyuk, and Anna Shcherbak. 2016. "Board of Directors and Corporate Sustainability – Outlining the Effective Profile of the Board." *Risk Governance and Control: Financial Markets and Institutions*, no. 3: 80–88. https://doi.org/10.22495/rcgv6i3art12.

LLBCPA. 2013. "GAAP: Generally Accepted Accounting Principles." Professional Accounting Services - LLBCPA. July 1, 2013. https://llbcpa.com/gaap-generally-accepted-accounting-principles/.

Mesure, Hervé. 2007. "Interdisciplinary Yearbook of Business Ethics20075Edited by Laszlo Zsolnai. Interdisciplinary Yearbook of Business Ethics. Bern: Peter Lang AG 2006. Volume 1." *Society and Business Review*, no. 3 (October): 334–35. https://doi.org/10.1108/17465680710825541.

Declaration in lieu of oath

I hereby declare that I produced the submitted paper with no assistance from any other party and without the use of any unauthorized aids and, in particular, that I have marked as quotations all passages which are reproduced verbatim or near-verbatim from publications. Also, I declare that the submitted print version of this thesis is identical with its digital version. Further, I declare that this thesis has never been sub-mitted be-fore to any examination board in either its present form or in any other similar version. I herewith agree/disagree that this thesis may be published. I herewith consent that this thesis may be uploaded to the server of external contractors for the purpose of submit-ting it to the contractors' plagiarism detection systems. Uploading this thesis for the purpose of submitting it to plagiarism detection systems is not a form of publication.
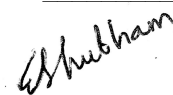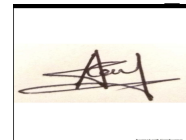
Agnishwar Das

Sagnik Patra

Shubham Kolpe

Tamal Chakraborty

Abhishek Pandve

ssen, March 5, 2021

_____

(Location, Date)

_____

(Signature)