

1.Extracting Information from Reports

This section shows you how you how to effectively extract information from XBRL-based financial reports.

One of the reasons for going through all the trouble of representing financial information using a structured format such as XBRL is to be able to effectively extract information from such reports.

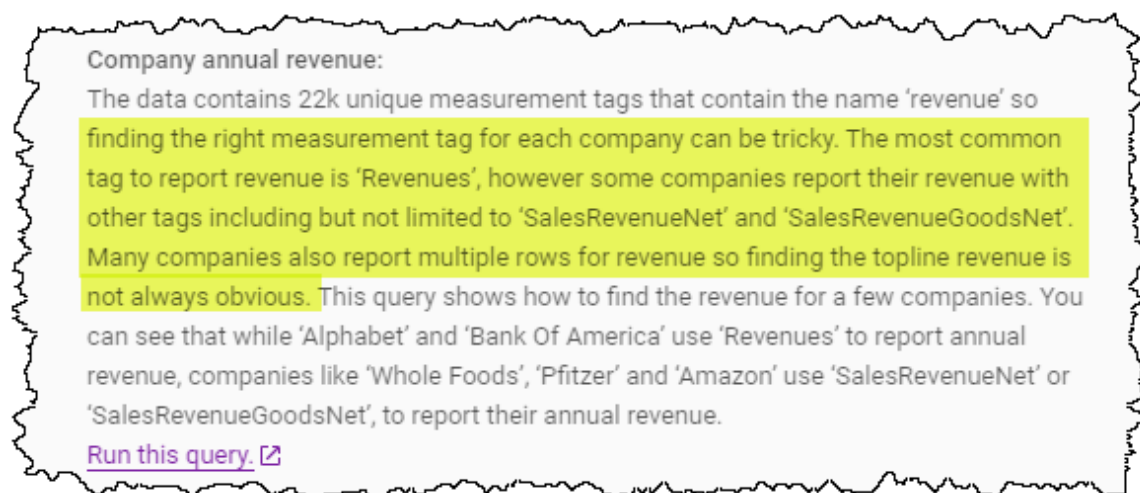
But, because financial statements are not forms and therefore not all financial reports are identical, there are more steps than one might think when it comes to extracting information from such rules and using that information in automated process of one sort or another. We will make you conscious of these issues.

1.1. Problems Caused by Errors

One data aggregator that I spoke with lamented that they spent about 50% of their development effort related to extracting information from XBRL-based financial reports correcting errors in reported information.

1.2. Problems of Missing Metadata

Another issue related to extracting information from XBRL-based reports is missing metadata. For example, if you attempt to extract information from the free SEC Data Set provided by Google BigQuery¹, this issue becomes clear. This issue is even discussed by Google:



Note that this narrative above only tells PART of the story. See these human readable MAPPINGS²: (over comes the issue of using different revenues concepts)

¹ SEC Data Set on Google, <http://xbrl.squarespace.com/journal/2020/7/21/sec-data-set-on-google.html>

² Human readable mappings, <http://www.xbrl.org/2018/Prototype/ReportingStylesUSGAAP/COMID-BSC-CF1-IS3-IEMIB-OILN/mapping-definition.html>

153	faci:Revenues	class-equivalentClass	us-gaap:ReceivableFromControllingInterestEquityPreferredCarryingAmount	1
154	faci:Revenues	class-equivalentClass	us-gaap:Revenues	1
155	faci:Revenues	class-equivalentClass	us-gaap:SalesRevenueNet	2
156	faci:Revenues	class-equivalentClass	us-gaap:RevenueFromContractWithCustomerExcludingAssessedTax	2
157	faci:Revenues	class-equivalentClass	us-gaap:RevenueFromContractWithCustomerIncludingAssessedTax	3
158	faci:Revenues	class-equivalentClass	us-gaap:SalesRevenueServicesNet	4
159	faci:Revenues	class-equivalentClass	us-gaap:SalesRevenueGoodsNet	5
160	faci:Revenues	class-equivalentClass	us-gaap:RevenueFromInterestExpense	6
161	faci:Revenues	class-equivalentClass	us-gaap:RealEstateRevenueNet	7
162	faci:Revenues	class-equivalentClass	us-gaap:InterestAndDividendIncomeOperating	8
163	faci:Revenues	class-equivalentClass	us-gaap:RevenueMineralSales	9
164	faci:Revenues	class-equivalentClass	us-gaap:OilAndGasRevenue	10
165	faci:Revenues	class-equivalentClass	us-gaap:FinancialServicesRevenue	11
166	faci:Revenues	class-equivalentClass	us-gaap:RegulatedAndUnregulatedOperatingRevenue	12
167	faci:Revenues	class-equivalentClass	us-gaap:ShippingAndHandlingRevenue	13
168	faci:Revenues	class-equivalentClass	us-gaap:SalesRevenueFromEnergyCommoditiesAndServices	14
169	faci:Revenues	class-equivalentClass	us-gaap:UtilityRevenue	15
170	faci:Revenues	class-equivalentClass	us-gaap:PhaseInPlanAmountOfCapitalizedCostsRecovered	16
171	faci:Revenues	class-equivalentClass	us-gaap:SecondaryProcessingRevenue	17
172	faci:Revenues	class-equivalentClass	us-gaap:RevenueFromProductsAndServices	18
173	faci:Revenues	class-equivalentClass	us-gaap:RevenueFromLeasesAndOwnedHotels	19
174	faci:Revenues	class-equivalentClass	us-gaap:FranchiseRevenue	20
175	faci:Revenues	class-equivalentClass	us-gaap:SubscriptionRevenue	21
176	faci:Revenues	class-equivalentClass	us-gaap:AdvertisingRevenue	22
177	faci:Revenues	class-equivalentClass	us-gaap:AdmissionRevenue	23
178	faci:Revenues	class-equivalentClass	us-gaap:RevenueFromEnrollmentAndRegistrationFeesExcludingHospitalityEnterprises	24
179	faci:Revenues	class-equivalentClass	us-gaap:MembershipDuesRevenueOngoing	25
180	faci:Revenues	class-equivalentClass	us-gaap:LicenseRevenue	26
181	faci:Revenues	class-equivalentClass	us-gaap:RoyaltyRevenue	27
182	faci:Revenues	class-equivalentClass	us-gaap:SalesOfOilAndGasProspects	28
183	faci:Revenues	class-equivalentClass	us-gaap:ClearingFeesRevenue	29
184	faci:Revenues	class-equivalentClass	us-gaap:ContractRevenue	30

Here is that SAME INFORMATION on that HTML page in MACHINE READABLE, global standard XBRL³.

So, there are actually about 79 different concepts that could be used to represent the notion of “Revenues”. If you create a machine-readable set of these mappings, put the concepts in order, then you can effectively extract information from XBRL-based financial reports.

But that is just for one concept. There are about 50 or so high-level concepts like “Revenues” including “Assets”, “Liabilities and Equity”, “Net Income (Loss)”, “Net Cash Flow” and so forth.

And the mappings above are for US GAAP based financial reports. The same thing needs to be done to extract information from IFRS based financial reports.

What is really needed is an entire system for extracting high-level financial concepts from XBRL-based reports, and that is what reporting styles⁴ do.

1.3. Basic Extraction Examples

I created a set of about 13 Excel extraction tools that extract information effectively from 4,060 (68% of all reports) XBRL-based financial reports⁵.

³ Machine-readable mappings, <http://www.xbrlsite.com/2018/Prototype/ReportingStylesUSGAAP/COMID-BSC-CF1-IS3-IEMIB-OILN/mapping-definition.xml>

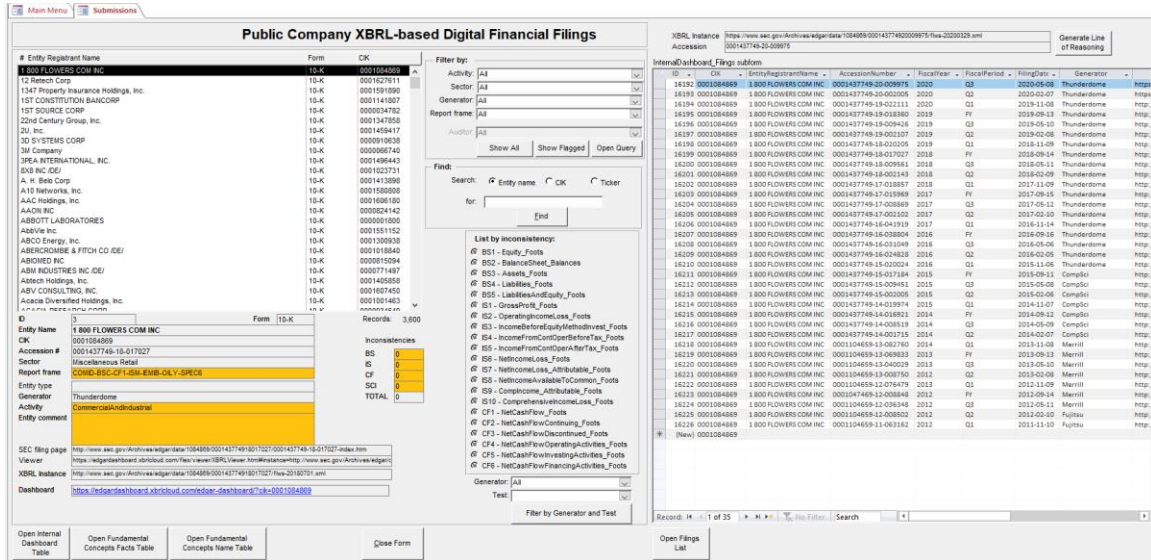
⁴ Reporting Styles, US GAAP, <http://www.xbrlsite.com/2018/Prototype/ReportingStylesUSGAAP/Index.html>

⁵ Further Updated and Expanded XBRL-based Financial Report Extraction Tools, <http://xbrl.squarespace.com/journal/2018/1/11/further-updated-and-expanded-xbrl-based-financial-report-ext.html>

If you go into the Excel spreadsheet VBA code, you can see what is involved in extracting information from such XBRL-based reports. Essentially, you have to deal with mappings, unreported high-level line items, etc.

1.4. Explore! Working Prototype

I put together a working prototype that I call Explore!⁶. The prototype includes a Microsoft Access database application that contains links to 109,777 fundamentally sound XBRL-based reports of 3,600 public companies that report to the SEC using US GAAP. The prototype highlights fundamental issues related to extracting information from XBRL-based financial reports.



1.5. Financial Analysis Models Example

I created a working proof of concept that shows how to represent an unlevered discounted cash flow model using Excel⁷.

Select Operating Data	Actual			Projected Annual Forecast				
	2016A	2017A	2018A	2019P	2020P	2021P	2022P	2023P
Revenue	\$85,320,000,000	\$89,950,000,000	\$110,360,000,000	\$121,396,000,000	\$133,535,600,000	\$146,889,160,000	\$161,578,076,000	\$177,735,883,600
Revenue Growth Rate (%)		5%	23%	10.0%	10.0%	10.0%	10.0%	10.0%
EBITDA	\$27,616,000,000	\$34,149,000,000	\$49,468,000,000	\$48,558,400,000	\$53,414,240,000	\$58,755,664,000	\$64,631,230,400	\$71,094,353,440
EBITDA Margin (%)	32.4%	38.0%	44.8%	40.0%	40.0%	40.0%	40.0%	40.0%
EBIT	26,373,000,000	31,927,000,000	46,735,000,000	\$36,418,800,000	\$40,060,680,000	\$44,066,748,000	\$48,473,422,800	\$53,320,765,080
EBIT Margin (%)	30.9%	35.5%	42.3%	30.0%	30.0%	30.0%	30.0%	30.0%
Depreciation & Amortization	\$6,622,000,000	\$8,778,000,000	\$10,261,000,000	\$9,711,680,000	\$10,682,848,000	\$11,751,132,800	\$12,926,246,080	\$14,218,870,688
D&A as a % of revenue	7.8%	9.8%	9.3%	8.0%	8.0%	8.0%	8.0%	8.0%

You can explore this working proof of concept and apply these ideas to other financial analysis models you might want to create.

⁶ Explore!, <http://xbrl.squarespace.com/journal/2020/6/14/explore.html>

⁷ Representing Unlevered Discounted Cash Flow Model Using XBRL, <http://xbrl.squarespace.com/journal/2018/9/4/representing-unlevered-discounted-cash-flow-model-using-xbrl.html>

1.6. Comparability with Consistency

Per SFAS 8⁸ issued by the FASB, page 19, QC23:

"Comparability is not uniformity. For information to be comparable, like things must look alike and different things must look different. Comparability of financial information is not enhanced by making unlike things look alike any more than it is enhanced by making like things look different."

A form is uniformity. As stated, financial statements are not forms. And while financial statements are not forms, they are likewise not random either.

It is important to understand what the FASB means by "comparability (including consistency)". That is explained in SFAS 8⁹. Here is the pertinent section of that document. This is well stated, very clear, and every word is worth reading:

- **QC20.** Users' decisions involve choosing between alternatives, for example, selling or holding an investment, or investing in one reporting entity or another. Consequently, information about a reporting entity is more useful if it can be compared with similar information about other entities and with similar information about the same entity for another period or another date.
- **QC21.** Comparability is the qualitative characteristic that enables users to identify and understand similarities in, and differences among, items. Unlike the other qualitative characteristics, comparability does not relate to a single item. A comparison requires at least two items.
- **QC22.** Consistency, although related to comparability, is not the same. Consistency refers to the use of the same methods for the same items, either from period to period within a reporting entity or in a single period across entities. Comparability is the goal; consistency helps to achieve that goal.
- **QC23.** Comparability is not uniformity. For information to be comparable, like things must look alike and different things must look different. Comparability of financial information is not enhanced by making unlike things look alike any more than it is enhanced by making like things look different.
- **QC24.** Some degree of comparability is likely to be attained by satisfying the fundamental qualitative characteristics. A faithful representation of a relevant economic phenomenon should naturally possess some degree of comparability with a faithful representation of a similar relevant economic phenomenon by another reporting entity.
- **QC25.** Although a single economic phenomenon can be faithfully represented in multiple ways, permitting alternative accounting methods for the same economic phenomenon diminishes comparability.

US GAAP is an excellent financial reporting scheme because it strikes a good balance between the ability to compare and the ability to accurately report the financial condition and financial position of an economic entity. When trying to implement

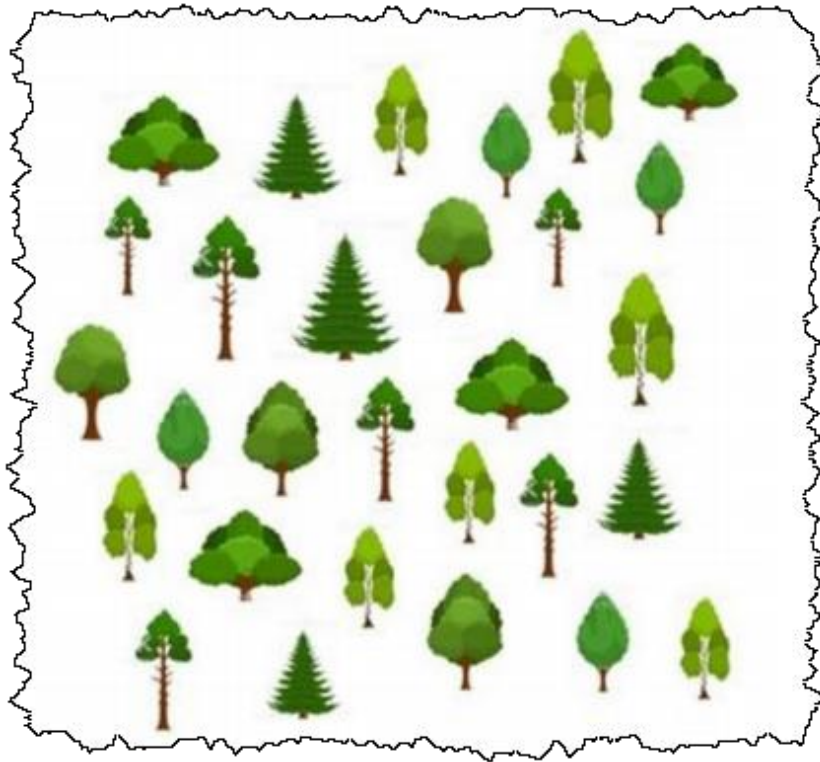
⁸ FASB, *Statement of Financial Accounting Concepts No. 8*, page 19, <http://www.fasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175822892635&blobheader=application/pdf>

⁹ FASB, *Statement of Financial Accounting Concepts No. 8*, page 19, <http://www.fasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175822892635&blobheader=application/pdf>

"comparisons" in software, it is very important to understand the goal of comparability the financial reporting scheme enables.

1.7. Understanding Financial Report Variability

The document *Essence of Accounting*¹⁰ and the video playlist *Understanding the Financial Report Logical System*¹¹ discusses variability and other topics that help you understand more issues related to effectively extracting information from an XBRL-based financial report.



¹⁰ Essence of Accounting, <http://xbrlsite.azurewebsites.net/2020/Library/EssenceOfAccounting.pdf>

¹¹ Understanding the Financial Report Logical System, https://www.youtube.com/playlist?list=PLqMZRUzQ64B7EWamzDP-WaYbS_W0RL9nt