Understanding Disclosure Mechanics

By Charles Hoffman, CPA (Charles.Hoffman@me.com)

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XBRL is a facility for expressing meaning. The meaning conveyed by an XBRL-based public company financial report as to the financial position and financial condition of an economic entity must be a stable, consistent representation of meaning. That way, meaning represented and conveyed by such reports will be understood consistently by all users of the information.

While enforcement of the logical, mechanical, and mathematical relations by the SEC of such reports are in an embryonic state; enforcement of these rules is bound to increase at some point. Understanding these sorts of relations will put the reader at the head of the quality curve.

This document helps the reader understand the notion of these logical, mechanical, and mathematical relations which I call disclosure mechanics. Each XBRL-based public company financial report has these logical, mechanical, and mathematical relations. Those relations exist within each report fragment, between report fragments, and between the report itself and the fragments which make up a report.

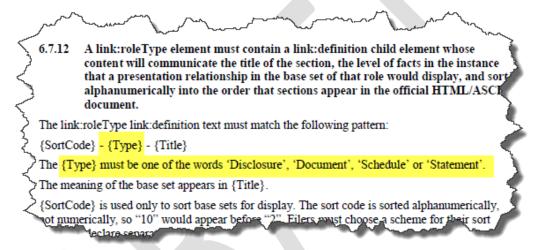
1. Deconstructing the Mechanics of an SEC Style XBRL-based Digital Financial Report

The U.S. Securities Commission's Edgar Filer Manual¹ (EFM) specifies rules for creating XBRL-based digital financial reports. Another source for understanding how to create these reports comes from the empirical evidence offered by the reports themselves.

First I will deconstruct the pieces which make up an XBRL-based digital financial report and then put the pieces back together and in doing so describe the logical, mechanical, and mathematical relations of these report fragments which make up such reports.

1.1. Understanding the notion of type

The EFM defines the "Type" in section 6.7.12:



Put simply, each Network label² MUST contain one of the following terms to identify the "Type" of the Network:

- Document
- Statement
- Disclosure
- Schedule

The type is used to organize the report fragments in software applications such as the SEC Interactive Data Viewer³.

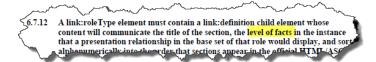
¹ I am using Version 37 of the Edgar Filer Manual, https://www.sec.gov/info/edgar/edgarfm-vol2-v37.pdf

² A Network label is articulated by the link:definition of the extended link role.

³ Here is the SEC Interactive Data Viewer for the 10-K filing by Microsoft, https://www.sec.gov/cgi-bin/viewer?action=view&cik=789019&accession number=0001193125-15-272806&xbrl type=v

1.2. Understanding the notion of level

That same EFM section conveys the meaning of the term "Level" of a disclosure based on its usage in that section and in previous sections.

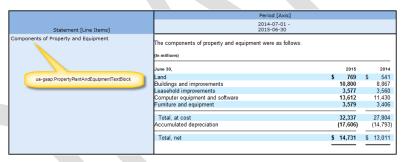


Again, put simply, a level relates to the "tagging level" of facts that are included within an XBRL-based financial report. Levels are always one of the following:

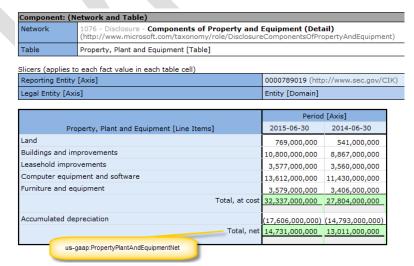
- Level 1 Note Text Block: an entire note of the financial report.
- Level 2 Policy Text Block: an individual policy within a financial report.
- **Level 3 Disclosure Text Block**: an entire individual disclosure that is contained within a note.
- **Level 4 Disclosure Detail**: a set of individual facts that make up an entire individual disclosure.

The focus of this document is Level 3 Disclosure Text Blocks and Level 4 Disclosure Detail. Here is an example of each:

Level 3 Disclosure Text Block:



Level 4 Disclosure Detail:



1.3. Understanding the difference between a note and a disclosure

For this discussion, understanding the difference between a note and a disclosure is important. There is a significant difference between a note and a disclosure. A note is a presentation related artifact. A disclosure is an informational artifact. Disclosures are presented with a note or a statement. In this discussion a balance sheet, income statement, statement of comprehensive income, cash flow statement, and statement of changes in equity are all considered disclosures. So the term "statement" is similar to the term "note" in that a statement is a presentation artifact into which a disclosure, such as the balance sheet information, goes.

1.4. Ordering of report fragments

The EFM specifies the ordering of the fragments of an XBRL-based financial report. XBRL uses what it calls a Network to organize fragments of a report. Each Network has two traits: Type and Level. Networks must be in the following order per the EFM:

- 1. Document types (all of which are Level 4 detail)
- 2. Statement types (all of which are Level 4 detail)
- 3. Disclosure types which are Level 1 (note level) text blocks
- 4. Disclosure types which are Level 2 (policy) text blocks
- 5. Disclosure types which are Level 3 (disclosure) text blocks.
- 6. Disclosure types which are Level 4 (disclosure) details.

The EFM is vague when it comes to the "Schedule" types. It seems to me that the type "Schedule" is interchangeable with the type "Disclosure". However, the type "Schedule" is not explained well, not used that often, generally interchangeable with Disclosure type, and in my opinion are best avoided until how they should be used is more clear.

1.5. Basic mechanical rule: don't use Level 3 Disclosure Text Blocks to represent Level 4 Note Text Block information

An easy to understand idea is that XBRL-based reports need to use Level 1 Note Text Blocks to represent information that goes into slot #3 from the ordering of report fragments above. Occasionally, a public company filings uses what is defined as a Level 3 Disclosure Text Block⁴ to represent a Level 1 Note Text Block. That is an example of a mechanical rule.



⁴ The US GAAP XBRL Taxonomy calls these "Table Text Blocks"; see the comprehensive list of each type of Text Block here, <a href="http://xbrlview.fasb.org/yeti/resources/yeti-gwt/Yeti.jsp#tax~(id~156*v~4370)!con~(id~3498213)!net~(a~3063*l~749)!lang~(code~enus)!path~(g~89174*p~0)!rg~(rg~32*p~12)

1.6. Basic mechanical rule: put Level 1 Note Text Blocks in networks of the time "Disclosure"

Another basic mechanical rule is that a Level 1 Note Text Block must go into an XBRL Network that has the type of "Disclosure". They don't go into Networks of type "Document" or "Statement".

Very few public companies violate this rule. Those two basic examples helps you understand the idea of disclosure mechanics. Now we will get into some disclosure mechanics which are less understood but true none-the-less.

1.7. Understanding the relation between Level 1 Note Text Blocks and Level 3 Disclosure Text Blocks

Every financial report is broken into the presentation artifacts "statements" and "notes". A note is a presentation related artifact. Disclosures go into notes. Which note a disclosure is presented in varies widely between reporting entities, although there can be some common patterns public companies use. However, these rules are not really enforceable because there is nothing in the accounting literature that states precisely where a disclosure must be presented. For example, the estimated useful lives of classes of property, plant, and equipment disclosure could be presented in the note "significant accounting policies" or "property, plant and equipment". Both make sense. Future minimum lease payments might go into "leases" note or "commitments and contingencies" note some other note.

Different reporting entities could have policies for which specific note a disclosure is placed. And so a business rule can be created which is unique to a reporting entity or reporting entities that have the same policies as to how they construct their financial report.

All the above said, every Level 3 Disclosure Text Block is also reported within some Level 1 Note Text Block. But there is not necessarily a specific relation between which Level 1 Note Text Block contains which specific Level 3 Disclosure Text Block.

Further, while it is true that every Level 3 Disclosure Text Block report fragment is also within some Level 1 Note Text Block; it is NOT THE CASE that every part of a Level 1 Note Text Block also has a Level 3 Disclosure Text Block.

For example, the Level 1 Note Text Block "Nature of Operations" and "Basis of Reporting" do not have a corresponding Level 3 Disclosure Text Block.

So for now, I am pretty much ignoring which Level 1 Note Text Block filers use, I may leverage these mechanics and logic later in specific ways.

1.8. Understanding the relation between Level 3 Disclosure Text Blocks and Level 4 Disclosure Detail

There is generally an extremely high correlation, if not a one-to-one correlation, between a Level 3 Disclosure Text Block report fragment and a Level 4 Disclosure Detail report fragment. It is likewise true that there is a high correlation between a Level 4 Disclosure Detail and a Level 3 Disclosure Text Block. The relations go both ways. Exceptions will be covered in another section. This section examines the relationship between Level 3 Disclosure Text Blocks and Level 4 Disclosure Details.

Below you see a Level 3 Disclosure Text Block provided by a public company. The Level 3 Text Block provides the disclosure components of inventory and it uses the US GAAP XBRL Taxonomy concept: **us-gaap:ScheduleOfInventoryCurrentTableTextBlock**.

Further, note the type of the network which is "Disclosure". As mentioned, every Level 3 Disclosure Text Block is always contained in a Network that has a type "Disclosure" or "Schedule".

Component: (Net	omponent: (Network and Table)						
	1040 - Disclosure - INVENTORIES (Tables) (http://www.microsoft.com/taxonomy/role/NotesToFinancialStatementsInventoryDisclosureTextBlockTables)						
Table S	Statement [Table]						
Slicers (applies to e	each fact value in each table cell)						
	porting Entity [Axis] 0000789019 (http://www.sec.gov/CIK)						
Legal Entity [Axis]			Entity [Domain]				
			Period [Axis]				
Statement [Line Items]		2014-07-01 - 2015-06-30					
Components of In	ventories	The compo	nents of inventories were as follows:				
		(In millions)					
June		June 30,			2015		2014
		Raw materi	ials	\$ 1	,100	\$	944
us-gaap:Sched	duleOfInventoryCurrentTableTextBlock	Work in pro	ocess		202		266
Finished goods 1,600 Total \$ 2,902			1	,600	1	1,450	
			,902	\$ 2	2,660		

In the next graphic below you can see the Level 4 Disclosure Detail for the exact same information contained in the Level 3 Disclosure Text Block shown above. While there are some presentation related differences such as the text block is shown "in millions" (e.g. \$2,902) and the detail is shown as the actual reported value (2,902,000,000); the information is exactly the same.

Further, note the concept used as the total of the components of inventory which is "us-gaap:InventoryNet".

Component: (N	etwork and Table)			
Network	1075 - Disclosure - Components of Inventories (Detail) (http://www.microsoft.com/taxonomy/role/DisclosureComponentsOfInventories)			
Table	Inventory, Current [Table]			
Slicers (applies to	o each fact value in each table cell)			
Reporting Entity	[Axis]	0000789019 (http://www.sec.gov/CIK)		
Legal Entity [Axi	s]	Entity [Domain]		
		Period [Axis]		
	Inventory [Line Items]	2015-06-30	2014-06-30	
Raw materials		1,100,000,000	944,000,000	
Work in process	rk in process		266,000,000	
Finished goods	us-gaap:InventoryNet	1,600,000,000	1,450,000,000	
	Total	2,902,000,000	2,660,000,000	

And so, the Level 3 Disclosure Text Block and the Level 4 Disclosure Detail report exactly the same information. The information reported is the components of inventory roll up.

There is a correlation between the Level 3 Disclosure Text Block concept (**us-gaap:ScheduleOfInventoryCurrentTableTextBlock**) and the Level 4 Disclosure Detail concept (**us-gaap:InventoryNet**).

Examining 100% of the 10-Ks of public companies as of March 1, 2016 (basically, the 2015 10-K filing) the following results were obtained:

DisclosureFound	DisclosureConsistent	RepresentationConcept_TextBlock	RepresentationConcept_Detail	Count	Percent	
FALSE	CONSISTENT	NOT-FOUND	NOT-FOUND	3,612	56%	0
TRUE	CONSISTENT	us-gaap:ScheduleOfInventoryCurrentTableTextBlock	us-gaap:InventoryNet	1,721	27%	0
TRUE	INCONSISTENT	NOT-FOUND	us-gaap:InventoryNet	1,061	16%	3
TRUE	INCONSISTENT	us-gaap:ScheduleOfInventoryCurrentTableTextBlock	NOT-FOUND	46	1%	4
TRUE	CONSISTENT	us-gaap:ScheduleOfUtilityInventoryTextBlock	us-gaap:InventoryNet	19	0%	9
TRUE	INCONSISTENT	us-gaap:ScheduleOfUtilityInventoryTextBlock	NOT-FOUND	7	0%	0
				6,466	100%	0
						-
			Consistent with expectation	5,352	83%	
			Inconsistent with expectation	1,114	17%	
			Total	6,466	100%	

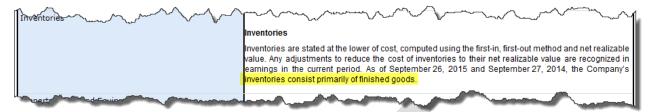
This analysis reiterates the correlation between the Level 3 Disclosure Text Block and the Level 4 Disclosure Detail. There are 5,352 reporting entities, 83% of all entities, that either report no remnants of the components of inventory roll up because they don't have inventory; or they report both the Level 3 and Level 4 concepts that are expected.

Interpreting each line (indicated by the RED circles to the right):

- **Line #1** indicates that NEITHER the Level 3 Disclosure Text Block nor the Level 4 Disclosure Details were found, meaning this disclosure is not present and is consistent with expectations should the disclosure not exist in the report. Basically, 56% of public companies do not report inventory.
- **Line #2** indicates that BOTH the Level 3 Disclosure Text Block AND the Level 4 Disclosure Detail line items WERE found. This is as expected. A total of 27% of public companies report using these two specific concepts.
- Line #3, Line #4, and Line #7 indicates an inconsistency because either the Level 3 Disclosure Text Block was found OR the Level 4 Disclosure Detail was found but NOT BOTH.
- Line #5 indicates that 19 companies used an ALTERNATIVE Level 3 Disclosure Text Block to report the inventory components roll up (usgaap:ScheduleOfUtilitiesInventoryTextBlock), but the same Level 4 Disclosure Detail concept.
- **Line #7** indicates the total population of public company financial reports analyzed, which is 6,466 10-K filings as of March 31, 2016.

Further analysis of this example revealed that as per **Line #3** in the above table; 1,061 or 16% of public companies reported the detailed line item "inventory" and reported the components breakdown ON THE BALANCE SHEET. It seems that the SEC does not require the Level 3 Disclosure Text Block to be reported if the inventory components breakdown is reported within the balance sheet. The specific number of economic entities which report the components of inventory on the balance sheet is not currently known.

A second reason public companies might report "us-gaap:InventoryNet" but not provide a Level 3 Disclosure Text Block is because the breakdown of the components of inventory is done in narrative form within the inventory policy. For example, this is how Apple indicates that the components of inventory are "finished goods":



Note that Apple could have reported the components of inventory as below and a machine can safely and reliably understand the components of inventory:

us-gaap:FinishedGo	us-gaap:FinishedGoods		
	2015-09-26	2014-09-27	
Inventory, net [Abstract]			
Finished goods	2,349	2,111	
Total	2,349	2,111	
us-gaap:InventoryNet			

1.9. Mathematical relations of a Level 4 Disclosure Detail

Note that the Level 4 Disclosure Detail for the disclosure in the prior section, components of inventory, is a roll up and contrast to a roll forward. A specific disclosure is either a roll up or a roll forward, not both. Be careful not to misinterpret what I am saying. What I am saying is that a specific instantiation of a disclosure cannot be a roll up and a roll forward at the same time; it has to be one or the other. Now, a reporting entity in many cases can choose to disclosure detailed information in the form of a roll up or in the form of a roll forward. I consider those two different disclosures. A public company might have one, it might have the other, or it might provide both the roll up and the roll forward.

The point is, a disclosure might have mathematical relations. For example, the disclosure above is a roll up. If it is a roll up, that roll ups is expected to have (a) a set of XBRL calculation relations provided by the public company and (b) that set of XBRL calculations is expected to roll up correctly per the rules of how XBRL conveys information. To not provide the XBRL calculation relations is an error. To not have the XBRL calculations show that the mathematical relations actually roll up is likewise an error.

The exact same thing is true about the mathematical relations of a roll forward or any other mathematical relation in a Level 4 Disclosure Detail. It is NOT OK if the math does not work. While it is true that the SEC does not require that, say, XBRL Formulas be provided within a report; it does not mean that a roll forward in a report is OK if it doesn't roll forward correctly. Again, the mathematical relations and enforcement of the rule by the SEC are two completely different things.

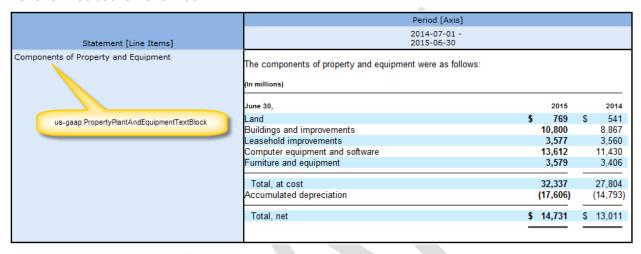
There tend to be three very common patterns of mathematical relations in disclosures and all must work correctly: roll ups, roll forwards, adjustments, and member aggregations. While it might be convenient to not test these mathematical relations to make sure the

numbers in a report "cross cast" and "foot", and otherwise "tick" and "tie"; it is likewise sloppy accounting.

1.10. Property, plant and equipment example

Similarly, the Level 3 Disclosure Text Block and the Level 4 Disclosure Detail correspond to one another whether the Level 4 Disclosure Detail is represented using [Line Items] or represented using [Axis]/[Member]s to represent the disclosure.

Level 3 Disclosure Text Block:



Level 4 Disclosure Detail (using Line Items):

Component: (Network and Table)			
	1076 - Disclosure - Components of Property and Equipment (Detail) (http://www.microsoft.com/taxonomy/role/DisclosureComponentsOfPropertyAndEquipment)		
able Property, Plant and Equipment [Table]			

	Entity [Domain]		
	0000789019 (http://www.sec.gov/CIK)		
Slicers (applies to each fact value in each table cell)			

		Period	[Axis]
Property, Plant and Equipment [Line Items]	2015-06-30	2014-06-30	
Land		769,000,000	541,000,000
Buildings and improvements		10,800,000,000	8,867,000,000
Leasehold improvements		3,577,000,000	3,560,000,000
Computer equipment and software		13,612,000,000	11,430,000,000
Furniture and equipment		3,579,000,000	3,406,000,000
Total,	at cost	32,337,000,000	27,804,000,000
Accumulated depreciation To	otal, net	(17,606,000,000) 14,731,000,000	
us-gaap:PropertyPlantAndEquipmentNet			

Level 3 Disclosure Text Block:

				_
	Period [Axis]			
	2014-04-01 -			
Property Plant And Equipment [Abstract]	2015-03-31			
Property Plant And Equipment [Abstract]				
Schedule of Cost and Accumulated Depreciation of Property and Equipment	The cost and accumulated depreciation of property and as follows (in thousands):	equipment at March	31, 2015 and 2014	are
		March 31,	March 31,	
		2015	2014	
	Land	\$ 3,643	\$ 3,6	43
us-gaap:PropertyPlantAndEquipmentTextBlock	Construction in progress - equipment	130	1	17
	Buildings	34,549	34,3	41
	Equipment and software	81,855	83,8	61
	Furniture and fixtures	1,156	1,3	53
	Leasehold improvements	4,132	5,2	.11
	Property, plant and equipment, gross	125,465	128,5	26
	Less accumulated depreciation	(69,368)	(63,9	52)
	Property, plant and equipment, net	\$ 56,097	\$ 64,5	74
				_

Level 4 Disclosure Detail (using [Axis]/[Member]s):



Again, note the mathematical relations. In the Line Items (the first approach), the roll up of property, plant and equipment can be handled by XBRL calculation relations. In the second [Axis]/[Member]s approach to representing this disclosure, XBRL calculations will not work. However, XBRL Formulas can be used to test the roll up relationship which I refer to as a member aggregation because it is an aggregation of information across a set of members. Clearly, picking one representation approach as contrast to another does not change the fact that a roll up rolls up.

1.11. Missing US GAAP XBRL Taxonomy Text Blocks

One situation which causes issues for the Level 3 Disclosure Text Block and Level 4 Disclosure Details relation is the many, many Level 3 Disclosure Text Blocks that are missing from the US GAAP XBRL Taxonomy. A clear sign of a missing text block is finding many, many filer extension concepts for the same Level 3 Disclosure Text Block. Another clear sign of missing text blocks is a significant amount of variability in concepts used by filers in an effort to find some Level 3 Disclosure Text Block so that they don't have to create an extension concept.

One example of a missing Level 3 Disclosure Text Block is the disclosure of future minimum payments receivable from noncancelable operating leases⁵. An analysis of 25 public company disclosures revealed:

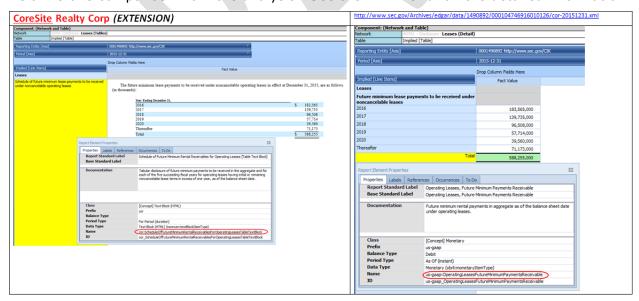
- All 25 XBRL-based financial reports of public companies analyzed used this Level 4
 Disclosure Detail concept to represent Future minimum payments receivable under
 non-cancelable operating leases: "us-gaap:OperatingLeasesFutureMinimumPaymentsReceivable"
- To represent the Level 3 Disclosure Text Block,
 - 19 use extension concept which they created
 - 6 used an existing US GAAP XBRL Taxonomy concept. All 6 which used the
 existing concept used this concept: "usgaap:ScheduleOfFutureMinimumRentalPaymentsForOperatingLeasesTableTe
 xtBlock"

Note the "RentalPayments" in the Level 3 Disclosure Text Block concept name as contrast to "PaymentsReceivable" in the Level 4 Disclosure Detail concept. The Level 4 Disclosure Detail concept relates to rental payments receivable, not payable. And so one of two things must be true:

- 1. The Level 3 Disclosure Text Block is supposed to be used for BOTH payments receivable and payments payable.
- 2. The Level 3 Disclosure Text Block for payments receivable is missing from the US GAAP XBRL Taxonomy.

What is very clear is that an extension concept should not need to be created by filers for this very common disclosure.

Below is one comparison from the analysis. See the PDF file for all the detailed information:



⁵ Analysis of future minimum payments receivable from noncancelable operating leases, http://xbrlsite.azurewebsites.net/2016/Analysis/COMPARE_FutureMinimumPaymentsReceivableOperatingLeases.pd f

1.12. Results of testing 55 different disclosures Level 3 Disclosure Text Block and Level 3 Disclosure Details relations

The examples thus far represent just that, examples of something that is applicable to the entire set of public company XBRL-based financial filings. The previous examples are simply a few examples were shown to help understand the relation between Level 3 Disclosure Text Blocks and Level 3 Disclosure Detail.

Below is a list of approximately 55 different disclosures where the relationship between the Level 3 and Level 4 information is analyzed⁶.

Note that this is only the first pass at this analysis but already the correlation is quite high. The next step is to examine why inconsistencies exist and then to modify the business rules to better tune the rules.

Summary Table: (First Pass at Disclosures)

	Canalatant	
	Consistent with	
Disclosure	expectations	Comments
Document and entity information	100%	
Balance sheet	99%	
Cash flow statement	93%	
Significant accounting policies	98%	
Basis of reporting	93%	
Nature of operations	81%	Is this a REQUIRED disclosure?
Revenue recognition policy	77%	
Inventory components	83%	One issue here is if inventory
		components are reported on the balance
		sheet; inventory components are
		present, but Level 3 Disclosure Text
		Block is generally not provided
Property, plant and equipment components	85%	One issues here is if PPE components are
(using Line Items)		reported on the balance sheet; then PPE
		components are present, but Level 3
		Disclosure Text Block is generally not
		provided
Property, plant and equipment components	85%	One issues here is if PPE components are
(using [Axis]/[Member]s)		reported on the balance sheet; then PPE
		components are present, but Level 3
		Disclosure Text Block is generally not
		provided
Goodwill roll forward	79%	
Finite-lived intangible assets	75%	
Estimated future amortization of finite-lived	81%	
intangible assets		
Infinite-lived intangible assets	85%	
Deferred tax assets and liabilities	72%	
Product warranty liability	95%	
Future minimum rental payments due for	83%	
operating leases		
Future minimum rental payments receivable	52%	It appears that the text block is missing

⁶ For the full analysis, please see, http://xbrlsite.azurewebsites.net/2016/Analysis/SummaryTable.pdf

for operating leases		for this disclosure or for payments due (able), cannot determine which
Present value of future minimum lease payments payable for capital lease obligations	86%	
Future minimum lease payments receivable from capital leases	99%	
Long-term debt instruments	74%	
Long-term debt maturities (roll up)	67%	
Long-term debt maturities (no total)	88%	This is not correct, double counting disclosures.
Reconciliation of statutory tax rate to effective rate (percent or amount)	85%	Currently covers both percent approach and amount approach, need to separate perhaps
Restructuring reserve roll forward	93%	
Earnings per share summary	59%	
Share-based compensation roll forward (one of many, need more detail)	80%	
Share-based compensation award assumptions	82%	
Long-lived assets by geographic area	87%	
Revenues from external customers by geographic area	100%	
Property, plant and equipment estimated useful lives	78%	
Finite-lived intangible assets estimated useful lives	73%	
Unrecognized tax positions roll forward	65%	
Restructuring reserve roll forward	94%	
Accumulated other comprehensive income roll forward	68%	
Environmental exit costs roll forward	99%	
Extended product warranty reserve roll forward	100%	
Benefit obligation roll forward	84%	
Net periodic benefit costs	94%	
Allocation of plan assets	93%	
Fair value assets measured on recurring basis, unobservable input reconciliation	94%	
Defined benefit plan assumptions used	92%	
Income tax expense components	80%	
Allowance for credit losses roll forward	77%	
Past due receivables	98%	
Share-based compensation (various, needs to be unbundled)	88%	