Business Requirements Analysis Document (BRAD)

For Trading Partner Performance Management

BRAD: 1.0.0
BRG: Trading Partner Performance Management Work Group

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Disclaimer

Table of Contents

1.   Executive Overview

1.1.   Business Opportunity and Business Needs

Many retailers and manufacturers engage in joint performance scorecarding initiatives in their ongoing trading relationships. To date, the means of calculating metrics values and communicating results has been proprietary. As the availability of data increases and scorecards proliferate, the diversity of measurements, systems and access approaches adds costs and hampers collaboration. GS1 standards-based performance management is needed to yield the value and productivity that trading partner scorecards can provide.

Standards are needed in two areas:

1. Comprehensive measure definitions.

    □   Companies need to have enough standard measures available to represent diverse performance measurement requirements. They must include revenue, margin, market share, inventory, logistics, data quality, product quality, order management, invoicing and payment.

    □   Definitions need to be precise enough that independent companies working with the same underlying data will derive the same metrics result.

2. Standard communications mechanisms:

    □   Both goals and measures need to be shared at whatever level of detail makes sense for the trading relationship.

    □   Both manufacturers and retailers need to be able to submit measurement data to be used in the scorecard.

    □   A standard format for messages allows each company to use its own technology (if desired) to aggregate, display and analyze results.

1.2.   Business Intention

1. Create a reference set of business measures that can be used to evaluate trading partner performance (leveraging existing standards such as the GCI Scorecard)

2. Identify a core set of measures for general use

3. Express common calculation alternatives precisely enough that independent companies working with the same underlying data will arrive at the same results

4. Express goals and results at any level of trading relationship (store, DC, company; item, category, brand; ship point, supplier)

5. Set goals and measure results at whatever time scale is business appropriate

6. Leverage global standard messages to transmit business goals and results between trading partners

7. Enable both manufacturers and retailers to contribute goals and results data

1.3.   Business Justification

■   Provide a means to harmonize business results across trading relationships, in order to uncover systemic opportunities or issues.

■ GS1 Standards based performance management will yield the value and productivity based on the collaborative exchange of results and scorecarding.

1.4. Audience

The audience would be any participant engaged in collaboratively monitoring the health of their trading relationship through scorecarding. This would include the roles of retailers/sellers, manufacturers/buyers, and other third parties.

2. Acknowledgements

2.1. Task/Project Group Participants

Function	Name	Company / Organisation
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2.2. Project Support

Function	Name	Organisation
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Peer Reviewer	Eric Kauz	GS1 Global Office

2.3. Project Advisors

Function	Name	Organisation
eCom Business Unit Manager	Anders Grangard	GS1 Global Office

3. References

Reference Name	Description
Global Commerce Initiative (GCI) Global Scorecard	The GCI Global Scorecard offers a set of industry measures that are used most often for benchmarking corporate performance against peer companies. The GCI Scorecard is heavily weighted towards supply chain measures.

Reference Name	Description
Voluntary Interindustry Commerce Solutions (VICS)	A not-for-profit association with a mission to take a global leadership role in the development of business guidelines and specifications; facilitating implementation through education and measurement, resulting in the improvement of the retail supply chain efficiency and effectiveness, which meet or exceed customer and consumer expectations. GS1 US is the secretariat to the Voluntary Interindustry Commerce Solutions Association.
Grocery Manufacturers Association (GMA), Food Marketing Institute (FMI), National Association of Chain Drug Stores (NACDS)	"A Comprehensive Guide to Retail Out-of-Stock Reduction in the Fast-Moving Consumer Goods Industry" by Thomas Gruen and Daniel Corsten.
New Ways of Working Together Initiative (NWWT)	*NWWT* is a joint project of Procter & Gamble, J.M. Smucker Co., Coca-Cola, Wegmans Food Markets, Safeway, Kroger, Oracle and a number of industry associations. One of the group's initiatives has been to use common goals and common measures to drive opportunities for growth and avoid issues that could lead to disruptions. Several of the TPPM core measures were based on the Common Goals and Common Measures identified in the NWWT initiative.

4. Scope

4.1. Overall Business Context

Context Category	Value(s)
Industry	Retail, Distribution, and Manufacturing
Geopolitical	All
Product	All
Process	Plan Process
System Capabilities	GS1 System
Official Constraints	None

4.2. In Scope

4.2.1. Immediate Phase

This specification includes sales, supply chain and operational performance measures that are core to measuring the performance of a supplier/customer relationship. These measures have been based on requirements from retail, distribution and consumer goods manufacturing industries. 17 core measures have been defined in this phase. This standard also provides a technical mechanism for sharing these measures.

1. Sales Growth (%)

2. Share (%)

3. Retail Item Gross Margin (%)

4. Retail Gross Profit Margin (%)

5. Invoice Accuracy (%)

6. Item Master Data Accuracy (%)

7. Item Data Synchronisation (%)

8. Order Item /Quantity Change (%)

9. Service Level / Fill Rate (%)

10. Order to Delivery Cycle Time (Hours)

11. On Time Delivery (%)

12. Finished Goods Inventory Cover (Days)

13. Sales Forecast Accuracy (%)

14. On Time Payment (%)

15. Out of Stock (%)

16. Unsaleables (%)

17. Markdown (%)

4.2.2. Subsequent Phases

■ A pilot will be conducted to ensure quality and implementation of the enhanced Performance History Business Message Standard (BMS).

■ Future change requests could expand the functional scope to include new categories of measures (such as consumer/shopper measures) and requirements from other industry segments (such as healthcare).

4.3. Out of Scope

■ Industry requirements outside of retail, distribution and manufacturing

■ Measures influenced solely by one trading partner

5. General Definition

5.1. Initial Challenges

The GS1 Trading Partner Performance Management standard must overcome the challenges that hamper the productivity and performance improvement opportunity of scorecarding initiatives. These challenges include the following:

■ Diverse names for similar measures

■ Ambiguity of measure definitions

■ Proprietary calculation approaches

■ Inconsistency among trading relationships

■ Manual distribution of results

■ Traditional scorecarding as the "blame game"

5.2. Assumptions

■ Not all measures will be scorecarded. Parties choose those measures most relevant to their relationship.

■ Measure confidentiality is respected between trading partners.

■ Measure information will be shared in a secure environment.

■ GCI Scorecard and the TPPM Measures will be aligned on common measures.

5.3. Dependencies

Although not specifically required, GS1 standards are instrumental in the scaling of implementations of this TPPM standard. The relevant standards include:

■ GDSN Trade Item BMS and GDSN Data Accuracy Standard

■ GS1 eCom standard based on the enhancements of Performance History BMS XML Transactional Standard

■ Global Product Classification recommendation for grouping of products into standard product classification.

6. Business Process Analysis

6.1. Business Scenario for Processing Performance History

6.1.1. Business Process Participants Descriptions

The GS1 System distinguishes between parties and roles.

■ A party is a generalisation of a legal or physical entity, for example a retailer.

■ A role is a specific function of a party in a specific process at a specific time for example, a buyer.

A party can have more than one role. For example, the Manufacturer can act as the seller of items to the consumer and buyer of raw materials.

Figure 6-1 Party Relationship
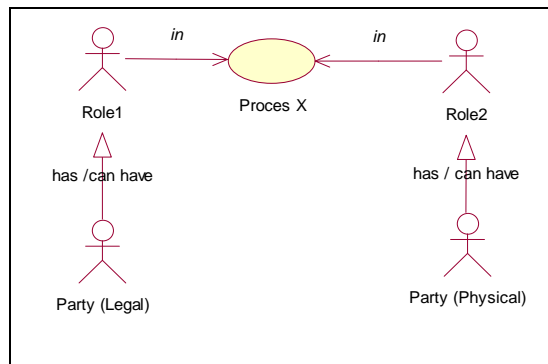
List of Parties:

Party	Description
Retailer	The party that sells the item to a consumer.
Manufacturer	The party that produces the item.

List of Roles:

Roles	Description
Buyer	An entity, to where products or services are sold from another entity.
Seller	An entity, which provides a combination of many services or items for another entity.

6.1.2. Business Scenario Overview

The Buyer and Seller share performance data related to their trading relationship.

6.1.3. Current Business Scenario ('as is')

The Buyer publishes a "vendor scorecard" via a spreadsheet or web site containing performance results that it has calculated using proprietary means, and described using proprietary nomenclature. The Buyer may evaluate vendor performance relative to specific goals that it has set, or relative to the performance of other Sellers.

6.1.4. Proposed Business Scenario ('to be')

The Buyer and Seller utilize standardized calculation methods and nomenclature to describe the performance of their trading relationship, and explicitly identify the levels of detail, time period and other parameters used. Performance may be evaluated relative to goals that the Buyer and Seller have shared, utilizing the same level of detail, time period, and parameters as the results data. Further root cause analysis is done where needed.

7. Business Rules and Requirements Analysis

7.1. Business Requirements

Note: Test criteria (pass/fail) are not included in this section. A separate pilot test specification will be prepared for the pilot testing.

#	Business Requirement	Rationale
1	Provide standard definitions for commonly used trading partner performance measures with formulas and explicit policy recommendations.	Trading partners who expect to use the standard should be able to find the core measures that they need for any particular initiative from among the standard measures. They should also be able to refer to recommendations about which data elements to include or exclude from the measurement, and what formula to use.
2	Specify measures in a way that is independent of specific levels of product, location and time period.	Depending upon the business scenario, companies need to set goals and measure results at varying levels of detail.

#	Business Requirement	Rationale
3	Specify additional parameters that affect particular measures, such as the lag (historical offset) for forecast accuracy calculations.	Parameters often vary based upon the length of the supply chain or other business factors, and have a major effect on the results.
4	Provide a way for trading partners to exchange goals and thresholds for any performance measure at any level of detail.	It is common for trading partners to establish explicit goals for performance over a planning period, and to have thresholds that differentiate between good performances ("green light"), caution ("yellow light") and immediate intervention required ("red light").
5	Indicate whether results being reported are original or restated values.	Indicates to users that previously reported results have been updated.
6	Be able to specify measure at appropriate detail which is important to trading partners.	Perform analysis for trending and side by side comparison.

7.2.   Technical Requirements

#	Technical Requirement	Rationale
1	This specification assumes that the data interchange mechanism will leverage the security, reliability, performance and other technical attributes of the GS1 eCom messaging infrastructure.	This will ensure the trading partners will have the ability to exchange their information.

7.3.   Business Rules

Figure 7-1 TPPM Measures
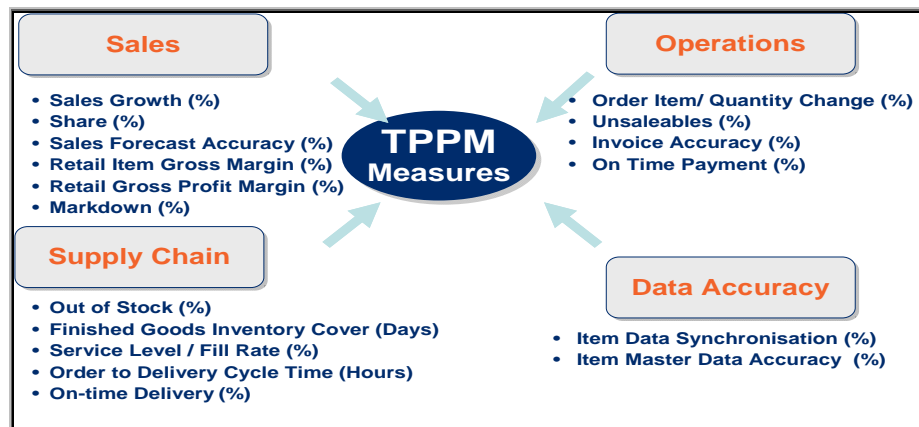
Seventeen Measures have been defined for Trading Partner Performance Management. Definitions, formulas for calculating results, parameters and constraints are provided for each measure below.

7.3.1.   Sales Growth (%)

7.3.1.1. Aliases

■   Annual Growth Rate

■   Monetary Sales Growth

■ Unit Sales Growth

7.3.1.2. Definition

The percentage increase in monetary or unit sales compared to an equivalent time period one year prior to the period being measured

7.3.1.3. Rationale

The purpose is to record the growth rate and allow correlations to be made between growth and other metrics.

7.3.1.4. Formula

$$SalesGrowth\% = \left(\frac{Sales_Y - Sales_{y-1}}{Sales_{y-1}} \right) * 100$$

■ y = period in year being measured

■ y – 1 = equivalent prior-year period

Note: Comparison Period: A given year's, quarter's, month's or week's sales can be compared to the equivalent prior year period. The options of quarter-over-quarter and month-over-month growth were excluded. Note due to calendar variations, the prior year period may have a different number of days or weeks.

7.3.1.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which sales growth is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which sales growth is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which sales growth is being measured.
Period Type	Period Type Code	Indicator of the period of time for which sales growth is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Sales Basis	Quantity Type Code	Specifies whether sales growth is being measured in unit or monetary terms.

7.3.1.6. Conditions

Sales is the total business in the scope of the geography being measured, not a "same store sales" growth measure.

7.3.1.7. Examples

Example 1

- Sales in most recent 12 months = 12.0 Million
- Sales in previous 12 months = 11.2 Million
- Sales Growth = ((12.0- 11.2)/11.2)*100 =7.14%

Example 2

- Sales in most recent 12 months = 100
- Sales in previous 12 months = 95
- Sales Growth = ((100-95)/95)*100 =5.26%

7.3.1.8. Reference Source

- Annual Growth Rate GCI BM01

7.3.1.9. Typical Data Source

- Retailer

7.3.2. Share (%)

7.3.2.1. Aliases

- Category share
- Market share
- Share of market
- Share of wallet (depending on the context)

7.3.2.2. Definition

The percentage of sales of a subset of items and / or locations in a broader market context, which can be defined in terms of a product category, class of trade or geography.

7.3.2.3. Rationale

Share calculations help trading partners understand the strength of their business activity relative to sales overall.

7.3.2.4. Formula

$$Share\% = \frac{SalesActivity(itemScope, locationScope)}{SalesActivity(itemContext, locationContext)} * 1oo$$

Sales may be measured in monetary or volume (unit) terms. Typical cases (with their common names) include:

1. "Supplier's market share": A manufacturer's brand sales as a percentage of a global product category (across all classes of trade) in a specified geographic area.

2. "Retailer's category share of market": A retailer's sales of a category of products (across all brands) relative to the total sales of that category of products in the region the retailer serves

3. "Supplier's share of retailer category": A manufacturer's brand sales as a percentage of a given retailer's or distributor's category sales.

Calculations of share often depend upon third-party data to ascertain the total sales volume across multiple trading partners. However, in a trading partner performance management context, most share calculations are usually relative to the customer's sales activity (whether a retailer or distributor), and they can be calculated directly based upon the customer's data.

7.3.2.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, brand or other product classification data element (e.g. "Coca-Cola") for which share is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND").
Item Context Value	Text	Identifier of the category or other product classification data element (e.g. "Carbonated Soft Drinks") that provides the context for the share being measured.
Item Context Type	Item Scope Type Code	Indicator of the type of product classification element the item context value represents (e.g. "CATEGORY", "DEPARTMENT").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Store #1023") for which share is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Location Context Value	Text	Identifier of the city, region, country or other location classification data element (e.g. "Minneapolis") that provides the context for the share being measured.
Location Context Type	Location Scope Type Code	Indicator of the type of location classification element the location context value represents (e.g. "CITY", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which share is being measured.
Period Type	Period Type Code	Indicator of the period of time for which share is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Sales Basis	Sales Basis Type Code	Specifies whether share is being measured in unit or monetary terms.

7.3.2.6. Examples

Example 1

- Retailer A sales in Category X are €100,000 in Week 43

- Manufacturer B sales at Retailer A in Category X are €20,000 in the same week

- So Manufacturer B has a 20% share of Category X sales at Retailer A for Week 43

- Share Calculation: (20000/100000) *100 =20%

Example 2

- Distributor A sells 50,000 units of Manufacturer B products in New York State in September

- Market data estimates total sales of Manufacturer B products in New York State in September was 200,000 units

- So Distributor A has a 25% share of Manufacturer B product sales in New York State

- Share Calculation: (50000/200000) *100 =25%

7.3.2.7. Reference Source

- Marketing Channel Management: People, Products, Programs, and Markets, Russell W. McCalley. Greenwood Publishing Group, 1996.

7.3.2.8. Typical Data Source

- The customer is the typical source for sales data within their chain; either the customer or the supplier could gather broader market sales data (typically via third-party providers).

7.3.3. Retail Item Gross Margin (%)

7.3.3.1. Aliases

- Margin

- Gross Margin

- Retail Margin

7.3.3.2. Definition

The average percentage amount a Retailer will earn for an item sold to a consumer before deducting operating expenses.

7.3.3.3. Rationale

Both Customer and Supplier need to understand the amount earned and/or the value of items sold to the consumer based on the retail price paid for these items in the market. Margins can vary based on market demographics and pricing strategy used by a Retailer.

7.3.3.4. Formula

$$RetailItemGrossMargin\% = \left(\frac{AverageItemRetailPrice - AverageItemCost}{AverageItemRetailPrice} \right) *100$$

- Average Item Retail Price = Average Retail Price paid by the consumer in the retail market for a given item

- Average Item Cost = Average Item Net Invoice Cost

7.3.3.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which retail item gross margin percentage is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which retail item gross margin percentage is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which retail item gross margin percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which retail item gross margin percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.3.6. Conditions

- Average Item Cost does not include Retailer operating expenses.
- Item Cost only includes allowances or other adjustments directly allocated to the item as listed on the invoice item line and does not include total invoice allowances, adjustments or other rebates provided after an invoice has been finalized.

Item Cost Calculation Included

- Line Item Cost
- Item Net Invoice Cost

Item Cost Calculation Excluded

- Total Invoice Allowances
- After Invoice Rebates
- Retailer Operating Expenses
- Other Total Invoice Adjustments

7.3.3.7. Examples

- Supplier Cost of Item A to Retailer = 10.50
- Retails Price of Item A in Store = 17.00
- Retail Item Gross Margin %: [(17.00 – 10.50)/17.00] * 100 = 38.24%

7.3.3.8. Reference Source

- About.com – Retailing
- http://retail.about.com/od/glossary/g/gross_margin.htm

7.3.3.9. Typical Data Source

■ Retailer

7.3.4. Retail Gross Profit Margin (%)

7.3.4.1. Aliases

■ Gross Profit Margin %

■ Retail Profit Margin %

■ Profit Margin %

7.3.4.2. Definition

The average percentage amount a Retailer will profit per item or group of items sold to a consumer after deducting operating expenses.

7.3.4.3. Rationale

A Retailer will manage an item or group of items according to the overall profit and profit margin of that item or group of items sold to the consumer based on the retail price paid for these items in the market. Profit Margins can vary based on market demographics and pricing strategy used by a Retailer and the operating costs associated with selling that item.

7.3.4.4. Formula

$$RetailGrossProfitMargin\% = \left(\frac{AverageItemRetailPrice - AverageNetItemCost}{AverageItemRetailPrice} \right) *100$$

■ Average Item Retail Price = Average Retail Price paid by the consumer in the retail market for a given item

■ Average Net Item Cost = Average Item NET Cost after operating expenses

7.3.4.5. Parameter

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which retail item gross margin percentage is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which retail item gross margin percentage is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").

Parameter Name	Parameter Type	Description
Period End	Date Time Stamp	Date and time of the end of the period for which retail item gross margin percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which retail item gross margin percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.4.6. Condition

Average Net Item Cost is inclusive of all Retailer operating expenses

Item NET Cost Calculation Included:

- Line Item Cost

- Item Net Invoice Cost

- Invoice level Allowances allocated to an item or across a group of items

- After Invoice Rebates

- Retailer Operating Expenses

- Shopper Loyalty Discounts

- Item Coupons

7.3.4.7. Examples

- Retails Price of Item A in Store = 17.00

- Supplier Cost of Item A to Retailer = 10.50

- Item Rebate based on sales performance = 0.20 per 100 items sold* (Rebate)

- Retailer Loyalty Promotion discount per item sold = 0.25 (Operating Expense)

- Item Operating / Supply Chain Expenses = 0.08 per item (Operating Expense)

- *Retailer sold 120 items and has earned the Rebate offered

Calculation 1 Full Formula

- Retail Gross Profit Margin %: [[(Retail Price – Cost – Rebates) + (Operating Expenses)]/Retail Price]

- Retail Gross Profit Margin %   [[17.00 – [(10.50 – 0.20) + (0.25 + 0.08)] / 17.00] * 100 = 37.47%

Calculation 2 Component Formula

- Profit = Retail Price – Total Cost + Total Operating Expense

- Retail Gross Profit Margin % = Total Profit / Retail Price

- Item Cost after Rebates 10.50 – 0.20 = 10.30

- Operating Expenses 0.25 + 0.08 = 0.33 per item

- Total Profit   17.00 – 10.30 + 0.33 = 6.37

- Retail Gross Profit Margin % = 6.37 / 17.00 = 37.47%

7.3.4.8. Reference Source

- About.com – Profit Margin
- http://retail.about.com/od/glossary/g/profit_margin.htm

7.3.4.9. Typical Data Source

- Retailer

7.3.4.10. Retail Item Gross Margin and Retail Gross Profit Margin Comparison Example

Item	Amount	Margin % Calculations
Retail Price	17.00	
Base Price	13.00	
- Discount	-1.00	
- Promo Discount	-1.00	
- Allowance	- 0.50	**Retail Item Gross Margin %**
Invoice Cost	10.50	[(17.00 – 10.50) / 17.00] * 100 = 38.24%
- Rebate	- 0.20	
Total Cost	10.30	
+ Shopper Discount Operating Expense	+ 0.25	
+ Retailer Operating Expense per item	+ 0.08	**Retail Gross Profit Margin %**
Net Cost	10.63	[(17.00 – 10.63) / 17.00] * 100 = 37.47%
Net Profit	6.37	(17.00 – 10.63)

7.3.5. Invoice Accuracy (%)

7.3.5.1. Aliases

- None

7.3.5.2. Definition

The percentage of seller invoices deemed accurate out of all invoices received.

7.3.5.3. Rationale

Invoice Accuracy provides the trading partner an ability to measure the efficiency of the invoices. It monitors the accuracy of the billing / payment process to properly invoice customers the first time.

7.3.5.4. Formula

$$InvoiceAccuracy\% = \left(\frac{InvoicesDeemedAccurate}{TotalInvoices} \right) * 100$$

7.3.5.5. Parameters

Parameter Name	Parameter Type	Description
Buyer Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. channel or country) that received the invoices whose accuracy is being measured.
Seller Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. supplier group or country) that submitted the invoices whose accuracy is being measured.
Period End	Date Time Stamp	Date and time of the end of the period for which invoice accuracy percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which invoice accuracy percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.5.6. Conditions

The seller's invoice must completely match the products received in terms of price, allowances, charges, quantity and unit of measure, terms of sale (payment / legal documents) and GTINs or mutually agreed and documented tolerances.

The buyer (purchasing company) determines if the invoice is accurate.

An invoice is defined as accurate when the supplier's invoice completely matches the products received in the following:

- Price
- Allowances
- Charges
- Quantity and unit of measure
- Terms of sale (Payment / Legal Documents)
- GTIN
- Or mutually agreed and documented tolerances

Note: This is not a measure of electronic well formed / compliant invoicing. Tolerances are not part of this measure as tolerances are variable and determined by each trading partner.

7.3.5.7. Examples

- Company A determines 99 invoices are deemed accurate
- 100 Total invoices
- Invoice accuracy is 99% =(99/100)*100

7.3.5.8. Reference Source

- Invoice Accuracy GCI BM13

7.3.5.9. Typical Data Source

- Retailer

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7.3.6. Item Master Data Accuracy (%)

7.3.6.1. Aliases

■ None

7.3.6.2. Definition

The percentage of items with accurate physically measured dimensions and weight attributes (as provided by the seller) out of all items that were physically verified.

7.3.6.3. Rationale

Data Accuracy is critical to business applications for the foundational product information shared between trading partners. This product information is used to drive the business processes of both partners in the relationship from new item introduction, administrative set up and logistics information throughout the supply chain.

7.3.6.4. Formula

There is currently one way to calculate Item Master Data Accuracy. For the purposes of TPPM, the formula is the number of items where all attributes pass the industry tolerance divided by the total number of items physically verified.

$$ItemMaster\ DataAccura\ cy = \left(\frac{NumberofIt\ emsPassing\ PhysicalVe\ rification}{TotalNumbe\ rofItemsPh\ ysicallyVe\ rified} \right) * 100$$

7.3.6.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the category, brand or other product classification data element (e.g. "Cold Care") for which Item Master Data Accuracy is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "BRAND", "CATEGORY", "DEPARTMENT").
Buyer Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. channel or country) that received the items whose accuracy is being measured.
Seller Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. supplier group or country) that supplied the items whose accuracy is being measured.
Period End	Date Time Stamp	Date and time of the end of the period for which Item Master Data Accuracy percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which Item Master Data Accuracy percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.6.6. Condition

Standards and best practices should be adhered to ensure consistency of how validations and tolerances for different packaging types are applied to products being evaluated. Please note that new tolerances for different packaging types continue to be developed; as these tolerances are standardized they will need to be applied to keep the metric consistent between the trading partners. A link is provided to these documents ensuring that the most current will be available.

- http://www.gs1.org/docs/gsmp/gdsn/GDSN_Package_Measurement_Rules.pdf

- http://www.gs1.org/docs/gsmp/gdsn/GDSN_Standard_Package_Measurement_Tolerances_Best_Practice_i1.pdf

- http://www.gs1.org/docs/gsmp/gdsn/GDSN/Data Quality of Framework.pdf

The **GTIN Allocation Rules** which is located on the GS1 website at: www.gs1.org/gtinrules/

The **GS1 General Specifications** is the core standards document of the GS1 System describing how GS1 BarCodes and identification keys should be used. It is available through your local GS1 Member Organisation (MO).

7.3.6.7. Examples

	Items Passing Physical Verification	Total Number of Items Physically Verified
Count	172	179
Percent	96.09%	

Figure 7-2 Before and After Item Master Data Accuracy Implementation
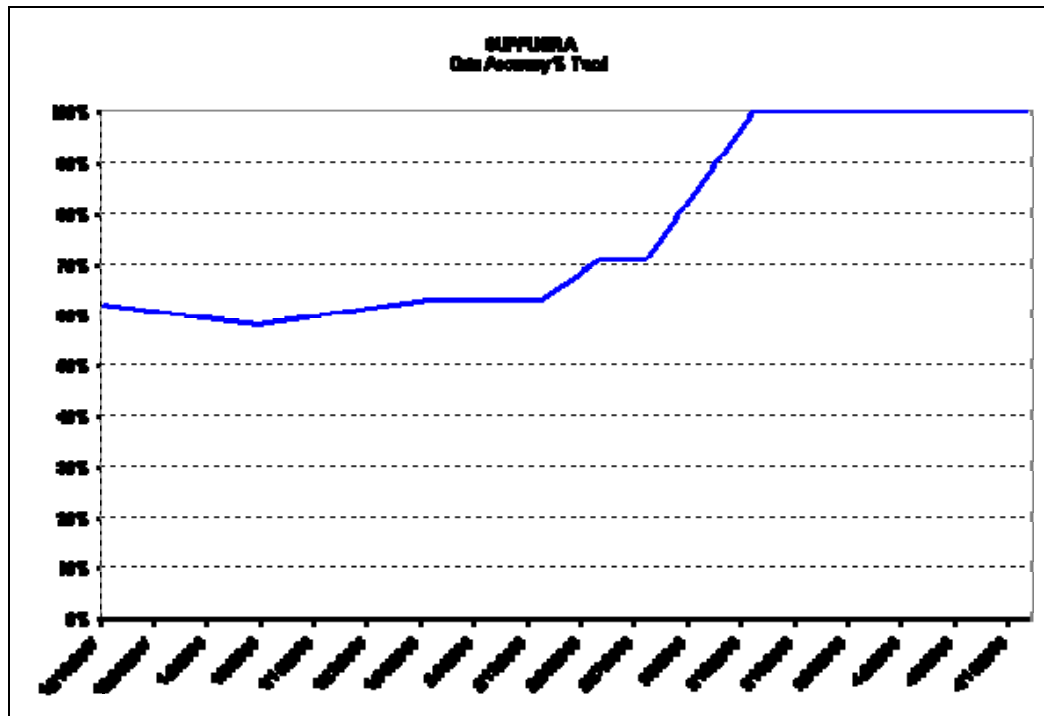
*Table of Attributes to be compared

	Height	Width	Depth	Weight	Total Retail Units
Case	X	X	X	X	X
Inner Pack	X	X	X		
Each	X	X	X		

Note These validations can extend to additional levels of an item such as a shipper, mixed modular pallet and pallet.

7.3.6.8. Reference Source

- Item Data Synchronisation GCI IM10 & 11

7.3.6.9. Typical Data Source

- Retailer

7.3.7. Item Data Synchronisation (%)

7.3.7.1. Aliases

- None

7.3.7.2. Definition

The percentage of items (including applicable trade item hierarchy) published and sold from the seller that are synchronised by the buyer via the Global Data Synchronisation Network (GDSN).

7.3.7.3. Rationale

Item Synchronisation is the foundation for trading partner relationships, providing the product information for items that are traded between partners. This product formation is used to drive the business processes of both partners in the relationship from new item introduction, administrative set up and logistics information throughout the supply chain.

7.3.7.4. Formula

$$ItemDataSynchronisation = \left(\frac{NumberofItemsSynchronised}{TotalNumberofCata\log ItemstheTradingPartnerisExpecting} \right) * 100$$

7.3.7.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the category, brand or other product classification data element (e.g. "Cold Care") for which item data synchronization percentage is being measured.

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Parameter Name	Parameter Type	Description
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "BRAND", "CATEGORY", "DEPARTMENT").
Buyer Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. channel or country) that received item data via the GDSN.
Seller Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. supplier group or country) that supplied item data via the GDSN.
Period End	Date Time Stamp	Date and time of the end of the period for which item data synchronization percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which Item Master Data Accuracy percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Synchronization Percentage Calculation Type	Synchronization Percentage Calculation Type Code	Specifies whether the calculation was based on the total number of items, or the incremental number of items synchronized.

7.3.7.6. Examples

Supplier Name	Total Number of Catalogue the Trading Partner is Expecting	Number of Item Synchronised	Item Data Synchronisation
Supplier A	2	1	50%
Supplier B	600	550	91.7%
Supplier C	20	19	95%

7.3.7.7. Condition

It is assumed that the supplier and receiver of information is adhering to the GS1 System Standards for GDS as documented in the GDSN Standards documents which can be found on the link below or through the guidance of your certified Data Pool.

http://www.gs1.org/services/gsmp/kc/gdsn/index.html

The **GTIN Allocation Rules** which is located on the GS1 website at: www.gs1.org/gtinrules/

The **GS1 General Specifications** is the core standards document of the GS1 System describing how GS1 BarCodes and identification keys should be used. It is available through your local GS1 Member Organisation (MO).

7.3.7.8. Reference Source

- Item Data Synchronisation % GCI IM10 & 11

7.3.7.9. Typical Data Source

- Retailer

7.3.8. Order Item / Quantity Change (%)

7.3.8.1. Aliases

- Touched Orders
- Perfect Order

7.3.8.2. Definition

The percentage of orders placed by the customer in the trading relationship that required changes in items or item quantities prior to release.

7.3.8.3. Rationale

Order Item / Quantity changes are a common source of disruptions in supply chain performance. In some trading relationships, 40% or more of the orders are revised one or more times before shipment. Reasons for order changes that are within the scope of this measure include:

- Invalid item ordered (item number incorrect, discontinued item, item not yet introduced or synchronized via the Global Data Synchronization Network (GDSN). Additional items added, removed or quantities changed.
- Delivery date changes are not included in the scope of this measure. The TPPM proposes that a future measure address this issue.

7.3.8.4. Formula

$$ItemChange \mid QuantityCh \; ange \Rightarrow RevisedOrd \; er$$

$$OrderItem / QuantityChange\% = \left(\frac{\sum RevisedOrders}{\sum Orders} \right) * 100$$

Only orders that have been shipped within the time period specified for the measure are considered to be within the scope of the calculation.

7.3.8.5. Parameters

Parameter Name	Parameter Type	Description
Buyer Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. channel or country) that placed the orders for which a change percentage is being measured.
Seller Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. supplier group or country) that processed the orders whose change percentage is being measured.
Period End	Date Time Stamp	Date and time of the end of the period for which order change percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which order change percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

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7.3.8.6. Examples

A distributor places three orders with a manufacturer in October, each for 1000 litres of cola syrup. Subsequently, the distributor reduces the quantity of the second order to 500 litres. As a result, the order item / quantity change percentage for October is 1/3 * 100 = 33%.

Order Number	Ordered Units	Order Change	Absolute Deviation	Result
1	1000	0	0	
2	1000	500	500	
3	1000	0	0	
				1/3 = 33% Order Item / Quantity Change

7.3.8.7. Reference Source

■ New Ways of Working Together Initiative

7.3.8.8. Typical Data Source

■ The supplier typically provides the results of this measure. It is usually evaluated at a trading relationship level, though it may be broken down to the level of a supplier's ship point or a customer's purchasing organization for root cause analysis.

7.3.9. Service Level / Fill Rate (%)

7.3.9.1. Aliases

■ Supplier Service Level

■ Order to Delivery Service Level

■ Order Fill Rate

■ Case Fill Rate

■ Item Fill Rate

■ First time fill rate (%)

7.3.9.2. Definition

The percentage of product that a buyer received or the seller shipped compared to the original ordered quantity

7.3.9.3. Rationale

Be more externally focused using a measure that includes Buyer expectation vs. purely manufactured delivered capability. Improve Buyer's Fill Rate level by comparing Received Units at the Buyer vs. Ordered Units by the Buyer. Buyer level reporting should match an individual buyer's ordering unit.

Use this measure as a complement of Out of Stock and On Time measures (recognizing that Service Level/Fill Rate partly overlaps with On Time measures of availability driven delays). As part of the Trading Partner Performance scorecard, analysis of root cause data should drive the implementation of action plans, with the goal to systemically fix supply chain issues.

Principle

Measure is kept simple (as definition) reliable and actionable and is simple to report, largely relying on readily available information.

The "ordered units" should be taken from the "Original Buyer Order". There are some events where the original orders are changed legitimately (e.g. wrong product ordered, order sent to wrong manufacturer) which could be given a reason code that updates the original order without impacting the fill rate %.

✅ **Note:** If order changes come in between the Original Order and product receipt, this will be reflected in the Order Item / Quantity Change % measure.

Double counting of repeat orders will not be adjusted as it reflects true service level the customer is experiencing when repeated orders are constantly unfulfilled.

In the event a SKU is put on allocation, during periods of tight availability, demand quantities as determined by the demand planning organizations (minimum volume based on last unconstrained forecast) should be included in the measure to accurately reflect the service level to our customers. (Some of this demand may be automatically captured through customer orders while the remainder is manually loaded. This process is referred to as Suppressed Demand.)

Cuts/delays on Continuous Replenishment Program (CRP) or Vendor Managed Inventory (VMI) generated orders should be reported in Service Level / Fill Rate, even including orders on products which are used to fill up the truck.

7.3.9.4. Formula

For Order to Receipt:
$$Fill\,Rate(\%) = \frac{Received\,Units}{Ordered\,Units} \times 100$$

For Order to Ship:
$$Fill\,Rate(\%) = \frac{Shipped\,Units}{Ordered\,Units} \times 100$$

Ordered Units: Units ordered by the buyer in the original order.

$$Ordered\,Units = System\,Captured\,Units^{(1)} + Dropped\,Units^{(2)}$$

Received Units: Units received by the buyer. These are the invoiced units minus refused units.

$$Shipped / Received\,Units = Invoiced\,Units^{(3)} - R.efused\,Units^{(5)}$$

(1) System Captured Units: Units input in the Order/Shipping/Billing (OSB) System using any order acquisition tool. Some order acquisition tools may drop some units due to product data base misalignment; this amount will be reflected as "Dropped Units".

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(2) Dropped Units: Units dropped by misalignment of Product Data Base between Buyer and Seller. Some of these misalignments are: Initiatives data, depletion time alignments and prices differences. E.g. orders on closed codes which are not processed in OSB.

(3) Invoiced Units: Units billed and shipped to Buyer.

$$Invoiced\,Units^{(3)} = System\,Captured\,Units^{(1)} - Canceled\,Units^{(4)}$$

(4) Cancelled Units: Units cut (or cancelled) or delayed due to availability issues during Delivery Schedule system (DSS/ATL) process, Loading process, Buyer caused or Allotments.

(5) Refused (rejected) Units: Units rejected by buyer due to Seller or Buyer reasons. Main mistakes are codes changes, quality issues or not ordered product.

7.3.9.5. Parameter

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, brand or other product classification data element (e.g. "DVD Players") for which service level is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Receiving Location Scope Description	Text	Identifier of the store, region, country or other receiving location classification data element (e.g. "Value Mart") for which service level is being measured.
Receiving Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the receiving Location Scope Description represents (e.g. "STORE", "CHAIN", "REGION", "COUNTRY").
Shipping Location Context Value	Text	Identifier of the ship point, supplier, country or other shipping location classification data element (e.g. "North Distribution Region") for which service level is being measured.
Shipping Location Context Type	Location Scope Type Code	Indicator of the type of location classification element the shipping location context value represents (e.g. "PLANT", "SUPPLIER", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which service level is being measured.
Period Type	Period Type Code	Indicator of the period of time for which service level is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Service Level Measurement Type	Service Level Measurement Type Code	Specifies whether the service level is based upon quantity shipped or quantity received. (Quantity received is the default.)
Calculation Basis	Service Level Basis Code	Indicator of the basis for which the Service Level is to be calculated. This parameter allows the service level/fill rate measure to be calculated on 3 options: "ORDER", "LINE", or "VOLUME" basis.

7.3.9.6. Conditions

Table 7-1 Counted against Service Level/ Fill Rate Goals

Description	When to Use
Beyond Selling Period	Product cut on items seasonal in nature with a buy period, or in-out products
CPU Space/Weight	Cut is driven by CPU truck size
Discontinued / Too Early Product	Quantity change due to a discontinued item, or new item prior to start ship
Major Service Issue	Product cut due to a major long-term supply chain issue communicated to buyers
Material Change	Materials / Orders being rejected
National Sales Allocation	Product cut due to a national allocation
Order Increment Adjustment	Quantity change because it doesn't fit in case/layer/pallet increments.
Order Size Change	If supplier changes the quantity to the size of the order
Over ship – regular order	Over ship on 1 line item does not count toward fill rate/service level %
Space/Weight Delivered	Cut due to space or weight of a delivered truck
Stock Out/Unavailable	Cuts product as product is not available
VMI Change	Change in VMI order after order has been placed.
VMI Original Order Qty	Units ordered by our Customer in the original order may not fulfill demand.
VMI return/refusal	Over ship on 1 line item and it for any reason it's returned or refused.

Table 7-2 Not Counted against Service Level/ Fill Rate Goals

Description	When To Use
Material Change	Materials / Orders being added not previously on an order
Over ship - VMI/CRP only	Over ship on 1 line item does not count toward fill rate/service level (unless it creates a cut in a different SKU.)
Quantity Change	Quantity change (increase or decrease) to item already on the order via buyer request

7.3.9.7. Examples

Example 1 Simple Scenario

■ RET Company orders 10 products that total 1000 cases, on its Purchase Order #PO1.

■ MAN Company ships out 800 cases on 3/3/2007 and the remaining 200 cases on 3/10/2007.

■ MAN Company sends an invoice for 800 cases, on its invoice #INV1 and the remaining 200 cases on its Invoice#INV2.

■ RET Company accepts 800 cases on 3/4/2007.

■ The Fill Rate for this PO1 is 80%.

Calculation:

■ **Fill Rate %** = Received Cases/ Ordered Cases. (800/1000 = 80%)

■ **Ordered Cases** = System Captured Cases + Dropped Cases (1000 + 0 =1000)

■ **Received Cases** = Invoiced Cases (System Captured Cases – Cancelled Cases) –Refused Cases ((800 -0) -0)

Example 2 Complex Scenario

■ RET Company orders 10 products that total 1000 KG on its Purchase Order #PO1.

■ MAN Company ships out 800 KG on 3/3/2007, and the remaining 200 KG on 3/10/2007.

■ MAN Company sends an invoice for 800 KG, on its invoice #INV1 and the remaining 200 KG on its Invoice#INV2.

■ RET Company accepts 500 KG and refused 300 KG on 3/4/2007.

■ The Fill Rate for this PO1 is 50%.

Calculation:

■ **Fill Rate %** = Received KG/ Ordered KG. (500/1000 = 50%)

■ **Ordered Pounds** = System Captured KG + Dropped KG (1000 + 0 =1000)

■ **Received Pounds** = Invoiced KG (System Captured KG – Cancelled KG) –Refused KG ((800 -0) -300)

7.3.9.8. Reference Source

■ GCI KPI02/03 (unit basis vs. cost basis)

7.3.9.9. Typical Data Source

■ Retailer for Received Fill Rate

■ Supplier for Shipped Fill Rate

7.3.10. Order to Delivery Cycle Time (Hours)

7.3.10.1. Aliases

■ Order / Delivery Lead Time

■ Lead Time

■ Cycle Time

■ Order Delivery Cycle Time

■ Delivery Lead Time

7.3.10.2. Definition

The average length of time between order placement (fax, phone, EDI) and the time product arrived and was available for unloading at the agreed customer location.

7.3.10.3. Rationale

This measure provides an ability to calculate how quickly an order is processed to delivery. The measure plays an important role in evaluating the effectiveness of the organizations order to delivery process.

7.3.10.4. Formula

$$OrderToDeliveryCycleTime = \frac{\sum_i \left(ReceivedDateTime_i - OrderDateTime_i \right)}{i}$$

Where *ReceivedDateTime* = Date Time on which product is 'checked in and available for unloading' by the customer (including transit, warehousing, appointment delays)

Elapsed time is measured in calendar hours, not business hours.

Order Received Date Time = Date Time 0

Order Actual Receipt Date Time = Date Time on which product is 'checked in and available for unloading' by the customer (including transit, warehousing, appointment delays)

Individual Orders

OrderActualReceiptDateTime – OrderReceivedDateTime = OrderToDeliveryCycleTime

Orders over a Period

=*Average of Order to Delivery Cycle Time (for all orders* delivered *within period)*

Note: Order to Delivery Cycle Time does not include the time during which product is being slotted in a customer's warehouse until such time as available to ship to retail outlets

7.3.10.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, brand or other product classification data element (e.g. "DVD Players") for which order cycle time is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Receiving Location Scope Description	Text	Identifier of the store, region, country or other receiving location classification data element (e.g. "Value Mart") for which order cycle time is being measured.
Receiving Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the receiving Location Scope Description represents (e.g. "STORE", "CHAIN", "REGION", "COUNTRY").
Shipping Location Context Value	Text	Identifier of the ship point, supplier, country or other shipping location classification data element (e.g. "North Distribution Region") for which order cycle time is being measured.
Shipping Location Context Type	Location Scope Type Code	Indicator of the type of location classification element the shipping location context value represents (e.g. "PLANT", "SUPPLIER", "REGION", "COUNTRY").
Vendor Source Location Context Value	Text	Identifier of the vendor source location classification data element (e.g. "North Distribution Region") for which order cycle time is being measured.
Vendor Source Location Context Type	Location Scope Type Code	Indicator of the type of vendor source location classification element the shipping location context value represents (e.g. "PLANT", "SUPPLIER", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which order cycle time is being measured.

Parameter Name	Parameter Type	Description
Period Type	Period Type Code	Indicator of the period of time for which order cycle time is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Periodicity	Periodicity Type Code	Specifies the time unit of measure of the reported result (e.g. "HOURS", "DAYS"). The default value is "HOURS".

7.3.10.6. Conditions

Order to Delivery Cycle Time is highly dependent on manufacturer lead-time requirements and buyer requested delivery date. It should however, be simple to report basis 2 common activities, order placement and order actual arrival at the customer's gate/dock location (i.e. checked in at gate and available for unloading).

The date time stamp of order placement should be a common metric of date time -0- and not factored into the cycle time calculation due to the variability of order placement methodologies.

Order to Delivery Cycle Time is calculated using actual elapsed time in calendar hours, not business hours.

Many activities can occur simultaneously within the cycle (ex. transportation tendering and warehouse picking)

Backorder of cut cases should be factored with a new Order to Delivery Cycle Time, even though an open component of the original purchase order.

Advanced orders can increase the cycle time substantially.

7.3.10.7. Examples

Note The unit of measure to calculate Order to Delivery Cycle Time is hours, and the alternative can be days as it can be calculated. This is consistent with GCI use of hours to calculate

Example 1: Manufacture to forecast assuming 7 calendar day operations

- Order is placed via EDI by customer (Hour #0)
- Order is processed/reviewed by manufacturer and/or sent to plant/distribution facility for fulfilment (Hour #24)
- Order is picked and transportation arranged in correspondence with the buyer 'requested delivery/pickup date' (Hour #48 - Hour #72)
- Shipment departs fulfilment location en route to customer location (Hour #96) – 24 hour transit
- Product arrives at customer location and is available for unloading (Hour #120)
- Order to Delivery Cycle Time = 120 hours
- Order to Delivery Cycle Time = (120-0)/1

Example 2: Manufacture to order, assuming 3 day production cycle

- Order is placed via EDI by customer (Hour #0)
- Order is processed/reviewed by manufacturer and/or sent to plant/distribution facility for fulfilment (Hour #24)
- Production of product occurs (Hour #96)
- Order is staged and transportation arranged in correspondence with the buyer 'requested delivery/pickup date' (Hour # 120)

- Shipment departs fulfilment location en route to customer location (Hour # 144) – 24 hour transit

- Product arrives at customer location and is available for unloading (Hour #168)

- Order to Delivery Cycle Time = 168 hours

- Order to Delivery Cycle Time = (168-0)/1

7.3.10.8.Reference Source

- GCI Lead Time – Order / Delivery Cycle Time

7.3.10.9.Typical Data Source

- Retailer

Note From a Direct Store Delivery perspective-- there are too many uncontrollable factors at a store level to apply this measure

7.3.11. On Time Delivery (%)

7.3.11.1.Aliases

- None

7.3.11.2. Definition

The percentage of shipments that arrived on the receiver's premises within the agreed date time out of all shipments that were delivered. The first scheduled appointment date time is the recommended agreed date time, and the complete agreed date time list is available in the parameter table.

7.3.11.3. Rationale

On Time Delivery is a measure that is used to evaluate the timeliness of deliveries to the receiver. It is commonly used between trading partners to determine the effectiveness of the transportation carrier that is being used, as well as the overall responsiveness of the supplier. Late deliveries create supply chain inefficiencies as they disrupt the receiving process and lead to extra trailer moves and appointment scheduling adjustments. In more "lean" or "just-in-time" environments, a poor On Time Delivery rating could have serious store service level ramifications, as it is an indicator that the product was not available for shipment to the stores.

7.3.11.4. Formula

$$OnTimeDelivery\% = \left(\frac{TotalDeliveries - NonCompliantDeliveries}{TotalDeliveries} \right) * 100$$

- **Total Deliveries:** refers the number of deliveries made from the supplier to the receiver in a given time period

- **Noncompliant Deliveries:** refers to the number of deliveries that did not arrive on the receiver's premises within the agreed date time in the same time period.

7.3.11.5. Parameters

Parameter Name	Parameter Type	Description
Receiving Location Scope Description	Text	Identifier of the store, region, country or other receiving location classification data element (e.g. "Value Mart") for which on-time delivery is being measured.
Receiving Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the receiving Location Scope Description represents (e.g. "STORE", "CHAIN", "REGION", "COUNTRY").
Shipping Location Context Value	Text	Identifier of the ship point, supplier, country or other shipping location classification data element (e.g. "North Distribution Region") for which on-time delivery is being measured.
Shipping Location Context Type	Location Scope Type Code	Indicator of the type of location classification element the shipping location context value represents (e.g. "PLANT", "SUPPLIER", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which on-time delivery is being measured.
Period Type	Period Type Code	Indicator of the period of time for which on-time delivery is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Periodicity	Periodicity Type Code	Specifies the time unit of measure of the reported result (e.g. "HOURS", "DAYS"). The default value is "HOURS".
Delivery Time Reference Basis	Delivery Time Reference Type Code	Specifies the source of the date to be used to determine whether a delivery was on-time (the original P.O. need-by date, the first scheduled appointment date time or the recipient last scheduled appointment date time). The first scheduled appointment date time is the recommended value.
Appointment Time Measurement Basis	Appointment Time Measurement Type Code	Specifies whether the calculation considers the appointment date time to be the latest time that the delivery can arrive (the default option), or the center of a delivery window that allows delivers before or after the appointment time by an amount indicated by the Appointment Window parameter.
Delivery Window	Integer	The number of minutes before or after the appointment time that a delivery can arrive and still be considered on time, if the Appointment Time Measurement Basis is set to "Delivery Window."

7.3.11.6. Conditions

1. On Time Delivery should be based on the receiver's record of check-in.

2. There are several commonly used definitions for this measure. For example:

   □ Some trading partners consider a delivery "on time" if it arrived within a defined time window (e.g. within 2 hours of a scheduled appointment date time). However, the most common definition considers a delivery "on time" only if it arrived <u>on</u> or <u>before</u> the scheduled appointment date time. While this measure supports both "delivery window" and "on or before" alternatives. The recommend approach is to use "on or before".

   □ Oftentimes, the timeliness of deliveries is measured against the original order (PO) date. However, the first scheduled appointment date time is the preferred target as it is the first time that both trading partners are able to confirm a delivery time. Similarly, the last scheduled appointment date time is not the preferred target as it often tends to measure a retailer, supplier, or carrier's ability to adjust to last minute changes, as opposed to truly measuring on time delivery.

3. DSD Considerations.

  ☐ In a traditional Direct-Store-Delivery (DSD) environment, such as beverages, packaged cookies/crackers, and bagged snacks, there is typically not a "Purchase Order," but rather an order that is generated by the supplier or an agent of the supplier. Therefore, "On Time Delivery" should be based on the order that is generated by the supplier.

  ☐ DSDs are typically measured by the ability to deliver the product within a date time window.

  ☐ Since there will not necessarily be a receiver check-in log, the DSD supplier's records will determine whether a delivery is on time or not.

  ☐ Given these considerations, DSD On Time Delivery should be the percentage of a supplier's shipments that arrived at the store by the end of the agreed upon delivery window.

4. Backhaul / CPU Considerations

  ☐ On Time Delivery for Customer Pick-Ups (CPU) should be measured the same as it is for traditional deliveries.

7.3.11.7. Examples

Example 1: "On or before" appointment time vs delivery window

A retail buyer creates a Purchase Order, which includes a delivery date of March 15. The supplier contracts with a carrier to make the delivery. The carrier calls the retailer to obtain an appointment date time at the retail distribution centre. The carrier is given an appointment date time of 3PM on March 15. According to the retail check-in records, the carrier arrived at the retail distribution guard shack at 3:15PM.

This delivery is late when the Delivery Time Reference Basis parameter is the "first scheduled appointment" date time and the Appointment Time Measurement Basis is "on or before".

If the Appointment Time Measurement Basis is set to "delivery window" and the Delivery Window is equal to or greater than 15, the delivery would be considered on time.

Example 2: First vs Last scheduled appointment date time (weather related)

A retail buyer creates a Purchase Order, which includes a delivery date of March 15. The supplier contracts with a carrier to make the delivery. The carrier calls the retailer to obtain an appointment date time at the retail distribution centre. The carrier is given an appointment date time of 3PM on March 15. Due to a snow storm, the retailer contacts the carrier and pushes the delivery appointment back to 1PM on March 17. According to the retail check-in records, the carrier arrived at the retail distribution guard shack at 12:30PM on March 17.

The delivery is considered to be on time when the Delivery Time Reference Basis parameter is based on recipient last scheduled appointment date time and the Appointment Time Measurement Basis is "on or before".

The delivery is considered late when the Delivery Time Reference Basis parameter is based on first scheduled appointment date time and the Appointment Time Measurement Basis is "on or before".

Example 3: First vs Last scheduled appointment date time (production issue)

A retail buyer creates a Purchase Order, which includes a delivery date of March 15. The supplier contracts with a carrier to make the delivery. The carrier calls the retailer to obtain an appointment date time at the retail distribution centre. The carrier is given an appointment date time of 3PM on March 15. Due to a production problem, the supplier is behind and the product is not ready for shipment. The carrier calls the retailer to reschedule the delivery and they agree on a new

appointment date time of 1PM on March 17. According to the retail check-in records, the carrier arrived at the retail distribution guard shack at 12:30PM on March 17.

The delivery is considered to be on time when the Delivery Time Reference Basis parameter is based on recipient last scheduled appointment date time.

The delivery is considered late when the Delivery Time Reference Basis parameter is based on first scheduled appointment date time.

Example 4: First scheduled appointment date time vs. need-by date

On March 14, a retail buyer creates a Purchase Order, which includes a delivery date of March 15. The supplier requires 3 days of lead time, so the product will not be available for delivery at the distribution centre until March 17. The carrier calls the retailer to obtain an appointment date time at the retail distribution centre. The carrier is given an appointment date time of 3PM on March 17. According to the retail check-in records, the carrier arrived at the retail distribution guard shack at 2:30PM on March 17.

This load would be considered late when the Delivery Time Reference Basis parameter is based on the original P.O. need-by date.

This load would be considered on time when the Delivery Time Reference Basis parameter is based on first scheduled appointment date time.

Example 5: (direct store delivery)

Retail Outlet has set delivery days assigned by the supplier. Store has agreed upon delivery windows within those given days for DSD suppliers to arrive. Retailer has this schedule in their receiving system. Suppliers' delivery driver arrives at the store on the day of the week and within the delivery window they are assigned to.

This is considered on time when the Delivery Time Reference Basis parameter is based on first scheduled appointment date time.

Example 6: Early delivery

A retail buyer creates a Purchase Order, which includes a delivery date of March 15. The supplier contracts with a carrier to make the delivery. The carrier calls the retailer to obtain an appointment date time at the retail distribution centre. The carrier is given an appointment date time of 3PM on March 15. According to the retail check-in records, the carrier arrived at the retail distribution guard shack at 12:30 PM.

This delivery is on time when the Delivery Time Reference Basis parameter is the "first scheduled appointment" date time and the Appointment Time Measurement Basis is "on or before."

If the Appointment Time Measurement Basis is set to "delivery window" and the Delivery Window is less than 150, the delivery would be considered non-compliant.

7.3.11.8. Reference Source

- None

7.3.11.9. Typical Data Source

- Receiver (Retailer, Wholesaler) for the non DSD environment
- Supplier for the DSD environment

7.3.12. Finished Goods Inventory Cover (Days)

7.3.12.1. Aliases

- Days of Supply
- Days of cover
- Manufacturer / Supplier finished goods inventory
- Retail Distribution Centre Finished Goods Inventory
- Retail Store Finished Goods Inventory

7.3.12.2. Definition

The amount of finished goods inventory at the stocking location (or locations) in terms of the estimated daily demand.

7.3.12.3. Rationale

The GCI Scorecard currently contains four separate definitions for Inventory Cover spanning across various points of the supply chain. Those definitions include **raw materials** at the manufacturer and **finished goods** at the supplier, the retail distribution centre, and the retail store. For the purposes of this exercise, Finished Goods Inventory Cover will be defined to encompass all finished goods regardless of where they exist in the supply chain. Raw Materials Inventory Cover will be defined separately. In the future, the ability to aggregate inventory across the entire supply chain will allow for better purchasing and distribution decisions.

7.3.12.4. Formula

$$InventoryCover_{Days} = \frac{OnHandInventoryBalance}{EstimatedDemand_{Day}}$$

- **OnHandInventoryBalance** = Finished goods inventory on hand in units or cases. Pipeline finished goods inventory (en route to next recipient in supply chain) is also included if the Inventory Basis parameter is set to PIPELINE INVENTORY INCLUDED. The default is not to include pipeline inventory.

- **Estimated Demand =** Demand in number of cases or units required for one day. Demand is estimated based upon average historical movement by default, but if the Demand Estimation Basis is set to FORECAST BASIS, forecasted demand is used instead.

Note Units could be substituted for cases (especially useful for DSD measurements)

7.3.12.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which finished goods inventory cover is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").

Parameter Name	Parameter Type	Description
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which finished goods inventory cover is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which finished goods inventory cover is being measured.
Period Type	Period Type Code	Indicator of the period of time for which finished goods inventory cover is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Inventory Basis	Inventory Basis Type Code	Specifies whether the inventory cover value includes pipeline inventory. Values include "ON HAND ONLY" and "PIPELINE INVENTORY INCLUDED".
Demand Estimation Basis	Demand Estimation Type Code	Specifies the technique used to estimate demand (either "HISTORICAL BASIS" or "FORECAST BASIS"). Historical basis is the default.

7.3.12.6. Condition

The valuation of Finished Goods Inventory and demand should be expressed using a consistent basis. For example, the number of cases in Finished Goods Inventory and the demand could each be expressed in terms of cases or units. Both variables must be expressed in the same context.

Finished Goods Inventory on hand and pipeline Finished Goods Inventory are snapshots that must be captured at consistent time periods.

7.3.12.7. Examples

Example 1: Manufacturer/Supplier's Finished Goods Inventory Cover

A manufacturer has 10,000 cases of finished goods inventory on hand, and 5,000 cases of finished goods inventory in transit to their retailers. They project a demand of 35,000 cases for the upcoming 7 days.

- *OnHandInventoryBalance* = 10,000 Cases on Hand + 5,000 Cases in Pipeline

- *Estimated Demand* = 5,000 cases per day **(35000/7)**

- *OnHandInventoryBalance* **/** *Estimated Demand* = 10,000 cases + 5,000 cases / 5,000 cases = 3 days of cover

Example 2: Retail Distribution Centre Finished Goods Inventory Cover

A retailer has 125,000 cases of finished goods inventory on hand in their distribution centre, and 12,000 cases of finished goods inventory in transit to their retail stores. They project a demand of 105,000 cases for the upcoming 7 days.

- *OnHandInventoryBalance* = 125,000 Cases on Hand + 12,000 Cases in Pipeline

- *Estimated Demand* = 15,000 cases per day (105000/7)

- *OnHandInventoryBalance* **/** *Estimated Demand* = 125,000 cases + 12,000 cases / 15,000 cases = 9.13 days of cover

Example 3: Retail Store Finished Goods Inventory Cover

A retailer has 500 cases of finished goods inventory on hand in their store (includes the sales floor and the backroom). They project a demand of 350 cases for the upcoming 7 days.

- ■ *OnHandInventoryBalance* = 500 cases

- ■ *Estimated Demand* = 50 cases per day (350/7)

- ■ *OnHandInventoryBalance / Estimated Demand* = 500 cases / 50 cases = 10 days of cover

7.3.12.8. Reference Source

- ■ GCI BM07/8/9

7.3.12.9. Typical Data Source

- ■ Retailer

- ■ Supplier for Scenario #1 Manufacturer/Supplier's Finished Goods Inventory Cover

7.3.13. Forecast Accuracy (%)

7.3.13.1. Aliases

- ■ Forecast Quality

7.3.13.2. Definition

The mean absolute percent agreement of the forecast with the actual sales, receipt or shipment quantity, expressed in unit volume or monetary terms.

7.3.13.3. Rationale

Forecast Accuracy is the measure that business people most commonly use to evaluate the effectiveness of sales, order or shipment forecasts. While forecasting as an academic discipline most often measures forecast quality in terms of forecast error, it is more typical in trading partner relationships to set goals in terms of improving accuracy.

7.3.13.4. Formula

There are many ways to calculate forecast accuracy. For the purposes of Trading Partner Performance Management (TPPM), the preferred formula is one minus the unit-sales-weighted mean absolute percentage error (MAPE). This is the sum of the absolute values of the forecast errors (unit forecast – actual sales units) divided by the sum of the actual sales units.

$$ForecastAccuracy\% = \left(1 - \left(\frac{\sum_{i=1}^{n} |Actual_i - Forecast_i|}{\sum_{i=1}^{n} Actual_i} \right) \right) * 100$$

Period of Time is defined by the submitter of the Forecast

Technically, this formula is more properly referred to as a Percentage Mean Absolute Deviation (PMAD), because classical MAPE calculations sum together the individual percentage errors, rather than summing the absolute errors and dividing by the total sales. The reason that the PMAD approach is preferred in practice for retail sales forecasting is because classical MAPE causes a divide-by-zero

error if any product in the scope of the calculation has zero sales. The PMAD approach usually avoids this problem when used at a category or business level, where forecast accuracy is usually reported.

There are situations in which forecast error can be greater than 100%, and as a result, forecast accuracy is negative. In these cases, forecast accuracy is defined as 0%.

7.3.13.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which sales forecast accuracy is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which sales forecast accuracy is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which sales forecast accuracy is being measured.
Period Type	Period Type Code	Indicator of the period of time for which sales forecast accuracy is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Quantity Type	Quantity Type Code	Indicates whether the forecast and actual values used in the calculation are unit quantities or monetary values.
Forecast Lag	Integer	Specifies the minimum age of a forecast that is to be compared with actual sales for accuracy measurement.
Forecast Purpose	Forecast Purpose Code	Indicates whether the forecast is for sales, receipts or shipments.
Forecast Type	Forecast Type Code	Specifies whether the forecast includes pertains to all items in the period ("TOTAL"), only item/location combinations on promotion during the period ("PROMOTIONAL"), or non-promoted items ("BASELINE"). Total is the default.

7.3.13.6. Condition

Forecast Accuracy should be measured at a product item level for the scope of the business being evaluated. Sales forecast accuracy for XYZ brand in the trading relationship between Retailer A and Manufacturer B would take the forecast for each item in the XYZ brand, and compare it to actual sales for that brand summed across all Retail A unit store sales.

Forecast Accuracy should also be measured based upon a lagged forecast – that is, a forecast that was made some time prior to the actual sales being recorded. TPPM recommends that a forecast lag of four weeks (or one month) be used. If the forecast was based upon a different lag, the lag value should be noted.

7.3.13.7.Examples

A retailer has three stores – 1, 2 and 3 – that sell Item A. On February 1, the retailer forecasts sales of 100 units of Item A for each store for the week of March 1.

On March 2, the retailer reports that actual sales of Item A at stores 1, 2 and 3 for the week of March 1 were 90, 100, and 110. As a result, the forecast accuracy for Item A was:

Store	Forecast Unit Sales	Actual Unit Sales	Absolute Deviation	Result
1	100	90	10	
2	100	100	0	
3	100	110	10	
	300		20	20/300 = 6.7% Forecast Error. 100% - 6.7% = 93.3% Forecast Accuracy

7.3.13.8.Typical Data Source

■ Retailer

7.3.14. On Time Payment (%)

7.3.14.1.Aliases

■ None

7.3.14.2.Definition

The percentage of payments made within a seller's terms of sale out of all payments received.

7.3.14.3.Rationale

On time payment is a critical measure to drive the implementation of action plans, with the goals to drive timely payment of invoice.

7.3.14.4.Formula

$$IF\left(FundsReceiptDate - InvoiceDate\right) \leq SellerTerms \Rightarrow OnTimePaymentOccurence$$

$$OnTimePayment\% = \left(\frac{\sum OnTimePaymentOccurrence}{\sum PaymentOccurence}\right)*100$$

Where Start of Terms Date is the date at which the invoice is generated by the seller (Day 0).

Receipt of Funds Equals:

1. Funds in the Mail: Date of payment postmark by US Postal Service

2. Funds in the Bank: Date at which funds are received into the manufacturers account

   a. Electronic Funds Transfer: Date at which verifiable 'good funds' (bank clearing date) are received into the Manufacturer's account.

b. Bank Clearing Date: When the funds are cleared and available to the recipient (which is often 24 hours after the initiation of the payment).

7.3.14.5. Parameters

Parameter Name	Parameter Type	Description
Buyer Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. channel or country) whose on-time payment percentage is being measured.
Seller Party Identification	Party Identification Type	Identifier of the organization or multi-organization context (e.g. supplier group or country) receiving the payments being measured.
Period End	Date Time Stamp	Date and time of the end of the period for which on-time payment is being measured.
Period Type	Period Type Code	Indicator of the period of time for which on-time payment is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.14.6. Condition

On Time Payment is highly dependent on each manufacturer's terms of sale.

The Start of Terms Date should be a common metric to commence the On Time Payment metric (Day 0)

Receipt of funds ends the On Time Payment metric

7.3.14.7. Examples

Example 1 Simple Scenario – In the Mail Terms

■ Manufacturer: Net 30 Terms

■ Start of Terms Date: 9/1/2007

■ Invoice is generated on 9/1/2007 (Day 0)

■ Customer mails payment on 9/30/2007

■ Postmarked by USPS on 10/1/2007

■ Payment is considered 100% On-Time

Example 2 Complex Scenario - EFT w/discount ***

■ Manufacturer: 2%/10 days, Net 20, In the Bank

■ Payment Method   EFT

■ Start of Terms Date: 9/1/2007

■ Invoice is generated on 9/1/2007 (Day 0)

■ Customer begins EFT transaction on 9/10/2007 (w/2% discount)

■ Bank clears funds on 9/11/2007

■ Payment is considered 100% On-Time

- OR -

- Invoice is generated on 9/1/2007
- Customer begins EFT transaction on 9/20/2007 (for full invoice $)
- Bank clears funds on 9/21/2007
- Payment is considered 100% On-Time

> **Note** Calculation is strictly a measure of timing; it does not take into consideration compliance with other terms (e.g. discount).

7.3.14.8. Reference Source

- None

7.3.14.9. Typical Data Source

- Manufacturer

7.3.15. Out of Stock (%)

7.3.15.1. Aliases

- Stockout Percentage
- Use of the reciprocal (in-stock percentage) is also common

7.3.15.2. Definition

The percentage of items that is not available at their expected stocking locations out of the set of item stocking locations that were evaluated.

7.3.15.3. Rationale

The most basic way to evaluate the effectiveness of distribution practices is to measure the percentage of items that are out of stock at a store or distribution centre at any given time.

While the formula for out-of-stock percentage is simple, the means of identifying which locations are out of stock can vary dramatically – particularly when the measure is being calculated at the store shelf. Common techniques of out-of-stock measurement include the following:

Manual audits – Personnel scan a set of stocking locations at a point in time, and note how many items is out-of-stock.

Perpetual inventory – Automated systems adjust the on-hand quantity by the number of items sold and received each day.

RFID/EPC – RFID tags identify each unit, or each case or pallet of product at the location.

Sales data analysis – Statistical models identify which items are likely to be out-of-stock based on deviations from an expected sales rate. For example, if sales for a fast-moving item are zero at a store on a given day, it can be assumed to be out-of-stock.

Some techniques try to determine the cost or duration of particular out-of-stocks. However, for trading partner performance measurement purposes, the out-of-stock percentage is usually reported in aggregate, and a simple point-in-time calculation is recommended. Related measures such as lost sales can be used to estimate the financial impact of in-stock improvements.

7.3.15.4. Formula

$$OnHandInventory(StockingLocation) = 0 \Rightarrow OutOfStockLocation$$

$$OutOfStockPercentage = \left(\frac{\sum OutofStockLocation}{\sum StockingLocation} \right) * 100$$

7.3.15.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which out-of-stock percentage is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which out-of-stock percentage is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which out-of-stock percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which out-of-stock percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").
Measurement Method	Out-of-Stock Measurement Method Type Code	Specifies the technique used to measure the out of stock percentage being reported (e.g. "PERPETUAL INVENTORY", "MANUAL_AUDIT", "RFID EPC").

7.3.15.6. Examples

A retailer hires a firm to conduct weekly audits of out-of-stock items in the beverage category across all of its stores. The firm finds that, on average, 150 items are out of stock out of an average of 2000 total beverage items that are stocked in each store. As a result, the out-of-stock percentage at shelf level for the beverages category is (150/2000)*100 = 7.5%.

7.3.15.7. Reference Source

- A more detailed discussion of out-of-stock measurement and remediation can be found in "A Comprehensive Guide to Retail Out-of-Stock Reduction in the Fast-Moving Consumer Goods Industry" by Thomas Gruen and Daniel Corsten, published by the GMA, FMI and NACDS. It can be found at:
- http://www.gmaonline.org/publications/docs/2007/OOS_fullreport.pdf.

7.3.15.8. Typical Data Source

- Retailer
- Third Party Data (i.e. Nielsen, IRI)

7.3.16. Unsaleables (%)

7.3.16.1.Aliases

■ None

7.3.16.2.Definition

The percentage of products that were removed from the primary channel of distribution due to damage, expiration, discontinuation, seasonality, promotion completion or defects.

7.3.16.3.Rationale

Provide a common framework for the calculation of unsaleables for CPG products. As part of the Trading Partner Performance scorecard, results of the unsaleables measurement should drive collaborative discussions between manufacturers and wholesalers/distributors. These discussions should focus on:

■ Collaboration to identify root causes of unsaleables

■ Plans to reduce overall unsaleable expense in the supply chain

■ Sharing of expenses associated with unsaleables

■ Use of reclamation centres remains widespread and provides useful data to identify and address the root causes of Unsaleables.

Note The payment process for unsaleables typically occurs in one of two formats, retailer reclamation invoice/deduction or a vendor's reimbursement program. For purposes of this document, payment of unsaleables process /method of reimbursement are NOT addressed.

7.3.16.4.Formula

$$Unsaleables\% = \left(\frac{TotalItemCost - UnsaleableItemCost}{TotalItemCost} \right) *100$$

7.3.16.5.Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which unsaleables percentage is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which unsaleables percentage is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which unsaleables percentage is being measured.

Parameter Name	Parameter Type	Description
Period Type	Period Type Code	Indicator of the period of time for which unsaleables percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.16.6. Condition

Unsaleable Reasons may include

Unsaleable Reason	Description
DAMAGED	product that the average retailer would choose not to shelve or consumer would choose not to purchase based on condition of external packaging
DEFECTS	items that are not in workable condition
DISCONTINUED	products that are no longer active in the marketplace
OUTDATED	product beyond its 'best if used by' or shelf life
POST_PROMOTIONAL	post promotional items that are not able to be placed into open stock on the shelf (i.e. unique and not stocked)
SEASONAL_ITEMS	post seasonal items that are not able to be placed into open stock on the shelf (i.e. unique and not stocked)

Note Quality or Safety recalls are not considered part of the unsaleables process and should be addressed separately.

7.3.16.7. Examples

Cost of goods removed as unsaleable	$10		100	
Cost of total goods purchased	$1,000	X	1	= 1%

Note The "true cost" of Unsaleables, when measured in financial terms, should be *NET* of any manufacturer provided allowances or discounts

Results of the above calculation are typically 'benchmarked' against other vendors and/or against other Wholesalers/Distributors depending on the party analyzing the information.

7.3.16.8. Reference Source

- "Improving Unsaleables Management Business Practices – Joint Industry Recommendation", 2005 FMI, GMA
- "Product Reclamation Centres: A Joint Industry Report", 1990, FMI, GMA et al.

7.3.16.9. Typical Data Source

- Retailers

7.3.17. Markdowns (%)

7.3.17.1. Aliases

■ None

7.3.17.2. Definition

The percentage of monetary sales that were sold at below the normal retail price (that can include but not exclusive to) seasonal clearance, discontinuation, employee discount, response to competitive activity or other retailer-initiated price reductions.

7.3.17.3. Rationale

This measure captures the extent to which items sold did not yield the (unit retail) revenue that might have been expected. Some level of markdowns can always be expected, but increases in this value could indicate that seasonal timing, assortments, pricing or product placement need to be adjusted.

7.3.17.4. Formula

$$Markdown\% = \left(\frac{Sales_{Markdown}}{Sales_{Total}} \right) * 100$$

■ $Sales_{Markdown}$ = Monetary sales in the period for items sold at lower than the normal retail price.

■ $Sales_{Total}$ = All monetary sales for items sold in the period.

Note: This measure depends upon the retailer's information systems being able to capture and report instances of sales made at markdown prices.

7.3.17.5. Parameters

Parameter Name	Parameter Type	Description
Item Scope Description	Text	Identifier of the item, category, brand or other product classification data element (e.g. "Cold Care") for which markdown percentage is being measured.
Item Scope Type	Item Scope Type Code	Indicator of the type of product classification element the Item Scope Description represents (e.g. "ITEM", "BRAND", "CATEGORY").
Location Scope Description	Text	Identifier of the store, region, country or other location classification data element (e.g. "Portugal") for which the markdown percentage is being measured.
Location Scope Type	Location Scope Type Code	Indicator of the type of location classification element the Location Scope Description represents (e.g. "STORE", "REGION", "COUNTRY").
Period End	Date Time Stamp	Date and time of the end of the period for which the markdown percentage is being measured.
Period Type	Period Type Code	Indicator of the period of time for which the markdown percentage is being measured (e.g. "DAY", "CALENDAR WEEK", "YEAR TO DATE").

7.3.17.6.Conditions

The monetary sales values used to calculate markdown percentage are the total business in the scope of the geography being measured, not a "same store sales" measure.

7.3.17.7.Example

- Sales in most recent 12 months = 12.0 Million

- Sales of items at marked down price in most recent 12 months = 300,000

- Markdown percentage = ((300,000)/12,000,000)*100 =2.5%

7.3.17.8.Reference Source

- None

7.3.17.9.Typical Data Source

Retailer

7.4.   Business Rule Parameter Values

7.4.1.   Item Scope Type Code

Specifies the type of item scope (brand, category, etc.) of a goal or measure value.

Value	Description
BRAND	All products of a specific brand
CLASS	All products that fall within a global product class or category
COLOR	All products of a specific colour
DEPARTMENT	All products that fall within a retailer's department
FLAVOR	All products of a specific flavour
GTIN	A uniquely identifiable, individual product
ITEM	All of the style, colour, size, flavour and variety variations of a specific product
LINE_OF_BUSINESS	All products that fall within a supplier's line of business
RETAIL CATEGORY	All products that fall within a retailer's item category
SIZE	All products of a specific size
SKU	All products that are equivalent from a retailer's stocking perspective
STYLE	All products of a specific style
SUBCLASS	All products that fall within a global product subclass or subcategory
TOTAL	All products
TRADING_RELATIONSHIP	All of the supplier's products that the customer distributes
VARIETY	All products of a specific variety

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7.4.2. Location Scope Type Code

Specifies the type of location scope (store, region, chain) of a goal or measure value.

Value	Description
AREA	All store regions within an area
CHAIN	All locations within a retail chain
CHANNEL	All locations within a specific class of trade
CITY	All locations within the boundaries of a city
COUNTRY	All locations within a country
DISTRIBUTION_CENTER	A specific distribution centre location
GEOGRAPHICAL_REGION	All locations within a specified geographic region
GEOGRAPHICAL_SUBREGION	All locations within a specified geographic subregion
LANE_OR_ROUTE	A specific transportation lane or route
PLANT	A specific production plant or factory location
POSTAL_CODE	All locations within a specific postal code
STATE	All locations within a state or province
STOCKING_LOCATION	A specific stocking location (e.g. shelf, display) within a store
STORE	A specific store location
STORE_CLUSTER	All locations that share a set of common characteristics (such as customer demographics)
STORE_REGION	All locations within a retailer's store region
SUPPLIER	All supplier distribution locations (plant / DC)
TOTAL	All locations
ZONE	All locations within a zone

7.4.3. Period Scope Type Code

Specifies the type of time period of a goal or measure value.

Value	Description
CALENDAR_MONTH	A calendar month
CALENDAR_QUARTER	A three-month calendar quarter
CALENDAR_YEAR	A calendar year
DATETIME	A specific moment in time
DAY	An individual day
FISCAL_MONTH	A month in terms of the sender's fiscal calendar
FISCAL_QUARTER	A three-month quarter in terms of the sender's fiscal calendar
FISCAL_YEAR	A year in terms of the sender's fiscal calendar
MONTH_TO_DATE	The range of days from the start of the current calendar month to the specified date

Value	Description
QUARTER_TO_DATE	The range of days from the start of the current calendar quarter to the specified date
ROLLING_12_MONTH_PERIOD	The 12-month period ending on the specified date
ROLLING_13_WEEK_PERIOD	The 91-day period ending on the specified date
ROLLING_4_WEEK_PERIOD	The 28-day period ending on the specified date
TIME_INDEPENDENT	All periods
WEEK	A seven-day week
YEAR_TO_DATE	The range of days from the start of the current calendar year to the specified date

7.4.4. Periodicity Type Code

Specifies the time unit of measure of a result.

Value	Description
DAY	24-hour day
HOUR	Hour
MONTH	Calendar month
QUARTER	3-month period
WEEK	Seven day week
YEAR	12-month period

7.4.5. Quantity Type Code

Indicates whether the values used in the calculation are on a volume (unit) basis, or value (monetary) basis.

Value	Description
MONETARY_BASIS	Product value in monetary terms
UNIT_BASIS	Product volume in terms of units

7.4.6. Inventory Measurement Basis

Indicator of whether the inventory included in an inventory cover calculation includes inbound (pipeline) inventory.

Value	Description
ON_HAND_ONLY	Only the current on-hand balance is included in the inventory cover calculation
ON_HAND_PLUS_PIPELINE	Both the current on-hand balance as well as inbound inventory in the distribution pipeline is included in the inventory cover calculation

7.4.7. Delivery Time Measurement Type Code

Indicates the source of the date to be used to determine whether a delivery was on-time (the original P.O. need-by date, the first scheduled appointment date or the last scheduled appointment date).

Value	Description
FIRST_APPOINTMENT_TIME	First negotiated appointment date and time
LAST_APPOINTMENT_TIME	Last negotiated appointment date and time
PO_NEED_BY_DATE	Desired delivery date as expressed in the purchase order

7.4.8. Out-of-Stock Measurement Type Code

Specifies the technique used to measure the out of stock percentage being reported.

Value	Description
MANUAL_AUDIT	Visual inspection of stocking locations
OTHER	Other method
PERPETUAL_INVENTORY	Estimate of on-hand balance based upon the previous inventory value, adjusted by subsequent sales and receipts
RFID_EPC	Physical count of items at stocking locations taken by radio frequency identification
SALES_DATA_ANALYSIS	Estimate of on-hand balance based upon the observed vs. expected rate of sale

7.4.9. Demand Estimation Type Code

Specifies the technique used to estimate demand when measuring inventory cover.

Value	Description
FORECAST_BASIS	Demand estimate is based upon a forecast
HISTORICAL_BASIS	Demand estimate is based upon historical results

7.4.10. Service Level Measurement Type Code

Indicates whether a fill rate / service level calculation is based upon the quantity shipped or quantity received.

Value	Description
RECEIVED_QUANTITY	The calculation is based on the quantity received by the customer
SHIPPED_QUANTITY	The calculation is based on the quantity shipped by the supplier

7.4.11. Forecast Purpose Code

Specifies whether the forecast is for the amount sold, received or shipped.

Value	Description
RECEIPT	The forecast is for the expected receipt of items at the location. (This is also frequently called an "order forecast.")

Value	Description
SALES	The forecast is for the expected sales or consumption of items at the location.
SHIPMENT	The forecast is for shipments to the location.

7.4.12. Forecast Type Code

Specifies whether the forecast pertains to all items in the period, only item/location combinations on promotion during the period, or non-promoted items.

Value	Description
BASELINE	The forecast includes only baseline (non-promoted) demand
PROMOTIONAL	The forecast includes only promotional demand
TOTAL	The forecast includes all types of demand

7.4.13. Synchronisation Percentage Calculation Type Code

Indicates whether the item data synchronization percentage calculation was based on the total number of items, or the incremental number of items synchronised.

Value	Description
INCREMENTAL_ITEMS	The item synchronisation calculation is based upon the items added to the customer's catalogue.
TOTAL_ITEMS	The item synchronisation calculation is based upon the total number of items in the customer's catalogue.

8.   Structured Business Scenarios

8.1.1.   Use Case Diagram: Processing Performance History

Figure 8-1 Use Case Diagram Processing Performance History
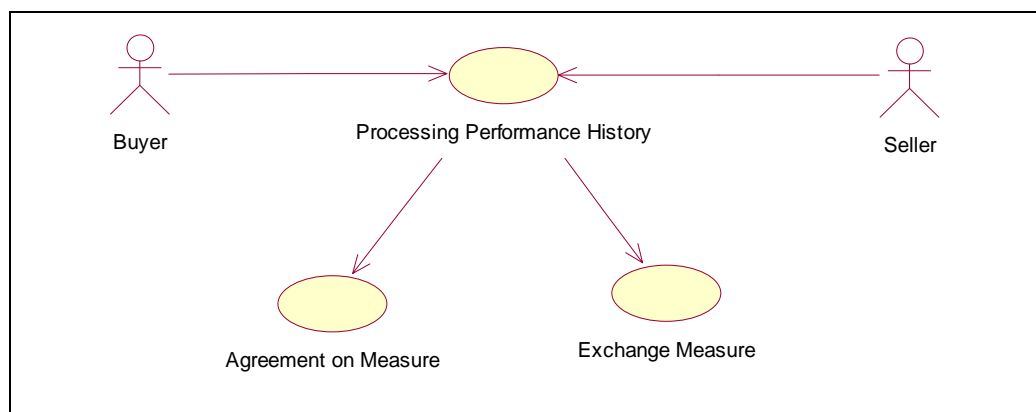
8.1.2. Use Case Definition: Processing Performance History

Use Case ID	UC-1
Use Case Name	Processing Performance History
Use Case Description	The objective is for a pair of trading partners to elaborate upon operational conditions and key metrics that would identify business issues or achievements.
Actors (Goal)	Performance History is a two-actor system involving a collaborative effort between a buyer and a seller across one or more locations. The lead actor in the collaboration depends upon the scenario most appropriate to the trading partner's business situation.
Performance Goals	The ability to exchange performance goals and results.
Preconditions	A collaboration agreement and joint business plan must be in place. If goals are to be exchanged, they must be prepared and received by the trading partners.
Post conditions	**Successful Condition:** Trading partners review their performance and take corrective action when necessary. **Unsuccessful Condition:** Operational activities and key metrics are not exchanged, preventing trading partners from reviewing their performance.
Scenario	Begins with the receipt of data by one of the Actors Continues with... *table below* Ends with corrective action to improve performance, if required.
Alternative Scenario	Not Applicable
Related Requirements	Not Applicable
Related Rules	Not Applicable

Step #	Actor	Activity Step
1	Buyer, Seller	Calculates performance results.
2	Buyer, Seller	Transmits Performance History message
3	Buyer, Seller	Reviews performance relative to goals (if provided).

8.1.3. Use Case Definition: Agreement on Measure

Use Case ID	UC-1.1
Use Case Name	Agreement on Measure
Use Case Description	The objective is for a pair of trading partners to agree on which measure to track.
Actors (Goal)	Performance History is a two-actor system involving a collaborative effort between a buyer and a seller across one or more locations. The lead actor in the collaboration depends upon the scenario most appropriate to the trading partner's business situation.
Performance Goals	The ability to agree on the measure selection.
Preconditions	A collaboration agreement and joint business plan must be in place. There must be an agreement from buyer and seller to process performance history.

Use Case ID	UC-1.1
Post conditions	**Successful Condition:** Trading partners agree to the measure and plan to exchange the information. **Unsuccessful Condition:** Trading partners cannot agree to the measure.
Scenario	Begins with the receipt of data by one of the Actors Continues with...

Step #	Actor	Activity Step
1	Joint	Agree on measure with item and location
2	Decision	Determine who is the owner of the data?
3	Buyer, Seller	Determine on level of detail to track
4	Buyer, Seller	Determine Parameter for each measure
5	Buyer, Seller	Determine Frequency of updates.

Ends with plans to exchange this information.

Alternative Scenario	Receive performance history Message without measure results data.
Related Requirement	Not Applicable
Related Rule	Not Applicable

8.1.4. Activity Diagram: Agreement on Measure

**Figure 8-2** Activity Diagram Agreement on Measure
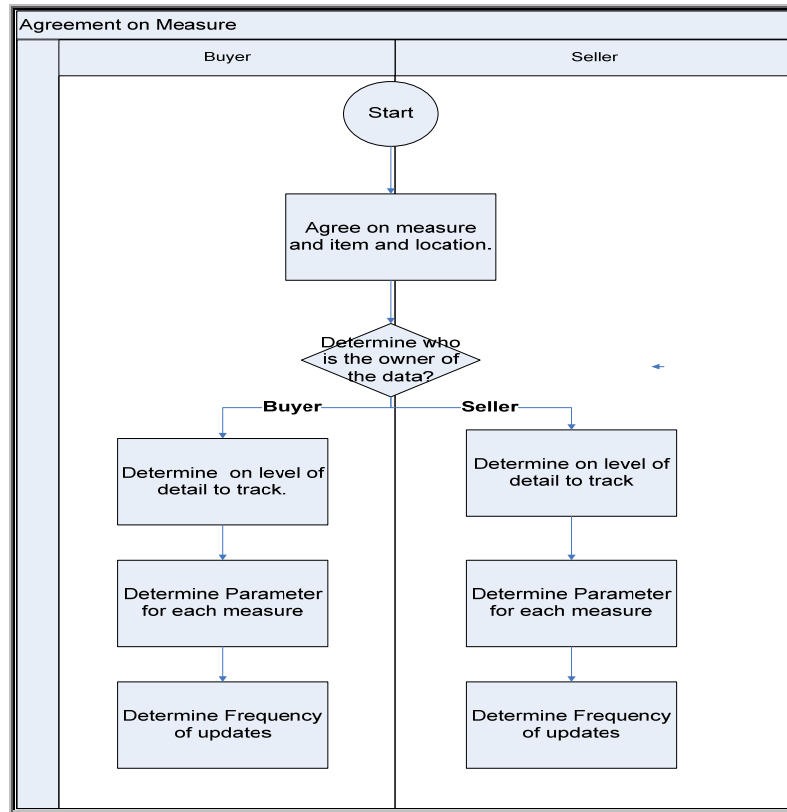
8.1.5. Use Case Definition: Exchange Measure

Use Case ID	UC-1.2
Use Case Name	Exchange Measure
Use Case Description	The objective is for a pair of trading partners to exchange measure information.
Actors (Goal)	Performance History is a two-actor system involving a collaborative effort between a buyer and a seller across one or more locations. The lead actor in the collaboration depends upon the scenario most appropriate to the trading partner's business situation.
Performance Goals	The ability to exchange performance goals and results.
Preconditions	There must be an agreement on which measure is to be exchanged.
Post conditions	**Successful Condition:** Trading partners can exchange measure information. **Unsuccessful Condition:** Trading partners cannot exchange measure information.

Use Case ID	UC-1.2		
Scenario	Begins with the agreement on measure to be exchanged Buyer is the data source.		
	Continues with...		
	Step #	Actor	Activity Step
	1	Buyer	Reference definition/ formulas/ parameter
	2	Buyer	Determine what raw data is needed
	3	Buyer, Seller	Gather Raw Data
	4	Buyer	Transmit Measure via Performance History
	Ends with Seller receiving the Performance History Message which contains the measures.		
Alternative Scenario	Not Applicable		
Related Requirement	Not Applicable		
Related Rule	Not Applicable		

8.1.6. Activity Diagram: Exchange Measure

Figure 8-3 Activity Diagram Exchange Measure
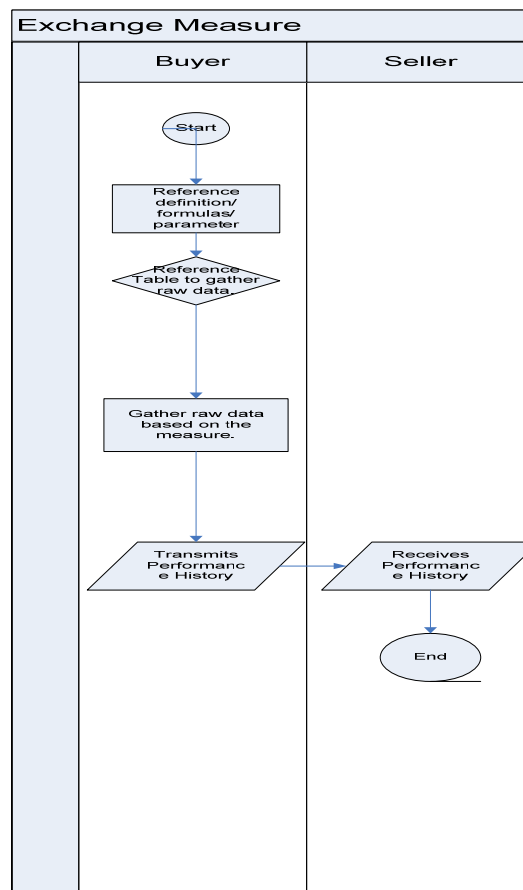
9. Business Object Analysis

9.1. Business Object Life-Cycle Discussion
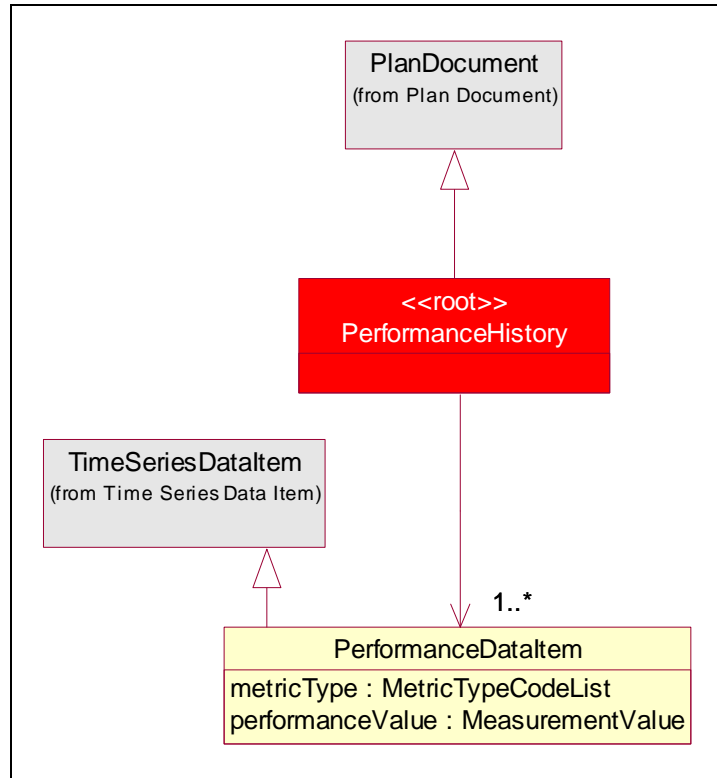
Figure 9-1 Performance History
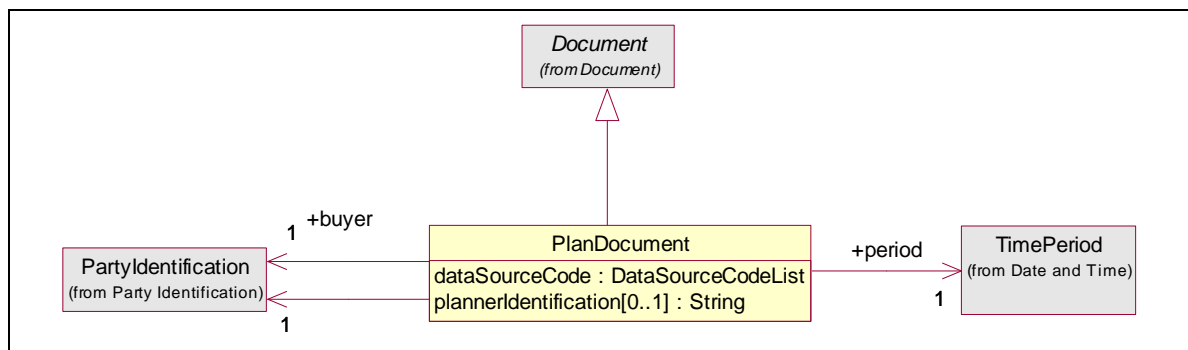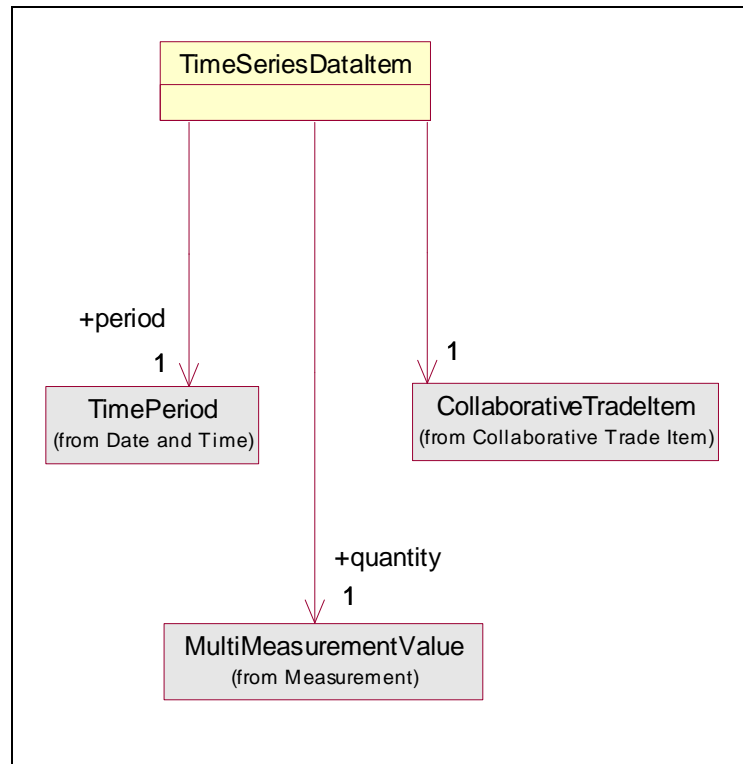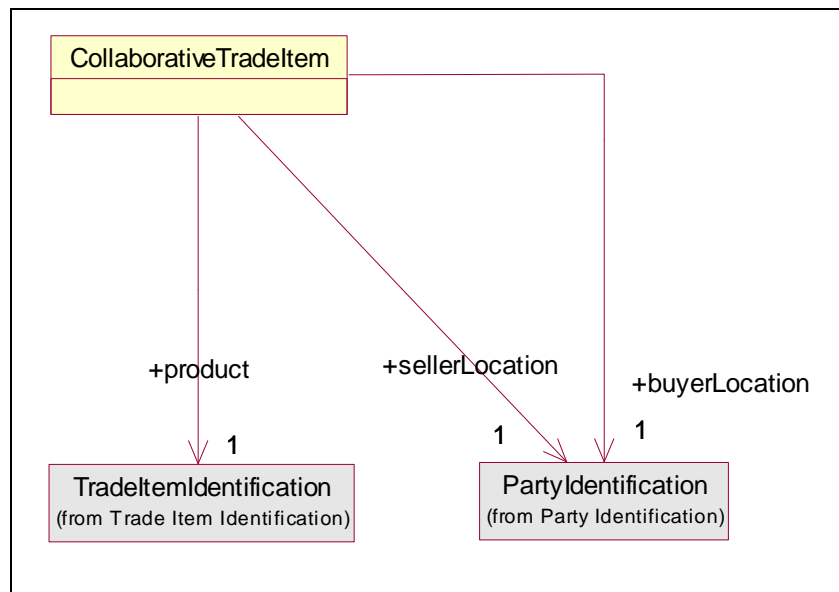

Figure 9-2 Plan Document

Figure 9-3 Time Series Data Item

**Figure 9-4** Collaborative Trade Item

10. Conceptual Solution (Examples)

10.1. Information Systems Deployment

There are multiple deployment options for trading partner performance management. Before starting an initiative, a buyer and seller need to select that approach that works best for their relationship.

10.1.1. Supplier Extranet

A retailer can set up a supplier extranet, and allow manufacturer users to log in, review information and perform tasks on the retailer's site. The extranet model has the advantage of offering access to manufacturers of any size - they do not need any in-house IT or planning applications to participate. However, a manufacturer has to work with each retailer that has an extranet separately, and often must cope with widely varying capabilities, navigation paradigms and user expectations. Manufacturers that depend on retailers' extranets cannot easily aggregate data across all of their customers to understand demand patterns and anomalies.
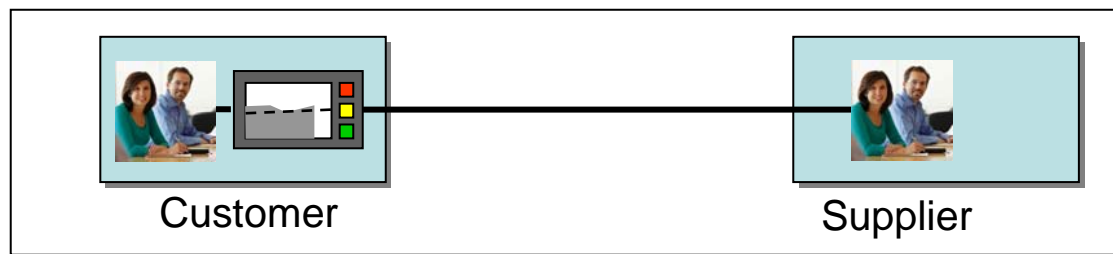
10.1.2. Message Interchange

Some companies exchange data through business-to-business transactions sets, using EDI, XML or flat file formats. The company-to-company model offers the advantage of standards based messages, and uses each company's own enterprise applications to analyze and act on the data. Companies can also combine this data across trading partners to get market-level insights. However, this approach also demands that a company invest in a B2B communications infrastructure, and have applications that can deal with large volumes of consumer demand data. The company-to-company approach also must overcome batch data synchronization delays, and subtle differences in each company's user views.
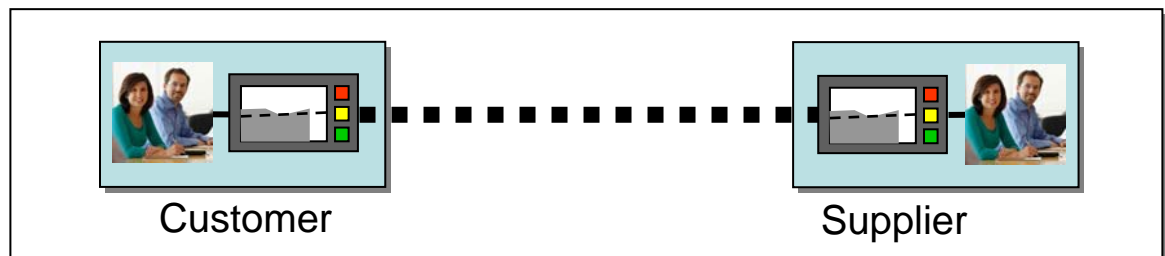
10.1.3. Hosted/On-Demand

The hosted/on-demand model collects data from multiple retailers and makes it available to multiple manufacturers through a public exchange or private service. The hosted model combines the benefits of ease of access of the extranet model with the data aggregation and single point of access of the

company-to-company model. However, the hosted model raises issues of data ownership and payment, security and competitive positioning. Some retailers also do not allow their data to be hosted by a third party, limiting the potential for the hosted model to become universal.
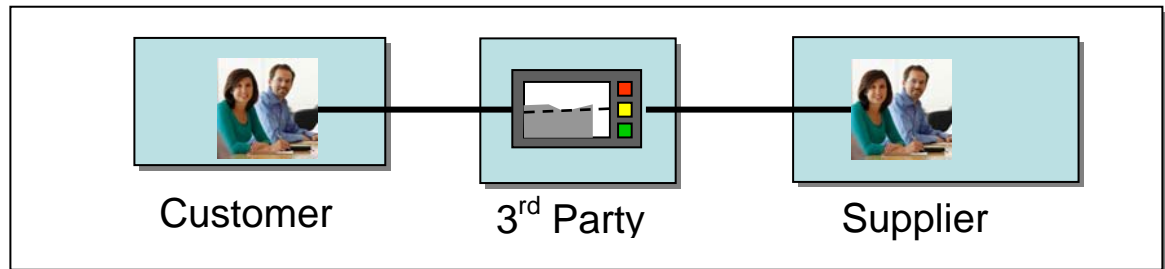

10.1.4. Service-Oriented Architecture (SOA)

An emerging alternative is to use a service-oriented architecture (SOA) approach for collecting and reviewing trading partner scorecard data. The scorecard display sends a service request corresponding to each measure to the solution that owns the data. It calculates the result and sends it as a response to the scorecard display.

The advantage of the service oriented approach is that the data can remain wherever it was originally produced. If a combination of customer, supplier and third-party sources own this data, the services fetch the results from wherever they are, rather than transferring the large volumes of transaction data needed to calculate the measures. The SOA approach also always presents the user with the latest results, based on the original source for the data.

The potential disadvantages of the SOA approach are 1) the potential delay in assembling the results "on demand" from disparate sources spread across a wide-area network, and 2) the likelihood that users will want to review the underlying data that caused specific results to be reported, necessitating ad hoc transfers of voluminous transaction data.
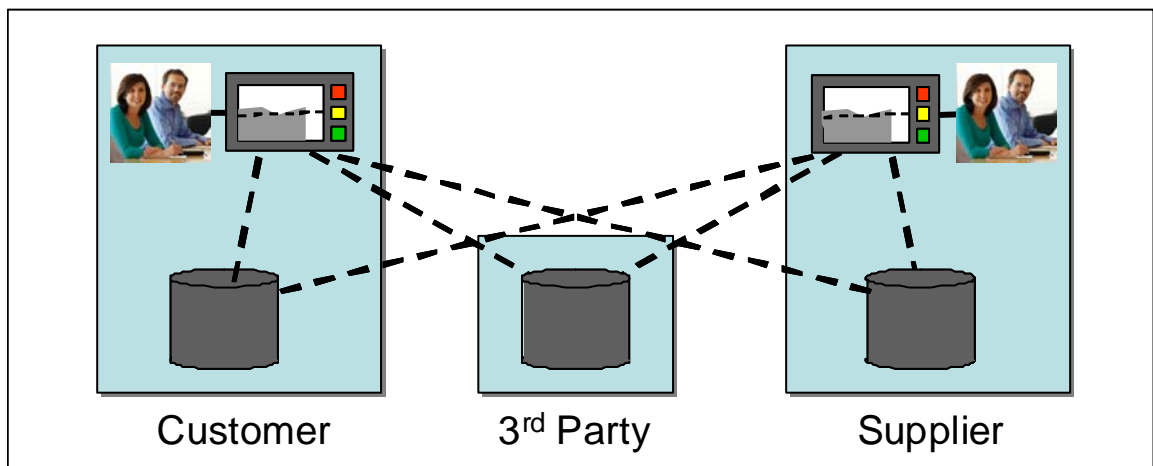
10.1.5. Hybrid

Realistically, most companies will have to accommodate multiple models. For example, a retailer may operate an extranet for smaller suppliers, while sending B2B transaction data to larger ones. Manufacturers may need to access extranets for retailers who do not offer message interchange as an option. In this complex environment, the use of standards is vital.

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10.2. Measure and Data Transmission

When companies begin to exchange results data, they have two options:

■   Calculate the results based upon the underlying data, and share those.

■   Share the underlying data, and allow each party to calculate the results.

Each option has advantages and disadvantages. Sharing the underlying data gives trading partners the greatest flexibility in generating aggregate measures in any number of business contexts. They also provide the best basis for investigating the conditions that caused inadequate or exceptional performance. However, this data sharing approach places a demand on each participating organization to be able to store the data, run the calculations on a consistent basis, and maintain the master data that determines which items belong in which calculations on a synchronized basis with their trading partner. Use of the GS1 Global Data Synchronization Network (GDSN) is practically essential in this scenario, but even it only covers item master data. Location and time (calendar) master data must also be synchronized.

Sharing the measure results themselves assures that all trading partners are looking at the same values at any given time, and lowers the minimum IT requirements for participation in a performance management initiative. However, sharing the results alone can make it difficult to interpret the values reported, or investigate how to address issues as they occur.

The best option is to share both the measure results and the underlying data used to calculate them. This approach allows trading partners to check whether their own local calculations still line up with those their customer or supplier has made – meaning their master data and methods are aligned.

11.   Implementation Considerations

Trading partner performance is vital to the success of any business. Many companies seek to improve this performance by setting goals for the relationship, sharing data with trading partners and monitoring results over time.

Trading Partner Performance Management (TPPM) is a GS1 standard that defines a common set of measures companies can use to evaluate sales, supply chain and operational effectiveness. It also offers methods for exchanging goals and results.

To have any long term impact, TPPM initiatives must take a strategic approach. They start with an organizational commitment to trading partner collaboration, and follow a systematic process with clear objectives and milestones.

Figure 11-1 presents an implementation framework for trading partner performance management, which outlines the major steps in a typical project. Companies can adapt this process to their needs.

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Figure 11-1 Trading Partner Performance Management Implementation Framework

1 Plan	2 Prepare	3 Implement	4 Manage
Set the Agenda	Choose measures	Set frequency of measurement	Transmit measures & data
Commit the organization	Select levels of measurement	Set timeliness of delivery	Respond to issues & opportunities
Engage trading partners	Align required reference data	Provide transaction data	Periodically reassess goals & measures
Develop a joint business plan	Select parameter alternatives	Assign user roles	
	Identify data sources	Deploy information systems	
	Set goals and thresholds		

11.1. Plan

11.1.1. Set the Agenda

At the outset, any company that engages in a performance management initiative should have a clear sense of its long-term objectives, as well as emerging consumer and industry trends. Economic, technological, environmental and political trends have a profound effect on the business and its trading relationships.

The Global Commerce Initiative (GCI) has published a study of major trends in the consumer goods industry called *2016: The Future Value Chain*. It identifies several themes for industry development (as shown in Figure 11-2), and calls for greater collaboration among retailers and manufacturers to respond to changing consumer demands.

Figure 11-2 Consumer Goods Industry Trends
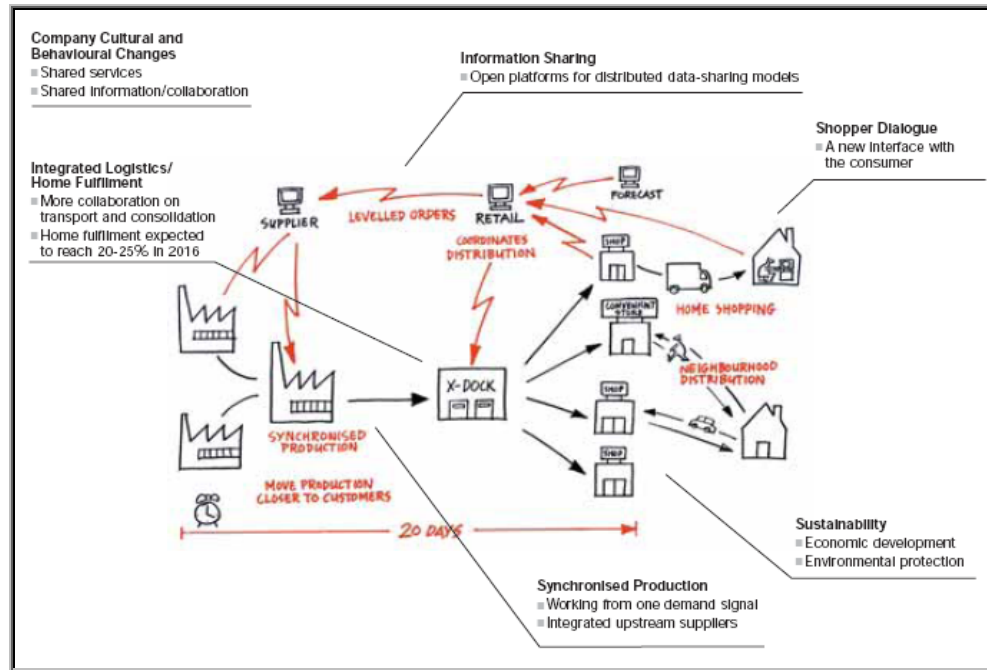
Source 2016: The Future Vale Chain

Each company should work with its trading partners to address new challenges as the global value chain evolves. Performance management efforts must reach beyond achieving targets for the next few months to support long-term business strategies.

11.1.2. Gain Organizational Commitment

Business-to-business programs are challenging because they require the cooperation of multiple organizations. Each company that participates should gain the commitment of participants – from senior management to financial, supply chain and operations personnel – and keep them engaged to ensure that the process remains relevant.

The New Ways of Working Together program, an industry initiative endorsed by several industry associations (including GS1, GCI, FMI, GMA and NACDS) defines best practices for trading partner collaboration. Figure 11-3 depicts the New Ways of Working Together framework, which puts TPPM in the broader context of the overall trading relationship. TPPM falls within the "Connect our Business Information" section of the framework.

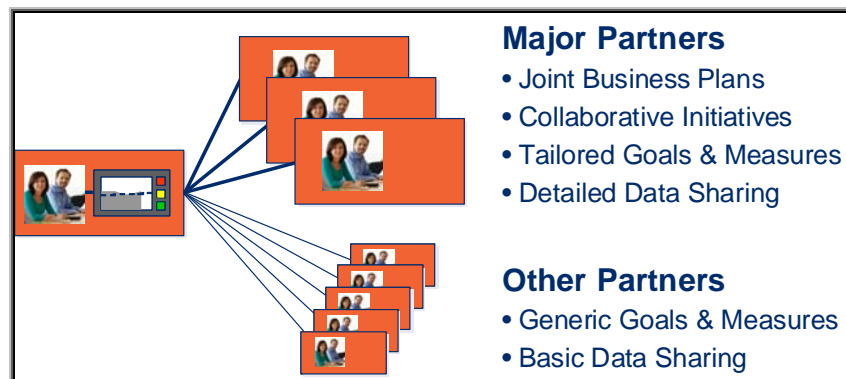**Figure 11-3** New ways of Working Together Best Practice Framework

Companies can consult the New Ways of Working Together documentation for guidance on aligning strategy, preparing people in the organization for change and taking action based upon the insights that are shared.

11.1.3. Engage Trading Partners

TPPM facilitates mass calculation and distribution of measurement data, allowing performance information to be shared across both small and large trading relationships. At the same time, it allows companies to share information with strategic trading partners at a greater level of detail.

Buyers and sellers should select partners and the level of sharing based upon the value of the trading relationship, the availability of resources and the capability those resources have to analyze and act upon the information provided. Figure 11-4 illustrates how some companies work with their top 10-20 partners on a strategic basis (including joint business planning collaborative initiatives, tailored measures, goals and data sharing), while providing more generic set of measures, goals and results to small and medium trading partners.

Figure 11-4 Base Activities on the Value of the Relationship

Major Partners
• Joint Business Plans
• Collaborative Initiatives
• Tailored Goals & Measures
• Detailed Data Sharing

Other Partners
• Generic Goals & Measures
• Basic Data Sharing

11.2. Prepare

11.2.1. Choose Measures

Trading Partner Performance Management provides a balanced set of standard measures across sales, supply chain and operations areas of the business. These measures are compatible with the GCI Global Scorecard Business Measures that are widely used for corporate benchmarking.

Figure 11-5 identifies the measures included in the GS1 TPPM standard. See the appendix for definitions of each TPPM measure.

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Figure 11-5 TPPM Measures by Category
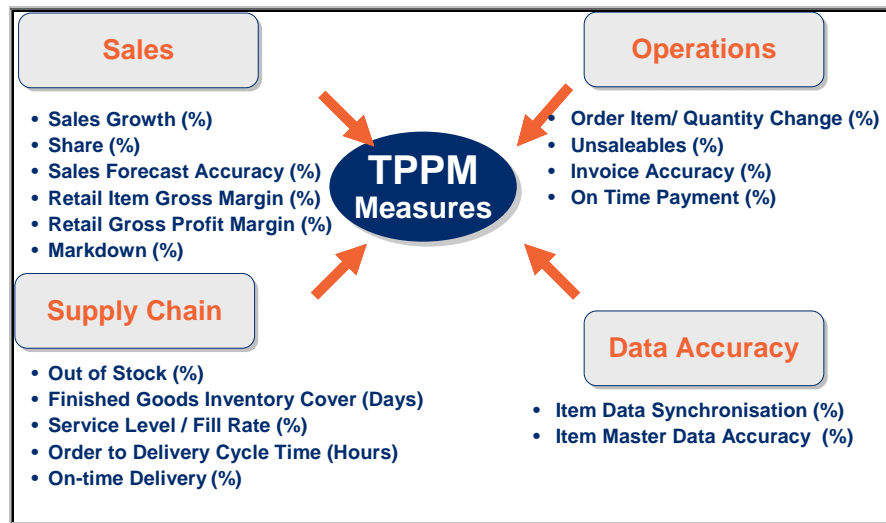
In any particular relationship, it is unlikely that all of the TPPM measures will be used. On the other hand, there may be additional measures that are unique to one organization or trading relationship. Most companies select a foundation set of values to monitor the basics of business performance, supplemented by one or two measures that correspond to strategic initiatives.

For example, if a retailer is working on improving the responsiveness of their supply chain, they might focus on the service level / fill rate, order-to-delivery cycle time and on-time delivery measures, while providing sales growth and share values for context.

Some companies already have proprietary scorecards that they use with trading partners. To gain the benefits of a global standard for scorecarding, they must consider how the GS1 TPPM measures, definitions and formulas represent their needs. Figure 11-6 provides a decision matrix that trading partners could use to select the measures and calculation alternatives to migrate their existing scorecards.

If proprietary measures are still required, they should be clearly documented, including:

■ Precise definition

■ Common aliases

■ Mathematical formula

■ Scope, location, and timing of measurement

■ Detailed examples

The GS1 Performance History message does not support proprietary measures.

Figure 11-6 Measure Selection Decision Process
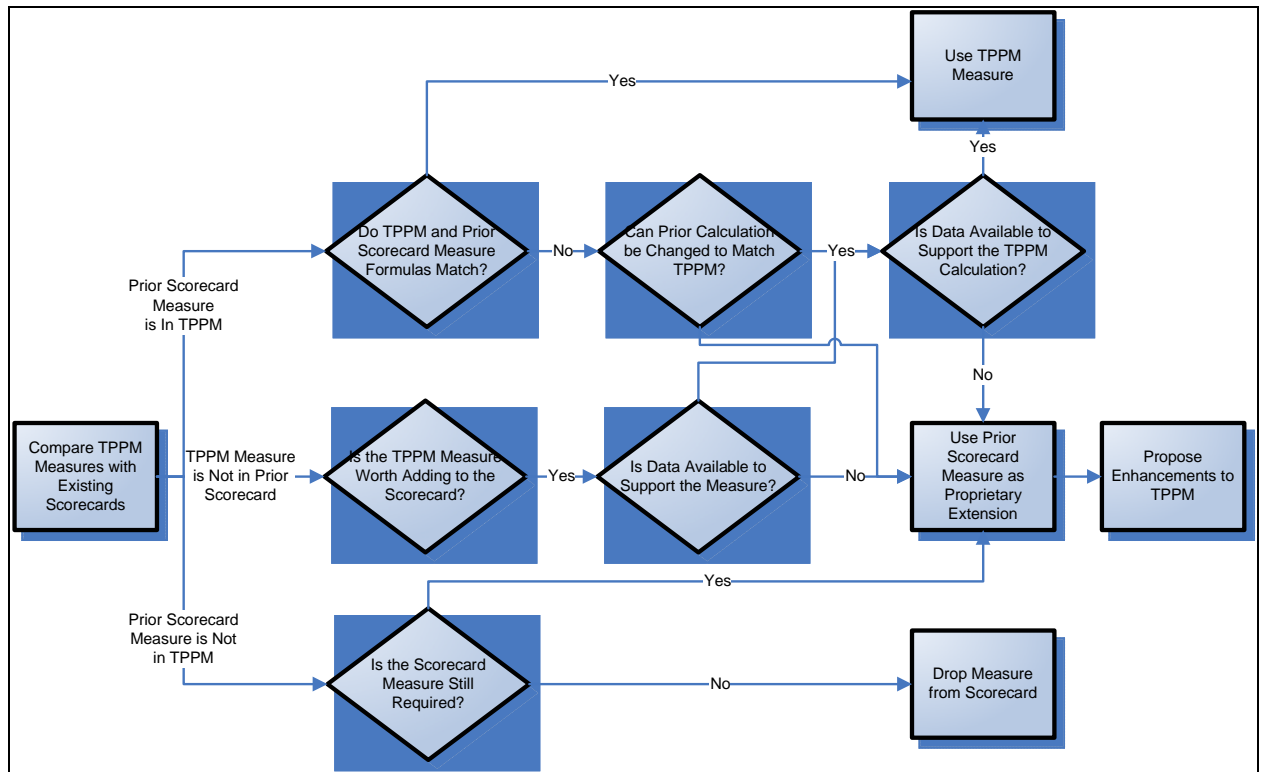
It is not always practical for measure selection to be collaborative. For the sake of efficiency, one trading partner (typically the customer) may establish the set of measures to be used across all relationships based on the data that is available.

11.2.2. Select Measurement Levels

The TPPM specification allows data sharing at virtually any level of detail, as shown in Table 11-1. However, to reduce complexity, most trading relationships will select the minimum number of data points that can describe the health of the business. Once they identify an issue or opportunity through the trading partner performance measures, buyers and sellers can "drill down" to transaction data (exchanged through other GS1 or ANSI standards) to investigate in more detail.

Table 11-1 Standard TPPM Measurement Levels

| Product Scope	Location Scope	Timeframe
GTIN	Stocking Location	Day / Week / Month
Item	Store	Quarter / Year
Style / Color / Size	Store Region / Cluster	Month to Date
Flavor	Zone / Area / Channel	Quarter to Date
Variety	DC / Plant	Year to date
Brand	Lane or Route	Rolling 4-week Period
Class / Subclass	Postal Code	Rolling 13-week Period
Category / Department	City / State / Country	Rolling 12-month Period
Line of Business	Geographic Region	Time-Independent
Trading Relationship	Geographic Subregion	
Total	Total	

Measures should be shared at a level of aggregation where there is a reasonably stable basis of comparison. For example, many product lifecycles are a year or less, making it impractical to measure year-over-year sales growth at the level of individual items. Usually, the product class, category or brand is a more useful level for measuring ongoing sales performance. Similarly, in location terms, sales trends in a particular store may be of interest for diagnostic purposes, but they do not typically represent enough volume to be significant to the overall performance of the trading relationship. Goals and measures set at a region, country or global geographic level are likely to yield insights that trading partners can leverage.

11.2.3. Align Required Reference Data (Master Data)

Many performance measures are calculated at an aggregate level of products and/or locations. Typical examples include category-level sales, brand-level share and regional supply chain performance. In order to get an accurate understanding of performance, both trading partners must be aware of which items fall within which categories, and which locations are within which regions. This alignment must be maintained in the face of ongoing item introductions, location openings and closures, and periodic reorganizations.

The GS1 Global Data Synchronisation Network (GDSN) is a vital contributor to maintaining item data alignment. It allows manufacturers to publish their items and item attribute data to the marketplace, and for retailers and distributors to subscribe to the items that they need. Figure11-7 depicts how the GDSN operates, with local data pools and a common global registry. Its use is highly recommended, though not required to participate in a TPPM initiative.

Figure 11-7 GS1 Global Data Synchronisation Networks
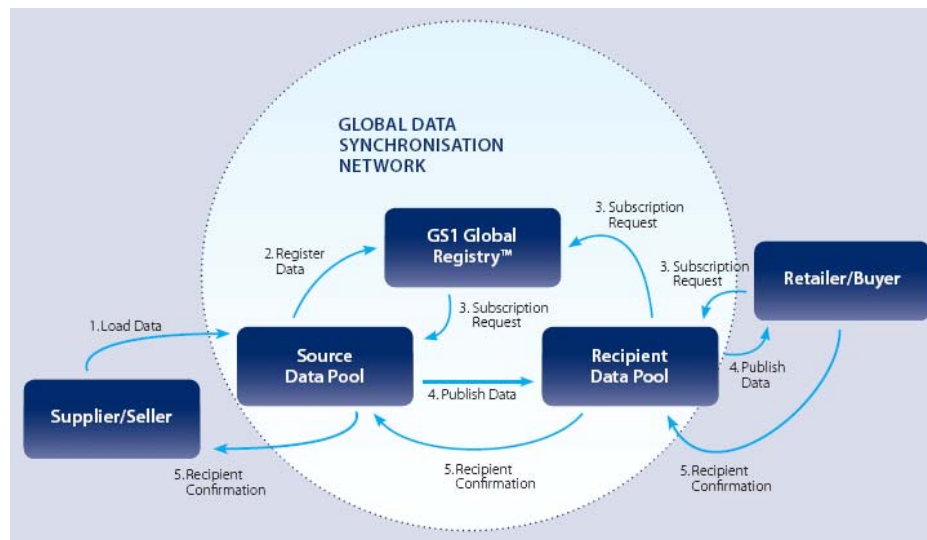
Source: GS1

GS1 Global Product Classification (GPC) bricks also provide a common basis for identifying groups of items that may fall into a product category, class or subclass. However, note that many TPPM measures are relative to a particular customer's or supplier's own categorization scheme, which may deviate from the standard item categories. Trading partners must agree on an approach to align their understanding of these proprietary classifications, whether through a direct data interchange, or via a third party master data management approach.

11.2.4. Select Measure Parameter Alternatives

The results of any TPPM measure calculation can vary significantly depending upon the parameter selections that are made. Companies must agree not only on the measures, but on the parameters that will be used in each case. Table 11-2 summarizes the alternatives that are available in the GS1 TPPM standard. The TPPM Work Group has recommended an alternative in most cases (shown in bold), but retailers and suppliers can negotiate the parameter selections that make the most sense for their relationship.

Table 11-2 Parameters for TPPM Measures

Measure	Parameter	Values
On-Time Delivery %	Delivery time measurement basis	P.O. need-by date First appointment time Last appointment time
Out-of-Stock %	Out-of-stock measurement method	Manual audit Perpetual inventory Sales data analysis RFID / EPC Other
Finished Goods Inventory Cover	Inventory basis	On hand only Pipeline inventory included
Finished Goods Inventory Cover	Demand estimation basis	Forecast basis Historical basis

| Measure	Parameter	Values
Fill Rate / Service Level %	Service level measurement basis	Shipped quantity Received quantity
Retail Item Gross Margin %	Cost allocation basis	Miscellaneous costs excluded Miscellaneous costs included
Sales Forecast Accuracy %	Forecast type	Total Promotional Baseline
Item Data Synchronisation %	Synchronization calculation type	Total items Incremental items

11.2.5. Identify Data Sources

Both the buyer and seller may contribute data and or results in the trading relationship. For example, the customer has the best information about sales growth, but the supplier has the best information about order changes. In most scenarios, the majority of the data originates with the buyer.

11.2.6. Set Goals and Thresholds

Goals should be set relative to the trading relationship's business objectives and technical capabilities, which have been established through a joint planning process or by a benchmark for a class of trade, set of suppliers or some other cohort group. They must also respect the technical capabilities of each organization to get access to the data. Goals should be set relatively infrequently, following the business cycle of the relationship. They typically should not be revised mid-cycle, unless there is a fundamental change in business conditions, or errors were made in the goal-setting process.

Goals may be set in terms of a lower bound or an upper bound for a measure. Sales measures such as sales growth typically set a lower bound for performance, beyond which any increase is considered favourable. Some other measures, such as order cycle time, set their goal as an upper bound; lower numbers are always better. Finally, some measures may have both an upper and lower bound. Inventory cover must neither be too low (indicating an under stock or out-of-stock condition) or too high (highlighting an overstock condition). See Figure 11-8 for examples of upper and lower bound goal setting.

Figure 11-8 Examples of Minimum and Maximum Goals
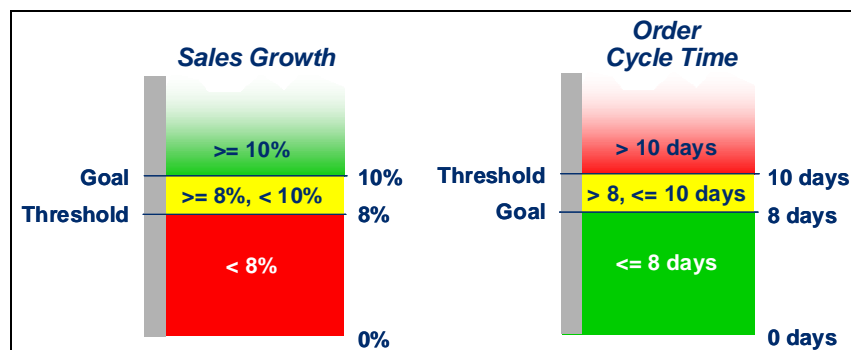
Goals at an aggregate level tend to be nearly constant, while those at a more detailed level can be highly dynamic. Detailed goals must reflect seasonality, promotions, expected competitor activity and any other condition that makes one week or month unlike the next. Statistical forecasts can be used to set detailed sales growth goals, alternatively, the trading partners may apply the sales growth goal percentage equally to each period based on historical results. When the time interval being measured

is short (e.g. weekly), these methods must consider holidays (such as Easter) that fall on different weeks in subsequent years, as well as shifts in calendars (such as the 53rd week in one out of every five business years).

Figure 11-9 shows the goal configuration for a TPPM project. In this example, sales measures have goals at a category/brand level, while supply chain measures have goals at a regional level. Operational measures have a single goal for the entire trading relationship.

Figure 11-9 Sample Goal Configuration

		Category/Brand Goals (All Regions)			
	Total	Category 1	Category 2	Brand A	Brand B
Sales Growth (Monetary Basis)		4%	5%	6%	-2%
Sales Growth (Unit Basis)		2%	0%	5%	-6%
Share (Supplier Share of Retail Category)		37%	49%	31%	18%
Retail Item Gross Margin Percentage		23%	27%	29%	24%
		Regional Goals (All Items)			
	Total	Region 1	Region 2	Region 3	Region 4
Finished Goods Inventory Cover		7 days	10 days	10 days	14 days
On-Time Delivery Percentage		96%	95%	95%	92%
Order Cycle Time		5 days	6 days	6 days	8 days
Service Level / Fill Rate		95%	95%	95%	95%
Item Data Synchronisation Percentage	100%				
Item Data Accuracy Percentage	95%				
Order Item / Quantity Change Percentage	5%				
On-Time Payment Percentage	98%				
Invoice Accuracy	99%				
Unsaleables Percentage	1%				

Some goals are interdependent. In the example, the supplier has two brands (A and B) in Category 2. One brand is expected to grow by 6%, while the other's sales are expected to decline by 2%. As a result, the overall sales growth objective for the supplier's items in Category 2 are the weighted average of the growth goals for Brands A and B (5%). The goal for share should similarly apply the expected sales growth to current sales to produce realistic numbers.

In addition to a goal, some trading relationships set a threshold that distinguishes a level of performance that marginally misses the target from critical shortfalls that require immediate action. A typical portrayal is a "green light" status for meeting or beating the goal, "yellow light" status for falling somewhat short of the goal, and "red light" status for being far off of the goal. Figure 11-10 shows an example of such a scorecard display.

Figure 11-10 Sample Scorecard Stoplight Display
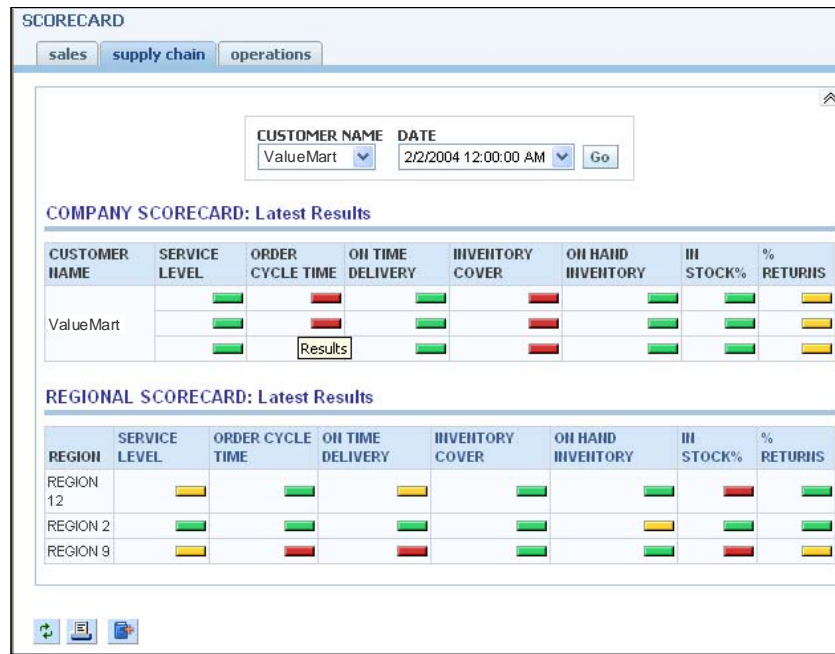
To simplify interpretation of red vs. yellow status, some trading relationships adopt a consistent rule for all measures (within 20% of goal is yellow, beyond is red). However, thresholds should reflect the volatility and scale of the data. A single category's sales falling 6% below goal for one week might not be a great cause for concern, but sales across all products falling 6% below goal for the year would be a disaster.

11.3. Implement

11.3.1. Set Frequency of Measurement

The frequency of measurement depends upon the performance objective, which may be tactical or strategic, as well as the velocity of the distribution channel.

In tactical applications, results should be shared and compared with goals frequently enough to give trading partners the opportunity to take corrective action when business conditions change, but not so frequently that the data is either incomplete or so volatile that it gives false indications of a performance trend.

As shown in Figure 11, many retail businesses' sales and supply chain processes operate in a weekly rhythm, making weekly evaluation possible. In this case, goals must be set carefully to reflect business events that affect particular weeks, such as major promotions and holidays.

Corporate operations and financial processes often operate on a monthly cycle, making a monthly evaluation more effective for those measures. For simplicity's sake, many trading relationships will align all of the measures that they share to the same period type (e.g. monthly), though the specification does not require this.

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Figure 11-11 Frequency of Measures
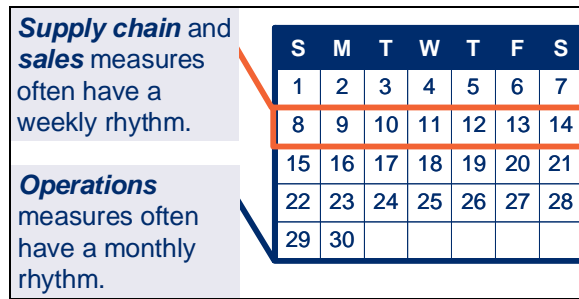
Tactical measures give immediate feedback, but they do not always give the best indication of the overall state of the relationship. Many initiatives will share both the latest short-term results (prior week or month) along with more "strategic" results for the most recent quarter, year-to-date or past twelve months.

11.3.2. Set Timeliness of Delivery

The timeliness of data is an important consideration. Many retailers can produce sales data overnight that is accurate enough for aggregate performance measurement. Sales growth, the manufacturer's share of the retailer's category, retail gross margin and forecast accuracy for a Sunday-to-Saturday week could be exchanged on the next day (Sunday). On-time delivery, service level and order cycle time can also be calculated on an ongoing basis, enabling immediate data sharing. However, financial processes such as on-time payment and invoice accuracy percentage may require more time, depending on the companies' information systems infrastructure. Share calculations that require syndicated data (e.g. retailer's share of market) also require greater lead times for preparation.

As a result of varying data delivery schedules, trading partners may receive data for the prior week for some measures, for the three-week-prior period for others, and for the prior month for a third group. Buyers and sellers have the option of withholding data until the results are available for all measures, but that compromises the value of the more immediate measures. Trading partners should rather take care to correlate the performance information they receive with the appropriate period, to avoid mixing results from different weeks or months.

In projects that have multiple parties, companies typically set a "cut off" date and time by which data must be received in order to be considered for that week's (or month's) results calculations. Figure 11-11-12 shows an example of a cut-off period that ends at Midnight Sunday. If an inadequate amount of data is received to produce a useful result, no result is reported for that period. Some systems can continuously update data so the latest results for any particular measure can be reviewed.

**Figure 11-12** Weekly Results Processing Cut-off Period
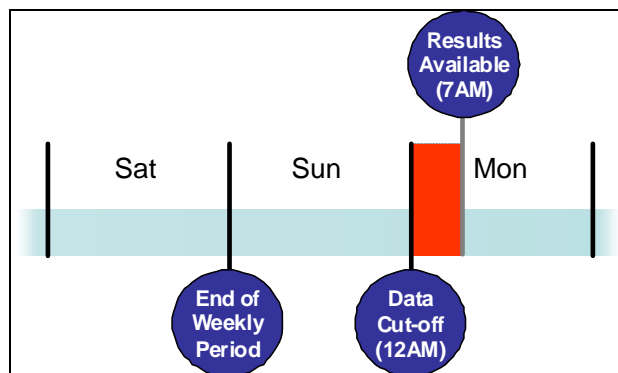
Inevitably, there will be occasions when restatements will be required. Buyers and sellers need to have some indication of when restatements occur, so that they can be aware that their performance may have changed.

The forecast accuracy measure is based upon lagged forecast values. Some trading relationships may choose to share forecast accuracy for multiple lag periods for the same product/location/time combination. While this is more strictly a case of versioning rather than restatements, it reflects a need to deal with data calculated at multiple times for the same period.

11.3.3. Provide Contextual Data

The companies should agree on the amount of contextual data that is required to support effective analysis. When a relationship is set up, it is recommended that partners provide historical results (typically for a year or more – sometimes up to five years). They may also provide the underlying historical data that was used to generate the results, as shown in Figure 13. By providing the point-of-sale history, shipment history, on hand inventory information and other source data, the trading partners give each other a basis for investigating issues and looking for patterns based on prior incidents. Providing the underlying data also gives trading partners the opportunity to harmonize measures across trading relationships that use incompatible formulas for calculating their key performance indicators.

Figure 11-13 Business Transaction Data Used to Calculate GS1 TPPM Measures
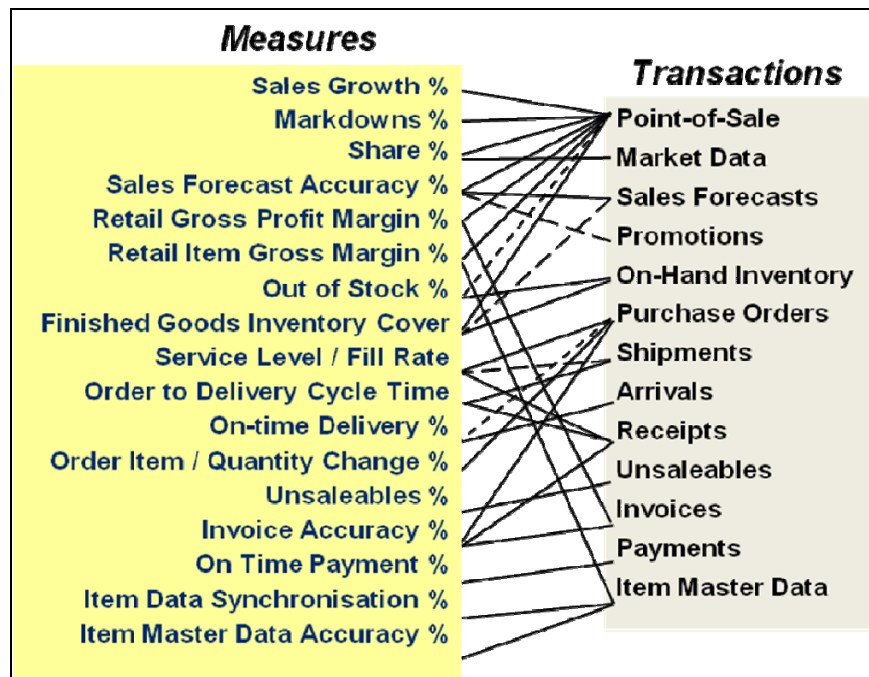
There are standards-based approaches to share much of this data, but for certain measures (such as item data synchronization %), some or all of the information does not a corresponding eCommerce standard message. Table 11-3 summarizes the available transaction sets that supply underlying data to perform the measure calculations. Where there are gaps, the TPPM Work Group is highlighting the potential requirement for new transactions to other GS1 work groups.

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Table 11-3 eCommerce Standard Sources of Underlying Data for TPPM Measure Calculations

		Available Supporting E-Commerce Transactions		
Data	**Relevant Measures**	**GS1 XML**	**EANCOM EDI**	**X.12 EDI**
Point-of-Sale	Sales Growth % Share % Retailer Item Gross Margin % Sales Forecast Accuracy %	eCom Product Activity	Sales Report (SLSRPT)	Product Activity (852)
Sales Forecasts	Sales Forecast Accuracy %	eCom Forecast	Sales Forecast Report (SLSFCT)	Planning Schedule with Release Capability (830)
Market Data	Share %	N/A	N/A	N/A
Purchase Orders	Order Item / Quantity Change % Service Level / Fill Rate Order-to-Delivery Cycle Time On-Time Delivery % Invoice Accuracy %	eCom Order	ORDERS	Purchase Order (850) or Grocery Order (875)
Shipment Notifications	Service Level / Fill Rate1	eCom Despatch Advice	Despatch Advice (DESADV)	Advance Ship Notice (856)
Arrivals	On-Time Delivery %	eCom Receiving Advice	Receiving Advice (RECADV)	Delivery/Return Acknowledgement (895)
Receipts	Order-to-Delivery Cycle Time Service Level / Fill Rate2	eCom Receiving Advice	Receiving Advice (RECADV)	Delivery/Return Acknowledgement (895)
Unsaleables	Unsalesables %	eCom Inventory Activity or Inventory Status	Inventory Report (INVRPT)	
Invoices	Invoice Accuracy % Retailer Item Gross Margin % Retailer Gross Profit Margin %	eCom Invoice	Invoice (INVOIC)	Invoice (810) or Grocery Invoice (880)
Promotions	Sales Forecast Accuracy %3	eCom Retail Event	Price Catalogue (PRICAT)	Promotional Announcement (889)
On-Hand Inventory	Out-of-Stock %	eCom Product Activity eCom Inventory Activity or Inventory Status	Inventory Report (INVRPT)	Product Activity (852)

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[1] Only relevant when service level / fill rate is calculated based on quantity shipped (rather than quantity received).
[2] Relevant when service level / fill rate is calculated based upon quantity received.
[3] Only relevant when forecast accuracy % is based on a promotional forecast type.

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11.3.4. Assign User Roles

The TPPM specification itself does not reference individual users or roles. However, some teams are naturally more concerned with particular measures based on their role. While everyone may get visibility to the results, particular roles (as shown in Figure 11-14) may take the lead in responding to issues and opportunities that specific measures reveal.

Figure 11-14 Lead Role Assignments for Trading Partner Measures
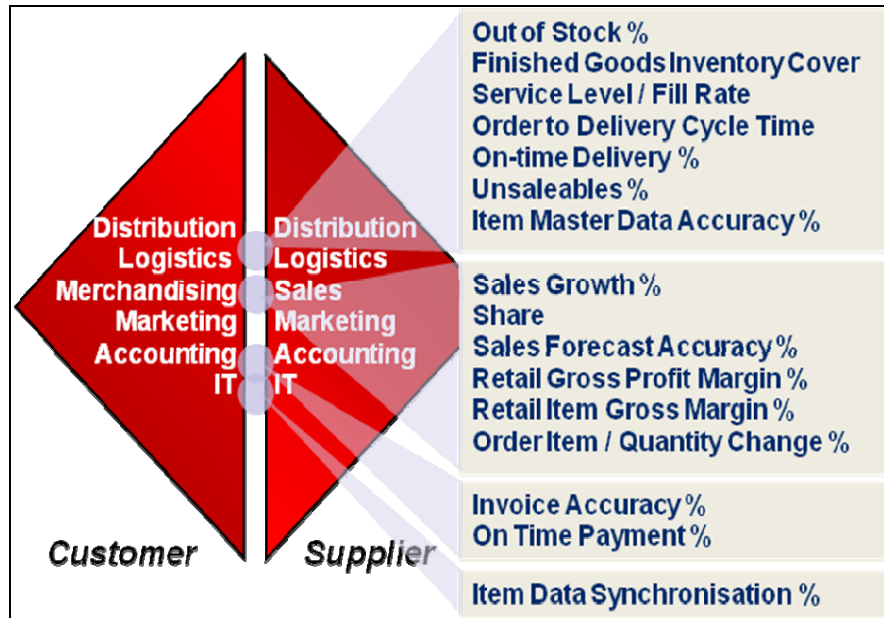
TPPM does not establish any policy for data sharing with third parties, or define security beyond what is provided by the underlying data transport mechanism and data management facilities at either end of the trading relationship. Nonetheless, trading partner performance data is highly sensitive, and any implementation of TPPM must carefully consider data security and user access rights.

Some companies' policies may require data for one company to be physically segregated from that of its competitors. Some users should only see results for one trading relationship. Others may be allowed to review summary results, but not the data for individual stores. Finally, some users may have access to one type of data (e.g. supply chain measures), but not be privy to financial results for a trading relationship.

11.3.5. Deploy Information Systems

See section 10.1, Information Systems Deployment for more information on this step.

11.4. Manage

11.4.1. Transmit Measures and Data

See section 10.2, Measure and Data Transmission

 for more information on this step.
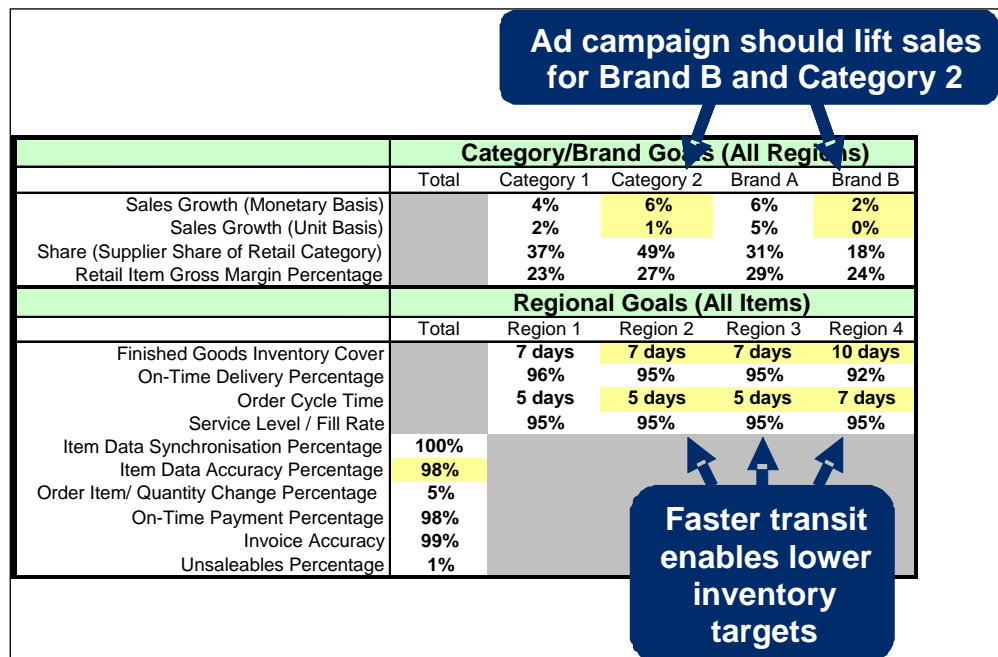
11.4.2. Respond to Issues and Opportunities

The most critical step in the performance management process is taking action to yield better results – both short and long term. Long term improvements typically come from making fundamental changes to operating procedures or rules of engagement. The trading partners should consider which major joint initiatives they want to pursue as an outcome of their joint business plan, and monitor progress through their scorecarding process.

More tactical performance results may point the way to more basic problems that can be solved on an ad hoc basis. These could include pricing errors that cause invoice accuracy problems, or issues with a particular carrier or facility that hamper on-time delivery performance. If team members across the organization have clear visibility to issues as they arise through TPPM, they can address them before they have a long-term impact on performance.

11.4.3. Periodically Reassess Goals and Measures

Business conditions change over time, making some existing goals and measures obsolete. Trading partners should periodically reassess their goals, thresholds and measure selections to ensure that they are still relevant. In Figure 11-15, a national advertising campaign results in a higher sales target for Brand B and Category 2; meanwhile, faster transit times drive lower goals for Region 2, 3 and 4 cycle time and inventory cover.

Figure 11-15 Revising Goals Based on Changing Business Conditions

	Total	Category 1	Category 2	Brand A	Brand B
Category/Brand Goals (All Regions)					
Sales Growth (Monetary Basis)		4%	6%	6%	2%
Sales Growth (Unit Basis)		2%	1%	5%	0%
Share (Supplier Share of Retail Category)		37%	49%	31%	18%
Retail Item Gross Margin Percentage		23%	27%	29%	24%
Regional Goals (All Items)					
	Total	Region 1	Region 2	Region 3	Region 4
Finished Goods Inventory Cover		7 days	7 days	7 days	10 days
On-Time Delivery Percentage		96%	95%	95%	92%
Order Cycle Time		5 days	5 days	5 days	7 days
Service Level / Fill Rate		95%	95%	95%	95%
Item Data Synchronisation Percentage	100%				
Item Data Accuracy Percentage	98%				
Order Item/ Quantity Change Percentage	5%				
On-Time Payment Percentage	98%				
Invoice Accuracy	99%				
Unsaleables Percentage	1%				

Ad campaign should lift sales for Brand B and Category 2

Faster transit enables lower inventory targets

Ultimately, the TPPM process should become an integral part of the weekly, quarterly and annual rhythm of events in the trading relationship.

11.5. For More Information

A number of other resources can help address issues that project teams face in a TPPM initiative:

Setting Priorities: The Global Commerce Initiative (GCI) has published a vision of how consumer needs could evolve over the next several years, and how the industry should adopt new ways of working together (and enhanced information sharing) to respond. The document is available at www.gci-net.org/gci/content/e29/e1525.

- ■ *Gaining Organizational Commitment:* The New Ways of Working Together initiative provides a number of resources at www.gmaonline.org/industryaffairs/newways.htm, including an industry framework document, a guide to developing business cases and a comprehensive study on out-of-stock reduction.

- ■ *Joint Business Planning:* An overview of VICS CPFR can be found at www.vics.org/committees/cpfr/CPFR_Overview_US-A4.pdf.

- ■ *Measure Selection:* The GCI Global Scorecard business measures that form the basis for the GS1 TPPM measure set can be found www.globalscorecard.net.

- ■ *Data Alignment:* More information about the GS1 Global Data Synchronization Network (GDSN) and GS1 Global Product Classification (GPC) can be found at http://www.gs1.org/services/gsmp/kc/gdsn/index.html.

12. Test Scenario Summary

Test Scenario ID	Description	Rule ID	Requirement ID	Use Case ID
	Not Applicable			

13. Adherence to Architectural Principles

#	Architectural Principle	Does BRAD Adhere?	Comment
1	The requirements in the BRAD maintain the GS1 keys as the primary, mandatory identifiers.	Yes	
2	The requirements in the BRAD do not alter the formats of primary identifiers and comply with data elements as defined in the Global Data Dictionary.	Yes	
3	The requirements stated in the BRAD are backwards compatible according to the stated scope in the document. The document scope explicitly states whether requirements included in document are backwards compatible.	TBD	Backward compatibility will be determined during the BSD phase.
4	All business requirements contained in the BRAD come from trading partners or representatives with a genuine intention to implement the standards when developed. All requirements are driven by the business needs of the trading partners.	Yes	
5	The business requirements contained in the BRAD do not violate consistency of the data architecture within each layer and between each layer of the GS1 System. For example, requirements do not alter a key used across GS1 standards or alter a reusable object without applying this change across related standards.	Yes	
6	The business requirements take into consideration the potential impact of the standard, especially with respect to implementation and maintenance. Any potential known impact is documented in the BRAD.	Yes	

#	Architectural Principle	Does BRAD Adhere?	Comment
7	The business requirements take into consideration the potential scalability of the standard. Any potential known impact to scalability is documented in the BRAD.	Yes	
8	The business requirements take into consideration data and process interoperability. For example, any shared objects between interoperable messages must remain consistent. Any potential known impact to interoperability is documented in the BRAD.	TBD	Interoperability will be determined during the BSD phase.
9	The business requirements in the BRAD do not threaten the standardisation of the interfaces of the GS1 System. Interfaces are not limited to references to technology but also include such ideas as business interfaces and process interfaces.	Yes	
10	The business requirements in the BRAD do not create duplications with existing GS1 components. If there are potential duplications, these are documented within the BRAD with a stated rationale for the duplication.	Yes	
11	The business requirements in the BRAD do not impose implicit or explicit restrictions of any technology.	Yes	
12	The business requirements in the BRAD take into account a global perspective. All local (Industry or Geopolitical) requirements have a suitable rationale to explain why they cannot be handled globally. For example, a Boolean indicator of a specific regulation as opposed to a generic code list covering multiple regulations.	Yes	

14. Glossary of Terms

http://gdd.gs1.org

15. Summary of Changes

Change	BRAD Version	Associated CR Number
Initial Draft for ■ Executive Overview – Business Opportunity – Business Justification – Business Needs ■ Scope ■ General Definition ■ Structured Business Scenarios	0.1.0	07-000283
Incorporate all agreed upon measures into BRAD template. In preparation for F2F meeting in Dallas TX March 13 and 14.	0.2.0	Not Applicable

Change	BRAD Version	Associated CR Number
Incorporated and prep for GSMP Brussels Meeting on April 14. ■ Added Implementation Consideration ■ Added Use Case Analysis ■ Harmonized Measure ■ All sections completed for GS1 QA checks	0.3.0	Not Applicable
Edits prior to GSMP Brussels Meeting ■ Addressed enquiries from GCI community regarding Item Data Accuracy which has been renamed to Item Master Data Accuracy ■ Incorporated Parameter Value Codes ■ Addressed enquiries from VICS regarding Sales Forecast to incorporate Order Forecast ■ Modified Finished Goods Inventory Cover Definition to include Pipeline inventory as a parameter	0.3.1	Not Applicable
Edits from GSMP Brussels Meeting and handoff to GS1 Peer Review Quality Assurance. Item Master Data Accuracy Amended Formula ■ Numerator = Number of Items Passing Physical Verification/ ■ Denominator = Total Number of Items Physically Verified against the Number of Item Passing Physical Verification	0.3.2	Not Applicable

Incorporate GS1 Quality Peer Review
■ Updated Parameter Table
    o Changed Item Scope Value to Item Scope Description
    o Changed Location Scope Value to Location Scope Description
    o Changed Time Stamp to Date Time Stamp
■ Updated Use Case section 8.1
■ Corrected Typos
■ Updated BRAD File Name accordingly to GS1 Methodology
	0.3.3	Not Applicable

Based on GSMP Washington DC 2008 Fall Event ■ Update based on Public Review resolution ■ Reference Public Review_TPPM_Resolution_for details. ■ Added Markdown Measure ■ Added Architectural Principles	0.3.4	Not Applicable
Updated document status to Issue eBallot Approved	0.3.5	Not Applicable