

# Product Profitability Analytics Performance Blueprint





## **Product Profitability Analytics Performance Blueprint**

This document explains the content of a Web-based performance solution for financial analytics that specifically focuses on product profitability. The solution is an asset for analyzing product profitability performance data that can help management make faster decisions by providing multiple metrics for multiple business perspectives.

IBM Cognos Performance Blueprints are pre-defined data, process and policy software models developed in partnership with leading academic institutions. They are essentially "quick-start" data models that IBM customers can download and implement at no extra cost. Focusing on financial analytics and profitability analysis, the *IBM Cognos® Product Profitability Performance Blueprint* was developed jointly by the IBM Cognos Innovation Center for Performance Management and Breakaway Technologies Inc. (an IBM Business Partner).

This *Blueprint* is the first of its kind in the context of profitability modeling and optimization. It provides views of product profitability (both from a revenue and cost standpoint) from the highest company level to the lowest product stock keeping unit level. It even provides the means for understanding the impact of product level profitability on your company's EPS.

When you use the *Blueprint* with your IBM Cognos performance management system, you can clearly identify product performance and track it consistently and logically. Its foundation is the IBM Cognos performance management platform that capitalizes on the power of IBM Cognos TM1 (an in-memory OLAP engine) for analytical computations and presents the analytical insights gained in a highly contextual and intuitive user interface environment built on the IBM Cognos BI platform.

The main features and business value are as follows:

- Visualization of profitability by product
- Product profitability and inventory analysis
- Direct Product Profitability (DPP) analysis
- Product-channel profitability analysis-heavy allocations
- Costing engines integration
- Tie back into enterprise planning processes
- Contextual role-based analytical insight

The basis of this *Blueprint* is a scenario that features a hypothetical company, Entronics Co., Inc., a retailer of consumer electronic products such as televisions, receivers, DVDs and more. Entronics has four different sales channels: company owned retail stores, external retailers, membership warehouses and entronics.com (online).

## IBM Cognos TM1 data source overview

The TM1 data model consists of 14 TM1 cubes, of which two are used for analytics. These TM1 cubes are Finished Goods Inventory Analysis and Income Statement. The remaining TM1 cubes generate data for the Finished Goods Inventory Analysis and Income Statement in a controlled manner and are not necessarily examples of proven process practice. This section describes these cubes and explains the purpose of each.

#### Component cost

The dimensions for this cube are:

- Product SKUs
- Time
- Scenarios
- Components
- Component Cost

This cube builds up the component cost for each product SKU per unit. The receiver SKUs and the 65-inch flat panel television SKU are all outsourced and so have one component cost. The data from this cube populates the Unit Component Cost in the Income Statement, which in turn is used to calculate the Component Cost of units sold (Figure 1).

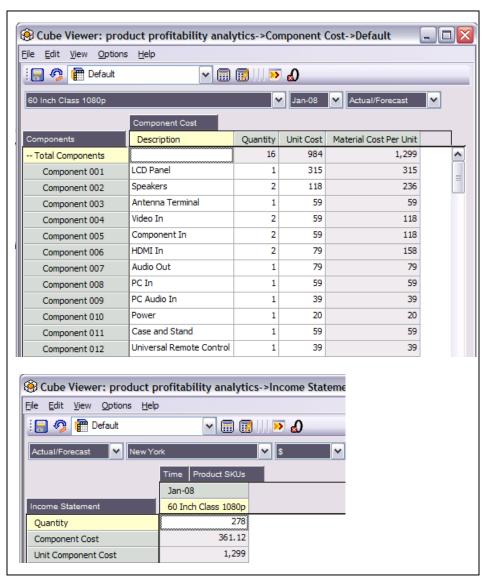


Figure 1. Component cost and Income Statement

#### **Cost of Funds**

The dimensions for this cube are:

- Annual cost of funds
- Scenarios
- Time

This cube (Figure 2) contains the annual percentage rate for the cost of funds. The Finished Goods Inventory Analysis cube uses it to calculate the Inventory Carrying Cost (based on the average period inventory), which in turn is linked to the Income Statement cube.

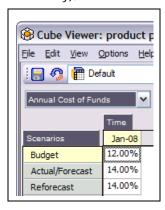


Figure 2. Cost of Funds cube

#### **Cube Size**

This cube contains the Product SKU "cube size" in cubic feet. It is the basis for calculating distribution cost in the Income Statement for all channels and the DPP calculation uses it in the Income Statement for Entronics retail stores.

## Days per Period

The dimensions for this cube are Days and Time. This cube contains the number of days per period. This is used in the Inventory Carrying Cost calculation.

#### **Direct Labor**

The dimensions for this cube are Product SKUs and Time. The scenarios are Direct Labor and Component Cost. This cube is similar to the Component Cost cube and calculates the product sku per unit labor cost. The Income Statement then uses it to calculate the per product sku direct labor cost for the volume sold.

## **Distribution Cost per Cubic Foot**

The dimensions for this cube are:

- Channels
- Scenarios
- Time
- Rate per Cubic Foot

This cube contains the distribution rate per cubic foot for each channel. It is used to calculate the distribution cost by product and channel in the Income Statement based on volume sold.

#### Finished Goods Inventory Analysis

The dimensions for this cube are:

- Product SKUs
- Time
- Scenarios
- Finished Goods Inventory Analysis

This cube calculates various inventory metrics (Figure 3).

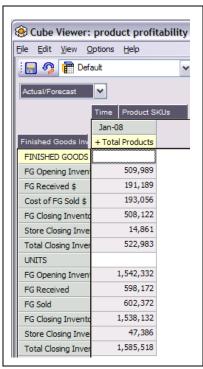


Figure 3. Finished Goods cube

#### **Income Statement**

The dimensions for this cube are:

- Scenarios
- \$ Percent of Sales
- Channels
- Time
- Product SKUs
- Income Statement

This cube calculates various income statement metrics (Figure 3). It is the main cube for driving the analytics.

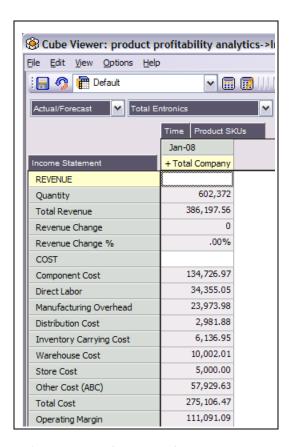


Figure 4. Income Statement cube

Manufacturing Overhead, Manufacturing Overhead Allocation and Product Relativity These three cubes are very closely related. The dimensions for the Manufacturing Overhead cube are:

- Scenarios
- Years
- Manufacturing Overhead

The dimensions for the Manufacturing Overhead Allocation cube (Figure 5) are:

- Scenarios
- Time
- Product SKUs
- Manufacturing Overhead Allocation

The dimensions for the Product Relativity cube are Product SKUs and Product Relativity.

These cubes calculate the per unit allocation of annual manufacturing overhead for each product SKU. This in turn is used in the Income Statement to calculate the manufacturing overhead based on volume sold.

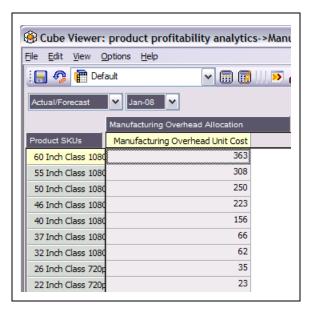


Figure 5. Manufacturing Overhead Allocation cube

#### **Store Cost**

The dimensions for this cube are:

- Store Cost
- Scenarios
- Channels
- Time

This cube contains the cost for each Entronics retail store. The *Blueprint* uses it to calculate the Store Cost in the Income Statement by product SKU.

## **Store Inventory**

The dimensions for this cube are:

- Scenarios
- Time
- Channels
- Product SKUs
- Store Inventory

This is the volume of inventory held in the store. It is used in the Direct Product Profitability calculation in the Income Statement.

#### Warehouse Cost

The dimensions for this cube are:

- · Warehouse Cost per Cubic Foot
- Scenarios
- Time

This cube contains the per cubic foot warehouse cost. It helps calculate the warehouse cost in the Income Statement base on volume sold.

## Blueprint scenario

Entronics Co., Inc., is a hypothetical manufacturer and retailer of consumer electronic products. Entronics has four different sales channels: company-owned retail stores, external retailers, membership warehouses and entronics.com (online).

Although Entronics has made its budgeted profit dollars in the last several quarters, it has most recently been affected by the ongoing economic slowdown. The company's CFO wants to uncover the factors and sources affecting profitability and implement operational improvements.

This *Blueprint* helps the CFO and his profitability analysis team members start analyzing what is seemingly a profitability problem at the company level and drill down to find the root causes—all while relating analytical insights gained from product profitability together with business contexts.

Two such areas that this Blueprint scenario focuses on are:

- Product profitability for the receiver product being affected because of disproportionately high inventory carrying costs
- Lower profitability from a particular flat panel TV (65-inch model) that consumes disproportionately higher shelf space relative to the profitability it generates

A simulated sandbox environment helps users visualize and understand the effect of certain proposed actions for correcting the profitability problem. Users can even see the effect of specific actions on the company's overall revised plans.

## **Uncovering Profitability issues**

The CFO dashboard (Figure 6) is the entry point into the *Blueprint*.

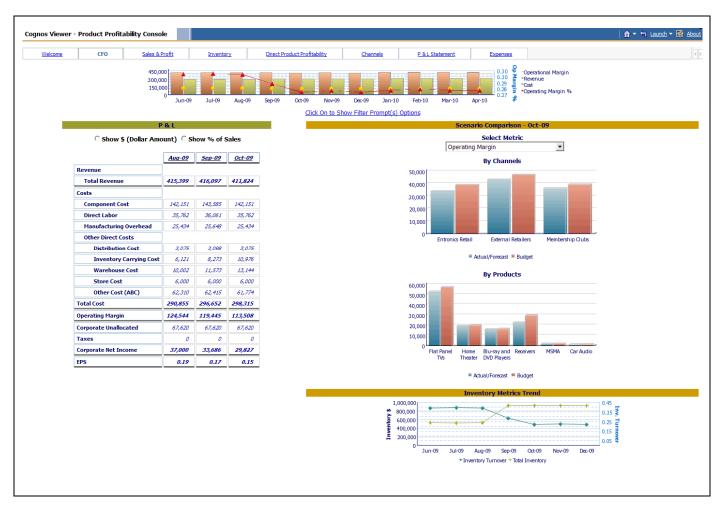


Figure 6. CFO dashboard

This dashboard provides the CFO with a snapshot of the company's overall performance. The CFO can view profitability metrics from the overall company level, down to an individual stock keeping unit (SKU) level and anywhere in between. Further, such visualization can be seen in the context of multiple dimensions of profitability such as time periods, sales channels and more.

In the dashboard shown in Figure 6, the CFO sees the following:

 A snapshot of performance for three months: last month, the current month and next month. Note that, although revenue is forecasted to increase in September 2009, the operating margins are expected to come down and this trend is expected to continue into October 2009 and EPS is forecast to drop from 17 cents in August to 15 cents (Figure 7) in October.

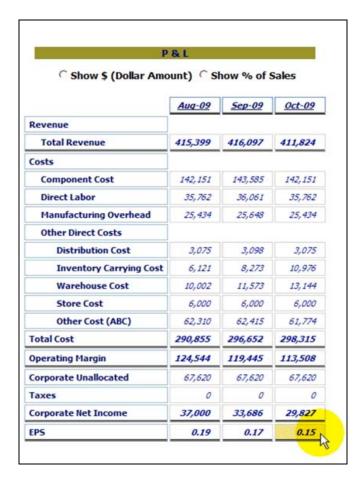


Figure 7. EPS projections

• There has been a spike in the inventory dollars during the same months and a corresponding drop in inventory turnover (Figure 8).

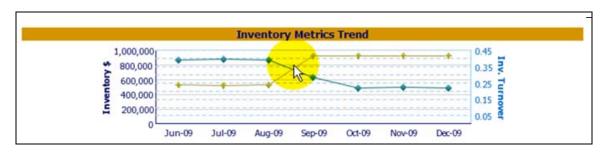


Figure 8. Inventory metrics trend

• Two major line items of expense, warehousing costs and inventory carrying costs (Figure 9), are the main cause of the drop in profitability.

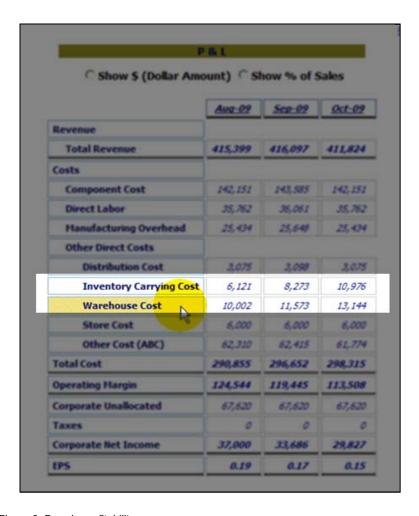


Figure 9. Drop in profitability causes

At this stage the CFO forms a hypothesis that inventory spikes are causing the projected drop in profitability and wants his team to investigate further.

The Director of Financial Performance and Analysis is responsible for product profitability, so she starts the investigation by working with the sales and profit dashboard (Figure 10).

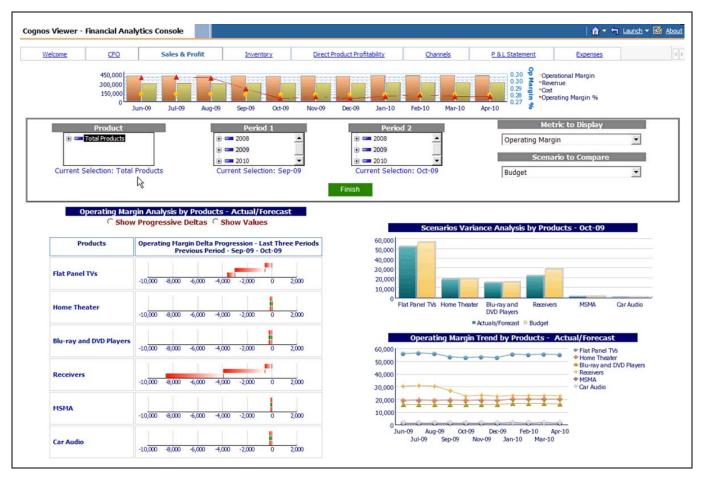


Figure 10. Sales and profit dashboard

The director selects different values from among the various prompts available (Figure 11) to build this page on the fly.



Figure 11. Prompts for sales and profit dashboard.

Right under the parameters, she sees the incremental "delta" graph (Figure 12), which highlights changes in operating profit from month to month for the various product families.



Figure 12. Incremental delta graph

The director can immediately see that two product families seem to contribute disproportionately to the drop in profitability for receivers and flat panel TVs (Figure 13).

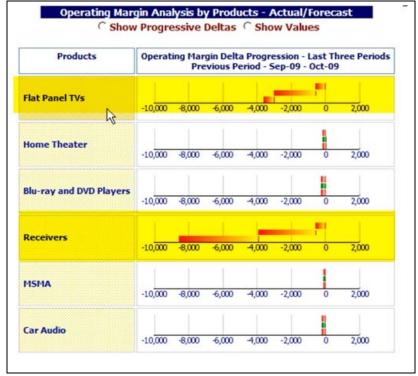


Figure 13. Receiver and flat panel TV performance.

She can also see that these are the very same product families that have a budget shortfall (Figure 14).

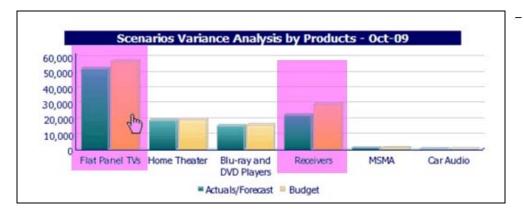


Figure 14. Variance by products

At the bottom of the sales and profit dashboard page, there are the top five and bottom five products that contribute to this change in profitability between September 2009 and October 2009 (Figure 15.).

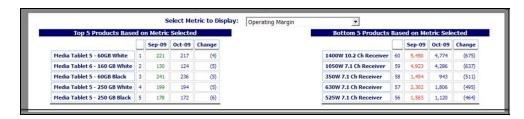


Figure 15. Top five and top bottom

The director is now aware that profitability has dipped between September 2009 and October 2009 and that two major product families, receivers and flat panel TVs, are causing the dip.

Equipped with this insight, the director wants to undertake some alternative analysis across some related dimensions to profitability before coming to some final conclusions. She realizes that she must perform a product profitability inventory analysis as her next step. The inventory analysis dashboard (Figure 16) is a good place to start.



Figure 16. Inventory analysis dashboard

In the doughnut chart to the right, you can see the inventory levels for all products and a corresponding table shows that receivers are accounting for 52% of all inventory at \$487 million (Figure 17).

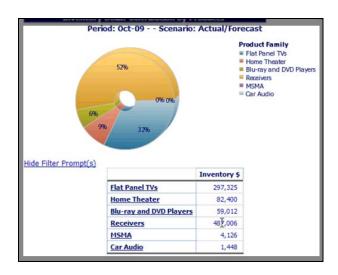


Figure 17. Chart showing inventory levels for all products.

Also, the Inventory Dollars/Inventory Turnover trend chart points to an anomaly during the month of September 2009 (Figure 18).

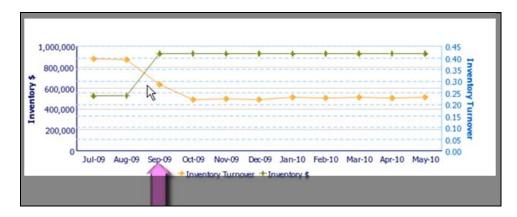


Figure 18. Anomaly in September 2009.

The director then runs the same report for only the receiver product family because of the huge amount of inventory holdings in that category.

In the new dashboard output, she sees the comparison of inventory dollars performance to the budgets for all receivers. What she sees from the bar chart, is that for all product SKUs in the receivers family, there is excessive inventory build up and a corresponding decline in inventory turns (Figure 19).

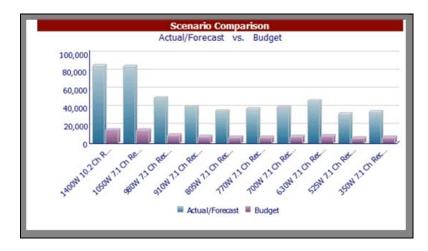


Figure 19. Inventory dollars performance

She calls the operations department and is able to confirm that a bulk shipment of receivers arrived from China during September, creating an abnormal increase in inventory and a deviation in performance. After talking to the operations teams, she further learns that the company agreed to the bulk shipment to take advantage of extra discounts.

Finally, before deciding on the next course of action, the director wants to determine the top and bottom products that caused this rise in inventory (Figure 20). What she notices is that receivers are among the poorest performers with respect to inventory dollars for the whole company.

	Delta	Previous Perio	d Oct-09
ledia Tablet 5 - 60GB White	<u>e</u> 7	686	693
ledia Tablet 5 - 60GB Black	7	592	599
VD HD Upconversion Black	9	5,926	5,935
VD HD Upconversion White	9	7,410	7,419
00W 5.1 Ch	10	12,822	12,832
	Delta	Previous Period	Oct-09
	221	85,796	86,017
1400W 10.2 Ch Receiver			
65 Inch Class 1080p	180	24,136	24,316
	180 174	24,136 84,602	24,316 84,776
65 Inch Class 1080p			

Figure 20. Top and bottom products

## **DPP** analysis

The director now wants to understand the second root cause of profitability problems: flat panel televisions. The inventory analysis screen indicates that there is a problem with the flat panel TV inventory. She wants to understand further if the inventory has any impact on store profitability because flat panel TVs use more space in retail stores, so the director loads the DPP analysis page (Figure 21).



Figure 21. DPP analysis page

DPP is the profitability generated by a product relative to the shelf space it occupies. It is widely used in the retail industry to optimize profitability based on merchandizing mix. When profitability is presented in these terms, non-finance business users can then take corrective action to achieve overall profit maximization. Such metrics help business and finance users analyze product profitability relative to the resource they are trying to optimize (in the case of DPP, it is the shelf space in a retail store).

On this page, the director sees that flat panel TVs are occupying a high percentage of the available cubic space and contributing the lowest in terms of operating margin (Figure 22). The size of the bubble (that measures the DPP) is also small. There clearly is a problem with flat panel TVs at the store level.

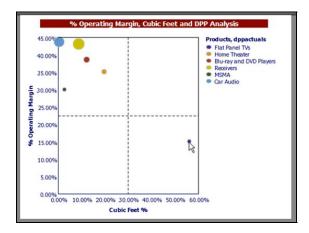


Figure 22. DPP bubble for flat panel TVs

She now wants to validate this further by looking at specific SKUs in the flat panel TV product family. She finds that, of all SKUs, the 65-inch flat panel TV has the lowest DPP. You can see this in the bubble graph and also in the bottom 5 products that contribute to low DPP (Figure 23).

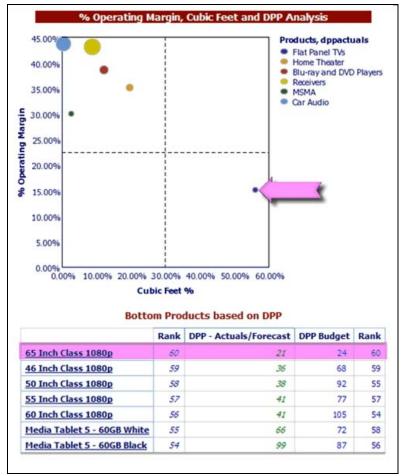


Figure 23. Flat panel TV analysis

The Director now decides to take corrective actions for the flat panel TVs.

#### **Proposed actions**

The following two problems related to profitability have been uncovered:

- A large shipment of receivers from China has created a substantial inventory and carrying cost increase and a corresponding drop in profitability.
- The high stock of flat panel TVs in the retail stores (particularly 65-inch TVs) has resulted in lower DPP and lower profitability.

To fix these problems, the director recommends the following actions:

Reduce the assortment of receivers that the company carries from 10 to a total of 5 SKUs. This action
cuts the amount of inventory they have to carry in half but still provides consumers with a good
selection of receivers. The director contacts her operations department to return the SKUs that will no
longer be carried to the vendor.

Reduce the store space allocation for the 65-inch Flat Panel TV because this particular model seems to
provide the least amount of profit relative to the shelf space that it occupies. The space saved from
removing almost 40% of the shelf allocated to the 65 inch model is allocated to other product lines in
retail store.

The *Blueprint* model has built-in processes to simulate these two scenarios in a sandbox. We can simulate it by clicking on specific processes. The IBM Cognos TM1 application has a sandbox pre-populated version with the proposed changes.

By reviewing the sandbox version, reforecast, the director can determine whether the profitability will improve with the proposed actions.

To visualize the changes, she logs into IBM Cognos TM1 Web and takes a look at the Finished Goods Inventory Analysis cube, focusing on the reforecast version in this cube.

On this page (Figure 24), she sees where the receivers have been returned to vendor and the corresponding reduction in inventory.

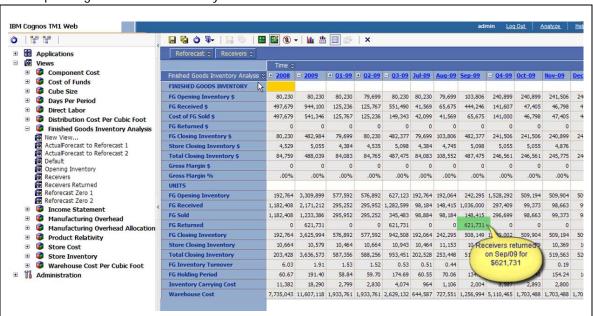


Figure 24. Reduction in receiver inventory

She can also see the effects of the proposed actions in the Business Intelligence Analytics dashboards.

When the inventory analysis dashboard page is loaded with the reforecast results for Receivers, the director sees certain improvements. First, the inventory dollars and inventory turnover trend chart shows improvement (Figure 25) because some of the receivers have been returned to the vendor.

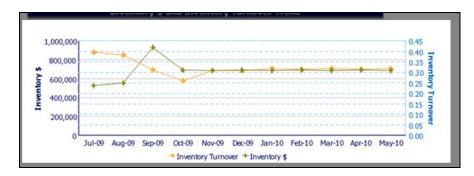


Figure 25. Inventory turnover trend improvements

Second, the effect of that return shipment on the outstanding receiver inventory now constitutes 36 percent of the overall inventory level of the company (Figure 26). That figure is down from 52 percent.

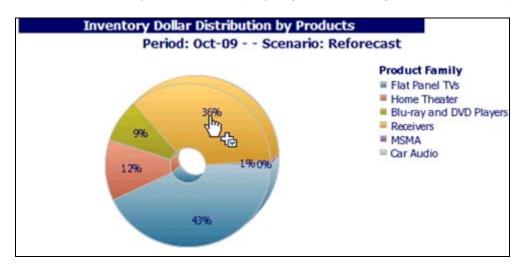


Figure 26. Drop in receiver inventory after reforecast

Third, the director sees a substantial improvement in inventory dollars (and corresponding turnover) in the reforecast relative to the actual/forecast.

On the DPP analysis page, the director can see the effect of reallocating store space away from the 65-inch flat panel TV to other product lines. The reforecast DPP has improved substantially relative to the actual/forecast (Figure 27). This means that the shelf space in the retail stores is being put to better use from a profitability standpoint.

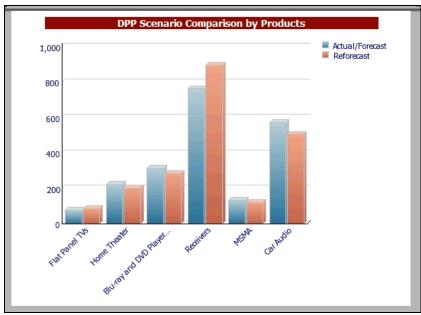


Figure 27. DPP improvement after reforecast

Finally, the director needs to see the effect of the actions on profitability. She loads the profit and loss page to compare the reforecast to the actual/forecast and sees that inventory carrying costs and warehousing costs have come down because of the receiver return (Figure 28). She also sees an improvement in retail store profitability because shelf space is being used better. So, the two actions she decided to take have resulted in improved operating margins for the company and a net addition of 0.04 cents to the EPS for October 2009.

	P & L Statement Analysis for Periods											
		Aug-09		Sep-09			Oct-09					
	Actuals/Forecast	Reforecast	Difference	Actuals/Forecast	Reforecast	Difference	Actuals/Forecast	Reforecast	Difference			
Revenue												
Total Revenue	415,399	415,399	0	416,097	465,349	49,252	411,824	425,298	13,475			
Costs												
Component Cost	142,151	142,151	0	143,585	167,339	(23, 754)	142, 151	147,552	(5,402)			
Direct Labor	35,762	35,762	0	36,061	36, 131	(69)	35,762	35,829	(67)			
Manufacturing Overhead	25,434	25,414	20	25,648	25,676	(29)	25,434	25,462	(28)			
Other Direct Costs												
Distribution Cost	3,075	3,075	0	3,098	3,242	(143)	3,075	3,082	(7)			
Inv Carrying Cost	6,121	6,265	(144)	8,273	6,998	1,275	10,976	8,069	2,907			
Warehouse Cost	10,002	10,088	(86)	11,573	10,621	952	13, 144	11,071	2,073			
Store Cost	6,000	6,000	0	6,000	6,000	0	6,000	6,000	0			
Other Cost (ABC)	62,310	62,310	0	62,415	69,802	(7,388)	61,774	63,795	(2,021)			
Total Costs	290,855	291,065	(210)	296,652	325,809	(29,157)	298,315	300,859	(2,544)			
Operating Margin	124,544	124,334	(210)	119,445	139,540	20,095	113,508	124,439	10,931			
Corporate Level												
Corporate Unallocated	67,620	67,620	0	67,620	67,620	0	67,620	67,620	0			
Taxes	19,923	19,850	73	18, 139	25, 172	(7,033)	16,061	19,887	(3,826)			
Corporate Net Income	37,000	36,864	(136)	33,686	46,748	13,062	29,827	36,932	7,105			
EPS	0.19	0.18	0.00	0.17	0.23	0.07	0.15	0.18	0.04			

Figure 28. Inventory carrying and warehouse costs after reforecast

This detailed understanding of product profitability has helped Entronics take corrective actions that result in improved profitability.

## Blueprint dashboards

The *Product Profitability Blueprint* has pre-developed content that addresses specific business needs for reporting such as the CFO dashboard, sales and profit, inventory analysis and so forth. This section briefly explains the structure of content for all the dashboards. Although the prompts and parameters (filters) available can be located in different positions in the dashboard viewer, they serve a similar purpose to allow global filtering.

#### CFO dashboard

This dashboard (see Figure 6) provides a multi-dimensional view of your organization's overall performance.

#### Sales and profit dashboard

The sales and profit dashboard (see Figure 10) provides views that help with trending and multi-dimensional analysis of your organization's sales and profit performance. Figure 29 shows the dashboard with a bar graph.



Figure 29. Sales and analysis dashboard with bar graph

#### Inventory dashboard

The inventory dashboard (see Figure 16) highlights the differences and similarities between multiple products and provides trending analysis for inventory data. Figure 30 shows the prompts available for this dashboard.



Figure 30. Inventory dashboard prompts

#### DPP dashboard

This dashboard (see Figure 21) provides multidimensional analysis of the DPP metric.

#### <L2>Channels dashboard

This dashboard (Figure 31) provides multiple views of profitability for different product levels.



Figure 31. Channels dashboard

## Profit and loss page

The profit and loss page (Figure 32) provides information about profit and loss for analysis of multiple parameters. Period, scenario (Figure 33) and product comparisons (Figure 34) are available for viewing.

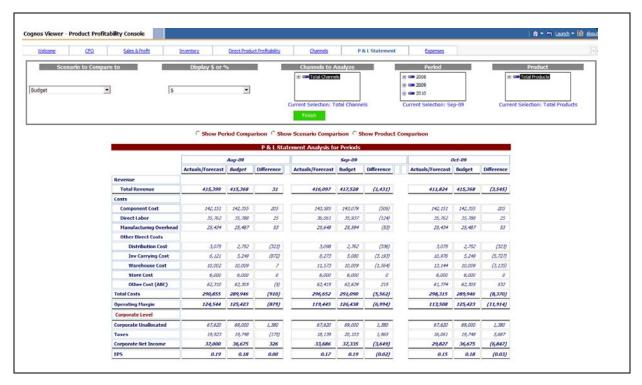


Figure 32. Profit and loss page

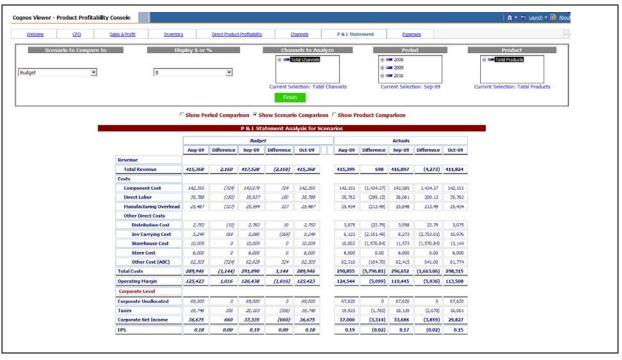


Figure 33. Scenario comparison

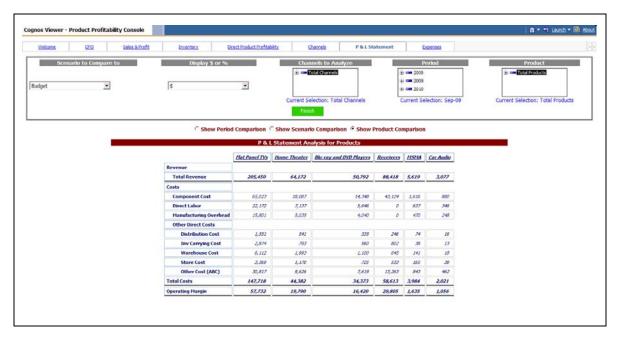


Figure 34. Product comparison

## Expenses page

This page (Figure 35) shows cost trending data at multiple levels.



Figure 36. Expenses page

## About the IBM Cognos Innovation Center for Performance Management

The IBM Cognos Innovation Center was established in North America and Europe to advance the understanding of proven planning and performance management techniques, technologies, and practices. The Innovation Center is dedicated to transforming routine performance management practices into "next practices" that help companies:

- Cut costs
- Streamline processes
- Boost productivity
- Enable rapid response to opportunity
- Increase management visibility

Staffed globally by experts in planning, technology, and performance and strategy management, the Innovation Center partners with more than 600 IBM Cognos customers, academicians, industry leaders and others seeking to accelerate adoption, reduce risk and maximize the impact of technology-enabled performance management practices.

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# IBM Cognos Innovation Center

for Performance Management



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