

**InfoSphere Warehouse Pack for
Customer Insight
in a Retail Environment**

Whitepaper

Contents

Executive Summary	Page 3
Chapter 1 <i>Support for Customer Profitability Analysis</i>	Page 4
Chapter 2 <i>Support for Customer Profiling</i>	Page 6
Chapter 3 <i>Business Questions around Customer Profitability</i>	Page 8
Chapter 4 <i>Business Questions around Customer Profiling</i>	Page 11
Chapter 5 <i>Components of the InfoSphere Warehouse Pack for Customer Insight</i>	Page 14

About This Paper

The purpose of this paper is to outline the components of the IBM InfoSphere Warehouse (IWH) Pack for Customer Insight and how these assist organizations in the retail sector to profile and measure the profitability of their customers.

This paper is divided into the following chapters:

Chapter 1, "**Support for Customer Profitability Analysis**" outlines a high level view of some of the issues facing Retail organizations in the area of Customer Profitability and how these are addressed by the IWH Pack for Customer Insight.

Chapter 2, "**Support for Customer Profiling**" outlines a high level view of some of the issues facing Retail organizations in the area of Customer Profiling and how these are addressed by the IWH Pack for Customer Insight.

Chapter 3, "**Business Questions around Customer Profitability**" describes a selection of typical business focused questions relating to Customer Profitability and how these can be answered.

Chapter 4, "**Business Questions around Customer Profiling**" describes a selection of typical business focused questions relating to Customer Profiling and how these can be answered.

Chapter 5, "**Components of the InfoSphere Pack for Customer Insight**" describes briefly the major components of the IWH Pack for Customer Insight.

Who Should Read This Document

- Customer Relations Executives
- Sales and Marketing Executives
- Buying and Merchandizing Executives
- Finance Directors and Board Directors
- IT, Operations Managers
- Business Intelligence practitioners

Retail Organizations need a coherent view of performance against targets and underlying trends

Executive Summary

Customer Insight

- Retailers generally deal with a wide range of products, many customers and very large volumes of transactions.
- Retail differs from many other business sectors in that many of its customers can be “unidentified” making it difficult for the organization to fully understand the individual customer.
- Profiling customers based on behavior patterns and product purchases is critical to achieving the maximum level of profitability.
- Monitoring trends in customer activity can enable a retail organization to react early to exploit growth areas or to respond quickly to problems.
- Consistent and timely reporting of performance against the organization’s budgets and forecasts is necessary to support the implementation of common strategies.

How does the IWH Pack for Customer Insight help?

- The IWH Pack for Customer Insight provides the retailer with a Business Issue focused approach.
- The IWH Packs share common atomic data and are designed to easily integrate with each other.
- The Pack includes a data model, dimensional data warehouse and sample reports – all connected up.

What are the benefits?

- The IWH Pack for Customer Insight uses tried and tested concepts to ensure easy integration with other IWH Packs. This means that the organization can concentrate on its most relevant business issues, Customer Profitability and Profiling, while still building an enterprise data warehouse.
- The sample Cognos reports provide the organization with an accelerated path to meaningful analysis of Customer profitability and profiling.

Chapter 1: Support for Customer Profitability Analysis

There are many factors which influence customer profitability and a retail organization may be able to control these to a greater or lesser extent. However the typical starting point is the product which the retailer sells to a customer and the gross profit which such product sales generate.

What do we sell, who buys it and how much profit do we make?

Access to large volumes of customer transaction data allows the retailer to identify customer groups who generate above or below average margins. It can also identify products or product groups which have a positive or negative influence on profitability. These same large volumes of data, however, can also obscure information as their very volume makes it difficult for traditional information systems to process in a timely and coherent manner.

This problem is exacerbated when some or all of the customers cannot be identified. Retail, by its very nature often involves a significant proportion of anonymous customers.

Comparative analysis allows the retailer to establish the “norm” and then work on the customers, products, locations or channels which are exceptional.

Many factors affect profitability

Customer Profitability can be affected by many factors;

- The customer's spending pattern where a greater spend generates greater revenue and more profit while less spend equals less profit.
- Product mix can impact profitability. If customers cherry pick special deals and chose no added value offerings the organization will loose margin.
- Product Offerings and Pricing may enhance or reduce profitability. This can often present itself as geographic performance variances where competitive pressures, local taxes or currencies lead to different pricing and packaging policies. For example, certain goods like tobacco and liquor may be taxed at a higher rate than general merchandise and these tax rates may vary by location.
- Seasons may change the spending pattern and product mix in some retail sectors while in others such as fashion the entire product range may change on a seasonal basis.

Different business users require diverse views of the same facts

To be able to understand these factors and identify issues the organization must have a well structured data warehouse. Diverse business users need access to common data in their own language.

Understanding how the same product range can deliver different levels of profitability depending on the type of customer, location or channel involved in their sale can help the organization to maximize its profit performance from existing business as well as targeting the most lucrative areas for new business.

The retailer is under constant pressure to list new products for sale but generally has a finite merchandizing capacity. Again, by understanding which products appeal to customers the retailer can decide which of the many new offerings should be taken on and which of the existing offerings contribute least or generate customer complaints and should be de-listed to make room.

To support these requirements the IWH Pack for Customer Insight provides access to the analytical data over many business dimensions including;

- Locations including Geographic and Organizational such as Stores and operational areas.
- Customer Segmentation, including Socio Economic Group, Gender, Marital Status, Age Range Nationality and Language Preference.
- Product Classification including Line of Business, Product Type and Product Group providing the means to record the retailer's product hierarchy.

This information is stored in a flexible data warehouse incorporating both an Atomic Data Warehouse Layer and the Data Mart Layer which supports the business analysis. Users access the information via business focused reports.

Chapter 2: Support for Customer Profiling

Most organizations would like to think they know and understand their customers. Understanding their customers makes it easier to retain existing customers, gain new ones and sell additional products and services to them.

Who are our customers?

The problem in retail is that many customers are anonymous. They may walk into a store select a product or products, pay cash and leave. The sale is good for the retail organization but they know nothing about the customer. Furthermore, any attempt at acquiring identification and other customer information would act as an impediment to the sale and therefore cannot be countenanced.

What many retailers do to get around this is to create loyalty programs. These offer the customer extra discounts or other incentives but the customer must register for the program and produce their loyalty id when making purchases. Thus the company can establish the customers name, address and other contact information. They will also try to elicit further information such as gender, age range and interests under the guise of “keeping you informed about relevant special offers”. Having enrolled in a loyalty program, it is in the customer’s interest to identify themselves during sales transactions to earn points, discounts or other incentives. This means that the retailer now knows what this particular customer buys, where they buy it and how often.

With the large volumes of transaction data typical in retail it is not always practical to “know” each individual customer and to market to them on an individual basis. Instead, retailers will profile their customers using a number of different classifications. This allows them to target relevant customers with products and service offers.

A very obvious example of this might be a promotion of “baby products”. Knowing that particular customers have young children through loyalty registration information can identify them for inclusion in the promotional mailing. Similarly identifying customers who regularly buy baby product allows the retailer to deduce that they have young children and therefore should be profiled as such and included in the promotion.

Customer profiles support marketing effort by reducing clutter

Blindly sending all offers to all loyalty scheme members can antagonize the customer for whom an offer is inappropriate as it becomes junk mail to them.

Retailers value this ability to identify and profile their customers. They will take whatever information is available to them through loyalty schemes and try to supplement it through various means;

- Product purchasing patterns as already discussed can indicate certain profiling characteristics including gender, age and even income range.
- Offering warranties on products can capture additional details about the customer.
- Customer satisfaction surveys, and product reviews can also be used to capture details about the customer.
- A home address may be used to derive other information such as socio economic category

Supplementing basic customer identification information

Having captured as much profiling information as possible the retail organization can use it to support business activities such as;

- Customer retention – offering incentives which are appropriate to the customer makes it more likely that the customer will continue to shop with the retailer rather than defect to a competitor.
- Cross selling – understanding a customers profile can identify products which the customer does not purchase but which other similar customers do. This may be an opportunity to cross sell to the customer and win part of their wallet share which is currently going to a competitor.

Using profiles to support and add value to business processes

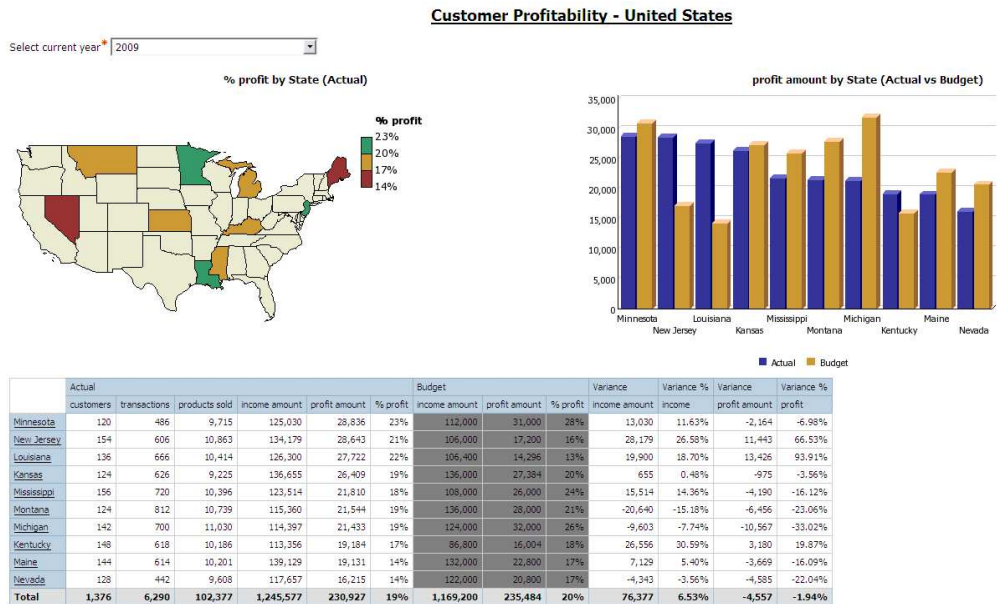
Again, the IWH Pack for Customer Insight supports these requirements through its dimensional data warehouse structures incorporating both an Atomic Data Warehouse Layer and the Data Mart Layer for business analysis.

Chapter 3: Business Questions around Customer Profitability

Consider a typical business question; **“Where are our most profitable customers?”**

Any marketing or operations executive will want to monitor this constantly. The IWH Pack for Customer Insight includes sample reports in this area;

Where are our most profitable customers?



How are we performing against our budgets?

By addressing the question “Where are our most profitable customers?” we can also locate our least profitable customers. This sample also introduces performance against budgets and allows business users to identify locations which are failing to meet their budgets as well as those surpassing them.

Consistent information across multiple dimensions

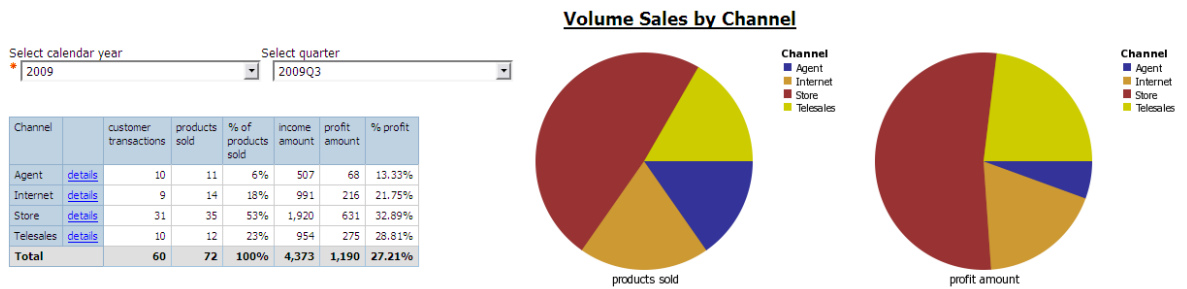
There can be many reasons why different locations have exceptional performance, good or bad;

- Proximity of competitors. This can impact performance of a store or of a range of products in the store. For example a food retailer with a competitor’s supermarket nearby will see an overall impact while a nearby liquor store will only impact sales of products in the liquor department. Price wars are one option but cannot always be sustained in the longer term. Another more sustainable option is to improve knowledge of the customer so that they can be encouraged through appropriate incentives to shop with the retailer

rather than the competitors.

- Local management and operations. This is an area where the retailer can act to improve poor performers by trying to replicate the ethos of the excellent performers.
- Demographics. If a store is in an unsuitable location, it is unlikely to perform well. Retailers are loath to close outlets as it means a reduction in market share but they can work to improve the performance by changing the product range to suit the customer base and by running local campaigns that suit the store demographics.

The IWH Pack for Customer Insight provides the retail organization with information arranged the way the business users require it. For example, the finance and operations departments want to know which customers are using which channels;



They now see a divergence between volume and profit across channels.

By providing drill down capacity to lower levels of data the business user can view consistent information from total organization summaries down to transaction line detail.

Customer Listing

Details for Customers in calendar year 2009 in calendar quarter 2009Q3 for channel Store

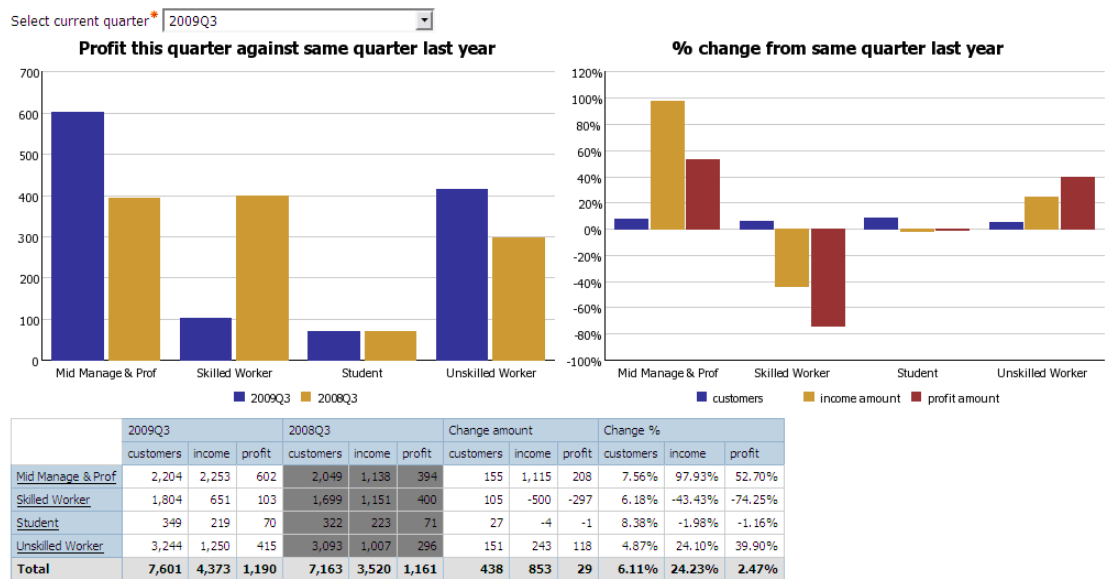
Customer	Customer Status	customer transactions	products sold	income amount	cost amount	profit amount	Text Item
Mike Royal	Active	2	4	384.00	280.00	104.00	transaction details
Joe Blogs	Active	3	3	109.39	74.50	34.89	transaction details
Jane Wells	Active	3	3	260.40	156.00	104.40	transaction details
Joe James	Active	2	3	145.50	89.80	55.70	transaction details
Martin Rhodes	Active	3	3	109.39	74.50	34.89	transaction details
Lance Lott	Active	3	3	234.70	172.50	62.20	transaction details
Fred Smith	Active	1	2	5.50	4.80	0.70	transaction details
Anne Baker	Active	2	2	6.74	5.90	0.84	transaction details
John Plumber	Active	2	2	92.99	90.50	2.49	transaction details
Eric Bee	Active	2	2	4.69	4.00	0.69	transaction details
Hans Haig	Active	2	2	4.69	4.00	0.69	transaction details
Mary Jones	Active	1	1	140.00	85.00	55.00	transaction details
Pat Murphy	Active	1	1	3.99	3.50	0.49	transaction details
Peter McKay	Dormant	1	1	155.00	85.00	70.00	transaction details
P Lott	Active	1	1	104.00	70.00	34.00	transaction details
Hannah Hynde	Active	1	1	3.99	3.50	0.49	transaction details
Denise Kane	Active	1	1	155.00	85.00	70.00	transaction details
Summary		31	35	1,919.97	1,288.50	631.47	

Who are we selling to, What are they buying, Where are our customers making their purchases and When do they make them?

Consider another typical question; “How are we performing Year on Year?”

As well as measuring performance against budgets and forecasts, retailers constantly monitor trends. The most common form of such analysis is performance against the same period last year but it can also be a month on month or any other time based comparison such as before, during and after a promotion. The IWH Pack for Customer Insight retains information over a time dimension to support such analysis.

Individual - Current Quarter This Year vs Same Quarter Last Year



For example, this report compares income and profitability of customers over two date ranges showing the increase or decrease in performance for each customer socio economic category.

The diagram showing % change on last year will focus attention on the group of customers where income and profit are down. The retailer would carry out further investigative analysis exploiting the multiple dimensions of the data warehouse to identify the underlying causes of this drop in performance.

With this knowledge the retailer is in a position to take remedial action such as targeted marketing campaigns, re-merchandizing, price adjustments and organizational changes.

Chapter 4: Business Questions around Customer Profiling

Consider another typical question; “Who buys what”

An organization supplying a small number of products or services to a small number of customers can easily identify which customers are purchasing which products and services.

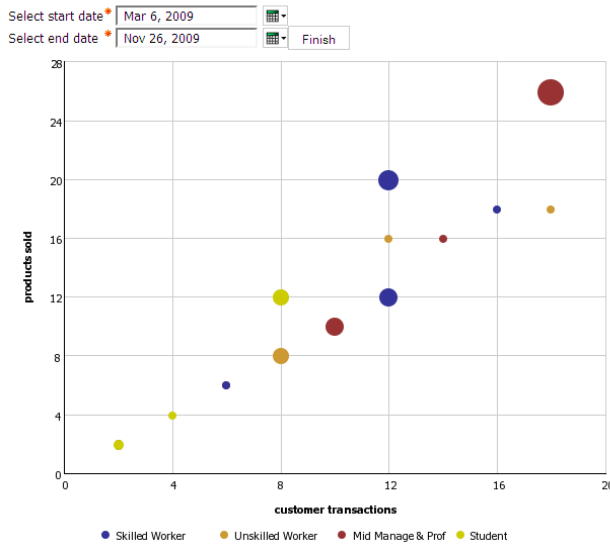
Who buys what?

When large volumes of customers and / or products are involved, as is generally the case in retail this becomes more difficult. The retailer will first try to identify patterns based on customer profiles and product types.

The IWH Pack for Customer Insight database will help the retail organization to identify these patterns by analyzing the vast amounts of customer transaction data across multiple dimensions.

The following sample shows the transaction activity analyzed by the socio economic categories of the retailer’s customers on one table and the same transaction data analyzed by major product types on a second table. These tables basically identify which type of customers are most active and which types of products sell best.

Profit by Socio Economic Category and Product Type



How to read this graph:
each bubble represents a product
the colour represents the socio economic category
the bigger the bubble, the higher the profit
put the mouse over a bubble to see the data behind
click on an underlined item to drill down

same data, by socio economic category

	customer transactions	products sold	profit amount	income amount	
<u>Mid Management & Prof</u>	filter on Product(All)	48	58	1,291.00	4,129.40
<u>Skilled Worker</u>	filter on Product(All)	48	58	987.30	3,593.50
<u>Student</u>	filter on Product(All)	16	20	484.98	1,506.98
<u>Unskilled Worker</u>	filter on Product(All)	48	52	657.92	2,082.12
Total		160	188	3,421.20	11,312.00

same data, by product type

	customer transactions	products sold	profit amount	income amount	
<u>Electronics</u>	filter on Socio Economic Category(All)	4	4	80.00	320.00
<u>Fashion</u>	filter on Socio Economic Category(All)	32	32	1,346.00	4,082.00
<u>Food</u>	filter on Socio Economic Category(All)	34	34	10.80	37.80
<u>Furniture</u>	filter on Socio Economic Category(All)	46	66	1,962.00	6,692.00
<u>Non-food</u>	filter on Socio Economic Category(All)	44	52	22.40	180.20
Total		160	188	3,421.20	11,312.00

The bubble chart on the left, meanwhile, combines these two analyzes showing which type of customers generate most profit through purchases of which types of products.

Drill down facilities allow the business user to focus on products in a particular category or to further analyze customers of a particular socio economic group by introducing another dimension such as gender. Of course, in a real world situation we would expect to see some of the customer profile classifications appear as “unknown”

Drill downs in the product dimension in retail are typically multi layered reflecting the organization’s product hierarchy. The retailer might never actually want to drill down to individual products purchased by an individual customer on a specific date but they can if they need to as this atomic level data is retained within the data warehouse.

The date range in this example is not restricted to any pre-defined period structure and so the business user can examine any range of dates such as promotional periods, school holidays sports tournaments as well as the usual week, month, accounting period and year to date.

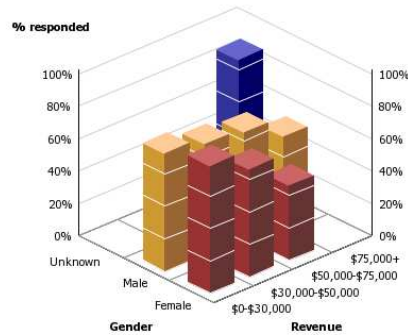
This flexibility in the use of diverse dimensions allows the retailer to gain the maximum business intelligence on customer profiles from available data.

Consider another typical business question; **“Which of our customers are most responsive?”**

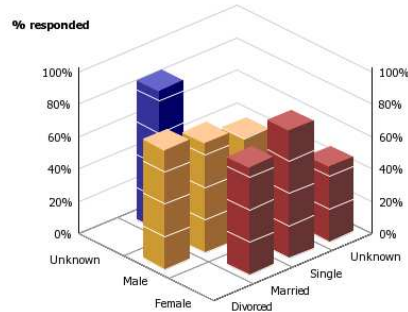
Knowing the propensity of customers to respond to communications such as customer surveys or promotions helps the retailer to apply marketing and sales effort where it has the greatest chance of success. The IWH Pack for Customer Insight includes sample reports in this area;

Customer Survey Response Details

Country: Age Group: Calendar Year:



% responded	Unknown	Male	Female	Average
\$0-\$30,000		73%	78%	75%
\$30,000-\$50,000		68%	66%	68%
\$50,000-\$75,000		65%	46%	54%
\$75,000+	86%	52%		71%
Average	86%	66%	61%	67%



% responded	Unknown	Male	Female	Average
Divorced		73%		73%
Married	86%	67%	66%	72%
Single		60%	78%	64%
Unknown			46%	46%
Average	86%	66%	61%	67%

This sample shows the response rates for customer surveys analyzed by revenue range and by marital status. Each group is further analyzed by gender to give the business user a clear picture of the type of customer who most often responds.

Which customers are most likely to respond to a promotion?

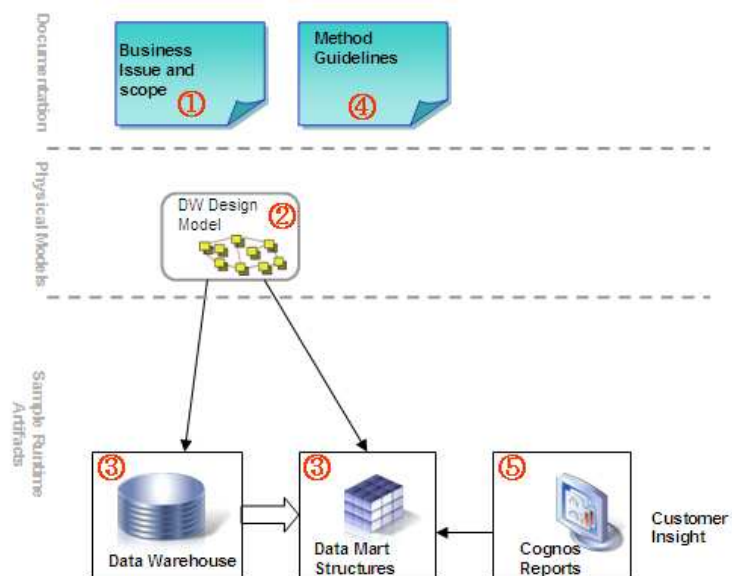
The IWH Pack for Customer Insight database will allow the business user to explore this information in finer detail. For example, by making a few simple selections the organization can see how customers in the 20-35 age group living in the United States responded to surveys in 2009. Again, as expected, we see some “unknowns” in the analysis. Retailers will generally use the identified customers to extrapolate overall profile analysis including the anonymous group.

Chapter 5: Components of the InfoSphere Warehouse Pack for Customer Insight

The IWH Pack for Customer Insight comprises the following major components;

The IWH Pack for Customer Insight includes a fully integrated set of components to specifically address the issues of Customer Profitability and Profiling

1. A document describing the **Business Issues** and outlining how they are addressed by the pack under 2 broad headings of Customer Profitability and Customer Profiling.
2. Predefined **Physical Models** containing the Data Warehouse and Data Mart definitions needed for the business issues addressed by the pack
3. Associated sample **Runtime Artifacts** being the DDL for the data warehouse and data mart.
4. A **Method Guidelines** document outlining the proposed method and design decisions regarding the Physical, Relational and Star Schema models.
5. Integrated sample best-practice OLAP **Cognos Reports** and Framework Manager structures



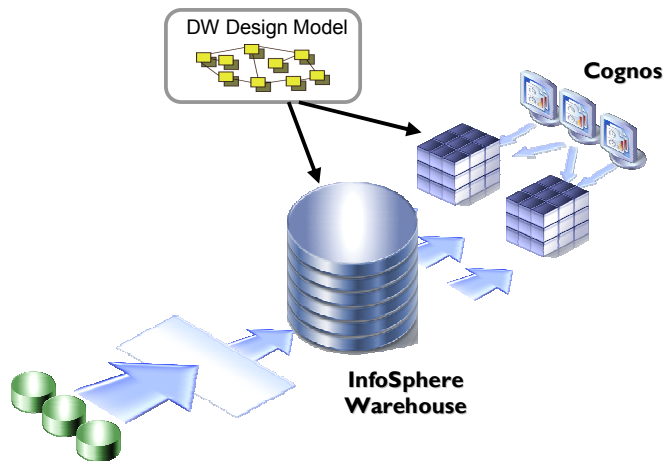
Being based on InfoSphere Warehouse, the IWH Pack for Customer Insight provides a scalable platform for information delivery that transparently offers incremental value such as advanced data mining and scalable cubing services to any Cognos 8 BI-based solution.

A Data Warehouse model that balances ease of use with extensibility.

Extensible Data Warehouse Model.

The core of this offering is the Physical Data Warehouse Model. While this model contains all of the elements and structures needed to deliver on analytics in the area of Customer Insight, this model is also designed as the starting point for a warehouse capable of growing to support the needs of other data warehouses. This Model benefits from the 100's of person years of experience that IBM has in building pre-defined Data Warehouse models for many of IBM's customers in a number of different industries.

This physical model has been constructed to deliver a simple easy to comprehend Data Model, but which benefits from many of the features of IBM's larger data models such as flexibility, extensibility and scalability.





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