IBM

InfoSphere Warehouse Pack for

Customer Insight

in a Telecommunications Environment

Whitepaper

Contents

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 Telecommunications 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 Service Providers 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 Service Providers 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
- Finance Directors and Board Directors
- Product Managers
- IT, Operations Managers
- Business Intelligence practitioners

Telecommunication Service Providers need more advanced customer insights and more effective cost management

Executive Summary

The telecommunications industry has experienced more change in the last decade than in its entire history. In 1999, only 15 percent of the world's population had access to a telephone; by 2009, nearly 70 percent had mobile phone subscriptions. This decade has also brought steep declines in public switched telephone network (PSTN) voice revenues, an explosion of over-the-top (OTT) communication services, phenomenal growth in mobile communications, global industry consolidation and even ground-breaking telco decisions to outsource their networks.

Telecoms are looking to where will future growth come from? Some of the critical capabilities that are necessary include: business optimization based on more advanced network and **customer Insights** and more effective **cost management**.

Source : Telco 2015 Report from IBM Institute for Business Value

Customer Insight

- Service Providers generally deal with a small range of products or product bundles but may have many customers and very large volumes of transactions .
- Telecoms Service Providers suffer more from churn than many other business sectors.
- Profiling customers based on behavior patterns and product purchases is critical to achieving the maximum level of Average Revenue Per User (ARPU).
- Monitoring trends in customer activity can enable a telecommunication 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 Service Provider 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

What do we sell, who buys it and what is the Average Revenue Per User?

There are many factors which influence customer profitability and a Service Provider may be able to control these to a greater or lesser extent. However the typical starting point is the product which the Service Provider sells to a customer and the Average Revenue Per User (ARPU) which such product sales generate.

Access to large volumes of customer transaction data allows the Service Provider 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.

Many factors affect profitability

Customer Profitability can be affected by many factors;

- Increasing the velocity, rationing and targeting of marketing programs and incentives to customer segments with proven contribution potential.
- Effective transaction / service costing, pricing / costing rules, actual charges and discounts, historical activity and price performance etc.
- Product choice can impact profitability. Subscribers choice of product bundle e.g. a wireless per monthly contract charge vs pay as you go / per min.
- Product Offerings and Pricing may enhance or reduce profitability. Product offerings must be attractively priced but also generate profit.

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 can help the organization to maximize its profit performance from existing business as well as targeting the most lucrative areas for new business.

The Service Provider is under constant pressure to list new product offerings or bundles for sale in order to capture market share. Again, by understanding which product offerings appeal to customers the

Service Provider can decide which of the potential new offerings should be pursued or launched and which of the existing offerings contribute least or generate customer complaints and should be removed.

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

- Customer Segmentation for Residential, including Socio Economic Group, Gender, Marital Status, Age Range Nationality and Language Preference.
- Customer Segmentation for Business including Size (Revenue, Employees etc), Business Type, Location
- Product Classification including Line of Business, Product Type and Product Group providing the means to record the Service Provider's product hierarchy.

This information is stored in a flexible data warehouse incorporating both a Detailed 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?

One of the key problems with Telecoms Service Providers is loss of customers or churn. With the ease of transferring providers & porting numbers & services, customers are less sticky to their Service Provider.

According to Industry retention surveys, most people leave any service because of dissatisfaction with customer care and would not be looking around if they were happy with their current provider, its service and employees.

For example, most subscribers signing up with a new wireless carrier are coming from another wireless provider and hence are already churners. As it costs a lot to acquire a new customer in most Telecom industries, when a customer leaves, the Service Provider loses not only the future revenue from this customer but also the resources spent to acquire the customer in the first place.

Therefore, Service Providers need to know not only who their current customers are & what product offerings they have but also which customers have left. Understanding why some customers have cancelled can allow the Service Provider to create new or change existing product offerings to entice these churners back in the future plus also assist in holding on their existing customers.

Service Providers have access to vast amounts of data through the Call Detail Records. By analyzing this data correctly, the Service Provider can ascertain how different customers use the service. By profiling their customers using a number of different classifications, it allows them to target relevant customers with products and service offers.

An example of this might be a promotion based on the customer profiles. For example a mobile operator may notice that younger customers use SMS more than voice calls & produce a product offering with a large number of inclusive SMS and less voice call minutes for a contract price per month.

Customer profiles support marketing effort by targeting the correct segments

Blindly sending all offers to all customers can antagonize the

customer for whom an offer is inappropriate as it becomes junk mail to them.

Supplementing basic customer identification information

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

- Product usage patterns can indicate certain profiling characteristics including gender, age and even income range.
- Offering upgrades on products or new services 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
- Registering for on-line billing and asking customers to provide additional personal information.

Using profiles to support and add value to business processes

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

- Customer retention – offering incentives and additional services e.g. bundle of phone, broadband and/or tv, which are appropriate to the customer, makes it more likely that the customer will continue to stay with the Service Provider 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.
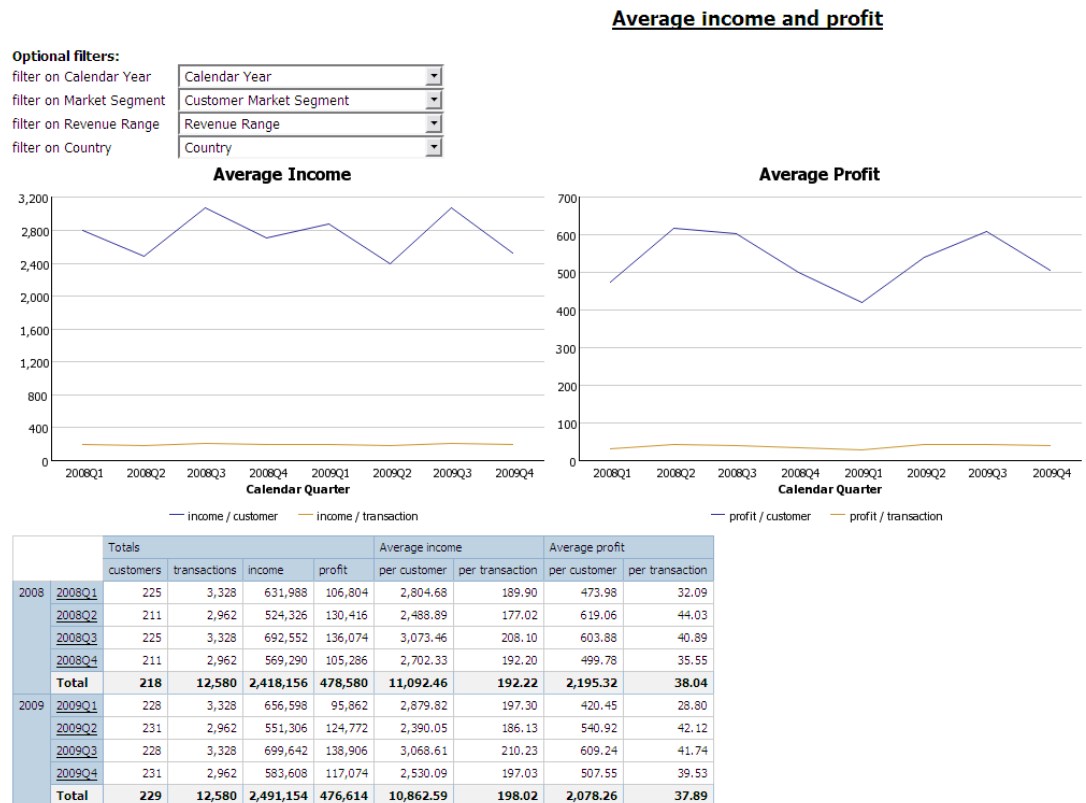
Again, the IWH Pack for Customer Insight supports these requirements through its dimensional data warehouse structures incorporating both an Atomic Data Warehouse Layer and the Data Mart Layer for business analysis.

Chapter 3: Business Questions around Customer Profitability

Who are our most profitable customers?

Consider the following business question "**Who are our most profitable customers** ?"

Average Revenue Per User is key for a Telecommunications Company and they want to know which customer & products contribute most to it.   The IWH Pack for Customer Insight has several Income & Profitability reports which allow for analysis in this area. An example below displays a quarterly summary of customer transaction activity over available periods calculating the Average Income Per Customer or ARPU.

Average income and profit

Optional filters:

filter on Calendar Year	Calendar Year
filter on Market Segment	Customer Market Segment
filter on Revenue Range	Revenue Range
filter on Country	Country

		Totals				Average income		Average profit	
		customers	transactions	income	profit	per customer	per transaction	per customer	per transaction
2008	2008Q1	225	3,328	631,988	106,804	2,804.68	189.90	473.98	32.09
	2008Q2	211	2,962	524,326	130,416	2,488.89	177.02	619.06	44.03
	2008Q3	225	3,328	692,552	136,074	3,073.46	208.10	603.88	40.89
	2008Q4	211	2,962	569,290	105,286	2,702.33	192.20	499.78	35.55
	Total	**218**	**12,580**	**2,418,156**	**478,580**	**11,092.46**	**192.22**	**2,195.32**	**38.04**
2009	2009Q1	228	3,328	656,598	95,862	2,879.82	197.30	420.45	28.80
	2009Q2	231	2,962	551,306	124,772	2,390.05	186.13	540.92	42.12
	2009Q3	228	3,328	699,642	138,906	3,068.61	210.23	609.24	41.74
	2009Q4	231	2,962	583,608	117,074	2,530.09	197.03	507.55	39.53
	Total	**229**	**12,580**	**2,491,154**	**476,614**	**10,862.59**	**198.02**	**2,078.26**	**37.89**

Consistent information across multiple dimensions

By addressing the question "who are our most profitable customers ?" a Service Provider can also identify who are the least profitable customers. This example also shows the number of customers, the transactions they made & the total income & profit. It also displays the Average Income per customer & per transaction for each quarter.

It allows the user to look at Profit & Income over a number of dimensions including :

- Calendar Year

- Customer Market Segment
- Customer Revenue Range
- Location

There may be many reasons why profit is up or down for a particular month or quarter.

- A promotion campaign may have increased income but due to costs of running the campaign, profits may have decreased
- Over holiday periods such as Christmas, calls made by businesses may decrease while residential calls increase.

*Who are our new customers and who have renewed contracts ?*

Another key business question for Telecom Service Providers is "**Who are our new customers and how many renewals were there of existing customers ?**"

The IWH Pack for Customer Insight provides a Service Provider with the information it needs arranged in the way the business users require it. For example, given that customer churn is an issue, the telecom may want to know how many contracts have been renewed & by whom.

Renewals Analysis

Select Calendar Year* [2009 ▾]

		income amount	income contribution	profit amount	profit contribution	arrangements opened	arrangements renewed	cost of renewal	average income per arrangement	average profit per arrangement	average renewal cost
Canada	Skilled Worker	1,933	7%	572	6%	225	1,196	2,200	1.36	0.40	1.84
	Student	1,707	6%	574	6%	70	308	0	4.52	1.52	0.00
	Mid Manage & Prof										
	Unskilled Worker										
	subtotal	3,640	13%	1,147	13%	295	1,504	2,200	2.02	0.64	1.46
United States	Skilled Worker	6,751	24%	2,126	23%	970	5,966	18,676	0.97	0.31	3.13
	Student	1,696	6%	563	6%	151	349	0	3.39	1.13	0.00
	Mid Manage & Prof	9,642	34%	3,053	33%	705	2,724	97,572	2.81	0.89	35.82
	Unskilled Worker	6,806	24%	2,238	25%	909	3,817	24,419	1.44	0.47	6.40
	subtotal	24,896	87%	7,980	87%	2,735	12,856	140,667	1.60	0.51	10.94
Total		28,536	100%	9,127	100%	3,030	14,360	142,867	1.64	0.52	9.95
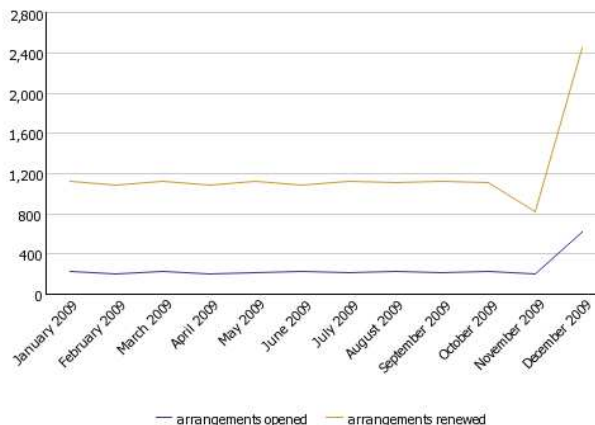
Breakdown by Location and Socio Economic Category

Country	Socio Economic Category	2009
Canada	Skilled Worker	
	Student	
United States	Mid Manage & Prof	
	Skilled Worker	
	Student	
	Unskilled Worker	

— arrangements opened   — arrangements renewed

Obtaining new customers is more costly than retaining existing customers

This sample report lists the amount of income and profit generated in the selected year by customers in various socio economic categories in each location. The contribution to total income and profit for each group of customers is also shown.

As it is typically more costly to gain new customers than retain existing customers, by analyzing the number of arrangements opened by new customers or renewed by existing customers in each group of customers, the Service Provider can identify which customer group it is most profitable to retain and also target new customers in this group with campaigns.
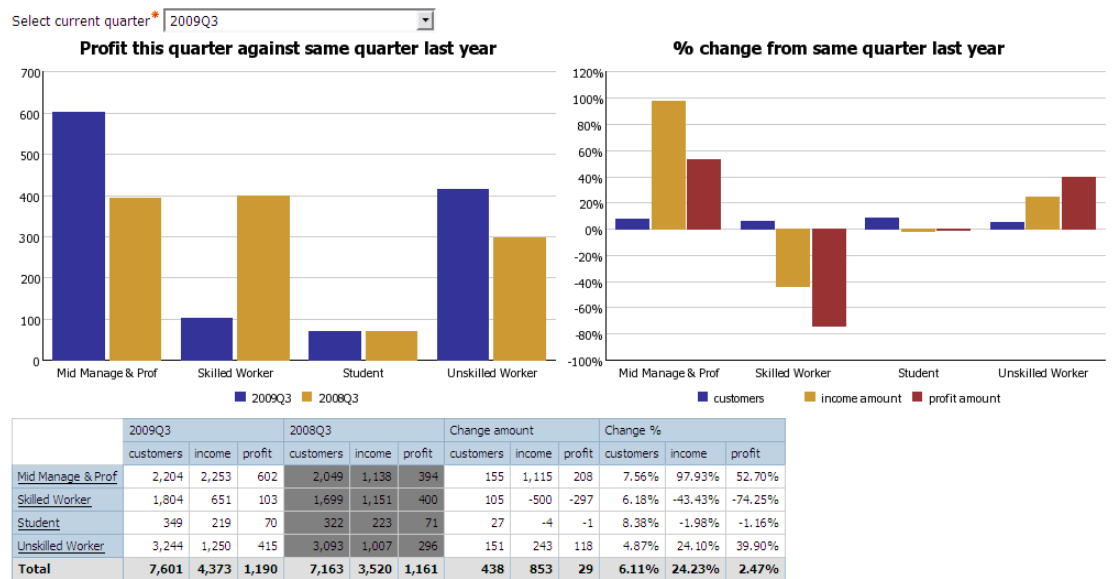
The cost of renewals, typically discounts and incentives, are also shown.

Is our performance improving ?

Consider another typical question; "**How are we performing Year on Year?**"

As well as measuring performance against budgets and forecasts, Service Providers 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

Select current quarter* 2009Q3

Profit this quarter against same quarter last year

2009Q3 2008Q3

% change from same quarter last year

customers income amount profit amount

	2009Q3			2008Q3			Change amount			Change %		
	customers	income	profit	customers	income	profit	customers	income	profit	customers	income	profit
Mid Manage & Prof	2,204	2,253	602	2,049	1,138	394	155	1,115	208	7.56%	97.93%	52.70%
Skilled Worker	1,804	651	103	1,699	1,151	400	105	-500	-297	6.18%	-43.43%	-74.25%
Student	349	219	70	322	223	71	27	-4	-1	8.38%	-1.98%	-1.16%
Unskilled Worker	3,244	1,250	415	3,093	1,007	296	151	243	118	4.87%	24.10%	39.90%
Total	**7,601**	**4,373**	**1,190**	**7,163**	**3,520**	**1,161**	**438**	**853**	**29**	**6.11%**	**24.23%**	**2.47%**

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 Service Provider 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 Service Provider is in a position to take remedial action such as targeted marketing campaigns, price adjustments and organizational changes.

Chapter 4: Business Questions around Customer Profiling

Who buys what ?

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.

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

The IWH Pack for Customer Insight database will help the Service Provider 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 Service Provider'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

Select start date * Mar 6, 2009
Select end date * Nov 26, 2009   Finish
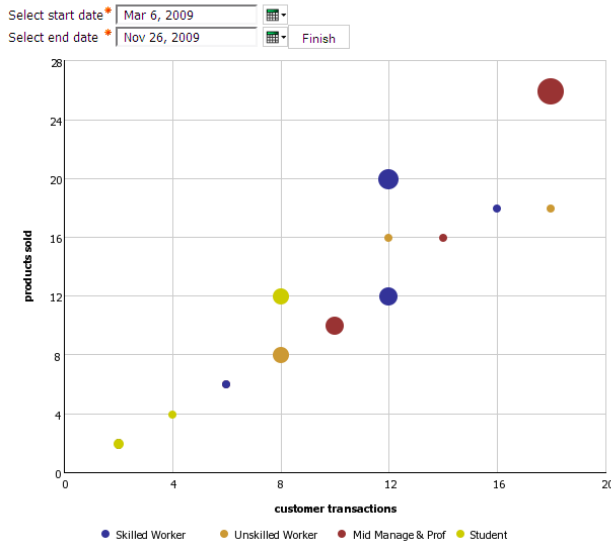
How to read this graph:
each bubble represents a product
the colour represents the socio economic category
the bigger the bubble, the higher the profit
put the mouse over a bubble to see the data behind
click on an underlined item to drill down

same data, by socio economic category

			customer transactions	products sold	profit amount	income amount
Mid Manage & Prof	filter on	Product(All)	48	58	1,291.00	4,129.40
Skilled Worker	filter on	Product(All)	48	58	987.30	3,593.50
Student	filter on	Product(All)	16	20	484.98	1,506.98
Unskilled Worker	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
Electronics	filter on	Socio Economic Category(All)	4	4	80.00	320.00
Fashion	filter on	Socio Economic Category(All)	32	32	1,346.00	4,082.00
Food	filter on	Socio Economic Category(All)	34	34	10.80	37.80
Furniture	filter on	Socio Economic Category(All)	46	66	1,962.00	6,692.00
Non-food	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 the analysis in the tables, 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 telecommunications are typically multi layered reflecting the organization's product hierarchy. The Service Provider might never actually want to drill down to individual calls made by an individual customer on a specific date but they can if they need to as this detailed 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 Service Provider to gain the maximum business intelligence on customer profiles from available data.

How many complaints have we received ?

Consider another business question "**How many complaints have we received** ?"

Knowing how much customer activity there has been in a given period & the level of complaints is important for a Telecom Service Provider. Sample causes of complaints for Service Provider are billing errors, "My service is down", "My service is slow or erratic". As mentioned previously, dissatisfaction with a provider is the number one cause for churn therefore analysis of customer complaints & their resolution is key. The Telecommunications Company may also have Service Level Agreements with other Service Providers so it needs to know if there were complaints, when, by whom & find out what was the reason & resolution.

This sample plots the number of complaints per 1,000 customers for each month of a given period. The table lists the number of customers, number of product sold, number of communications, number of complaints and the number of complaints per 1,000 customers for each month.

The report gives the overall trend in customer complaints which is hopefully downward.

By analyzing when complaints were highest the Service Provider could perhaps ascertain that it was due to network problems on a particular day e.g. due to a sports tournaments, SMS failures on New Years Eve.
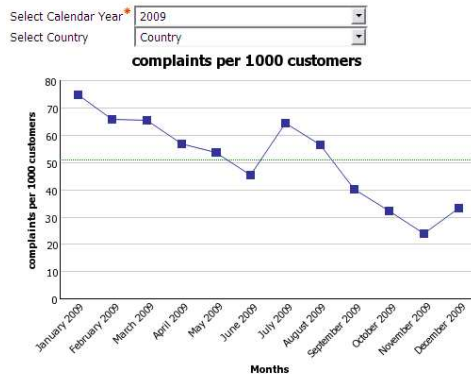
Customer Activity and Complaints

Select Calendar Year* 2009
Select Country Country

complaints per 1000 customers

	customers	products sold	communications	customer complaints	complaints per 1000 customers
January 2009	7,098	16,589	523	531	74.81
February 2009	7,176	16,038	590	474	66.05
March 2009	7,197	16,529	523	471	65.44
April 2009	7,268	15,978	590	414	56.96
May 2009	7,261	16,449	523	391	53.85
June 2009	7,345	15,898	590	334	45.47
July 2009	7,530	16,544	523	486	64.54
August 2009	7,566	15,993	590	429	56.70
September 2009	7,707	16,343	524	309	40.09
October 2009	7,746	16,206	590	249	32.15
November 2009	7,866	16,547	590	187	23.77
December 2009	7,768	52,586	1,770	259	33.34
Total	7,504	231,700	7,926	4,534	604.17

They may want to look at this data over other dimensions such as :

- Number of Complaints per Product Type and per Product
- Number of Complaints by Channel e.g. value-added resellers (VARs); interconnected carriers, virtual network operators and communications services providers etc.
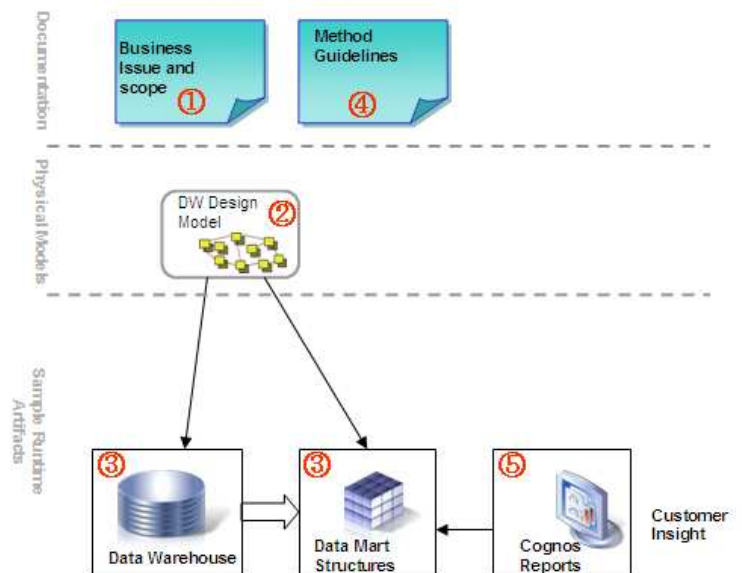- Number of Complaints per Customer

The IWH Pack for Customer Insight allows this further type of flexible analysis.

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

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

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

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

*Which customers are most likely to respond to a promotion?*

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.

IBM
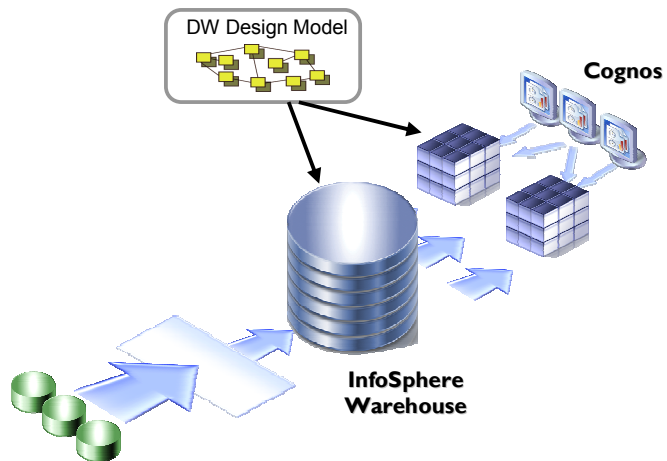
IBM Industry Models & Assets
IBM Ireland
Building 6
Dublin Technology Campus
Damastown Industrial Estate
Mulhuddart
Dublin 15
Ireland

The IBM home page can be found on the Internet at **ibm.com**

Part No :
Release : 8.2