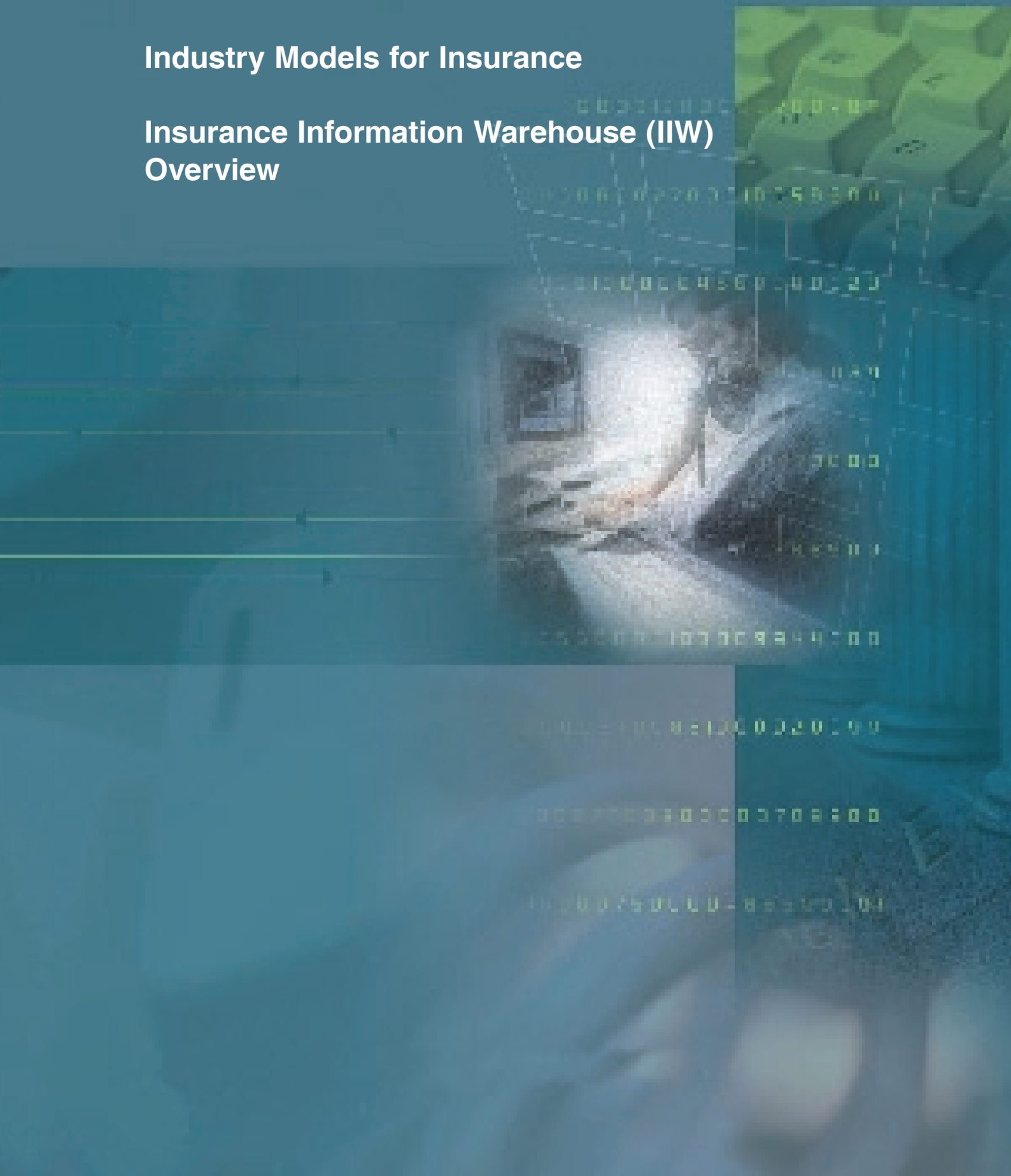


## Industry Models for Insurance

### Insurance Information Warehouse (IIW) Overview



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# Chapter 1. Introduction

## The Insurance Marketplace

Over the past decade, all insurance industry sectors have experienced profound transformations in their business environments. Deregulation, competition, technology advances and globalization combine to exert enormous pressure on insurers, brokers, asset managers and re-insurers and on their ability to respond to these changes. Some of these key forces shaping the insurance industry include:

### Shifting customer needs and expectations

- Erosion of traditional value propositions, including the emphasis on value delivered through personal relationships
- Willingness to assume more risk, and an increasing preference for self insurance and unbundled services
- Desire for self-direction, supported by rich sets of product and price information
- Requirements for new standards of convenience and service
- Demand for improved capabilities including mass customized products and services
- Increasing willingness to deal with multiple insurers, and change insurers more frequently

### Changing competitive dynamics

- Increasing focus on both revenue generation and cost reduction among existing insurers and emerging competitors
- Potential for dramatically lower acquisition costs for new entrants
- Ability of institutions to capitalize on existing trust-based or transaction-based relationships
- Increasing product and service commoditization through competitive actions and informational transparency
- Emerging lower cost distribution options, potentially favoring new competitors

### Emerging technology levers

- Rapid emergence of valuable but potentially disruptive new technologies
- Development of technologies enabling better collaboration and information sharing across insurers
- Technology-driven delivery efficiencies and economies
- Sustainable competitive advantages of insurers skilled at identifying and deploying key technologies

### Changing economic and business environment

- Continuing global deregulation fueling competition, threatening revenue streams, and eroding market shares
- Growing customer turnover in increasingly saturated markets, requiring higher customer acquisition rates merely to maintain market share
- Significant decline in long term investment returns, severely impacting revenues
- Unsustainably high combined and loss ratios
- Growing medical inflation, increasing numbers of class action suits, asbestos claims, and risk-covered catastrophes all impacting costs

In response to these forces, many insurance companies are determined to obtain and maintain market leadership by:

- Increasing emphasis on growth in core businesses
- Shifting focus from market share and acquisition to customer penetration, profitability, and retention
- Lowering costs relating to claims and claims management through streamlined processes and improved fraud detection
- Developing, bundling, and selling more innovative products more rapidly
- Improving customer relationships to build brand loyalty
- Using technology to improve product offerings and levels of service
- Restructuring the organization so it is more responsive to support market needs and customer requirements

In order to successfully address these issues the insurer must:

Acquire more customers with high value (or value potential)

Increase profitable product/service uptake

Reduce costs associated with claims management, policy administration, and distribution channel management

Broaden penetration – cross sell and up sell its own, and partner, products and services

Ration and target promotions to customers with value improvement potential

Reduce customer turnover – retaining valuable customers longer

Increasingly, insurers turn to the features and capacity of data warehouses to support them in making the best business decisions to face these challenges. Simply put, a data warehouse is a corporate level store of high quality and integrated data from a company's own operational systems (often supplemented with purchased data) that is structured for analytical use. The warehouses provide data for even more refined data in downstream data marts which are data subsets that are usually departmental, line of business, or business function oriented. Without a data warehouse and without the right analytical tools, making the right decisions in today's business environment is more than challenging - it may be impossible. Yet making better decisions faster can be the difference between surviving and thriving in an increasingly competitive insurance marketplace.

Well implemented data warehousing solutions provide information quickly and in a format that greatly improves the decision making process. The data warehouse allows insurance companies to exploit the potential of detailed information previously locked in legacy systems or summarized in distributed and often fragmented data marts, and hence inaccessible to the business user. The effective use of such consolidated information by an organization is commonly called "Business Intelligence".

### Typical Uses of Business Intelligence and Data Warehousing

Business Intelligence (BI) is no longer a luxury, but has become fundamental to the success and growth of business worldwide. Some of the initiatives undertaken through use of BI by insurers include:

- Customer prospecting and acquisition
- Improving agent productivity and associated costs
- Underwriting performance analysis
- Campaign performance management
- Revenue, cost, and profitability analysis

### Critical Success Factors in Business Improvement Facilitated by BI

<b>Customer Intelligence</b>		
<b>Critical Success Factors</b>	<b>Key Business Questions</b>	<b>Pain/Inhibitors</b>
Identify, acquire, grow and retain the most profitable customers.  Develop the 360 degree view across products, channels and life-cycles (life cycles of customers? Products? Channel? All?) that is necessary to understand:  - Customer usage behavior and spending patterns - Realized and unrealized margin contribution - Drivers of product bundle and channel profitability	Who are your most valuable customers?  What are their geo-demographic and usage profiles?  What is their product mix?  What is their turnover rate?  What is their growth potential?  How much can you expect to earn from them?  How do you identify similar prospects?	Most insurers lack a common customer key across lines of businesses

<b>Customer Relationship Management</b>		
<b>Critical Success Factors</b>	<b>Key Business Questions</b>	<b>Pain/Inhibitors</b>
Use Customer Value measures: - Ration and target marketing and servicing resources - Increase the velocity of relationship marketing activities - Service and communicate through the most efficient and effective channels - Understand customer behavior, including changing risk and investment requirements - Improve credit risk management	What percentage of your marketing budget is focused on acquisition?  What is your retention marketing ROI?  Which events have you identified as effective cross-sell triggers?  Which channels have the best response rates for "switch" promotions?	Most insurers lack the ability to measure marketing performance across campaigns and channels against stable baselines.  Effective CRM requires near real-time access to Customer Intelligence. Distributed data marts typically have poor end-to-end data latency (e.g. difficult real time access.)

### What is a Data Warehouse?

A data warehouse is a central repository of detailed and summarized data from disparate internal operational systems often supplemented with data from external sources. Operational and external source data is extracted, integrated, summarized, and stored into a data warehouse, and can then be accessed by users in a consistent and subject oriented format. Data that is organized around a business entity such as customer, product, or service area is more useful for analysis than operational applications which tend to be designed to support a vertical function of the business such as policy administration, accounts receivables, or general ledger.

A data warehouse has a very different structure from an OLTP system. Data in a warehouse vs. operational data may be:

- Archived and summarized as opposed to current or near current
- Organized by subject as opposed to application
- Static until refreshed as opposed to dynamic
- Simplified for analysis as opposed to complex for computation
- Accessed and manipulated as opposed to updated
- Unstructured for analysis as opposed to structured for repetitive processing

A data warehouse provides an on-line analytical processing (OLAP) data structure, as opposed to the operationally tuned OLTP data structure. A user wishing to perform OLAP may access many records per transaction, while OLTP users may only access one record one at a time. Analytical users rarely update data and require response times ranging from minutes to hours, while OLTP users constantly update individual records and expect sub-second response times.

An OLAP environment supports analytical queries against the data that represent an organization's state at a specific point in time. An OLAP data structure describes the organization of the data prepared for use with analytical (multidimensional) tools and allows for accessing, storing and manipulating the forms of information required by DSS, EIS and MIS applications. For example:

- Complex ad-hoc queries are submitted and executed rapidly because the data is stored in a consistent format
- Queries don't interfere with ongoing operations because the system is dedicated to serving as a data warehouse
- Data can be organized by useful categories such as customers or products because the data is consolidated from multiple sources.

### Business Advantages of Data Warehousing

There are several business benefits that can be delivered by the construction and use of a data warehouse:

Competitive Advantage	Gained from focused marketing campaigns, product structuring and bundling, promotional pricing, cross-selling, etc..
Customer Intelligence	Gained from understanding a customer's value across all products and services, evaluating responses to total customer needs, performing predictive analysis to define pre-emptive approaches that focus on building and retaining a valuable customer base, etc.
Risk Mitigation	Gained from understanding past experience and be able to predict future outcomes, minimization of credit risk, better fraud detection.
Profit Improvement	Gained from income planning, revenue optimization, accurate pricing / costing rules, understanding actual charges and discounts, analyzing historical activity, price performance monitoring, etc.
Organizational Efficiencies	Gained from the creation of profitable alliances, maintenance of optimal organization structure, quantifying measures and scores, rewarding on desired results, etc.

Business advantage is gained from using information in the data warehouse to develop a coherent business strategy, which enables the insurer to respond to the pressures of increased competition, to the need to increase the speed of marketing activities, and to expanding market globalization and product innovations. The data warehouse can be used here as a single source of consolidated data about:

Historical business trends	Product gaps and opportunities
Activity and performance targets	Cross-selling opportunities
Customer market segmentation	Sales and distribution channel performance
Premiums, commissions and investments	

Organization of information in this manner enables business advantage by identifying opportunities for:

Focused marketing campaigns	Product customization
Product bundling	Behavioral scores and rewards
Performance tracking	Cross-selling
Exposure management	Sales channel incentives
Promotional pricing	Competitor alliances
Wallet share and market share estimation	Forecasting and Planning

### Cost Versus Value Justification

There are two points to consider when justifying the cost of constructing the data warehouse. The first point is that while operational cost reductions can be realized by analytical use of the information in the data warehouse, incremental operational value can also be driven by it. For example, using the data warehouse to omit non-responding or non-profitable customers has been estimated to save 10% of direct marketing operational costs.

The second point is the most important: that the data warehouse is really about facilitating the acquisition of future revenue. The business drivers for this include the identification of new sources of revenue through more flexible market response capabilities and shorter product time to market. Resulting new insurance and investment products can generate faster growing or completely new revenue streams. The data warehouse supplies information about customer behavior with regard to their profitability, wallet share, and spending patterns. From this, opportunities may be identified for improving customer

relationships, leading to increased customer satisfaction, product uptake and usage (penetration), and retention.

The effect is significant: An IDC 2002 report on the “Financial Impact of Business Analytics” found that data warehouse and business analytics implementation can generate a median five-year return on investment (ROI) of 112% with a mean payback of 1.6 years on average costs of \$4.5 million. Of the organizations included in this study, 54% have an ROI of 101% or more.

This study also shows that although a business analytics implementation is a substantial investment for an organization, it can deliver considerable benefits. For the study participants, value accrued through quantitative and qualitative benefits that ranged from increased business performance to reduced operations costs and improved customer relations. These organizations consider their particular business analytics implementation either a necessary cost of business or a critical factor in their plan for success and survival in a highly competitive market.

IBM helps organizations to accelerate achievement of similar results by providing a low risk data warehouse solution, which forms the foundation for the entire data warehouse development.

### **Building a Data Warehouse**

As data warehouses are typically run as stand-alone projects, building a data warehouse gives an organization a unique development opportunity. The results of implementing a data warehouse are immediate and quantifiable and the implementation need not interfere with business operations. Because the operational data of internal systems and external feeds potentially comes from many different sources, the first step must be to produce a logical model of an insurance company’s organizational (enterprise level) data requirements, fully independent of any particular application.

To achieve the organization-wide benefits of this modern information management , a comprehensive specification of the organization’s existing data must also be defined. Because designing and implementing this solution is a complex process – often much more complex than expected or planned for - many organizations may not have all the appropriate skills and resources available in-house to complete the project.

The most cost-effective solution with the shortest deployment time frame is to purchase a data warehouse architecture and blueprint and to tailor it to the insurance company’s specific requirements rather than to attempt to build from scratch.

## Chapter 2. IBM Insurance Information Warehouse

### What is the IBM Insurance Information Warehouse?

IBM's Insurance Information Warehouse (IIW) is a fully realized development blueprint that enables insurance companies to build data warehouse solutions to suit their specific needs. IIW includes all of the key components required for the core of a data warehousing solution.

IIW comprises a flexible and scalable data warehouse infrastructure, enabling organizations to build a comprehensive data warehouse solution through phased development. This allows for rapid delivery of high business value deliverables by initially focusing on the business areas offering the greatest returns and feasibility, while building within a proven technical warehousing architecture.

IIW includes content to cover analysis in critical insurance business areas such as Profitability, Analytical CRM, Financial Reporting, and Risk Management. Selected analysis areas are described in further detail at the end of this chapter.

IIW has the flexibility to make possible the creation of a range of data warehouse solutions, from departmental data marts to enterprise-wide data warehouses.

IIW is a proven flexible and scalable data warehouse technical infrastructure which is required for successfully building a comprehensive data warehouse solution that provides the rapid delivery of business value without compromising on a sound and scalable structure.

IIW supplies that infrastructure blueprint. Consisting of analytical requirements satisfied by thousands of common business definitions and logical data structures, IIW is used by insurance companies to integrate data from multiple operational platforms and to design this data warehouse infrastructure.

### IIW Business Solution Templates

The IIW solution offers a set of Business Solution Templates (BSTs) that describe how information can be effectively structured and presented to business users. Examples include:

- Analytical CRM
- Claims Efficiency
- Intermediary Performance
- Business Performance
- Solvency II
- Sarbanes Oxley Act
- IAS

### IIW Business Model

The IIW Business Model is a flexible conceptual business model providing an implementation independent view of the data of the insurance business. It presents a common communication link between the specific warehouse implementation and the core operational data. A customizable business level data model, it enables agreement on common definitions for the data warehouse, and of information likely to be coming from multiple systems. This is described in further detail in Chapter 5.

### IIW Enterprise Model

The IIW Enterprise Model is an enterprise-wide entity-relationship model with pre-defined data warehouse structures for the insurance business. When used with any commercially available modeling CASE tool, IIW allows you to automatically generate the physical data warehouse database from the model. This is described in further detail in Chapter 6.





**Analytical CRM**

Campaign Answer Analysis	Campaign Communication Analysis
Campaign Contact Analysis	Campaign Cost Analysis
Campaign Installment Analysis	Campaign Profitability Analysis
Campaign Sales Analysis	Campaign Analysis by Customer
CRM Event Analysis	Cross Sell Strategy Analysis
Cross Sell Forecasting Analysis	Policyholder Behavior Analysis
Household Value Analysis	Customer Persistency Analysis
Customer Profitability Analysis	Customer Prospect Optimization Analysis
Customer Satisfaction Analysis	Customer Risk Analysis

**Profitability - Claims Efficiency**

Claim Handling Performance Analysis	Claim Incoming Recovery Payments Analysis
Claims Audit Analysis	Claims Monthly Close Off Analysis
Claims Statistical Analysis	Claims Value Variation Analysis
Late Claims Analysis	Loss Event Analysis
Year-To-Date Claims Comparison Analysis	

**Profitability - Intermediary Performance**

Agency Continuous Professional Development	Agent Performance Based on Competency
Agent Training Analysis	Customer Feedback on Intermediary Analysis
Intermediary Compensation Analysis	Intermediary Persistency Analysis
Intermediary Production Analysis	Intermediary Sales Performance Analysis
Policy Delivery Analysis	

**Profitability - Business Performance**

Advance Analysis	Business Volume Analysis
New Business Volume Analysis	Policy Event Analysis
Policy Persistency Analysis	Surrender Analysis
Switching Analysis	Underwriting Analysis

**Risk & Compliance - Solvency II**

Liabilities Analysis for P&C Insurance	P&C Claims, Expenses and Technical Provisions Analysis
Expenses for Long Term Insurance	Premiums for Long Term Insurance
Liabilities and Margins Analysis for Long Term Insurance	Admissible Asset Analysis
Net Asset Analysis	Profit and Loss Analysis
Summary of Premiums and Claims for P&C	Solvency Analysis for P&C
Solvency Analysis for Long Term Insurance	Statement of Solvency

**Risk & Compliance - Sarbanes Oxley Act**

Consolidated Financial Statements Analysis	Consolidated Statement of Cash Flows
Consolidated Stmt of Changes in Shareholders' Equity	Consolidated Balance Sheet Analysis
Consolidated Statement of Income Analysis	Management's Discussion and Analysis of Financial Condition and Results of Operations

**Risk & Compliance - IAS**

Balance Sheet Classified Approach Analysis	Balance Sheet Net Assets Approach
Balance Sheet Order of Liquidity Approach	Balance Sheet Portfolio Basis Approach

Cash Flow Direct Analysis	Cash Flow Direct Financial Institution Analysis
Cash Flow Indirect Analysis	Cash Flow Indirect Financial Institution Analysis
Income Statement by Function Analysis	Income Statement by Nature Analysis
Income Statement Financial Institution Approach Analysis	Statement of Changes in Equity Analysis

Some of these analytical areas are further explained in the following sections.

### **Campaign Management Analysis**

Campaign Management Analysis measures the performance of campaigns (e.g., profit, sales) and other marketing activities is increasingly important as budgets are trimmed and insurers are forced to ration and target marketing activities more effectively. A 360° view of customers, their product profiles, and their wallet share are crucial in the development of effective cross-sell and up-sell promotions. Furthermore, the ability to assess the aggregate effect of all marketing activities and campaigns across lines of business and communication channels is critical in understanding real customer segment performance. In the end, the insurer must not only select the right target group, product offer, and premium but it must also choose the most effective and efficient distribution channels based on anticipated response rates and costs. The insurer uses Campaign Analysis to accelerate the speed of closed-loop marketing where campaign results feed back valuable insights that can be re-used in subsequent campaign targeting and planning.

Often insurers use non-value based performance measures such as number of new policies and new customers. However, Insurers are increasingly turning to more accurate profitability measures to understand their real marketing ROI. Setting up control groups, monitoring campaigns in progress, and reporting on campaign response can give the marketing manager the deep insights required to better leverage their marketing resources and channels.

### **Customer Acquisition Analysis**

Attracting new customers is a central driver for many insurers, especially for new entrants into deregulated markets. By understanding the attributes of the existing subscriber base, it is possible to perform proactive market segmentation and targeting of customer prospects with specific products and services. Using information gleaned from the data warehouse, a company may develop new products and services to attract specialized segments of additional subscribers.

But without discerning analysis, those newly targeted customers may not be all that they seem. Would you be happy to accept any given customer from your competitor? What if they have a history of late or missed premium payments, or are a low value customer with minimum coverage? But even then, perhaps they are in the final year of college right now and with their new, first job next year they will have more money to spend, be already loyal to you, and be on the way to becoming a valuable customer? Only refined analysis can help you differentiate between a seemingly poor value or risk or a “diamond in the rough”.

It may even be possible that they are not new customers at all but have changed over from one product to another that is administered in a different system. The relationship between true acquisition and mere product churn is a complex one which requires detailed analysis, first to differentiate and then to understand.

Finally, the cost involved in acquiring new customers can vary considerably and maximizing new customer acquisition may not necessarily lead to optimized revenues. Acquiring those new customers has been shown to be as much as 5 times more expensive than retaining existing customers so care must be taken in balancing retention and acquisition strategies.

### **Customer Value Analysis**

As in many industries, the value of the customer to the insurer can vary dramatically. How can you identify the customer who will be profitable in six months as opposed to twenty-four months? As costs increase and margins decline, differentiating between the customers you want to keep and the ones you would prefer were your competitor's becomes even more

valuable. Age group, location, and total insurance and investment wallet are some of the typical statistics used when trying to define profiles and segments for your customer base.

### **Customer Persistency Analysis**

Persistency is one of the most important metrics for insurers. As penetration rates for many products in many countries approach saturation, competition becomes even more fierce. There is no longer a vast pool of new customers to attract. Instead, the challenge will be to retain existing customers and to attract new ones away from competitors.

IIW has been designed to lead companies to uncovering vital information about persistency. Insight into who are your existing customers, what are their spending patterns, what are their risk and investment needs and why they have those needs is vital. The ability to discover product sales trends, to identify and seek out customers who may be considering changing insurers or asset managers, and to fully understand the net financial impact of customers surrendering policies contributes to a company's comprehension of its actual persistency levers. Customer winback through incentives is always possible, but before doing that, imagine being able to tell which customer is worth keeping and which is better off with your competitor! Comparing retention costs against the present value of different types of policyholders can be useful in order to distribute marketing budgets more effectively.

If retention is impossible, a customer may explain the motivation for leaving. This key information can be combined with other data to reveal important insights about how your customers view your products and services.

### **Product Profitability Analysis**

When deciding on insurance and investment products, the choices facing potential customers are many. From a customer's point of view, this selection can be daunting. From the insurer's point of view, defining what can be selected involves coming up with a sufficient number of policy coverage variants, premium ranges, and payment options to cater to as many customer preferences as possible, while ensuring that this will still generate profits. Trying to identify offers that are both appealing to a potential customer and still profitable for the insurer is a core task.

As the industry continues to deliver new products and services, companies need to understand who is actually buying them, and why, and how often. The answers can have a major influence on the development of product bundles and pricing models. Given lengthy product development timelines and associated costs, companies must be able to predict how its markets will accept new products. For example, some newer and more sophisticated investment and pension products have not yet proven themselves as sizeable revenue generators, while some simple retail lines are accounting for a substantial percentage of company incomes. By using a data warehouse, specific trends that reveal the need for a new product or service targeted at a specific market segment can emerge with a more predictable rate of success, acceptance, and profitability.

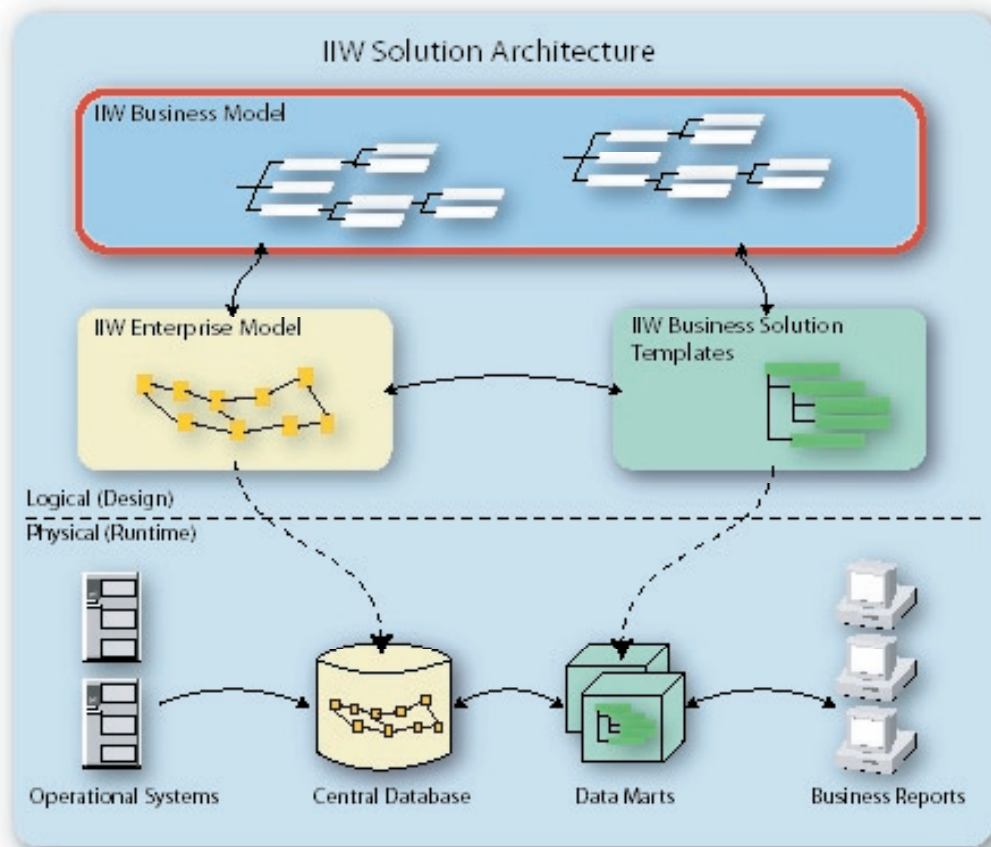
### **Sales and Distribution Channel Analysis**

Insurers often don't interact directly with their customer base, so it is essential for them to understand what is happening in their distribution channels. For customer acquisition, no channel is more important than the agency and financial intermediary networks. These networks interact directly and regularly with most customers. While some sales activity occurs through direct sales or over the Web, significant numbers of new customers are still gained through partner channels. Commissions, persistency, surrenders, and sales promotions therefore retain a major impact on an insurer's bottom line. It remains fundamental to know who is selling what to whom, when and why. Just because one channel partner sold twice as much as the next best partner does not necessarily make it your most valuable channel. If the customers that come through that channel are also canceling, surrendering and failing to renew at twice the level of the average policyholder, looking at the type and value of the partner's customers may be in order.

**Fund Switching Analysis**

Investment-based products are a major insurance industry growth area. Unit-linked insurance is a particularly dynamic product, gaining a significant share of the life and pensions market in a relatively short time. Consumers are increasingly aware of the potential high rates of return offered by funds linked to stock markets, as well as the higher flexibility offered by unit-linked products. Switching among those funds is both possible and commonly done by active and informed customers who are looking for higher yield opportunities and for products most suited to their needs.. The analysis of fund-switching activities among the insurer's customer base offers important insight on the customer profile, preferred products and product features, and financial objectives.

### Chapter 3. IIW Business Model



#### What is the IIW Business Model?

The IIW Business Model is a data model designed specifically for the insurance industry, containing thousands of carefully constructed business definitions reflecting the result of many person-years of analysis. It provides an enterprise-wide view of data common to all insurers.

The Business Model has been developed to provide the insurer with a “jump start” in its model development process and to assist in maximizing the value of its information. It is a generic model, defining data that is widely applicable to any insurer. The information reflected in the data model is independent of organizational structure and has been validated by multiple sources within the industry.

The Business Model provides a vehicle for merging requirements of existing models and is designed for stability, flexibility and reusability. By using this model, the information management team can proactively support the business response to the dramatic changes that drive today’s insurance industry.

The IIW Business Model represents upwards of 80% of the data required by an insurer in carrying out its core business. Rather than a simplistic listing of data types and definitions, it is a fully defined set of fulfilled business requirements, delivered in a model structure that is designed to address key issues that face insurers in the current environment of deregulation, changing social welfare parameters, product innovation, and accelerating technological change and to reflect the industry’s key business values.

The Business Model covers data to support analysis such as:

<p><b>Improved customer care</b></p>	<p>It reflects the complex inter-relationships between customers and between customers and the insurer. It distinguishes between the natures of the customers themselves and the relationship the customer has with the insurer and becomes a pivotal component in the insurer's response to changing market dynamics. The model exposes the data that enables the business to refine its approach to the management of customer relationships while providing information systems staff with a blueprint for integrated customer care systems.</p>
<p><b>Rapid development of new products</b></p>	<p>It recognizes that products can be rapidly assembled from fundamental components and readily packaged together. It understands the distinction between marketable products and the components that make up those products. Further, it recognizes the complex ways in which a product may be acquired by a customer and then be serviced by direct or indirect channels. By clarifying the distinction between a marketed product and the policy, pension, or investment policies themselves, the model enables the insurer to plan and manage the increasingly complex relationships between the products and services offered and the means of selling, servicing and fulfilling those products and services.</p>
<p><b>Complex relationships with competitors</b></p>	<p>It recognizes that competitors can also be customers and, on occasion, strategic partners. It allows for these changing roles and the corporate policies, regulations, and agreements that impact these roles.</p>
<p><b>Integration of business</b></p>	<p>The Business Model does not differentiate fundamental data according to lines of business or organizational structures. The model reflects a fully integrated view of data that can be used by all segments of the business. The model focuses on providing the insurer with a means of understanding the different facets of each business challenge, and how those facets can then be combined into a solution. It cuts through the confusion of legacy systems and provides the path to coordination among business applications.</p>

### Features of the Business Model

The Business Model is an enterprise-wide model of the business requirements of a global, generic player in the Insurance Industry. Expressed in data that satisfies those requirements, the Business Model covers the many business areas in the insurance industry. Its key features are:

- A layered model structure with sufficient detail to represent the data requirements of a multi-line insurer operating in an international environment
- Use of advanced modeling techniques to encourage reusability of system assets
- Composite data model for defining system requirements
- Designed for flexibility in extension and expansion
- Customizable to provide a platform for improved data management and systems development
- Structured to provide direct benefit in all phases of the systems development life cycle
- Defined with full integration to the Enterprise Model
- Structured starting point to integrate data and process

### Benefits of Using the Business Model

- Rigorous specification of data requirements to reduce redundancy of information across the enterprise
- Common definitions for improved accuracy and consistency of data

- Facilitates the application development life cycle thereby reducing system and lost opportunity cost
- Consistent data architecture for modeling new or changed requirements
- Customizable model and that can incorporate the organization's unique data requirements and business rules
- Focuses the development effort on validating, enhancing, and extending data requirements rather than devoting time to the labor-intensive process of developing a data model for the enterprise from the ground up.

IIW has been developed with the assistance of insurance companies, other insurance professionals, and data warehousing experts. The structure, especially that of the business model, is designed to be readily understood and navigated by those who may have had minimal exposure to data modeling. At the same time, the structure and rigor of IIW satisfies the needs of the experienced modeler and analyst. Consequently, IIW provides a communication bridge between the business and the technical professionals within the organization.

### The Packages

The Business Model is organized into key 'packages', each focused on a specific business concept:

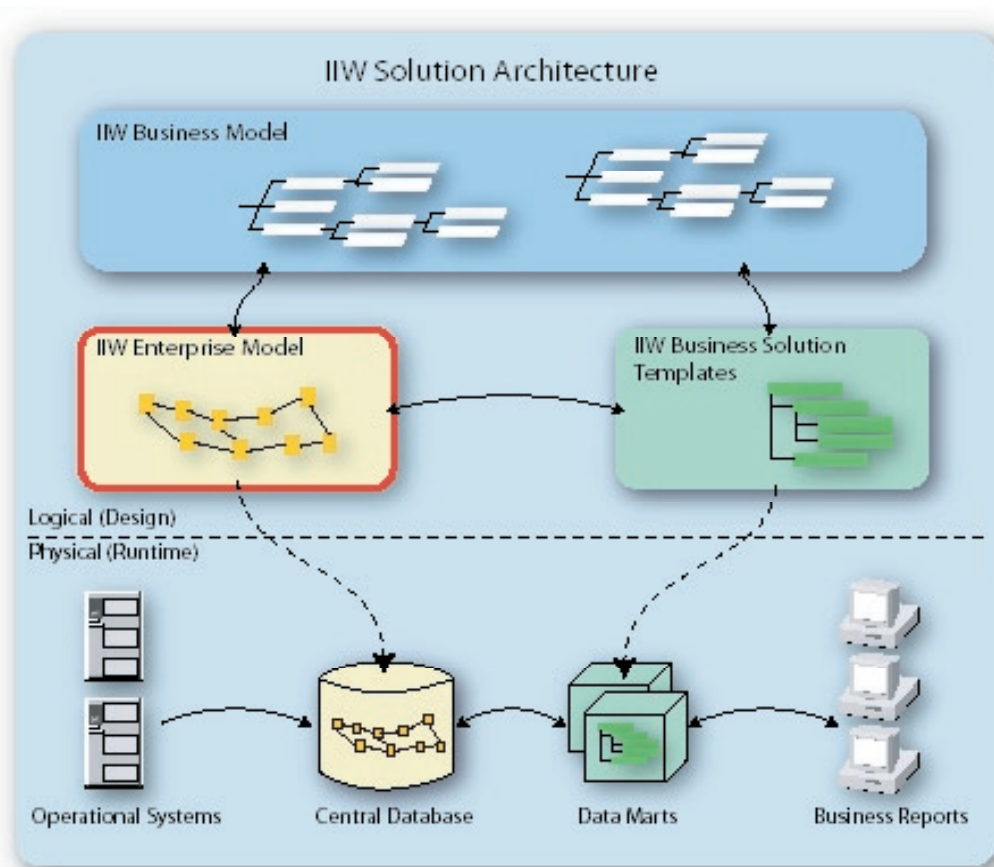
Account and Fund	Customer accounts, monetary accounts (liabilities, reserves, revenues), financial asset holding and funds need to be considered in the insurer's accounting process.
Activity	Various activities are of interest to an insurer, especially those in the underwriting and claims management areas. During the underwriting process, the insurer needs to understand its exposed risk, based on the activities performed by the insured, either professionally or privately. For example, an insurance company may decide not to cover certain occupations or hobbies or may request an additional premium for the added risk. During the claims management process, the insurer needs to understand the circumstances that surround the loss event resulting in a claim. Activities describe what the different parties were doing at the time of the loss event. The activities are validated against the conditions defined in the insurance agreement, with the result that the claim may not be paid if the conditions are not met.
Actuarial Statistics and Index	Actuarial statistics may be managed either internally or externally to the insurance company, and typically represent a table or algorithm to supply a particular value based on a set of parameters associated with the insurance agreement. Indexes are usually defined by an external body, but are used within the product structure to define how monetary amounts will be incremented or decremented over time.
Assessment and Condition	Assessments are used by the insurer to represent the results of an evaluation based on a subjective opinion or a scientific approach. Condition is the state of a place, a physical object, or an activity occurrence existing at a given point in time.
Claim	Claim enables the insurer to represent requests for insurance benefits (money, services or goods), and to show how these requests for benefits are related to the different aspects of the insurance business. The definition of a claim in the context of the model involves the structure of a claim (the splitting of a claim into smaller claims parts), the responsibilities of a claim (what the operations to be performed by a claim are, and what information is to be included in a claim), and the relationships claims have with other areas in the organization.
Contact Point and Preferences	Contact Point and Preferences represent addresses in a general sense (postal addresses, also include telephone numbers, e-mail addresses, and so on) as well as preferences of how customers want to be contacted (timing preferences, preferred name to use in communication, person by whom you prefer to be contacted and so on).
Event	Many events (life events, business events, loss events, etc..) are of interest to the insurer. A special case of event is a loss event that represents an event that caused a loss to an insured as covered by an insurance contract.



Financial Transaction	<p>Financial transaction allows an insurer to define accounts receivable (inbound payments due), accounts payable (outbound payments due), payments in, and payments out, and to capture the relationships between these transactions. Outbound payments (for example, the payment of a claim to a customer) result from the accounts payable, whereas inbound payments (for example, a customer paying his premium) are created by recording of the physical money transaction as registered by a bank.</p> <p>Naturally, the concept of Financial Transaction is closely related to the Account, as all financial transactions must be posted to accounts via account entries.</p>
Goal and Need	<p>Goal and Need represents the financial objectives or requirements of a customer or a market segment. It includes natural phenomenon protection, liability protection as well as financial planning. Financial planning covers the areas of retirement funding, education funding, dependent protection, purchase of durable goods, tax reduction, risk minimization, and so on.</p>
Legal Action	<p>A legal action represents a process of having a court of law (or any recognized arbitration body) render judgment on a dispute between two parties or groups of parties. This includes criminal and civil cases. This may be caused by non-fulfillment of a delivery of financial liability, service, or goods or by the breaking of an agreement between two or more parties. Disputes may be resolved by an independent arbitrator appointed by the insurance companies involved, or by a court care. Disputes may arise for different reasons, but very often are related to claims; for example, when the liability of a claim is disputed, when a subrogation is issued, when financial obligations are not met, or when the cost of a service is disputed.</p>
Money Provision	<p>Money Provision identifies monetary amounts outside the context of billing and accounting that are likely to become payable to or by the insurer. Money Provision makes it possible to define how much money can be payable, by whom and to whom, and how the payments will be scheduled over time when the money becomes payable. It is therefore strongly related with other concepts in the model, such as Product and Agreement, Activity, and Claim, and to the financial related areas, such as Financial Transaction and Account.</p>
Party	<p>Party represents all participants in the Organization's environment that are of interest to the Organization. It covers information about people, organizations, divisions of organizations, government agencies, clubs, businesses and many other parties. Party also covers the involvement that parties can have in different business contexts, such as administering a contract and processing a claim.</p>
Physical Object	<p>The objective of the Physical Object concept is to define physical objects such as cars, houses, human bodies, or any grouping of these from a risk and claims management perspective. All physical objects that can be covered by an insurance policy, excluded from insurance, or involved in a claim, are represented in the model. Physical objects can also be used as collateral in financial services agreement (like a house in a mortgage for example).</p>
Place	<p>Place allows an insurer to represent places from a risk management perspective as well as from a territory management point of view. Place is a bounded area defined by nature, by an external authority (such as a government) or for an internal business purpose. Used to identify a location in space that is not a structured address; for example, country, city, continent, postal area or risk area. A place may also be used to define a logical place in a computer or telephone network.</p>
Registration	<p>Registration defines the existence of different types of official registrations and the role of each of these types of registration in the insurance business. Registration represents the formal recording by an authorized body of the granting of rights, privileges, favors, or statuses.</p>

Specification, Product & Agreement	Allows an insurer to model financial services products and to define how financial services agreements are created and maintained based on the definition of a product. An agreement specification indicates the type of product or product component on which the policy or policy component is based. It maintains an inventory of products, coverages, and so on. An agreement represents a mutual understanding between two or more parties, each committing themselves to fulfill one or more obligations. An agreement can also represent an intermediary agreement, as in an agency contract or a brokerage contract or an employment agreement between the insurer and an employee.
Standard Text and Communication	Standard Text and Communication is used to define templates that can be used for mass-generating documents, as well as to look up important documents the insurer wants to keep track of in its operations. It is also used to keep track of communications: the receiving or sending (or of the intention to send) of a communication between two parties, for example a telephone call, a letter, a fax, an e-mail or a meeting.

## Chapter 4. IIW Enterprise Model



### What is the Enterprise Model?

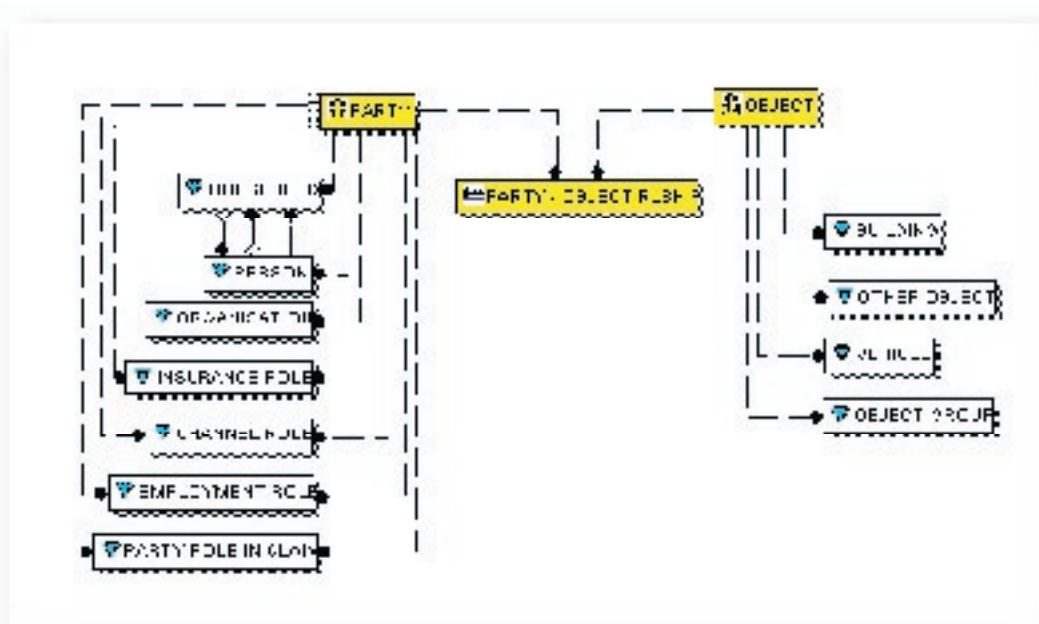
Once the data requirements are accounted for and validated in the Business Model, that data must be put into a structure that is specifically appropriate for the data warehouse and data marts. In essence, this data is carefully organized in accordance with its intended informational use for easier consumption by the end user.

The Insurance Information Warehouse Enterprise Model provides both the content and the structure to support the provision of this clean, rationalized, and easily accessible data from a central information repository.

The Enterprise Model is a logical model consisting of the data structures typically needed by an insurer for a data warehouse. Once the logical model has been customized to meet the exact requirements of the insurer, the physical data warehouse database definition can be automatically generated through the use of a modeling CASE tool.

A logical model is a representation of an insurer's data or information requirements and is usually represented in an Entity Relationship Diagram (ERD) using business definitions. The data needs are represented without consideration for technology constraints associated with platforms, tools, and software or how the application will be finally implemented. It is generic and flexible in design and facilitates an insurer's understanding of the true meaning of its data.

An example of an ERD from IIW is shown:



The Enterprise Model features a flexible “Atomic Data” area (primary data storage area) as well as the typical summaries needed by most insurers to roll-up the detail data for analysis purposes. The Enterprise Model has been designed to be one step from a physical data base generation. Normally, only a portion of the Enterprise Model is generated in the initial project phase. Other areas can be generated as the insurer tackles more business areas over time.

This comprehensive data model is derived from IBM’s highly successful Insurance Application Architecture (IAA) Business Model, from customer development partnerships, and from leading data warehousing design practices. The Enterprise Model can be used as the basis for supporting a detailed analysis of the areas of most concern to insurers today:

- Relationship management
- Profitability and performance of customers, products and channels
- Maximization of wallet share
- Customer loyalty and retention
- Enterprise-wide risk management
- Improvement of cross-selling ratios
- Marketing campaign management
- House holding
- Consistent definition of customer and products across the organization
- Identification of purchasing and product usage patterns

### Uses of the Enterprise Model

The Enterprise Model can be used as:

- The blueprint for a design of a central business data warehouse database structure. In this case the Enterprise Model assists in the creation of a flexible and extensible data warehouse-specific physical database.
- A logical reference point for the consolidation of data definitions and structures across a number of data marts.
- A starter set for the design of a data mart. In this case the structure can be optimized for the performance of end-user delivery functions or specific application (e.g., CRM).
- A logical reference point for the consolidation of data definitions and structures across lines of business and in cases of mergers and acquisitions, customer loyalty and retention.

## Major Groupings within the Enterprise Model

The Enterprise Model contains current and historical, atomic and summarized, de-normalized corporate data. Its purpose is to deliver a unique, consolidated, consistent, aggregated at the most detailed level, corporate source of information for distribution to users with specific needs. The Enterprise Model contains:

- A de-normalized representation of the atomic information of interest for the data warehouse. This part is derived from the normalized atomic information represented in the Business Model and is used as the basis to derive the dimensional structures.
- A dimensional representation of the analysis areas, which includes conformed dimensions and conformed facts (where conformed means “defined consistently”). The Enterprise Model represents summarized and aggregated information. It uses dimensional modeling techniques to present data in a standard, predictable, intuitive framework that sustains high-performance physical access.
- Historical information.

### Atomic Data

This is the component of the data warehouse that acts as the primary storage area for the data in the data warehouse. Typically this component is populated by data coming from the operational systems. The data structures in the Atomic Data are usually generalized and the bulk of the Enterprise Model would fit into this component.

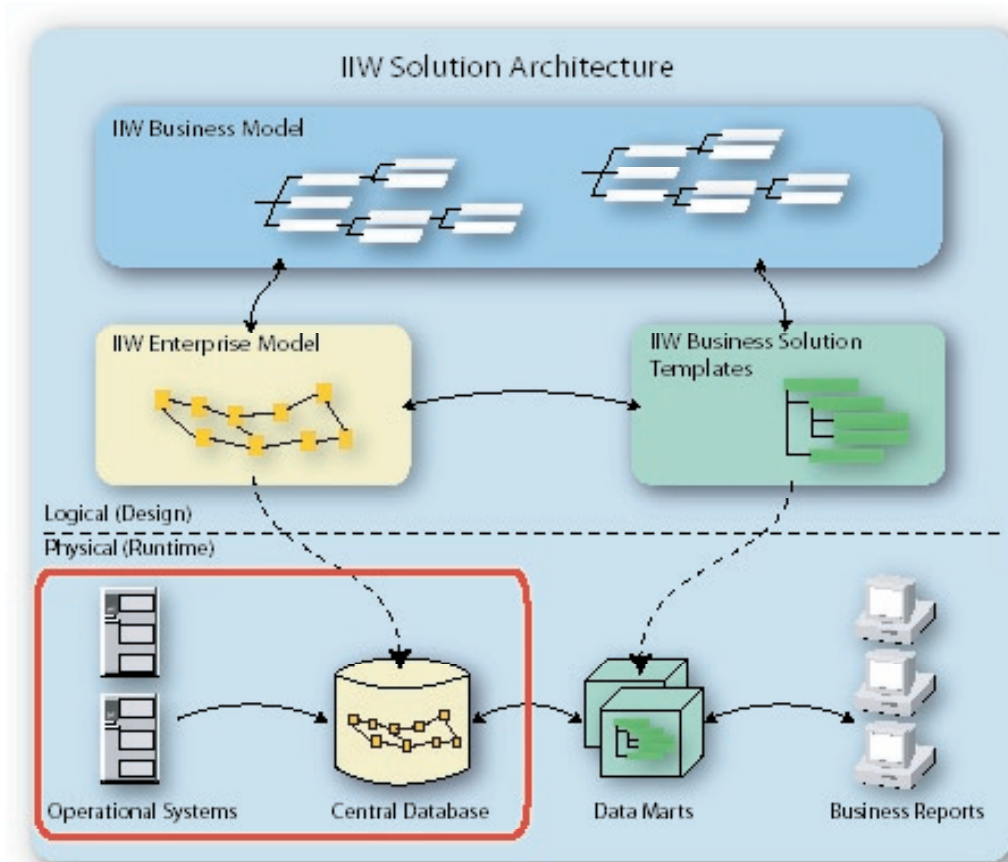
### Analysis Area

This is the component of the data warehouse that prepares the data initially stored in the Systems of Record (source systems or operational data store) for subsequent distribution to the data marts. The entities in the Analysis Area contain the specific aggregations or summaries of data needed to be a specific data mart or part of a data mart.

Representative Analysis Areas include:

Advances analysis	Investment contracts analysis
Agent commission analysis	Market share analysis
Auto claim analysis	Loss events analysis
Auto claim payments analysis	New business volume analysis
Campaign communications analysis	Person citations analysis
Campaign contacts analysis	Person value analysis
Campaign installments analysis	Policyholder behavior analysis
Campaign profit analysis	Policy event tracking analysis
Campaign responses analysis	Policy lifecycle analysis
Campaign sales analysis	Policy payments analysis
Cash flow analysis	Policy persistency analysis
Claim and benefit analysis	Policy volume for vehicles analysis
Credit contracts analysis	Portfolio analysis
Credit withdrawals analysis	Reinvestment analysis
Cross selling analysis	Surrender analysis
Customer event analysis	Switching analysis
Customer persistency analysis	Underwriting analysis
Forecast analysis	Life, savings and investments claim analysis

## Chapter 5. IIW Physical Environment



### Open Architecture

The Insurance Information Warehouse physical environment provides a physical data warehouse infrastructure. This infrastructure is tightly integrated with the logical environment incorporating both the IIW Business Model and IIW Enterprise Models.

IIW promotes an open architecture with each component adhering to industry standards. This allows the insurer to implement its data warehouse using existing or preferred commercially available tools for data cleansing, data movement, model management, and end user access.

It is possible to automatically generate the required data structures for a full data warehouse physical environment using the IIW Enterprise Model.

The main components of the physical environment are:

- IIW Database
- Data Marts
- Business Reports
- Operational System Data

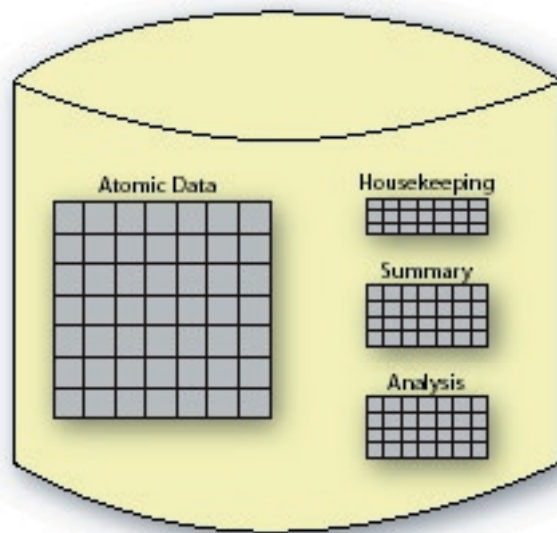
### IIW Database

The IIW Database is forward engineered from the IIW Enterprise Model (described in the previous chapter) and is designed as a starter kit for insurers who wish to create an overall data warehouse solution. The IIW Database provides a blueprint for a data warehouse, which first consolidates data from operational systems and then supplies data to a range of downstream data marts. It has been designed to support the needs of a central data warehouse and supplies the data needed by specific marts.

Transformation rules are used for identifying the adjustments made to a logical data model (Enterprise Model) to transform the structure into a more physical design. For example, these rules might define when two or more entities should be collapsed into one table, when attributes might be replicated in multiple tables, or when a subtype entity might be collapsed into its parent table.

The IIW Database is designed to provide a compromise between the need to provide a structure that is flexible and one that is relatively easily populated. The need for flexibility is driven by the requirement to support a range of different types of analytical and other future applications, without knowing the exact requirements of these applications. The ease of population is an objective driven by the need to ensure that the data warehouse is as easy to maintain as possible.

The IIW Database is divided up into a number of areas:



### Atomic Data Tables

The Atomic Data (or System of Record) is the area of the physical database where the data is stored in a flexible generalized format. Typically, all data supplied to the IIW Database as part of the normal updates from the operational systems would be stored here.

### Analysis and Summary Tables

The analysis tables are designed to aggregate the data for use by specific analytical applications. While the summary tables are designed to store commonly used aggregations, the analysis tables are effectively a staging area for a specific business applications.

The analysis tables may be necessary to collect the data into a format which is usable by an analytical tool. The analysis tables are typically of use where the application needs highly summarized data, such as with end user OLAP products.

An example of an analysis tables is the Customer Persistency Analysis table. This table is designed to gather the data from within the data warehouse for a specific set of OLAP reports and charts dealing with analyzing customer persistency. This table needs to pull data from other Data warehouse tables such as Product, Measurement Period, Customer, Policy, and Organization Unit.

## Data Marts

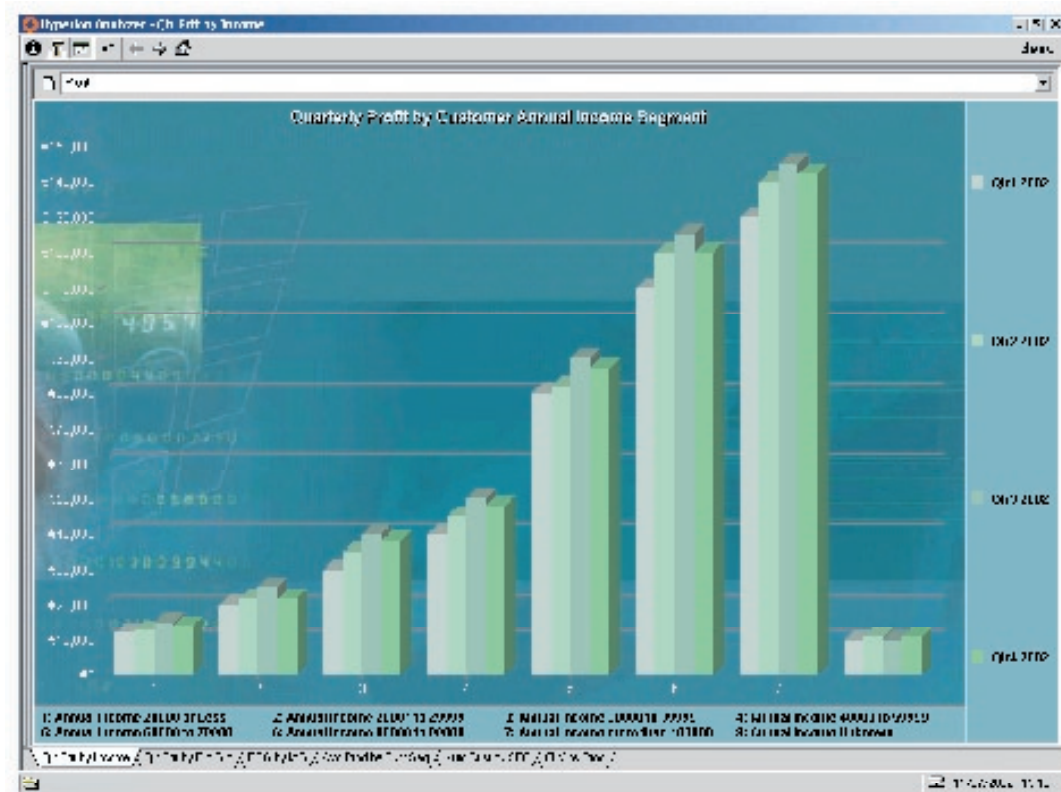
On-Line Analytical Processing lets users gain insight into data through fast, consistent and interactive access to a wide variety of data. OLAP transforms raw data into actionable information. With IIW, it is possible to develop multi-dimensional data marts that source the data from the central warehouse and transform it into this useful information. These data marts can be stored in an OLAP server and can be accessed by a range of spreadsheet and data warehouse reporting tools.

## Business Reports

IIW supports the development of a range of business reports. Such solutions range from spreadsheets and data warehouse reporting tools to specific applications such as customer profiling, data mining, campaign analysis, customer prospecting, and profitability and risk analysis applications.

In the case of spreadsheets or data warehousing reporting tools, once the equivalent data mart structures have been created it is then possible to rapidly create extensive and sophisticated reports and charts that are customized to the exact needs of the business users.

Using summary reporting, the insurers can 'slice and dice' the information to quickly identify trends and patterns. Summary reports typically query data marts. Thi is an example of a summary report:



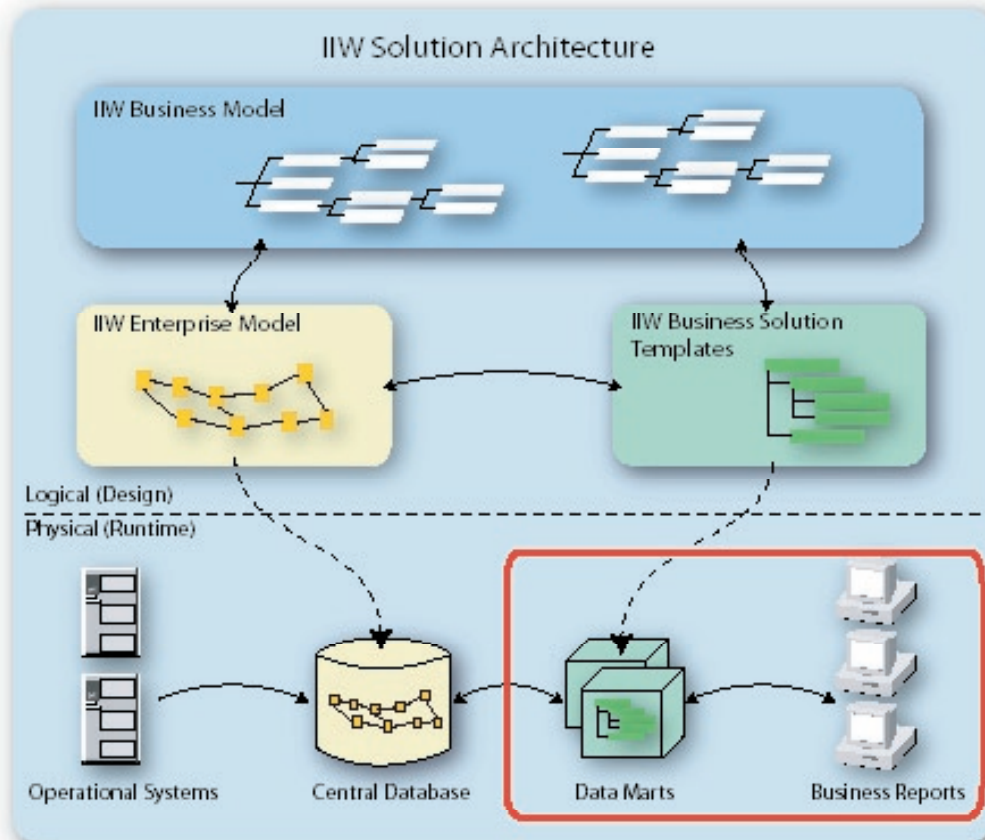
## Data from Operational Systems

Existing operational systems are the primary input to the data warehouse. The state and amount of this data varies widely from one insurer to another. However, in designing and building the IIW Database, a number of assumptions have been made:



- The data is supplied to the data warehouse on a periodic basis (daily, weekly, monthly)
- The data is primarily detailed
- The data has been through a cleaning process
- The data represents the “delta”, or change captured since the last extraction

## Chapter 6. Business Applications & Data Marts



To help insurers pursue BI-related customer relationship marketing and underwriting goals, IIW includes business applications and data marts.

Each data mart is designed to support a specific purpose, to focus on a particular problem, or on a departmental information requirement. This is in contrast to the Enterprise Model which is designed to be as open and as flexible as possible.

The following data marts are provided with the IIW solution, included for prototyping purposes and/or illustrating the types of business applications that the data warehousing infrastructure can facilitate:

### Segmentation Discovery and Management (SDM)

The SDM Application was developed taking into account the following principles:

- Starter Set - The SDM Application provides an insurance company with the key building blocks of a segmentation management facility: business requirements, data models, data analysis examples, and business reporting templates.
- Open solution - Independent of any business intelligence tool (OLAP, data mining). Although the SDM application uses IBM Intelligent Miner as data mining support tool, it can be easily customized and adapted to any other data mining tool. Likewise, Business Objects OLAP tool is used as an illustration of the multi-dimensional analysis capabilities of the SDM application but other tools could be used.
- Compliance with IIW architecture - The SDM application complies with IIW architectural principles. The building blocks are positioned in the relevant layers: Source layer, Business Data Warehouse layer (BDW), Business Information Warehouse layer (BIW) and Client layer.
- Modeling approach - Bearing in mind the usual characteristics of a data mart, such as user accessibility and performance, the SDM data mart is de-normalized and its entities are specialized. Also, the granularity of the fact entities has been adapted to the most appropriate level of aggregation on each of its dimensions.

The SDM data mart model and business application contains:

- A subset of the Enterprise data warehouse: a limited number of tables with only the relevant attributes for the data mining exercises
- A set of tables that represent the flat files used as input for the data mining tool
- A set of fact tables surrounded by their dimension tables for the OLAP tool (Business Objects)

The chart below shows a typical business report that may be used to identify the most promising cross-selling strategies. The business opportunity for each cross-selling strategy is quantified by examining the number of policyholders who hold one base product but who are not policyholders of the target product the insurance company wants to cross-sell. These policyholders are candidates for cross-selling. The average target product premium for holders of both products is calculated and multiplied by the number of cross-selling candidates to arrive at the premium opportunity for each cross-selling strategy.

Cross-Selling Strategy	Base Number Of Policyholders	Target Number Of Policyholders	Cross-Selling Penetration	Opportunity Number Of Policyholders	Total Target Standardized Premium	Average Target Standardized Premium	Opportunity Standardized Premium
Policyholder	62	15	24.19 %	47	169,000.00	1600.00	220,200.00
Target Product	1	1	100.00 %	1	1,000,000.00	1,000,000.00	1,000,000.00
			Sum:	65		Sum:	1,000,200.00

### Campaign Management - Quick Start (CMQS)

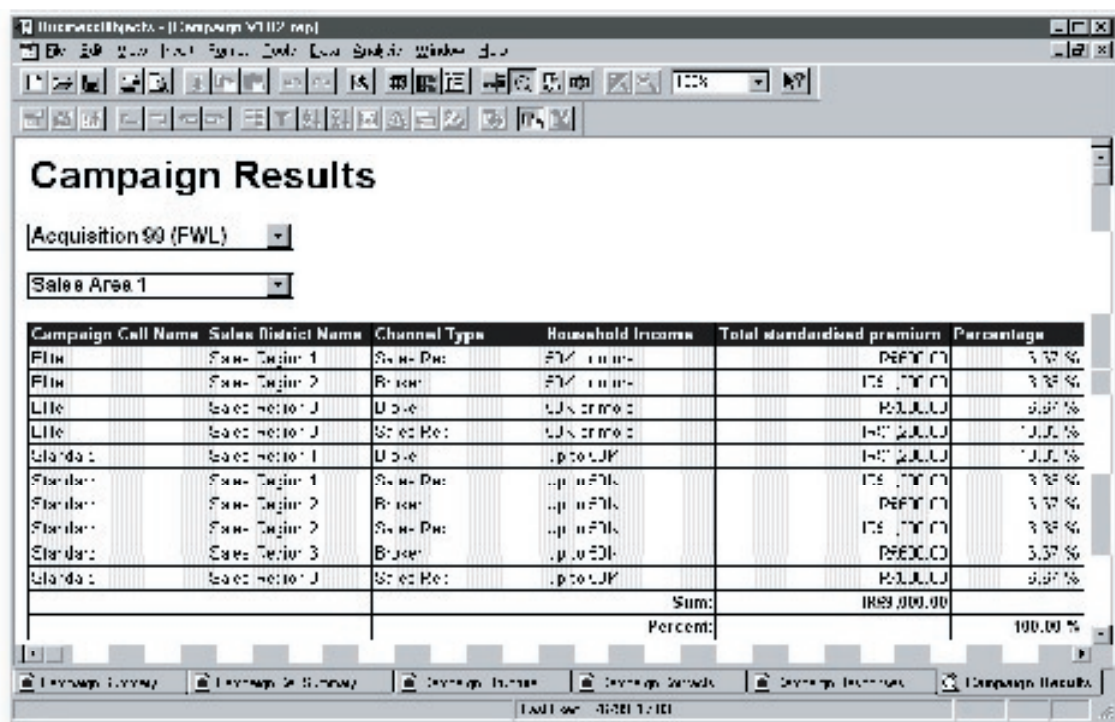
The CMQS was developed taking into account the following principles:

- Starter Set - The CMQS Application provides an insurance company with the key building blocks of a campaign management facility: business requirements, data models, data analysis examples, and business reporting templates.
- Open solution - Independent of any campaign management tool or business intelligence tool (OLAP). Although the CMQS uses a campaign management support tool, it can be customized and adapted to another campaign management tool. Likewise, an OLAP tool is used as an illustration of the multi-dimensional analysis capabilities of the CMQS but other tools could be used..
- Compliance with IIW architecture - The CMQS complies with IIW architectural principles. The building blocks are positioned in the relevant layers: Source layer, Business Data Warehouse layer (BDW), Business Information Warehouse layer (BIW) and Client layer.
- Modeling approach - Bearing in mind the usual characteristics of a data mart, such as user accessibility and performance, the CMQS data mart is de-normalized and its entities are specialized. Also, the granularity of the fact entities has been adapted to the most appropriate level of aggregation on each of its dimensions.

The CMQS data mart model and business application contains:

- Campaign contacts fact with dimensions Time, Campaign, Communication Medium and Market Segment
- Campaign responses fact with dimensions Time, Campaign, Market Segment, Communication Medium and Response Code
- Campaign sales and profits fact with dimensions Time, Campaign, Market Segment, Geographic Area, Channel Role, Payment Method dimensions, product and Communication Medium.
- Campaign communications fact with dimensions Time, Campaign, Channel role, Market Segment and Communication Purpose

The following chart shows an interactive OLAP report that facilitates the analysis of the premium volumes written as the result of a campaign by campaign/campaign cell/campaign step, sales geography, distribution channel, and household income.



### Underwriting Profitability Analysis (UPA)

The core of the UPA business application is a client-server application environment that facilitates the development of risk models based on the characteristics and risk experience of an auto insurance business portfolio. It identifies the rating factors and rules which predict the customer segments by calculating virtual 'pure premium' for each segment based on claims frequency and severity.

The UPA application consists of the following components:

- The UPA client provides a graphical user interface from which analysts can manage the data mining process.
- The Probabilistic Estimator (ProbE) data mining engine performs the data mining computations.
- The UPA server manages communication between the ProbE engine and one or more UPA Clients and handles queuing of data mining runs.
- A meta file generation utility automates the creation of a UPA meta file from an Erwin data model.
- The UPA data models (CASE tool format) provide a starter set to rapidly scope, design and implement data stores that are suitable for analysis via UPA and the ProbE data mining engine.

- Several sample data sets, provided to support installation, testing and education activities in advance of real data sets being available.

The UPA data mart models and business application contains:

- Claims fact with dimensions Time, Policy, Person, Geographic area, Vehicle, Specification, Channel role, Claim.
- Claim payments fact with dimensions Time, Policy, Person, Geographic area, Vehicle, Specification, Channel role, Claim.
- Policy payments fact to record measures related to policies component payment. The measures are fully identified by dimensions Time, Policy, Geographic area, Vehicle, Specification and Channel role.

The chart below illustrates the UPA generation of IF-THEN rules, that predict pure premium according to the claim frequency and severity experience of a given customer risk segment.

Rule ID	Rule Text	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6	Value 7	Value 8	Value 9	Value 10	Value 11	Value 12
Rule 1	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Rule 2	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Rule 3	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Rule 4	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Rule 5	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Rule 6	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Rule 7	IF [Condition]	...	...	...	...	...	...	...	...	...	...	...	...
Summary		40830	80074	0.0912	2140	22.0	90*	218	00	05	2.90		

## Demonstrators

Additionally, the IIW solution includes a set of demonstrators:

**Customer and Prospect Optimizer (CPO)** - CPO is a web-enabled customer prospect management and delivery system showing how an insurance company's sales force (agents, brokers and internal sales personnel) could deliver leads and capture feedback on the success of those leads.

**Profitability Analysis for Motorcycle (PAM)** - PAM uses MicroStrategy's Decision Support System (DSS) suite, specifically the DSS Architect and DSS Agent™ (trademark of MicroStrategy, Inc.), to provide sample reports related to profitability analysis, claims analysis and cost analysis for motorcycles.

**Risk Pricing Analysis (RPA)** - RPA is a data mart which can be used to illustrate analysis of past claims experience for different types of risk in relation to rating variables, for motor and household insurance.

## Sample Reporting Environments

### Health Profitability Management

The Health Profitability Management (HPM) data mart enables the analysis of key performance indicators for individual and corporate health insurance clients. Examples include:

Profitability by policy type (e.g., Private Medical Insurance (PMI), critical illness, income replacement, total individual incapacity, long-term care insurance)

- Gross earned premiums by policy type (individual and group)
- Gross earned premiums compared to gross claims (or gross earned premiums minus gross claims)
- Mean annual premium for individual and group policies
- Mean annual claim per policy

New Business and Business in-force by policy type and distribution channel (e.g., Broker or Independent Financial Advisor, sales force and tied agents)

- New individual and group policies
- New individual critical illness policies by type (e.g., heart attack, coronary bypass, kidney failure, major organ transplant, cancer, stroke)
- New individual premiums (increments/decrements)
- Mean premium
- Regular pre-funded long term care policies in force by age and gender
- Single pre-funded and point of need long term care policies in force by age and gender
- Single long term care in force by age and gender

Sales Performance by policy type and distribution channel

- Actual and planned numbers of policyholders
- Actual and planned mean premiums
- Actual and planned gross earned premium, gross claims and gross claims ratio
- Actual and planned mean premiums

Health expenditures by type of service and treatment incurred (e.g., hospital care, physician/clinical services, prescription drugs, nursing home care, home health care, other personal healthcare).

### Intermediary Performance Analysis (IPA)

Intermediary Performance Analysis (IPA) data mart focuses on the management of various sales channels in terms of production, productivity, training, and competencies. It enables management reporting on the following business areas:

- Agency continuous professional development analysis
- Agency learning achievement analysis
- Agency resource profile analysis
- Agency resource qualification analysis
- Agent performance and competency development analysis
- Agent training analysis
- Analysis of agent achievements against competition criteria
- Analysis of customer feedback on intermediaries
- Analysis of policy delivery
- Intermediary compensation analysis
- Intermediary persistency analysis

- Intermediary production analysis
- Intermediary productivity analysis

The chart below shows a range of key performance indicators associated with the Agent performance and competency development analysis used to identify training gaps. Business reporting can be performed along the following dimensions: Type of Agent, Class of Business, Insurance Product, Geographic Area, Premium Stream (Regular, Single), Type of Policy, and Type of Training.

### Financial Reporting

The Financial Reporting data mart enables the development of an effective insurance management information system (e.g., Executive Dashboard). Additionally, it addresses the regulatory compliance issues such as those imposed by the Solvency II initiative in the European Union (EU). It comprehensively covers the following financial reporting areas:

Admissible Assets Analysis	Analysis of Claims for Long-Term Insurance
Analysis of New Business for Long Term Insurance	Analysis of P&C Claims & Premiums by Risk Group - Accident Year Basis
Analysis of P&C Claims & Premiums by Risk Group - Underwriting Year Basis	Analysis of P&C Claims, Expenses & Technical Provisions - Accident Year Basis
Analysis of P&C Net Claims and Premiums - Accident Year Basis	Analysis of P&C Premiums - Accident Year Basis
Analysis of P&C Premiums, Claims & Expenses - Underwriting Year Basis	Analysis of P&C Technical Provisions - Underwriting Year Basis
Analysis of Premiums for Long Term Insurance	Analysis of the effect of financial engineering on solvency
Capital adequacy analysis for With-Profits business	Equalization Provisions Analysis
Equalization Provisions Technical Account - Accident Year Basis	Equalization Provisions Technical Account - Underwriting Year Basis
Expenses Analysis for Long Term Insurance	Financial analysis of claims
Fixed and Variable Interest Assets analysis for Long Term Insurance	Index-Linked Assets Analysis for Long Term Insurance
Internal Linked Funds Unit Price Analysis for Long Term Insurance	Liabilities Analysis for P&C (Non-Life) Insurance
Liabilities and Margins Analysis for Long Term Insurance	Linked funds balance sheet - Long Term Insurance
Loss Adjustment Expenses analysis	Mathematical Reserves analysis for Long Term Insurance
Net Assets Analysis	Non-Linked Assets Analysis for Long Term Insurance
Profit & Loss Analysis for P&C Insurance - Technical Account	Profit And Loss (non-technical account) analysis
Revenue Account for Internal Linked Funds - Long Term Insurance	Revenue Account for Long Term Insurance
Solvency Analysis for Long Term Insurance	Solvency Analysis for P&C (Non-Life) Insurance
Solvency Analysis for Supplementary Accident & Sickness Insurance	Solvency Analysis for Supplementary Accident & Sickness Insurance
Summary of New Business for Long Term Insurance	Summary of Premiums and Claims - P&C Insurance
Valuation Analysis by Contract and Business for Long Term Insurance	Valuation Analysis for Long Term Insurance
Valuation Interest Rate Analysis for Long Term Insurance	With-Profits Funds - Analysis of Payouts on Maturity
With-Profits Funds - Analysis of Payouts on Surrender	With-Profits Funds - Realistic Balance Sheet Analysis

**Overall Profitability Analysis (OPA)** is a simple decomposition of the main profitability ratios for non-life insurance: combined ratio, loss ratio, operating ratio and so on.

**Sales Forecast Analysis (SFA)** addresses the factors determining the forecast of sales by: Determining the market size to assess details of product sales and premium volume, determining the market share by product, considering competitors and target market share, forecasting product sales volume and premium income based upon previous sales history and market analysis , planning the growth rates based upon market analysis.

**Claim Efficiency Analysis (CEA)** addresses the factors impacting the efficiency of the claims handling process by: monitoring incoming recovery payments from third parties and re-insurers, assessing the distribution of claims amongst intermediaries and the loading of claim handlers, reconciling claims outstanding versus claims estimates, performing claims statistical analysis, which may influence product development, analyzing the distribution of claims across all types of loss events.











**For more information:**

**IBM Industry Models & Assets  
IBM Belgium  
Avenue du Bourget 42  
1130, Brussels  
Belgium**

**Email: [fssc@be.ibm.com](mailto:fssc@be.ibm.com)**

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