

Business Intelligence Solution Framework for Insurance Vertical



To survive in today's volatile marketplace? 'Information' or more precisely, 'Actionable Information' is the key factor. For no other industry is it as important as for the Insurance Industry, which is almost totally dependent on current and insightful information. This is exactly what our solution framework on Business Intelligence seeks to provide. A close look at the insurance value chain suggests that Business Intelligence can play a crucial role in almost every aspect of the chain. It can help identify the right customers for target marketing and analyze the reasons for customer attrition. It can help the insurer better manage its agents and sales force and improve the effectiveness of actuarial and underwriting functions. Business Intelligence forms the most critical component of claims management, helping in fraud detection and claims estimation. On the asset management side, it can lower the insurer's risk through sophisticated risk models. And most importantly, Business Intelligence can help insurers provide crucial information to corporate clients, which can go a long way in cementing the insurer's relations with the clients.

Major Trends in the Insurance Industry

The insurance industry is quite diverse in terms of portfolio of products provided by different companies. The products can be broadly classified into two product lines: *property and casualty* (P&C) and *life insurance*. Life insurance product line can be further sub-divided into life insurance, health insurance and annuity products. Growing consolidation and change in the regulatory framework has led many insurers to add new products to their portfolio. This presents its own unique challenge to the insurer in leveraging its greatest asset - data. A number of other trends in the insurance industry have also exponentially increased the importance of an effective business intelligence environment; at the same time, these trends are responsible for increasing the complexity of building such an environment:

Growing Consolidation: Consolidation is a major force altering the structure of insurance industry, as insurers seek to create economies of scale and broaden their product portfolios.

Convergence of Financial Services: Mergers and acquisition of insurance companies with other financial service providers like banks has led to the emergence of integrated financial services companies.

New Distribution Channels: New distribution channels are fast catching up with the traditional insurance agent. Though these channels are not a major threat as yet, they are rapidly changing the way insurers and customers interact with each other.

Focus on Customer Relationship Management: The only viable strategy for insurers today is to focus on the needs of the customers and strive to serve them better. Customers have extremely differentiated needs and, also, the profitability of individual customers differs significantly; hence, an effective CRM strategy becomes the most vital component of an insurer's overall business strategy.

The Insurance Value Chain

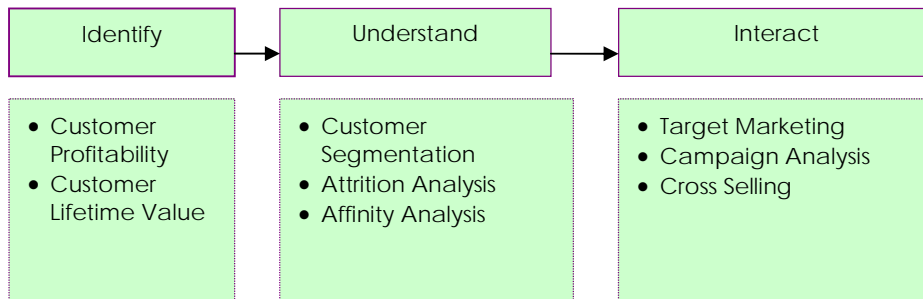
Insurance companies acquired significant product development capabilities; but they lagged behind in truly understanding the customer. This led most firms to develop products that they could, rather than those required by their customers. But during last few years, deregulation and growing competition has forced insurance companies to move from traditional product-centric operations to customer - centric operations. To succeed in this market, insurers have to analyze their customer's needs and tailor all the business processes in the value chain to effectively meet their unique requirements. Implicit in this argument is the assumption that insurance companies have the ability to turn volumes of data - pertaining to their customers, agents, claims and policies - into actionable information. Business intelligence tools like data warehousing, OLAP, and data mining can significantly help in almost all the aspects of the value chain to achieve this objective. The above figure illustrates the insurance value chain. In the following discussion we will focus on some of the business intelligence applications in each block of the value chain.

Customer Relationship Management

A typical insurance company has a huge customer base, varied product lines with number of products within each line, many distribution channels, and a market spread across geographies. To effectively interact with customers and design suitable products, the insurer's CRM strategy has to fully utilize the potential of technology.

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The insurer has to leverage the vast pool of data at each step in the CRM process, and use the insight gained for developing new products and services to meet the ever-changing needs of the customers.



The CRM process in an insurance company has three steps as shown above:

1. Identify the most profitable or potentially profitable customers for future interaction,
2. Understand their needs and buying patterns
3. Interact with them so as to meet all of their expectations.

The above figure illustrates the role of the solution framework in each step of the CRM process. Right from identifying the most profitable customers to improving the overall quality of customer interaction, BI tools can go a long way in making the insurer's CRM strategy a roaring success.

Customer Profitability: Rather than simply acquiring new customers, it is vitally important to retain and increase the profitability of existing ones. Identifying the most profitable customers is the first step in that direction. To arrive at the overall profitability of a customer, insurers must quantify (a) the costs involved in serving the customer over a period and (b) the revenues realized from the customer during that period. The results of customer profitability analysis can point towards the reasons behind why some customers are not as profitable as others are. For example, a customer might be unprofitable because the products used by him/her do not match her risk profile. Customer profitability analysis can significantly help in developing new products and customizing existing products for a customer or customer segment.

Customer Lifetime Value: Customer profitability is not the sole measure of a customer's value to the insurance company. A customer may have the potential of buying profitable products in the future; she may also serve as an excellent reference for more profitable customers. Customer Lifetime Value (LTV) is, hence, a more insightful measure.

Customer Segmentation: Segmentation is used to segregate customers, who exhibit common characteristics, in different segments. These segments can then be treated as distinct entities and the future interaction with them can be tailored accordingly. Customer segmentation can save a lot of marketing effort, which would otherwise go waste.

Attrition Analysis: Studies have shown that across industries, acquiring new customers is much more costly than retaining existing ones. This is especially true for insurance. Typically, buying an insurance product is a long-term decision for a customer; and if she decides to switch, it is very likely that she will not come back. Hence retaining the existing customers is of paramount importance; customer attrition analysis is the first step in this direction. It involves analysis of data captured during individual customer contacts at the various touch points. For attrition analysis, customer contact data is coupled with other data sources like claims and policies; the resultant data set is then associated with customers who have switched to analyze the possible reasons behind this decision. The results can also be used to improve the performance of customer touch points.

Affinity Analysis: It is often referred to as *market-basket analysis*. Certain products show an affinity towards each other, and are likely to be bought together. For example, a man in his early thirties who buys a life insurance policy might also be interested in a certain type of annuity. These affinities can be, at times, extremely difficult to unearth and often data mining tools are used for this purpose. These tools use a technique called 'association analysis' for arriving at the right combination of products and services for a customer or customer segment.

Target Marketing: Target marketing - marketing to a specific customer group - is a natural outcome of customer segmentation. Once distinct customer segments are identified, BI tools can be used to study the products likely to be bought by the segment. Often data mining is used to develop predictive models to establish the buying propensity of a segment towards various existing or new products. Armed with this knowledge, marketing managers can design specific campaigns targeted at individual segments.

Campaign Analysis: Campaign analysis is used to analyze the effectiveness of a marketing or promotion campaigns. The effects of a particular campaign on sales of the promoted product can be tracked using the solution framework. Often the surge in sales of the promoted product can result in decrease in sales of other related products. The solution framework can also help identify such relationships. The campaign data is stored in a data warehouse and can be used to predict the effectiveness of similar campaigns in future.

Cross Selling: Cross selling is a major source of revenue for insurance companies. For effective cross selling, an insurer can leverage the data - housed in the data warehouse - to quickly zero down on the new products that would be required by its existing customers. These can then be offered to them during the next contact.

Channel Management

Insurance companies have till now relied on independent agents, brokers, and direct sales force for distributing their products. These are still the primary distribution channels and are likely to remain so in the near future. Internet is emerging as a popular distribution option for certain types of insurance products. But most of the insurance products have not been much successful on the Net, primarily because of the complex nature of transactions involved. Fear of channel conflict has also prevented many insurers from fully exploiting its potential. No wonder, most of the traditional insurers currently use the Internet only to provide information about their products. But one thing is sure: insurers will have to quickly integrate the Internet with their existing channels. At the same time they will have to improve the overall distribution effectiveness via the traditional channels. The solution framework allows insurers gain insight into the various distribution channels to help them intelligently address the various issues in channel management:

Agent and Sales Force Deployment: Based on geographical analysis of its customer base, insurers can optimally deploy the right number of agents and sales persons in different locations. This analysis should also include the potential customers for the new and existing products offered by the insurer.

Agent Development and Relationship Management: The solution framework can leverage the sales data - stored in the data warehouse - to analyze the selling behavior of agents and sales persons. This analysis can identify the best agents and sales people who can then be adequately rewarded. The analysis can be extended to include more subtle behavioral aspects, which can be used to design training programs for agents. For example, some agents might just be selling certain products and totally missing out on others. This may indicate need for product specific training.

Channel Analysis: This involves calculating the performance of various channels. Using the solution framework, insurers can compare the performance of various channels and drill down to the level of individual agents and products. The performance should be tracked over time so as to measure the effectiveness of corrective/developmental actions undertaken by the insurer.

E Business Development: A variety of analytics can be done on customer and transaction data captured via the Internet. This data should be integrated with data collected from traditional channels for a more meaningful segmentation of customers who buy policies over the net. This 'e-segmentation' can help in designing campaigns specifically for the online customers.

Actuarial

The actuarial function is the crux of the insurance business. It involves estimating risk pertaining to the asset that is being insured. In case of life and health insurance it involves calculating the probability of accident or death based on various demographic and environmental characteristics. The task of an actuary is extremely complex and has strategic implications for the insurance company; it often takes up to a decade to become a certified

actuary. An actuary can use sophisticated mathematical models - developed using data mining tools - to calculate future premiums and to allocate portions of a book of business for reinsurance:

Risk Modeling: Actuaries can develop predictive models using the solution framework – data mining tools, for identifying risk profiles of various customer segments. These models can include risk measures like mean claim amount, claim frequency, and loss ratios. For example, rich men who show propensity towards drinking and drive sports cars constitute a high-risk profile group. Various risk measures can be calculated for this customer segment, which can, then, be used for calculating at the right premium amount.

Reinsurance: A reinsurance company can take up a part of the insurers' risk in return for a part of the premium. In case of a claim, the reinsurance company will pay the corresponding claim amount. Actuaries need to decide the right amount of reinsurance in order to maximize the returns for the risk acceptable to the insurance company. The solution framework – Data mining tools can be used to develop predictive models to arrive at the reinsurance level for the book of business based on the historical claims data residing in the data warehouse. These predictive models can identify suitable policies for reinsurance based on the loss experience of similar policies in the past.

Profitability Analysis: Profitability of the existing products can be tracked along various factors like product line, geographic region, agency, customer segment, etc. This is often the first step in predicting the viability of new products. Based on historical profitability, actuaries can also develop more sophisticated predictive models - using the solution framework – data mining tools - for estimating the marketability of new products and identifying the most profitable customer segments for those products.

Underwriting and Policy Management

An underwriter decides whether the risk undertaken by insuring a client is acceptable or not; and if it is acceptable, he/she determines the right amount of premium to be charged. The solution framework can leverage the claims, policies, loss and other data stored in a data warehouse - to help improve underwriting and policy management. Following are some of the applications in this area:

Premium Analysis: Premium income is the primary source of revenue for an insurance company. Premium analysis allows the tracking of premium performance by a product or product line; a geographical region; an agency or a particular agent; and by a branch office. A variety of reports and analysis can be generated by 'slicing and dicing' the data.

Loss Analysis: For some products or product lines, the premium revenue might be less than the cost of servicing them. This loss, often termed as underwriting loss, may be due to inaccurate initial risk estimate. Insurers need to constantly monitor the loss data to determine the cost of getting new customers and renewing old ones for those products or product lines. This can help in improving profitability of underwriting programs and help insurers salvage their book of business.

Claims Management

The importance of claims management cannot be overemphasized. Speedy and effective claims handling forms the basis of sound customer relationship management. At the same time, the insurer has to guard against the ever-increasing specter of fraudulent claims. The opportunity cost of ineffective claims management is extremely high - hasty claim settlement can result in increased fraud related costs and, at the same time, slow fraud detection can increase the overall claims cycle-time, leading to higher customer dissatisfaction. No wonder insurance companies around the world are looking at technology for that 'right' claims management solution. Experience of various companies suggests that without sophisticated analytical capabilities such a solution would remain an elusive dream. Following are some Business Intelligence applications in claims management:

Claims Analysis: Claims analysis is one of the most common applications in the insurance industry. It involves analysis of the claims data coupled with other data sources like underwriting and policies. It is primarily used to gauge claims processing efficiency, which has a direct bearing on customer satisfaction. Claims analysis is also used to understand subtle business trends in claims, which would have been otherwise difficult to spot. The solution framework can be utilised to analyze and drill down to the detailed level for a better understanding of these trends. For example insurers can use this data to analyze trends in claims and loss patterns, which can help

optimize reserve management, leading to lower risk and more available funds for investment. Claims analysis can also help in spotting fraud by analyzing above normal payoffs along different factors like geographical region, agent, and insured party. In case of health insurance, claims analysis can reduce abuse by analyzing the behavior of various practitioners. It can spot practitioners who have been consistently prescribing expensive medicines and tests in cases where they are not required. The analysis can also include other procedures and practices like the average length of hospital stay followed by the practitioner.

Fraud Detection: The likelihood of fraud in a claim can be detected by sophisticated analysis of claims data coupled with other internal or external data like payment history, underwriting, and ISO Claim Search database. Solution framework – Data mining tools typically used to develop models that can spot patterns in fraudulent claims.

Claims Estimation: The actual value of claims can not be known before hand when a new product is launched. In such cases, an estimated value has to be set aside in the form of cash reserves; and such funds cannot be used for long-term investments. The accuracy of these estimates has far reaching impact on the profitability of the insurance company. The solution framework can be used to do an analysis on the claims data across geographies and customer segments to arrive at better claim estimates. For higher accuracy, data mining tools can also used to develop sophisticated claim estimation models.

Finance and Asset Management

The role of financial reporting has undergone a paradigm shift during the last decade. It is no longer restricted to just financial statements required by the law; increasingly it is being used to help in strategic decision making. Historically, interest earned on investments has been a major source of income for insurers and this income has greatly contributed to the overall profitability of insurance industry; at the same time underwriting costs have drastically brought down profitability. To compete in this market, insurers need to increase their return on investments and bring down underwriting costs. This requires ready access to financial data for analysis purposes.

Budgeting: Data warehousing facilitates analysis of budgeted versus actual expenditure for various cost heads like promotion campaigns, underwriting expenses, commissions, etc. The solution framework can provide drill down facility whereby the reasons for cost overruns can be analyzed in more detail. It can also be used to allocate budgets for the next financial period.

Asset Liability Management: Models can be developed using the solution framework to measure the insurer's exposure to various risk factors like change in the interest rate structure, share market volatility, etc. These models can be used to predict the performance of the portfolio under different economic scenarios and predict future liquidity needs of the insurer.

Financial Ratio Analysis: Various financial ratios like debt-equity, liquidity ratios, etc. can be analyzed over a period of time. The ability to drill down and join inter-related reports and analyses.

Profitability Analysis: This includes profitability of individual products, product lines, underwriting activity, and investments. A major component of profitability analysis is a thorough analysis of costs incurred during underwriting, which has been a major factor in bringing down the overall profitability of insurance companies.

Web Reporting and Analysis: Swift decision-making requires ready access to financial data via an intuitive web interface.