

DISCUSSION DRAFT

Statement of Guidance Regarding Management Data and Information

The purpose of this statement is to provide guidelines to be used by actuaries in designing 1) data collection systems and 2) management information systems in the following areas: ratemaking, reserving, underwriting/marketing, claims, financial analysis and investments. It is a statement of the Casualty Actuarial Society's Committee on Management Data and Information.

The insurance system relies on the quality and timeliness of its information for its internal management needs and to fulfill its many public reporting requirements. Because of their training and background, actuaries have a responsibility to help develop quality procedures for collecting data and reporting useful and accurate management information to serve as the basis for sound decision making.

The statement consists of four parts:

- I. Data Collection Principles
 - II. Data Access Principles
 - III. Management Information Considerations
 - IV. Conclusions
- I. Data Collection Principles

Before it can be decided what data elements should be captured in a data collection system, the end use of the data must be specified. Actuaries traditionally are responsible for defining information needs for ratemaking and reserving. In some cases, they are involved in

designing management information for other disciplines: underwriting, marketing, claims, financial analysis and investments. While each of these areas has different needs for management information, the system used to collect the underlying data should be designed with all of the users' needs in mind.

The principles of data collection are separated into the principles of data capture and the principles of data quality control. Data gathering should follow certain principles, in order to develop an accurate and timely data collection system. In addition, a data quality control system should be implemented to ensure that the data being captured, processed and reported is accurate and complete.

A. Data Capture Principles

1. Data requirements should be compatible and consistent, regardless of line of business or policy form, to the extent possible. Monoline and multiline data should have similar requirements to facilitate combination. Common data elements should be defined similarly, regardless of line of business or function supported.
2. Data requirements and instructions for capture and storage should be conducive to acceptable data quality. Definitions and rules should be understandable at the support staff level and updated promptly when changes occur. Clear, explicit directions for data entry, including default values, should exist to eliminate judgmental assignment of values at the data entry level.
3. Statistical coding should follow usage. For example, rating manual and statistical plan codes and definitions must be compatible.
4. Technical parameters (field sizes and values) should be flexible in anticipation of future needs.

5. Meaningful values instead of codes should be used.
6. Statistical coding should be positive and absent of specific alpha codes that may be misinterpreted.
7. Statistical coding should be sufficiently detailed to meet possible future reporting requirements.

B. Data Quality Control Principles

1. A data quality control function should be established, and standards of data quality should be established and monitored within and across operational areas.
2. Critical processing points should be identified. Control procedures at these points should be developed and documented to assure that data which is transferred, translated or reproduced is done completely and accurately, with appropriate backup and audit trails.
3. Edits should be installed to check accuracy, validity and reasonableness. These edits should be performed as closely as possible to the data entry source.
4. Balancing or reconciliation procedures and standards should be established in the initial project description. Special reports and techniques should be developed to test data accuracy on a selected basis.

II. Data Access Principles

While numerous data elements can be captured, they are of limited value unless the data is efficiently organized in a way to maximize the use and value of the information. In a dynamic, ever-changing environment, every information system must be designed with flexibility in mind. The following concepts should be considered in the design of a data base (the repository of data elements).

- A. Central Data Base - The ideal repository of data collected is a central data base. Here, all the detail collected would be stored and accessible to all report systems. Thus updates, corrections, and controls are maintained at one location. Multiple locations of the same data elements, on the other hand, make it more likely that updates are not applied to all data bases uniformly.
- B. Detailed Data Base - The data base should contain sufficiently broad and detailed data elements to satisfy the needs of all end users.
- C. Data Dictionary - Definitions of data elements should be commonly understood by all suppliers and end users of data. These definitions should be maintained in a single source.
- D. Data Base Design - The design or organization of the data should address the following considerations:
1. Run time, storage costs, or volume restrictions may necessitate the creation of multiple, summarized data bases to fulfill different end user needs. For example, a data base containing only loss information can be extracted from the central data base in order to review loss developments. Ideally, a summarized data base should support all routine corporate reporting for that specific data at that particular level of detail. This smaller data base enables the various report generation systems to execute or run faster, since there are many less records to be accessed. Also, a summarized subset of the central data base would likely incur lower storage (hardware) costs. These advantages must be weighed against the potential control problems outlined in Section A. Central Data Base.

2. Segmentation, if necessary, is an important facet of data base design. The central data base may need to be organized into smaller units because of volume considerations. Data may need to be grouped by line of business or by state, for example, depending again on the needs of the users.
 3. The file structure, sequential versus random access, becomes an important consideration as the size of the data base increases. Multiple passes of a sequential data base to extract the same or different data elements may be costly and inefficient. In this situation a random access file with a data base management system may be preferable.
- E. Ad-Hoc Capabilities - While many pre-programmed reports may be specified to extract information routinely, data bases should be flexible and organized to facilitate the use of higher level languages by end users for special ad-hoc reports.
- F. Storage - The retention period of data in the data base depends on the number of years of data needed for meaningful analysis, and legal and regulatory requirements.

III. Management Information Considerations

There are several different types of management information systems necessary in a property/casualty insurance system, including ratemaking, reserving, underwriting/marketing, claims, financial analysis and investments.

The types of data outlined below are fundamental requirements within each discipline and are not meant to be an exhaustive list of every possible piece of information.

A. Ratemaking

Historical premium, exposure, loss and expense experience is usually the starting point of ratemaking. There are several acceptable methods of summarizing data for ratemaking purposes including calendar year, calendar/accident year, or policy year. The nature of the coverage being provided and data availability will affect the choice of the system used. There are three general types of data needed in any ratemaking process:

1. Premium and Exposure Information should include actual collected written and earned premium, written and earned exposures, including the effect of audit adjustments, and premium at present manual rates (where applicable). Information should be organized to monitor growth rates and changes in the mix of business and therefore should be available by class, by territory, by policy limit and by state within each line or subline of business. Information about historical rate changes and exposure trends should also be available.
2. Loss and Loss Adjustment Expense Information is needed in greater detail than premium and exposure information because of the greater number of variables that can affect loss estimates developed in the ratemaking process. Historical loss development patterns of paid and incurred loss amounts, claim counts and loss adjustment expenses should be available to properly estimate the ultimate value of currently outstanding claims. The impact of changes in the frequency and severity of claims should be measured with appropriate reports. Possible changes in the underlying loss distribution should be analyzed by reviewing data segregated by size of claim.

3. Expense Information should be available to determine the appropriate provisions for various categories of expenses: unallocated loss adjustment expenses, commissions, other acquisition expenses, taxes, licenses and fees, general administrative expenses and dividends.

Insurance ratemaking takes place in the broad economic environment that affects every business. The ratemaker may supplement internal information with external economic data or industry-wide ratemaking data that may be relevant.

B. Reserving

Information produced for the loss reserving function must be sufficient to analyze the essential characteristics of the claim reporting and settlement process. Information is usually organized in a two dimensional matrix that reflects the historical claim process in some way. The correct matching of the matrix to the reserving task is critical to the effectiveness of the reserving function.

Each loss reserving matrix is defined by: 1) the characteristics of its two dimensions, which are usually time units, 2) its data groupings, and 3) the statistics displayed.

1. Dimensions

One dimension is usually accident periods or report periods. In other words, losses are grouped according to the date of loss or the date of reporting. Accident date configurations are normally used to estimate total loss reserve needs (for both known and unknown claims), while report date configurations are used to estimate known claim reserves.

The second dimension usually reflects development or maturity levels thereby showing a particular accident or report period's history.

2. Data Groupings

Groupings can reflect line of business, class, type of loss or geographical location. Data can be configured on a gross, direct or net basis. The degree of refinement should reflect a balancing of the possibly conflicting goals of homogeneity and credibility.

3. Statistics

The following are some common statistics that are useful in the reserving process:

- i. The number of open claims
- ii. The number of claims closed with payment
- iii. The number of claims closed without payment
- iv. The number of reported claims
- v. The amount of paid losses
- vi. The amount of paid allocated loss adjustment expenses
- vii. The amount of outstanding losses
- viii. The amount of outstanding allocated loss adjustment expenses
- ix. The amount of incurred losses
- x. The amount of incurred allocated loss adjustment expense

Combinations of these statistics, such as the amount of paid losses divided by the number of claims closed with payment, i.e., paid severity, or ratios of these statistics to exposure bases are also useful to review.

C. Underwriting/Marketing

Whether the underwriting and marketing functions are handled in one or many departments, their management information needs are similar:

Information is needed 1) to monitor and reevaluate marketing objectives and underwriting policy, and 2) to monitor and appraise the performance

of individual producers and underwriters.

Areas that should be monitored include the following:

1. Distribution of the current book of business by branch or region, by line, by class, by territory, etc. with comparisons to prior time periods.
2. Trends in premium and loss experience by branch, by line, by class (reflecting demographic and or industrial breakdowns) and by territory (for individual producers or for the company as a whole).
3. Analysis of underwriting results by type of distribution system (agency vs. brokerage vs. direct mail), if applicable.
4. Analysis of amounts of new business, non-renewed business and renewal increases by line of business, by class and by territory.
5. Monitoring of experience modifications, schedule modifications and other individual risk rating modifications.

In each case, the reporting categories should include information on production source (agent, underwriter, branch), line of business, territory, coverage, and class. Amounts to be analyzed should include in force policy count, written and earned premiums, paid and incurred losses, IBNR estimates, commission expenses (flat and contingent) and other assignable underwriting expenses.

D. Claims

Management information required by the claims function generally falls into three areas: 1) claim count transactional data, 2) information on pending claims, and 3) information on closed claims.

The level of detail required depends on the level of management using the data, and ranges from data by individual claim adjuster to data by unit, branch, region, company, or national. Time periods covered can be weekly, monthly, quarterly, year-to-date or the latest 12 months. Data generally should be summarized by type of claim, i.e. line of business, coverage, cause of loss, etc., with identification of catastrophe losses.

1. Claim count information includes the number of claims opened, the number of claims closed with payment, the number closed without payment, the number of claims reopened and the number reclosed. Appropriate ratios between the various claim counts should be calculated. The average lag between initial reporting, establishment of a reserve, and final payment should be monitored.
2. Information on pending claims should include the number of pending claims, the number of pending law suits, the amount of reserves and average reserve on open claims by age since opened, the amount of reserves and average reserve on open claims by size of reserve, paid and reserved amounts for allocated loss adjustment expenses, and partial payments on pending claims.
3. Information on closed claims should include average paid claim cost (with comparisons by unit within a branch or region or state), claims closed by size of loss, analysis of salvage and subrogation recoveries, and analysis of paid allocated loss adjustment expenses (by type, by adjuster, by law firm, etc.). Loss development should be monitored by reviewing report year data.

E. Financial Analysis/Investments

Management information needed to support the financial analysis and investment function generally breaks down into two areas: short run cash flow analysis and long term profit maximization analysis.

1. In the short run, the immediate concern is to be able to meet current period obligations with current assets. Reports should be available to summarize current income items such as net premiums written, net investment income received, cash on hand and on deposit and the value of bonds maturing. Current liabilities should be estimated, including expected loss and loss adjustment expense payments, commissions, salaries, other expenses, stockholders and policyholders dividends, and interest payable.

The short run should be defined as the next month or the next quarter. Besides displaying the above dollar amounts, management reports should provide analysis of trends in the various items.

2. In order to maximize long run operating profit, management information is needed which summarizes all the financial activities of the company in a logical and useful manner. Each company will have its own particular style in which they conduct this analysis, but the general goal is to maximize total return, while maintaining an adequate cash flow to meet expected liabilities. All this should be done with an awareness of the tax consequences of various portfolio structures. The types of information that should be available include the following:

- i. Mix of current investments and the related interest and dividend income, including bonds (amortized and cash value), preferred stocks, common stocks, real estate, cash, etc.
- ii. Premium income by line of business.
- iii. Loss and loss adjustment expense payments, projected by calendar year.
- iv. Stockholders and policyholder dividend requirements.
- v. Tax liabilities - Federal and State.
- vi. Expense requirements - commissions, salaries, overhead, etc.
- vii. Projected underwriting results by line of business.
- viii. Projected surplus growth in comparison to projected written premium volume.

F. Financial Reporting

Information is required to meet financial reporting obligations. The information normally includes calendar period premiums, losses, expenses and investment income. The major obligations are:

1. Statutory reporting
2. Shareholder reporting
3. Income tax reporting
4. Internal profitability/planning

IV. Conclusion

The actuary, by applying the above principles, will encourage the existence of adequate, quality information to better manage the major disciplines of the insurance system.