

*Guidance Regarding Management Data
and Information*
by the CAS Committee on Management
Data and Information

INTRODUCTION

The CAS Committee on Management Data and Information has developed a paper entitled, "Guidance Regarding Management Data and Information". The purpose of this paper is to provide guidelines to be used in designing and managing data systems in the following areas: collection of data, ensuring the quality of data, ratemaking reserving, underwriting, marketing, claims, financial analysis and investments.

The Committee is looking for comments from the membership to improve the paper as to its value as well as any suggestions to improve it.

Respectively,

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GUIDANCE REGARDING MANAGEMENT DATA AND INFORMATION

The purpose of this paper is to provide guidelines to be used in designing and managing data systems in the following areas: collection of data, ensuring the quality of data, ratemaking, reserving, underwriting, marketing, claims, financial analysis and investments.

Data needs to be managed as a critical resource. Information needed to make business decisions is best when it is timely, accurate, easily obtainable and consistent with the same information produced in other reports. To control the costs of providing this information, data, as well as systems, should not be redundant and it should be consistently defined and shareable.

Actuaries should be making significant contributions in the design and management of systems for collecting data and reporting useful and accurate management information to serve as the basis for sound decision making.

The statement consists of three parts:

- I. Data Collection
- II. Data Design
- III. Management Information Considerations

I: DATA COLLECTION

Data collection can be separated into two areas: Data Capture and Data Quality Control. Data Capture is concerned with the what, when and how of data to capture. Data Quality Control should ensure that the data being captured, processed and reported is accurate, complete, and collected in a cost effective manner.

Before deciding what data elements should be captured, the internal (underwriters, actuaries, accountants, etc.) and external (NAIC, regulators, legislators, statistical agents, etc.) information needs must be determined, and data collection capabilities considered. Current data availability, its quality and the data collection costs need also be considered. While each of the organizations have different requirements for how the data are displayed, the system used to collect the data should be designed with each of the users' needs in mind.

A. DATA CAPTURE

Most data is captured in code. There should be an established code structure incorporating the considerations listed below. The actual use of the data and the cost to collect and store the data also need to be considered. Low redundancy of data, fast processing, flexible access to data and low storage costs may be conflicting design considerations.

1. Data requirements should be compatible and consistent to the extent possible, i.e.: monoline and multiline data.
2. Data elements should be defined to have only one meaning.
3. Common data elements should be defined similarly, regardless of line, business or function supplied.
4. Flexibility should accommodate expansion of data elements to anticipate future needs.
5. Codes should be constructed to meaningfully represent information.
6. Consideration should be given to how often the data will be updated. Will the file be on-line or changed daily, weekly, monthly, quarterly, etc.?
7. Where possible, codes which are established and understood in a wider context should be used.

B. DATA QUALITY CONTROL

Data Quality Control should ensure that the data being captured, processed and reported is accurate, complete and collected in a cost effective manner. Data Quality principles apply to the workflows for getting data into the system, the internal system checks, and the workflows for getting data out of the system.

1. A data quality control function should be established and standards of data quality should be developed 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 complete and accurate, 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, and any errors detected should be corrected as closely as possible to the point of discovery of the error.

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.
5. The monitoring of data quality is an ongoing process. Reconciliation reports and edit error reports should be produced and examined regularly.
6. Changes made to a data field or to processing, must be thoroughly tested in order to assure data integrity is maintained. It is important adequate time is allowed to achieve this objective.

II. DATA DESIGN PRINCIPLES

Data should be managed as a critical resource. To truly control cost, data, as well as systems, should not be redundant; it should be consistently derived, consistently defined and shareable. Numerous data elements can be captured, but they are of limited value unless the data is efficiently organized in a way to maximize the use and value of the information. Every information system should be designed with flexibility to respond to different requests. The following concepts should be considered in the design of the data base.

A. CENTRAL DATA BASE

The ideal repository of data collected is a single central location. Here, all the detail collected could be stored and accessible to all report systems. Thus updates, corrections, and controls could be maintained at one location. Multiple locations of the same data elements require more stringent controls to guarantee that all data bases are updated uniformly.

B. DETAILED DATA BASE

The data base should contain all reported data elements to satisfy the needs of internal and external users.

C. DATA DICTIONARY

The existence and wide availability of a data dictionary will help assure consistency by the various users of a system. Definitions of data elements, as well as lists of codes, should be available to and commonly understood by both the providers and end users of data.

D. DATA BASE DESIGN

The design or organization of the data should address the following considerations:

1. Low redundancy of data, fast processing, flexible access to data, and low storage costs may be conflicting design considerations.
2. Run time, storage costs, volume restrictions or other processing constraints may necessitate the creation of multiple summarized or segmented data bases to fulfill different user needs. The smaller data base(s) enables report generation systems to run faster, since there are many less records to be accessed. A summarized subset of the central data base should incur lower storage cost. Summarized and/or segmented data should be updated automatically from the central source to avoid the potential control problems for updating multiple locations of the same data elements.

E. NON STANDARD REQUESTS

While many reports may be specified to extract information on a regular schedule, data bases should be flexible and organized to facilitate ad hoc report requests as well as direct user access to the central data base and/or segmented data bases.

F. STORAGE

The retention period of data in the data base depends on the number of years of data needed for meaningful analyses, legal and regulatory requirements. The form of storage depends on access requirements, such as immediate access or overnight access.

III. MANAGEMENT INFORMATION CONSIDERATIONS

How the data will be used has an effect on how the data files are managed. The basic use of the data must be well understood when designing file structure and access. Detail appropriate to the intended use of the data base should be stored.

The following examples serve to illustrate the need to capture different data in different levels of detail for different purposes. It is not intended to be a complete list of all possible Management Information System considerations. In evaluating these needs, be sure to consider any requirements for evaluating reinsurance programs.

A. RATEMAKING

There are several acceptable methods of capturing data for ratemaking purposes including calendar year, calendar/accident year, report year or policy year. The nature of the coverage being provided and data availability will determine which is most appropriate. There are three general types of data needed in any ratemaking process:

1. Premium and exposure information which could be on a written or earned basis. Adjustments to premium, such as retro adjustments, experience, schedule or other modifications, should be collected as needed. Information should be organized to monitor changes in the mix of business, such as available by class, territory, policy limit and state within each line or subline of business.
2. Loss and claim information should be collected the the same categories as premiums. In addition, historical loss development patterns of paid and incurred loss amounts, claim counts and loss adjustment expenses are needed to be available to properly estimate their ultimate values and current frequency and severity trends. Changes in the underlying loss distribution are analyzed by reviewing data segregated by size of claim and against different policy limits or deductible levels.
3. Expense information should be available to determine the appropriate provisions for various categories of expenses including 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.

B. RESERVING

Reserves can be categorized as premium or loss reserves. Premium reserves include a variety of subcategories such as unearned premium, earned but not reported, audit, dividend, retro premium reserves, and contingent commission reserves. The techniques and data required to calculate premium reserves vary depending on the subcategory. For example, the unearned premium reserve calculation usually requires only the written premium amount, the appropriate policy effective and expiration dates, and the booking date. For other subcategories, calculations may involve the need for other premium exposure or loss information.

Information needed for the loss reserving function should 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 usually defined by: 1) the characteristics of its dimensions, which are time related, 2) its data groupings, and 3) the statistics displayed.

1. Dimensions

One dimension is usually accident periods, report periods, or policy periods. In other words, losses are grouped according to the date of loss, the date of reporting or the policy effective date.

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

2. Data Groupings

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

3. Statistics

Typically, counts and dollar amounts are collected for reserve calculations. They may be displayed either cumulatively or incrementally. Some examples are:

- i. Counts - open/outstanding claims, closed claims with or without payment, reported claims, reopened claims.
- ii. Amounts-paid, outstanding or incurred loss and/or allocated loss adjustment expense.

In addition, when evaluating reinsurance reserves, other data items may be useful such as policy retention, layer limit, and codes indicating occurrence or aggregate coverage.

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 might be monitored include the following:

1. Distribution of the current book of business, and how it has changed over time. Trends in premium and loss experience.
2. Underwriting results (including expenses) by type of distribution system (agency vs. brokerage vs. direct mail), if applicable.
3. Amounts of new business, non-renewed business, cancellations, endorsements, renewal changes and hit ratios.
4. Use of experience modifications, dividends, schedule modifications, preferred rating programs, and other individual risk rating modifications to test for conformance to pricing guidelines.
5. Changes in average premium and growth of gross premium.

In each case, the reporting categories should include information on production source (agent, underwriter, branch), line of business, territory, coverage, and class.

D. CLAIMS

Management information required by the claims function generally falls into three areas: 1) claim count transactional data, 2) information on open claims, and 3) information on closed claims. The level of detail required 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 twelve months. Data generally should be available by type of claim, i.e., line of business, coverage, cause of loss, etc., with identification of catastrophe losses and applicable reinsurance.

1. Claim count information includes the number of claims opened, the number of claims closed with payment, the number of claims 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 open claims can include the number of open 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 can include average paid claim cost (with comparisons by unit within a branch or region or state), claims closed by size of loss, claims closed by length of time to close, analysis of salvage and subrogation recoveries, and analysis of paid allocated loss adjustment expenses (by type, by adjuster, by law firm, etc.).

E. FINANCIAL ANALYSIS/INVESTMENTS

Management information needed to support the financial analysis and investment function generally breaks down into two areas: cash flow and operating results.

1. In cash flow analysis, the concern is to be able to meet current period obligations. Reports should be available to analyze current cash items such as net premiums collected, net investment income received, cash on hand and on deposit and the maturing assets. Payout of liabilities should be estimated, including expected loss and loss adjustment expenses, commissions, salaries, other expenses, stockholders and policyholders dividends, and interest payable. Besides displaying the above dollar amounts, management reports should provide analysis of trends in the various items to help maximize cash flow in the future.
2. In order to develop and analyze operating results, management information is needed which summarizes all the financial activities of the company. Data is needed which will help the company maximize total return and grow surplus while maintaining an adequate cash flow to meet expected liabilities. The types of information needed should 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, capital gains, cash, etc.
 - ii. Premium income by line of business.
 - iii. Loss and loss adjustment expense payments, by line of business projected by calendar year.
 - iv. Stockholder and policyholder dividend requirements.
 - v. Tax liabilities - Federal and State.
 - vi. Expense requirements - commissions, salaries, overhead, etc.

F. FINANCIAL REPORTING

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

1. Statutory reporting
2. Trade associations and bureaus
3. Shareholder reporting
4. Income tax reporting

