



Project Summary

Development and Application of a Water Supply Financial Reporting System: Volumes I and II

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This two-volume report describes the development of a computerized financial reporting system (FRS) for the Kenton County, Kentucky, Water District No. 1 (KCWD). The system was designed and implemented after a computer-based cost analysis system (CAS) had proved to be advantageous and had demonstrated the value of automated data processing. Together the two systems will help the utility control costs and manage a rapidly expanding system more effectively and efficiently. The objectives of the FRS were (1) to provide computer programs that produce a general ledger accounting system and financial reports, (2) to function as a modular system that can be used either independently or with the CAS, and (3) to verify its satisfactory operation through practical applications at KCWD.

The computer programming was accomplished by use of American Standard COBOL operating in an IBM 370 environment.* This combination of software and hardware was chosen because of its widespread use.

The FRS was able to satisfy the KCWD reporting requirements with information furnished monthly. The system has met the basic requirements and is considered a proven system because it has produced monthly and annual reports parallel with the old manual system, and it has provided financial data for rate adjustments and a bond issue.

*Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

This Project Summary was developed by EPA's Municipal Environmental Research Laboratory, Cincinnati, OH, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

The Kenton County, Kentucky, Water District No. 1 (KCWD) has developed a computer-based financial reporting system (FRS) that is compatible with their automated cost analysis system (CAS). Together the two systems will help the utility to control costs and manage a rapidly expanding system more effectively and efficiently.

The CAS was developed first as a management tool for cost control. The system consists of a group of computer programs that use financial and operational information to identify expenses to cost centers. After the CAS proved advantageous and demonstrated the value of computerized data processing, KCWD took steps to develop an automated FRS that would be compatible.

This two-volume report discusses the background conditions and results of the project in Volume I and provides complete documentation (including diagrams and program listings) in Volume II.

Background

The Safe Drinking Water Act of 1974 (PL 93-523) necessitated a fundamental reexamination of the way in which drinking water is supplied to the American

public. A primary feature of the Act is that the economics and cost of water supply and delivery must be considered before regulations are promulgated. In 1974, a cost study of selected water utilities was undertaken to collect data from at least one Class A water utility (revenues greater than \$500,000 per year) in each of the 10 EPA Regions. The purpose of the study was to collect data in such a manner that the resulting information could be easily compared among utilities and provide an understanding of some of the fundamental factors that affect the cost of water supply and utility management.

One conclusion resulting from the investigation was that although each of the selected utilities kept financial records (in some cases extensive ones), the data among utilities varied significantly. Another conclusion was that many of the records were kept primarily for accounting purposes and had little relation to the short- and long-term operational needs of the utility manager. After carefully analyzing the data flow and the information transfers of a number of large and small utilities, the investigators developed a technique for data collection and analysis that would fulfill both managerial and accounting needs. The technique was based on a matrix concept and was tested by means of a water supply simulation model developed by the Drinking Water Research Division of EPA in Cincinnati.

After the data collection and analysis technique was proved both effective and efficient in a hypothetical situation, it was developed into the CAS and implemented at the KCWD, where it was further refined and modified based on operational experience. Both the system and the KCWD experience are described in a two-volume report entitled *Development and Application of a Water Supply Cost Analysis System* (James I. Gillean, William L. Britton, Jr., John H. Brim, Rex D. Osborn, and Robert M. Clark, July 1980, EPA-600/2-80-012a and EPA-600/2-80-012b, U.S. Environmental Protection Agency, Cincinnati, OH 45268).

The CAS implemented at the KCWD was functional on a computer and provided timely cost accounting data. At the time of implementation, the KCWD had a manual financial reporting system, and their expanding service area was creating a heavy burden of record maintenance. The CAS made the advantages of automation obvious, and therefore KCWD took steps to develop an FRS. The FRS was to provide KCWD's routine

financial reports and was to be designed to use the same source data as the CAS. Figure 1 illustrates the combined CAS and the manual financial reporting system used by KCWD before development of the automated FRS.

Objectives of the Financial Reporting System

The following objectives were established for the FRS:

1. Development of a standardized, automated FRS that will provide a general ledger accounting system and financial accounting reports. The FRS is to be compatible with the existing CAS and to interface with it. Together the FRS and the CAS are to form a complete, automated financial accounting system with broad application to the water supply industry.
2. Development of the CAS and the FRS as modular systems so that utilities can use either one independently or together as a total financial accounting system.
3. Verification of the satisfactory operation of the FRS as an independent subsystem through practical applications at KCWD.

Description of the Kenton County Utility

The KCWD was the first water district established in the State of Kentucky and originally developed its water supply system by purchasing the Dixie Highway Water Company system in 1926. Before that date, treated water was being purchased from the City of Covington, Kentucky, and delivered by the KCWD to its customers.

In 1954, the KCWD built a new water intake on the left bank of the Licking River approximately 4 3/4 miles upstream from the Ohio River. A treatment plant was also built at Grant and Howard Avenues in Taylor Mill, Kentucky. The treatment plant presently contains eight mixed-media filters and has a rated capacity of 12.0 mgd. After being treated, the raw water flows into a clearwell with a capacity of approximately 1 mil gal. The treated water is pumped into the distribution system by two primary pumping stations—one at the treatment plant and one at Dudley Pike. The distribution system contains approximately 160 miles of pipe and consists of three pressure levels. The first pressure level (a 5.0 mgd storage tank) is filled directly from the treatment facility or by the pumping

capacity at the treatment plant. The second pressure level (which provides water to the largest service area) is supplied by gravity from three elevated storage tanks or by the capacity of the main booster pump station at Dudley Pike. The third pressure level is fed by gravity from two elevated storage tanks in the Northern Kentucky Industrial Foundation Park and the City of Florence, or by the two booster stations on Turkey Foot Road at Lafayette Avenue.

In July 1977, the KCWD acquired operating control, and about 1 1/2 years later, it merged with the City of Covington, Kentucky, Water Utility to form the KCWD system. In addition to the Covington utility service area, the KCWD provides water to about 15,600 customers of the northwestern portion of Kenton County, Kentucky, in a 40-square-mile retail service area (Figure 2). Treated water is supplied to 12 townships, an industrial park, and unincorporated areas of Kenton County lying within the service area. In addition, water is supplied to the City of Florence and to the International Airport. The map in Figure 2 shows the KCWD service (excluding Covington) and the locations and relative sizes of the three original pressure zones.

As with most government accounting systems, the KCWD system is operated on a fund basis (defined as a group of accounts, including assets, liabilities, and balance accounts, that are isolated to comply with a specific objective or to specify a special purpose of the activities associated with the accounts). The funds established by the KCWD are categorized as general, operating and maintenance, bond, depreciation, and plant funds.

The general fund consists of the accounts that are general in nature and not applicable to the other specific funds. At KCWD, revenues are initially recorded within the general fund and then are transferred to other individual funds as needed to provide for the expenses or appropriations required of the other specific funds. The operating and maintenance fund consists of only those accounts that reflect the operating and maintenance activities of the utility. The bond, depreciation, and plant funds, like the operating and maintenance fund, consist of groups of accounts that identify activities associated with the funds. Other funds may be established as the need arises to isolate a certain accounting activity.

The KCWD chart of accounts, like those of many other water supply utilities, was originally developed by the National

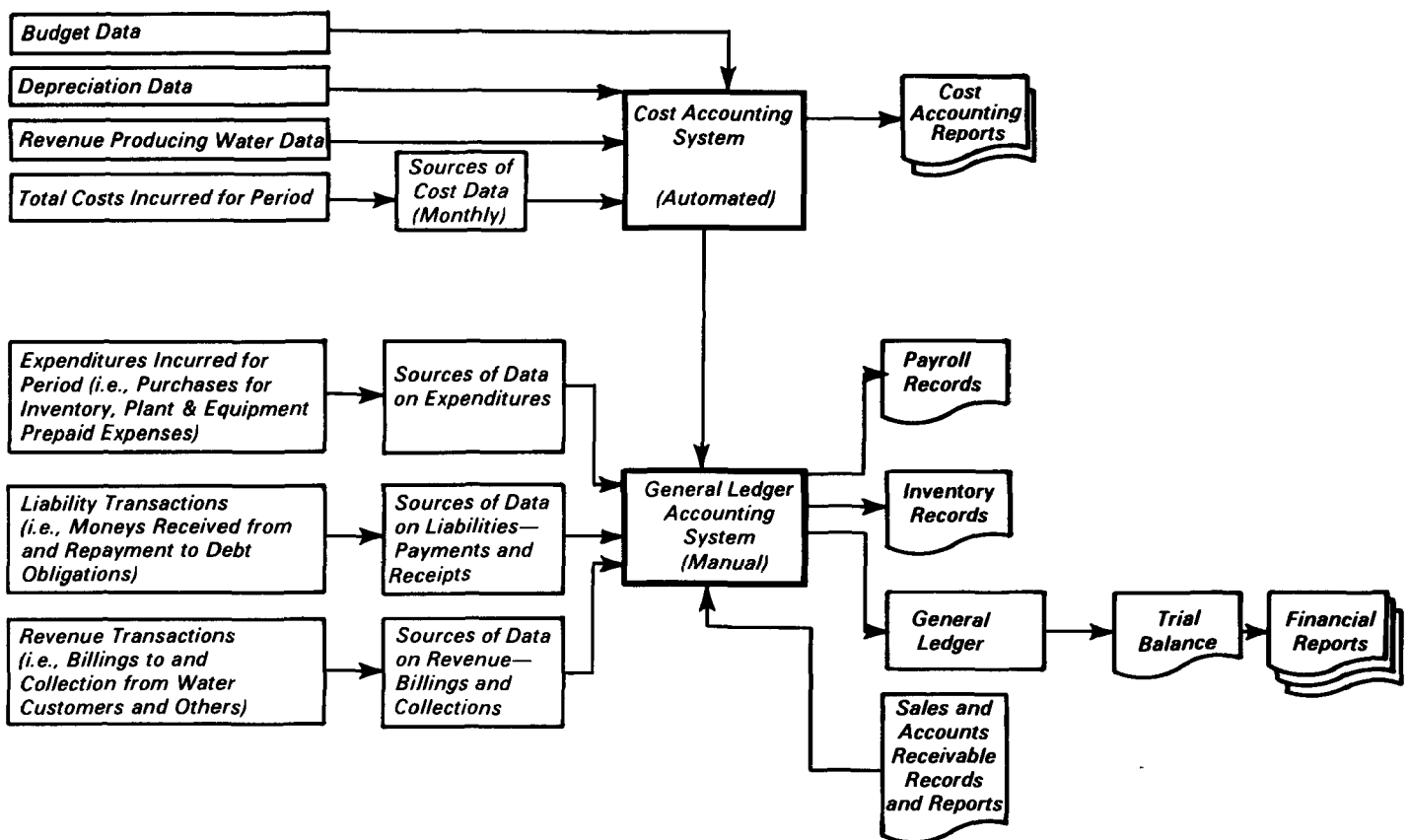


Figure 1. Financial accounting system used by KCWD before development of the financial reporting system.

Association of Regulatory Utility Commissioners (NARUC). According to them, the KCWD is a Class A water utility (having annual operating revenues of \$500,000 or more) and therefore uses the chart of accounts for Class A utilities. For further description or information concerning the NARUC/KCWD chart of accounts, refer to the *National Association of Regulatory Utility Commissioners - Uniform System of Accounts for Water Utilities* (National Association of Regulatory Utility Commissioners, Washington, DC, 1977).

As transactions occur each month, various source documents are routinely prepared to record information concerning the transaction. On these source documents are coded with the account numbers, cost center numbers, amounts, and any other descriptive data important in identifying the transactions. Since the source document is the authority from which the accounting entry originates, recording of complete accounting information is imperative.

From the originating documents, accounting entries are summed each month by account number and then recorded into the general and subsidiary

ledgers within each applicable fund. After all entries have been posted to the general ledger, a total is calculated by account, and the accounts in each fund are balanced. At this point, a preliminary trial balance is prepared until the end of the fiscal year. Thus each year, after year-end adjustments and closing entries have been recorded in the general ledger, the accounting books are closed and a trial balance, statement of revenue and expenditures, and balance sheet are manually prepared.

Accounting Considerations

The function of accounting is to provide quantitative financial information useful for economic decision making. The products of an accounting operation are financial statements or reports. The financial reports may vary because of the way in which financial accounting information is listed, classified, recorded, summarized, or reported to the person who will make use of the information; but they normally are produced in a standard, generally accepted format. The financial reports provide information on current and past events and thus can help

management evaluate earlier decisions and provide a starting point for producing future conditions or changes. In addition to being useful for assessment of current and future financial needs, the information may be important for policy setting. In essence, financial reports are normally designed to provide a manager with some of the information required for many of his decisions (operational as well as financial) about the use and stewardship of resources. Adequate financial reporting is important because the utility has an economic obligation and responsibility to manage its resources efficiently and provide the services required by its customers.

All water utilities are concerned with two basic types of financial reports: external and internal. The external financial reports are necessary to meet the requirements of various interested parties within the management or regulatory area of the utility. Some users of the external financial reports (such as the State Public Service Commissions) are interested because they are charged with the responsibility of protecting customers who have a direct interest. In the case of the KCWD, the Kentucky

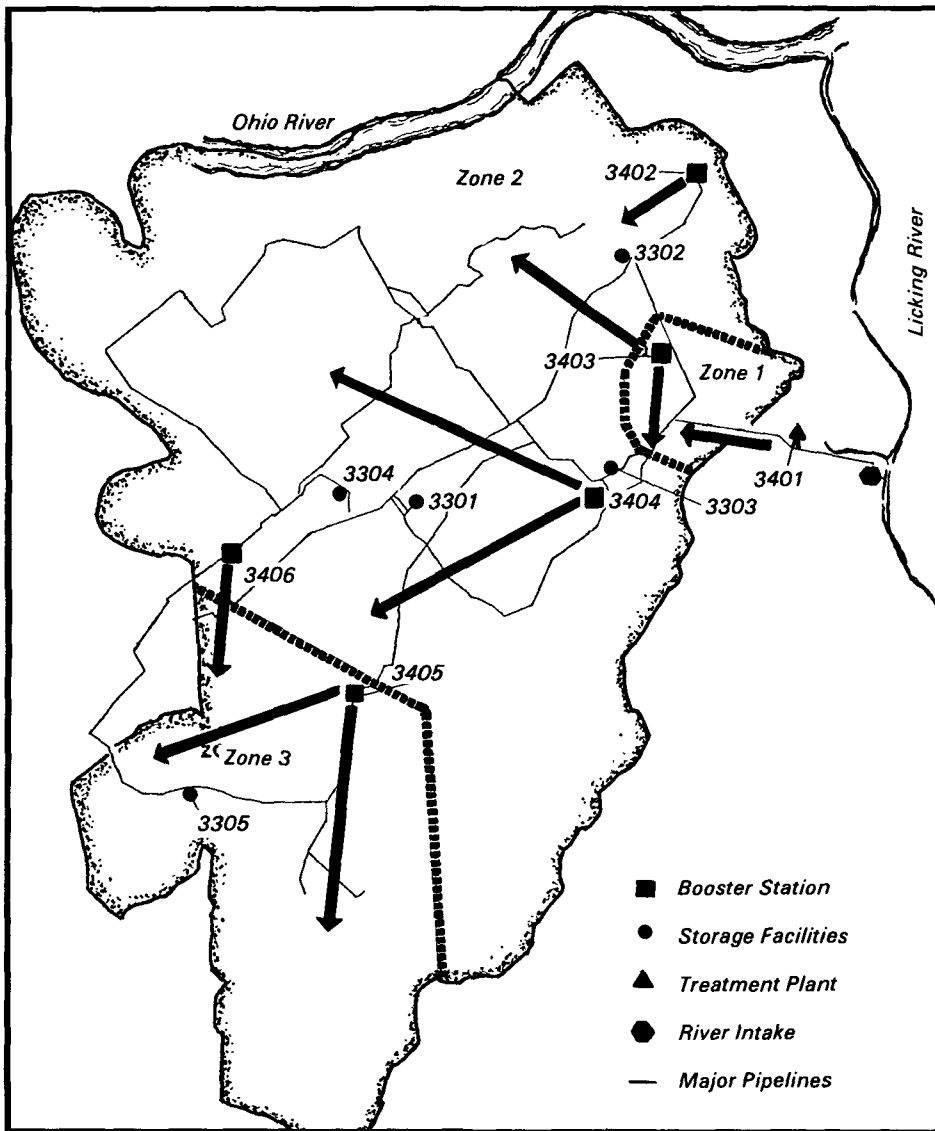


Figure 2. Kenton County Water District No. 1 service area.

Public Service Commission uses the external financial reports of the utility to determine the reasonableness of the rate of return from their sale of water. An example of an internal report is a trial balance report; examples of external reports are the balance sheet and the statement of revenue and expenditures.

As the KCWD manual financial reporting system was being adapted to the computerized system, careful attention was given to the accounting practices so that they would conform to the guidelines set forth by *Governmental Accounting, Auditing, and Financial Reporting* (National Committee on Government Accounting, Municipal Finance Officers

Association of the United States and Canada, Chicago, IL, 1978).

Internal Reports

To produce internal financial reports, transactions are entered into the computer system from various source documents, creating a general ledger data file. Figure 3 is a simplified flow schematic of the FRS. The same six types of source documents on which financial data were recorded for the KCWD manual accounting system are also used in the FRS. These source documents include the payroll time card, miscellaneous transaction form, cashier's daily report, service contract form, requisition from stock

form, and journal authorization form. From the source documents, data are keyed into the computer.

To verify that source document data are entered into the computer correctly, edit reports for each type of source document are produced. The payroll edit report lists the date of the report, the employee social security number, the date of the pay period, the account number to which his labor was charged, the cost center or location in which his labor was charged, the cost center or location in which the work was performed, the total cost by account, and balancing features of the edit routine, including comments for error conditions.

Edit reports are produced from the source data by computer programs in a similar process. By matching the edit reports with the source documents, the flow of data can be examined. Since the computer program does as much as possible, every transaction is not apparent but follows a similar logic to the payroll edit report. For details, refer to the computer program listings in Volume II of the full report. These describe the action of each specific data element.

After all the source documents are recorded and entered into the computer system, edit listings and a trial balance sheet are produced. The trial balance report is printed in account number order within each fund. The report provides the following information: account description (along with the account number), the beginning amount within each account as of the beginning of the accounting period, the current amount charged to the account during the current period, and the ending amount (which is a total of the beginning balance and the current amount). The beginning amount of the trial balance is the ending amount of the previous trial balance and is produced from retained information. The current amount is the summation of all expenses from the source data (edit reports) for each account number. Thus, the audit trial between the trial balance and the edit reports is the summation of individual accounts. Assuming that the beginning amount on the trial balance is accurate, an out-of-the-balance condition on a new trial balance would most likely be caused by an error in the source data. Thus the trial balance report and the edit reports are used to detect errors before they are processed by the accounting system. The trial balance report may be run as many times as necessary to produce valid data. Once the data are determined to be valid and each account is in balance by fund, a

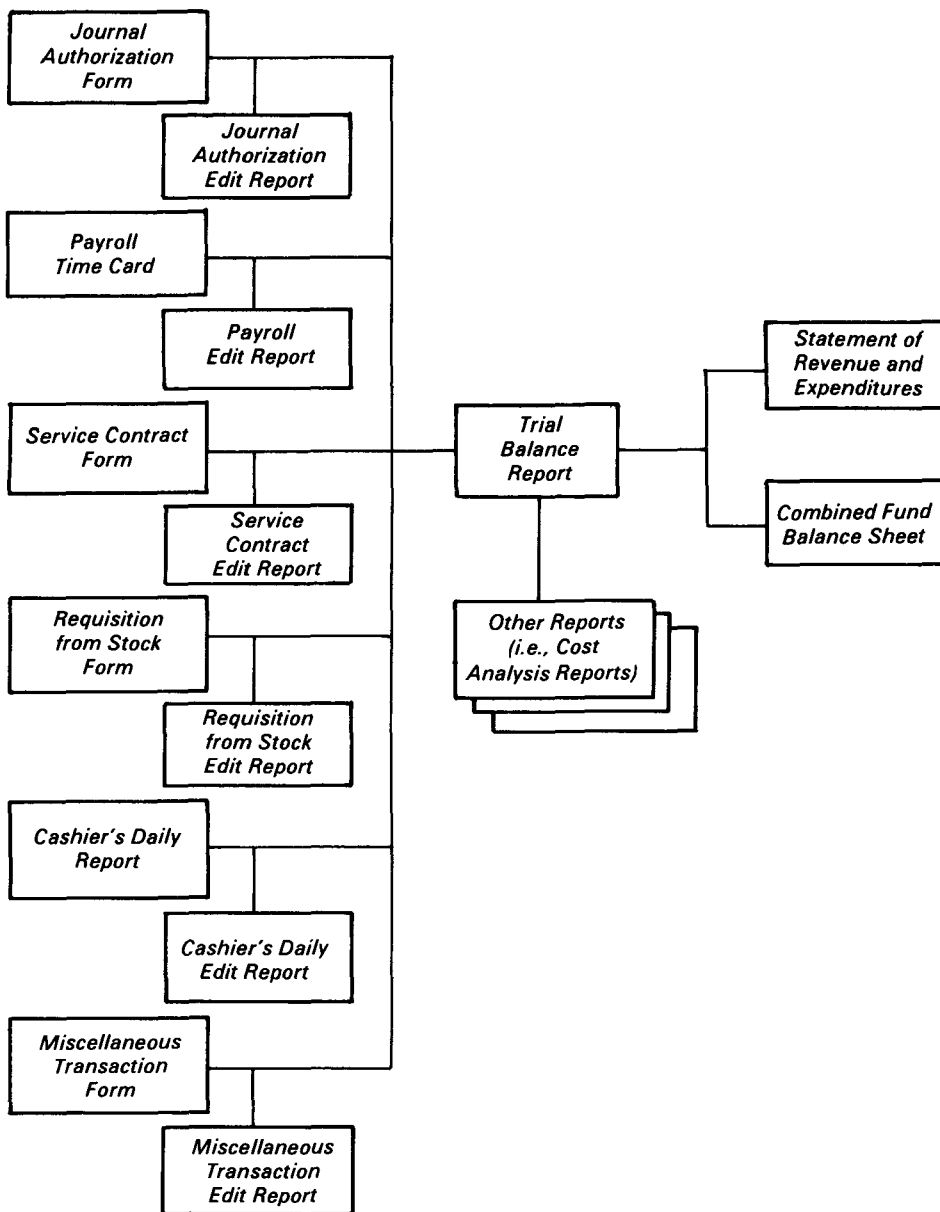


Figure 3. Simplified flow schematic of the FRS.

final trial balance for the current period is produced.

External Reports

After the final trial balance is completed, the combined fund balance sheet and the statement of revenue and expenditure reports are produced. These reports are generated from information contained in the trial balance, plus data retained from the previous processing. As in the trial balance, these reports are developed by combining data in a predetermined way

to produce the desired specialized reports.

Computer Programs

All of the computer programs are written in American Standard COBOL to operate in the IBM 370 environment. The computer language and hardware were selected because of their widespread use.

The computer operations and programs (including operating instructions, data format, file layout, program flow diagrams,

and program listings) are described in Volume II of the full report.

Conclusions

The FRS was able to satisfy the KCWD financial reporting requirements with information furnished monthly. The system has met the basic requirements and is considered a proven system because it has:

- Produced parallel reports with KCWD's manual system,
- Produced more than 24 sets of monthly reports,
- Produced reports for two annual closings,
- Provided the financial data to the Kentucky Utility Regulatory Commission for rate adjustments,
- Been examined and accepted by interveners at a rate adjustment, and
- Provided the financial data for a major bond issue.

The full report was submitted in fulfillment of Cooperative Agreement No. CR806448-01 by Kenton County, Kentucky, Water District No. 1 under the sponsorship of the U.S. Environmental Protection Agency.

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Robert M. Clark is the EPA Project Officer (see below).

The complete report consists of two volumes entitled "Development and Application of a Water Supply Financial Reporting System":

Volume I (Order No. PB 83-249 417; Cost: \$10.00, subject to change)

Volume II (Order No. PB 83-249 425; Cost: \$20.50, subject to change)

The above report will be available only from:

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