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Cost-accounting system for conference services

Report of the Secretary-General

1. The present report is submitted pursuant to section D of General Assembly resolution 52/214 of 22 December 1997. The background to this question is discussed in the previous report by the Secretary-General, issued under the symbol A/52/1000. The present document supplements the information provided therein.

I. General conceptual issues

2. Traditional cost-accounting systems were set up primarily to meet the needs of manufacturing concerns. To a considerable degree, they are intended to provide information according to the standards established by the accounting regulatory bodies and tax authorities of most countries. Those standards, for example, require that all the indirect costs of a product be added to the direct costs. The main accounting theory used to meet this objective is referred to as "full absorption costing". It implies that all the overhead related to a product should be assigned in some manner to the product. Thus, for example, the plant where the product is made is included in the cost of the product, even though the plant remains fixed in its place over a long period of time.

3. There are problems with making management decisions based on full absorption costing. For example, if sales declined for a specific product, companies could decide that, as long as they covered their direct costs and some profit, they would forego any inclusion of overhead (plant costs) in price. They would argue that the plant was there whether the product was manufactured or not. This type of reasoning is considered essential for short-term decision-making, but would clearly not work for the long term.

4. In order to make effective management decisions based on cost, there are two matters to consider. The first is how much of the overhead to allocate to the product. The answer to this question often depends on the objectives of the firm. For example, a company may choose one level of overhead when it provides one of its products to one of its own divisions, and another overhead allocation if it sells the product to a different firm. In essence, objectives determine the level of overhead that is allocated to a product.

5. A second issue revolves around how the overhead charges are assigned to the product. In the simplest cases, the overhead can be allocated to each unit of product on the basis of the number of hours worked on each unit. Not all organizations have such an easy or logical way of assigning overhead costs. Current cost -accounting theory suggests that the method of allocating overhead costs should be linked to any activities that are related to those costs. Thus, the method called "activity-based costing" was devised. The idea is to determine which overhead costs should be charged to the

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product and what activity should be used to allocate those costs.

6. Cost accounting in not-for-profit service organizations is quite different. In such organizations, it is difficult to measure outputs and many of their costs are fixed. There is no profit motive and there is no inventory that needs to be valued at the end of the year for financial statement reporting purposes. Other legal requirements on financial reporting often restrict the structure of cost reports and limit their use for internal management purposes. In the United Nations, for example, the chart of accounts is primarily focused on the need to ensure that expenditures are incurred in accordance with the budgetary decisions of the General Assembly.

7. Service organizations have set out to develop alternative accounting systems that meet their decision-making needs. In most of them, it is difficult to determine the cost of each output. In hospitals and schools, for instance, it is difficult to measure outputs accurately. Most of their costs are fixed in place, no matter what their level of activity. The hospital emergency room has to be staffed even when there are no patients. In designing cost systems for those types of organizations, there has to be a fundamental understanding of their purpose and functions.

II. Conceptual issues particularly relevant to United Nations conference services

8. In the field of conference services, activity-based costing can offer an approach consistent with cost-accounting theory. Under such a system, overheads are linked to different parts of the production process in order to allow for a better understanding of the relevant costs. For example, the overheads traced to an output should make apparent those overheads that would be saved were the output not to be produced. The same idea is repeated for batches of outputs. Overheads that would be saved only if a particular organizational unit were to be shut down are allocated at the level of the unit and not at the level of its outputs.

9. Activity-based costing starts from the premise that it is activities and not outputs that consume resources. Activities, once costed, can then be traced or allocated to those outputs that use them. Costs of specific kinds of resources (e.g., translators' salaries) are allocated to activities based on usage (e.g. translation and précis-writing), and the cost of activities to the outputs produced (e.g., documents and summary records), based on the amount of activities used by the respective outputs. The cost of outputs can then be aggregated to the level of meaningful batches (e.g., the cost of all the pre-session documents of a particular body).

10. Conference services operations are characterized by considerable uncertainty in the level of demand. Therefore, the determination of the optimal staffing level needed to meet this uncertain demand is problematic. In addition, at any reasonable staffing level, theoretically there may be periods of either too much or too little demand. Conference services involve large fixed costs (mainly salaries) relative to variable costs (supplies, temporary assistance, contractual services). In general, when there is little uncertainty in demand, capacity should be matched with average long-term demand for services, and capacity costs should be allocated on that basis. That is, if capacity costs are F and average long term demand is Q units of service, the budgeted resources for each unit of service should be F/Q. Any additional demand above Q should be budgeted at a different incremental rate.

11. This theoretical rule breaks down in conference services, however, because the volume of work that can be performed by permanent staff is lower than the average annual demand for services. Consequently, the allocation rules for fixed costs as well as the level of demand at which incremental costing should begin are unclear.

12. If additional services to be provided beyond a predetermined level could be scheduled in slack periods, incremental costs would drop virtually to zero. Non-zero allocations typically assume that there is a real opportunity cost for scheduling a particular service, and this assumption may not be valid at times of low activity. However, arguments of this kind are suspect when there is significant uncertainty regarding the demand for services. For instance, a meeting scheduled at an ostensibly slack period may suddenly involve the need for temporary assistance because another priority meeting, impossible to foresee when the original scheduling decision was taken, must necessarily be held at the same time.

13. Incremental costs also vary according to the mix of resources (e.g., short-term staff or contractual services) available and suitable to meet specific kinds of additional demand; activity peaks and valleys do not occur simultaneously in all activities, and a given cost may be prospectively marginal at one point and become fixed later. Any incremental cost based on allocations of resources to activities has to be re-examined when the relevant decisions are made.

14. For these reasons, the quantification of such "contingent opportunity costs" is extremely difficult. Under current practice, when cost information is needed, the highest possible marginal cost is estimated. In view of the multiplicity of servicing scenarios that are viable at different points in

time, it could be possible to use instead some historical average cost derived from an activity-based costing system reflecting more closely actual financial reality. These average costs could also be used to determine expenditures that are subject to reimbursement.

15. In the United Nations context, capital costs and certain other variable costs, like power, security, maintenance services, sound engineers and other support services, are not linked to conference services. These variable costs, however, can be tracked and, if necessary, rules could be devised so that they could be allocated to conference-servicing activities. On the other hand, this would not be possible as far as capital costs are concerned.

III. Information systems

16. Several management information systems are available in the Secretariat that contain activity and output data. However, those systems operate independently. In some cases, they compute similarly defined output measures using different techniques and parameters. They are hosted on old hardware and are not fully reliable to be used as part of a cost-accounting system. The chart of accounts is not linked closely enough to the current organizational structure. This causes some problems in matching costs to outputs. Despite these problems, an abundance of useful data exists.

17. The data gathered through the current formal and informal information systems need extensive modification to support a meaningful cost-accounting system. Document Records, Information and Tracking System (DRITS) tracks documents through the various functions of editing, translation, text processing, reproduction and distribution. It also maintains output statistics measured in words or page impressions required to produce a document.

18. Jobs are logged in and out of each processing stage, but the time that a document remains within a specific processing unit is not related to the hours actually worked on it. Staff often work on several documents, a single document could be assigned to more than one person, and priority work is given preference, thus interrupting other jobs. Time expended to process a particular document is not tracked. DRITS has no interface with the Integrated Management Information System (IMIS) or with any source of financial or accounting data. Besides, it needs to be improved in two dimensions. All past data should be saved to ensure that future standards can be estimated, and additional fields should be constructed to capture the time spent on activities.

19. Within IMIS, there is a need for additional account subdivisions so that all the costs relating to each language service can be determined easily. When the payroll system is incorporated in IMIS, the current lag between the moment when a service is performed and when the staff concerned are paid will shorten. The activity data currently being gathered independently by most of the language services and the Reproduction Section must be incorporated into a single centralized costing system.

20. The accuracy of any cost-accounting system depends on the accessibility and validity of the data available. DRITS and IMIS, along with data gathered directly in certain services, can be the initial focal points for building the database required to develop a cost-accounting system. They contain sufficient information to start the development of a prototype system. However, data refinements in terms of source, type, methods of computation and validation will be needed in the long term to improve the information to be used. Upgrades currently foreseen in both DRITS and IMIS should be reviewed early so as to ensure that they can accommodate a cost-accounting system later on.

IV. Objectives and benefits of a cost-accounting system

21. A fully developed cost-accounting system should be able to estimate accurately the costs of specific conference services outputs; establish a sound basis to estimate the actual cost of services provided on a reimbursable basis; and determine the costs or savings resulting from the addition or deletion of a certain volume of services after the conference services budget has been adopted.

22. Such a system will not lead to savings in and of itself. On the other hand, conference services are provided using a combination of permanent and temporary staff and contractual services, and, subject to organizational constraints, the cost-accounting system should make it possible to determine the optimum mix of resources in specified circumstances or for a specific output or time period. The costs of providing services at different locations will eventually be known. The system can also provide an alternative or cross-check to existing procedures. It can evaluate budget plans and provide additional rationales to support budget and special funding requests.

23. Better estimates of costs will allow a better determination of the level of service that can be produced with a given amount of resources. Accurate pricing for services should make United Nations bodies aware of incremental

costs and thereby facilitate a more prudent scheduling of meetings and help to contain requests for documentation. Activity-based costing standards could also provide good benchmarks to measure increases in efficiency.

24. A cost-accounting system would generate standardized cost and activity reports that would make it easier to look at the provision of conference services as a whole, rather than as a collection of discrete services. It is problematic to predict specific savings in monetary terms, but savings have ultimately been achieved in both not-for-profit and profit-making organizations that have developed and used activity-based costing systems.

V. Prototype approach

25. In order to develop a cost-accounting system, a prototype approach seems advisable. It is an approach to systems design in which a simplified working model, or prototype, of an information system is developed. This scaled-down, experimental "first draft" is quickly and inexpensively built and provided to users for testing. Experimenting with the prototype allows users to determine what they like and do not like about the system. Based upon their reactions and feedback, the developers modify the system and again present it to the users. This iterative process of trial usage and modification continues until the users are satisfied that the system meets their needs.

26. The basic premise of prototyping is that it is easier for people to express what they like or dislike about an existing system (the prototype) than to imagine what they would like about a system. If users can try out an actual system, they can provide good feedback. Even a simple system that is not fully operational demonstrates features far better than diagrams, verbal explanations or documentation.

27. The first step in developing a prototype is to identify basic system requirements by agreeing with the users on the size and scope of the system. The emphasis is on what should be produced rather than how it should be produced. The designer must ensure that users' expectations are realistic and their basic information requirements can be met. The designer uses the information requirements to develop cost, time and feasibility estimates for alternative solutions.

28. In the second step, the analyst develops an initial prototype that meets the agreed-upon requirements. The emphasis in on speed and low cost, rather than efficiency of operation. The goal is to implement the prototype within a short time period, perhaps days or weeks. Because of these time limitations, some aspects of the system are sacrificed in the interest of simplicity, flexibility and ease of use. Therefore, non-essential functions, system controls, exception handling, validation of input data, processing speed and efficiency considerations are often ignored at this point. It is crucial, however, that users see and use tentative versions of data-entry display screens, menus, input prompts and source documents. They must also respond to prompts, query the system, judge response times and issue commands. When the prototype is finished, the developer returns to the users and demonstrates the system. The users are instructed to experiment with the system and comment on what they do and do not like about its content and performance. The results are communicated to the developer, who implements the changes.

29. The third step is an iterative process in which users identify changes, developers make changes, and the system is again turned over to the users for evaluation. This iterative process continues until the users are satisfied with the system. The fourth step is to use the system approved by the users. Some prototypes are turned into operational prototypes by incorporating needed controls, improving efficiency, providing back-up and recovery and integrating the prototype with other systems. Other prototypes are not made operational. These throwaway prototypes may be used as the basis for a new system.

30. Prototypes should be considered and used in circumstances in which users have complex and manifold needs or where these change rapidly, system requirements are hard to define, system inputs and outputs are not known, the task to be performed is unstructured or semi-structured, designers are uncertain about which technology to use, the risk associated with developing the wrong system is high, the users' reaction to the new system is an important development consideration and many design strategies must be tested.

31. The advantages offered by prototyping are that, thanks to intensive user involvement, users' needs are more clearly defined. Because of this, systems do not have to be modified as often in the future. Early user involvement helps to build a climate of acceptance and realism about the capabilities of the system. Also, it is usually a less costly approach: systems may be designed for 10 to 20 per cent of the cost of alternative approaches. On the other hand, the prototype approach demands a significant amount of users' time and it may be difficult for them to spare the time necessary for extensive involvement. Besides, if the steps necessary to make the system operational are not completed, it may be risky to depend upon a partially developed system.

32. The cost-accounting prototype for conference services could be limited to one duty station (Headquarters) and cover only the costs currently associated with conference services.

Future expansions might include other locations and conference-related costs. In parallel with the development of the conference services system, the system of accounts must also be reviewed and modified, if necessary, to make its output more amenable to activity- based costing. If data not currently available are considered desirable, a judgement must be made to determine whether the cost of a change is justified. The prototype method will indicate changes that would have to be made to information systems to develop a satisfactory cost-accounting system. This is another good reason for using a prototype approach.

33. The prototype development process would continue for a period of several months through successive, improving iterations. A cost-benefit analysis could be conducted at the beginning of each successive iteration. Throughout the process, a development team that includes staff with database and costing skills and staff knowledgeable in conference services and United Nations budgeting and accounting procedures, as well as an oversight group that would advise the team and provide assistance as needed, would be required.

34. At the point where the developer and the users decide that the prototype is providing the right cost inputs to management functions, the cost-accounting system should be "hardened" and turned into an operational system. For this purpose, the system must be made robust, so that operator errors and hardware and software problems do not make the system crash; system documentation and flow charts must be prepared; and additional hardware and communications capability must be provided, as well as documentation for users and training. Consideration could be given to formalizing and automating data input procedures and to expanding the system to other duty stations.

VI. Conclusions

35. The development of an activity-based costing system for conference services can be started using the information available in existing databases. As the development of the system advances, however, information sources will have to be refined in order to generate new data on costs, activities and outputs. If it is based on the level of data currently available, a new system may not bring a significant improvement over the methods used so far to estimate costs. A prototype approach offers the most promising route for future efforts because it is less expensive and less risky than other methods. Very importantly, it allows for successive cost-benefit analyses to evaluate the relative advantages and requirements of additional stages of development of the system.

36. To establish a prototype, the range and sophistication of the off-the-shelf software available to support activity-based costing is more than sufficient to meet the relevant requirements. The cost of the necessary software and hardware needed to put the prototype in operation is estimated at $65,000. Other costs would include system analysts' fees and training ($240,000) for a total of $305,000. A time-frame of six months can be foreseen, with about half that time required for initial development activities. At the conclusion of the first three-month period, a progress review should be conducted to evaluate the economic, technical and operational feasibility of the prospective system.

37. The investment and time required to turn the prototype into a stable, permanent system, it should be noted, will exceed significantly the figures quoted in the preceding paragraph. In addition, those estimates do not include the time and cost of any necessary improvements in the existing information systems, namely DRITS and IMIS.

38. Subject to the advice that the Committee on Conferences, the Advisory Committee on Administrative and Budgetary Questions and the General Assembly may wish to give, the Secretary-General considers that the development of a cost-accounting system based on the present report can contribute to a better understanding of the implications of requests for services made regularly by intergovernmental and expert bodies, as well as to achieving managerial improvements in the area of conference services.

39. In order to proceed further, it will be necessary to identify staff with the required knowledge of United Nations budgeting and accounting practices and conference-servicing activities to work in this field. None of the permanent staff members with the requisite qualifications in the Office of Programme Planning, Budget and Accounts or in the

Department of General Assembly Affairs and Conference Services can be redeployed from their current duties for this purpose at this time. System analysts will certainly be external consultants, but the experience gathered in the preparation of the present report indicates conclusively that the next stages in the development of a cost-accounting system will require the involvement, even perhaps on a full- time basis, of experienced United Nations accounting, budget and conference service specialists.

40. The Secretary-General will consider all viable alternatives in this connection and will keep the Committee on Conferences, the Advisory Committee on Administrative and Budgetary Questions and the General Assembly informed of progress in the development of a cost-accounting system for conference services.