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Article

Determinants of the functionality of cost accounting systems in social welfare organizations: Exploratory study using cluster analysis

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Abstract: This paper presents a quantitative exploration of the functionality of cost accounting systems and their determinants in social welfare organizations. We conducted a questionnaire survey of managers of social welfare organizations running special nursing homes for the elderly and conducted a cluster analysis based on the data collected. The questionnaire was created based on the scales used in previous studies, with some new scales developed. For data analysis, the statistical analysis environment R was used. The clValid package of R was used to assess the validity of the cluster analysis. Based on the results of the analysis in this paper, it is expected that social welfare organizations that pursue cost leadership strategies and have a strong public interest orientation will benefit greatly by being able to utilize a highly functional cost accounting system. Such organizations will be able to improve their business efficiency by utilizing cost information, and their social contribution activities based on the resulting resources will truly be a contribution to public welfare. The findings from this study are of practical significance because they can be used by business managers of social welfare organizations to review the functionality of their cost accounting systems. We also focus on the degree to which nonprofit organizations focus on social contribution activities (in this paper, we call this public interest orientation). The public interest orientation of an organization is thought to affect the functionality of the cost accounting system in the same way as the organization's strategy, but there has not been enough quantitative research on this point. By focusing on the public interest orientation of social welfare organizations, this study contributes to deepening our knowledge in this area.

Keywords: cost accounting system; nonprofit organization; accounting information; financial performance; cost leadership

1. Introduction

Many social welfare organizations engaged in the long-term care business are expected to be forced to streamline their management. It is difficult to imagine that a large positive revision of long-term care insurance fees will be implemented in the future, given the aging population and the worsening of long-term care insurance finances. In the same way that the use of cost accounting for business management has become widespread in the medical industry, where severe revisions of medical fees continue (Jovanović et al., 2019), the number of social welfare organizations that use cost accounting for business management purposes is expected to increase in the long-term care industry.

Thus, the use of cost accounting systems for social welfare organizations is expected to become increasingly important in the future; however, when we focus on individual social welfare organizations at present, there are significant differences in

the ability of each organization's cost accounting system to provide information. According to Pizzini (2006), management accounting research has considered the ability of cost accounting systems to provide information in at least four aspects (Pizzini, 2006). The four aspects are the ability to calculate detailed costs for each costing object, the ability to classify costs based on cost status, the ability to provide costing information frequently, and the ability to perform detailed variance analysis. The ability of a cost accounting system to provide cost information in these four aspects is called cost system functionality[1] (Pizzini, 2006). Some social welfare organizations have cost accounting systems with high functionality (Macinati and Anessi-Pessina, 2014), while others hardly utilize cost accounting (Ahmed et al. 2023). Why are these differences observed?

Studies on the determinants of cost accounting system functionality show that the functionality of an organization's cost accounting system changes under the influence of the organization's strategy, structure, and competitive environment (Erfan et al. 2022; Kuzey et al., 2019; Pizzini, 2006; Ruiz and Collazzo, 2021). The diversity in the functionality of cost accounting systems of social welfare organizations may be because the appropriate level of cost accounting systems differs depending on the strategies and organizational size of each organization. If the functionality of the cost accounting systems of social welfare organizations is determined by various factors, what patterns can be observed?

This paper presents a quantitative exploration of the functionality of cost accounting systems and their determinants in social welfare organizations. The findings from this study are of practical significance because they can be used by business managers of social welfare organizations to review the functionality of their cost accounting systems. In this paper, we also focus on the degree to which nonprofit organizations focus on social contribution activities (in this paper, we call this "public interest orientation"). As will be discussed later, the public interest orientation of an organization is thought to affect the functionality of the cost accounting system in the same way as the organization's strategy, but there has not been enough quantitative research on this point (e.g., Pizzini, 2006). By focusing on the public interest orientation of social welfare organizations, this study contributes to deepening our knowledge in this area.

2. Factors affecting the functionality of cost accounting systems in social welfare organizations

What factors have been considered to affect the functionality of cost accounting systems? Previous studies have suggested that the functionality of a cost accounting system depends on the strategy of the organization, the size of the organization, and the number of business types of the organization.

Several studies have confirmed that the functionality of cost accounting systems is affected by the strategies taken by organizations (Pizzini, 2006; Ruiz and Collazzo, 2021). In these studies, strategies were typified as cost leadership strategies and differentiation strategies, with the result that organizations pursuing cost leadership strategies have more functional costing systems. Social welfare organizations pursuing cost leadership strategies may need to frequently produce more detailed cost

information to be used for cost maintenance and improvement. In such cases, social welfare organizations are expected to increase the functionality of their cost accounting systems.

The size of the organization is also considered to affect the functionality of the cost accounting system. The larger the organization, the more difficult it becomes for the business manager to directly supervise the organization, and he or she will decentralize authority to subordinates and control operations indirectly. At that time, accounting information is used to grasp the results and problems of each department within the organization, and corrective actions are taken if necessary. In this way, it can be considered that larger social welfare organizations have more developed cost accounting systems, while smaller organizations do not need to have such highly functional cost accounting systems. While some empirical studies indicate that larger organizations adopt more functional costing systems (Jovanović et al., 2019; Kludacz-Alessandri, 2020), some studies show no relationship between the size of the organization and the functionality of the costing system (Krupička, 2019; Pizzini, 2006; Ruiz and Collazzo, 2021), and consistent research results have not been obtained.

If the products and services produced by an organization are diversified, it is said that a costing system with high functionality will be needed to grasp the resource consumption for each different product or service (Ruiz and Collazzo, 2021). In the case of social welfare organizations, if they are engaged in diverse businesses, they may need a costing system with high functionality to grasp the cost of services provided by each business.

Thus, the factors that influence the functionality of the cost accounting system of social welfare organizations are considered to be strategy, size of the organization, and number of projects. However, it is not sufficient to focus only on these influential factors. What should be noted here is the public interest orientation of social welfare organizations.

The public interest orientation of social welfare organizations refers to the degree to which they focus on social contribution activities. Social welfare organizations are expected to implement projects that are difficult for for-profit organizations to perform, and such projects include providing free services to low income people and responding to needs outside the system. This strong public interest orientation is an important characteristic of social welfare organizations, which are nonprofit organizations, and is thought to affect the functionality of the cost accounting system. For example, let us assume that social welfare organizations raise funds for their social contribution activities by improving the efficiency of their ordinary operations. In this case, an organization with a strong public interest orientation may increase the functionality of its cost accounting system because it can utilize the information obtained from a highly functional cost accounting system to improve the efficiency of its business. If the organization is somewhat large, the benefits of efficiency improvement by utilizing cost information will exceed the administrative costs of developing and operating a highly functional cost accounting system. On the other hand, if the organization is small, it cannot afford to allocate resources to administrative costs, so it may not allocate resources to the maintenance and operation of the cost accounting system, but may use those resources to conduct social contribution activities. The strength of social welfare organizations' public interest orientation is thus considered to affect the

functionality of the cost accounting system by interacting with other variables.

The above four variables will influence each other to determine the functionality of the cost accounting system of social welfare organizations. The purpose of this study is to identify patterns in the functionality of the cost accounting systems of social welfare organizations and their determinants and to analyze the characteristics of a group of organizations with similar cost accounting system functionality. The method used in such cases in management accounting research is cluster analysis (Alakkas et al. 2024; Khatoon et al. 2023; Mishra et al. 2022; Nimtrakoon and Tayles, 2015). Cluster analysis makes it possible to group organizations with similar characteristics concerning their strategy, size of the organization, number of operations, public interest orientation, and functionality of the cost accounting system.

3. How well the cost accounting system functionality fits with the organization's situation

Assuming that the functionality of an appropriate costing system depends on the characteristics of the social welfare organization, how can we determine whether the functionality of the costing system is at an appropriate level? In previous studies, satisfaction with the costing system and the financial performance of the organization have been used to make this judgment (Pizzini, 2006).

About social welfare organizations that are nonprofit organizations, can we judge whether the level of functionality of the cost accounting system is adequate based on financial performance? Generally speaking, nonprofit organizations are organizations that cannot distribute profits and have other objectives (e.g., contribution to public welfare) rather than profit-making as their primary objective (Ali et al. 2022; Felcíio et al., 2021). However, it is not the case that nonprofit organizations do not aim to earn profits. The acquisition and accumulation of profits is necessary for nonprofit organizations for a variety of reasons, and indeed they do so (Berglund and Sterin, 2021; Samagaio and Rodrigues, 2021).

Why would a nonprofit organization even acquire profits? For example, to renew facilities and equipment or expand operations, it is necessary to accumulate profits and provide funds to some extent, even if part of the funds can be covered by borrowing (Berglund and Sterin, 202; Samagaio and Rodrigues, 2021). Profits earned from profitable operations can also be a source of funds for less profitable public services (Berglund and Sterin, 2021; Garven et al., 2018). Furthermore, if a nonprofit organization is not earning profits and is making losses, its managers may be held accountable and forced out of their positions or may have difficulty borrowing from financial institutions (Wen et al., 2019). A certain amount of profit is necessary for the management of a nonprofit organization as well as for fulfilling its social mission.

For these reasons, this paper expects that the profit margin will be high and the percentage of loss-making organizations will be low in the group of organizations for which the characteristics of the social welfare organization and the functionality of the cost accounting system are well matched. Conversely, in the case of incompatibility, the profit rate will be low and the percentage of loss-making organizations will be high.

Satisfaction with accounting information is also expected to vary across groups. The group of firms using cost accounting systems that are well adapted to the

organization's situation will have a high level of satisfaction with the accounting information. Conversely, managers may be dissatisfied with the accounting information provided if they have a cost accounting system with inadequate functionality considering the situation in which the organization finds itself.

4. Research methodology

4.1. Scope of the survey

In this paper, we conducted a questionnaire survey of managers (facility directors, office managers, etc.) of social welfare organizations running special nursing homes for the elderly (including community-based nursing homes), and conducted a cluster analysis based on the data collected. A list of 1368 social welfare organizations (1000 organizations) was compiled from the list of social welfare organizations managing special nursing homes, and 1000 organizations were randomly sampled. The questionnaire was created based on the scales used in previous studies, with some new scales developed. Before sending the questionnaire, a pretest was conducted with two managers of social welfare organizations, and the questionnaire was modified based on the feedback obtained from the test. The questionnaire is presented in the Appendix with only a selection of the questions used in this paper. The questionnaire was sent out in November 2022 and was sent again in December 2022 to those firms that had not responded. 244 firms responded (response rate: 24.4%).

The request letter and return envelope were sent in April 2023 to the 211 organizations whose names were indicated in the returned questionnaires. For those that did not respond, we sent the request letter and return envelopes in May 2023. In addition, we collected the financial statements published on the Web by each organization and by the local governments that have jurisdiction over the organizations. For those organizations whose financial statements were not publicly available even on the Web, we collected the financial statements by making a public records request to each municipality in August 2023. For our analysis, we used data from 173 organizations (17.3%) for which we had complete data for cluster analysis.

4.2. Variables

4.2.1. Variables for cluster analysis

- Functionality of cost accounting system

To measure the functionality of the costing system, we used a partially modified version of Pizzini's (2006) scale, which measures the functionality of the costing system in terms of four aspects: (1) the creation of information for each costing object (Detail), (2) the classification of costs based on costing type (Classify), (3) the frequency of reporting cost information and the breadth of the reporting hierarchy (Frequency), and (4) the number and type of variance analyses.

Since Pizzini's (2006) scale was developed for U.S. hospitals, modifications were necessary when surveying Indian social welfare organizations. Specifically, the costing target was measured in Detail and the choices in Variance were changed. For the latter, the items were changed significantly. Variance questions in Pizzini (2006) were designed to investigate "whether efficiency variances, case-mix variances, and

price variances can be calculated. Considering that business managers of Indian social welfare organizations are not necessarily familiar with these terms, we changed the question to ask to what extent they break down the factors to be investigated when conducting variance analysis on the revenue and cost sides.

Table 1 lists the questions of the scale and the results of the exploratory factor analysis. Since there were four factors with factor loadings exceeding 1, the number of factors was determined to be 4, and factor analysis was conducted using the maximum likelihood method and Promax rotation. The results are similar to those of Pizzini (2006), except for Q6_1, which is shaded where the factor loading exceeds 0.3.

Q6_1 measures the ability to produce costing information by facility and business, but many firms responded with high values. Since this response pattern is similar to that of Q8, which is a measure of cost classification based on cost type, the factor loadings from Classify to Q6_1 are large. However, theoretically, Q6_1 is considered to be an item that investigates the ability to create cost information for each costing target, and therefore, in this paper, it is used as an item to measure Detail.

Table 1. Exploratory factor analysis results and reliability coefficients.

	Detail	Classify	Frequency	Variance	Commonality	Uniqueness
Q6_1Costs by facility and business	–0.02	0.53	0.07	0.04	0.32	0.68
Q6_2Costs by department	0.76	–0.06	–0.04	0.15	0.61	0.39
Q6_3Costs by nursing/medical field staff	0.86	–0.07	0.02	0	0.70	0.31
Q6_4Costs by user	0.9	0	–0.05	–0.04	0.76	0.24
Q6_5Costs by service	0.75	0.11	0.06	–0.08	0.65	0.35
Q8_1Variable and Fixed Costs	0.01	0.82	–0.05	–0.02	0.64	0.36
Q8_2Direct and indirect costs	–0.05	0.93	–0.05	–0.07	0.73	0.27
Q8_3Controllable/uncontrollable expenses	0.26	0.5	0	0.01	0.47	0.53
Q7_1Management top management	–0.09	0.17	0.33	0.04	0.17	0.83
Q7_2 Middle management	0.01	0.09	0.52	–0.03	0.30	0.70
Q7_3Field chief	–0.06	0.01	0.95	–0.05	0.83	0.17
Q7_4On-site caregivers and nurses	0.09	–0.22	0.75	0.05	0.55	0.45
Q5_1Income	–0.06	0.12	0.01	0.61	0.43	0.57
Q5_2 Expenses	0.01	–0.09	–0.03	1.02	0.94	0.06
Cronbach's alpha coefficient	0.84	0.81	0.75	0.77		
McDonald's ωt coefficient	0.85	0.81	0.76	0.77		

Each of the four scales is a reflective scale because it is considered to consist of multiple questions measuring the same characteristics. Therefore, the criteria for reflective scales were used to confirm the reliability and validity of the scales (Diamantopoulos et al., 2008).

As shown in **Table 1**, the reliability of each item was high for both alpha and ωt coefficients, confirming the reliability of the scale[2]. A confirmatory factor analysis was conducted (**Figure 1**), and all path coefficients from each scale to the items were statistically significant[3] (p-value < 0.001), with high values (>0.5) for paths other than Q6_1 and Q7_1. The goodness-of-fit indices were CFI = 0.887 and RMSEA = 0.098,

which were not higher than CFI = 0.95 and RMSEA = 0.05, the criteria for a good fit between data and model. However, neither was RMSEA = 0.1 or higher, which is considered a poor fit. Based on the above, it is considered that there are no major problems with the construct validity of the four scales.

The score for each scale for each organization was calculated as the sum of the scores for the items comprising each of the four scales. The results were standardized to a mean of 0 and a standard deviation of 1, as described below and used in the cluster analysis.

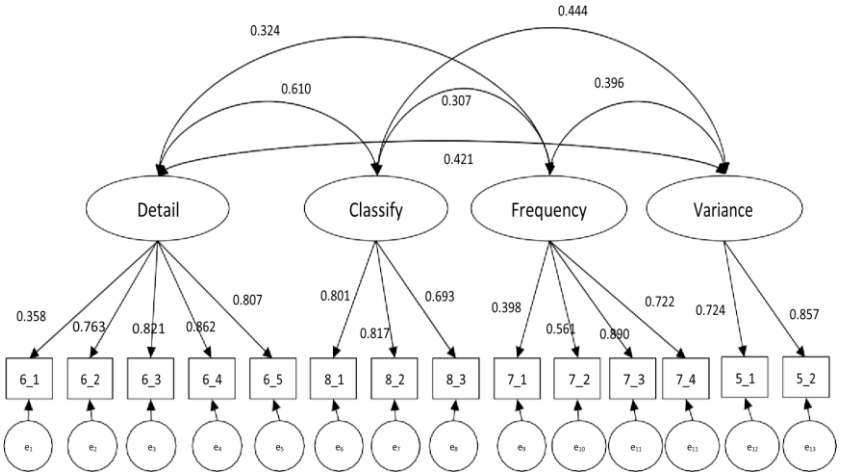

Figure 1. Results of confirmatory factor analysis of cost accounting system functionality.

- Public interest oriented

This paper quantifies the strength of an organization's public interest orientation from the standpoint of the economics of nonprofit organizations. In the economics of nonprofit organizations, nonprofit organizations are viewed as organizations that produce multiple goods (Garven et al., 2018; Ressler, 2023; Toepler and Anheier, 2004). The first is public services (preferred collective goods) that are difficult to sell in the market but are consistent with the mission of the organization. The second is a service that can be sold in the market but that the organization wants to make available to certain users regardless of their ability to pay (preferred private goods). The third is a service that can be sold in the market but is provided only to generate income for Type 1 (non-preferred private goods).

If we view social welfare organizations as multiple-goods-producing organizations, the strength of their public interest orientation is reflected in the extent to which they actively try to provide services (priority public goods) that are difficult to sell in the market but are consistent with the mission of the organization. Specifically, we can consider services that are unprofitable but related to social welfare, such as the organization's community contribution activities, long-term care insurance services that are prepared to lose money, basic research activities related to long-term care, and free assistance to the needy. In this paper, we developed a scale in which respondents were asked to indicate the total amount of effort they devote to activities related to priority public goods, priority private goods, and nonpriority private goods, respectively, by giving a total of 100%. The high allocation of effort to priority public

goods was used in the cluster analysis as the public interest orientation of social welfare organizations.

- Organizational Strategy

The category of strategy that is believed to influence the functionality of costing systems is the category of cost leadership strategy or differentiation strategy (Pizzini, 2006; Ruiz and Collazzo, 2021). In this paper, the scale developed by Govindarajan and Fisher (1990) was used to measure strategy. This scale explains to respondents the difference between cost leadership and differentiation strategies and then asks them to indicate which of the two strategies their organization's sales are based on, totaling 100%.

The original measure asks about the percentage of "sales," but in this study, the item was modified to investigate the impact of the strategy on the "income and expenditure balance (profit). In the long-term care business, where the capacity of facilities and projects is predetermined and it is difficult to increase the number of users at will, the impact of cost leadership strategies on service activity revenue (sales) is considered to be limited. We modified the questionnaire items because we believe that the impact of the competitive strategy adopted by the organization appears more in the income and expenditure balance (profit), which reflects the results of the cost side as well as the revenue side. We also modified the wording of the explanation of the competitive strategy to make it easier for managers of social welfare organizations that operate long-term care businesses to understand. For the cluster analysis, we used the percentage of the income and expenditure difference affected by the cost leadership strategy[4].

- Size of organization, number of business types

Various measures of organizational size have been used in previous studies, including sales, total assets, and the number of beds in the case of hospitals. In this paper, we use total assets as a proxy variable for size because we believe that firms with larger total assets have larger facilities and operations, and thus have more capacity to develop and operate cost accounting systems. Specifically, total assets as of the end of the financial year 2022 are used in the cluster analysis.

The type of business is measured by the number of businesses operated by the social welfare organization, in addition to the businesses defined by long-term care insurance, related to the physically, intellectually, and mentally disabled, and other businesses that may be operated by the social welfare organization.

4.2.2. Variables reflecting the fit between organizational context and costing system functionality

In this paper, we will focus on the following four areas as the financial performance of the organization: the difference between the increase/decrease in service activities, the ratio of the difference between the revenue from service activities and the increase/decrease in service activities, the difference between the balance of funds from business activities, and the existence of losses. The first three correspond to operating income, operating margin, and operating CF, respectively. The scale used by Pizzini (2006) is used to measure the level of satisfaction with accounting information.

4.3. Cluster analysis

This paper uses cluster analysis to group social welfare organizations. It is known that cluster analysis results are strongly influenced by the scale with the largest range of possible values (Hancock et al., 2018) when using different ranges of possible values for the scales in the cluster analysis. Therefore, in this paper, all data used were converted to standard scores with a mean of 0 and a standard deviation of 1 before cluster analysis[5].

There are various methods of cluster analysis, but the methods frequently used in management accounting research include hierarchical cluster analysis using the Ward method and the k-means method[6], which is one of the non-hierarchical methods (Alakkas et al. 2024). In this paper, we chose to use one of these two methods. Whichever method we choose, we are faced with the problem of how many clusters to choose. In other words, cluster analysis requires two decisions: the choice of analysis method and the determination of the number of clusters.

In this paper, we decided to use the validity indices of the cluster analysis results as criteria for making these two judgments. We use some of the indicators organized by Brock et al. (2008), namely, internal validation measurers and stability measures[7]. The three internal validation measurers and the average proportion of non-overlap (APN) were used as stability measures. The three internal validity indices and the APN are calculated for each cluster analysis method and each number of clusters. In this paper, the number of clusters is set from 2 to 10, and two cluster analysis methods, the hierarchical method, and the k-means method, are used, so 18 values are calculated for each indicator. The results of this calculation are used to determine which is the most valid cluster analysis result.

- Confirmation of reproducibility of analysis results

Cluster analysis produces results when the analysis is performed even when no clusters exist in reality. Therefore, it is necessary to dispel doubts by showing that cluster analysis produces consistent results even when the conditions of the analysis are changed (confirming the reproducibility of the analysis results) (Hancock et al., 2018).

In this paper, we follow Kruis, Speklé, and Widener (2016) as a method to check the reproducibility of cluster analysis, randomly separating the sample into two groups and running the cluster analysis again. The classification results obtained with this method are compared with those obtained using all the data to check the proportion of the same data being classified into the same group. If this percentage is high, the reproducibility of the analysis results is confirmed.

- Statistical applications used

For data analysis in this paper, the statistical analysis environment R was used (R Core Team, 2020). The clValid package of R was used to assess the validity of the cluster analysis (Brock et al., 2008).

5. Analysis results

Table 2 shows the descriptive statistics for the measures used in the cluster analysis and other variables used in later analyses. Descriptive statistics for the items comprising the functionality of the costing system are also presented in **Table 3**. The

correlation coefficients among the scales used in the cluster analysis are shown in **Table 4**. The questionnaire items are listed in the Appendix.

Table 2. Descriptive statistics of variables used in the analysis.

	n	Mean	Standard deviation	Median	Minimum	Maximum
Detail	173	17.4	6.77	16	5	33
Classify	173	12.9	4.27	13	3	21
Frequency	173	14.51	4.08	14	4	24
Variance	173	5.54	1.59	5	2	8
Public Interest Orientation (%)	173	24.4	22.8	20	0	100
Cost Leadership Strategy (%)	173	43.1	19.9	40	0	90
H25 Total Assets (thousand rupees)	173	2.562.821	3.685.169	1.594.439	3.927	40.175.720
Number of Businesses	173	5.12	2.6	4	1	15
Profit (thousand rupees)	170	61.964	264.658	19.222	–120.077	3.187.184
ROS (%)	168	4.0	7.8	3.2	–24.6	61.1
Operating CF (thousand rupees)	170	83.719	147.696	45.782	–448.379	973.442
Satisfaction with accounting information	171	4.29	1.29	4	1	7
					n	ratio
Percentage of loss-making organizations (%)					173	25.4

Table 3. Descriptive statistics of cost accounting system functionality.

Detail	n	Mean	Standard deviation	Median	Minimum	Maximum
Q6_1Costs by facility and business	173	5.17	1.56	5	1	7
Q6_2Costs by department	173	3.08	1.73	3	1	7
Q6_3Costs by nursing/medical field staff	173	2.97	1.67	3	1	7
Q6_4Costs by user	173	3.11	1.86	3	1	7
Q6_5Costs by service	173	3.08	1.82	3	1	7
Classify						
Q8_1Variable and Fixed Costs	173	4.65	1.66	5	1	7
Q8_2Direct and indirect costs	173	4.61	1.69	5	1	7
Q8_3Controllable/uncontrollable cost	173	3.63	1.68	4	1	7

Frequency	n	Not reported	Yearly	Half yearly	Quarterly	Monthly	Weekly	Daily
Q7_1 Top management (%)	173	4.0	2.9	7.5	6.9	75.7	1.7	1.2
Q7_2 Middle management (%)	173	6.4	5.2	12. 7	9.8	64.2	0.6	1.2
Q7_3Field chief (%)	173	17.9	22.0	17. 3	8.1	33.5	0.6	0.6
Q7_4 Front-line caregivers and nurses (%)	173	31.2	32.4	13. 9	4.0	18.5	0.0	0.0

Variance	n	No comparison	Simple comparison	One factor analysis	Multiple factor analysis
Q5_1 Income side (%)	173	1.7	37.6	27.7	32.9
Q5_2 Expenditure side (%)	173	2.9	57.2	15.0	24.9

Table 4. Pearson's product rate correlation coefficients between variables used in cluster analysis.

Variables	1	2	3	4	5	6	7	8
Detail	1							
Classify	0.60	1						
Frequency	0.33	0.26	1					
Variance	0.38	0.38	0.32	1				
Public interest orientation (%)	–0.01	–0.14	–0.08	–0.08	1			
Cost leadership strategy (%)	–0.12	–0.10	–0.14	–0.06	0.08	1		
H25 total assets (thousand rupees)	0.02	0.13	0.21	0.04	–0.07	–0.09	1	
Number of Businesses	0.04	0.21	0.21	0.03	0.06	–0.11	0.38	1

It is noteworthy here that a relatively large number of firms are not able to measure detailed information for each costing object. The mean and median values of the ability to understand cost accounting items other than facility and business-specific costs were low, around 3 on a 7-point Likert scale. The social welfare organizations are able to grasp costs by facility and business but are not able to grasp costs by department or service in detail.

Looking at the frequency of reporting cost information by level of use, many firms report cost information monthly to top management and middle management. On the other hand, only about 30% of the companies report cost information to the on-site supervisor level on a monthly basis, and nearly 40% of the companies report once a year or do not report, indicating that cost information is not utilized at the on-site supervisor level. In addition, more than 60% of the organizations report to the on-site caregivers and nurses either once a year or not at all. The closer the staff members are to the caregivers; the less cost information is provided to them.

Regarding the analysis of differences, interestingly, it was found that more emphasis was placed on the profit side than on the cost side. Although the interview survey reported that management of the revenue side is emphasized in social welfare organizations that operate facilities, the results of this survey confirm the findings of the interview survey. On the other hand, nearly 60% of the organizations only conducted simple budgetary comparisons and comparisons with past results in the management of expenses.

Of course, whether cost information needs to be understood in detail and provided at a level close to the field will depend on the management strategy of the organization, its public interest orientation, and the size of the organization. Just because cost information is not captured in detail or provided to the field does not mean that it is a problem. It is important that cost information be provided in a manner that matches the situation of each organization, as discussed below.

5.1. Cluster analysis results

The scores of the validity indices obtained through repeated cluster analysis are shown in **Table 5**. The validity indices are calculated for each of the k-means method and hierarchical cluster analysis results from 2 to 10 clusters so that a total of 72 scores are calculated (4 validity index types × 9 clusters × 2 methods). Of these, only the best

scores for each indicator are listed in **Table 5**. **Table 5** shows that the result of the analysis with the number of clusters 2 using the k-means method is the most valid for several indicators. Therefore, the characteristics of the two groups (Group One and Group Two) obtained from this analysis are discussed below.

Table 5. Calculation results of validity indices.

	Score	Method	Number of clusters
Connectivity	54.02	k-means	2
Silhouette width	0.19	k-means	2
Dunn index	0.18	Hierarchical approach	7
APN	0.09	k-means	2

Table 6 shows the results of the tests of differences in means between groups for the variables used in the cluster analysis. It can be seen that Group One has a more functional costing system than Group Two. In fact, statistically significant differences were found in all four measures and their components that reflect the functionality of the costing system (**Tables 6–9**). On the other hand, Group One does not place as much importance on cost leadership strategies as Group Two. Group One was also less public interest oriented than Group Two. When we look at the total amount of assets and the number of businesses, we find that Group One is a larger group of firms with more businesses.

Table 6. Intergroup comparison of means of variables used in cluster analysis.

	Group One (n = 82)	Group Two (n = 91)	t-value	p-value
Detail	21.5	13.7	9.25	0.000***
Classify	15.7	10.3	10.80	0.000***
Frequency	17.1	12.2	10.08	0.000***
Variance	6.5	4.7	9.07	0.000**
Public benefit orientation (%)	19.9	28.4	–2.51	0.013*
Cost Leadership Strategy (%)	39.8	46.1	–2.12	0.036*
H25 Total Assets (thousand rupees)	3.338.278	1.864.059	2.57	0.012*
Number of projects	6.0	4.4	4.11	0.000***

Table 7. Group comparison of cost accounting system functionality[8].

Detail	Group One (n = 82)	Group Two (n = 91)	t-value	p-value
Q6_1Costs by facility and business	5.9	4.5	6.56	0.000***
Q6_2Costs by department	3.9	2.4	6.24	0.000***
Q6_3Costs by nursing/medical field staff	3.7	2.3	6.36	0.000***
Q6_4Costs by user	4.0	2.3	6.67	0.000***
Q6_5Costs by service	4.0	2.2	7.27	0.000***
Classify				
Q8_1Variable and fixed costs	5.5	3.8	7.94	0.000***

Q8_2Direct and indirect costs	5.5	3.8	8.15	0.000***
Q8_3Controllable/uncontrollable cost	4.7	2.7	9.30	0.000***

Table 8. Group comparison of cost accounting system functionality[8].

Frequency	Groups	Not reported	Yearly	Half yearly	Quarterly	Monthly	Weekly	Daily	χ^2	*p*-value
Q7_1 Top management (%)	Group One (n = 82)	0.0	1.2	3.7	4.9	84.1	3.7	2.4	18.86	0.004***
	Group Two (n = 91)	7.7	4.4	11.0	8.8	68.1	0.0	0.0		
Q7_2 Middle management (%)	Group One (n = 82)	0.0	1.2	4.9	12.2	78.0	1.2	2.4	31.10	0.000***
	Group Two (n = 91)	12.1	8.8	19.8	7.7	51.6	0.0	0.0		
Q7_3Field chief (%)	Group One (n = 82)	2.4	13.4	12.2	13.4	56.1	1.2	1.2	59.78	0.000***
	Group Two (n = 91)	31.9	29.7	22.0	3.3	13.2	0.0	0.0		
Q7_4 Front-line caregivers and nurses (%)	Group One (n = 82)	14.6	23.2	22.0	6.1	34.1	0.0	0.0	47.40	0.000***
	Group Two (n = 91)	46.2	40.7	6.6	2.2	4.4	0.0	0.0		

Table 9. Group comparison of cost accounting system functionality[8].

Variance	Group	No comparison	Simple comparison	One factor analysis	Multiple factor analysis	χ^2	*p*-value
Q5_1 Income side (%)	Group One (n = 82)	0.0	18.3	23.2	58.5	50.28	0.000***
	Group Two (n = 91)	3.3	54.9	31.9	9.9		
Q5_2 Expenditure side (%)	Group One (n = 82)	0.0	36.6	17.1	46.3	45.50	0.000***
	Group Two (n = 91)	5.5	75.8	13.2	5.5		

Table 10 summarizes the results of statistical tests on satisfaction with financial indicators and accounting information for each group. For almost all of the indicators shown in **Table 10**, Group One has a higher mean value than Group Two. However, two statistically significant differences were found for operating CF and satisfaction with accounting information.

Table10. Comparison of satisfaction with financial indicators and accounting information among groups[9].

	Group One	Group Two	*t*-value	*p*-value
Profit (thousand rupees)	97.378	28.965	1.64	0.105
ROS (%)	4.7	3.5	1.02	0.308
Operating CF (thousand rupees)	110.580	59.273	2.25	0.026*
Satisfaction with accounting information	4.8	3.8	5.20	0.000***
	Group One	**Group Two**	**χ^2value**	***p*-value**
Percentage of loss organizations (%)	25.6	26.4	0.00	1.000

5.2. Reproducibility of analytical results

To check the reproducibility of the results of the cluster analysis, the sample was randomly divided into two groups, and a cluster analysis using the k-means method was performed for each. Comparing the results of this analysis with those of the analysis using all data, 96.5% of the data were classified into the same group (**Table 11**). Therefore, the reproducibility of the analysis results was confirmed.

Table 11. Comparison of cluster analysis results after sample split and using all data.

Sample splitting %		1	2
All data	1	51.4	1.2
	2	2.3	45.1

6. Discussion and conclusion

The results of the cluster analysis may be interpreted as follows. Social welfare organizations belonging to Group One have large and complex organizations and adopt highly functional cost accounting systems to control their organizations. Social welfare organizations in Group Two emphasize cost leadership strategies and social contribution activities and thus require a highly functional cost accounting system. However, due to the small size of the organization, it does not have sufficient capacity to operate a cost accounting system and is dissatisfied with its accounting information system. The following is a detailed discussion.

The social welfare organizations classified in Group One are large and operate many types of businesses. However, they are not pursuing cost leadership strategies. In addition, they are not enthusiastic about social contribution activities. It is difficult to believe that this group needs a highly functional cost accounting system from the viewpoint of strategy and public interest orientation. If this group of organizations needs a highly functional cost accounting system, it would be solely for controlling an organization that is large in size and has a large number of businesses. In fact, they have a high ability to perform costing by facility business and by department, which may be useful for control purposes, and they conduct thorough variance analysis not only on the revenue side but also on the cost side, and they frequently provide accounting information to business managers. The distinction between controllable and uncontrollable costs is probably for control purposes. The level of satisfaction with the accounting information in this group is high, probably because sufficient cost information is provided for control purposes.

Since Group Two is pursuing a cost leadership strategy, the potential benefits from a highly functional cost accounting system would be large. Since they also have a strong public interest orientation, they may try to increase the resources available for social contribution activities by using the cost information generated by a highly functional cost accounting system to improve the efficiency of their business operations. However, the functionality of the cost accounting system in this group of organizations is lower than that of Group One. This is thought to be due to the small organizational size of the Group Two firms, which cannot afford to develop and operate a cost accounting system with high functionality. The low level of satisfaction with accounting information in Group Two reflects their dissatisfaction with the fact that they are not able to use a highly functional cost accounting system, even though they would like to use such a system.

There was little difference in financial performance between the groups. This result suggests that both groups use costing systems that are adapted to their respective organizational situations to the same degree. This does not necessarily mean, however, that each group is using the most appropriate costing system for its current situation. Group One may not be fully utilizing the benefits obtained from the costing system

because it has adopted a costing system that does not match well with the organization's strategy and public interest orientation. Therefore, they may have only the same level of financial performance as Group Two. Group Two may not have improved its financial performance because it has not adopted a costing system with functionality that matches its strategy and public interest orientation.

In this paper, based on the assumption that the strategy and public interest orientation of social welfare organizations, the size of the organization, and the number of projects determine the functionality of the cost accounting system, we conducted an exploratory study of the patterns created by the influence of these variables on each other. We conducted a cluster analysis and categorized the sample into two groups: those with a cost accounting system with high functionality for control purposes due to the large size of the organization and the large number of business types, and those with a cost accounting system that does not match the strength of their strategies and public interest orientation due to the small size of the organization. The former is a group of organizations that need a cost accounting system to control their organizations. The former group was highly satisfied with the accounting information, probably because they were able to obtain the cost information necessary to control their organizations. The latter group was less satisfied with the accounting information, perhaps because they did not have sufficient cost information necessary to implement the cost leadership strategy they originally wanted to pursue or to obtain the funds for their social contribution activities. No differences in financial performance were found between the groups, but this does not necessarily mean that the two groups are in an optimal position. Group One may not have high financial performance compared to Group Two because they are not fully utilizing the information available from their highly functional cost accounting systems. Group Two is presumably not performing as well because it has not developed and operated a costing system that provides the cost information needed to pursue cost leadership strategies and improve efficiency.

Based on the results of the analysis in this paper, it is expected that social welfare organizations that pursue cost leadership strategies and have a strong public interest orientation will benefit greatly by being able to utilize a highly functional cost accounting system. Such organizations will be able to improve their business efficiency by utilizing cost information, and their social contribution activities based on the resulting resources will truly be a contribution to public welfare. However, as we have seen in this paper, this type of organization is relatively small in size and does not seem to have the managerial leeway to develop and operate a cost accounting system. It may be necessary to establish a system (e.g., subsidies) to support such social welfare organizations in developing and operating a cost accounting system, or to establish a system that encourages organizations to expand their scale.

The results of this study differ in part from those of previous studies. While previous studies did not find a clear relationship between the functionality of cost accounting systems and organizational size (Pizzini, 2006; Ruiz and Collazzo, 2021), in this study, the functionality of cost accounting systems was higher in the group of larger organizations. Regarding the perception of the usefulness of the cost accounting system, in this paper, as in the previous study (Pizzini, 2006), the higher the functionality of the cost accounting system, the higher the perception of its usefulness

by the business managers. On the other hand, while previous studies have suggested that higher functionality of cost accounting systems leads to higher financial performance of organizations (Pizzini, 2006), there is no clear relationship between the two in this paper. Pizzini (2006) suggests that in the U.S. medical community, cost accounting systems with functionality that corresponds to the organizational situation have been developed, and hospitals use the information provided by cost accounting systems to improve the financial performance of their organizations. On the other hand, social welfare organizations in India have not necessarily developed such a system, and the information provided by cost accounting systems may not be fully utilized to improve the financial performance of the organizations. In the future, if more organizations develop cost accounting systems in accordance with their strategies, public interest orientation, and scale, and utilize the information provided for business management, their financial performance may improve. If this happens, we may find a similar relationship between the functionality of cost accounting systems and financial performance in Indian social welfare organizations as in previous studies[10].

Although the above has been clarified in this paper, there are some limitations and issues to be addressed. This paper focused on the functionality of cost accounting systems, but its utilization was only inferred from the analysis results. In the future, it will be necessary to collect data not only on the "existence of cost accounting systems" but also on the "utilization of cost accounting systems" to conduct more precise analysis.

A growing number of studies have examined whether managers' knowledge of cost accounting and their knowledge of the business affect their effectiveness in utilizing cost accounting information. An increasing number of studies have been conducted in recent years to verify that the effectiveness of utilizing cost accounting information changes depending on the manager's knowledge of cost accounting and the business. This paper was based on the assumption that business managers can use the information provided by a highly functional cost accounting system without any problems, but in reality, business managers' ability to understand and process cost information may vary. In particular, in social welfare organizations, where approaches to business management have traditionally been neglected, there is likely to be a large variation in the abilities of business managers. In the future, it may be necessary to conduct an analysis that incorporates the abilities of such managers.

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Notes

[1] In this study, we are discussing "functionality" at an abstract level. Since it is not certain how widespread cost accounting is in social welfare organizations, investigating the actual situation regarding the adoption of specific techniques and methods is considered to be an effective research method at this stage. The reason why we used the concept of "functionality of cost accounting systems" instead of adopting such an approach in this paper is that this concept has been established in previous studies, and we thought it would be useful to use it to build up research results. It is also important to clarify the adoption status of cost accounting methods in social welfare organizations, which will be discussed in a separate paper.

[2] Regarding reliability, it has recently been recommended to report not only Cronbach's alpha coefficient but also McDonald's ωt coefficient. Cronbach's alpha coefficient includes bias in estimating reliability, while McDonald's ωt coefficient is said to have a relatively small bias (Malkewitz et al., 2023).

[3] However, for the first item of the four scales, Q5_1, Q6_1, Q7_1, and Q8_1, the unstandardized coefficient was fixed at 1 for the analysis, so no p-value was calculated.

[4] Since the purpose of this paper is to look at the impact of cost leadership strategies, we followed Van der Stede (2000) and used only the responses for one of the strategies in our analysis.

[5] Jaeger & Banks (2023) provide details on the standardization of variables when conducting cluster analysis.

[6] The final result of the k-means method depends on which data are randomly selected at the beginning of the analysis. Therefore, the cluster analysis was repeated many times, and the one with the smallest intracluster sum of squares was adopted as the result of the analysis as the initial values were changed. In this paper, the initial values were set 1,000 times and the results obtained are reported.

[7] Internal validity index is a method to evaluate the validity of the analysis results using the information in the data, using the dataset, and the cluster analysis results as input to the calculation. The value of connectivity ranges from 0 to ∞, and the smaller the value, the higher the validity of the cluster analysis results. Silhouette width ranges from -1 to 1, and Dunn index ranges from 0 to ∞. The larger the value of these two parameters, the higher the validity of the cluster analysis results. On the other hand, the stability index refers to the degree to which the analysis results remain unchanged when cluster analysis is performed by excluding one column (variable) at a time, with the rows of data as samples and the columns as variables, compared to an analysis using all columns (Brock et al., 2008). The APN used in this paper takes a value between 0 and 1. The smaller this value is, the higher the validity of the cluster analysis.

[8] It is recommended to use Fisher's exact probability test instead of the χ-square test when the cell contains frequencies of 5 or less. Therefore, Fisher's exact probability test was conducted, and the results for all the questions included in Q7 and Q5 were similar to those of the χ-square test.

[9] The number of Groups 1 and 2 varies depending on each variable because there were some firms for which the data shown here were not available. Let n1 and n2 denote the number of samples for Groups 1 and 2, respectively, and we obtain n1 = 83 and n2 = 88 for profit, n1 = 80 and n2 = 88 for ROS, n1 = 81 and n2 = 89 for operating CF, n1 = 82 and n2 = 89 for satisfaction with accounting information, and n1 = 82 and n2 = 87 for the percentage of loss-making organizations.

[10] This study is based on the configuration approach noted by Nimtrakoon and Tayles (2015), while Pizzini (2006) is based on the cartesian approach (path analysis was not performed but the functionality of the costing system can be viewed as a mediating variable). Therefore, one could criticize the comparison of the two as nonsense (Nimtrakoon and Tayles, 2015). See Nimtrakoon and Tayles (2015) for methodological issues regarding the form of contingency fit.

References

Ahmed, A., Vadera, S., Bashir, S., et al. (2023). The influence of managerial competence on the relationship between cost accounting systems and financial performance: A quantitative study of social welfare organizations. International Journal of Applied Economics, Finance and Accounting, 17(2), 279–293. https://doi.org/10.33094/ijaefa.v17i2.1162

Alakkas, A. A., Alhumoudi, H., Khan, H., Imam, A., Khatoon, A., Bashir, S., & Khan, I. A. (2024). Impact of manager's motivation on fraudulent accounting: An empirical study. Corporate Governance and Organizational Behavior Review, 8(2), 93–102. https://doi.org/10.22495/cgobrv8i2p9

Ali, I., Sami, S., Senan, N. A. M., Baig, A., & Khan, I. A. (2022). A study on corporate sustainability performance evaluation and management: The sustainability balanced scorecard. Corporate Governance and Organizational Behavior Review, 6(2), 150–162. https://doi.org/10.22495/cgobrv6i2p15

Berglund, N. R., & Sterin, M. (2021). Internal Controls and Operational Performance of Nonprofit Organizations. Journal of Governmental & Nonprofit Accounting, 10(1), 134–156. https://doi.org/10.2308/jogna-19-001

Brock, G., Pihur, V., Datta, S., et al. (2008). clValid: AnRPackage for Cluster Validation. Journal of Statistical Software, 25(4). https://doi.org/10.18637/jss.v025.i04

Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. Journal of Business Research, 61(12), 1203–1218. https://doi.org/10.1016/j.jbusres.2008.01.009

Erfan, N., Ali, I., Khan, S., & Khan, I.A. (2022). Effects of the Fair Value of Biological Assets on the Cost of Debt: An International Study. The Journal of Asian Finance, Economics and Business, 9 (8), 71–80. https://doi.org/10.13106/JAFEB.2022.VOL9.NO8.0071

Felício, T., Samagaio, A., & Rodrigues, R. (2021). Adoption of management control systems and performance in public sector organizations. Journal of Business Research, 124, 593–602. https://doi.org/10.1016/j.jbusres.2020.10.069

Garven, S. A., Beck, A. W., & Parsons, L. M. (2017). Are Audit-Related Factors Associated with Financial Reporting Quality in Nonprofit Organizations? AUDITING: A Journal of Practice & Theory, 37(1), 49–68. https://doi.org/10.2308/ajpt-51819

Govindarajan, V., & Fisher, J. (1990). Strategy, control systems, and resource sharing: effects on business-unit performance. Academy of Management Journal, 33(2), 259–285. https://doi.org/10.2307/256325

Hancock, G. R., Stapleton, L. M., & Mueller, R. O. (2018). The Reviewer's Guide to Quantitative Methods in the Social Sciences. Routledge. https://doi.org/10.4324/9781315755649

Jaeger, A., & Banks, D. (2022). Cluster analysis: A modern statistical review. WIREs Computational Statistics, 15(3). Portico. https://doi.org/10.1002/wics.1597

Jovanović, T., Dražić-Lutilsky, I., & Vašiček, D. (2019). Implementation of cost accounting as the economic pillar of management accounting systems in public hospitals – the case of Slovenia and Croatia. Economic Research-Ekonomska Istraživanja, 32(1), 3754–3772. https://doi.org/10.1080/1331677x.2019.1675079

Khatoon, A., Alhebry, A., Khan, H., Al-Matari, E.M., Baig A., & Khan, I.A. (2023). Performance Management Accounting and Profitability: Evidence from Small and Medium Enterprises. Review of Economics and Finance, 21, 475-483. https://refpress.org/ref-vol21-a48/

Kludacz-Alessandri, M. (2020). The Relationship between Cost System Functionality, Management Accounting Practices, and Hospital Performance. Foundations of Management, 12(1), 223–236. https://doi.org/10.2478/fman-2020-0017

Kruis, A.-M., Speklé, R. F., & Widener, S. K. (2016). The Levers of Control Framework: An exploratory analysis of balance. Management Accounting Research, 32, 27–44. https://doi.org/10.1016/j.mar.2015.12.002

Krupička, J. (2020). The Management Accounting Practices in Healthcare: The Case of Czech Public Hospitals. European Financial and Accounting Journal, 15(1), 53–66. https://doi.org/10.18267/j.efaj.233

Kuzey, C., Uyar, A., & Delen, D. (2019). An investigation of the factors influencing cost system functionality using decision trees, support vector machines and logistic regression. International Journal of Accounting & Information Management, 27(1), 27–55. https://doi.org/10.1108/ijaim-04-2017-0052

Macinati, M. S., & Anessi-Pessina, E. (2014). Management accounting use and financial performance in public health-care organisations: Evidence from the Italian National Health Service. Health Policy, 117(1), 98–111. https://doi.org/10.1016/j.healthpol.2014.03.011

Malkewitz, C. P., Schwall, P., Meesters, C., et al. (2023). Estimating reliability: A comparison of Cronbach's α, McDonald's ωt and the greatest lower bound. Social Sciences & Humanities Open, 7(1), 100368. https://doi.org/10.1016/j.ssaho.2022.100368

Mishra, N. K., Ali, I., Senan, N. A. M., et al. (2022). Cost Behaviors and Cost Structure of Public Hospitals in India: Analysis from the Perspective of Congestion Costs. The Journal of Asian Finance, Economics and Business, 9(4), 315-324.

Najera Ruiz, T., & Collazzo, P. (2021). Determinants of the use of accounting systems in microenterprises: evidence from Chile. Journal of Accounting in Emerging Economies, 11(4), 632–650. https://doi.org/10.1108/jaee-07-2020-0173

Nimtrakoon, S., & Tayles, M. (2015). Explaining management accounting practices and strategy in Thailand. Journal of Accounting in Emerging Economies, 5(3), 269–298. https://doi.org/10.1108/jaee-02-2013-0012

Pizzini, M. J. (2006). The relation between cost-system design, managers' evaluations of the relevance and usefulness of cost data, and financial performance: an empirical study of US hospitals. Accounting, Organizations and Society, 31(2), 179–210. https://doi.org/10.1016/j.aos.2004.11.001

R Core Team (2020). The R Project for Statistical Computing. Available online: https://www.r-project.org/ (accessed on 5 April

2024).

Ressler, R. W. (2023). Nonprofit organizations: Theory, management, policy, 3rd edition. Journal of Public Affairs Education, 1–3. https://doi.org/10.1080/15236803.2023.2190722

Van der Stede, W. A. (2000). The relationship between two consequences of budgetary controls: budgetary slack creation and managerial short-term orientation. Accounting, Organizations and Society, 25(6), 609622. https://doi.org/10.1016/S0361-3682(99)00058-6

Wen, Y.-C., Huang, P., Shen, H.-C., et al. (2019). The role of organizational forms in nonprofit firms' real earnings management: Evidence from nonprofit hospitals in Taiwan. Advances in Accounting, 46, 100418. https://doi.org/10.1016/j.adiac.2019.04.003

Zimmer, A., & Priller, E. (2004). Future of Civil Society. VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-322-80980-3

Appendix

Questionnaire (excerpt)

Q1. Please select the type of facility or business your organization operates. (Multiple choices allowed).

(1) Special nursing homes for the elderly (2) Health care facilities for the elderly (3) Care for specified facility residents (4) Home-visit nursing care (5) Home-visit bathing care (6) Home-visit nursing care (7) Home-visit rehabilitation (8) Short-term care for the elderly (9) Short-term care for daily living (10) Day service (daycare) (11) Outpatient rehabilitation (12) Daycare for dementia (13) Small-scale multifunctional in-home care (14) Group home (15) In-home care support office (16) Community comprehensive support center (17) Other nursing care services (18) Businesses related to physically disabled persons (19) Businesses related to the intellectually disabled (20) Businesses related to the mentally disabled (21) Other Businesses

Q5. How does your organization analyze the difference between the budget and the previous month's results 603 and the current month's results?

1	Income side	(1) No comparison, (2) Simple comparison of current performance with budget or past performance, (3) Analysis based on a single factor (e.g., occupancy rate), (4) Analysis broken down into multiple factors (e.g., average compensation per unit and occupancy rate)
2	Expenditure side	(1) No comparison, (2) Simple comparison of current performance with budget or past performance, (3) Analysis based on a single factor (e.g., working hours), (4) Analysis broken down into multiple factors (e.g., average wage rate and working hours)

Q6. To what extent can your firm produce information that would allow analysis of costs in the following 606 units?

		Cannot create at all/ Can be created completely
1	Costs by facility and business (e.g., costs per special care, elderly care, day service, and community comprehensive support center)	1 2 3 4 5 6 7
2	Costs by department within the facility/project (e.g., costs by department, section, or floor within a special care facility)	1 2 3 4 5 6 7
3	Costs by nursing and medical field staff (e.g., A Cost incurred by the activities of nursing staff)	1 2 3 4 5 6 7
4	Cost by User	1 2 3 4 5 6 7
5	Cost per service (e.g., cost per bath, cost per meal, cost per transportation)	1 2 3 4 5 6 7

Q7. How often does your organization document cost information for each of the following positions?

1	Top management (President, Facility Director, Office Manager)	(1) Daily (2) Weekly (3) Monthly (4) Quarterly (5) Half year (6) One year (7) No report
2	Middle management (heads of facilities, business, and section managers other than top management)	(1) Daily (2) Weekly (3) Monthly (4) Quarterly (5) Half year (6) One year (7) No report
3	Field Officers (Nursing Officers, Nursing Officers, Management Nutritionists, etc.)	(1) Daily (2) Weekly (3) Monthly (4) Quarterly (5) Half year (6) One year (7) No report
4	On-site caregivers and nurses	(1) Daily (2) Weekly (3) Monthly (4) Quarterly (5) Half year (6) One year (7) No report

Q8. To what extent is your organization able to distinguish costs based on the following cost categories?

		Cannot create at all/ Can be created completely
1	Costs that increase with changes in occupancy rates and number of residents (variable costs) and costs that do not change (fixed costs)	1 2 3 4 5 6 7
2	Costs directly associated with facilities, projects, and services (direct costs) and costs allocated using some standard (indirect costs)	1 2 3 4 5 6 7
3	Costs that can be controlled by the efforts of the person in charge of the facility, project, or floor (controllable costs) and costs that cannot be controlled by the person in charge (uncontrollable costs)	1 2 3 4 5 6 7

Q9. To what extent is your organization's balance of payments (profit) affected by the following two policies (strategies)? Please answer so that the total is 100%.

1	Lower costs than other providers; vigorously pursue cost reductions; provide standard, common services (cost leadership strategy)	%
2	Provide services that users and their families consider distinctive. Care to enhance the quality of services and the image and reputation of the organization (differentiation strategy).	%

Total 100%

Q11. How much effort does your organization devote to each of the following activities? Please answer so that the total is 100%.

1	Provide services that are unprofitable but related to social welfare (e.g., the organization's own community contribution activities, long-term care insurance services at a loss, basic research activities, free assistance to the needy, etc.)	%
2	Provide services that are profitable and related to social welfare. However, services may be provided free of charge or at a reduced price to users in need (e.g., profitable longterm care insurance services, meal delivery services for watch-over, etc.).	%
3	Provide products and services that are profitable but not related to social welfare (e.g., rental building management, parking lot management, concession stand management)	%

Total 100%

Q13. Overall, how satisfied are you with the accounting information provided by your firm for business management?

		Cannot create at all/ Can be created completely
1	Satisfaction with accounting business management information for	1 2 3 4 5 6 7