Using Analytic Hierarchy Process to Analyse the Critical Success Factors for Performance Management of the Taiwanese Veterans Home

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Abstract

In order to take care of the veterans who have contributed to the country and spent half of their life defending the country, the Veterans Affairs Commission Taiwan is assigned with responsibilities to assist in medical care, home care and other general services. These services were designed to facilitate the transition of military personnel from the armed forces to civilian life. It is also concerned with improving their quality of life. The aim of this paper is to identify the critical successful factors for performance management of the Taiwanese Veterans Home by Analytic Hierarchy Process (AHP). The authors' survey results revealed that the top three critical successful factors for performance management of the Taiwanese Veterans Home are; quality of the professional team, long-term care planning and accidents audit plan.

Key words: Analytic Hierarchy Process, Critical Successful Factor, Taiwanese Veterans Home

1. Introduction

With decreasing birth rates and increasing life expectancy, Taiwan is facing the economic impact of the aging population on its health care system, especially public funded health care services. Furthermore, with rising expectations for the quality of care, has made health care reform a major task of the Taiwanese government (Leung *et al*., 2004).

It is estimated that the Taiwanese population aged 65 and older will grow to 14% of the total population in 2016 and 20% of the total population in 2025. Even though aging is not synonymous with frailty, elderly people are major consumers of health care. In the United States, health care spending is expected to grow by two thirds by 2008, and the elderly account for one third of the country's $ 112 billion prescription drug costs, which are growing by more than 10% a year (Critical Conditions, 2000).

According to the Veterans Affairs Commission (VAC), Taiwan survey in April of 2011, there are 456,866 veterans (ex-armed service persons) living in Taiwan (one in fifty Taiwanese residents is a veteran, see Table 1). Their average age is 68.1 years old and the majority of veterans (56%) are aged 65 and older (VAC, 2011). There are two salient demographic changes that will take place in the Taiwanese veteran population over the next ten years, which will greatly affect the demand for long-term care and other services (Washington State Department of Veterans Affairs, 2006).

1.1. An extraordinary increase in the veteran population aged 80 and older

Over the next 10 years, the number of veterans aged 65 and older in Taiwan will remain relatively stable, fluctuating between 200,000 and 250,000. However, there will be a sharp rise in veterans aged 80 and older. According to VAC, Taiwan (2011) projections, the number of veterans age 80 and over will increase by 20% between 2011 and 2021.

Table 1: Number of Taiwanese Veterans – by Age

Categories	20-49 years old	50-64 years old	65 years old & over	Total
2007	105,064	91,205	295,265	491,534
2008	103,215	95,662	283,225	482,102
2009	98,143	101,668	271,495	471,306
2010	92,574	109,457	259,604	461,635
Until April 2011	90,608	111,424	254,834	456,866

Source: Veterans Affairs Commission (2011)

The growth in very elderly veterans is resulting in increased demands for long-term care, including special needs such as hospice care and care for Alzheimer's and other dementia conditions. According to the Washington State Department of Veterans Affairs (WDVA, 2006) study on prevalence rates for Alzheimer's, it is estimated that approximately 16,000 Washington veterans aged 65 and older will be diagnosed with this disorder by 2010, representing an increase of almost 100%.

1.2. The highest proportion of aging veterans is male

One unique characteristic of older Taiwanese veterans that affect service needs is the high proportion of males – 97% of veterans over the age of 65 are males, compared to 50% for the country population as a whole – and the presence of wartime disabilities, both physical and mental. Using data from a VAC, Taiwan (2011) statistic, approximately 10,000 veterans aged 65 and over in Taiwan are currently receiving war-related disability compensation or pensions from the central government.

The main purpose of a veterans home is to achieve their organisational mission and vision. In addition, they need to focus on customer satisfaction in order to maintain sustainable service operations (Predrag, 2011). This paper addresses the emerging phenomenon of providing a health care system for an aging population. It also identifies the critical success factors for performance management of the Taiwanese Veterans Home (TVH).

2. Introduction to Taiwanese Veterans Homes

In order to take care of the veterans who have contributed to the country and spent half of their life defending the country, the Taiwan VAC is assigned with responsibilities to assist in educational support, employment assistance, medical care, home care and other general services. These services were designed to facilitate the transition of military personnel from the armed forces to civilian life. It is also concerned with improving their quality of life. (Veterans Affairs Commission, 2011)

According to the Republic of China (ROC) Veterans Assistance Act, the VAC is to set up institutes to provide home-care for veterans. Under these principles, the VAC has set up 14 veteran's homes and 4 domiciliary centres (see Figure 1) to provide home-care services in following categories.

Figure 1: 14 veterans homes and 4 domiciliary centres around the island
Source: Veterans Affairs Commission (2011)

2.1. Home-care at government's expenses

Veterans aged 61 and older, receiving less than an average monthly income of NT $ 13,550 (about USD 417) and holding a valid household registration in Taiwan as well as those service connected injured or sick veterans, are entitled to VAC home-care of this category. In addition, qualified single veterans are encouraged to live inside the veterans homes. To the end of April 2011, Taiwanese veterans homes provide 6,862 beds at the government's expense (see Table 2). Currently, 6,577 veterans are living in veterans homes, with bed occupancy rates of 96% (Veterans Affairs Commission, 2011).

Table 2: Number of Beds of Veterans Homes at Government's Expense

Categories	Independent domiciliary	Nursing care / disabled	Nursing care / Dementia	Total
Banciao Veterans Home	150			150
Taipei Veterans Home	639	270	70	979
Taoyuan Veterans Home	416	158	50	624
Hsinchu Veterans Home	348	176		524
Changhua Veterans Home	327	144	80	551
Yunlin Veterans Home	178	200		378
Baihe Veterans Home	263	169		432
Jiali Veterans Home	278	68		346
Tainan Veterans Home	348	93		441
Gangshan Veterans Home	548	211	100	859
Pingtung Veterans Home	142	174	60	376
Hualien Veterans Home	330	130		460
Taiping Veterans Home	188	94	67	349
Malan Veterans Home	252	141		393
Total	4,407	2,028	427	6,862

Source: Veterans Affairs Commission (2011)

2.2. Home-care at self-expenses domiciliary

Veterans aged 61 and older, and who are financially capable to support their own home-care services are included in this category. If the applicants are married, their spouses, over 50 years old, are qualified to apply with the veterans as well, but they should be able to handle their daily activities. To the end of April 2011, Taiwanese veteran's homes and domiciliary centres provide 2,769 beds at a self-expense domiciliary (see Table 3). Currently, 2,107 veterans are living in veterans homes and domiciliary centres, where the occupancy rate of beds is 76% (Veterans Affairs Commission, 2011).

2.3. Home-care resource sharing

In order to build up better neighbourhood relationships and facilitate better use of government resources the VAC has launched a new project to share its home-care facilities with civilians in the vicinity from 2007. VAC veterans homes and domiciliary centres are instructed to offer day-care centres and the rehabilitation facilities inside the home-care institutes to the nearby civilians (Veterans Affairs Commission, 2011).

Table 3: Number of Beds of Veterans Homes at Self-expense Domiciliary

Categories	Independent domiciliary	Nursing care / disabled	Nursing care / Dementia	Total
Taipei Veterans Home		45	20	65
Taoyuan Veterans Home		69	27	96
Hsinchu Veterans Home	26	24		50
Changhua Veterans Home			20	20
Yunlin Veterans Home		200		200
Baihe Veterans Home	87	70		157
Jiali Veterans Home	26			26
Tainan Veterans Home	61	30		91
Gangshan Veterans Home	2			2
Pingtung Veterans Home		100	40	140
Hualien Veterans Home	10	20		30
Taiping Veterans Home	6	62	25	93
Malan Veterans Home	15	19		34
Bade Domiciliary Center	666	34		700
Changhua Domiciliary Center	352	32		384
Nanzih Domiciliary Center	408	75		483
Hualien Domiciliary Center	183	15		198
Total	1,842	795	132	2,769

Source: Veterans Affairs Commission (2011)

Currently, there are a lot of challenges facing Taiwanese veterans homes on future developments, for example, accommodating a continued decrease in the number of veterans. There were 598,000 veterans in 1991, but in April 2011 there are only 456,866 veterans living in Taiwan, decreasing by more than 7,000 veterans a year.

Holmes (1996) indicated that a proxy measure of financial performance is the occupancy rate of the facility. Facilities with high occupancy rates are likely to be more profitable or at least have greater economies of scale. This should enable veterans homes to increase service provisions. As a consequence, these facilities may also be more likely to have improved resident outcomes (Castle and Banaszak-Holl, 2003).

Although Taiwanese veterans home are public funded health care services, Kaplan and Norton (2001) stated that both profit and non-profit organisations need to focus on profitability and customer satisfaction in order to maintain sustainable business operations. Therefore, it is important to increase the occupancy rate of the facility for Taiwanese veterans homes on future developments.

3. Critical Success Factors Of Non-Profit Organisation, Nursing Home And Veterans Home

The Critical Success Factors (CSFs) are interdependent; one is not more important than another. However, the success factors cascade down and build on one another beginning with a shared mission, values, vision and direction and then proceeding to clearer definitions of relationships and processes (Mollenhauer, 2006, see Figure 2).

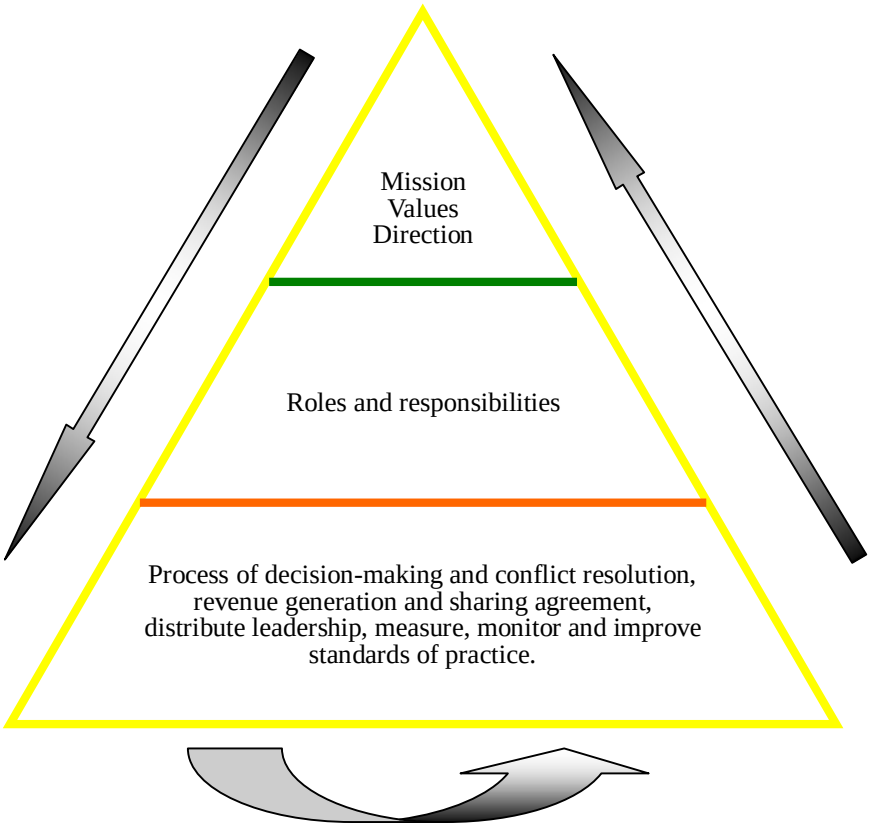

Figure 2: Triangle of success factors
Source: Mollenhauer (2006) adapted by author

Veterans home staff must articulate clear and meaningful values that drive their behaviour. For example, Veterans home values might be to; ensure that the veterans served come first, value the different capacities and interests of all veterans, consistently aim for efficiency and effectiveness and communicate in an open and transparent fashion (Mollenhauer, 2006). In addition, the division of roles and responsibilities reflect the veterans homes values and are based on what each part of the veterans home can do most effectively. There is a clear value added and no duplication of effort. Additionally, the roles and responsibilities are based on realistic expectations because they take into consideration the various capacities of homes. Once the role and responsibilities are established, a successful veterans home ensures that each member of staff is fulfilling their role (Mollenhauer, 2006).

Moreover, a strong and healthy institution has developed clear and effective decision-making processes that result in the best possible decisions. Critical decisions are also based on reliable information, such as facts and evidence, so they are informed and unbiased. There is also a formal mechanism in place to manage conflict and resolve disputes. The mechanism provides a range of procedures to address different severities of conflicts and disputes (Mollenhauer, 2006). Furthermore, a successful organisation has set clear outcome based standards of practice that apply to all organisational members. For example, standards of practice might address areas such as strategic planning, service delivery and human resource management. There should also be a clear and reasonable mechanism to review and revise them.

3.1. Critical success factors of a non-profit organisation

Kaplan and Norton (2001) proposed a non-profit organisation structure to establish the four major Balanced Score Card (BSC) perspectives. The organisational mission is at the top followed by the customer, internal process, learning and growth, and financial perspectives. Through the balanced score card approach, each individual will find his or her orientation and connection within the organisation and will determine how to satisfy customer requirements, improve organisational financial performance and contribute to staff growth (Lawrence and Sharma, 2002; Wilson et al., 2003; Kaplan and Norton, 2004; Chen et al., 2006).

Table 4 demonstrates BSC measures for improvement and modified goals of the non-profit organisation. Non-profit organisations must emphasise the financial costs and benefits of performance management. Without awareness of the complete financial structure, including resources and budgets, it is impossible to achieve a vision or mission (Predrag, 2011). Many non-profit organisations have admirable mission and vision statements but lack adequate financial support, which results in poor performance. Fletcher and Smith (2004) suggested that the learning and growth perspective was the leading indicator of the internal business process, which in turn, was the leading indictor of customer satisfaction. A degree of improvement in internal business processes and the level of customer satisfaction will also affect the financial perspective.

Predrag (2011) stated that non-profit organisational members that have core abilities in quality awareness can improve their internal processes to increase administrative efficiency. He further indicated that if the organisational services and education are of good quality and adequate operational facilities, customer requirements will be satisfied. When non-profit organisational internal and external customers are satisfied with its performance, its profit growth will most likely be positive and sustainable. Therefore, an adequate financial structure helps a non-profit organisation achieve their mission and vision.

Table 4: Measures for improved and modified BSC goals of the non profit organisation

Objectives	Measures		
Develop needed workforce skills and competencies	Retain best qualified staff	Track all external trainings and conferences for division and departments	Communications and marketing plan is developed and executed
Ensured organisational learning based on data, outcomes and experience	Turnover rate	Organisational learning	Promotion rate
Deliver services aligned with resources and prioritised core activities	Number of consults	Process efficiency	Marketing performance
Build professional competencies that support strategy	Number of solutions evaluated	Number of joint projects in new or emerging markets	Level of satisfaction with newly implemented solutions
Understand customer segments	Number of repeat customers	Offering customers high-quality services	Number of services available to customers
Provide quality programs that are superbly executed	Number of hours spent with customer	Market share	Customer loyalty program
Average gift amount	Number of safety incidents from new products		Revenue from markets and segments
Achieve financial sustainability	Revenue growth vs budget targets	Number of new business opportunity identifications	
Be the best managed non-profit organisation in the country	Marketing, selling, distribution and administrative as percent of total cost		

Source: Predrag (2011)

A survey of Employee Volunteering Program (EVP) for the small to medium Not-for Profit Sector (NFPs) conducted by Dalton et al. (2008) indicated that interviewees generally said that the commitment of volunteers was important. Their reliability contributed to the success of the EVP. Moreover, quantitative data revealed that a key point to success is the relationship between NFPs and corporations. Good communication, clarity of purpose and direction, understanding each other and good management were also significant themes. Mutual benefit was achieved via skills and experience exchange. Some stated good planning of a project is also a crucial factor.

3.2. Critical success factors of nursing home

Nursing homes are being challenged in many ways. For example, there is an ever-growing elderly cohort, patients may be admitted to nursing homes in poor health conditions and reimbursement for nursing homes services may not be adequate (Childs, 2000). These trends are likely to continue. Nursing Homes therefore may need better leadership qualities within the industry so that they can improve services to the elderly. Castle and Banaszak-Holl (2003) believed that it is equally obvious that the administration of nursing homes may determine the context and content of nursing home care and may also have an important effect on quality.

The Institute of Medicine (IOM) estimated that more than half of the nursing homes in the United States of America (USA) provided low standards of care (IOM, 1986). Several USA government reports also indicated that many of their nursing homes have serious quality problems that can harm residents (General Accounting Office, 1999a, 1999b, 1999c). Harrington et al. (2000) found that administrative staff time was not related to any deficiencies for resident care but was inversely related to non-health deficiencies. Castle and Banaszak-Holl (2003) agreed and stated that the ability of administration to react to resident outcomes and code violations on state inspections may be tied to the organisation's financial performance. They also indicated that competition may be an important influence on the behaviour of administration, especially in promoting quality care.

Research by Castle and Banaszak-Holl (2003) revealed that the effective staffing levels of nurses need to be larger than those for administration. They believed that administrative staffing is important but clearly not as influential as caregiver staffing. Previous research has identified high rates of administrator turnover in nursing homes (Singh & Schwab, 1998). Rubin and Shuttlesworth (1986) surveyed the average turnover of administrators to be 33% per year. A recent study using data from five states of the USA found turnover rates to average 43% per year (Castle, 2001). Additionally, several research studies have identified turnover of administrators in nursing homes as a potential influence on quality of care, therefore making an understanding of the factors associated with turnover even more pressing (Christensen & Beaver, 1996; Singh et al., 1996).

Turnover of nursing aides (NAs), licensed practical nurses (LPNs), and registered nurses (RNs) in nursing homes was also high and has been identified as a factor for these caregivers in many facilities. A recent study has shown that the average annual NA turnover rates to be more than 100% in many facilities (Castle & Engberg, 2005). Decreasing turnover rate in nursing homes is important. This is because turnover can influence facility operating costs, lower caregiver job satisfaction and have negative health outcomes for residents (Parsons et al., 2003; Castle & Engberg, 2005; Castle, 2008). In general, high staff turnover is associated with poor quality. For example, for RNs, high turnover (i.e., >60% per year) is associated with high numbers of deficiency citations compared to medium RN turnover (i.e., 30% to 60% per year; Castle, 2008). Phillips (2002) described that organisational context can help differentiate between more and less effective organisations with respect to turnover and vacancy rates.

In addition, Castle and Shugarman (2005) also indicated that administrator turnover is affected by both organisational characteristics and the personal characteristics of top managers. They also showed that top management teams with longer tenured administrators are 40% less likely to leave the organisation than those with shorter tenure. Therefore, increased tenure is generally associated with stability within a facility.
Currently, care facilities are facing increasing pressure to provide higher staffing levels. Several states of the USA, for example, have mandated minimum staffing levels (Mueller et al., 2006). This clearly comes at an added expense for the facility. Castle (2008) indicated that one beneficial outcome of higher staffing levels could be lower staff turnover.

Following nursing home admission, family members of the new resident and the health care staff should interact with each other. Some staff mistakenly think that family members abandon their relatives once they are admitted to the nursing home (Rowles & High, 2003), but the reality is that most family and friends remain involved in the care of their relative through visits and phone calls (Port et al., 2001). A recent research has shown that family members value effective relationships with nursing home staff, whom they see as a source of information and a means of remaining involved in care decisions. Family members who also possess information about residents' preferences, habits and goals of care can assist staff to establish an optimal plan of care that contributes to resident well-being (Rowles & High, 2003).

Wilder (2005) suggested that improved interaction and communication between staff and family are necessary to improve relationships and decrease family complaints that can lead to costly investigations.

However, a survey conducted by Utley-Smith et al. (2010) indicated that staff at two nursing homes described staff-family relationships as difficult, problematic and time consuming. An earlier study also revealed that the same was true for families, which contributed to unresolved staff-family member conflicts (Marzialli et al., 2006). Utley-Smith et al. (2010) further identified that differences between the staff attitudes and perceptions of family expectations at two nursing homes could be due to general differences in socioeconomic status. Working class families are possibly less demanding or more appreciative of the care received by their relative, while the middle and upper middle class families may expect and demand more.

One nursing home introduced a system of communication with family members in the first 72 hours after admission. The program was intended as a preventative strategy to ensure that family members were intended as a preventative strategy to ensure that they were comfortable with their relative's care. During the first 24 hours the admission director telephoned the family, at 48 hours the nurse telephoned the family and at 72 hours the social worker contacted the family. The assistant nursing home administrator admitted that the system was not always followed but believed it worked when it was adhered to.

4. Research Methodology

The Analytic Hierarchy Process (AHP) is a mathematically based, multi-objective decision making tool which was introduced by Saaty (1990). It uses the pair wise comparison method to rank order alternatives of a problem that are formulated and solved in hierarchical structure (Udo, 2000; Coyle, 2004; Saaty, 2008). The AHP approach has been adopted in many applications including project management (Kamal & Al-Subhi, 2001), project risk management (Dey, 2002) and supplier evaluation and selection (Tahriri, *et al.*, 2008). Additional application areas include problems in vendor selection, information technology outsourcing decision and decision making etc. (Udo, 2000; Saaty, 2008; Kumar, et al., 2009).

The objective of this survey is to use the AHP method for Critical Success Factor's judgement. In order to comply with collecting quantitative and qualitative data for AHP CSFs model that could be applied in the Taiwanese Veterans Home; a three step approach was performed to ensure successful implementation as follows:

4.1. Step 1: Structure the hierarchical model

The first step in AHP rating procedure is to establish the criteria and sub-criteria to be used for CSFs judgement. To comply with the criteria for CSFs judgement and their importance required data to be collected, based on the literature review. Figure 3 shows that three important criteria in the second level and fifteen sub-criteria from the third level were selected to analyse the CSFs for performance management of the TVH.

4.2. Step 2: Prioritise the order of criteria and sub-criteria

The mathematics of the AHP and the calculation techniques require a matrix to be constructed that expresses the relative values of a set of attributes. Each of these attributes is assigned a number on a scale (see Table 5). Udo (2000) stated that priority values can also be used as evaluation or performance measures. Businesses, government and even other organisations that seek to perform are able to evaluate their actions with measures of performance. He further explained that Expert Choice is a multi-attribute decision support software tool based on the AHP methodology. This tool can help the decision makers to examine and resolve problems involving multiple evaluation criteria.

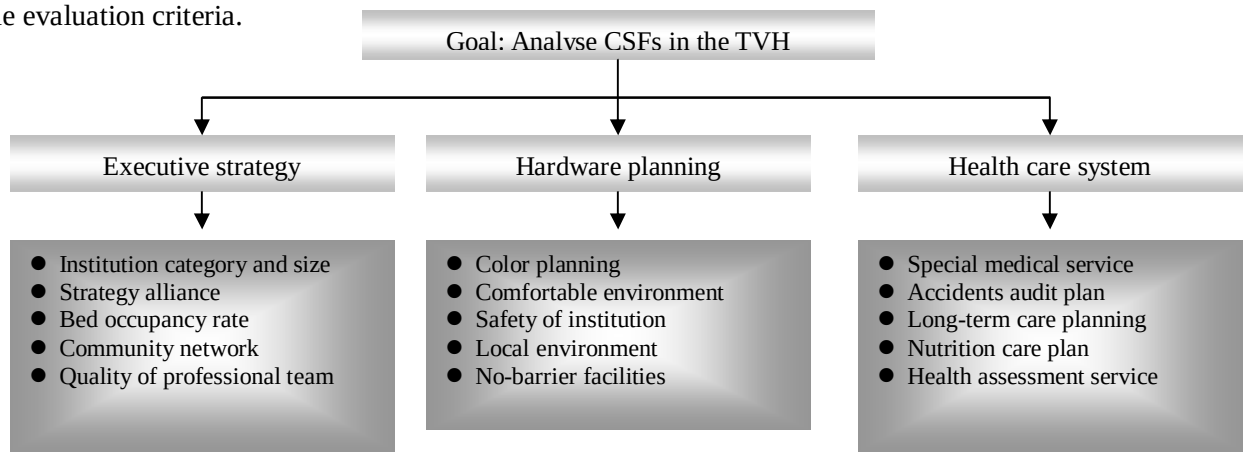

Figure 3: Hierarchy model of CSFs judgement

Table 5: The Saaty rating scale

Intensity of importance	Definition	Explanation
1	Equal importance	Two factors contribute equally to the objective
3	Some what more important	Experience and judgement slightly favour one over the other.
5	Much more important	Experience and judgement strongly favour one over the other.
7	Very much more important	Experience and judgement very strongly favour one over the other. Its importance is demonstrated in practice.
9	Absolutely more important	The evidence favouring one over the other is of the highest possible validity.
2,4,6,8	Intermediate values	When compromise is needed

Source: Coyle (2004)

To identify the CSFs for performance management of the Taiwanese Veterans Home, a questionnaire was conducted, which was designed and based upon the current literature review and research objectives. Before the main survey was undertaken, a draft version of the questionnaire was piloted with one VAC officer, one Veterans Home administrator and also with one eminent academic professor. This pilot study was undertaken to elicit responses that would help to test the wording of the questionnaire, identify ambiguous questions, and also provide an indication of the time to complete the questionnaire. A number of the comments and suggested amendments from the pilot study respondents were used to amend the questionnaire prior to its final distribution.

A total of 81 experts were asked to evaluate the priority of CSFs based on three criteria in the second level and fifteen sub-criteria in the third level by comparing the criteria with each other with respect to the goal. Expert Choice provides excellent facilities for performing these comparisons.

A total of 52 valid returns were received during January 2013 and March 2013, representing a response rate of 64%. Naoum (1998) however suggests that 40%-60% is a more typical response rate for postal questionnaires. Therefore, the 64% response rate was considered very acceptable. The data obtained from the questionnaire survey was analysed according to the categories of expert, which was distinguished in three categories as indicated in Table 6.

Table 6: Questionnaire response rate

Categories	No. sent	No. returned	Response rate
VAC officer	10	5	50%
Veterans Home administrator	59	41	70%
Academic professor	12	6	50%
Average	**81**	**52**	**64%**

4.3. Step 3: Calculate the consistency ratio and identify the CSFs

The final step is to calculate a Consistency Ratio (CR) to measure how consistent the judgements have been relative to large samples of purely random judgements. If the CR is much in excess of 0.1 the judgements are untrustworthy because they are too close for comfort to randomness and the exercise is valueless or must be repeated (Coyle, 2004; Farzad Tahriri et al., 2008). Based on the global priority, weights of each alternative can be evaluated and summarised. The summaries of overall criteria are discussed in next section.

5. Research results and Discussion

The results have been classified under the following headings:

a). The results of pair-wise comparison in the second level
b). The results of pair-wise comparison in the third level
c). The overall results of the hierarchy model

5.1. The results of pair-wise comparison in the second level

The authors' survey results revealed that 'executive strategy' has a weight of 0.332, 'hardware planning' 0.248 and 'health care system' 0.454 (see Table 7). The interpretation of this survey result is that 'health care system' is the most attractive option of CSFs for performance management of the Taiwanese Veterans Home. The result found in the authors' survey was also confirmed by a study conducted by Abbott, et al. (2007) who indicated that almost half of the frail male veterans in their study are at risk of having no one to provide instrumental aid and health monitoring support if something should happen to the one person who provides this type of assistance.
The authors' survey results also indicated that Consistency Rate (CR) for the integrated matrix of pair-wise comparison of the category VAC officer was 0.01, VH administrator was 0.00 and academic professor was 0.00, as these rates are less than 0.1, it shows the consistency of the comparisons. Therefore, the prioritizations can be considered reliable.

Table 7: The results of pair-wise comparison in the second level

Criteria in the second level	VAC officer	VH administrator	Academic professor	The overall
Executive strategy	0.338	0.230	0.327	0.332
Hardware planning	0.155	0.288	0.301	0.248
Health care system	0.507	0.482	0.373	0.454

5.2. The results of pair-wise comparison in the third level

5.2.1. Within the executive strategy category

A research survey carried out by Utley-Smith et al. (2010) concluded that by increasing connections and exchange of information between nursing home staff and family members, potentially better outcomes may be realised for nursing home staff members, family members and ultimately residents. Soderstrom et al. (2003) agreed and stated that nurses who promoted inviting interactions with family members by listening, being present and answering questions spent less time with families overall than their non-inviting colleagues. Nurses who used "non-inviting interactions" became defensive and withdrew from family interactions. This led family members to mistrust staff and spend more time on the unit with their relative.

The authors' survey results revealed that 'quality of the professional team' (0.530) is the major critical successful factor within the executive strategy category, followed by 'institution category and size' (0.173) and 'strategy alliance' (0.115) (see Table 8). These findings concur with the study conducted by Castle and Banaszak-Holl (2003) who indicated that the administration of nursing homes may have an important relationship with quality of care. They further stated that nursing homes are being challenged in many ways. For example, there is an ever-growing elderly cohort, patients may be admitted to nursing homes in a poor health condition, and reimbursement for nursing home services may not be adequate. These trends are likely to continue. Therefore, they may need more and better leadership within the nursing home industry so that they could improve services to the elderly.

Table 8: The results of pair-wise comparison within executive strategy category

Executive strategy	VAC officer	VH administrator	Academic professor	The overall
Quality of professional team	0.565	0.459	0.566	0.530
Institution category and size	0.160	0.180	0.180	0.173
Strategy alliance	0.104	0.103	0.098	0.115
Community network	0.086	0.115	0.092	0.097
Bed occupancy rate	0.085	0.143	0.065	0.084

5.2.2. Within the hardware planning category

Kazis, et al., (1998) Veterans Health Study revealed that 36% of the patients had a disability. Duh et al. (2008) reported that the incidence of injurious falls among American community-dwelling older adults ranged from 9.5 to 15.8 per 1000 person-years. Furthermore, a similar survey conducted by Chu et al. (2008) indicated that the fall rate in the Hong Kong Special Administrative Region of China was 26.4%.

Table 9 shows that 'safety of institution' (0.377) is the major critical successful factor within the hardware planning category, this was followed by 'no-barrier facilities' (0.372), 'local environment' (0.109) and 'comfortable environment' (0.076).

Leung, et al. (2010) agreed and stated that a high standard of care management service demonstrated a significant preventive effect on falls in the Chinese population. It reduced the risk of falling by 73%. They further indicated that cognitive impairment, unsteady gait, perceived poor health status, dizziness and depression were identified as the significant factors related with falls. Therefore, the safety of an institution will be a major factor to prevent the incidence of injurious falls in the Taiwanese Veterans Home.

The authors' survey results also revealed a CR of 0.02 (VAC officer), 0.01 (VH administrator) and 0.02 (academic professor) within the hardware planning category. The Consistency Rate (CR) provides a measure of the logical rationality of the pair-wise comparison, these figures are all less than 0.10 so they are generally considered acceptable.

Table 9: The results of pair-wise comparison within hardware planning category

Hardware planning	VAC officer	VH administrator	Academic professor	The overall
Safety of institution	0.384	0.377	0.370	0.377
No-barrier facilities	0.378	0.341	0.398	0.372
Local environment	0.113	0.108	0.106	0.109
Colour planning	0.065	0.073	0.060	0.066
Comfortable environment	0.061	0.102	0.066	0.076

5.2.3. Within the health care system category

Nakatani and Shimanouchi (2004) suggested that it is important to develop a care plan based on the necessary amount of service. Continuous monitoring and evaluation are also essential and these measures lead to satisfactory client outcomes. Leung et al. (2010) further stated that care managers are able to identify the high-risk group of service recipients, allocate resources to develop tailor-made care and eventually monitor the service recipients' progress in a continuous manner.

The authors' survey results revealed that 'long-term care planning' (0.299) was considered to be most important critical successful factor within the health care system category. The sub-criteria: 'accidents audit plan' (0.247), and 'special medical service' (0.199), ranked second and third most important respectively (see Table 10).

These findings concur with the survey conducted by Leung et al. (2004) who indicated that the major important reason for moving to a Continuing Care Retirement Community (CCRC) was to seek continuing care. They further stated that the long-term care provided by a CCRC is a paramount motivator for moving there.

Another study confirmed that the most effective way to prevent falls is by using a multi-factorial fall risk assessment and management program. Therefore, comprehensive fall risk assessment and a multidisciplinary management programme were recommended to reduce the risk of falls for frail older adults (Leung et al., 2010).

Table 10: The results of pair-wise comparison within health care system category

Health care system	VAC officer	VH administrator	Academic professor	The overall
Long-term care planning	0.310	0.282	0.305	0.299
Accidents audit plan	0.250	0.222	0.271	0.247
Special medical service	0.229	0.203	0.166	0.199
Nutrition care plan	0.118	0.142	0.120	0.128
Health assessment service	0.093	0.151	0.138	0.128

5.3. The overall results of hierarchy model

Turnover of nursing aides, licensed practical nurses and registered nurses in nursing homes has been a subject of research for the past decades. This interest has primarily been the result of consistently high rates of turnover identified for these caregivers in many facilities. (Castle & Engberg, 2005). Castle & Engberg (2005) further reported that understanding turnover in nursing homes is important. This is because turnover can influence facility operating costs, lower care-giver job satisfaction and have negative health outcomes for residents.

Castle (2008) agreed and stated that probably the most important concern about staff turnover is its potential association with quality of care. In general, high staff turnover is associated with poor quality. The critical successful factors for performance management of the Taiwanese Veterans Home have been identified in the authors' survey.

The results are illustrated in Table 11, 12, 13, 14 and indicate that the top six critical successful factors are:

- Quality of the professional team
- Long-term care planning
- Accidents audit plan
- Safety of the institution
- Special medical service
- No-barrier facilities

These findings concur with the survey carried out by Leung *et al*. (2004) who identified the most important general considerations in selecting a CCRC were, respectively; continuing care (71.4%), on-site medical services (60.4%), a desire to remain independent (36.3%), the reputation of the facility (35.2%), the size, design, or choice of the living units (31.9%) and the facility's reputation for being well-managed (30.8%).

Phillips (2002) agreed and stated that some nursing homes are better than others, because some nursing homes are more effective organisations than other nursing homes. Castle (2008) also believed that the organisational context can help differentiate between more and less effective organisations with respect to turnover and vacancy rates.

6. Conclusion

The Critical Success Factors are interdependent; one is not more important than another. However, the success factors cascade down and build on one another, beginning with a shared mission, values and vision. Veterans Home values might be to; ensure that the veterans served come first; value the different capacities and interests of all veterans; consistently aim for efficiency and effectiveness and communicate in an open and transparent fashion.

Currently, there are a lot of challenges facing Taiwanese veteran's homes on future developments. For example, the growth in very elderly veterans is resulting in increased demands for long-term care, including special needs such as hospice care and care for Alzheimer's and other dementia conditions. The authors' survey results revealed that the top six critical successful factors for performance management of the Taiwanese Veterans Home are:

- Quality of the professional team
- Long-term care planning
- Accidents audit plan
- Safety of the institution
- Special medical service
- No-barrier facilities

The result found in authors' survey was also confirmed by the studies conducted by Phillips (2002), Leung et al. (2004) and Castle (2008).

7. Acknowledgements

The authors would like to acknowledge the contribution of the VAC officers, Taiwanese Veterans Home administrators and academic professors who participated in this survey.

Table 11: The overall results of pair-wise comparison from the VAC officer opinion

The second level		The third level		Combined weight	The order of priority
Criteria	Weight	Sub-criteria	Weight		
Executive strategy	0.338	Institution category and size	0.160	0.054	8
		Strategy alliance	0.104	0.035	10
		Bed occupancy rate	0.085	0.029	11
		Community network	0.086	0.029	12
		Quality of professional team	0.565	0.191	1
Hardware planning	0.155	Colour planning	0.065	0.010	14
		Comfortable environment	0.061	0.009	15
		Safety of institution	0.384	0.060	5
		Local environment	0.113	0.017	13
		No-barrier facilities	0.378	0.059	7
Health care system	0.507	Special medical service	0.229	0.116	4
		Accidents audit plan	0.250	0.127	3
		Long-term care planning	0.310	0.157	2
		Nutrition care plan	0.118	0.060	6
		Health assessment service	0.093	0.047	9

Table 12: The overall results of pair-wise comparison from the VH administrator opinion

The second level		The third level		Combined weight	The order of priority
Criteria	Weight	Sub-criteria	Weight		
Executive strategy	0.230	Institution category and size	0.180	0.041	9
		Strategy alliance	0.103	0.024	14
		Bed occupancy rate	0.143	0.033	10
		Community network	0.115	0.027	13
		Quality of professional team	0.459	0.105	4
Hardware planning	0.288	Colour planning	0.073	0.021	15
		Comfortable environment	0.102	0.029	12
		Safety of institution	0.377	0.109	2
		Local environment	0.108	0.031	11
		No-barrier facilities	0.341	0.098	5
Health care system	0.482	Special medical service	0.203	0.098	6
		Accidents audit plan	0.222	0.107	3
		Long-term care planning	0.282	0.136	1
		Nutrition care plan	0.142	0.068	8
		Health assessment service	0.151	0.073	7

Table 13: The overall results of pair-wise comparison from the academic professor opinion

The second level		The third level		Combined weight	The order of priority
Criteria	Weight	Sub-criteria	Weight		
Executive strategy	0.327	Institution category and size	0.180	0.059	7
		Strategy alliance	0.098	0.032	10
		Bed occupancy rate	0.065	0.021	13
		Community network	0.092	0.030	12
		Quality of professional team	0.566	0.185	1
Hardware planning	0.301	Colour planning	0.060	0.018	15
		Comfortable environment	0.066	0.020	14
		Safety of institution	0.370	0.111	4
		Local environment	0.106	0.032	11
		No-barrier facilities	0.398	0.120	2
Health care system	0.373	Special medical service	0.166	0.062	6
		Accidents audit plan	0.271	0.101	5
		Long-term care planning	0.305	0.114	3
		Nutrition care plan	0.120	0.045	9
		Health assessment service	0.138	0.051	8

Table 14: The overall results of hierarchy model

Sub-criteria	VAC officer	VH administrator	Academic professor	The overall	The order of priority
Institution category and size	0.054	0.041	0.059	0.051	9
Strategy alliance	0.035	0.024	0.032	0.020	13
Bed occupancy rate	0.029	0.033	0.021	0.028	11
Community network	0.029	0.027	0.030	0.029	10
Quality of professional team	0.191	0.105	0.185	0.160	1
Colour planning	0.010	0.021	0.018	0.016	15
Comfortable environment	0.009	0.029	0.020	0.019	14
Safety of institution	0.060	0.109	0.111	0.093	4
Local environment	0.017	0.031	0.032	0.027	12
No-barrier facilities	0.059	0.098	0.120	0.092	6
Special medical service	0.116	0.098	0.062	0.092	5
Accidents audit plan	0.127	0.107	0.101	0.112	3
Long-term care planning	0.157	0.136	0.114	0.136	2
Nutrition care plan	0.060	0.068	0.045	0.058	7
Health assessment service	0.047	0.073	0.051	0.057	8

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