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Developing the Strategic Control System in Hospital Setting

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Abstract

Background and Aim: Application of a suitable strategic control system helps managers of healthcare organizations to accurately develop a strategic program, implement the strategies, and monitor and evaluate the outcomes of program implementation. The present study was conducted with the aim of developing a strategic control system in Iranian hospitals.

Materials and Methods: In this descriptive study, a total of 15 academic, hospital, and healthcare informants of strategic control and management were selected by purposive sampling method. A researcher-made questionnaire based on pair-wise comparisons was used to collect data. MATLAB software was used to analyze data with FUZZY DEMATEL technique.

Results: On the basis of results of cause-effect relations, the most effective causes were the parameters "sharing program and performance data (8.17, 0.916)", "clarification of the landscape and strategies and their conversion to action (7.63, 1.21)", and "feedback and strategic learning (8.41, 0.160)"; the least effective parameters were "planning and goal setting (7.92, -1.44)" and "infrastructures and external support (6.85, -0.84)" that were rendered as "effects".

Conclusion: It was concluded that establishment of information flow, sharing of landscape and strategies, and provision of purposeful feedback to different organizational levels can greatly improve planning and goal setting leading to acquisition of external support and reinforcement of infrastructures required in this field.

Keywords: Strategy, Control System, Hospital.

Introduction

Today, organizational managers must adapt to the many changes and inefficiencies occurring around them and adopt a new approach to thinking and acting (1). Managers need to adopt prospective, environment-based strategic planning to anticipate external change drivers, assess their long-term impacts, and strengthen the organization's adaptive capacity (2). Hence, having an approach and strategic planning is the best instrument for all organizations that want to have a conscious presence in the market without succumbing to inevitable changes (3).

In the healthcare domain, numerous changes such as shifts in external environments, rising system dynamism, and the imperative for continuous quality improvement (4, 5) have compelled hospital leaders to adopt prospective strategic planning to confront environmental challenges (6). Senior hospital executives must recognize that although strategic planning demands investment in both time and resources, it is a prudent investment for enhancing hospital performance and achieving objectives like improved quality of care, cost containment, and elevated patient satisfaction (7).

Nonetheless, strategic planning in hospitals will not be implemented spontaneously. Indeed, hospital managers that use strategic planning to achieve success will face some obstacle in designing plans and their implementation. Thus, it is necessary to pay due attention to the influential parameters

affecting program implementation and removing barriers (8).

Based on the foregoing arguments, leveraging the benefits of strategic planning requires rigorous programme development, competent governance, and timely, accurate monitoring and evaluation of outcomes; this can be reliably facilitated through the deployment of a strategic-control system (9). Over the two last decades, studies on management control systems in hospitals have emphasized the importance of paying attention to strategic control systems which involve positive outcomes like improved organizational performance (10). The strategic control system involves components of agreement on development of short-term objectives, monitoring of work units to ensure of stabilized performance indices, and feedback of the resulting outcomes. Strategic control systems must receive special attention due to reasons such as coordination of various activities of personnel, obtaining agreement on objective measurable goals that lead to behavioral changes in managers at various levels, and relating personnel's individual motivation to organizational goals and performance monitoring (11). In this way, senior hospital managers learn to, firstly, focus on the key point(s) by the use of strategic control system and secondly, make sure through strategic revisions that the hospital is moving in the right designed path with no deviation (12). Generally, what is referred to as strategic management in Iranian hospitals is, in fact, strategic planning. These programs are either implemented improperly for various reasons or there is no approach for their strategic control. Therefore, it appears that the present problem pertains mostly not to the lack of strategic plans, but to the inability in converting strategies to operations, and monitoring and evaluation of the results produced by implementation. Consequently, the present study aimed at developing a strategic control system in Iranian hospitals.

Materials and Methods

This descriptive study was carried out quantitatively using operation research techniques. The study population consisted of informants in the field of strategic healthcare management. Given the necessity of collecting round view of key informants on the subject under study, purposive sampling method was applied. Snowball sampling was used as a complementary method. In this way, the key informants entered the study in the form of heterogeneous groups of faculty members, hospital experts, and healthcare informants in the field of strategic management affiliated to the Iranian Ministry of Health, Treatment, and Medical Education. Given that the researchers focused on eliciting opinions of informants on the subject under study rather than on sample volume, a total of 15 informants were selected as the study sample and entered the study consciously and voluntarily.

The data were gleaned using a researcher-made questionnaire based on pair-wise comparisons that was developed through review of literature and expert opinion. The items in the questionnaire included parameters related to strategic control system in the hospital system. The informants studied these parameters and compared them in a pair-wise manner and scored them for their effect on each other using a five-point Likert scale. The first researcher explained the method of completing the questionnaire appropriately to the informants and personally distributed the instrument to the participants. After one week, the completed questionnaires were collected. Informed consent was obtained from study participants before completing the questionnaire.

The study aimed at determining the priorities and causal relations between parameters and the intended known variables. The weight of the parameters was estimated by MATLAB using FUZZY DEMATEL and their priorities were determined. The DEMATEL technique is based on diagraphs that can classify the contributing components into causes and effects. These diagraphs depict the correlation among the elements of a system. The causal diagraph is created by plotting the sorted pairs (Dk+Rk, Dk-Rk) in which the horizontal axis (abscissa) (D+R) called "superiority" is produced by adding Rk and

Dk, and the vertical axis (ordinate) (D-R) called "relation" is produced by subtracting Rk from Dk. When the value of Dk-Rk is positive, that criterion belongs to the "causes category" and when the value of Dk-Rk is negative, that criterion pertains to the "effects category". Hence, the causal digraphs can convert the complex causal relations among the criteria into a visible structural model and thus, producing an accurate insight into solving the problem. Furthermore, proper decisions may be made with the aid of the causal diagram and through distinguishing the differences among cause-effect criteria (13-14). The steps of the process are as follows:

Stage 1: Preparation of contingency matrix of direct fuzzy relations

To investigate the internal relations, informants are asked to perform pair-wise comparisons between the major parameters in terms of the rate of the effect of "parameter *i*" in the row on "parameter *j*" in the column. The positive fuzzy numbers used for the comparisons are given in Table 1.

Table 1: Expression variables and corresponding fuzzy numbers

Values of expression scales	Triangular fuzzy numbers
Highly great effect	(0.75, 1.00, 1.00)
Great effect	(0.50, 0.75, 1.00)
Equal effect	(0.25, 0.50, 0.75)
Small effect	(0.00, 0.25, 0.50)
Very small effect	0.00, 0.00, 0.25)

The goal of the first stage is to form a matrix called "primary direct relations matrix".

Stage 2: Formation of the normalized matrix of "direct relations matirx"

In this stage, the CFCS method, introduced by Opricovic and Tzeng, is used to to normalize the direct relations matrix. The following relations are used to form the normalized matrix of dierct relations matirx. Consider the triangualr fuzzy number $\breve{w}_{ij}^{k} = (a_{1ij}^{k}, a_{2ij}^{k}, a_{3ijk}^{k})$ in which k represents the informant.

-Normalization:

$$xa_{1ij}^{k} = \left(a_{1ij}^{k} - \min a_{1ij}^{k}\right) \Big/ \Delta_{\min}^{\max}$$
$$xa_{2ij}^{k} = \left(a_{2ij}^{k} - \min a_{1ij}^{k}\right) \Big/ \Delta_{\min}^{\max}$$
$$xa_{3ij}^{k} = \left(a_{3ij}^{k} - \min a_{1ij}^{k}\right) \Big/ \Delta_{\min}^{\max}$$

$$\Delta_{\min}^{\max} = \max a_{3ii}^{k} - \min a_{1ii}^{k}$$

in which

-Estimation of left normal values (*ls*) and right normal values (*rs*):

$$xls_{ij}^{k} = xa_{2ij}^{k} \Big/ \left(1 + xa_{2ij}^{k} - xa_{1ij}^{k}\right)$$
$$xrs_{ij}^{k} = xa_{3ij}^{k} \Big/ \left(1 + xa_{3ij}^{k} - xa_{2ij}^{k}\right)$$

-Estimation of final definite normal value:

$$x_{ij}^{k} = \left[xls_{ij}^{k}\left(1 - xls_{ij}^{k}\right) + xrs_{ij}^{k} xrs_{ij}^{k}\right] / \left[1 - xls_{ij}^{k} + xrs_{ij}^{k}\right]$$

-Estimation of definite values:

$$w_{ij}^{k} = \min a_{1ij}^{k} + x_{ij}^{k} \Delta_{\min}^{\max}$$

-Combination of definite values:

$$\tilde{w}_{j} = \frac{1}{k}\left(\tilde{w}_{ij}^{1} + \tilde{w}_{ij}^{2} + \tilde{w}_{ij}^{3} + \ldots\ldots + \tilde{w}_{ij}^{k}\right)$$

Stage 3: Formation of total relations matrix

The X matrix is calculated by the following relation after obtaining the matrix of combined informants' opinions (*w*) in the last stage.

$$X = k \cdot A$$
$$k = \frac{1}{\max\limits_{1 \le i \le n} \sum_{j=1}^{n} a_{ij}}, \quad i, j = 1, 2, \ldots\ldots, n$$

The total relations matrix is also estimated using the following formula where I is an mentioned matrix.

$$T = X\,(I - X)^{-1}$$

Stage 4: Plotting of cause-effect curve

The set of elements in rows and columns of T matrix are labelled respectively as D and R vectors. D indicates the total direct and indirect effects of i^{th} criterion on other criteria and R indicates the direct or indirect effects that it receives from other criteria. If D+R is great for a specific parameter, this means the parameter has much interaction with other parameters. The positive D-R combination for a parameter also demonstrates the causality of the parameter indicating that the i^{th} criterion affects other criterion. Negative D-R also suggests that the i^{th} criterion is affected by other criterion.

D and R are estimated by the following relations:

$$T = [t_{ij}]_{n\times n}, \quad i, j = 1, 2, \ldots\ldots\ldots\ldots, n$$

$$D = \left[\sum_{i=1}^{n} t_{ij}\right]_{n\times 1} = [t_i]_{n\times 1}$$

$$R = \left[\sum_{j=1}^{n} t_{ij}\right]_{1\times n} = [t_j]_{n\times 1}$$

Finally, the causal curve is plotted through connecting some points with (D+R, D-R) specifications for each parameter in a Cartesian coordinate system. To carry out the study, the research proposal was approved first by Committee of Ethics in Human Research. The informants participated in the study consciously and voluntarily. Their organizational affiliation was not mentioned in the final report.

Results

Most participants were male (%86.6), held a PhD/specialist degree, had a work experience of 11-20 years (%46.7), and were employed as faculty members (%53.3) (Table 2).

Table 2: Demographics of participants of the study

Variable		Number	Percentage
Gender	Male	13	8.6
	Female	2	13.4
Work field	Ministry of Health	3	20
	University	8	53.3
	Hospital	4	26.7
Academic degree	PhD	10	66.7
	Professional doctorate	4	26.6
	MSc	1	6.7
Work experience	5-10 years	5	33.3
	11-20 years	7	46.7
	21-30 years	3	20
Management experience	Yes	13	86.6
	No	2	13.4
Employment status	Faculty member	8	53.3
	Non-faculty member	7	4.7

Determining the Cause-Effect Relations of the Parameters and Strategic Control Variables

In this study, 6 general parameters were explored on the basis of DEMATEL technique. For the parameter "infrastructures and external support", the variables "senior managers' commitment and responsibility (V8P1)" and "preparation of organizational culture (V2P1)" were the most effective, and "senior managers' commitment and responsibility (V8P1)" was affected most. Among the variables of the parameter "clarification of landscape and strategy and their conversion to action", the variable "involvement of key beneficiaries in strategic management process (V4P2)" was the most effective and the variable "physicians' contribution to planning and implementation (V1P2")" was affected most. For the parameter "sharing and establishing information flow and knowledge", the variable "training and creation of awareness (V5P3)" was the most effective while the variable "coordination and internal convergence among the units and individuals (V1P3)" was affected most. Also, for the parameter "planning and goal setting", the variable "clarification of goals and strategies (V1P4)" was the most effective whereas the variable "balance and coordination in strategic goals (V5P4)" was affected most. Moreover, for the parameter "feedback and strategic learning", the variable "active regular debates on implementation outcomes

in routine ward and hospital sessions (V5P5)" was the most effective whereas the variable "awareness of barriers to implementation of strategic plans (V4P5)" was affected most (Table 3).

Investigation of the cause-effect relations among the five parameters suggested that the parameters "sharing of program and performance data (8.17, 0.916)", "clarification of landscape and strategy and their conversion to action (7.63, 1.21)", and "feedback and strategic learning (8.41, 0.160)" were, respectively, the most effective and fell in the category of "causes". The parameters "planning and goal setting (7.92, -1.44)", and "infrastructures and external support (6.85, -0.84)" were affected most and fell in the category of "causes" (Table 4) (Figure 1).

Discussion

In this study, of the five parameters pertaining to strategic control, "sharing of program and performance data" was the most effective parameter. This parameter is required to share knowledge and create the necessary strategy links throughout the whole organization until the strategic goals and performances are realized (15).

Senior hospital managers should effectively disseminate the strategic management process, ensuring staff and line-managers are informed and committed. Moreover, programmed data, performance outcomes and exemplary models ought to be communicated via multiple channels (e.g., newsletters, hospital websites, informal workshops, routine meetings) to foster transparency and organizational engagement (16). For this parameter, the variable "coordination and convergence among the units and individuals" was affected most.

As the components of a program must be interrelated aiming at goals of higher order organizations, individuals and units involved in program planning and implementation should also be appropriately coordinated and step forward in line with implementation of strategies. Each individual and each hospital ward should be aware of the degree of the relevance of the developed programs to them and know how to administer these programs in their interactions with other individuals and units. When a hospital achieves convergence, each individual perceives their "role and share" in implementing the hospital strategies leading to synergism among the heads of hospital wards and units.

The parameter "clarification of landscape and strategy and their conversion to action" was also the second parameter affecting strategic control. Given that creation of a transparent process for determining hospital landscape and strategy and the conversion of these subjective categories into operational projects is one of the most emphasized parameters in strategic control system, this aspect of strategic control is more concerned with controlling program development so that it seeks to ensure of correct strategy development. Undoubtedly, one strategy in this regard is absorption of effective continuous contribution of senior managers of the organization. Čater & Pučko showed in their study on 172 Slovenian companies that, given the role of managers in planning and organizing activities related to strategy implementation, poor leadership is the greatest barrier to strategy implementation (17).

In this regard, the study by Foreman & Argenti rendered managers' contribution as one of the important parameters of strategic program implementation (18). Another study in Zimbabwe indicated that low contribution of managers in strategy implementation only led to slight strategy success so that the general important strategies did not achieve success (19). The senior management ought to explain clearly, simply, and transparently the organizational strategy and landscape to the staff at different levels in a way that landscape and strategy manifest themselves in every daily affair of their lives (20). For this parameter, the two variables "involvement of key beneficiaries in the strategic management process" and "managers' and personnel's shared perception of strategy" were "causes" affecting the three other variables. To enjoy a suitable program, it is highly mandatory for clinical staff, specifically physicians as one of the most influential group whose

performance directly affects key hospital outcomes, to contribute to various stages of strategic management, especially development of strategies and their implementation. The study by Kaissi et al., conducted on 138 hospitals in Texas, assessed the level of physicians' involvement in strategy development as moderate-to-low and showed that high contribution level is positively correlated with appropriate hospital performance (21).

Also, active contribution of the staff is rendered as a necessity in developing and administering effectively the BSC model as one of the most modern strategic management models (22). Regarding the variable "managers' and personnel's shared perception of strategy", it is highly significant for hospital managers at different levels and clinical staff to have a homogeneous perception of hospital goals and strategies. This shared perception diminishes conflicts of preferences over hospital affairs predisposing to integrated and aligned behaviors in the hospital.

"Feedback and strategy learning" obtained a high score as one of the parameters affecting development of strategic control system. In the globalization era with its highly competitive milieu, feedback and learning from different aspects serve as a prompt help to implementing organizational strategy (15). For this parameter, the variable "regular active debates on implementational outcomes in routine ward and hospital sessions" was the most effective whereas the variable "awareness of barriers to strategic program implementation" was affected the most. Awareness of barriers to strategic program implementation during both strategy development and revision and removal of the barriers are helpful. The study by Schalm et al. introduced prompt data collection and interpretation in a cost-effective manner as an obligation for implementing a balanced score card (23).

The importance of holding numerous formal and informal sessions with the staff and managers indicates the presence of a contribution culture that helps improve implementational efforts and innovations (24). In one section of the study by Rabbani, a fixed time-table without any accurate guideline for holding the sessions disturbed the BSC implementation process (25). In Groene et al.'s perspective, an important parameter in implementing strategic management system based on BSC in hospital setting is the transmission of results of implementation and establishment of BSC to the organization through brochure, news letter, etc. and reception of feedback from the staff to update BSC components (22). Holding regular team sessions is an important key factor referred to in Groene et al.'s study as a parameter necessary for achieving success in implementing BSC (22).

"Infrastructures and external support" and "planning and goal setting" are also among the parameters that affect development of strategic control system. Providing infrastructures and suitable floors are rendered as mandatory for strategic management process. This component and its related variables ought to be considered as primary parameters in hospital strategic control system. Slater & Olson introduced suitable relations among strategies and organizational structure as the most influential parameter in organizational success (26).

Matanda & Ewing and also Bhimani & Langfield asserted in their studies that organizational structure plays a significant role in strategy implementation and organizational success (27-28). Given that organizational structure consists of decision-making process, clarity of roles and responsibilities, allocation of human resources, and determination of the level of flexibility of an organization for responding to unexpected circumstances (29), organizational structure may enhance strategy implementation through the mentioned instruments. In this regard, Bushardt et al. showed in their study that organizational structure exerts a positive effect on strategy implementation through facilitating decision-making process and allocation of resources (30). Miller et al. also demonstrated that strategy implementation can be promoted via increasing responsibility

and responsiveness and reinforcement of activities (31). The presence of sufficient facilities and financial resources is also a basic variable related to strategic control. Absence of serious constraints in financial and temporal resources is an important prerequisite for implementing BSC-based strategic management system (23). Indeed, strategic management system gains its true meaning when hospitals try competitively to apply their capacity accurately, despite their limited resources, with the most possible efficiency and, efficacy. Presently, Iranian hospitals, at least governmental hospitals, have no competition at all and unfortunately, they have no autonomy for resources management, either.

In a highly centralized system, hospital managers mostly deal with daily routines and fulfilling the obligations of higher order organizations. The study by Radnor et al. emphasized the necessity of securing financial, human, and support resources and hardware and software facilities sufficiently to implement BSC successfully (32). For the parameter "infrastructures and external support", the variable "senior managers' commitment" was the most effective whereas the variable "senior managers' responsibility" was affected most. Responsibility and strategy implementation should be communicated to hospital senior managers, and their performance ought to be evaluated on the basis of realization of these responsibilities. It is very important for senior managers to manifest responsibility and commitment for strategy implementation in their behaviors. This must be spread to the whole hospital setting in a cascade-like manner. In Sshalm et al.'s view, senior managers' commitment and allocation of sufficient time for program on their part play a significant role in implementing BSC in hospital system (23).

Another important element of strategic control system is "planning and goal setting". On the basis of Kaplan & Norton's opinion, setting important goals for the organization serves as a guide and asset in the allocation of limited resources and measurement of short-term and long-term financial and non-financial performances (33). This component basically focuses on the content of strategic program and progresses to the point of attending the implementational measures and innovations in the operational program. For the parameter "planning and goal setting", the variable "clarity of goals and strategies" was the most effective whereas the variable "balance and coordination of strategic goals" was affected the most. In strategic controlling of the created strategies, we should seek whether these strategies and their related goals are sufficiently clear or not, and whether a crystal-clear approach has been used in their creation or not. Transparency/clarity in implementational goals and programs is a key factor in strategic management system emphasized in the study by Mihic et al. (34).

Contrary to the old models of strategic planning, in modern approaches like BSC, the strategic goals should be interrelated and their interactions and relations should lead to synergism and convergence of strategy implementation. Such a view toward strategic goals causes hospitals not to be looked at as various scattered islands. This leads to the dominance of a systematic approach over the hospital. Consequently, personnel's collective efforts can warrant hospital success.

Limitations of the Study

The data in this study were culled through self-report; so, they may be confounded under the influence of various factors like social favorability. This was relatively overcome by the researchers' familiarity with the informants' work environment, their companionship with the participants for more than three years, asking the informants to relay the details of their experience, and the use of triangulation in data collection.

Conclusion

Given the high influence of the parameters "sharing of program/performance data" and "clarification of landscape and strategy and their conversion to operational projects", it is recommended that program data (related to content) and performance data (related to

program implementation) be shared at different hospital levels through active approaches like public lectures, brochure, hospital site, and news letter. Also, innovative tell-show-do approaches such as balanced score card (BSC) should be used to create a correct strategic management system in which hospital strategy and landscape as abstract concepts are optimally converted to clear operational projects. It is further recommended that future studies focus on identification of infrastructures and the prerequisite conditions for successful implementation of strategic management system, the possible barriers to establishment of strategies, and assessment of consequences. In this way, a greater benefit may be made of the advantages of strategic management in the hospital system.

Abbreviations

DEMATEL, Decision making trial and evaluation laboratory.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval for this study was obtained from Ethics Committee of Iran University of Medical Sciences (Approval Number/IUMS/SHMIS-2012/527).

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Table 3: The cause-effect matrix of the importance of variables related to the five parameters

Parameters	Variables	D	R	D+R	D-R
Infrastructures and external support	V1P1: supportive leadership	4.002	3.318	7.320	0.684
	V2P1: Preparation of organizational culture	4.125	3.791	7.916	0.334
	V3P1: Higher order organizational support	3.391	2.522	2.522	0.869
	V4P1: Sufficient facilities and financial resources	2.154	2.264	4.417	-0.110
	V5P1: Change management	4.040	3.568	7.609	0.472
	V6P1: Development and establishment of a local strategic management model	2.978	4.174	7.152	-1.196
	V7P1: Creation and growth of strategic and systematic thought in managers and personnel	3.868	4.315	8.183	-0.448
	V8P1: Commitment and responsibility of senior managers	4.507	4.583	9.090	-0.076
	V9P1: Substantiation of strategic management process	4.066	4.529	8.595	-0.464
	V10P1: Transparency of roles and authorities	3.009	3.074	6.083	-0.065
Clarification of landscape and strategy and their conversion to action	V1P2: Physicians' contribution to planning and implementation	13.6966	14.2570	27.9537	-0.5604
	V2P2: Managers' and personnel's shared perception of strategy	14.2093	13.9596	28.1690	0.2497
	V3P2: Conversion of landscape to distinct implementable projects	12.5210	13.7295	26.2505	-1.2085
	V4P2: Involvement of key beneficiaries in strategic management process	14.6047	12.8407	27.4454	1.7640
	V5P2: Encouraging and publicizing team work	13.7536	13.9984	27.7520	-0.2447
Sharing and establishing information flow and knowledge	V1P3: Coordination and internal convergence among the units and individuals	3.7020	4.9197	8.6217	-1.2177
	V2P3: Management performance on the basis of fulfillment of strategic goals	4.7648	3.7544	8.5192	1.0104
	V3P3: Integrity of strategic plan and alignment with higher order organizations	3.3741	4.5240	7.8982	-1.1499
	V4P3: Empowerment of human resources	4.3311	4.3528	8.6839	-0.0217
	V5P3: Training and creation of awareness	4.9901	3.6112	8.6013	1.3789
Planning and goal setting	V1P4: Transparency of goals and strategies	3.7643	1.7071	5.4714	2.0572
	V2P4: Development and application of suitable measurands	2.6124	3.3964	6.0087	-0.7840
	V3P4: Converging of administrative innovations	2.6040	2.9684	5.5724	-0.3644
	V4P4: Paying attention to straightened circumstances and strategic subjects	2.9010	3.0704	5.9714	-0.1694
	V5P4: Balance and coordination in strategic goals	2.9083	3.6477	6.5560	-0.7394

Feedback and strategic learning	V1P5: Sharing of data and program and performance information	8.5868	7.0547	15.6415	1.5321
	V2P5: Prompt revision of programs	8.5425	7.8813	16.4238	0.6612
	V3P5: Flexibility and dynamism in programs	6.3455	7.7291	14.0746	-1.3837
	V4P5: Awareness of barriers to implementation of strategic programs	6.9377	8.6011	15.5388	-1.6634
	V5P5: Regular active debates on implementational outcomes in routine ward and hospital sessions hospital	8.6642	7.8105	16.4747	0.8537

Table 4: Matrix of cause-effect relations of the importance of parameters related to strategic control

	D	R	D+R	D-R
P2: Clarification of landscape and strategy and their conversion to action	4.4245	3.2087	7.6331	1.2158
P5: Feedback and strategic learning	4.2885	4.1283	8.4168	0.1602
P4: Planning and goal setting	3.2395	4.6823	7.9217	-1.4428
P1: Infrastructures and external support	3.0010	3.8506	6.8517	-0.8496
P3: Sharing of program and performance data	4.5478	3.6315	8.1793	0.9164

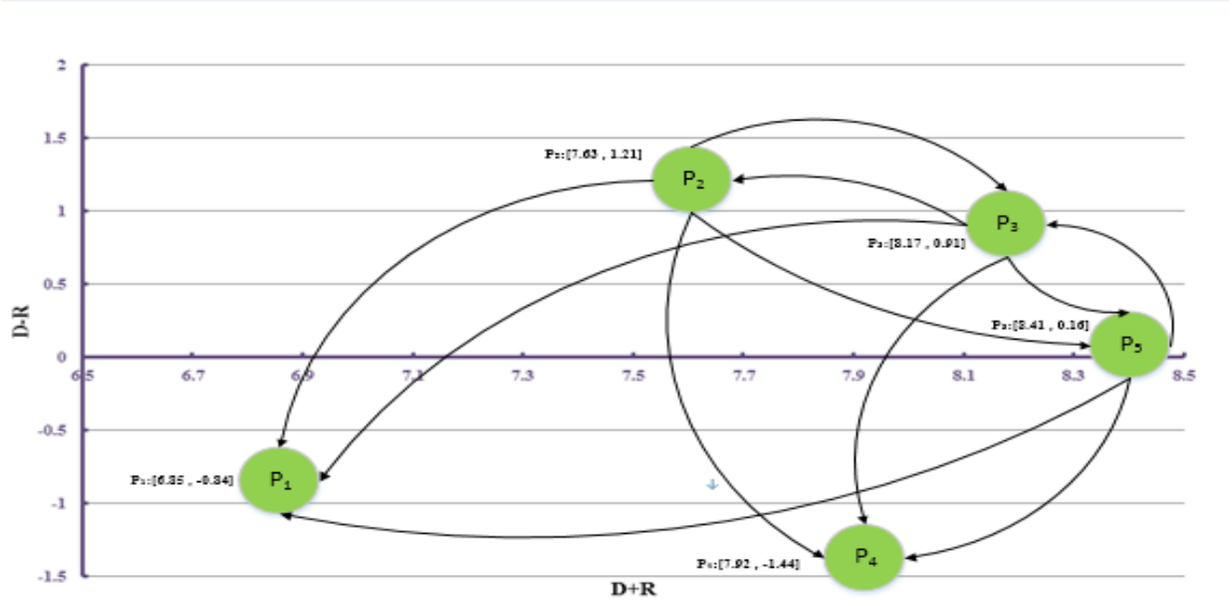

Figure 1: The cause-effect curve of the importance of parameters related to strategic control

Refrences

1. Mahamoud Hasan M, Aparisi-Torrijo S, González-Ladrón-de-Guevara F. Change management and organizational performance: current key trends. Cogent Business & Management. 2025;12(1):2478447.
2. Kumar A, Lam SSW, Chan SL, Xu Y, Ge Y, Gui GKT, et al. Strategizing towards the future hospital: a systems thinking approach. Health Research Policy and Systems. 2025;23(1):71.
3. Kutschera I, Ryan MH. Implications of intuition for strategic thinking: Practical recommendations for gut thinkers. SAM Advanced Management Journal. 2009;74(3):12-20.
4. Endalamaw A, Khatri RB, Mengistu TS, Erku D, Wolka E, Zewdie A, et al. A scoping review of continuous quality improvement in healthcare system: conceptualization, models and tools, barriers and facilitators, and impact. BMC Health Services Research. 2024;24(1):487.
5. Sebire N, Adams A, Celi L, Charlesworth A, Gorgens M, Gorsky M, et al. The Future Hospital in Global Health Systems: The Future Hospital Within the Healthcare System. The International journal of health planning and management. 2025;40(3):741-51.
6. Rachuba S, Reuter-Oppermann M, Thielen C. Integrated planning in hospitals: a review. OR Spectrum. 2024:1-54.

7. Wongsin U, Pannoi T, Prutipinyo C, Maruf MA, Pongpattrachai D, Quansri O, et al. Strategic planning and organizational performance in public health sector: a scoping review. BMC Health Services Research. 2025;25(1):1017.
8. Grigoroudis E, Orfanoudaki E, Zopounidis C. Strategic performance measurement in a healthcare organisation: A multiple criteria approach based on balanced scorecard. Omega. 2012;40(1):104-19.
9. Lunkes RJ, Naranjo-Gil D, Lopez-Valeiras E. Management control systems and clinical experience of managers in public hospitals. International Journal of Environmental Research and Public Health. 2018;15(4):776.
10. King R, Clarkson PM, Wallace S. Budgeting practices and performance in small healthcare businesses. Management Accounting Research. 2010;21(1):40-55.
11. Mintzberg H. Understanding Strategic Management, Chapter 10: Organizational Systems and Strategic Change.2nd edition, Oxford University Press. 2011.
12. Nejatbakhsh A, Tavalaei R. Developing National Model for Strategic Control of Iranian Cultural Organization. Journal of Human Management Researchs. 2008(1):105-48.
13. Tzeng G-H, Chiang C-H, Li C-W. Evaluating intertwined effects in e-learning programs: A novel hybrid MCDM model based on factor analysis and DEMATEL. Expert systems with Applications. 2007;32(4):1028-44.
14. Wu W-W, Lee Y-T. Developing global managers' competencies using the fuzzy DEMATEL method. Expert systems with Applications. 2007;32(2):499-507.
15. Kaplan RS, Norton DP. The balanced scorecard: translating strategy into action: Harvard Business Press; 1996.
16. Ginter PM, Duncan WJ, Swayne LE. The strategic management of health care organizations: john wiley & sons; 2018.
17. Čater T, Pučko D. Factors of effective strategy implementation: Empirical evidence from Slovenian business practice. Journal for east european Management Studies. 2010:207-36.
18. Foreman J, Argenti PA. How corporate communication influences strategy implementation, reputation and the corporate brand: an exploratory qualitative study. Corporate Reputation Review. 2005;8(3):245-64.
19. Mapetere D, Mavhiki S, Nyamwanza T, Sikomwe S, Mhonde C. Strategic role of leadership in strategy implementation in Zimbabwe's state owned enterprises. International Journal of Business and Social Science. 2012;3(16):271-6.
20. Porter ME, Lee TH. The strategy that will fix health care. Harv Bus Rev. 2013;91(10):50-70.
21. Kaissi AA, Begun JW, Welson T. Strategic planning processes and hospital financial performance. Journal of healthcare management. 2008;53(3):197.
22. Groene O, Brandt E, Schmidt W, Moeller J. The Balanced Scorecard of acute settings: development process, definition of 20 strategic objectives and implementation. International Journal for Quality in Health Care. 2009;21(4):259-71.
23. Schalm C. Implementing a balanced scorecard as a strategic management tool in a long-term care organization. Journal of Health Services Research & Policy. 2008;13(suppl 1):8-14.
24. Amaratunga D, Baldry D, Sarshar M. Process improvement through performance measurement: the balanced scorecard methodology. Work study. 2001;50(5):179-89.
25. Rabbani F, Lalji S, Abbas F, Jafri S, Razzak JA, Nabi N, et al. Understanding the context of balanced scorecard implementation: a hospital-based case study in Pakistan. Implement Sci. 2011;6(1):31.
26. Slater SF, Olson EM. Marketing's contribution to the implementation of business strategy: An empirical analysis. Strategic Management Journal. 2001;22(11):1055-67.
27. Bhimani A, Langfield-Smith K. Structure, formality and the importance of financial and non-financial information in strategy development and implementation. Management Accounting Research. 2007;18(1):3-31.
28. Matanda T, Ewing MT. The process of global brand strategy development and regional implementation. International Journal of Research in Marketing. 2012;29(1):5-12.
29. Rajasekar J. Factors affecting effective strategy implementation in a service industry: A study of electricity distribution companies in the sultanate of oman. International Journal of Business and Social Science. 2014;5(9):169-83.
30. Bushardt SC, Glascoff DW, Doty DH. Organizational culture, formal reward structure, and effective strategy implementation: A conceptual model. Journal of Organizational Culture, Communication and Conflict. 2011;15(2):57.
31. Miller S, Wilson D, Hickson D. Beyond Planning:: Strategies for Successfully Implementing Strategic Decisions. Long range planning. 2004;37(3):201-18.
32. Radnor Z, Lovell B. Success factors for implementation of the balanced scorecard in

a NHS multi-agency setting. International Journal of Health Care Quality Assurance. 2003;16(2):99-108.
33. Kaplan RS, Norton DP. Alignment: Using the balanced scorecard to create corporate synergies. Boston: Harvard Business School Press; 2006.
34. Mihic MM, Obradovic VL, Todorovic ML, Petrovic DC. Analysis of implementation of the strategic management concept in the healthcare system of Serbia. HealthMed. 2012;6(10).