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Strategic prerequisites for effective healthcare management control

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Abstract

Over the decades, most authors have interpreted management control to be only limited to setting standards, measuring and comparing actual performance with expected performance, and correcting deviations. However, while using confirmatory factor analysis as a principal technique in quantitative research method, this paper proves that the effectiveness of such a three-tier framework is influenced by a combination of certain management control pillars and prerequisites such as employee empowerment, information technology and embracement of a culture of knowledge management.

Although x^2 statistics and the root mean square error of approximation (RMSEA) did not indicate good model fitness, on a sample of 416 respondents drawn through multi-stage sampling from 4776 managers and primary healthcare coordinators in the entire South African public healthcare system, the modification indices, and standardised regression weights and the squared multiple correlation co-efficient (r^2) confirmed the null hypothesis that the integration of such prerequisites in a healthcare management control framework predicts improvement in compliance with established healthcare standards and effective use of different control techniques.

Results indicated that all these edify identification of all deviations and the determining of remedial measures that can be undertaken for improving the entire performance of a public healthcare setting.

Key phrases

healthcare; management control; performance improvement; prerequisites

1. INTRODUCTION

In today's more complex public sector organisations, the integration of certain strategic management control prerequisites in a management control framework predicts the overall effectiveness of the strategic management control process (Auzair 2011:236). Strategic

management control prerequisites refer to critical factors like employee empowerment, resource adequacy, community involvement as well as a functioning information system that managers must consider before outlining standards and techniques that can be used in the process of activities' measuring and evaluation (Butler & Rose 2011:139). Strategic management control is a process of measuring and evaluating whether the processes of activities' accomplishment are leading towards the achievement of the defined organisational objectives and goals (Duening & Ivancevich 2011: 201).

Strategic management control prerequisites provide a foundation that determines the establishment of effective management control system (Duening & Ivancevich 2011: 201). This signifies that although strategic management control is often undertaken by senior managers and executives at the top level of the organisational structures, the extent to which such prerequisites are integrated in a management control framework and cascaded throughout the middle and lower management structures influences the overall effectiveness of the strategic management control process.

Poor integration of all the essential strategic management control prerequisites can undermine the ability of healthcare managers to ensure effective use of all the essential techniques such as the balanced scorecard, performance management, benchmarking and total quality management to enhance compliance with the outlined set standards (Auzair 2011:236; Ho, Huang & Hu 2011:77). Such drawbacks may also tend to saddle the overall ability of healthcare managers and employees to identify all deviations and determine appropriate intervention measures that can be undertaken (Ho *et al.* 2011:77).

Sadly, prior debates among different authors have only focused on examining control techniques, such as the balanced scorecard, performance management, benchmarking and statistical control mechanisms as critical determinants of the effectiveness of the contemporary strategic management control (Arachchilage & Smith 2013:9; Kaplan 2010:10). Even if some of the studies have evaluated and postulated theories on strategic management control prerequisites (Butler & Rose 2011:139; Duening & Ivancevich 2011: 201), they have done so on just certain control prerequisites. Such theories have also failed to pin point how such prerequisites link with different control frameworks to cause alluring positive effects on the effectiveness of strategic management control (Butler & Rose 2011:139; Duening & Ivancevich 2011: 201).

Analysis of the practices in the South African public healthcare system indicates that it is not exceptional to such deficiencies. In effect, reviews of relevant theories are undertaken in this

paper to make a meaningful interpretation of the strategic framework of healthcare management control prerequisites that would influence the effectiveness of strategic management control process in the contemporary South African public healthcare setting.

2. STRATEGIC MANAGEMENT CONTROL PREREQUISITES

Despite lack of a single theory outlining all the strategic management control prerequisites, Grant (2011:249), Koontz and Weihrich (2010:199), Mansoor, Aslam, Barbu, Capusneanu and Lodhi (2012:48) and Rao (2010:88) share similar views that the effectiveness of management control in the contemporary organisations is predicted by the use of a combination of certain traditional and contemporary management control prerequisites.

2.1 Traditional management control prerequisites

Traditional management control prerequisites refer to critical success factors like planning, strategy, organisational structures, rules and regulations and leadership that emerged from the debates in the primary management control theories in the period between 1176 and 1960s (Anthony 1965:1; Fayol 1916:6; Smith 1776:1; Taylor 1915:5; Weber 1920:2).

A strategic plan is a framework outlining critical activities that must be accomplished for the organisation to achieve the desired level of performance. A strategic plan provides guidance for formulating expected standards, targets and objectives that guide the process of activities' control to ensure that the organisation achieves the desired objectives and state of performance (Fayol 1916:6; Pryor & Taneja 2010:3).

Such outlined objectives, goals and expected actions and behaviours are blueprints which indicate key areas where standards can be determined for measuring performance and the progress of activities' accomplishments (Kaplan 2010:22). This implies that in the event of inappropriately established plans and strategies, it is unlikely that managers are able to set appropriate standards (Koontz & Weihrich 2010:96; Pryor & Taneja 2010:3).

Inappropriate organisational performance standards often affect the successful monitoring and evaluation of the general organisational activities to thereby undermine the overall effectiveness of the strategic management control. In addition to an effective strategic plan, the appropriateness of the organisational structures also determines successful activities' monitoring and evaluation (Koontz & Weihrich 2010:96; Pryor & Taneja 2010:3).

Appropriate functional departments or division or units resulting from appropriate structuring edifies the overall effectiveness of strategic management control (Koontz & Weihrich 2010:96; Pryor & Taneja 2010:3). While activities are divided in smaller divisions and units, it

becomes easier to monitor and control the smaller units of the divided activities as compared to the activities in the larger undivided organisations. However, such structuring approach must be accompanied by outline of clear rules and regulations to ensure that the process of activities' accomplishments in such divisions or units contribute to the achievement of a common goal (Lussier 2010:392). Clear rules and regulations prescribe processes and methods through which different organisational activities must be accomplished. Secondly, rules and regulations are also important for determining how activities must be evaluated to reach relevant logical conclusions.

Besides the overall effectiveness of the guiding rules and regulations, the achievement of the outlined desired strategic goals and objectives is unlikely to be possible in the midst of an ineffective organisational leadership (Lussier 2010:392); McCraken & Wallace 2008:467). Effectiveness of the organisational leadership contributes to the extent to which leaders are able to influence employees to effectively accomplish the required activities (Lussier 2010:392); McCraken & Wallace 2008:467).

The extent to which leadership is able to influence effectiveness of strategic management control depends on the type of leadership that the organisation emphasises. Ancient leadership theories highlight leadership effectiveness in the contemporary organisations to be explained by leadership styles or approaches that include trait-based, situational, contingency, transactional and transformational leadership theories (Lussier 2010:392); McCraken & Wallace 2008:467). Alternative leadership theories that emerged in the period between 1840 and 1980 to elucidate on the determinants of leadership effectiveness encompass authentic leadership theory, adaptive leadership theory, neuroleadership theory and complexity leadership theories (Lussier 2010:392); McCraken & Wallace 2008:467).

Despite these different types of leadership styles or approaches, situational and Fiedler's contingency leadership theories seem to be appropriate approach to leadership that impacts positively on the overall effectiveness of the strategic management control process (Koontz & Weihrich 2010:96). Tailoring leadership styles applied to the situation that the organisation faces as in the case of situational leadership approach or leadership traits as required under Fiedler's contingency leadership theory may impact on the overall effectiveness leadership (Koontz & Weihrich 2010:96). Some flexibility in the approach to leadership may tend to motivate and influence employees to perform more effectively as compared to the circumstance where employees are faced with some rigid approach to leadership (Koontz & Weihrich 2010:96). In other words, it is apparent from theories that a strategic plan, strategy,

organisational structures, rules and regulations, and leadership are fundamental traditional prerequisites that influence the overall effectiveness of the strategic management control framework. However, empirical facts indicate that since organisations have overtime undergone tremendous changes, additional new prerequisites have also emerged as critical determinants of the effectiveness of strategic management control in the contemporary organisations (Auzair 2011:236; Ho *et al.* 2011:77). In these changes, Moisello (2012:58) and Oz (2010:46) note that trends imply that the effectiveness of control is measured by the extent to which the four traditional management control prerequisites are applied in conjunction with the three contemporary management control prerequisites that comprise of employee empowerment, effective information systems and communication mechanisms.

2.2 Contemporary management control prerequisites

Contemporary management control prerequisites are the critical success factors for strategic management control that have emerged as a result of the emergence of social movements and the increasing integration of technology in organisational operations in 1980s (Moisello 2012:58)). In effect, empirical facts imply that the implementation of a strategic management control framework in the contemporary organisations are unlikely to be successful unless accompanied by the integration of contemporary strategic management control prerequisites that include employee empowerment, effective information systems and communication mechanisms (Moisello 2012:58; Oz 2010:46;Tutar, Altinoz & Cakiroglu 2011:22).

Grant (2011:3) explains that employee empowerment influences ordinary employees' motivation and commitment to impact positively on the control of the process of activities' accomplishments. The overall effectiveness of employee empowerment is determined by structural and psychological empowerment. In structural empowerment process, employees are granted the necessary autonomy to make decisions and change the way work is done (Tutar *et al.* 2011:22). Such approach provides employees with significant levels of controls over their work roles (Tutar *et al.* 2011:22). It also enhances individual creativity and innovation of new work methods, systems and processes in a manner that places less strain on management (Batoo 2011:48; Caglio & Zoni 2010:58; Drake, Wong & Salter 2007:71). Psychological empowerment deals with providing employees with opportunities to find meaningfulness in the job that they are allocated.

The establishment of effective information system facilitates ease of interaction between employees and management as well as communication, and information sharing to impact positively on the extent to which employees are be able to exercise effective control. This

also influences the determining of the intervention measures that must be put in place (Drake *et al.* 2007:71; Moorthy, Gopalan & Yew 2012:66). Whereas decision support system provides information and models that facilitate tactical and strategic decision-making, information reporting system provides pre-specified reports for day-to-day decision-making (Laudon & Laudon 2007: 53).

Executive information system enhances analysis, comparing and highlighting trends to help senior managers govern the strategic direction of an organisation (Laudon & Laudon 2007:53). A well-functioning organisational information system also edifies the efficiency of the entire organisational communication mechanisms (Moorthy *et al.* 2012:66). It is through such established communication mechanisms that consultations between managers and employees are facilitated during goal setting and standards' formulations (Gamble & Blackwell 2011:13). This enhances employees' understanding of standards and action required of them to render it possible for effective activities' accomplishment (Gamble & Blackwell 2011:13).

Generally, there are stronger theoretical views implying that in addition to the four traditional management control prerequisites that include strategic plan, organisational structure, effective rules and regulations, and supporting leadership styles, the effectiveness of control is also enhanced by the additional three modern management control prerequisites comprising of employee empowerment, information systems and communication (Grant 2011:249; Koontz & Weihrich 2010:218; Mansoor *et al.* 2012:48; Rao 2010:88). The argument that the four traditional management control prerequisites may not influenced effectiveness of strategic management control in the contemporary organisations is not only evident in management control theories, but also in practices in the South African public healthcare system.

3. HEALTHCARE MANAGEMENT CONTROL: THE SOUTH AFRICAN PUBLIC HEALTHCARE SYSTEM

Despite lack of a single framework, it is apparent from the analysis in the South African public healthcare system that most of the traditional and contemporary management control perquisites are commonly used by the managers in the South African public healthcare system. The traditional management control prerequisites used by the managers in the South African public healthcare system include the healthcare strategic plan, healthcare structuring, and rules and regulations outlining processes and methods of activities' accomplishments. There is also stronger evidence that the contemporary strategic

management control techniques that are used by the managers in the South African public healthcare system include the healthcare information system and emphasis of the overall effectiveness of communication mechanisms. This implies that the approach in the contemporary South African public healthcare system also echo the reasoning that reliance on the traditional management control prerequisites can also undermine the overall effectiveness of the strategic healthcare management control process.

However, further analysis indicates that the South African public healthcare system also relies on certain new forms of management control pillars such as community engagement and consultation, and the embracement of the concept of good governance (Schaay, Sanders & Kruger 2011:66; Van Holdt & Murphy 2007:14). Control pillars create the foundation that does not only influence the effectiveness of strategic planning, but also the undertaking of relevant monitoring and evaluation. It also edifies commitment to ensure that improvement measures are effectively implemented (World Bank Report 2011:46).

Engagement and consultation of communities enhance the extent to which the larger population can understand and be involved in the assessment of whether different government programmes which are being implemented are most likely to lead to the achievement of the desired objectives (Schaay *et al*. 2011:66). Community engagement refers to the process of networking and building relationships with different key stakeholders in the community and different sections of the communities (Chappell 2008:8).

Community consultation is a measure for improving efficiency and transparency through the involvement of communities in the design, implementation, and monitoring and evaluation of the implementation of community programmes (Chappell 2008:8). Good governance emphasises core pillars such as accountability, responsibility, consultation, information sharing and exchange as fundamental concepts for ensuring that employees do not engage in activities that affect effective implementation of different government programmes (Whittaker, Shaw, Spieker & Linegar 2011:19). Although these are clearly management control prerequisites, practices in the South African public healthcare system indicate that lack of appropriate framework undermines the extent to which they are coherently integrated as part of the management control prerequisites to influence the overall effectiveness of the strategic healthcare management control process (World Bank Report 2011:46). It is such conceptual limitations that this paper seeks to resolve by reviewing relevant theories and literature so as to make a meaningful interpretation of the strategic framework of healthcare management control prerequisites that would influence the effectiveness of strategic management control in the contemporary public healthcare setting.

4. PROBLEM INVESTIGATED

Limiting the concept of healthcare management control to a mere process of setting standards, measuring and correcting deviations without prior consideration of a set of certain management control prerequisites like employees empowerment and information system, undermines the effectiveness of a healthcare management control framework (Schaay *et al.* 2011:66; Van Holdt & Murphy 2007:14; Whittaker *et al.* 2011:19).

5. PURPOSE OF THIS PAPER

The main purpose of this paper is to test and postulate a framework of strategic healthcare management control prerequisites that can be used for improving the effectiveness of the strategic management control process in the contemporary South African public healthcare system.

6. RESEARCH HYPOTHESIS AND THEORETICAL FRAMEWORK

In a bid to achieve this objective, it is postulated in the overriding hypothesis in Figure 1 that the three sets of the strategic healthcare management control prerequisites that influence the effectiveness of a healthcare management control framework include the four management control pillars, four traditional management control prerequisites and four modern management control prerequisites.

As it is explained in Figure 1, the four management control pillars that encompass community engagement, community consultation, sufficient resources and good governance set the foundation for the integration of the four traditional management control prerequisites (strategic planning, the creation of effective structures, the establishment of effective rules and regulations, and emphasis of the appropriate strategic leadership styles) that must also be considered by the public sector managers.

In the context of the illustration of Figure 1, this leads to the integration of the four modern management control prerequisites that encompass: employee empowerment, information technology, information exchange and embracement of a culture of knowledge management. In effect, it is posited in this paper that this renders it possible for public healthcare managers to ensure effective compliance with established healthcare standards by using different healthcare management control techniques. This subsequently edifies identification of all deviations and determine remedial measures that can be undertaken to improve the entire performance of a public healthcare setting.

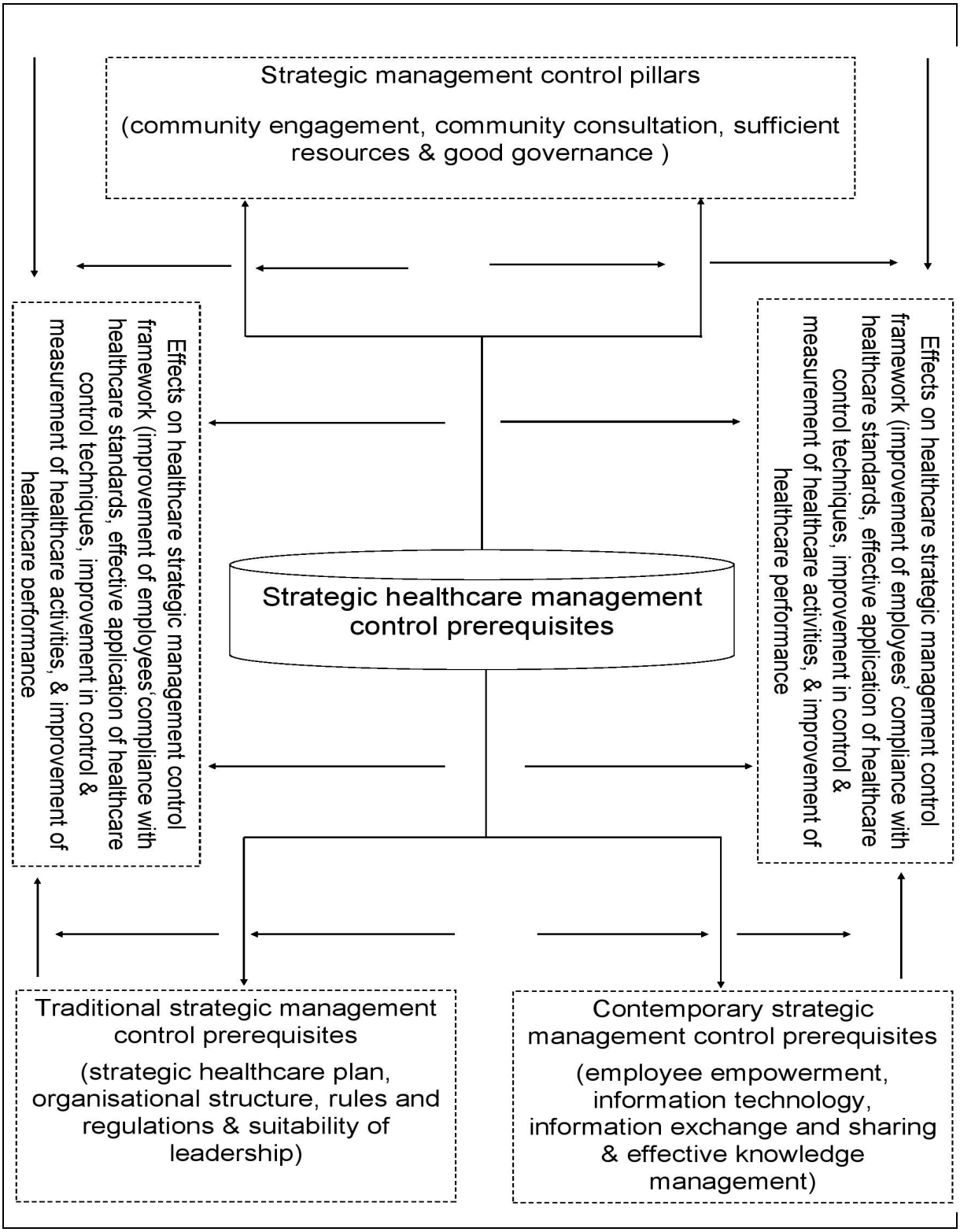

FIGURE 1: A framework of the strategic healthcare management control prerequisites

Source: Researcher's construed as derived from different management control theories and interpretation of the documents from the South African Department of Health

Confirmatory analysis was used to test whether the specified sample covariance matrix represented in Figure 1 matches the SEM estimated sample covariance matrix.

7. RESEARCH METHODOLOGY

The study was quantitative and a confirmatory factor analysis was used as the main quantitative research technique. Confirmatory factor analysis was accomplished in the context of Hair, Black, Babin and Anderson's (2010:94) prescribed four main steps involving model specification, sample size determination, data collection and calculation of estimates. With the model and the associated measuring constructs and underlying variables already specified in Figure 1, the second step in confirmatory factor analysis involved determining the sample size of the population against which confirmatory factor analysis was to be based.

7.1 Sample size determination

The Department of Health (2011:203) and Statistics South Africa (2012:16) indicate that there are approximately 4 776 public healthcare facilities (hospitals and clinics) in South Africa. The fact that each hospital has a manager and each clinic has a primary healthcare coordinator signifies that the target population of the study comprised of the 4 776 public hospital managers and primary healthcare coordinators.

Using multi-stage sampling involving application of a combination of cluster sampling and simple random sampling techniques, the first step involved clustering the 4 776 public hospital managers and primary healthcare coordinators into the nine clusters (primary units) or provinces that include Eastern Cape (92 hospitals and 780 clinics), Free State (32 hospitals and 298 clinics), Gauteng (31 hospitals and 438 clinics), Kwa-Zulu Natal (71 hospitals and 629 clinics), Limpopo (43 hospitals and 664 clinics), Mpumalanga (33 hospitals and 386 clinics), Northern Cape (31 hospitals and 152 clinics), North-West (33 hospitals and 474 clinics), and Western Cape (531 hospitals and 531 clinics) (Churchill, Iacobucci & Israel 2010:14).

After clustering, simple random sampling using Albridged list of random numbers was undertaken to draw sample clusters or secondary units (provinces) from these nine clusters. The effect was that Mpumalanga and Gauteng provinces were selected as the sample clusters or secondary units (provinces) from the nine clusters.

The calculation of sample units (hospital managers and facility coordinators) that must be drawn from the clusters of Mpumalanga and Gauteng (secondary units) was accomplished using Hammond and McCullagh's (1978:157) formula: n (Sample Size)

$$=\left(\frac{z\ (Derived\ from\ Z{-}Table\ )\quad x\quad S\ (Standard\ Deviation\ of\ the\ Pilot\ Sample)}{d\ (the\ Tolerable\ Margin\ of\ Error)}\right)^2.$$

The estimate for the sample size was $\left(\frac{2\quad x\quad 24.57}{2.5}\right)^2$ = 386.This implies that in addition to the 30 pilot samples, 386 sample respondents that comprised of public hospital managers and facility coordinators had to be added to achieve a total of 416 (30 + 386=416) as the estimated sample size for the study. The effect was that 416 sample respondents were drawn from a total of 824 public healthcare facilities in the selected sample clusters of Mpumalanga and Gauteng. While applying a formula

$$\frac{N\ (total\ units\ of\ analysis\ in\ Mpumalanga\ and\ Gauteng){=}824}{n\ (the\ Estimated\ Sample\ Size){=}416} = 2$$

The process of drawing units into the sample of the public hospital managers and facility managers was accomplished after every 2nd interval from the drawn list of the public healthcare facilities in Mpumalanga and Gauteng until the desired sample size of 416 was achieved.

7.2 Data collection

Primary data collection was accomplished through personal administration using a five point Likert's (1932) scale survey questionnaire containing scales encompassing strongly disagree (1), disagree (2), unsure (3), agree (4), and strongly agree (5). The survey questionnaire was designed in accord with the three constructs in Figure 1 that include the four management control pillars, four traditional management control prerequisites and four modern management control prerequisites. A Cronbach's (1951) alpha analysis result of 0.8 was concluded to be indicating good validity and reliability of the research instrument. The obtained total of the collected 416 sample data was used in the calculation of estimates using the AMOS Version 21 of the SPSS.

7.3 Calculation of estimates

The techniques and indices which were used in determining model fitness include Chi-Square (x^2) analysis. The analysis of the modification indices encompassed the application of the root mean residual (RMR), comparative fit index (CFI), Tucker Lewis index (TLI), normed fit index (NFI) and the root mean square error of approximation (RMSEA) (Steinberg

010:20). David's (2014:75) interpretation was used in determining whether the results of GFI, PNFI, TLI and CFI were within acceptable limits of 0 and 1. As cited in Bollen and Davis (2009:523), Carmnines and McLver's (1981:1) and Wheaton (1987:2), arguments were used in assessing whether the RMSEA (root mean square error of approximation) fell in the acceptable limit of 0.05 and 0.08.

In addition to the application of Chi-square (x^2) value and these modification indices, standardised regression weights (factor loadings) were also used in determining how each of the hypothesised variables significantly load onto the hypothesised constructs in Figure 1. Within context of Bollen and Davis' (2009:536) criterion of 0.50, a loading was considered to be significant if it fell at 0.50 or above. The squared multiple correlation coefficient (R^2) was used to assess the extent to which the variance in the common factor is explained by the existence of each of the measured variable. In line with Bollen and Davis's (2009:536) prescription, a score of 30% was considered significant. The details of the findings are as presented and discussed in the next section.

8. MODEL FITNESS

It is argued in the underpinning hypothesis in this paper that usage of a framework of strategic healthcare management control prerequisites in Figure 1 would significantly influence the overall effectiveness of the strategic healthcare management control process in the contemporary South African public healthcare system.

In a bid to assess whether the overall results of confirmatory factor analysis support the null research hypothesis, the findings were presented and discussed as follows:

8.1 Chi-squared (χ^2) statistics

The interpretation of the results of chi-squared x^2 statistics in Table 1 would imply that it does not support the representation in Figure 1 that the use of a set of the outlined strategic healthcare management control prerequisites in Figure 1 predicts the effectiveness of a healthcare management control process. As cited in Hirschfeld and Brachel's (2014:9) explanation, this interpretation is consonant with Bentler and Bonett's (1980:2) founding theory that the observed sample covariance matrix matches the SEM estimated covariance matrix if chi-squared (x^2- statistics) (probability value (p-value) is greater than 0.05 (p-value $>$ 0.05). Lack of model fitness exists if chi-squared ($x^2 -$ statistics) (probability value (p-value) is less than 0.05 (p-value $<$ 0.05) (Hirschfeld & Brachel 2014:9; Bentler & Bonett 1980:2).

When examined in the context of the illustration in Table 1, it can be noted that for N= 416, x^2 statistic = 302 (df=44; p-value = 0.000). In this instance, it can be construed that a chi-squared (x^2 statistics) p-value = 0.000 is less than 0.05 to thereby imply that the estimated sample covariance matrix in Figure 1 does not match the SEM estimated sample covariance matrix. Such a conclusion not only defies the logic of reasoning in Figure 1, but also the theoretical and practical articulations that signify that the use of certain strategic healthcare management control prerequisites influence the effectiveness of a strategic healthcare management control framework) (Bredmar 2011:106; Pierce & Gardner 2010:319).

Even if the interpretation of x^2 statistic is approached in the context of CMIN/df = $\frac{x^2 \text{ statistic}}{df}$, there is still lack of model fitness for that it falls outside Bollen and Davis's (2009:536) rule of thumb of the range of 2 to 1 or 3 to 1. While supported by Amos' (2011) Guideline for model fitness, Bollen and Davis (2009:536) posit that a CMIN/df $\frac{x^2 \text{ statistic}}{df}$ falling in the ratio of 2 to 1 or 3 to 1 indicates good model fitness. However, in this instance, the observation of the illustration in Table 1 would indicate that CMIN/df= $\frac{x^2 \text{ statistic } (302)}{df\ (44)}$ = 6.8 falls outside the range of 2 to 1 or 3 to 1.

Such a finding implies that the use of the strategic healthcare management control framework in Figure 1 would not influence the effectiveness of a healthcare strategic management control framework and the overall improvement in the performance of the South African public healthcare system. Although x^2 statistics provides an accurate technique for assessing the fitness of a model, Hair *et al.* (2010:94) advise that it must be used with caution. The susceptibility of x^2 statistics to the variation in sample sizes can lead to a type 1 error which is associated with the acceptance of a model that should have been rejected or a type 11 error linked to rejection of a true proposition that should have been accepted (Hair *et al.* 2010:94).

Hair *et al.* (2010:94) share similar views with authors such as Beaujean (2013:29) and Rhemtulla, Brosseau and Savalei (2012:354) that such errors can be circumvented through the additional use of modification indices. Modification indices refer to the use of statistical indices that are often not affected by the variation in sample sizes (Breevaart, Bakker, Demerouti & Hetland 2012:305; Pornprasertmanit, Jaehoon & Preacher 2014:518). In line with the views of these authors, incremental fit indices and parsimony-adjusted measures were applied in this case in order to minimise such errors and corroborate the results of x^2 statistics (Breevaart *et al.* 2012:305; Pornprasertmanit *et al.* 2014:518).

TABLE 2: Ch-squared (x^2 statistics); incremental fit indices and Parsimony-adjusted measures

Model Fitness: Techniques	Significance (Value)		Interpretation
Chi-squared (x^2) In a view consonant with Bentler and Bonett's (1980:2) founding theory, Hirschfeld and Brachel (2014:9) explain that the observed sample covariance matrix matches the SEM estimated covariance matrix if chi-squared (x^2- statistics) (probability value (p-value) is greater than .05 (p-value > .05). On the converse, these authors state that a lack of model fitness exists if chi-squared (x^2 – statistics) (probability value (p-value) is less than .05 (p-value < .05).	Chi-squared (x^2) = 302 ; Degree of freedom = 44 ; Probability level = .000; CMIN/df = 6.884 (Hence, the decision rule is that the null hypothesis (H_0) would be accepted if the observed sample covariance matrix matches the SEM estimated covariance matrix if chi-squared (x^2-statistics) (probability value (p-value) is greater than .05 (p-value > .05), and the alternative hypothesis (H_1) would be accepted and H_0 rejected if chi-squared (x^2 – statistics) (probability value (p-value) is less than .05 (p-value < .05).		Reject the model; chi-squared (x^2-statistics) (probability value (p-value) = .000 < .05, and Chi-squared (x^2)/df = 6.884 > ratio of 2 to 1 or 3 to 1
Modification Indices (Alternative Fit Statistical Techniques) (Hu and Bentler's (2006:22) interpretation, GFI, NFI, RFI, TLI and CFI acceptable, if falling in the limit of 0 and 1, and using Wheaton (1987:2), a RMSEA falling between 0.05 and 0.08 with a higher PClose is acceptable)	Modification Indices(Alternative Fit Statistical Techniques)	Significance (Value)	Interpretation
	CFI (Comparative Fit Index, acceptable if it falls between 0 and 1)	.73	Acceptable
	NFI (Normed Fit Index, acceptable if it falls between 0 and 1)	.42	Acceptable
	GFI (Goodness of Fitness Index Acceptable if it falls between 0 and 1)	.75	Acceptable
	TLI (Tucker Lewis Index, acceptable if it falls between 0 and 1)	.64	Acceptable
	RFI (Relative Fit Index, acceptable if it falls between 0 and 1)	.62	Acceptable
	RMSEA (Root Mean Squared Error of Approximation, acceptable if it falls between 0.05 and 0.08)	.165 (PClose=.000)	Unacceptable

Source: As derived from the results of confirmatory factor analysis using Amos Version 21 of the Statistical Programme for Social Sciences (SPSS)

8.2 Modification indices

Contrary to the results of x^2 statistics, Table 1 indicates that most of the incremental fit indices which were analysed as part of the modification indices support the null hypothesis. The null hypothesis highlights that the use of a framework of strategic healthcare management control prerequisites in Figure 1 predicts the effectiveness of a healthcare management control process in the contemporary South African public healthcare system. Such interpretation is attributable to the fact that the illustration in Table 1 indicates that comparative fit index (CFI) was 0.73 which in the context of O'Boyle and Williams' (2011:8) prescription indicates good model fitness. O'Boyle and Williams (2011:8) argue that a comparative fit index (CFI) indicates good model fitness if it is closer or = or > 0.9. While drawing from the illustration in Table 1, it can be interpreted that a CFI of .73 is closer to 0.9 to thereby imply that there is better model fitness.

It is not only the CFI which indicates good model fitness, but also further analysis of the findings in Table 1 would suggest that NFI (Bentler-Bonnet Normed Fit Index Delta 1) of 0.45 can be construed in line with Hu and Bentler's (2006:22) rule of thumb to fall within the acceptable range of 0.0 and 0.95. Further prove of fitness of the model in Figure 1 is accentuated in the goodness of fitness index (GFI) of 0.75 for the reason that using Bollen and Davis' (2009:536) criterion, it can be noted that a GFI of 0.75 is closer to 0.9.

Just like Hu and Bentler's (2006:22) rule of thumb, Bollen and Davis (2009:536) reason that a GFI indicates good model fitness if it is closer or = or > 0.9. At the same time, these authors highlight that TLI Tucker-Lewis Index (TLI) and the Relative Fit Index RHOI (RFI) falling in the range of 0 and 1 indicates good model fitness. When observations are made of the findings in Table 1, the interpretation is that TLI of 0.64 and RFI of 0.62 fall within such a criterion. This confirms the null hypothesis that the use of a framework of strategic healthcare management control prerequisites in Figure 1 would significantly influence the effectiveness of healthcare management control in the contemporary South African public healthcare system.

However, such a conclusion seems not applicable in regard to the results of the root mean squared error of approximation (RMSEA) which was used as part of the parsimony adjusted measures. This is attributable to the fact that the RMSEA of 0.165 with a PClose of 0.000 does not fall within the criterion prescribed by O'Boyle and Williams (2011:8). O'Boyle and Williams (2011:8) argue that the RMSEA (root mean squared error of approximation) falling between 0.05 and 0.08 with a higher PClose can be considered as acceptable. With RMSEA

in Table 1 falling at 0.165 with a PClose of 0.000, it can be construed that it does not meet the criterion for concluding that the RMSEA support the null hypothesis in Figure 1.

Although RMSEA indicated lack of model fitness, the overall analysis of the results of standardised regression weights and squared multiple correlation co-efficient (r^2) indicate that most of the observed variables in Figure 1 loaded significantly onto their associated latent constructs.

9. STANDARDISED REGRESSION WEIGHTS AND SQUARED MULTIPLE CORRELATION CO-EFFICIENT (r^2)

Bollen and Davis' (2009:536) posits that loadings of at least 0.50 or higher confirm that the indicators are strongly related to their associated latent constructs or common factors. Hair et al. (2011:463) emphasise that the squared multiple correlation coefficient (r^2) for a variable is significant if it falls at 30% or above. In other words, Hair *et al*. (2011:463) construe that the squared multiple correlation coefficient which is the factor loadings squared (r^2) provides a description of the percentage of the variance in the common factor in respect to a particular variable.

9.1 Healthcare management control pillars

In terms of healthcare management control pillars, the illustrations in Figure 2 highlight that community engagement (CE) as an observed variable loaded significantly at .81 onto the latent construct (strategic healthcare management control pillars). Table 2 further indicates that the loading for community consultation (CC) was 0.89, sufficient resources Loaded at 0.43, and good governance (GG) was noted to have loaded at 0.64. Except sufficient resources (SR) of 0.43 that loaded below the criterion prescribed by Bollen and Davis's (2009:536), it can be noted that all the other variables loaded quite significantly above 0.50 onto the latent construct. This is further echoed in the results of the squared multiple correlation coefficient (r^2) that although Sufficient Resources (SR) is explained by only 19% of the variance in the common factor, all the other observed variables are explained by the variance in the common factor (Strategic Healthcare Management Control Pillars).

As it is indicated in Figure 2 that community engagement (CE) is explained by 66% of the variance in the common factor, community consultation (CC) by 79%, and good governance (GG) 41%. These findings imply that prior to the development of any strategic healthcare management control framework, the integration of these pillars are prerequisites that define the effectiveness of the other activities to be accomplished.

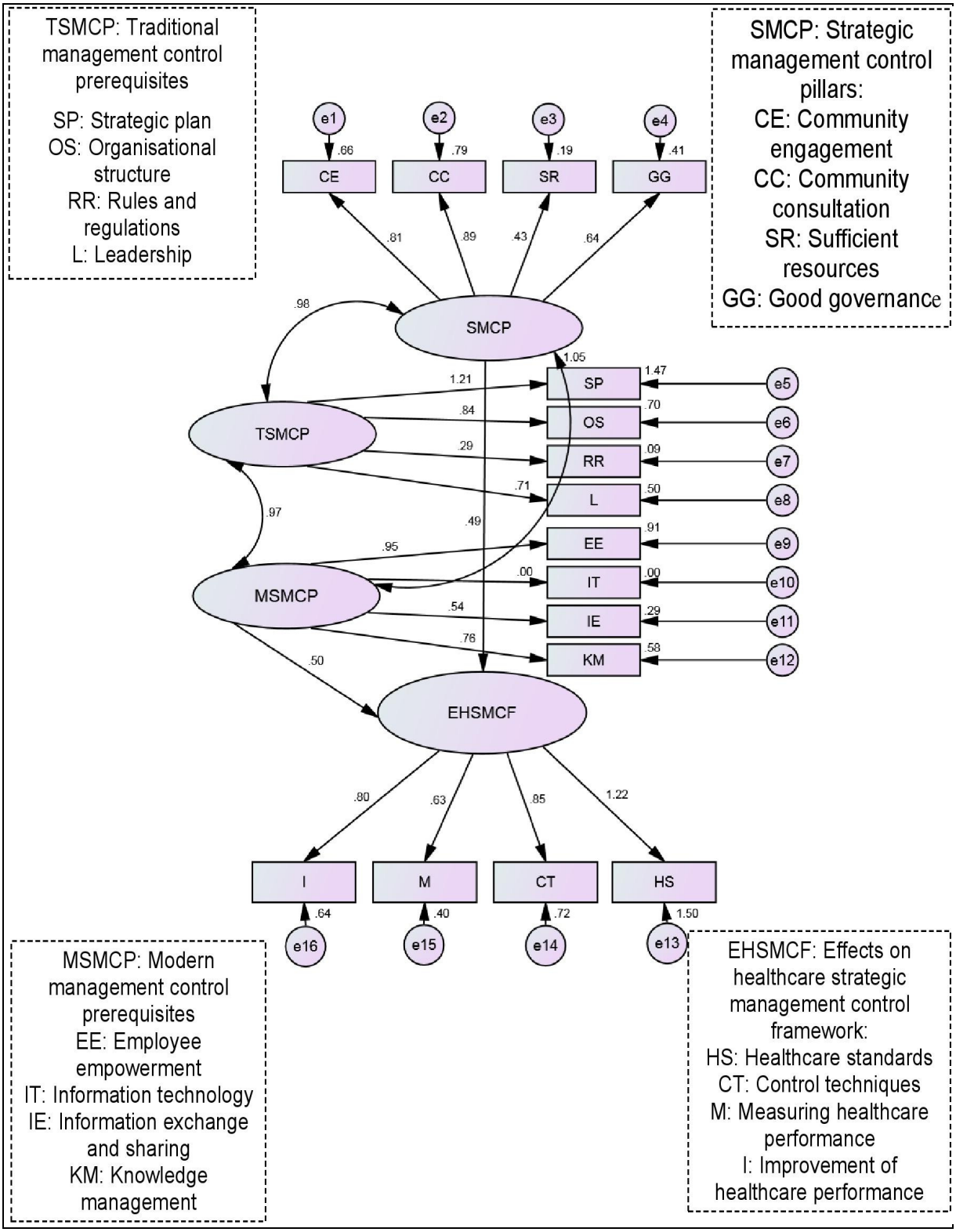

FIGURE 2: Standardised regression weights (factor loadings) and squared multiple correlation co-efficient (r^2)

Source: Researcher's construct as replicated from the results of confirmatory factor analysis using Amos Version 21 of the Statistical Programme for Social Sciences (SPSS)

Such a view is further substantiated in the fact that Figure 2 indicates that a significant co-relationship of .98 exists between the effectiveness of the strategic healthcare management control pillars which are put in place and the effectiveness of the traditional management control prerequisites. Such interpretation falls within precincts of Jasper's (2010:104) postulation that a relationship between two variables or sets of variables is significant if the result falls in between the range of $\pm 0\ and\ 1$. At the same time, it is noted in Figure 2 that the effective integration of these pillars influence the extent of effective compliance with prescribed healthcare standards, the effective use of all the healthcare management control techniques, and the process of measuring and improving the general performance of a public healthcare sector.

This interpretation is based on the fact that Figure 2 indicates that the effectiveness of the strategic healthcare management control pillars (SMCP) loads significantly at 0.49 on the Strategic Healthcare Management Control Framework (ESHMCF). When rounded up, it can be interpreted that it meets Bollen and Davis' (2009:536) postulation that loadings of at least 0.50 or higher confirm that either indicators or a set of indicators are strongly related to their associated latent constructs or common factors. The fact that Figure 2 indicates that there is a significant direct positive relationship between the strategic management control pillars and the traditional management control prerequisites echoes the theoretical findings in which it was noted that consideration of pillars such as community engagement influences the effective consultation with the community to ensure that whatever strategic healthcare plan which is put in place directly meets the needs of the communities.

9.2 Traditional healthcare management control prerequisites

In terms of core traditional strategic management control prerequisites (TSMCP), the standardised regression weights in Figure 2 indicate that strategic healthcare plan (SP) loads at 1 and explained by 100% of the variance in the common factor. Organisational structure is noted to load at 0.84 and explained by a variance of 70%, rules and regulations loads at 0.29 (9% variance in common factor) and strategic leadership loads at 0.71 with a variance of 50%. Although it is evident in Figure 2 that most of the observed variables loaded quite significantly, it is also apparent that rules and regulations were noted to be less significant for influencing the effectiveness of healthcare management control for the reason that it falls below Bollen and Davis' (2009:536) criterion of = or > 0.50.

Nonetheless, it is illustrated in Figure 2 that the co-relationship between the traditional strategic healthcare management control prerequisites (TSMCP) and the modern strategic

healthcare management control prerequisites (MSMCP) is significant in the context of Jasper's (2010:104) prescription at 0.97. Such a finding signifies that for control to be effective in modern public healthcare settings, the use of the traditional management control prerequisites such as the strategic plan, organisational structure, rules and regulations, and strategic leadership must be integrated with the modern management control prerequisites that include employee empowerment, information technology, information exchange and embracement of a culture of knowledge management.

9.3 Modern management control prerequisites

As far as the concept of the modern management control prerequisites is concerned, it is illustrated in Figure 2 that employee empowerment loads significantly at 0.95 with a variance of 91%, as information technology is noted not to be insignificant at all. However Figure 2 indicates that information exchange loads at 0.54 with a variance of 29% and embracement of a culture of knowledge management loaded at 0.76 with a variance of 58%. The combined effects of the traditional strategic healthcare management control prerequisites (TSMCP) and the modern strategic healthcare management control prerequisites (MSMCP) are then noted in Figure 2 to have alluring positive effects on the overall improvement on the effectiveness of the strategic management control framework. Attributable to this view is the fact that it is noted in Figure 2 that these combined effects of TSMCP and MSMCP load significantly at 0.56 to influence the overall effectiveness of the strategic healthcare management control framework that outlines essential healthcare standards (1-100%), healthcare management control techniques (0.85-72%), the measuring of healthcare activities (0.63 – 40%), and subsequently the improvement in the entire performance of a public healthcare system (0.80-64%).

10. DISCUSSIONS

Although x^2 statistics and the root mean square error of approximation (RMSEA) did not indicate good model fitness, the overall interpretation of the results of confirmatory factor analysis implies that most of the modification indices and the standardised regression weights and squared multiple correlation co-efficient (r^2) confirm the null research hypothesis that the framework of strategic healthcare management control prerequisites in Figure 1 would influence effectiveness of a healthcare management control framework and improvement in the performance of the South African public healthcare system. Such a view contradicts the views of authors such as Armstrong (2010:29), Butler and Rose (2011:139) and Caglio and Zoni (2010:58) that the effectiveness of a healthcare management control

framework is measured by only the three main constructs that include; setting standards, measuring and improving the organisational performance.

Instead, the results of confirmatory factor analysis imply that the link of essential strategic healthcare management control prerequisites to such a framework influences the overall effectiveness of the strategic management control process. As much as community engagement and consultation can cause alluring positive effects on the improvement of strategic management control, the interpretation of the results of confirmatory factor analysis implies that their effects may tend to be only limited unless accompanied by the initiative of ensuring that there exist sufficient resources and the willingness to embrace the concept of good governance (Salarzehi & Kord 2010:193).

However, even if all the four management control pillars and the four traditional management control prerequisites are considered, the effectiveness of the strategic healthcare management control framework would still be undermined in lieu of integration of the four contemporary management control perquisites including employee empowerment, information technology, information exchange and embracement of a culture of knowledge management (Mandal 2011:110; Marchewka 2010:29; Surendran 2010:216).

Attributable to such a view is the fact that such management control prerequisites influence the extent of compliance with the prescribed standards (Bormann, Bouwen & Hoffman 2014:23; Gani & Jermias 2010:5: Ho *et al.* 2011:77). In the modern continuously extended enterprises, it may become difficult to coordinate, harmonise and monitor effective compliance with the set expected standards across all departments without the use of the contemporary management control prerequisites such as an effective organisational information system and effective communication mechanisms (Ho, Huang & Hu 2011:77; Gani & Jermias 2010:5: Bormann, Bouwen & Hoffman 2014:23).

11. MANAGERIAL IMPLICATIONS

Findings imply that the South African public healthcare system still faces a challenge of a strategic framework that facilitates the integration of critical prerequisites that would influence the effectiveness of its strategic healthcare management control frameworks. In effect, it is argued that it must consider using the framework in Figure 3 in order to integrate all the critical management control prerequisites that would impact positively on the improvement of the effectiveness of its strategic management control process.

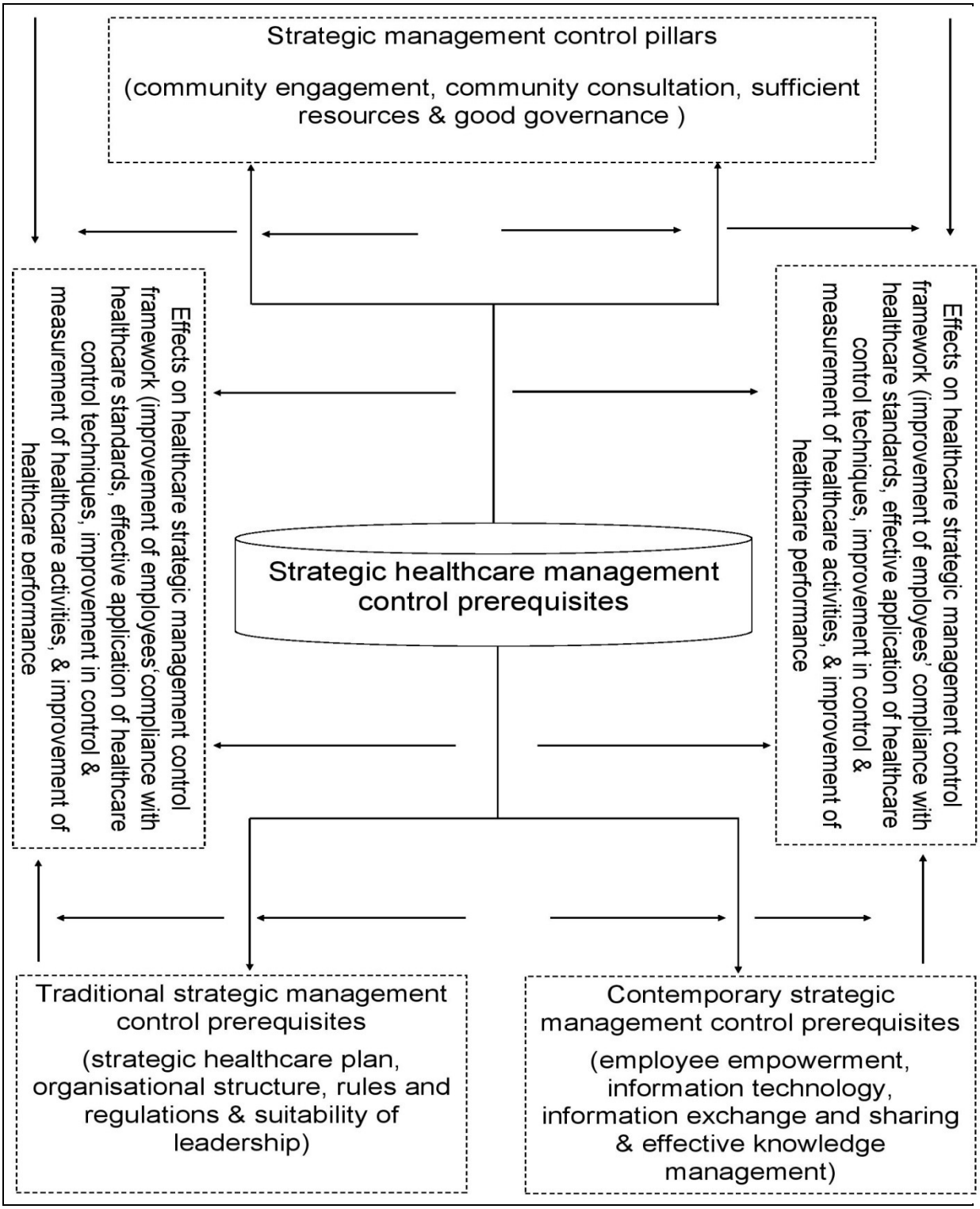

FIGURE 3: A framework of the strategic healthcare management control prerequisites for effective performance of the South African public healthcare system

Source: Researcher's construed as derived from the results of confirmatory factor analysis and different management control theories and interpretation of the documents from the South African Department of Health

In a bid to accomplish this, it is illustrated in Figure 3 that the critical management control prerequisites that the executives in the South African public healthcare system must consider include:

11.1 Strategic healthcare management control pillars

As illustrated in Figure 3, the four core management controls pillars that managers in the South African public healthcare system must consider include community engagement and consultation, allocation of sufficient resources and the embracement of the principles of good governance. These strategic management control pillars refer to important factors that set the foundation for the integration of other management control prerequisites such as the strategic planning and structuring of the public healthcare system. Community engagement influences ability of public healthcare managers to understand the needs of the communities. This enhances interaction between public sector managers and the communities to impact positively on effective understanding of different needs and the determining of the healthcare programmes that must be put in place to meet such needs. With effective community engagement, accurate strategic plan can be put in place to enhance effective meeting of the needs of the community members.

However, attainment of all these positive effects of community engagement will depend on the extent to which public sector managers are able to determine the appropriate amount of resources that must be allocated to influence the successful implementation of such public healthcare programmes and strategic plans. At the same time, public sector managers must create environments that foster the embracement of the concept of good governance. The emphasis of the concept of good governance among public healthcare managers and employees will contribute towards the elimination of unfair and unethical practices to impact positively on the improvement of accountability of the extent to which the allocated resources are used effectively for the attainment of the desired strategic healthcare objectives and goals. After considering these critical strategic healthcare management control pillars, managers in the South African public healthcare system must then integrate the traditional strategic healthcare management control prerequisites.

11.2 Traditional strategic healthcare management control prerequisites

Regarding the four traditional prerequisites for an effective public healthcare system, it is highlighted in Figure 3 that the managers in the South African public healthcare system will have to consider the variables encompassing a public healthcare strategic plan, supporting

organisational structures, supporting rules and regulations, and the use of the appropriate leadership styles. With detailed information gained from the previous analysis, the managers in the South African public healthcare system can undertake the necessary process of strategic planning to provide a framework of the critical healthcare activities that must be accomplished to render it possible for the attainment of the outlined public healthcare strategic objectives and goals. This must be accompanied by initiatives for ensuring that appropriate healthcare organisational structures are put in place.

Whereas a strategic healthcare plan provides the framework for assessing whether all the outlined critical activities are being effectively accomplished, appropriate structures influence the allocation of responsibilities among managers, supervisors and employees. Such division of tasks enhances effectiveness of control for the reason that specialisation not only edifies employees' self-control, but also the ease of monitoring and evaluation by managers and supervisors. Rules and regulations provide standards for judging what must be done or not done. As on the other hand, leadership effectiveness enhances the extent to which public sector managers are able to influence employees to accomplish different allocated tasks more effectively. For all the critical management control prerequisites to be effectively integrated in the strategic healthcare management control framework, managers in the South African public healthcare system must ensure that a set of the traditional management control prerequisites to be used is accompanied by the integration of the contemporary strategic healthcare management control prerequisites.

11.3 Contemporary strategic healthcare management control prerequisites

The four modern management control prerequisites that the South African public healthcare system must consider are further noted in Figure 3 to include employee empowerment, public healthcare information systems, information sharing and exchange and embracement of a culture of knowledge management. Employee empowerment will influence the extent to which the contemporary South African public healthcare managers are able to get ordinary employees involved in the monitoring and evaluation of activities. This will improve the overall effectiveness of the strategic management control process. However, the extent to which employee empowerment is able to influence effectiveness of the strategic management control process will depend on the extent to which it is accompanied by measures that encourage structural and psychological empowerment of the employees.

Structural empowerment involve ensuring not only decentralisation and delegation of authorities, but also the passing of the decision-making powers and authorities to the

employees in the lower echlons of the public healthcare structures. Psychological empowerment requires the undertaking measures that render it possible for employees to feel the overall meaningfulness of the allocated tasks. Public healthcare information systems will influence not only the improvement in communication and information sharing and exchange, but also the quality of the gathered data. All these can impact positively on the quality of the decisions that public healthcare managers are able to make from such data.

It is through the gatherance of such quality data and information that public healthcare managers are able to identify deviations and undertake appropriate intervention measures. This must be accompanied by embracement of a culture of knowledge management to improve the quality and management of information. In other words, effective integration of all these management control pillars and prerequisites under a single strategic healthcare management control framework would create a good foundation for the South African public healthcare system to design and implement the remaining key steps that include determining the strategic public healthcare performance targets, setting the expected public healthcare performance standards, the application of a combination of public healthcare management control techniques, and implementation of public healthcare corrective and improvement measures. The use of the framework in Figure 3 will enable healthcare managers assess and evaluate the prerequisites that must be in place to influence the improvement in compliance with standards and the effective use of all the healthcare management control techniques in the evaluation and improvement of the processes for activities' accomplishment.

12. CONCLUSION

It is not only evident in the practices in the South African public healthcare system, but also in theories that most authors have for decades tended to limit the understanding and application of control to a three-tier management control framework that involves setting standards, measuring and comparing the actual performance with the expected performance, correcting deviations and improving performance.

However, this paper has indicated that the fundamental management control prerequisites far exceed such three steps to encompass the integration of certain four traditional prerequisites (planning, structuring, rules and regulations, and leadership) with certain unique prerequisites that include good governance, community engagement and consultation, information technology, information sharing and the embracement of a culture of knowledge management. By postulating the strategic framework in Figure 1, this paper

minimises such conceptual deficiency. However, since it is highly apparent that prerequisites that determine the effectiveness of control keep on changing as time evolves, it is suggested that future research must focus on the assessment and evaluation of the changes in organisational trends to identify new prerequisites that can be added onto the management control prerequisites prescribed in Figure 1 to influence the overall effectiveness of the strategic management control.

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