International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 6 Issue 23 (December 2023) PP. 01-25
DOI: 10.35631/IJEMP.623001

INTERNATIONAL JOURNAL OF ENTREPRENEURSHIP AND MANAGEMENT PRACTICES (IJEMP)
www.ijemp.com

THE IMPACT OF STRATEGY DIFFUSION ON ORGANISATIONAL PERFORMANCE OF PROJECT-BASED ORGANISATIONS: A STRUCTURAL EQUATION MODELLING APPROACH

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Article Info:

Article history:
Received date: 05.10.2023
Revised date: 15.10.2023
Accepted date: 30.10.2023
Published date: 05.12.2023

To cite this document:

AlMaazmi, J.J. (2023). The Impact Of Strategy Diffusion On Organizational Performance Of Project-Based Organizations: A Structural Equation Modelling Approach. *International Journal of Entrepreneurship and Management Practices*, *6* (23), 01-25.

DOI: 10.35631/IJEMP.623001.

Abstract:

This study investigating the utilization of top-down and bottom-up techniques in spreading an organisation's strategy and getting back the performance. Additionally, project-based organizations may not have yet examined the use of one of the diffusion theories (such as Rogers' Theory of Innovation Diffusion) in contexts related to strategy or projects. Therefore, it was important and essential within project-based organizations to comprehend and use a strategy diffusion (top-down) and report its performance (bottom-up); to fulfil the entire drive of the strategy and increase the competitive advantage of firms. This study included a thorough examination of strategic management, diffusion theory, and project management facets. The strategy spreading techniques were based on Rogers' five well-known skills of diffusion theory; to diffuse the strategy (top-down) and reveal performance results (bottom-up) to feed each level of the project-based organization hierarchy structure, taking advantage of the interactions that exist among the strategy, the portfolio, and the project management facets. Additionally, since it is well known that organizational culture has a significant impact on business outcomes, mediation effects for the organizational culture related to the four organizational levels were considered throughout the relationship's examination between all the research variables. The research framework was therefore adopted and created. A questionnaire was designed and administered to strategy, portfolio, program and project professionals and data was analysed by using structural equation modelling (SEM) to assess the strength of the relationship between the strategy diffusion (top-down) variables, performance feedback (bottom-up) variables at all project-based organizational levels and the organizational performance variables, as well as, considering the mediation effects of the organizational culture. In addition, the direct and indirect causal influence of strategy diffusion influencing factors at all the levels of strategy, portfolio, program, and project and the organizational performance were

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evaluated. The findings indicate that strategy diffusion has a strong impact on organizational performance within project-based organisations. Whereas significant positive influences on the relationships were found between the research variables. In recent years, many studies have examined topics about relationships amongst strategy management, portfolio management, program management, and project management. However, those studies investigating the traditional one-way cascading of the organizational strategy. Furthermore, a few studies have been conducted to investigate the usage of top-down and bottom-up strategies to propagate an organization's strategy and improve performance. Furthermore, in project-based organizations, the prospect of applying one of the diffusion theories (e.g., Rogers' Theory of Innovation Diffusion) inside strategy or project contexts has not yet been investigated. As a result, this study added value in terms of the application of Structural Equation Modelling (SEM) to comprehend and apply strategy dissemination (top-down) and report its performance (bottom-up) within project-based organizations.

Keywords:

Diffusion Theory, Portfolio Management, Program Management, Project Management, Strategy Management

Introduction

Despite the important role of the strategy diffusion process in strategic management, empirical research focusing on project-based organisations in strategy diffusion has been limited. This study seeks to delve deeper to understand the impact of strategy diffusion on organisational performance within project-based organisations.

The organisational strategy needs to be understood by all staff at all levels of governance within the organisations very well, to implement their daily business in a way that contributes to the success of that strategy (Kaplan & Norton 2001).

Strategy management classically uses top-down perception to make sense of the collaborations amongst portfolios, programs, and projects (Clegg et al. 2018). But several scholars have criticized the common top-down, one-dimensional standpoints of strategy in the project-management literature (Lowstedt, Raisanen & Leiringer 2018), as the traditional (top-down) approach in project management focuses on rational structural aspects of strategizing, which leads to losing the focus on the fundamental practices and processes that are initiated by the strategy and how these practices and processes frame strategy implementation (Clegg et al. 2018).

Thus, the emergence of using a diffusion strategy (top-down) and (bottom-up) is imperative, so that the diffusion process can be significantly accelerated, and the organisational strategy will be translated, improvised, and made sensible. This will also fulfil the complete drive of strategy (Clegg et al. 2018; Lowstedt, Raisanen & Leiringer, 2018), especially as the professional strategy diffusion is the right method to help practitioners to enhance their tasks and activities, contribute more to their organisational strategic objectives, and enhance their organisational outcomes (Köhler & Zerfass 2019). Similarly, project management levels should know about their corporate aspect of their projects to know how to deal with it, to support their top strategy, understand the corporate needs; ultimately, this will lead to customer

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satisfaction and achieving business success (Meskendahl 2010; Patanakul & Shenhar 2012). Thus, a bi-directional link between strategy, projects, and project portfolio management is suggested in the literature on the practicing of strategy over projects, and the ability of project portfolio and project actions and processes to update the strategy (Killen et al. 2012). Furthermore, it will build on continuous mixes of bottom-up learning from projects-to-organisation and top-down strategic decision-making from organisation-to-projects (Lowstedt, Raisanen & Leiringer 2018).

The aim of this study is to investigate the effects of strategy diffusion on organisational performance in projects-based organisations. This can be done through developing an appropriate model that can ensure diffusing of the organisational strategy considering the presence of organisational involvement culture dimensions. This is in order to embed, translate and contribute that strategy in the organisation daily activities at all levels, as well as to confirm reporting back all performance and lessons learnt at all levels; for better decision-making and adjustment of the strategy, which ultimately will lead to enhanced and increased organisational performance (including financial, product market, shareholder return and stakeholder satisfaction) in project-based organisations (Clegg et al. 2018; Lowstedt, Raisanen & Leiringer, 2018; Köhler & Zerfass 2019).

In sum, a strategy concept with diffusion may help in bridging the gap related to the above argument about the utilisation of the strategy diffusion practice as a top-down approach. This can spread the organisational strategy and support reporting performance bottom-up, to learn the lessons and to make decisions accordingly, which will lead confidently to increase all organisational performance indicators. This research seeks to better model the relationships among strategy diffusion top-down, performance reporting bottom-up, and firm performance.

Rogers' Diffusion Theory And David's Strategic Management Model Integration

There was evidence by Kenny (2003) for the utilisation of Rogers' diffusion theory in the context of strategy and project management for educational innovation projects, where the strategy implementation often results in the change of identification and innovative projects, and the certainty is also involved in this formula.

However, to confirm additional validation about the concepts similarity of innovation diffusion and strategy diffusion, thus, a thorough mapping was conducted for the five diffusion decision process that consists of knowledge, persuasion, decision, implementation, and adaptation stages, which are adopted from Rogers' diffusion theory, with the strategic management three phases that consist of formulation, implementation, and evaluation that taken from David's strategic management model at each of the project-based organisation hieratical levels for strategy, portfolio, program and project levels as a top-down perspective.

Furthermore, the meanings of the four innovation diffusion factors (innovation, communication channels, time, and social system) in Rogers' diffusion theory and David's strategy management model are indicated below. Following that, it will provide the meanings of the characteristic's compatibility, relative advantage, complexity, observability, and trialability in Rogers' innovation diffusion theory and the meanings of the parallel characteristics (consistency, advantage, clarity, visibility consonance, and feasibility) in David's strategic management model. These terms have different meanings but the same terminology.

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Strategic Management And The Four Main Elements Of Rogers' Diffusion Theory

Rogers (2003, p. 5) defined diffusion as "the process in which an innovation is communicated thorough certain channels over time among the members of a social system". Therefore, as mentioned in this statement the four key elements of the diffusion are innovation, communication channels, time, and social system.

Innovation: for Rogers (2003), innovation definition is "an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers 2003, p. 12). The idea, practice, or project terms in strategic management are synonym to objectives, products, goals, and initiatives terms (David 2011). Thus, strategic decision to "adopt an innovation" happens only when a "shared vision" is approved over a mixture of top-down and bottom-up courses (Kenny 2003).

Communication channels: Rogers (2003, p. 5) defined communication as "a process in which participants create and share information with one another in order to reach a mutual understanding," with two ways of communication; mass communication and interpersonal communication (Sahin 2006). Likewise, in the setting of strategic management, to support a firm main role as a competitive team, communication and interaction adaptation between managers and employees across hierarchical levels are a must. This is because boosted communication provides deeper understanding of the strategies, which leads to higher commitment therefore, offering effective outcomes. Therefore, communication is crucial to successful strategic management. Moreover, top-down flow of communication is important to encourage and develop bottom-up support (Foreman & Argenti 2005; Hallahan et al. 2007; David 2011; Hume & Leonard 2014).

Time: The innovation-diffusion process, rate of adoptions, and adopter categorization all contain a time aspect (Sahin 2006). Furthermore, in strategic management there is a long-term objective, where the time frame should be reliable, usually from two to five years. In addition, there are short-term objectives, and the time frame for those objectives are less. Equally, in the strategy implementation stage the time aspect is crucial for deploying the strategic initiatives or projects. Moreover, the time dimension also must be considered for the monitoring, controlling, and measuring performance in the strategy evaluation stage (David 2011).

Social system: Rogers (2003, p.23) defined the social system as "a set of interrelated units engaged in joint problem solving to accomplish a common goal." Similarly, in the strategic management field, strategy formulation, implementation, and evaluation events happen at three hierarchical levels in a large organisation: enterprise, divisional or strategic business unit, and functional, sharing the same challenges to be solved and same objective to be achieved within targeted time (David 2011).

Strategic Management And The Five Characteristics Of Rogers' Diffusion Theory

As per Rogers (2003, p. 232), the process of innovation-diffusion is "an uncertainty reduction process", and he recommended number of attributes of innovations that could support in reducing the innovation uncertainty. Attributes of innovations consist of five characteristics of innovations: compatibility, relative advantage, complexity, observability, and trialability. Moreover, Rogers (2003, p. 219) indicated that "individuals' perceptions of these characteristics predict the rate of adoption of innovations".

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In Rogers' (2003, p. 229) diffusion theory relative advantage is defined as "the degree to which an innovation is perceived as being better than the idea it supersedes." Compatibility is defined as "the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (p. 15). Complexity is defined as "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 15). Trialability is defined as "the degree to which an innovation may be experimented with on a limited basis" (p. 16). Moreover, observability is defined as "the degree to which the results of an innovation are visible to others" (p. 16).

On the other hand, the same characteristics can be found in strategic management features as indicated by Rumelt (1998), which are: advantage, consistency, consonance, clarity, feasibility, and visibility. Advantage means that strategy must deliver for the foundation and up keeping of a competitive advantage in the chosen area of activity. Consistency in strategy means to provide consistent goals and policies. In consonance, the strategy must show an adaptive reaction to the exterior environment and to the serious modifications happening inside it. Moreover, strategy mission, vision and objectives should be clear to have the right foundation for all strategic planning, implantation, and evaluation undertakings, as well as to have same direction, achieve support, synergy, clarity, and gain higher performance among all levels of company. Additionally, feasibility of the strategy must provide the right resources availability and avoid forming unsolvable sub complications. Therefore, over-all, strategic objectives should be challenging, consistent measurable, clear, and realistic (David 2011).

All the above support and confirm the possibility of the study proposed concept of utilising Rogers' diffusion theory for strategy diffusion within project context as top-down method in a project-based organisation.

Review Of Strategy Diffusion (Top-Down) And Performance (Bottom-Up) In Project Based Organizations

Strategy Diffusion (Top-Down) Alignment

More studies have confirmed that it is very important that the firms correctly know their business management framework and the location of their portfolio, program, and projects management within it (Morris & Jamieson 2005). Several scholars (Artto & Dietrich 2004; Morris & Jamieson 2005; Thiry & Deguire 2007; Deloitte 2015; EY 2015; Walter, Lechner & Kellermanns 2016) outlined many practices and processes for governing the strategic, portfolio, program, and project connections in multi-project settings.

Traditionally, a pyramidal structure has been seen in project-based organisations, where management debating converted to project discussion. By the time, the practical implementation was renewed in such a way that supported in appearance of the top-down style within project management organisations, where the style suggested a cascading arrangement from the top management down to a single project, going through the portfolios and programs. In addition, the board of directors in the company can control the portfolio environment, classify programs, and accept projects for improvement. In figure 1, there is an individual portfolio, a minor quantity of programs inside the portfolio, and some projects contained by each program, where a synergy is formed amongst the projects (Thiry & Deguire 2007).

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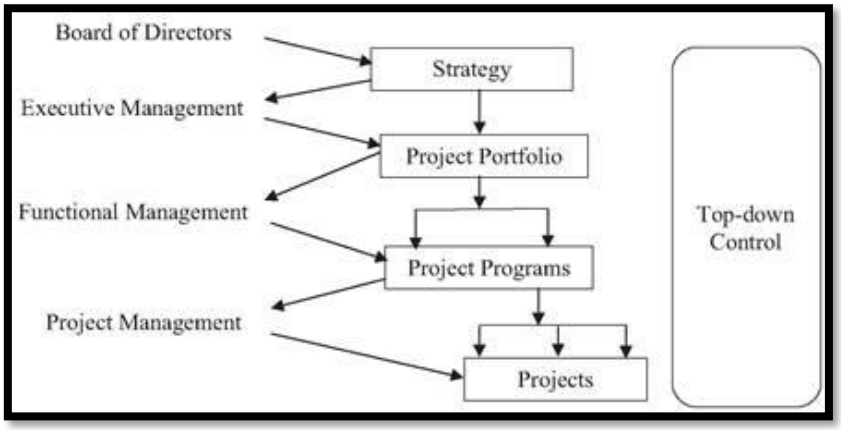

Figure 1: The Pyramid Structure Of A Project-Based Organisation
Source: (Thiry and Deguire 2007)

Additionally, according to Morris and Jamieson (2005) a hierarchy of objectives, strategies and strategic initiatives can usually be created as an output of a planning strategy phase, which can strongly affect the means of configuring, strategy managing and communicating it to the association. As shown in figure 2, the cascading process is proposed to show how organisations locate business strategy, portfolios, programs, and projects to accomplish their objectives and goals. As a result of these literatures suggestions, the equivalent top-down model has been adapted in this research.

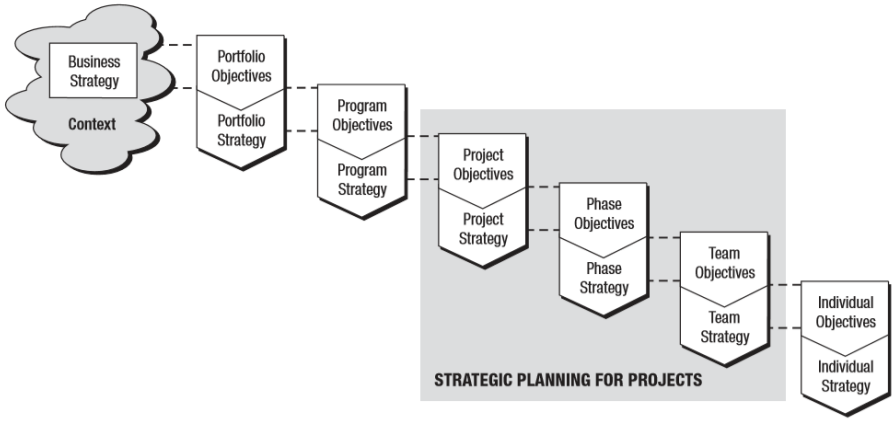

Figure 2: Linking Corporate And Project Strategy
Source: (Morris & Jamieson 2005)

Performance (Bottom-Up) Alignment

The strategy top-down and bottom-up mechanisms roles are diverse based on the organisation. This has also been explored in prior studies (e.g., Artto & Dietrich 2007; Killen *et al.* 2012; Kim *et al.* 2014). For instance, see figure 3 representing the model of the process of decision-making divided at three organisational levels, which highlights communication and data sharing amongst those levels. The communication and information flows are very important for the entire decision-oriented procedure for the multiple projects' strategic management. The arrows show communication and information flows, which considered as essential inputs and outputs for decision options (Artto & Dietrich 2007).

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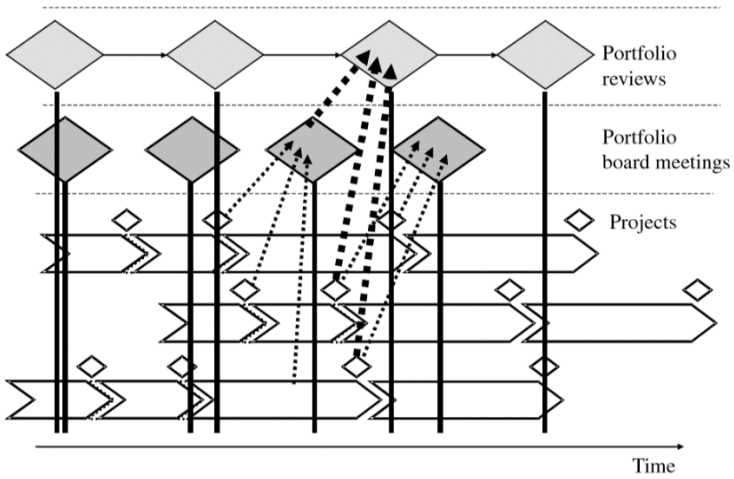

Figure 3: Bottom-Up Method For Information And Communication Flows Within The Organisational Levels

Source: (Artto & Dietrich 2007)

A bottom-up approach can be developed as an unplanned outline of activities and possibly will realize outcomes not originally proposed by top management. Therefore, bottom-up can shape objectives and action of the operations strategy, at least partially through the knowledge and lessons learnt from its day-to-day activities. According to the initial outcomes, top management strengthens or adjusts its plans as applicable (Kim et al. 2014).

Furthermore, a study by Serra and Kunc (2015) provided a conceptual example about benefits realisation, launching from projects and ending with the accomplishment of business objectives, as shown in figure 4. Theoretically, the process initiates on project results allowing direct delivery of intermediate benefits or business changes. In addition, as a strategic viewpoint, effective projects deliver the predictable benefits, then generate strategic value to the organisation. Hence, a good project management ensures the delivery of outputs, which enables outcomes, and then in turn facilitates the right benefits realisation.

As highlighted by EY (2015) that despite the importance of portfolio, programs and projects should work coherently although they have different objectives, however, to deliver the organisational objectives effectively. For example, project management focuses on providing a concrete output, and to do the things right. On the other hand, program management is the intermediary level that focuses on the provision of business benefits and realising the benefits. Portfolio management focuses on doing the right things via the decision-making process about which projects and/or programs should be implemented, based on their association with the organisational strategic key objectives and goals (see figure 5).

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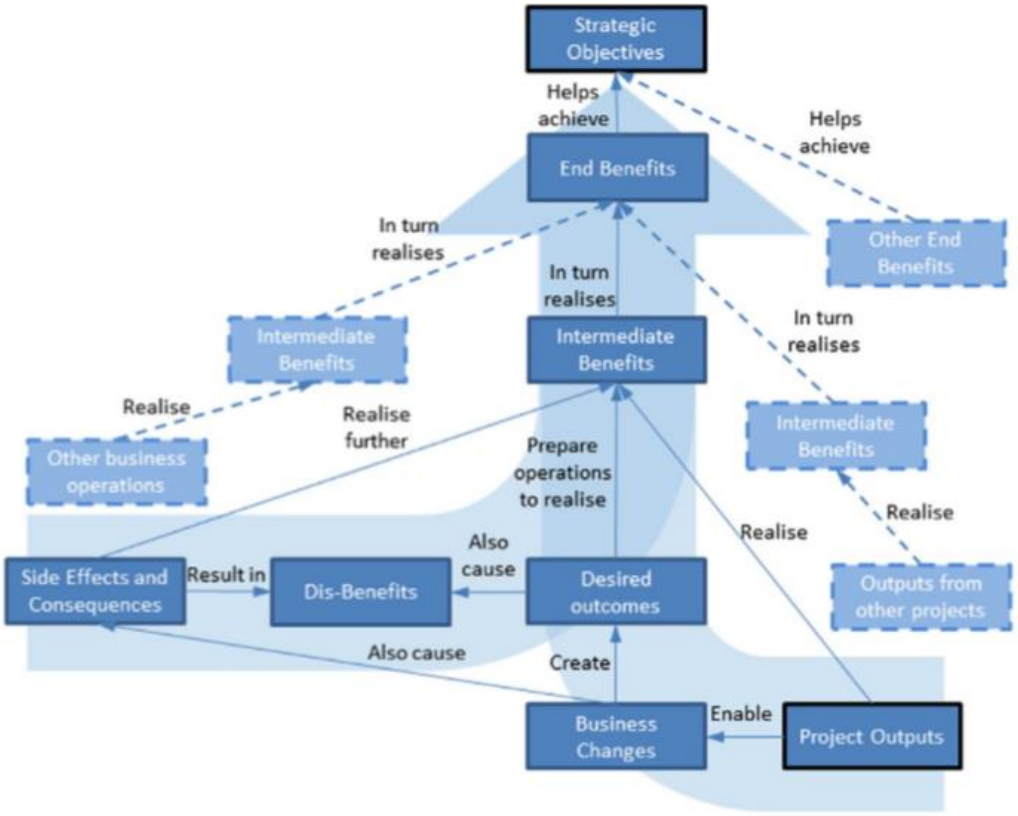

Figure 4: Benefits Realization Process

Source: (Serra & Kunc 2015)

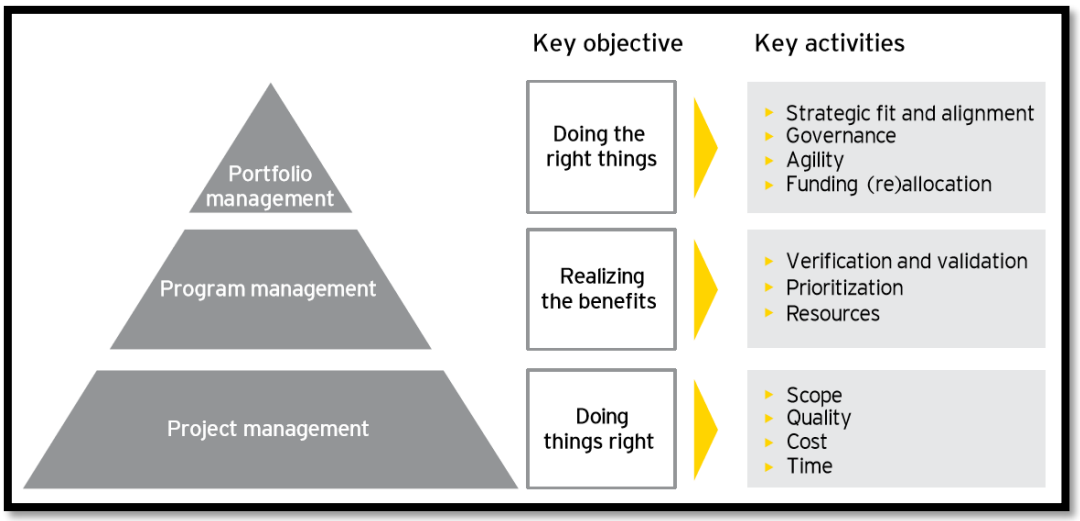

Figure 5: Portfolio, Program And Project Management Objectives And Activities

Source: (EY 2015)

In sum, from the above reviews top-down and bottom-up links between strategy, projects, and project portfolio management was explained in detail. Rogers's diffusion theory showed a perfect integration with strategic management phases at each level of the project-based organisation in a top-down manner. After that, the performance reporting method demonstrated

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a perfect alignment between project to program to portfolio reaching to strategic levels in a bottom-up method. All that paved the way for the established research conceptual framework.

Theoretical framework

The research objective required a review of existing strategic management theories and aligning them with business strategy and organisational project management levels. Thus, this section was intended to select a proper and effective strategic management style that can work for this research. Based on Muogbo (2013), David's strategic management model was a proper framework to utilise for this research as it is a mixture of strategy formulation, implementation, and evaluation, which is effective for all types of organisations specially for project management.

Likewise, since Rogers' diffusion theory is the most popular theory in diffusing and spreading practiced and shows its effectiveness within a quite good number of different fields. Furthermore, Rogers' diffusion theory offers a useful theoretical model to support the planning and implementation of any new improvement (Doyle, Garrett & Currie 2014). It is aligned with the research objective to appraise diffusion theories and assess the suitability of the selected theory for strategy diffusion in project-based organisations. Therefore, Rogers' diffusion model has been used to be imbedded in the suggested system for this study.

Finally, regarding project management, several literature reviews have been studied to define portfolio, program, and project management, to understand more about their main roles, and to explore more about their linkages amongst the portfolio, program, and project terms and the corporate direction. Accordingly, another objective for this study was settled through checking existing project management theories for the appropriate viewpoints of diffusing or spreading the strategy, which is the utilisation of the (top-down and bottom-up) approaches.

In summary, there will be an effort for this research to plan a relative structure of business layers (strategic level, business unit level including portfolio level, then program and project level), and all the intended levels are intersected with the three strategic phases from formulation, implementation, to evaluation. Moreover, for all top-down strategy phases, Rogers' diffusion theory will be utilised to diffuse the strategy from a top-down approach. To be more specific, it is suggested that for the (top-down) approach, the strategic "initiatives" will be spread by adopting Rogers' diffusion theory within each strategy phase, starting from the enterprise level to business unit project portfolio management, reaching to program and project levels. Then, for the bottom-up part, "performance" will be reported to higher levels, as the data will be going upward to the next level above it and so on until it reaches the organisational top level. See figure 6 for more explanation about the proposed research outline, where the strategy initiatives have been diffused from top levels to down levels, so that each level knows their links to the organisational strategy and to know their precise roles and activities. It is then required to identify the outputs and outcomes (performance) at each level, which are to be reported to the levels above. Finally, and as a goal for doing so, is to improve the organisational performance for the project-based firms, considering the culture of the organisation and how this influences the overall system.

Therefore, the conceptual framework of this study suggests that organisational performance can be improved through the strategy diffusion (top-down) practices, performance (bottom-up) drivers, and organisational culture driver and their associations directly or indirectly with the organisational performance.

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This model suggests that organisational performance is dependent on strategy diffusion (top-down) practices drawn from strategy initiative diffusion practice, portfolio initiative diffusion practice, program initiative diffusion practice, and project initiative diffusion practice.
It also suggests that organisational performance is dependent on strategy diffusion (top-down) practices mentioned with the presence of the mediation roles of the performance (bottom-up) aspects counting strategy performance, portfolios performance, programs performance, and projects performance.

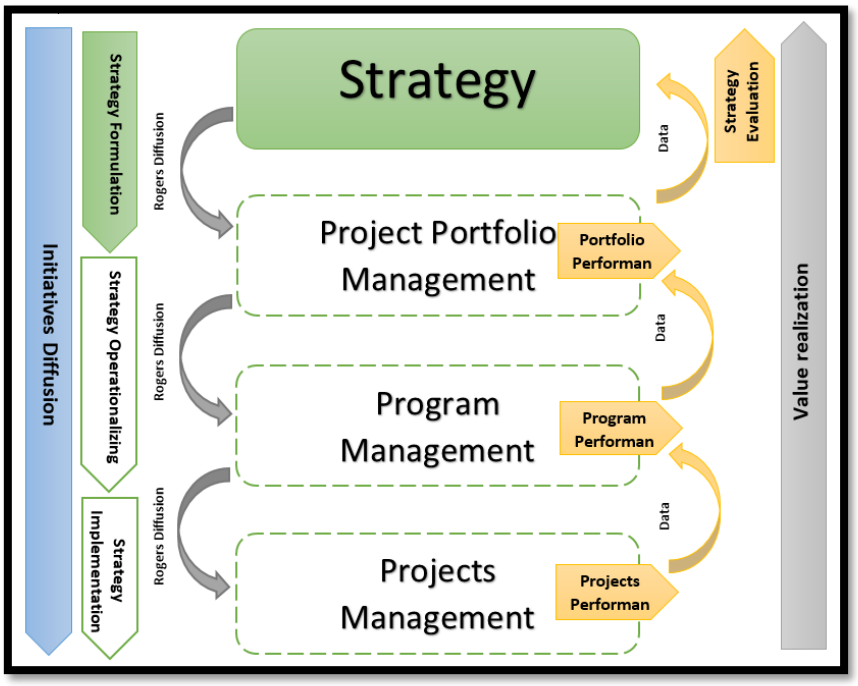

Figure 6: Research Proposed Outline

Moreover, the model suggests that organisational performance is dependent on strategy diffusion (top-down) practices with the occurrence of the mediation role of the organisational culture driver.

Furthermore, the framework proposes that there are top-down links amongst strategy diffusion from the strategy level, to portfolio, then to program and project levels, like studies (e.g., Ligetvári 2013). These relationships between strategy diffusion (top-down) practices at each level of a project-based organisation including the strategy, portfolio, program, and project levels will be explained, based on PMI (2017).

Furthermore, the model suggests that there are bottom-up links between performance reporter, means reporting from the project level as the bottom level of the organisation to the program level, then to the portfolio, and finally to the top level, which is the strategy level of the organisation, within project-based organisations based on PMI (2017).

Using this framework of factors and dimensions of strategy diffusion, a hypothetical diagram of the structural model is presented in figure 7. In the structural model, the arrow reflects the direction of hypothesized influences.

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The corresponding hypotheses are as follows:

- Strategy diffusion (top-down) hypotheses

H5a: There is a significant relationship between strategy initiatives diffusion practice and portfolio initiatives diffusion practice in the project-based organisations.
H5b: There is a significant relationship between portfolio initiatives diffusion practice and program initiatives diffusion practice in the project-based organisations.
H5c: There is a significant relationship between program initiatives diffusion practice and project initiatives diffusion practice in the project-based organisations.

- Performance (bottom-up) hypotheses

H6a: There is a significant relationship between project performance and program performance in the project-based organisations.
H6b: There is a significant relationship between program performance and portfolio performance in the project-based organisations.
H6c: There is a significant relationship between portfolio performance and strategy performance in the project-based organisations.

- Strategy level hypotheses

❖ Strategy initiative diffusion practice

H1a: There is a significant relationship between strategy initiatives diffusion practice and the organisational performance in the project-based organisations.

❖ Strategy performance as mediator

H1b: There is a significant relationship between strategy initiatives diffusion practice and the organisational performance mediated by strategy performance in the project-based organisations.

❖ Organisational culture as mediator at the strategy level

H1c: There is a significant relationship between strategy initiatives diffusion practice and the organisational performance mediated by organisational culture in the project-based organisations.

- Portfolio level hypotheses

❖ Portfolio initiative diffusion practice

H2a: There is a significant relationship between portfolio initiatives diffusion practice and the organisational performance in the project-based organisations.

❖ Portfolio performance as mediator

H2b: There is a significant relationship between portfolio initiatives diffusion practice and the organisational performance mediated by portfolio performance in the project-based organisations.

❖ Organisational culture as mediator at the portfolio level

H2c: There is a significant relationship between portfolio initiatives diffusion practice and the organisational performance mediated by organisational culture in the project-based organisations.

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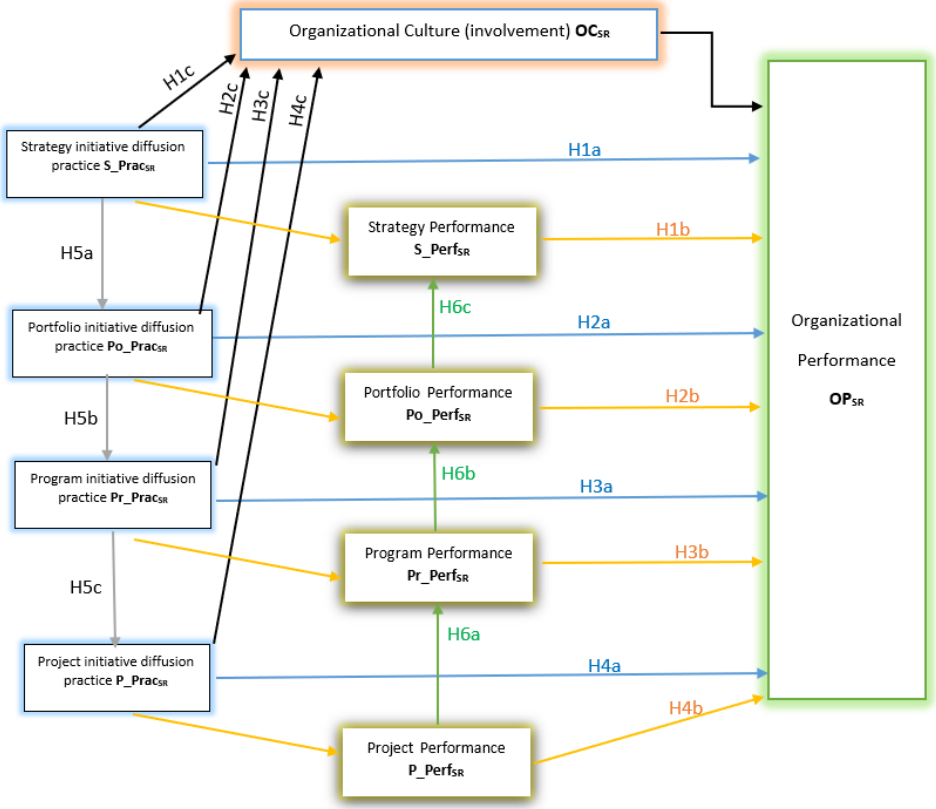

Figure 7: Proposed Research Hypothesised Model (Top-Down) And (Bottom-Up)

- Program level hypotheses

❖ Program initiative diffusion practice

H3a: There is a significant relationship between program initiatives diffusion practice and the organisational performance in the project-based organisations.

❖ Program performance as mediator

H3b: There is a significant relationship between program initiatives diffusion practice and the organisational performance mediated by program performance in the project-based organisations.

❖ Organisational culture as mediator at the program level

H3c: There is a significant relationship between program initiatives diffusion practice and the organisational performance mediated by organisational culture in the project-based organisations.

- Project level hypotheses

❖ Project initiative diffusion practice

H4a: There is a significant relationship between project initiatives diffusion practice and the organisational performance in the project-based organisations.

❖ Project performance as mediator

H4b: There is a significant relationship between project initiatives diffusion practice and the organisational performance mediated by project performance in the project-based organisations.

❖ Organisational culture as mediator at the project level

H4c: There is a significant relationship between project initiatives diffusion practice and the organisational performance mediated by organisational culture in the project-based organisations.

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Research methodology

The research method was a quantitative data collection method and the research technique for data collection was a survey method in which a structured seven-point Likert scale was utilized to test the hypotheses. A sample of the questionnaire is shown in Appendix A. And a simple random sampling (SRS) technique was proposed for generalization and the estimated targeted sample were from the fields of strategy, portfolio, program and project within the relative companies and utilities needed for this study numbered 3000. The responded to the survey were 567 with the rate of 19% from the estimated targeted sample. And the final valid sample applicable for the study was 373.

A regression analysis was performed to investigate the links between the outcome variable and the predicted variables with the presence of mediator variables. Especially, that the influence of strategy diffusion drivers in strategy, portfolio, program, and project levels on organisational performance development in project-based organisations needs to be evaluated. Furthermore, the mediating roles of performance (bottom-up) drivers in strategy, portfolio, program and project levels among strategy diffusion drivers and organisational performance in project-based organisations needs to be appraised.

The meditating role of the organisational culture driver in strategy, portfolio, program and project levels among strategy diffusion drivers and organisational performance in project-based organisations needs to be appraised.

According to Bacon and Bacon (2001), Byrne (2001), Chenini and Khemiri (2009) AMOS can be used to fit the kinds of factor analysis or regression models. AMOS has a graphical interface easy and effective to use and represent complicated models. It allows drawing the models according to researcher convenience, and it can make path diagrams for robust reporting, all those and more are important characteristics for software that researcher needs to use. Furthermore, AMOS is used to represent and examine the in-depth (the direct and indirect) effects of the identified independent, dependent, and moderator variables, which are equivalent to linear and multi regression analyses in SPSS software.

Therefore, the regression test was done via path analysis (causal model), to get the structural equation model (SEM). There was a model establishing process through adopting an initial model, then modifying the model, till getting the best fit model (final model) for the study that compliance the model fitness required criteria; to accomplish the research, aim and objectives. Accordingly, the coming sections will present the modelling, findings/results of the path analysis Structural Equation Model (SEM) performed on data through Amos statistical package software.

Modelling

At first, AMOS software with Maximum likelihood parameter estimation is used to assess the degree to which the predictor variables (Strategy Initiative Diffusion Practice (S_PracSR), Portfolio Initiative Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR), and Project Initiative Diffusion Practice (P_PracSR)) related to the outcome variable Organisational Performance (OPSR). Furthermore, Amos software is used to check the degree in which Organisational Culture (OCSR) related to Organisational Performance (OPSR).

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Then, Amos is used to check the huge mediation role of Organisational Culture (OCSR) between the independent variables (Strategy Initiative Diffusion Practice (S_PracSR), Portfolio Initiative Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR), Project Initiative Diffusion Practice (P_PracSR)), and the dependent variable Organisational Performance (OPSR).

The opening stage of modelling the association is to test whether performance can be predicted from the strategy diffusion (top-down). The tested initial model is shown in table 1 and figure 8. The results from the testing show that strategy diffusion (top-down) is not a good predictor of the organisational performance (RMSEA = 0.689). Precisely, the results also indicate that S_PracSR and P_PracSR only have significant predictors of the organisational performance with p<0.001, however the other two predictors Po_PracSR and Pr_PracSR also can be accepted with p<0.5. Thus, this initial model supports and accepts all the hypotheses: **H1a, H2a, H3a and H4a.**

Table 1: Regression Weights: (Group Number 1 - Default Model)

Outcome	Path	Predictor	Standardized Estimates (Beta)	S.E.	C.R.	P
OP_SR	<---	S_Prac_SR	,249	,061	4,063	***
OP_SR	<---	P_Prac_SR	,294	,048	6,077	***
OP_SR	<---	Po_Prac_SR	,051	,075	,680	,497
OP_SR	<---	Pr_Prac_SR	,096	,065	1,468	,142

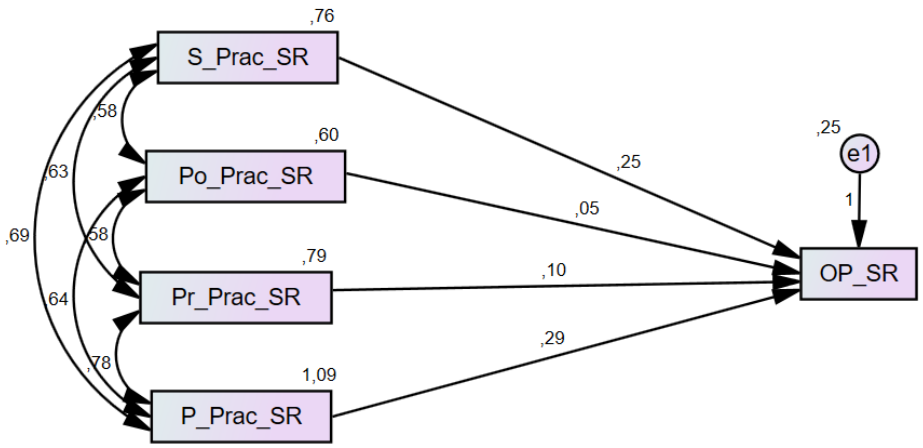

Figure 8: Research Initial Model With Standardized Estimates

The next analysis is to introduce OC_{SR} as mediator, to check whether it will have an influence on the associations between organisational performance and strategy diffusion (top-down). Thus, to make sure of these assessments, model 1 has been created. See the graphical model figure 9, for more explanation of model 1 with the mediation of Organisational Culture (OC_{SR}) role. The graphical model illustrates the Standardised Estimates, and all estimated path coefficients were statistically positive.

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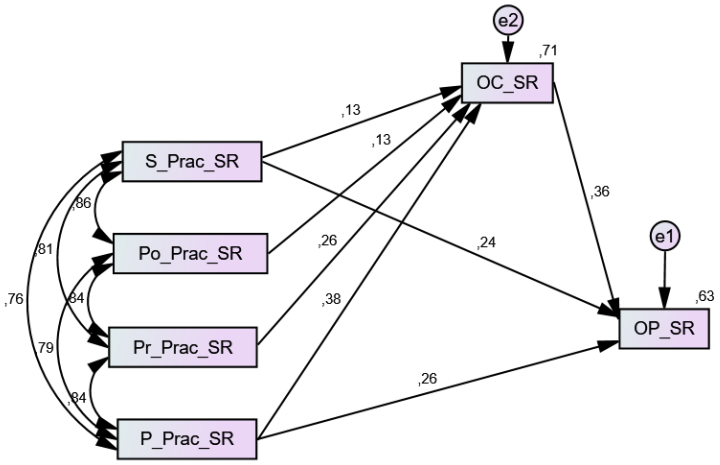

Figure 9: Research (Model 1) With Standardised Estimates With OCSR Mediation Role

Model Fit Analysis Summary (Model 1) In Case Of The Presence of OCSR Mediation Role
It is very essential to evaluate the model fitness before starting the data analysis of the model. The model fitness includes the following (as shown in table 2):

- The absolute fit indicator CMIN = 0.056 at ($p < 0.972$) an insignificant level,
- And the normal CMIN/DF = 0.028 is an excellent fit.

In addition, TLI = 1.006 indicates an excellent fit, CFI = 1.000 indicates an excellent fit, and RMSEA = 0.000 is less than 0.06 which is an excellent value. Overall, the theoretical model fit is in an excellent fit range, based on Cut-off Criteria table 3.

Table 2: Model Fitness Analysis Summary (Model 1)

Measures of Fit	Estimate Value	Indications of Model Fit	Interpretation
Chi-Square (CMIN)	0.056	-	-
DF	2	-	-
P	0.972	A value is greater than 0.05 indicates a close fit.	Acceptable fit
CMIN/DF	0.028	A value less than 1 indicates an over-fit of the model.	Acceptable fit
GFI	1.000	A value close to 1 indicates a perfect fit.	Excellent fit
TLI	1.006	A value greater than 1 indicates an over-fit of the model.	Excellent fit
CFI	1.000	A value close to 1 indicates a very good fit.	Excellent fit
NFI	1.000	A value close to 1 indicates a very good fit.	Excellent fit
RMSEA	0.000	A value of 0.0 indicates the exact fit of the model.	Excellent fit

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Table 3: Cut-Off Criteria

Measure	Terrible	Acceptable	Excellent
CMIN/DF	>5	>3	>1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
P Close	<0.01	<0.05	>0.05

Source: (Hu & Bentler 1999)

Global Framework's Hypotheses (Model 2) Testing Results

For further examination for global framework's hypothesis testing, a final and revised model (Model 2) has been constructed with additional paths that are linked to the company performance data reporting part, which basically representing the research proposed bottom-up method. Those additional paths are the independent mediation variables (Strategy Performance (S_PerfSR), Portfolio Performance (Po_PerfSR), Program Performance (Pr_PerfSR), and Project Performance (P_PerfSR)) that also could influence the organisational performance.

Therefore, Amos software with Maximum likelihood parameter estimation is used to assess in (Model 2) again the updated degree to which the predictor variables (Strategy Initiative Diffusion Practice (S_PracSR), Portfolio Initiative Diffusion Practice (Po_PracSR), Program Diffusion Practice (Pr_PracSR), and Project Initiative Diffusion Practice (P_PracSR)) are related to the outcome variable Organisational Performance (OPSR). Furthermore, Amos software is used to check the updated degree to which Organisational Culture (OCSR) was related to Organisational Performance (OPSR).

Then, Amos is used to check the huge mediation roles of Organisational Culture (OCSR), Strategy Performance (S_PerfSR), Portfolio Performance (Po_PerfSR), Program Performance (Pr_PerfSR), and Project Performance (P_PerfSR) between the independent predictor variables (Strategy Initiative Diffusion Practice (S_PracSR), Portfolio Initiative Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR), and Project Initiative Diffusion Practice (P_PracSR)). The dependent variable Organisational Performance (OPSR) connections. See figure 10, the final and revised model (model 2) with the mediation of Organisational Culture (OCSR), Strategy Performance (S_PerfSR), Portfolio Performance (Po_PerfSR), Program Performance (Pr_PerfSR), and Project Performance (P_PerfSR). The graphical model below is illustrated with Standardised Estimates, and all estimated paths coefficients are statistically positive as seen.

The absolute fit indicator CMIN = 65.209 ($p < 0.001$) has reached a significant level, and the normal CMIN/DF = 3.260 is within the reasonable range of acceptance. In addition, TLI = 0.977 indicates a very good fit, CFI = 0.990 indicates a very good fit, and RMSEA = 0.078 is a barely acceptable standard value. Overall, the theoretical model fit is in the acceptable range. See table 4.

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Results of SEM

Path Analysis Results In (Model 1)

The standardised regression weights are used since they enable comparison of the relative impact of each independent variable on the dependent variable. Table 5 presents the standardised regression estimates allowing us to investigate the direct relationship between the studied constructs. It should be emphasized that the degree of significance is determined by the regression estimate's critical ratio (CR), Where all CR values are greater than or equate to 2.58, indicating a 99 percent level of significance, except for the paths amongst (S_Prac_{SR} and OC_{SR}) and amongst (Po_Prac_{SR} and OC_{SR}).

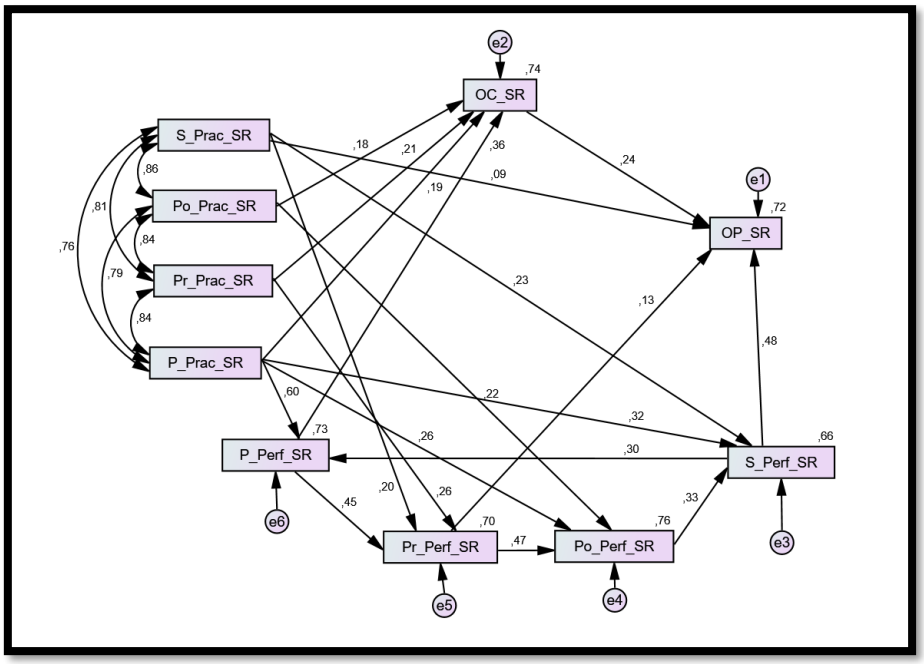

Figure 10: Research Final Revised Model (Model 2) With Standardized Estimates With OCSR And Performance Mediation Variables Roles

Table 4: Final Revised Model Fit Analysis Summary (Model 2)

Measures of Fit	Estimate Value	Indications of Model Fit	Interpretation
Chi-Square (CMIN)	65.209	-	-
DF	20	-	-
P	0.000	A value is less than 0.01 indicates a Terrible fit.	Excellent fit
CMIN/DF	3.260	As beginning to be reasonable.	Acceptable fit
GFI	0.967	A value close to 1 indicates a perfect fit.	Excellent fit
TLI	0.977	A value close to 1 indicates a very good fit.	Excellent fit
CFI	0.999	A value close to 1 indicates a very good fit.	Excellent fit
NFI	0.985	A value close to 1 indicates a very good fit.	Excellent fit

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RMSEA	0.078	A value of about 0.08 or less indicates a reasonable error of Approximation.	Acceptable fit

Table 5: (Model 1) Regression Weights: (Group Number 1 - Default Model)

Path			Standardized Estimates (Beta)	S.E.	C.R.	P
Outcome		**Predictor**				
OC_SR	<---	S_Prac_SR	,127	,060	2,216	,027
OC_SR	<---	Po_Prac_SR	,131	,074	2,092	,036
OC_SR	<---	Pr_Prac_SR	,261	,064	4,205	***
OC_SR	<---	P_Prac_SR	,383	,048	7,034	***
OP_SR	**<---**	**S_Prac_SR**	**,238**	**,047**	**4,614**	*******
OP_SR	**<---**	**P_Prac_SR**	**,262**	**,044**	**4,519**	*******
OP_SR	<---	OC_SR	,361	,048	6,401	***

Significance of Correlations: *** p < 0.001, ** p < 0.01, * p < 0.05, p < 0.1

Summary Of (Top-Down) Hypotheses Testing Results (Model 1)

In summary, Strategy Initiatives Diffusion Practice (S_PracSR) and Project Initiative Diffusion Practice (P_Prac_{SR}) will all lead to an increase in the Organisational Performance (OP_{SR}) in the public project-based organisations directly.

The influence of OCSR as a mediator on the relationships between the predictor variables (S_PracSR, Po_Prac_{SR}, Pr_Prac_{SR}, and P_Prac_{SR}) and the outcome variable Organisational Performance (OP_{SR}) has shown that the path coefficients of Program Initiative Diffusion Practice (Pr_PracSR) and Project Initiative Diffusion Practice (P_Prac_{SR}) are statistically significant at $p < 0.001$ level and associated positively. However, the paths between Strategy Initiative Diffusion Practice (S_Prac_{SR}) and Organisational Culture (OC_{SR}), as well as between Portfolio Initiative Diffusion Practice (Po_Prac_{SR}) and Organisational Culture (OC_{SR}), are statistically positive and significant at $P<0.05$ level. The path which is between Organisational Culture (OC_{SR}) and organisational performance (OP_{SR}) is statistically significant at $p < 0.001$ level as below table, which means that the organisational culture mediation role is more effective for Portfolio Initiatives Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR) and Project Initiative Diffusion Practice (P_Prac_{SR}) on Organisational Performance (OPSR).

Based on the Beta coefficient calculation shown in table 6 below, and as per the total, direct and indirect effects matrix, the best ways to emerging the organisation performance within project-based organisations are through:

The direct influence of strategy diffusion practice and project diffusion practice.

The indirect influences of portfolio diffusion practice and program diffusion practice, which is caused by the mediation effect of organisational performance.

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Table 6: (Model 1) Standardised Specific Indirect Path Effects Calculation

Path	Direct Effect (X→Y)	Indirect Effect (X→ M → Y)	Result
S_Prac$_{SR}$ → OC$_{SR}$ → OP$_{SR}$	0.24***	0.13*0.36 = 0.0468*	Partial Mediation
Po_Prac$_{SR}$ → OC$_{SR}$ → OP$_{SR}$	0	0.13*0.36 = 0.0468*	Full Mediation
Pr_Prac$_{SR}$ → OC$_{SR}$ → OP$_{SR}$	0	0.26*0.36 = 0.0936***	Full Mediation
P_Prac$_{SR}$ → OC$_{SR}$ → OP$_{SR}$	0.26***	0.38*0.36 = 0.1368***	Partial Mediation

*****p<0.001; **p<0.01; *p<0.05; p<0.1; ns= "not significant"**

Although, all the diffusion practices show a strong impact on increasing the organisational performance when carrying out the mediation of organisational culture, the organisational culture plays a huge role in mediating between all the diffusion practices at the Strategy, Portfolio, Project, and Project levels and the organisational performance.

Moreover, it is confirmed from the associations' findings through positive and significant correlations at 0.001 level found for all the diffusion practice independent variables (Strategy, Portfolio, Project, and Project), leading to an important conclusion that the strategy initiatives diffusion using top-down approach of this research is supported and endorsed. Therefore, the strategy diffusion occurs from the strategy to portfolio, then to program, and finally to project levels within project-based organisations.

Path Analysis Results In (Model 2)

AMOS software is used to assess again the degree to which (Strategy Initiative Diffusion Practice (S_PracSR), Portfolio Initiative Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR), and Project Initiative Diffusion Practice (P_PracSR)) variables, and Strategy Performance (S_PerfSR), Portfolio Performance (Po_PerfSR), Program Performance (Pr_PerfSR), and Project Performance (P_PerfSR)) variables are related to Organisational Performance (OPSR) and Organisational Culture (OCSR). Furthermore, the degree to which Organisational Culture (OCSR) relating to Organisational Performance (OPSR) is also assessed again using AMOS software.

Table 7 below presents the standardised regression estimates for Model 2 and has allowed us to investigate the direct relationship between the studied constructs. The level of significance is determined by the critical ratio (CR) of the regression estimate, according to the researcher. Thus, all CR values are greater than or equate to 2.58, except for the path between S_PracSR and OPSR which is = 1.942.

The Global Framework's Hypotheses (Model 2) Testing Results Summary

In summary, from Model 2 the Strategy Initiatives Diffusion Practice (P_PracSR) will lead directly to an increase in the Organizational Performance (OPSR) in the public project-based organization s. But it does not lead to increasing the Organizational Performance (OPSR) through using the influence of the Organisational Culture (OCSR).

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Table 7: (Model 2) Regression Weights: (Group Number 1 - Default Model)

Path			Standardized Estimates (Beta)	S.E.	C.R.	P
Outcome		**Predictor**				
Po_Perf_SR	<---	Po_Prac_SR	,222	,038	5,178	***
Pr_Perf_SR	<---	Pr_Prac_SR	,258	,033	4,910	***
P_Perf_SR	<---	P_Prac_SR	,599	,031	14,536	***
S_Perf_SR	<---	P_Prac_SR	,316	,029	5,766	***
Po_Perf_SR	<---	P_Prac_SR	,257	,030	5,587	***
Pr_Perf_SR	<---	S_Prac_SR	,204	,032	4,141	***
S_Perf_SR	<---	S_Prac_SR	,233	,031	4,762	***
OC_SR	<---	Po_Prac_SR	,184	,059	3,627	***
OC_SR	<---	Pr_Prac_SR	,211	,059	3,688	***
OC_SR	<---	P_Prac_SR	,192	,054	3,092	,002**
OC_SR	<---	P_Perf_SR	,355	,055	7,568	***
OP_SR	<---	S_Prac_SR	,087	,040	1,942	,052
OP_SR	<---	OC_SR	,240	,038	5,458	***
OP_SR	<---	S_Perf_SR	,484	,063	10,879	***
OP_SR	<---	Pr_Perf_SR	,133	,063	2,917	,004**
Po_Perf_SR	<---	Pr_Perf_SR	,469	,049	11,799	***
Pr_Perf_SR	<---	P_Perf_SR	,454	,030	10,835	***
S_Perf_SR	<---	Po_Perf_SR	,327	,042	6,231	***
P_Perf_SR	<---	S_Perf_SR	,300	,059	7,202	***

Significance of Correlations: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$

In Model 2 the influence of Organisational Culture (OCSR) as a mediator on the relationships between the predictor variables (Po_PracSR, Pr_PracSR, and P_PracSR) and the outcome variable Organisational Performance (OPSR) has shown very good path coefficients being statistically significant at $p < 0.001$ and $p < 0.01$ levels and associated positively. This means that the organisational culture mediation role is effective for Portfolio Initiatives Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR) and Project Initiative Diffusion Practice (P_PracSR) on Organisational Performance (OPSR).

Furthermore, in Model 2 the influence of S_PerfSR, Po_PerfSR, Pr_PerfSR, and P_PerfSR as a mediator on the relationships between the predictor variables (S_PracSR, Po_PracSR, Pr_PracSR, and P_PracSR) and the outcome variable Organisational Performance (OPSR) has shown very good path coefficients being statistically significant at $p < 0.001$ level and only on path as $p < 0.1$ level and associated positively. This means that the performance variables as a mediation role is effective for Strategy Initiatives Diffusion Practice (S_PracSR), Portfolio Initiatives Diffusion Practice (Po_PracSR), Program Initiative Diffusion Practice (Pr_PracSR) and Project Initiative Diffusion Practice (P_PracSR) on Organisational Performance (OPSR), which supports the hypotheses H1b, H2b, H3b and H4b.

From Model 1, the huge influence of the predictor variables (S_PracSR, Po_PracSR, Pr_PracSR), and P_PracSR on the outcome variable OPSR is tested, but only S_PracSR and P_PracSR has statistically positive and significant direct effect, which supports the hypotheses H1a and H4a, but not the hypotheses H2a and H3a.

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In addition, from Model 1 and Model 2, the huge influence of the mediation role for organisational culture is obvious in the relations between all the predictor variables (S_PracSR, Po_PracSR, Pr_PracSR), and P_PracSR and the outcome variable OPSR, as they have statistically positive and significant effects, which supports the hypotheses H1c, H2c, H3c and H4c.

When testing the effect of (S_PerfSR, Po_PerfSR, Pr_PerfSR), and P_PerfSR variables amongst each other from Model 1 and Model 2, there is statistically significant and positive effect at 0.001 level and one effect only at 0.052 level found in the path coefficient between Pr_PerfSR and P_PerfSR; Po_PerfSR and Pr_PerfSR; S_PerfSR and Po_PerfSR; and between S_PerfSR and P_PerfSR, which supports the hypotheses H6a, H6b and H6c. Thus, this leads to increasing of Strategy Performance (S_PerfSR), and/or Portfolio Performance (Po_PerfSR), and/or Program Performance (Pr_PerfSR), and/or Project Performance (P_PerfSR) will lead to increasing the growth of OPSR in the public project-based organisations.

Moreover, it is confirmed from the correlations results a positive and significant associations at $p < 0.001$ level found for all the diffusion practice independent variables (Strategy, Portfolio, Project, and Project), leading to an important conclusion that the strategy initiatives diffusion using top-down approach of this research is supported. Therefore, the strategy initiatives spread from strategy to portfolio, then to program, and finally to project levels within project-based organisations, which totally support the hypotheses: H5a, H5b, and H5c.

As per the Beta coefficient and the total, direct and indirect effects matrix in Model 1 the best ways to emerging the organisation performance within project-based organisations are through:

- The direct influence of strategy diffusion practice and project diffusion practice as (Model 1).
- The indirect influences of strategy diffusion practice, portfolio diffusion practice, program diffusion practice, and project diffusion practice, which are caused by the mediation effect of organisational culture as (Model 1).

However, according to the Beta coefficient and the total, direct and indirect effects matrix in Model 2, the best ways to emerging the organisation performance within project-based organisations are through:

- The direct influence of strategy diffusion practice only as Model 2.
- The indirect influences of portfolio diffusion practice, program diffusion practice, and project diffusion practice, which are caused by the mediation effect of organisational culture as Model 2.
- The indirect influences of strategy diffusion practice, portfolio diffusion practice, program diffusion practice, and project diffusion practice, which are caused by the mediation effect of the strategy performance, portfolio performance, program performance, and project performance as Model 2.

In public project-based companies, embedding OCSR as a causal effect at the organisation structural levels of Strategy, Portfolio, Program, and Project will lead to increase the development of organisation performance. Therefore, the organisational culture plays a huge role in mediating between all the diffusion practices at the Strategy, Portfolio, Project, and Project levels and the organisational performance. Furthermore, embedding S_PerfSR, Po_PerfSR, Pr_PerfSR and P_PerfSR as a causal effect at the organisation structural levels of

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Strategy, Portfolio, Program, and Project levels, will also lead to increasing the development of organisation performance. Therefore, the performance management for each level (Strategy, Portfolio, Program, and Project) plays a huge role in mediating between all the diffusion practices at the Strategy, Portfolio, Project, and Project levels and the organisational performance.

Similar closing indicates the necessity of having the OCSR as a mediator of strategy diffusion practices that spreads the top-down strategic initiatives and decision-making from the company till the Project level and then bottom-up learning and reporting the performance data from the project to the organisation.

Conclusion

The main findings of the study that there are clear significant relationships between the independent variables, mediator's variable with dependent variable, and the findings approved that the proposed framework is workable and can act as the basis of the strategy diffusion within PBOs.

The research questions led to the development several hypotheses that were: (18 Nos) tested and (14 Nos) accepted, in which (4 Nos) only conditionally accepted, where:

- 3 (direct) relationships between for strategy diffusion practices at (Portfolio, Program, Project) levels toward (OP) were conditionally accepted; the impact is more effective (indirectly) when there is (an organizational culture) involvement to support the strategy spreading during the implementation of the strategy diffusion (top-down), rather than their direct effects.
- One of the proposed relationships mediated by OC between (S-Pract) at strategy level and (OP), was conditionally accepted supported by study data; as its supported theoretically.
- All (indirect) relationships that mediated by OC or/and Performances are strongly justified by study data and theoretically. As study done by (Al-bawaia, et al., 2022), where the study proved a significant effect of corporate culture on organizational effectiveness.
- All relationships (between the levels): top-down & bottom-up indicates that strategy management within PBOs can't stand alone (strongly supported by study data and previous studies).

In sum, the final acceptance of the hypotheses and their assignment within the study framework was confirmed the new framework with study data and previous literatures, and the mediations variables had strong impact on the diffusion processes to enhance the organizational performance within PBOs.

The study framework proofed to be appropriate as a scaffolding on which to build the strategy diffusion culture within PBOs. Thus, this study will develop a new practical robust platform (model) that can diffuse successfully the organisational strategy using the theory of Rogers innovation diffusion theory via practicing all the diffusion decision process stages through utilising the top-down method to each project-based organisational levels at strategy, portfolio, program and project levels and report back all the needed performance via applying the bottom-up approach from each of these levels. This is done to establish a proper decision-making bases and for competitive advances as indicated by Clegg et al. (2018).

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As recommendation, the study new conceptual model (captures at once the bidirectional strategy diffusion top-down method and performance reporting bottom-up method with Roger's diffusion concept within project-based companies), so it is a promising framework for additional investigations.

The new model introduced novel interrelations paths beyond the scope of this research:

- Path P-Prac → P-Perf → OC → OP, means the influence of organizational culture can be extended also on all PBOs levels' performances also when reporting the data, not only on the PBOs levels' practices.
- Paths like: S-Prac → Pr-Perf → OP and P-Prac → Po-Perf or S-Perf → OP, means the impact of one level practices can be seen from to other level performance. Like what addressed by Ojiako et al. (2023) the influence of project portfolio management strategies on the link between organizational ambidexterity and project success. Also, like what found by Unegbu et al. (2022) a significant relationship between construction project management practices and project performance. And then, there is a strong correlation between project performance and success.
- Multi-Mediation effects within the new model, means for each level practice can be reported to op at any of above levels at any time.

These unforeseen paths have widened the horizon to conduct further investigations and more findings with more hypotheses can be proposed for the same constructed model.

Acknowledgement
I would like to convey my heartfelt gratitude to my university BUiD and BUiD Library team for their assistance and contributions during the research process.

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International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 6 Issue 23 (December 2023) PP. 01-25
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