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DETERMINANT FACTORS FOR KNOWLEDGE SHARING OF OUTSOURCED FACILITIES MANAGEMENT DELIVERABLES IN GOVERNMENT BUILDINGS

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ABSTRACT

It was not until 2007 that the government of Malaysia paid additional attention to improving the national assets and facilities through outsourced facilities management (www) and maintenance services as part of the overall public delivery system improvement. An effective knowledge management (KM) is needed to guarantee that the quality of public assets is not compromised despite the costly government services, as compared to the private sector. Poor service delivery, lack of communication and weak performance management are among the hitches reported from the OFM team, which are believed to have resulted from the absence of knowledge sharing (KS) activities within the members of the organisation. This paper aims to identify the factors that determine the KS of OFM services in government buildings. Based on the Theory of Planned Behaviour (TPB), a set of questionnaires has been developed concerning past studies and distributed to OFM personnel through a self-administered online platform. 112 out of 200 responded data set is analysed through SPSS Version 28. The findings from Factor Analysis finalised 30 out of 33 proposed construct items, where training and development, organisation structure and explicit knowledge were eliminated due to low communality value. Thus, from

the research, a conceptual framework is suggested that consists of five determinant factors as independent variables, namely self-attitude, nature of knowledge, motivation to share, organisation culture and opportunity to share, while KS towards performance improvement of OFM in government buildings is the dependent variable.

Keywords: *Government buildings, Knowledge sharing, Performance improvement, Outsourced facilities management, Theory of Planned Behaviour*

INTRODUCTION

Outsourcing is a method of managing government assets by transferring the resources to service providers (Lok et al., 2018) as a way for the government to reduce its expenses on non-core services. In Malaysia, the privatization of public hospitals' non-clinical support services in 1996 was the start of outsourced Facilities Management (FM) involving government buildings. It is a new era of FM where the beginning in 1974 was on the maintenance of public buildings, roads, and sewerage systems of buildings under the Public Works Department (PWD) (Kamaruzzaman & Zawawi, 2010). The establishment of the National Asset and Facilities Management (NAFAM) Convention in 2007 was the first attempt to show that the government of Malaysia was committed to establishing a systematic management in FM. The intention was to improve the public delivery system by turning it into a more effective and efficient public service through a well-functioning national asset and facilities (Myeda & Pitt, 2014; Isa et al., 2016; Kamaruzzaman et al., 2018). A well-strategised system is crucial for government buildings and assets as they do not merely represent the image of a country but also the wise spending of public money by the ruling government. This is because government services are more expensive than private sector services (Hopland, 2019), and government assets require significant financial investment. Ongoing cost reduction exercises in the public sector are not the only solution, but also to adopt effective knowledge management (KM) efforts and programs (Haile et al., 2020). KM involves strategies to enhance the performance of government services by managing their intellectual assets, including existing knowledge and expertise (Sadat, 2021). As the main part of KM, Knowledge sharing (KS) is a central process

that connects and integrates various other KM processes and practices (Abdelwhab et al. 2019), where workers exchange knowledge, experiences and skills throughout the organisation through behavioural beliefs (Farooq, 2018). KS is characterised by profound human interactions, which make it a dynamic social process (Kucharska, 2018). Several studies have claimed that adopting good KS culture will improve social interactions, hence enhance innovation (Yao et al., 2020), boost job and life happiness (Ahmad & Karim, 2019) and develop a sense of satisfaction (Saffar & Obeidat, 2020), which leads to organisation performance improvement.

Although the advantages of knowledge have been discovered by past researchers, the awareness and research of KS in FM organisations is very low Sanboskani & Srour (2022); Kamaruzzaman et al., (2016); Yasin & Egbu (2010). This is due to a lack of motivation in individuals and groups to get involved in KS (Farooq, 2018), which is the main barrier for sustainable KS activities (Zaidi et al, 2021). Rather than being documented and shared, knowledge gained from development solutions is always at risk of being forgotten or lost (Janus, 2016). This will lead to a loss of tacit knowledge and a knowledge gap, especially in the case of reorganisation or personal displacement in FM. The agility of the public service provided will be decreased as the institution needs to realign the policy and strategy (Sulistyaningsih et al., 2021).

In outsourced FM, the client's expected sourcing outcomes, such as service quality and cost reduction, are not achieved when service providers and the client do not share adequate, relevant knowledge. (Zimmermann et al., 2018). Hence, it is difficult to achieve a mutual understanding among the team members and resulting in unnecessary outlay for maintenance and remedial work. Failure of outsourcing leads to in-house staff's resistance, poor communication, cultural clashes, conflict of interest and poor mutual understanding. (Sridarran & Fernando, 2016). This, in turn, will jeopardise the overall performance of government assets.

Thus, improving outsourced FM is important to enhance public confidence towards the government's responsibilities (Ismail et al., 2019). With the implementation of a systematic KM through KS, government organisations will be able to optimise their intellectual asset and investments and ensure knowledge sustainability. This study, therefore, seeks to identify

the factors that determine the KS of outsourced FM services in government buildings.

LITERATURE REVIEW

Knowledge Sharing Determinant Factors

The research adopts the Theory of Planned Behaviour (TPB) introduced by Ajzen in 1991. The theory assumes every element (attitude, subjective norm and perceived behavioural control) is totalled as part of actual behaviour (Tohidinia & Mosakhani, 2010). The theory is selected for this study as it is regarded as the most influential and popular model for describing and predicting human behaviour in a specific context (Ajzen, 2002). The TPB is known to have a robust construct, hence justifying the reliability and validity of the variables (Rahadhi & Suzianti, 2020) TPB is also commonly used to study the intention of individuals to participate in KS behaviours (Abdelwhab et al., 2019).

The focus of KS as part of KM needs to be understood and classified distinctively in three dimensions as: individual, organisational and technical (Lin, 2007; Edwards, 2011; Abdelwhab et al., 2019) and be considered collectively (Abdelwhab et al., 2019). With regards to TPB, individual dimension refers to attitude or behavioural belief, organisational dimension is subjective norm or normative belief, and technical dimension is perceived behavioural control or control belief.

Individual Dimension

Self-Attitude

TPB regards attitude as a critical factor influencing the intention towards a specific behaviour (Al-Kurdi et al., 2020), which is based on individual characteristics (Ayub et al., 2019). It derives from the individual's intrinsic belief in how they see a behaviour (Fauzi et al., 2019). According to Fathi (2011), a supportive attitude in KS will positively influence the intention to share knowledge.

In this study, self-attitude includes enjoying helping others (Rasdi & Tangaraja, 2020; Ali et al 2018; Abdelwhab et al 2019), mentoring (Saide

et al. 2017; Thuan, 2020), openness (Schlagwein et al. 2017; Pereira & Mohiya 2021; Abou-Shouk et al. 2022), and responsibility (Hauashdh et al., 2020; Mukelas et al., 2012), loyalty (Pereira & Mohiya, 2021) compassion (Clercq & Renarto, 2020; Matošková, et al. 2022) and self-efficacy (Rasdi & Tangaraja, 2020; Thakadu 2018; Wahyudi, 2020)

Nature of Knowledge

According to Ali et al. (2019), the nature of knowledge itself is what makes it significant. It is the character or the way knowledge is presented and formed inside an individual or organisation that influences KS.

The Nature of Knowledge characteristics included in this study are access to knowledge (Farooq, 2018; Zimmermann et al., 2018, explicit knowledge (Nonaka & Takeuchi, 1995; Sanboskani & Srour, 2022); tacit knowledge (Nonaka & Takeuchi, 1995; Shi & Guo, 2021), benchmarking of best practice (Amos et al., 2019, Barua 2021) and value of knowledge (Akosile & Olatokun, 2019).

Motivation to Share

Motivation is a crucial factor influencing the intention to engage in knowledge-sharing behavior (Farooq, 2018). First, organizations should recognize the role of employee motivation in affecting knowledge sharing, as insufficient motivation can significantly diminish the level of knowledge sharing (Yang et al., 2020). According to Yang et al. (2020), some employees believed that the organizational culture did not encourage them to share knowledge. Additionally, Pereira and Mohiya (2021) found a consensus among employees that it is the company's responsibility to provide motivation through appropriate returns and incentives.

The identified motivation to share characteristics are recognition (Abdullah et al 2008, Venkatesh et al 2022), rewards (Naim & Lenka, 2017; Behr et al 2022), sense of belonging (Rasdi & Tangaraja 2020; Sanboskani & Srour, 2022), training and development (Barua, 2021; Thuan, 2020), reciprocity (Matoskova et al, 2020; Abdelwhab et al, 2019), trust (Rasdi & Tangaraja, 2020, Farooq, 2018), Management support (Pereira & Mohiya, 2021; Abdelwhab et al., 2019) and job satisfaction (Naim & Lenka, 2017; Muwardi et al., 2020)

Organisational Dimension

Organisation Culture

In an organisation, employees play a significant role as team players. Employees often believe relationships with co-workers can be improved by sharing their knowledge and skills, fostering a more positive attitude towards knowledge sharing (Fathi et al., 2011). Additionally, organizational learning culture significantly impacts knowledge-sharing behaviours and strategies (Al-Mahruqi et al., 2020)

The characteristics of organisation culture that involve in the study are corporate vision (Sharif et al 2023), diversity (Farooq, 2018; Klofsten et al 2019), fairness (Rahadhi & Suzianti, 2020), social ties (Sanboskani & Srour, 2022; Zimmermann et al 2018), organisation structure (Arif et al, 2017; Abdelwhab et al, 2019), innovation (Barua, 2021; Rahadhi & Suzianti, 2020), creativity (Ali et al, 2018) and organisation value (Rahadhi & Suzianti, 2020)

Technical Dimension

Opportunity to Share

Opportunity to share is the technical aspect which acts as the enabler of KS. It is undeniable that digital technologies expedite the process of knowledge generation, exchange and integration, process occurs extensively (Massa et al., 2023)

The identified characteristics for opportunity to share in this study are infrastructure (Chion et al., 2020; Al-Mahruqi et al, 2020), time (Rahadhi & Suzianti, 2020), KS system (Abdelwhab et al., 2019), communication platform (Abdelwhab et al 2019; Farooq, 2018) and information technology (Arif et al, 2017; Rahadhi & Suzianti, 2020; Abdelwhab et al., 2019).

METHODOLOGY

This study aims to identify the determinant factors of KS for the performance improvement of outsourced FM in government buildings. The research employed a deductive approach from a positivist philosophical perspective. It employed a cross-sectional time horizon with a quantitative method through a survey strategy. Factor Analysis was conducted to achieve the

research objective, and the data set was analysed with SPSS version 28.

Sample

A non-probability convenience sampling was chosen, involving executives and managers from Facilities Management and Maintenance Contract (FMMC) and Housekeeping and Pest Control Services Contract (HPCSC) service providers managing 101 federal government sites in West and East Malaysia. These sites are administered under 11 Facilities Superintendent Officers (FSO) offices of the Public Work Department (PWD). The respondents are identified and invited to participate through several platforms such as email, WhatsApp and LinkedIn application. Through a self-administered online platform, 112 participants responded to the questionnaires out of 200 sample size. The number of responses only represents 56 per cent of the sample size due to confidentiality of the contacts and low participation of respondents. Though according to Wu et al. (2022), the average response rate for online survey is 44 percent, hence the response rate for this research is acceptable.

Instrumentation

This study used a questionnaire instrument that has two sections, A and B. Section A contains six multiple-choice questions for respondents' profile, while Section B contains 38 questions of a 5-point Likert scale, including one reversed question on the factors that determine KS behaviour. 33 of the questions are for independent variables, and five are for dependent variables.

Data Analysis

Exploratory Factor Analysis (EFA) was employed to meet the research objective. According to Osborne (2015), EFA reduces the construct sets by examining all pairwise relationships between individual constructs and identifying latent constructs that are relevant in concept to be extracted from the measured constructs (Osborne, 2015). It thus confirms the significant KS determinant factors to improve the performance of outsourced FM in government buildings. The flow of analysis begins with checking the reliability of the data by using Cronbach's Alpha and followed by validity testing, which includes preliminary assessment, factor extraction and factor rotation.

RESULTS

Data acquisition of the response is shown in Table 1.

Table 1. Overall Data Acquisition for Factor Analysis

	Frequency	Percent	Valid Percent	Cumulative Percent
Questionnaire distributed	200	100.0	100.0	100.0
Questionnaire responded	112	56.0	56.0	56.0
Total questionnaire analysed	112	56.0	56.0	56.0

Source: Author, 2025

The table above shows the total responded questionnaires that were involved in the analysis, which is 56 per cent of the total distributed questionnaires. The survey was conducted through Google Form and all questions were compulsory. Therefore, there was missing data or values for analysis. The detail of the respondents' demographic profile is presented in Table 5.2.

Respondents' Profile

The frequency descriptive analysis was conducted to obtain the respondents' demographic background. The profile data includes gender, age, working experience in the FM industry, working experience in the current organisation, academic background and job position.

The responses received were male respondents, outnumbering females by 51.8 percent, which reflects the domination of male workers in the FM industry. The majority of the respondents were from the 31-40 group of age group (55.4%), which mainly held managerial positions, while the other age groups were 21-30 (21.4%), 41-50 (16.1%) and 51-60 (7.1%).

On working experience, most of the respondents have worked for over 10 years in the FM industry (34.8%), followed by 2-5 years (24.1%) and 5-8 years (21.4%) of experience. This shows that the respondents were experienced working in FM and understand the industry quite well. However, when it comes to the years of working experience in the current organisation, most of the respondents had below 2 years' experience (34.8%) and 33.9% with two to five years' experience. A minority of them

with over 10 (5.4) and 8.9% with 8-10 years' experience working in the current organisation. FM is experiencing a high employee turnover rate. In FMMC, reorganisation and displacement of personnel upon the end of the contract period is quite common, as the employment is based on contract. The duration of a FMMC is between three to five years, depending on the contract nature.

Table 2. Respondents' Background Information

Profiles	Category	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Female	27	24.1	24.1	24.1
	Male	85	75.9	75.9	100.0
	Total	112	100	100	
Age	21-30	24	21.4	21.4	21.4
	31-40	62	55.4	55.4	76.8
	41-50	18	16.1	16.1	92.9
	51-60	8	7.1	7.1	100.0
	Total	112	100	100	
Working years' experience in the FM industry	2-5	27	24.1	24.1	24.1
	5-8	24	21.4	21.4	45.5
	8-10	17	15.2	15.2	60.7
	Less than 2	5	4.5	4.5	65.2
	More than 10	39	34.8	34.8	100.0
	Total	112	100	100	
Working years' experience in the current organisation	2-5	38	33.9	33.9	33.9
	5-8	19	17	17	50.9
	8-10	10	8.9	8.9	59.8
	Less than 2	39	34.8	34.8	94.6
	More than 10	6	5.4	5.4	100
	Total	112	100	100	
Academic qualification	Bachelor	90	80.4	80.4	80.4
	Certificate	1	0.9	0.9	81.3
	Diploma	6	5.4	5.4	86.6
	Master	13	11.6	11.6	98.2
	Others	1	0.9	0.9	99.1
	SPM	1	0.9	0.9	100.0
	Total	112	100	100	

Job Position	CEO/ Director	3	2.7	2.7	2.7
	Facility Manager	61	54.4	54.4	57.1
	Assistant Facility Manager	2	1.8	1.8	58.9
	Facility Executive	16	14.3	14.3	73.2
	Engineer	20	17.9	17.9	91.1
	Assistant Engineer	3	2.7	2.7	93.8
	Quality Officer	5	4.4	4.4	98.2
	Health and Safety Officer	2	1.8	1.8	100.0
	Total	112	100	100	

Source: Author, 2025

Respondents with a bachelor's degree are the dominant with 80.4%, followed by a master's degree (11.6%) and a Diploma (5.4%). A bachelor's degree is the requirement for admission to managerial and executive-level posts in FMMC. Among them, 54.4% are facilities managers, 17.9% are engineers, and 14.3% are facilities executives. Besides that, there small percentage of other positions, namely quality officer (4.4%), Chief Executive Officer (CEO) and director (2.7%), assistant engineer (2.7%) and Health and Safety officer (1.8%). A typical FMMC consists of a facility manager, facility executives, engineers (electrical, mechanical and civil), quality officer, safety officer, energy officer, supervisors and technicians. Hence, the respondents are mainly from the management tier, comprising facility managers along with engineers, facility executives and officers.

Reliability Test

Cronbach's Alpha (CA) is used to test the reliability of the measured items or variables, whereby the reliability relies on the closeness of the coefficient to the CA 1.0. The result from the reliability test is shown in Table 3 below:

Table 3. Cronbach's Alpha Value of All Variables

	Constructs	Number of items	Cronbach's Alpha
IV	Self-Attitude (SA)	7	0.873

IV	Nature of Knowledge (NK)	5	0.782
IV	Motivation to Share (MS)	8	0.847
IV	Organisation Culture (OC)	8	0.906
IV	Opportunity to Share (OS)	5	0.882
DV	Knowledge Sharing (KS)	5	0.922

Source: Author, 2025

The value of CA above shows that all of the constructs for the individual beliefs towards KS in outsourced FM for government buildings are reliable, which exceeds 0.8. The value that exceeds 0.8 is considered good, 0.7 reasonably accepted, and below 0.6 is weak (Cavana et al., 2001; Neuman, 2010). Hence, the determinant factors are highly interconnected, and the instrument used for data collection is highly reliable.

Validity Test

Validity test is conducted to assess whether all of the questions in the questionnaire are engaged in the right concept (Cavana et al, 2001). In considering the appropriateness of a data set for factor analysis, two pre-requisite issues need to be addressed: sample size and the relationship strength among the items (Pallant, 2020).

This analysis employed a sample size of 112, with five main variables. Hair et al. (1998) recommended a sample size of 100 or more for factor analysis, with a minimum of five times the number of analysed variables. This study proposes five main variables, which contain 33 independent variables and one main variable with five dependent variables. Therefore, 112 samples or observations are sufficient to examine these five main variables, hence for factor analysis.

Preliminary Assessment

Two statistical measures were conducted in the preliminary assessment, namely Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. These measures are performed separately for IV and DV. For factorability of a data set, Kaiser (1974) recommends that the minimum value of KMO is 0.05 ($p<0.05$) for Bartlett's test.

Independent Variables

Table 5.4 shows the result of KMO and Bartlett's test for independent variables. The KMO value is 0.865, higher than 0.6, the minimum value suggested by Pallant (2020). Likewise, the value of Bartlett's Test of sphericity is $p<0.001$, which according to Meyers et al (2013). significant for statistical analysis. With the justification above, the data set is qualified for factor analysis.

Table 4. KMO and Bartlett's Test for Independent Variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.865
Bartlett's Test of Sphericity	Approx. Chi-Square	2709.718
	df	528
	Sig.	<.001

Source: Author, 2025

The subsequent anti-image correlation matrix examines the diagonal elements of the anti-image correlation matrix. The values should be greater than 0.50 for the items to be retained (Hair et al., 2013). Table 5 shows all of the variables valued above 0.5, ranging from 0.704 to 0.934, hence, all would be retained for the analysis that follows.

Table 5. Anti-image Correlation Matrix for Independent Variables

SA1	Enjoy helping others	.880a
SA2	Mentoring	.810a
SA3	Openness	.820a
SA4	Responsibility	.875a
SA5	Loyal	.897a
SA6	Compassion	.869a
SA7	Self-efficacy	.934a
NK1	Access to knowledge	.821a
NK2	Explicit knowledge	.855a
NK3	Tacit knowledge	.903a
NK4	Benchmarking	.898a
NK5	Value of knowledge	.923a
MS1	Recognition	.704a
MS2	Rewards	.712a
MS3	Sense of belonging	.798a

MS4	Training and development	.885a
MS5	Reciprocity	.831a
MS6	Trust	.853a
MS7	Management support	.862a
MS8	Job satisfaction	.825a
WC1	Corporate vision	.926a
WC2	Diversity	.909a
WC3	Fairness	.864a
WC4	Social ties	.864a
WC5	Organisation structure	.829a
WC6	Innovation	.828a
WC7	Creativity	.845a
WC8	Organisation value	.927a
OS1	Infrastructure	.866a
OS2	Time	.876a
OS3	Knowledge sharing system	.868a
OS4	Communication platform	.866a
OS5	Information technology	.880a

Note. a.Measures of sampling adequacy (MSA)
Source: Author, 2025

Dependent Variables

The result of KMO and Bartletts's Test of Sphericity for DV is tabulated in Table 6. The value of KMO is 0.869, and the value for Bartlett's test is $p< 0.001$, hence, the data set is statistically significant for FA.

Table 6. KMO and Bertless's Test for Dependent Variables

Kaiser-Meyer-Olkin of Sampling Adequacy		.869
Bartlett's Test of Sphericity	Approx. Chi-Square	452.644
	df	10
	Sig.	<0.001

Source: Author, 2025

In Table 7 below, the values of the anti-image correlation matrix for all DVs are more than 0.5, with the lowest being 0.844, thus bringing forward for further analysis.

Table 7. Anti-Image Correlation Matrix for Dependent Variables

KS1	Communication	.895a
KS2	Performance management	.902a
KS3	Relationship	.826a
KS4	Service delivery	.844a
KS5	Organisation sustainability	.908a

Note. a.Measures of sampling adequacy (MSA)
Source: Author, 2025

Factors Extraction

For Factor Extraction, the phase begins with communalities. It reflects the extent to of each item's variance is explained. In the "Initial" column, a communality of 1.000 means that the factors explain all of the variance in the model (Pallant, 2020). In contrast, if the communality value in the "Extraction" column is higher than 0.50, the variable is substantially alike to all of the other constructs collectively. Thus, only items with values greater than 0.50 were retained.

Independent Variables

In Table 5.8, which shows the communalities of IV, three items have value extraction below 0.5, namely Explicit knowledge (NK2) with 0.474, Training and Development (MS4) with 4.94 and Organisation Structure (WC5) with 4.27. It means that these items did not go well with the other items in the model, and thus would be removed.

Table 8. Communalities for IV

	Constructs	Initial	Extraction
SA1	Enjoy helping others	1.000	.756
SA2	Mentoring	1.000	.704
SA3	Openness	1.000	.794
SA4	Responsibility	1.000	.611
SA5	Loyalty	1.000	.579
SA6	Compassion	1.000	.645
SA7	Self-efficacy	1.000	.635
NK1	Access to knowledge	1.000	.556

NK2	Explicit knowledge	1.000	.474
NK3	Tacit knowledge	1.000	.694
NK4	Benchmarking	1.000	.712
NK5	Value of knowledge	1.000	.687
MS1	Recognition	1.000	.831
MS2	Rewards	1.000	.759
MS3	Sense of belonging	1.000	.612
MS4	Training and development	1.000	.494
MS5	Reciprocity	1.000	.617
MS6	Trust	1.000	.798
MS7	Management support	1.000	.745
MS8	Job satisfaction	1.000	.605
WC1	Corporate vision	1.000	.572
WC2	Diversity	1.000	.748
WC3	Fairness	1.000	.685
WC4	Social ties	1.000	.706
WC5	Organisation structure	1.000	.427
WC6	Innovation	1.000	.882
WC7	Creativity	1.000	.831
WC8	Organisation value	1.000	.699
OS1	Infrastructure	1.000	.685
OS2	Time	1.000	.705
OS3	Knowledge sharing system	1.000	.803
OS4	Communication platform	1.000	.827
OS5	Information technology	1.000	.642

Note. Extraction method: Principal Component Analysis
Source: Author, 2025

Next, the analysis was carried out with factor extraction, which explains the Eigenvalues of total variance as shown in Table 5.9.

Table 9. Total Variance Explained for IV

	Initial Eigenvalues Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Comp	Total	% of Var.	Cum. %	Total	% of Vari.	Cum. %	Total	% of Var.	Cum. %
1	11.896	36.049	36.049	11.896	36.049	36.049	6.361	19.276	19.276
2	4.720	14.303	50.353	4.720	14.303	50.353	5.458	16.539	35.814
3	2.049	6.208	56.561	2.049	6.208	56.561	3.785	11.469	47.283
4	1.499	4.542	61.102	1.499	4.542	61.102	2.976	9.019	56.303
5	1.304	3.951	65.053	1.304	3.951	65.053	2.679	8.118	64.421
32	.077	.233	99.860						
33	.046	.140	100.000						

Note. Extraction method: Principal Component Analysis
Source: Author, 2025

According to Hair et al. (2014) and Leech (2012), only Eigenvalues over 1.0 are to be retained. Table 5.9 presents five factors for IV with Eigenvalues greater than 1.0. These factors can be extracted, which are factor 1 = 11.896; factor 2 = 4.720; factor 3 = 2.049; factor 4 = 1.499; factor 5 = 1.304. Total variance explained by these five factors is 65.053, which surpassed 60 percent of the total variance explained.

Dependent Variables

Based on the communalities for DV shown in Table 10, all of the extraction values were more than 5.0, and therefore included in the analysis.

Table 10. Communalities for Dependent Variables

	Constructs	Initial	Extraction
KS1	Communication	1.000	.634
KS2	Performance management	1.000	.773
KS3	Relationship	1.000	.892
KS4	Service delivery	1.000	.844
KS5	Organisation sustainability	1.000	.687

Note. Extraction method: Principal Component Analysis
Source: Author, 2025

Table 11.Total Variance Explained for Dependent Variables

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	3.831	76.616	76.616	3.831	76.616	76.616
2	.548	10.955	87.572			
3	.286	5.717	93.288			
4	.217	4.344	97.632			
5	.118	2.368	100.000			

Note. Extraction method: Principal Component Analysis
Source: Author, 2025

Correspondingly, Table 11 shows only 1 factor extracted for DV with an Eigenvalues 3.831, and represents 76.616%, exceeding the total variance explained.

Factors Rotation

The final phase in FA is Factor Rotation. According to Hair et al (2013), a significant factor loading for the item to be retained is 0.40 and above. The results from Table 12 show that all items valued over 0.40 explain 65.053 percent of the total variance of IV, above the recommended value for social science research Hair et al. (2013).

Table 11. Rotated Component Matrixa for Independent Constructs

	Component	1	2	3	4	5
SA1	Enjoy helping others	.861				
SA2	Mentoring	.828				
SA3	Openness	.884				
SA4	Responsibility	.607				
SA5	Loyalty	.500				
SA6	Compassion	.713				
SA7	Self-efficacy	.669				
NK1	Access to knowledge		.524			
NK3	Tacit knowledge		.508			
NK4	Benchmarking		.710			
NK5	Value of knowledge		.764			
MS1	Recognition			.890		
MS2	Rewards			.853		
MS3	Sense of belonging			.675		

MS5	Reciprocity			.645		
MS6	Trust			.719		
MS7	Management support			.668		
MS8	Job satisfaction			.644		
WC1	Corporate vision				.521	
WC2	Diversity				.674	
WC3	Fairness				.719	
WC4	Social ties				.649	
WC6	Innovation				.858	
WC7	Creativity				.858	
WC8	Organisation value				.730	
OS1	Infrastructure					.728
OS2	Time					.788
OS3	Knowledge Sharing System					.801
OS4	Communication platform					.836
OS5	Information technology					.591

Note. Extraction method: Principal Component Analysis
Rotation method: Varimax with Kaiser Normalisation
a.Rotation converged in 6 iterations
Source: Author,2025

From the results shown above, all of the 30 determinant factors are grouped into five groups of factors.

Group one consists of seven factors, namely i) Enjoy helping others; ii) Mentoring; iii) Openness; iv) Responsibility; v) Loyalty; vi) Compassion; vii) Self-efficacy. All seven factors are grouped under one group factor called "Self-Attitude" with an eigenvalue of 11.896 and total variance of 36.049.

Group two is represented by four determinant factors: i) Access to knowledge; ii) Tacit knowledge; iii) Benchmarking; iv) Value of knowledge. These factors are grouped under "Nature of Knowledge" with eigenvalue 1.304 and total variance 65.053.

Group three contains seven determinant factors, which are i) Recognition; ii) Rewards; iii) Sense of belonging; iv) Reciprocity; v) Trust; vi) Management support; vii) Job satisfaction; These factors are grouped under "Motivation to share" which has eigenvalue 1.499 and total variance of 61.102.

Group four is represented by seven determinant factors, namely i) Corporate vision; ii) Diversity; iii) Fairness; iv) Social ties; v) Innovation; vi) Creativity; vii) Organisation value. All these factors are grouped under "Organisation Culture" with eigenvalue 4.720 and total variance 50.353.

Group five consists of five determinant factors: i) Infrastructure; ii) Time; iii) Knowledge sharing system; iv) Communication platform; v) Information Technology. All these factors are grouped under "Opportunity to share" with eigenvalue 2.049 and total variance = 56.561.

DISCUSSION

From the analysis of findings above, five research hypotheses are formulated concerning group factors of individual beliefs on KS towards performance improvement of outsourced FM in government buildings, which are:

i. Self-Attitude (SA) – Hypothesis 1: There is a significant relationship between determinant factors of "Self-Attitude" with KS towards performance improvement of outsourced FM in government buildings.
ii. Nature of Knowledge (NK) – Hypothesis 2: There is a significant relationship between determinant factors of "Nature of Knowledge" with KS towards performance improvement of outsourced FM in government buildings.
iii. Motivation to Share (MS) – Hypothesis 3: There is a significant relationship between determinant factors of "Motivation to Share" with KS towards performance improvement of outsourced FM in government buildings.
iv. Organisation Culture (OC) – Hypothesis 4: There is a significant relationship between determinant factors of "Organisation Culture" with KS towards performance improvement of outsourced FM in government buildings.
v. Opportunity to Share (OS) – Hypothesis 5: There is a significant relationship between determinant factors of "Opportunity to Share" with KS towards performance improvement of outsourced FM in government buildings.

CONCLUSION

The study has identified the factors that influence KS behaviour among the staff of outsourced FM in federal government buildings. There are five group factors namely self-attitude, nature of knowledge and motivation to share which belong to individual dimension, organisational culture under organisation dimension and opportunity to share, a technical dimension. In general, it can be concluded that the FM providers' team agree that all of these factors determine the KS behaviour in the deliverables of FM in government premises. The findings, however, are limited to the context of outsourced FM for FMMC and services contracts and a small data set to generalise the results. The limitation is due to difficulties in getting the contacts of service providers, consequent to confidentiality and low participation. The study will be able to assist service providers in identifying the potential workforce behaviour and conduct initiatives that could enhance KS participation among existing staff members. Nonetheless, three factors which were found as less influential, specifically training and development, organisation structure and explicit knowledge, are the areas that require improvement, as they are regarded as relevant factors by other researchers. Further research is suggested to investigate the relationship between the KS determinant factors and the performance improvement of OFM in government buildings. The identified KS factors will fulfil the knowledge gap in the research field, which are determinant factors of knowledge sharing of outsourced FM in government buildings.

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AUTHOR CONTRIBUTION

The main author is a PhD candidate who took the lead in writing and conducting the study. The co-authors, who are the supervisors of the main author, contributed to the conceptualisation, direction, and proofreading

of the article.

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