

Understanding Agile Innovation Management Adoption for SMEs

Shavneet Sharma, Gurmeet Singh, Paul Jones, Sascha Kraus and Yogesh K. Dwivedi

Abstract— Research interest in Agile Innovation Management (AIM) has increased due to its growing popularity. However, little is known about adaptability by Small and Medium Enterprises (SMEs). This study examines the factors affecting intention to adopt AIM in SMEs. A conceptual framework is developed by combining internal and external environmental factors that influence adoption intention. Responses were received from 276 SMEs and analyzed using Covariance-Based Structural Equation Modelling (CB-SEM). The results confirmed that external environmental factors of mimetic isomorphism and normative isomorphism have a positive association with the intention to adopt AIM. Moreover, the internal environmental factors of top management championship, adhocracy culture, clan culture, and organizational readiness were confirmed to be positively associated with AIM adoption. This study provides one of the first empirical evidence of AIM for SMEs. In doing so, the study contributes both theoretically and practically towards understanding strategies that would enhance adoption by SMEs.

Index Terms— Agile innovation management, Internal environmental stimuli, External environmental stimuli, Small and medium enterprises, Business process management.

I. INTRODUCTION

COMPETITIVE advantage is driven by innovation [1]. These yields increased sales and market shares for businesses [2]. Customer demand is constantly changing influenced by digitalization and globalization. Competition has greatly intensified, posing challenges for small and medium enterprises (SMEs) [3]. These challenges are attributed to their small size and financial constraints. SMEs are defined as “a small enterprise as an en/terprise that has total assets or turnover between F\$30,000 and \$100,000 and employs between 6 and 20 employees”. A medium enterprise was defined as having a “total assets or turnover between F\$100,000 and F\$500,000 and employs between 21 and 50 employees” [3]. Despite the challenges faced by SMEs due to their small size and financial constraints they are an essential part of the global and global economy, a major source of income and employment for many individuals [4]. As such, SMEs must adopt innovation to maintain competitiveness in the market [5]. Systematic

innovation management can accomplish this by enabling ideas to materialize into innovation through a planned and controlled approach [6]. The term agile refers to an organisation’s need to be adaptive, flexible, and rapid in its actions [7]. This is in terms of the organisation's ability to be responsive to the external market, economic, and social threats [7, 8]. Such challenges and external threats can also encompass the adoption of new systems and technologies [9]. The agile process offers one such solution through customer-focused product development [10]. Despite software development being the initial idea of agile methods, crowdsourcing and the internet of things provide new opportunities for development [11]. Transferring agile methods from virtual to physical products such as furniture, wood, and metal fabrication products among others holds tremendous potential for SMEs [6].

Agility in the development process implies the ability of the development team to be flexible and reactive in a changing environment [12]. There is a lack of definition of agile innovation management for SMEs [6]. Literature reveals several definitions of innovation management, and there is a lack of consensus on a standardized definition. In this study, the definition for AIM is adopted from Mergel [13]. It is an umbrella term describing the set of the software development process and project management, HR policies, adjusted procurement procedures, and managerial and organisational approaches to support the delivery of innovative services for SMEs. Compared to the conventional waterfall approach to project management, where each step is performed in sequential order, the agile approach focuses more on collaboration with the client and a shorter development process [13]. There is immediate testing and presentation of the results from sub-project tests without waiting for the project to be fully completed [13]. The evolution of this methodology is from the Japanese approach of ‘new product management’ that was the IT industry subsequently adopted [14].

Studies have revealed a positive association between agile methods and businesses success with innovation [6] and performance [15]. Despite these benefits of agile methods, the adoption of AIM has been low, with few studies exploring the

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antecedent factors [16]. The underlying factors arising from organizations' intent to adopt AIM are not well known and are not well explained in the extant literature [5]. The literature relating to AIM remains scarce and lacks strong empirical evidence. This is particularly in the context of SME adoption. Studies on agile innovation management have typically been conducted with larger businesses [17] and governments [13]. SMEs have unique characteristics that make them different from larger businesses. SMEs are result-oriented and less risk-taking than larger businesses [18]. Business owners for SMEs want a greater degree of control, are less open, and have a high reluctance to disclose innovation relation information [18]. Furthermore, SMEs have a flexible and more organic culture than larger businesses which allows them to react faster to environmental changes. SMEs decision making manager's level is centralised and are responsible for many management decisions and many business facets [18]. Due to SMEs' smaller size, the number of employees is also less than larger businesses, resulting in informal and loose relationships [18]. These businesses also have a smaller supplier and customer base. SMEs are also disadvantaged due to a lack of technical, managerial, financial, and human resources [19, 20].

This investigation is important as SMEs contribute significantly to the growth and development of the economy and social stability [21-23]. The result provides valuable insights on the antecedents to adoption [3]. In addition, most studies on adopting AIM have been conducted in large and developed countries. The difference in economic, cultural, and political factors between developed and developing countries profoundly impacts technology adoption [23].

Therefore, the purpose of this study is to make the first attempt to fill the gap in the literature by empirically examining the factors that impact businesses to adopt AIM in SMEs. This study employs the theoretical model proposed by Lee and Chen [17] to empirically test the factors that impact adoption intention. This will provide valuable insights into the influence of internal and external environmental antecedents on SMEs' decision to adopt AIM. Although the related extant literature has declared the many benefits of AIM, there still needs to be robust and compelling evidence for increasing our understanding of the contexts that truly spur an organization into action to adopt AIM more effectively [17, 24, 25].

II. LITERATURE REVIEW: COMPETING VALUES FRAMEWORK

Based on organisational values, the competing values framework (CVF) (see Figure 1) provides an analytical model of organisational culture. The values of categories in two distinct categories of stability-flexibility and internal-external. Four organisational cultures emerge from the four quadrants; adhocracy culture (open systems model), clan culture (human relations model), market culture (rational goal model), and hierarchy culture (internal process model) [26]. The first dimension describes the external and internal focus according to the model. The interactions with the external environment are accentuated by the external focused organisations when it comes to seeking innovative breakthroughs stimuli and novel external knowledge, while internal development in terms of cohesion and collaboration are emphasized by the internally focused organisation [27]. The second dimension describes

stability and flexibility at opposite extremes. The differences in the organisation in terms of providing discretion and flexibility to employees or emphasizing control, order, and stability is encapsulated by this dimension [28]. Based on the two dimensions discussed above, the four distinct types of culture possess unique assumptions, beliefs, and values while reflecting differences within the organisation that profoundly influence behaviour and attention [29].

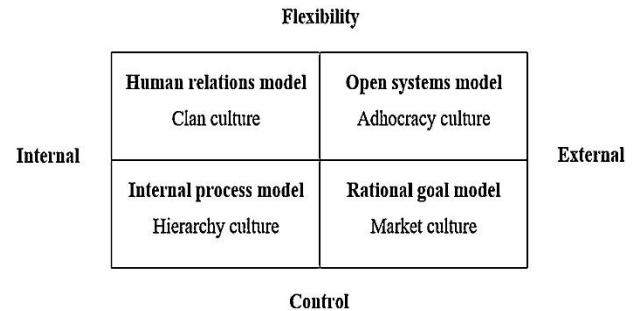


Fig. 1: Competing Values Framework

Figure 1 illustrates how the different organisational cultures and distinct from each other. For instance, adhocracy culture contrasts to hierarchy culture characterised by internal focus and control. Similarly, clan culture characterised by internal focus and flexibility contrasts with the market culture that emphasizes external focus and control. Based on the characteristics of agile management that focuses on adaptive, flexible, and rapid action, this study will adopt clan and adhocracy culture to examine its impact on adoption. Similarly, Lee and Chen [17] also employed these two cultural variables to examine the impact of cultural values' differences and assumptions on agile adoption.

III RESEARCH HYPOTHESIS AND CONCEPTUAL FRAMEWORK

Firms working in a similar environment tend to mimic the actions of other firms based on the numbers eliciting the behaviour or the critical mass [30]. This mimicking behaviour avoids the embarrassment of being less responsive or less innovative than other similar firms in the industry [31]. The study by Gopalakrishna-Remani, et al. [30] highlighted that a high level of mimic pressure is positively associated with increased Electronic Medical Records (EMR) adoption for organizations in the healthcare industry. Similarly, Bak, et al. [22] found that hotels attempt to adopt standards similar to other hotels in the industry to mimic competition to achieve legitimacy in the marketplace. Organisations that have yet to adopt agile innovation management are likely to be motivated by the successful adoption of their competitors [17]. Mimicking another firm's agile innovation adoption acts as an inspiration to move forward in terms of innovation, and it enables a firm that has not adopted to copy the adoption behaviour [32]. Therefore, the following hypothesis is proposed:

H1: Mimetic isomorphism positively influences SMEs intention to adopt agile innovation management.

OPERATION DEFINITIONS OF THE STUDY MEASURES

Measures	Description	Reference
Mimetic isomorphism	It is an SME's automatic and obligatory adoption of agile innovation management actions.	[33]
Coercive isomorphism	It is the formal and informal pressures exerted on SMEs by other organizations on which they depend on the adoption of agile innovation management actions, such as the legal, regulatory system within which organizations function.	[34]
Normative isomorphism	The SME's environment institutions define and promote norms but do not directly sanction compliance or noncompliance. Regulations pertaining to professional or industry associations that enable organizations to learn from others in professional networks.	[35]
Top management championship	It is the managerial beliefs about agile innovation management initiatives and participation in those initiatives	[36]
Adhocracy culture	It is an idealistic and novel vision that persuades employees to be creative and take risks, and employees in an adhocracy organization are encouraged to undertake external learning to stimulate creativity that enables cultivation, innovation, and cutting-edge output in products or services.	[37]
Clan culture	It is the belief that human affiliation produces positive affective employee attitudes directed toward the organization. In other words, "organizations succeed because they hire, develop, and retain their human resource base".	[29]
Organisational readiness	It is how well employees are prepared for and willing to accept innovation based on the perceived capability of the organization to absorb the innovation	[38]
Agile innovation management	It is the set of project management and software development processes, adjusted procurement procedures, combined with HR policies, and organizational and managerial approaches to support innovative digital service delivery for SMEs	[13]

Firms dependent on their customers give power to these customers to exert force or put coercive pressure on them to adopt innovative technologies. Customers who are dominant and powerful may expect their suppliers to adopt agile innovation to enable better collaboration and increase product and software delivery [17]. In the tourism industry, tourists consistently demand high technological innovation levels, and businesses in this industry respond as not to risk losing their competitive edge [39]. The government department and regulators can also apply coercive pressure [40]. The need to follow legislation is essential in the health industry, which puts organizations under pressure to change their operations [41]. Lee and Chen [17] stated that organizations high in coercive isomorphism would be more likely to adopt agile innovation

[30, 42]. A positive relationship has been found between coercive pressure and technological adoption [43]. Therefore, the following hypothesis is proposed:

H2: Coercive isomorphism positively influences SMEs' intention to adopt agile innovation management.

There are multiple sources of normative pressures, including professional societies, industrial standards, and media [43]. An organization that follows industry standards is linked with professional associations and has a good relationship with consultancy firms that share the benefits and beliefs of adopting new technology [35]. Organizations in the tourism industry perceive that third-party accreditation is a fundamental source of legitimization [40]. Professionalization leads to adopting new technologies to achieve legitimization [44]. Firms comply as they perceive that following the norms established by industry institutions and professions would benefit their business [45]. An example of normative pressure is the adoption of automatic teller machines by banks started due to mimetic pressure but became a standard in the banking industry [46]. Lee and Chen [17] theorized that normative pressure would be positively associated with agile innovation adoption. Therefore, it is hypothesized that:

H3: Normative isomorphism positively influences SMEs' intention to adopt agile innovation management.

Top management championship is a critical factor influencing the adoption of innovative technology in a firm [47]. A top management championship concept can be divided into two dimensions: top management participation and top management belief. To ensure technology adoption in a firm, top management needs to assign resources, create and implement policies and procedures that influence control and communication, plan and observe processes to facilitate effective relationships between line managers and the IT team [30]. According to Kankanhalli, et al. [48], with strong top-level support, firms can overcome barriers and resistance within the firm to adopt new technology. [30] found a positive association between top management championship and electronic medical records adoption by US hospitals. Therefore, the following hypotheses can be proposed:

H4: Top management championship positively influences SMEs' intention to adopt agile innovation management.

The culture of an organisation plays a key role in its innovative ability. The competing values framework of organisational culture typography proposed by Cameron and Quinn [26] that divides organisational across two dimensions (internal and external) that make up four types of dominant culture (market, hierarchy, adhocracy, and clan). Internally focused organisations emphasise internal development, for instance, cohesion and collaboration. Externally focused organisations interact with the external environment, for instance, stimuli for innovation and search for new knowledge

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[27]. Academic and practitioners have validated the four distinct organisational culture types [29, 49]. From the four culture types, this study adopts clan and adhocracy culture.

The primary assumption of adhocracy culture is that acquisition, growth, and new opportunities arise due to change [37]. The central belief of an adhocracy firm is that employees are encouraged to be creative through external learning and are persuaded to take risks [17, 26]. Such organizations favour innovation, cultivation, and cutting-edge outputs [29]. The values of adhocracy culture are driven by external stimuli and value agility, adaptability, and flexibility [17]. This cultural value would allow businesses to embrace changes emerging from adopting AIM. Tseng [50] found that firms with an adhocracy culture are more open to risk-taking and are willing to change their working environment by adopting innovative technologies. del Rosario and René [51] found that adhocracy culture explains environmental innovation adoption in the hotel industry. According to Tolfo and Wazlawick [52], firms that emphasize open-mindedness and flexibility are more likely to adopt agile development strategies. Therefore, the following hypothesis is proposed:

H5: Adhocracy culture positively influences SMEs' intention to adopt agile innovation management.

Clan culture highlights the internal focus, cohesiveness, and flexibility that is supported by a flexible organizational structure [26, 29]. According to Ashok, et al. [53], the main characteristics of clan culture include highly committed employees, open communication, employee involvement, trust, and teamwork [54]. Studies have shown a positive association between clan culture and the adoption of agile methods by firms [25, 55]. Lee and Chen [17] theorized that firms that have a high level of clan culture are more likely to adopt agile innovation. Tseng [50] also found that clan culture positively influences innovative technology adoption. Therefore, the following hypothesis is proposed:

H6: Clan culture positively influences SMEs' intention to adopt agile innovation management.

Organizational readiness is defined in this study as an organisation's assessment of its state of being prepared for assimilation, adoption, and exploitation of innovative technology [56]. It is the willingness and ability to adopt new technology [57]. This criterion mainly focuses on technical and financial readiness [58]. Technological readiness refers to the organisation's perception of the capability of technical human resources (skills, knowledge, expertise, and agile professionals) and technology-related infrastructure (hardware, software, and platform required to support agile innovation management) [59]. Financial readiness refers to the organization's perception of financial resourcing to transition, support, and pay for AIM expenses [17]. Studies have found a positive association of organizational readiness to the perceived usefulness of technology [60]. In the context of SMEs, Asiaei and Rahim [61] found that organizational readiness is positively associated with adopting innovative technology. Therefore, the following hypothesis is proposed:

H7: Organisational readiness positively influences SMEs' intention to adopt agile innovation management.

The above discussion has led to the development of seven hypotheses. H1 to H3 relates to the external factors influencing the adoption of AIM by SMEs, while H4 to H7 relates to the internal factors. These hypotheses are illustrated in Figure 2 below.

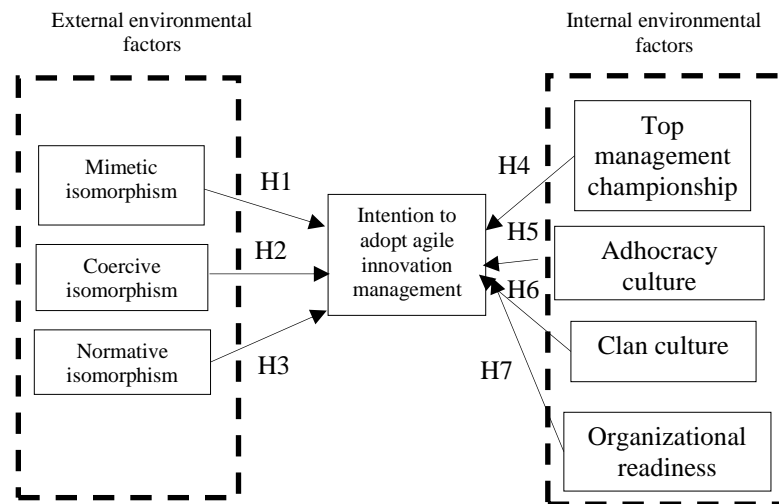


Fig. 2: Conceptual Framework

IV. RESEARCH METHOD

A. Procedure and Participants

An online survey for this study was created with the use of SurveyMonkey (see Appendix). The population is made up of SMEs in Fiji. Fiji is a developing country located in the South Pacific. The selection for the study to be conducted in Fiji is justified due to the absence of empirical data relating to AIM from Small Island Developing State like Fiji. Most studies on the adoption of AIM have been conducted in large and more developed countries [13]. The difference in economic, cultural, and political factors between developed and developing countries profoundly impacts technology adoption [62]. Before conducting the full-scale survey, a pilot study was conducted with 20 SMEs. This was done to test for the readability and understandability of the questionnaire. After making changes based on the pilot study result, a sponsored advertisement was placed on Facebook to collect responses. This method is used as there is no list of registered SMEs in Fiji. Facebook was selected as it ranks as the most popular social networking site in Fiji, with the most users [3]. The online data collection is also justified due to the restrictions on movement imposed due to the COVID-19 pandemic. A similar data collection method has been used by other studies conducted in Fiji [62-64]. The survey contained screening questions to ensure that the respondents were indeed business owners of SMEs. The participants were informed about the definition of AIM for clear understanding and context. Participants were given the incentive to go into the draw to win prizes to increase the survey's response rate. This

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method resulted in the collection of 282 responses. The respondents came from owner/managers of SMEs in Fiji.

B. Measures

All scales used in this survey were pre-validated by prior studies. Changes were made to the wording of the items to ensure it was reflective of the context of this study. The following sources were used to adapt the scales for this study: mimetic isomorphism [32], coercive isomorphism [32], normative isomorphism [32], top management championship [65], adhocracy culture [66], clan culture [66], organizational readiness, and intention to adopt agile innovation management [67] (see Table 1). Due to its high reliability, a 7-point Likert scale (1= strongly disagree, 7 =strongly agree) was used to capture the responses for all constructs used in the survey. Details about each of the constructs and items are provided in Appendix A.

C. Data Analysis

Recent studies have employed structural equation modelling (SEM) when analysing data where multiple relationships are tested among constructs [68-70]. Partial Least Squares Structural Equation Modelling (PLS-SEM) and covariance-based SEM (CB-SEM) are two variants of SEM that are utilised for analysis [71]. However, certain prerequisites related to data need to be considered that have been highlighted in recent studies [72, 73] when selecting the best variant for data analysis. CB-SEM has requirements relating to sample size and requires the sample free from multicollinearity and homoscedastic, normally distributed, linear, and absence of outliers [74, 75]. In comparison, PLS-SEM is more lenient in data-related and sample size requirements while being more suited for theory-building [71, 76].

As this study aimed to test the hypotheses that were proposed at the beginning of this study rather than engaging in theory-building, CB-SEM was employed [76]. A similar approach was adopted by other recent studies [77-79]. Furthermore, this choice is justified as the data meet the sample size requirements, suggested by Henseler, et al. [74] and Hair, et al. [75]. This analysis is performed using Statistical Package for the Social Sciences (SPSS 24.0) and AMOS (24.0). The two-step analysis process included the examination model fit of the measurement model using the confirmatory factor analysis (CFA), followed by examining the structural model and testing the hypotheses. Common method bias examination was conducted using Harman's single factor test.

Before carrying out the analysis, a thorough data screening was conducted. First, this involved identifying missing and unengaged responses. Second, the outliers were identified using the Z-score figures. This step led to the deletion of six responses from the dataset. Third, the normality of data distribution was confirmed using the kurtosis and skewness tests. Fourth, confirmation of the absence of multicollinearity issues used ascertained by employing variance inflation factors and tolerance values. The remaining 276 responses were used to conduct further analysis.

D. Common Method Bias

To prevent common method bias issues from occurring, the following steps were undertaken. First, respondents were asked to answer the survey honestly as confidentiality and anonymity of their identity and responses were assured. According to Podsakoff, et al. [66], this reduces the respondents' apprehensions and increases honest responses. Second, using online surveys over traditional surveys also reduces social desirability bias [64]. Harman's single factor test was employed to confirm the absence of social desirability bias issues despite taking these preventive measures. The test calculated variance of 36.19%, which is well below the 50% threshold. This result confirms the absence of common method bias.

V RESULTS

A. Measurement Model

Confirmatory factor analysis was used to assess the measurement model. The assessment of the measurement model-derived the following fit values (Ratio of the chi-square and degrees of freedom (χ^2/df) = 2.87, Comparative fit index (CFI) = 0.95; Goodness-of-Fit statistic (GFI) = 0.92; Tucker-Lewis index (TLI) = 0.91; Normed-fit index (NFI) = 0.91; Root mean square error of approximation (RMSEA) = 0.06). These values confirm a good model fit for the measurement model [80]. Following this confirmation of the measurement model, the validity and reliability were ascertained. As this study used pre-validated scales from the literature sources, content validity was confirmed. Face validity was assured as a pilot test was conducted, and changes to the survey were made based on the results. As the factor loadings of the construct's items were more than 0.50, composite reliability values were more than 0.70; this confirms composite reliability. The internal consistency of the constructs was confirmed as the Cronbach's alpha values for all items were more than 0.83. The Average Variances Extracted (AVE) scores were more than their corresponding maximum shared variance and average shared variance, thus confirming discriminant validity (see Table 2 and Table 3).

Table 2: Validity and reliability

	CR	AVE	MSV	MMI	CRP	NMI	TM C	ADC	CNC	ORG	IAM
MMI	0.9	0.76	0.37	0.86							
CRP	0.9	0.82	0.39	0.19	0.9						
NMI	0.9	0.74	0.49	0.21	0.22	0.89					
TMC	0.9	0.77	0.48	0.19	0.26	0.44	0.87				
ADC	0.9	0.73	0.52	0.42	0.11	0.39	0.48	0.93			
CNC	0.9	0.78	0.31	0.15	0.17	0.15	0.49	0.18	0.92		
OGR	0.9	0.78	0.55	0.49	0.24	0.35	0.17	0.46	0.4	0.88	
IAM	0.9	0.75	0.54	0.15	0.49	0.15	0.34	0.34	0.49	0.11	0.93

Note: AVE = Average Variance Extracted; CR = Composite Reliability; MaxR(H) = Maximum Reliability; MSV = Maximum Shared Variance; Significance of Correlations: † p < 0.100; * p < 0.050; ** p < 0.010; *** p < 0.001.

Table 3: Measurement of study variables

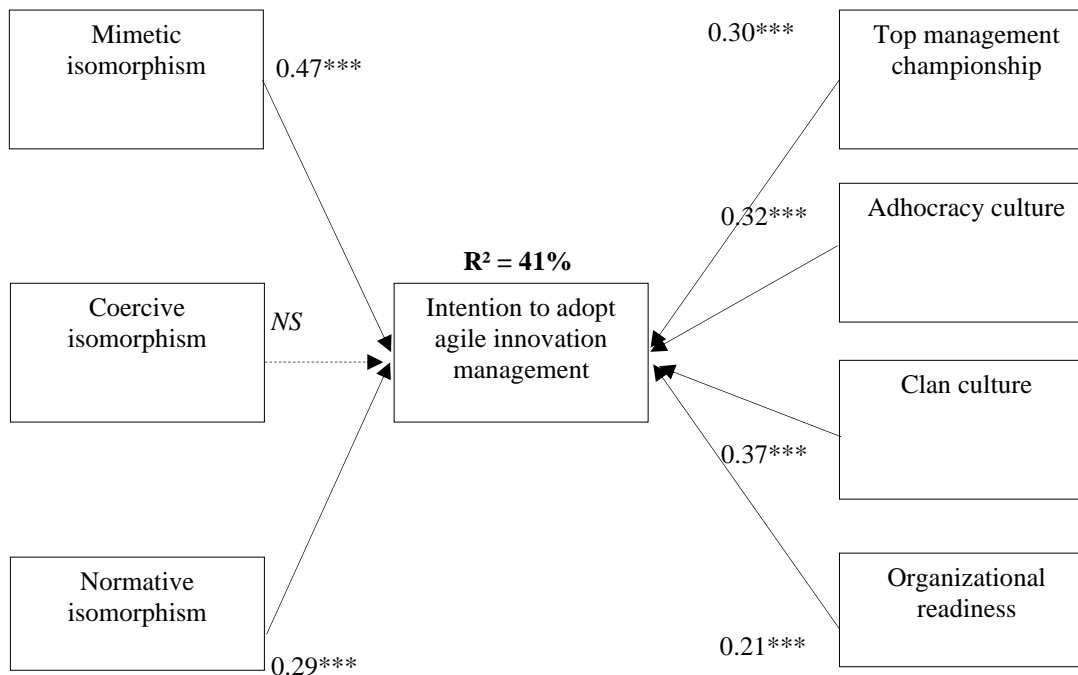
Variable	Measurement items	Model and item indices	
		SL	SMC
Memetic Isomorphism	MMI1	0.85	0.72
	MMI2	0.86	0.74
	MMI3	0.91	0.83
	MMI4	0.85	0.72
	MMI5	0.88	0.77
Coercive isomorphism	CRP1	0.93	0.86
	CRP2	0.85	0.72
	CRP3	0.93	0.86
Normative isomorphism	NMI1	0.94	0.88
	NMI2	0.83	0.69
	NMI3	0.81	0.66
Top management championship	TMC1	0.85	0.72
	TMC2	0.88	0.77
	TMC3	0.94	0.88
	TMC4	0.83	0.69
	TMC5	0.89	0.79
Adhocracy culture	ADC1	0.91	0.83
	ADC2	0.87	0.76
	ADC3	0.81	0.66
	ADC4	0.83	0.69
Clan culture	CLC1	0.86	0.74
	CLC2	0.86	0.74

Organizational readiness	CLC3	0.92	0.86
	OGR1	0.87	0.76
	OGR2	0.89	0.79
	OGR3	0.85	0.72
Intention to adopt agile innovation management	OGR4	0.93	0.86
	IAM1	0.92	0.85
	IAM2	0.81	0.66
	IAM3	0.86	0.74

Note: SME = Squared multiple correlations; SL = standardized loadings.

B. Structural Model

The assessment of the structural model-derived (see Figure 3) the following fit values ($\chi^2/df = 2.73$, CFI = 0.93; GFI = 0.91; TLI = 0.92; NFI = 0.90; RMSEA = 0.05). These values confirm a good model fit of the structural model [80, 81]. Following this, the hypotheses of this study were tested. Results from the direct relationship test of the external environmental factors showed that mimetic isomorphism ($\beta = 0.47$, $p < 0.001$) and normative isomorphism ($\beta = 0.29$, $p < 0.001$) have a positive association with the intention to adopt agile innovation management. Therefore, in relation to external environmental factors H1 and H3 are accepted. The results for internal environmental factors show that top management championship ($\beta = 0.30$, $p < 0.001$), adhocracy culture ($\beta = 0.32$, $p < 0.001$), clan culture ($\beta = 0.37$, $p < 0.001$), and organizational readiness ($\beta = 0.21$, $p < 0.001$) were found to be positively associated with agile innovation management. Therefore, H4, H5, H6, and H8 were accepted. The R² value for the dependent variable (intention to adopt agile innovation management) in this study was computed to be 41%. Straub, et al. [82] highlighted that the minimum requirement for the R² value is 40%. Therefore, this study's dependent variable meets this criterion.



Note: *** $p < 0.001$, NS = Not significant

Fig 3. Results

VI DISCUSSION

Mimetic isomorphism was found to have a positive association with SMEs' intention to adopt AIM. This finding is consistent with the study by Gopalakrishna-Remani, et al. [30] that found a high level of mimic pressure is positively associated with increased EMR adoption for organizations in the healthcare industry. Moreover, Bak, et al. [22] found that hotels attempt to adopt standards similar to other hotels in the industry to mimic competition to achieve legitimacy in the marketplace. Therefore, this study's result implies that SMEs adopt AIM by copying the actions of other businesses based on the number of firms eliciting the behaviour. SMEs that have yet to adopt AIM are motivated by their competitors' successful adoption. Mimicking such competitors would be a 'safe way' for non-adaptors to be motivated to adopt AIM [32].

The relationship between coercive isomorphism was also not found to have a positive association with SMEs' intention to adopt agile management. This result is not consistent with findings by Soares, et al. [40], Lee and Chen [17], and Yuan, et al. [39]. For instance, Soares, et al. [40] found that organizations in the health industry adopt innovation and changes to their operations to legislations by the government. Lee and Chen [17] also conceptualized that organizations high in coercive isomorphism would be more likely to adopt agile innovation. In the tourism industry, tourists consistently demand high technological innovation levels, and businesses in this industry respond as not to risk losing their competitive edge [39]. This finding could be because there are no Fiji regulations that require AIM. The smaller size could also explain customers and suppliers of SMEs not forcing the adoption of AIM for SMEs.

Normative isomorphism was found to have a positive association with SMEs' agile innovation management intention.

This finding is consistent with prior studies in different contexts. Organizations in the tourism industry perceive that third-party accreditation is a fundamental source of legitimization [40]. In addition, Lai, et al. [44] found that professionalization leads to the adoption of new technologies to achieve legitimization. This result implies that SMEs, like other organisations, modify their activities, structure, and behaviour based on their perception of what stakeholders in their social network deem appropriate [83]. The sources of normative pressure can come from professional societies, industrial standards, and media, among others [58]. Therefore, SMEs would seek to adopt AIM to gain legitimacy based on the perception that adoption is an appropriate action. The strength of the relationship shows that the major external factor affecting SMEs' intention to adopt innovation management is mimetic isomorphism followed by normative isomorphism, while coercive isomorphism was not found significant.

Results reveal that top management championship was positively associated with SMEs' AIM adoption intention. This finding is consistent with other studies. According to Kankanhalli, et al. [48], with solid top-level support, firms can overcome barriers and resistance within the firm to adopt new technology. Gopalakrishna-Remani, et al. [30] found a positive association between top management championship and electronic medical records adoption in US hospitals. Therefore, this result implies that SMEs with good support from owner-managers would have a higher intention to adopt agile innovation management. Top management champions in SMEs would-be owners who can take a power-coercive or role model approach towards the adoption of AIM [84]. Long term vision and goal can be established communicating the norms and benefits of AIMS to employees. Owner-managers would play a

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critical role in reducing resistance due to the changes arising from redesigning the development process and organisational changes to adopt AIM [85].

Adhocracy culture was also found to have a positive association with SMEs' intention for agile innovation management. Researchers in other studies derived similar findings. Tseng [50] found that firms with an adhocracy culture are more open to risk-taking and are willing to change their working environment by adopting innovative technologies. del Rosario and René [51] found that adhocracy culture explains the adoption of environmental innovation in the hotel industry. Therefore, this result implies that SMEs with a high culture that favours agility, adaptability, and flexibility would have a higher intention to adopt AIM. Such SMEs that have a culture of open-mindedness and flexibility would be more comfortable to adopt AIM. This is because the beliefs and values of the adhocracy culture of embracing change is similar to the principles of AIM.

Clan culture was found to have a positive association with SMEs' intention to adopt agile innovation management. This result is consistent with prior studies. Studies have shown a positive association between clan culture and the adoption of agile methods by firms [25, 55]. Tseng [50] also found that clan culture positively influences the adoption of innovative technology. Therefore, this result implies that SMEs with a culture of highly committed employees, open communication, employee involvement, trust, and teamwork will likely have a greater intention to adopt agile innovation management. Literature has highlighted that teamwork characterised by cooperation, coordination, and self-organisation are critical elements of AIM [86]. The findings confirm that clan culture provides the needed environment and conditions for AIM to succeed, thus increasing the intention to adopt AIM.

Organizational readiness was also confirmed to be positively associated with SMEs' agile innovation management. Previous studies have shown consistent findings [60, 61]. For example, a positive association of organizational readiness to the perceived usefulness of technology [60]. In the context of SMEs, Asiaei and Rahim [61] found that organizational readiness is positively associated with adopting innovative technology. Therefore, this result implies that SMEs with commitment, resources, and awareness factors would have a higher intention to adopt agile innovation management. Having sufficient financial sources would enable SMEs to develop routines and processes, invest in technology, conduct training on skills and knowledge required to adopt AIM as well as get consultancy needed to guide the adoption of AIM. Therefore, financial and technical readiness is key to adopting AIM which has been confirmed by this study. The results of the internal factors show that adhocracy culture is the most influential factor. Comparing both the internal and external environmental factors, mimetic isomorphism is the strongest antecedent to SMEs' adoption of AIM.

VII PRACTICAL IMPLICATIONS

The findings of this study have the following practical implications. First, the study confirmed that mimetic and normative isomorphism would influence the adoption of AIM by SMEs. These findings imply that SMEs seek social legitimacy, respond to stakeholder pressures, and are

relationship-oriented. SMEs can follow market leaders' best practices to gain social legitimacy. This highlights SMEs' needs to be aware of recent market trends and actions of other businesses in the industry. Managers must foster an organisational culture that encourages continuous improvement and competition with other players in the market. To gain legitimisation, business managers need to seek accreditation to ensure high standards based on current professional practices and the latest research, institutionalizing values, assumptions, and norms are more influential than the technical rationality of AIM. As such, this finding is of particular value to policymakers and practitioners. To encourage more SMEs to adopt AIM, the role of institutions must be reinforced. Pressure from institutions would encourage SMEs' culture, beliefs, and norms to adopt AIM.

This study has confirmed that internal environmental factors are equally important. Top management support often comes in the form of verbal commitment to innovation, but by itself, this is of little value. Therefore, top management must support this commitment with actions and guidance to adopt AIM. There needs to be effective assigned of, clarification of direction, and ensure that there is an adequate assignment of personnel to ensure adoption of AIM. Through supplementary support by top management, the uncertainty towards AIM can be gradually reduced. Senior managers in SMEs should give incentives to participate in the successful adoption of AIM. Senior managers must also facilitate SMEs' absorptive knowledge capabilities as AIM requires knowledge sharing and continuous learning.

There is also a need to ensure that the internal environment of SMEs is conducive to the adoption of AIM. This will help in the identification of strengths and weaknesses. This is crucial to ensure that SME employees are less resistant to the changes needed to adopt AIM. There needs to be a motivating atmosphere, convincing evidence for employees to accept the change. It is imperative that leaders within the business outline the benefits of AIM to both the employees and the business. For example, assisting the employees in realizing how AIM will help their career development, growth, and promotion. Leaders also need to establish a supportive environment that employees socialize and learn from each other.

AIM provides higher quality products, a more organised workforce, satisfied customers, team morale, and increased collaboration. Given these benefits of AIM, small businesses would be more competitive. Project management for such businesses is more beneficial as everything needs to be done by small business owners for SMEs, from juggling responsibilities to shifting roles. It increases SMEs ability to handle large projects in the minimum amount of time. Oversight is required on every transaction that occurs in the business by the owner to ensure smooth operation [79]. As SMEs struggle to do more with limited resources, AIM can solve SMEs to enhance profitability, competitiveness, and efficiency [13]. The bottom line remains irrespective of the business's size; however, the AIM needs for a business depend on the team, management style, and projects [6].

VIII THEORETICAL IMPLICATIONS

The study's findings make the following theoretical contributions. First, this study makes the first effort towards

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bridging this gap in the literature relating to SMEs' adoption of agile innovation management. This investigation is essential as SMEs contribute significantly to the growth and development of the economy and social stability [21, 87, 88]. Studies on agile innovation management have typically been conducted with larger businesses [17] and the government [13]. SMEs have unique characteristics that distinguish them from larger businesses. As the adoption of AIM has been previously explored with larger businesses, the uniqueness of SMEs generates valuable insights. Second, most studies on the adoption of AIM have been conducted in large and more developed countries. This study provides the first insights from a Small Island Developing State like Fiji. The difference in economic, cultural, and political factors between developed and developing countries profoundly impacts technology adoption [62]. The findings from this study show that only mimetic and normative isomorphism are significant external environmental factors affecting the adoption of agile innovation management, with mimetic isomorphism being the stronger of these two factors. This provides new insights and contributes to the literature on agile innovation management for SMEs. Third, this study provides comprehensive insights into the adoption of AIM by testing a conceptual model that includes both internal and external factors. This is important as both internal (organizational theories) and external factors affect adopting intentions. Studies have highlighted that a single theory alone is not sufficient to examine a phenomenon [89].

environmental factors of mimetic isomorphism) and normative isomorphism has a positive association with the intention to adopt agile innovation management. The internal environmental factors of top management championship, adhocracy culture, clan culture, and organizational readiness were confirmed to be positively associated with agile innovation management. Despite these findings contributing theoretically and practically, more studies are needed to understand the applicability and adaptability of agile innovation management for SMEs. Particularly, as this study has only examined clan and advocacy culture, future studies can examine hierarchy and market culture in influencing agile innovation management.

IX CONCLUSIONS, LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Despite this study conducting a thorough investigation, certain limitations need to be highlighted as they provide fertile grounds for future research. First, this study adopts a cross-sectional design that collects data from SMEs in Fiji. The results from this study are valid for Fiji only. Therefore, generalization of the results needs to be done with caution. Future studies should employ other types of research methodologies, such as longitudinal research design. Second, data collection for this study was done using Facebook. Despite other studies employing this data collection method, not all SMEs may be present on Facebook. Therefore, future studies should use a data collection method that uses random sampling techniques. Third, despite the predictive power of this study's dependable variable being within the accepted range [82], future studies can explore other variables to increase the predictive power of the model and gain better insights into the dependent variable. For example, studies can also conceptualize factors such as organizational readiness as multidimensional constructs. This would provide valuable insights into specific factors affecting organizational readiness. Additionally, future studies can explore possible mediators and moderators between the internal and external factors affecting the adoption of AIM for SMEs.

There are several opportunities available for SMEs by adopting agile innovation management. Despite the limitations mentioned above, this study provides valuable insights into its adoption factors. The results confirmed that external

APPENDIX

Questionnaire

CRP	Coercive pressure [12]
CRP1	Institutional pressures external to the firm (e.g., industry associations, customers) require the use of agile innovation management.
CRP2	Our business's parent company (or shareholders) of our firm requires the use of agile innovation management.
CRP3	The competitive conditions require our firm to use agile innovation management.
MMP	Mimetic pressure [12]
MMP1	The proportion of my business's competitors that use similar systems is with regard to the adopted system.
MMP2	My business's competitors that have adopted the system, or similar systems, are benefiting greatly.
MMP3	My business's competitors that have adopted the system, or similar systems, are favourably perceived by others in the same industry.
MMP4	My business's competitors that have adopted the system, or similar systems, are favourably perceived by their suppliers.
MMP5	My business's competitors that have adopted the system, or similar systems, are favourably perceived by their customers.
NMP	Normative pressure [12]
NMP1	Your business's suppliers have adopted agile innovation management.
NMP2	Your business's customers have adopted agile innovation management.
NMP3	The government promotes the use of agile innovation management.
TMC	Top management championship [38]
TMC1	Top managers having important influences on our business's valuing of agile innovation management in strategy and operations.
TMC2	Top managers integrate agile innovation management into our business's strategic planning.
TMC3	Top managers believe the implementation of green practices will be conducive to enhancing our business's competitiveness.
TMC4	Top managers support the implementation of agile innovation management.
TMC5	Top managers are willing to invest in the implementation of agile innovation management.
ADC	Adhocracy culture
ADC1	The business is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.
ADC2	The leadership of the business is generally considered to exemplify entrepreneurship, innovation, or risk-taking.
ADC3	The business emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.
ADC4	The business defines success based on having the most unique or the newest products. It is a product leader and innovator.
CLC	Clan culture [39]
CLC1	There is adequate assistance from the boss and colleagues in a difficult situation
CLC2	There is a cordial relationship between the individuals and management in the business.
CLC3	There are loyalty and teamwork relationships between members of the business.
OGR	Organisation readiness [40]
OGR1	Our business has the financial resources for agile innovation management.
OGR2	Our business has expert human resources in agile innovation management.
OGR3	Our business has the technical resources to use agile innovation management.
OGR4	Our management has a willingness to invest in agile innovation management.
ITA	Intention to adopt [41]

ITA1	Our business intends to adopt agile innovation management.
ITA2	Our business intends to start using agile innovation management regularly in the future.
ITA3	Our business would highly recommend agile innovation management for other enterprises to adopt.

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