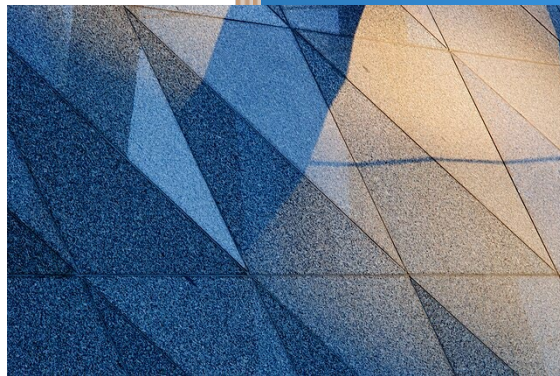




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Job Crafting Antecedents and Consequences: Evidence from Jordanian Universities

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Abstract: Purpose - This article explores academic job crafting's significant conditions (antecedents and consequences). The impact of encouraging learning environments and the leadership that fortifies learning was studied. Knowledge management and job crafting are closely related in their ability to empower employees and enhance organizational effectiveness. **Design/methodology/approach** –217 academics serving in a Jordanian University, in Jordan, took part in this study. Statistical parameters endorsed the significant impact of two learning organization building blocks on job crafting. **Findings** - It was shown that supportive learning environments and leadership reinforces learning; and positively impacts job crafting, which consequently reflects upon job satisfaction levels among academics. The results imply that strategies conducive to learning provide the most rewarding approach to enhancing academic job crafting and job satisfaction. **Originality/value** – To the authors' knowledge, no prior study has examined job crafting and linked it to the study dimensions within the Arab context generally and particularly in the academic field. We propose this model as a system crafting theory and end our research with suggestions for further research on these issues.

Keywords: Job crafting, Job satisfaction, Learning organization, Academic organization, Supportive learning environment, Leadership support, Jordan

1. Introduction

When addressing academic careers, we need to examine how far the efforts of scholars have come in evolving knowledge (Hambrick, 2007) or directing colleagues and students towards improving their research and academic performance, and therefore influencing the academic community. These aspects directly impact the scholar's self-vitality, self-worth, self-actualization, and the extent to which they enjoy a meaningful academic career (Wrzesniewski and Dutton, 2001). Wellman and Spreitzer (2011) employed the job crafting theory to exhibit how academics can give more meaning to their tasks by changing how they carry out their work. Their work was built upon the assumption that enhancing the personal meaning of academic jobs adds value and significance (Wrzesniewski and Dutton, 2001; Vogt, et al., 2016). For many authors, job crafting is defined as a proactive alteration to a given job content and context (Wrzesniewski and Dutton, 2001; Dubbelt, Demerouti and Rispens, 2019). It is comprised of three dimensions: Mental model crafting, which involves mindset context; transformational crafting related to the nature of the duties or job; and interactional crafting (Wrzesniewski and Dutton, 2001; Dubbelt, Demerouti and Rispens, 2019).

Many scholars theorize job crafting in academia as well as various sectors (Kozlowski, et al., 1999; Cameron and Dutton, 2003; Wellman and Spreitzer, 2011; Arachie, et al., 2021). Nevertheless, a transformation as such is difficult to maintain if not driven by environmental and contextual changes. Most research neglects to address the conditions and antecedents necessary to support employees in crafting their jobs. Further, given the increasing attention regarding job crafting and its benefit to organizations, there is still a lack of studies that examine the proper interventions to enhance job crafting implementation, and according to Roczniowska, et al. (2023), some studies are only theoretically oriented. This proposed model as a system crafting theory attempts to close this gap by exploring and testing such significant antecedents to job crafting (Nielsen and Abildgaard, 2012), particularly focusing on antecedents related to a) supportive learning environments and b) leadership that reinforces learning among employees (Melhem, 2011). Research to date focuses on various factors and antecedents to job crafting, including autonomy (Kim and Qu, 2018), knowledge, empowerment, work engagement (Petrou and Demerouti, 2015; Park and Park, 2023) and self-efficacy. Moreover, this research contributes to job crafting knowledge by providing insights into different contextual factors including the role of leadership and learning. Closely related, organizations and leaders can help employees craft their jobs through effective learning, experimenting and development. Knowledge management and job crafting are inherently interconnected and relevant concepts, particularly within academic and scholarly contexts. Job crafting involves purposefully modifying job tasks, relationships and perceptions to create more meaningful jobs (He, Teng and

Song, 2023). In an academic setting, this process heavily relies on knowledge creation, sharing and effective knowledge management (He, Teng and Song, 2023). This is evident in academics' actions in job re-design and job crafting as they engage in research, conferences, seminars and various scholarly activities for career advancement and recognition (Irfan, et al., 2022).

2. Literature Review

The existing literature overlooks the role of the organization system, management and structure, which may partially restrict job crafting due to the nature of the organization. Job crafting should be a strategic issue; it cannot work as an ad hoc approach because it might run counter to management directives (Hornung, et al., 2010). For successful job crafting, vertical support in the organization hierarchy is needed, as well as lateral support from colleagues, specifically when your job interacts or overlaps with others in a reciprocal interdependent fashion. Thus, this research proposes a system crafting model using support from both the system and management in a strategic job crafting program for the entire organization (Ucar and Kerse, 2022; Wrezinswsky and Dutton, 2001; Dubbelt, Demerouti and Rispens, 2019).

In a landmark study, Wrezinswsky and Dutton (2001, p.193) argued that: "employees actively crafted the job, sometimes against management's wishes. Rather than have managers intervene to enable or encourage these employees to act as job crafters, the employees took the initiative on their own".

This implies that employees work in an independent setting, with minimal daily interaction with their managers. While this might be effective in a more empowering organization (Spreitzer, 1995), it might be unreasonable in many other formal ones. Some crafting, however, requires resources, information, material and time that requires management and team support. This research suggests that two antecedents are vital to enhance job crafting and extend its adoption across various sectors and different organizations. These antecedents are i) leadership that reinforces learning and ii) a supportive learning environment. While some organizations are highly bureaucratic, others are highly centralized with jobs that are very limited and scripted. Hence, this crafting model adds to the literature by recommending an integrated approach to job crafting incorporating these two antecedents (Garvin, Edmondson and Gino, 2008). This argument calls for organizational and leadership intervention.

2.1 Job Crafting Conditions

Although job crafting principally refers to a constructive, genuine process in redefining one's job, it is not clearly authorized by management. Hornung, et al. (2010) argue that the supervisor or management may object to the employee manipulating his/her job task or context (Morrison, 2006). This is the case in most top-down approaches and bureaucratic organizations (Dubbelt, Demerouti and Rispens, 2019). However, widespread job crafting without the proper organizational context is a recipe for chaos, rejection and frustration for those employees seeking to craft their jobs. Hence, employee opportunities to exert freedom over work characteristics tend to be controlled (Hornung, et al., 2010). That is why this article proposes that specific learning organizational dimensions are necessary prerequisites for enabling employees to naturally restructure their jobs for the benefit of both the employee and the organization (Wellman and Spreitzer, 2011; Nielsen and Abildgaard, 2012).

2.2 Research Contribution

Melhem (2019) sees university academics as an apt research target group when investigating the job crafting concept, particularly in the Middle East, where there are limited publications linking job crafting with learning organization practices and principles. This article quantitatively investigates job crafting theory by proposing an integrative system crafting framework by linking essential and viable learning organization building blocks as an antecedent to job crafting, sustaining it more effectively and successfully; specifically among university scholars and researchers (Nielsen and Abildgaard, 2012). It then examines the impact of job crafting and measures how far it enhances their satisfaction with their careers.

2.3 Method in Perspective

This research focuses on a quantitative research methodology using survey and questionnaire design and SEM analysis with Amos. We introduce three dimensions of job crafting: mental, transformational and relational crafting. Subsequently, two building blocks are explained and put forth to amplify the job crafting theory. Finally, we discuss job satisfaction considering job crafting (Nielsen and Abildgaard, 2012).

2.4 Job Crafting Situations

Among the various forms of job crafting is cognitive or mental model crafting which includes altering task-related boundaries and cognitions (Wellman and Spreitzer, 2011). An impactful mental model allows associates to discuss with their co-workers the nature and scope of everyone's role and abilities and to traverse the limits and extent of each other's proficiencies and roles (Mohammed, Klimoski and Rentsch, 2000). Scholars, for example, can clarify how their knowledge, research and schooling combine, and how to optimize their interactions in the processes of learning and research (Katz and Kahn, 1978; Kozlowski, et al., 1999). A competent mental model will potentially aid in the collaboration of scholars to create better results in terms of academic performance at multiple planes. The mental model enables those in any institution to continuously review and develop the flow of work to upgrade functioning (Pearsall, Ellis and Bell, 2010).

The term 'cognitive crafting' is used by Wellman and Spreitzer (2011) in which two patterns appear i.e., broadening one's point of view and leveraging the best version of oneself. Upon working hand in hand, intellectuals obtain more personal sense and worth, thereby presenting the opportunity to share and respect each other's input and perspectives leading to a collective of contributions and a joint influence on the students, the organization, and the society as a whole. The atmosphere created by this mental model will enforce the notion of living up to one's best potential (Roberts, et al., 2005).

Overall, in job crafting, employees actively engage to mould their jobs' features to fit their specific capabilities, skills and preferences. They may craft their jobs by taking on more duties or different ones, craft their working relationships by changing how they interact with their co-workers and, finally, employees might engage in mental crafting, in which they perceive their jobs positively and re-view their jobs to become more exciting and meaningful (Wrzesniewski and Dutton, 2001).

Hypothesis 1: Mental model crafting has a significant positive impact on scholars' career/ job satisfaction.

2.4.1 Transformational crafting

Transformational crafting involves making job content more exciting and meaningful (Wrzesniewski and Dutton, 2001). Tasks can be rendered meaningful through mindful or cognitive association and by emotionally engaging with the task being performed (Petrou, et al., 2012; Dash and Vohra, 2019), both of which are fundamental to research work. Quality research is the outcome delivered by researchers who are invested both intellectually and emotionally, and who rise to the challenge to prosper. Research may be conducted as cause-related, socially oriented, or positive organizational scholarship (Cameron and Dutton, 2003), resolving societal issues in varying areas and disciplines. Furthermore, Wellman and Spreitzer (2011) suggested that scholars can achieve meaning by incorporating further challenges to their work content by undertaking difficult research problems that may have the potential to solve demanding social, economic, or structural predicaments.

Hypothesis 2: Transformational crafting has a significant positive impact on scholars' career/ job satisfaction.

2.4.2 Relational crafting

Job meaningfulness can also be augmented by establishing valuable relationships between co-workers. Wellman and Spreitzer (2011) proposed that relational crafting, maintained by promoting high-quality connections and increasing contact with recipients, can increase the meaning of scholarly work. In high-quality connections, colleagues share mutual respect and interest in research and academic concerns, increasing the vitality of all parties (Petrou and Demerouti, 2015; Arachie, et al., 2021). Several tools and mechanisms may help academic partners form such connections in sharing knowledge and academic interests, including creating research agendas and clusters that hold monthly seminars. Dutton and Heaphy (2003) suggest creating social and sporting connections that serve to lubricate the relationship between academics. Wright and Wright (2002) pioneered the concept of *committed to participant research*, in which, scholars and subjects taking part in the study consider such an experience as a calling rather than a mere assignment or series of tasks. This indicates that researchers or scholars could enhance their degree of communication with their research partakers and beneficiaries.

Hypothesis 3: Relational crafting has a significant positive impact on scholars' career/ job satisfaction.

2.5 Towards an Integrated System Crafting Theory

This article proposes an integrated system crafting approach which draws on both learning organization literature and the original job crafting conception to create effective scholarly career enhancement and satisfaction.

The three types of above-mentioned job crafting are essential strategies for effective academic career enhancement and job satisfaction. Any climate receptive to change necessitates certain building blocks, and the literature on learning organizations is a valuable source of information (Garvin, Edmondson and Gino, 2008). The system must accommodate this change. Thus, the three crafting methods work to benefit each scholar. With relevance to this issue, we use some drivers for change from the learning organization conception presented by Garvin, Edmondson and Gino (2008). Figure 1 illustrates this article's proposal for a system crafting theory that integrates the following three building blocks with job crafting antecedents.

3. Antecedents of Job Crafting

3.1 Leadership Support

An integrated system crafting theory requires supportive leaders who encourage participation, empowerment and learning within the learning organization culture. Sahin, Cubuk and Uslu (2014) asserted that under participatory, democratic and transformational leadership styles, employees have the opportunity to share information and examine their knowledge. Moreover, they can solve problems by generating creative and alternative approaches to work (Davis and Newstorm, 1993, p. 227). Leadership support can lead to feelings of empowerment, commitment and trust (Gupta, MacMillan and Surie, 2004; Khan, Mubarak and Islam, 2020). For example, Dash and Vohra (2019) concluded that empowering leadership has a direct impact on job crafting. Scholars need top management support and involvement to assist their initiatives and praise their scholarly influence among fellow academics and students and in wider society (Gupta, MacMillan and Surie, 2004). Leaders may provide time, resources and incentives to support transformation more systematically in academic jobs and, conversely, may impede such change by limiting resources and support (Garvin, Edmondson and Gino, 2008). The results of Liaw, Chi and Chuang (2010) emphasized the significant role of transformational and empowerment leadership in supporting employees' learning and capabilities to serve customers differently. They indicated that employees who receive leadership support become more motivated to value and satisfy customer needs. Leadership support influences job perception among employees and can enable them to be more significant and influential in job outcomes, according to the following hypothesis:

Hypothesis 4: Leadership support has a significant impact on the three job crafting conditions: mental, transformational, and relational crafting.

3.2 Supportive Learning Environment

Various organizations have an inherent culture that impacts the organizational operation. Schein (1990) stated that organizational cultures consist of visible features, such as physical surroundings like buildings, behaviours, regulations and hidden features, such as shared values, norms and mental models of its members (Daft, 2001). These features can either support learning and advancement, or otherwise obstruct learning at the individual and organizational levels. Nebojša, Marija and Kristina, 2020 concluded in their study that enhancing organizational culture might improve professors' job satisfaction, which eventually will positively influence the effectiveness of higher education institutions. A supportive environment and strong learning culture are expected to increase the ability of the organization's human resources to derive meaning in their jobs. A 'supportive learning environment' is the 5th hypothesis. It is deemed one of the essential conditions and prerequisites for the remodelling of jobs and development at the scholarly level:

Hypothesis 5: A supportive learning environment has a significant impact on the three job crafting conditions: Mental, transformational, and relational crafting.

4. Job Crafting and Employee Satisfaction: Consequences

Kohn and Schooler (1982) argued that people carry their workplace experiences into their personal lives. Consequently, employees who successfully craft their jobs may extend that positive experience and expand their own resources. An exclusive resource of wide concern is psychological capital and job satisfaction linked to positive psychological resources: hope, optimism, efficacy and resilience, grouped in one higher-order factor (Luthans, et al., 2007; Avey, et al., 2011). Hence, job satisfaction is clearly associated with an individual's positive psychological constructs that consist of self-efficacy, optimism, hope and resilience to attain success (Luthans,

et al. 2007, p. 542). Here job satisfaction can be associated with employee attitudes, such as organizational commitment and involvement (Luthans, et al. 2008; Vogt, et al., 2016).

According to Siddiqi (2015, p.281), “self-perceived decision-making authority and consequent perceived better performance make employees feel that their jobs are more worthwhile, meaningful or something they should take pride in”. This enhances employees’ job satisfaction, feelings of self-respect and sense of belonging. Literature on Job satisfaction by Mackenzie, Podsakoff and Ahearne (1998) and Yoon and Suh (2003) and literature on identity theory by Loscocco (1989) assert that these optimistic notions are of great importance to the delivery of quality service and overall client satisfaction.

There is a clear link between job crafting and satisfaction, with employees feeling more satisfied in having an exciting and meaningful job that they have helped to shape (Zhao, Li and Shields, 2022; Siddiqi, 2015). Sousa-Poza and Sousa-Poza (2000) demonstrated in their research that the most critical aspects of being satisfied with one’s job were enthusiasm, solid relationships with superiors and colleagues, good income and autonomy (Deci and Ryan, 2000). The level of satisfaction will also reciprocally influence job engagement and job involvement among employees (Bakker and Oerlemans, 2011). Hackman, Pearce and Wolfe (1978) examined the impact of job redesign on job satisfaction, finding that employees whose jobs were redesigned stated greater satisfaction and interest in their challenging jobs than those with less challenging jobs and, according to scholars, their increased involvement in knowledge creation, research and community services should make their jobs more exciting and meaningful. (Hackman, 2011). In a review of these contentions, we propose the following hypothesis:

Hypothesis 6: Job crafting has a significant and positive impact on job satisfaction.

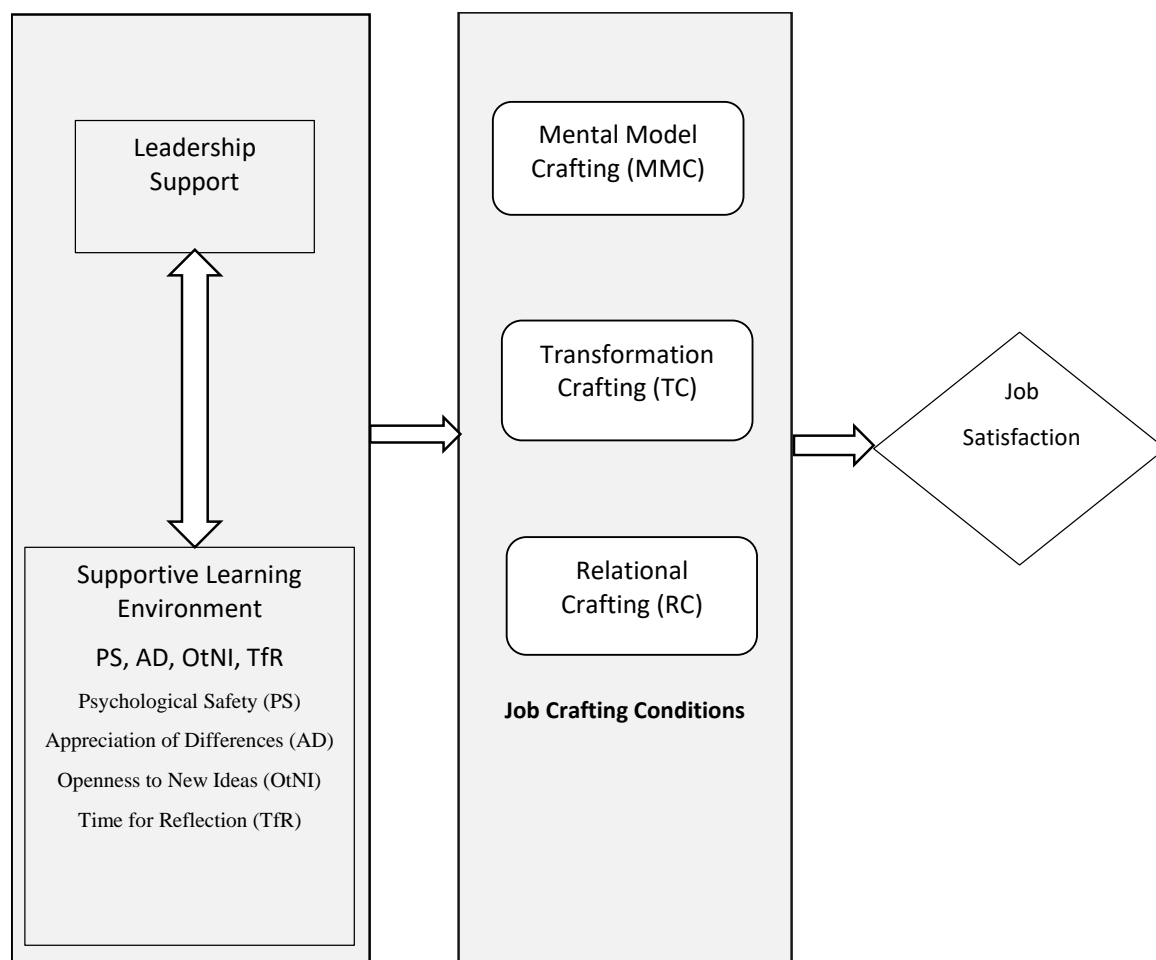


Figure 1: Proposed system crafting

5. Methodology

Data were collected from academics at Yarmouk University, a Jordanian public university. A list of academic records, including lecturers' names, titles and positions was obtained from the university site (www.yu.edu.jo) to create a random sample from Yarmouk's 1004 academic staff members. The questionnaire was distributed to 300 participants from a full range of academic ranks. 237 questionnaires were returned, of which 217 were completed and valid for analysis. This sample size was statistically accurate with a 95% confidence level and 4 confidence intervals (Sekaran and Bougie 2003). After receiving training and guidance, MBA students with scholarships and grants from the university collected the data. At the time, the university was undergoing a quality initiative (Accreditation Process) that impacted teachers' jobs and changed work methods. The university involved teachers in improving areas of quality research, community service, and college service, which was consistent with job crafting and learning organization principles - the focus of this research. The questionnaire contained questions related to the three main dimensions: job crafting, learning organization dimensions and employee satisfaction.

5.1 Research Design

The questionnaire was initially written in English, translated and then translated back to English to facilitate the language abilities and comprehension of respondents. It included three factors: learning organization dimension as an independent factor, job crafting as an intervening variable and job satisfaction as a dependent variable. Learning organization encompasses two main variables: leadership that reinforces learning and a supportive learning environment. Job crafting consists of task transformation and relational and mental model crafting. After pretesting by eight professor's faculty of Business at Yarmouk University, the questionnaire was created and finalized. A pilot study was performed through a discussion of the questionnaire with 12 professors from different Yarmouk colleges. Their responses to questions about the questionnaire's comprehensibility helped modify it before the final distribution.

5.2 Measures

A five-point Likert scale was used to measure all scales in the study; it ranged from 1 for strongly disagree to 5 for strongly agree. To test the hypothesized model, measurement instruments taken from the literature were implemented. For credibility reasons, a few statements were built in reverse. After reviewing returned questionnaires 20 of 237 were not eligible for analysis and thus excluded.

In this study, 75% of the participants were male, and the participants' age was 36 to 45 years of age. 33% came from the Economics and Management School, 9% from Education, 27% from Arts and Literature, and 31% from other disciplines. 35% of the sample were assistant professors, 29% were lecturers, 14% were full professors, and 23% were associate professors. It is worth mentioning here that demographic variables did not significantly impact any of the study variables with $P > 0.05$ in all measures.

Job crafting: as the focal construct in this study was measured using 15 items, with 1 to 5 reflecting transformational crafting, 6 to 10 reflecting cognitive (mental model), and 11 to 15 reflecting relational crafting. Thirteen items were obtained from Slemp and Vella-Brodrick (2013) and two items were obtained from Leana, Appelbaum and Shevchuk (2009).

Learning organization (two building blocks): The items, adopted from a Harvard Business Review article by Garvin, Edmondson and Gino (2008) entitled "Is Yours a Learning Organization?", consist of two main factors: supportive learning environment and leadership that reinforces learning.

Job satisfaction: six items were used to measure job satisfaction that were adopted from the Michigan Organizational Assessment Questionnaire (MOAQ) (Cook, et al., 1981).

Cronbach's Alpha was employed to test the study measure's reliability; it represented 82% for the job crafting dimension, 72% for the supportive learning environment and 90% for leadership that reinforces learning and, finally, job satisfaction scored 88% in reliability.

6. Results

6.1 Data Analysis

The Skewness and Kurtosis indices was used to verify the univariate normality of distributions. Following that, the Kurtosis multivariate Mardia coefficient was applied to determine the multivariate normality of the variables (Barbaranelli, 2006). Next, descriptive statistics and correlations between variables were calculated. To test our

model, we employed structural equation modelling (SEM)/AMOS, 24th version (Arbuckle, 2008). The SEM procedure was suited for testing our theoretical model as it made it possible to assess to what extent a proposed conceptual model comprised of observed and unobserved constructs explained or suited the collected data (Bollen, 1989). For estimation, a maximum likelihood method was chosen. The model fit was evaluated using the listings shown in our statistics. Table 1 illustrates the study measures.

Table 1: The study measures

Measure	CMIN	DF	CMIN/DF	CFI	TLI	IFI	SRMR	RMSEA	PClose
Estimate	484.180	312	1.552	0.935	0.927	0.936	0.076	0.049	0.561

Means, standard deviations, correlations and reliabilities for all variables are presented in Table 2. All variables were deemed reliable and were approved for carrying out research. The reliabilities ranged from 0.70 to 0.89. A positive correlation between the variables was found at $p < 0.01$ and at $p < 0.05$.

Table 2: Descriptive and Correlations of Study Variables

Variables	M	SD	1	2	3	4	5	6
1 Transformational Crafting (TC)	4.056	.531	(.70)					
2 Relational Crafting (RC)	3.873	.619	.448**	(.72)				
3 Mental Model Crafting (MM)	4.227	.527	.402**	.363**	(.75)			
4 Learning Support (SLE)	2.998	.424	.085	.109	.022	(.72)		
5 Job Satisfaction (JS)	4.111	.659	.372**	.229**	.343**	.270**	(.88)	
6 Leadership Support (LS)	3.200	.745	.241**	.286**	.133*	.462**	.350**	(.89)

Note: N = 217, ** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level, Reliabilities are in parentheses.

Data analysis was performed using the two-step approach of Anderson and Gerbing (1988), by which the confirmatory measurement model estimate presages the structural model estimate. All study variables were exposed to confirmatory factor analyses (CFA) using AMOS software to test the quality of the measurement model applying convergent and discriminant validity for the main variables before performing hypothesis testing. After the study by Hu and Bentler (1999), numerous model fit indexes investigations were carried out. The following fit indicators were employed to evaluate the model's fitness: CMIN/DF measure; the comparative fit index (CFI); Bollen's Incremental Fit Index (IFI); TLI = Tucker-Lewis Index; SRMR = standardized root mean squared residual; RMSEA = root mean squared error of approximation and PClose measure. As indicated by the fit indexes for the preliminary model fit, it needed to be re-specified to be more suitable for the sample data. To enhance model fit, 13 items were extracted because of low loading, and another 4 were extracted owing to the value of residual covariance being beyond a value of 2.0 and greatly decreasing the model fit and, to address the most significant modification indices, many error terms that are part of the same factor were correlated. To achieve adequate convergent and discriminant validity, 3 items were extracted. As a result of the confirmatory factor analysis (CFA), Table 3 displayed all extracted items.

Table 3: Removed items during CFA

Items	Factor	Reason For Removing
Craft 4	Transformational Crafting	Low loading
Craft 5	Transformational Crafting	Low loading

Items	Factor	Reason For Removing
Craft 9	Mental Model Crafting	Low loading
Craft 10	Mental Model Crafting	Residual covariance exceeding a value of 2.0
Craft 14	Relational Crafting	Low loading
Craft 15	Relational Crafting	Low loading
Lead 1	Leadership Support	Convergent and discriminant validity Issue
Lead 8	Leadership Support	Convergent and discriminant validity Issue
Spychosaf 1	Psychological Safety	Low loading
Spychosaf 2	Psychological Safety	Low loading
Spychosaf 5	Psychological Safety	Convergent and discriminant validity Issue
Diff 2	Appreciation of Differences	Low loading
Diff 4	Appreciation of Differences	Low loading
Open 2	Openness to New Ideas	Low loading
Open 4	Openness to New Ideas	Low loading
Time 1	Time for Reflection	Low loading
Time 2	Time for Reflection	Low loading
Time 3	Time for Reflection	Residual covariance exceeding a value of 2.0
Satisfy 1	Job Satisfaction	Residual covariance exceeding a value of 2.0
Satisfy 2	Job Satisfaction	Residual covariance exceeding a value of 2.0

After successive refinements, the obtained adjusted measurement model can be seen in Figure (2)

After sequential readjustments, the resulting refined measurement model is presented in Figure (2):

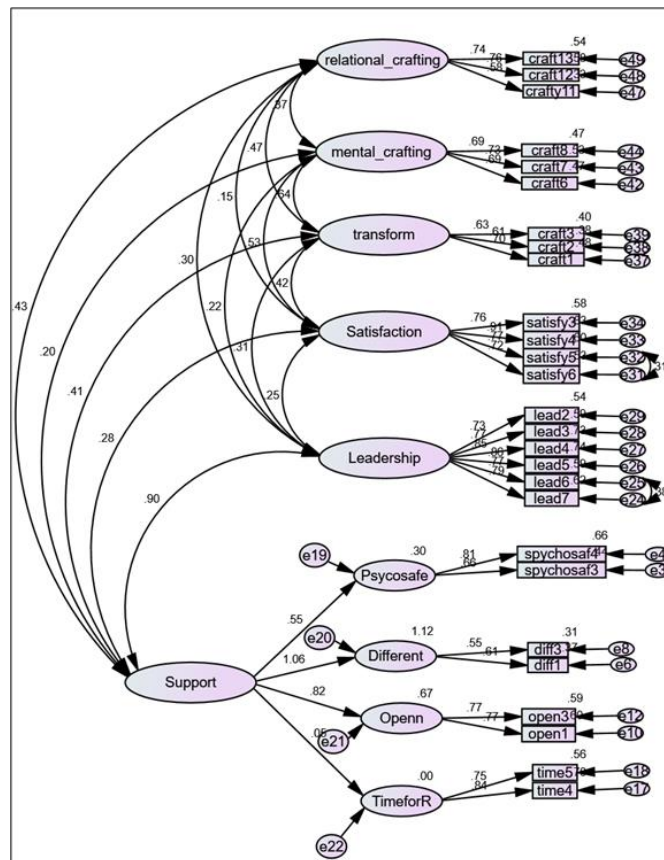


Figure 2: Confirmatory Factor Analysis (CFA)

Figure 2 shows that all items loaded conveniently onto the factors. The outcome of the Confirmatory Factor Analyses (CFA) model fit indices showed excellent model fit. As for indices values, these were CMIN/DF=1.37; CFI=0.958; SRMR=0.054; RMSEA=0.040; PClose=0.961; TLI =0.951 and IFI=0.959. When referring to Hu and Bentler’s (1999) cut-off criteria for fit indexes, these values reflected proper model fit. The estimations of the model fit parameters are shown in Table 4.

Table 4: Estimations of the model fit measures

Measure	Estimate
CMIN	416.35
DF	304
CMIN/DF	1.37
CFI	0.958
TLI	0.951
IFI	0.959
PClose	0.961
SRMR	0.054
RMSEA	0.040

6.2 The Measurement Model – Validity and Reliability

To assert whether the measurement model is valid or not, it is essential to examine its convergent and discriminate validity. Whilst each measurement item correlates strongly with its assumed theoretical construct, the Convergent validity is shown, while discriminant validity tests whether measurements that are not supposed to be related are unrelated (Lowry and Gaskin, 2014). Furthermore, convergent, and discriminate validity were examined in terms of Composite Reliability (CR), Average Variance Extracted (AVE), and Maximum Shared Variance (MSV) using the ‘Stats Tools Package’ developed by Gaskin and Lim (2016). The values were as evidenced (by convergent is AVE above 0.5, discriminate is a square root of AVE greater than correlations), and the evidence for reliability is achieved (by CR value greater than 0.700). This value lies within the normal range according to Hu and Bentler (1999). The model validity measures are represented in Table 5.

Table 5: Model Validity Measures

	CR	AVE	MSV	LeS	LS	Satisfy	T.C	M.M	R.C
LeS	0.761	0.522	0.805	0.722					
LS	0.913	0.637	0.805	0.897***	0.798				
Satisfy	0.873	0.634	0.285	0.281**	0.248**	0.796			
T.C	0.686	0.422	0.412	0.405***	0.311***	0.422***	0.650		
M.M	0.742	0.490	0.412	0.203*	0.222**	0.534***	0.642***	0.700	
R.C	0.737	0.486	0.225	0.432***	0.297***	0.145*	0.474***	0.368***	0.697

Notes: CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Variance; The square root of the AVE in bold; LeS = Learning Support; LS = Leadership Support; Satisfy = Job Satisfaction; T.C = Transformational Crafting; M.M = Mental Model Crafting; R.C = Relational Crafting.

After the refined model was obtained, the structural model was delineated and the valuation by maximum probability method was used via Amos Program, 24th version. The standardized parameter estimates for the structural model are laid out in Figure 3. The model fit indices offer a good model fit for the structural model. The values for indices were CMIN/DF = 1.552; CFI = 0.935; SRMR = 0.076; RMSEA = 0.049; TLI = 0.927; IFI = 0.936 and P close= 0.561. According to Hu and Bentler (1999), it reflected an appropriate model fit. Therefore, the

suggested research model adapts the data in a reasonable fashion. All the paths estimated in the model were indicative, except for the direct path from relational crafting to job satisfaction. Therefore, all hypotheses are supported except the hypothesis that “relational crafting has a significant positive impact on job satisfaction”. Table 6 presents the result of the hypotheses testing and the standardized regression weights of the output.

Table 6: Weights of the output and result of the hypotheses testing

Path	(β value)	(P value)	Result
Learning Support <--- Leadership Support	.870	***	significant
Relational Crafting <--- Learning Support	.413	***	significant
Mental Model Crafting <--- Learning Support	.297	***	significant
Transformational Crafting <--- Learning Support	.438	***	significant
Job Satisfaction <--- Relational Crafting	-.073	.329	insignificant
Job Satisfaction <--- Mental Model Crafting	.454	***	significant
Job Satisfaction <--- Transformational Crafting	.257	.002	significant

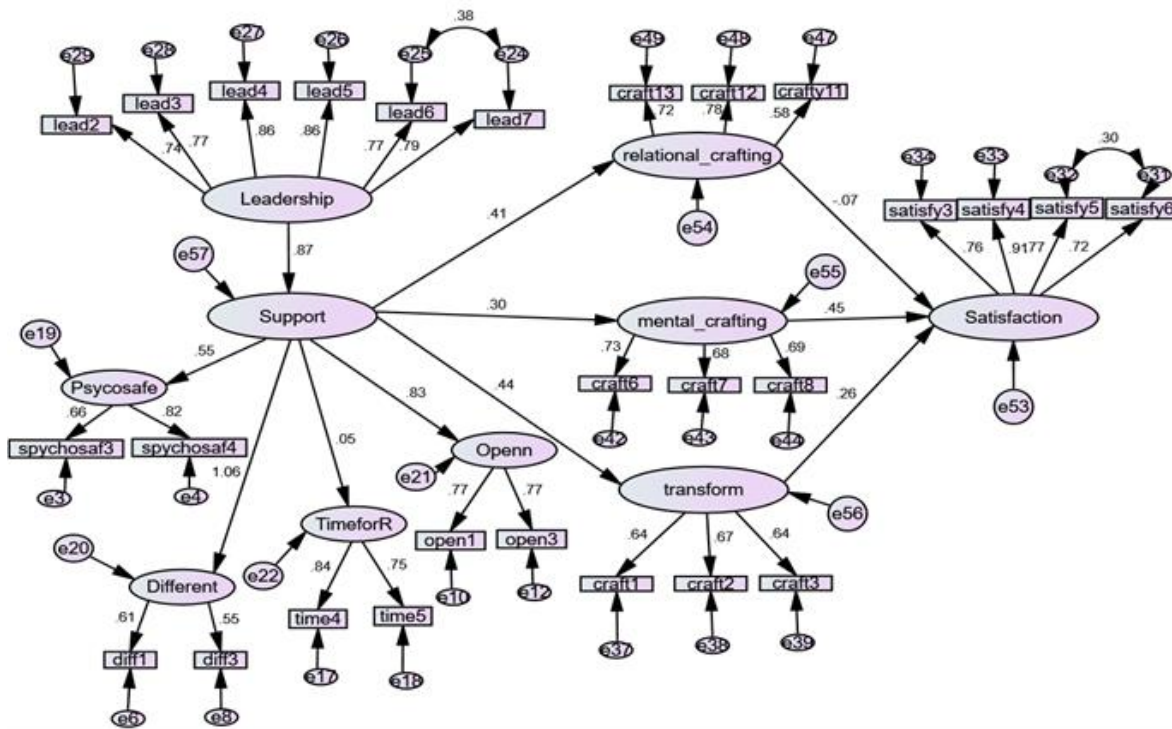


Figure 3: The structural model

6.3 Discussion

This article argues that job crafting requires important antecedents and that an incentivizing learning climate and leadership that is conducive of learning are essential for job crafting, which, in turn, is essential for job satisfaction in the academic arena (Ghaffar, Waheed and Iqbal, 2021; Wrzesniewski and Dutton, 2001; Bakker, Tims and Derks, 2012). The survey results showed that crafting one’s job leads to a more exciting and meaningful job with positive impact and significance (Bakker, 2011; Shang, 2022).

This article hypothesized that a supportive learning environment with its main dimensions of psychological safety, openness to new ideas, time for reflection, and valuing differences (Garvin, Edmondson and Gino, 2008) among university scholars would support their ability to craft their jobs in three main aspects of job crafting: TC, MMC, and RC (Wrzesniewsky, 2003; Wellman and Spreitzer, 2011). For academics, scholarly life characterized by job satisfaction is a significant outcome of job crafting and therefore promotes dynamic and quality

performance in research, teaching and community service (Shang, 2022; Ghaffar, Waheed and Iqbal, 2021; Avey, et al., 2011; Shoji, et al., 2016; Siddiqi, 2015; Sudibjo and Widiastuti, 2021).

The first hypothesis that job crafting impacts job satisfaction was supported by a positive result which backed the findings of Kohn and Schooler (1982) that work to out of work scenarios and job crafting may impact personal resources (Shoji et al., 2016), including job satisfaction and self-efficacy (Luthans, et al., 2007; Avey, et al., 2011). This study, however, has focused on the relationship between job satisfaction and three independent job crafting dimensions. Hence, job crafting impacts job satisfaction in aggregate and specifically with relations to primary job crafting dimensions (TC, MMC, and RC). While job satisfaction is an old and vital measure of hope, optimism, efficacy and resilience (Luthans, et al., 2007; Avey, et al. 2011) for employees in general, it is highly significant and vital for academics and scholarly jobs. Scholars derive satisfaction from their jobs' short-term and long-term impact reflected in their scholarly life, academic environment, students and research community (Wellman and Spreitzer, 2011). Thus, we find a positive impact and association in this hypothesis (Van den Heuvel, Demerouti and Peeters, 2015; Wang, Demerouti and Bakker, 2016).

This study found that two dimensions (mental model crafting and job transformation) impact job satisfaction, while relational crafting did not. This observation was inconsistent with prior studies (Wrzesniewski and Dutton, 2001). Salanova and Schaufeli (2008), Hakonen, Perhoniemi and Toppinen-Tanner (2008) and Zhao, Li and Shields (2022) reported that job crafting factors were positively linked with the level of job satisfaction. The faculty members in our study prioritize schooling, and the degree of interchange and the shape of the relationship might be constrained to the relationship between the students and teachers in the research sample.

A critical contribution of this study is the linking of two learning organization building blocks suggested by Garvin, Edmondson and Gino (2008) with job crafting. The related hypothesis revealed a positive linkage between the learning organization building blocks and job crafting. This association has not been investigated in previous studies and thus requires more testing and investigation. Leadership that supports learning is associated with mental model crafting, transformational crafting, and relational crafting (Chang and Lee, 2007; Melhem, 2018). In the second learning organizational building block, a supportive learning environment impacts mental model crafting in aggregate. However, PS is the only SLE dimension that impacts mental model crafting, while AD, OtNI, and TFR have no impact (Garvin, Edmondson and Gino, 2008; Nielsen and Abildgaard, 2012).

The results indicate that a supportive learning environment generally impacts transformational crafting. However, we find that psychological safety stands out as a significant impact on transformational crafting compared to openness to new ideas, time for reflection and valuing differences (Wrzesniewski and Dutton, 2001). Also, a supportive learning environment was found to impact relational crafting in aggregate, while PS, in particular impacts relational crafting more than AD, OtNI and TFR.

This article adds to the job crafting literature by measuring the impact and role of leadership in enhancing the concept of job crafting among professional and knowledge workers like university scholars (Lyons, 2008; Mattarelli and Tagliaventi, 2015). Thus, job crafters may find managers' support as an essential driver for crafting their jobs in a more effective and channelled way for accomplishing the organization's overall goals and objectives (Irfan, et al., 2022; Morrison, 2006; Hornung, et al., 2010). The research results supported the assumption that the LSE significantly impacts mental model crafting, transformational and relational crafting (Rousseau, Ho and Greenberg, 2006). Although job crafting literature has hitherto overlooked the association between job crafting and leadership that reinforces learning among employees, this research reveals the significance of this association so that workers find support and guidance when crafting their jobs (Rousseau, 2005). The outcome is guided and directed crafting in line with the organization strategy, goals, and objectives. Hornung, et al. (2010), for example, argue that undirected job crafting may result in poor performance or low productivity by employees (Leana, Appelbaum and Shevchuk, 2009; Hornung, et al., 2010; Kira, van Eijnatten and Balkin, 2010).

This article adds new constructs to the job crafting conception, SLE, and LS. We found that SLE and LS are positively related to job crafting and positively impact job satisfaction (Siddiqi, 2015). Further, we established that job crafting partially mediated the relationship between SLE and job satisfaction (Avey, et al., 2011; Shoji, et al., 2016).

To conclude, the three crafting proposals for academic career development could operate harmoniously to create more personally fulfilling careers for scholars. Nonetheless, some obstacles might stand in the way that exceeds individuals' capability to craft their careers which are integral to the university culture, direction, resources, and maybe desire for change (Bipp and Demerouti, 2015).

Three supportive and integrative components are essential in reinforcing the three predominant factors addressed in our presented study (Wellman and Spreitzer, 2011; Mäkikangas, Bakker and Schaufeli, 2017), which Figure 1, illustrates and curtly explains. At this point in time, this study is an appeal to the development of a crafting system incorporating two essential building blocks with three job-tailoring prerequisites with the aim of academic career advancement, vitality and influence (Mäkikangas, Bakker and Schaufeli, 2017; Bruning and Campion, 2018).

7. Conclusion

Furthering the existing research on job crafting, the study was structured to examine the impact of contextual factors that can promote job crafting leading to employee satisfaction (Cameron and Dutton, 2003). The results expand the domain of job crafting by integrating it with two learning organization building blocks and testing the impact on job satisfaction (Garvin, Edmondson and Gino, 2008). Based on our results, we proposed that job crafting is vital for enhancing employees' job satisfaction as a result of a supportive learning environment and leadership that reinforces learning (Ghaffar, Waheed and Iqbal, 2021; Mäkikangas, Bakker and Schaufeli, 2017).

A primary goal of this study was to delineate further the positioning of job crafting as an intervening variable affected by two building blocks in the organization (supportive learning environment and leadership support for learning) and the impact of job crafting on employee satisfaction in academic environments (Ghaffar, Waheed and Iqbal, 2021; Mäkikangas, Bakker and Schaufeli, 2017). In doing so, we assumed that a direct relationship exists between job crafting and the organizational contextual factors, including leadership and a supportive learning environment. However, in this study, job crafting mediated the relationship between organizational contextual factors (SLE and LS) and employee satisfaction. These findings indicate that leaders' direct effort to reinforce and support learning is highly encouraged, especially when psychological safety is a significant dimension of a supportive learning environment. Hence, it is highly recommended that managers accommodate a safe environment where employees proactively express themselves and craft their jobs to achieve greater satisfaction and quality of work (Mäkikangas, Bakker and Schaufeli, 2017).

Our study revealed that successful job crafting requires that employees feel safe, open to new ideas, appreciate differences, have time for reflection, have an environment supportive of learning, and have leaders' support for learning (Bipp and Demerouti, 2015; Ucar and Kerse, 2022). Although many leaders and managers encourage their employees to be more autonomous and learn on the job, we believe that it is rare that today's organizations, including academic institutions, create an environment conducive to learning confidence, and job crafting (Mattarelli and Tagliaventi, 2015). Professionals and academics can incorporate such elements into leadership training and coaching or mentoring arrangements (Lyons, 2008; Leana, Appelbaum and Shechuk, 2009; Kira, van Eijnatten and Balkin, 2010), this recommendation is consistent with a recent study that indicates the importance of Human Resource Management (HRM) systems and practices that can enhance employees' job crafting (Hu, et al., 2022; Irfan, et al., 2022). Thus, the universities, including Yarmouk University, need to develop and integrate their HRM systems and practices to serve as antecedents to job crafting, for example, the performance evaluation system should override the traditional system. Thus, the actual needs could be figured out and developed; on the other hand, exceptional performance should be rewarded to enhance the continuous learning experience, which eventually encourages them to craft their jobs. Finally, considering the context when suggesting any interventions or supportive strategies to enhance job crafting is crucial as these interventions vary across sectors (Roczniewska, et al., 2023) and countries (Roczniewska, et al., 2023). Thus, given the scarcity of studies within the academic organization within Arab contexts, this study has a vital contribution.

8. Limitations

The present study has some limitations. As all measures were self-reported, it is unclear whether common method biases might affect our findings (Podsakoff, et al., 2003). This may be overcome by using a longitudinal design in future studies (Doty and Glick, 1998). Also, observers may not be able to see a major proportion of job crafting (Wrzesniewski and Dutton, 2001), which may pose a challenge when assessing this behaviour with instruments other than self-reporting. We recommend future researchers investigate the effects of job crafting on more objective measures such as creativity, innovation, productivity, or measures from sources aside from self-reporting.

9. Future Research

The learning organization building blocks were assumed to predict job crafting and its components in this study. However, future research may consider other antecedents, including job engagement and empowerment, which

may have a reciprocal relationship (Van den Heuvel, Demerouti and Peeters, 2015; Wang, Demerouti and Bakker, 2016). Hence, employee empowerment is expected to influence employees' levels of satisfaction and, therefore, engagement at work, specifically in academic organizations. Future research may investigate the potential relationships between learning organization dimensions and job crafting approaches to further this framework and further explore the possible linkages between learning organization and job crafting. More learning building blocks might be of interest for researchers to explore, such as 'Concrete Learning Processes and Practices' (Garvin, Edmondson and Gino, 2008), and disciplines of the learning organization proposed by Senge (1990), including system thinking, team learning, shared vision and personal proficiency. Moreover, future research may examine job crafting antecedents and contextual factors on a practical level with real-life organizational experiences and practices, specifically following relevant organizational human resource development interventions. Finally, future research may link the national cultural aspect that might have an impact on job crafting consequences, including job commitment and work engagement, and other significant performance indicators.

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Assessing the Success of Village Asset Management Systems: An Employee Perspective

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Abstract: This study aims to examine the success of Village Asset Management Systems (VAMS). The measurement uses the Delone McLean success model (D&M model), which provides six interrelated dimensions of information system success: system quality, information quality, service quality, intention to use, user satisfaction, and net benefits. 112 respondents who had used the VAMS application were surveyed, and data was analyzed using the structural equation modeling (SEM) technique. We find that information quality, system quality, and service quality are significant determinants to increase the VAMS application's user satisfaction. The intention to use positively impacts user satisfaction of the VAMS application. Furthermore, both intention to use and user satisfaction effectively increase the net benefits of the VAMS application. On the other hand, although system quality has no impact on the intention to use VAMS applications, interestingly, when we did a split sample test based on the knowledge transfer method in the VAMS implementation process, all dimensions on the D&M model were well-proven and validated. Finally, this study also demonstrates that information quality and service quality positively affect intentions to use the VAMS application in the context of a mandatory government information system.

Keywords: Delone McLean model, Information systems success, VAMS, Knowledge transfer

1. Introduction

Information technology is currently experiencing rapid development. The adoption of information systems is becoming increasingly massive, especially in the government sector. Private and government organizations have now accelerated with the times by using information technology to carry out their activities and services to the public. Wang and Liao (2008) stated that the Delon McLean model can measure the success of an information system in the public sector in implementing an Electronic Government aimed at providing electronic information and services to the public.

The direction and development of e-government in Indonesia have been regulated in the Presidential Instruction of the Republic of Indonesia No. 3 of 2003 concerning National Policies and Strategies for e-government Development. The purpose of e-government is to improve effective and efficient public services. The target of e-government development is from the central government to the local government level. The central government started by using a technology-based system or application using features or displays that are easy to use by local government officials up to village governments in Indonesia. Based on Law No. 6 of 2014 concerning villages, the village government is expected to be more independent in village governance and be able to manage village finances and assets owned by the village in a transparent and accountable manner.

In order to improve public services and make them more effective and efficient, village governments are introducing e-government. As a form of implementation of this strategy, in 2016, an application was developed to manage village financial management called the Village Financial System (VFS). One of the consequences of financial management is capital expenditure, which impacts increasing Village Assets. Assets are economic resources that must be appropriately managed to optimize utilization and use for community service. Ministerial Home Affairs Regulation No. 1 of 2016 concerning village asset management, regulates starting from planning to reporting related to the utilization of village assets. The regulation is translated as a platform application developed by the Ministry of Home Affairs of the Republic of Indonesia in 2017 named Village Asset Management System (VAMS). The application began to be implemented in 2018. In March 2021, the application changed its platform which was originally from a desktop base to a Web-based application with the hope of having convenience and flexibility in its implementation.

At least two years after VAMS was introduced, a series of Technical Guidance was carried out by the Ministry of Home Affairs and accounting professional organizations. The application is also gradually implemented by all villages within local governments throughout Indonesia. The five-year process of implementing the VAMS application was broken down into two phases: a desktop basis in the first four years and a web basis in the last

year. The implementation stage, of course, impacts and benefits the village government in providing services to the community. The success of information systems can be assessed by a test using various models. Information systems success testing is essential because evaluating a system or applications can determine whether the application or system can impact or benefit users (DeLone and McLean 2016; Petter, DeLone, and McLean 2013; Winarno and Putra 2020).

A measurement for the success of information systems that is often and popularly used is the Delon McLean model of information system success. The model was first put forward in 1992 and updated with some modifications in 2003 (Ojo 2017; Delone and McLean 2003, 2004; Petter, DeLone, and McLean 2013). D&M model provides six dimensions of success of interrelated information systems: system quality, information quality, service quality, use intentions, user satisfaction, and net benefit. Testing the effectiveness of information system implementation is essential because village government investment in the form of assets averages 60% of the total village government budget. The largest source of funding for this expenditure is from transfer income from the central government in the form of Village Funds and Village Fund Allocations, which are transfers from local governments.

Measuring the success of village asset management is essential in order to show the effectiveness, efficiency, and economy of managing village finances and assets. As part of the information system success testing model, the D&M Model has also been used by (Veeramootoo, Nunkoo, and Dwivedi 2018) in the context of e-government, which in this case is the application of tax services in the form of an e-filing system. E-Filing is an essential system for the community in carrying out their tax obligations. The study's findings showed that system quality, user satisfaction, and habit are the three elements that most strongly affect intention in utilizing the e-filing system. Another study conducted by (Rana et al. 2014) in India tested the efficacy of the online public grievance redressal system (OPGRS), stating that system quality and information quality will increase user satisfaction with OPGRS applications.

Numerous studies have examined the effectiveness of e-government; however, our study is noteworthy for being the first to investigate the viability of VAMS applications in Indonesia, particularly concerning web-based VAMS implementation, which has not been mandatory in the most recent year of implementation. Second, the implementation of VAMS, which has been carried out for two years, has gone through a long process, such as a knowledge-sharing mechanism between internal and external government parties. Effective knowledge transfer and sharing mechanisms will be essential to successfully implement VAMS and eventually enhance organizational performance (Alattas and Kang 2016). From the point of view of the knowledge transfer process, several perspectives, such as socialization (tacit-to-tacit), externalization (tacit-to-explicit), combination (explicit-to-explicit), and internalization (explicit-to-tacit) (Marwick 2001; McGinnis and Huang 2007; Rothberg and Erickson 2017) have also been undertaken in an effort to improve the success of VAMS implementation.

The central government carries out socialization and externalization programs from the ministries of the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration of the Republic of Indonesia as the central government that develops VAMS. Furthermore, the government involves accounting professional organizations that act as consultants to carry out continuous internalization by providing professional experiences (Rowley 2007) in village financial and asset management, which can be adopted by VAMS users/operators. To speed up the transformation of tacit knowledge into explicit knowledge inside an organization (Kuciapski 2017; Usman and Ahmad 2012; Sedera and Gable 2010), experts and professionals might impart information to end users of VAMS in the early phases of deployment through structured workshops or training (Lech 2011). This section is expected to contribute to the knowledge transfer process in implementing VAMS applications. Evidence of this contribution is shown from the results we have done in additional testing and sensitivity, which proves that knowledge-sharing mechanisms carried out through several schemes and methods contribute better when the intensity of socialization and knowledge-sharing through experienced consultants (Lech 2011; Finnegan and Willcocks 2006; Asrar-ul-Haq, Anwar, and Nisar 2016).

2. Literature Review and Hypothesis Development

2.1 Literature Review

2.1.1 Village asset management systems and e-Government information systems success

Village assets are property derived from the original wealth owned by the village, purchased, or obtained at the expenditure of the Village Budget or the acquisition of other legitimate rights. The central government launched an application to make managing village assets easier. The VAMS application is a tool that records the

administration of village assets designed with the mandate of Ministerial Regulation No. 1 of 2016 regarding village asset management. VAMS was created to make it easier to manage village assets transparently and accountably (Aprilia, Winarno, and Prasetyo 2022; Winarno and Putra 2020). VAMS application contains planning, pawning, administration, and presenting reports complete with the codification and labeling of village assets per the general guidelines for the codification of village assets. There are two important features in the VAMS application, namely the sub-system to carry out management related to using village assets. First, a sub-system that administrates assets in order to support the implementation of village governance in accordance with its main duties and functions (Aprilia, Winarno, and Prasetyo 2022). Second, a sub-system is used to monitor the utilization of village assets whose purpose is to increase income for village welfare.

The successful implementation of the VAMS application is a form of support for improving good governance and achieving successful e-government implementation in Indonesia (Sari and Winarno 2012). However, implementing the VAMS application will not be successful without a knowledge-sharing mechanism and knowledge transfer from the Ministry of Home Affairs as the developer of the VAMS application and external parties such as consultants and accounting professional associations. The acceptance of migration of an information system will be high if there is a suitable knowledge transfer mechanism (Kuciapski 2017). Therefore, knowledge management is an essential foundation for the successful implementation of information systems, which will ultimately ensure the sustainability of an organization (Asrar-ul-Haq, Anwar, and Nisar 2016).

Many researchers have widely used and developed Delone McLean's model of the successful implementation of information system measurement. The role of information systems has changed and evolved over the past decade. Similarly, academic investigations on the effectiveness of information systems have progressed over the same period (Delone and McLean 2003). The D&M model, a ten-year update, has six interconnected variables that affect each other. In the context of electronic-based systems, the revised model was successfully applied in predicting e-commerce-based systems in 2004 (Delone & Mclean, 2004), so the model is also worthy of being adopted in the context of e-government (Delone and Mclean 2004) in predicting the success of the implementation of information systems, especially from systems that provide public (Scott, DeLone, and Golden 2015; Stefanovic et al. 2016; Veeramootoo, Nunkoo, and Dwivedi 2018). Therefore, based on the arguments in the previous section, we adopted the D&M model into this research model as shown in Figure 1.

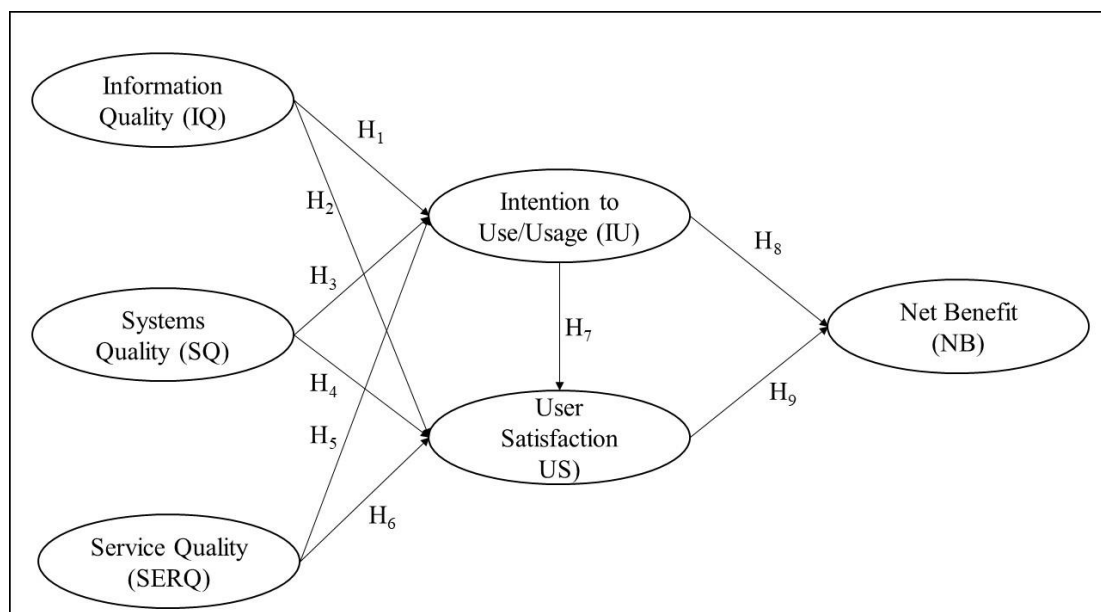


Figure 1: Research Model

2.2 Hypothesis Development

2.2.1 Information quality and intention to use of VAMS

O'Brien and Marakas (2006, 703) state that information quality provides value to the end user with characteristics such as content, form, and time. The information received by the user will be valued according to its quality, which will also affect the user's desire to utilize the information to make decisions. The end user of a system will receive outputs or results that are useful for improving its performance. Delone and McLean

(2003) explain that the intention of using a system is to use outputs or outcomes from the systems. Intention to use is an attitude that arises from a user who uses the system and gives the final attitude to determine whether the system can be reused or not. Septianita, Winarno, and Arif (2014) state that information technology from a system must provide information to help a company or organization make decisions.

Making the right decisions is influenced by how qualified the information obtained by the system's users is. Information quality is information that users can receive, such as the information obtained being relevant to the user's needs. In addition to being relevant, information must be up to date and able to describe the happening circumstances. While the poor or bad quality of information will affect the system's reliability, it will reduce the intention to use it for system users. Therefore, the quality of information is essential in this case in the process of working on the obligation for village governments to use the VAMS application. The use of the VAMS application by the village government of Situbondo Regency is expected to provide good quality information to increase the intention to use the VAMS application and help the village government make its decision, especially on village asset management. Several studies have shown that the quality of information positively affects the intention to use the system (Delone and McLean 2003; Wang and Liao 2008; Scott, DeLone, and Golden 2015; Stefanovic et al. 2016). Based on this description, a hypothesis can be formulated as follows.

H1: Information Quality positively impacts the Intention to Use of the VAMS application.

2.2.2 Information quality and user satisfaction of VAMS

Information Quality is a level of information that provides value to end users with characteristics such as content, form, and time (O'Brien and Marakas 2006; DeLone and McLean 2016). The quality of information that has value is information that can be received by the user, such as relevant information. Information relevant to user needs proves that the information generated from a system is of good quality. The quality of information can be said to be the output or the result of an information system application. The output or final result of such information is like information that is easy to understand and has good accuracy, sufficient completeness, and accuracy (Delone and McLean 2003). Good information will influence one's preferences or level of satisfaction as a system user—in this example, the VAMS application user.

The VAMS application is an information system used to support activities in finance, accounting, and managerial village asset management (Aprilia, Winarno, and Prasetyo 2022). User satisfaction can be defined as the way the user perceives something from a system application. In this case, a sense arises from using a system that has fulfilled its information (Mithas, Krishnan, and Fornell 2016; Danila and Abdullah 2014). The information users obtain is useful for enhancing decision-making in the organization. So, the higher the quality of information obtained from the VAMS application to manage village assets, the more it will increase user satisfaction of the VAMS application. The results of research consistently prove that the quality of information has a positive effect on user satisfaction (Delone and McLean 2003; Septianita, Winarno, and Arif 2014; Petter, DeLone, and McLean 2008; Petter, DeLone, and McLean 2013) Based on this explanation, the research hypothesis can be formulated as follows.

H2: Information Quality positively impacts on the User Satisfaction of the VAMS Application

2.2.3 System quality and intention to use of VAMS

According to Delone & McLean (2003) system quality is a concept that reflects the utilization of information systems by its users. The system's quality is formed through interaction with the system, when the user completes a certain task (Rana et al., 2014), which characterizes the system's quality as a desirable characteristic of the information system itself. Delone and McLean (2003) incorporated five items into system quality: adaptability, availability, reliability, response time, and usability to measure the system's success. A reliable system will affect the user because there is a belief that the information system can help the system user complete his task according to its function (Veeramootoo, Nunkoo, and Dwivedi 2018). The user's intention to use the system is an attitude after using and receiving the output or final result (Delone and McLean 2003). The final result of the VAMS application is in the form of a reliable report so that the resulting report can be accounted for and prove that the system's quality will affect the intention to use VAMS applications. Research evidence shows that higher System Quality will positively impact the intention of the user to use the systems (Urbach and Müller 2012; Ojo 2017; Veeramootoo, Nunkoo, and Dwivedi 2018; DeLone and McLean 2016). Based on these arguments, a hypothesis can be formulated as follows.

H3: System Quality positively impacts on the Intention to Use of the VAMS Application.

2.2.4 System quality and user satisfaction of VAMS

System quality is used to measure the quality of the system infrastructure, both software and hardware. System quality is the performance of a system that refers to how well an information system's hardware, software, policies, and procedures capabilities can provide information on user needs (DeLone & McLean, 1992) (DeLone and McLean 1992). System quality is often judged to fall under the dimensions of flexibility, reliability, functionality, ease of use, data importance, and integrity (Delone and McLean 2003, 2016). The VAMS application is compiled and given in a user-friendly manner, making it easier for users to operate the application.

User satisfaction is a feeling that arises because the system that has been used or given meets the information. Flexibility and user-friendliness of the VAMS application web-based information systems will increase the satisfaction of the VAMS user. Seddon (1997) surveyed users who had just implemented an information system and a university accounting system and found a positive relationship between system quality and user satisfaction (Rana et al. 2014; Ojo 2017; Wang and Liao 2008). Based on these arguments, a hypothesis can be formulated as follows.

H4: System Quality positively impact on the User Satisfaction of the VAMS Application

2.2.5 Service quality and intention to use of VAMS

Service quality is a comparison between user expectations and their perception of the quality of user services provided (DeLone and McLean 2016). The intention of using the system is to use outputs or end results that are expected to help in decision-making that is beneficial to the organization (Delone and McLean 2003). The intention to use VAMS will be measured by timeliness because the final result of using this system is a report, so timeliness is essential. Timely reports are the user's expectations of the application so that the perception arising from the results of using the application is good (Fitzgerald 2006; Ojo 2017). The higher the level of conformity between expectations and the realization of the VAMS application regarding village asset management reports, the more it will increase user interest in utilizing the VAMS application. In other words, the quality of service can affect the intention to use the VAMS application. Based on this explanation, a hypothesis can be formulated as follows.

H5: Service Quality positively impacts on the Intention to Use of the VAMS Application

2.2.6 Service quality and user satisfaction of VAMS

Service quality is a comparison between user expectations and their perception of the quality of service usage of a system (Petter, DeLone, and McLean 2013). VAMS application users will feel satisfied when the quality of services they have provided to villagers in Situbondo related to asset utilization is in accordance with their expectations. Thus, VAMS application users will also feel satisfied using the application because their performance benefits the community. The review of this explanation resulted in a prediction that the higher quality of services provided by the government for rural communities in Situbondo Regency will affect the level of satisfaction of VAMS application users. Testing of these two variables has been carried out (Wang and Liao 2008; Septianita, Winarno, and Arif 2014), and the results show that providing quality of-service results can positively affect user satisfaction with VAMS applications. Based on this explanation, a hypothesis can be formulated as follows.

H6: Service Quality positively impacts on the User Satisfaction of the VAMS application.

2.2.7 Intention to use and user satisfaction of VAMS

Petter, DeLone, and McLean (2013) explain that the user's intention to utilize the system is demonstrated by their behavior after using it and seeing the output or result as a measure of information systems success. DeLone and McLean (2003) state that the intention to use a system will be measured by timeliness because the final result of using this system is a report, so punctuality is very concerned. Timeliness in preparing reports, in this case, a village asset report, is essential, considering that the village asset report will be used for consideration in making decisions. Making the right decisions can affect user satisfaction in using the application. User satisfaction is a feeling that arises due to the system that has been used or given to fulfill the information. Using the real-time report of the VAMS application is expected to positively influence the satisfaction of its users.

Previous research proof that the intention to use as a significant predictor of user satisfaction (Rana et al. 2014). In the study, it was suggested that it was a determinant of the influence of user satisfaction in several studies (Veeramootoo, Nunkoo, and Dwivedi 2018; Rana et al. 2014) related to the adoption of e-government. Rana et

al. (2014) state that the ease of using the system can cause users to be more satisfied with its complexity. Based on this explanation, a hypothesis can be formulated as follows.

H7: The Intention to use positively impacts on the User Satisfaction of VAMS application.

2.2.8 Intention to use and net benefit of VAMS

The intention in using information system applications is the attitude shown by users after knowing or having used output from an information system DeLone and McLean (1992). The flexibility of VAMS in providing asset management reports will positively impact village governments. The impact obtained by an organization can be used to assess a system that has been used and whether it is successful or not. The assessment of the final results can be seen by whether the system or application that an organization has used can be helpful. It can be called a net benefit. Net benefits are also considered one of the most critical steps in the success of information systems, and it will show the extent to which information systems contribute to the success of various stakeholders, both positive and negative (Ojo 2017). The success of a system in providing benefits to the organization is also determined by the high and low intention of users in utilizing the system that has been implemented (DeLone and McLean 2016). Several studies have proven that there is a positive influence between the intention to use and the net benefit felt by the user (Ojo 2017; Wang and Liao 2008). Based on this description, a hypothesis can be formulated as follows.

H8: The Intention to Use positively impacts the Net Benefit of the VAMS application.

2.2.9 User satisfaction and net benefit of VAMS

User Satisfaction is a response or feedback from a user after using the system. User satisfaction can be seen from the features provided by an application system. The existence of an application system will affect the attitude of acceptance from users, and this also helps users to make reports more easily. The VAMS application can be appropriately implemented and follows Law No. 1 of 2016 concerning village asset management, which will improve the performance and quality of work from the village government in a better direction, as well as speed up the work to be more effective and efficient. Empirical research has proved that user satisfaction positively affects perceived net benefit (Wang and Liao 2008; Stefanovic et al. 2016; Scott, DeLone, and Golden 2015). Based on this explanation, a hypothesis can be formulated as follows.

H9: User Satisfaction positively impacts on the Net Benefit of the VAMS application.

3. Methods

3.1 Sampling and Data Collection

To test the hypotheses developed in this study, we distributed a questionnaire to a sample of VAMS operators from the village apparatus in Situbondo Regency. Sampling is carried out by the purposive sampling method, which is a sampling method with specific criteria. The criteria for sampling the study were determined as follows: a village apparatus that acts as a VAMS operator and has carried out internal computer training organized by the Regional Government of Situbondo Regency and external training organized by the accounting professional organization. (See Table 2).

3.2 Measurement

The variable measurement technique used in this study (see Table. 1) was using a 5-point Likert scale. The respective indicators of the VAMS application implementation success variables were adopted from the modified D&M success model (DeLone and McLean 2004, 2003; Petter, DeLone, and McLean 2013; Petter, DeLone, and McLean 2008) and have also been used and retested by several previous studies (Urbach and Müller 2012; Stefanovic et al. 2016; Veeramootoo, Nunkoo, and Dwivedi 2018; Wang and Liao 2008) in the context of implementing applications that support e-government.

Table 1: VAMS Success Variables

Variables	Definition	Indicators
System Quality (SQ)	Define the desired characteristics of VAMS applications, such as ease of use, system flexibility, system reliability, usability, and ease of learning.	SQ1: The VAMS application is easy to use. SQ2: The VAMS application is Easy to learn. SQ3: The VAMS applications have system flexibility. SQ4: The VAMS application provides system services for users. SQ5: The VAMS application has a reliable system.
Information Quality (IQ)	Defines the output quality characteristics of VAMS applications, such as measuring precision, accuracy, adequacy of information, reliability, and useful information.	IQ1: The VAMS application provides precise information. IQ2: The VAMS application provides accurate information. IQ3: The VAMS application provides sufficient information. IQ4: The VAMS application provides reliable information. IQ5: The contents of the VAMS Application follow the village government's user requirements.
Service Quality (SERVQ)	Measure the general quality of VAMS applications from the perspective of personnel readiness to provide appropriate services, transaction security when using a system or application, system availability to users, individual attention to information system personnel, and providing specific user needs.	SERVQ1: The VAMS application is always ready to help. SERVQ2: The VAMS application is guaranteed to be safe and can maintain user privacy. SERVQ3: The VAMS application can be used at any time. SERVQ4: VAMS applications can provide individual attention. SERVQ5: VAMS applications understand specific needs.
Intention to Use (IU)	Measure user behavior and attitudes related to dependence on the VAMS application, frequency of use of the system, and future usage trends and duration.	IU1: I depend on the VAMS application. IU2: My frequency of using VAMS applications is high. IU3: I will be using the VAMS application in the future. IU4: I will be using VAMS applications frequently at times coming.
User Satisfaction (US)	Measure general satisfaction of government employees with VAMS applications, perceived utilities, meet expectations, and whether it is worth using because they are end users of central government applications and use the system as a tool for daily work activities.	US1: I am satisfied with the VAMS application. US2: The services of the VAMS application are of high quality. US3: The VAMS application has met my expectations.
Net Benefit (NB)	Measure how much a VAMS system or application contributes to users, such as making work easier, saving time, and increasing usability.	NB1: The VAMS application makes my job easy. NB2: The VAMS application saved me time. NB3: The VAMS application is useful for my work.

Table 2: Characteristics of Respondents

Classification	Item	Frequency	Percent (%)
Gender	Male	88	78.57%
	Female	24	21.43%
Position	Village secretary	18	16.07%

Classification	Item	Frequency	Percent (%)
	Staff	9	8.04%
	VAMS Operator Staff	47	41.96%
	General Affairs and Administration	11	9.82%
	Finance Officer	4	3.57%
	Planning Department	10	8.93%
	Head of Government	8	7.14%
	Head of People's Welfare	4	3.57%
	Head of Service	1	0.89%
Job	VAMS Users	45	40.18%
	VAMS Users concurrently VFS Users	58	51.79%
	VAMS Users concurrently RSD-PPA Users	3	2.68%
	VAMS Users concurrently Circa Users	3	2.68%
	Treasurer concurrently VAMS Users	2	1.79%
	Other Coordinator concurrently VAMS Users	1	0.89%
Training	1	19	16.96%
	2	65	58.04%
	3	14	12.50%
	4	11	9.82%
	5	3	2.68%
Total		112	100%

3.3 Data Analysis

We use descriptive statistical methods to find the data pattern or an overview of the research data. Meanwhile, to test the hypothesis in this study using structural equation model (SEM) calculation analysis. SEM is a multivariate technique that combines aspects of factor analysis and multiple regression analysis that allows researchers to simultaneously analyze a series of interrelated dependency relationships between constructs (Hair et al. 2019; Hair Jr et al. 2017; F. Hair Jr et al. 2014). This study used a variance-based PLS-SEM technique because (a) the structural model was complex, (b) the sample was relatively small, and (c) a variance-based PLS-SEM requires modest assumptions or implies that no assumptions regarding the distribution (Migliore et al. 2022)

4. Results and Discussion

4.1 Descriptive Characteristics of Respondents

We used the characteristics of respondents to provide information about respondents' characteristics based on gender, position (job title), occupation, and training intensity. Based on Table 2, we found that the respondents were mostly male, totaling 88 people. The positioning structure in the Village Government that serves as VAMS operator staff without concurrently serving is 45 people. While most of the respondents' jobs are VAMS operators concurrently VFS with a total of 58 people (51.79%), and 65 respondents (58.04%) have conducted VAMS training two times.

4.2 Measurement Model

We evaluate the measurement model (outer model) before testing the structural model of this research hypothesis. Outer model testing is carried out by looking at the reliability indicator value, which shows the variance of the indicator that latent variables can explain. A variable is valid if the loading factor value is greater than 0.5.

Based on Table 3, it is known that all indicators that make up latent variables have a loading factor value of more than 0.5, so it might be concluded that all indicators that make up all variables are valid, or the indicators used can measure each latent variable with optimal. Based on the analysis results, all latent variables have an AVE

value above the minimum criterion of 0.5. All latent variables in this study can be said to meet the convergent validity criteria because they have an AVE value above 0.5. In addition, based on the CR values presented in Table 3, it can be obtained that all latent variables have a CR value above 0.6, which means that the indicators used have been said to be able to measure latent variables well or it can also be said that the entire measurement model is reliable.

Table 3: Indicators for the evaluation of the measurement model

Variables	Indicators	Factor Loadings	Construct Validity (AVE)	Composite Reliability (CR)
System Quality	SQ1	0.827	0.693	0.919
	SQ2	0.791		
	SQ3	0.832		
	SQ4	0.838		
	SQ5	0.874		
Information Quality	IQ1	0.824	0.717	0.927
	IQ2	0.878		
	IQ3	0.912		
	IQ4	0.847		
	IQ5	0.765		
Service Quality	SERQ1	0.845	0.688	0.917
	SERQ2	0.846		
	SERQ3	0.781		
	SERQ4	0.857		
	SERQ5	0.815		
Intention to Use	IU1	0.812	0.749	0.922
	IU2	0.892		
	IU3	0.934		
	IU4	0.818		
User Satisfaction	US1	0.878	0.844	0.942
	US2	0.942		
	US3	0.935		
Net Benefit	NB1	0.921	0.828	0.935
	NB2	0.923		
	NB3	0.885		

4.3 Structural Model

After measuring the outer model (all constructs and indicators), the next step is to measure the complete structural model measurement (inner model). Measurements are carried out by measuring the value of R^2 on the endogenous construct. Based on the results of the R-square value for each endogenous variable in Figure 2, it can be seen that the Intention to Use variable has a coefficient of determination of 0.711, meaning that for the model, intention in using VAMS applications can be predicted 71.1% varies determined by system quality, information quality, and service quality. Moreover, the coefficient of determination for User Satisfaction was 81.1% when predicted by the quality triad and the intention to use. The overall model accounted for 76.2% of the variance in the perceived Net Benefits, with User Satisfaction exerting a stronger direct effect than intention to use on the perceived net benefits of the VAMS application.

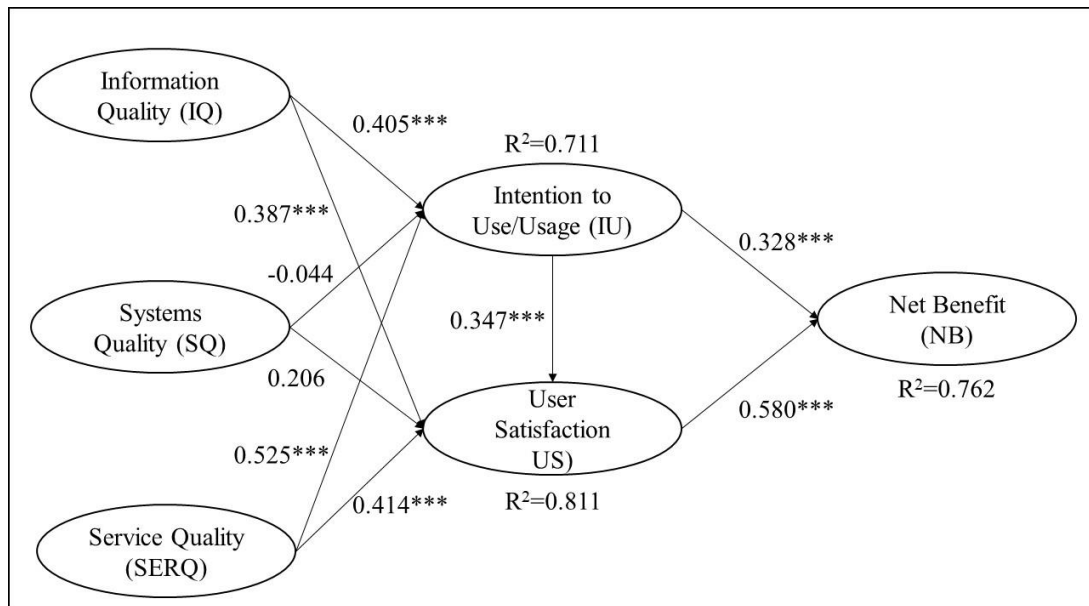


Figure 2: Path Model with Standardized Coefficients

In addition to using R-squared and F-squared, the model's goodness can also be calculated with a value of Q^2 . The value of Q^2 is more than zero, indicating that the model has a relevant prediction. In contrast, if the value of Q^2 is less than 0, it is proven that the model does not have predictive relevance (Hair Jr et al. 2017; Migliore et al. 2022). The Q^2 value obtained in this study is 0.987, so it can be concluded that the model compiled already has relevant predictions and is quite good.

After measuring the feasibility of a measurement model using R square, F square, and Q square, then also measuring the feasibility of a measurement model by looking at the results of the t-statistical value of the result of the path coefficient. The condition is that the t-statistical value must be greater than the critical value of t by 1.96 at a significant level of 5%. The loading factor value and the t-statistical value for this study model were derived from the bootstrapping method using a total sample of 112 samples with 6000 repetitions.

4.4 Discussion

4.4.1 Information quality and intention to use of VAMS application

The results of our hypothesis test can be seen in Table 4. Findings provided support for H1, suggesting that information quality positively affects intention to use of the VAMS application ($\beta=0.405$ $t=3.619$). DeLone and McLean (2003) explain the effect of information quality on the intention of using VAMS applications if the quality of information measured must be complete, easy to understand, and relevant. These characteristics can be a benchmark for operators in using VAMS applications. The results of the questionnaires show that the VAMS application can provide the correct information and has simple features to offer convenience for operators in using the application. In addition, the VAMS application operator felt that they needed the application in the future to administer village assets. This condition illustrates that the quality of information can affect the operator's intention to use the VAMS application because the intention to use is a form of attitude from the operator who is already using the VAMS application. The operator feels that the VAMS application can provide a good response and has long-term value in completing the operator's tasks and obligations regarding the administration of village assets, affecting the operator's attitude toward using the application.

Previous studies have shown that information quality results positively affect the intention to use an information system application (Wang and Liao 2008; Stefanovic et al. 2016; Ojo 2017). These previous studies have an object about the use of the system among local governments. This positive result concludes that the higher the quality of information obtained from the VAMS application, the more the intention to use the VAMS application will be for the operator.

4.4.2 Information quality and VAMS user satisfaction

The analysis results in Table 4 show that the information quality positively affects user satisfaction of the VAMS application ($\beta=0.387$, $t=3.351$). Thus, H2 was supported. This study shows that the results of information quality variables affect user satisfaction. DeLone and McLean (2016) explain that user satisfaction is a form of user

feedback on using a system. A good response form will be satisfactory for users of VAMS applications. The VAMS application can provide users with precise, accurate, sufficient, and reliable information. The content of the VAMS application can also adjust the needs of each village government in Situbondo Regency. A final report on village asset management might be considered the outcome of utilizing the VAMS application. The output or final report of a quality VAMS application by looking at the information received by the user is relevant information, meaning that it provides information according to the integrity of the user. In this case, the operator compiles the final report, namely a village asset report, which will help improve decision-making. Finally, the main result will be to provide a sense of satisfaction to the operator for implementing the VAMS application.

Table 4: Structural Model Path Analysis

	Relationships	Path Coefficient	Sample Mean (M)	t-stat	Decision
H ₁	Information Quality → Intention to Use	0.405	0.404	3.619***	Supported
H ₂	Information Quality → User Satisfaction	0.387	0.389	3.351***	Supported
H ₃	System Quality → Intention to Use	-0.044	0.035	0.419	Not Supported
H ₄	System Quality → User Satisfaction	0.206	0.194	2.129**	Supported
H ₅	Service Quality → Intention to Use	0.525	0.516	4.235***	Supported
H ₆	Service Quality → User Satisfaction	0.414	0.397	3.085***	Supported
H ₇	Intention to Use → User Satisfaction	0.347	0.351	2.819***	Supported
H ₈	Intention to Use → Net Benefit	0.328	0.317	2.459**	Supported
H ₉	User Satisfaction → Net Benefit	0.580	0.590	4.917***	Supported

Note: *p < 0.10; **p < 0.05; ***p < 0.01.

Based on the research of Wang and Liao (2008), the quality of information also positively influences user satisfaction and provides convenience in using the VAMS application, as well as ultimately providing benefits for users of the application. As a result, our study finally validated previous studies (Wang and Liao 2008; Ojo 2017; Veeramootoo, Nunkoo, and Dwivedi 2018; Stefanovic et al. 2016), which further strengthens the explanation that the quality of information generated from an information system will have an impact on user satisfaction of the application.

4.4.3 System quality and the intention to use of VAMS application

Based on the analysis in Table 4, hypothesis 3 which suggested a positive correlation between system quality and intention to use the VAMS application, was rejected ($\beta = -0.044$, $t = 0.419$). According to the results of research by Kurnianto, Kurniawansyah, and Ekasari (2019), the system's quality influences user satisfaction but does not affect the use of the systems. The difference between the results of the previous study and the regression results of researchers showed that the VAMS application did not have a system quality equivalent to the quality of the VFS system used in the study. This result differs from the implementation of the VFS application because village governments in Indonesia first used VFS as a village financial recording system and began with an appeal for rule changes that made operators compete to use the VFS application. Meanwhile, VAMS applications in that period were still voluntary. On the other hand, VAMS is a new application that is being used, and the call for using the application is still not comprehensive, so there is no integration of regulations in the use of the VAMS application in all village governments in Indonesia. This hypothesis is not in line with Delone McLean's theory, and it has explained that the existence of system quality will significantly affect the performance of a person who uses or receives the final result. Delone McLean explained that the higher the quality of the system in an application, the higher the intention to use from the operator or user of the application.

An empirical study that proves the existence of negative results for hypotheses that align with our results is (Ikhyannuddin 2017), which reveals that Government Financial Information Systems (GFIS) in Indonesia are still not good. In the study, the researcher explained that every local government has something that affects the success of the information system. Efforts to improve the system's quality require the readiness of mature resources such as internet networks that can help an integrated system. Integrating with the internet network will make it easier for the information system to reach every point where it operates. This negative result concludes that the third hypothesis (H3) is rejected, and there needs to be improvement or reassessment in preparing for the needs of the information system to be used or operated, especially by paying attention to the areas that will be targeted for the reach of the information system.

The results of testing hypotheses that do not yet fit the D&M model led us to test this phenomenon further. Through additional testing, we split the sample as done in Table 5. The argument underlying this treatment is that in implementing VAMS, there is an essential contribution to knowledge transfer that involves socialization, and personal exploration in the process of sharing knowledge on the new platform of VAMS applications. Table 5 shows the results after we split the sample between users who are also application users in the village government. The results prove that for the context of not concurrently, the system's quality affects the increase in intention to use the VAMS application. This result is also a significant contribution and evidence that knowledge-sharing mechanisms are the primary key for users in interpreting the quality of the VAMS system. Table 4 also shows that the knowledge-sharing process that uses socialization and workshop approaches from internal and external parties has a higher coefficient than knowledge-sharing about VAMS, which is only carried out internally by the government. This result proves that an explorative-oriented approach is also very effective in knowledge transfer (Lech 2011).

4.4.4 System quality and VAMS user satisfaction

The analysis results in Table 4 show that the system quality positively affects user satisfaction of the VAMS application ($\beta=0.206$, $t=2.129$). Thus, H4 was supported. Delone and McLean (2003) state that the system's quality will affect the user satisfaction of a system or application because user satisfaction is a form of response from a system or application itself. The VAMS application has features that are easily accessible to users, and the contents of the VAMS application can provide needs for users, namely the VAMS application operator. The results of this fifth hypothesis conclude that the system's quality has a statistically positive effect on user satisfaction with a moderate/sufficient coefficient value. System quality affects user satisfaction because the VAMS application operator in Situbondo Regency village is based on the results of a questionnaire that shows the operator as a VAMS application user feels satisfied with the VAMS application. The implementation of the VAMS application already meets the quality criteria of a system, and this can be seen from the ease of use, functionality, reliability, flexibility, data quality, portability, integrity, and importance of the VAMS application. Wang and Liao (2008) state that the higher the system quality, the greater the satisfaction of information system users. Other studies show the same results as this hypothesis and confirm the results of this study (Kurnianto, Kurniawansyah, and Ekasari 2019; Ojo 2017; Veeramootoo, Nunkoo, and Dwivedi 2018; Wang and Liao 2008). Thus, the fourth hypothesis is supported by a theoretical perspective and previous research.

4.4.5 Service quality and intention to use of VAMS application

Hypothesis 5 investigated and revealed a statistically significant association between service quality and intention to use of the VAMS application ($\beta=0.525$, $t=4.235$). As a result, it can be concluded that improving service quality will increase users' intentions to utilize the VAMS application.

The intention to use is a form of attitude from the operator who will use the VAMS application. Our result shows that the service quality variables affect the intention to use the VAMS application. Therefore, if there is an improvement in the quality of service in VAMS, it will be followed by an increase in the intention of using it. The quality of services provided to the VAMS end-users of Situbondo Regency through village empowerment services to operators in the village government, such as communicating intensity to the VAMS application operator if an error or interruption occurs, will increase the intention to use the VAMS application. In addition, the Situbondo Regency community and village empowerment service provided assistance in the form of training, which representatives of the operators of each village in Situbondo Regency attended. Quality of service should focus on providing the best service to VAMS application operators to increase the intention to use VAMS applications. Based on the research of Wang and Wang and Liao (2008), an influence on the intention to use VAMS is because high service quality can increase user intention and intensity in using VAMS applications. Based on the research of Wang and Wang and Liao (2008), an influence on the intention to use VAMS is because high service quality

can increase user intention and intensity in using VAMS applications (Ikhyanuddin 2017; Scott, DeLone, and Golden 2015; Rana et al. 2014).

4.4.6 Service quality and user satisfaction of the VAMS application

The analysis results in Table 4 show that the service quality positively affects user satisfaction of the VAMS application ($\beta=0.414$, $t=3.085$). Thus, H6 was supported. This result reveals that users of VAMS applications will be more satisfied when the quality of VAMS services increases.

Service quality is about the overall support provided by the service provider, regardless of whether this support is provided by the information systems department, a new organizational unit, or outsourced to an Internet service provider (DeLone and McLean 2016, 2004). The positive influence of service quality on user satisfaction with the VAMS application can be seen from the results of the questionnaire that the readiness of the VAMS application to help services, application security, and privacy preservation, the flexibility of using the VAMS application time, the presence of attention and being able to provide needs for VAMS application users who show the results of the answer agree. Other research stated that service quality positively affects customer satisfaction, meaning that quality service can provide a sense of comfort to users, affecting their psychology to continue using the VAMS application (Sari and Winarno 2012). Several previous studies have also consistently stated that service quality positively affects customer satisfaction (Wang and Liao 2008; Ikhyanuddin 2017; Stefanovic et al. 2016; Ojo 2017).

4.4.7 Intention to use and user satisfaction of VAMS

Based on the results in Table 4, it can be seen that the impact of the intention to use has a positive effect on user satisfaction of the VAMS application ($\beta=0.347$, $t=2.819$), thus H7 was supported. Intention to use is to direct to a result and how often the user uses a system or application. The intensity of use of an application will affect the response from the user VAMS application. VAMS application operators will tend to use the application frequently because, in the village government of Situbondo Regency, it is mandatory for all villages to use the VAMS application. This obligation is a form of measuring the intensity of the intention to use the VAMS application for operators, and as well as the increasing frequency of use of the VAMS application, it proves that the application is increasingly useful for village governments.

Based on previous research related to government or having a district or village government object that gives the same results from this study. Wang and Liao (2008) stated that a web-based government system used by district governments in carrying out their duties and responsibilities to the community with quality systems and information would increase net benefits for users. Likewise, the impact on the intention to use a high information system will increase user satisfaction (Wang and Liao 2008; Ikhyanuddin 2017).

4.4.8 Intention to use and net benefit of VAMS application

The result of the path coefficient shows that the intention of using VAMS applications positively affects the net benefits of VAMS applications ($\beta=0.328$, $t=2.459$). Thus, H8 was supported. If there is an increase in user intention to use VAMS, it will be followed by an increase in net benefits obtained. Increased user intent is characterized by how often or intensely users use the system. High user intensity is caused by several factors, one of which is the mandatory use of the system in organizations/institutions, which can affect the attitude of system users to learn and practice the system as well as possible to obtain net benefits such as effectiveness, efficiency, and high quality of work for related organizations/institutions. The existence of an intention to use an application from a high VAMS operator illustrates that the intensity of using the VAMS application is also high. It is marked by the results of a questionnaire that has been filled out showing that the VAMS application can meet the needs of operators and time efficiency in working in the village government. These two things are a form of benefits received by VAMS application users that have an impact on performance in an organization, in this case, the village government in Situbondo Regency.

Ikhyanuddin (2017) stated that the VAMS application positively affects net benefits because an information system with high benefits will motivate users to use the system so that it can increase the productivity of their work. The information system is expected to bring benefits to users in carrying out their duties. Timeliness concerns the effectiveness and efficiency of the output to meet the user's needs. Our results also confirm several previous studies stated that the intention to use the system positively influences the net benefits felt by users of the information system (Petter, DeLone, and McLean 2013; Petter, DeLone, and McLean 2008).

4.4.9 User satisfaction and net benefit of VAMS application

The analysis results in Table 4 show that user satisfaction positively affects the net benefit of the VAMS application ($\beta=0.580, t=4.917$). Thus, H9 was supported. In other words, increasing user satisfaction will increase the net benefit of the VAMS application.

Petter, DeLone, and McLean (2013) state that net benefits are the impact or impact on the existence and use of information systems on the quality of user performance, both for individuals and organizations, including productivity, increasing knowledge, and reducing the length of time for information search. These conditions are directly related to what the VAMS application operator feels, such as the VAMS application being time efficient in the process of administering village assets; apart from that, they also feel like they want to always use the VAMS application in the future. These feelings have affected users' satisfaction, in this case, the operator of the VAMS application.

The positive effect of user satisfaction on net benefits in this study is because operators as users of the VAMS application feel satisfied because the VAMS application can make operators more comfortable in doing their daily work to administer assets in the village. Therefore, our research's findings support other studies which show that increased user satisfaction with information system applications will result in greater net benefits for both individuals and organizations (Wang and Liao 2008; Ojo 2017; Stefanovic et al. 2016).

4.5 Additional Test

This study conducted additional testing intending to see the level of sensitivity of the main hypothesis testing results. The additional test process begins with a split sample or breaking down the research sample based on its criteria. The sample criteria in this study are workers, such as breaking the sample into subgroups, namely the original VAMS operator group and the concurrent VAMS operator group (Aprilia, Winarno, and Prasetyo 2022). The test results showed that both sample separation models gave results that were more consistent with the theories and hypotheses developed. In addition, in Table 5, we conducted another test to prove that the knowledge-sharing mechanism in the VAMS implementation process, accompanied by consultants and from professional organizations, can contribute more in the form of higher net benefits. More specifically, in the context of small entities and organizations such as village governments, the knowledge transfer process through informal socialization will be more effective (Sedera and Gable 2010).

Table 5: Subgroup Sample: Knowledge Transfer Categories

Relationships	Knowledge Transfer Categories						Decision
	Personalization: Internal Socialization only			Personalization: Internal & External Socialization			
	Original Sample (O)	Sample Mean (M)	T statistics (O/STDEV)	Original Sample (O)	Sample Mean (M)	T statistics (O/STDEV)	
Information Quality Intention to Use	0.128	0.126	2.325**	0.177	0.174	3.521***	Supported
Information Quality → Intention to Use	0.230	0.242	2.508**	0.262	0.272	2.977***	Supported
Information Quality → User Satisfaction	0.133	0.135	2.569***	0.154	0.157	2.875***	Supported
System Quality → Intention to Use	0.215	0.231	2.013**	0.226	0.241	2.190**	Supported
System Quality → User Satisfaction	0.277	0.278	2.164**	0.337	0.338	2.483**	Supported
Service Quality → Intention to Use	0.459	0.454	2.181**	0.488	0.483	2.348**	Supported
Service Quality → User Satisfaction	0.431	0.430	3.604***	0.487	0.486	4.160***	Supported

Relationships	Knowledge Transfer Categories						Decision
	Personalization: Internal Socialization only			Personalization: Internal & External Socialization			
	Original Sample (O)	Sample Mean (M)	T statistics (O/STDEV)	Original Sample (O)	Sample Mean (M)	T statistics (O/STDEV)	
Intention to Use → User Satisfaction	0.582	0.553	2.494**	0.600	0.568	2.689***	Supported
Intention to Use → Net Benefit	0.175	0.177	3.006***	0.198	0.200	3.420***	Supported

Note: *p < 0.10; **p < 0.05; ***p < 0.01.

5. Conclusions, Limitations, and Suggestions

5.1 Conclusion

This research paper was conducted to measure the success of the VAMS application information system in Situbondo Regency. We found that the D&M information system success model was validated in the context of e-government implementation (Stefanovic et al. 2016), especially for the implementation of VAMS applications in local governments and village governments. Although in the early stages of testing, system quality is not proven to increase user interest in VAMS applications, at the advanced analysis stage, the three dimensions of information system success, namely Information Quality, System Quality, and Service Quality, have a positive effect on the intention to use VAMS applications. Furthermore, the higher the intention to use the VAMS application will impact the level of user satisfaction and increase the net benefits of implementing the VAMS application.

Testing the success of VAMS applications from the perspective of employees in this paper provides evidence that the condition that VAMS application operators do not hold concurrent positions has provided a higher coefficient of success dimensions compared to VAMS application users who concurrently hold job positions. At this stage of analysis, it is known that the dominance of the most job concurrent positions is between VAMS application users and VFS application users simultaneously. The concurrent condition of the position makes the knowledge transfer process during implementation distorted in concentration on the employees who carry it out. To solve the problem of work distortion in employees, our study seeks to prove the contribution of knowledge transfer methods that have been applied, namely by socialization and workshops conducted by the government and collaboration with external parties. The results proved that the knowledge transfer mechanism in the form of massive outreach would be more effective in implementing the VAMS application when it is carried out in collaboration between internal parties, in this case, the government, and external parties, such as consultants and accounting professional organizations.

5.2 Limitations

The limitations of this study are (1) This research in distributing questionnaires has experienced obstacles due to the ongoing COVID-19 pandemic conditions, and if an alternative procedure is carried out, namely fully with an online survey assisted by Google Form, it will have a low response; (2) a potential source of bias in the questionnaire's results is the presence of respondents who are employed as application users in addition to having no direct relationship with the village's assets or finances, such as users of the Participatory Population Analysis (PPA) Regional System who concurrently serve as users of the VAMS application and (3) this research model is less able to predict the actual use of VAMS applications because the applications are mandatory in nature that must be applied by all village governments.

5.3 Suggestion

Based on some of the previous limitations, the following suggestions for further research are: (1) in the following study, if the pandemic has ended, they can use direct survey techniques so that the response rate from respondents is high; (2) For subsequent researchers, it is recommended to choose a Regency or City whose VAMS operator does not have concurrent task responsibilities, so that the filling out of the questionnaire can be optimized so that the research results are also optimal, and (3) for future researchers to use the research model by combining the information system success model with the Technological Acceptance Model (TAM) is

expected to use more other variables such as computer anxiety and computer playfulness which have the potential to affect the perceived ease of use of applications.

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Knowledge Collaboration Among Fashion Designers: An *A Priori* Conceptual Model

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Abstract: Whilst collaboration from the branding and marketing perspective for the fashion industry is well documented, little is known about the knowledge collaboration (KC) of fashion designers, and how information and communication technology (ICT) is involved within their Communities of Practice (CoPs). This paper proposes an *a priori* conceptual model to enable the examination of KC among fashion designers within their CoPs. It aims to interlink the concepts of KC, CoPs, and ICT to understand fashion designers in their social learning reality. In that regard, the *a priori* conceptual model addresses three broad research questions: 1) How do fashion designers collaborate? 2) How do they participate within their professional communities? And 3) Does ICT play a role? The concepts used in the *a priori* conceptual model will be interlinked with specific indicators extracted from past studies. Since past studies had not focused on this area of research before, future studies can benefit from the *a priori* conceptual model by applying it to examine KC within CoPs of fashion designers or other groups.

Keywords: Knowledge collaboration, Communities of practice, Fashion and design, Fashion designers, Information and communication technology, *A priori* conceptual model

1. Introduction

Collaboration is defined as a process in which different parties who see different aspects of a problem constructively explore the differences so as to seek solutions which may go beyond their own limited possibilities (Gray, 1989). It is a knowledge-based learning activity. Knowledge is part of mutual engagement through which participants refine and expand their experiences of practice (Wenger, 2009, Wenger, 2011b). Nonetheless, Faraj, Jarvenpaa and Majchrzak (2011) viewed knowledge collaboration (KC) as a process of sharing, transferring, accumulating, transforming, and co-creating knowledge, such that knowledge may be added to, recombined, modified, or integrated with the knowledge of others. In her review, Tessier (2020) identified at least 24 actions in the collaborative design process which may involve KC. They include “sharing knowledge,” “establishing shared design goals,” “working together, co-evolving, or co-elaborating,” “negotiating, arguing and making trade-offs or compromising,” “sharing expertise,” “reflecting,” “decision-making,” “producing a common design proposition,” “exploring and proposing ideas,” “searching information,” “defining constraints,” “communicating and listening to others,” “joint problem-solving,” “organizing,” “building consensus,” “clarifying task or context,” “reaching agreement,” “building a common language,” “commercialization,” “consulting others,” “responding to feedback,” and “performing with synergy.”

Fashion is a social phenomenon that can be seen as a system of interlocking institutions, organizations, groups, practices, individuals and even events (Kawamura, 2004). Over the years, fashion as an industry has accommodated well to the general idea of collaboration, to the extent that collaboration is seen as key to the design activity (Nguyen and Mougenot, 2022). Collaboration is a cooperative relationship between two or more companies, brands, or individuals; it is aimed at providing customers with significantly better outcomes, particularly when supported by the competitive advantage of differing collaborative parties on an equal basis (Chun and Niehm, 2010). Observations by Powell (1998) showed that enterprises within the innovation-driven fields are engaging in the learning race through collaborations. For instance, in design collaboration, product design involves collective and joint-efforts such that expertise, ideas, resources, and responsibilities are shared among all involved (Wang, Shen and Liu, 2017). Fashion retail executives also emphasized collaboration as an important strategy (Testa and Karpova, 2022), with the most common type of collaboration involving fashion brands and brands outside of fashion (Jang, 2006, Alexander *et al.*, 2016) and by fashion brands with retailers (Shen *et al.*, 2014). Retailers often capitalize on small fashion designers or independent designers outside their

organization for innovative products as they lack product creativity skills, but they excel at the commercialization process such as marketing, branding, production, and market access which small fashion designers are weak at (Lin, Piercy and Campbell, 2012). Brokers may also be involved in this innovation exchange (Lin, 2018). Despite fashion designers particularly independent fashion designers having a reputation for innovativeness they seem to be hindered by their position at the periphery of the fashion field and also by their focus on creativity rather than commerce (Rieple and Gornostaeva, 2014).

Collaboration is important in the fashion industry because the success of fashion design products relies heavily on two critical factors: 1) highly creative new products (design), and 2) successful commercialization (marketing, branding, production, and market access) (Calvo Dopico and Calvo Porral, 2012, Lin, Piercy and Campbell, 2012). Collaboration is also key if the goal is to maintain competitiveness for fashion enterprises (Andriani *et al.*, 2018). Calvo Dopico and Calvo Porral (2012) mentioned that fashion enterprises can compete on cost or differentiation, but products with high added values, require focus on variations such as distinctive designs produced by highly creative individuals. These highly creative individual are fashion designers whom are known to create significant innovative fashion products (Lin and Piercy, 2013).

Collaboration in the fashion industry is largely characterized by branding and marketing (Millspaugh *et al.*, 2016) through terms such as co-branding, strategic alliance, brand alliance, co-marketing, brand mix, brand cooperation, joint brand strategy or brand expansion. While collaboration in the fashion industry has been examined from the branding and marketing perspective, little is known about the KC between fashion designers. KC as opposed to just collaboration such as branding and marketing collaboration in the fashion industry focuses on knowledge as a resource and learning as an activity between collaborative parties.

Since “community” is an important part of collaborative designs (Fritsch, 2008, Tessier and Zahedi, 2019, Tessier, 2020), fashion designers may form their own Communities of Practice (CoPs) to exchange views or ideas as a shared endeavor (Yu, 2009, Wenger, 2010). CoPs can be defined as groups of people with a shared concern, problem, or passion on a particular topic. Members deepen their knowledge and expertise in the shared area by interacting continuously with each other (Wenger, McDermott and Snyder, 2002). In this regard, CoPs are a social learning system (Wenger, 2010) which may utilise KC as a process for learning. This is embedded in a social activity that has context and culture of its own, where learning tends to occur in an unintentional way rather than through deliberate means (Lave and Wenger, 1991). While CoPs can enhance success of fashion designers, evidence highlighting this aspect of KC within CoPs is far in between (Faraj, Jarvenpaa and Majchrzak, 2011, Park and Park, 2016, Majchrzak, Jarvenpaa and Faraj, 2017, Randhawa *et al.*, 2017, Wei *et al.*, 2018, Cheng and Chang, 2020, Bahar, Bahri and Zakaria, 2022). Cheng and Chang (2020) also notes that the field of KC is only in its initial development stage. Thus, evidence showing how fashion designers undertake KC within their CoPs is still somewhat lacking.

The importance of CoPs to fashion designers should however not be underplayed. Within CoPs, fashion designers have the opportunity to know what others in their community are doing, and what their aspirations, ideas, competencies, and skills are. While the learning of tacit knowledge cannot be codified, written down, or expressed in precise words or numbers (Anklam, 2002), studies suggest that the know-how and experience occur informally within the fashion designers’ CoPs (Duguid, 2005, Jurasaitė-Harbišon and Rex, 2010). CoPs increases the probability of KC, to the extent that fashion designers could even develop projects together (Bettiol and Sedita, 2011). As members of a CoP, fashion designers engage in mutual sense-making on a continuous basis, thereby deepening their shared knowledge with regards to their enterprise and ways of doing things. This encompass their diverse views, values, power relations, communication, and others (Eckert, 2006). Undeniably, these CoPs offer fashion designers a platform for KC such that fashion designers can observe and model after each other (Li *et al.*, 2009a). It also enables fashion designers to make better sense of their own personal practice of fashion designing.

The *a priori* conceptual model proposed by this paper can serve as a network or a nomological net, offering a “plane” of interlinked concepts that can highlight understanding of a phenomenon (Cronbach and Meehl, 1955, Jabareen, 2009). It is an abstraction or mental concept of the way that can be chosen to perceived a specific part, function, property or aspect of social reality and is fundamentally theoretical in nature (Jonker and Pennink, 2009). It may also build on theory or theories by offering propositions regarding previously untested relationships (Gilson and Goldberg, 2015). Since KC within CoPs of fashion designers have not been explored before, this paper offers an *a priori* conceptual model as an exploratory approach for qualitative research involving KC in the context of CoPs of fashion designers. The *a priori* conceptual model helps highlight gaps in the literature which are the interlinks between KC of fashion designers, CoPs particularly extra-organizational

CoPs of fashion designers, the value of such CoPs to fashion designers and how information and communication technology (ICT) interlinks with KC within CoPs of fashion designers. ICT may support KC within CoPs of fashion designers by way of its use and impact.

Indicators are proposed for each concept used in the *a priori* conceptual model. The concepts with proposed indicators include KC, CoPs and their value, and ICT use and impact. As distinguished by Jabareen (2009), this paper presents a model and not a framework as it provides indicators (or variable or factors) for the focal phenomenon. It is important to understand however that the conceptual interrelationships and the indicators in the proposed *a priori* conceptual model do not provide a causal, predictive, or analytical setting. It is also not deterministic. Causal structures are indeed very complex in the social sciences. Instead, it provides a starting point for an interpretive approach towards understanding, and in explaining a phenomenon in social reality (Jabareen, 2009, Jaakkola, 2020). It is a means to communicate that social reality. Albeit only a mere slice of that social reality. The *a priori* conceptual model as an outcome of this paper could be used by future researchers in further theorizing or empirically elucidating KC within CoPs along with the involvement of ICT for fashion designers, as well as in other groups.

2. Literature Review

2.1 KC Models

D'Amour *et al.* (2005) reviewed concepts related to collaboration. They mentioned that the collaboration process was a complex, voluntary and dynamic process which involved several skills, incurring changes of paradigm from the logic of collaboration rather than the logic of competition. Thomson, Perry and Miller (2007) defined collaboration as a process where autonomous or semi-autonomous actors interact, whether through formal or informal negotiations. They jointly create rules and structures to govern their relationships, and they develop ways to act or decide on the issues that brought them together. This involves shared norms and mutually beneficial interactions.

There are several collaboration models. They are based on various stages set within a continuum, with variations in elaborations. These models generally focus on the three main steps which are cooperation and coordination which result in collaboration. They are more commonly used by sectors such as public administration, healthcare, and education/online learning (Gray, 1989, Peterson, 1991, Gitlin, Lyons and Kolodner, 1994, Bergstrom *et al.*, 1995, Cigler, 1999, Bailey and Koney, 2000, Himmelman, 2002, Gajda, 2004, Murphy, 2004, Frey *et al.*, 2006, Thomson and Perry, 2006, Horwath and Morrison, 2007, Thomson, Perry and Miller, 2007, Kilbride *et al.*, 2011, McNamara, 2012, Quinn *et al.*, 2016, Roberts, Van Wyk and Dhanpat, 2017, Schaefer *et al.*, 2019). These associated models can also be used in multidisciplinary settings.

KC represents a more specific type of collaboration. It focuses on learning which is intentional in nature. It is directed towards delivering a product (knowledge, service or technology) (Du Chatenier *et al.*, 2009). There are overlaps in the steps with regards to the general continuum of collaboration among models. Frey *et al.* (2006), for example, proposed a seven step model starting with co-existing, followed with communication, cooperation, coordination, coalition, collaboration and finally coadunation (joining together or uniting to become one). Du Chatenier *et al.* (2009) proposed a four-step model of collaborative knowledge which looks at 1) externalizing and sharing, 2) interpreting and analyzing, 3) negotiating and revising, and 4) combining and creating. The said model was developed based on nine relevant KC models. Bettoni and Obeng (2020) created a knowledge-based collaboration and community-oriented collaboration model called "New Collaboration." It comprised seven steps including, 1) physical space (either real or virtual), 2) social presence and leading presence (which is the design, facilitation, and support of the cognitive and social presence), 3) artefacts-mediated interaction, 4) co-construction of knowledge (first of the two components of cognitive presence), 5) negotiation of meaning (second of the two components of cognitive presence), 6) knowledge sharing, and finally, 7) "New Collaboration" where collaborators construct and maintain the "Joint Knowledge Base" or JKB (a shared knowledge structure where each team member constructs and maintains in his or her mind from knowledge sharing during collaboration and for which each collaborator contributes to in relation to the task at hand via conversations, physical actions and other interactions involving a combination of words and actions). Given the various models of collaboration and KC available, there is perhaps a need to clarify or harmonize KC in terms of its activities into a general scheme.

2.2 Value of KC

Value from collaboration and thus KC is rooted in the resource based view of the firm which states that firms develop a competitive advantage by creating, storing, and applying knowledge (Grant and Baden-Fuller, 1995).

Collaboration is essentially part of knowledge management. Collaboration in firms enables members to exchange and share their knowledge with each other. This belief is also rooted in the social exchange theory which states that individuals will try to maximize benefits whilst minimizing the cost of participation, thereby maintaining an equitable exchange (Gitlin, Lyons and Kolodner, 1994). Collaboration allows the members to reconstruct shared meanings into greater meanings (Peltonen and Lämsä, 2004). There is a preponderance of studies focused on intra-firm and inter-firm collaborations which mentioned that collaboration could generate value for organizations (Inkpen, 1996, Powell, 1998, Hardy, Phillips and Lawrence, 2003, Cricelli and Grimaldi, 2010, Franssila *et al.*, 2012, Ashok, Narula and Martinez-Noya, 2016, Lin, 2019, Milagres and Burcharth, 2019, Jian *et al.*, 2020). Collaboration is thus generally viewed as a value generating proposition for organizations in the literature.

2.3 KC in Communities

Anklam (2002) noted that the first stage of knowledge management focuses on the use of communication and publishing technologies to connect people to the information they need. The second stage of knowledge management involves the exploration of methods of capturing tacit knowledge and enabling people to find each other. It deals with themes such as organizational best practices, knowledge networks, and expertise locators. The third stage of knowledge management is described as the stage of collaboration (co-laboring, sharing, and co-creating together) involving KC and occurs in communities (in various forms i.e., CoPs, communities of learning, communities of interest and communities of purpose). This appears to be consistent with recent studies (Ben Yahia, Bellamine and Ben Ghezala, 2012, Handzic, Bratianu and Bolisani, 2021, Bahar, Bahri and Zakaria, 2022). However, studies focusing on inter-firm and inter-firm collaborations tend to only deal with the first and second stage of knowledge management as described by Anklam (2002).

The third stage of knowledge management, involving KC in communities is a new concept to most organizations even though the idea has been around for a while. Research work stressing on KC in communities has also tended to be geared towards online communities (Johnson, 2001, Murphy, 2004, Cress and Kimmerle, 2008, Gunawardena *et al.*, 2009, Oguz, Marsh and Landis, 2010, Faraj, Jarvenpaa and Majchrzak, 2011, Le Dinh *et al.*, 2013, Park and Park, 2016, Randhawa *et al.*, 2017). There is good reason for this as modern technology has enabled communities to collaborate fully online through convenient devices. The advent of social media networking such as wikis and blogs has also encouraged community dialogs and conversations online (Gunawardena *et al.*, 2009). This activity allows past and present experiences to be utilized as a learning and collaborative effort. In that regard, more knowledge is shared, stored, and captured, leading to the creation of new ideas.

Murphy (2004)'s collaboration model was developed for the online community, but since then, the model has been modified (Schaefer *et al.*, 2019, Schaefer, Fabian and Kopp, 2020). The modified version is represented by a continuum of eight steps. First, participants seek assistance from each other (technical assistance). Then they present themselves to others (social presence). Next, they externalize their points of view (articulating individual perspectives). They also potentially restructure their ideas (accommodating or reflecting the perspectives and meanings). Meantime, they could create shared meanings (co-constructing shared perspectives and meanings) whilst also applying the knowledge (taking to the outside), and then setting goals (building shared goals). Finally, they realize shared artefacts (producing shared artefacts).

Murphy (2004)'s modified collaboration model can be described as analogous to other selected models produced by Frey *et al.* (2006), Du Chatenier *et al.* (2009), Faraj, Jarvenpaa and Majchrzak (2011) and Bettoni and Obeng (2020). For example Faraj, Jarvenpaa and Majchrzak (2011) considered KC as activities which can be viewed with similarities to Murphy (2004)'s modified collaboration model such as: 1) to Share (analogous to providing technical assistance, social presence and articulating individual perspectives), 2) to Transfer, (analogous to accommodating or reflecting the perspectives of others), 3) to Accumulate and to Transform (analogous to co-constructing shared perspectives and meanings), and 4) to Co-create (taking to the outside such as applying the knowledge, building shared goals and producing shared artefacts). However, Faraj, Jarvenpaa and Majchrzak (2011) did not indicate social presence like that in the modified Murphy (2004)'s collaboration model as an activity in KC. Social presence however can be taken to be part of the "to Share" KC activity in Faraj, Jarvenpaa and Majchrzak (2011)'s KC model. Table 1 illustrates various selected models from various authors and their similarities and overlaps with regards to KC activities. Faraj, Jarvenpaa and Majchrzak (2011)'s KC model arguably provides the most succinct and parsimonious general scheme for KC activities when similarities of KC activities are compared between the selected models.

Table 1: Similarities of KC Activities

Authors	Frey <i>et al.</i> (2006)	Du Chatenier <i>et al.</i> (2009)	Faraj, Jarvenpaa and Majchrzak (2011)	Murphy (2004), Schaefer <i>et al.</i> (2019), Schaefer, Fabian and Kopp (2020)	Bettoni and Obeng (2020)
Knowledge Collaboration (KC) Activities	<ul style="list-style-type: none"> • Co-exist • Communication 	<ul style="list-style-type: none"> • Externalizing and sharing 	<ul style="list-style-type: none"> • Share 	<ul style="list-style-type: none"> • Providing technical assistance • Social presence • Articulating individual perspectives 	<ul style="list-style-type: none"> • Physical space (<i>real or virtual</i>) • Social presence • Leading presence (<i>design, facilitation, and support of the cognitive and social presence</i>) • Artefacts-mediated interaction
	<ul style="list-style-type: none"> • Cooperation • Coordination 		<ul style="list-style-type: none"> • Transfer 	<ul style="list-style-type: none"> • Accommodating or reflecting the perspectives of others 	
	<ul style="list-style-type: none"> • Coalition 	<ul style="list-style-type: none"> • Interpreting and analysing • Negotiating and revising 	<ul style="list-style-type: none"> • Accumulate • Transform 	<ul style="list-style-type: none"> • Co-constructing shared perspectives and meanings 	<ul style="list-style-type: none"> • Co-construction of knowledge (<i>cognitive presence</i>)
	<ul style="list-style-type: none"> • Collaboration • Coadunation (<i>joining together or uniting to become one</i>) 		<ul style="list-style-type: none"> • Combining and creating 		<ul style="list-style-type: none"> • Co-create
					<ul style="list-style-type: none"> • “New Collaboration” by means of knowledge sharing (<i>where collaborators construct and maintain the JKB</i>)

2.4 KC in Fashion and Design

In fashion and design, literature emphasizing on knowledge management (Li, 2005, Li, 2006, Andriani *et al.*, 2019), and KC or KC within CoPs specifically, is far in between. Among these, Maciver and Malins (2016) discussed the challenges of the collaborative design process. This centered around the gathering of insights, the generating of ideas, and the facilitation of communications. Ideas are generated by KC from the insights gathered in CoPs. The communication process in the gathering of insights and the generation of ideas is in part facilitated by ICT. This is important for fashion designers who are pursuing creative designs and distinguished brands (Lee, Ahn and Kim, 2018). In their study, Andriani *et al.* (2019) examined how knowledge management was linked to organizational growth in the context of creative industries in Indonesia. Collaboration was found to be the pinnacle of organizational growth. Silva *et al.* (2018) examined the departments, processes, and knowledge management elements that influenced the purchasing department in a fashion and clothing company. Acharya *et al.* (2018) used big data on knowledge co-creation from four fashion retailing organizations to understand how knowledge co-creation could be utilized for better decision making. Ashton (2006) reviewed the fashion networks of the knitting industry of Nottingham, and found that intangibles such as values, norms, and tacit knowledge were exchanged in social relationships. This implies that relationships, instead of competition, trigger collaboration. Bandinelli, d'Avolio and Rinaldi (2014) also examined collaborative networks of Italian suppliers in the fashion industry whereas Azuma (2002) detailed the Korean-Japanese collaborations in the casual fashion sector. Interestingly, Dell'era, Acur and Verganti (2009) examined the portfolio of designers of different nationalities and how they impacted the innovative performance of Italian furniture companies. More recently, Suib, Engelen and Crul (2020) highlighted that craftspeople and designers can collaborate and share knowledge with effectiveness when focus is given to their domain knowledge. This showed a research gap because in the context of fashion and design, little is known specifically about KC in its entirety as a process with its various activities.

2.5 Conceptualizing CoPs

The concept of the CoPs was introduced and popularized by Etienne Wenger in Lave and Wenger (1991), Wenger (1998a), and Wenger, McDermott and Snyder (2002). It was derived from the social learning theory (Vygotsky, 1962, Bandura, 1977, Vygotsky, 1978, Lave and Wenger, 1991), in line with the social constructivist view of learning. It reflects the non-canonical nature of learning (Brown and Duguid, 1991). It is not a theory of social learning in itself, but rather a broad conceptualization of how learning occurs within a social environment (Li *et al.*, 2009b, Wenger, 2010, Farnsworth, Kleanthous and Wenger-Trayner, 2016). In order to learn, one has to belong to something, and “community” is what that “something” is (Hodkinson, 2004). The concept of the CoPs can be classified as an “instrumental” theory which are any analytical tools, models or processes that theorizes how work is done or how outcomes are achieved (Davison, Martinsons and Ou, 2012). It can also be viewed from a purely theoretical sense (McKellar, 2019) or as a “focal” theory (Davison, Martinsons and Ou, 2012) which is broader and provides for the intellectual basis for social learning. Wenger (2010) however observed that the concept of CoPs may not be adequate to explain other dimensions of learning, such as the biological, psychological, cognitive as well as historical and political elements of learning. Thus, Wenger (2010) recommended the plug-and-play approach by combining the concept of CoPs with other concepts or theories so as to explain other salient dimensions. In this paper the concept of CoPs was combined with KC and ICT support by its use and impact.

The concept of CoPs initially centered on the interactions between novices/apprentices and experts, and the process by which newcomers create a professional identity. Following this, the focus shifted to personal growth and the trajectory of individuals’ participation within a group (i.e., peripheral versus core participation). It was then applied as a managerial tool for improving an organization’s competitiveness (Li *et al.*, 2009a). The concept continues to evolve as it allows for diversity (Li *et al.*, 2009a). This diversity can be challenging when trying to take full advantage of the benefits that CoPs offer, particularly when considering the tension between satisfying individuals’ needs for personal growth versus the empowerment of organizations. Politics of management and organizations also play a part in CoPs (Contu and Willmott, 2003, Contu, 2014). This suggests that CoPs can also be problematic (Yanow, 2004, Hong and Fiona, 2009, Macpherson and Clark, 2009, Mørk *et al.*, 2010, Heizmann, 2011, Rennstam and Karreman, 2020) as CoPs can be understood differently based on the lens it is viewed from (Nicolini *et al.*, 2022).

As a start, CoPs are naturally self-organizing, self-evolving, and informal. However, they can be intentionally cultivated and managed as a knowledge management tool (Wenger and Snyder, 2000, Wenger, McDermott and Snyder, 2002, Loyarte and Rivera, 2010). It is not sufficient to just set-up CoPs because developing an understanding of the nature of collaborative learning, i.e. the process of “thinking together,” is also critical (Pyrko, Dörfler and Eden, 2017). Wenger, McDermott and Snyder (2002) noted that CoPs cannot be cultivated as how traditional organizations are structured. Amin and Roberts (2008) observed that cultivating CoPs is important because they support a specific form of learning and knowing or knowing in action for members. McDermott (1999a) suggests that CoPs can reduce the downsides of teams in organizations. Of course, CoPs are also differentiated based on their activities, such as craft or task based, professional, epistemic, or creative, and virtual. Each of these categories have different forms of knowledge, social interactions, impact to innovation and organizational dynamics. Therefore, when it comes to learning and practice, CoPs also have wider and looser forms, such as landscapes of practice, collectivities of practice, and networks of practice (Brown and Duguid, 1991, McDermott, 1999b, Lindkvist, 2005, Gherardi, 2006, Gherardi, 2009, Beane, 2019, Pyrko, Dörfler and Eden, 2019).

Not everything termed as a community is a Community of Practice (CoP) however. A neighborhood, for instance, is a community, but not a CoP because it lacks the three characteristics of a CoP: 1) domain or mutual engagement (identity defined by a shared domain of interest), 2) community or joint enterprise (engage in joint activities and discussions, help each other, share information and build relationships that enable them to learn from each other), and 3) practice or shared repertoire (develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problem – a shared practice) (Wenger, 1998a, Wenger, 1998b, Wenger, 2011a). CoPs are also not permanent because they go through five stages of evolutionary development - identification, coalescence, maturation, stewardship and dissolution, and transformation (Wenger, McDermott and Snyder, 2002). In this regard, a neighborhood does not qualify.

2.6 Value of CoPs

Although it is accepted that knowledge is a key competitive advantage in business, an understanding in how to create and leverage this in practice, is still lacking (Wenger, 1998a). CoPs enable particular organizations to know

and to learn (Wenger, 1998a) and can become part of an organization's knowledge management strategy (Venkatraman and Venkatraman, 2018). They are important to those organizations who recognize knowledge as an asset (Peltonen and Lämsä, 2004). CoPs serve as nodes for the exchange and interpretation of information, for knowledge to be retained in "living" ways, and for the stewarding of competencies so that organizations can acquire a cutting edge. CoPs are also homes for various members to showcase their different identities and where attention needs to be focused (Peltonen and Lämsä, 2004). CoPs are groups of people bound together informally by shared expertise and passion. They act as a joint enterprise for the various professions, such as engineers engaged in deep-water drilling, consultants specializing in strategic marketing, or frontline managers of large commercial banks in-charge of check processing. As a platform, CoPs can drive strategy, generate new lines of business, solve problems, promote best practices, develop professional skills, and help companies to recruit and retain talent (Wenger and Snyder, 2000, Cox, 2005).

Schwen and Hara (2003) stated that the concept of the CoPs is compelling. It can be used to understand the complicated pattern of workplace learning, and the idea of identity formation. Wenger (1998a) and Wenger, McDermott and Snyder (2002) argued that CoPs are everywhere, developed by people around things that mattered to them. Some CoPs carry a name, others do not, but most of the members are familiar with the experience of belonging to a CoP since almost everyone belongs to a number of these CoPs. Some may be core members while others are peripheral members (Wenger, McDermott and Snyder, 2002). The concept of the CoPs has been widely used in the educational, business and medical disciplines such as seen in Hodges (1998), Holmes and Meyerhoff (1999), Wenger, McDermott and Snyder (2002), Printy (2007), Gherardi (2009), Le May (2009), Li *et al.* (2009b), Shih-Hsien (2009), Jurasaitė-Harbisson and Rex (2010), Mørk *et al.* (2010), Barnett *et al.* (2012), McDonald and Cater-Steel (2017a), McDonald and Cater-Steel (2017b), Struminger *et al.* (2017), Yarris *et al.* (2019), Shaw *et al.* (2022) and Guénette *et al.* (2022) but limited in fashion and design.

To ascertain if CoPs are effective and generate value, evaluation models are required. There are at least 17 evaluation models for CoPs that has been identified (McKellar *et al.*, 2014, McKellar *et al.*, 2020). Among them are by Verburg and Andriessen (2006), Wenger, Trayner and De Laat (2011), Wenger-Trayner *et al.* (2017) and McKellar *et al.* (2020). Having said that, according to McKellar (2019) the evaluation of CoPs in term of the value it creates is limited in the literature. This is especially so with regards to extra-organizational CoPs. This has resulted in limited evidence supporting the effectiveness and how value is generated in CoPs.

2.7 CoPs of Fashion Designers

Fritsch (2008) noted that the community in the creative industry of fashion and design can be considered a CoP based on the elements of ideas, process, experience, innovation, and collaboration. This community has an important role to play in collaborative design (Tessier and Zahedi, 2019, Tessier, 2020). While CoPs are important for fashion designers, it is undeniable that literature stressing on fashion designers in CoPs is less abundant. This is especially so when one considers the literature on extra-organizational CoPs and evaluating such extra-organizational CoPs (McKellar, 2019). Thus, there is a need to examine how the fashion and design industry collaborates within CoPs. An insight into this area would help to broaden the fashion and design field because it could enhance the exchange of information among the members, thereby enabling the retention of knowledge in "living" ways unlike in just databases or manuals while providing homes for their identities (Wenger, 1998a).

Studies state that CoPs create spaces for learning and collaboration, thereby adding value, developing networks, and fostering communication among members who excel in learning and innovation (Dougherty, 2001, Swan, Scarbrough and Robertson, 2002, Brown, 2004, Sánchez-Cardona, Sánchez-Lugo and Velez-González, 2012, Kirkman *et al.*, 2013, Pattinson and Preece, 2014, Pattinson, Preece and Dawson, 2016). Some notable literature on fashion and design included the examination of creative industry projects in Italy (Bettiol and Sedita, 2011) where CoPs support interactions that go beyond knowledge sharing. This had led the creative professionals who shared a common identity and language, to interact and collaborate their expertise and experiences. Creative professionals also can know what other professionals are doing. This knowledge can increase the probability of collaborations. CoPs are known to exist in the purchasing department of the fashion and clothing industry (Silva *et al.*, 2018) and can also take the form of an organization aimed at assisting upcoming designers to launch their own labels through networking knowledge resources (Azuma, 2003). Poggenpohl (2015) proposed that design research take on a broader, less insular, and more holistic form when examining CoPs.

2.8 ICT and Fashion Designers

The fashion industry is increasingly being influenced by the advent of ICT which can be classified into three broad categories: 1) communications and marketing, 2) design and production, and 3) culture and society (Noris *et al.*,

2020, Nobile *et al.*, 2021). There are four important value creation approaches in the design and production category which focuses on design collaboration, organizational process, information, and electronic coordination. Of these elements, electronic coordination is the critical bridge for connecting organizations, processes, and information (Wang, Shen and Liu, 2017). This means that ICT is important in collaboration (Hossain and Wigand, 2004) especially, design collaboration (Wang, Shen and Liu, 2017) because it facilitates communications, making it easier for the diverse groups to get together, and to share insights and ideas (Maciver and Malins, 2016). ICT puts emphasis on certain processes such as presence, visibility, rhythm, variety of interactions, efficiency of involvement, and connection to the world (Peltonen and Lämsä, 2004). Nonetheless, the process can also have many challenges (Karsten, 1999, McCormick, 2004, Li, 2006) since it could affect members' behaviors. One of the difficulties faced is in the capturing and sharing tacit knowledge unless it is first converted to explicit and communicable knowledge (Li, 2006). This could defeat the purpose of using ICT to enhance KC within CoPs.

Therefore, as a support or facilitator for KC within CoPs, ICT has certain advantages and limitations (Kling and Courtright, 2003, Correia, Paulos and Mesquita, 2010, Sims, 2018). Blogs, for example, can enhance collaboration in CoPs (Shih-Hsien, 2009) because it promotes active audience relationships by fostering participation and reciprocity (Swale, 2017). Wikis, on the other hand, offers new opportunities for learning and collaborative knowledge building (Cress and Kimmerle, 2008). Social networks are particularly beneficial for supporting collaborations and communities (Van Noorden, 2014). Thus, it is imperative that the use of ICT by fashion designers be examined together with KC within CoPs. The fact is that CoPs have become virtual networks for many industries, where knowledge is shared by using all opportunities offered by ICT (Dubé, Bourhis and Jacob, 2005, Constantin, 2015).

Unlike traditional face-to-face interactions which require a tangible platform to meet and interact, thereby taking up time and space, virtual interactions and collaborations only require modern devices. Meetings can occur almost anywhere. In this regard, members of any industry should be encouraged to utilize all opportunities offered by ICT (Dubé, Bourhis and Jacob, 2005, Casalini, Janowski and Estevez, 2006, Dubé, Bourhis and Jacob, 2006, Gunawardena *et al.*, 2009, Hara, Shachaf and Stoerger, 2009, Oguz, Marsh and Landis, 2010, Barnett *et al.*, 2012, Constantin, 2015, Struminger *et al.*, 2017, Ogbamichael and Warden, 2018, Yarris *et al.*, 2019, Haas *et al.*, 2020, Embrett *et al.*, 2021, Ghamrawi, 2022, Guénette *et al.*, 2022, Shaw *et al.*, 2022). To date, online platforms and communities are becoming important for fashion designers to generate new insights and ideas besides facilitating communications in their collaborative process (Maciver and Malins, 2016).

ICT can impact KC and CoPs by way of social presence. Social presence is important for social learning (Tu, 2000). It is also part of virtual or online collaboration and creates group cohesion whilst enriching interaction (Murphy, 2004, Schaefer *et al.*, 2019, Schaefer, Fabian and Kopp, 2020). Social presence is therefore relevant for understanding how ICT impacts KC that involves virtual or online CoPs. Social presence is the degree of salience involving two communicators using a communication media. It explains the effects a communication medium has on the way people communicate (Short, Williams and Christie, 1976). Social presence can also be seen as the degree to which participants in a collaboration interact and create awareness of each other's presence as they begin to relate as a group (Murphy, 2004). This is when they are able to project or share their characteristics onto the group by presenting themselves as "real people" to others by mainly expressing emotions via an artefacts-mediated interaction such as in a computer-based environment using ICT (Bettoni and Obeng, 2020). There is however no short of ideas on what precisely social presence is in the literature as it is still widely debated with many definitions (Lowenthal, 2009, Kreijns, Xu and Weidlich, 2021).

Three categories of social presence indicators were presented by Rourke *et al.* (2001). They include: 1) affective responses using emoticons, for example, to represent personal expressions of emotions, feelings, beliefs, and values (Gunawardena and Zittle, 1997, Swan and Shih, 2005), 2) interactive responses, for instance, agreement/disagreement, approval, referencing previous messages and so on, evidencing attendance (Swan and Shih, 2005) followed by 3) cohesive responses which involve greetings, salutations, and group or personal references that help to build sustained group commitment (Swan and Shih, 2005). Kim (2011) determined four factors for social presence which are mutual attention and support (a broad concept as an extension of being attentive to each other), affective connectedness (similar to affective responses), sense of community (similar to cohesive responses) and open communications (similar to interactive responses). Mutual attention and support could be integrated with interactive responses or open communications as it is a broad concept related to attentiveness as acknowledged by Kim (2011). Privacy is also a facet of social presence (Tu, 2002b, Tu, 2002c, Tu and Mclsaac, 2002). It is important when trying to understand how KC within CoPs works in addition to the

three categories of social presence. A reduced level in privacy or perception of privacy could lead to reduced social presence in online mediums (Tu, 2001, Tu, 2002a).

3. Methodology

This paper is premised on three broad research questions: -

RQ1. How do fashion designers collaborate?

RQ2. How do they participate within their professional communities?

RQ3. Does ICT play a role?

Conceptual framework analysis proposed by Jabareen (2009) was adapted along with utilizing an integrative literature review (Torraco, 2005, Snyder, 2019) and guidance on constructing conceptual models by Jonker and Pennink (2009). This was in order to analyze the concepts related to the three broad research questions. Conceptual framework analysis is practical when exploring a phenomenon linked to multidisciplinary bodies of knowledge (Jabareen, 2009). Integrative literature review allows for the overview of the knowledge base to be known and also the generation of initial or preliminary new conceptualization and synthesis from a review of relevant literature based on the broad research questions. Selected concepts were then combined to an *a priori* conceptual model which expands the theoretical foundation of the areas related to the broad research questions (Snyder, 2019). As Yadav (2010) noted, the creative scope for conceptual papers can remain relatively unfettered by data-related limitations since the focus is on theoretical development, and not theory testing. In this regard, this present paper directs attention to the conceptual interrelationships which have not been explored previously, that is, KC of fashion designers within their CoPs, particularly extra-organizational CoPs, and the use and impact of ICT for KC within CoPs.

Literature search to identify relevant papers was made using selected web databases - Clarivate's Web of Science, Elsevier's Scopus, and Google Scholar. This process helped to establish an understanding of the multidisciplinary standpoints. A comprehensive group of key search terms were used to ensure identification of literature meeting the aim of this study; terms included - "Fashion Designer," "Fashion AND Collaboration," "Fashion AND Innovation," "Collaboration," "Collaboration Models," "Collaborative Knowledge," OR "Knowledge Collaboration," and "Communities of Practice" OR "Community of Practice" within article titles, abstracts, and keywords until year 2022. Only articles in the English language were considered. The literature was then manually screened and selected iteratively for the contents which may demonstrate some clues towards answering any one of the three broad research questions formulated. The aim was not to cover all articles ever published on the topic but rather to combine perspectives and insights from the different areas of interest (Snyder, 2019) which are KC, CoPs and ICT based on the broad research questions. A total of 478 sources were found to be relevant for further review.

Extensive reading and categorization of concepts were then undertaken. Relevant selected concepts were deconstructed and categorized to identify their main attributes which were traced to their indicators. These were mapped with their supporting sources. Concepts and their indicators which were similar were then integrated or selected based on what best represents the concept and indicator. Concepts that were redundant were removed. The aim was for parsimony, that is to present the least number of concepts and indicators which would best describe the phenomenon being examined. A concept map was developed showing the relationships between the concepts including cross connections among concepts, and their manifestations (Eppler, 2006) and this serves as a graphical tool, visual pathway, or schematic device for organizing and representing those concepts (Novak and Gowin, 1984, Novak, 1998, Novak and Cañas, 2008). Figure 1 shows the outcome of this process and was developed using IHMC CmapTools version 6.04 (IHMC, 2019).

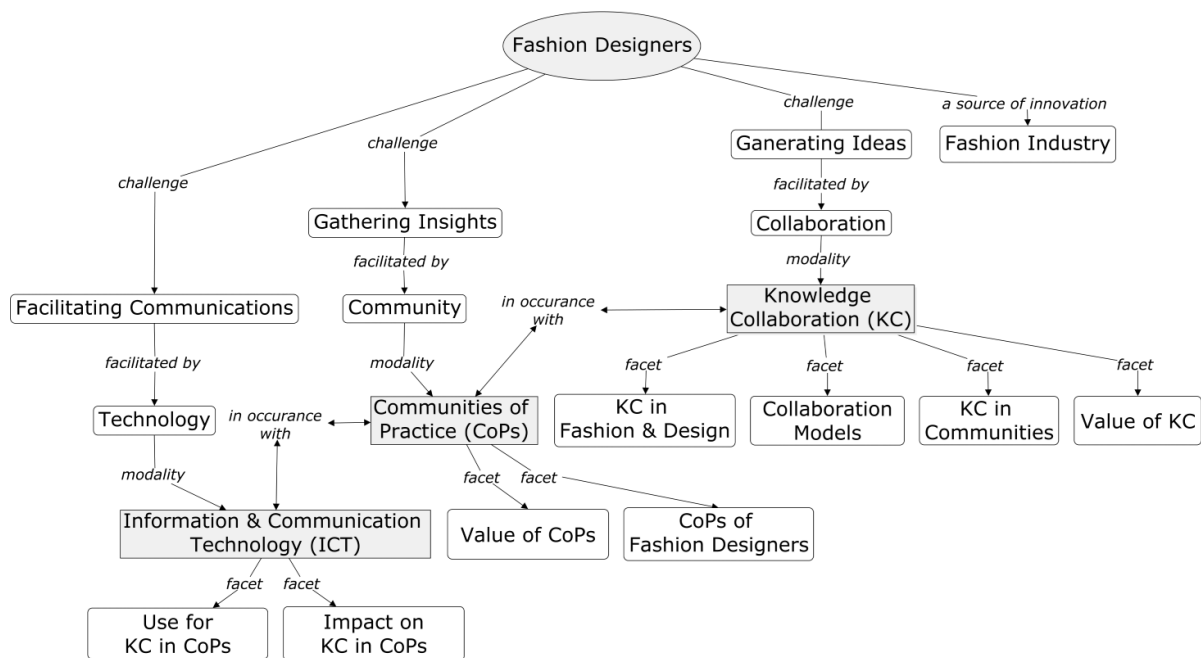


Figure 1: Concept Map

Under KC, the concepts of “Collaboration,” “Collaboration of Knowledge,” and “Knowledge Collaboration” were integrated. Their indicators were KC activities, mapped and integrated together into terms adopted from the literature which best described similar indicators. The mapping can be seen in Table 1. For CoPs, the concepts and indicators as proposed by seminal authors were used. In terms of ICT, literature showed some variations in concepts and indicators, but the iterative process consisting of synthesis, resynthesis, and adaptation led to the identification of concepts and indicators that would enable the exploration of the phenomenon of ICT use and its impact on KC within CoPs of fashion designers. The finalized concepts and their respective indicators were then interlinked into the *a priori* conceptual model. Therefore, the *a priori* conceptual model, whether with or without propositions depicting (representing or describing but not explaining) the abstract concepts, events, objects, and processes (Meredith, 1993, Eppler, 2006) was derived from the combination of past studies. A total of 29 sources were selected to support the *a priori* conceptual model. The exploratory research propositions were then described based on the *a priori* conceptual model to direct attention for future research. These propositions will enable the validation and rethinking of the *a priori* conceptual model when empirically examining the focal phenomenon.

4. A Priori Conceptual Model

The proposed *a priori* conceptual model which posits the interrelationships between KC, CoPs and ICT was developed within the theory of CoPs. CoPs acted as an “instrumental” theory (Davison, Martinsons and Ou, 2012) that guided the model. KC was proposed to occur within CoPs, and its indicators were guided by insights from Murphy (2004), Frey *et al.* (2006), Du Chatenier *et al.* (2009), Faraj, Jarvenpaa and Majchrzak (2011), Majchrzak, Jarvenpaa and Faraj (2017), Schaefer *et al.* (2019), Bettoni and Obeng (2020) and Schaefer, Fabian and Kopp (2020). Indicators noted by Faraj, Jarvenpaa and Majchrzak (2011) which are the process activities of KC, parsimoniously represented the concept of KC.

The indicators for the presence of CoPs, were adopted from Wenger (1998a), Wenger (1998b), and Wenger (2011a) with Wenger (1998b) being the primary source for understanding. The value creation framework and evaluation models focusing on extra-organizational CoPs were guided by Verburg and Andriessen (2006), Wenger, Trayner and De Laat (2011), McKellar *et al.* (2014), Wenger-Trayner *et al.* (2017), McKellar (2019) and McKellar *et al.* (2020). The evaluation model with varying levels of value and differing types of values as proposed by McKellar *et al.* (2020) was used to represent the concept of value when participating in extra-organizational CoPs.

The understanding of ICT use which supported KC within CoPs was primarily obtained from Gunawardena *et al.* (2009), Oguz, Marsh and Landis (2010), Maciver and Malins (2016), Noris *et al.* (2020), Nobile *et al.* (2021). The discussion by Oguz, Marsh and Landis (2010) was key to begin linking ICT use for KC within CoPs. The indicators

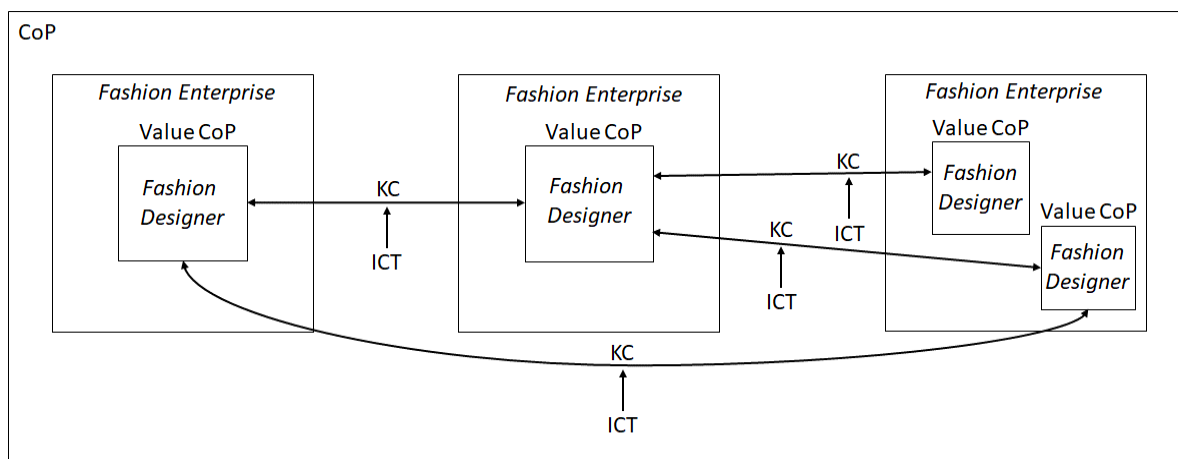
for ICT which impacted (social presence) KC within CoPs were guided by Rourke *et al.* (2001), Tu (2002a), Tu (2002b), Tu (2002c), Murphy (2004), Swan and Shih (2005), Kim (2011), Schaefer *et al.* (2019), Schaefer, Fabian and Kopp (2020), and Kreijns, Xu and Weidlich (2021). To this end work by Rourke *et al.* (2001), Tu (2002b) and Kim (2011) was particularly elucidating for the identification of the indicators of ICT impact. Table 2 summarizes the *a priori* conceptual model and its concepts and indicators. It also provides proposed operational definitions for each of the indicators followed by the selected supporting sources used for understanding the concepts and indicators (with key supporting sources underlined and highlighted in bold).

Table 2: A Priori Conceptual Model Indicators and The Selected Supporting Sources

Code	Concepts	Indicators	Proposed Operational Definitions	Selected Supporting Sources
KC	Knowledge Collaboration	Sharing	Providing technical assistance, social presence (<i>presenting themselves to others</i>) and articulating individual perspectives	Murphy (2004), Frey <i>et al.</i> (2006), Du Chatenier <i>et al.</i> (2009), Faraj, Jarvenpaa and Majchrzak (2011) , Majchrzak, Jarvenpaa and Faraj (2017), Schaefer <i>et al.</i> (2019), Bettoni and Obeng (2020), Schaefer, Fabian and Kopp (2020)
		Transfer	Accommodating or reflecting the perspectives of others	
		Accumulate	Co-constructing (<i>jointly producing</i>) shared perspectives and meanings	
		Transform	Negotiating and revising (<i>jointly modifying</i>) shared perspectives and meanings	
		Co-create	Applying the knowledge, building shared goals, and producing shared artefacts	
CoP	Participation in Extra-organizational CoP	Mutual Engagement (<i>Domain</i>)	Building relationships around what they do	Wenger (1998a), Wenger (1998b) , Wenger (2011a)
		Joint Enterprise (<i>Community</i>)	Develop understanding of what binds them together – shared concern or passion	
		Shared Repertoire (<i>Practice</i>)	Share, maintain and do certain things which expressed their membership and identity to the community	
Value CoP	Value of Extra-organizational CoP (<i>Types of Value: "Motivation & Participation," "Relational," "Knowledge," "Learning & Identity," "Intangible," "Tangible," "Applied," "Realized" and "Reframing & Transformative"</i>)	Level: Individual Value	Value for individual members of the CoP	Verburg and Andriessen (2006), Wenger, Trayner and De Laat (2011), McKellar <i>et al.</i> (2014), Wenger-Trayner <i>et al.</i> (2017), McKellar (2019), McKellar et al. (2020)
		Level: Collective Value	Value of participation at the collective level as a whole CoP	
		Level: Organizational Value	Value to firms, institutes, or organizations to which members of the CoP belong	
		Level: Value to External Stakeholders	Value to individuals, organizations, and/or target populations external to the CoP	
		Level: Value to Field	Value to subject, issue, or topic in which members of CoP share an interest or passion in	
ICT	ICT: Supporting KC & CoP	Use of ICT	Use of electronic mediums for the facilitation of communications	Gunawardena <i>et al.</i> (2009), Oguz, Marsh and Landis (2010) , Maciver and Malins (2016), Noris <i>et al.</i> (2020), Nobile <i>et al.</i> (2021)

Code	Concepts	Indicators	Proposed Operational Definitions	Selected Supporting Sources
		Impact of ICT <i>(Social Presence)</i>	Affective	Feelings of connectedness, intimacy, and warmth
			Interactive	Open communications and attentiveness (<i>mutual attention and support</i>)
			Cohesive	Group commitment and a sense of community
			Privacy	Perception of online privacy
				Rourke et al. (2001) , Tu (2002a), Tu (2002b) , Tu (2002c), Murphy (2004), Swan and Shih (2005), Kim (2011) , Schaefer et al. (2019), Schaefer, Fabian and Kopp (2020), Kreijns, Xu and Weidlich (2021)

An overall view of the proposed *a priori* conceptual model is further illustrated in Figure 2, in the form of a nomological net involving a network which interlinks KC, a CoP, value from a CoP (Value CoP) and ICT. Figure 2 provides an example of one CoP. It aims to conceptually show the interrelationships between the instrumental theory of CoPs and the concept of KC with its various activities as well as the involvement of ICT (both use and impact) in supporting KC within the CoPs of fashion designers. Five exploratory research propositions were formulated from the *a priori* conceptual model to understand KC among fashion designers.



Key: -

A Community of Practice (CoP): Indicated by 1) Mutual Engagement, 2) Joint Enterprise, and 3) Shared Repertoire.

Value from A Community of Practice (Value of CoP): Indicated by 5 different levels of value which are at the 1) Individual, 2) Collective, 3) Organization, 4) External Stakeholders, and 5) Field, levels and by 9 different types of value: 1) Motivation & Participation, 2) Relational, 3) Knowledge, 4) Learning & Identity, 5) Intangible, 6) Tangible, 7) Applied, 8) Realized, and 9) Reframing & Transformative.

Knowledge Collaboration (KC): Indicated by the 1) Sharing, 2) Transferring, 3) Accumulating, 4) Transforming, and 5) Co-creation of knowledge.

Information and Communication Technology (ICT): Indicated by 1) Use, and 2) Impact (Social Presence: Affective, Cohesive, Interactive and Privacy) of ICT.

Figure 2: The A Priori Conceptual Model as a Nomological Net

As noted in Figure 2, fashion designers are represented by the small boxes, bound by Wenger’s three dimensions of the CoPs (mutual engagement, joint enterprise, and shared repertoire). The fashion enterprises are represented by the larger boxes which enclose the small boxes located in one extra-organizational CoP represented by the all-encompassing large rectangle. Proposition 1 from this representation assumes that fashion designers do form extra-organizational CoPs.

They create value for themselves individually at different levels, that is their collective, their organization, other external stakeholders, and their field. They obtain distinct types of values at those different levels i.e., motivation & participation, relational, knowledge, learning & identity, intangible, tangible, applied, realized and reframing & transformative values. This is denoted by “Value CoP” in Figure 2. Proposition 2 from this representation assumes that fashion designers derive value from extra-organizational CoPs.

They create value by undertaking the activities of KC as denoted by “KC” in Figure 2 which are sharing, transferring, accumulating, transforming, and co-creation of knowledge. This represents KC in the form of

activities within a CoP, thereby leading to proposition 3 which assumes that fashion designers undertake KC within an extra-organizational CoP.

ICT supports KC in extra-organizational CoPs of fashion designers by means of its use and its impact (through social presence at the affective, cohesive, interactive, and privacy levels) as denoted by "ICT" in Figure 2, thereby representing proposition 4 that assumes ICT use supports KC within an extra-organizational CoP of fashion designers, and also finally, proposition 5 which assumes that ICT impacts KC within an extra-organizational CoP of fashion designers.

The proposed *a priori* conceptual model can allow the examination of these five exploratory research propositions so as to see if it indeed represents a part of social reality for fashion designers. This fulfills the aim of the *a priori* conceptual model which is to help understand the phenomenon in focus. Having said this, due to the iterative process of developing the *a priori* conceptual model, different researchers using the same sources and same approaches in theorizing could arrive at very different conclusions on the concepts and their indicators. This may seem like a manifest limitation of the proposed *a priori* conceptual model. However, this could be valuable since new or different insights from new or further theorizing could enhance or otherwise revise the *a priori* conceptual model.

As such the *a priori* conceptual model needs to maintain its flexible, exploratory, and non-predictive nature. If at all, it is only one representation of the social reality of fashion designers. As Sayer (2010) mentioned, theories are not monolithic and discrete. They can overlap and differentiate internally. The proposed *a priori* conceptual model as an outcome of theorizing shown in Figure 2 can be further revised for future studies to explain KC within CoPs of fashion designers when there are competing theories or rival explanations. This is especially so since the proposed *a priori* conceptual model is multidisciplinary and dynamic in nature, which allows the theoretical perspectives of the disciplines involved to be further broadened (Jabareen, 2009). Upon empirical examination an *a posteriori* conceptual model can also be proposed.

5. Contributions

To date, there is a lack of understanding about KC, particularly for fashion designers, the main innovators, and differentiators, within the fashion and design industry. The social environment or reality, particularly involving extra-organizational CoPs and the activities of KC can determine fashion designers' insights and ideas. ICT may also play a role in supporting and impacting KC within CoPs. This paper suggests that the *a priori* conceptual model could be used to understand KC by fashion designers in the fashion industry.

The first contribution of this paper is thus the examination of KC among fashion designers within their extra-organizational CoPs by means of conceptualizing the interrelationships between concepts and their indicators based on three broad research questions. This conceptualizing led to the development of an *a priori* conceptual model which is distinctive and for which interrelationships have not been explored before in prior studies. This contribution also addresses the research gap where past studies for collaboration in fashion design had mainly focused on organizational marketing and branding, but not KC.

The second contribution of this paper is the identification of new avenues for future research. The *a priori* conceptual model identifies an opportunity for future prospective researchers to frame their research in the under explored area of KC within CoPs of fashion designers. It also allows them to frame their research looking into the role of ICT in KC within CoPs. It is hoped that this paper will provide researchers with a foundation to study the interrelationship between KC, fashion enterprises, fashion designers, CoPs, and ICT.

The third contribution of this paper lies in management practice, particularly for fashion enterprises. The significance of the *a priori* conceptual model to fashion enterprises is to help address the need for managers to improve upon their fashion designers' knowledge and abilities in keeping up with constant change. This is especially so on an extra-organizational level. By conceptually understanding at least at the fundamental level how fashion designers exist within their extra-organizational CoPs, and how they undertake KC with the support of ICT, managers may then effectively conceive strategies to upgrade and improve the knowledge stock of fashion designers within their enterprise. Fashion designers who are knowledge workers will then be able to live up to their full potential and create fashion products and experiences that exceed customers' expectations.

6. Conclusion

In conclusion, the *a priori* conceptual model described in this paper fills the gap on the nature of KC, CoPs, and ICT with regards to fashion designers in fashion enterprises. It conceptualizes the interrelationships between

these concepts and their indicators through five propositions. In that regard, this paper has focused on KC and how this occurs within CoPs of fashion designers, the value of CoPs to fashion designers undertaking KC, and how ICT (its use and impact) supports KC in extra-organizational CoPs. Insights obtained from utilizing the *a priori* conceptual model could extend theoretical knowledge demonstrating how KC occurs in the CoPs of fashion designers. The outcome can then be used by fashion enterprises to build their innovation approach and capability. Future researchers can also utilize the *a priori* conceptual model to investigate KC within CoPs of other groups including other professional groups. To the best of the authors' knowledge, this paper appears to be the first to offer an *a priori* conceptual model to understand KC within CoPs of fashion designers.

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Mitigating Tacit Knowledge Loss in South African State-Owned Companies: HRM Approach

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Abstract: This study is an interdisciplinary research that sought to explore knowledge loss risks interdependently in relation to the knowledge management (KM) and human resource management (HRM) disciplines in South African state-owned companies (SOCs). This study highlighted the significant role of knowledge-based HRM systems, which will naturally enhance the management capacity of tacit knowledge to mitigate risks and assist SOCs to deliver on a developmental mandate, as well as ensure their survival and the economic growth of developing nations. The paper aims to explore the connection between KM and HRM practices for the effective management of enterprise tacit knowledge loss risks using the SOCs of South Africa as a case. This study is a mixed methods research project, using the exploratory sequential design as a research strategy. Data were collected qualitatively through interviews with 20 purposively nominated human resource managers, and survey data was collected randomly from 25% (145 of the 585 responses) of the workers employed in SOCs. Qualitative data were analysed thematically using Atlas.ti and Statistical data were analysed using SAS and exploratory factor analysis. The relationship between HRM and KM practices in lessening the risks inherent in tacit knowledge loss, mainly from voluntary turnover, is underdeveloped in many South African SOCs. The study established that the role of HRM in supporting KM is limited and underdeveloped in many SOCs, largely because they are lagging in key structures and knowledge-centric cultures, behaviours and HRM practices to drive the effective management of company knowledge. This study assists HRM executives and KM practitioners to develop knowledge-driven HRM practices in order to mitigate risks from the loss of tacit knowledge, whilst ensuring sustained performance in public enterprises. The study and proposed strategies seek to influence the discourse, policies, practices and theories on KM and HRM praxis in companies to mitigate the risks associated with the loss of tacit knowledge.

Keywords: Knowledge management, Human resource management practices, Knowledge risk management, Knowledge loss, State-owned enterprises, South Africa

1. Introduction

Employee turnover and mobility are serious issues facing many countries and companies of different shapes across the world (Allen and Vardaman, 2021). Within this conundrum regarding the mobility of knowledge workers lies serious tacit knowledge loss risks which threaten the survival, productivity and sustainability of many organisations (Zieba, 2020). Tacit knowledge is defined as a type of knowledge that is deeply entrenched in the minds of firm-specific employees, which includes intangible assets such as know-how and know-why forms of knowledge that are difficult to share and retain in a tangible manner without losing its value (Becerra-Fernandez and Sabherwal, 2015; Phaladi, 2022a). The loss of these firm-specific knowledge assets affects organisational performance and sustainability (Jennex, Durcikova and Ilvonen, 2022). Companies operating within the current knowledge-based competitive context have a greater reliance on tacit knowledge in the form of skills, expertise and abilities to derive a sustainable competitive advantage. Equally, employees within these companies are sources of enterprise knowledge that drive organisational performance, product development, service delivery and innovation capacity. Globally, the phenomenon of loss of enterprise tacit knowledge troubles many private and public companies across many sectors of their economies and thus, in the process, threatens their viability in the tough knowledge-based competitive economy (Singh and Gupta, 2020). State-owned companies (SOCs) in South Africa are no exception to this global phenomenon. SOCs are knowledge-intensive business companies. The Resource-Based View Theory (RBVT) of the firm considers SOCs as resource-intensive companies. Similarly, the Knowledge-Based View Theory (KBVT) regards companies operating in the current knowledge-based economy as knowledge-intensive, knowledge-creating and knowledge explorer companies (Grant, 1996).

Dalkir (2020) highlights the importance of HRM practices in mitigating tacit knowledge loss risks in the context of RBVT and KBVT. Both RBVT and KBVT emphasize the importance of employees within firms as sources of business performance and a sustainable competitive edge. KBVT views knowledge as a key driver of economic production and organizational life and places greater emphasis on firms' intangible assets (Grant, 1996). However, few empirical studies explore the HRM position and practices in tacit knowledge management to lessen knowledge loss (Phaladi, 2021). HRM practices should drive organizational efforts to facilitate and shape knowledge management behaviours and practices in order to mitigate the risks associated with tacit knowledge

loss. The study sought to address the following research questions; *what is the role of HRM in managing tacit knowledge loss in the SOCs and to what extent does it facilitate knowledge management in the SOCs; what HRM practices are currently in place to mitigate tacit knowledge loss and how effective are HRM practices in facilitating knowledge management?* The link between HRM and KM practices in mitigating tacit knowledge loss risks remains underdeveloped in theory and practice. In the South African context, there is limited research on the relationship between KM and HRM practices in mitigating knowledge loss in public sector companies.

South African state-owned companies play a crucial role in driving economic growth and positioning the country in the knowledge-based economy. However, many public sector companies face the risk of tacit knowledge loss, which is mainly caused by turnover, knowledge-unfriendly organizational cultures and structures, and a lack of retention practices. Phaladi (2022b, 2021) highlights the central role of the human resource management division in managing enterprise knowledge. HRM departments in South African SOCs are lacking in their role in managing organizational knowledge, despite being natural custodians of enterprise-specific human and knowledge assets. The lack of knowledge-oriented HRM strategies complicates the landscape of tacit knowledge loss in many publicly owned companies (Ngulube and Phaladi, 2022).

This research project explores the connection between knowledge management and human resource practices in South African SOCs to effectively manage tacit knowledge loss risks. It aims to propose knowledge-based strategies to mitigate these risks, focusing on the role of HRM in supporting enterprise knowledge risk management in state-owned companies. Key HRM practices are identified, and the effectiveness of these practices is assessed. Additionally, strategies for integrating HRM practices are recommended for the effective management of tacit knowledge loss risks in South African SOCs.

2. Literature Review

2.1 Human Resource Management and Knowledge Management

Kianto, Sáenz and Aramburu (2017) emphasize the importance of HRM practices in managing enterprise knowledge. Strategic human resource management is rooted in the resource-based view (RBV) of the firm, while the knowledge-based theory views the organization's intangible knowledge assets as drivers of sustained competitive advantage. Knowledge management involves creating, applying, sharing and retaining knowledge assets within firms, while HRM departments manage firm-specific human resources. The focus of the paper is on the specific type of workers known as knowledge workers. Knowledge workers are a unique type of human resources, totally different from any other workers largely due to their high human capital, social capital, technical skillsets, education, learning and networking capabilities (Cegarra-Navario, Garcia-Perez and Bedford, 2020). They possess valuable tacit knowledge. Gürlek (2020) and Dalkir (2020) assert that the effective management of enterprise knowledge prevents its loss and inherent risks. Durst and Zieba (2019) characterize knowledge loss risks in organizations as human knowledge risks. Gürlek (2020) agrees that enterprise knowledge is contingent on firm-specific knowledge workers, highlighting the crucial role of HRM in knowledge management processes. Additionally, El-Farr and Hosseingholizadeh (2019) and Kianto et al. (2017) highlight knowledge-based human resource management practices that significantly impact firm performance and facilitate KM initiatives in business enterprises. However, knowledge-oriented HRM processes have not been applied in an interdisciplinary manner to the problem of enterprise tacit knowledge loss in the KM literature, particularly in the South African context (Phaladi, 2021). Human resource management divisions can formulate and implement high-performance work practices and cultures that decrease opportunities for employees to look outside organizational boundaries, thereby enhancing productivity and sustainability. However, the extent to which these practices mitigate against potential knowledge loss remains a critical question.

The retention of knowledge workers and the inherent tacit knowledge loss associated with such workers remain serious challenges in South African SOCs (Phaladi and Marutha, 2023). State-owned companies across the world are no exception to the challenges associated with the mobility of knowledge workers; an ageing workforce and a lack of retention practices (Kumar 2020), yet they remain critical drivers of economic growth and Gross Domestic Products (GDPs) in both developed and developing economies (Phaladi and Ngulube, 2022). In a South African context, SOCs are companies owned wholly or partially by the state. SOCs remain important drivers of the South African emerging economy to address perplexing socio-economic challenges. Phaladi and Ngulube (2022) argue that they are generally considered unproductive and incompetent, thus failing to deliver on their mandates and facing many challenges, including high human resource attrition rates and knowledge loss risks (Phaladi and Ngulube, 2022). Moreover, the South African economy and many sectors of this economy are heavily dependent on SOCs. Phaladi and Marutha (2023) aver that SOCs are lacking in knowledge-driven leadership at the executive level and within HRM practices and systems. Human resource turnover and its

associated knowledge loss risks will continue to threaten their survival and capacity to deliver on their developmental mandate and hamper efforts to address socio-economic problems facing the country.

2.2 Human Resource Management Practices Supporting the Management of Firm-Specific Tacit Knowledge

HRM is an important enabler for the effective implementation and management of a desired KM culture within companies (Gürlek, 2020). Khawaldeh (2020) points out that the effective management of enterprise tacit knowledge mainly hinges on employees and the management of these company-specific staff members. It is in this regard that strategies aimed at acquiring, developing, rewarding and retaining employees could serve as important provisions for the effective management of enterprise knowledge. According to Wright, Dunford and Snell (2001), the RBVT emphasises that strategic human resource management divisions within firms focus their attention on the recruitment (identification and selection), learning and development, performance management, contracting and retention of enterprise-specific human resources.

2.3 Recruitment Practices

It is a well-established fact within the existing body of knowledge that HRM plays an important role in the acquisition of the required enterprise-specific knowledge, skills and expertise through the recruitment process. Such an acquisition practice is the first critical step in developing knowledge management capabilities within firms. However, the evidence in extant literature highlights that the main problem facing human resource executives or managers is identifying, sourcing and deploying employees with such attributes (Sokolov and Zavyalova, 2020). Allen and Vardaman (2021) point out that talent retention and knowledge workers' turnover is a serious challenge facing many organizations and countries across the globe. This means that firms operating in knowledge-based competition and economies are in a perpetual recruitment process. Recruiting knowledge workers comes with its own challenges in that they are unique from any other workers, largely since they possess highly specialised human capital, as well as specialised educational and technical skills and competencies. Edvardson (2008) avers that traditional recruitment strategies or practices are not supportive of KM activities and therefore become irrelevant in recruiting the kind of knowledge worker required in knowledge-based enterprises. In response to these issues and as part of the ideal, knowledge-driven HRM practices are proposed as the alternative to traditional practices (Delery and Roumpi, 2017). The sourcing of the organisational members' competencies from external firms is the terrain of HRM recruitment practices (Dalkir, 2020). Such a position remains undisputable. Nevertheless, arguing from the KM standpoint, recruitment is more than just the sourcing of potential organisational members. At the centre of any recruitment strategy is the acquisition of the required organisational intangible knowledge resources such as knowledge, skills and competencies. Phaladi (2023) infers that recruitment practices facilitate knowledge acquisition and absorptive capacities in state-owned companies. Recruitment practice is the genesis of the direct link between HRM and KM.

2.4 Training and Development Practices

Developing firm-specific human resource capabilities is critical in knowledge-based companies as it enhances the sharing and retention of tacit knowledge between and amongst knowledge workers. It is for this reason that training and development strategies are central to any KM initiative. Within firms, HRM is the custodian of human capital development. Training and developing knowledge workers play a critical part in the development of the required firm-specific knowledge, expertise and abilities (Delery and Roumpi, 2017). This effectively means that the training of knowledge workers plays a significant role in the development of enterprise-specific knowledge, skills and other attributes. Therefore, training and development becomes an important enabler for building KM capabilities within firms. Furthermore, the literature shows that many knowledge-intensive companies spend millions on capacity development programmes by building the required human resources' knowledge, skills, abilities and other attributes expected of knowledge workers (El-Farr and Hosseingholizadeh, 2019). HRM practices such as capacity development strategies present the right enterprise knowledge-based context for workers to apply and share knowledge (Chaita and Sibanda, 2021). As such, training and development processes are knowledge-driven and geared towards the acquisition, use and sharing of valuable firm knowledge, expertise and competencies. These practices serve to inculcate a knowledge-oriented culture, KM practices and innovation in enterprises. However, the paradox is that such investment goes to waste if employees end up leaving to go elsewhere in search of greener pastures. The knowledge loss risks become evident when such well-developed knowledge workers leave their employers (Phaladi and Ngulube, 2022). When so much of the firm's valuable knowledge is lost either through voluntary or involuntary turnover, this affects the productivity, sustainability and the morale of the remaining staff (Phaladi, 2021; Durst and Henschel, 2020).

2.5 Performance Management Practices

Performance management systems can significantly influence enterprise knowledge and human resource turnover by rewarding knowledge-driven practices. Cabrera and Cabrera (2005) suggest that performance management systems can incentivize employees to acquire, assimilate, apply and share knowledge. HRM practices, such as performance appraisal processes, can assess knowledge-based attributes and reward employees based on their contribution to organisational tacit knowledge management. Companies can use performance assessment tools to assess and reward expected knowledge-driven behaviours, with financial and non-monetary rewards potentially unleashing desired KM behaviours. Rewarding knowledge workers for their contribution to the achievement of organisational goals and their knowledge-driven behaviours and activities help build employee engagement, loyalty and commitment (Phaladi and Marutha, 2023; Toth, Heinänen and Nisula, 2020). This, in the process contribute to their long tenure within organisations and translates into retention of their knowledge and protective capacities. However, Cabrera and Cabrera (2005) caution that performance incentive mechanisms should focus on developmental assessments as opposed to critical focus assessments. These developmental evaluations encourage workers to be more innovative and creative by sharing ideas, in comparison to those who receive critical performance evaluations.

2.6 Compensation and Rewards Practices

Compensation is perhaps the most critical component in the employee retention scheme. Shafagatova and Van Looy (2020) postulate that compensation systems such as incentive and reward practices can influence the cost, pace and the results and impact of KM strategies. Broadly, rewards and incentives are employed with the purpose of motivating knowledge workers to do more in terms of reaching the set performance targets. Strategies on remuneration and rewards could develop or destroy a culture of knowledge management within firms. According to Foss, Pedersen, Fosgaard and Stea (2015), knowledge workers that are rewarded with knowledge-sharing incentives tend to be highly motivated to acquire, use and share knowledge. Such practices help to nurture employee engagement or commitment. Job engagement is critical for the retention of knowledge workers and their valuable knowledge (Toth et al., 2020). Firms use HRM approaches such as compensation and reward strategies to cultivate the desired knowledge-based activities in their human resources (El-Farr and Hosseingholizadeh, 2019). El-Farr and Hosseingholizadeh (2019) infer that remuneration and incentive practices have a positive influence on knowledge management processes. Additionally, Donate and Guadamillas (2015) concur that human resource practices such as compensation and rewards have a significant influence on both KM strategies, innovation capability and the overall enterprise performance. HRM strategies such as performance management, compensation, and rewards systems could be used to assess the knowledge-based attributes of knowledge workers and reward such workers in accordance with their performance contribution to firm tacit knowledge management in order to mitigate against the potential risks associated with employee turnover and inherent knowledge loss. The intention of these strategies should be about building employee loyalty or commitment, and knowledge-driven behaviours and activities (Phaladi, 2022b; Foss et al., 2015).

2.7 Organisational Structure and Culture

HRM departments in organisations are custodians of the organisational structural design. These enterprise structures play a critical facilitation role in enabling knowledge management cultures and processes (Matošková and Směšná, 2017). However, Phaladi (2022b) laments that HRM establishments within South African state-owned firms are failing in facilitating and building knowledge-driven organisational structural configurations and cultures that are knowledge-based, as well as failing to develop enterprise capabilities and resources to propel effective strategies for managing organisational tacit knowledge to prevent its loss. Regarding organisational structures, Ayatollah and Zeraatkar (2019) argue that the way in which an organisation is structurally designed could influence the success of KM strategy execution either constructively or adversely. In other words, the practice of effectively managing knowledge in organisations is much dependent on their structural configurations. Phaladi (2022b) deduces that enterprises should structure jobs and their business workflow processes with the intention of developing the requisite knowledge creation, application, use, and sharing attitudes and behaviours. Similar sentiments (Cabrera and Cabrera, 2005) are expressed in the existing literature on KM which indicates that work design, workflows and processes must be structured in a way that encourages teamwork and collaboration amongst workers; interdependencies; and cross-functional business processes and relationships. The design of the organisational structure is likely to shape knowledge-based sharing behaviours and activities either positively or negatively.

3. Methodology

The production of scientific knowledge is largely dependent on the research strategies used in such a knowledge discovery process. The pragmatism philosophy provided the necessary guidance in the development of the research strategy underpinning this study. The study used a mixed method research approach by adopting an exploratory sequential design as the overall research strategy guiding the data collection and analysis activities. Problems regarding the management of tacit knowledge loss in this study are complex, interdisciplinary and multi-faceted in nature and scope (Phaladi and Ngulube, 2022). Therefore, the mixed methods research (MMR) methodology was the best suited to research the complex phenomenon of enterprise tacit knowledge loss and the role of HRM practices in knowledge management in terms of mitigating such knowledge risks. The underlying principle for the deployment of the MMR methodology was based on the need for the researcher of the current scientific project to generate an all-inclusive, diverse and sensible picture from different viewpoints and lenses by exploring the role of HRM in facilitating the effective management of tacit knowledge, and to mitigate against its loss in South African state-owned companies. The mixed methodology is the best-fit for investigating complex multi-faceted problems (Mertens, 2015; Creswell and Creswell, 2018). Ngulube (2019) and Phaladi (2022a) also posit the fact that problems in KM research are complex and, as such, a mixed research methodology is well-matched for exploring such difficult and multifarious phenomena that are interdisciplinary and multi-disciplinary from diverse perspectives.

The study as an exploratory sequential MMR design project, unfolded in two distinct stances, namely the qualitative part in the first stance and the survey component in the second stance (Phaladi, 2021). For the first component, the researcher qualitatively explored the phenomenon of the research through interviews with twenty purposively nominated managers in the HRM divisions in nine SOCs across five sectors of the South African economy. The research project adhered to the ethical standards in both the qualitative and quantitative research strands. Ethical considerations were maintained in both the qualitative and quantitative research phases, including attaining approval from the participating SOCs and informed consent from participants, as per Creswell and Creswell (2018). In order to maintain confidentiality in data collection and presentation, the research participants remained anonymous. Sample sizes in qualitative-oriented studies are usually smaller. According to Creswell (2014), cases ranging from 1 to 40 are adequate in qualitative research projects for scholars to develop a coherent picture of the research findings. Creswell and Creswell (2018) postulate that sample sizes in the qualitative-oriented stance in MMR projects are usually smaller compared to sample sizes in the survey stance. The sample size in the second (survey) component was larger and representative in that the questionnaire was distributed to 585 randomly selected knowledge workers in three SOCs that agreed to participate in the qualitative component. Only three SOCs out of nine that partook in the qualitative study agreed to be part of the second, quantitative component. The Likert scale questionnaire was considered a reliable instrument with a Cronbach's alpha of 0.94. The scale included five response options ranging from strongly agree to strongly disagree. A response rate of 25% (145) for the distributed instrument was achieved for the survey phase of the MMR project. Hair et al., (2014) are of the firm view that 120 responses or more are adequate for research that employs exploratory factor analysis (EFA). The qualitative data gathered in the first strand of the project was analysed thematically using Atlas.ti. The rationale behind the use of Atlas.ti was to categorize the research findings and knowledge discovered from the first phase into themes for better analysis and logical presentation, and the development of the survey instrument used in the second phase of the study. The Statistical Analysis System (SAS) was employed to analyse the numerical data collected in the second (survey) strand of the study. SAS was used to identify key variables that were critical in the development of a model on knowledge loss reduction in the main study. This article has been extracted from the bigger doctoral study which sought to develop a knowledge loss reduction model that integrated HRM and KM in the South African SOCs (Phaladi, 2021).

4. Research Findings

Given the fact that this research project is an exploratory sequential MMR design, the findings are presented in two sequential elements, starting with the account of investigation results from the qualitative stance collected through interviews, followed by the quantitative research findings.

4.1 Qualitative Research Findings

4.1.1 *The role of HRM and its effectiveness in mitigating knowledge loss risks*

The research question explores whether there is a role played by human resource management in knowledge management for the reduction of enterprise risks associated with knowledge loss. All the participants (HR

managers) showed that they play a role in the management of the enterprises' knowledge. This expression or response was irrespective of whether or not their enterprises had a KM function. The human resource managers consider that their role is influencing and shaping certain KM behaviours. Their role in enterprise knowledge management was summed up from the actual recruitment to the retention of the firm-specific employees; capacitating employees in terms of training and development opportunities; succession management; conducting exit interviews; skills gap analysis; managing performance appraisals; facilitating enterprise-specific knowledge-friendly structures and cultures; coaching and mentoring initiatives; and establishing KM awareness. The role of HRM entails the whole process of managing talent in their respective enterprises. On the contrary, the role of HRM in developing or nurturing KM capabilities was on a very limited scale in several SOCs. Only three SOCs of the nine that participated in the enquiry had a fully dedicated KM establishments in their structural provisions, which made it easier for them to identify and manage tacit knowledge loss risks. Participants identified key HRM strategies for enhancing KM capabilities in companies such as human resource recruitment, remuneration, talent management, performance appraisal, culture management, organisational structural designs, employee retention, and capacity development.

According to the participants, these practices were at the core of HRM systems across the state-owned companies, and as such provided an enabling organisational capability for the effective management of the enterprise-specific knowledge to mitigate against its potential loss and associated risks. Likewise, it is significant to determine how and in what way these practices facilitate KM behaviours and capabilities.

4.1.2 Recruitment process supporting KM activities

Regarding how specific HRM recruitment strategies support KM practices and behaviours in the SOCs under study, the recruitment practice was found to be supportive of KM processes, especially in the acquisition or sourcing of the required knowledge, skills and other attributes. All twenty participants concurred that their recruitment practice was somewhat knowledge-driven in sourcing potential employees with the required knowledge and skillsets. However, the process for the execution of the recruitment strategy varied from one entity to another. For instance, four of the state-owned companies focused only on technical competencies, whilst the remaining five entities' recruitment practice was focused on technical as well as behavioural competencies. Competency-based assessment was a common tool used in all the participating state-owned companies. Regarding competency-based interviewing or assessments, the participants contend that they were able to identify skill gaps and address them through specialised capacity development plans. As such, they play a role in the knowledge development of those employees. However, on the contrary, many participants indicated that focusing on specific knowledge-behavioural competencies was a serious problem in many state-owned companies, mainly due to the lack of a common KM vocabulary and understanding. The lack of focus on specific KM attitudes and behaviours such as the ability to learn, collaborate and network was a serious challenge in many SOCs in the study. However, a few participants emphasised KM behavioural attributes in recruitment strategies for team fitness, culture fit, longevity, alignment with the organisational knowledge vision, sustainability, and a focus on efficient human resources for enterprise productivity and sustainability.

Most HR managers found their recruitment process effective in attracting candidates with knowledge-based qualities and behaviors, with 15 out of 20 participants stating that it was effective. The participants who argued that their enterprises were effective in sourcing workers with the required knowledge and skillsets ascribe such success to their focus on internal promotion or recruitment. A participant from SOC2 summarised their focus on internal recruitment as follows:

I think on that process we have an above-average process. We also focus on building our own timber in terms of having own people, so that as they grow.... It is a graduate program. It is an experiential program. In terms of the core function, very minimum people have exposure of what we do. Therefore, the best thing is to identify our own people and get them the exposure through some specific relevant training interventions (Participant #5, 2019).

A majority of the public enterprises were very successful at recruiting the right employees, but not very effective in retaining them. They struggle to recruit employees of the right calibre at the right market price. This was a serious limitation in their practice because it encouraged their workers to look elsewhere, resulting in high employee attrition rates in the process. As a result, these prevailing conditions cause knowledge losses in those enterprises.

4.1.3 Learning and development practice support for KM

Participants identified practices supporting KM processes, including capacity development, workplace skills plans, job shadowing, staff bursaries, in-house training academies, technical skills development, on-the-job training, induction programs, coaching, mentoring, personal development, internal job promotions, graduate programs, masterclasses, and leadership development.

Given the abovementioned HRM practices, public enterprises invest in various capacity development strategies for the development of their firm-specific knowledge workers and knowledge-based assets. Therefore, it can be deduced that HRM development strategies in public enterprises are very intentional in facilitating the acquisition of knowledge and the development thereof within their processes. Public entities provided the much-needed important human capital development infrastructure and investment, hence they deliberately develop KM capabilities.

With regard to the question of the effectiveness of their training and development strategies, most participants (seventeen of twenty) argued that their strategies aimed at training and developing their knowledge workers were effective in developing current as well as future knowledge, skills and expertise sets. However, it is interesting to note that the majority of the participants did not have a measurement tool in place to assess the return on investment of such initiatives. Only three managers from one developmental finance SOC indicated that they have a measurement tool in place to measure the effectiveness of their training and development investments.

4.1.4 Remuneration practices supporting the retention and transfer of critical knowledge

Regarding the retention practices in place to manage the challenge of voluntary resignations or turnover and the inherent knowledge loss and risks, the data showed that a few SOCs had several retention strategies in place to mitigate employee attrition. Such strategies included staff retention policy frameworks, rewarding and recognizing employees, remuneration benefits, post-retirement retention policies, incentive schemes, tracking attrition rates, market-related salaries, exit interviews, training and development opportunities, internal appointments, retention guidelines, employee value proposition, performance management practices, enterprise culture surveys, entropy scores, and market-related salary benchmarking exercises, all of which are essential for retaining critical employees.

Whilst the aforementioned practices were mentioned as some of the common strategies in the majority of SOCs to deal with the challenges pertaining to voluntary employee turnover rates, around 40 percent of the participants alluded to the fact that they did not have retention strategies in place to arrest the challenges of turnover and the resultant knowledge loss risks. It is an interesting observation that one participant (SOC6) operating in the research and development space had much of its staff complement on fixed-term appointment contracts. The prevailing situation led to a high employee attrition rate and a subsequent massive erosion of enterprise tacit knowledge. One participant in SOC6 summarized the situation as follows:

Most of the contracts are limited duration contracts or fixed-term contracts. Therefore, the one thing we are putting in place is identifying core positions in the organisation, which should become permanent. Currently, these fixed-term contracts are killing the organisation and eroding organisational memory (Participant #13, 2019).

Making this case difficult to manage was the absence of a retention strategy, which is further complicated by the lack of a funding solution to convert these fixed-term appointments into permanent employment. Effectively, high employee turnover is a normal development, which does not worry or shock the system anymore. From a KM perspective, this picture complicates the landscape of lost knowledge, thus contributing to unsustainable productivity rates and reduced knowledge protective capacities.

The effectiveness of retention strategies in South African state-owned companies was a 50-50 split, with 50% of participants stating that they were not effective in managing knowledge and shaping the necessary KM behaviors. High employee retention rates were cited as the sole reason for their effectiveness.

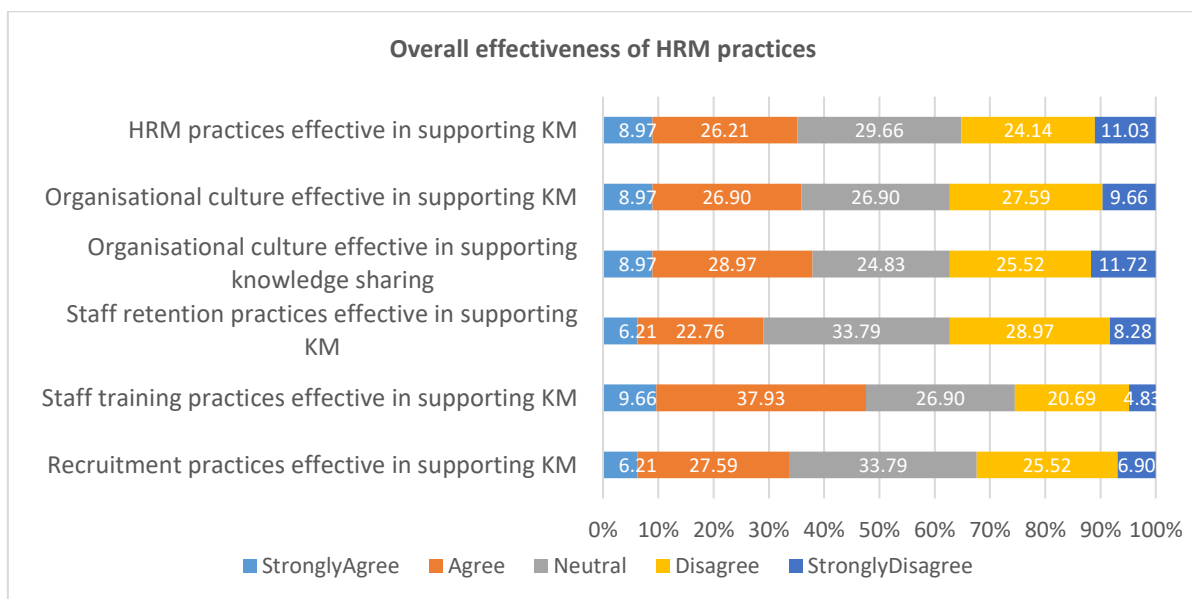
4.1.5 Organisational structure and culture

The data collected from the interviews with participants in the HRM establishments of these public enterprises showed that all the HR managers interviewed concurred that HRM, through its various practices, plays a central role in the effective management of enterprise knowledge, making it part of the business' life. The majority of participants inferred that the cultures of their enterprises support KM, and their role in facilitating a knowledge-

friendly organisational culture and structural provisions is inevitable. A lack of dedicated KM structures and roles remains a serious problem in the majority of South African SOCs. The data also revealed that the absence of a knowledge-friendly or knowledge-driven enterprise culture is attributed to the absence of KM functions within structures and processes. This was the case even in those three public enterprises that had a functioning KM unit. Similarly, a majority of the participants acknowledged that their practices were very successful in facilitating a knowledge-driven culture and knowledge management praxis in their organisations.

4.2 Findings of the Quantitative or Survey Research

Reactions differed insofar as recruitment strategies or systems were concerned, regarding their effectiveness in the management of and reduction of tacit knowledge loss. Figure 1 illustrates a diagrammatic representation of the responses to the survey questionnaire. As far as the responses were concerned, 34% of the respondents showed that, overall, their HRM systems were successful. Equally, 34% of the responses were neutral, not knowing whether the practices were effective. In contrast, 32% believed that their HRM practices were not that successful.



Source: Phaladi (2021)

Figure 1: Overall effectiveness of HRM strategies

Concerning the overall success of training and development systems, many (48%) responses indicated that staff training and development practices were effective in supporting the management of the enterprise. Conversely, 25% of the respondents posited that the practice was not successful. A small noticeable share of the responses (27%) was neutral or less informed on the effectiveness of training and development systems in supporting the management of tacit knowledge to prevent its potential loss.

Pertaining to the overall success of retention strategies, the majority (37%) of respondents illustrated that their retention processes were not that effective in retaining critical people with the required competencies. The minority share of responses, at 29%, highlighted that the retention systems were not successful in facilitating or supporting the required knowledge management behaviours and practices. The data revealed a worrying reflection in that 34% were neutral about the success of the practices.

Different response reactions were noted regarding whether HRM divisions drive an enterprise culture that is effective in supporting a culture of knowledge sharing. Of the total responses received on this variable, 38% were of the view that the business culture is successful in support of a knowledge-friendly culture. In contrast, 37% of the respondents argued that HRM departments were not that effective in inculcating a knowledge-driven culture. A noticeable small share of responses at 25% were neutral, indicating that they did not know whether HRM divisions and their practices were supportive of a KM culture.

HRM functions were not successful in driving a knowledge-driven enterprise structure, with 37% stating it is not successful; whilst 36% showed that it was successful in driving a knowledge-driven structure, and 27% were neutral. Most respondents indicated that HRM strategies or systems were unsuccessful in supporting knowledge

management, while 35% believed that the practices were successful. A significant minority of 30% remained neutral on the effectiveness of HRM systems in influencing relevant knowledge management attitudes, behaviours and cultures.

5. Discussion of the Research Findings

5.1 Role of HRM in Building or Facilitating KM

The findings of this scholarly tract affirm extant literature that established the role of HRM in KM as unavoidable (Gürlek, 2020; Dalkir, 2020). Equally, the qualitative and quantitative data firmly alluded to the critical, inevitable strategic and operational partnership role of HRM in the management of the enterprise's knowledge and in facilitating KM capabilities in SOCs. All the participants in the qualitative interview process stressed the inevitable role of HRM in supporting KM initiatives in their companies. This position was supported by the survey findings in that the quantitative data revealed a need for HRM processes to drive and support knowledge management practices in the SOCs. Despite that role being inevitable, much of the quantitative data lamented the fact that HRM functions are neglecting their role. It is an established fact that KM was underdeveloped in a majority of the enterprises, largely due to the invisible role of HR managers and their practices in facilitating and nurturing KM as a management discipline to mitigate against the risks of tacit knowledge loss. However, such a role is hindered by the absence of a relationship or interface between HRM and KM. Survey findings highlighted that a lack of such a relationship is a serious burning issue that should be addressed as a matter of urgency.

In support of the existing body of knowledge on the research problem in question, the findings of the qualitative component uncovered culture management, staffing, learning and development, remuneration, rewards, retention and performance management as the potential HRM strategies that enhance KM capacities in the enterprises under study. The study findings confirmed previous research by Donate and Quadamillas (2015), establishing that KM practices are directly or indirectly shaped by HR practices and systems. The deductions on this variable exposed a strong connection between the RBV and KBV of the firms in that it was clear that the sourcing of enterprise-specific staff and knowledge and skillsets has always remained the realm of personnel management in companies. The absence of the synergy or interface between HRM and KM exhibited a serious problem in the companies under study.

5.2 Knowledge-Driven Recruitment Practices

Conventionally, the sourcing of company-specific human capital and knowledge assets to drive superior performance, innovation and sustainability has often been located within the space of personnel recruitment procedures (Jøranli 2018). As such, it presents an indispensable process for gaining access to the cutting-edge knowledge, skills and abilities existing outside the business. The majority of participants in both the qualitative and quantitative enquiry phases of the study affirmed that their recruitment practices are knowledge-driven, and they assist their entities in the sourcing of potential workers who are in possession of the required human and knowledge capital assets. However, due to the increased mobility of these knowledge workers, their recruitment practices were in a perpetual struggle to source and fill mission-critical posts in key business areas. For instance, the qualitative data obtained from participants indicated that it took them anything between six months to a full year to fill vacant posts, and in worst cases, one to two years, to source and fill vacancies in mission-critical areas of their businesses. Moreover, the articulation of certain KM behaviours in talent sourcing practices was a serious challenge in many public enterprises. A majority of the HR managers flagged the challenges that they experienced regarding their lack of focus on coaching, teamwork, networking, innovation and knowledge sharing attributes as specific knowledge management behavioural competencies. It is for this reason that the personnel sourcing practices were considered not to show knowledge-based attributes in many state-owned companies. Only three out of the nine public enterprises did indicate that the sourcing of potential candidates focused on these specific KM behavioural attributes. The fact that KM was not well-developed in a majority of the public enterprises could explain the reasoning behind the lack of focus on specific knowledge-based behavioural attributes. Therefore, it can be deduced that recruitment practices are failing to be knowledge-centric in many state-owned companies.

5.3 Knowledge-Driven Training and Development Practices

One of the main findings of the qualitative enquiry was that public enterprises took pride in being knowledge-based and learning companies. This was evident in their budgets for capacity development interventions. Investments in capacitating their employees illustrate that their practices are focused on acquiring and developing the knowledge, skills and competencies to sustain the entities. Such training and development initiatives enhance knowledge absorptive capacity. Absorptive capacity is the ability of public enterprises to

absorb or assimilate outside knowledge (Cohen and Levinthal, 1990). The study has qualitatively and quantitatively shown that huge investments are made in developing human resources in state-owned companies. However, one of the key problems lies in the actual protection of the firm-specific tacit knowledge. SOCs need to invest and develop in capacities to protect their hard-earned investments in the knowledge acquired (Andersén, 2012) through training and development practices. Subjecting employees to outside sources of knowledge through these capacity development initiatives but not being in a position to retain them caused serious calamities in many of the public enterprises that participated in the study. Learning and development practices present workers and public entities with opportunities to acquire and absorb knowledge. Nonetheless, inasmuch as developing workers appears to be the right investment decision in theory and practice insofar as the sourcing and development of enterprise is concerned, this research project underscored that a lack of knowledge transfer and retention was a serious challenge in many public enterprises. Therefore, the research findings disclosed that some elements of the capacity development initiatives were, to a certain extent, knowledge-oriented in nature, but were not knowledge-driven insofar as sharing and retaining enterprise tacit knowledge.

5.4 Knowledge-Driven Retention Practices

Many public enterprises are lacking in key retention strategies to lessen knowledge loss risks. The research findings from both the qualitative and quantitative stances of the project found most public enterprises wanting when it comes to human resource retention issues. The loss of tacit knowledge, absence of retention plans and high turnover point to the ineffectiveness of retention practices in the public enterprises of the research project. Knowledge-oriented retention strategies include remuneration, rewards and incentives that are directed at retaining and protecting valuable company-specific knowledge and skillsets to mitigate against potential loss. Many retention practices in public enterprises were not in a position to help retain and support knowledge protective capacity. This was reflected as such in their remuneration and rewards mechanisms. Andersén (2012) explains knowledge protective capacity as the capacity of the company to maintain or lessen the pace of the depreciation of firm-specific knowledge assets. The existing research shows the strong connection between knowledge management and reward systems, illustrating that businesses need to provide incentives or some rewards to re-inforce and unleash the desired knowledge-driven behavioural expectations (Kianto et al., 2017). This study confirms previous studies by Allen and Vardaman (2021), which established that retaining highly skillful knowledgeable organisational members who are at the pinnacle of their productivity remains a burning issue for HR executives. The absence of knowledge-driven personnel management strategies aimed at retaining valuable organisational members will unavoidably lead to tacit knowledge loss in many cases of the study.

5.5 Knowledge-Driven Culture and Structures

KM as a management discipline to assist in lessening the risks of tacit knowledge loss is poorly established in many SOCs across the world (Kumar, 2020). In a South African context, the study established that KM is underdeveloped in many public enterprises (67%), largely due to the fact that they are lagging in key structures and knowledge-centric cultures, behaviours and practices to drive the effective management of company knowledge. Quantitative data obtained from the survey phase revealed that HR departments within SOCs were not very effective in driving and establishing knowledge-based structures. For organisations to be successful in sharing and retaining their mission-critical knowledge and skillsets, they will need to have a well-established structure dedicated to the effective management of enterprise knowledge and to lessen its loss. A lack of incentives and recognition to reward the workforce for their contribution to KM leads to an organisational culture that is not knowledge management-friendly. KM-unfriendly organisational cultures contribute to knowledge stickiness and negatively affect its flow within companies (Phaladi, 2022b). Furthermore, a lack of dedicated KM functions, structures and practices is complicating the landscape of lost knowledge, knowledge stickiness and retentive capacities in South African public enterprises (Phaladi and Ngulube, 2022). This study infers that HRM establishments and practices within state-owned companies are not sufficiently effective in inculcating the required KM behaviours and practices.

6. Limitations and Suggestions for Further Research

The study was restricted to nine state-owned companies in the first (qualitative) element and three SOCs in the quantitative phase. Furthermore, the project was limited to SOCs that were operating in five market sectors of the South African economy, ranging from regulatory to water utilities, the developmental finance industry, research and innovation entities and service-oriented public enterprises. It is for this reason that its findings should be used with restraint by other SOCs that were not part of the sampled entities. However, the inferences drawn on various HRM practices, roles and their capabilities in furthering the KM discipline could be used in similar South African SOCs, given the fact that such practices discussed in this paper are common in many other

companies. Similar studies could be undertaken in government departments and private companies to explore the role of HRM in managing the risks associated with tacit knowledge loss. Given the fact that knowledge risk management is emerging as a new research area, more empirical research is needed to explore the link between HRM and knowledge risk management in both public and private companies. Business enterprises across the globe are facing all manner of knowledge risks (Durst and Henschel, 2020). Hence, in order to manage these kinds of risks, interdisciplinary and multidisciplinary research is necessary for a holistic management approach. Limited research in this area, especially in African countries, is a worrying observation. Therefore, other African and non-African countries could benefit from conducting similar studies.

7. Conclusion and Recommendations

Knowledge management is under-developed in a majority of SOCs largely because HRM executives and their practices are failing in their role of facilitating and supporting tacit knowledge management. The role of HRM and its practices is inevitable in the successful management of tacit knowledge to prevent the risks associated with its loss. Knowledge-based competition requires HR business executives to devise knowledge-driven strategies aimed at enhancing knowledge management capacity (knowledge absorptive and protective capacities) to ensure superior performance and sustained competition. The constant loss of enterprise-specific employees and their tacit knowledge in the form of knowledge, skills and expertise will adversely impact the developmental mandate of the SOCs and their performance and sustainability. Similarly, HRM establishments and executives within SOCs will be blamed for these unfortunate circumstances, largely because their role in KM is peripheral and not entrenched in the management of business knowledge. Many of the workforce recruitment practices are not considered to be knowledge-driven due to the lack of focus and inclusion of certain KM behaviours such as coaching, teamwork, networking, innovation and knowledge-sharing attributes. However, on a positive note, training and development practices were found to positively contribute to knowledge development and absorptive capacity. Many retention practices in most SOCs are not in a position to help retain workers, and are not supportive in building knowledge protective capacities. As such, they cannot be claimed to be knowledge-driven practices. Furthermore, the overall HRM practices are not effective in enabling a knowledge-friendly business culture and structural provisions that are supportive of organisational KM initiatives and practices. Human resource attrition and inherent tacit knowledge loss risks remain serious problems in a majority of the state-owned companies. Moreover, the study recommends that HRM practices need to be re-visited in order to inculcate and focus on knowledge-driven approaches, cultural fabric and knowledge-friendly enterprise structural provisioning. Furthermore, HR and knowledge managers in SOCs need to develop a close working relationship to ensure the effective management of tacit knowledge and mitigate the risks inherent in employee voluntary exit and consequential tacit knowledge loss risks. Recruitment practices should be knowledge-driven by focusing on certain KM attributes and behaviours in their talent sourcing strategies. The retention of key knowledge workers will also inevitably lead to the retention of valuable enterprise-specific knowledge assets. It is for this reason that state-owned companies should develop, refine and invest in knowledge-driven HRM approaches. The development of such knowledge-oriented practices will certainly help in fostering knowledge-friendly enterprise cultures, structures and strategies. The study presents a unique interdisciplinary approach that investigate the phenomenon of tacit knowledge loss interdependently from HRM and KM perspectives. By exploring the role of HRM practices in facilitating the management of tacit knowledge loss, this study sought to influence the discourse, praxis and theories linking HRM and KM to mitigate tacit knowledge risks in organisations. The practical implications of the study are that it can be used by HRM executives and KM practitioners to drive their investment efforts into the development of relevant knowledge-driven HRM practices to mitigate tacit knowledge risks.

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