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Abstract

This paper presents the conceptual model of TM practices on engineers' ITS in Malaysia's manufacturing sector. This article argues that the best retention strategy for employees fails to capture the peculiarities of HRM practices amongst engineers. The article instead articulates the view that the different and unique KSAs of engineers allow manufacturing companies to adopt distinct practices, which may not cohere with the perspective of standard HRM practices within organisations. The article aims to further the thesis that the approach to TM practices does not always match with manufacturing engineers because of their unique characteristics as talent resources. This makes TM prescriptions for workforces invalid on engineers, especially in the manufacturing sector. As this is a theoretical-based article, a systematic literature review method was conducted to draw findings and conclusions. The findings of the article show that the engineers' high shortages and low retention in the market make it hard to generalise TM practises across all levels of an organisation. This shows that the practices that work in companies may not always work at the same level of an organisation. TM practices in manufacturing companies must be reviewed and modified in order to retain engineers for a long time and sustain the company's competitive advantage. The findings also give future research a better idea of how manufacturing companies manage their talent resources by revealing the company's unique way of managing talent, especially engineering talent. The article is important because it has opened up new avenues to look at TM and how it works for manufacturing engineers.

Keywords: Talent Management, Employer Branding, Retention, Engineers, Manufacturing, Resource-Based View Theory, Social Exchange Theory

Introduction

The high global shortage and uncertain retention behaviours amongst engineers have become one of the most concerning to organizational Human Resource Management (HRM). Although intention to stay (ITS) academic research has shown intense growth in recent literature, organisations still suffer from low retention among engineers. Engineer shortages have shaped their behaviour to actively search and hop to other organisations for more attractive employment opportunities (Poisat et al., 2018; Sparrow, 2019). There is no concrete antecedents to influence an engineer's ITS and yet to be ascertained (Bigliardi et al., 2005; Lee et al., 2018).

Meanwhile, previous research suggests that Talent Management (TM) is a crucial strategy to influence individual talents' ITS (i.e., engineers) (Gupta, 2019b; Mohammed et al., 2020). Previous studies have explored the implementation of TM practices in various countries due to continuous talent shortages. However, Anlesinya, Dartey-Baah, & Amponsah-Tawiah (2019) argued the statement of scholars based in Europe are leading in TM discourse. Based on their systematic literature review, the Asian context has also emerged as the leading region in empirical research. The popular notion of the TM literature from US-centric is also a bit exaggerated. They concluded that not only among European, TM research has also been led by Asian scholars and contexts (Anlesinya, Amponsah-Tawiah, et al., 2019), but research specifically in Malaysia is severely underrepresented (Abdul Hamid, 2016; Abdull Rahman, 2012).

Therefore, the rationale for conceptualising this article is to close the research and theoretical gaps in the existing literature by introducing an exclusive approach of TM practices (i.e., performance management, career development, and employer branding) in predicting engineers' ITS.

Problem Statement

This article argues that most TM literature investigated a practical set of TM practices that contribute to talent retention (for example, management positions Shikweni et al (2019); knowledge workers Sutherland & Jordaan (2004); academicians Zeeshan (2020a); PhD holders who contribute to the innovative achievements (Sinniah et al., 2019); ICT engineers Ahmed & Yang (2017); Singh et al (2013); IT specialists Eom et al (2019); professional auditors (Valeau et al., 2019). However, very little scholarly research on TM practices and retention among engineers has been implemented (Nittala & Jesiek, 2018; Van Hoek & Schultz, 2013).

Furthermore, very little research on TM practices and retention has been found in the manufacturing sector (Osman et al., 2017, 2018; Subramaniam et al., 2019). Most of the previous findings were found from sector of construction (Shikweni et al., 2019); education (Zeeshan, 2020); ICT (Ahmed & Yang, 2017); GLCs (Government-linked Companies) (Isa et al., 2018); private organisations (Singh & Sharma, 2015); hospital (Eltaybani et al., 2018). This reasoning is derived from the previous studies (Whysall et al., 2019) who claim that most TM literature were focused on inclusive approach and therefore what is ideal to retain engineers for a long time in an uncertain employment market is to implement an exclusive approach to TM practices for engineers in the manufacturing sector.

Therefore, the article seeks to explore the veracity of the resources-based view (RBV) and social exchange theory (SET) view that a prescribed set of TM practices can be applied to engineers' retention generically to all organisations, global or local, with the same result or may be, as Alias, Roni, Merga, & Ismail (2017) note, there is a distinctive difference in

approach to TM practices on specific talent (i.e., engineers) to continue to sustain the organisational competitive advantage and retain them for a long time.

Theoretical Underpinnings

According to Maurya & Agarwal (2018), there are glaring differences of opinion on what constitutes TM in the talent workforce within organisations. Based on the theoretical foundation gaps, the RBV theory (Barney, 1991) and SET (Blau, 1964) still lack empirical findings to address TM practices in predicting engineers' ITS. The conceptual model of the article is based on the RBV theory, with the SET as the primary component of the theoretical framework. These underpinning theories are specifically selected to address the issue of talent shortages and retention (among manufacturing engineers) in Malaysia. This is achieved by conceptualising the tangible and intangible resources of the RBV (i.e., TM practices), and relationships between variables are explained under SET.

The combination resources in RBV theory (TM practices as tangible and intangible resources) also allows the current study to investigate the connection between TM practice resources in achieving high talent retention and sustainable competitive advantage (Narayanan et al., 2019). The lack of studies examining TM resources underpinned by the foundation theory of RBV theory and SET also provides the research gaps and justifies the study theoretically (Mensah, 2019). This article therefore seeks to lay bare literature and fulfil the theoretical foundation gaps with the following aims: a) to enhance individual talent's attitudes and behaviours toward TM practices, b) to resolve the continuous issues of managing engineer shortages and low retention, and c) to extend years of service among engineers.

The Scenario of Engineers' Retention

Today, employers' primary concern is to retain their top talents, especially in identifying the engineers' underlying behaviours and attitudes. Talent retention is becoming a significant determinant of an organisation's long-term survival, competitiveness, and dominance (Tanwar & Prasad, 2016). Hence, ITS has become a significant variable in the HRM and organisational research fields to measure the retention level among talents in organisations (Alves et al., 2020). ITS has been extensively explained as an individual employee's consciousness and intentional determination to remain with their current employment on a long-term basis (Bangwal & Tiwari, 2019). ITS has also been used to accommodate shortages among talents with specific knowledge, skills, and abilities (KSAs).

Engineering institutions worldwide have recognised the significance of engineering talents in achieving Sustainable Development Goals (SDGs). Most world countries engineering institutions have collaborated with their members, educational institutions, government, and industry to address the need for engineering capacity and engineers' quality. Further, the World Federation of Engineering Organisations (WFEO) and the ASEAN Federation of Engineering Organisations (AFEO) declared the continuation to accelerate the SDGs' implementation and lead the engineering profession to the main SDGs to build a fairer, safer, and more sustainable world, especially as aimed in Goal 3, Good Health and Well-Being (ASEAN Federation of Engineering Organisations, 2021; WFEO, 2020b, 2020a). Furthermore, the local Institution of Engineers Malaysia (IEM) also continued its efforts to deliver initiatives and events to create awareness and promote sustainability in managing, innovating, and developing engineering projects in any circumstance (IEM, 2020).

However, the issue of the global engineer shortage has been one of the most concerning issues today. The phenomenon of talent competition, or "war for talent" due to talent

shortages, has become a priority issue, specifically among engineers (Bass et al., 2018). The Asian engineers' shortage is also not a new issue and has become a significant concern among employers, especially in manufacturing engineering. Attracting and retaining engineers are critical human capital challenges that have become a significant concern for many Asian organisations (Yee et al., 2012). Furthermore, in the local position, Malaysia is also facing a shortage of engineers.

According to the Malaysian Education Ministry, only a few graduated engineers registered their engineering qualifications legally with the Board of Engineers Malaysia (BEM) (Harun, 2020). Under the Act, individuals who are not registered with the BEM as professional engineers are not permitted to practice, conduct business, or work as engineers, collect any fee, or charge remuneration for professional services provided as engineers. In addition to the issue, the Eleventh Malaysia Plan 2016-2020 has anticipated that the nation will experience a significant shortage of skilled and professional workers (including engineers) (ILMIA, 2018; Mitchell et al., 2004). Malaysia is still facing a shortage of engineers and retention issues in the employment market, especially in manufacturing companies (StudyMalaysia.com, 2020). Although organisations have implemented various strategies to retain their engineers, they still face difficulties keeping them longer (Chamchan & Kittisuksathit, 2019).

Research Design

This article is attempting to explore the validity of the perception that TM practices are generic and therefore can be applied with success in any organisation, regardless of shape, size, or type of employees. In the interest of striking a balance between the recent literature trends and the need for an in-depth analysis, a systematic search of the literature was conducted, and the identified studies were matched against several criteria. Firstly, in peer-reviewed journals, the literature search was conducted on the following academic databases: Scopus and Web of Science (WoS), using an advanced and rigorous literature search: (*"talent management"*) AND (*retention OR stay OR remain*) AND *engineer*. As recommended by Bergh (2012) this article used Boolean logic to refine the literature searches to the range of 100–150 hits per keyword search. This had the effect of focusing the literature searches on the core thesis proposed in this article. In addition, selective searches were carried out on Google Scholar using the same search terminology to widen the literature reach. Then, all relevant articles from various peer-reviewed journals were tabled into Microsoft Excel database established by the researchers. Accumulatively, 150 journal articles within the year of 2005-2021 (excluding the obtained dissertation and theses) have been thoroughly reviewed and keyed-in into Excel database in order to examine the precise research gaps in the field of study.

Data Analysis

Given the qualitative approach adopted to produce this article, a thematic analysis was applied to produce meanings and draw conclusions in this article. According to Braun and Clarke (2006), thematic analysis involves the repeated reading and analysing of texts and the identification of key themes and concepts drawn from across diverse literature claims. Likewise, this article used thematic analysis to isolate literature that reveals that TM practices (i.e., performance management, career development, and employer branding) amongst engineers in the manufacturing sector are unique and appropriate for their human capital and retention strategies constraints.

Observations and Reflections

As previously reported, the practice of TM on engineering talent is unique as compared to what prevails in other human resource practices. Collings & Mellahi (2009) and Festing & Schäfer (2014) concur and report that talent is perceived as rare, valuable, and difficult to imitate, and is therefore classified as human capital with high value. When compared to other human resources in an organization, talent resources are viewed as strategic resources. Talent has a natural ability to create a competitive advantage for organisations and impact organisational performance (Lepak & Snell, 1999; Tlaiss et al., 2017). In the literature, talent is typically found and characterised as specific KSAs and attributes in their specific context (Festing & Schäfer, 2014).

In fact, as Ingersoll (2002); Rahman (2012) explain, there are various employees with specific KSAs in organisations who are considered talented in their respective fields. Traditionally, doctors, lawyers, architects, dentists, and accountants belong to the western culture of talents in private industries. Evolutionary engineers came to the employment market, especially in the emerging industrialising economies, and have been categorised as highly skilled and technical workers in an organisation. Due to their minimum requirement to be an engineer, which at least to attain a certain level of academic qualification, professional certificates, or working experience, engineers are classified as technical elites employed in industrial organisations.

Meanwhile, in a local study, Abdul Hamid & Yahya (2016) asserted the minimum academic qualifications an engineer should possess. An engineer must have a bachelor's degree in any engineering-related field and experience in the job position as an engineer through formal education – for instance, an internship programme or practical training with any one or more organisations. With the proper education, they learned specific engineering and related field KSAs to meet the job demands in the employment market. Those KSAs would also help them implement the job effectively and efficiently, increasing their motivation and satisfaction.

Additionally, engineers have been widely considered and accepted by many organisations as their critical workforce and hard-to-replace resources. Hence, effective management and development of engineers has become a significant agenda item where top management believes these talent resources can enhance an organisation's strength and competitive position (Nittala & Jesiek, 2018). It can be said that engineers are a talent resource in organisations and have acquired specific and in-depth KSAs that make them hard to replace in an organisation, and this visualises the nature of engineers' employment (Gandy et al., 2018). Although previous studies have empirically found the determinants of engineers' retention, the low retention rate among this talent continues to jeopardise organisational stability and performance. This article surmises that it does not follow that there is anything wrong with TM practices in organisations, but rather shows that TM practices on specific engineering talents are unique and suited to the significant economic growth and environmental circumstances of the manufacturing sector.

Significant Contributions of Engineers in the Manufacturing Sector in Malaysia

In Malaysia, there are various sectors for engineers to serve, including manufacturing, consultation, research and development, construction, building services, maintenance, plantation, aviation, maritime, sales, and oil and gas industries, as well as institutions of higher learning as an engineering academician (Harun, 2020). In conjunction with that, a well-established recruitment agency in Malaysia (i.e., JobStreet Malaysia) reports that the top

three career opportunities that are still relevant are in manufacturing, information and technology (IT) and banking (StudyMalaysia.com, 2020).

Among various sectors, manufacturing is a dominant sector and a strong indicator of economic growth. Fazil (2020) stated that engineers in the manufacturing sector put Malaysia in good stead as the nation heads towards Industrial Revolution 4.0 (IR 4.0). With artificial intelligence (AI) advancements, new engineering-related jobs have emerged in this sector, such as automation engineers, robotics engineers, and AI engineers. The manufacturing sector has been recognised as crucial for the nation's development and sustainability and has recorded impressive growth recently (Malaysia Labour Market Review by DOSM, 2020b). Hence, it is undeniably claimed that the manufacturing sector is important for both developed and emerging economies (DOSM, 2020; MIDA Insights, 2020), and the engineering KSAs are essential determinants contributing to economic growth and shrinkage (Deloitte, 2020; MIDA, 2019).

Intention to Stay among Manufacturing Engineers

Due to a high demand for engineering jobs and a shortage of engineers in the manufacturing sector, organisations struggled to attract and retain their existing engineers. However, this talent has been recognised as having some lingering behavioural issues (McDonnell et al., 2017; Zheng, 2009). Yet, the low level of ITS in an organisation may cause the industry to lose its competitive advantage in retaining the engineers' workforce, especially in manufacturing (Bethke-Langenegger et al., 2011).

The manufacturing sector is always associated with engineers, who are characterised as 'knowledge workers.' The concept of 'knowledge worker' has developed alongside manufacturing engineers' retention literature. A 'knowledge worker' mainly creates, distributes, and applies knowledge on the job, while a 'worker' usually uses knowledge to perform the job (Rahman, 2012). As knowledge workers, engineers can apply theoretical and analytical knowledge and work smarter and faster than other employees (Lejdeby & Östman, 2019). In a similar study, Khalid & Nawab (2018) found that engineers are usually looking forward to develop and advance opportunities in their career with their current employer. Further, manufacturing engineers have the behaviour to leave organisations if they received lack of career development opportunities. They will seek new employment in the manufacturing employment market that is more promising and offers a variety of choices.

In the Malaysian manufacturing context, such a work environment and nature reinforce human behaviour (Pervin, 1989). The specific aspects of the manufacturing working environment in Malaysia are likely to affect engineers' retention. It follows, then, that training and development and various aspects of the work environment must be given serious attention to address engineer retention issues in the manufacturing sector (Subramaniam et al., 2019). Engineers in developed countries consider manufacturing engineering work and infrastructure always needs expansion and development. Therefore, it is essential to review and revise the engineers' retention strategies (Lejdeby & Östman, 2019). Yet, many employment factors that can affect higher retention have not been adequately fulfilled, particularly in sector where competition for highly skilled employees is fierce, such as in the manufacturing industry (Subramaniam et al., 2019).

As talent shortages continue to be a critical issue and phenomenon, the labour market has devolved into a "war for talent" (Palmer, 2003). Hence, organisations have started to concern about losing their talents because the unique KSAs may also be more attractive to their competitors, especially among those talents that are in short supply in the market (Rezaei &

Beyerlein, 2018; Zheng, 2009). As a result, organisations begin to evaluate and revise their strategic HR planning for long-term profitability and performance. Since then, organisations have continued to develop competitive strategies to attract and retain top talent (Alias, Othman, et al., 2017; Alves et al., 2020).

The Concept of Talent Management Practices

The famous idiom in the TM field is the “war for talent.” Since the 2000s, many employers have failed to retain their talents from departing to other competitors (Ngan & Tze-Ngai Vong, 2019). Consequently, a constant review and identification of retention factors among engineers continue to capture the attention of academics and practitioners. Successfully determined engineers’ retention factors can enhance employers’ understanding of their potential talent’s employment needs (Smyth & Zimba, 2019). Thus, TM practice is one of the retention strategies that continually identifies the factors of engineers’ decision to stay (Yelamanchili, 2018).

Exclusive Approach to Talent Management

Conceptually, there are two (2) approaches in implementing TM practices: exclusive and inclusive. The exclusive approach focuses on specific talent segmentation and treats them as an elite subset of its population. On the contrary, the inclusive approach believes that everyone in the organisation is treated as talent potential. Previous scholars, however, continue to argue about whether the TM approach should be implemented inclusively or exclusively (Pant & Venkateswaran, 2019). Above all the contradictory perspectives on the TM approach, in relevance to previous studies, they recommend pursuing an exclusive approach to TM practice. The approach is matched to solve the specific talent shortages in the employment market, where their retention behaviour is nauseous (Shikweni et al., 2019). Managers of Asian Multinational Corporations (MNCs) claim to follow an inclusive TM strategy, but when it comes to talent, an elitist mindset emerges. Talents are employees with the highest education, highest potential, and unique KSAs (Cooke et al., 2014). Hence, Iles et al (2010) and Li et al. (2018) also support the exclusive approach as the preferred strategy among Asian organisations. The exclusive approach of TM practice is far more common and relevant in the practice of Asian organisations as emerging economies than the other approach in developed countries (Vnouckova et al., 2018). Hence, this justifies why organisations consider some talent or positions as rare, valuable, and difficult to imitate (Festing & Schäfer, 2014) and operationalised them as human capital that offers high value to the organisation (Lepak & Snell, 1999). Not only that, top management identified some employee talents as strategic resources for the organisations as they can create a sustainable competitive advantage that impacts performance and profitability (Tlaiss et al., 2017).

In addition, TM practices have received growing devotion over the past decade to curbing talent shortages and retention issues, but the field study still lacks intellectual and theoretical foundations. Further, previous research on TM practices and employee retention among specific talents or KSAs is still scarce in providing empirical evidence (Neri & Wilkins, 2019). Not to mention, only a few studies have explored the exclusive approach of TM practices on individual engineers’ ITS (Vnouckova et al., 2018). Previous studies have recommended an exclusive approach to TM practices on engineers’ ITS (Nittala & Jesiek, 2018). Therefore, this article conceptualised the exclusive approach to TM practices on engineers in the manufacturing sector.

Talent Management Practices and Intention to Stay of Engineers

From an extensive and rigorous literature review that has been conducted, the researchers have identified the three significant practices of managing engineering talents in previous studies that significantly influenced engineers' retention. Similarly, the SET also supports this notion and RBV theory, which describes TM practices (i.e., performance management, career development, and employer branding) as valuable resources for organisational sustained competitive advantage (Barney, 1991, 2001; Blau, 1964; Blau, 2017).

TM Practice (Performance Management)

Performance management is defined as the extent to which organisations enhance a sense of performance standards' meaningfulness through goal setting, inform and guide talented employees to experience the challenge and, hence, motivate them to perform better at their work (Tymon et al., 2010a). Continuous feedback is given to help the talented employees grow more and feel motivated to perform better in the future (Shyam Nivedhan & Priyadarshini, 2018). Especially among professional and talented employees, feedback always inspires them to give their best (Doh et al., 2011). For example, engineers prefer to discuss their goal-setting or performance standards that include clarifying role expectations and bringing out the abilities (Mwanzi et al., 2017). Performance management also serves as a strategic tool in making administrative decisions, mainly those concerning promotions and merit pay increases, indicating that they are a valued part of the organisation. Consequently, talented employees perceive these decisions as being made through a fair and equitable process (Shikweni et al., 2019).

A study by Alias, Roni, Merga, Ismail, et al. (2017) confirmed the relationship between performance management and employee retention. It was found that performance management is a significant predictor in TM practice, and the usage of performance review and feedback is most valuable to talented employees in Malaysian ICT companies. Similarly, performance management was also found to influence intention to stay among talented employees (Baharin & Hanafi, 2018). From the engineers' context, studies (e.g., Sutherland & Jordaan, 2004; Yee et al., 2012) found that performance management was related to positive engineers' retention.

TM Practice (Career Development)

Career development is defined as an organisational strategy to maintain and enhance talented employees' career paths through their set of KSAs and align them with the organisation's strategic goals (Paré & Tremblay, 2007). Career development is an advancement opportunity to improve talented employees and signal that top management is willing to invest in them beyond short-term returns, i.e., performance and productivity (Younas & Bari, 2020). Due to the rapid advancement of technology, engineers must keep up with the changes and acquire new KSAs for future career development as well as for engineering product needs and demands (Letchmiah & Thomas, 2017). As mentioned above, engineers seek a working environment that offers the opportunity to be promoted in the future. Hence, a lack of career development and promotional opportunities increase the possibility of talent loss (Stahl et al., 2012).

Findings of studies (e.g., Singh & Sharma, 2015; Tlaiss et al., 2017) relating to career development on TM practices and employee retention have been consistent in the literature. From Asian context, previous studies (e.g., Alias, Othman, et al., 2017; Baharin & Hanafi, 2018) found that career development was related to positive employees' ITS. From the engineers'

context, studies (e.g., Anvari et al., 2014; Rahim et al., 2019) found that career development practices were related to positive engineers' retention.

TM Practice (Employer Branding)

Ambler & Barrow (1996) defined employer branding as a cluster of organisational benefits in terms of functional, economic, and psychological that the employing organisation provides. As Ambler & Barrow (1996) state, employer branding is an intangible asset that must be cultivated if performance is to be optimised. There are two perspectives of employer branding, internal and external. Lloyd identified employer branding as the organisations total effort to communicate with existing talents (internal branding) or potential candidates (external branding) why this company is a 'desirable place to work' (Lloyd, 2002). Backhaus & Tikoo (2004) state that internal employer branding focuses on retaining employees who are difficult to replicate in other organisations. Internal employer branding is successful for a company if its employees thrive at work, become loyal, and act as great ambassadors for the organisation. Meanwhile, external employer branding aims to attract potential candidates by engaging in organisational activities that promote social responsibility and trustworthiness. However, the concept of internal employer branding has increased the attention of academics following a growing interest in the management and retention of talents.

Most previous scholars in TM studies have empirically researched the influence of the internal perspective of employer branding on retention among talents or specific KSAs in organisations (Alves et al., 2020; Espinoza et al., 2019; Maheshwari et al., 2017; Shikweni et al., 2019; Tymon et al., 2010b). Maurya & Agarwal (2018) state that the internal perspective of employer branding is complemented by the current issue of talent shortages and low retention rates among talent in organisations. Further, Maurya & Agarwal (2018) and Tanwar & Prasad (2016) recommended future research to further study employer branding on existing talents in organisations to continuously ascertain their desired retention behaviour. According to Ramaiah & Raut (2014), the value of employer branding that an employer has established among its internal consumers (i.e., existing talents) can retain them for a long period. TM practice such as employer branding is also a significant predictor of high ITS level among engineers (Gandy et al., 2018; Nittala & Jesiek, 2018; Pant & Venkateswaran, 2019; Ramli, 2016; Van Hoek & Schultz, 2013).

Proposed Conceptual Model

lack of studies examining TM resources underpinned by the foundation theory of RBV theory and SET also provides the research gaps and justifies the study theoretically

As mentioned above, the lack of studies examining TM resources underpinned by the foundation theory of RBV theory and SET also provides the research gaps and justifies the study theoretically. The two crucial resources theorised by RBV theory are tangible and intangible resources in TM practices to sustain the retention level among employee talents with specific KSAs in organisations (i.e., engineers). The tangible resources consist of (TM practice: performance management) and intangible resources consist of (TM practice: career development and employer branding) will be examined to have a significant relationship with engineers' ITS. Figure 1 presents the relationships between TM practices (i.e., performance management, career development, and employer branding) and ITS.

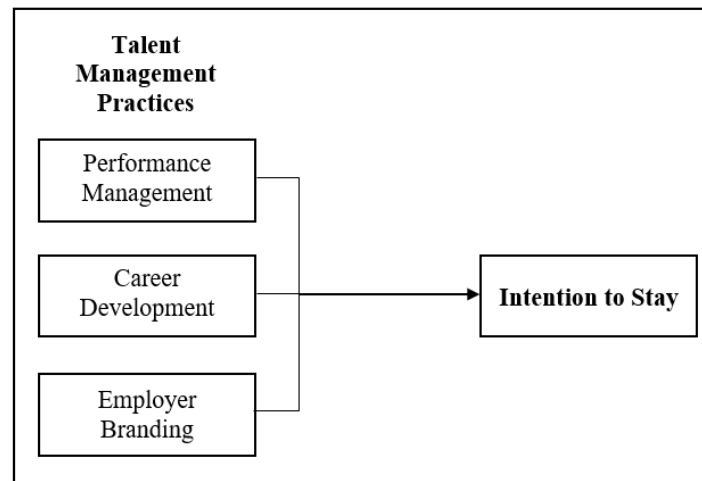


Figure 1 Conceptual Model for Talent Management Practices on Engineers' Intention to Stay

Evaluation of Contribution

This theoretical article is an attempt to draw the line between TM practices-retention on engineering talents and those prevailing in other organisations on all employees. The article does this by exploring the veracity of the resources-based view (RBV) and social exchange theory (SET) view that a prescribed set of TM practices can be applied to engineers' retention generically to all organisations global or local with the same result or may be. In other words, there is a distinctive difference in approach to TM practices on specific talent (i.e., engineers) to continue sustain the organisational competitive advantage and retaining them for a long time. The article is therefore making a significant contribution to the field of TM on engineers by revealing the exclusive approach to management of organisational talent resources.

There are several expected contributions where this study makes an original contribution. Firstly, the findings of the article show that TM practices on engineers are at best described as a spectrum of stereotypes to organisational practice. Although organisations strive to anticipate their employees' job and employment expectations, many nevertheless struggle to keep their talented and skilled employees (Mohammed et al., 2020a). Thus, this article facilitates organisations by emphasising the need to manage engineers' retention behaviours and employment demands to improve retention rates. Further, an organisation's TM practices for a skilled workforce are an essential part of employee retention and HR strategic planning (Guðmundsdóttir & Helgudóttir, 2018). The findings of the article contribute to the manufacturing organisation's HR decision-maker to review and revise the TM practices for the engineers.

Secondly, research focusing on exclusive approach to TM practices on specific talent has been generally passive, partly because of the organisational HRM belief that HR practices can be universally applied to all kind of organisations and employees with equal success. There were less focused in the literature on TM practices on engineers (Anlesinya, Dartey-Baah, et al., 2019). This article casts aspersions to this view and seeks to assert that, on the contrary, TM practices that work on engineers in manufacturing sectors are different from and may not work on other talent and sectors. Thus, this article fills the gaps in the literature and loosely coupled integration of TM-ITS of engineers from the behavioural-related theories (e.g., the proposed conceptual model is the combination of underpinning theories, SET and RBV theory).

Finally, based on previous recommendations and theoretical gaps, this article also contributes to developing a model of ITS that integrates the TM dimensions to suggest behavioural factors

that retain engineers within manufacturing companies. Further, previous researchers have highlighted the TM roles contribute to individual employees' ITS at all levels of positions from the banking sector, multinational organisations, the mining sector, the higher learning institutions, etc. (Gupta, 2019a; Plessis et al., 2015). However, very little scholarly research has addressed the specific issues involved in managing individual engineers in manufacturing sector (Nittala & Jesiek, 2018; Ramli, 2016). Thus, the findings help us to reconcile the previous conflicting arguments about the applicability of those theories to explain TM practices on engineers' retention in manufacturing sector.

Conclusion

From the foregoing, this article has shown the possibilities and factors affecting the implementation of TM in the manufacturing sector. It was therefore suggested that manufacturing sector engineers be defined as those individuals who possess specific and unique KSAs that reflect the manufacturing sector and the nation's growth. Additionally, TM within manufacturing sector is characterised by the implementation of a set of significant TM practices which ensure fit within this context to address complex challenges, especially in terms of engineers' shortage and low retention rate. Thus, it is vital to focus on TM practices (e.g., performance management, career development, and employer branding) in the sense of supporting an engineer's career development opportunities and ITS.

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