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The Essential Characteristics of Knowledge Transfer Programme (KTP): A review

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Abstract
Over the year, the collaboration among universities, industries, and communities has increased, which is a fundamental pillar for a successful knowledge transfer programme (KTP). The platform provides the exchange of ideas and information among them, such as skills, knowledge, experience, and others. However, there is a lack of studies to examine the essential characteristics of KTP. Hence, the article conducted a systematic literature review on Malaysia's KTP characteristics. This study employed ROSES as a review protocol. The study's thematic analysis found five themes.

Keywords: Community; Industry; Knowledge Transfer Programme; University

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1.0 Introduction

Knowledge transfer (KT) is part of the human capital initiative taken by most institutions, such as universities, government, industries, private sector, public sector, business entities, and others. KT is defined as a movement of meaningful information, technical knowledge, and innovative ideas or technologies from one organisational setting to another (Nilsen & Anelli, 2016). Mohidin et al. (2017) defined KT as creating, acquiring, and managing knowledge resources. KT plays a crucial role for a country to meet competitive advantage and boost national income. Meanwhile, the government plays a significant role in designing a framework to ensure that the organisation fully utilises the resources. Human capital is the greatest asset for an organisation and a country. Universities play a significant role in delivering the knowledge to the people as their contribution. In addition, Mohidin et al. (2017) mentioned that the universities are currently responsible for serving the industries and communities as the KT mechanism instead of education and research centres. Recently, knowledge is the most valuable asset not only for individuals but also for organisations, groups, and societies (Drucker, 1994; Maier, 2004). An organisation needs to manage the asset efficiently and effectively as it is the way to meet competitive advantage (Alavi and Leidner, 1999). KT involves an individual or group sharing knowledge with another individual or group. KT covers a wide range of activities, including product commercialisation, sharing expertise through industry-university or university-community partnership and internship, and to some extent getting the involvement of industry and community in designing the curriculum broader influence to enhance the capabilities of graduates (Tichá & Havlícek, 2008).

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In Malaysia, the government acknowledges KT ideas as the government plays a significant role in providing funds and designing a framework encouraging universities to contribute to society. The uniqueness of the initiative will significantly impact the country's national income. KT is important because it has been highlighted since the 10th Malaysian Plan (2011 – 2015), designated by the Ministry of Higher Education, known as National Higher Education Strategic Planning (NHESP) and until now. KT requires explicit and tacit knowledge, tangible and intangible (Mohidin et al., 2017). The knowledge transfer programme (KTP) is derived from knowledge management as the way to manage the knowledge to meet the best achievement. Leveraging explicit and tacit knowledge will enable the organisation to continuously improve and meet the organisational performance (Salleh et al., 2011). There are programmes introduced under KT, such as job rotation, on-the-job training, and others, as most organisations have a similar way of managing the knowledge (Salleh et al., 2011; Matsuo, 2015). It is significant for Malaysia to utilise the country's assets fully as Malaysia is moving towards a knowledge-based economy and high-income country (Mohidin et al., 2019; Saleh, 2017). The KTP has urged educational institutions to be actively involved in the activities serving the industries and communities as it is the objective of the KTP (Mohidin et al., 2019). The government plays a crucial role in ensuring a robust framework to rectify the issue.

Several research objectives guided the article review to study the factors contributing to the successfulness of KT activities and investigate and recognise the essential characteristics of the KTP.

2.0 Methodology

The Reporting Standards for Systematic Evidence Syntheses (ROSES) review protocol guided the present study. Haddaway et al. (2018) described that ROSES is explicitly designed for systematic review and maps for the environmental management field. ROSES is significant as it ensures researchers provide accurate information with the right level of detail. It is important to meet the article's quality as a few processes, such as identification, screening, and eligibility, need to be gone through.

2.1 Identification

Identification is a process of identifying any synonym term, related terms and terminologies, and variation for the study's main keywords, namely knowledge transfer, company, business, and characteristics. The purpose is to give more possibilities for a selected database to search for more similar articles for the review. The three primary databases for the search are Scopus, Web of Science(WoS), and Google Scholar, as shown in Table 1. Three hundred forty-one articles have been found in this phase for the databases, and after a thorough examination, four articles have been eliminated because of duplication.

Table 1. The search string used for the systematic review process

Databases	Keywords used
Scopus	TITLE-ABS-KEY ("knowledge transfer programme") OR ("knowledge transfer project") OR ("knowledgetransfer") AND ("company" OR "business" OR "industry") AND "university*" OR "higher learning institution*" AND "characteristic*s" OR "attributes" AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (OA, "all")) AND (LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013)) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SUBJAREA, "BUSI")) AND (LIMIT-TO (LANGUAGE, "English"))
WoS	TS = ("knowledge transfer programme" OR "knowledge transfer project' OR "knowledge transfer") AND ("company" OR "business" OR "industry") AND ("university*" OR "higher learning institution*") AND ("characteristic*s" OR "attributes")
Google Scholar	Knowledge transfer programme characteristics

2.2 Screening

The screening stage is screening all the related journals with the article. A comprehensive screening stage enables the article to meet quality articles. The screening process must be at a specific period between 2012 to 2021. Qualitative and quantitative articles were included in the article as the criteria of the systematic literature review. Articles published in English were included in the article, providing clear justification only.

2.3 Eligibility

Table 2. The inclusion and exclusion criteria

Criterion	Eligibility	Exclusion
Type of literature	Articles	Conference papers, book reviews, book chapters, proceedings papers
Timeline	2012 - 2021	< 2012
Language	English	Non-English
Scope of studies	Business, management, accounting, and social sciences	Other than business, management, accounting, and social sciences

The authors manually monitored the retrieved articles during the eligibility phase to guarantee that all remaining articles (after the screening procedure) met the requirements. It was accomplished by reading the title and abstract of the articles. Table 2 shows the inclusion and exclusion criteria for selecting and choosing the relevant articles.

2.4 Systematic review process

The systematic review process involved four phases. The first phase was the identification of keywords and thesaurus words for searching for relevant articles. The keywords used for this SLR are illustrated in Table 2. The second process was screening through all the results shown on the databases. Out of 337 articles, a total of 304 articles were removed at this stage. The next stage was eligibility, in which the full articles were examined. The last stage of review had resulted in a total of thirteen out of thirty three articles eligible for the review, consisting of ten strong and high-level articles and three articles at a moderate level that contribute to the research. Figure 1 illustrates the flow diagram of the process.

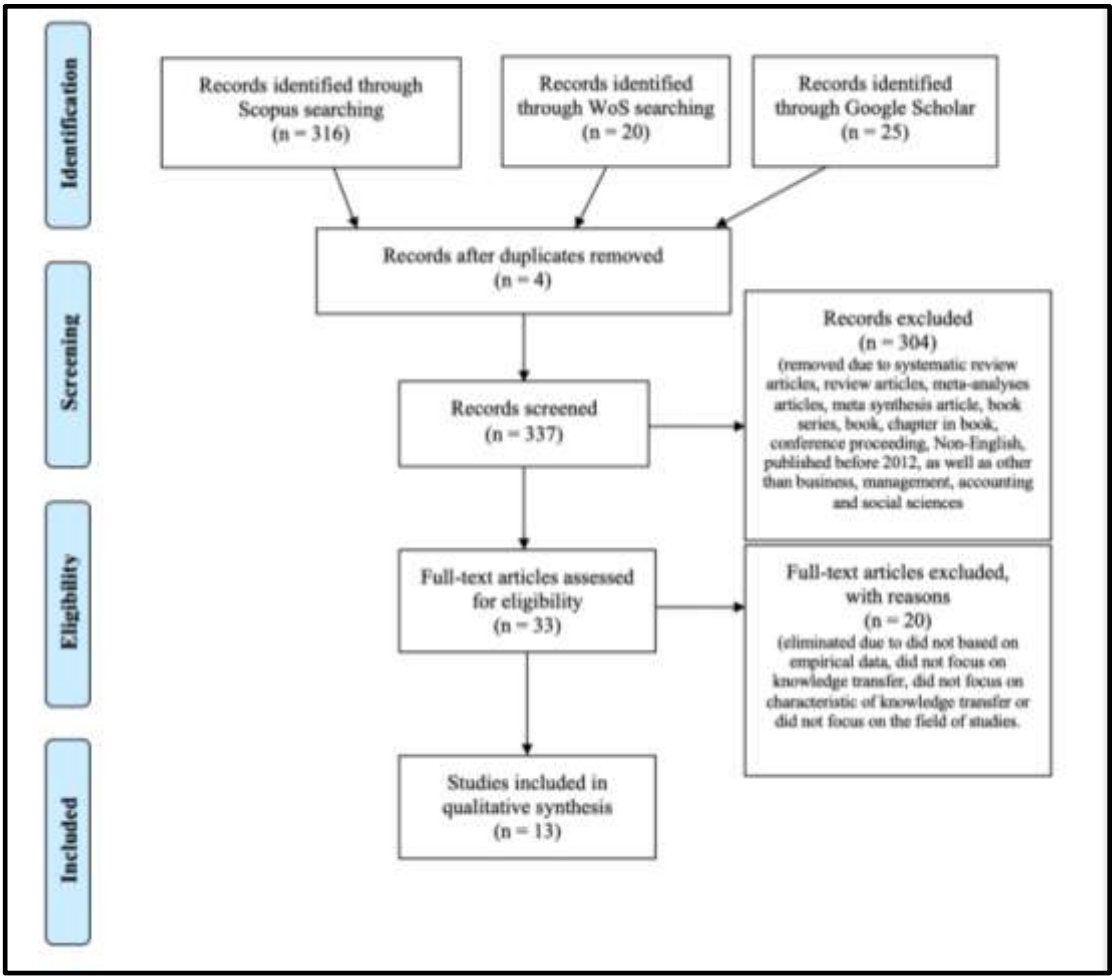

Fig. 1: The flow diagram of the study
(Source: Shaffril et al., 2019)

2.5 Data abstraction and analysis

The data analysis method used in this systematic review was content analysis. The research reports and related journals were summarised and collated to increase the overall effectiveness of this review. The data analytic strategy was used to investigate and recognise the essential characteristics of the KTP. By interpreting the coding textual material, we could determine the keywords and figure out the main concept of each journal. From there, we could generate the themes and sub-themes from the text. We identified the keywords describing the essential characteristics of the KTP. Accordingly, we developed a few categories based on the core content and grouped them into different segments.

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3.0 Findings

The analysis produced five themes and nine sub-themes related to KT characteristics. As presented in Table 3, the three themes are Knowledge Management (two sub-themes), Innovation (two sub-themes), Quality (one sub-theme), Communication (two sub-themes), and Competitive Advantage (two sub-themes).

Table 3. Main Themes and Sub-themes

Authors	Main theme	Knowledge Management		Innovation		Quality	Communication		Competitive Advantage	
	Sub-theme	Transfer Technique	Individual Capabilities	Investment	Industry-University Collaboration	Continuous Improvement	Process	Tool	Knowledge-Based Corporation	Connect to Organisational Process
Saleh (2017)		√								
Alaei et al. (2012)		√		√		√	√			
Mohidin et al. (2017)			√							
Salleh et al. (2012)		√	√							
Schofield (2013)		√		√						
Gontareva et al. (2022)		√			√	√				
Cai et al. (2020)					√					
Whah & Tiek (2012)						√			√	
Fatimayin (2018)							√			
Miller & Katherine (2014)		√					√	√		
Hudcova (2014)		√						√		
Frank & Ribeiro (2014)								√		
Singh (2012)									√	
Rahimli (2012)		√	√						√	√
Islami et al. (2020).									√	
Liebowitz & Beckman (2020)		√	√						√	√

3.1 Knowledge Management

The idea of a KTP is for knowledge management. Knowledge management is vital to ensure the knowledge is preserved as knowledge is the most valuable asset in an organisation. It is the key to meeting competitive advantage for the organisation. Saleh (2017) highlighted a few ways to transfer knowledge, such as communication, mentoring, learning by observation and learning by example, brainstorming, and teamwork. Knowledge management uses systematic techniques to produce value, uncover knowledge, comprehend, access experience, information, and expertise, provides new skills, enables greater performance, and fosters development and innovation (Alaei et al., 2012). Alaei et al. (2012) mentioned that knowledge management is a management function developing knowledge, managing knowledge flow, and ensuring that knowledge is used effectively and efficiently for the organisation's long-term objectives. Saleh (2017) indicated organisational culture, motivation, relationship, trust, experience, and communication. Knowledge management is important to meet the best practices and increase the organisation's profitability. Everyone in the organisation plays a significant role in meeting the goals. An effective way is vital to transfer tacit and explicit knowledge to the community, industry, or society for them to implement the practices. Knowledge management has a strategy pointing to the intellectual organisation, such as information or human resource talents, that will lead to increased productivity, values, development, and greater competition; thus, knowledge management wants managers to learn to employ what makes their skills as a unit practical and improvements (Alaei et al., 2012). A retention strategy is needed, and language is responsible as simple language is important to deliver the knowledge to the people. Mohidin et al. (2017) indicated that the individual

capabilities are vital in a KTP as they influence the performance of the individual, group, or society after the KTP. Individual capabilities refer to an individual's knowledge, readiness, and soft skill to deliver knowledge to others. Knowledge management is significant as it allows for cooperation, knowledge sharing, continuous learning, and quality improvement, leading to better decisions, ensuring that mental capital is valued and shared, and organisational efficiency and effectiveness (Alaei et al., 2012 ; Salleh et al. 2011). Knowledge management is significant for the experts and professionals to utilise and apply the knowledge.

3.2 Innovation

Innovation is a process in which existing knowledge to create new knowledge is collected, shared, and integrated. Innovation can be new technology, new product, or new service. In other words, innovation is related to change that can be integrated or incremental. Generally, innovation can be considered as the implementation of exploration and processes shaping outcomes, products, new processes, or systems (Alaei et al., 2012). Schofield (2013) stressed the significance of KT for the business industry as most countries are moving towards a knowledge-based economy. Hence, innovation is vital to boosting the country's economy**.** Innovation investment includes coordinating and implementing research and development to provide new technology or products meeting people's needs, as well as new goods, technologies, markets, materials, and combinations (Alaei et al., 2012). KT between universities and students will acquire industries to generate new ideas, develop capabilities between both parties, and practically implement what students have learned during classes at the industries, creating more productivity. Collaboration between universities and industries will create more opportunities and leverage the technology because the technology is moving at a faster pace. On the other hand, KT will create innovation at all levels of stakeholders, such as the government, business industries, small-medium enterprises, and others. It is a mechanism to accelerate the technology commercialisation, a robust national tool and strengthen the relationship between the public-private partnership. Innovation hugely affects the KT cycle as it starts at the early stage until the final stage affecting the economic activities. Industry- university-government play a significant role in the effectiveness of KTP in creating innovation. Universities play a significant role as an innovation centre and are the main platform for providing an innovative ecosystem (Cai et al., 2020 ; Gontareva et al., 2022). Universities are the main actor in collaborating with other parties as they have stronger networking to create more opportunities. KT enables the country to increase the national income across all sectors, openness, and others. Training, cooperation, commercialisation, and consulting are the direction to create innovation. Universities do not even provide education, yet universities play a significant role in providing the country's future direction to meet high income**.**

3.3 Quality

KTP is vital to make continuous improvements for an organisation to achieve its goals. Individuals attending the KTP will receive knowledge and experience that can be implemented in the organisation. The knowledge received by the individuals will make them have high quality as it is important to meet competitive advantage for an organisation. Continuous improvement enables an organisation to ensure that the whole process meets the standards and reduces waste. KTP will promote an excellent idea for the organisation to have great individuals achieve greater achievement. Leveraging the knowledge received will make the organisation a learning organisation and lead the mindset to change and improve the task performance. Quality is significant to ensure that the organisation meets the effectiveness and efficiency as it is the main objective to meet high profitability in the organisation. Each organisation's mindset and activities are different as they are embedded in broader social and economic structures according to the task given, which will hugely improve the organisation's performance (Whah & Tiek, 2012).

3.4 Communication

The general perception of communication is that it is a social interaction usually involving a sender (source) and a receiver (Fatimayin, 2018). According to Fatimayin (2018), communication is the process of creating and ascribing meaning. It is the interaction and sharing of ideas among group members. In organisational terms, communication is the sending and receiving messages among interconnected persons within a certain environment or setting to achieve individual and shared goals (Miller & Katherine, 2014). Organisational communication is heavily influenced by context and culture. Individuals in organisations communicate using face-to-face, textual, and mediated channels (Miller & Katherine, 2014). In terms of KT, an effective communication tool is critical to assisting organisational management in organising internal communication in a way allowing them to achieve their knowledge management goal (Hudcova, 2014). According to Hudcova (2014), trust is the most important condition for effective information transfer. Communicating people who trust each other are more likely to share. Sharing can only take place through contact when an immediate response is provided. A good relationship between communicating individuals is required, but there is no clear description of how the encounters occur. More methods, such as face-to-face meetings, phone talks, and emails, are feasible, and a combination of communication tools may be utilised (Frank & Ribeiro, 2014).

3.5 Competitive Advantage

Competitive advantage is an advantage, circumstance, or position allowing an organisation to operate more efficiently and produce higher-quality products or services (Singh, 2012). The primary definition of competitive advantage is putting the organisation at the top of the industry and having productivity gains against competitors (Islami et al., 2020). The knowledge-based interpretation thinks through knowledge, as a corporate is the most significant strategic resource because this kind of asset will generate possible competitive advantages (Rahimli, 2012). Corporations or organisations with more knowledge are undoubtedly successful. Still, organisations applying their information correctly and understanding what is important to them in terms of strategy may also be successful (Liebowitz & Beckman, 2020). To maintain a sustainable competitive advantage, an organisation must understand how to create, share, and utilise information

and connect it to organisational processes (Rahimli, 2012). Another critical aspect is that a leader understands the knowledge that should be sought to improve organisational activities and gain a lasting competitive advantage (Rahimli, 2012).

4.0 Discussion

There are five main themes and nine sub-themes discussing the essential characteristics of KT and KTP. Knowledge management is an important characteristic of successful KTPs. Managing knowledge effectively should strike a balance between the pull and push elements. On the one hand, organisation, being the pull element, must have the right transfer technique to pull the recipient to accept and apply the knowledge. On the other hand, the recipients need to push themselves to appreciate and utilise the knowledge. Saleh (2017) and Alaei et al. (2012) highlighted a few systematic techniques to transfer knowledge, such as communication, mentoring, learning by observation, learning by example, brainstorming, and teamwork, while Mohidin et al. (2017) highlighted individual capabilities factors.

Innovation plays an important role in the KT cycle as it starts at the early stage until the final stage affecting the economic activities. The innovation cycle needs investment in new goods, technologies, markets, materials, and combinations (Alaei et al., 2012). In addition, there should be stronger networking and collaboration between organisations, industries, or universities to create more opportunities in the innovative ecosystem (Cai et al., 2020).

KTPs need to include the element of quality to ensure that the organisation meets the effectiveness and efficiency as it is the main objective to meet high profitability. Each organisation's mindset and activities are different as they are embedded in broader social and economic structures according to the task given, which will hugely improve the organisation's performance (Whah & Tiek, 2012).

Communication is also an essential element in smoothing the KT process. It includes the use of the right communication process and tools. Communication involves creating and ascribing meaning among interconnected persons (Miller & Katherine, 2014; Fatimayin, 2018). It is facilitated by effective communication tools, such as face-to-face meetings, phone talks, and emails, which are feasible, and a combination of communication tools may be utilised (Frank & Ribeiro, 2014).

Lastly, KT must have a competitive advantage because a corporation is the most significant strategic resource. A knowledge-based corporation must understand how to create, share, and utilise information within the organisation and connect it to organisational processes (Rahimli, 2012).

The study's significance will contribute to the practitioners, body of knowledge, policymakers, and others. KT is significant for students, communities, and industries to meet the knowledge-based economy creating innovation for future needs. Higher education institutions need to address the issue of human capital as the rate shows a worsening trend. KT should be implemented to meet students' capabilities in dealing with communities and industries.

5.0 Conclusion

The systematic review of the articles aims to study the essential characteristics of the KTP. The study has shown several characteristics that are important for KT. The results from the review have informed the researchers that there are five important characteristics: knowledge management, innovation tools and process, quality improvement element, communication process and tools, and competitive advantage corporation and process. Thus, organisations planning to conduct a KTP must include these aspects in their checklist to ensure its effectiveness.

The limitation of this study is the methodology itself. The SLR relies heavily on the reliability of the primary source of databases themselves. Therefore, conducting a systematic review does not overcome inherent problems in the design and execution of the primary studies.

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